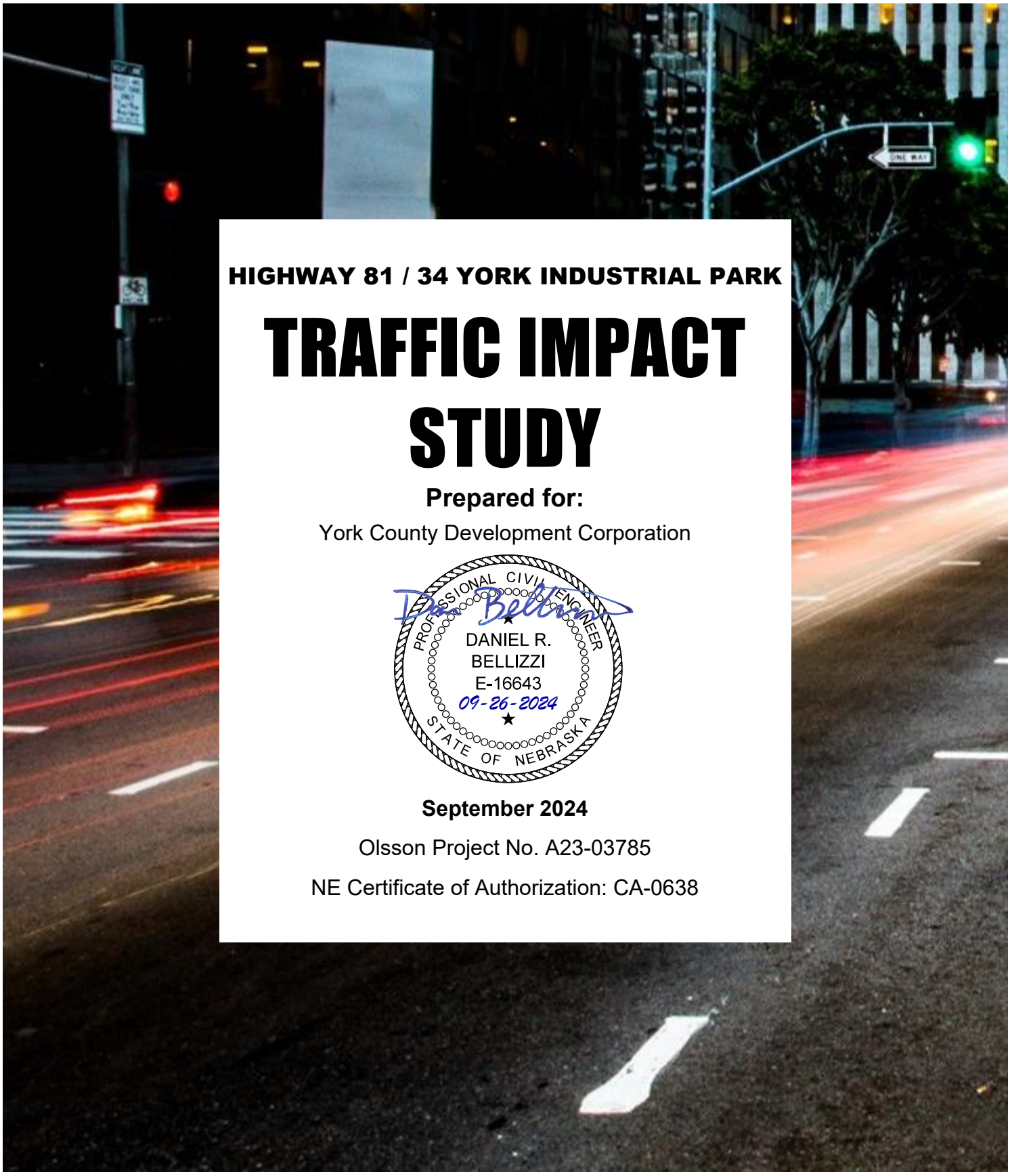


HIGHWAY 81 / 34 YORK INDUSTRIAL PARK

TRAFFIC IMPACT STUDY

Prepared for:

York County Development Corporation

PROFESSIONAL CIVIL ENGINEER
DANIEL R.
BELLIZZI
E-16643
09-26-2024
STATE OF NEBRASKA

September 2024

Olsson Project No. A23-03785

NE Certificate of Authorization: CA-0638

olsson®

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1. INTRODUCTION

This report documents the traffic impacts of the proposed industrial park located in the northwest and northeast quadrants of U.S. Highway 81/34 (US-81/34) and 25th Street in York, Nebraska. The location of the proposed development is shown in **Figure 1**.

This report presents the potential impacts of the proposed development on the existing and proposed roadway network modifications and, as appropriate, recommends turn lane and storage bay modifications, intersection control methods, and other traffic-related countermeasures per Nebraska Department of Transportation (NDOT) and Institute of Transportation Engineers (ITE) criteria. The study intersections include the following:

- US-81/34 and 25th Street
- US-81/34 and County Road 15
- Lincoln Avenue and 25th Street
- US-34 and County Road L
- Proposed Site Drives

The following scenarios were analyzed considering weekday AM and PM peak hours:

- Existing Conditions
- Future Year 2030 Conditions (No Development)
- Future Year 2040 Conditions (No Development)
- Future Year 2030 Plus Site Conditions
- Future Year 2040 Plus Site Conditions

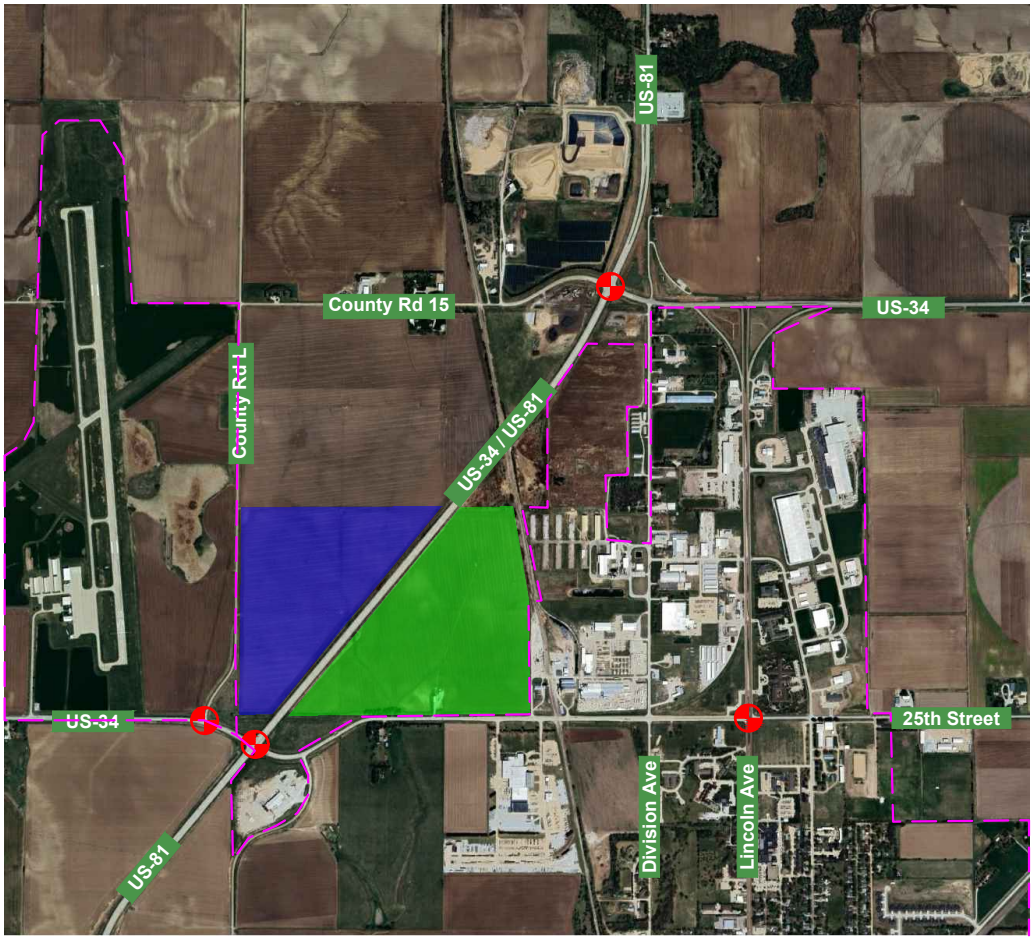
2. DATA COLLECTION

The data collection effort included obtaining turning movement counts (TMCs) and documentation of current roadway geometrics and traffic control. Olsson coordinated eight-hour TMCs (7:00-9:00am, 11:00am-2:00pm, 3:00-6:00pm) at the study intersections on Thursday, April 18, 2024. The count data included a breakdown of vehicular counts by classification.

The counts were taken at 15-minute intervals and separated by vehicle classifications. A summary of the existing AM and PM peak hour traffic count data is illustrated in **Figure 2**. Traffic count data is provided in **Appendix A**.

FIGURE 1
Vicinity Map

N
N.T.S.



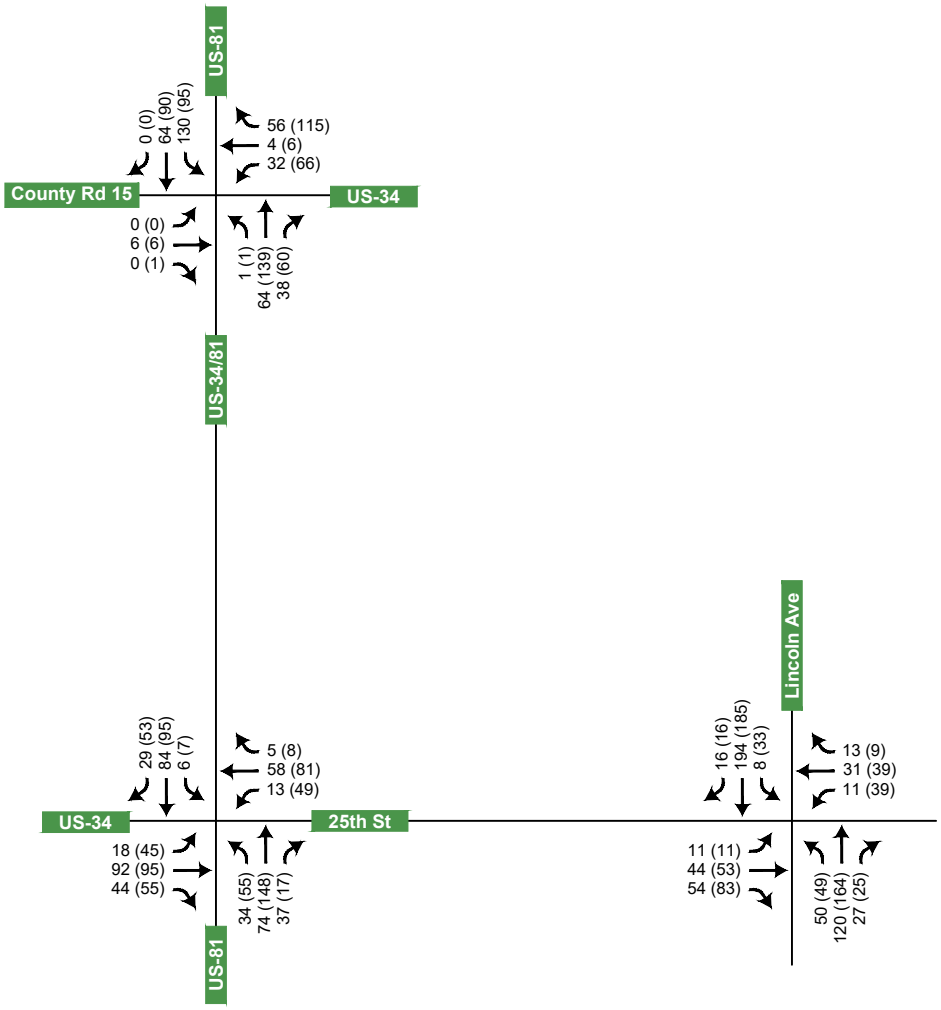
LEGEND

- Phase 1 Site Development
- Phase 2 Site Development
- Study Intersection
- York Corporate Boundary

FIGURE 2

Existing Conditions
Peak Hour Volumes

N.T.S.



LEGEND

AM (PM) Peak Hour Volumes

3. EXISTING CONDITIONS

Existing traffic conditions were evaluated to identify any existing deficiencies and to provide a baseline for comparison purposes.

3.1 Network Characteristics

Within the study area there are six roadways that were considered during analysis: US-34, US-81, 25th Street, Lincoln Avenue, County Road 15, and County Road L. Data for each facility was acquired from aerial photography and the NDOT National Functional Classification Map. Current network characteristics were determined and are summarized in **Table 1**.

Table 1. Existing Network Summary

Roadway	Functional Classification	Typical Section	Median Type	Posted Speed
US-34	Minor Arterial	Two-Lane	n/a	65 mph
US-81	Other Freeway / Expressway	Four-Lane	Divided	60 mph
25th Street	Other Principal Arterial	Two-Lane*	n/a	45 mph
25th Street	Other Principal Arterial	Three-Lane*	Raised	45 mph
Lincoln Avenue	Other Principal Arterial	Four-Lane	Divided	45 mph
County Road 15	Local	Gravel	n/a	n/a
County Road L	Local	Gravel	n/a	n/a

*25th Street is a two-lane typical section with raised medians and turn lanes from west of Division Avenue to Lincoln Avenue.

All study intersections are unsignalized with two-way stop control. There are closed off exclusive side street left-turn lanes at all study intersections which reduces vehicular conflicts. Existing lane configurations and traffic control for the study network are illustrated in **Figure 3**.

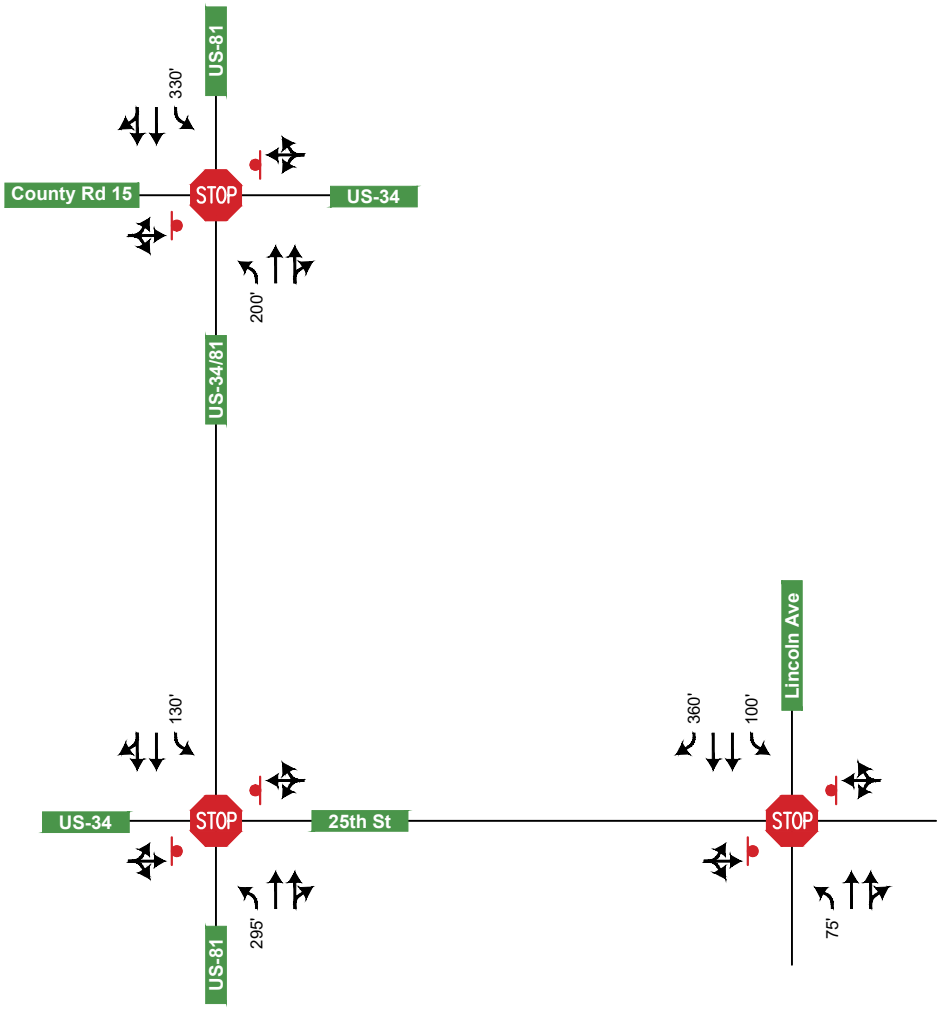
3.2 Existing Crashes

During the process of this traffic impact study, two fatal crashes occurred at study intersections: on at US-81/34 and 25th Street (July 2024), and one at US-81/34 and County Road 15 (May 2024). A detailed safety evaluation is out of the scope of this study, but such an evaluation should be performed at these intersections to determine appropriate safety measures that could be implemented. The recommendations in this report do not reflect potential improvements from a detailed safety evaluation.

FIGURE 3

Existing Conditions
Lane Configuration and Traffic Control

N.T.S.



LEGEND

XX' → Lane Configuration & Storage Length

STOP Stop Controlled Intersection

Stop Sign

3.3 Existing Capacity Analysis

Capacity analysis was performed for the study intersections using the existing lane configurations and traffic control. Analysis was conducted using Synchro, Version 11, based on the *Highway Capacity Manual* (HCM) delay methodologies. For simplicity, the amount of control delay is equated to a grade or Level of Service (LOS) based on thresholds of driver acceptance. The amount of delay is assigned a letter grade A through F, LOS A representing little or no delay and LOS F representing very high delay. **Table 2** shows the delays associated with each LOS grade for signalized and unsignalized intersections, respectively. Queuing analysis was conducted referencing the 95th percentile queue length. This represents the queue length that has a 5 percent probability of being exceeded during the peak hour period.

Table 2. Intersection Level of Service Criteria.

Level of Service	Average Control Delay (seconds)	
	Signalized	Unsignalized
A	< 10	< 10
B	> 10-20	> 10-15
C	> 20-35	> 15-25
D	> 35-55	> 25-35
E	> 55-80	> 35-50
F	> 80	> 50
Highway Capacity Manual (6th Edition)		

Analysis was conducted referencing the existing peak hour factors and heavy vehicle percentages as obtained from data collection. All individual movements at study intersections are operating at LOS C or better in both peak hours. The 95th percentile queues are reported as no more than two vehicles in both peak hours. The Existing conditions capacity analysis summary is illustrated in **Figure 4**. Detailed results are provided in **Appendix B**.

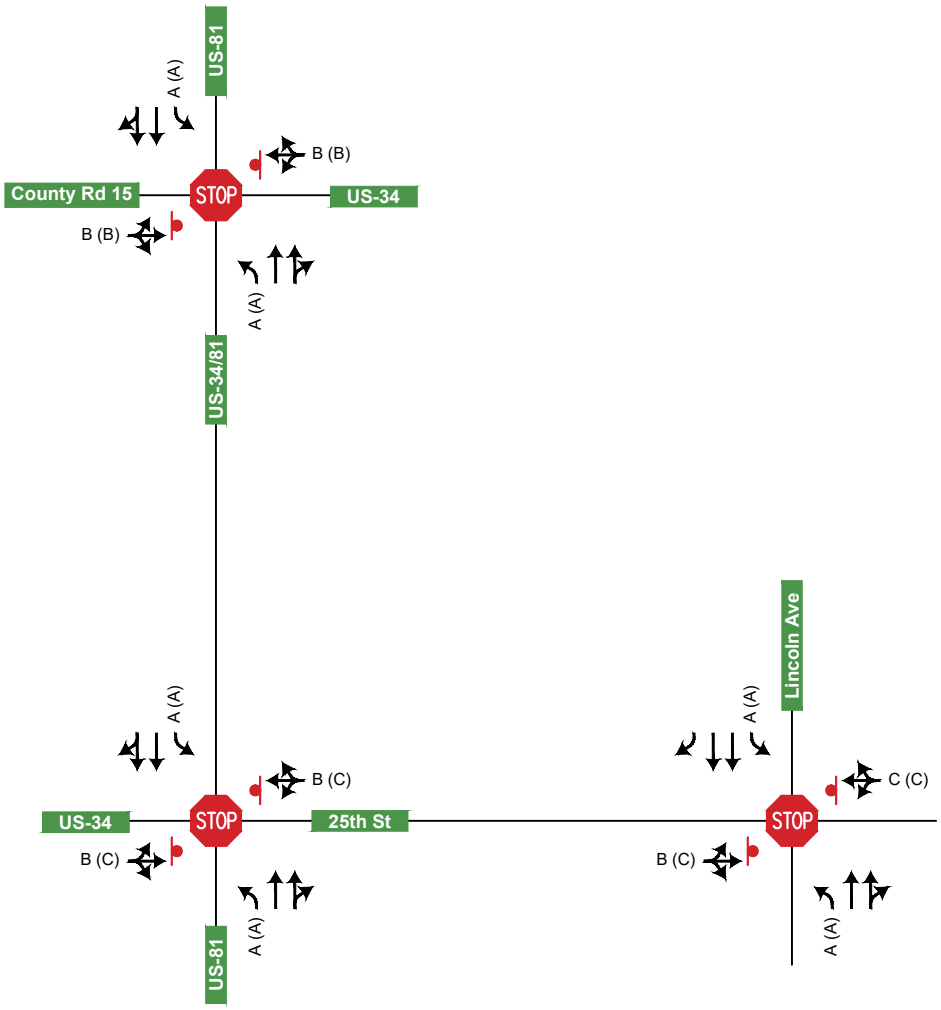
3.4 Existing Turn Lane Warrant Evaluation

The National Cooperative Highway Research Program (NCHRP) has developed guidelines for determining when to provide a left-turn bay and right-turn bay on the major road of a two-way stop-controlled intersection. These guidelines are based on an evaluation of the operating and collision costs associated with the turning maneuver relative to the cost of constructing a turn bay. These guidelines are published in NCHRP Report 457. The Existing AM and PM peak hour volumes were examined at the intersections of 25th Street and County Road 15 at US-81/34. Based on the evaluation, a northbound right-turn lane meets guidance at US-81/34 and County Road 15. In addition, a southbound right-turn lane meets guidance at US-81/34 and 25th Street. Detailed sheets are included in **Appendix B**.

FIGURE 4

Exisitng Conditions
Capacity Analysis

N.T.S.



LEGEND

→	Lane Configuration
AM (PM)	Movement LOS
STOP	Stop Controlled Intersection
●	Stop Sign

4. FUTURE YEAR CONDITIONS (NO DEVELOPMENT)

Future year scenarios consider operations of the future roadway network considering background traffic growth without the proposed development. The year 2030 was selected as the opening year of the development. The year 2040 was selected as the 10-year horizon analysis year.

Historical average daily traffic (ADT) volumes from the NDOT map library were reviewed along US-81 and US-34. Based on the historical ADTs, an annual growth rate of two percent was chosen to apply to existing volumes to develop future year turning movement volumes. **Figure 5** and **Figure 6** illustrate the Future Year 2030 and Future Year 2040 traffic volumes, respectively.

4.1 Future Year Network Modifications

Intersection control and the need for turn lanes was evaluated for Future Year 2030 and Future Year 2040 volumes.

4.1.1 Traffic Signal Warrant Evaluation

Based on the projected traffic volumes, the intersection of US-81/34 and 25th Street was evaluated for potential signalization. The Manual of Uniform Traffic Control Devices, 2009 Edition (MUTCD) provides nine signal warrants for evaluation of signalization at intersections. Warrant 1 (Eight Hour), Warrant 2 (Four Hour), and Warrant 3 (Peak hour) were used for evaluation. In addition, an adapted version of Warrant 1, which is based on daily traffic volumes as developed by NDOT, was also used to provide supplemental information. This methodology is intended for use as planning-level guidance and assumes certain characteristics of traffic flow.

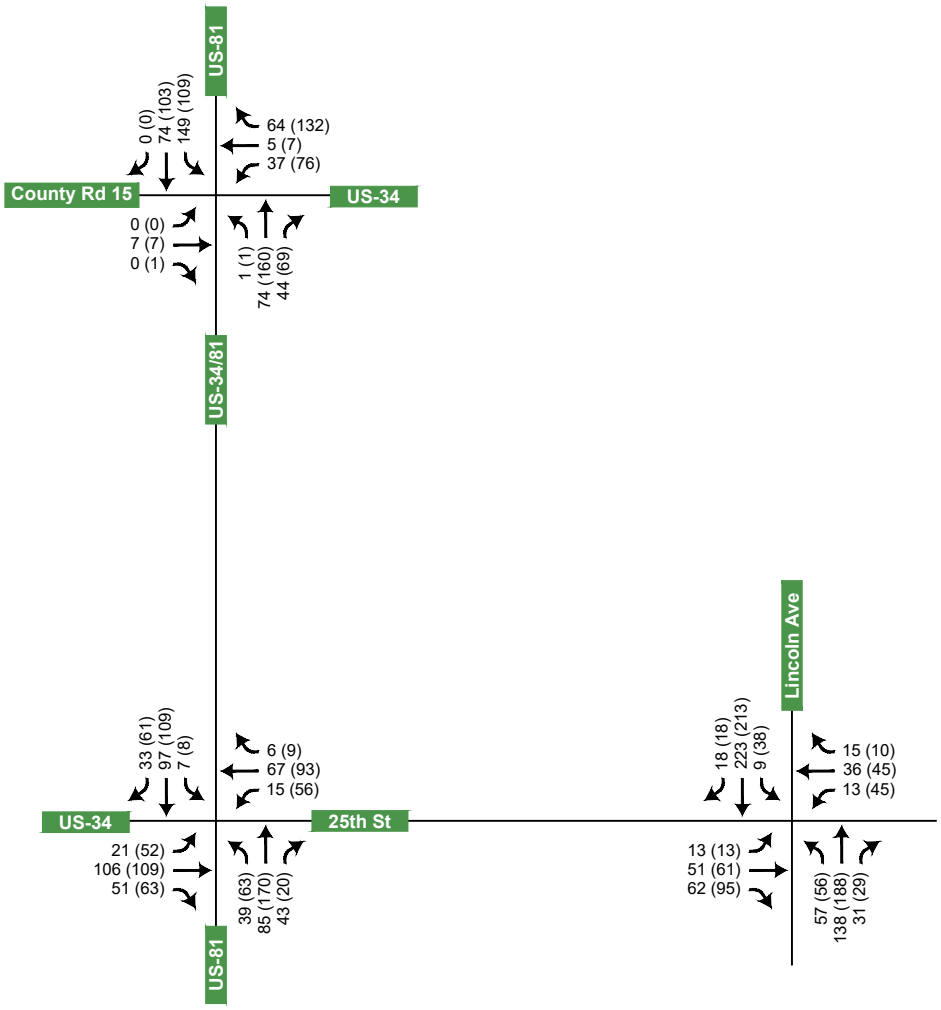
The National Cooperative Highway Research Program (NCHRP) Report 457 provides guidance as to how right-turn volumes should be utilized in the evaluation of signal warrants. Vehicles making right-turn from minor approaches at unsignalized intersections experience less delay than vehicles making left-turn or crossing through the intersection. Therefore, intersections with high right-turn volumes may not benefit from signalization as much as intersections with high left-turn and through volumes. To account for the reduced impact that a right-turning vehicle has on intersection delay, all warrants were evaluated with right-turn reductions (“Rt Red.”) and without right-turn reductions (“No Rt Red.”).

Results of the signal warrant evaluation are summarized in **Table 3**. Detailed signal warrant evaluations are included in **Appendix C**.

FIGURE 5

Future Year 2030 Conditions
Peak Hour Volumes

N.T.S.



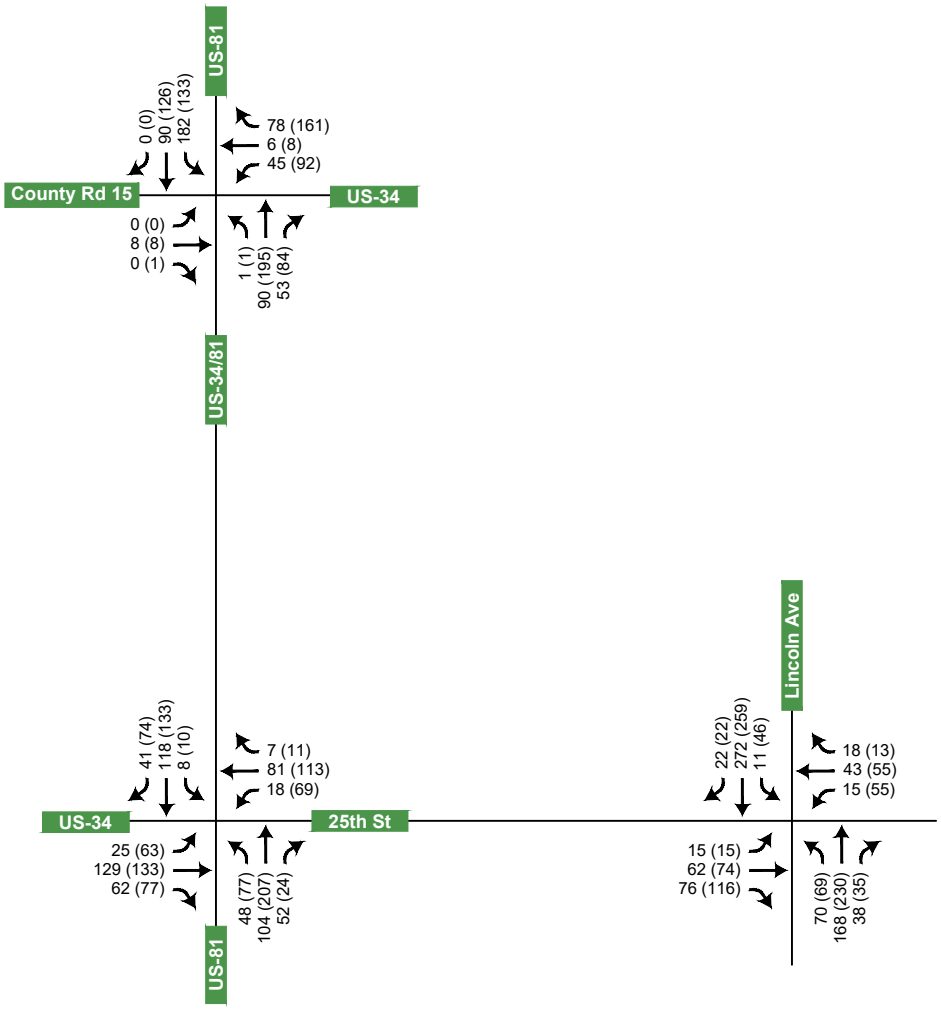
LEGEND

AM (PM) Peak Hour Volumes

FIGURE 6

Future Year 2040 Conditions
Peak Hour Volumes

N.T.S.



LEGEND

AM (PM) Peak Hour Volumes

Table 3. Background Signal Warrant Evaluation Summary

Intersection	Scenario	NDOT Warrant 1		MUTCD Warrant 1		MUTCD Warrant 2		MUTCD Warrant 3	
		No Rt Red.	Rt Red.	No Rt Red.	Rt Red.	No Rt Red.	Rt Red.	No Rt Red.	Rt Red.
US-81/34 and 25th St	Future Year 2030	No	No	No	No	No	No	No	No
	Future Year 2040	No	No	No	No	No	No	No	No

Based on the results of the signal warrant evaluations, a traffic signal was not analyzed at the intersection of US-81/34 and 25th Street in Future Year (No Development) scenarios.

4.1.2 Turn Lane Warrant Evaluation

The Future Year 2030 and Future Year 2040 AM and PM peak hour volumes were examined at the intersections of 25th Street and County Road 15 at US-81/34.

Based on the results of the evaluation, a northbound right-turn lane met guidance at US-81/34 and County Road 15. Similarly, a northbound and southbound right-turn lane met guidance at US-81/34 and 25th Street. As such, these turn lanes were analyzed in future year conditions. Detailed sheets are provided in **Appendix C**.

4.2 Future Year 2030 Conditions Capacity Analysis

Capacity analysis was performed for Future Year 2030 conditions using the methodologies presented in **Section 3.3**. The peak hour factors and truck percentages observed in existing conditions were assumed to remain consistent in the study area.

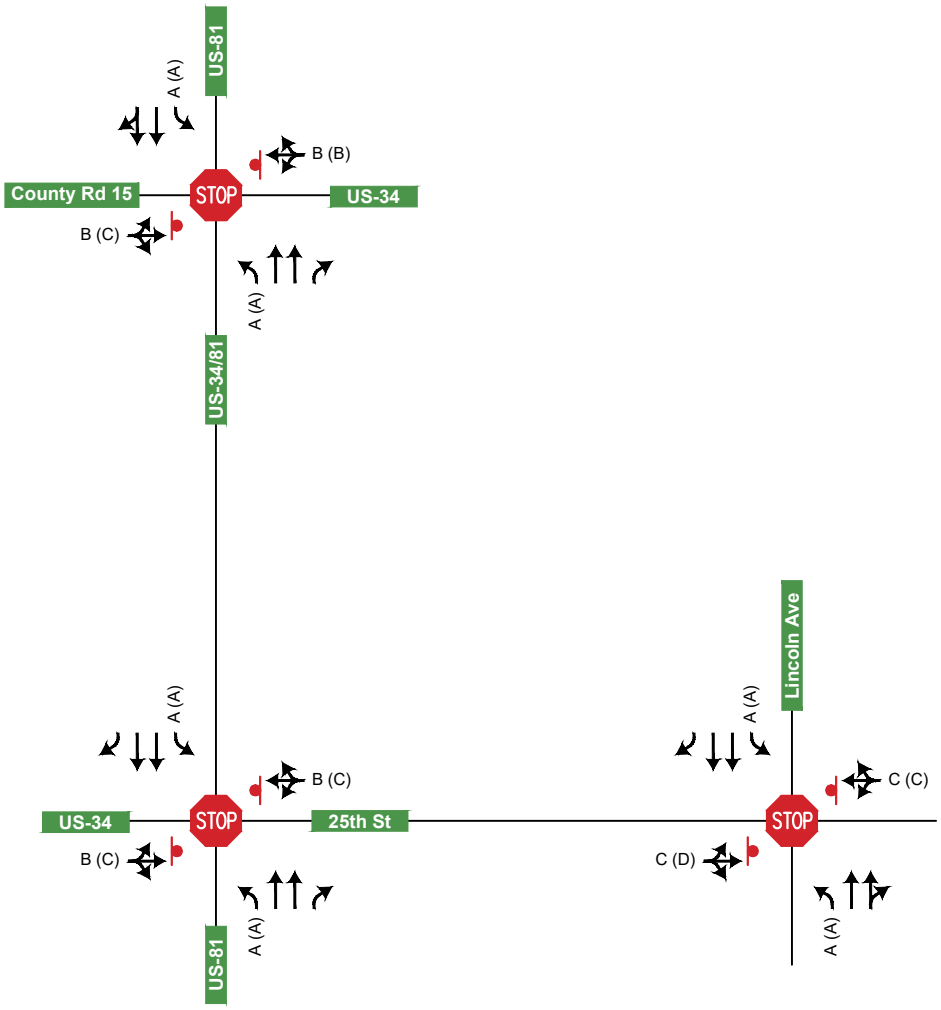
All individual movements at study intersections are expected to continue operating at LOS C or better in both peak hours except for eastbound vehicles at Lincoln Avenue and 25th Street which is expected to operate at LOS D in the PM peak hour. The 95th percentile queues for all movements are reported as no more than three vehicles in both peak hours.

The Future Year 2030 capacity analysis summary is illustrated in **Figure 7**. Detailed results are provided in **Appendix D**.

FIGURE 7

Future Year 2030 Conditions
Capacity Analysis

N.T.S.



LEGEND

→	Lane Configuration
AM (PM)	Movement LOS
STOP	Stop Controlled Intersection
	Stop Sign

4.3 Future Year 2040 Conditions Capacity Analysis

Capacity analysis was performed for Future Year 2040 conditions using the methodologies presented in **Section 3.3**. The peak hour factors and truck percentages observed in existing conditions were assumed to remain consistent in the study area.

Several individual movements at study intersections are expected to operate at LOS E or LOS F in the PM peak hour. These movements include:

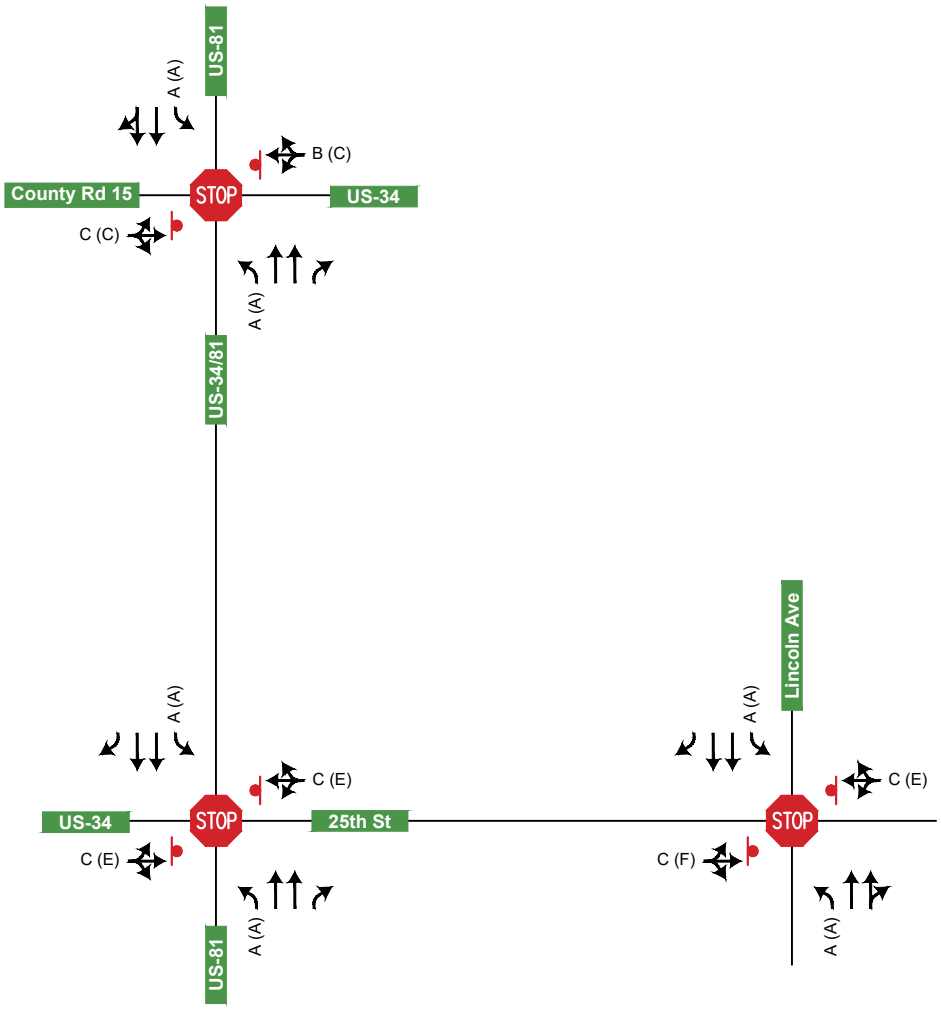
- Eastbound and westbound movements (LOS E) at US-81/34 and 25th Street.
    - 95th percentile queue lengths reported at up to seven vehicles (175 feet).
- Eastbound and westbound movements (LOS E and LOS F, respectively) at Lincoln Avenue and 25th Street.
    - 95th percentile queue lengths reported as up to eight vehicles (200 feet).

The Future Year 2040 capacity analysis summary is illustrated in **Figure 8**. Detailed results are provided in **Appendix E**.

FIGURE 8

Future Year 2040 Conditions
Capacity Analysis

N.T.S.



LEGEND

→	Lane Configuration
AM (PM)	Movement LOS
STOP	Stop Controlled Intersection
	Stop Sign

5. SITE CHARACTERISTICS

The proposed site is located in the northeast and northwest quadrants of US-81/34 and 25th Street in York, Nebraska. The site is proposed to have a variety of industrial uses. The site is anticipated to be broken out into two phases. Phase 1 construction includes the build out of area east of US-81/34 and is anticipated to be completed by the year 2030. Phase 2 construction includes the build out of the area west of US-81/34 and is anticipated to be fully built out by the year 2040. Access to Phase 1 is proposed at two drives along 25th Street, and access to Phase 2 is proposed at two drives along County Road L. The site plan is shown in **Figure 9**.

5.1 Trip Generation

To determine the impact of potential site traffic on the roadway network, expected trips associated with the proposed site were generated and applied to the study network. Typically, site traffic is estimated using trip generation rates for common land uses found in the Institute of Transportation Engineers (ITE) *Trip Generation Manual (11th Edition)* and were used for the purposes of this study. Common Land Use Codes (LUC) are published with rates that can be applied to values related to the size of the proposed site to estimate the anticipated entering and exiting trips. The site is comprised of a variety of industrial uses, and because of the proposed size of the site lots, LUC 130 Industrial Park was used to estimate the number of site trips.

Phase 1 is anticipated to have approximately 1.8 million gross building square footage. Phase 2 is anticipated to have approximately 1.4 million gross building square footage. Phase 1 of the site is expected to generate 4,224 daily, 613 AM peak hour trips, and 613 PM peak hour trips. Phase 2 of the site is expected to generate 3,702 daily, 476 AM peak hour trips, and 476 PM peak hour trips. Combined trips are expected to be 7,926 daily, 1,089 AM peak hour trips, and 1,089 PM peak hour trips. The trip generations for the proposed site are shown in **Table 4** and **Table 5**.

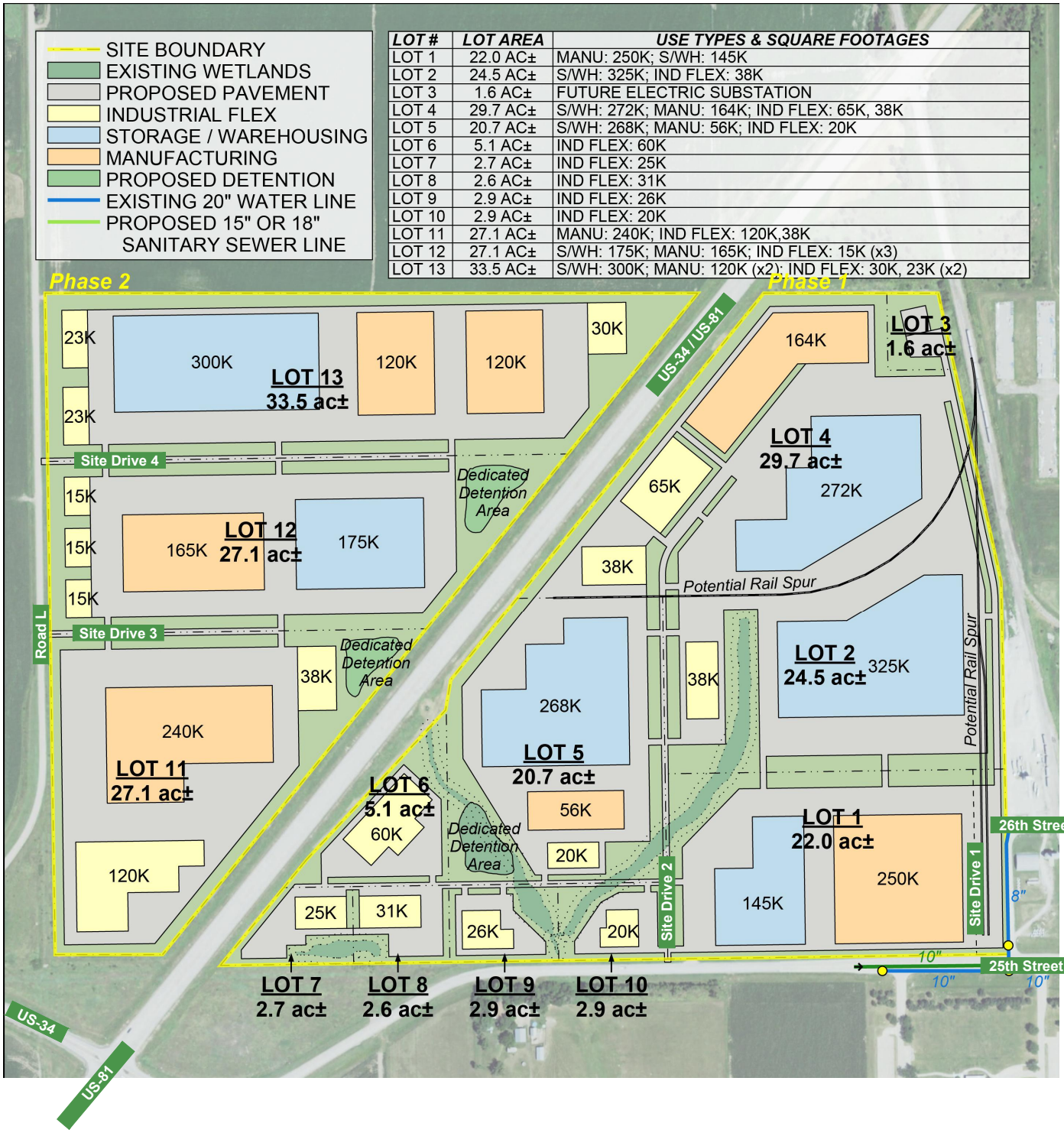
5.2 Trip Distribution

A trip distribution was developed based on existing travel patterns, surrounding land uses, and the street network. The Phase 1 and Phase 2 trip distributions are illustrated in **Figure 10**. The Phase 1 and Phase 2 site trips are illustrated in **Figure 11**.

Truck trips are included in the total site trips and were separated out for informational purposes. Truck trips are based on truck data plots provided in the *Trip Generation Manual*. LUC 130 Industrial Park does not have truck data plots, so a similar land use was used (LUC 110 General Light Industrial). Based on the truck plots, approximately 12 percent of total site trips are truck trips. Phase 1 and Phase 2 truck trips are illustrated in **Figure 12**.

FIGURE 9
Site Plan

N.T.S.



