

TRAFFIC IMPACT STUDY

For

**Woodmen & Mohawk Residential
Colorado Springs, Colorado**

November 2021

Prepared for:

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21-101525

Table of Contents	Page
I. Introduction	1
Project Overview	1
Study Area Boundaries	1
Site Description	1
Existing and Committed Surface Transportation Network	4
II. Existing Traffic Conditions	5
Existing Traffic Analysis Results	7
III. Future Traffic Conditions Without Proposed Development.....	8
Background Traffic Analysis Results – Year 2023	11
Background Traffic Analysis Results – Year 2041	12
IV. Proposed Project Traffic	13
Trip Generation	13
Adjustments to Trip Generation Rates	14
Trip Distribution	14
Trip Assignment	14
V. Future Traffic Conditions With Proposed Developments.....	16
VI. Project Impacts	19
Peak Hour Intersection Levels of Service	19
Total Traffic Analysis Results Upon Development Build-Out	20
Queue Length Analysis	21
Auxiliary Lane Analysis	21
VII. Conclusion	22

List of Figures	Page
Figure 1 – Location.....	2
Figure 2 – Site Plan.....	3
Figure 3 – Existing Traffic Volumes.....	6
Figure 4 – Background Traffic Volumes – Year 2023.....	9
Figure 5 – Background Traffic Volumes – Year 2041.....	10
Figure 6 – Distribution and Site Generated Assignment.....	15
Figure 7 – Total Traffic Volumes – Year 2023.....	17
Figure 8 – Total Traffic Volumes – Year 2041.....	18

List of Tables	Page
Table 1 – Intersection Capacity Analysis Summary – Existing Traffic.....	7
Table 2 – Intersection Capacity Analysis Summary – Background Traffic – Year 2023.....	11
Table 3 – Intersection Capacity Analysis Summary – Background Traffic – Year 2041.....	12
Table 4 – Trip Generation Rates.....	13
Table 5 – Trip Generation Summary.....	13
Table 6 – Intersection Capacity Analysis Summary – Total Traffic – Year 2023.....	19
Table 7 – Intersection Capacity Analysis Summary – Total Traffic – Year 2041.....	20

Appendices

APPENDIX A	TRAFFIC COUNT DATA
APPENDIX B	LEVEL OF SERVICE DEFINITIONS
APPENDIX C	CAPACITY WORKSHEETS

I. Introduction

Project Overview

This traffic impact study addresses the capacity, geometric, and control requirements associated with the development entitled Woodmen & Mohawk Residential.

This proposed residential development consists of a multifamily housing subdivision. The development is located at the southwest corner of the intersections of E Woodmen Road with Mohawk Road in Colorado Springs, Colorado.

Study Area Boundaries

The study area to be examined in this analysis encompasses the E Woodmen Road intersections with Mohawk Road and Marksheffel Road, and proposed site accesses.

Figure 1 illustrates location of the site and study intersections.

Site Description

Land for the development is currently vacant and surrounded by a mix of recreational, residential, and open space land uses.

The proposed development is understood to entail the new construction of approximately 487 multifamily dwelling units.

