File #227701639
September 2021

Intersection Control Evaluation (ICE) for MN Highway 7 and MN Highway 23 Intersection

Prepared for:

Minnesota Department of Transportation

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September 2021

Intersection Control Evaluation (ICE) Report

MN Highway 7 and MN Highway 23
City of Clara City
County of Chippewa

I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

_____ Date: September 1, 2021
Edward Terhaar
Stantec Consulting Services, Inc.
Mn Reg. No. 24441

APPROVED:

_____ Date: _____
District Traffic Engineer – District 8

Table of Contents

1.0 PURPOSE AND BACKGROUND 1-1

2.0 EXISTING CONDITIONS 2-1

3.0 FUTURE CONDITIONS 3-1

4.0 ANALYSIS OF ALTERNATIVES 4-1

5.0 RECOMMENDED INTERSECTION CONTROL 5-1

6.0 APPENDIX 6-1

FIGURES

FIGURE 1 PROJECT LOCATION 1-2
FIGURE 2 EXISTING CONDITIONS 2-2
FIGURE 3 EXISTING TURN MOVEMENT VOLUMES 2-3
FIGURE 4 YEAR 2040 TURN MOVEMENT VOLUMES 3-2

1.0 Purpose and Background

The purpose of this Intersection Control Evaluation (ICE) is to determine the appropriate control at the existing intersection of MN Highway 23 and MN Highway 7. The intersection is located in Chippewa County on the south side of Clara City. The intersection has commercial development in the northwest, northeast, and southeast quadrants, and an agricultural field in the southwest quadrant. The intersection location is shown in **Figure 1**.

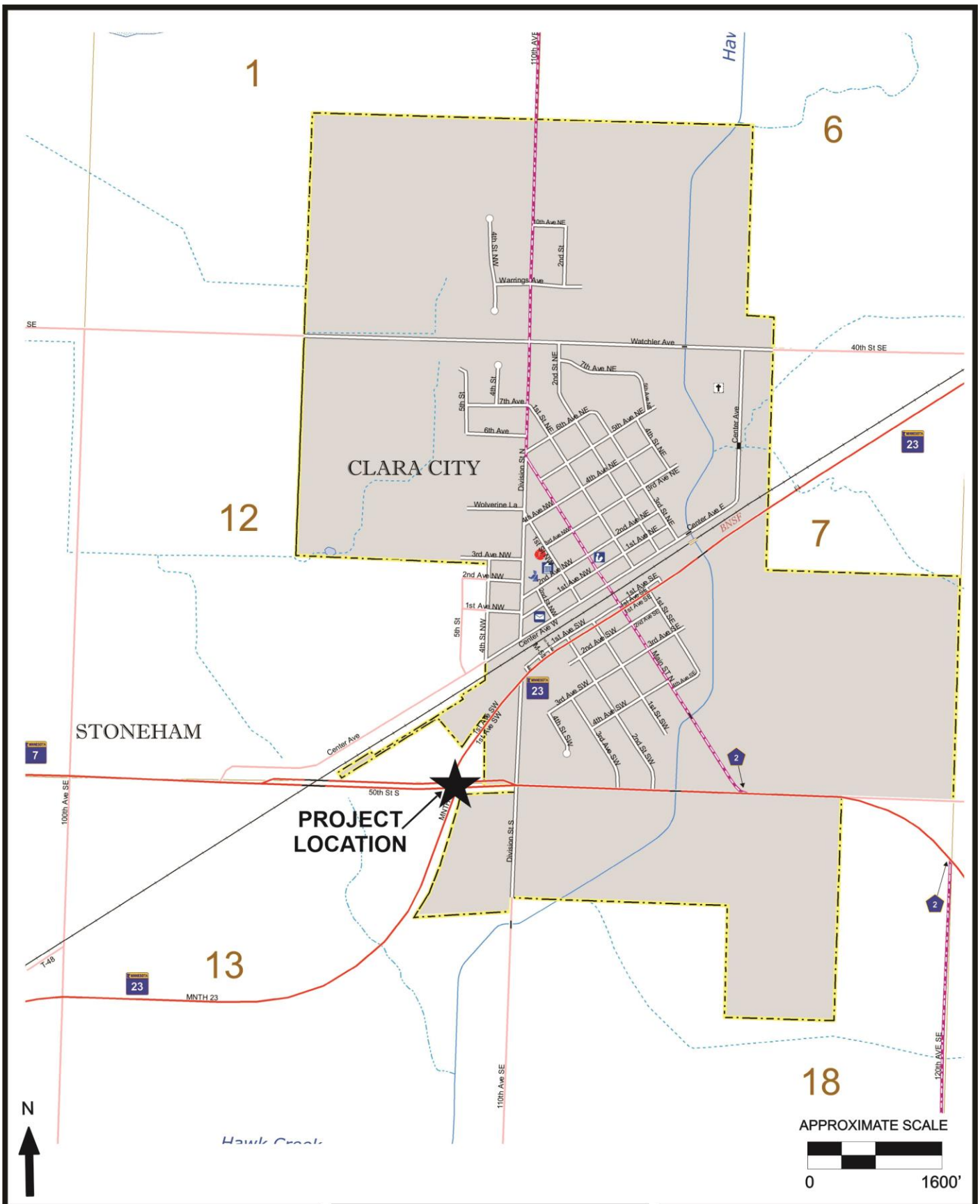
The following goals were identified for this study:

- Improve safety
- Maintain access for nearby businesses and landowners
- Reduce delays for traffic on MN Highway 23
- Make it easier for people walking or biking to cross the intersection
- Ensure freight (including over-size, over-weight) can use the intersection
- Ensure the solution is cost effective
- Reduce driver confusion (who is supposed to stop)

As part of the community engagement for this study, MnDOT provided an online survey to obtain feedback on existing issues and potential solutions. The survey was launched on February 11, 2021 and closed on February 21, 2021. A summary of the survey results are included in the Appendix.

MnDOT also conducted phone interviews of interested stakeholders that the City helped to identify. MnDOT staff spoke with nine different stakeholders through these interviews.

The objective of this report is to provide a recommendation for intersection improvements to adequately serve existing and future mobility needs.



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INTERSECTION CONTROL EVALUATION (ICE) FOR MN HWY 7 AND MN HWY 23 CLARA CITY, MN

FIGURE 1

PROJECT LOCATION

2.0 Existing Conditions

MN Highway 23 is a two-lane undivided roadway with a posted speed limit of 60 miles per hour north and south of Clara City. Within Clara City, the speed limit is 30 miles per hour. The 2018 Annual Average Daily Traffic (AADT) on MN Highway 23 was 4,650 north of MN Highway 7 and 3,300 south of MN Highway 7.

MN Highway 7 is a two-lane undivided roadway with a posted speed limit of 60 miles per hour east and west of Clara City. Near the MN Highway 23 intersection, the speed limit is reduced to 50 miles per hour. The 2018 Annual Average Daily Traffic (AADT) on MN Highway 7 was 3,100 west of MN Highway 23 and 2,550 east of MN Highway 23.

The subject intersection, shown in **Figure 2**, is controlled with stop signs on the MN Highway 23 approaches. The MN Highway 23 approaches consist of one shared left turn/through lane and one channelized right turn lane. The MN Highway 7 approaches consist of one left turn lane, one through lane, and one right turn lane.

The existing stop signs on MN Highway 23 have continuous flashing red beacons above them. The MN Highway 23 approaches also have blank out signs that indicate traffic is approaching when the yellow beacons are flashing. These are known as Rural Intersection Conflict Warning Systems (RICWS) and were installed in December 2015.

Land uses near the intersection include a grain elevator in the northeast quadrant, a City park and recreational vehicle dealer in the northeast quadrant, a gas station in the southeast quadrant, and agricultural land in the southwest quadrant.

Twelve hour turn movement count data was collected in July 2020. At the time of the data collection, automatic count locations on both MN Highway 7 and MN Highway 23 indicated daily traffic volumes were approximately 15% lower than 2019 due to COVID-19 impacts. The turn movement volumes collected for this project were therefore increased by 15% to account for this reduction to estimate volumes during normal conditions.

Peak hour volumes were determined for the intersection during the a.m. and p.m. time periods. During the typical 7-9 a.m. time period, the peak hour was 7:45-8:45 a.m. However, volumes continue to build through the morning, so the actual peak hour occurs from 10:15-11:15 a.m. The p.m. peak hour occurs from 3:30-4:30 p.m. The existing turn movement volumes are shown in **Figure 3**.

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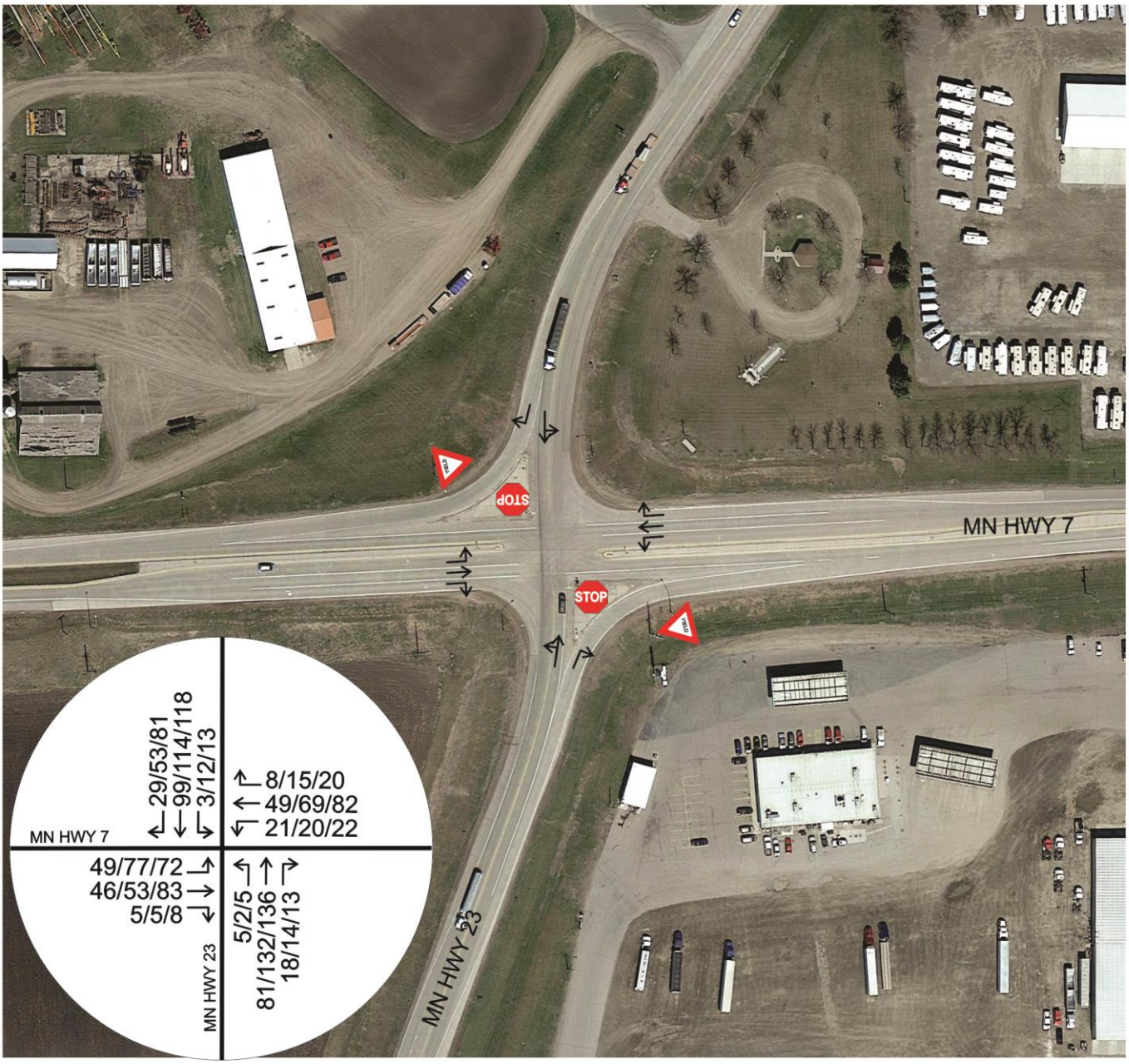
INTERSECTION CONTROL EVALUATION (ICE) FOR
MN HWY 7 AND MN HWY 23
CLARA CITY, MN

FIGURE 2

EXISTING CONDITIONS



N

LEGEND

745-845 AM
1015-1115 AM
330-430 PM
XX/XX/XX

NOTE: DATA RECORDED ON THURSDAY JULY 9, 2020

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INTERSECTION CONTROL EVALUATION (ICE) FOR MN HWY 7 AND MN HWY 23 CLARA CITY, MN

FIGURE 3

EXISTING TURN MOVEMENT VOLUMES

3.0 Future Conditions

Analysis of the traffic control alternatives was completed for 2040. Hourly traffic forecasts were completed for the intersection using the following procedure:

1) Existing hourly traffic counts were collected at the subject intersection in July 2020.

2) The turn movement volumes collected were increased by 15% to account for observed reductions due to COVID-19 impacts resulting in 2020 volumes during normal conditions.

3) Based on historic growth trends on MN Highway 7 and MN Highway 23, a one percent per year growth rate was applied to the existing volumes to determine future 2040 No-Build volumes.