LOT #	LOT AREA	USE TYPES & SQUARE FOOTAGES
LOT 1	22.0 AC±	MANU: 250K; S/WH: 145K
LOT 2	24.5 AC±	S/WH: 325K; IND FLEX: 38K
LOT 3	1.6 AC±	FUTURE ELECTRIC SUBSTATION
LOT 4	29.7 AC±	S/WH: 272K; MANU: 164K; IND FLEX: 65K, 38K
LOT 5	20.7 AC±	S/WH: 268K; MANU: 56K; IND FLEX: 20K
LOT 6	5.1 AC±	IND FLEX: 60K
LOT 7	2.7 AC±	IND FLEX: 25K
LOT 8	2.6 AC±	IND FLEX: 31K
LOT 9	2.9 AC±	IND FLEX: 26K
LOT 10	2.9 AC±	IND FLEX: 20K
LOT 11	27.1 AC±	MANU: 240K; IND FLEX: 120K,38K
LOT 12	27.1 AC±	S/WH: 175K; MANU: 165K; IND FLEX: 15K (x3)
LOT 13	33.5 AC±	S/WH: 300K; MANU: 120K (x2); IND FLEX: 30K, 23K (x2)

Table 4. Phase 1 Trip Generation

Daily Trips									
ITE 11th Ed				Trip Gen.	Daily	Trip Distribution		Total Daily Trips	
Code	Land Use	Size	Units	Avg. Rate/Eq.	Trips	Enter	Exit	Enter	Exit
130	Industrial Park	1,803,000	s.f.	=0.52*Ln(X/1000)+4.45	4,224	50%	50%	2,112	2,112
				Cars	3,727			1,864	1,864
				Trucks	497			248	248
AM Peak Hour Trips									
ITE 11th Ed				Trip Gen.	AM	Trip Distribution		Total AM Trips	
Code	Land Use	Size	Units	Avg. Rate/Eq.	Trips	Enter	Exit	Enter	Exit
130	Industrial Park	1,803,000	s.f.	0.34	613	81%	19%	497	116
				Cars	541			439	102
				Trucks	72			58	14
PM Peak Hour Trips									
ITE 11th Ed				Trip Gen.	PM	Trip Distribution		Total PM Trips	
Code	Land Use	Size	Units	Avg. Rate/Eq.	Trips	Enter	Exit	Enter	Exit
130	Industrial Park	1,803,000	s.f.	0.34	613	22%	78%	135	478
				Cars	541			119	422
				Trucks	72			16	56

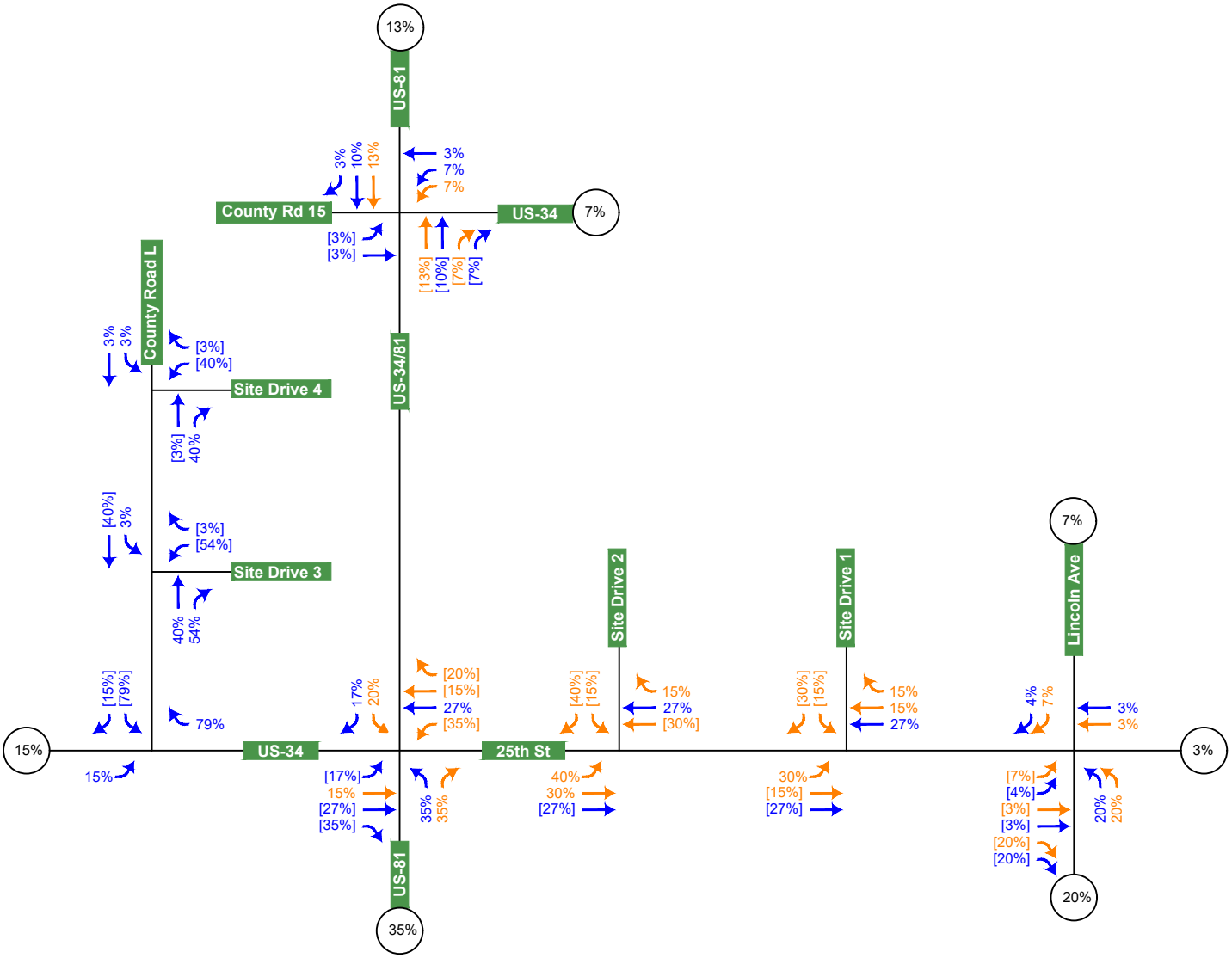
Table 5. Phase 2 Trip Generation

Daily Trips									
ITE 11th Ed				Trip Gen.	Daily	Trip Distribution		Total Daily Trips	
Code	Land Use	Size	Units	Avg. Rate/Eq.	Trips	Enter	Exit	Enter	Exit
130	Industrial Park	1,399,000	s.f.	=0.52*Ln(X/1000)+4.45	3,702	50%	50%	1,851	1,851
				Cars	3,266			1,633	1,633
				Trucks	436			218	218
AM Peak Hour Trips									
ITE 11th Ed				Trip Gen.	AM	Trip Distribution		Total AM Trips	
Code	Land Use	Size	Units	Avg. Rate/Eq.	Trips	Enter	Exit	Enter	Exit
130	Industrial Park	1,399,000	s.f.	0.34	476	81%	19%	386	90
				Cars	420			341	79
				Trucks	56			45	11
PM Peak Hour Trips									
ITE 11th Ed				Trip Gen.	PM	Trip Distribution		Total PM Trips	
Code	Land Use	Size	Units	Avg. Rate/Eq.	Trips	Enter	Exit	Enter	Exit
130	Industrial Park	1,399,000	s.f.	0.34	476	22%	78%	105	371
				Cars	420			93	327
				Trucks	56			12	44

FIGURE 10

Phase 1 and Phase 2
Trip Distribution

N.T.S.



LEGEND

XX% (XX%) Entering Phase 1 Distribution

[XX% (XX%)] Exiting Phase 1 Distribution

XX% (XX%) Entering Phase 2 Distribution

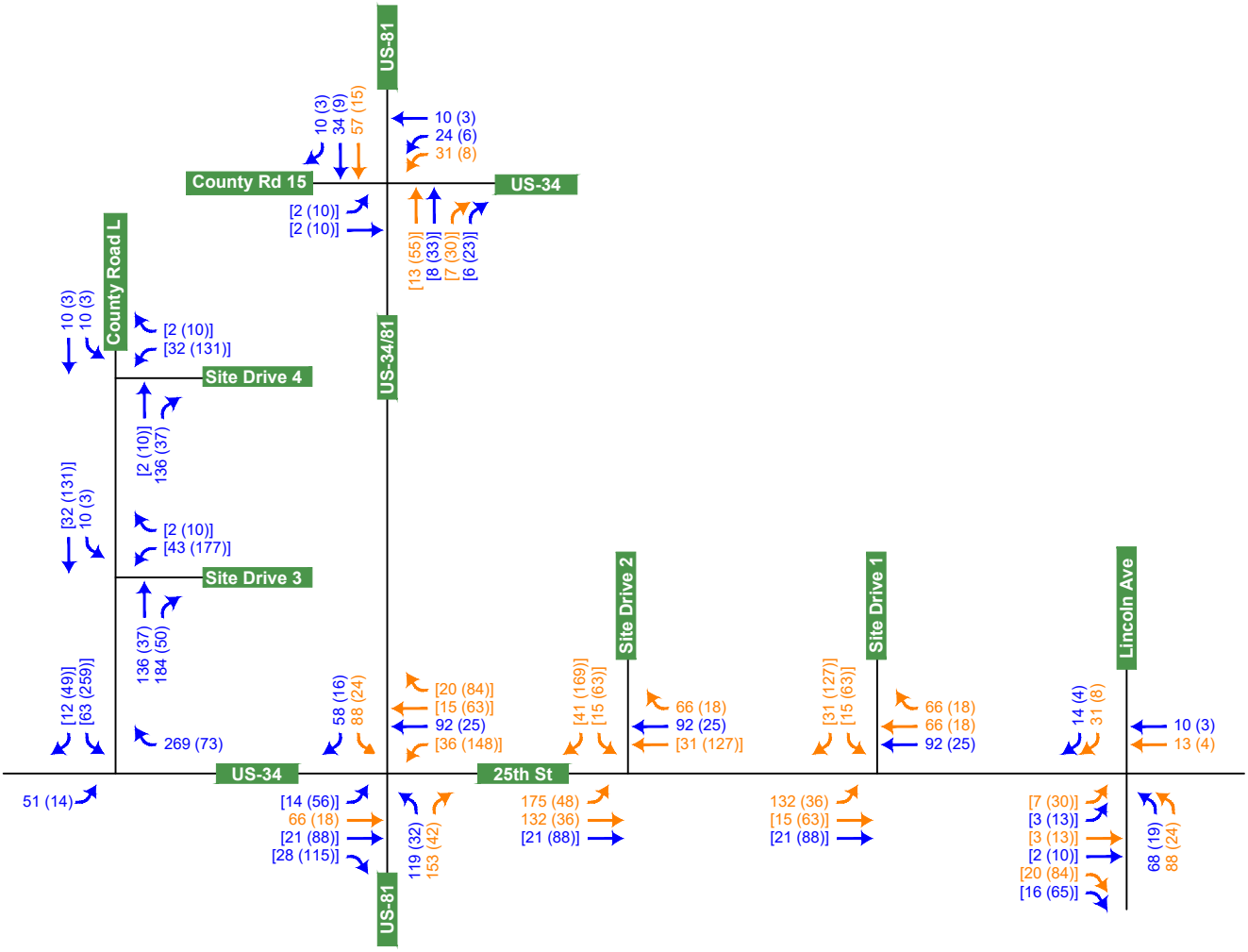
[XX% (XX%)] Exiting Phase 2 Distribution

X% External Distribution

FIGURE 11

Phase 1 and Phase 2
Passenger Car Trips

N.T.S.



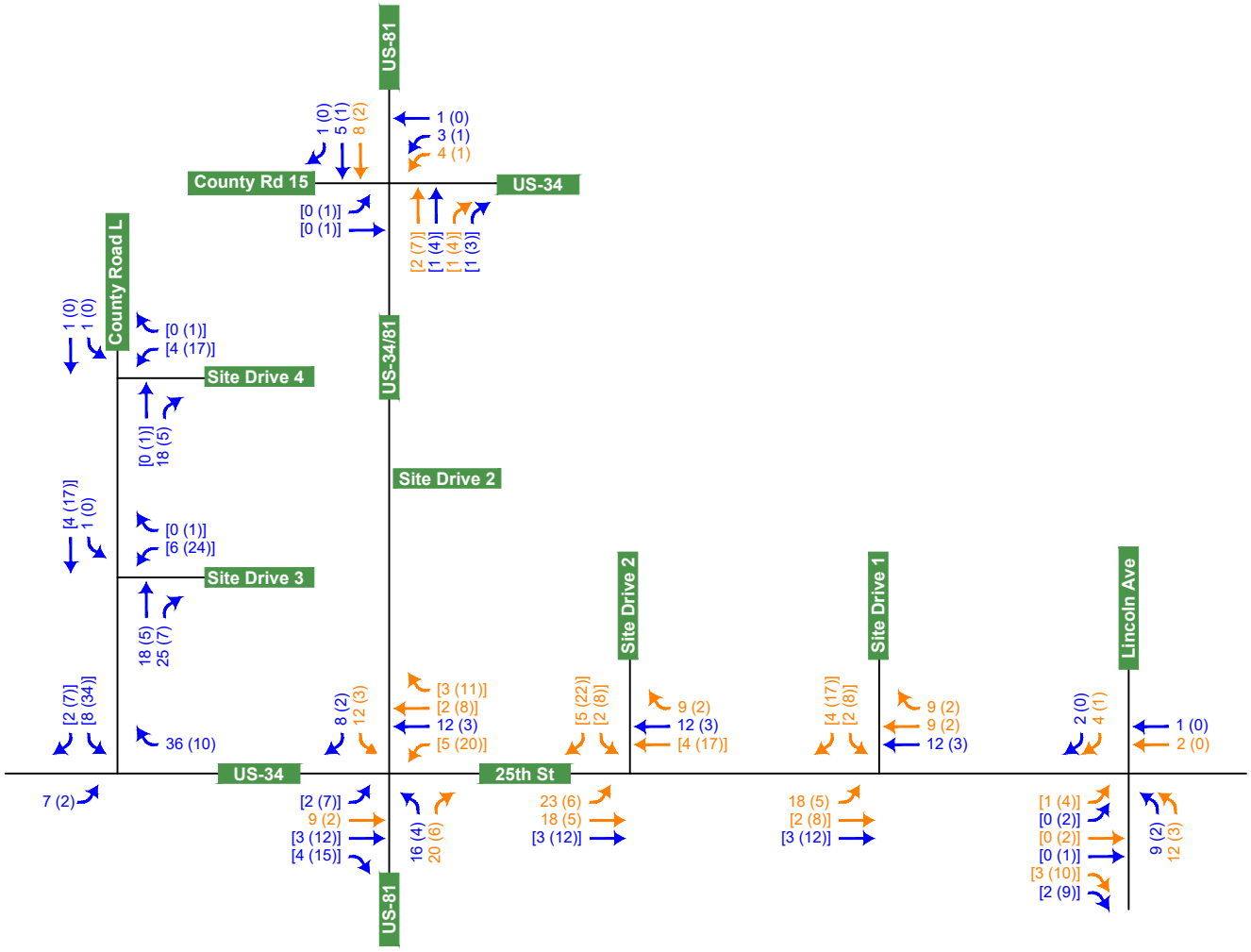
LEGEND

AM (PM)	Entering Phase 1 Trips
[AM (PM)]	Exiting Phase 1 Trips
AM (PM)	Entering Phase 2 Trips
[AM (PM)]	Exiting Phase 2 Trips

FIGURE 12

Phase 1 and Phase 2
Truck Trips

N.T.S.



LEGEND

AM (PM)	Entering Phase 1 Truck Trips
[AM (PM)]	Exiting Phase 1 Trucks Trips
AM (PM)	Entering Phase 2 Truck Trips
[AM (PM)]	Exiting Phase 2 Truck Trips

6. PLUS SITE CONDITIONS

This scenario considers operations of the future roadway network considering background traffic growth (as presented in **Section 4**) with the addition of proposed development volumes. **Figure 13** illustrates the expected Future Year 2030 Plus Site volumes. **Figure 14** illustrates the 2040 Plus Site peak hour volumes.

6.1 Plus Site Network Modifications

Intersection control and the need for turn lanes was evaluated for Future Year 2030 Plus Site and Future Year 2040 Plus Site volumes.

6.1.1 Traffic Signal Warrant Evaluation

Based on the projected traffic volumes, the intersections of US-81/34 and 25th Street, US-81/34 and County Road 15, and Lincoln Avenue and 25th Street were evaluated for potential signalization. To account for the reduced impact that a right-turning vehicle has on intersection delay, all warrants were evaluated with right-turn reductions ("Rt Red.") and without right-turn reductions ("No Rt Red.").

Results of the signal warrant evaluation are summarized in **Table 6**. Detailed signal warrant evaluations are included in **Appendix F**.

Table 6. Plus Site Signal Warrant Evaluation Summary

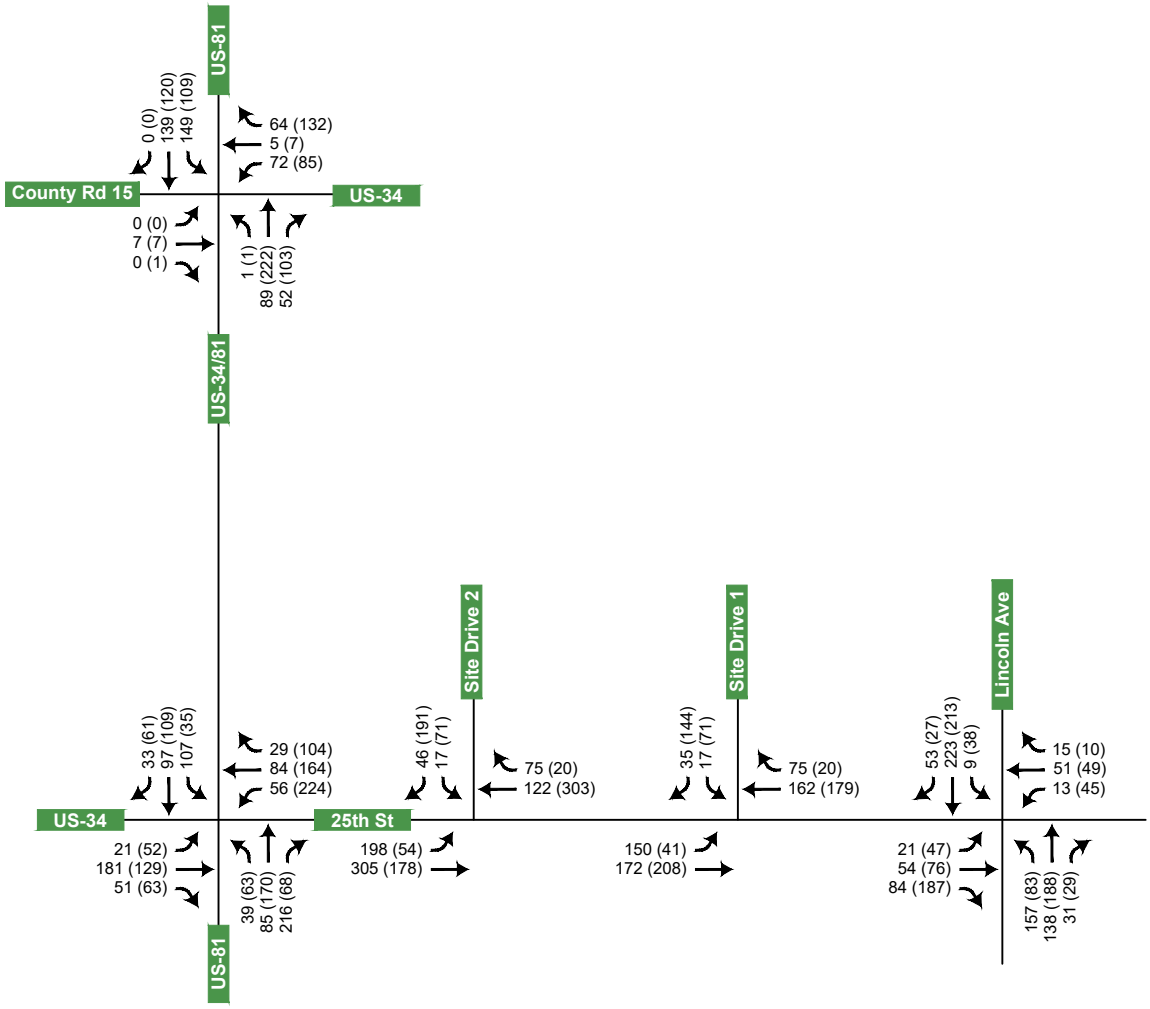
Intersection	Scenario	NDOT Warrant 1		MUTCD Warrant 1		MUTCD Warrant 2		MUTCD Warrant 3	
		No Rt Red.	Rt Red.	No Rt Red.	Rt Red.	No Rt Red.	Rt Red.	No Rt Red.	Rt Red.
Lincoln Ave and 25th St	2030 Plus Site	Yes	Yes	No	No	No	No	Yes	No
	2040 Plus Site	Yes	Yes	Yes	No	Yes	No	Yes	No
US-81/34 and 25th St	2030 Plus Site	Yes	No	No	No	Yes	No	Yes	Yes
	2040 Plus Site	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
US-81/34 and County Road 15	2030 Plus Site	No	No	No	No	No	No	No	No
	2040 Plus Site	Yes	No	No	No	No	No	No	No

Based on the results of the signal warrant evaluation, a traffic signal was analyzed at US-81/34 and 25th Street in both plus site volume scenarios. In addition, a traffic signal was analyzed at Lincoln Avenue and 25th Street in the 2040 Plus Site conditions. US-81/34 and County Road 15 should be monitored for signalization as traffic volumes increase, and for the purposes of this study, a traffic signal was not analyzed at this intersection.

FIGURE 13

Future Year 2030 Plus Site Conditions
Peak Hour Volumes

N.T.S.



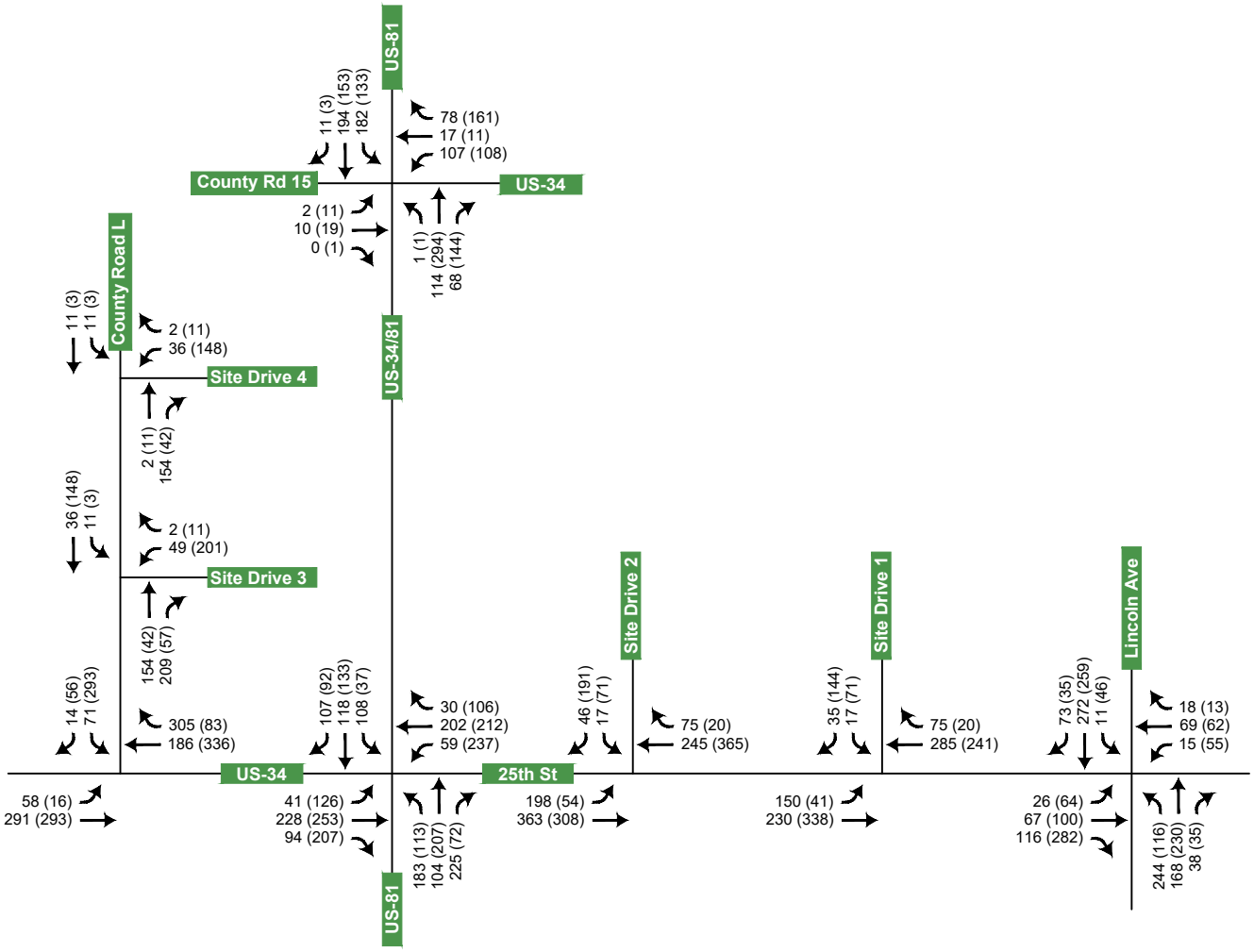
LEGEND

AM (PM) Peak Hour Volumes

FIGURE 14

Future Year 2040 Plus Site Conditions
Peak Hour Volumes

N.T.S.



LEGEND

AM (PM) Peak Hour Volumes

6.1.2 Turn Lane Warrant Evaluation

Based on the results of the evaluation, a westbound right-turn lane met guidance at US-34 and County Road L. Westbound right-turn lanes at the 25th Street drives did not meet NCHRP guidance. However, because the site is industrial and there are anticipated to be heavy trucks regularly visiting the site, installing right-turn lanes would be beneficial to remove turning trucks from the through lane. Therefore, westbound right-turn lanes at site drives were analyzed. Detailed sheets are provided in **Appendix F**.

Eastbound left-turn lanes at site drives along 25th Street and at US-34 and County Road L should be installed based on the projected turning volumes. Because 25th Street is partially a three-lane section between Lincoln Avenue and US-81/34, extending the existing three-lane section west to US-81/34 should be considered.

6.2 Future Year 2030 Plus Site Capacity Analysis

Capacity analysis was performed for Future Year 2030 Plus Site conditions using the methodologies presented in **Section 3.3**. The intersection of US-81/34 and 25th Street was analyzed with traffic signalization. Truck percentages were updated based on the number of trucks generated by the proposed site.

With signalization, the intersection of US-81/34 and 25th Street is anticipated to operate at LOS A during both peak hours. Individual movements at this intersection are anticipated to operate at LOS B or better during both peak hours. The 95th percentile queue lengths for all movements are not anticipated to exceed 85 feet in both peak hours.

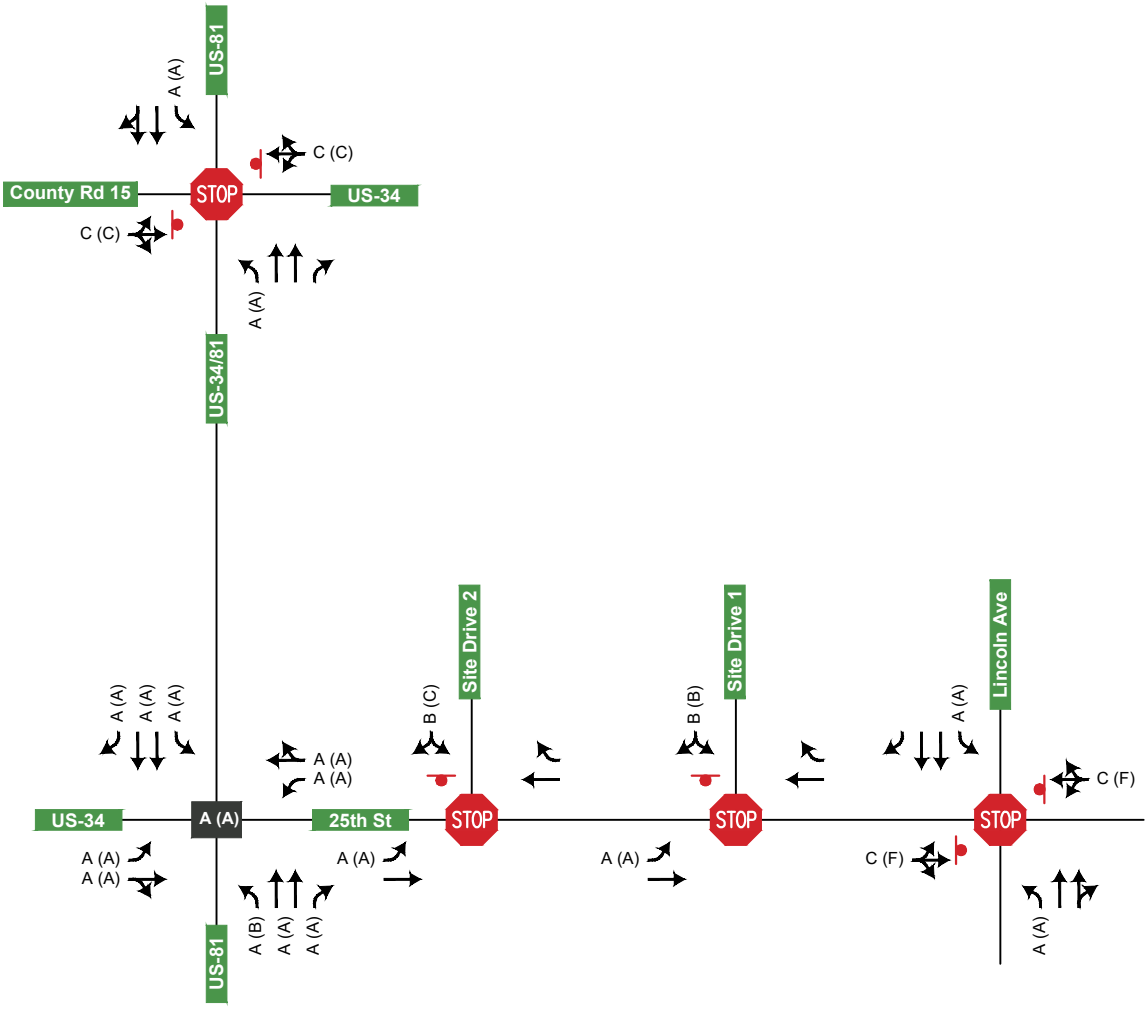
At unsignalized intersections, most individual movements are expected to operate at LOS C or better in both peak hours. Exceptions include eastbound and westbound movements at Lincoln Avenue and 25th Street, which are anticipated to operate at LOS F in the PM peak hour. The 95th percentile queues for these eastbound and westbound movements are reported at 13 and 5 vehicles, respectively.

The Future Year 2030 Plus Site capacity analysis summary is illustrated in **Figure 15**. Detailed results are provided in **Appendix G**.

FIGURE 15

Future Year 2030 Plus Site Conditions
Capacity Analysis

N.T.S.



LEGEND

→	Lane Configuration
AM (PM)	Movement LOS
AM (PM)	Signalized Intersection LOS
STOP	Stop Controlled Intersection
	Stop Sign

6.3 Future Year 2040 Plus Site Capacity Analysis

Capacity analysis was performed for Future Year 2040 Plus Site conditions using the methodologies presented in **Section 3.3**. The intersection of US-81/34 and 25th Street was analyzed with traffic signalization. In addition, the intersections of Lincoln Avenue and 25th Street, and US-81/34 and County Road 15 were analyzed with both two-way stop control and signalization for comparison purposes.

With signalization at Lincoln Avenue and 25th Street, and US-81/34 and Country Road 15, signalized intersections are anticipated to operate at LOS B or better in both peak hours. Individual movements are anticipated to operate at LOS C or better in both peak hours. The 95th percentile queue lengths are anticipated to be contained within existing storage bays.

Several individual movements at unsignalized intersections are expected to operate at LOS E or LOS F in both peak hours, including:

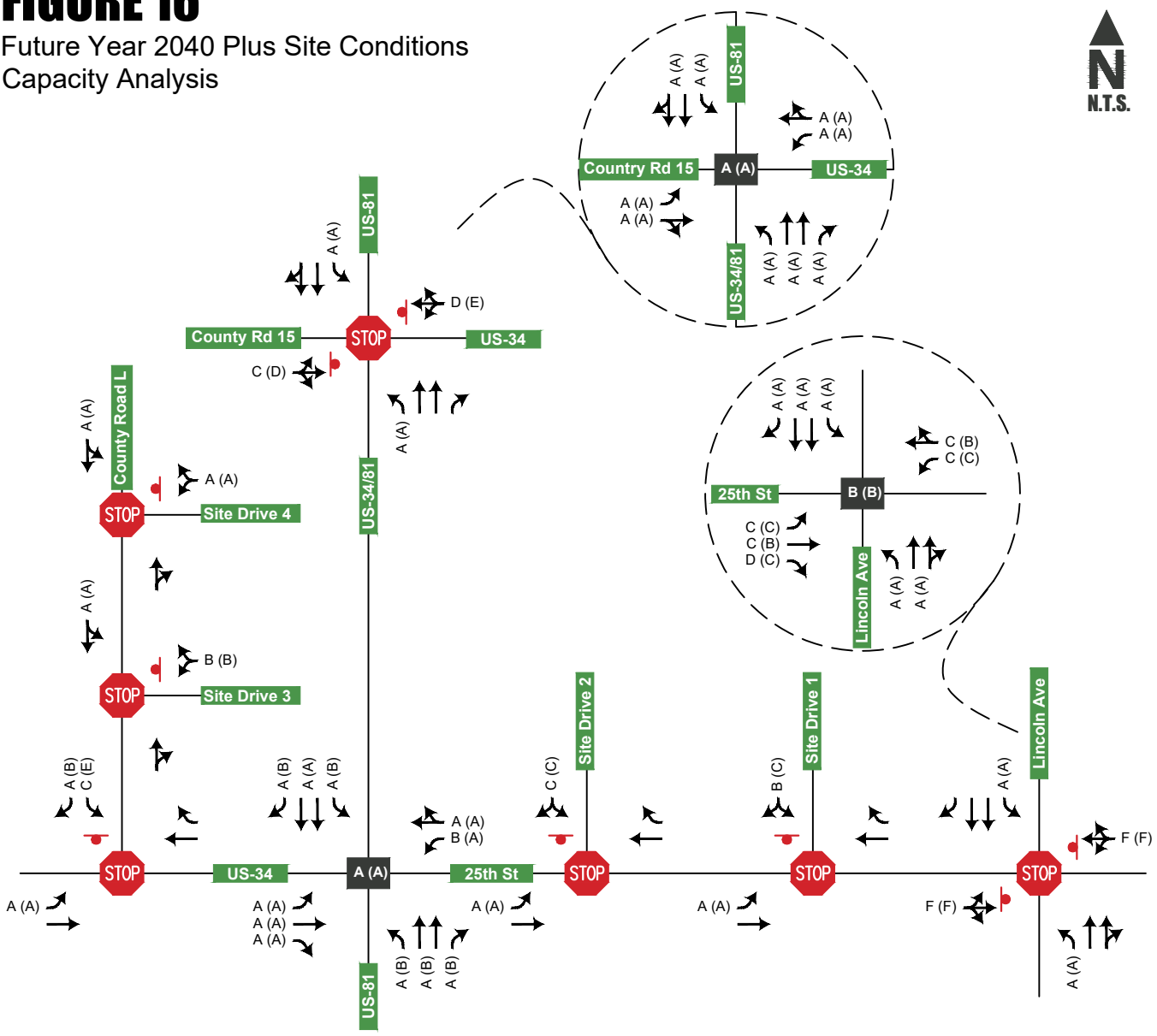
- Westbound movements (LOS E) at US-81/34 and County Road 15 in the PM peak hour.
    - 95th percentile queue lengths reported at up to 8 vehicles (200 feet).
- Southbound left-turning movements (LOS E) at US-34 and County Road L in the PM peak hour.
    - 95th percentile queue lengths reported at up to eight vehicles (200 feet).
- As an unsignalized intersection, eastbound and westbound movements (LOS F) at Lincoln Avenue and 25th Street in both peak hours.
    - 95th percentile queue lengths for eastbound movements are reported between 7 and 44 vehicles.
    - 95th percentile queue lengths for west movements are reported between 4 and 18 vehicles.

All other movements are anticipated to operate at LOS D or better in both peak hours with 95th percentile queues of no more than four vehicles in both peak hours.

The Future Year 2040 Plus Site capacity analysis summary is illustrated in **Figure 16**. Detailed results are provided in **Appendix H**.

FIGURE 16

Future Year 2040 Plus Site Conditions
Capacity Analysis



LEGEND

→	Lane Configuration
AM (PM)	Movement LOS
AM (PM)	Signalized Intersection LOS
STOP	Stop Controlled Intersection
	Stop Sign

7. SUMMARY

This report summarizes analyses conducted for the proposed industrial park development located in the northeast and northwest quadrants of US-81/34 and 25th Street in York, Nebraska.

7.1 Conclusions

The general findings for this traffic impact study include the following:

1. The site is anticipated to be broken out into two phases. Phase 1 construction includes the build out of area east of US-81 and is anticipated to be completed by the year 2030. Phase 2 construction includes the build out of the area west of US-81 and is anticipated by the year 2040.
2. Phase 1 is anticipated to have approximately 1.8 million gross building square footage. Phase 2 is anticipated to have approximately 1.4 million gross building square footage.
    a. Phase 1 of the site is expected to generate 4,224 daily, 613 AM peak hour trips, and 613 PM peak hour trips.
    b. Phase 2 of the site is expected to generate 3,702 daily, 476 AM peak hour trips, and 476 PM peak hour trips.
    c. Combined trips are expected to be 7,926 daily, 1,089 AM peak hour trips, and 1,089 PM peak hour trips.
3. Existing intersections of US-81/34 and 25th Street, and Lincoln Avenue and 25th Street are anticipated to satisfy traffic signal warrants in plus site conditions.

7.2 Recommendations

Proposed drives and recommended improvements should be constructed following agency guidelines. Sight distance should be provided at new intersections.

7.2.1 Existing Conditions

No recommended improvements.

7.2.2 Future Year 2030 Conditions

US-81/34 and 25th Street

- Construct offset northbound right-turn lane with 600 feet of deceleration length following requirements outlined in the NDOT Roadway Design Manual.
- Construct offset southbound right-turn lane with 600 feet of deceleration length following requirements outlined in the NDOT Roadway Design Manual.

US-81/34 and County Road 15

- Construct offset northbound right-turn lane with 600 feet of deceleration length following requirements outlined in the NDOT Roadway Design Manual.

7.2.3 Future Year 2040 Conditions

No recommended improvements.

7.2.4 Future Year 2030 Plus Site Conditions

US-81/34 and 25th Street

- Install traffic signal.
- Activate eastbound and westbound left-turn lanes with existing storage lengths.

US-81/34 and County Road 15

- Monitor intersection for the need for traffic signalization.

Lincoln Avenue and 25th Street

- Monitor intersection for the need for traffic signalization.

25th Street and Site Drive 1

- Construct eastbound left-turn lane.
- Construct westbound right-turn lane with 150’ of storage and deceleration length.

25th Street and Site Drive 2

- Construct eastbound left-turn lane.
- Construct westbound right-turn lane with 150’ of storage and deceleration length.

25th Street

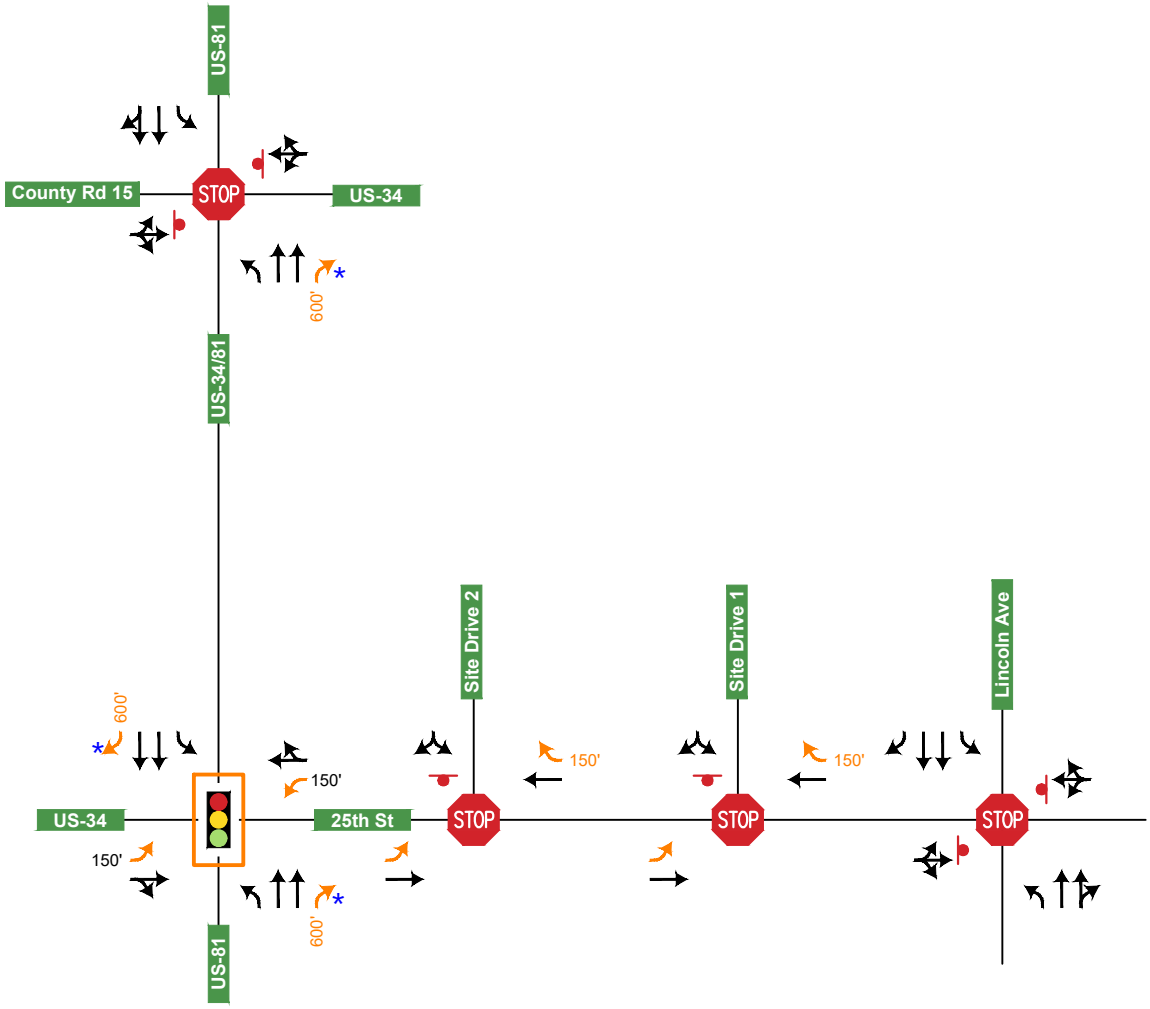
- Consider constructing 3,000’ section of 25th Street beginning just east of US-81/34 as a three-lane section to match the roadway cross-section to the east.

Future Year 2030 Plus Site recommended improvements are shown in **Figure 17**.

FIGURE 17

Future Year 2030 Plus Site Conditions
Recommended Improvements

N.T.S.



*Background conditions improvement

LEGEND

XX' → Lane Configuration & Storage Length

XX' → Plus Site Improvements

Signalized Intersection

STOP Stop Controlled Intersection

Stop Sign

7.2.5 Future Year 2040 Plus Site Conditions

US-81/34 and 25th Street

- Construct eastbound right-turn lane following requirements outlined in the NDOT Roadway Design Manual.

US-81/34 and County Road 15

- Monitor intersection for the need for traffic signalization.

Lincoln Avenue and 25th Street

- Install traffic signal.
    - The intersection should be monitored for traffic signalization. A signal should be installed prior to the full build out of Phase 2 of the site.
    - When a traffic signal is installed, the eastbound left-turn lane should be activated, and a corresponding westbound left-turn lane should be constructed.
- Construct eastbound right-turn lane with 150’ of storage and deceleration length.

US-34 and County Road L

- Construct eastbound left-turn lane following requirements outlined in the NDOT Roadway Design Manual.
- Construct westbound right-turn lane with 150’ of storage and deceleration length.
- Construct southbound right-turn lane with 200’ of storage and deceleration length.

County Road L

- Construct two-lane paved section through site drives.

County Road L and Site Drive 3

- Construct site drive based on local requirements.

County Road L and Site Drive 4

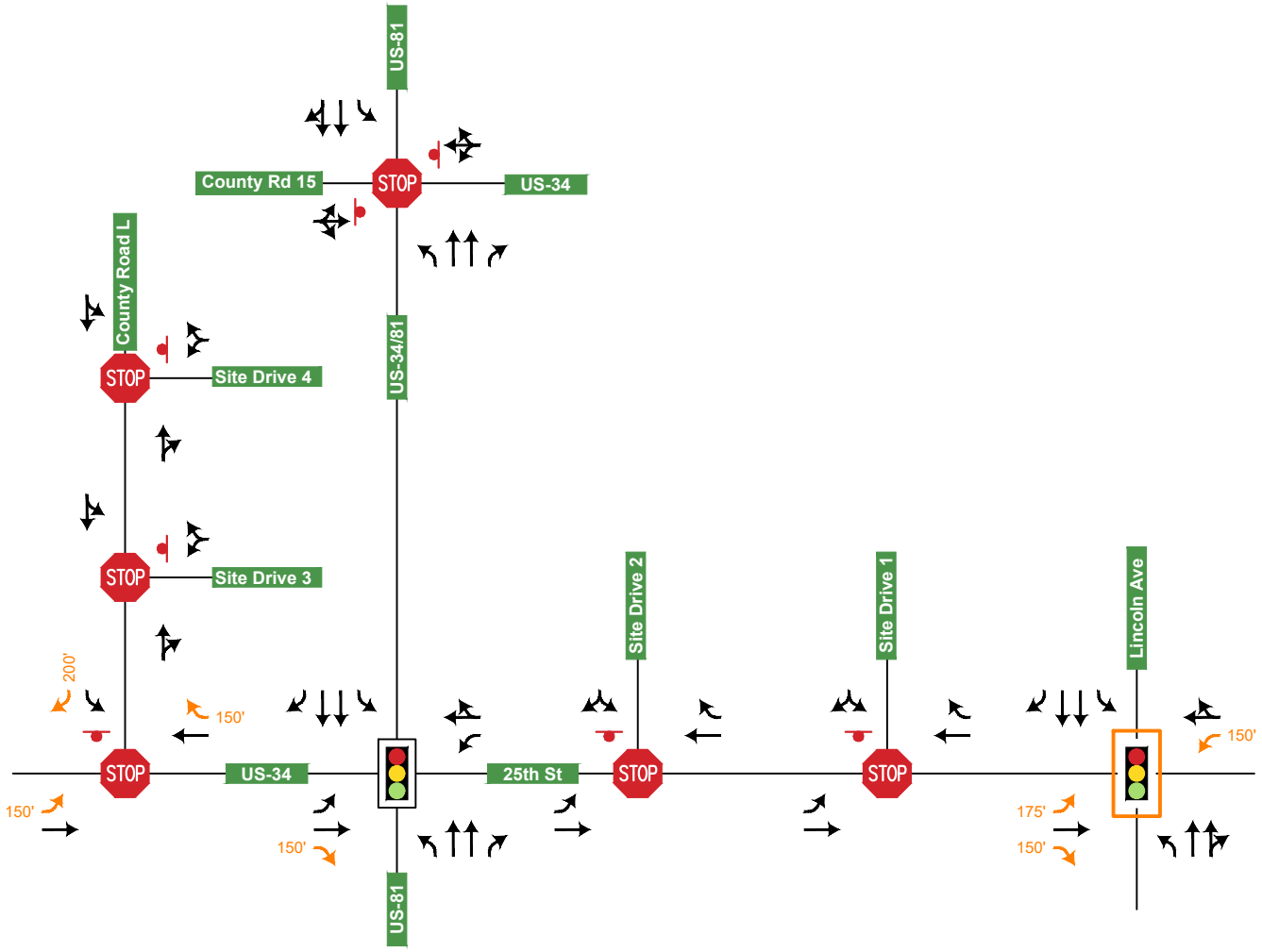
- Construct site drive based on local requirements.

Future Year 2040 Plus Site recommended improvements are shown in **Figure 18**.