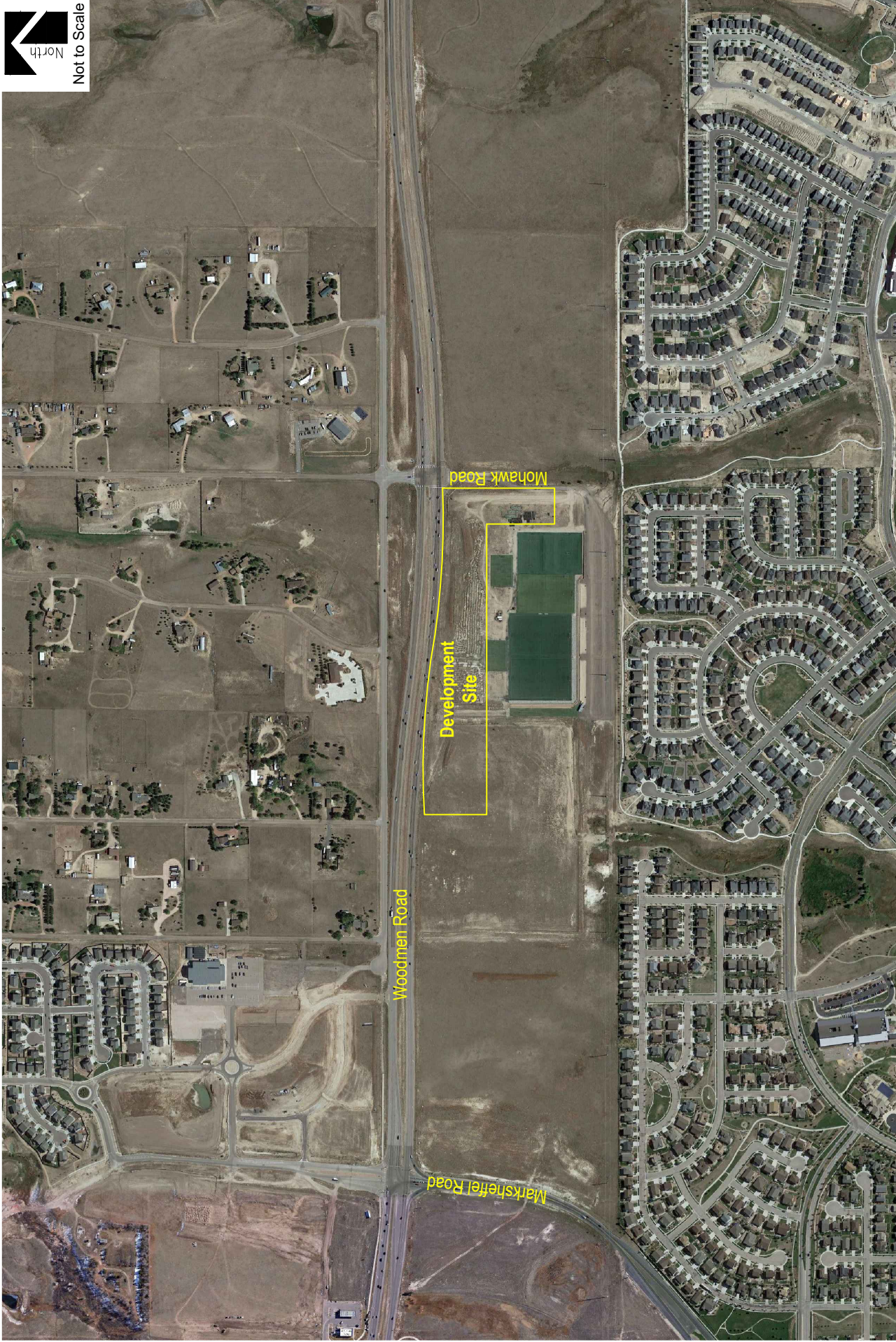
Proposed access to the development is provided at the following locations: one full-movement access onto Mohawk Road (referred to as Access A), and one right-in / right-out access on E Woodmen Road (referred to as Access B),

For purposes of this study, it is anticipated that development construction would be completed by end of Year 2023.

A conceptual site plan, as prepared by Santulan Architecture is shown on Figure 2. This plan is provided for illustrative purposes.