4) Proposed traffic volumes were generated for a potential future industrial park located south of the gas station in the southeast quadrant of the intersection. Traffic volumes for this development were estimated using the following:

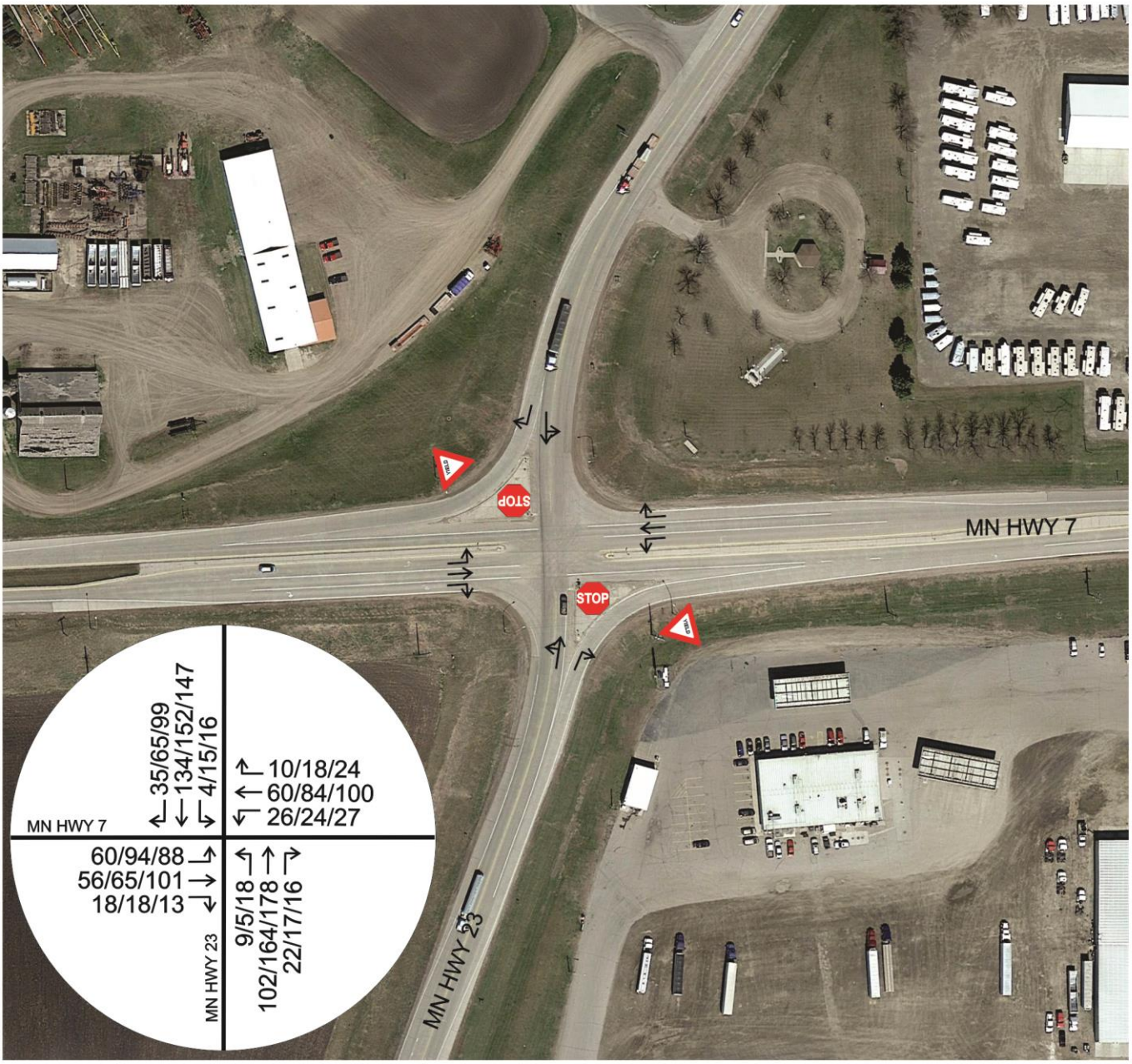
    a. Trip Generation – Peak hour trip generation estimates for the industrial park were established based on data presented in the Institute of Transportation Engineers' Trip Generation, 10th Edition. Trip Generation for the off-peak hours was estimated based on data collected at other similar uses.

    b. Trip Distribution and Assignment – Based on existing and expected future traffic patterns, location of major trip attractions, and the surrounding roadway network, the following trip distribution percentages were established for development trips:

        - 25 percent to/from the west on MN Highway 7
        - 25 percent to/from the north on MN Highway 23
        - 25 percent to/from the south on MN Highway 23
        - 15 percent to/from the east on MN Highway 7
        - 8 percent to/from the north on Division Street
        - 2 percent to/from the south on Division Street

    Development trips were assigned to the subject intersections based on the preceding distribution percentages to establish future 2040 Build volumes. The resultant a.m. and p.m. peak hour volumes are shown in **Figure 4**.

    The resultant 2040 traffic forecasts are considered the worst-case scenario as they account for both background growth and full buildout of the future industrial park. Future traffic volumes would be lower if less growth occurs than assumed.



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INTERSECTION CONTROL EVALUATION (ICE) FOR MN HWY 7 AND MN HWY 23 CLARA CITY, MN

FIGURE 4

YEAR 2040 TURN MOVEMENT VOLUMES

4.0 Analysis of Alternatives

To determine the most appropriate form of traffic control for the subject intersection capable of accommodating existing and future volumes, the following alternatives were examined:

1) Two-way stop control
2) All way stop control
3) Traffic Signal
4) Roundabout

Two-Way Stop Control (Existing control)

Description

With this traffic control, the north and south approaches are subject to stop sign control and the east and west approaches have the right-of-way. The following lane geometrics exist for this alternative:

- Eastbound MN Highway 7 – One left turn lane, one through lane, and one right turn lane
- Westbound MN Highway 7 – One left turn lane, one through lane, and one right turn lane
- Northbound MN Highway 23 – One left turn/through lane and one channelized right lane
- Southbound MN Highway 23 – One left turn/through lane and one channelized right lane

Capacity Analysis

Capacity analyses were completed using Synchro software for the 2020 and 2040 a.m. and p.m. peak hours. Results of the capacity analysis show the following:

- 2020 – All movements operate at Level of Service (LOS) C or better during the a.m. and p.m. peak hours.

- 2040 - All movements operate at LOS C or better during the a.m. and p.m. peak hours.

Crash Analysis

Crash data was obtained from the Minnesota Crash Mapping Analysis Tool (MnCMAT2) for the five-year period of January 1, 2016, to December 31, 2020. The number and severity of the crashes are shown in **Table 1**.

Table 1
Intersection Crash Data

Intersection	Crash Severity					Total Crashes
		Personal Injury				
	Fatal	Type A	Type B	Type C	Property Damage	
MN Highway 7/ MN Highway 23	0	0	4	3	5	12

The intersection crash rate and the intersection severity rate were calculated using an entering volume of 6,820 vehicles per day. The resultant rates are shown in **Table 2**.

Table 2
Crash Rate Comparison

	Crash Rate			Severity Rates		
Intersection	Analysis Intersection	Statewide Average	Critical Crash Rate	Analysis Intersection	Statewide Average	Critical Severity Rate
MN Highway 7/ MN Highway 23	0.96	0.065	0.29	0.0	0.35	6.51

Note: Statewide average rates based on rates from the MnDOT 2015-2019 toolkit.

The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference.

The observed total crash rate for this period is 0.96 per MEV. The observed fatal and serious injury crash rate for this period is 0.00 per 100 MEV.

All-Way Stop Control

Description

This form of control would include stop signs on all four approaches to the subject intersection. All-way stop control is typically considered for low volume intersections.

The following lane geometrics were assumed for this alternative:

- Eastbound MN Highway 7 – One left turn lane, one through lane, and one right turn lane
- Westbound MN Highway 7 – One left turn lane, one through lane, and one right turn lane
- Northbound MN Highway 23 – One left turn/through lane and one channelized right lane
- Southbound MN Highway 23 – One left turn/through lane and one channelized right lane

Warrant Analysis

An All-Way stop warrant analysis was completed using the 2020 and 2040 traffic volumes in accordance with the Minnesota Manual on Uniform Traffic Control Devices (MnMUTCD). The analysis was completed using the existing lane geometrics assuming MN Highway 7 is the major roadway. The results indicate warrants are met for All-Way stop control for the 2020 and 2040 scenarios. The warrant is met for 8 hours using the 2020 volumes and 12 hours using the 2040 volumes. These results meet the requirement that the warrant is met for a minimum of 8 hours. The full warrant results are included in the Appendix.

Capacity Analysis

Capacity analyses were completed using Synchro software for the 2020 and 2040 a.m. and p.m. peak hours. Results of the capacity analysis show the following:

- 2020 – All movements operate at Level of Service (LOS) C or better during the a.m. and p.m. peak hours.

- 2040 - All movements operate at LOS C or better during the a.m. and p.m. peak hours.

Crash Analysis

Projected 2040 traffic volumes and standard crash rates for state highway intersections were used to estimate the average number of crashes for All-Way stop control. A total crash rate of 0.241 per million entering vehicles and a fatal and serious injury crash rate of 0.225 per million entering vehicles were used for the calculations. Based on the projected 2040 entering volume of 8,640 vehicles per day, the average number of total crashes with All-Way stop control would be 0.8 per year. The average number of serious and fatal crashes would be 0.7.

Traffic Signal Control

Description

This form of control would involve the installation of a fully actuated traffic signal at the subject intersection.

The following lane geometrics were assumed for this alternative:

- Eastbound MN Highway 7 – One left turn lane, one through lane, and one right turn lane
- Westbound MN Highway 7 – One left turn lane, one through lane, and one right turn lane
- Northbound MN Highway 23 – One left turn lane, one through lane, and one channelized right lane
- Southbound MN Highway 23 – One left turn lane, one through lane, and one channelized right lane

Warrant Analysis

A traffic signal warrant analysis was completed using the 2020 and 2040 traffic volumes in accordance with the Minnesota Manual on Uniform Traffic Control Devices (MnMUTCD). The analysis was completed using the existing lane geometrics assuming MN Highway 7 is the major roadway. The results indicate warrants are not met for the 2020 and 2040 scenarios. The warrant is met for 0 hours using the 2020 volumes and 0 hours using the 2040 volumes. The full warrant results are included in the Appendix.

Capacity Analysis

Capacity analyses were completed using Synchro software for the 2020 and 2040 a.m. and p.m. peak hours. Results of the capacity analysis show the following:

- 2020 – All movements operate at Level of Service (LOS) B or better during the a.m. and p.m. peak hours.

- 2040 - All movements operate at LOS B or better during the a.m. and p.m. peak hours.

Crash Analysis

Projected 2040 traffic volumes and standard crash rates for state highway intersections were used to estimate the average number of crashes for traffic signal control. A total crash rate of 0.420 per million entering vehicles and a fatal and serious injury crash rate of 0.635 per million entering vehicles were used for the calculations. Based on the projected 2040 entering volume of 8,640 vehicles per day, the average number of total crashes with traffic signal control would be 1.3 per year. The average number of serious and fatal crashes would be 2.0.

Roundabout Control

Description

This form of control would involve the installation of a single lane roundabout at the subject intersection.

Warrant Analysis

Roundabouts are considered to be warranted if traffic volumes meet the criteria for either all-way stop or traffic signal control. In this case, the warrant for all-way stop is met and therefore it is also met for roundabout control.

Capacity Analysis

Capacity analyses were completed using the Synchro software for the 2020 and 2040 a.m. and p.m. peak hours. Results of the capacity analysis show the following:

- 2020 – All movements operate at Level of Service (LOS) A during the a.m. and p.m. peak hours.

- 2040 - All movements operate at LOS A during the a.m. and p.m. peak hours.

Crash Analysis

Projected 2040 traffic volumes and standard crash rates for state highway intersections were used to estimate the average number of crashes for roundabout control. A total crash rate of 0.778 per million entering vehicles and a fatal and serious injury crash rate of 0.377 per million entering vehicles were used for the calculations. Based on the projected 2040 entering volume of 8,640 vehicles per day, the average number of total crashes with roundabout control would be 2.5 per year. The average number of serious and fatal crashes would be 1.2.

5.0 Recommended Intersection Control

Note: After the data was collected and analyzed for this report, three additional crashes were recorded at this intersection in June and July of 2021. While this recent crash data that traffic engineers use to make recommendations on intersection controls is not yet finalized, the District 8 Traffic Engineer has reviewed the preliminary details of all three recent crashes and has taken them into account in the recommendations below.

Based on the analysis in this report along with review of crashes that happened after the data for this report had been collected and analyzed, it is recommended that the following intersection control plan be implemented:

Short Term Recommendations:

1. Review and analyze the final crash data from the recent crashes in June and July of 2021 as they become available.
2. Replace the existing red flashing beacon stop signs with flashing LED stop signs on the MN Highway 23 approaches (if recommendation #7 is implemented, LED stop signs would be installed at the same time).
3. Review and analyze the current Rural Intersection Conflict Warning System (RICWS) to determine if it should be removed or remain.
4. Review existing signs on all approaches to determine if any can be removed to reduce sign clutter.
5. Review existing pavement markings to determine if any need to be replaced or updated.
6. Work with Clara City staff to improve pedestrian facilities on Division Street, east of the MN Highway 7 and 23 intersection to reduce vehicle and pedestrian conflicts.
7. Consider changing the intersection control to an all-way stop, adding LED stop signs to the MN Highway 7 approaches (LED stop signs would be installed in coordination with recommendation #2).

Additional Considerations:

If the severity of crashes increases above the critical rate in the future, a roundabout control should be considered for a long-term solution.