FIGURE 18

Future Year 2040 Plus Site Conditions
Recommended Improvements

N.T.S.



LEGEND

XX' → Lane Configuration & Storage Length

XX' → Plus Site Improvements

Signalized Intersection

STOP Stop Controlled Intersection

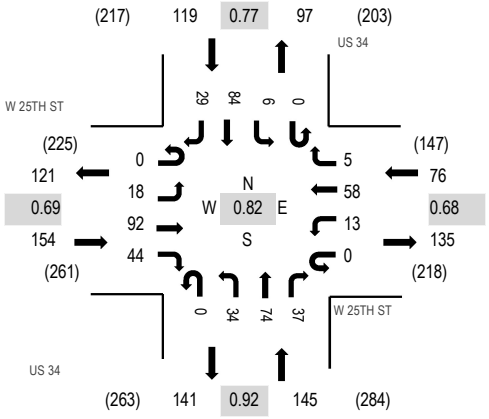
Stop Sign

APPENDIX A
Data Collection

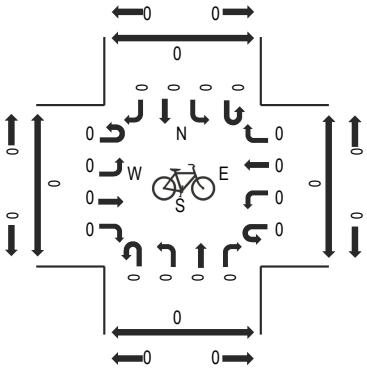
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 1 US 34 & W 25TH ST AM
Date: Thursday, April 18, 2024
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

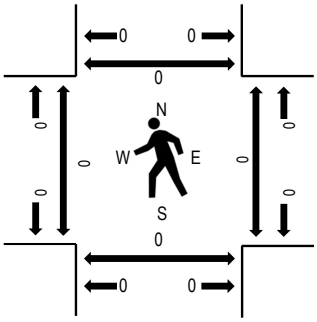
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

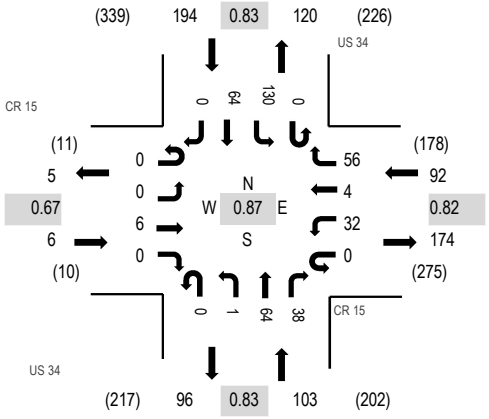
Traffic Counts - Motorized Vehicles

Interval Start Time	W 25TH ST Eastbound				W 25TH ST Westbound				US 34 Northbound				US 34 Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	3	12	5	0	5	14	1	0	6	17	7	0	0	18	5	93	471	0	0	0	0
7:15 AM	0	4	22	9	0	5	13	0	0	5	22	1	0	0	13	4	98	481	0	0	0	0
7:30 AM	0	4	25	15	0	1	10	1	0	6	23	16	0	3	16	9	129	494	0	0	0	0
7:45 AM	0	8	36	15	0	5	23	2	0	11	15	4	0	0	26	6	151	474	0	0	0	0
8:00 AM	0	2	17	5	0	5	13	0	0	10	20	11	0	1	11	8	103	438	0	0	0	0
8:15 AM	0	4	14	9	0	2	12	2	0	7	16	6	0	2	31	6	111		0	0	0	0
8:30 AM	0	7	9	6	0	3	14	1	0	9	22	9	0	1	23	5	109		0	0	0	0
8:45 AM	0	4	14	12	0	3	12	0	0	8	25	8	0	0	20	9	115		0	0	0	0
Count Total	0	36	149	76	0	29	111	7	0	62	160	62	0	7	158	52	909		0	0	0	0
Peak Hour	0	18	92	44	0	13	58	5	0	34	74	37	0	6	84	29	494		0	0	0	0

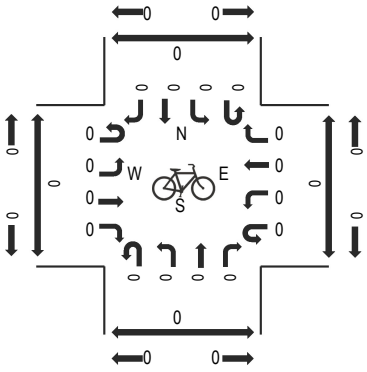
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 2 US 34 & CR 15 AM
Date: Thursday, April 18, 2024
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

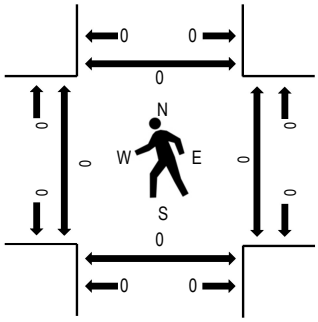
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

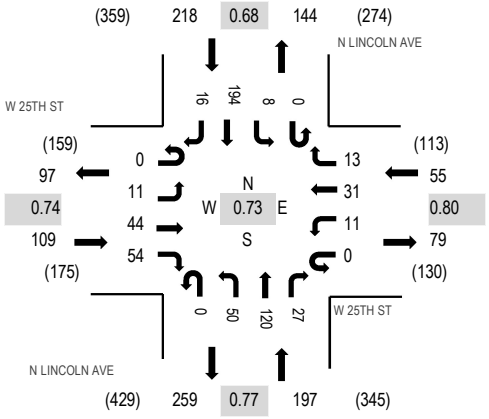
Traffic Counts - Motorized Vehicles

Interval Start Time	CR 15 Eastbound				CR 15 Westbound				US 34 Northbound				US 34 Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	0	0	0	0	10	0	8	0	0	8	9	0	21	14	0	70	387	0	0	0	0
7:15 AM	0	0	0	0	0	5	0	15	0	0	16	15	0	30	12	0	93	395	0	0	0	0
7:30 AM	0	0	3	0	0	9	2	15	0	0	19	8	0	37	18	0	111	391	0	0	0	0
7:45 AM	0	0	0	0	0	11	1	16	0	0	13	13	0	38	21	0	113	361	0	0	0	0
8:00 AM	0	0	3	0	0	7	1	10	0	1	16	2	0	25	13	0	78	342	0	0	0	0
8:15 AM	0	0	2	0	0	8	1	9	0	0	18	7	0	17	27	0	89		0	0	0	0
8:30 AM	0	0	1	0	0	12	2	9	0	0	21	5	0	12	19	0	81		0	0	0	0
8:45 AM	0	0	1	0	0	13	3	11	1	0	22	8	0	18	17	0	94		0	0	0	0
Count Total	0	0	10	0	0	75	10	93	1	1	133	67	0	198	141	0	729		0	0	0	0
Peak Hour	0	0	6	0	0	32	4	56	0	1	64	38	0	130	64	0	395		0	0	0	0

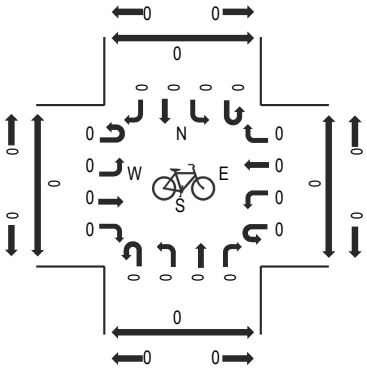
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 3 N LINCOLN AVE & W 25TH ST AM
Date: Thursday, April 18, 2024
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

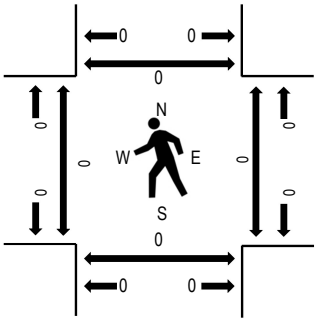
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

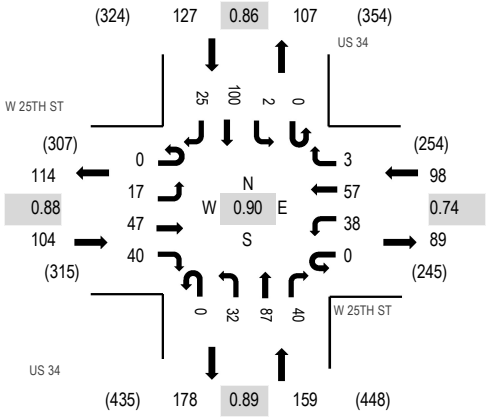
Traffic Counts - Motorized Vehicles

Interval Start Time	W 25TH ST Eastbound				W 25TH ST Westbound				N LINCOLN AVE Northbound				N LINCOLN AVE Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	2	6	12	0	3	10	5	0	10	24	3	0	1	29	4	109	575	0	0	0	0
7:15 AM	0	2	6	12	0	3	5	2	0	8	37	5	0	0	36	2	118	579	0	0	0	0
7:30 AM	0	4	16	17	0	1	4	4	0	12	26	3	0	5	55	3	150	561	0	0	0	0
7:45 AM	0	2	12	19	0	4	13	3	0	20	35	9	0	2	71	8	198	507	0	0	0	0
8:00 AM	0	3	10	6	0	3	9	4	0	10	22	10	0	1	32	3	113	417	0	0	0	0
8:15 AM	0	4	9	3	0	7	8	0	0	3	17	9	0	6	33	1	100		0	0	0	0
8:30 AM	0	2	4	4	0	5	6	2	0	5	31	4	0	0	29	4	96		0	0	0	0
8:45 AM	0	3	6	11	0	5	3	4	0	3	36	3	0	0	29	5	108		0	0	0	0
Count Total	0	22	69	84	0	31	58	24	0	71	228	46	0	15	314	30	992		0	0	0	0
Peak Hour	0	11	44	54	0	11	31	13	0	50	120	27	0	8	194	16	579		0	0	0	0

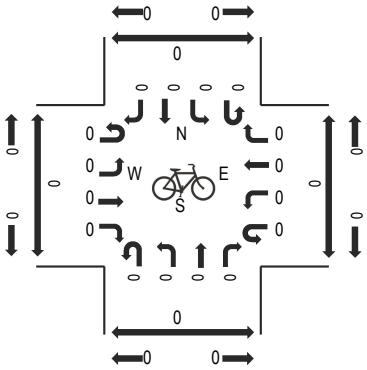
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 1 US 34 & W 25TH ST Noon
Date: Thursday, April 18, 2024
Peak Hour: 11:30 AM - 12:30 PM
Peak 15-Minutes: 12:00 PM - 12:15 PM

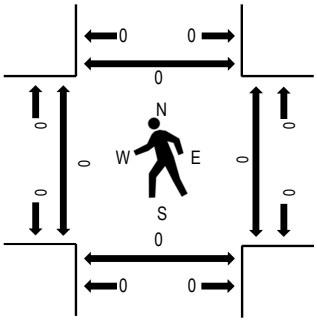
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

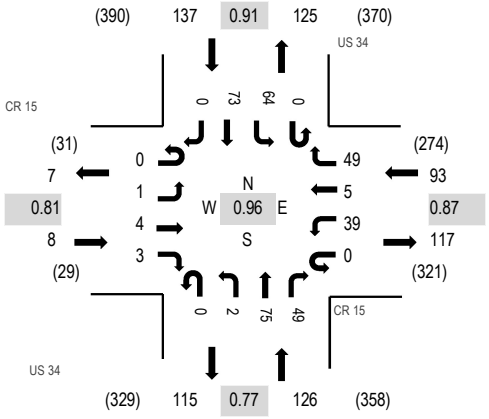
Traffic Counts - Motorized Vehicles

Interval Start Time	W 25TH ST Eastbound				W 25TH ST Westbound				US 34 Northbound				US 34 Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
11:00 AM	0	7	11	7	0	7	13	4	0	9	24	5	0	2	17	4	110	433	0	0	0	0
11:15 AM	0	11	10	10	0	8	9	1	0	8	20	5	0	1	18	3	104	458	0	0	0	0
11:30 AM	0	5	12	12	0	10	17	0	0	10	13	3	0	0	28	9	119	488	0	0	0	0
11:45 AM	0	4	5	9	0	9	9	1	0	7	24	7	0	0	20	5	100	485	0	0	0	0
12:00 PM	0	1	14	11	0	13	20	0	0	6	27	12	0	1	28	2	135	482	0	0	0	0
12:15 PM	0	7	16	8	0	6	11	2	0	9	23	18	0	1	24	9	134	457	0	0	0	0
12:30 PM	0	11	10	9	0	4	14	1	0	10	31	4	0	1	17	4	116	429	0	0	0	0
12:45 PM	0	2	17	3	0	4	14	0	0	10	17	5	0	3	17	5	97	432	0	0	0	0
1:00 PM	0	4	14	5	0	8	14	1	0	11	27	2	0	1	20	3	110	426	0	0	0	0
1:15 PM	0	7	11	7	0	5	14	0	0	1	25	6	0	0	23	7	106		0	0	0	0
1:30 PM	0	0	20	11	0	5	16	0	0	4	26	9	0	1	21	6	119		0	0	0	0
1:45 PM	0	6	12	6	0	6	7	1	0	3	21	6	0	0	19	4	91		0	0	0	0
Count Total	0	65	152	98	0	85	158	11	0	88	278	82	0	11	252	61	1,341		0	0	0	0
Peak Hour	0	17	47	40	0	38	57	3	0	32	87	40	0	2	100	25	488		0	0	0	0

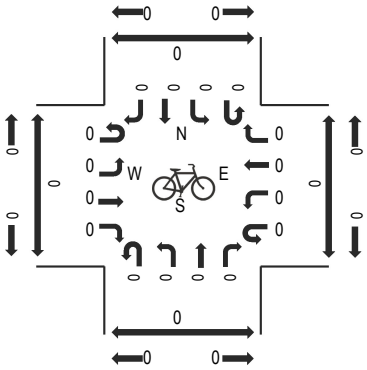
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 2 US 34 & CR 15 Noon
Date: Thursday, April 18, 2024
Peak Hour: 12:00 PM - 01:00 PM
Peak 15-Minutes: 12:30 PM - 12:45 PM

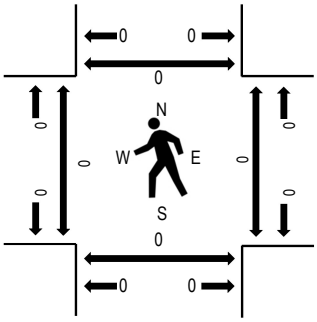
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

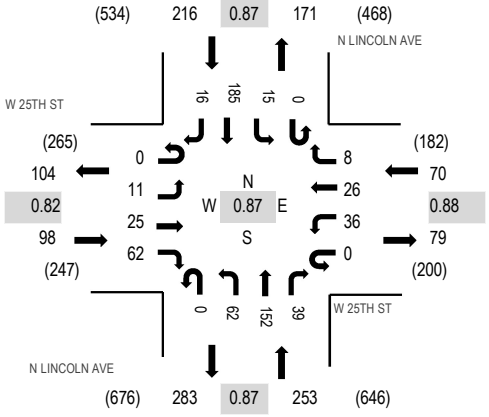
Traffic Counts - Motorized Vehicles

Interval Start Time	CR 15 Eastbound				CR 15 Westbound				US 34 Northbound				US 34 Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
11:00 AM	0	0	3	1	0	8	0	10	0	0	23	13	0	12	14	0	84	339	0	0	0	0
11:15 AM	0	0	2	0	0	3	7	9	0	0	20	11	0	15	22	0	89	349	0	0	0	0
11:30 AM	0	0	2	2	0	16	1	12	0	0	11	8	0	18	20	0	90	354	0	0	0	0
11:45 AM	0	0	2	0	0	3	1	14	0	0	13	13	0	12	17	1	76	359	0	0	0	0
12:00 PM	0	0	1	3	0	12	2	12	0	2	16	12	0	11	23	0	94	364	0	0	0	0
12:15 PM	0	1	2	0	0	16	1	11	0	0	22	9	0	18	14	0	94	353	0	0	0	0
12:30 PM	0	0	0	0	0	5	1	10	0	0	26	16	0	19	18	0	95	360	0	0	0	0
12:45 PM	0	0	1	0	0	6	1	16	0	0	11	12	0	16	18	0	81	341	0	0	0	0
1:00 PM	0	0	0	1	0	6	1	14	0	4	21	8	0	10	18	0	83	348	0	0	0	0
1:15 PM	0	0	1	2	0	11	3	16	0	0	18	14	0	19	16	1	101		0	0	0	0
1:30 PM	0	0	3	0	0	9	1	10	0	0	21	3	0	11	18	0	76		0	0	0	0
1:45 PM	0	0	1	1	0	13	2	11	0	2	22	7	0	16	13	0	88		0	0	0	0
Count Total	0	1	18	10	0	108	21	145	0	8	224	126	0	177	211	2	1,051		0	0	0	0
Peak Hour	0	1	4	3	0	39	5	49	0	2	75	49	0	64	73	0	364		0	0	0	0

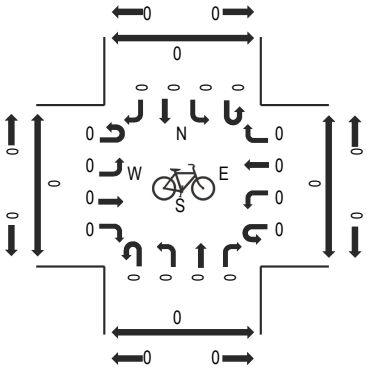
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 3 N LINCOLN AVE & W 25TH ST Noon
Date: Thursday, April 18, 2024
Peak Hour: 11:30 AM - 12:30 PM
Peak 15-Minutes: 12:00 PM - 12:15 PM

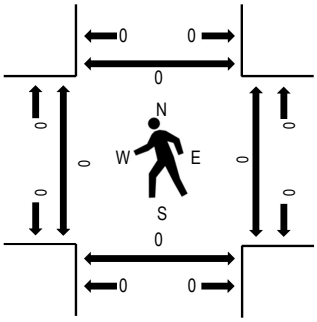
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

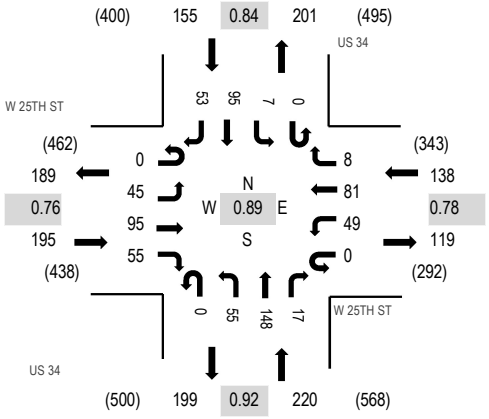
Traffic Counts - Motorized Vehicles

Interval Start Time	W 25TH ST Eastbound				W 25TH ST Westbound				N LINCOLN AVE Northbound				N LINCOLN AVE Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
11:00 AM	0	2	3	8	0	5	6	5	0	6	26	6	0	0	48	2	117	524	0	0	0	0
11:15 AM	0	3	6	7	0	6	8	2	0	5	25	10	0	2	35	2	111	590	0	0	0	0
11:30 AM	0	0	7	13	0	13	4	4	0	13	27	5	0	3	50	9	148	637	0	0	0	0
11:45 AM	0	2	5	13	0	9	6	2	0	10	40	10	0	3	44	4	148	620	0	0	0	0
12:00 PM	0	3	7	20	0	11	9	0	0	20	45	12	0	7	48	1	183	600	0	0	0	0
12:15 PM	0	6	6	16	0	3	7	2	0	19	40	12	0	2	43	2	158	541	0	0	0	0
12:30 PM	0	1	4	13	0	3	9	3	0	20	30	9	0	2	36	1	131	497	0	0	0	0
12:45 PM	0	6	5	11	0	1	11	3	0	14	33	10	0	3	26	5	128	479	0	0	0	0
1:00 PM	0	3	8	10	0	7	4	2	0	10	39	10	0	1	28	2	124	485	0	0	0	0
1:15 PM	0	1	5	9	0	1	4	0	0	11	35	5	0	3	38	2	114		0	0	0	0
1:30 PM	0	2	7	16	0	4	6	4	0	7	33	3	0	2	25	4	113		0	0	0	0
1:45 PM	1	2	5	11	0	4	10	4	0	6	33	7	0	5	41	5	134		0	0	0	0
Count Total	1	31	68	147	0	67	84	31	0	141	406	99	0	33	462	39	1,609		0	0	0	0
Peak Hour	0	11	25	62	0	36	26	8	0	62	152	39	0	15	185	16	637		0	0	0	0

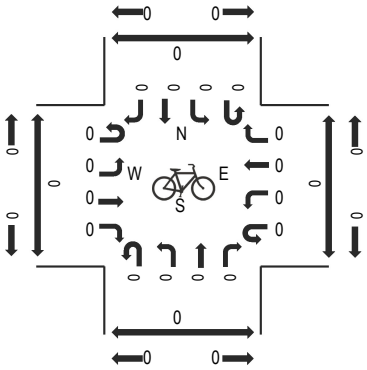
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 1 US 34 & W 25TH ST PM
Date: Thursday, April 18, 2024
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

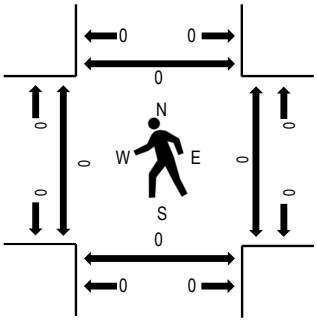
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

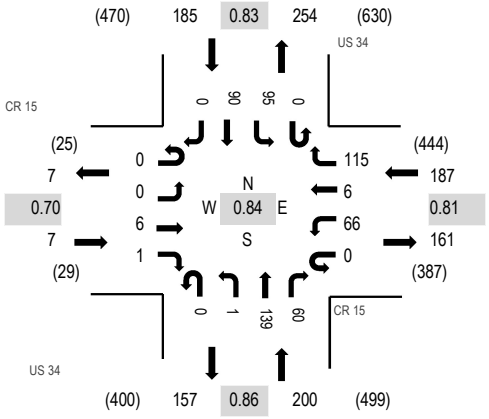
Traffic Counts - Motorized Vehicles

Interval Start Time	W 25TH ST Eastbound				W 25TH ST Westbound				US 34 Northbound				US 34 Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
3:00 PM	0	7	16	4	0	9	21	1	0	10	33	6	0	1	19	9	136	529	0	0	0	0
3:15 PM	0	9	9	8	0	11	16	3	0	16	33	4	0	1	19	3	132	520	0	0	0	0
3:30 PM	0	9	12	7	0	9	16	1	0	8	26	4	0	0	36	6	134	509	0	0	0	0
3:45 PM	0	7	15	6	0	8	23	0	0	10	19	6	0	2	22	9	127	551	0	0	0	0
4:00 PM	0	11	15	10	0	8	16	2	0	7	20	9	0	1	18	10	127	571	0	0	0	0
4:15 PM	0	11	13	6	0	5	11	0	0	12	28	7	0	1	18	9	121	642	0	0	0	0
4:30 PM	0	10	19	10	0	6	23	2	0	12	45	3	0	3	22	21	176	708	0	0	0	0
4:45 PM	0	7	12	8	0	12	16	2	0	12	35	1	0	1	34	7	147	659	0	0	0	0
5:00 PM	0	17	30	17	0	20	20	4	0	13	39	7	0	1	21	9	198	649	0	0	0	0
5:15 PM	0	11	34	20	0	11	22	0	0	18	29	6	0	2	18	16	187		0	0	0	0
5:30 PM	0	6	15	10	0	6	18	0	0	8	32	4	0	0	23	5	127		0	0	0	0
5:45 PM	0	6	21	10	0	3	18	0	0	6	30	10	0	1	26	6	137		0	0	0	0
Count Total	0	111	211	116	0	108	220	15	0	132	369	67	0	14	276	110	1,749		0	0	0	0
Peak Hour	0	45	95	55	0	49	81	8	0	55	148	17	0	7	95	53	708		0	0	0	0

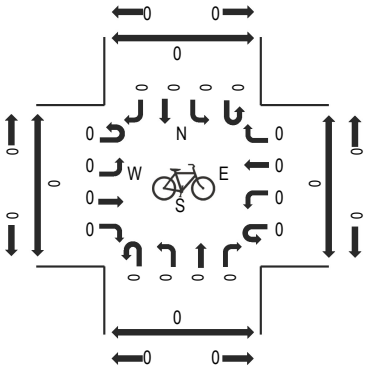
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 2 US 34 & CR 15 PM
Date: Thursday, April 18, 2024
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

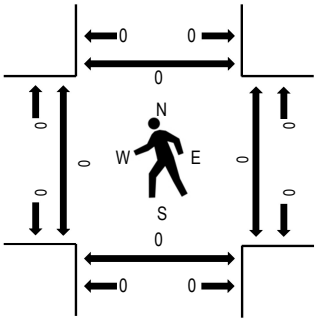
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

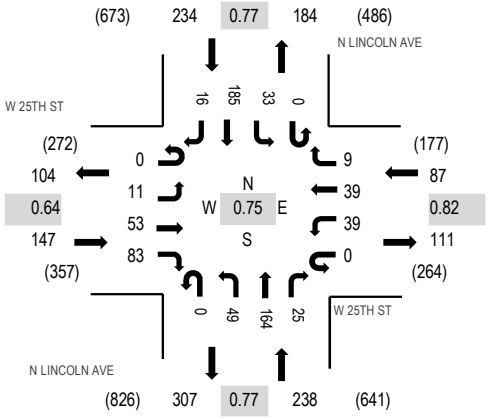
Traffic Counts - Motorized Vehicles

Interval Start Time	CR 15 Eastbound				CR 15 Westbound				US 34 Northbound				US 34 Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
3:00 PM	0	0	3	2	0	5	1	16	0	2	27	11	0	15	24	0	106	443	0	0	0	0
3:15 PM	0	0	1	2	0	7	2	19	0	2	32	12	0	11	24	0	112	441	0	0	0	0
3:30 PM	0	0	2	1	0	7	3	32	0	0	17	16	0	14	26	0	118	439	0	0	0	0
3:45 PM	0	0	3	0	0	16	1	25	0	1	19	9	0	19	14	0	107	467	0	0	0	0
4:00 PM	0	0	1	2	0	14	3	15	0	0	24	9	0	21	14	1	104	490	0	0	0	0
4:15 PM	0	0	3	1	0	8	0	21	0	0	30	10	0	19	18	0	110	559	0	0	0	0
4:30 PM	0	0	1	1	0	23	2	22	0	0	42	16	0	18	21	0	146	579	0	0	0	0
4:45 PM	0	0	3	0	0	14	2	21	0	1	30	9	0	21	29	0	130	537	0	0	0	0
5:00 PM	0	0	1	0	0	10	2	46	0	0	39	19	0	34	22	0	173	509	0	0	0	0
5:15 PM	0	0	1	0	0	19	0	26	0	0	28	16	0	22	18	0	130		0	0	0	0
5:30 PM	0	0	0	0	0	11	0	25	0	0	26	11	0	15	16	0	104		0	0	0	0
5:45 PM	0	0	1	0	0	10	0	16	0	2	32	7	0	13	21	0	102		0	0	0	0
Count Total	0	0	20	9	0	144	16	284	0	8	346	145	0	222	247	1	1,442		0	0	0	0
Peak Hour	0	0	6	1	0	66	6	115	0	1	139	60	0	95	90	0	579		0	0	0	0

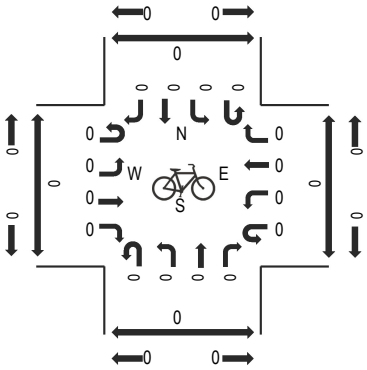
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 3 N LINCOLN AVE & W 25TH ST PM
Date: Thursday, April 18, 2024
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

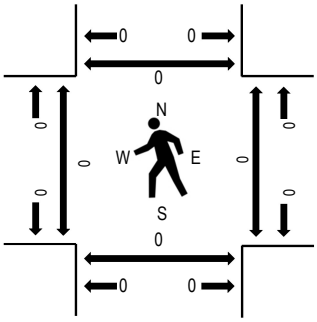
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	W 25TH ST Eastbound				W 25TH ST Westbound				N LINCOLN AVE Northbound				N LINCOLN AVE Southbound					Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
3:00 PM	0	4	10	15	0	1	5	1	0	14	34	6	0	7	61	8	166	608	0	0	0	0
3:15 PM	0	3	10	12	0	5	8	1	0	17	30	7	0	5	41	5	144	588	0	0	0	0
3:30 PM	0	2	7	24	0	7	9	2	0	5	34	7	0	4	51	5	157	562	0	0	0	0
3:45 PM	0	5	9	13	0	6	3	2	0	8	39	8	0	3	40	5	141	558	0	0	0	0
4:00 PM	0	4	5	14	0	5	2	1	0	12	33	2	0	0	61	7	146	547	0	0	0	0
4:15 PM	0	3	3	15	0	2	3	0	0	8	34	6	0	6	33	5	118	635	0	0	0	0
4:30 PM	0	2	9	16	0	6	10	2	0	13	35	2	0	3	52	3	153	706	0	0	0	0
4:45 PM	0	1	5	12	0	10	6	2	0	12	32	2	0	9	38	1	130	698	0	0	0	0
5:00 PM	0	5	22	33	0	11	14	2	0	10	60	8	0	16	45	8	234	693	0	0	0	0
5:15 PM	0	3	17	22	0	12	9	3	0	14	37	13	0	5	50	4	189		0	0	0	0
5:30 PM	0	3	11	11	0	9	9	2	0	7	33	8	0	5	42	5	145		0	0	0	0
5:45 PM	0	1	11	15	0	4	2	1	0	12	30	9	0	4	32	4	125		0	0	0	0
Count Total	0	36	119	202	0	78	80	19	0	132	431	78	0	67	546	60	1,848		0	0	0	0
Peak Hour	0	11	53	83	0	39	39	9	0	49	164	25	0	33	185	16	706		0	0	0	0

APPENDIX B

Existing Capacity Analysis Reports and Turn Lane Warrant Evaluations

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	92	44	13	58	5	34	74	37	6	84	29
Future Vol, veh/h	18	92	44	13	58	5	34	74	37	6	84	29
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	-	-	-	-	-	-	295	-	-	130	-	-
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, %	28	0	2	8	10	20	3	38	8	17	17	24
Mvmt Flow	22	112	54	16	71	6	41	90	45	7	102	35

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	297	351	69	316	346	68	137	0	0	135	0	0
Stage 1	134	134	-	195	195	-	-	-	-	-	-	-
Stage 2	163	217	-	121	151	-	-	-	-	-	-	-
Critical Hdwy	8.06	6.5	6.94	7.66	6.7	7.3	4.16	-	-	4.44	-	-
Critical Hdwy Stg 1	7.06	5.5	-	6.66	5.7	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.06	5.5	-	6.66	5.7	-	-	-	-	-	-	-
Follow-up Hdwy	3.78	4	3.32	3.58	4.1	3.5	2.23	-	-	2.37	-	-
Pot Cap-1 Maneuver	570	577	980	598	558	926	1437	-	-	1344	-	-
Stage 1	785	789	-	771	719	-	-	-	-	-	-	-
Stage 2	753	727	-	853	752	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	496	557	980	466	539	926	1437	-	-	1344	-	-
Mov Cap-2 Maneuver	496	557	-	466	539	-	-	-	-	-	-	-
Stage 1	762	785	-	749	698	-	-	-	-	-	-	-
Stage 2	653	706	-	687	748	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.2	13.1	1.8	0.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1437	-	-	625	539	1344	-	-
HCM Lane V/C Ratio	0.029	-	-	0.3	0.172	0.005	-	-
HCM Control Delay (s)	7.6	-	-	13.2	13.1	7.7	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.3	0.6	0	-	-

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	6	0	32	4	56	1	64	38	130	64	0
Future Vol, veh/h	0	6	0	32	4	56	1	64	38	130	64	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	-	330	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	19	0	5	0	41	48	2	20	0
Mvmt Flow	0	7	0	37	5	64	1	74	44	149	74	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	414	492	37	437	470	59	74	0	0	118	0	0
Stage 1	372	372	-	98	98	-	-	-	-	-	-	-
Stage 2	42	120	-	339	372	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.88	6.5	7	4.1	-	-	4.14	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.88	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.88	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.69	4	3.35	2.2	-	-	2.22	-	-
Pot Cap-1 Maneuver	527	481	1034	465	495	985	1538	-	-	1468	-	-
Stage 1	626	622	-	850	818	-	-	-	-	-	-	-
Stage 2	973	800	-	604	622	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	451	432	1034	424	445	985	1538	-	-	1468	-	-
Mov Cap-2 Maneuver	451	432	-	424	445	-	-	-	-	-	-	-
Stage 1	625	559	-	849	817	-	-	-	-	-	-	-
Stage 2	904	799	-	536	559	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.5	11.6	0.1	5.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1538	-	-	432	651	1468	-	-
HCM Lane V/C Ratio	0.001	-	-	0.016	0.162	0.102	-	-
HCM Control Delay (s)	7.3	-	-	13.5	11.6	7.7	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.6	0.3	-	-

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	44	54	11	31	13	50	120	27	8	194	16
Future Vol, veh/h	11	44	54	11	31	13	50	120	27	8	194	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	100	-	360
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	0	0	2	9	0	8	0	1	0	0	1	13
Mvmt Flow	15	60	74	15	42	18	68	164	37	11	266	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	527	625	133	504	629	101	288	0	0	201	0	0
Stage 1	288	288	-	319	319	-	-	-	-	-	-	-
Stage 2	239	337	-	185	310	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.94	7.68	6.5	7.06	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.68	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.68	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.32	3.59	4	3.38	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	438	404	892	435	402	916	1286	-	-	1383	-	-
Stage 1	701	677	-	648	657	-	-	-	-	-	-	-
Stage 2	749	645	-	779	663	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	374	379	892	335	377	916	1286	-	-	1383	-	-
Mov Cap-2 Maneuver	374	379	-	335	377	-	-	-	-	-	-	-
Stage 1	664	672	-	614	622	-	-	-	-	-	-	-
Stage 2	648	611	-	645	658	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.5	15.3	2	0.3
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1286	-	-	529	426	1383	-	-
HCM Lane V/C Ratio	0.053	-	-	0.282	0.177	0.008	-	-
HCM Control Delay (s)	8	-	-	14.5	15.3	7.6	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1.2	0.6	0	-	-

Intersection	
Int Delay, s/veh	8.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	95	55	49	81	8	55	148	17	7	95	53
Future Vol, veh/h	45	95	55	49	81	8	55	148	17	7	95	53
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	-	-	-	-	-	-	295	-	-	130	-	-
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, %	9	4	0	2	0	0	0	19	6	0	22	4
Mvmt Flow	51	107	62	55	91	9	62	166	19	8	107	60

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	406	462	84	423	483	93	167	0	0	185	0	0
Stage 1	153	153	-	300	300	-	-	-	-	-	-	-
Stage 2	253	309	-	123	183	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.58	6.9	7.54	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.68	5.58	-	6.54	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.58	-	6.54	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.04	3.3	3.52	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	513	491	965	515	486	952	1423	-	-	1402	-	-
Stage 1	814	765	-	684	669	-	-	-	-	-	-	-
Stage 2	710	653	-	868	752	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	416	466	965	383	462	952	1423	-	-	1402	-	-
Mov Cap-2 Maneuver	416	466	-	383	462	-	-	-	-	-	-	-
Stage 1	778	760	-	654	640	-	-	-	-	-	-	-
Stage 2	577	624	-	694	747	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.6	17.4	1.9	0.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1423	-	-	528	443	1402	-	-
HCM Lane V/C Ratio	0.043	-	-	0.415	0.35	0.006	-	-
HCM Control Delay (s)	7.6	-	-	16.6	17.4	7.6	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2	1.5	0	-	-

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	6	1	66	6	115	1	139	60	95	90	0
Future Vol, veh/h	0	6	1	66	6	115	1	139	60	95	90	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	-	330	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	3	0	2	0	21	7	1	22	0
Mvmt Flow	0	7	1	79	7	137	1	165	71	113	107	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	421	571	54	486	536	118	107	0	0	236	0	0
Stage 1	333	333	-	203	203	-	-	-	-	-	-	-
Stage 2	88	238	-	283	333	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.56	6.5	6.94	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.56	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.56	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.53	4	3.32	2.2	-	-	2.21	-	-
Pot Cap-1 Maneuver	521	434	1008	462	454	912	1497	-	-	1336	-	-
Stage 1	660	647	-	777	737	-	-	-	-	-	-	-
Stage 2	916	712	-	697	647	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	408	397	1008	426	415	912	1497	-	-	1336	-	-
Mov Cap-2 Maneuver	408	397	-	426	415	-	-	-	-	-	-	-
Stage 1	659	592	-	776	736	-	-	-	-	-	-	-
Stage 2	770	711	-	630	592	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.4	13.7	0	4.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1497	-	-	435	633	1336	-	-
HCM Lane V/C Ratio	0.001	-	-	0.019	0.352	0.085	-	-
HCM Control Delay (s)	7.4	-	-	13.4	13.7	7.9	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.6	0.3	-	-

Intersection	
Int Delay, s/veh	7.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	53	83	39	39	9	49	164	25	33	185	16
Future Vol, veh/h	11	53	83	39	39	9	49	164	25	33	185	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	100	-	360
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	3	1	0
Mvmt Flow	15	71	111	52	52	12	65	219	33	44	247	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	601	717	124	613	722	126	268	0	0	252	0	0
Stage 1	335	335	-	366	366	-	-	-	-	-	-	-
Stage 2	266	382	-	247	356	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.16	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.23	-	-
Pot Cap-1 Maneuver	388	358	910	381	355	907	1307	-	-	1303	-	-
Stage 1	658	646	-	631	626	-	-	-	-	-	-	-
Stage 2	722	616	-	741	633	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	315	329	910	263	326	907	1307	-	-	1303	-	-
Mov Cap-2 Maneuver	315	329	-	263	326	-	-	-	-	-	-	-
Stage 1	625	624	-	599	595	-	-	-	-	-	-	-
Stage 2	618	585	-	558	611	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.3	23.1	1.6	1.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1307	-	-	512	313	1303	-	-
HCM Lane V/C Ratio	0.05	-	-	0.383	0.371	0.034	-	-
HCM Control Delay (s)	7.9	-	-	16.3	23.1	7.9	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1.8	1.7	0.1	-	-

Intersection: US-34/81 & 25th St NBR
Existing AM

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

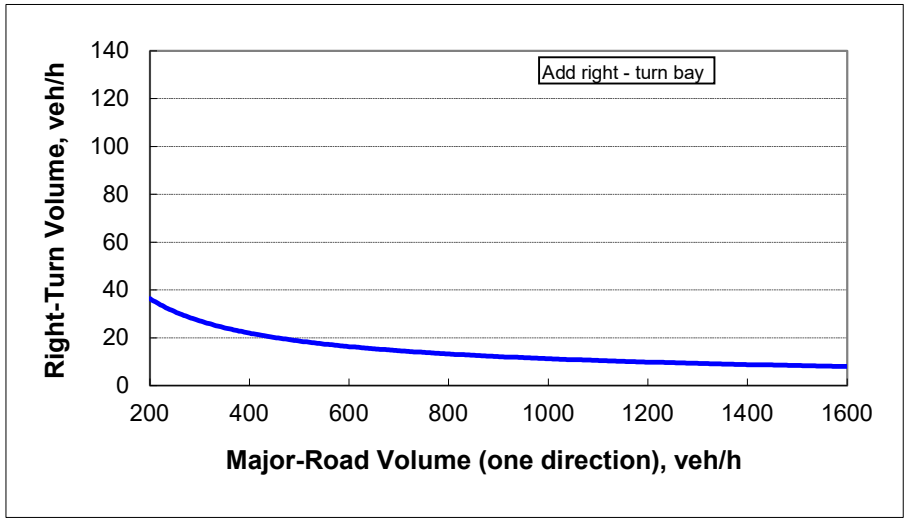
INPUT

Roadway geometry:	4-lane roadway

Variable	Value
Major-road speed, mph:	60
Major-road volume (one direction), veh/h:	145
Right-turn volume, veh/h:	37

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	46
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



Intersection: US-34/81 & 25th St NBR
Existing PM

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

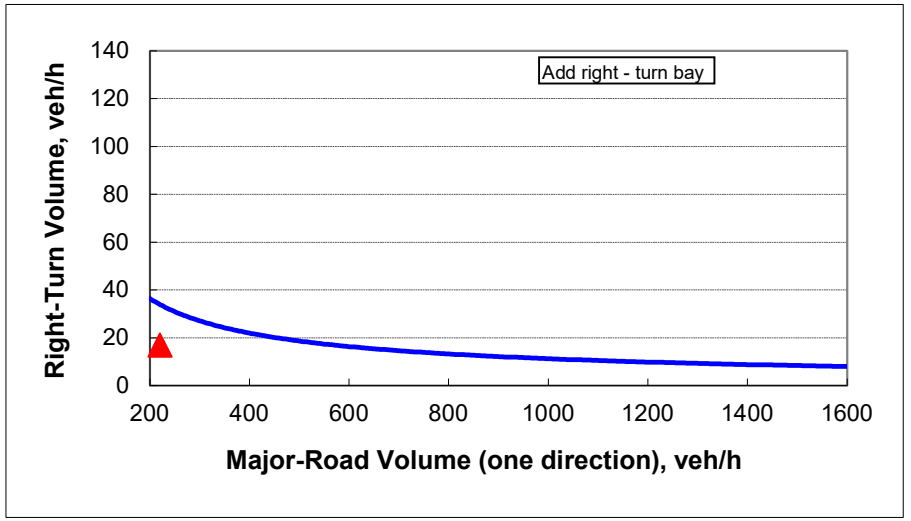
INPUT

Roadway geometry:	4-lane roadw ay

Variable	Value
Major-road speed, mph:	60
Major-road volume (one direction), veh/h:	220
Right-turn volume, veh/h:	17

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	34
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



Intersection: US-34/81 & 25th St SBR
Existing AM

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

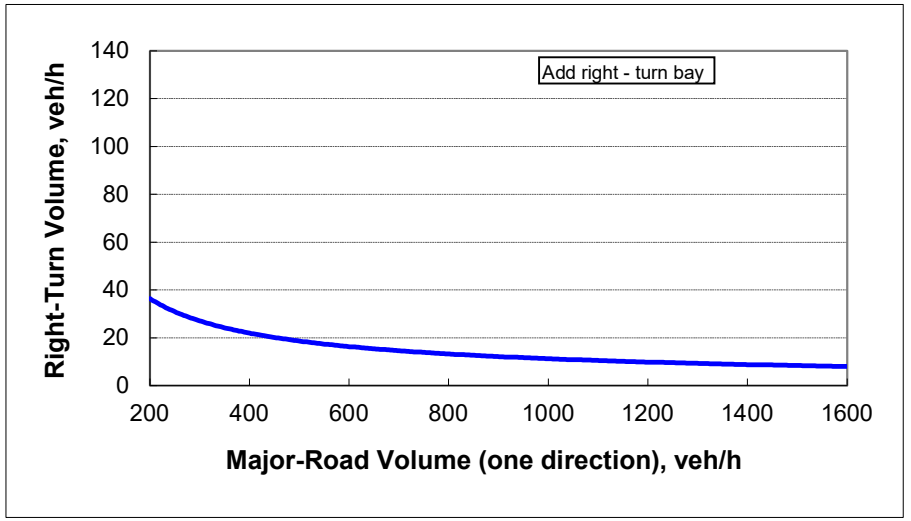
INPUT

Roadway geometry:	4-lane roadw ay

Variable	Value
Major-road speed, mph:	60
Major-road volume (one direction), veh/h:	119
Right-turn volume, veh/h:	29

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	53
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



Intersection: US-34/81 & 25th St SBR
Existing PM

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

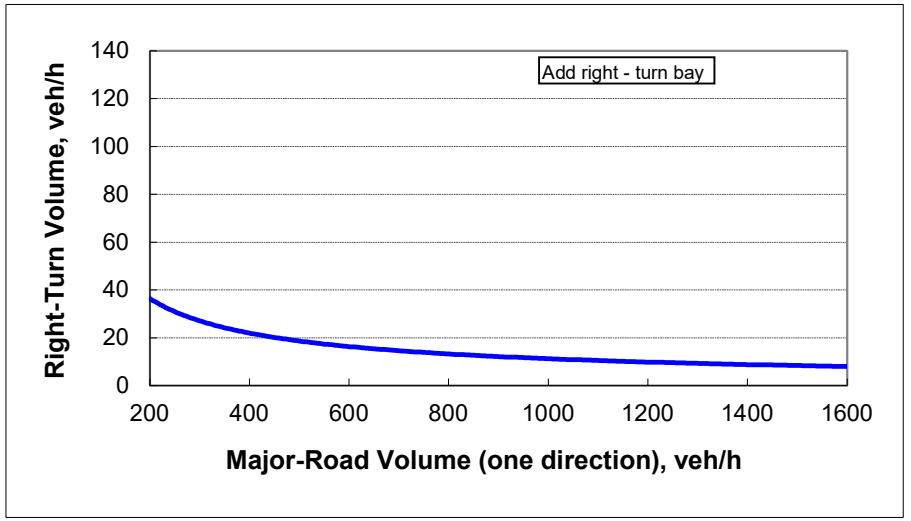
INPUT

Roadway geometry:	4-lane roadw ay

Variable	Value
Major-road speed, mph:	60
Major-road volume (one direction), veh/h:	155
Right-turn volume, veh/h:	53

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	44
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Add right-turn bay.	