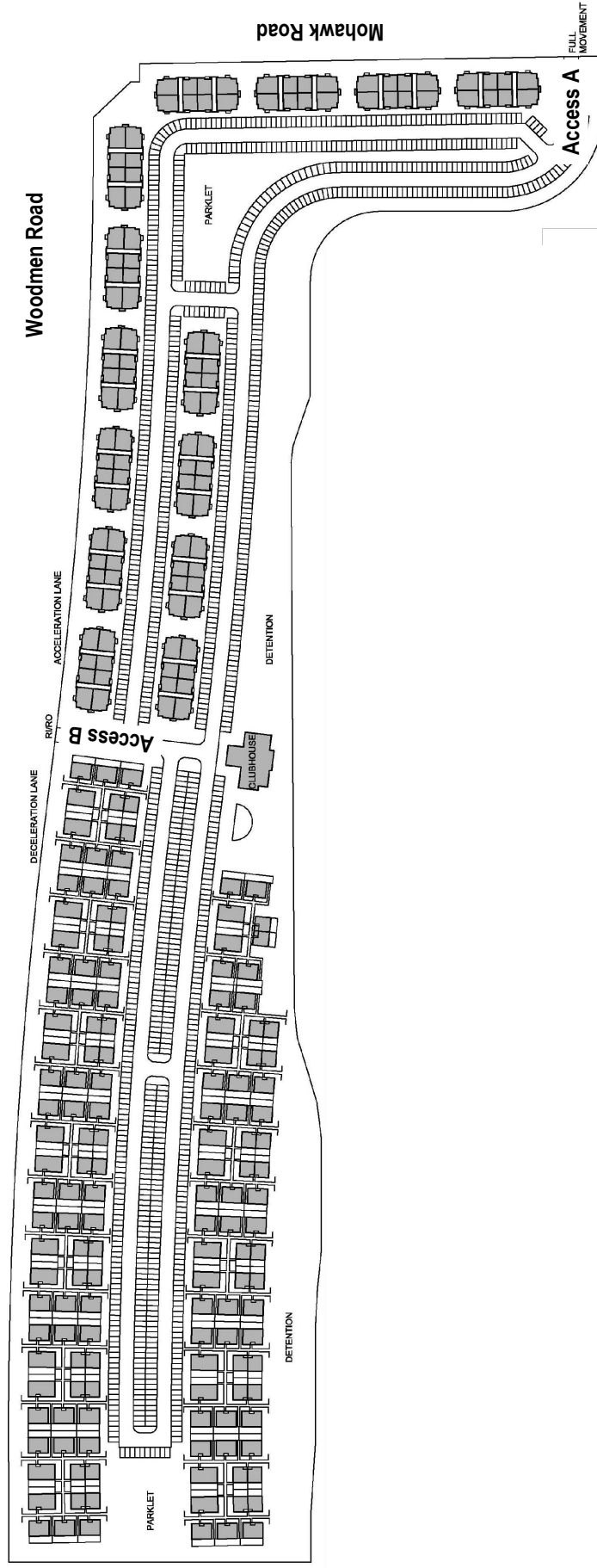


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Existing and Committed Surface Transportation Network

Within the study area, Woodmen Road is the primary roadway that will accommodate traffic to and from the proposed development. The secondary roadways include Mohawk Road and Marksheffel Road. A brief description of each roadway is provided below:

Woodmen Road is an east-west expressway roadway having four through lanes (two lanes in each direction) with exclusive turn lanes at the intersections within the study area. Woodmen Road provides a posted speed limit of 55 MPH.

Mohawk Road is a north-south collector roadway having two through lanes (one lane in each direction) with a combination of shared and exclusive turn lanes at the intersection within the study area. Mohawk Road provides a posted speed limit of 30 MPH.

Marksheffel Road is a north-south arterial roadway generally having two through lanes (one lane in each direction) with exclusive turn lanes at the intersection within the study area. Marksheffel Road provides a posted speed limit of 45 MPH.

The study intersections of Woodmen Road with Mohawk Road and Marksheffel Road are signalized. All other study intersections operate under a stop-controlled condition. A stop-controlled intersection is defined as a roadway intersection where vehicle rights-of-way are controlled by one or more “STOP” signs.

No specific improvements for the above-described roadways are known at this time. The existing study area roadways appear to be built to their ultimate cross-sections, assuming a no-build scenario. It is however noted that regional improvements related to this development area, including the construction of Banning Lewis Parkway to the east, will provide additional routes which may cause traffic patterns to vary significantly from existing conditions. Banning Lewis Parkway is understood to provide connections to proposed Briargate Parkway, a future east-west arterial roadway north of the proposed development, serving as an extension from the existing Briargate Parkway to the west. Banning Lewis Parkway will also provide future connections to the south with routes to US 24 and Marksheffel Road. It is assumed that these roadways will be constructed, at least in part, in relation to adjacent planned development areas for the purpose of determining future traffic distribution patterns. However exact details regarding construction timeframes and roadway designs are unknown at this time and can only be assumed. Therefore, for purposes of this analysis, no improvements to the study area roadways or intersections are assumed.

II. Existing Traffic Conditions

Morning (AM) and afternoon (PM) peak hour traffic counts at the intersections of Woodmen Road with Mohawk Road and Marksheffel Road were referenced from an adjacent ongoing traffic study¹. Average daily (24-hour) traffic volumes on Woodmen Road also obtained from the adjacent traffic report. These counts are shown on Figure 3.

Traffic count data is included for reference in Appendix A.

Existing signal timing parameters for the intersections of Woodmen Road with Mohawk Road and Marksheffel Road were assumed based on the existing signal head configuration and allowable movements. Timings were used throughout this study to the best extent possible in order to remain consistent with typical City signal coordination plans and previous traffic studies performed within the area.

¹ Woodmen East Commercial Center Traffic Impact Analysis, LSC Transportation Consultants, August 2021.