6.0 Appendix

- Survey Results
- All-Way Stop Warrants
- Traffic Signal Warrants
- Level of Service Worksheets

Hwy 23 & Hwy 7 Intersection Study – Clara City

An online survey was launched on February 11, 2021 as part of public engagement for the Hwy 23 & Hwy 7 intersection study in Clara City. The survey (via Survey Monkey) was offered and promoted in both English and Spanish. The online survey included three open ended questions and two multiple choice questions. The survey closed on February 21, 2021.

Survey Promotion

The survey was promoted primarily through social media (paid and organic FB ads) but was also promoted using a news release and emails to key stakeholders and partners. Six hundred and thirty-three (633) surveys were submitted through the English survey link. Three surveys (3) were submitted through the Spanish survey link.

The Spanish survey ad, to date, is the best performing non-English ad for MnDOT.

English Ad

- Reach (the number of people who saw the ad/post at least once): 16, 548
- Impressions (the number of times the ad/post was on screen. Impressions are different from reach; impressions may include multiple views of the ad/post by the same people): 37, 262
- Clicks (the number of times the link included in the ad/post was clicked; for this post, there were two links, one to the study website and one to the survey): 1, 058
- Comments (number of comments on the ad/post): 56
- Engagements (Likes, Shares, Reactions): 1, 206

Spanish Ad

- Reach (the number of people who saw the ad/post at least once): 9, 674
- Impressions (the number of times the ad/post was on screen. Impressions are different from reach; impressions may include multiple views of the ad/post by the same people): 27, 234
- Clicks (the number of times the link included in the ad/post was clicked; for this post, there were two links, one to the study website and one to the survey): 258
- Comments (number of comments on the ad/post): 11
- Engagements (Likes, Shares, Reactions): 291

Demographics (self-reported)

MnDOT strives to represent the communities it serves. To do so, we request survey respondents answer demographic questions. Demographic questions are not required and are at an individual's discretion.

Gender

Male: 333
Female: 333

Age

Under 18: 2
18-24: 57
25-34: 110
35-44: 128
45-54: 111
55-64: 105
65+: 91
No answer: 19

Ethnicity

Caucasian: 518
American Indian or Alaskan Native: 4
Asian: 1
Black or African American: 1
Hispanic/Latino: 5
Native Hawaiian or Pacific Islander: 1
Other: 9
Prefer not to answer: 79

Survey Reponses

Question 1: What concerns do you have about the intersection of Hwy 23 & Hwy 7 in Clara City? (Open ended question where respondents expressed concerns in their own words. Responses were summarized and grouped into like categories seen below)

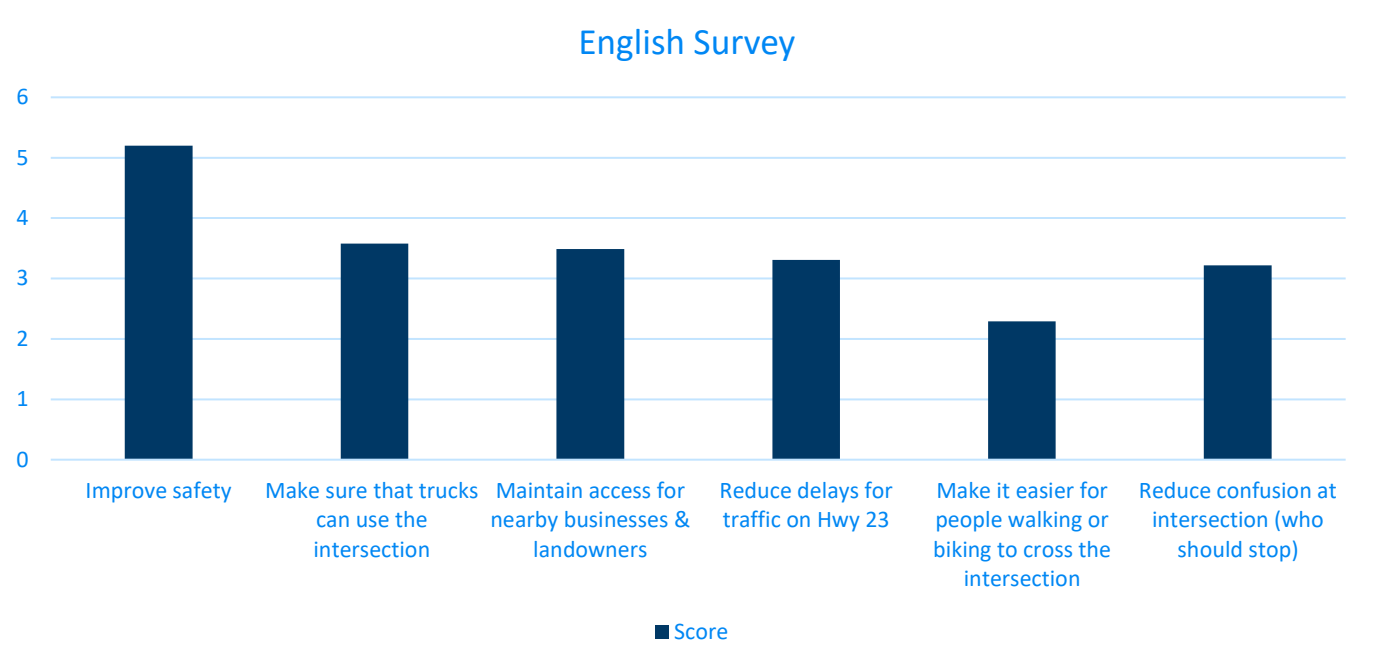
Response Category	# of comments
Safety (intersection is not safe/crash reduction)	134
Nothing needs to be done – intersection works as is	112
Visibility	86
Difficult to cross	41
Confusing (who should stop)	34
Truck traffic/large equipment	27
Other (also includes combinations of categories above)	43

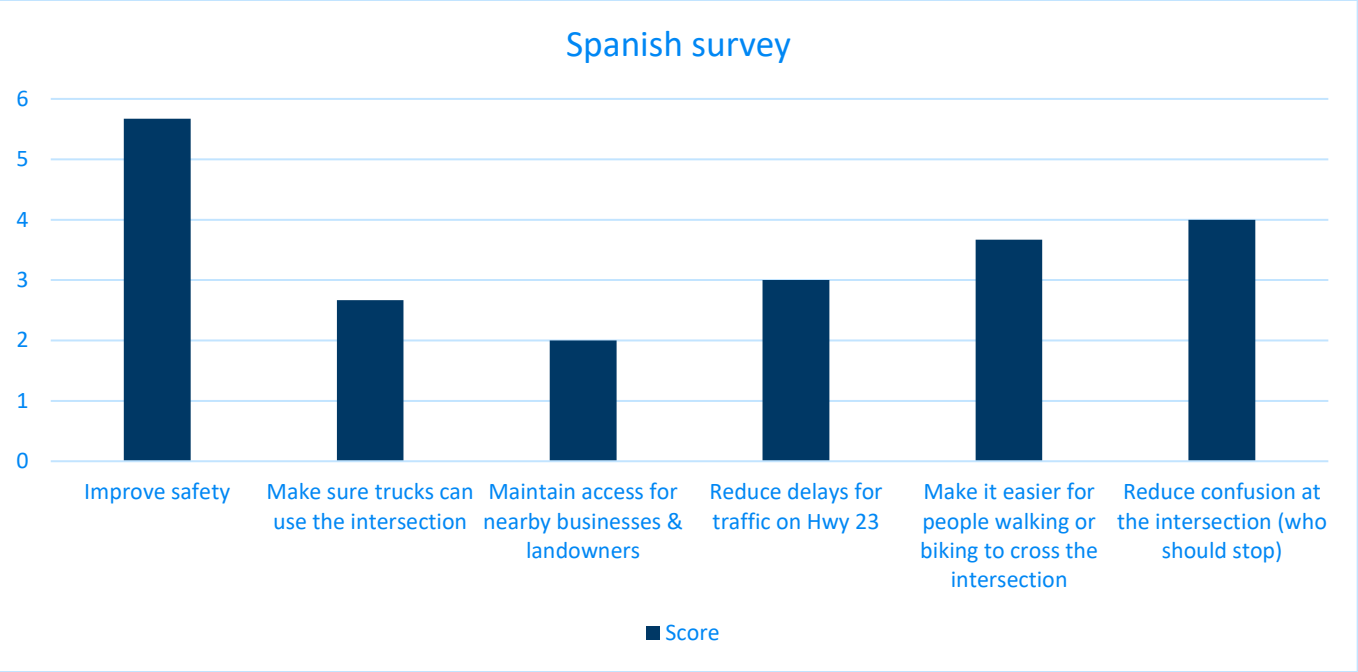
Question 2: What improvements would you like to see at the intersection of Hwy 23 & Hwy 7 in Clara City? (Open ended question where respondents expressed improvements they would like to see in their own words. Responses were summarized and grouped into like categories seen below)

Response Category	# of comments
Roundabout	88
Nothing/intersection works as is	78
Traffic signal	72
Combination of options	61

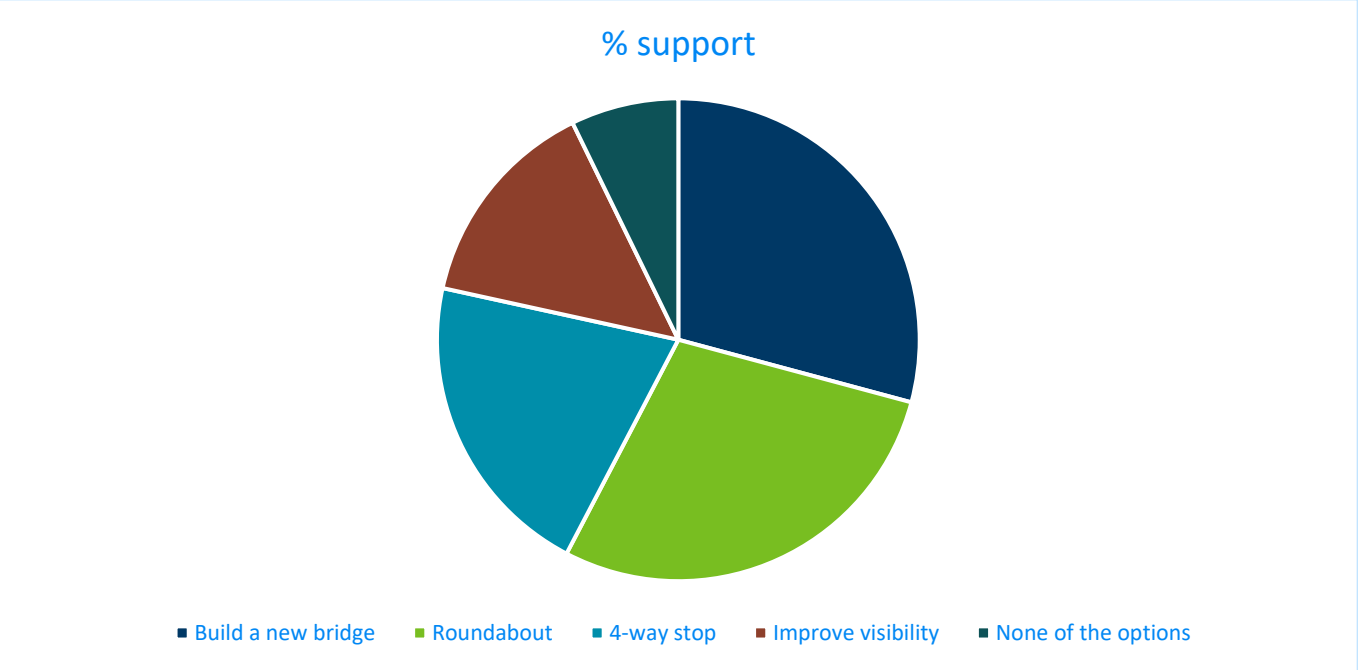
Response Category	# of comments
Bridge	30
Reduce speed limit	28
Four-way/all way stop	16
Make it safer	20
Better flow	8
Improve visibility	8
Four-lane around Clara City	5
Other (or combo of above)	73

Question 3: MnDOT has the following goals for the intersection of Hwy 23 & Hwy 7 in Clara City. Which goals are most important to you? Please put in order of importance with the goal you feel is most important. (Rank choice question with respondents ranking listed goals in order of importance)





Question 4: Please select (all) intersection options you can support at the intersection of Hwy 23 & Hwy 7 in Clara City. (Multiple choice question with the ability to select multiple answers - choices reflected solutions explored in the ICE report)



Other Comments

The last question of the survey asked if individuals would like to tell us anything else about the intersection of Hwy 23 and Hwy 7 in Clara City. Two hundred and fifty-five (255) comments were submitted. Of these comments, the majority referenced not making any improvements to the intersection.

Facebook Comments

MnDOT promoted the survey via paid Facebook ads (English and Spanish). Most comments were about roundabouts, but other comments fit into the categories of traffic lights, stop signs and reducing the speed limit.

All comments, those submitted through the survey as well as those made on Facebook are attached to this document.