Intersection: US-34/81 & CR 15 NBR
Existing AM

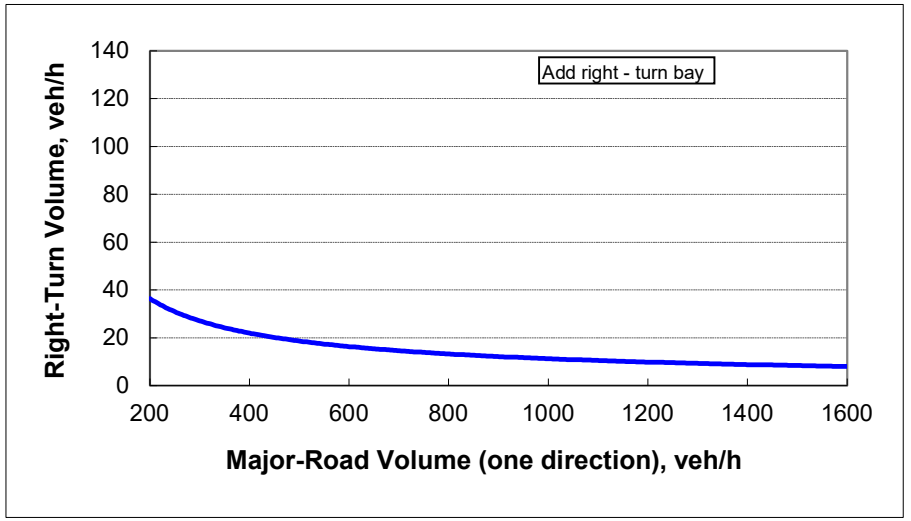
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	4-lane roadw ay
Variable	Value
Major-road speed, mph:	60
Major-road volume (one direction), veh/h:	103
Right-turn volume, veh/h:	38

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	59
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



Intersection: US-34/81 & CR 15 NBR
Existing PM

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

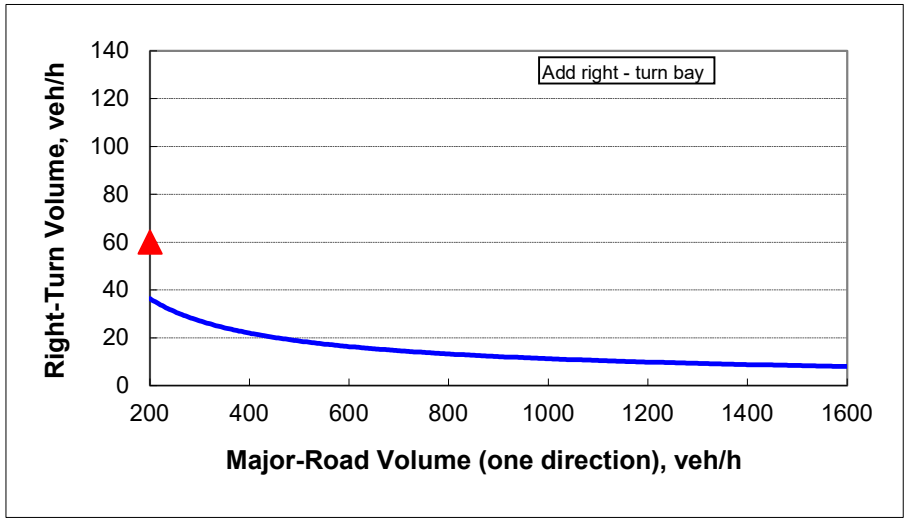
INPUT

Roadway geometry:	4-lane roadway

Variable	Value
Major-road speed, mph:	60
Major-road volume (one direction), veh/h:	200
Right-turn volume, veh/h:	60

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	36
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Add right-turn bay.	



APPENDIX C

Future Year Signal Warrant and Turn Lane Evaluations

Nebraska Department of Roads
Traffic Engineering Division

Hwy 34 at 25th St
Future Year 2030 and 2040
Conditions - No RT Reduction

Proposed Signal Warrants
For DHV's

2030 AM Volumes
Major: 304
Minor: 178

2030 PM Volumes
Major: 431
Minor: 224

2040 AM Volumes
Major: 371
Minor: 216

2040 PM Volumes
Major: 525
Minor: 273

Warrant 1 Eight-Hour Vehicular Volume Using DHV's

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		DHV on Major Street (Total of Both Approaches)				DHV on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1……	1……	870	715	635	N/A	324	277	254	N/A
2 or more	1……	1,025	840	745	N/A	324	277	254	N/A
2 or more	2 or more	1,025	840	745	N/A	403	340	310	N/A
1……	2 or more	870	715	635	N/A	403	340	310	N/A

Condition B - Interuption of Continuous Traffic									
Number of lanes for moving traffic on each approach		DHV on Major Street (Total of Both Approaches)				DHV on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1……	1……	1,258	1,024	907	N/A	162	138	128	N/A
2 or more	1……	1,491	1,211	1,071	N/A	162	138	128	N/A
2 or more	2 or more	1,491	1,211	1,071	N/A	201	170	154	N/A
1……	2 or more	1,258	1,024	907	N/A	201	170	154	N/A

These values are calculated using the equation:

DHV = 90.16 + (0.0934)(ADT), where the ADT is 16.67 times the Warrant 1 value from the MUTCD.

This equation is from Page 8 of the 2002 Continuous Traffic Count Data from Planning.

Nebraska Department of Roads
Traffic Engineering Division

Hwy 34 at 25th St
Future Year 2030 and 2040
Conditions - No RT Reduction

2030 ADTs
Major: 5,060
Minor: 3,380

2040 ADTs
Major: 6,170
Minor: 4,120

Proposed Signal Warrants
For ADT Volumes

Warrant 1, Eight-Hour Vehicular Volume Using ADT's

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		ADT on Major Street (Average of Both Approaches)				ADT on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1……	1……	8,350	6,675	5,850	4,675	5,000	4,000	3,500	2,800
2 or more	1……	10,000	8,000	7,000	5,600	5,000	4,000	3,500	2,800
2 or more	2 or more	10,000	8,000	7,000	5,600	6,675	5,350	4,675	3,750
1……	2 or more	8,350	6,675	5,850	4,675	6,675	5,350	4,675	3,750

Condition B - Interuption of Continuous Traffic									
Number of lanes for moving traffic on each approach		ADT on Major Street (Average of Both Approaches)				ADT on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1……	1……	12,500	10,000	8,750	7,000	2,500	2,000	1,750	1,400
2 or more	1……	15,000	12,000	10,500	8,400	2,500	2,000	1,750	1,400
2 or more	2 or more	15,000	12,000	10,500	8,400	3,350	2,675	2,350	1,875
1……	2 or more	12,500	10,000	8,750	7,000	3,350	2,675	2,350	1,875

[a] Basic hourly minimum volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures.

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population less than 10,000.

[d] May be used for combinations of Conditions A and B after adequate trial of other remedial measures when the major street speed exceeds 40 mph or in an isolated community with a population of less than 10,000.

To determine whether a signal should be installed on a construction project, the projected ADT's for 3 years after project completion should be used for an area showing reasonably steady growth. For projections assuming a drastic change in land use that is now undefined, engineering judgment should be used.

These values are based upon the eighth highest hour traffic volume on an average day being 6% of the ADT. This value was derived from the 2002 Continuous Traffic Count Data from Planning Division. The ADT on the minor leg is two-way traffic and assumes a 50/50 directional split (entering and exiting).

Nebraska Department of Roads
Traffic Engineering Division

Hwy 34 at 25th St
Future Year 2030 and 2040
Conditions - RT Reduction

Proposed Signal Warrants
For DHV's

2030 AM Volumes
Major: 304
Minor: 127

2030 PM Volumes
Major: 431
Minor: 161

2040 AM Volumes
Major: 371
Minor: 154

2040 PM Volumes
Major: 525
Minor: 196

Warrant 1 Eight-Hour Vehicular Volume Using DHV's

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		DHV on Major Street (Total of Both Approaches)				DHV on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1……	1……	870	715	635	N/A	324	277	254	N/A
2 or more	1……	1,025	840	745	N/A	324	277	254	N/A
2 or more	2 or more	1,025	840	745	N/A	403	340	310	N/A
1……	2 or more	870	715	635	N/A	403	340	310	N/A

Condition B - Interuption of Continuous Traffic									
Number of lanes for moving traffic on each approach		DHV on Major Street (Total of Both Approaches)				DHV on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1……	1……	1,258	1,024	907	N/A	162	138	128	N/A
2 or more	1……	1,491	1,211	1,071	N/A	162	138	128	N/A
2 or more	2 or more	1,491	1,211	1,071	N/A	201	170	154	N/A
1……	2 or more	1,258	1,024	907	N/A	201	170	154	N/A

These values are calculated using the equation:

DHV = 90.16 + (0.0934)(ADT), where the ADT is 16.67 times the Warrant 1 value from the MUTCD.

This equation is from Page 8 of the 2002 Continuous Traffic Count Data from Planning.

Nebraska Department of Roads
Traffic Engineering Division

Hwy 34 at 25th St
Future Year 2030 and 2040
Conditions - RT Reduction

Proposed Signal Warrants
For ADT Volumes

2030 ADTs
Major: 5,060
Minor: 3,300

2040 ADTs
Major: 6,170
Minor: 4,030

Warrant 1, Eight-Hour Vehicular Volume Using ADT's

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		ADT on Major Street (Average of Both Approaches)				ADT on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1……	1……	8,350	6,675	5,850	4,675	5,000	4,000	3,500	2,800
2 or more	1……	10,000	8,000	7,000	5,600	5,000	4,000	3,500	2,800
2 or more	2 or more	10,000	8,000	7,000	5,600	6,675	5,350	4,675	3,750
1……	2 or more	8,350	6,675	5,850	4,675	6,675	5,350	4,675	3,750

Condition B - Interuption of Continuous Traffic									
Number of lanes for moving traffic on each approach		ADT on Major Street (Average of Both Approaches)				ADT on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1……	1……	12,500	10,000	8,750	7,000	2,500	2,000	1,750	1,400
2 or more	1……	15,000	12,000	10,500	8,400	2,500	2,000	1,750	1,400
2 or more	2 or more	15,000	12,000	10,500	8,400	3,350	2,675	2,350	1,875
1……	2 or more	12,500	10,000	8,750	7,000	3,350	2,675	2,350	1,875

[a] Basic hourly minimum volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures.

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population less than 10,000.

[d] May be used for combinations of Conditions A and B after adequate trial of other remedial measures when the major street speed exceeds 40 mph or in an isolated community with a population of less than 10,000.

To determine whether a signal should be installed on a construction project, the projected ADT's for 3 years after project completion should be used for an area showing reasonably steady growth. For projections assuming a drastic change in land use that is now undefined, engineering judgment should be used.

These values are based upon the eighth highest hour traffic volume on an average day being 6% of the ADT. This value was derived from the 2002 Continuous Traffic Count Data from Planning Division. The ADT on the minor leg is two-way traffic and assumes a 50/50 directional split (entering and exiting).

Chapter 3 Warrant 1

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 Background - No RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

*Warrant 1 is satisfied if Condition A **or** Condition B is "100%" satisfied for eight hours.* ☐ Yes ☑ No

*Warrant 1 is also satisfied if both Condition A **and** Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).* ☐ Yes ☑ No

*Warrant 1 is satisfied if Condition A **or** Condition B is "70%" satisfied for eight hours.* ☐ Yes ☑ No

Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

[a] Basic Minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	7:00-8:00	8:00-9:00	11:00-12:00	12:00-13:00	13:00-14:00	15:00-16:00	16:00-17:00	17:00-18:00
Major	262	302	273	320	277	340	378	372
Minor	178	116	116	123	116	133	149	222

Existing Volumes

TRAFFIC SIGNAL WARRANT SUMMARY

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	**Minor**	**100%[a]**	**80%[b]**	**70%[c]**	**100%[a]**	**80%[b]**	**70%[c]**
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

[a] Basic Minimum hourly volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Eight Highest Hours								
Street	**7:00-8:00**	**8:00-9:00**	**11:00-12:00**	**12:00-13:00**	**13:00-14:00**	**15:00-16:00**	**16:00-17:00**	**17:00-18:00**
Major	262	302	273	320	277	340	378	372
Minor	178	116	116	123	116	133	149	222

Existing Volumes

Chapter 3 Warrant 2

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 Background - No RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☑ Yes ☐ No

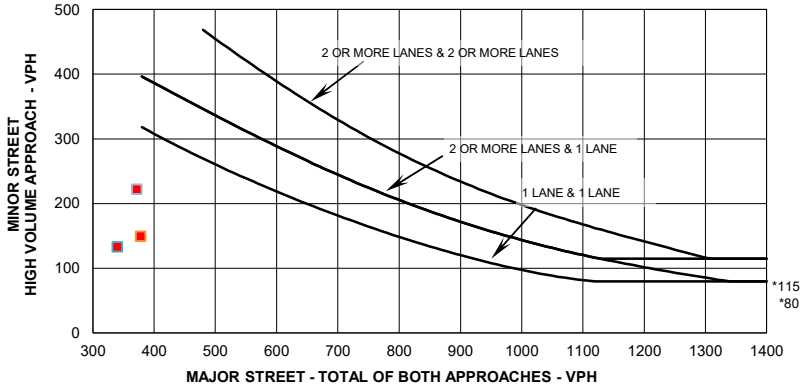
Satisfied: ☐ Yes ☑ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7:00-8:00	262	178
15:00-16:00	340	133
16:00-17:00	378	149
17:00-18:00	372	222

FIGURE 4C-1: Criteria for "100%" Volume Level



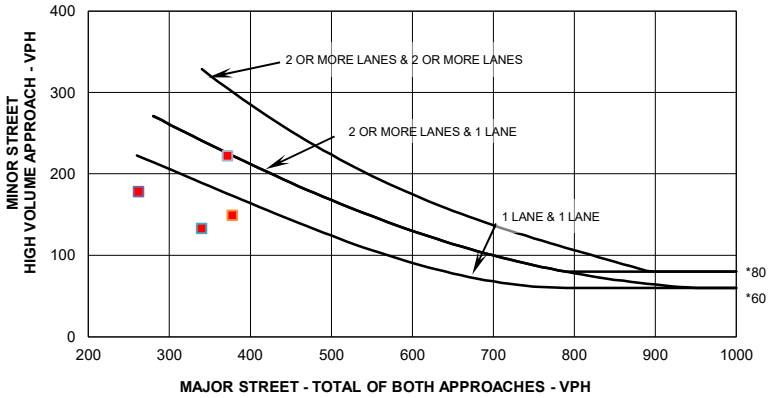
** Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7:00-8:00	262	178
15:00-16:00	340	133
16:00-17:00	378	149
17:00-18:00	372	222

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 3

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 Background - No RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 3 - PEAK HOUR

*If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.*

Applicable: ☑ Yes ☐ No

Satisfied: ☐ Yes ☑ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	431	161

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	431	161

Criteria

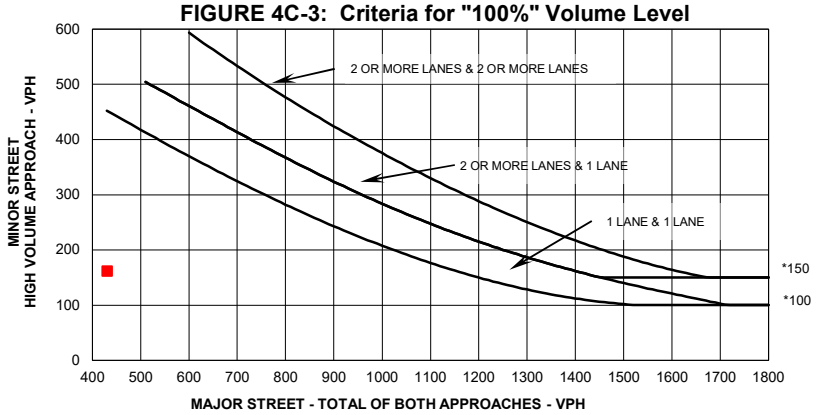
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	☐ Yes ☐ No	

2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	☐ Yes ☐ No	

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	☐ Yes ☐ No	

Plot volume combination on the applicable figure below.

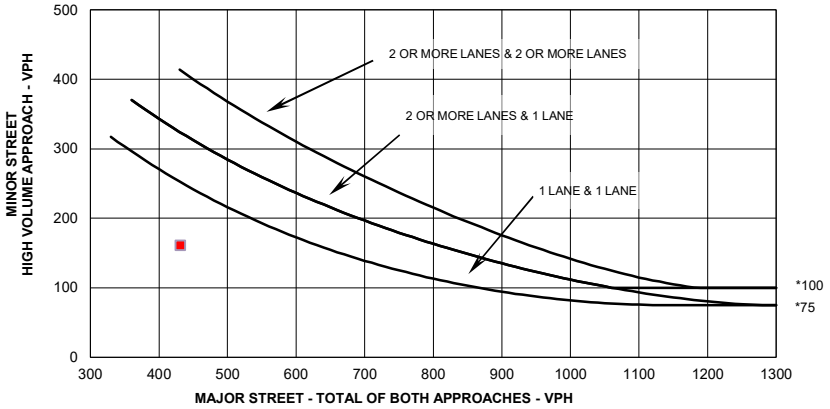
FIGURE 4C-3: Criteria for "100%" Volume Level



** Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 100 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 75 phi applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 1

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 Background - RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

*Warrant 1 is satisfied if Condition A **or** Condition B is "100%" satisfied for eight hours.* ☐ Yes ☑ No

*Warrant 1 is also satisfied if both Condition A **and** Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).* ☐ Yes ☑ No

*Warrant 1 is satisfied if Condition A **or** Condition B is "70%" satisfied for eight hours.* ☐ Yes ☑ No

Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

[a] Basic Minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	7:00-8:00	8:00-9:00	11:00-12:00	12:00-13:00	13:00-14:00	15:00-16:00	16:00-17:00	17:00-18:00
Major	262	302	273	320	277	340	378	372
Minor	128	80	92	97	84	127	110	158

Existing Volumes

TRAFFIC SIGNAL WARRANT SUMMARY

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	**Minor**	**100%[a]**	**80%[b]**	**70%[c]**	**100%[a]**	**80%[b]**	**70%[c]**
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

[a] Basic Minimum hourly volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Eight Highest Hours								
Street	**7:00-8:00**	**8:00-9:00**	**11:00-12:00**	**12:00-13:00**	**13:00-14:00**	**15:00-16:00**	**16:00-17:00**	**17:00-18:00**
Major	262	302	273	320	277	340	378	372
Minor	128	80	92	97	84	127	110	158

Existing Volumes

Chapter 3 Warrant 2

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 Background - RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☑ Yes ☐ No

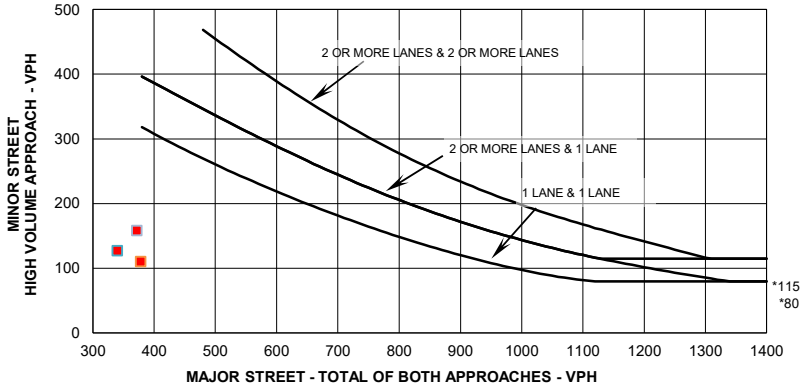
Satisfied: ☐ Yes ☑ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7:00-8:00	262	128
15:00-16:00	340	127
16:00-17:00	378	110
17:00-18:00	372	158

FIGURE 4C-1: Criteria for "100%" Volume Level



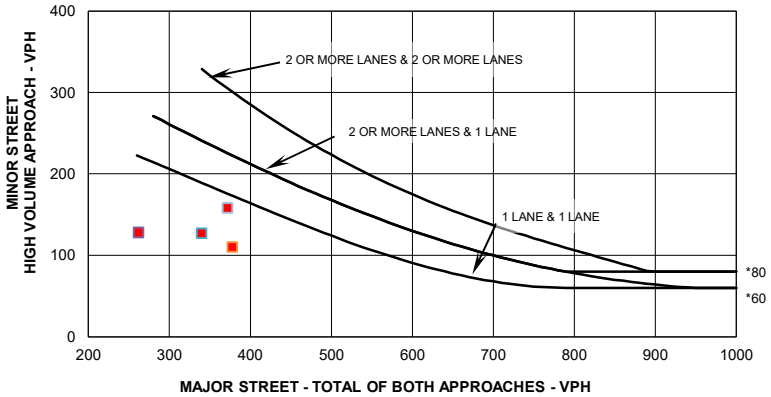
** Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7:00-8:00	262	128
15:00-16:00	340	127
16:00-17:00	378	110
17:00-18:00	372	158

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 3

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 Background - RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 3 - PEAK HOUR

*If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.*

Applicable: ☑ Yes ☐ No

Satisfied: ☐ Yes ☑ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	431	161

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	431	161

Criteria

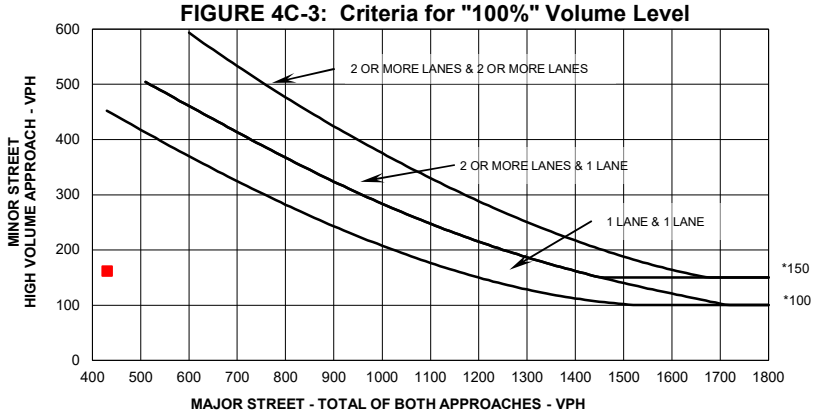
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	☐ Yes ☐ No	

2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	☐ Yes ☐ No	

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	☐ Yes ☐ No	

Plot volume combination on the applicable figure below.

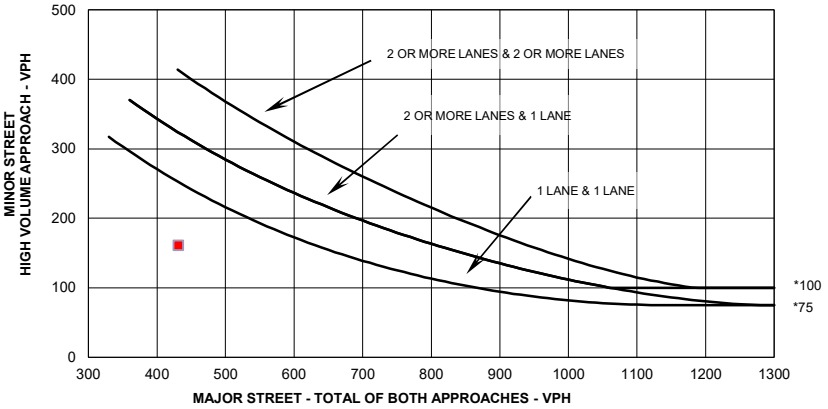
FIGURE 4C-3: Criteria for "100%" Volume Level



** Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 100 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 75 phi applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 1

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2040 Background - No RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

*Warrant 1 is satisfied if Condition A **or** Condition B is "100%" satisfied for eight hours.* ☐ Yes ☑ No

*Warrant 1 is also satisfied if both Condition A **and** Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).* ☐ Yes ☑ No

*Warrant 1 is satisfied if Condition A **or** Condition B is "70%" satisfied for eight hours.* ☐ Yes ☑ No

Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Applicable: ☑ Yes ☐ No
100% Satisfied: ☐ Yes ☑ No
80% Satisfied: ☐ Yes ☑ No
70% Satisfied: ☐ Yes ☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

[a] Basic Minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	7:00-8:00	8:00-9:00	11:00-12:00	12:00-13:00	13:00-14:00	15:00-16:00	16:00-17:00	17:00-18:00
Major	320	368	332	390	338	415	461	453
Minor	217	141	141	150	141	162	181	270

Existing Volumes

TRAFFIC SIGNAL WARRANT SUMMARY

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	**Minor**	**100%[a]**	**80%[b]**	**70%[c]**	**100%[a]**	**80%[b]**	**70%[c]**
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

[a] Basic Minimum hourly volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Eight Highest Hours								
Street	**7:00-8:00**	**8:00-9:00**	**11:00-12:00**	**12:00-13:00**	**13:00-14:00**	**15:00-16:00**	**16:00-17:00**	**17:00-18:00**
Major	320	368	332	390	338	415	461	453
Minor	217	141	141	150	141	162	181	270

Existing Volumes

Chapter 3 Warrant 2

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2040 Background - No RT Reductior		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☑ Yes ☐ No

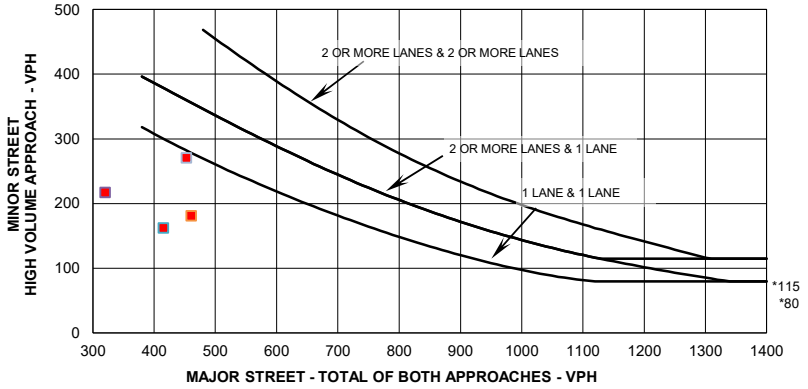
Satisfied: ☐ Yes ☑ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7:00-8:00	320	217
15:00-16:00	415	162
16:00-17:00	461	181
17:00-18:00	453	270

FIGURE 4C-1: Criteria for "100%" Volume Level



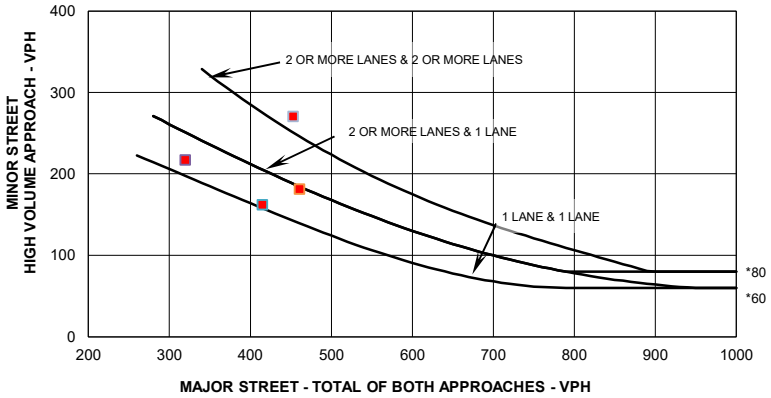
** Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7:00-8:00	320	217
15:00-16:00	415	162
16:00-17:00	461	181
17:00-18:00	453	270

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 3

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2040 Background - No RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 3 - PEAK HOUR

*If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.*

Applicable: ☑ Yes ☐ No

Satisfied: ☐ Yes ☑ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	525	273

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	525	273

Criteria

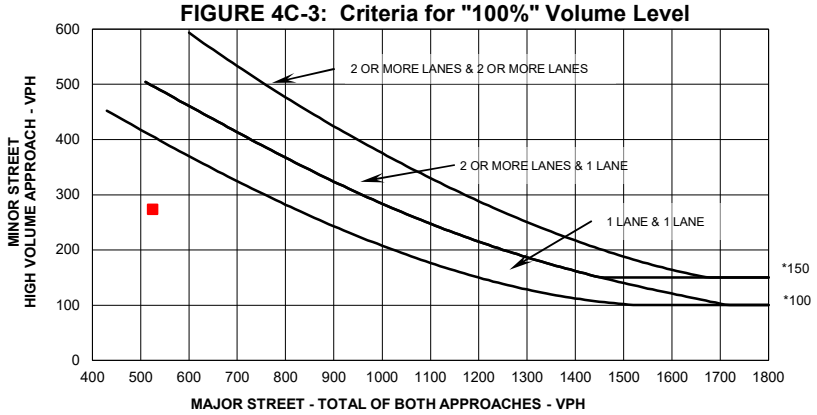
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	☐ Yes ☐ No	

2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	☐ Yes ☐ No	

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	☐ Yes ☐ No	

Plot volume combination on the applicable figure below.

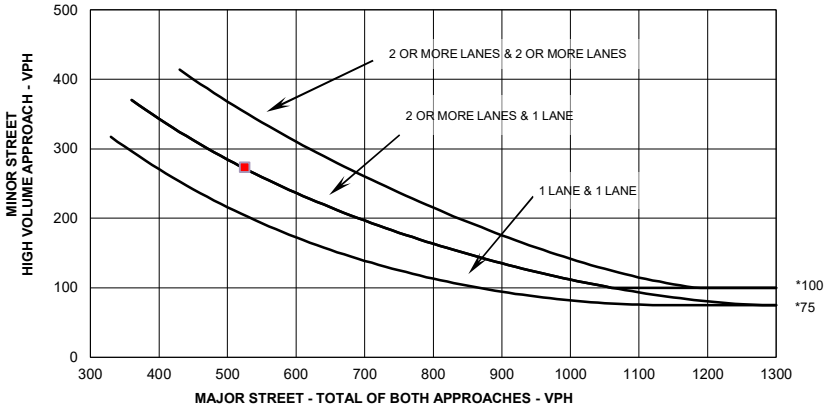
FIGURE 4C-3: Criteria for "100%" Volume Level



** Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 100 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 75 phi applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 1

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2040 Background - RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

*Warrant 1 is satisfied if Condition A **or** Condition B is "100%" satisfied for eight hours.* ☐ Yes ☑ No

*Warrant 1 is also satisfied if both Condition A **and** Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).* ☐ Yes ☑ No

*Warrant 1 is satisfied if Condition A **or** Condition B is "70%" satisfied for eight hours.* ☐ Yes ☑ No

Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

[a] Basic Minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	7:00-8:00	8:00-9:00	11:00-12:00	12:00-13:00	13:00-14:00	15:00-16:00	16:00-17:00	17:00-18:00
Major	320	368	332	390	338	415	461	453
Minor	156	97	113	118	103	155	135	192

Existing Volumes

TRAFFIC SIGNAL WARRANT SUMMARY

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	**Minor**	**100%[a]**	**80%[b]**	**70%[c]**	**100%[a]**	**80%[b]**	**70%[c]**
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

[a] Basic Minimum hourly volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Eight Highest Hours								
Street	**7:00-8:00**	**8:00-9:00**	**11:00-12:00**	**12:00-13:00**	**13:00-14:00**	**15:00-16:00**	**16:00-17:00**	**17:00-18:00**
Major	320	368	332	390	338	415	461	453
Minor	156	97	113	118	103	155	135	192

Existing Volumes

Chapter 3 Warrant 2

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2040 Background - RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☑ Yes ☐ No

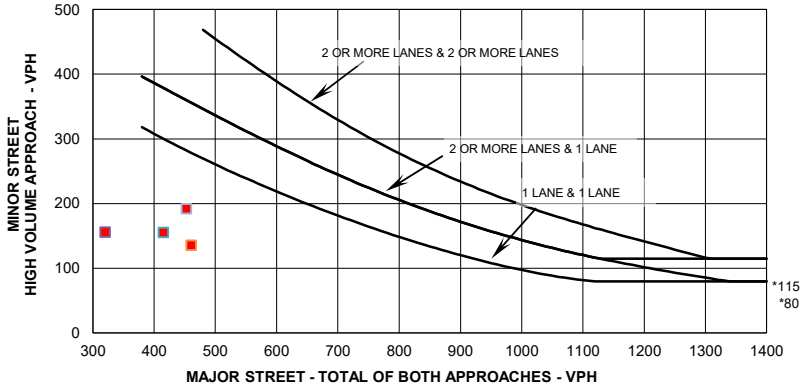
Satisfied: ☐ Yes ☑ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7:00-8:00	320	156
15:00-16:00	415	155
16:00-17:00	461	135
17:00-18:00	453	192

FIGURE 4C-1: Criteria for "100%" Volume Level



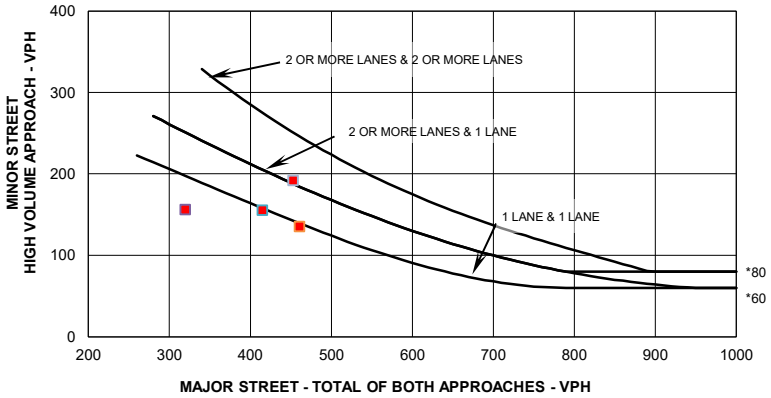
** Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7:00-8:00	320	156
15:00-16:00	415	155
16:00-17:00	461	135
17:00-18:00	453	192

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 3

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2040 Background - RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 3 - PEAK HOUR

*If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.*

Applicable: ☑ Yes ☐ No

Satisfied: ☐ Yes ☑ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	525	196

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	525	196

Criteria

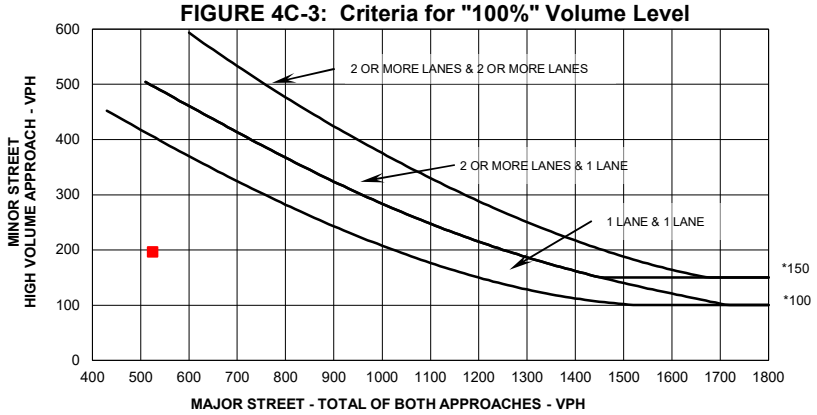
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	☐ Yes ☐ No	

2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	☐ Yes ☐ No	

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	☐ Yes ☐ No	

Plot volume combination on the applicable figure below.

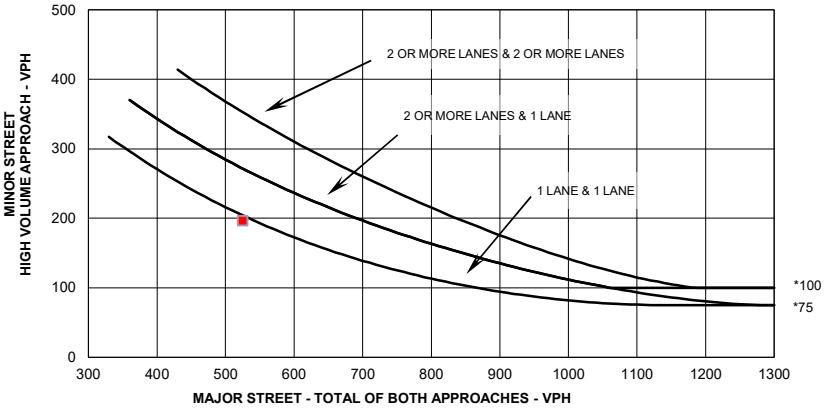
FIGURE 4C-3: Criteria for "100%" Volume Level



** Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 100 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 75 phi applies as the lower threshold volume threshold for a minor street approach with one lane.*

Intersection: US-34/81 & 25th St NBR
2030 AM

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

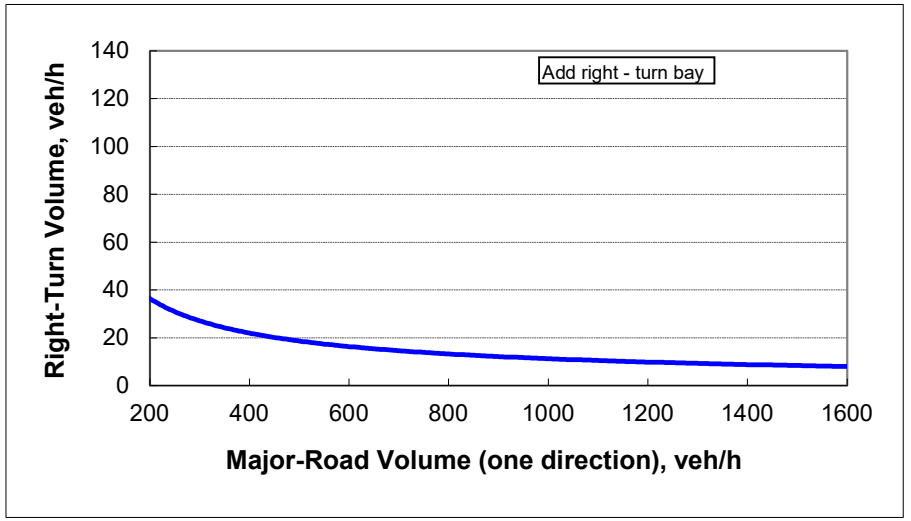
INPUT

Roadway geometry:	4-lane roadw ay

Variable	Value
Major-road speed, mph:	60
Major-road volume (one direction), veh/h:	167
Right-turn volume, veh/h:	43

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	42
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Add right-turn bay.	



Intersection: US-34/81 & 25th St NBR
2030 PM

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

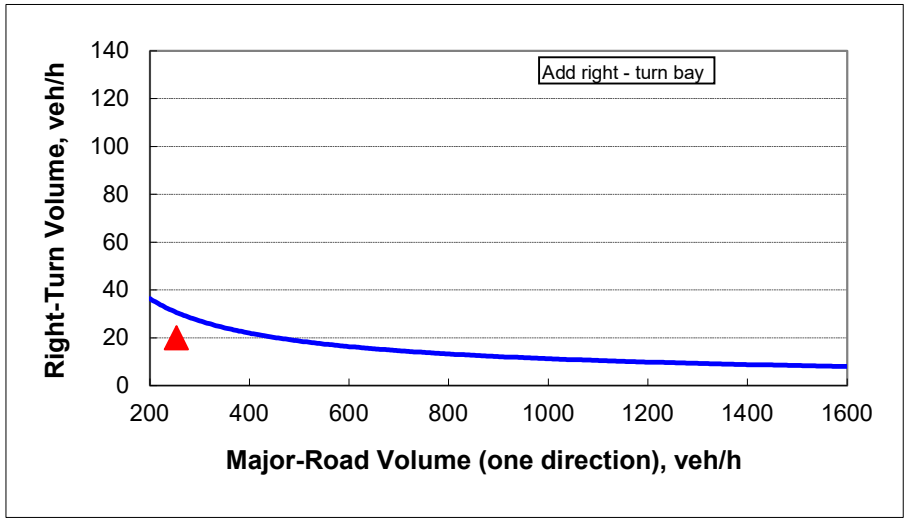
INPUT

Roadway geometry:	4-lane roadw ay

Variable	Value
Major-road speed, mph:	60
Major-road volume (one direction), veh/h:	253
Right-turn volume, veh/h:	20

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	31
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



Intersection: US-34/81 & 25th St SBR
2030 AM

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

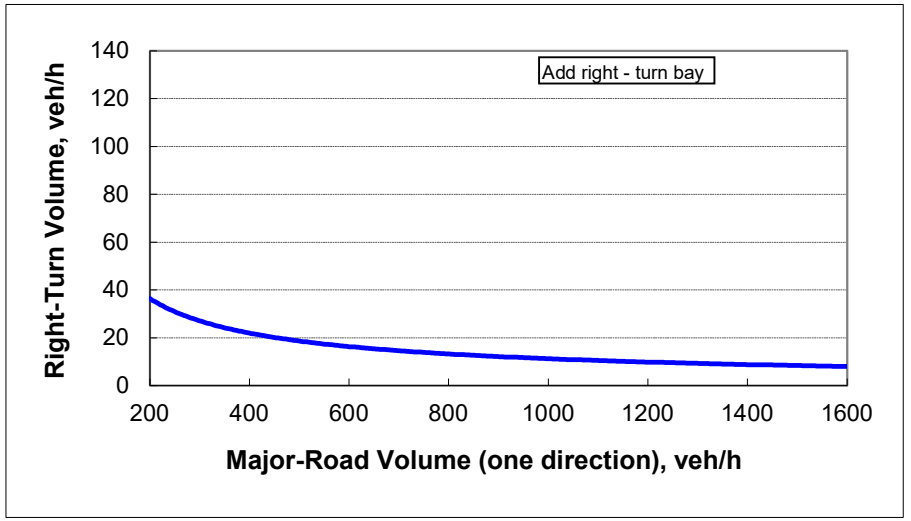
INPUT

Roadway geometry:	4-lane roadway

Variable	Value
Major-road speed, mph:	60
Major-road volume (one direction), veh/h:	137
Right-turn volume, veh/h:	33

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	48
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



Intersection: US-34/81 & 25th St SBR
2030 PM

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

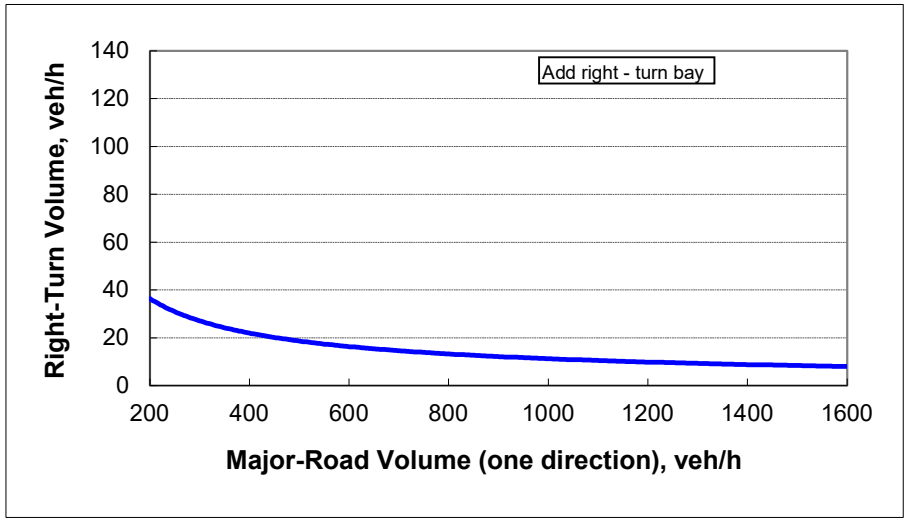
INPUT

Roadway geometry:	4-lane roadw ay

Variable	Value
Major-road speed, mph:	60
Major-road volume (one direction), veh/h:	178
Right-turn volume, veh/h:	61

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	40
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Add right-turn bay.	



Intersection: US-34/81 & CR 15 NBR
2030 AM

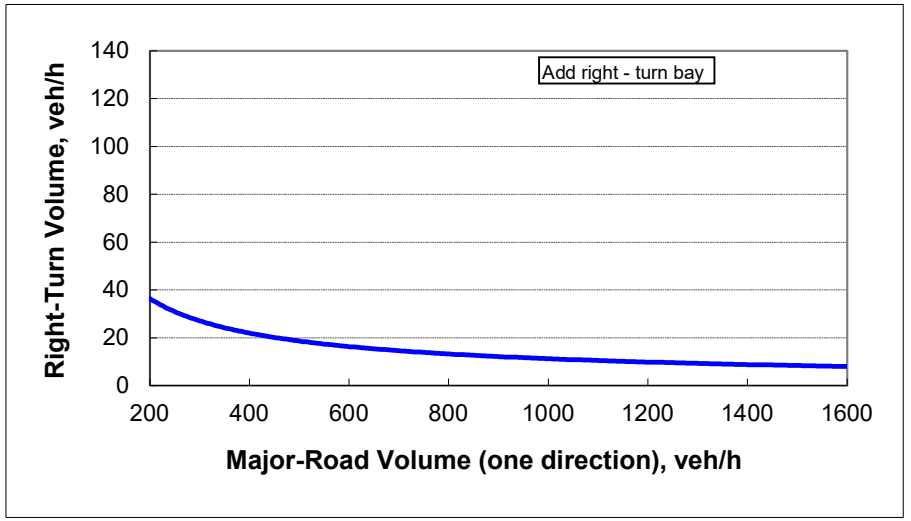
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	4-lane roadw ay
Variable	Value
Major-road speed, mph:	60
Major-road volume (one direction), veh/h:	119
Right-turn volume, veh/h:	44

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	53
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



Intersection: US-34/81 & CR 15 NBR
2030 PM

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

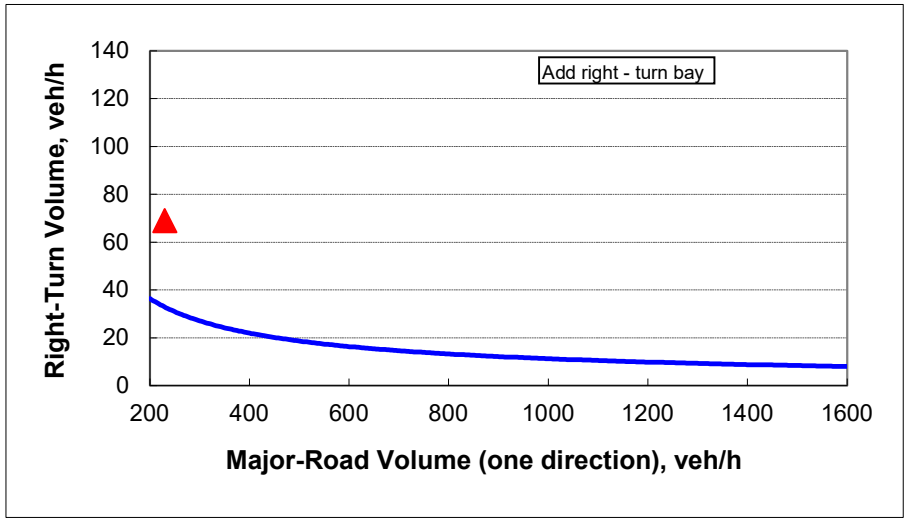
INPUT

Roadway geometry:	4-lane roadw ay

Variable	Value
Major-road speed, mph:	60
Major-road volume (one direction), veh/h:	230
Right-turn volume, veh/h:	69

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	33
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Add right-turn bay.	