2020 ADJUSTED VOLUMES WITH TH 7 MAJOR STREET
ALL WAY STOP WARRANT

LOCATION: TH 23 TH 7
COUNTY: Chippewa
DATE: 9-Jul-20

Speed	Approach	Description	Lanes
50	Major 1	WB TH 7	3
50	Major 2	EB TH 7	3
30	Minor 1	NB TH 23	2
30	Minor 2	SB TH 23	2

					210	140	
HOUR OF DAY	MAJOR APP 1	MAJOR APP 2	MINOR APP 1	MINOR APP 2	MAJOR TOTAL (APP 1 + APP 2)	MINOR TOTAL (APP 1 + APP 2)	WARRANT MET
12-1 am							
1-2 am							
2-3 am							
3-4 am							
4-5 am							
5-6 am	22	25	51	18	47	69	
6-7 am	55	62	110	60	117	170	
7-8 am	84	104	125	84	188	209	
8-9 am	89	98	129	104	187	233	
9-10 am	77	100	164	114	177	278	
10-11 am	112	122	185	136	234	321	Y
11am-12pm	81	143	182	129	224	311	Y
12-1 pm	94	122	177	130	216	307	Y
1-2 pm	99	147	186	113	246	299	Y
2-3 pm	87	140	182	167	227	349	Y
3-4 pm	106	154	204	171	260	375	Y
4-5 pm	117	147	198	153	264	351	Y
5-6 pm	62	154	160	151	216	311	Y
6-7 pm	63	110	125	133	173	258	
7-8 pm	53	63	116	70	116	186	
8-9 pm	44	37	87	59	81	146	
9-10 pm							
10-11 pm							
11-12 pm							
			Met (hr)	Required (hr)			
ALL WAY STOP WARRANT			8	8			

2040 VOLUMES WITH TH 7 MAJOR STREET
ALL WAY STOP WARRANT

LOCATION: TH 23 TH 7
COUNTY: Chippewa
DATE: 9-Jul-20

Speed	Approach	Description	Lanes
50	Major 1	WB TH 7	3
50	Major 2	EB TH 7	3
30	Minor 1	NB TH 23	2
30	Minor 2	SB TH 23	2

					210	140	
HOUR OF DAY	MAJOR APP 1	MAJOR APP 2	MINOR APP 1	MINOR APP 2	MAJOR TOTAL (APP 1 + APP 2)	MINOR TOTAL (APP 1 + APP 2)	WARRANT MET
12-1 am							
1-2 am							
2-3 am							
3-4 am							
4-5 am							
5-6 am	27	35	66	25	62	91	
6-7 am	67	82	140	78	149	218	
7-8 am	102	140	166	108	242	274	Y
8-9 am	109	129	166	133	238	299	Y
9-10 am	94	127	205	145	221	350	Y
10-11 am	137	152	229	172	289	401	Y
11am-12pm	99	177	225	164	276	389	Y
12-1 pm	115	152	219	166	267	385	Y
1-2 pm	121	182	230	145	303	375	Y
2-3 pm	106	174	225	212	280	437	Y
3-4 pm	129	191	252	219	320	471	Y
4-5 pm	143	182	245	202	325	447	Y
5-6 pm	76	191	198	209	267	407	Y
6-7 pm	77	137	156	177	214	333	Y
7-8 pm	65	78	143	92	143	235	
8-9 pm	54	46	107	75	100	182	
9-10 pm							
10-11 pm							
11-12 pm							

	Met (hr)	Required (hr)
ALL WAY STOP WARRANT	12	8

TH 23 TH 7

CITY OF CLARA CITY, MN

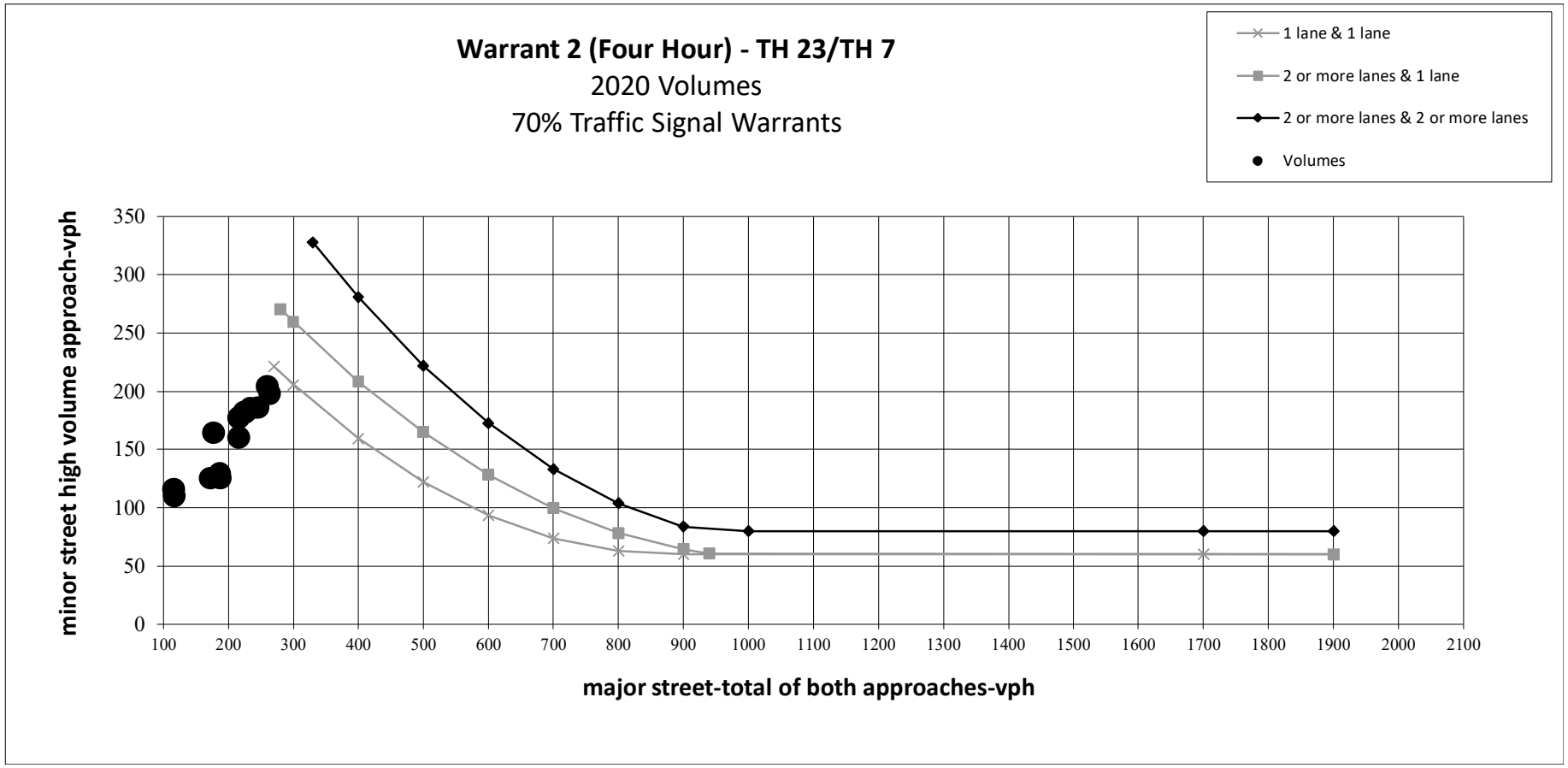
2020 volumes with TH 7 the Major Street

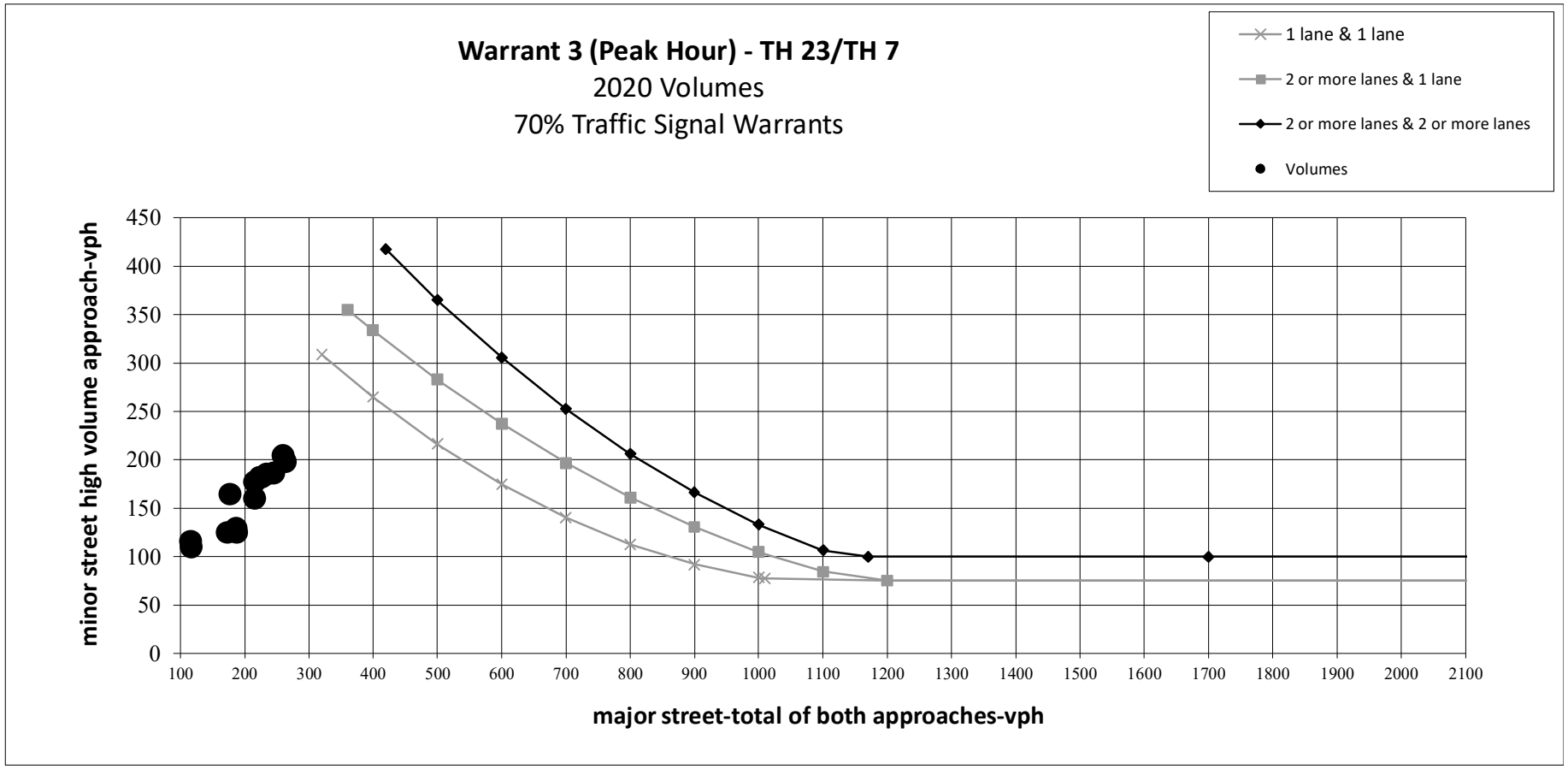
70% Traffic Signal Warrants

HOUR OF DAY	TWO-WAY VOLUME MAJOR STREET	HIGHER VOLUME APPROACH MINOR STREET	SIGNAL WARRANTS 1A	1B	2	3
6-7 am	117	110				
7-8 am	188	125				
8-9 am	187	129				
9-10 am	177	164				
10-11 am	234	185				
11am-12pm	224	182				
12-1 pm	216	177				
1-2 pm	246	186				
2-3 pm	227	182				
3-4 pm	260	204				
4-5 pm	264	198				
5-6 pm	216	160				
6-7 pm	173	125				
7-8 pm	116	116				
		Main Street Volume Needed	420	630	warr 2	warr 3
		Side Street Volume Needed	140	70	graph	graph
		Hours Needed	8	8	4	1
		Hours Met	0	0	0	0

* = Indicates the hours in which the warrants are met.

Warrant Met (YES or NO)	NO	NO	NO	NO


Warrant 2 (Four Hour) - TH 23/TH 7
2020 Volumes
70% Traffic Signal Warrants
1 lane & 1 lane
2 or more lanes & 1 lane
2 or more lanes & 2 or more lanes
Volumes
minor street high volume approach-vph
major street-total of both approaches-vph
0
50
100
150
200
250
300
350
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100


Warrant 3 (Peak Hour) - TH 23/TH 7
2020 Volumes
70% Traffic Signal Warrants
1 lane & 1 lane
2 or more lanes & 1 lane
2 or more lanes & 2 or more lanes
Volumes
minor street high volume approach-vph
major street-total of both approaches-vph
0
50
100
150
200
250
300
350
400
450
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100

TH 23 TH 7

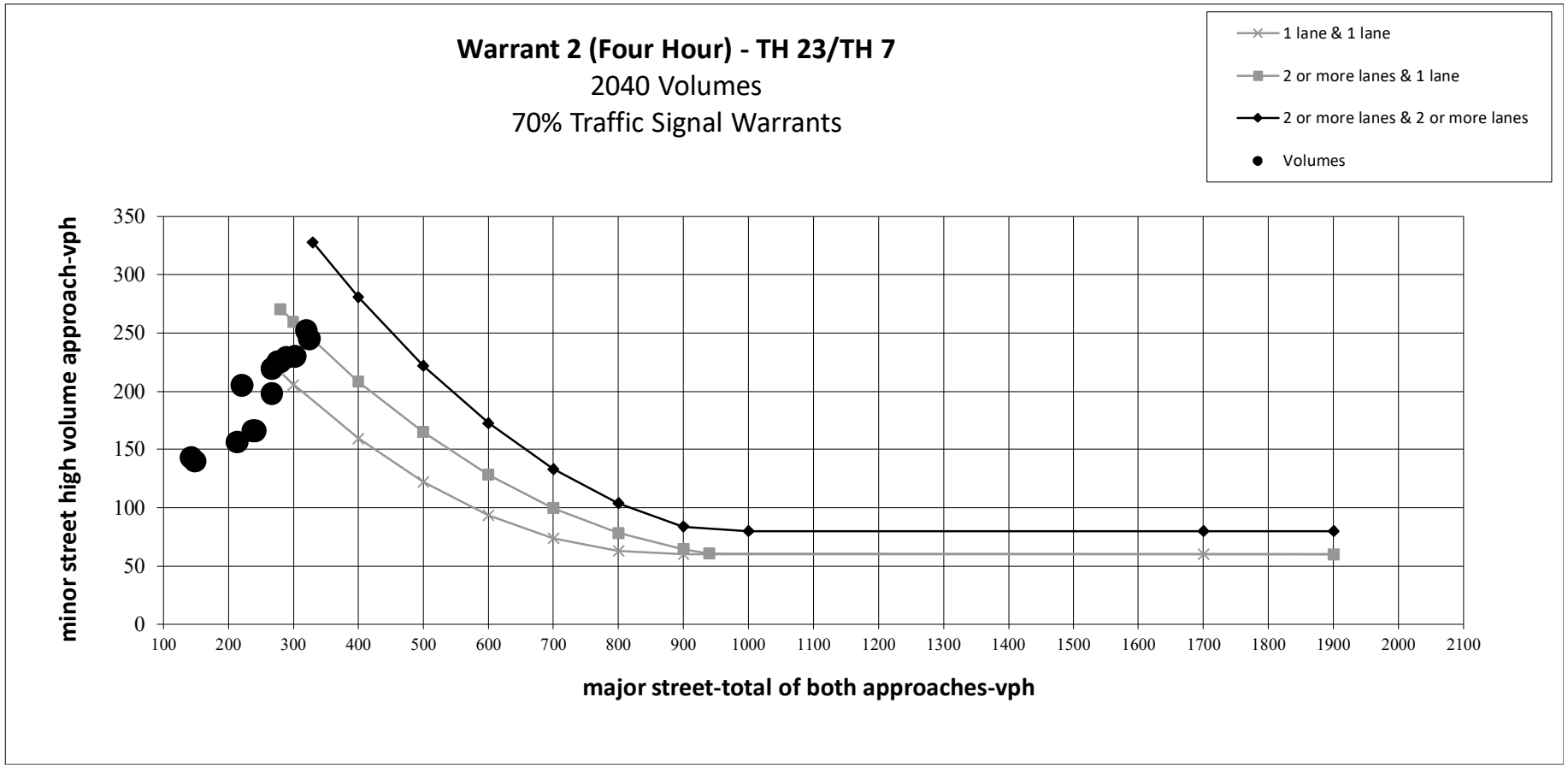
CITY OF CLARA CITY, MN

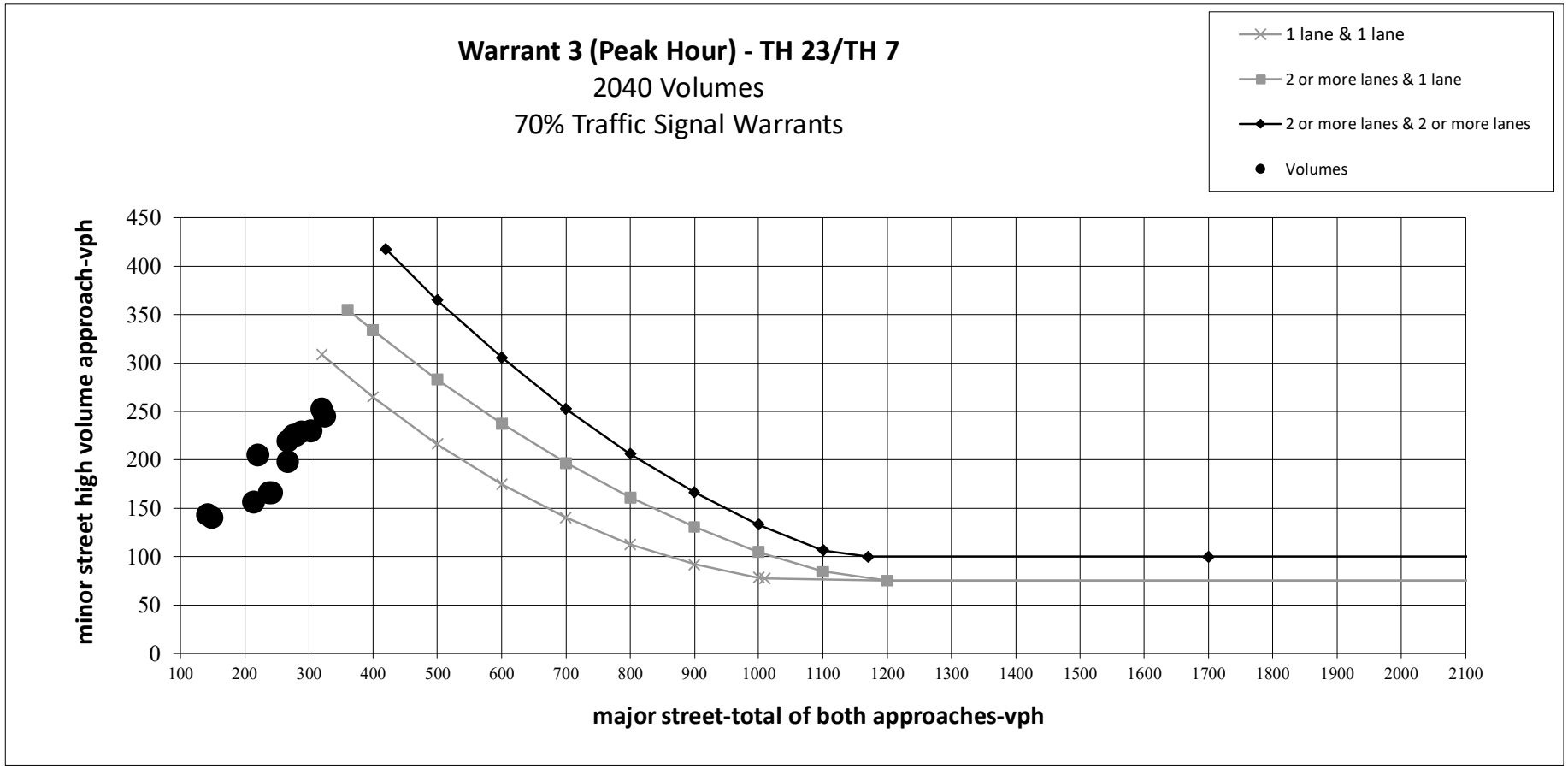
2040 volumes with TH 7 the Major Street
70% Traffic Signal Warrants

HOUR OF DAY	TWO-WAY VOLUME MAJOR STREET	HIGHER VOLUME APPROACH MINOR STREET	SIGNAL WARRANTS 1A	1B	2	3
6-7 am	149	140				
7-8 am	242	166				
8-9 am	238	166				
9-10 am	221	205				
10-11 am	289	229				
11am-12pm	276	225				
12-1 pm	267	219				
1-2 pm	303	230				
2-3 pm	280	225				
3-4 pm	320	252				
4-5 pm	325	245				
5-6 pm	267	198				
6-7 pm	214	156				
7-8 pm	143	143				
		Main Street Volume Needed	420	630	warr 2	warr 3
		Side Street Volume Needed	140	70	graph	graph
		Hours Needed	8	8	4	1
		Hours Met	0	0	0	0

* = Indicates the hours in which the warrants are met.

Warrant Met (YES or NO)	NO	NO	NO	NO


Warrant 2 (Four Hour) - TH 23/TH 7
2040 Volumes
70% Traffic Signal Warrants
1 lane & 1 lane
2 or more lanes & 1 lane
2 or more lanes & 2 or more lanes
Volumes
minor street high volume approach-vph
major street-total of both approaches-vph
0
50
100
150
200
250
300
350
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100


Warrant 3 (Peak Hour) - TH 23/TH 7
2040 Volumes
70% Traffic Signal Warrants
1 lane & 1 lane
2 or more lanes & 1 lane
2 or more lanes & 2 or more lanes
Volumes
minor street high volume approach-vph
major street-total of both approaches-vph
0
50
100
150
200
250
300
350
400
450
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
2100

Intersection	
Int Delay, s/veh	8.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	49	46	5	21	49	8	5	81	18	3	99	29
Future Vol, veh/h	49	46	5	21	49	8	5	81	18	3	99	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	Yield
Storage Length	300	-	300	300	-	300	-	-	250	-	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	14	13	25	50	26	43	2	23	38	33	30	32
Mvmt Flow	60	56	6	26	60	10	6	99	22	4	121	35

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	70	0	0	62	0	0	354	298	56	341	294	60
Stage 1	-	-	-	-	-	-	176	176	-	112	112	-
Stage 2	-	-	-	-	-	-	178	122	-	229	182	-
Critical Hdwy	4.24	-	-	4.6	-	-	7.12	6.73	6.58	7.43	6.8	6.52
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.73	-	6.43	5.8	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.73	-	6.43	5.8	-
Follow-up Hdwy	2.326	-	-	2.65	-	-	3.518	4.207	3.642	3.797	4.27	3.588
Pot Cap-1 Maneuver	1458	-	-	1284	-	-	601	581	918	558	573	927
Stage 1	-	-	-	-	-	-	826	715	-	823	752	-
Stage 2	-	-	-	-	-	-	824	756	-	709	699	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1458	-	-	1284	-	-	457	546	918	448	539	927
Mov Cap-2 Maneuver	-	-	-	-	-	-	457	546	-	448	539	-
Stage 1	-	-	-	-	-	-	792	686	-	789	737	-
Stage 2	-	-	-	-	-	-	649	741	-	568	670	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.7	2.1	12.6	12.7
HCM LOS			B	B

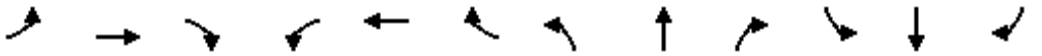
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	540	918	1458	-	-	1284	-	-	536	927
HCM Lane V/C Ratio	0.194	0.024	0.041	-	-	0.02	-	-	0.232	0.038
HCM Control Delay (s)	13.3	9	7.6	-	-	7.9	-	-	13.7	9
HCM Lane LOS	B	A	A	-	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0.7	0.1	0.1	-	-	0.1	-	-	0.9	0.1

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	49	46	5	21	49	8	5	81	18	3	99	29
Future Vol, veh/h	49	46	5	21	49	8	5	81	18	3	99	29
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	14	13	25	50	26	43	2	23	38	33	30	32
Mvmt Flow	60	56	6	26	60	10	6	99	22	4	121	35
Number of Lanes	1	1	1	1	1	1	0	1	1	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	3	3
HCM Control Delay	9.5	9.7	9.3	9.9
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	6%	0%	100%	0%	0%	100%	0%	0%	3%	0%
Vol Thru, %	94%	0%	0%	100%	0%	0%	100%	0%	97%	0%
Vol Right, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	86	18	49	46	5	21	49	8	102	29
LT Vol	5	0	49	0	0	21	0	0	3	0
Through Vol	81	0	0	46	0	0	49	0	99	0
RT Vol	0	18	0	0	5	0	0	8	0	29
Lane Flow Rate	105	22	60	56	6	26	60	10	124	35
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.163	0.032	0.105	0.091	0.009	0.05	0.101	0.015	0.207	0.051
Departure Headway (Hd)	5.583	5.211	6.342	5.821	5.321	7.01	6.095	5.68	6.004	5.238
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	639	682	562	611	667	508	583	625	595	679
Service Time	3.354	2.981	4.122	3.6	3.1	4.796	3.88	3.465	3.775	3.008
HCM Lane V/C Ratio	0.164	0.032	0.107	0.092	0.009	0.051	0.103	0.016	0.208	0.052
HCM Control Delay	9.5	8.2	9.9	9.2	8.1	10.2	9.6	8.6	10.4	8.3
HCM Lane LOS	A	A	A	A	A	B	A	A	B	A
HCM 95th-tile Q	0.6	0.1	0.4	0.3	0	0.2	0.3	0	0.8	0.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	46	5	21	49	8	5	81	18	3	99	29
Future Volume (veh/h)	49	46	5	21	49	8	5	81	18	3	99	29
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	1693	1707	1530	1159	1515	1263	1870	1559	1337	1411	1455	1426
Adj Flow Rate, veh/h	60	56	6	26	60	10	6	99	0	4	121	0
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %	14	13	25	50	26	43	2	23	38	33	30	32
Cap, veh/h	543	296	224	460	208	147	172	321		164	306	
Arrive On Green	0.07	0.17	0.17	0.03	0.14	0.14	0.21	0.21	0.00	0.21	0.21	0.00
Sat Flow, veh/h	1612	1707	1296	1104	1515	1070	42	1498	1133	21	1425	1208
Grp Volume(v), veh/h	60	56	6	26	60	10	105	0	0	125	0	0
Grp Sat Flow(s),veh/h/ln	1612	1707	1296	1104	1515	1070	1539	0	1133	1446	0	1208
Q Serve(g_s), s	0.7	0.7	0.1	0.5	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.7	0.7	0.1	0.5	0.8	0.2	1.3	0.0	0.0	1.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.06		1.00	0.03		1.00
Lane Grp Cap(c), veh/h	543	296	224	460	208	147	493	0		469	0	
V/C Ratio(X)	0.11	0.19	0.03	0.06	0.29	0.07	0.21	0.00		0.27	0.00	
Avail Cap(c_a), veh/h	812	1355	1029	683	1202	849	1633	0		1547	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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.6	8.2	8.0	8.2	9.0	8.8	7.7	0.0	0.0	7.9	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.3	0.0	0.1	0.8	0.2	0.2	0.0	0.0	0.3	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	0.2	0.0	0.1	0.2	0.0	0.3	0.0	0.0	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.7	8.5	8.1	8.3	9.8	8.9	7.9	0.0	0.0	8.2	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A		A	A	
Approach Vol, veh/h		122			96			105	A		125	A
Approach Delay, s/veh		8.1			9.3			7.9			8.2	
Approach LOS		A			A			A			A	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	5.3	8.5		9.5	6.1	7.7				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		22.5	5.5	18.5		22.5	5.5	18.5				
Max Q Clear Time (g_c+I1), s		3.3	2.5	2.7		3.7	2.7	2.8				
Green Ext Time (p_c), s		0.5	0.0	0.2		0.6	0.0	0.2				