APPENDIX D

2030 Capacity Analysis Reports

Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	106	51	15	67	6	39	85	43	7	97	33
Future Vol, veh/h	21	106	51	15	67	6	39	85	43	7	97	33
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	-	-	-	-	-	-	295	-	400	130	-	400
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, %	28	0	2	8	10	20	3	38	8	17	17	24
Mvmt Flow	26	129	62	18	82	7	48	104	52	9	118	40

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	325	388	59	342	376	52	158	0	0	156	0	0
Stage 1	136	136	-	200	200	-	-	-	-	-	-	-
Stage 2	189	252	-	142	176	-	-	-	-	-	-	-
Critical Hdwy	8.06	6.5	6.94	7.66	6.7	7.3	4.16	-	-	4.44	-	-
Critical Hdwy Stg 1	7.06	5.5	-	6.66	5.7	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.06	5.5	-	6.66	5.7	-	-	-	-	-	-	-
Follow-up Hdwy	3.78	4	3.32	3.58	4.1	3.5	2.23	-	-	2.37	-	-
Pot Cap-1 Maneuver	543	550	994	573	536	949	1412	-	-	1319	-	-
Stage 1	783	788	-	766	715	-	-	-	-	-	-	-
Stage 2	725	702	-	829	733	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	459	527	994	423	514	949	1412	-	-	1319	-	-
Mov Cap-2 Maneuver	459	527	-	423	514	-	-	-	-	-	-	-
Stage 1	756	782	-	740	691	-	-	-	-	-	-	-
Stage 2	613	678	-	644	728	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.4	13.9	1.8	0.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1412	-	-	597	511	1319	-	-
HCM Lane V/C Ratio	0.034	-	-	0.364	0.21	0.006	-	-
HCM Control Delay (s)	7.6	-	-	14.4	13.9	7.7	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.7	0.8	0	-	-

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	7	0	37	5	64	1	74	44	149	74	0
Future Vol, veh/h	0	7	0	37	5	64	1	74	44	149	74	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	400	330	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	19	0	5	0	41	48	2	20	0
Mvmt Flow	0	8	0	43	6	74	1	85	51	171	85	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	475	565	43	476	514	43	85	0	0	136	0	0
Stage 1	427	427	-	87	87	-	-	-	-	-	-	-
Stage 2	48	138	-	389	427	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.88	6.5	7	4.1	-	-	4.14	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.88	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.88	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.69	4	3.35	2.2	-	-	2.22	-	-
Pot Cap-1 Maneuver	477	437	1025	435	467	1008	1524	-	-	1446	-	-
Stage 1	581	589	-	864	827	-	-	-	-	-	-	-
Stage 2	965	786	-	562	589	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	398	385	1025	389	411	1008	1524	-	-	1446	-	-
Mov Cap-2 Maneuver	398	385	-	389	411	-	-	-	-	-	-	-
Stage 1	580	519	-	863	826	-	-	-	-	-	-	-
Stage 2	888	785	-	488	519	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.6	12.2	0.1	5.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1524	-	-	385	621	1446	-	-
HCM Lane V/C Ratio	0.001	-	-	0.021	0.196	0.118	-	-
HCM Control Delay (s)	7.4	-	-	14.6	12.2	7.8	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.7	0.4	-	-

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	51	62	13	36	15	57	138	31	9	223	18
Future Vol, veh/h	13	51	62	13	36	15	57	138	31	9	223	18
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	-	-	-	-	-	-	75	-	-	100	-	360
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	0	0	2	9	0	8	0	1	0	0	1	13
Mvmt Flow	18	70	85	18	49	21	78	189	42	12	305	25

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	604	716	153	578	720	116	330	0	0	231	0	0
Stage 1	329	329	-	366	366	-	-	-	-	-	-	-
Stage 2	275	387	-	212	354	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.94	7.68	6.5	7.06	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.68	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.68	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.32	3.59	4	3.38	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	386	358	866	384	356	895	1241	-	-	1349	-	-
Stage 1	664	650	-	607	626	-	-	-	-	-	-	-
Stage 2	713	613	-	751	634	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	316	333	866	275	331	895	1241	-	-	1349	-	-
Mov Cap-2 Maneuver	316	333	-	275	331	-	-	-	-	-	-	-
Stage 1	622	644	-	569	587	-	-	-	-	-	-	-
Stage 2	598	574	-	598	628	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.9	17.7	2	0.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1241	-	-	474	370	1349	-	-
HCM Lane V/C Ratio	0.063	-	-	0.364	0.237	0.009	-	-
HCM Control Delay (s)	8.1	-	-	16.9	17.7	7.7	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1.6	0.9	0	-	-

Intersection	
Int Delay, s/veh	10.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	52	109	63	56	93	9	63	170	20	8	109	61
Future Vol, veh/h	52	109	63	56	93	9	63	170	20	8	109	61
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	-	-	-	-	-	-	295	-	400	130	-	400
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, %	9	4	0	2	0	0	0	19	6	0	22	4
Mvmt Flow	58	122	71	63	104	10	71	191	22	9	122	69

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	430	495	61	473	542	96	191	0	0	213	0	0
Stage 1	140	140	-	333	333	-	-	-	-	-	-	-
Stage 2	290	355	-	140	209	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.58	6.9	7.54	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.68	5.58	-	6.54	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.58	-	6.54	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.04	3.3	3.52	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	493	470	998	474	450	948	1395	-	-	1369	-	-
Stage 1	829	775	-	654	647	-	-	-	-	-	-	-
Stage 2	674	623	-	849	733	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	379	443	998	332	424	948	1395	-	-	1369	-	-
Mov Cap-2 Maneuver	379	443	-	332	424	-	-	-	-	-	-	-
Stage 1	787	770	-	621	614	-	-	-	-	-	-	-
Stage 2	525	591	-	659	728	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.2	21.2	1.9	0.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1395	-	-	502	397	1369	-	-
HCM Lane V/C Ratio	0.051	-	-	0.501	0.447	0.007	-	-
HCM Control Delay (s)	7.7	-	-	19.2	21.2	7.6	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	2.8	2.2	0	-	-

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	7	1	76	7	132	1	160	69	109	103	0
Future Vol, veh/h	0	7	1	76	7	132	1	160	69	109	103	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	400	330	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	3	0	2	0	21	7	1	22	0
Mvmt Flow	0	8	1	90	8	157	1	190	82	130	123	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	484	657	62	518	575	95	123	0	0	272	0	0
Stage 1	383	383	-	192	192	-	-	-	-	-	-	-
Stage 2	101	274	-	326	383	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.56	6.5	6.94	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.56	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.56	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.53	4	3.32	2.2	-	-	2.21	-	-
Pot Cap-1 Maneuver	470	387	996	438	431	943	1477	-	-	1296	-	-
Stage 1	617	616	-	789	745	-	-	-	-	-	-	-
Stage 2	900	687	-	658	616	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	356	348	996	396	387	943	1477	-	-	1296	-	-
Mov Cap-2 Maneuver	356	348	-	396	387	-	-	-	-	-	-	-
Stage 1	616	554	-	788	744	-	-	-	-	-	-	-
Stage 2	741	686	-	582	554	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.7	15	0	4.2
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1477	-	-	379	614	1296	-	-
HCM Lane V/C Ratio	0.001	-	-	0.025	0.417	0.1	-	-
HCM Control Delay (s)	7.4	-	-	14.7	15	8.1	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	2.1	0.3	-	-

Intersection	
Int Delay, s/veh	9.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	61	95	45	45	10	56	188	29	38	213	18
Future Vol, veh/h	13	61	95	45	45	10	56	188	29	38	213	18
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	-	-	-	-	-	-	75	-	-	100	-	360
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	3	1	0
Mvmt Flow	17	81	127	60	60	13	75	251	39	51	284	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	692	826	142	706	831	145	308	0	0	290	0	0
Stage 1	386	386	-	421	421	-	-	-	-	-	-	-
Stage 2	306	440	-	285	410	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.16	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.23	-	-
Pot Cap-1 Maneuver	334	310	886	327	307	882	1264	-	-	1261	-	-
Stage 1	614	614	-	586	592	-	-	-	-	-	-	-
Stage 2	684	581	-	704	599	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	255	280	886	202	277	882	1264	-	-	1261	-	-
Mov Cap-2 Maneuver	255	280	-	202	277	-	-	-	-	-	-	-
Stage 1	578	589	-	551	557	-	-	-	-	-	-	-
Stage 2	565	547	-	499	575	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.8	34.3	1.6	1.1
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1264	-	-	449	252	1261	-	-
HCM Lane V/C Ratio	0.059	-	-	0.502	0.529	0.04	-	-
HCM Control Delay (s)	8	-	-	20.8	34.3	8	-	-
HCM Lane LOS	A	-	-	C	D	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	2.8	2.8	0.1	-	-

APPENDIX E

2040 Capacity Analysis Reports

Intersection	
Int Delay, s/veh	8.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	129	62	18	81	7	48	104	52	8	118	41
Future Vol, veh/h	25	129	62	18	81	7	48	104	52	8	118	41
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	-	-	-	-	-	-	295	-	400	130	-	400
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, %	28	0	2	8	10	20	3	38	8	17	17	24
Mvmt Flow	30	157	76	22	99	9	59	127	63	10	144	50

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	395	472	72	416	459	64	194	0	0	190	0	0
Stage 1	164	164	-	245	245	-	-	-	-	-	-	-
Stage 2	231	308	-	171	214	-	-	-	-	-	-	-
Critical Hdwy	8.06	6.5	6.94	7.66	6.7	7.3	4.16	-	-	4.44	-	-
Critical Hdwy Stg 1	7.06	5.5	-	6.66	5.7	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.06	5.5	-	6.66	5.7	-	-	-	-	-	-	-
Follow-up Hdwy	3.78	4	3.32	3.58	4.1	3.5	2.23	-	-	2.37	-	-
Pot Cap-1 Maneuver	480	493	975	507	480	932	1369	-	-	1278	-	-
Stage 1	752	766	-	720	683	-	-	-	-	-	-	-
Stage 2	682	664	-	797	705	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	382	468	975	333	456	932	1369	-	-	1278	-	-
Mov Cap-2 Maneuver	382	468	-	333	456	-	-	-	-	-	-	-
Stage 1	720	760	-	689	654	-	-	-	-	-	-	-
Stage 2	549	635	-	578	699	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.1	16.4	1.8	0.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1369	-	-	534	443	1278	-	-
HCM Lane V/C Ratio	0.043	-	-	0.493	0.292	0.008	-	-
HCM Control Delay (s)	7.7	-	-	18.1	16.4	7.8	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.7	1.2	0	-	-

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	8	0	45	6	78	1	90	53	182	90	0
Future Vol, veh/h	0	8	0	45	6	78	1	90	53	182	90	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	400	330	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	19	0	5	0	41	48	2	20	0
Mvmt Flow	0	9	0	52	7	90	1	103	61	209	103	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	578	687	52	579	626	52	103	0	0	164	0	0
Stage 1	521	521	-	105	105	-	-	-	-	-	-	-
Stage 2	57	166	-	474	521	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.88	6.5	7	4.1	-	-	4.14	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.88	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.88	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.69	4	3.35	2.2	-	-	2.22	-	-
Pot Cap-1 Maneuver	403	372	1011	364	403	995	1502	-	-	1412	-	-
Stage 1	512	535	-	842	812	-	-	-	-	-	-	-
Stage 2	954	765	-	498	535	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	320	317	1011	316	343	995	1502	-	-	1412	-	-
Mov Cap-2 Maneuver	320	317	-	316	343	-	-	-	-	-	-	-
Stage 1	511	456	-	841	811	-	-	-	-	-	-	-
Stage 2	860	764	-	416	456	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.7	14.1	0.1	5.3
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1502	-	-	317	541	1412	-	-
HCM Lane V/C Ratio	0.001	-	-	0.029	0.274	0.148	-	-
HCM Control Delay (s)	7.4	-	-	16.7	14.1	8	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.1	0.5	-	-

Intersection	
Int Delay, s/veh	7.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	62	76	15	43	18	70	168	38	11	272	22
Future Vol, veh/h	15	62	76	15	43	18	70	168	38	11	272	22
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	-	-	-	-	-	-	75	-	-	100	-	360
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	0	0	2	9	0	8	0	1	0	0	1	13
Mvmt Flow	21	85	104	21	59	25	96	230	52	15	373	30

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	740	877	187	707	881	141	403	0	0	282	0	0
Stage 1	403	403	-	448	448	-	-	-	-	-	-	-
Stage 2	337	474	-	259	433	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.94	7.68	6.5	7.06	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.68	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.68	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.32	3.59	4	3.38	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	309	289	823	309	288	862	1167	-	-	1292	-	-
Stage 1	601	603	-	541	576	-	-	-	-	-	-	-
Stage 2	656	561	-	704	585	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	231	262	823	188	261	862	1167	-	-	1292	-	-
Mov Cap-2 Maneuver	231	262	-	188	261	-	-	-	-	-	-	-
Stage 1	552	596	-	497	529	-	-	-	-	-	-	-
Stage 2	520	515	-	521	578	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	24.7	24.6	2.1	0.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1167	-	-	388	286	1292	-	-
HCM Lane V/C Ratio	0.082	-	-	0.54	0.364	0.012	-	-
HCM Control Delay (s)	8.4	-	-	24.7	24.6	7.8	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	3.1	1.6	0	-	-

Intersection	
Int Delay, s/veh	17.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	63	133	77	69	113	11	77	207	24	10	133	74
Future Vol, veh/h	63	133	77	69	113	11	77	207	24	10	133	74
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	-	-	-	-	-	-	295	-	400	130	-	400
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, %	9	4	0	2	0	0	0	19	6	0	22	4
Mvmt Flow	71	149	87	78	127	12	87	233	27	11	149	83

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	525	605	75	578	661	117	232	0	0	260	0	0
Stage 1	171	171	-	407	407	-	-	-	-	-	-	-
Stage 2	354	434	-	171	254	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.58	6.9	7.54	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.68	5.58	-	6.54	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.58	-	6.54	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.04	3.3	3.52	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	420	406	978	399	385	919	1348	-	-	1316	-	-
Stage 1	794	751	-	592	601	-	-	-	-	-	-	-
Stage 2	617	574	-	814	701	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	284	377	978	239	357	919	1348	-	-	1316	-	-
Mov Cap-2 Maneuver	284	377	-	239	357	-	-	-	-	-	-	-
Stage 1	742	745	-	554	562	-	-	-	-	-	-	-
Stage 2	441	537	-	588	695	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	33.9	38.8	2	0.4
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1348	-	-	418	313	1316	-	-
HCM Lane V/C Ratio	0.064	-	-	0.734	0.693	0.009	-	-
HCM Control Delay (s)	7.9	-	-	33.9	38.8	7.8	-	-
HCM Lane LOS	A	-	-	D	E	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	5.8	4.8	0	-	-

Intersection	
Int Delay, s/veh	8.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	8	1	92	8	161	1	195	84	133	126	0
Future Vol, veh/h	0	8	1	92	8	161	1	195	84	133	126	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	400	330	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	3	0	2	0	21	7	1	22	0
Mvmt Flow	0	10	1	110	10	192	1	232	100	158	150	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	589	800	75	630	700	116	150	0	0	332	0	0
Stage 1	466	466	-	234	234	-	-	-	-	-	-	-
Stage 2	123	334	-	396	466	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.56	6.5	6.94	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.56	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.56	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.53	4	3.32	2.2	-	-	2.21	-	-
Pot Cap-1 Maneuver	396	320	978	364	366	914	1444	-	-	1231	-	-
Stage 1	551	566	-	745	715	-	-	-	-	-	-	-
Stage 2	874	647	-	598	566	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	276	279	978	319	319	914	1444	-	-	1231	-	-
Mov Cap-2 Maneuver	276	279	-	319	319	-	-	-	-	-	-	-
Stage 1	550	494	-	744	714	-	-	-	-	-	-	-
Stage 2	681	646	-	511	494	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.3	20.8	0	4.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1444	-	-	303	533	1231	-	-
HCM Lane V/C Ratio	0.001	-	-	0.035	0.583	0.129	-	-
HCM Control Delay (s)	7.5	-	-	17.3	20.8	8.4	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	3.7	0.4	-	-

Intersection	
Int Delay, s/veh	24.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	74	116	55	55	13	69	230	35	46	259	22
Future Vol, veh/h	15	74	116	55	55	13	69	230	35	46	259	22
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	-	-	-	-	-	-	75	-	-	100	-	360
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	3	1	0
Mvmt Flow	20	99	155	73	73	17	92	307	47	61	345	29

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	841	1005	173	859	1011	177	374	0	0	354	0	0
Stage 1	467	467	-	515	515	-	-	-	-	-	-	-
Stage 2	374	538	-	344	496	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.16	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.23	-	-
Pot Cap-1 Maneuver	261	243	847	253	241	842	1196	-	-	1194	-	-
Stage 1	551	565	-	516	538	-	-	-	-	-	-	-
Stage 2	624	526	-	650	549	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	170	213	847	120	211	842	1196	-	-	1194	-	-
Mov Cap-2 Maneuver	170	213	-	120	211	-	-	-	-	-	-	-
Stage 1	509	536	-	476	497	-	-	-	-	-	-	-
Stage 2	481	485	-	411	521	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	41.1	120.2	1.7	1.2
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1196	-	-	358	167	1194	-	-
HCM Lane V/C Ratio	0.077	-	-	0.764	0.982	0.051	-	-
HCM Control Delay (s)	8.3	-	-	41.1	120.2	8.2	-	-
HCM Lane LOS	A	-	-	E	F	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	6.1	7.7	0.2	-	-

APPENDIX F

Future Plus Site Signal and Turn Lane Warrant Evaluations

Nebraska Department of Roads
Traffic Engineering Division

Hwy 34 at 25th St
Future Year 2030 and 2040 plus
Site Conditions - No RT Reduction

Proposed Signal Warrants
For DHV's

2030 AM Volumes
Major: 577
Minor: 253

2030 PM Volumes
Major: 506
Minor: 492

2040 AM Volumes
Major: 845
Minor: 363

2040 PM Volumes
Major: 654
Minor: 555

Warrant 1 Eight-Hour Vehicular Volume Using DHV's

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		DHV on Major Street (Total of Both Approaches)				DHV on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1……	1……	870	715	635	N/A	324	277	254	N/A
2 or more	1……	1,025	840	745	N/A	324	277	254	N/A
2 or more	2 or more	1,025	840	745	N/A	403	340	310	N/A
1……	2 or more	870	715	635	N/A	403	340	310	N/A

Condition B - Interuption of Continuous Traffic									
Number of lanes for moving traffic on each approach		DHV on Major Street (Total of Both Approaches)				DHV on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1……	1……	1,258	1,024	907	N/A	162	138	128	N/A
2 or more	1……	1,491	1,211	1,071	N/A	162	138	128	N/A
2 or more	2 or more	1,491	1,211	1,071	N/A	201	170	154	N/A
1……	2 or more	1,258	1,024	907	N/A	201	170	154	N/A

These values are calculated using the equation:

DHV = 90.16 + (0.0934)(ADT), where the ADT is 16.67 times the Warrant 1 value from the MUTCD.

This equation is from Page 8 of the 2002 Continuous Traffic Count Data from Planning.

Nebraska Department of Roads
Traffic Engineering Division

Hwy 34 at 25th St
Future Year 2030 and 2040 plus
Site Conditions - No RT Reduction

2030 ADTs
Major: 7,380
Minor: 6,330

2040 ADTs
Major: 10,420
Minor: 8,070

Proposed Signal Warrants
For ADT Volumes

Warrant 1, Eight-Hour Vehicular Volume Using ADT's

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		ADT on Major Street (Average of Both Approaches)				ADT on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1……	1……	8,350	6,675	5,850	4,675	5,000	4,000	3,500	2,800
2 or more	1……	10,000	8,000	7,000	5,600	5,000	4,000	3,500	2,800
2 or more	2 or more	10,000	8,000	7,000	5,600	6,675	5,350	4,675	3,750
1……	2 or more	8,350	6,675	5,850	4,675	6,675	5,350	4,675	3,750

Condition B - Interuption of Continuous Traffic									
Number of lanes for moving traffic on each approach		ADT on Major Street (Average of Both Approaches)				ADT on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1……	1……	12,500	10,000	8,750	7,000	2,500	2,000	1,750	1,400
2 or more	1……	15,000	12,000	10,500	8,400	2,500	2,000	1,750	1,400
2 or more	2 or more	15,000	12,000	10,500	8,400	3,350	2,675	2,350	1,875
1……	2 or more	12,500	10,000	8,750	7,000	3,350	2,675	2,350	1,875

[a] Basic hourly minimum volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures.

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population less than 10,000.

[d] May be used for combinations of Conditions A and B after adequate trial of other remedial measures when the major street speed exceeds 40 mph or in an isolated community with a population of less than 10,000.

To determine whether a signal should be installed on a construction project, the projected ADT's for 3 years after project completion should be used for an area showing reasonably steady growth. For projections assuming a drastic change in land use that is now undefined, engineering judgment should be used.

These values are based upon the eighth highest hour traffic volume on an average day being 6% of the ADT. This value was derived from the 2002 Continuous Traffic Count Data from Planning Division. The ADT on the minor leg is two-way traffic and assumes a 50/50 directional split (entering and exiting).

Nebraska Department of Roads
Traffic Engineering Division

Hwy 34 at 25th St
Future Year 2030 and 2040 plus
Site Conditions - RT Reduction
Proposed Signal Warrants
For DHV's

2030 AM Volumes
Major: 577
Minor: 202

2030 PM Volumes
Major: 506
Minor: 388

2040 AM Volumes
Major: 845
Minor: 269

2040 PM Volumes
Major: 654
Minor: 449

Warrant 1 Eight-Hour Vehicular Volume Using DHV's

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		DHV on Major Street (Total of Both Approaches)				DHV on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1……	1……	870	715	635	N/A	324	277	254	N/A
2 or more	1……	1,025	840	745	N/A	324	277	254	N/A
2 or more	2 or more	1,025	840	745	N/A	403	340	310	N/A
1……	2 or more	870	715	635	N/A	403	340	310	N/A

Condition B - Interuption of Continuous Traffic									
Number of lanes for moving traffic on each approach		DHV on Major Street (Total of Both Approaches)				DHV on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1……	1……	1,258	1,024	907	N/A	162	138	128	N/A
2 or more	1……	1,491	1,211	1,071	N/A	162	138	128	N/A
2 or more	2 or more	1,491	1,211	1,071	N/A	201	170	154	N/A
1……	2 or more	1,258	1,024	907	N/A	201	170	154	N/A

These values are calculated using the equation:

DHV = 90.16 + (0.0934)(ADT), where the ADT is 16.67 times the Warrant 1 value from the MUTCD.

This equation is from Page 8 of the 2002 Continuous Traffic Count Data from Planning.

Nebraska Department of Roads
Traffic Engineering Division

Hwy 34 at 25th St
Future Year 2030 and 2040 plus
Site Conditions - RT Reduction
Proposed Signal Warrants
For ADT Volumes

2030 ADTs
Major: 7,380
Minor: 5,410

2040 ADTs
Major: 10,420
Minor: 7,140

Warrant 1, Eight-Hour Vehicular Volume Using ADT's

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		ADT on Major Street (Average of Both Approaches)				ADT on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1……	1……	8,350	6,675	5,850	4,675	5,000	4,000	3,500	2,800
2 or more	1……	10,000	8,000	7,000	5,600	5,000	4,000	3,500	2,800
2 or more	2 or more	10,000	8,000	7,000	5,600	6,675	5,350	4,675	3,750
1……	2 or more	8,350	6,675	5,850	4,675	6,675	5,350	4,675	3,750

Condition B - Interuption of Continuous Traffic									
Number of lanes for moving traffic on each approach		ADT on Major Street (Average of Both Approaches)				ADT on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1……	1……	12,500	10,000	8,750	7,000	2,500	2,000	1,750	1,400
2 or more	1……	15,000	12,000	10,500	8,400	2,500	2,000	1,750	1,400
2 or more	2 or more	15,000	12,000	10,500	8,400	3,350	2,675	2,350	1,875
1……	2 or more	12,500	10,000	8,750	7,000	3,350	2,675	2,350	1,875

[a] Basic hourly minimum volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures.

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population less than 10,000.

[d] May be used for combinations of Conditions A and B after adequate trial of other remedial measures when the major street speed exceeds 40 mph or in an isolated community with a population of less than 10,000.

To determine whether a signal should be installed on a construction project, the projected ADT's for 3 years after project completion should be used for an area showing reasonably steady growth. For projections assuming a drastic change in land use that is now undefined, engineering judgment should be used.

These values are based upon the eighth highest hour traffic volume on an average day being 6% of the ADT. This value was derived from the 2002 Continuous Traffic Count Data from Planning Division. The ADT on the minor leg is two-way traffic and assumes a 50/50 directional split (entering and exiting).

Nebraska Department of Roads
Traffic Engineering Division

Hwy 34 at CR15
Future Year 2030 and 2040 plus
Site Conditions - No RT Reduction

Proposed Signal Warrants
For DHV's

2030 AM Volumes
Major: 430
Minor: 141

2030 PM Volumes
Major: 555
Minor: 224

2040 AM Volumes
Major: 570
Minor: 202

2040 PM Volumes
Major: 728
Minor: 280

Warrant 1 Eight-Hour Vehicular Volume Using DHV's

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		DHV on Major Street (Total of Both Approaches)				DHV on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1……	1……	870	715	635	N/A	324	277	254	N/A
2 or more	1……	1,025	840	745	N/A	324	277	254	N/A
2 or more	2 or more	1,025	840	745	N/A	403	340	310	N/A
1……	2 or more	870	715	635	N/A	403	340	310	N/A

Condition B - Interuption of Continuous Traffic									
Number of lanes for moving traffic on each approach		DHV on Major Street (Total of Both Approaches)				DHV on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1……	1……	1,258	1,024	907	N/A	162	138	128	N/A
2 or more	1……	1,491	1,211	1,071	N/A	162	138	128	N/A
2 or more	2 or more	1,491	1,211	1,071	N/A	201	170	154	N/A
1……	2 or more	1,258	1,024	907	N/A	201	170	154	N/A

These values are calculated using the equation:

DHV = 90.16 + (0.0934)(ADT), where the ADT is 16.67 times the Warrant 1 value from the MUTCD.

This equation is from Page 8 of the 2002 Continuous Traffic Count Data from Planning.

Nebraska Department of Roads
Traffic Engineering Division

Hwy 34 at CR15
Future Year 2030 and 2040 plus
Site Conditions - No RT Reduction

2030 ADTs
Major: 5,540
Minor: 4,530

2040 ADTs
Major: 7,110
Minor: 5,830

Proposed Signal Warrants
For ADT Volumes

Warrant 1, Eight-Hour Vehicular Volume Using ADT's

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		ADT on Major Street (Average of Both Approaches)				ADT on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1……	1……	8,350	6,675	5,850	4,675	5,000	4,000	3,500	2,800
2 or more	1……	10,000	8,000	7,000	5,600	5,000	4,000	3,500	2,800
2 or more	2 or more	10,000	8,000	7,000	5,600	6,675	5,350	4,675	3,750
1……	2 or more	8,350	6,675	5,850	4,675	6,675	5,350	4,675	3,750

Condition B - Interuption of Continuous Traffic									
Number of lanes for moving traffic on each approach		ADT on Major Street (Average of Both Approaches)				ADT on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1……	1……	12,500	10,000	8,750	7,000	2,500	2,000	1,750	1,400
2 or more	1……	15,000	12,000	10,500	8,400	2,500	2,000	1,750	1,400
2 or more	2 or more	15,000	12,000	10,500	8,400	3,350	2,675	2,350	1,875
1……	2 or more	12,500	10,000	8,750	7,000	3,350	2,675	2,350	1,875

[a] Basic hourly minimum volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures.

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population less than 10,000.

[d] May be used for combinations of Conditions A and B after adequate trial of other remedial measures when the major street speed exceeds 40 mph or in an isolated community with a population of less than 10,000.

To determine whether a signal should be installed on a construction project, the projected ADT's for 3 years after project completion should be used for an area showing reasonably steady growth. For projections assuming a drastic change in land use that is now undefined, engineering judgment should be used.

These values are based upon the eighth highest hour traffic volume on an average day being 6% of the ADT. This value was derived from the 2002 Continuous Traffic Count Data from Planning Division. The ADT on the minor leg is two-way traffic and assumes a 50/50 directional split (entering and exiting).

Nebraska Department of Roads
Traffic Engineering Division

Hwy 34 at CR15
Future Year 2030 and 2040 plus
Site Conditions - RT Reduction
Proposed Signal Warrants
For DHV's

2030 AM Volumes
Major: 430
Minor: 77

2030 PM Volumes
Major: 555
Minor: 92

2040 AM Volumes
Major: 570
Minor: 124

2040 PM Volumes
Major: 728
Minor: 119

Warrant 1 Eight-Hour Vehicular Volume Using DHV's

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		DHV on Major Street (Total of Both Approaches)				DHV on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1……	1……	870	715	635	N/A	324	277	254	N/A
2 or more	1……	1,025	840	745	N/A	324	277	254	N/A
2 or more	2 or more	1,025	840	745	N/A	403	340	310	N/A
1……	2 or more	870	715	635	N/A	403	340	310	N/A

Condition B - Interuption of Continuous Traffic									
Number of lanes for moving traffic on each approach		DHV on Major Street (Total of Both Approaches)				DHV on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1……	1……	1,258	1,024	907	N/A	162	138	128	N/A
2 or more	1……	1,491	1,211	1,071	N/A	162	138	128	N/A
2 or more	2 or more	1,491	1,211	1,071	N/A	201	170	154	N/A
1……	2 or more	1,258	1,024	907	N/A	201	170	154	N/A

These values are calculated using the equation:

DHV = 90.16 + (0.0934)(ADT), where the ADT is 16.67 times the Warrant 1 value from the MUTCD.

This equation is from Page 8 of the 2002 Continuous Traffic Count Data from Planning.

Nebraska Department of Roads
Traffic Engineering Division

Hwy 34 at CR15
Future Year 2030 and 2040 plus
Site Conditions - RT Reduction
Proposed Signal Warrants
For ADT Volumes

2030 ADTs
Major: 5,540
Minor: 3,350

2040 ADTs
Major: 7,110
Minor: 4,390

Warrant 1, Eight-Hour Vehicular Volume Using ADT's

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		ADT on Major Street (Average of Both Approaches)				ADT on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1……	1……	8,350	6,675	5,850	4,675	5,000	4,000	3,500	2,800
2 or more	1……	10,000	8,000	7,000	5,600	5,000	4,000	3,500	2,800
2 or more	2 or more	10,000	8,000	7,000	5,600	6,675	5,350	4,675	3,750
1……	2 or more	8,350	6,675	5,850	4,675	6,675	5,350	4,675	3,750

Condition B - Interuption of Continuous Traffic									
Number of lanes for moving traffic on each approach		ADT on Major Street (Average of Both Approaches)				ADT on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1……	1……	12,500	10,000	8,750	7,000	2,500	2,000	1,750	1,400
2 or more	1……	15,000	12,000	10,500	8,400	2,500	2,000	1,750	1,400
2 or more	2 or more	15,000	12,000	10,500	8,400	3,350	2,675	2,350	1,875
1……	2 or more	12,500	10,000	8,750	7,000	3,350	2,675	2,350	1,875

[a] Basic hourly minimum volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures.

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population less than 10,000.

[d] May be used for combinations of Conditions A and B after adequate trial of other remedial measures when the major street speed exceeds 40 mph or in an isolated community with a population of less than 10,000.

To determine whether a signal should be installed on a construction project, the projected ADT's for 3 years after project completion should be used for an area showing reasonably steady growth. For projections assuming a drastic change in land use that is now undefined, engineering judgment should be used.

These values are based upon the eighth highest hour traffic volume on an average day being 6% of the ADT. This value was derived from the 2002 Continuous Traffic Count Data from Planning Division. The ADT on the minor leg is two-way traffic and assumes a 50/50 directional split (entering and exiting).

Nebraska Department of Roads
Traffic Engineering Division

Lincoln Ave at 25th St
Future Year 2030 and 2040 plus
Site Conditions - No RT Reduction

Proposed Signal Warrants
For DHV's

2030 AM Volumes
Major: 611
Minor: 159

2030 PM Volumes
Major: 578
Minor: 310

2040 AM Volumes
Major: 806
Minor: 209

2040 PM Volumes
Major: 721
Minor: 446

Warrant 1 Eight-Hour Vehicular Volume Using DHV's

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		DHV on Major Street (Total of Both Approaches)				DHV on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1……	1……	870	715	635	N/A	324	277	254	N/A
2 or more	1……	1,025	840	745	N/A	324	277	254	N/A
2 or more	2 or more	1,025	840	745	N/A	403	340	310	N/A
1……	2 or more	870	715	635	N/A	403	340	310	N/A

Condition B - Interuption of Continuous Traffic									
Number of lanes for moving traffic on each approach		DHV on Major Street (Total of Both Approaches)				DHV on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1……	1……	1,258	1,024	907	N/A	162	138	128	N/A
2 or more	1……	1,491	1,211	1,071	N/A	162	138	128	N/A
2 or more	2 or more	1,491	1,211	1,071	N/A	201	170	154	N/A
1……	2 or more	1,258	1,024	907	N/A	201	170	154	N/A

These values are calculated using the equation:

DHV = 90.16 + (0.0934)(ADT), where the ADT is 16.67 times the Warrant 1 value from the MUTCD.

This equation is from Page 8 of the 2002 Continuous Traffic Count Data from Planning.

Nebraska Department of Roads
Traffic Engineering Division

Lincoln Ave at 25th St
Future Year 2030 and 2040 plus
Site Conditions - No RT Reduction

Proposed Signal Warrants
For ADT Volumes

2030 ADTs
Major: 9,170
Minor: 4,590

2040 ADTs
Major: 11,810
Minor: 6,310

Warrant 1, Eight-Hour Vehicular Volume Using ADT's

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		ADT on Major Street (Average of Both Approaches)				ADT on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1……	1……	8,350	6,675	5,850	4,675	5,000	4,000	3,500	2,800
2 or more	1……	10,000	8,000	7,000	5,600	5,000	4,000	3,500	2,800
2 or more	2 or more	10,000	8,000	7,000	5,600	6,675	5,350	4,675	3,750
1……	2 or more	8,350	6,675	5,850	4,675	6,675	5,350	4,675	3,750

Condition B - Interuption of Continuous Traffic									
Number of lanes for moving traffic on each approach		ADT on Major Street (Average of Both Approaches)				ADT on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1……	1……	12,500	10,000	8,750	7,000	2,500	2,000	1,750	1,400
2 or more	1……	15,000	12,000	10,500	8,400	2,500	2,000	1,750	1,400
2 or more	2 or more	15,000	12,000	10,500	8,400	3,350	2,675	2,350	1,875
1……	2 or more	12,500	10,000	8,750	7,000	3,350	2,675	2,350	1,875

[a] Basic hourly minimum volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures.

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population less than 10,000.

[d] May be used for combinations of Conditions A and B after adequate trial of other remedial measures when the major street speed exceeds 40 mph or in an isolated community with a population of less than 10,000.

To determine whether a signal should be installed on a construction project, the projected ADT's for 3 years after project completion should be used for an area showing reasonably steady growth. For projections assuming a drastic change in land use that is now undefined, engineering judgment should be used.

These values are based upon the eighth highest hour traffic volume on an average day being 6% of the ADT. This value was derived from the 2002 Continuous Traffic Count Data from Planning Division. The ADT on the minor leg is two-way traffic and assumes a 50/50 directional split (entering and exiting).

Nebraska Department of Roads
Traffic Engineering Division

Lincoln Ave at 25th St
Future Year 2030 and 2040 plus
Site Conditions - RT Reduction

Proposed Signal Warrants
For DHV's

2030 AM Volumes
Major: 611
Minor: 75

2030 PM Volumes
Major: 578
Minor: 123

2040 AM Volumes
Major: 806
Minor: 93

2040 PM Volumes
Major: 721
Minor: 164

Warrant 1 Eight-Hour Vehicular Volume Using DHV's

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		DHV on Major Street (Total of Both Approaches)				DHV on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1……	1……	870	715	635	N/A	324	277	254	N/A
2 or more	1……	1,025	840	745	N/A	324	277	254	N/A
2 or more	2 or more	1,025	840	745	N/A	403	340	310	N/A
1……	2 or more	870	715	635	N/A	403	340	310	N/A

Condition B - Interuption of Continuous Traffic									
Number of lanes for moving traffic on each approach		DHV on Major Street (Total of Both Approaches)				DHV on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1……	1……	1,258	1,024	907	N/A	162	138	128	N/A
2 or more	1……	1,491	1,211	1,071	N/A	162	138	128	N/A
2 or more	2 or more	1,491	1,211	1,071	N/A	201	170	154	N/A
1……	2 or more	1,258	1,024	907	N/A	201	170	154	N/A

These values are calculated using the equation:

DHV = 90.16 + (0.0934)(ADT), where the ADT is 16.67 times the Warrant 1 value from the MUTCD.

This equation is from Page 8 of the 2002 Continuous Traffic Count Data from Planning.

Nebraska Department of Roads
Traffic Engineering Division

Lincoln Ave at 25th St
Future Year 2030 and 2040 plus
Site Conditions - RT Reduction

2030 ADTs
Major: 9,170
Minor: 4,590

2040 ADTs
Major: 11,810
Minor: 6,310

Proposed Signal Warrants
For ADT Volumes

Warrant 1, Eight-Hour Vehicular Volume Using ADT's

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		ADT on Major Street (Average of Both Approaches)				ADT on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1……	1……	8,350	6,675	5,850	4,675	5,000	4,000	3,500	2,800
2 or more	1……	10,000	8,000	7,000	5,600	5,000	4,000	3,500	2,800
2 or more	2 or more	10,000	8,000	7,000	5,600	6,675	5,350	4,675	3,750
1……	2 or more	8,350	6,675	5,850	4,675	6,675	5,350	4,675	3,750

Condition B - Interuption of Continuous Traffic									
Number of lanes for moving traffic on each approach		ADT on Major Street (Average of Both Approaches)				ADT on Minor Street (Highest Volume Leg)			
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	56%[d]	100%[a]	80%[b]	70%[c]	56%[d]
1……	1……	12,500	10,000	8,750	7,000	2,500	2,000	1,750	1,400
2 or more	1……	15,000	12,000	10,500	8,400	2,500	2,000	1,750	1,400
2 or more	2 or more	15,000	12,000	10,500	8,400	3,350	2,675	2,350	1,875
1……	2 or more	12,500	10,000	8,750	7,000	3,350	2,675	2,350	1,875

[a] Basic hourly minimum volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures.

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population less than 10,000.

[d] May be used for combinations of Conditions A and B after adequate trial of other remedial measures when the major street speed exceeds 40 mph or in an isolated community with a population of less than 10,000.

To determine whether a signal should be installed on a construction project, the projected ADT's for 3 years after project completion should be used for an area showing reasonably steady growth. For projections assuming a drastic change in land use that is now undefined, engineering judgment should be used.

These values are based upon the eighth highest hour traffic volume on an average day being 6% of the ADT. This value was derived from the 2002 Continuous Traffic Count Data from Planning Division. The ADT on the minor leg is two-way traffic and assumes a 50/50 directional split (entering and exiting).

Chapter 3 Warrant 1

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - No RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

*Warrant 1 is satisfied if Condition A **or** Condition B is "100%" satisfied for eight hours.* ☐ Yes ☑ No

*Warrant 1 is also satisfied if both Condition A **and** Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).* ☐ Yes ☑ No

*Warrant 1 is satisfied if Condition A **or** Condition B is "70%" satisfied for eight hours.* ☐ Yes ☑ No

Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Applicable: ☑ Yes ☐ No
100% Satisfied: ☐ Yes ☑ No
80% Satisfied: ☐ Yes ☑ No
70% Satisfied: ☐ Yes ☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

[a] Basic Minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	7:00-8:00	8:00-9:00	11:00-12:00	12:00-13:00	13:00-14:00	15:00-16:00	16:00-17:00	17:00-18:00
Major	471	427	349	425	376	410	426	386
Minor	212	184	242	283	224	300	309	469

Existing Volumes

TRAFFIC SIGNAL WARRANT SUMMARY

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	**Minor**	**100%[a]**	**80%[b]**	**70%[c]**	**100%[a]**	**80%[b]**	**70%[c]**
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

[a] Basic Minimum hourly volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Eight Highest Hours								
Street	**7:00-8:00**	**8:00-9:00**	**11:00-12:00**	**12:00-13:00**	**13:00-14:00**	**15:00-16:00**	**16:00-17:00**	**17:00-18:00**
Major	471	427	349	425	376	410	426	386
Minor	212	184	242	283	224	300	309	469

Existing Volumes

Chapter 3 Warrant 2

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - No RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

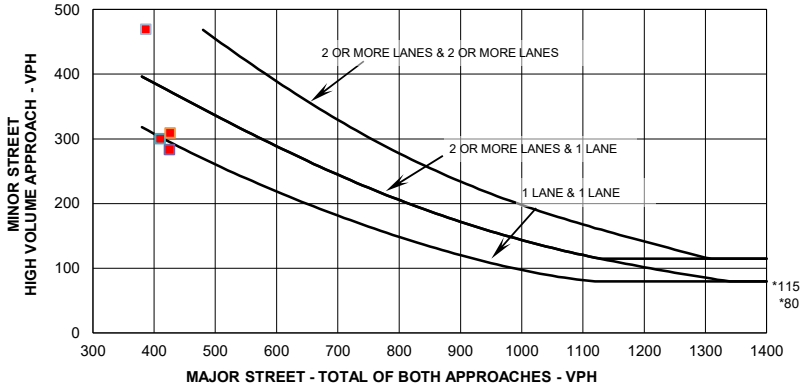
Applicable: ☑ Yes ☐ No
Satisfied: ☑ Yes ☐ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
12:00-13:00	425	283
15:00-16:00	410	300
16:00-17:00	426	309
17:00-18:00	386	469

FIGURE 4C-1: Criteria for "100%" Volume Level



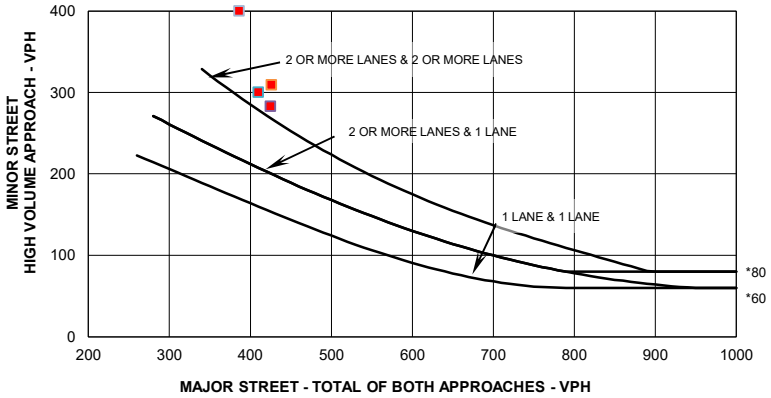
** Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
12:00-13:00	425	283
15:00-16:00	410	300
16:00-17:00	426	309
17:00-18:00	386	469

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 3

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - No RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 3 - PEAK HOUR

*If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.*

Applicable: ☑ Yes ☐ No

Satisfied: ☑ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	506	492

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	506	492

Criteria

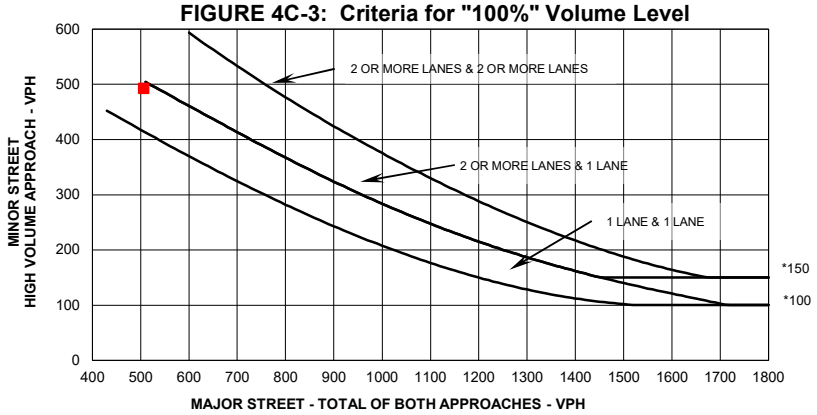
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	☐ Yes ☐ No	

2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	☐ Yes ☐ No	

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	☐ Yes ☐ No	

Plot volume combination on the applicable figure below.

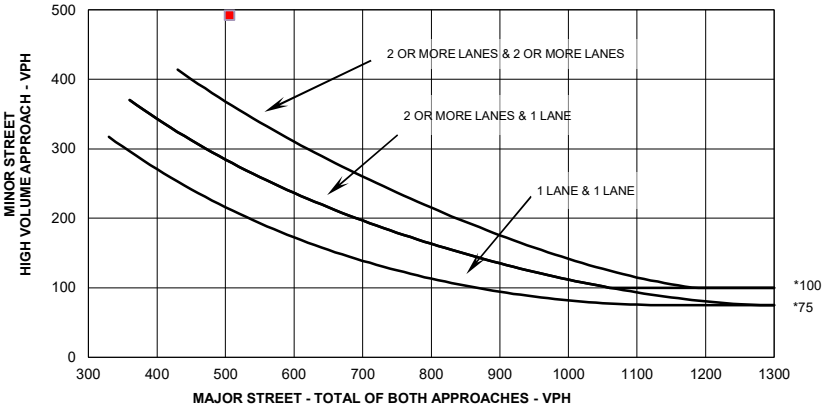
FIGURE 4C-3: Criteria for "100%" Volume Level



** Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 100 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 75 phi applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 1

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

*Warrant 1 is satisfied if Condition A **or** Condition B is "100%" satisfied for eight hours.* ☐ Yes ☑ No

*Warrant 1 is also satisfied if both Condition A **and** Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).* ☐ Yes ☑ No

*Warrant 1 is satisfied if Condition A **or** Condition B is "70%" satisfied for eight hours.* ☐ Yes ☑ No

Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

[a] Basic Minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	7:00-8:00	8:00-9:00	11:00-12:00	12:00-13:00	13:00-14:00	15:00-16:00	16:00-17:00	17:00-18:00
Major	471	427	349	425	376	410	426	386
Minor	152	129	182	211	161	246	224	334

Existing Volumes

TRAFFIC SIGNAL WARRANT SUMMARY

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	**Minor**	**100%[a]**	**80%[b]**	**70%[c]**	**100%[a]**	**80%[b]**	**70%[c]**
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

[a] Basic Minimum hourly volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Eight Highest Hours								
Street	**7:00-8:00**	**8:00-9:00**	**11:00-12:00**	**12:00-13:00**	**13:00-14:00**	**15:00-16:00**	**16:00-17:00**	**17:00-18:00**
Major	471	427	349	425	376	410	426	386
Minor	212	184	242	283	224	300	309	469

Existing Volumes

Chapter 3 Warrant 2

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☑ Yes ☐ No

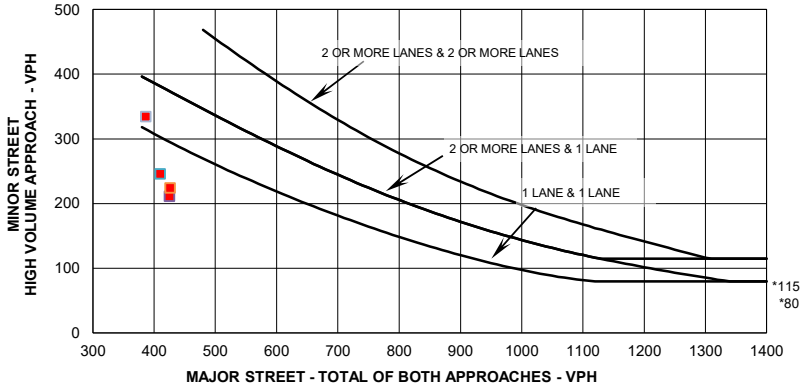
Satisfied: ☐ Yes ☑ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
12:00-13:00	425	211
15:00-16:00	410	246
16:00-17:00	426	224
17:00-18:00	386	334

FIGURE 4C-1: Criteria for "100%" Volume Level



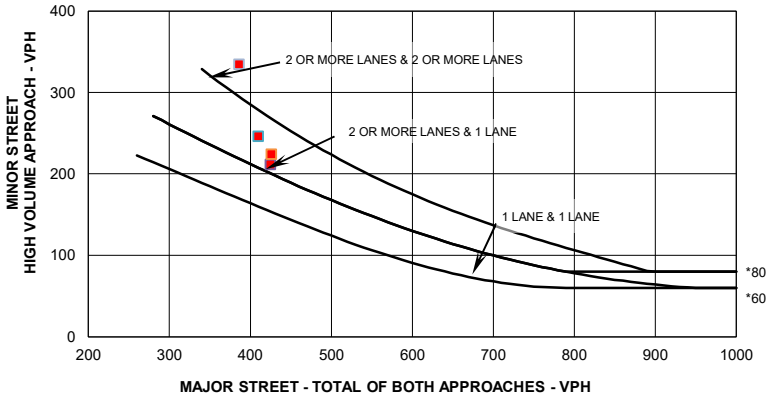
** Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
12:00-13:00	425	211
15:00-16:00	410	246
16:00-17:00	426	224
17:00-18:00	386	334

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 3

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 3 - PEAK HOUR

*If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.*

Applicable: ☑ Yes ☐ No

Satisfied: ☑ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	506	388

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	506	388

Criteria

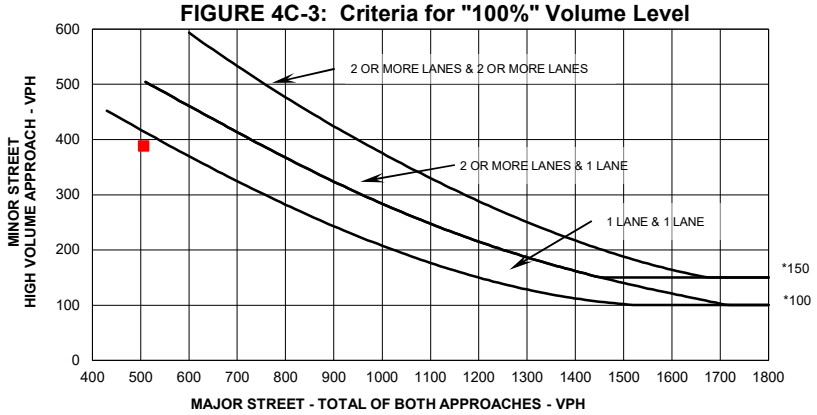
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	☐ Yes ☐ No	

2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	☐ Yes ☐ No	

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	☐ Yes ☐ No	

Plot volume combination on the applicable figure below.