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

Notes

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

Intersection	
Intersection Delay, s/veh	4.9
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	122	96	127	160
Demand Flow Rate, veh/h	139	129	158	208
Vehicles Circulating, veh/h	201	196	136	121
Vehicles Exiting, veh/h	82	68	203	204
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.8	5.4	4.5	4.9
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Bypass	Left	Bypass
Designated Moves	LTR	LTR	LT	R	LT	R
Assumed Moves	LTR	LTR	LT	R	LT	R
RT Channelized				Yield		Yield
Lane Util	1.000	1.000	1.000		1.000	
Follow-Up Headway, s	2.609	2.609	2.609		2.609	
Critical Headway, s	4.976	4.976	4.976	30	4.976	46
Entry Flow, veh/h	139	129	128	1287	162	1269
Cap Entry Lane, veh/h	1124	1130	1201	0.725	1220	0.758
Entry HV Adj Factor	0.876	0.747	0.822	22	0.770	35
Flow Entry, veh/h	122	96	105	933	125	961
Cap Entry, veh/h	985	844	987	0.024	939	0.036
V/C Ratio	0.124	0.114	0.107	4.1	0.133	4.1
Control Delay, s/veh	4.8	5.4	4.6	A	5.1	A
LOS	A	A	A	0	A	0
95th %tile Queue, veh	0	0	0		0	

Intersection	
Int Delay, s/veh	9.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	77	53	5	20	69	15	2	132	14	12	114	53
Future Vol, veh/h	77	53	5	20	69	15	2	132	14	12	114	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	Yield
Storage Length	300	-	300	300	-	300	-	-	250	-	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	24	11	50	18	27	46	2	14	17	70	19	28
Mvmt Flow	90	62	6	23	80	17	2	153	16	14	133	62

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	97	0	0	68	0	0	443	385	62	448	374	80
Stage 1	-	-	-	-	-	-	242	242	-	126	126	-
Stage 2	-	-	-	-	-	-	201	143	-	322	248	-
Critical Hdwy	4.34	-	-	4.28	-	-	7.12	6.64	6.37	7.8	6.69	6.48
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.64	-	6.8	5.69	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.64	-	6.8	5.69	-
Follow-up Hdwy	2.416	-	-	2.362	-	-	3.518	4.126	3.453	4.13	4.171	3.552
Pot Cap-1 Maneuver	1369	-	-	1437	-	-	525	530	962	422	531	913
Stage 1	-	-	-	-	-	-	762	684	-	738	760	-
Stage 2	-	-	-	-	-	-	801	756	-	567	671	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1369	-	-	1437	-	-	364	487	962	295	488	913
Mov Cap-2 Maneuver	-	-	-	-	-	-	364	487	-	295	488	-
Stage 1	-	-	-	-	-	-	712	639	-	689	748	-
Stage 2	-	-	-	-	-	-	605	744	-	396	627	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.5	1.5	15.2	14.3
HCM LOS			C	B

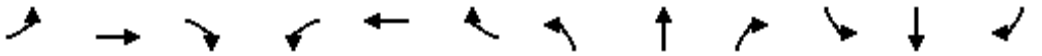
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	485	962	1369	-	-	1437	-	-	459	913
HCM Lane V/C Ratio	0.321	0.017	0.065	-	-	0.016	-	-	0.319	0.068
HCM Control Delay (s)	15.9	8.8	7.8	-	-	7.5	-	-	16.5	9.2
HCM Lane LOS	C	A	A	-	-	A	-	-	C	A
HCM 95th %tile Q(veh)	1.4	0.1	0.2	-	-	0	-	-	1.4	0.2

Intersection	
Intersection Delay, s/veh	10.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	77	53	5	20	69	15	2	132	14	12	114	53
Future Vol, veh/h	77	53	5	20	69	15	2	132	14	12	114	53
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	24	11	50	18	27	46	2	14	17	70	19	28
Mvmt Flow	90	62	6	23	80	17	2	153	16	14	133	62
Number of Lanes	1	1	1	1	1	1	0	1	1	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	3	3
HCM Control Delay	10.7	10.3	10.7	11.5
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	1%	0%	100%	0%	0%	100%	0%	0%	10%	0%
Vol Thru, %	99%	0%	0%	100%	0%	0%	100%	0%	90%	0%
Vol Right, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	134	14	77	53	5	20	69	15	126	53
LT Vol	2	0	77	0	0	20	0	0	12	0
Through Vol	132	0	0	53	0	0	69	0	114	0
RT Vol	0	14	0	0	5	0	0	15	0	53
Lane Flow Rate	156	16	90	62	6	23	80	17	147	62
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.262	0.025	0.176	0.109	0.01	0.046	0.15	0.031	0.29	0.094
Departure Headway (Hd)	6.05	5.545	7.069	6.339	6.301	7.064	6.712	6.33	7.116	5.498
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	594	645	508	566	568	507	534	565	505	651
Service Time	3.784	3.279	4.806	4.076	4.039	4.803	4.451	4.069	4.849	3.232
HCM Lane V/C Ratio	0.263	0.025	0.177	0.11	0.011	0.045	0.15	0.03	0.291	0.095
HCM Control Delay	10.9	8.4	11.3	9.9	9.1	10.1	10.6	9.3	12.7	8.8
HCM Lane LOS	B	A	B	A	A	B	B	A	B	A
HCM 95th-tile Q	1	0.1	0.6	0.4	0	0.1	0.5	0.1	1.2	0.3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	53	5	20	69	15	2	132	14	12	114	53
Future Volume (veh/h)	77	53	5	20	69	15	2	132	14	12	114	53
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	1544	1737	1159	1633	1500	1218	1870	1693	1648	863	1618	1485
Adj Flow Rate, veh/h	90	62	6	23	80	17	2	153	0	14	133	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	24	11	50	18	27	46	2	14	17	70	19	28
Cap, veh/h	540	368	208	513	221	152	152	344		178	307	
Arrive On Green	0.09	0.21	0.21	0.03	0.15	0.15	0.21	0.21	0.00	0.21	0.21	0.00
Sat Flow, veh/h	1471	1737	982	1555	1500	1032	10	1678	1397	81	1496	1259
Grp Volume(v), veh/h	90	62	6	23	80	17	155	0	0	147	0	0
Grp Sat Flow(s),veh/h/ln	1471	1737	982	1555	1500	1032	1688	0	1397	1577	0	1259
Q Serve(g_s), s	1.2	0.7	0.1	0.3	1.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.2	0.7	0.1	0.3	1.2	0.3	2.0	0.0	0.0	1.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.01		1.00	0.10		1.00
Lane Grp Cap(c), veh/h	540	368	208	513	221	152	496	0		485	0	
V/C Ratio(X)	0.17	0.17	0.03	0.04	0.36	0.11	0.31	0.00		0.30	0.00	
Avail Cap(c_a), veh/h	855	1460	826	818	1138	783	1565	0		1466	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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.5	7.9	7.6	8.4	9.4	9.0	8.5	0.0	0.0	8.5	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.2	0.1	0.0	1.0	0.3	0.4	0.0	0.0	0.3	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	0.2	0.0	0.1	0.3	0.1	0.5	0.0	0.0	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.7	8.1	7.7	8.4	10.3	9.3	8.8	0.0	0.0	8.8	0.0	0.0
LnGrp LOS	A	A	A	A	B	A	A	A		A	A	
Approach Vol, veh/h		158			120			155	A		147	A
Approach Delay, s/veh		7.8			9.8			8.8			8.8	
Approach LOS		A			A			A			A	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	5.2	9.7		9.5	6.8	8.1				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		20.5	5.5	20.5		20.5	7.5	18.5				
Max Q Clear Time (g_c+I1), s		4.0	2.3	2.7		3.9	3.2	3.2				
Green Ext Time (p_c), s		0.7	0.0	0.2		0.7	0.1	0.3				

Intersection Summary	
HCM 6th Ctrl Delay	8.8
HCM 6th LOS	A

Notes

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

Intersection	
Intersection Delay, s/veh	5.3
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	158	120	171	209
Demand Flow Rate, veh/h	190	154	195	261
Vehicles Circulating, veh/h	209	288	205	131
Vehicles Exiting, veh/h	104	93	194	311
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.5	6.0	5.0	4.9
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Bypass	Left	Bypass
Designated Moves	LTR	LTR	LT	R	LT	R
Assumed Moves	LTR	LTR	LT	R	LT	R
RT Channelized				Yield		Yield
Lane Util	1.000	1.000	1.000		1.000	
Follow-Up Headway, s	2.609	2.609	2.609		2.609	
Critical Headway, s	4.976	4.976	4.976	19	4.976	79
Entry Flow, veh/h	190	154	176	1255	182	1241
Cap Entry Lane, veh/h	1115	1029	1120	0.855	1207	0.781
Entry HV Adj Factor	0.832	0.781	0.879	16	0.806	62
Flow Entry, veh/h	158	120	155	1073	147	970
Cap Entry, veh/h	928	804	984	0.015	974	0.064
V/C Ratio	0.170	0.150	0.157	3.5	0.151	4.3
Control Delay, s/veh	5.5	6.0	5.1	A	5.1	A
LOS	A	A	A	0	A	0
95th %tile Queue, veh	1	1	1		1	

Intersection	
Int Delay, s/veh	9.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	72	83	8	22	82	20	5	136	13	13	118	81
Future Vol, veh/h	72	83	8	22	82	20	5	136	13	13	118	81
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	Yield
Storage Length	300	-	300	300	-	300	-	-	250	-	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	19	11	29	5	17	53	2	15	27	82	15	10
Mvmt Flow	78	90	9	24	89	22	5	148	14	14	128	88

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	111	0	0	99	0	0	458	405	90	462	392	89
Stage 1	-	-	-	-	-	-	246	246	-	137	137	-
Stage 2	-	-	-	-	-	-	212	159	-	325	255	-
Critical Hdwy	4.29	-	-	4.15	-	-	7.12	6.65	6.47	7.92	6.65	6.3
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.65	-	6.92	5.65	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.65	-	6.92	5.65	-
Follow-up Hdwy	2.371	-	-	2.245	-	-	3.518	4.135	3.543	4.238	4.135	3.39
Pot Cap-1 Maneuver	1379	-	-	1475	-	-	513	515	903	399	524	947
Stage 1	-	-	-	-	-	-	758	679	-	707	759	-
Stage 2	-	-	-	-	-	-	790	742	-	547	673	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1379	-	-	1475	-	-	351	478	903	283	486	947
Mov Cap-2 Maneuver	-	-	-	-	-	-	351	478	-	283	486	-
Stage 1	-	-	-	-	-	-	715	640	-	667	747	-
Stage 2	-	-	-	-	-	-	584	730	-	391	635	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.4	1.3	15.7	13.7
HCM LOS			C	B

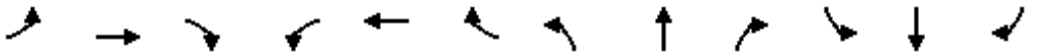
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	472	903	1379	-	-	1475	-	-	454	947
HCM Lane V/C Ratio	0.325	0.016	0.057	-	-	0.016	-	-	0.314	0.093
HCM Control Delay (s)	16.3	9.1	7.8	-	-	7.5	-	-	16.5	9.2
HCM Lane LOS	C	A	A	-	-	A	-	-	C	A
HCM 95th %tile Q(veh)	1.4	0	0.2	-	-	0	-	-	1.3	0.3

Intersection	
Intersection Delay, s/veh	11
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	72	83	8	22	82	20	5	136	13	13	118	81
Future Vol, veh/h	72	83	8	22	82	20	5	136	13	13	118	81
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	19	11	29	5	17	53	2	15	27	82	15	10
Mvmt Flow	78	90	9	24	89	22	5	148	14	14	128	88
Number of Lanes	1	1	1	1	1	1	0	1	1	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	3	3
HCM Control Delay	10.6	10.4	11	11.6
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	4%	0%	100%	0%	0%	100%	0%	0%	10%	0%
Vol Thru, %	96%	0%	0%	100%	0%	0%	100%	0%	90%	0%
Vol Right, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	141	13	72	83	8	22	82	20	131	81
LT Vol	5	0	72	0	0	22	0	0	13	0
Through Vol	136	0	0	83	0	0	82	0	118	0
RT Vol	0	13	0	0	8	0	0	20	0	81
Lane Flow Rate	153	14	78	90	9	24	89	22	142	88
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.265	0.022	0.154	0.162	0.015	0.046	0.165	0.04	0.293	0.135
Departure Headway (Hd)	6.214	5.715	7.09	6.445	6.046	6.958	6.658	6.568	7.42	5.528
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	578	626	506	557	592	514	538	545	484	648
Service Time	3.955	3.457	4.83	4.185	3.786	4.704	4.404	4.314	5.158	3.266
HCM Lane V/C Ratio	0.265	0.022	0.154	0.162	0.015	0.047	0.165	0.04	0.293	0.136
HCM Control Delay	11.2	8.6	11.1	10.4	8.9	10	10.7	9.6	13.2	9.1
HCM Lane LOS	B	A	B	B	A	A	B	A	B	A
HCM 95th-tile Q	1.1	0.1	0.5	0.6	0	0.1	0.6	0.1	1.2	0.5