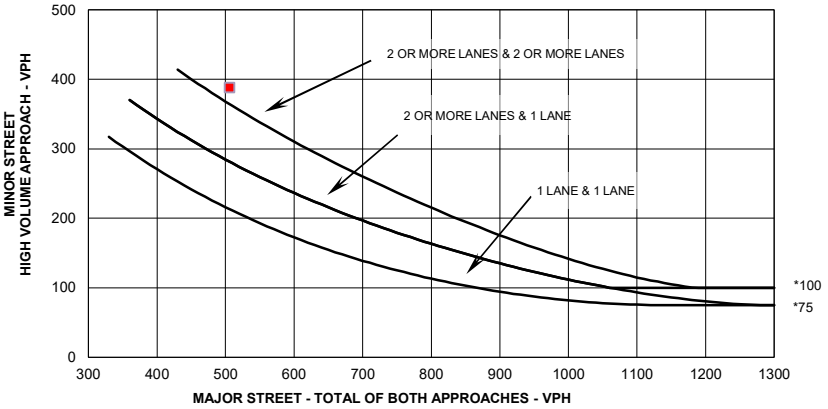
FIGURE 4C-3: Criteria for "100%" Volume Level



** Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 100 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 75 phi applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 1

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - No RT Reduction		

Major Street:	US-81/34	Lanes:	2	Major Approach Speed:	60
Minor Street:	County Road 15	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

*Warrant 1 is satisfied if Condition A **or** Condition B is "100%" satisfied for eight hours.* ☐ Yes ☑ No

*Warrant 1 is also satisfied if both Condition A **and** Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).* ☐ Yes ☑ No

*Warrant 1 is satisfied if Condition A **or** Condition B is "70%" satisfied for eight hours.* ☐ Yes ☑ No

Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

[a] Basic Minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	7:00-8:00	8:00-9:00	11:00-12:00	12:00-13:00	13:00-14:00	15:00-16:00	16:00-17:00	17:00-18:00
Major	388	328	328	366	327	396	432	458
Minor	131	113	105	118	122	160	169	188

Existing Volumes

TRAFFIC SIGNAL WARRANT SUMMARY

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	**Minor**	**100%[a]**	**80%[b]**	**70%[c]**	**100%[a]**	**80%[b]**	**70%[c]**
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

[a] Basic Minimum hourly volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Eight Highest Hours								
Street	**7:00-8:00**	**8:00-9:00**	**11:00-12:00**	**12:00-13:00**	**13:00-14:00**	**15:00-16:00**	**16:00-17:00**	**17:00-18:00**
Major	388	328	328	366	327	396	432	458
Minor	131	113	105	118	122	160	169	188

Existing Volumes

Chapter 3 Warrant 2

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - No RT Reduction		

Major Street:	US-81/34	Lanes:	2	Major Approach Speed:	60
Minor Street:	County Road 15	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☑ Yes ☐ No

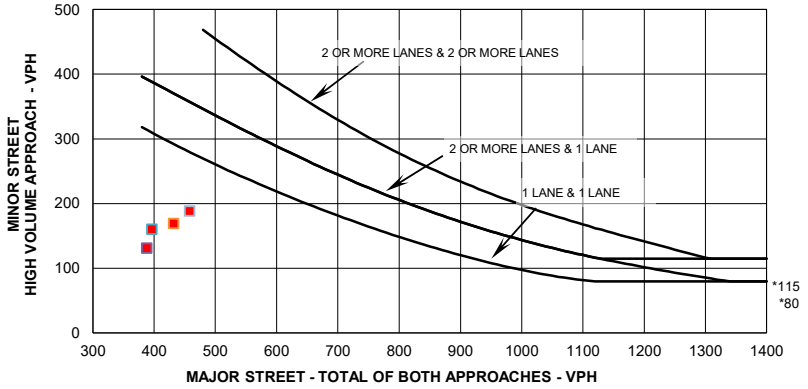
Satisfied: ☑ Yes ☐ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7:00-8:00	388	131
15:00-16:00	396	160
16:00-17:00	432	169
17:00-18:00	458	188

FIGURE 4C-1: Criteria for "100%" Volume Level



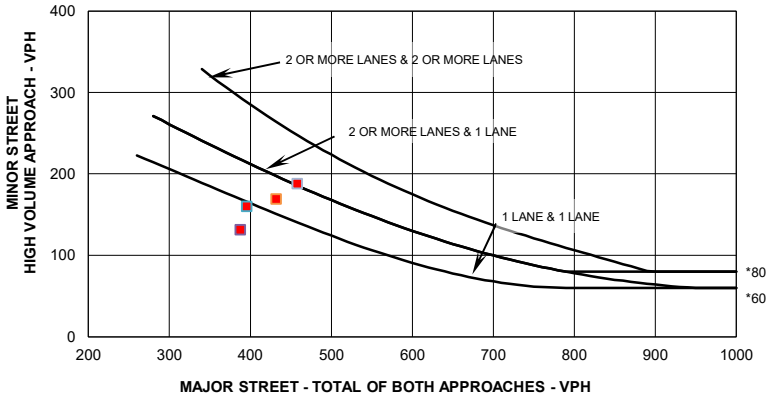
** Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7:00-8:00	388	131
15:00-16:00	396	160
16:00-17:00	432	169
17:00-18:00	458	188

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 3

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - No RT Reduction		

Major Street:	US-81/34	Lanes:	2	Major Approach Speed:	60
Minor Street:	County Road 15	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 3 - PEAK HOUR

*If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.*

Applicable: ☑ Yes ☐ No

Satisfied: ☐ Yes ☑ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	555	224

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	555	224

Criteria

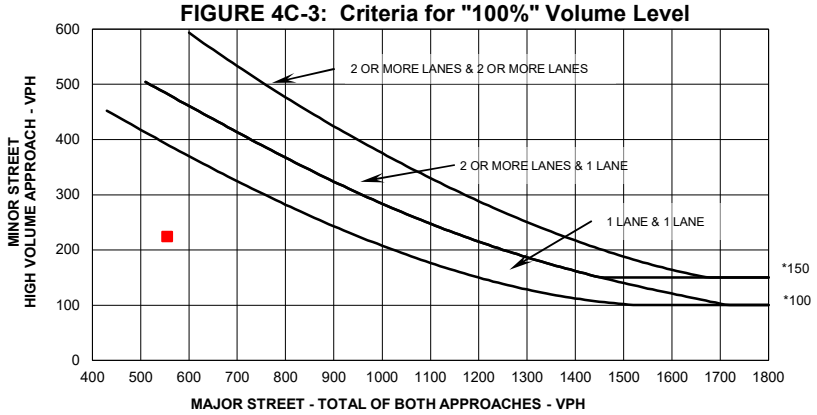
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	☐ Yes ☐ No	

2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	☐ Yes ☐ No	

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	☐ Yes ☐ No	

Plot volume combination on the applicable figure below.

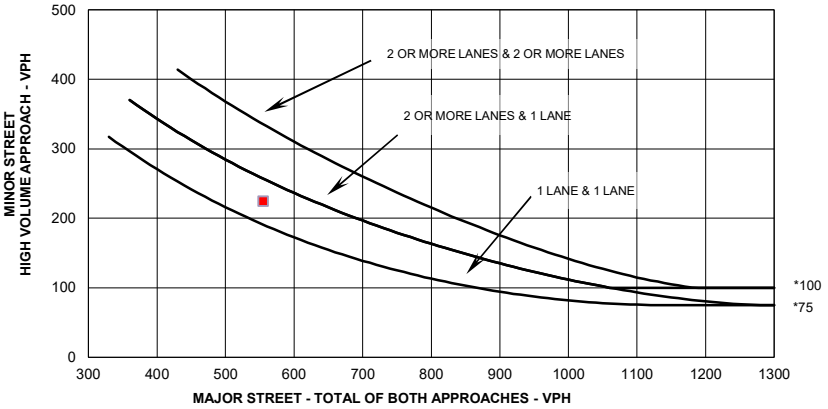
FIGURE 4C-3: Criteria for "100%" Volume Level



** Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 100 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 75 phi applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 1

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - RT Reduction		

Major Street:	US-81/34	Lanes:	2	Major Approach Speed:	60
Minor Street:	County Road 15	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

*Warrant 1 is satisfied if Condition A **or** Condition B is "100%" satisfied for eight hours.* ☐ Yes ☑ No

*Warrant 1 is also satisfied if both Condition A **and** Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).* ☐ Yes ☑ No

*Warrant 1 is satisfied if Condition A **or** Condition B is "70%" satisfied for eight hours.* ☐ Yes ☑ No

Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

[a] Basic Minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	7:00-8:00	8:00-9:00	11:00-12:00	12:00-13:00	13:00-14:00	15:00-16:00	16:00-17:00	17:00-18:00
Major	388	328	328	366	327	396	432	458
Minor	70	69	54	63	65	56	80	61

Existing Volumes

TRAFFIC SIGNAL WARRANT SUMMARY

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	**Minor**	**100%[a]**	**80%[b]**	**70%[c]**	**100%[a]**	**80%[b]**	**70%[c]**
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

[a] Basic Minimum hourly volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Eight Highest Hours								
Street	**7:00-8:00**	**8:00-9:00**	**11:00-12:00**	**12:00-13:00**	**13:00-14:00**	**15:00-16:00**	**16:00-17:00**	**17:00-18:00**
Major	388	328	328	366	327	396	432	458
Minor	70	69	54	63	65	56	80	61

Existing Volumes

Chapter 3 Warrant 2

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - RT Reduction		

Major Street:	US-81/34	Lanes:	2	Major Approach Speed:	60
Minor Street:	County Road 15	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☑ Yes ☐ No

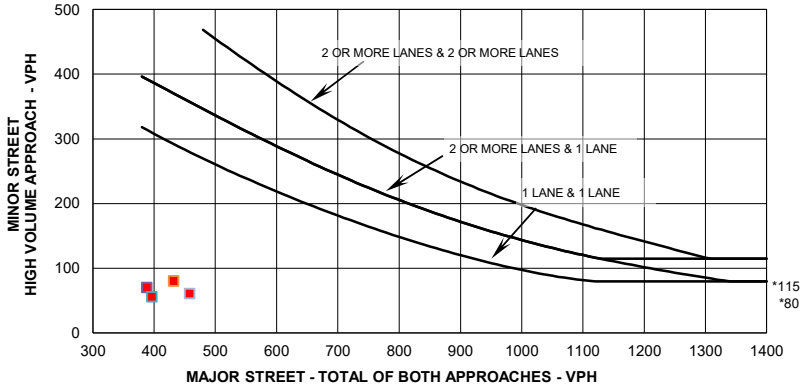
Satisfied: ☑ Yes ☐ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7:00-8:00	388	70
15:00-16:00	396	56
16:00-17:00	432	80
17:00-18:00	458	61

FIGURE 4C-1: Criteria for "100%" Volume Level



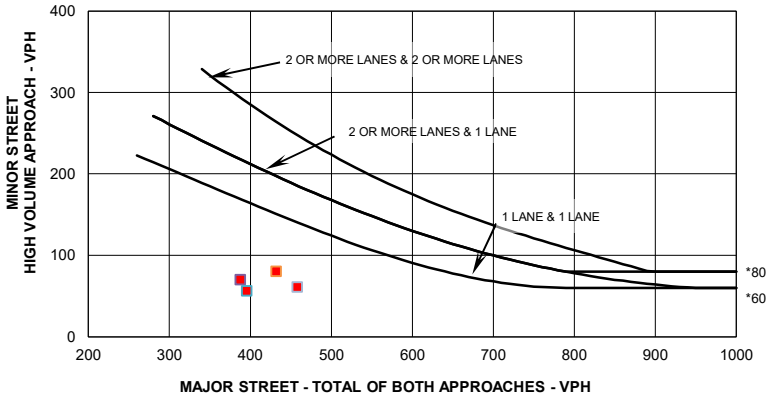
** Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7:00-8:00	388	70
15:00-16:00	396	56
16:00-17:00	432	80
17:00-18:00	458	61

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 3

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - RT Reduction		

Major Street:	US-81/34	Lanes:	2	Major Approach Speed:	60
Minor Street:	County Road 15	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 3 - PEAK HOUR

*If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.*

Applicable: ☑ Yes ☐ No

Satisfied: ☐ Yes ☑ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	555	92

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	555	92

Criteria

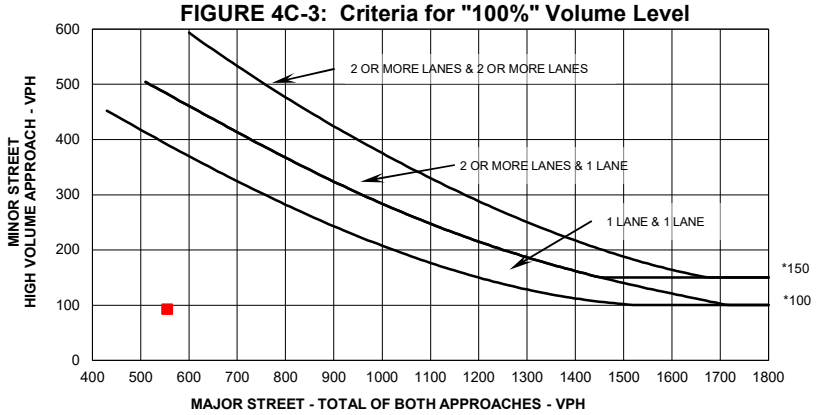
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	☐ Yes ☐ No	

2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	☐ Yes ☐ No	

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	☐ Yes ☐ No	

Plot volume combination on the applicable figure below.

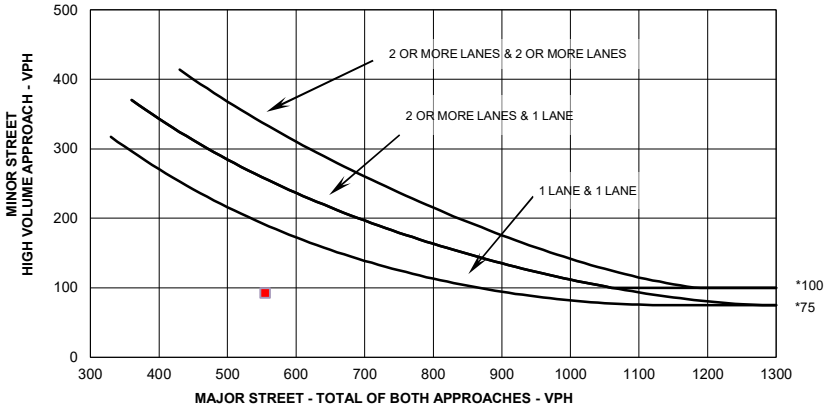
FIGURE 4C-3: Criteria for "100%" Volume Level



** Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 100 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 75 phi applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 1

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - No RT Reduction		

Major Street:	Lincoln Ave	Lanes:	2	Major Approach Speed:	45
Minor Street:	25th St	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

*Warrant 1 is satisfied if Condition A **or** Condition B is "100%" satisfied for eight hours.* ☐ Yes ☑ No

*Warrant 1 is also satisfied if both Condition A **and** Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).* ☐ Yes ☑ No

*Warrant 1 is satisfied if Condition A **or** Condition B is "70%" satisfied for eight hours.* ☐ Yes ☑ No

Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

[a] Basic Minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	7:00-8:00	8:00-9:00	11:00-12:00	12:00-13:00	13:00-14:00	15:00-16:00	16:00-17:00	17:00-18:00
Major	562	395	471	547	448	534	484	526
Minor	139	102	132	178	135	200	168	279

Existing Volumes

TRAFFIC SIGNAL WARRANT SUMMARY

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	**Minor**	**100%[a]**	**80%[b]**	**70%[c]**	**100%[a]**	**80%[b]**	**70%[c]**
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

[a] Basic Minimum hourly volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Eight Highest Hours								
Street	**7:00-8:00**	**8:00-9:00**	**11:00-12:00**	**12:00-13:00**	**13:00-14:00**	**15:00-16:00**	**16:00-17:00**	**17:00-18:00**
Major	562	395	471	547	448	534	484	526
Minor	139	102	132	178	135	200	168	279

Existing Volumes

Chapter 3 Warrant 2

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - No RT Reduction		

Major Street:	Lincoln Ave	Lanes:	2	Major Approach Speed:	45
Minor Street:	25th St	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☑ Yes ☐ No

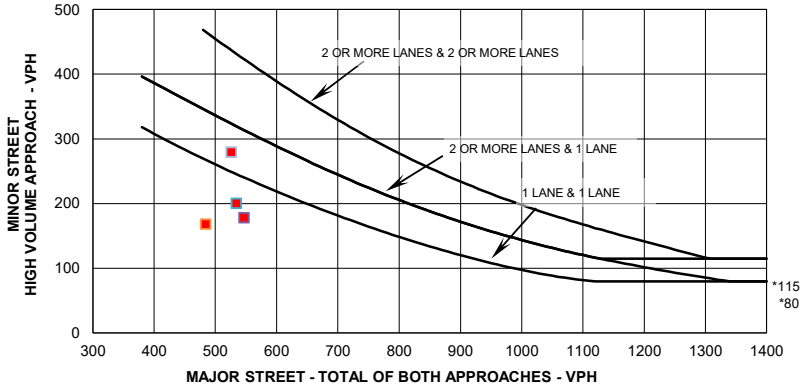
Satisfied: ☐ Yes ☑ No

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
12:00-13:00	547	178
15:00-16:00	534	200
16:00-17:00	484	168
17:00-18:00	526	279

Plot four volume combinations on the applicable figure below.

FIGURE 4C-1: Criteria for "100%" Volume Level



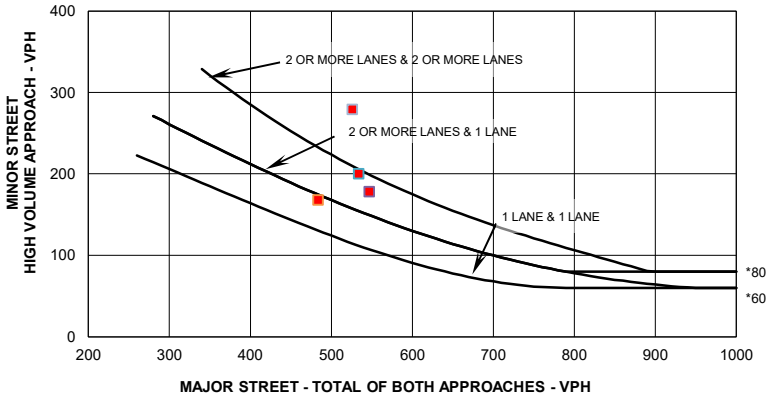
** Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
12:00-13:00	547	178
15:00-16:00	534	200
16:00-17:00	484	168
17:00-18:00	526	279

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 3

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - No RT Reduction		

Major Street:	Lincoln Ave	Lanes:	2	Major Approach Speed:	45
Minor Street:	25th St	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 3 - PEAK HOUR

*If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.*

Applicable: ☑ Yes ☐ No

Satisfied: ☑ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
PM	578	310

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
PM	578	310

Criteria

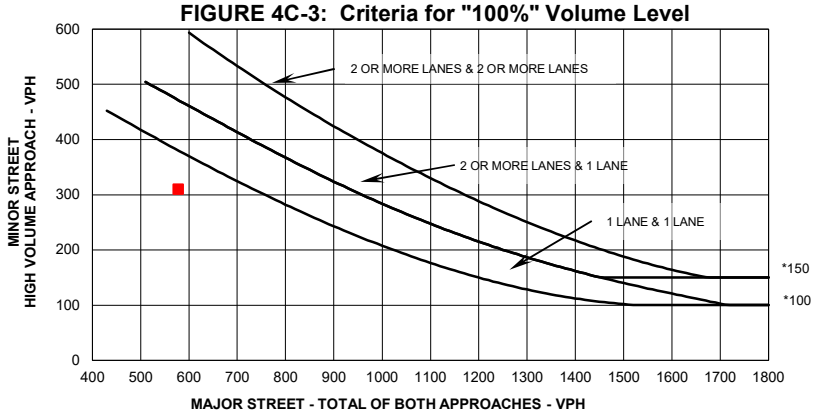
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	☐ Yes ☐ No	

2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	☐ Yes ☐ No	

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	☐ Yes ☐ No	

Plot volume combination on the applicable figure below.

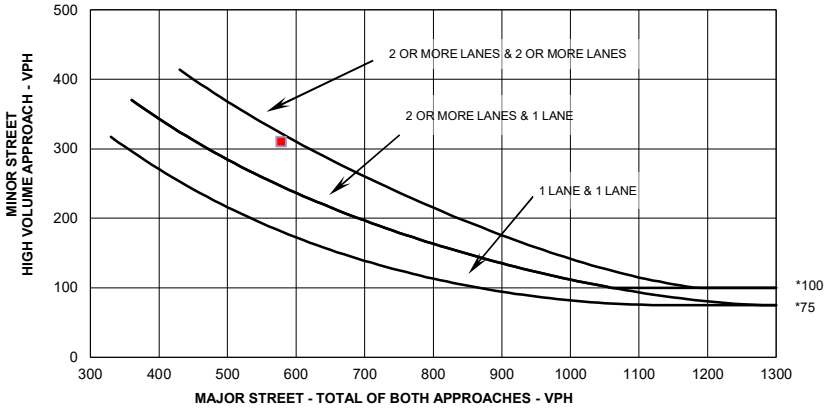
FIGURE 4C-3: Criteria for "100%" Volume Level



** Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 100 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 75 phi applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 1

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - RT Reduction		

Major Street:	Lincoln Ave	Lanes:	2	Major Approach Speed:	45
Minor Street:	25th St	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

*Warrant 1 is satisfied if Condition A **or** Condition B is "100%" satisfied for eight hours.* ☐ Yes ☑ No

*Warrant 1 is also satisfied if both Condition A **and** Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).* ☐ Yes ☑ No

*Warrant 1 is satisfied if Condition A **or** Condition B is "70%" satisfied for eight hours.* ☐ Yes ☑ No

Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

[a] Basic Minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	7:00-8:00	8:00-9:00	11:00-12:00	12:00-13:00	13:00-14:00	15:00-16:00	16:00-17:00	17:00-18:00
Major	562	395	471	547	448	534	484	526
Minor	61	56	50	66	52	80	59	117

Existing Volumes

TRAFFIC SIGNAL WARRANT SUMMARY

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	**Minor**	**100%[a]**	**80%[b]**	**70%[c]**	**100%[a]**	**80%[b]**	**70%[c]**
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

[a] Basic Minimum hourly volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Eight Highest Hours								
Street	**7:00-8:00**	**8:00-9:00**	**11:00-12:00**	**12:00-13:00**	**13:00-14:00**	**15:00-16:00**	**16:00-17:00**	**17:00-18:00**
Major	562	395	471	547	448	534	484	526
Minor	61	56	50	66	52	80	59	117

Existing Volumes

Chapter 3 Warrant 2

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - RT Reduction		

Major Street:	Lincoln Ave	Lanes:	2	Major Approach Speed:	45
Minor Street:	25th St	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☑ Yes ☐ No

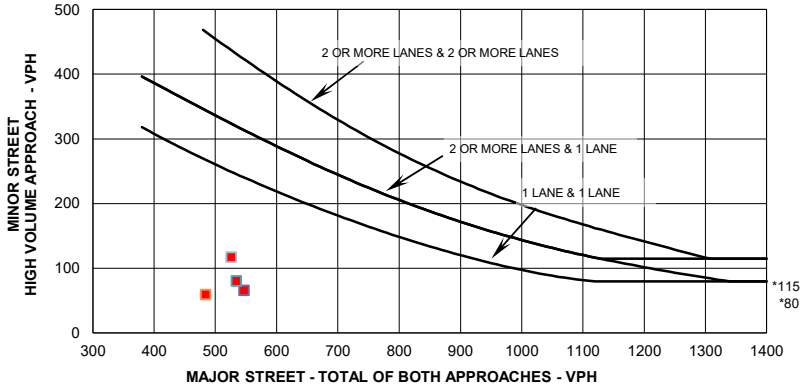
Satisfied: ☐ Yes ☑ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
12:00-13:00	547	66
15:00-16:00	534	80
16:00-17:00	484	59
17:00-18:00	526	117

FIGURE 4C-1: Criteria for "100%" Volume Level



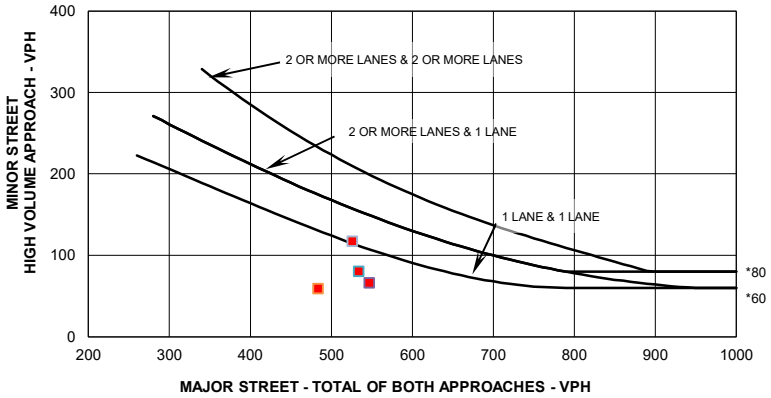
** Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
12:00-13:00	547	66
15:00-16:00	534	80
16:00-17:00	484	59
17:00-18:00	526	117

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 3

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - RT Reduction		

Major Street:	Lincoln Ave	Lanes:	2	Major Approach Speed:	45
Minor Street:	25th St	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 3 - PEAK HOUR

*If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.*

Applicable: ☑ Yes ☐ No

Satisfied: ☐ Yes ☑ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
PM	578	123

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
PM	578	123

Criteria

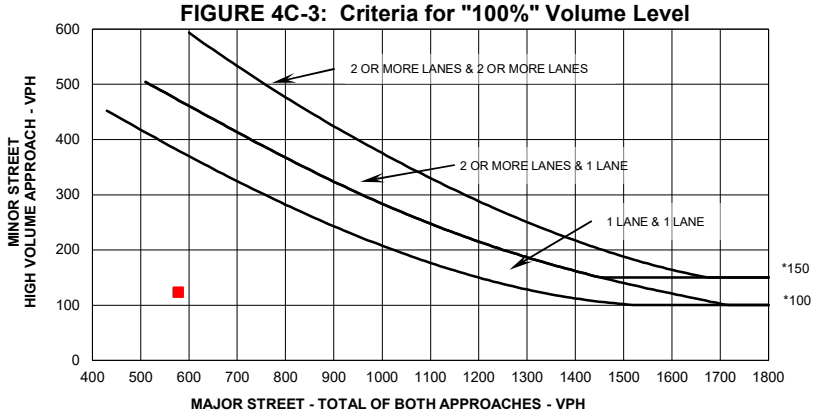
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	☐ Yes ☐ No	

2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	☐ Yes ☐ No	

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	☐ Yes ☐ No	

Plot volume combination on the applicable figure below.

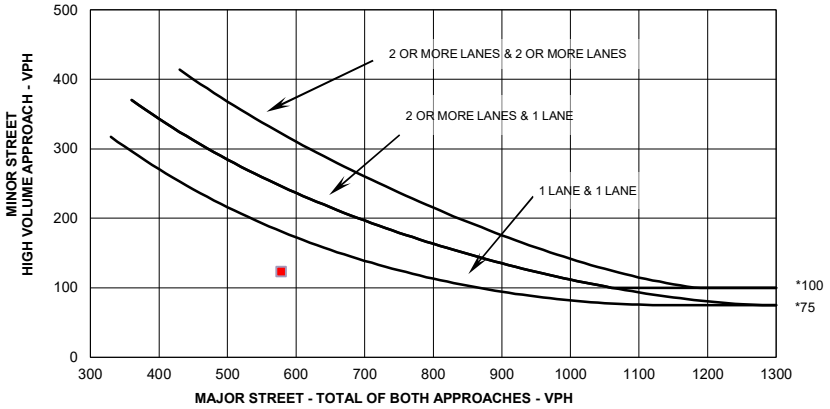
FIGURE 4C-3: Criteria for "100%" Volume Level



** Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 100 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 75 phi applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 1

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - No RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

*Warrant 1 is satisfied if Condition A **or** Condition B is "100%" satisfied for eight hours.* ☐ Yes ☑ No

*Warrant 1 is also satisfied if both Condition A **and** Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).* ☐ Yes ☑ No

*Warrant 1 is satisfied if Condition A **or** Condition B is "70%" satisfied for eight hours.* ☑ Yes ☐ No

Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☑ Yes	☐ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

[a] Basic Minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	7:00-8:00	8:00-9:00	11:00-12:00	12:00-13:00	13:00-14:00	15:00-16:00	16:00-17:00	17:00-18:00
Major	702	597	471	582	519	543	548	479
Minor	262	232	309	364	285	385	395	600

Existing Volumes

TRAFFIC SIGNAL WARRANT SUMMARY

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	**Minor**	**100%[a]**	**80%[b]**	**70%[c]**	**100%[a]**	**80%[b]**	**70%[c]**
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

[a] Basic Minimum hourly volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Eight Highest Hours								
Street	**7:00-8:00**	**8:00-9:00**	**11:00-12:00**	**12:00-13:00**	**13:00-14:00**	**15:00-16:00**	**16:00-17:00**	**17:00-18:00**
Major	702	597	471	582	519	543	548	479
Minor	262	232	309	364	285	385	395	600

Existing Volumes

Chapter 3 Warrant 2

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - No RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☑ Yes ☐ No

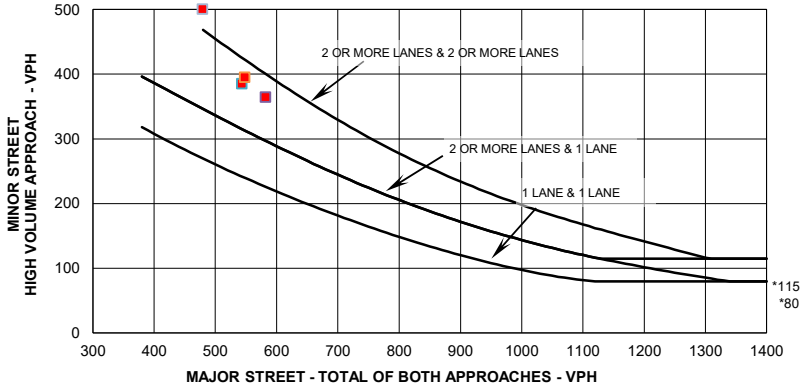
Satisfied: ☑ Yes ☐ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
12:00-13:00	582	364
15:00-16:00	543	385
16:00-17:00	548	395
17:00-18:00	479	600

FIGURE 4C-1: Criteria for "100%" Volume Level



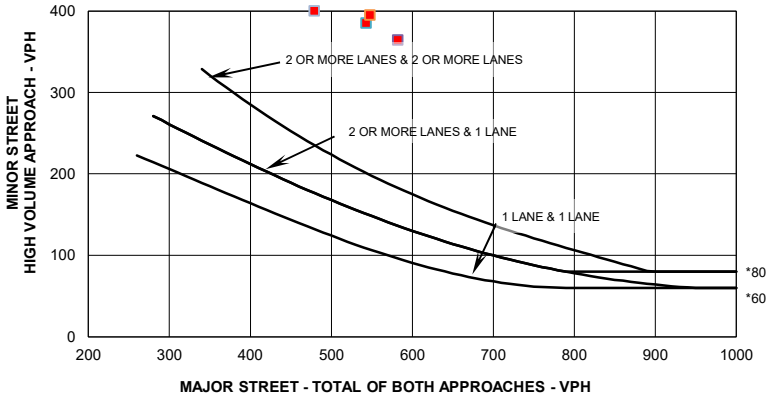
** Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
12:00-13:00	582	364
15:00-16:00	543	385
16:00-17:00	548	395
17:00-18:00	479	600

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 3

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - No RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 3 - PEAK HOUR

*If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.*

Applicable: ☑ Yes ☐ No

Satisfied: ☑ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	654	555

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	654	555

Criteria

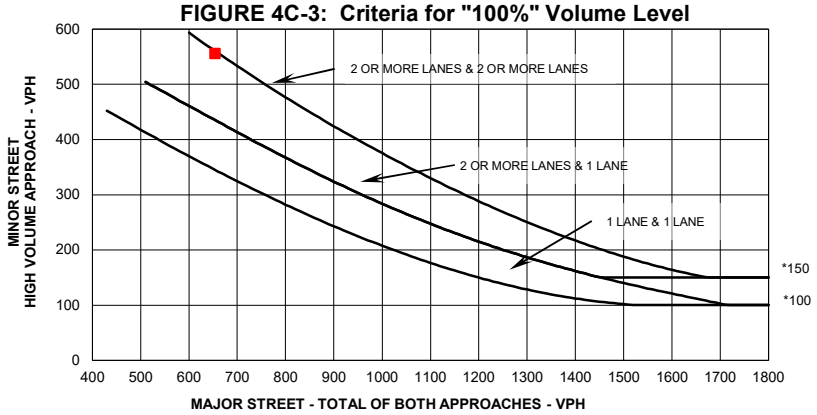
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	☐ Yes ☐ No	

2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	☐ Yes ☐ No	

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	☐ Yes ☐ No	

Plot volume combination on the applicable figure below.

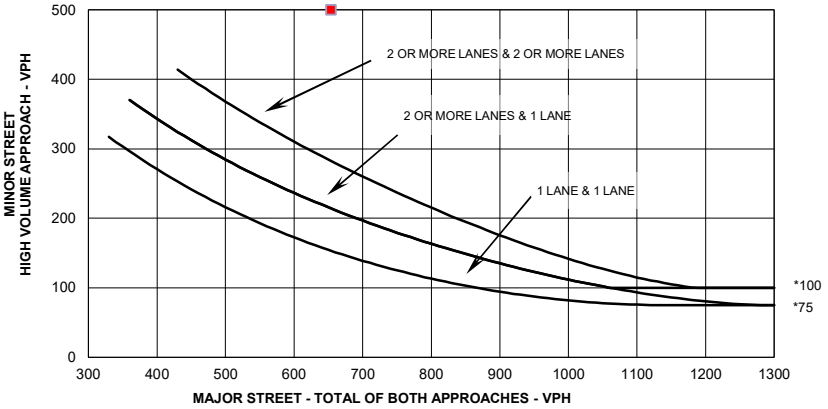
FIGURE 4C-3: Criteria for "100%" Volume Level



** Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 100 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 75 phi applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 1

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

*Warrant 1 is satisfied if Condition A **or** Condition B is "100%" satisfied for eight hours.* ☐ Yes ☑ No

*Warrant 1 is also satisfied if both Condition A **and** Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).* ☐ Yes ☑ No

*Warrant 1 is satisfied if Condition A **or** Condition B is "70%" satisfied for eight hours.* ☐ Yes ☑ No

Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

[a] Basic Minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	7:00-8:00	8:00-9:00	11:00-12:00	12:00-13:00	13:00-14:00	15:00-16:00	16:00-17:00	17:00-18:00
Major	702	597	471	582	519	543	548	479
Minor	180	146	203	232	180	274	249	368

Existing Volumes

TRAFFIC SIGNAL WARRANT SUMMARY

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	**Minor**	**100%[a]**	**80%[b]**	**70%[c]**	**100%[a]**	**80%[b]**	**70%[c]**
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

[a] Basic Minimum hourly volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Eight Highest Hours								
Street	**7:00-8:00**	**8:00-9:00**	**11:00-12:00**	**12:00-13:00**	**13:00-14:00**	**15:00-16:00**	**16:00-17:00**	**17:00-18:00**
Major	702	597	471	582	519	543	548	479
Minor	180	146	203	232	180	274	249	368

Existing Volumes

Chapter 3 Warrant 2

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☑ Yes ☐ No

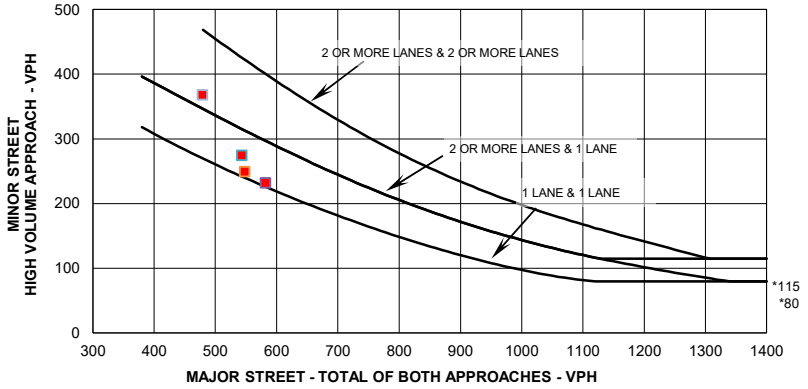
Satisfied: ☑ Yes ☐ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
12:00-13:00	582	232
15:00-16:00	543	274
16:00-17:00	548	249
17:00-18:00	479	368

FIGURE 4C-1: Criteria for "100%" Volume Level



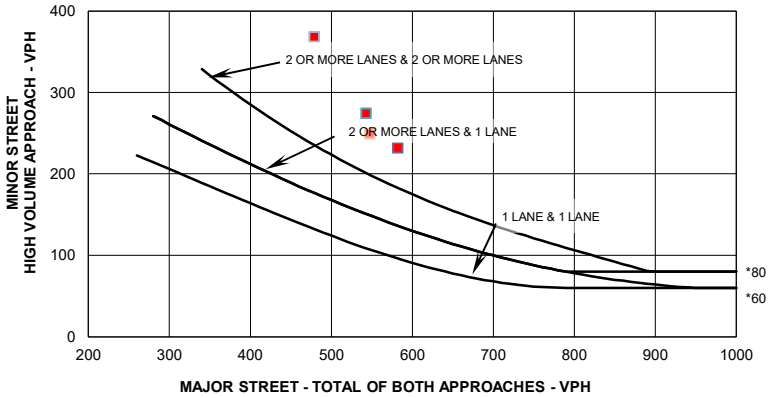
** Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
12:00-13:00	582	232
15:00-16:00	543	274
16:00-17:00	548	249
17:00-18:00	479	368

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 3

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2030 plus Site - RT Reduction		

Major Street:	US-34	Lanes:	2	Major Approach Speed:	60
Minor Street:	25th St	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 3 - PEAK HOUR

*If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.*

Applicable: ☑ Yes ☐ No

Satisfied: ☑ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	654	449

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	654	449

Criteria

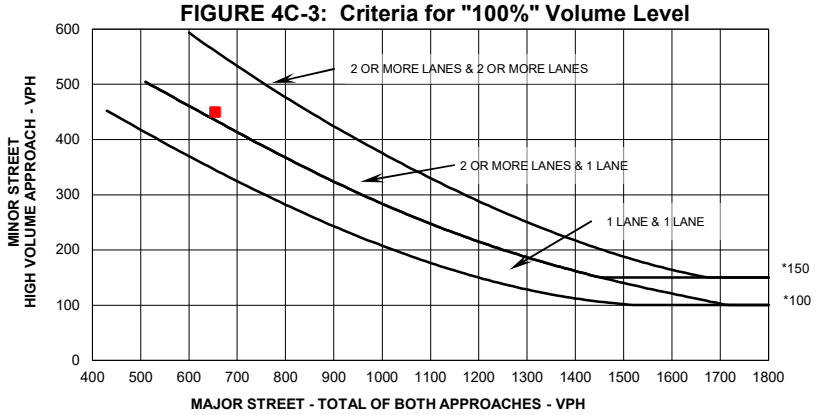
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	☐ Yes ☐ No	

2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	☐ Yes ☐ No	

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	☐ Yes ☐ No	

Plot volume combination on the applicable figure below.

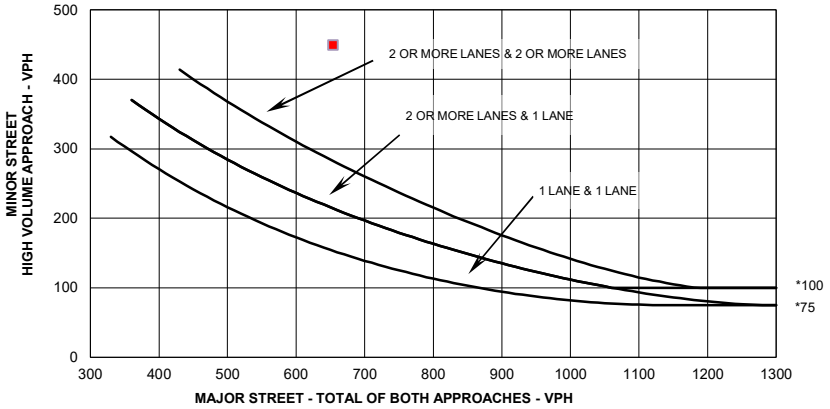
FIGURE 4C-3: Criteria for "100%" Volume Level



** Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 100 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 75 phi applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 1

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2040 plus Site - No RT Reduction		

Major Street:	US-81/34	Lanes:	2	Major Approach Speed:	60
Minor Street:	County Road 15	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

*Warrant 1 is satisfied if Condition A **or** Condition B is "100%" satisfied for eight hours.* ☐ Yes ☑ No

*Warrant 1 is also satisfied if both Condition A **and** Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).* ☐ Yes ☑ No

*Warrant 1 is satisfied if Condition A **or** Condition B is "70%" satisfied for eight hours.* ☐ Yes ☑ No

Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Applicable: ☑ Yes ☐ No
100% Satisfied: ☐ Yes ☑ No
80% Satisfied: ☐ Yes ☑ No
70% Satisfied: ☐ Yes ☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

[a] Basic Minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	7:00-8:00	8:00-9:00	11:00-12:00	12:00-13:00	13:00-14:00	15:00-16:00	16:00-17:00	17:00-18:00
Major	511	429	430	487	429	519	558	597
Minor	170	144	131	149	154	199	209	230

Existing Volumes

TRAFFIC SIGNAL WARRANT SUMMARY

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	**Minor**	**100%[a]**	**80%[b]**	**70%[c]**	**100%[a]**	**80%[b]**	**70%[c]**
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

[a] Basic Minimum hourly volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Eight Highest Hours								
Street	**7:00-8:00**	**8:00-9:00**	**11:00-12:00**	**12:00-13:00**	**13:00-14:00**	**15:00-16:00**	**16:00-17:00**	**17:00-18:00**
Major	511	429	430	487	429	519	558	597
Minor	170	144	131	149	154	199	209	230

Existing Volumes

Chapter 3 Warrant 2

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2040 plus Site - No RT Reduction		

Major Street:	US-81/34	Lanes:	2	Major Approach Speed:	60
Minor Street:	County Road 15	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☑ Yes ☐ No

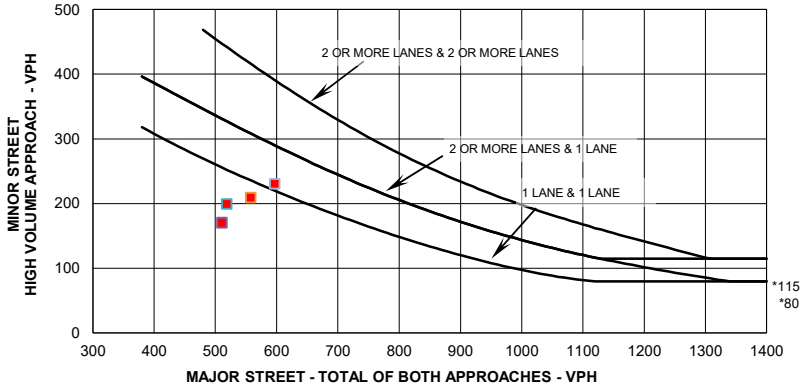
Satisfied: ☑ Yes ☐ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7:00-8:00	511	170
15:00-16:00	519	199
16:00-17:00	558	209
17:00-18:00	597	230

FIGURE 4C-1: Criteria for "100%" Volume Level



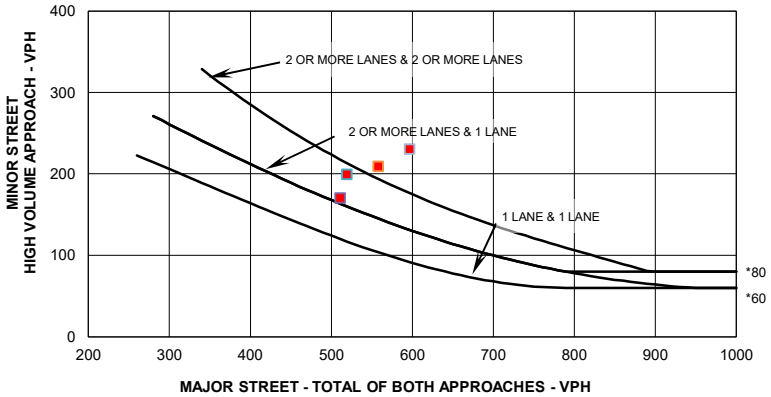
** Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7:00-8:00	511	170
15:00-16:00	519	199
16:00-17:00	558	209
17:00-18:00	597	230

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 3

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2040 plus Site - No RT Reduction		

Major Street:	US-81/34	Lanes:	2	Major Approach Speed:	60
Minor Street:	County Road 15	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 3 - PEAK HOUR

*If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.*

Applicable: ☑ Yes ☐ No

Satisfied: ☐ Yes ☑ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	728	119

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	728	119

Criteria

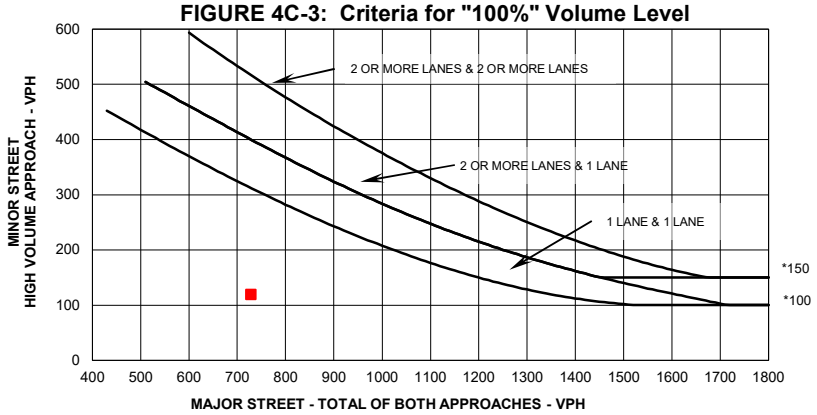
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	☐ Yes ☐ No	

2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	☐ Yes ☐ No	

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	☐ Yes ☐ No	

Plot volume combination on the applicable figure below.

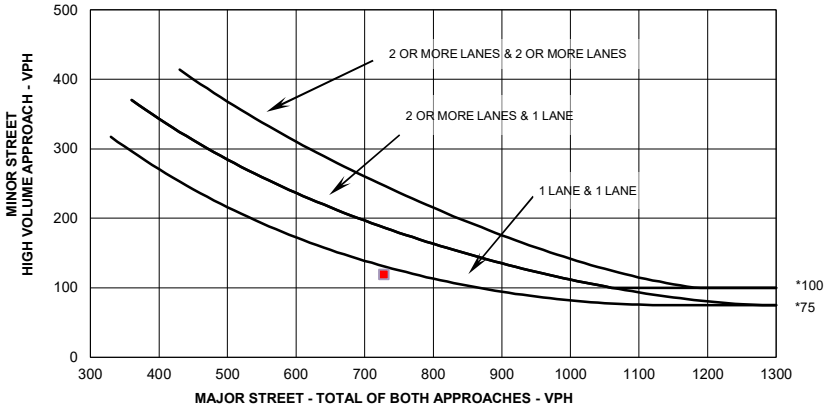
FIGURE 4C-3: Criteria for "100%" Volume Level



** Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 100 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 75 phi applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 1

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2040 plus Site - RT Reduction		

Major Street:	US-81/34	Lanes:	2	Major Approach Speed:	60
Minor Street:	County Road 15	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

*Warrant 1 is satisfied if Condition A **or** Condition B is "100%" satisfied for eight hours.* ☐ Yes ☑ No

*Warrant 1 is also satisfied if both Condition A **and** Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).* ☐ Yes ☑ No

*Warrant 1 is satisfied if Condition A **or** Condition B is "70%" satisfied for eight hours.* ☐ Yes ☑ No

Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

[a] Basic Minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	7:00-8:00	8:00-9:00	11:00-12:00	12:00-13:00	13:00-14:00	15:00-16:00	16:00-17:00	17:00-18:00
Major	388	328	328	366	327	396	432	458
Minor	70	69	54	63	65	56	80	61

Existing Volumes

TRAFFIC SIGNAL WARRANT SUMMARY

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	**Minor**	**100%[a]**	**80%[b]**	**70%[c]**	**100%[a]**	**80%[b]**	**70%[c]**
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

[a] Basic Minimum hourly volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Eight Highest Hours								
Street	**7:00-8:00**	**8:00-9:00**	**11:00-12:00**	**12:00-13:00**	**13:00-14:00**	**15:00-16:00**	**16:00-17:00**	**17:00-18:00**
Major	388	328	328	366	327	396	432	458
Minor	70	69	54	63	65	56	80	61

Existing Volumes

Chapter 3 Warrant 2

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2040 plus Site - RT Reduction		

Major Street:	US-81/34	Lanes:	2	Major Approach Speed:	60
Minor Street:	County Road 15	Lanes:	2	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☑ Yes ☐ No

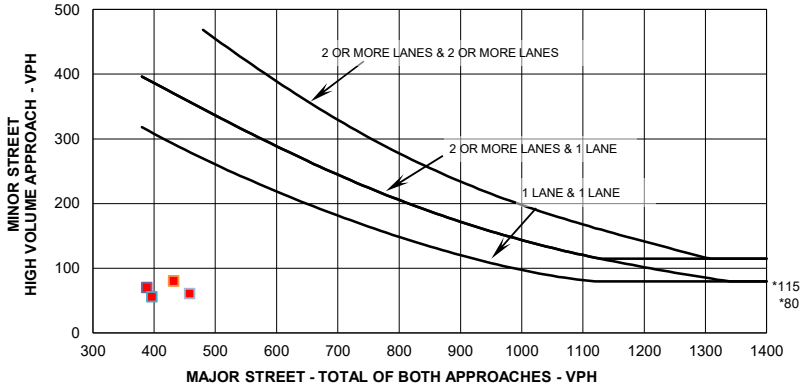
Satisfied: ☑ Yes ☐ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7:00-8:00	388	70
15:00-16:00	396	56
16:00-17:00	432	80
17:00-18:00	458	61

FIGURE 4C-1: Criteria for "100%" Volume Level



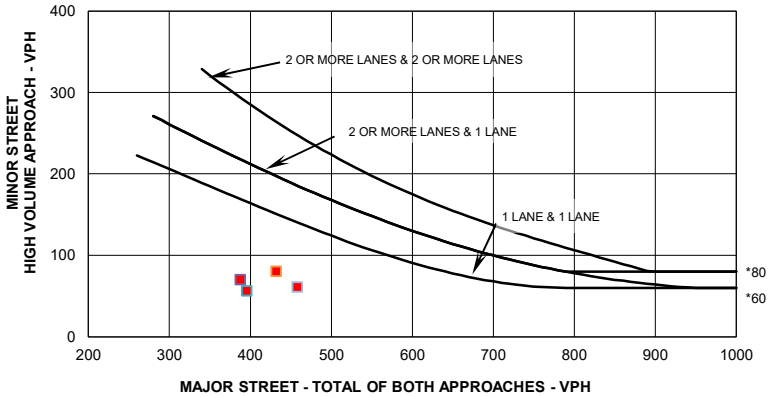
** Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
7:00-8:00	388	70
15:00-16:00	396	56
16:00-17:00	432	80
17:00-18:00	458	61

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 3

TRAFFIC SIGNAL WARRANT SUMMARY

City:	**York**	Engineer:	**Olsson**
County:	**York**	Date:	**April 29, 2024**
District:	**2040 plus Site - RT Reduction**		

Major Street:	**US-81/34**	Lanes:	**2**	Major Approach Speed:	**60**
Minor Street:	**County Road 15**	Lanes:	**2**	Minor Approach Speed:	**45**

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 3 - PEAK HOUR

*If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.*

Applicable: ☑ Yes ☐ No

Satisfied: ☐ Yes ☑ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	555	92

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
16:30-17:30	555	92

Criteria

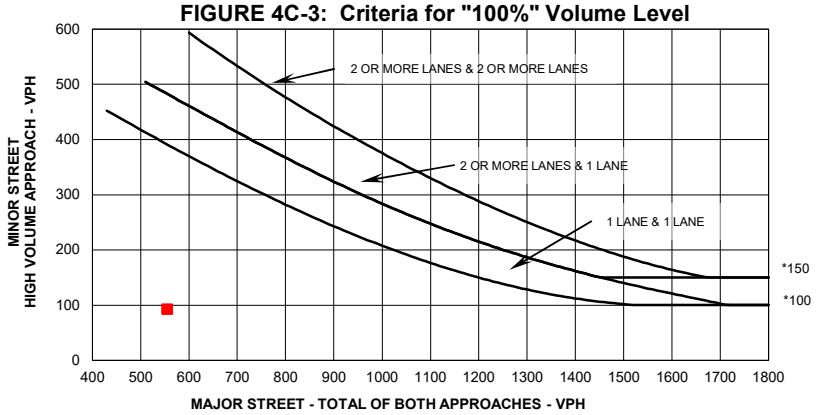
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	☐ Yes ☐ No	

2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	☐ Yes ☐ No	

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	☐ Yes ☐ No	

Plot volume combination on the applicable figure below.

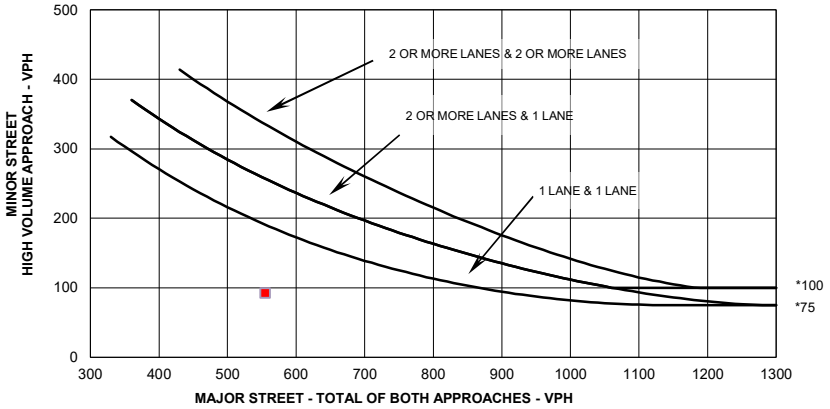
FIGURE 4C-3: Criteria for "100%" Volume Level



** Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 100 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 75 phi applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 1

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2040 plus Site - No RT Reduction		

Major Street:	Lincoln Ave	Lanes:	2	Major Approach Speed:	45
Minor Street:	25th St	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

*Warrant 1 is satisfied if Condition A **or** Condition B is "100%" satisfied for eight hours.* ☐ Yes ☑ No

*Warrant 1 is also satisfied if both Condition A **and** Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).* ☐ Yes ☑ No

*Warrant 1 is satisfied if Condition A **or** Condition B is "70%" satisfied for eight hours.* ☑ Yes ☐ No

Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☑ Yes	☐ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

[a] Basic Minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	7:00-8:00	8:00-9:00	11:00-12:00	12:00-13:00	13:00-14:00	15:00-16:00	16:00-17:00	17:00-18:00
Major	743	516	595	695	573	671	602	645
Minor	177	141	191	257	190	284	244	400

Existing Volumes

TRAFFIC SIGNAL WARRANT SUMMARY

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	**Minor**	**100%[a]**	**80%[b]**	**70%[c]**	**100%[a]**	**80%[b]**	**70%[c]**
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

[a] Basic Minimum hourly volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Eight Highest Hours								
Street	**7:00-8:00**	**8:00-9:00**	**11:00-12:00**	**12:00-13:00**	**13:00-14:00**	**15:00-16:00**	**16:00-17:00**	**17:00-18:00**
Major	743	516	595	695	573	671	602	645
Minor	177	141	191	257	190	284	244	400

Existing Volumes

Chapter 3 Warrant 2

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2040 plus Site - No RT Reduction		

Major Street:	Lincoln Ave	Lanes:	2	Major Approach Speed:	45
Minor Street:	25th St	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☑ Yes ☐ No

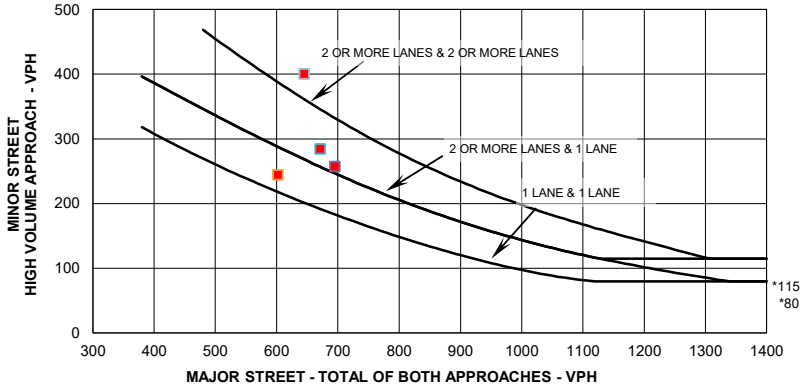
Satisfied: ☑ Yes ☐ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
12:00-13:00	695	257
15:00-16:00	671	284
16:00-17:00	602	244
17:00-18:00	645	400

FIGURE 4C-1: Criteria for "100%" Volume Level



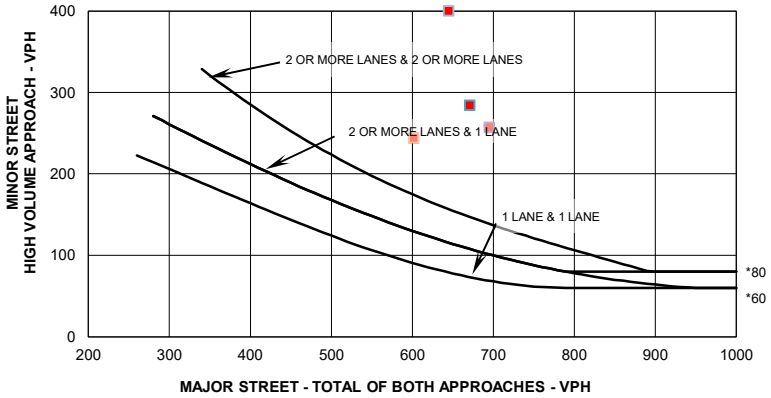
** Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
12:00-13:00	695	257
15:00-16:00	671	284
16:00-17:00	602	244
17:00-18:00	645	400

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 3

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2040 plus Site - No RT Reduction		

Major Street:	Lincoln Ave	Lanes:	2	Major Approach Speed:	45
Minor Street:	25th St	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 3 - PEAK HOUR

*If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.*

Applicable: ☑ Yes ☐ No

Satisfied: ☑ Yes ☐ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
PM	721	446

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
PM	721	446

Criteria

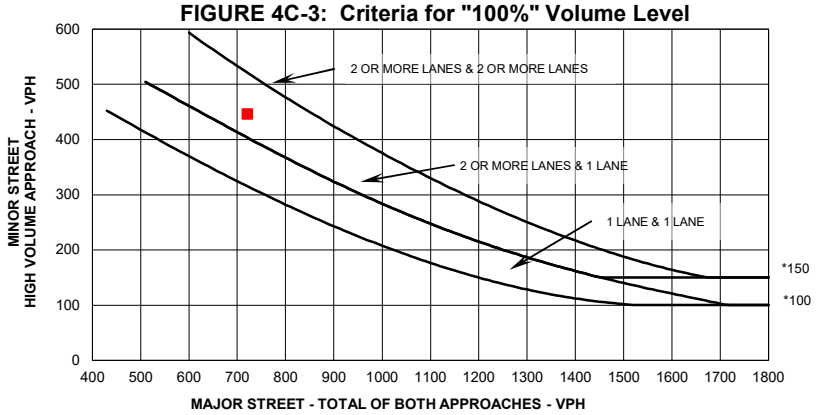
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	☐ Yes ☐ No	

2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	☐ Yes ☐ No	

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	☐ Yes ☐ No	

Plot volume combination on the applicable figure below.

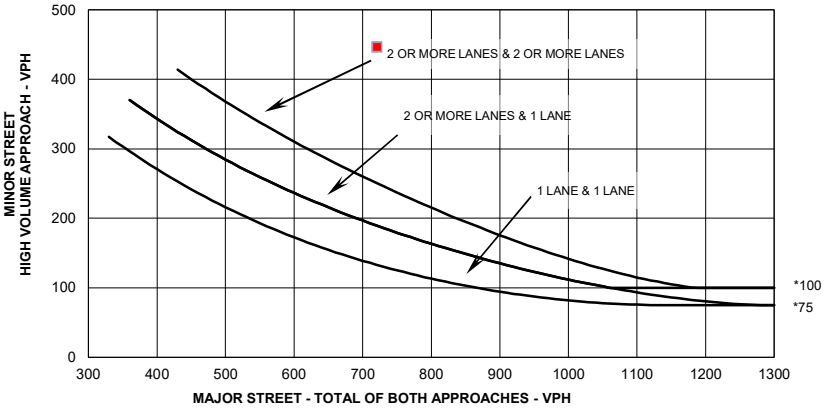
FIGURE 4C-3: Criteria for "100%" Volume Level



** Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 100 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 75 phi applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 1

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2040 plus Site - RT Reduction		

Major Street:	Lincoln Ave	Lanes:	2	Major Approach Speed:	45
Minor Street:	25th St	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

*Warrant 1 is satisfied if Condition A **or** Condition B is "100%" satisfied for eight hours.* ☐ Yes ☑ No

*Warrant 1 is also satisfied if both Condition A **and** Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).* ☐ Yes ☑ No

*Warrant 1 is satisfied if Condition A **or** Condition B is "70%" satisfied for eight hours.* ☐ Yes ☑ No

Condition A - Minimum Vehicular Volume

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

[a] Basic Minimum hourly volume
[b] Used for combination of Conditions A and B after adequate trial of other remedial measures
[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	7:00-8:00	8:00-9:00	11:00-12:00	12:00-13:00	13:00-14:00	15:00-16:00	16:00-17:00	17:00-18:00
Major	743	516	595	695	573	671	602	645
Minor	77	72	67	89	69	108	81	157

Existing Volumes

TRAFFIC SIGNAL WARRANT SUMMARY

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Applicable:	☑ Yes	☐ No
100% Satisfied:	☐ Yes	☑ No
80% Satisfied:	☐ Yes	☑ No
70% Satisfied:	☐ Yes	☑ No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	**Minor**	**100%[a]**	**80%[b]**	**70%[c]**	**100%[a]**	**80%[b]**	**70%[c]**
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

[a] Basic Minimum hourly volume

[b] Used for combination of Conditions A and B after adequate trial of other remedial measures

[c] May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Eight Highest Hours								
Street	**7:00-8:00**	**8:00-9:00**	**11:00-12:00**	**12:00-13:00**	**13:00-14:00**	**15:00-16:00**	**16:00-17:00**	**17:00-18:00**
Major	743	516	595	695	573	671	602	645
Minor	77	72	67	89	69	108	81	157

Existing Volumes

Chapter 3 Warrant 2

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2040 plus Site - RT Reduction		

Major Street:	Lincoln Ave	Lanes:	2	Major Approach Speed:	45
Minor Street:	25th St	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: ☑ Yes ☐ No

Satisfied: ☐ Yes ☑ No

Plot four volume combinations on the applicable figure below.

100% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
12:00-13:00	695	89
15:00-16:00	671	108
16:00-17:00	602	81
17:00-18:00	645	157

FIGURE 4C-1: Criteria for "100%" Volume Level

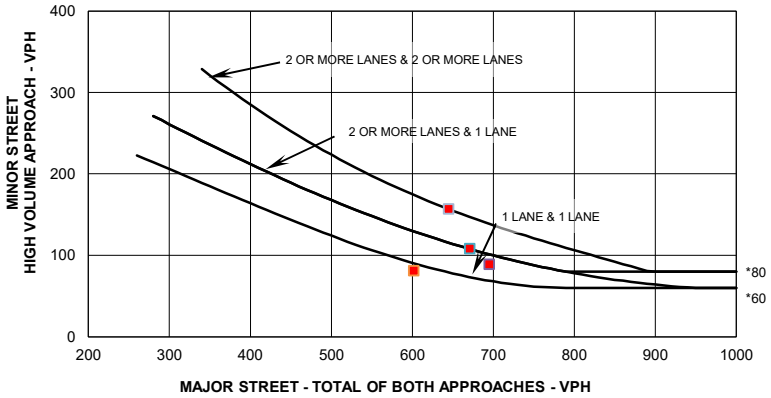
** Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.*

70% Volume Level

Four Highest Hours	Volumes	
	Major Street	Minor Street
12:00-13:00	695	89
15:00-16:00	671	108
16:00-17:00	602	81
17:00-18:00	645	157

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.*

Chapter 3 Warrant 3

TRAFFIC SIGNAL WARRANT SUMMARY

City:	York	Engineer:	Olsson
County:	York	Date:	April 29, 2024
District:	2040 plus Site - RT Reduction		

Major Street:	Lincoln Ave	Lanes:	2	Major Approach Speed:	45
Minor Street:	25th St	Lanes:	1	Minor Approach Speed:	45

MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf

Volume Level Criteria

1. Is the posted speed or 85th-percentile of major street > 40 mph? ☑ Yes ☐ No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000? ☐ Yes ☑ No

"70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes" ☑ MAY ☑ 70% ☑ 100%

WARRANT 3 - PEAK HOUR

*If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.*

Applicable: ☑ Yes ☐ No

Satisfied: ☐ Yes ☑ No

Unusual condition justifying use of warrant:

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
PM	721	164

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
PM	721	164

Criteria

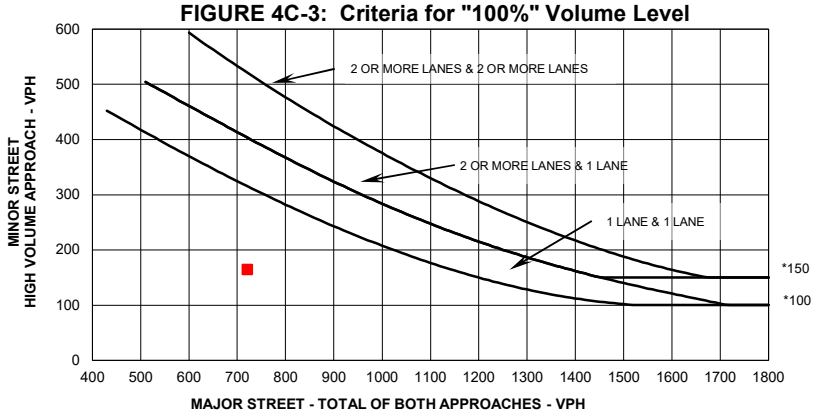
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	☐ Yes ☐ No	

2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	☐ Yes ☐ No	

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*		
Fulfilled?:	☐ Yes ☐ No	

Plot volume combination on the applicable figure below.

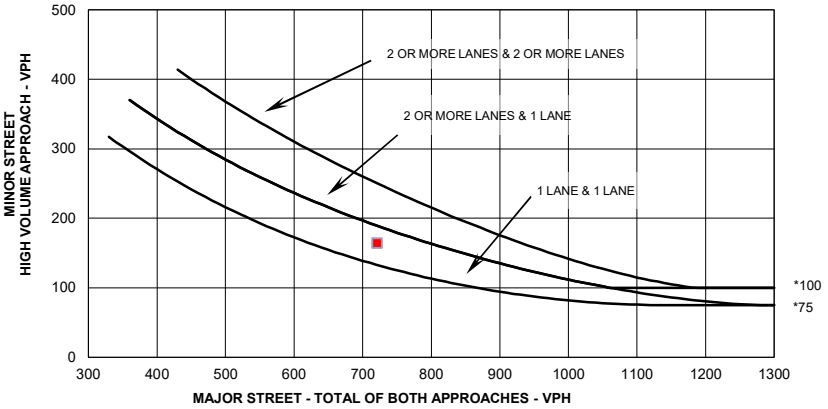
FIGURE 4C-3: Criteria for "100%" Volume Level



** Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.*

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr. (40 mph) on Major Street)



** Note: 100 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 75 phi applies as the lower threshold volume threshold for a minor street approach with one lane.*

Intersection: Site Drive 1 & 25th St
2030 Plus Site AM

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

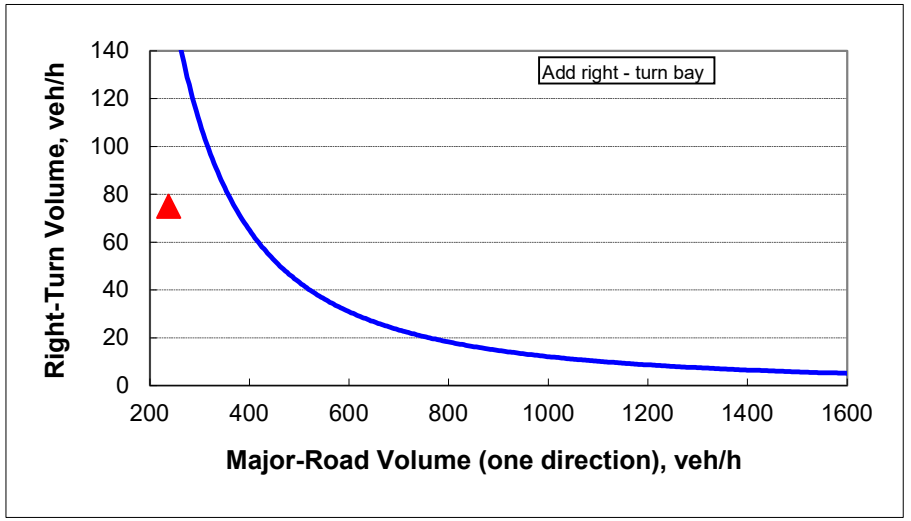
INPUT

Roadway geometry:	2-lane roadw ay

Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	237
Right-turn volume, veh/h:	75

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	170
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	



Intersection: Site Drive 1 & 25th St
2030 Plus Site PM

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

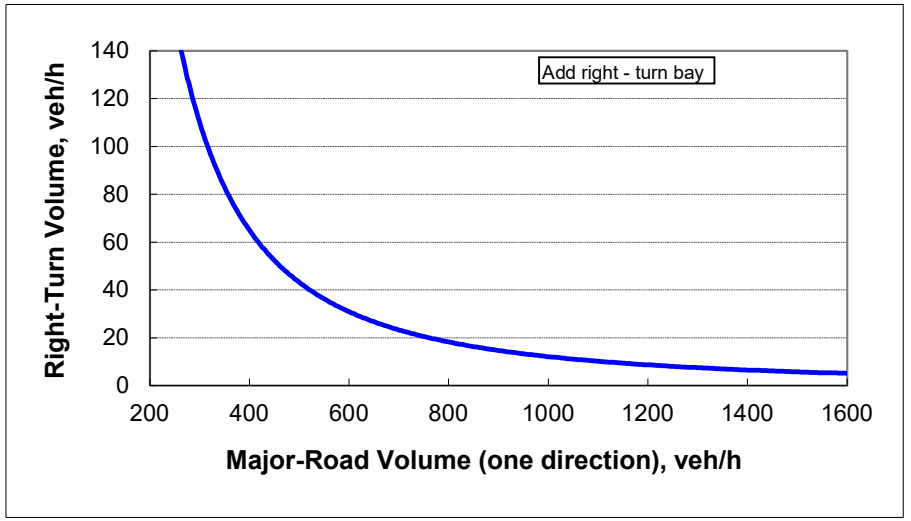
INPUT

Roadway geometry:	2-lane roadw ay

Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	199
Right-turn volume, veh/h:	20

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	234
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	



Intersection: Site Drive 1 & 25th St
2040 Plus Site AM

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

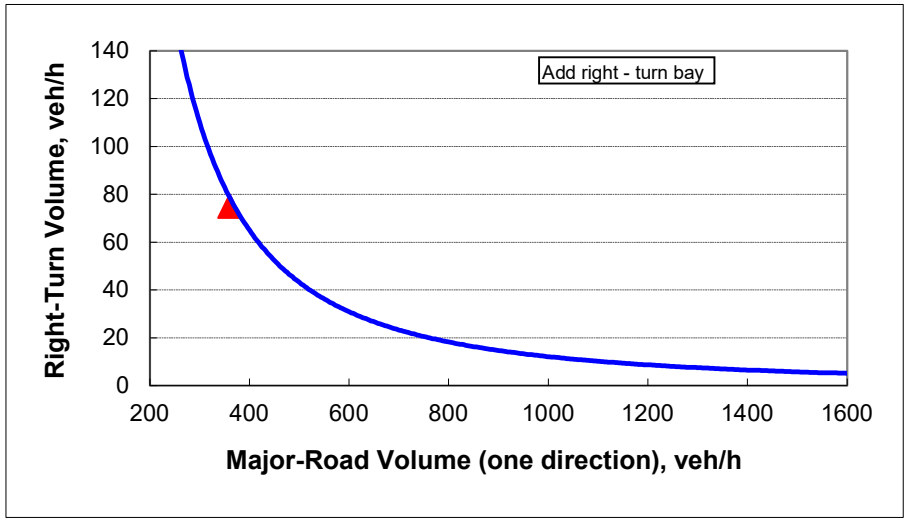
INPUT

Roadway geometry:	2-lane roadw ay

Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	360
Right-turn volume, veh/h:	75

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	79
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	



Intersection: Site Drive 1 & 25th St
2040 Plus Site PM

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

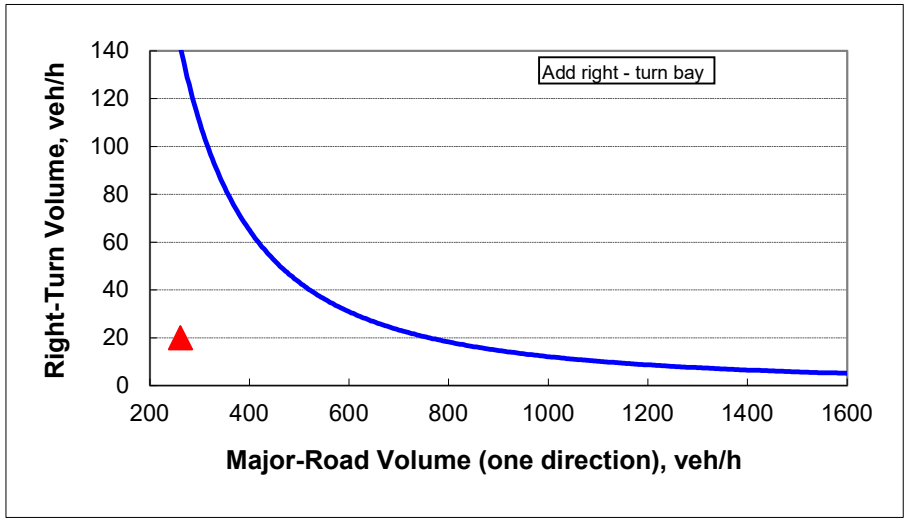
INPUT

Roadway geometry:	2-lane roadw ay

Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	261
Right-turn volume, veh/h:	20

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	142
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	



Intersection: Site Drive 2 & 25th St
2030 Plus Site AM

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

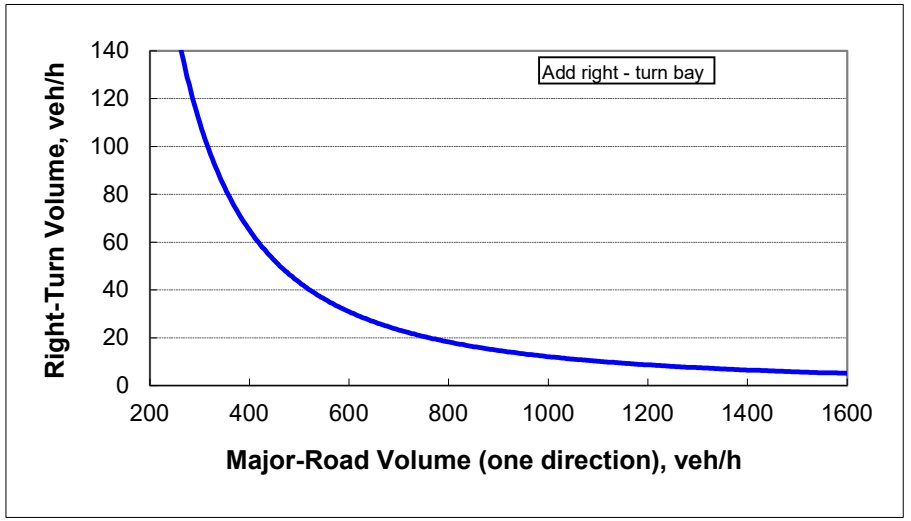
INPUT

Roadway geometry:	2-lane roadw ay

Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	197
Right-turn volume, veh/h:	75

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	238
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	



Intersection: Site Drive 2 & 25th St
2030 Plus Site PM

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

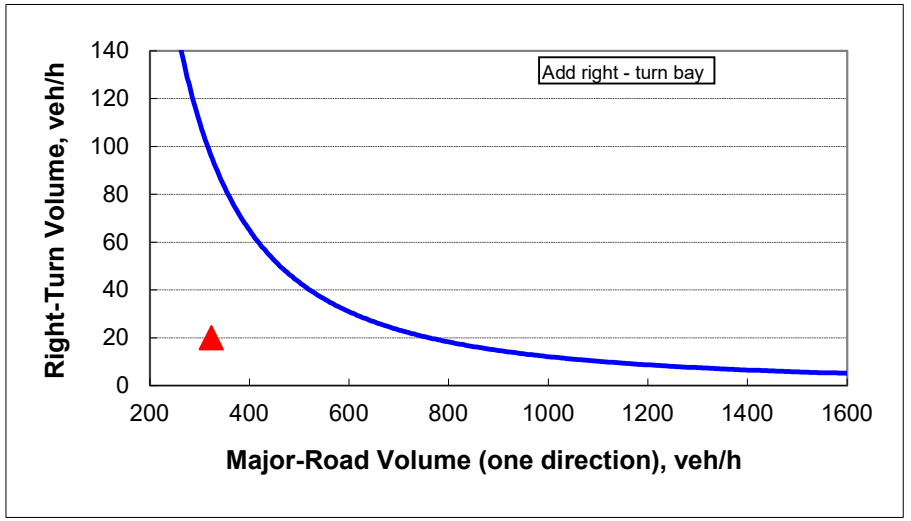
INPUT

Roadway geometry:	2-lane roadw ay

Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	323
Right-turn volume, veh/h:	20

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	96
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	



Intersection: Site Drive 2 & 25th St
2040 Plus Site AM

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

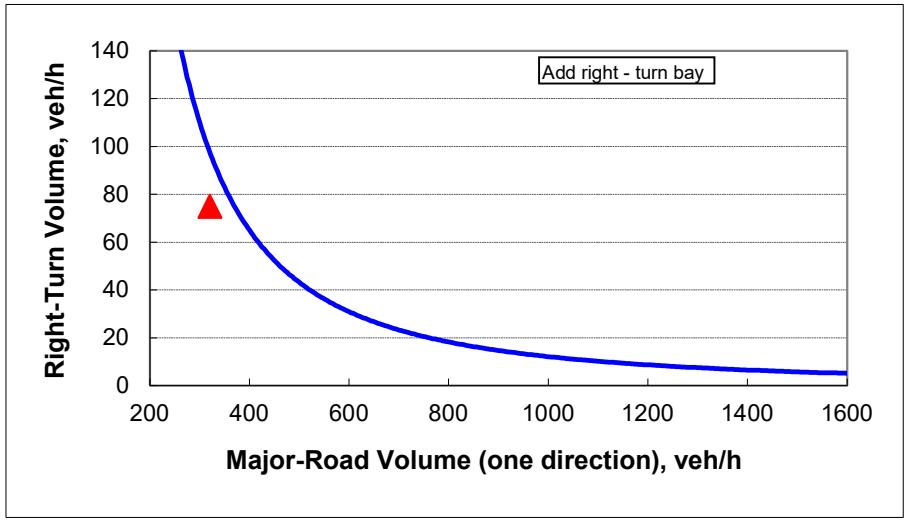
INPUT

Roadway geometry:	2-lane roadw ay

Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	320
Right-turn volume, veh/h:	75

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	98
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	



Intersection: Site Drive 2 & 25th St
2040 Plus Site PM

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

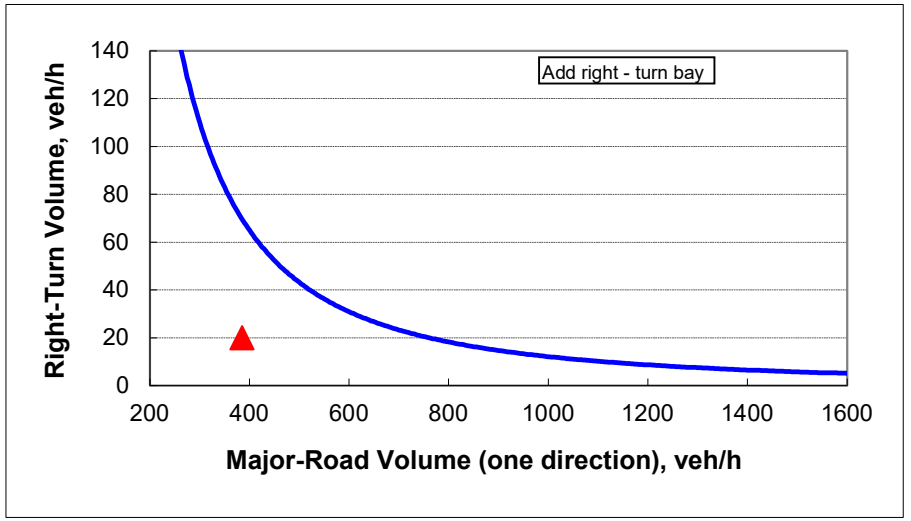
INPUT

Roadway geometry:	2-lane roadw ay

Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	385
Right-turn volume, veh/h:	20

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	70
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	



Intersection: US-34 & CR L
2040 Plus Site AM

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

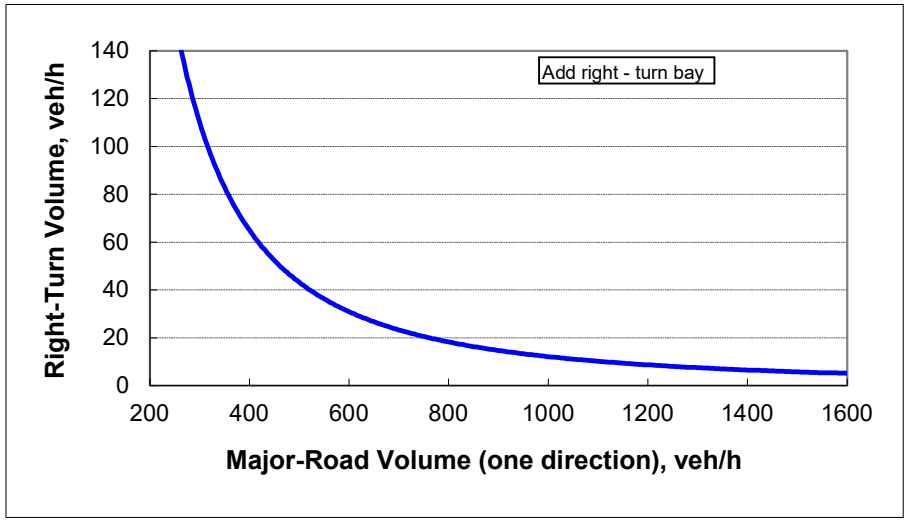
INPUT

Roadway geometry:	2-lane roadw ay

Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	491
Right-turn volume, veh/h:	305

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	45
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Add right-turn bay.	



Intersection: US-34 & CR L
2040 Plus Site PM

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

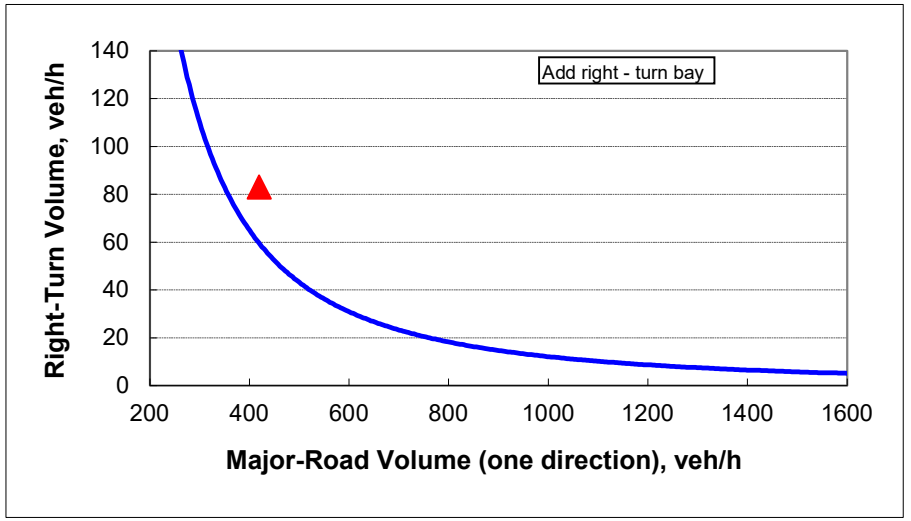
INPUT

Roadway geometry:	2-lane roadw ay

Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	419
Right-turn volume, veh/h:	83

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	60
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Add right-turn bay.	

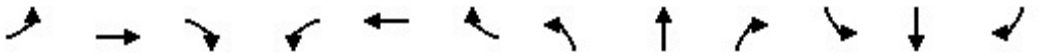


APPENDIX G

Future Year 2030 Plus Site Capacity Analysis Reports

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	26	283	68	137	48	104	263	130	118	40
v/c Ratio	0.08	0.47	0.20	0.24	0.11	0.11	0.39	0.32	0.11	0.08
Control Delay	7.2	9.5	8.5	6.6	8.0	7.5	3.4	10.3	7.4	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.2	9.5	8.5	6.6	8.0	7.5	3.4	10.3	7.4	3.8
Queue Length 50th (ft)	2	23	6	9	4	4	0	12	5	0
Queue Length 95th (ft)	11	61	22	29	17	14	21	39	15	9
Internal Link Dist (ft)		1422		911		1190			7321	
Turn Bay Length (ft)	150		150		295		150	130		400
Base Capacity (vph)	933	1606	913	1501	1070	2325	1284	997	2713	1149
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.18	0.07	0.09	0.04	0.04	0.20	0.13	0.04	0.03

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	181	51	56	84	29	39	85	216	107	97	33
Future Volume (veh/h)	21	181	51	56	84	29	39	85	216	107	97	33
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	1826	1870	1737	1752	1693	1856	1411	1737	1722	1693	1589
Adj Flow Rate, veh/h	26	221	62	68	102	35	48	104	263	130	118	40
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, %	24	5	2	11	10	14	3	33	11	12	14	21
Cap, veh/h	566	420	118	489	382	131	649	811	445	569	973	407
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1034	1372	385	1018	1247	428	1219	2681	1472	935	3216	1346
Grp Volume(v), veh/h	26	0	283	68	0	137	48	104	263	130	118	40
Grp Sat Flow(s),veh/h/ln	1034	0	1757	1018	0	1675	1219	1340	1472	935	1608	1346
Q Serve(g_s), s	0.4	0.0	3.1	1.4	0.0	1.4	0.7	0.6	3.5	2.7	0.6	0.5
Cycle Q Clear(g_c), s	1.9	0.0	3.1	4.4	0.0	1.4	1.3	0.6	3.5	3.3	0.6	0.5
Prop In Lane	1.00		0.22	1.00		0.26	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	566	0	538	489	0	513	649	811	445	569	973	407
V/C Ratio(X)	0.05	0.00	0.53	0.14	0.00	0.27	0.07	0.13	0.59	0.23	0.12	0.10
Avail Cap(c_a), veh/h	1440	0	2023	1350	0	1929	1578	2854	1567	1282	3424	1434
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.7	0.0	6.6	8.4	0.0	6.0	6.3	5.8	6.8	7.0	5.8	5.8
Incr Delay (d2), s/veh	0.0	0.0	0.8	0.1	0.0	0.3	0.0	0.1	1.3	0.2	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.4	0.1	0.0	0.2	0.0	0.0	0.3	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.8	0.0	7.4	8.6	0.0	6.3	6.3	5.9	8.1	7.2	5.9	5.9
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		309			205			415			288	
Approach Delay, s/veh		7.3			7.0			7.3			6.5	
Approach LOS		A			A			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		11.5		11.6		11.5		11.6				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		24.5		26.5		24.5		26.5				
Max Q Clear Time (g_c+I1), s		5.5		5.1		5.3		6.4				
Green Ext Time (p_c), s		1.5		1.6		1.3		0.9				
Intersection Summary												
HCM 6th Ctrl Delay			7.1									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	7	0	72	5	64	1	89	52	149	139	0
Future Vol, veh/h	0	7	0	72	5	64	1	89	52	149	139	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	400	330	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	14	2	5	2	31	15	2	15	2
Mvmt Flow	0	8	0	83	6	74	1	102	60	171	160	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	558	666	80	530	606	51	160	0	0	162	0	0
Stage 1	502	502	-	104	104	-	-	-	-	-	-	-
Stage 2	56	164	-	426	502	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.78	6.54	7	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.78	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.78	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.64	4.02	3.35	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	412	379	964	406	410	996	1417	-	-	1414	-	-
Stage 1	520	540	-	857	808	-	-	-	-	-	-	-
Stage 2	949	761	-	546	540	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	342	333	964	361	360	996	1417	-	-	1414	-	-
Mov Cap-2 Maneuver	342	333	-	361	360	-	-	-	-	-	-	-
Stage 1	519	475	-	856	807	-	-	-	-	-	-	-
Stage 2	872	760	-	472	475	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.1	15.4	0.1	4.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1417	-	-	333	508	1414	-	-
HCM Lane V/C Ratio	0.001	-	-	0.024	0.319	0.121	-	-
HCM Control Delay (s)	7.5	-	-	16.1	15.4	7.9	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.4	0.4	-	-

Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	54	84	13	51	15	157	138	31	9	223	53
Future Vol, veh/h	21	54	84	13	51	15	157	138	31	9	223	53
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	-	-	-	-	-	-	75	-	-	100	-	360
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	5	2	4	8	4	7	6	1	2	2	1	11
Mvmt Flow	23	58	90	14	55	16	169	148	33	10	240	57

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	700	779	120	672	820	91	297	0	0	181	0	0
Stage 1	260	260	-	503	503	-	-	-	-	-	-	-
Stage 2	440	519	-	169	317	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.54	6.98	7.66	6.58	7.04	4.22	-	-	4.14	-	-
Critical Hdwy Stg 1	6.6	5.54	-	6.66	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.54	-	6.66	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.02	3.34	3.58	4.04	3.37	2.26	-	-	2.22	-	-
Pot Cap-1 Maneuver	320	326	903	330	305	933	1233	-	-	1392	-	-
Stage 1	714	692	-	504	535	-	-	-	-	-	-	-
Stage 2	558	531	-	799	648	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	236	279	903	223	261	933	1233	-	-	1392	-	-
Mov Cap-2 Maneuver	236	279	-	223	261	-	-	-	-	-	-	-
Stage 1	616	687	-	435	462	-	-	-	-	-	-	-
Stage 2	417	458	-	654	643	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.2	22.2	4	0.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1233	-	-	423	293	1392	-	-
HCM Lane V/C Ratio	0.137	-	-	0.404	0.29	0.007	-	-
HCM Control Delay (s)	8.4	-	-	19.2	22.2	7.6	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-	1.9	1.2	0	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	150	172	162	75	17	35
Future Vol, veh/h	150	172	162	75	17	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	150	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	12	3	10	12	12	11
Mvmt Flow	163	187	176	82	18	38

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	258	0	-	0	689	176
Stage 1	-	-	-	-	176	-
Stage 2	-	-	-	-	513	-
Critical Hdwy	4.22	-	-	-	6.52	6.31
Critical Hdwy Stg 1	-	-	-	-	5.52	-
Critical Hdwy Stg 2	-	-	-	-	5.52	-
Follow-up Hdwy	2.308	-	-	-	3.608	3.399
Pot Cap-1 Maneuver	1251	-	-	-	397	844
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	581	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1251	-	-	-	345	844
Mov Cap-2 Maneuver	-	-	-	-	345	-
Stage 1	-	-	-	-	723	-
Stage 2	-	-	-	-	581	-

Approach	EB	WB	SB
HCM Control Delay, s	3.9	0	12
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1251	-	-	-	573
HCM Lane V/C Ratio	0.13	-	-	-	0.099
HCM Control Delay (s)	8.3	-	-	-	12
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.4	-	-	-	0.3

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	198	305	122	75	17	46
Future Vol, veh/h	198	305	122	75	17	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	150	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	12	7	10	12	12	11
Mvmt Flow	215	332	133	82	18	50

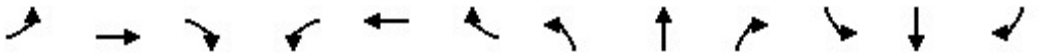
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	215	0	-	0	895	133
Stage 1	-	-	-	-	133	-
Stage 2	-	-	-	-	762	-
Critical Hdwy	4.22	-	-	-	6.52	6.31
Critical Hdwy Stg 1	-	-	-	-	5.52	-
Critical Hdwy Stg 2	-	-	-	-	5.52	-
Follow-up Hdwy	2.308	-	-	-	3.608	3.399
Pot Cap-1 Maneuver	1298	-	-	-	299	893
Stage 1	-	-	-	-	869	-
Stage 2	-	-	-	-	444	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1298	-	-	-	249	893
Mov Cap-2 Maneuver	-	-	-	-	249	-
Stage 1	-	-	-	-	725	-
Stage 2	-	-	-	-	444	-