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	83	8	22	82	20	5	136	13	13	118	81
Future Volume (veh/h)	72	83	8	22	82	20	5	136	13	13	118	81
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	1618	1737	1470	1826	1648	1115	1870	1678	1500	685	1678	1752
Adj Flow Rate, veh/h	78	90	9	24	89	22	5	148	0	14	128	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	19	11	29	5	17	53	2	15	27	82	15	10
Cap, veh/h	550	375	269	552	268	153	157	334		179	315	
Arrive On Green	0.08	0.22	0.22	0.03	0.16	0.16	0.20	0.20	0.00	0.20	0.20	0.00
Sat Flow, veh/h	1541	1737	1246	1739	1648	945	26	1640	1271	87	1547	1485
Grp Volume(v), veh/h	78	90	9	24	89	22	153	0	0	142	0	0
Grp Sat Flow(s),veh/h/ln	1541	1737	1246	1739	1648	945	1665	0	1271	1634	0	1485
Q Serve(g_s), s	1.0	1.1	0.1	0.3	1.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.0	1.1	0.1	0.3	1.2	0.5	2.0	0.0	0.0	1.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.03		1.00	0.10		1.00
Lane Grp Cap(c), veh/h	550	375	269	552	268	153	491	0		494	0	
V/C Ratio(X)	0.14	0.24	0.03	0.04	0.33	0.14	0.31	0.00		0.29	0.00	
Avail Cap(c_a), veh/h	766	1380	990	888	1309	750	1601	0		1568	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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.4	8.0	7.6	8.1	9.1	8.8	8.6	0.0	0.0	8.5	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.3	0.1	0.0	0.7	0.4	0.4	0.0	0.0	0.3	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	0.3	0.0	0.1	0.3	0.1	0.5	0.0	0.0	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.5	8.3	7.7	8.1	9.8	9.2	8.9	0.0	0.0	8.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A		A	A	
Approach Vol, veh/h		177			135			153	A		142	A
Approach Delay, s/veh		7.9			9.4			8.9			8.8	
Approach LOS		A			A			A			A	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	5.3	9.8		9.5	6.6	8.5				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		21.5	5.5	19.5		21.5	5.5	19.5				
Max Q Clear Time (g_c+I1), s		4.0	2.3	3.1		3.8	3.0	3.2				
Green Ext Time (p_c), s		0.7	0.0	0.4		0.6	0.0	0.4				

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

Notes

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

Intersection	
Intersection Delay, s/veh	5.1
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	177	135	167	230
Demand Flow Rate, veh/h	205	163	193	269
Vehicles Circulating, veh/h	197	268	218	134
Vehicles Exiting, veh/h	109	125	184	297
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.4	5.7	5.1	4.5
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Bypass	Left	Bypass
Designated Moves	LTR	LTR	LT	R	LT	R
Assumed Moves	LTR	LTR	LT	R	LT	R
RT Channelized				Yield		Yield
Lane Util	1.000	1.000	1.000		1.000	
Follow-Up Headway, s	2.609	2.609	2.609		2.609	
Critical Headway, s	4.976	4.976	4.976	18	4.976	97
Entry Flow, veh/h	205	163	175	1215	172	1235
Cap Entry Lane, veh/h	1129	1050	1105	0.787	1204	0.909
Entry HV Adj Factor	0.864	0.828	0.873	14	0.825	88
Flow Entry, veh/h	177	135	153	956	142	1122
Cap Entry, veh/h	975	869	965	0.015	992	0.078
V/C Ratio	0.182	0.155	0.158	3.9	0.143	3.9
Control Delay, s/veh	5.4	5.7	5.2	A	4.9	A
LOS	A	A	A	0	A	0
95th %tile Queue, veh	1	1	1		0	

Intersection	
Int Delay, s/veh	9.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	60	56	18	26	60	10	9	102	22	4	134	35
Future Vol, veh/h	60	56	18	26	60	10	9	102	22	4	134	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	Yield
Storage Length	300	-	300	300	-	300	-	-	250	-	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	14	13	25	50	26	43	2	23	38	33	30	32
Mvmt Flow	73	68	22	32	73	12	11	124	27	5	163	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	85	0	0	90	0	0	439	363	68	424	373	73
Stage 1	-	-	-	-	-	-	214	214	-	137	137	-
Stage 2	-	-	-	-	-	-	225	149	-	287	236	-
Critical Hdwy	4.24	-	-	4.6	-	-	7.12	6.73	6.58	7.43	6.8	6.52
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.73	-	6.43	5.8	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.73	-	6.43	5.8	-
Follow-up Hdwy	2.326	-	-	2.65	-	-	3.518	4.207	3.642	3.797	4.27	3.588
Pot Cap-1 Maneuver	1439	-	-	1251	-	-	528	533	903	490	516	911
Stage 1	-	-	-	-	-	-	788	688	-	797	733	-
Stage 2	-	-	-	-	-	-	778	736	-	658	661	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1439	-	-	1251	-	-	350	492	903	362	477	911
Mov Cap-2 Maneuver	-	-	-	-	-	-	350	492	-	362	477	-
Stage 1	-	-	-	-	-	-	748	653	-	756	714	-
Stage 2	-	-	-	-	-	-	557	717	-	491	627	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.4	2.2	14.4	15.2
HCM LOS			B	C

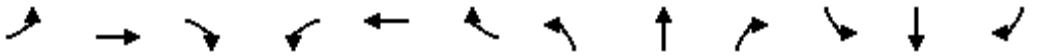
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	476	903	1439	-	-	1251	-	-	473	911
HCM Lane V/C Ratio	0.284	0.03	0.051	-	-	0.025	-	-	0.356	0.047
HCM Control Delay (s)	15.5	9.1	7.6	-	-	8	-	-	16.8	9.1
HCM Lane LOS	C	A	A	-	-	A	-	-	C	A
HCM 95th %tile Q(veh)	1.2	0.1	0.2	-	-	0.1	-	-	1.6	0.1

Intersection	
Intersection Delay, s/veh	10.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	60	56	18	26	60	10	9	102	22	4	134	35
Future Vol, veh/h	60	56	18	26	60	10	9	102	22	4	134	35
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	14	13	25	50	26	43	2	23	38	33	30	32
Mvmt Flow	73	68	22	32	73	12	11	124	27	5	163	43
Number of Lanes	1	1	1	1	1	1	0	1	1	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	3	3
HCM Control Delay	10.1	10.4	10.3	11.3
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	8%	0%	100%	0%	0%	100%	0%	0%	3%	0%
Vol Thru, %	92%	0%	0%	100%	0%	0%	100%	0%	97%	0%
Vol Right, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	111	22	60	56	18	26	60	10	138	35
LT Vol	9	0	60	0	0	26	0	0	4	0
Through Vol	102	0	0	56	0	0	60	0	134	0
RT Vol	0	22	0	0	18	0	0	10	0	35
Lane Flow Rate	135	27	73	68	22	32	73	12	168	43
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.228	0.042	0.139	0.12	0.035	0.067	0.135	0.021	0.3	0.067
Departure Headway (Hd)	6.053	5.669	6.832	6.309	5.807	7.552	6.632	6.216	6.415	5.648
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	594	632	525	569	617	475	541	576	562	635
Service Time	3.783	3.398	4.564	4.041	3.539	5.286	4.366	3.949	4.143	3.376
HCM Lane V/C Ratio	0.227	0.043	0.139	0.12	0.036	0.067	0.135	0.021	0.299	0.068
HCM Control Delay	10.6	8.6	10.7	9.9	8.8	10.8	10.4	9.1	11.9	8.8
HCM Lane LOS	B	A	B	A	A	B	B	A	B	A
HCM 95th-tile Q	0.9	0.1	0.5	0.4	0.1	0.2	0.5	0.1	1.3	0.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	56	18	26	60	10	9	102	22	4	134	35
Future Volume (veh/h)	60	56	18	26	60	10	9	102	22	4	134	35
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	1693	1707	1530	1159	1515	1263	1870	1559	1337	1411	1455	1426
Adj Flow Rate, veh/h	73	68	22	32	73	12	11	124	0	5	163	0
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %	14	13	25	50	26	43	2	23	38	33	30	32
Cap, veh/h	554	331	251	462	233	165	172	318		155	310	
Arrive On Green	0.08	0.19	0.19	0.04	0.15	0.15	0.22	0.22	0.00	0.22	0.22	0.00
Sat Flow, veh/h	1612	1707	1296	1104	1515	1070	61	1465	1133	19	1427	1208
Grp Volume(v), veh/h	73	68	22	32	73	12	135	0	0	168	0	0
Grp Sat Flow(s),veh/h/ln	1612	1707	1296	1104	1515	1070	1527	0	1133	1446	0	1208
Q Serve(g_s), s	0.9	0.8	0.3	0.6	1.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.9	0.8	0.3	0.6	1.1	0.2	1.8	0.0	0.0	2.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.08		1.00	0.03		1.00
Lane Grp Cap(c), veh/h	554	331	251	462	233	165	490	0		465	0	
V/C Ratio(X)	0.13	0.21	0.09	0.07	0.31	0.07	0.28	0.00		0.36	0.00	
Avail Cap(c_a), veh/h	786	1285	976	665	1140	805	1534	0		1467	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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.6	8.3	8.1	8.2	9.2	8.9	8.2	0.0	0.0	8.5	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.3	0.1	0.1	0.8	0.2	0.3	0.0	0.0	0.5	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	0.2	0.1	0.1	0.3	0.0	0.4	0.0	0.0	0.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.7	8.6	8.3	8.3	10.0	9.1	8.6	0.0	0.0	9.0	0.0	0.0
LnGrp LOS	A	A	A	A	B	A	A	A		A	A	
Approach Vol, veh/h		163			117			135	A		168	A
Approach Delay, s/veh		8.2			9.4			8.6			9.0	
Approach LOS		A			A			A			A	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.8	5.5	9.3		9.8	6.5	8.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		22.5	5.5	18.5		22.5	5.5	18.5				
Max Q Clear Time (g_c+I1), s		3.8	2.6	2.8		4.5	2.9	3.1				
Green Ext Time (p_c), s		0.6	0.0	0.3		0.8	0.0	0.3				

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

Notes

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

Intersection	
Intersection Delay, s/veh	5.5
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	163	117	162	211
Demand Flow Rate, veh/h	188	157	201	276
Vehicles Circulating, veh/h	267	247	167	151
Vehicles Exiting, veh/h	103	84	287	253
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.7	6.0	4.9	5.5
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Bypass	Left	Bypass
Designated Moves	LTR	LTR	LT	R	LT	R
Assumed Moves	LTR	LTR	LT	R	LT	R
RT Channelized				Yield		Yield
Lane Util	1.000	1.000	1.000		1.000	
Follow-Up Headway, s	2.609	2.609	2.609		2.609	
Critical Headway, s	4.976	4.976	4.976	37	4.976	57
Entry Flow, veh/h	188	157	164	1267	219	1242
Cap Entry Lane, veh/h	1051	1073	1164	0.725	1183	0.758
Entry HV Adj Factor	0.868	0.745	0.826	27	0.767	43
Flow Entry, veh/h	163	117	135	918	168	941
Cap Entry, veh/h	912	799	961	0.029	908	0.046
V/C Ratio	0.179	0.146	0.141	4.2	0.185	4.2
Control Delay, s/veh	5.7	6.0	5.1	A	5.8	A
LOS	A	A	A	0	A	0
95th %tile Queue, veh	1	1	0		1	

Intersection	
Int Delay, s/veh	12.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	94	65	18	24	84	18	2	164	17	15	152	65
Future Vol, veh/h	94	65	18	24	84	18	2	164	17	15	152	65
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	Yield
Storage Length	300	-	300	300	-	300	-	-	250	-	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	24	11	50	18	27	46	2	14	17	70	19	28
Mvmt Flow	109	76	21	28	98	21	2	191	20	17	177	76

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	119	0	0	97	0	0	547	469	76	554	469	98
Stage 1	-	-	-	-	-	-	294	294	-	154	154	-
Stage 2	-	-	-	-	-	-	253	175	-	400	315	-
Critical Hdwy	4.34	-	-	4.28	-	-	7.12	6.64	6.37	7.8	6.69	6.48
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.64	-	6.8	5.69	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.64	-	6.8	5.69	-
Follow-up Hdwy	2.416	-	-	2.362	-	-	3.518	4.126	3.453	4.13	4.171	3.552
Pot Cap-1 Maneuver	1343	-	-	1402	-	-	448	475	945	355	468	891
Stage 1	-	-	-	-	-	-	714	648	-	711	739	-
Stage 2	-	-	-	-	-	-	751	732	-	511	626	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1343	-	-	1402	-	-	257	428	945	211	422	891
Mov Cap-2 Maneuver	-	-	-	-	-	-	257	428	-	211	422	-
Stage 1	-	-	-	-	-	-	656	596	-	653	724	-
Stage 2	-	-	-	-	-	-	509	717	-	313	575	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.2	1.5	19.2	19.4
HCM LOS			C	C

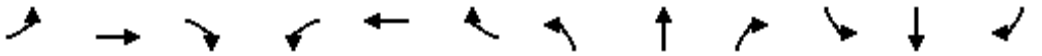
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	425	945	1343	-	-	1402	-	-	387	891
HCM Lane V/C Ratio	0.454	0.021	0.081	-	-	0.02	-	-	0.502	0.085
HCM Control Delay (s)	20.3	8.9	7.9	-	-	7.6	-	-	23.3	9.4
HCM Lane LOS	C	A	A	-	-	A	-	-	C	A
HCM 95th %tile Q(veh)	2.3	0.1	0.3	-	-	0.1	-	-	2.7	0.3