Approach	EB	WB	SB
HCM Control Delay, s	3.3	0	12.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1298	-	-	-	526
HCM Lane V/C Ratio	0.166	-	-	-	0.13
HCM Control Delay (s)	8.3	-	-	-	12.9
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.6	-	-	-	0.4

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	58	216	252	301	71	191	76	39	122	69
v/c Ratio	0.14	0.29	0.56	0.41	0.29	0.19	0.16	0.13	0.14	0.14
Control Delay	6.7	5.8	12.5	6.9	14.0	10.3	4.6	11.4	10.3	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.7	5.8	12.5	6.9	14.0	10.3	4.6	11.4	10.3	4.6
Queue Length 50th (ft)	5	14	25	21	8	11	0	4	7	0
Queue Length 95th (ft)	21	49	85	68	39	36	20	23	26	19
Internal Link Dist (ft)		1422		911		1190			7321	
Turn Bay Length (ft)	150		150		295		150	130		400
Base Capacity (vph)	842	1450	901	1396	739	2966	1243	914	2518	1313
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.15	0.28	0.22	0.10	0.06	0.06	0.04	0.05	0.05

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	129	63	224	164	104	63	170	68	35	109	61
Future Volume (veh/h)	52	129	63	224	164	104	63	170	68	35	109	61
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	1781	1826	1870	1767	1826	1737	1248	1885	1767	1767	1618	1856
Adj Flow Rate, veh/h	58	145	71	252	184	117	71	191	76	39	122	69
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, %	8	5	2	9	5	11	44	1	9	9	19	3
Cap, veh/h	587	504	247	654	454	289	436	843	352	480	723	370
Arrive On Green	0.44	0.44	0.44	0.44	0.44	0.44	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1027	1157	567	1101	1043	663	847	3582	1497	1126	3075	1572
Grp Volume(v), veh/h	58	0	216	252	0	301	71	191	76	39	122	69
Grp Sat Flow(s),veh/h/ln	1027	0	1724	1101	0	1707	847	1791	1497	1126	1537	1572
Q Serve(g_s), s	1.1	0.0	2.2	5.2	0.0	3.3	2.0	1.2	1.1	0.8	0.9	1.0
Cycle Q Clear(g_c), s	4.4	0.0	2.2	7.4	0.0	3.3	2.9	1.2	1.1	2.0	0.9	1.0
Prop In Lane	1.00		0.33	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	587	0	751	654	0	743	436	843	352	480	723	370
V/C Ratio(X)	0.10	0.00	0.29	0.39	0.00	0.40	0.16	0.23	0.22	0.08	0.17	0.19
Avail Cap(c_a), veh/h	1097	0	1607	1201	0	1591	1026	3340	1396	1265	2867	1466
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.8	0.0	5.0	7.4	0.0	5.3	9.5	8.4	8.4	9.2	8.3	8.4
Incr Delay (d2), s/veh	0.1	0.0	0.2	0.4	0.0	0.4	0.2	0.1	0.3	0.1	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.2	0.5	0.0	0.3	0.2	0.2	0.2	0.1	0.1	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.9	0.0	5.2	7.8	0.0	5.6	9.6	8.6	8.7	9.3	8.4	8.6
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		274			553			338			230	
Approach Delay, s/veh		5.5			6.6			8.8			8.6	
Approach LOS		A			A			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		10.9		16.4		10.9		16.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		25.5		25.5		25.5		25.5				
Max Q Clear Time (g_c+I1), s		4.9		6.4		4.0		9.4				
Green Ext Time (p_c), s		1.6		1.3		0.9		2.5				

Intersection Summary												
HCM 6th Ctrl Delay			7.3									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	7	1	85	7	132	1	222	103	109	120	0
Future Vol, veh/h	0	7	1	85	7	132	1	222	103	109	120	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	400	330	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	4	2	2	2	16	8	1	18	2
Mvmt Flow	0	8	1	101	8	157	1	264	123	130	143	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	541	792	72	602	669	132	143	0	0	387	0	0
Stage 1	403	403	-	266	266	-	-	-	-	-	-	-
Stage 2	138	389	-	336	403	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.58	6.54	6.94	4.14	-	-	4.12	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.58	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.58	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.54	4.02	3.32	2.22	-	-	2.21	-	-
Pot Cap-1 Maneuver	424	320	975	379	377	893	1437	-	-	1175	-	-
Stage 1	595	598	-	711	687	-	-	-	-	-	-	-
Stage 2	851	607	-	646	598	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	314	284	975	339	335	893	1437	-	-	1175	-	-
Mov Cap-2 Maneuver	314	284	-	339	335	-	-	-	-	-	-	-
Stage 1	594	532	-	710	686	-	-	-	-	-	-	-
Stage 2	692	606	-	565	532	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.9	18.3	0	4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1437	-	-	312	534	1175	-	-
HCM Lane V/C Ratio	0.001	-	-	0.031	0.499	0.11	-	-
HCM Control Delay (s)	7.5	-	-	16.9	18.3	8.4	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	2.8	0.4	-	-

Intersection	
Int Delay, s/veh	34.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	47	76	187	45	49	10	83	188	29	38	213	27
Future Vol, veh/h	47	76	187	45	49	10	83	188	29	38	213	27
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	-	-	-	-	-	-	75	-	-	100	-	360
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	9	3	4	2	2	2	2	1	2	3	0	4
Mvmt Flow	63	101	249	60	65	13	111	251	39	51	284	36

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	766	898	142	788	915	145	320	0	0	290	0	0
Stage 1	386	386	-	493	493	-	-	-	-	-	-	-
Stage 2	380	512	-	295	422	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.56	6.98	7.54	6.54	6.94	4.14	-	-	4.16	-	-
Critical Hdwy Stg 1	6.68	5.56	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.56	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.03	3.34	3.52	4.02	3.32	2.22	-	-	2.23	-	-
Pot Cap-1 Maneuver	280	276	874	282	271	876	1237	-	-	1261	-	-
Stage 1	590	606	-	526	545	-	-	-	-	-	-	-
Stage 2	595	532	-	689	587	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	197	241	874	123	237	876	1237	-	-	1261	-	-
Mov Cap-2 Maneuver	197	241	-	123	237	-	-	-	-	-	-	-
Stage 1	537	582	-	479	496	-	-	-	-	-	-	-
Stage 2	463	484	-	390	564	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	83.4	73.3	2.3	1.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1237	-	-	404	178	1261	-	-
HCM Lane V/C Ratio	0.089	-	-	1.023	0.779	0.04	-	-
HCM Control Delay (s)	8.2	-	-	83.4	73.3	8	-	-
HCM Lane LOS	A	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	13	5.2	0.1	-	-

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	41	208	179	20	71	144
Future Vol, veh/h	41	208	179	20	71	144
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	150	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	12	6	2	10	11	12
Mvmt Flow	45	226	195	22	77	157

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	217	0	-	0	511	195
Stage 1	-	-	-	-	195	-
Stage 2	-	-	-	-	316	-
Critical Hdwy	4.22	-	-	-	6.51	6.32
Critical Hdwy Stg 1	-	-	-	-	5.51	-
Critical Hdwy Stg 2	-	-	-	-	5.51	-
Follow-up Hdwy	2.308	-	-	-	3.599	3.408
Pot Cap-1 Maneuver	1296	-	-	-	507	821
Stage 1	-	-	-	-	817	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1296	-	-	-	489	821
Mov Cap-2 Maneuver	-	-	-	-	489	-
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	719	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	13.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1296	-	-	-	671
HCM Lane V/C Ratio	0.034	-	-	-	0.348
HCM Control Delay (s)	7.9	-	-	-	13.2
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1.6

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	54	178	303	20	71	191
Future Vol, veh/h	54	178	303	20	71	191
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	150	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	11	5	6	10	11	12
Mvmt Flow	59	193	329	22	77	208

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	351	0	-	0	640	329
Stage 1	-	-	-	-	329	-
Stage 2	-	-	-	-	311	-
Critical Hdwy	4.21	-	-	-	6.51	6.32
Critical Hdwy Stg 1	-	-	-	-	5.51	-
Critical Hdwy Stg 2	-	-	-	-	5.51	-
Follow-up Hdwy	2.299	-	-	-	3.599	3.408
Pot Cap-1 Maneuver	1159	-	-	-	426	690
Stage 1	-	-	-	-	709	-
Stage 2	-	-	-	-	723	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1159	-	-	-	404	690
Mov Cap-2 Maneuver	-	-	-	-	404	-
Stage 1	-	-	-	-	673	-
Stage 2	-	-	-	-	723	-

Approach	EB	WB	SB
HCM Control Delay, s	1.9	0	17.1
HCM LOS			C

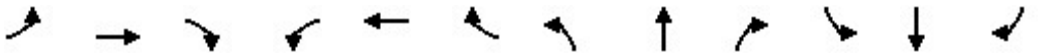
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1159	-	-	-	579
HCM Lane V/C Ratio	0.051	-	-	-	0.492
HCM Control Delay (s)	8.3	-	-	-	17.1
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	2.7

APPENDIX H

Future Year 2040 Plus Site Capacity Analysis Reports

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	50	393	72	283	223	127	274	132	144	130
v/c Ratio	0.14	0.60	0.26	0.45	0.50	0.11	0.37	0.30	0.11	0.21
Control Delay	11.6	15.2	13.5	13.2	14.5	8.9	3.2	11.5	8.8	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	15.2	13.5	13.2	14.5	8.9	3.2	11.5	8.8	3.2
Queue Length 50th (ft)	7	59	10	42	33	8	0	18	9	0
Queue Length 95th (ft)	29	157	40	115	95	25	26	57	27	20
Internal Link Dist (ft)		597		911		1190			7321	
Turn Bay Length (ft)	150		150		295		400	130		400
Base Capacity (vph)	821	1515	666	1475	1064	2625	1376	1051	2976	1318
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.26	0.11	0.19	0.21	0.05	0.20	0.13	0.05	0.10

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	228	94	59	202	30	183	104	225	108	118	107
Future Volume (veh/h)	41	228	94	59	202	30	183	104	225	108	118	107
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	1648	1826	1826	1752	1752	1707	1767	1500	1752	1722	1722	1693
Adj Flow Rate, veh/h	50	278	115	72	246	37	223	127	274	132	144	130
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, %	17	5	5	10	10	13	9	27	10	12	12	14
Cap, veh/h	457	456	189	393	553	83	558	1012	527	513	1162	510
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	966	1227	508	928	1488	224	1044	2850	1485	906	3272	1434
Grp Volume(v), veh/h	50	0	393	72	0	283	223	127	274	132	144	130
Grp Sat Flow(s),veh/h/ln	966	0	1735	928	0	1712	1044	1425	1485	906	1636	1434
Q Serve(g_s), s	1.4	0.0	6.1	2.3	0.0	4.1	6.0	1.0	4.8	3.8	1.0	2.1
Cycle Q Clear(g_c), s	5.5	0.0	6.1	8.3	0.0	4.1	7.0	1.0	4.8	4.8	1.0	2.1
Prop In Lane	1.00		0.29	1.00		0.13	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	457	0	645	393	0	636	558	1012	527	513	1162	510
V/C Ratio(X)	0.11	0.00	0.61	0.18	0.00	0.44	0.40	0.13	0.52	0.26	0.12	0.26
Avail Cap(c_a), veh/h	1197	0	1974	1104	0	1948	1566	3762	1960	1387	4320	1894
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.8	0.0	8.4	11.8	0.0	7.8	9.5	7.2	8.4	8.8	7.2	7.5
Incr Delay (d2), s/veh	0.1	0.0	0.9	0.2	0.0	0.5	0.5	0.1	0.8	0.3	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	1.3	0.3	0.0	0.8	0.7	0.1	0.7	0.4	0.1	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.0	0.0	9.3	12.0	0.0	8.3	10.0	7.2	9.2	9.0	7.2	7.8
LnGrp LOS	A	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		443			355			624			406	
Approach Delay, s/veh		9.4			9.0			9.1			8.0	
Approach LOS		A			A			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		16.2		16.7		16.2		16.7				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		43.5		37.5		43.5		37.5				
Max Q Clear Time (g_c+I1), s		9.0		8.1		6.8		10.3				
Green Ext Time (p_c), s		2.7		2.6		2.0		1.9				

Intersection Summary												
HCM 6th Ctrl Delay			8.9									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	9.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	10	0	107	17	78	1	114	68	182	194	11
Future Vol, veh/h	2	10	0	107	17	78	1	114	68	182	194	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	200	-	400	330	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	12	6	4	2	25	13	2	13	9
Mvmt Flow	2	11	0	123	20	90	1	131	78	209	223	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	726	859	118	668	787	66	236	0	0	209	0	0
Stage 1	648	648	-	133	133	-	-	-	-	-	-	-
Stage 2	78	211	-	535	654	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.74	6.62	6.98	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.74	5.62	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.62	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.62	4.06	3.34	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	312	292	912	325	315	978	1328	-	-	1359	-	-
Stage 1	425	464	-	828	776	-	-	-	-	-	-	-
Stage 2	922	726	-	472	452	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	236	247	912	277	266	978	1328	-	-	1359	-	-
Mov Cap-2 Maneuver	236	247	-	277	266	-	-	-	-	-	-	-
Stage 1	425	393	-	827	775	-	-	-	-	-	-	-
Stage 2	816	725	-	388	382	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.6	28.1	0	3.8
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1328	-	-	245	381	1359	-	-
HCM Lane V/C Ratio	0.001	-	-	0.056	0.609	0.154	-	-
HCM Control Delay (s)	7.7	-	-	20.6	28.1	8.1	-	-
HCM Lane LOS	A	-	-	C	D	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	3.9	0.5	-	-

Intersection	
Int Delay, s/veh	18.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	67	116	15	69	18	244	168	38	11	272	73
Future Vol, veh/h	26	67	116	15	69	18	244	168	38	11	272	73
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	-	-	-	-	-	-	75	-	-	100	-	360
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	4	2	4	7	4	6	7	1	2	2	1	11
Mvmt Flow	28	72	125	16	74	19	262	181	41	12	292	78

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	968	1062	146	932	1120	111	370	0	0	222	0	0
Stage 1	316	316	-	726	726	-	-	-	-	-	-	-
Stage 2	652	746	-	206	394	-	-	-	-	-	-	-
Critical Hdwy	7.58	6.54	6.98	7.64	6.58	7.02	4.24	-	-	4.14	-	-
Critical Hdwy Stg 1	6.58	5.54	-	6.64	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.58	5.54	-	6.64	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.54	4.02	3.34	3.57	4.04	3.36	2.27	-	-	2.22	-	-
Pot Cap-1 Maneuver	205	222	868	214	202	908	1150	-	-	1344	-	-
Stage 1	664	654	-	371	423	-	-	-	-	-	-	-
Stage 2	418	419	-	762	599	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	105	170	868	102	155	908	1150	-	-	1344	-	-
Mov Cap-2 Maneuver	105	170	-	102	155	-	-	-	-	-	-	-
Stage 1	513	648	-	286	327	-	-	-	-	-	-	-
Stage 2	244	323	-	575	594	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	60.7	60.4	4.9	0.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1150	-	-	270	167	1344	-	-
HCM Lane V/C Ratio	0.228	-	-	0.832	0.657	0.009	-	-
HCM Control Delay (s)	9.1	-	-	60.7	60.4	7.7	-	-
HCM Lane LOS	A	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0.9	-	-	6.8	3.8	0	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	150	230	285	75	17	35
Future Vol, veh/h	150	230	285	75	17	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	150	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	12	4	10	12	12	11
Mvmt Flow	163	250	310	82	18	38

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	392	0	-	0	886	310
Stage 1	-	-	-	-	310	-
Stage 2	-	-	-	-	576	-
Critical Hdwy	4.22	-	-	-	6.52	6.31
Critical Hdwy Stg 1	-	-	-	-	5.52	-
Critical Hdwy Stg 2	-	-	-	-	5.52	-
Follow-up Hdwy	2.308	-	-	-	3.608	3.399
Pot Cap-1 Maneuver	1114	-	-	-	303	710
Stage 1	-	-	-	-	722	-
Stage 2	-	-	-	-	543	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1114	-	-	-	259	710
Mov Cap-2 Maneuver	-	-	-	-	259	-
Stage 1	-	-	-	-	617	-
Stage 2	-	-	-	-	543	-

Approach	EB	WB	SB
HCM Control Delay, s	3.5	0	14.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1114	-	-	-	452
HCM Lane V/C Ratio	0.146	-	-	-	0.125
HCM Control Delay (s)	8.8	-	-	-	14.1
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.5	-	-	-	0.4

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	198	363	245	75	17	46
Future Vol, veh/h	198	363	245	75	17	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	150	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	12	7	10	12	12	11
Mvmt Flow	215	395	266	82	18	50

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	348	0	-	0	1091	266
Stage 1	-	-	-	-	266	-
Stage 2	-	-	-	-	825	-
Critical Hdwy	4.22	-	-	-	6.52	6.31
Critical Hdwy Stg 1	-	-	-	-	5.52	-
Critical Hdwy Stg 2	-	-	-	-	5.52	-
Follow-up Hdwy	2.308	-	-	-	3.608	3.399
Pot Cap-1 Maneuver	1157	-	-	-	227	751
Stage 1	-	-	-	-	756	-
Stage 2	-	-	-	-	414	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1157	-	-	-	185	751
Mov Cap-2 Maneuver	-	-	-	-	185	-
Stage 1	-	-	-	-	615	-
Stage 2	-	-	-	-	414	-

Approach	EB	WB	SB
HCM Control Delay, s	3.1	0	15.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1157	-	-	-	411
HCM Lane V/C Ratio	0.186	-	-	-	0.167
HCM Control Delay (s)	8.8	-	-	-	15.5
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.7	-	-	-	0.6

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	49	2	154	209	11	36
Future Vol, veh/h	49	2	154	209	11	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	12	2	12	12	9	11
Mvmt Flow	53	2	167	227	12	39

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	344	281	0	0	394	0
Stage 1	281	-	-	-	-	-
Stage 2	63	-	-	-	-	-
Critical Hdwy	6.52	6.22	-	-	4.19	-
Critical Hdwy Stg 1	5.52	-	-	-	-	-
Critical Hdwy Stg 2	5.52	-	-	-	-	-
Follow-up Hdwy	3.608	3.318	-	-	2.281	-
Pot Cap-1 Maneuver	633	758	-	-	1127	-
Stage 1	744	-	-	-	-	-
Stage 2	935	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	626	758	-	-	1127	-
Mov Cap-2 Maneuver	626	-	-	-	-	-
Stage 1	744	-	-	-	-	-
Stage 2	925	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	1.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	630	1127	-
HCM Lane V/C Ratio	-	-	0.088	0.011	-
HCM Control Delay (s)	-	-	11.3	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	36	2	2	154	11	11
Future Vol, veh/h	36	2	2	154	11	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	11	2	2	12	9	9
Mvmt Flow	39	2	2	167	12	12

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	122	86	0	0	169	0
Stage 1	86	-	-	-	-	-
Stage 2	36	-	-	-	-	-
Critical Hdwy	6.51	6.22	-	-	4.19	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.318	-	-	2.281	-
Pot Cap-1 Maneuver	852	973	-	-	1367	-
Stage 1	915	-	-	-	-	-
Stage 2	964	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	844	973	-	-	1367	-
Mov Cap-2 Maneuver	844	-	-	-	-	-
Stage 1	915	-	-	-	-	-
Stage 2	955	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	3.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	850	1367	-
HCM Lane V/C Ratio	-	-	0.049	0.009	-
HCM Control Delay (s)	-	-	9.5	7.7	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	58	291	186	305	71	14
Future Vol, veh/h	58	291	186	305	71	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	150	0	150
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	12	3	1	12	11	14
Mvmt Flow	63	316	202	332	77	15

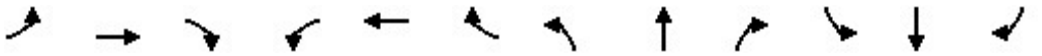
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	534	0	-	0	644	202
Stage 1	-	-	-	-	202	-
Stage 2	-	-	-	-	442	-
Critical Hdwy	4.22	-	-	-	6.51	6.34
Critical Hdwy Stg 1	-	-	-	-	5.51	-
Critical Hdwy Stg 2	-	-	-	-	5.51	-
Follow-up Hdwy	2.308	-	-	-	3.599	3.426
Pot Cap-1 Maneuver	985	-	-	-	423	809
Stage 1	-	-	-	-	811	-
Stage 2	-	-	-	-	629	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	985	-	-	-	396	809
Mov Cap-2 Maneuver	-	-	-	-	396	-
Stage 1	-	-	-	-	759	-
Stage 2	-	-	-	-	629	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	15.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	985	-	-	-	396	809
HCM Lane V/C Ratio	0.064	-	-	-	0.195	0.019
HCM Control Delay (s)	8.9	-	-	-	16.3	9.5
HCM Lane LOS	A	-	-	-	C	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7	0.1

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	2	11	123	110	1	131	78	209	236
v/c Ratio	0.01	0.02	0.34	0.21	0.00	0.09	0.10	0.32	0.14
Control Delay	8.0	8.1	11.9	4.6	6.0	6.2	2.5	8.4	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.0	8.1	11.9	4.6	6.0	6.2	2.5	8.4	5.8
Queue Length 50th (ft)	0	1	12	2	0	5	0	19	9
Queue Length 95th (ft)	3	8	44	22	2	16	13	59	26
Internal Link Dist (ft)		1175		2170		3631			697
Turn Bay Length (ft)	150		150		200		400	330	
Base Capacity (vph)	1010	1473	1005	1281	1017	2607	1298	1125	2868
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.01	0.12	0.09	0.00	0.05	0.06	0.19	0.08

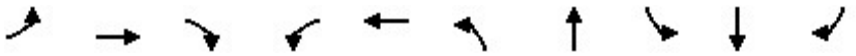
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	10	0	107	17	78	1	114	68	182	194	11
Future Volume (veh/h)	2	10	0	107	17	78	1	114	68	182	194	11
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	1722	1811	1841	1870	1530	1707	1870	1707	1767
Adj Flow Rate, veh/h	2	11	0	123	20	90	1	131	78	209	223	13
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	12	6	4	2	25	13	2	13	9
Cap, veh/h	520	348	0	593	53	240	720	1061	528	752	1137	66
Arrive On Green	0.19	0.19	0.00	0.19	0.19	0.19	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1283	1870	0	1292	287	1292	1144	2906	1447	1173	3116	181
Grp Volume(v), veh/h	2	11	0	123	0	110	1	131	78	209	115	121
Grp Sat Flow(s),veh/h/ln	1283	1870	0	1292	0	1579	1144	1453	1447	1173	1622	1675
Q Serve(g_s), s	0.0	0.1	0.0	1.7	0.0	1.2	0.0	0.6	0.7	2.9	1.0	1.0
Cycle Q Clear(g_c), s	1.2	0.1	0.0	1.8	0.0	1.2	1.0	0.6	0.7	3.5	1.0	1.0
Prop In Lane	1.00		0.00	1.00		0.82	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	520	348	0	593	0	294	720	1061	528	752	592	611
V/C Ratio(X)	0.00	0.03	0.00	0.21	0.00	0.37	0.00	0.12	0.15	0.28	0.20	0.20
Avail Cap(c_a), veh/h	1785	2193	0	1868	0	1851	1873	3987	1985	1933	2225	2298
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.7	6.7	0.0	7.4	0.0	7.1	4.7	4.2	4.3	5.4	4.4	4.4
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.2	0.0	0.8	0.0	0.1	0.1	0.2	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.7	6.7	0.0	7.6	0.0	7.9	4.7	4.3	4.4	5.6	4.5	4.5
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		13			233			210			445	
Approach Delay, s/veh		6.9			7.8			4.3			5.0	
Approach LOS		A			A			A			A	

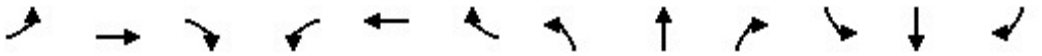
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		11.8		8.2		11.8		8.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		27.5		23.5		27.5		23.5				
Max Q Clear Time (g_c+I1), s		3.0		3.2		5.5		3.8				
Green Ext Time (p_c), s		0.9		0.0		1.8		0.9				

Intersection Summary												
HCM 6th Ctrl Delay			5.6									
HCM 6th LOS			A									



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	28	72	125	16	93	262	222	12	292	78
v/c Ratio	0.19	0.34	0.44	0.11	0.44	0.33	0.08	0.01	0.11	0.07
Control Delay	32.9	34.9	11.3	31.0	32.7	4.5	2.1	2.7	2.6	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	34.9	11.3	31.0	32.7	4.5	2.1	2.7	2.6	0.9
Queue Length 50th (ft)	12	31	0	7	35	29	8	1	13	0
Queue Length 95th (ft)	35	68	44	24	77	70	18	5	27	9
Internal Link Dist (ft)		2653			484		487		544	
Turn Bay Length (ft)	150		150			75		100		360
Base Capacity (vph)	383	560	555	379	540	784	2683	880	2755	1139
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.13	0.23	0.04	0.17	0.33	0.08	0.01	0.11	0.07

Intersection Summary



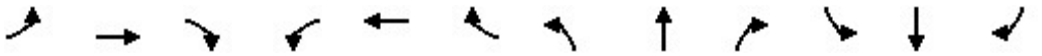
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	67	116	15	69	18	244	168	38	11	272	73
Future Volume (veh/h)	26	67	116	15	69	18	244	168	38	11	272	73
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1870	1841	1796	1841	1811	1796	1885	1870	1870	1885	1737
Adj Flow Rate, veh/h	28	72	125	16	74	19	262	181	41	12	292	78
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	2	4	7	4	6	7	1	2	2	1	11
Cap, veh/h	178	211	176	184	159	41	822	2236	495	967	2747	1129
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.77	0.77	0.77	0.77	0.77	0.77
Sat Flow, veh/h	1283	1870	1560	1139	1413	363	972	2915	645	1159	3582	1472
Grp Volume(v), veh/h	28	72	125	16	0	93	262	110	112	12	292	78
Grp Sat Flow(s),veh/h/ln	1283	1870	1560	1139	0	1775	972	1791	1769	1159	1791	1472
Q Serve(g_s), s	1.6	2.7	5.8	1.0	0.0	3.7	7.0	1.1	1.2	0.2	1.5	1.0
Cycle Q Clear(g_c), s	5.2	2.7	5.8	3.6	0.0	3.7	8.6	1.1	1.2	1.4	1.5	1.0
Prop In Lane	1.00		1.00	1.00		0.20	1.00		0.36	1.00		1.00
Lane Grp Cap(c), veh/h	178	211	176	184	0	200	822	1374	1357	967	2747	1129
V/C Ratio(X)	0.16	0.34	0.71	0.09	0.00	0.46	0.32	0.08	0.08	0.01	0.11	0.07
Avail Cap(c_a), veh/h	435	586	489	413	0	557	822	1374	1357	967	2747	1129
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.6	30.7	32.1	32.4	0.0	31.1	3.3	2.2	2.2	2.3	2.2	2.1
Incr Delay (d2), s/veh	0.4	1.0	5.2	0.2	0.0	1.7	1.0	0.1	0.1	0.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.2	2.3	0.3	0.0	1.6	0.9	0.2	0.2	0.0	0.2	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.0	31.6	37.3	32.6	0.0	32.8	4.3	2.3	2.3	2.4	2.3	2.3
LnGrp LOS	C	C	D	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		225			109			484			382	
Approach Delay, s/veh		35.1			32.8			3.4			2.3	
Approach LOS		D			C			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		62.0		13.0		62.0		13.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		57.5		23.5		57.5		23.5				
Max Q Clear Time (g_c+I1), s		10.6		7.8		3.5		5.7				
Green Ext Time (p_c), s		2.7		0.7		2.1		0.4				

Intersection Summary												
HCM 6th Ctrl Delay			11.6									
HCM 6th LOS			B									

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	142	517	266	357	127	233	81	42	149	103
v/c Ratio	0.24	0.47	0.56	0.32	0.62	0.31	0.21	0.19	0.23	0.25
Control Delay	7.2	7.6	13.6	6.2	37.1	22.6	6.9	22.8	21.9	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.2	7.6	13.6	6.2	37.1	22.6	6.9	22.8	21.9	6.6
Queue Length 50th (ft)	19	73	49	46	47	42	0	14	26	0
Queue Length 95th (ft)	59	184	156	116	96	68	28	37	47	32
Internal Link Dist (ft)		597		911		1190			7321	
Turn Bay Length (ft)	150		150		295		400	130		400
Base Capacity (vph)	619	1125	489	1142	561	2076	894	614	1790	937
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.46	0.54	0.31	0.23	0.11	0.09	0.07	0.08	0.11

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	126	253	207	237	212	106	113	207	72	37	133	92
Future Volume (veh/h)	126	253	207	237	212	106	113	207	72	37	133	92
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	1767	1796	1796	1767	1826	1752	1485	1900	1781	1781	1663	1841
Adj Flow Rate, veh/h	142	284	233	266	238	119	127	233	81	42	149	103
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, %	9	7	7	9	5	10	28	0	8	8	16	4
Cap, veh/h	601	532	436	472	669	334	341	862	360	347	754	372
Arrive On Green	0.58	0.58	0.58	0.58	0.58	0.58	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	968	913	749	835	1148	574	983	3610	1510	1093	3159	1560
Grp Volume(v), veh/h	142	0	517	266	0	357	127	233	81	42	149	103
Grp Sat Flow(s),veh/h/ln	968	0	1661	835	0	1723	983	1805	1510	1093	1580	1560
Q Serve(g_s), s	4.6	0.0	9.5	14.3	0.0	5.5	6.0	2.6	2.2	1.6	1.9	2.7
Cycle Q Clear(g_c), s	10.0	0.0	9.5	23.7	0.0	5.5	7.9	2.6	2.2	4.3	1.9	2.7
Prop In Lane	1.00		0.45	1.00		0.33	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	601	0	968	472	0	1003	341	862	360	347	754	372
V/C Ratio(X)	0.24	0.00	0.53	0.56	0.00	0.36	0.37	0.27	0.22	0.12	0.20	0.28
Avail Cap(c_a), veh/h	875	0	1437	708	0	1490	839	2692	1126	901	2356	1163
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.2	0.0	6.4	13.6	0.0	5.5	18.4	15.6	15.4	17.3	15.3	15.6
Incr Delay (d2), s/veh	0.2	0.0	0.5	1.1	0.0	0.2	0.7	0.2	0.3	0.2	0.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	1.8	2.1	0.0	1.1	1.1	0.8	0.6	0.3	0.5	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.4	0.0	6.8	14.6	0.0	5.7	19.1	15.7	15.7	17.5	15.4	16.0
LnGrp LOS	A	A	A	B	A	A	B	B	B	B	B	B
Approach Vol, veh/h		659			623			441			294	
Approach Delay, s/veh		7.2			9.5			16.7			15.9	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		16.5		33.8		16.5		33.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		37.5		43.5		37.5		43.5				
Max Q Clear Time (g_c+I1), s		9.9		12.0		6.3		25.7				
Green Ext Time (p_c), s		2.1		4.3		1.3		3.5				

Intersection Summary												
HCM 6th Ctrl Delay			11.3									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	14.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	19	1	108	11	161	1	294	144	133	153	3
Future Vol, veh/h	11	19	1	108	11	161	1	294	144	133	153	3
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	-	-	-	-	-	-	200	-	400	330	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	9	5	2	4	2	1	2	14	8	1	15	2
Mvmt Flow	13	23	1	129	13	192	1	350	171	158	182	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	684	1023	93	771	854	175	186	0	0	521	0	0
Stage 1	500	500	-	352	352	-	-	-	-	-	-	-
Stage 2	184	523	-	419	502	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.6	6.94	7.58	6.54	6.92	4.14	-	-	4.12	-	-
Critical Hdwy Stg 1	6.68	5.6	-	6.58	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.6	-	6.58	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.05	3.32	3.54	4.02	3.31	2.22	-	-	2.21	-	-
Pot Cap-1 Maneuver	322	229	946	286	294	841	1386	-	-	1048	-	-
Stage 1	504	534	-	632	630	-	-	-	-	-	-	-
Stage 2	780	521	-	577	540	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	211	194	946	231	249	841	1386	-	-	1048	-	-
Mov Cap-2 Maneuver	211	194	-	231	249	-	-	-	-	-	-	-
Stage 1	503	453	-	631	629	-	-	-	-	-	-	-
Stage 2	589	520	-	465	458	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26.4	46.4	0	4.2
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1386	-	-	205	398	1048	-	-
HCM Lane V/C Ratio	0.001	-	-	0.18	0.838	0.151	-	-
HCM Control Delay (s)	7.6	-	-	26.4	46.4	9	-	-
HCM Lane LOS	A	-	-	D	E	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	7.8	0.5	-	-

Intersection	
Int Delay, s/veh	286.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	64	100	282	55	62	13	116	230	35	46	259	35
Future Vol, veh/h	64	100	282	55	62	13	116	230	35	46	259	35
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	-	-	-	-	-	-	75	-	-	100	-	360
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	9	3	6	2	2	2	3	0	2	2	0	3
Mvmt Flow	85	133	376	73	83	17	155	307	47	61	345	47

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	972	1131	173	1002	1155	177	392	0	0	354	0	0
Stage 1	467	467	-	641	641	-	-	-	-	-	-	-
Stage 2	505	664	-	361	514	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.56	7.02	7.54	6.54	6.94	4.16	-	-	4.14	-	-
Critical Hdwy Stg 1	6.68	5.56	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.56	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.03	3.36	3.52	4.02	3.32	2.23	-	-	2.22	-	-
Pot Cap-1 Maneuver	197	201	828	197	196	835	1156	-	-	1201	-	-
Stage 1	527	558	-	430	468	-	-	-	-	-	-	-
Stage 2	500	454	-	630	534	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	101	165	828	~ 31	161	835	1156	-	-	1201	-	-
Mov Cap-2 Maneuver	101	165	-	~ 31	161	-	-	-	-	-	-	-
Stage 1	456	530	-	372	405	-	-	-	-	-	-	-
Stage 2	337	393	-	244	507	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 539.9	$ 998.6	2.6	1.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1156	-	-	282	60	1201	-	-
HCM Lane V/C Ratio	0.134	-	-	2.109	2.889	0.051	-	-
HCM Control Delay (s)	8.6	-	-	$ 539.9	$ 998.6	8.2	-	-
HCM Lane LOS	A	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-	44.1	17.8	0.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	41	338	241	20	71	144
Future Vol, veh/h	41	338	241	20	71	144
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	150	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	12	7	2	10	11	12
Mvmt Flow	45	367	262	22	77	157

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	284	0	-	0	719	262			
Stage 1	-	-	-	-	262	-			
Stage 2	-	-	-	-	457	-			
Critical Hdwy	4.22	-	-	-	6.51	6.32			
Critical Hdwy Stg 1	-	-	-	-	5.51	-			
Critical Hdwy Stg 2	-	-	-	-	5.51	-			
Follow-up Hdwy	2.308	-	-	-	3.599	3.408			
Pot Cap-1 Maneuver	1223	-	-	-	382	753			
Stage 1	-	-	-	-	761	-			
Stage 2	-	-	-	-	619	-			
Platoon blocked, %		-	-	-					
Mov Cap-1 Maneuver	1223	-	-	-	368	753			
Mov Cap-2 Maneuver	-	-	-	-	368	-			
Stage 1	-	-	-	-	733	-			
Stage 2	-	-	-	-	619	-			

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	16
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1223	-	-	-	560
HCM Lane V/C Ratio	0.036	-	-	-	0.417
HCM Control Delay (s)	8.1	-	-	-	16
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	2

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	54	308	365	20	71	191
Future Vol, veh/h	54	308	365	20	71	191
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	150	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	11	7	6	10	11	12
Mvmt Flow	59	335	397	22	77	208

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	419	0	-	0	850	397
Stage 1	-	-	-	-	397	-
Stage 2	-	-	-	-	453	-
Critical Hdwy	4.21	-	-	-	6.51	6.32
Critical Hdwy Stg 1	-	-	-	-	5.51	-
Critical Hdwy Stg 2	-	-	-	-	5.51	-
Follow-up Hdwy	2.299	-	-	-	3.599	3.408
Pot Cap-1 Maneuver	1093	-	-	-	319	631
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	622	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1093	-	-	-	302	631
Mov Cap-2 Maneuver	-	-	-	-	302	-
Stage 1	-	-	-	-	624	-
Stage 2	-	-	-	-	622	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	22.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1093	-	-	-	487
HCM Lane V/C Ratio	0.054	-	-	-	0.585
HCM Control Delay (s)	8.5	-	-	-	22.3
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	3.7

Intersection	
Int Delay, s/veh	5.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	201	11	42	57	3	148
Future Vol, veh/h	201	11	42	57	3	148
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	12	9	12	12	2	11
Mvmt Flow	218	12	46	62	3	161

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	244	77	0	0	108	0
Stage 1	77	-	-	-	-	-
Stage 2	167	-	-	-	-	-
Critical Hdwy	6.52	6.29	-	-	4.12	-
Critical Hdwy Stg 1	5.52	-	-	-	-	-
Critical Hdwy Stg 2	5.52	-	-	-	-	-
Follow-up Hdwy	3.608	3.381	-	-	2.218	-
Pot Cap-1 Maneuver	723	965	-	-	1483	-
Stage 1	921	-	-	-	-	-
Stage 2	839	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	722	965	-	-	1483	-
Mov Cap-2 Maneuver	722	-	-	-	-	-
Stage 1	921	-	-	-	-	-
Stage 2	837	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.2	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	732	1483	-
HCM Lane V/C Ratio	-	-	0.315	0.002	-
HCM Control Delay (s)	-	-	12.2	7.4	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.3	0	-

Intersection	
Int Delay, s/veh	7.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	148	11	11	42	3	3
Future Vol, veh/h	148	11	11	42	3	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	11	9	9	12	2	2
Mvmt Flow	161	12	12	46	3	3

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	44	35	0	0	58	0
Stage 1	35	-	-	-	-	-
Stage 2	9	-	-	-	-	-
Critical Hdwy	6.51	6.29	-	-	4.12	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.381	-	-	2.218	-
Pot Cap-1 Maneuver	944	1018	-	-	1546	-
Stage 1	965	-	-	-	-	-
Stage 2	991	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	942	1018	-	-	1546	-
Mov Cap-2 Maneuver	942	-	-	-	-	-
Stage 1	965	-	-	-	-	-
Stage 2	989	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	3.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	947	1546	-
HCM Lane V/C Ratio	-	-	0.182	0.002	-
HCM Control Delay (s)	-	-	9.6	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0	-

Intersection	
Int Delay, s/veh	14.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	293	336	83	293	56
Future Vol, veh/h	16	293	336	83	293	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	150	0	150
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	13	1	2	12	12	13
Mvmt Flow	17	318	365	90	318	61

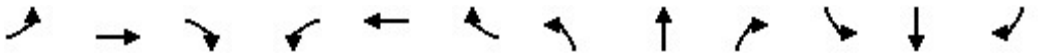
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	455	0	-	0	717	365
Stage 1	-	-	-	-	365	-
Stage 2	-	-	-	-	352	-
Critical Hdwy	4.23	-	-	-	6.52	6.33
Critical Hdwy Stg 1	-	-	-	-	5.52	-
Critical Hdwy Stg 2	-	-	-	-	5.52	-
Follow-up Hdwy	2.317	-	-	-	3.608	3.417
Pot Cap-1 Maneuver	1050	-	-	-	382	656
Stage 1	-	-	-	-	681	-
Stage 2	-	-	-	-	690	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1050	-	-	-	376	656
Mov Cap-2 Maneuver	-	-	-	-	376	-
Stage 1	-	-	-	-	670	-
Stage 2	-	-	-	-	690	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	43.5
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1050	-	-	-	376	656
HCM Lane V/C Ratio	0.017	-	-	-	0.847	0.093
HCM Control Delay (s)	8.5	-	-	-	49.7	11
HCM Lane LOS	A	-	-	-	E	B
HCM 95th %tile Q(veh)	0.1	-	-	-	7.9	0.3

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	13	24	129	205	1	350	171	158	186
v/c Ratio	0.04	0.05	0.34	0.35	0.00	0.27	0.24	0.37	0.14
Control Delay	8.4	8.0	11.1	4.1	6.0	7.0	2.6	10.1	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.4	8.0	11.1	4.1	6.0	7.0	2.6	10.1	6.4
Queue Length 50th (ft)	1	2	12	1	0	15	0	14	7
Queue Length 95th (ft)	8	12	44	26	2	38	18	47	22
Internal Link Dist (ft)		1175		2170		3631			697
Turn Bay Length (ft)	150		150		200		400	330	
Base Capacity (vph)	826	1358	1023	1267	1059	2836	1356	913	2809
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.02	0.13	0.16	0.00	0.12	0.13	0.17	0.07

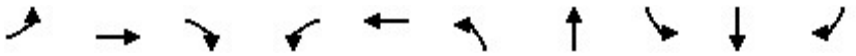
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	19	1	108	11	161	1	294	144	133	153	3
Future Volume (veh/h)	11	19	1	108	11	161	1	294	144	133	153	3
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	1767	1826	1870	1841	1870	1885	1870	1693	1781	1885	1678	1870
Adj Flow Rate, veh/h	13	23	1	129	13	192	1	350	171	158	182	4
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	9	5	2	4	2	1	2	14	8	1	15	2
Cap, veh/h	460	411	18	630	24	355	708	1164	546	616	1154	25
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1112	1737	76	1365	101	1499	1198	3216	1510	1039	3189	70
Grp Volume(v), veh/h	13	0	24	129	0	205	1	350	171	158	91	95
Grp Sat Flow(s),veh/h/ln	1112	0	1812	1365	0	1601	1198	1608	1510	1039	1594	1665
Q Serve(g_s), s	0.2	0.0	0.2	1.8	0.0	2.5	0.0	1.7	1.8	2.9	0.9	0.9
Cycle Q Clear(g_c), s	2.7	0.0	0.2	2.0	0.0	2.5	0.9	1.7	1.8	4.6	0.9	0.9
Prop In Lane	1.00		0.04	1.00		0.94	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	460	0	429	630	0	379	708	1164	546	616	577	603
V/C Ratio(X)	0.03	0.00	0.06	0.20	0.00	0.54	0.00	0.30	0.31	0.26	0.16	0.16
Avail Cap(c_a), veh/h	1312	0	1818	1676	0	1606	1796	4086	1918	1560	2025	2116
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.7	0.0	6.6	7.4	0.0	7.5	5.1	5.1	5.2	6.8	4.8	4.8
Incr Delay (d2), s/veh	0.0	0.0	0.1	0.2	0.0	1.2	0.0	0.1	0.3	0.2	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.2	0.0	0.4	0.0	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.7	0.0	6.7	7.6	0.0	8.7	5.1	5.3	5.5	7.0	5.0	5.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		37			334			522			344	
Approach Delay, s/veh		7.4			8.3			5.3			5.9	
Approach LOS		A			A			A			A	

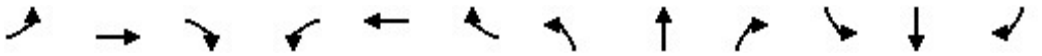
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		12.6		9.8		12.6		9.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		28.5		22.5		28.5		22.5				
Max Q Clear Time (g_c+I1), s		3.8		4.7		6.6		4.5				
Green Ext Time (p_c), s		2.5		0.1		1.5		1.4				

Intersection Summary												
HCM 6th Ctrl Delay			6.3									
HCM 6th LOS			A									



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	85	133	376	73	100	155	354	61	345	47
v/c Ratio	0.41	0.42	0.66	0.34	0.31	0.23	0.15	0.09	0.14	0.04
Control Delay	28.4	26.4	8.9	26.3	21.5	5.4	3.8	4.5	4.1	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.4	26.4	8.9	26.3	21.5	5.4	3.8	4.5	4.1	1.7
Queue Length 50th (ft)	28	44	0	24	28	17	17	6	18	0
Queue Length 95th (ft)	52	71	27	46	51	39	32	17	33	7
Internal Link Dist (ft)		2653			484		487		544	
Turn Bay Length (ft)	150		150			75		100		360
Base Capacity (vph)	780	1194	1119	810	1179	683	2407	684	2455	1081
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.11	0.34	0.09	0.08	0.23	0.15	0.09	0.14	0.04

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	100	282	55	62	13	116	230	35	46	259	35
Future Volume (veh/h)	64	100	282	55	62	13	116	230	35	46	259	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	1767	1856	1811	1870	1870	1870	1856	1900	1870	1870	1900	1856
Adj Flow Rate, veh/h	85	133	376	73	83	17	155	307	47	61	345	47
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Percent Heavy Veh, %	9	3	6	2	2	2	3	0	2	2	0	3
Cap, veh/h	405	538	445	396	436	89	656	1835	278	654	2107	918
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.58	0.58	0.58	0.58	0.58	0.58
Sat Flow, veh/h	1223	1856	1535	1257	1506	309	1027	3143	476	1027	3610	1572
Grp Volume(v), veh/h	85	133	376	73	0	100	155	175	179	61	345	47
Grp Sat Flow(s),veh/h/ln	1223	1856	1535	1257	0	1815	1027	1805	1814	1027	1805	1572
Q Serve(g_s), s	4.0	3.9	16.4	3.4	0.0	2.9	5.8	3.2	3.2	2.1	3.1	0.9
Cycle Q Clear(g_c), s	6.9	3.9	16.4	7.3	0.0	2.9	8.9	3.2	3.2	5.3	3.1	0.9
Prop In Lane	1.00		1.00	1.00		0.17	1.00		0.26	1.00		1.00
Lane Grp Cap(c), veh/h	405	538	445	396	0	526	656	1054	1059	654	2107	918
V/C Ratio(X)	0.21	0.25	0.85	0.18	0.00	0.19	0.24	0.17	0.17	0.09	0.16	0.05
Avail Cap(c_a), veh/h	730	1031	853	730	0	1008	656	1054	1059	654	2107	918
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.6	19.3	23.8	22.1	0.0	19.0	8.9	6.8	6.8	8.1	6.8	6.4
Incr Delay (d2), s/veh	0.3	0.2	4.5	0.2	0.0	0.2	0.8	0.3	0.3	0.3	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	1.5	5.8	0.9	0.0	1.1	1.2	1.0	1.0	0.4	0.9	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.8	19.6	28.2	22.3	0.0	19.2	9.7	7.2	7.2	8.3	7.0	6.5
LnGrp LOS	C	B	C	C	A	B	A	A	A	A	A	A
Approach Vol, veh/h		594			173			509			453	
Approach Delay, s/veh		25.4			20.5			7.9			7.1	
Approach LOS		C			C			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		46.0		25.1		46.0		25.1				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		41.5		39.5		41.5		39.5				
Max Q Clear Time (g_c+I1), s		10.9		18.4		7.3		9.3				
Green Ext Time (p_c), s		2.7		2.2		2.6		0.7				

Intersection Summary												
HCM 6th Ctrl Delay			15.0									
HCM 6th LOS			B									

HIGHWAY 34 / 81 YORK INDUSTRIAL PARK

York, NE

September 2024

Olsson Project No. A23-03785