Intersection	
Intersection Delay, s/veh	12.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	94	65	18	24	84	18	2	164	17	15	152	65
Future Vol, veh/h	94	65	18	24	84	18	2	164	17	15	152	65
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	24	11	50	18	27	46	2	14	17	70	19	28
Mvmt Flow	109	76	21	28	98	21	2	191	20	17	177	76
Number of Lanes	1	1	1	1	1	1	0	1	1	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	3	3
HCM Control Delay	11.7	11.4	12.5	13.8
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	1%	0%	100%	0%	0%	100%	0%	0%	9%	0%
Vol Thru, %	99%	0%	0%	100%	0%	0%	100%	0%	91%	0%
Vol Right, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	166	17	94	65	18	24	84	18	167	65
LT Vol	2	0	94	0	0	24	0	0	15	0
Through Vol	164	0	0	65	0	0	84	0	152	0
RT Vol	0	17	0	0	18	0	0	18	0	65
Lane Flow Rate	193	20	109	76	21	28	98	21	194	76
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.351	0.033	0.231	0.144	0.04	0.059	0.198	0.04	0.408	0.125
Departure Headway (Hd)	6.551	6.047	7.597	6.864	6.826	7.657	7.303	6.919	7.555	5.938
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	546	589	471	520	522	466	489	515	476	601
Service Time	4.319	3.814	5.369	4.635	4.597	5.435	5.081	4.697	5.317	3.699
HCM Lane V/C Ratio	0.353	0.034	0.231	0.146	0.04	0.06	0.2	0.041	0.408	0.126
HCM Control Delay	12.9	9	12.7	10.8	9.9	10.9	11.9	10	15.5	9.6
HCM Lane LOS	B	A	B	B	A	B	B	A	C	A
HCM 95th-tile Q	1.6	0.1	0.9	0.5	0.1	0.2	0.7	0.1	2	0.4



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	65	18	24	84	18	2	164	17	15	152	65
Future Volume (veh/h)	94	65	18	24	84	18	2	164	17	15	152	65
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	1544	1737	1159	1633	1500	1218	1870	1693	1648	863	1618	1485
Adj Flow Rate, veh/h	109	76	21	28	98	21	2	191	0	17	177	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	24	11	50	18	27	46	2	14	17	70	19	28
Cap, veh/h	535	397	224	511	238	164	141	369		166	331	
Arrive On Green	0.10	0.23	0.23	0.04	0.16	0.16	0.22	0.22	0.00	0.22	0.22	0.00
Sat Flow, veh/h	1471	1737	982	1555	1500	1032	7	1682	1397	71	1507	1259
Grp Volume(v), veh/h	109	76	21	28	98	21	193	0	0	194	0	0
Grp Sat Flow(s),veh/h/ln	1471	1737	982	1555	1500	1032	1689	0	1397	1578	0	1259
Q Serve(g_s), s	1.5	0.9	0.4	0.4	1.5	0.5	0.0	0.0	0.0	0.1	0.0	0.0
Cycle Q Clear(g_c), s	1.5	0.9	0.4	0.4	1.5	0.5	2.6	0.0	0.0	2.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.01		1.00	0.09		1.00
Lane Grp Cap(c), veh/h	535	397	224	511	238	164	510	0		496	0	
V/C Ratio(X)	0.20	0.19	0.09	0.05	0.41	0.13	0.38	0.00		0.39	0.00	
Avail Cap(c_a), veh/h	747	1331	752	754	1063	732	1527	0		1427	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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.7	8.1	7.9	8.6	9.9	9.4	9.0	0.0	0.0	9.0	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.2	0.2	0.0	1.1	0.3	0.5	0.0	0.0	0.5	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	0.3	0.2	0.1	0.1	0.4	0.1	0.7	0.0	0.0	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.9	8.4	8.1	8.7	11.0	9.8	9.4	0.0	0.0	9.5	0.0	0.0
LnGrp LOS	A	A	A	A	B	A	A	A		A	A	
Approach Vol, veh/h		206			147			193	A		194	A
Approach Delay, s/veh		8.1			10.4			9.4			9.5	
Approach LOS		A			B			A			A	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		10.2	5.4	10.5		10.2	7.2	8.6				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		21.5	5.0	20.0		21.5	6.5	18.5				
Max Q Clear Time (g_c+I1), s		4.6	2.4	2.9		4.8	3.5	3.5				
Green Ext Time (p_c), s		0.9	0.0	0.3		0.9	0.1	0.4				

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

Notes

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

Intersection	
Intersection Delay, s/veh	6.1
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	206	147	213	270
Demand Flow Rate, veh/h	251	188	243	337
Vehicles Circulating, veh/h	273	355	248	159
Vehicles Exiting, veh/h	126	113	275	384
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.7	6.9	5.6	5.4
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Bypass	Left	Bypass
Designated Moves	LTR	LTR	LT	R	LT	R
Assumed Moves	LTR	LTR	LT	R	LT	R
RT Channelized				Yield		Yield
Lane Util	1.000	1.000	1.000		1.000	
Follow-Up Headway, s	2.609	2.609	2.609		2.609	
Critical Headway, s	4.976	4.976	4.976	23	4.976	97
Entry Flow, veh/h	251	188	220	1230	240	1213
Cap Entry Lane, veh/h	1045	961	1071	0.855	1173	0.781
Entry HV Adj Factor	0.819	0.780	0.878	20	0.810	76
Flow Entry, veh/h	206	147	193	1051	194	948
Cap Entry, veh/h	856	749	941	0.019	950	0.080
V/C Ratio	0.240	0.196	0.205	3.6	0.205	4.5
Control Delay, s/veh	6.7	6.9	5.8	A	5.8	A
LOS	A	A	A	0	A	0
95th %tile Queue, veh	1	1	1		1	

Intersection	
Int Delay, s/veh	12.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	88	101	13	27	100	24	18	178	16	16	147	99
Future Vol, veh/h	88	101	13	27	100	24	18	178	16	16	147	99
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	Yield
Storage Length	300	-	300	300	-	300	-	-	250	-	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	19	11	29	5	17	53	2	15	27	82	15	10
Mvmt Flow	96	110	14	29	109	26	20	193	17	17	160	108

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	135	0	0	124	0	0	562	495	110	573	483	109
Stage 1	-	-	-	-	-	-	302	302	-	167	167	-
Stage 2	-	-	-	-	-	-	260	193	-	406	316	-
Critical Hdwy	4.29	-	-	4.15	-	-	7.12	6.65	6.47	7.92	6.65	6.3
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.65	-	6.92	5.65	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.65	-	6.92	5.65	-
Follow-up Hdwy	2.371	-	-	2.245	-	-	3.518	4.135	3.543	4.238	4.135	3.39
Pot Cap-1 Maneuver	1351	-	-	1444	-	-	438	457	880	331	465	923
Stage 1	-	-	-	-	-	-	707	641	-	679	736	-
Stage 2	-	-	-	-	-	-	745	717	-	490	632	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1351	-	-	1444	-	-	256	416	880	193	423	923
Mov Cap-2 Maneuver	-	-	-	-	-	-	256	416	-	193	423	-
Stage 1	-	-	-	-	-	-	657	595	-	631	721	-
Stage 2	-	-	-	-	-	-	502	703	-	301	587	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.4	1.3	23.3	17.6
HCM LOS			C	C

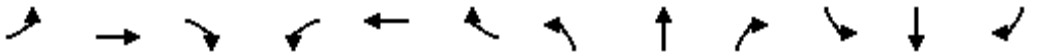
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	393	880	1351	-	-	1444	-	-	379	923
HCM Lane V/C Ratio	0.542	0.02	0.071	-	-	0.02	-	-	0.467	0.117
HCM Control Delay (s)	24.5	9.2	7.9	-	-	7.5	-	-	22.6	9.4
HCM Lane LOS	C	A	A	-	-	A	-	-	C	A
HCM 95th %tile Q(veh)	3.1	0.1	0.2	-	-	0.1	-	-	2.4	0.4

Intersection	
Intersection Delay, s/veh	12.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	88	101	13	27	100	24	18	178	16	16	147	99
Future Vol, veh/h	88	101	13	27	100	24	18	178	16	16	147	99
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	19	11	29	5	17	53	2	15	27	82	15	10
Mvmt Flow	96	110	14	29	109	26	20	193	17	17	160	108
Number of Lanes	1	1	1	1	1	1	0	1	1	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	3	3
HCM Control Delay	12	11.7	13.6	13.7
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	9%	0%	100%	0%	0%	100%	0%	0%	10%	0%
Vol Thru, %	91%	0%	0%	100%	0%	0%	100%	0%	90%	0%
Vol Right, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	196	16	88	101	13	27	100	24	163	99
LT Vol	18	0	88	0	0	27	0	0	16	0
Through Vol	178	0	0	101	0	0	100	0	147	0
RT Vol	0	16	0	0	13	0	0	24	0	99
Lane Flow Rate	213	17	96	110	14	29	109	26	177	108
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.399	0.03	0.204	0.215	0.026	0.062	0.22	0.052	0.391	0.181
Departure Headway (Hd)	6.74	6.212	7.694	7.046	6.645	7.604	7.302	7.213	7.936	6.041
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	530	573	464	506	535	468	488	493	452	591
Service Time	4.517	3.989	5.478	4.829	4.427	5.395	5.093	5.003	5.709	3.813
HCM Lane V/C Ratio	0.402	0.03	0.207	0.217	0.026	0.062	0.223	0.053	0.392	0.183
HCM Control Delay	14	9.2	12.5	11.8	9.6	10.9	12.2	10.4	15.8	10.2
HCM Lane LOS	B	A	B	B	A	B	B	B	C	B
HCM 95th-tile Q	1.9	0.1	0.8	0.8	0.1	0.2	0.8	0.2	1.8	0.7



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	101	13	27	100	24	18	178	16	16	147	99
Future Volume (veh/h)	88	101	13	27	100	24	18	178	16	16	147	99
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	1618	1737	1470	1826	1648	1115	1870	1678	1500	685	1678	1752
Adj Flow Rate, veh/h	96	110	14	29	109	26	20	193	0	17	160	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	19	11	29	5	17	53	2	15	27	82	15	10
Cap, veh/h	536	392	281	541	274	157	167	355		167	355	
Arrive On Green	0.10	0.23	0.23	0.04	0.17	0.17	0.23	0.23	0.00	0.23	0.23	0.00
Sat Flow, veh/h	1541	1737	1246	1739	1648	945	80	1556	1271	78	1555	1485
Grp Volume(v), veh/h	96	110	14	29	109	26	213	0	0	177	0	0
Grp Sat Flow(s),veh/h/ln	1541	1737	1246	1739	1648	945	1636	0	1271	1633	0	1485
Q Serve(g_s), s	1.3	1.4	0.2	0.4	1.6	0.6	0.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.3	1.4	0.2	0.4	1.6	0.6	3.0	0.0	0.0	2.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.09		1.00	0.10		1.00
Lane Grp Cap(c), veh/h	536	392	281	541	274	157	522	0		521	0	
V/C Ratio(X)	0.18	0.28	0.05	0.05	0.40	0.17	0.41	0.00		0.34	0.00	
Avail Cap(c_a), veh/h	767	1313	942	806	1152	660	1456	0		1451	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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.7	8.5	8.0	8.6	9.8	9.5	9.0	0.0	0.0	8.8	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.4	0.1	0.0	0.9	0.5	0.5	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	0.3	0.4	0.0	0.1	0.4	0.1	0.8	0.0	0.0	0.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.9	8.9	8.1	8.6	10.8	9.9	9.5	0.0	0.0	9.2	0.0	0.0
LnGrp LOS	A	A	A	A	B	A	A	A		A	A	
Approach Vol, veh/h		220			164			213	A		177	A
Approach Delay, s/veh		8.4			10.3			9.5			9.2	
Approach LOS		A			B			A			A	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		10.5	5.5	10.5		10.5	7.0	8.9				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		21.5	5.0	20.0		21.5	6.5	18.5				
Max Q Clear Time (g_c+I1), s		5.0	2.4	3.4		4.4	3.3	3.6				
Green Ext Time (p_c), s		1.1	0.0	0.5		0.8	0.1	0.5				

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

Notes

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

Intersection	
Intersection Delay, s/veh	5.9
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	220	164	230	285
Demand Flow Rate, veh/h	254	198	264	334
Vehicles Circulating, veh/h	245	356	267	178
Vehicles Exiting, veh/h	148	153	232	376
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.2	6.7	6.0	5.1
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Bypass	Left	Bypass
Designated Moves	LTR	LTR	LT	R	LT	R
Assumed Moves	LTR	LTR	LT	R	LT	R
RT Channelized				Yield		Yield
Lane Util	1.000	1.000	1.000		1.000	
Follow-Up Headway, s	2.609	2.609	2.609		2.609	
Critical Headway, s	4.976	4.976	4.976	22	4.976	119
Entry Flow, veh/h	254	198	242	1180	215	1187
Cap Entry Lane, veh/h	1075	960	1051	0.787	1151	0.909
Entry HV Adj Factor	0.866	0.830	0.880	17	0.823	108
Flow Entry, veh/h	220	164	213	930	177	1079
Cap Entry, veh/h	931	797	925	0.018	947	0.100
V/C Ratio	0.236	0.206	0.230	4.0	0.187	4.2
Control Delay, s/veh	6.2	6.7	6.2	A	5.6	A
LOS	A	A	A	0	A	0
95th %tile Queue, veh	1	1	1		1	