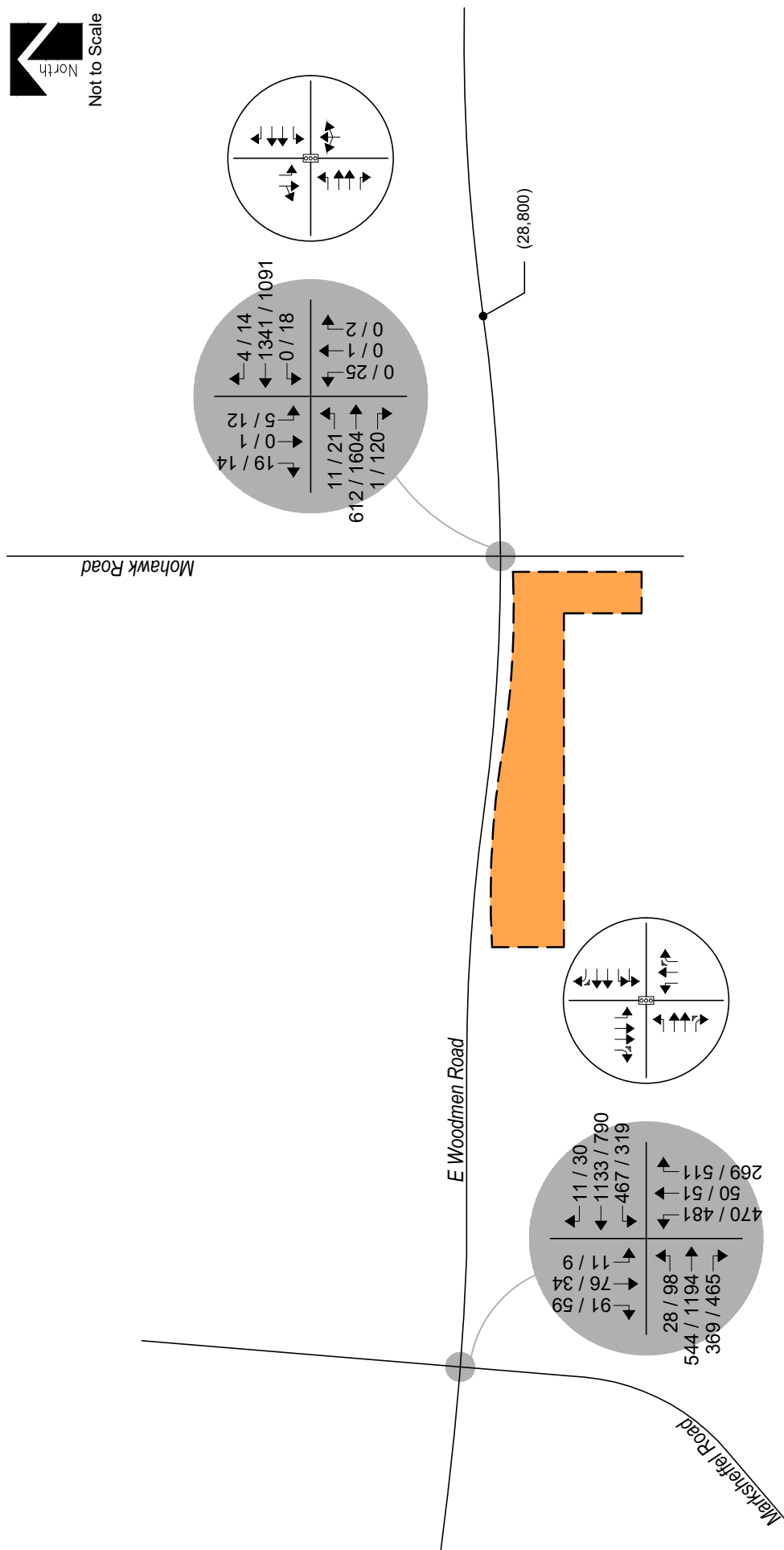


Figure 3
EXISTING TRAFFIC
 Volumes & Intersection Geometry
 AM / PM Peak Hour
 (ADT) : Average Daily Traffic

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The Signalized and Unsignalized Intersection Analysis techniques, as published in the Highway Capacity Manual (HCM) by the Transportation Research Board and as incorporated into the SYNCHRO computer program, were used to analyze the study intersections for existing traffic conditions. These nationally accepted techniques allow for the determination of intersection level of service (LOS) based on the congestion and delay of each traffic movement.

Level of service is a method of measurement used by transportation professionals to quantify a driver's perception of travel conditions that include travel time, number of stops, and total amount of stopped delay experienced on a roadway network. The HCM categorizes level of service into a range from "A" which indicates little, if any, vehicle delay, to "F" which indicates a level of operation considered unacceptable to most drivers. These levels of service grades with brief descriptions of the operating condition, for unsignalized and signalized intersections, are included for reference in Appendix B and have been used throughout this study.

The level of service analyses results for existing conditions are summarized in Table 1.

Intersection capacity worksheets developed for this study are provided in Appendix C.

Table 1 – Intersection Capacity Analysis Summary – Existing Traffic

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
Woodmen Road / Mohawk Road (Signalized)	A (1.5)	A (3.6)
Woodmen Road / Marksheffel Road (Signalized)	D (44.9)	D (50.7)

Key: Signalized Intersection: Level of Service (Control Delay in sec/veh)

Existing Traffic Analysis Results

Under existing conditions, operational analysis shows that the signalized intersection of Woodmen Road with Mohawk Road has overall operations at LOS A during both the morning and afternoon peak traffic hours.

The signalized intersection of Woodmen Road with Marksheffel Road has overall operations at LOS D during both the morning and afternoon peak traffic hours.

III. Future Traffic Conditions Without Proposed Development

Background traffic is the traffic projected to be on area roadways without consideration of the proposed development. Background traffic includes traffic generated by development of vacant parcels in the area.

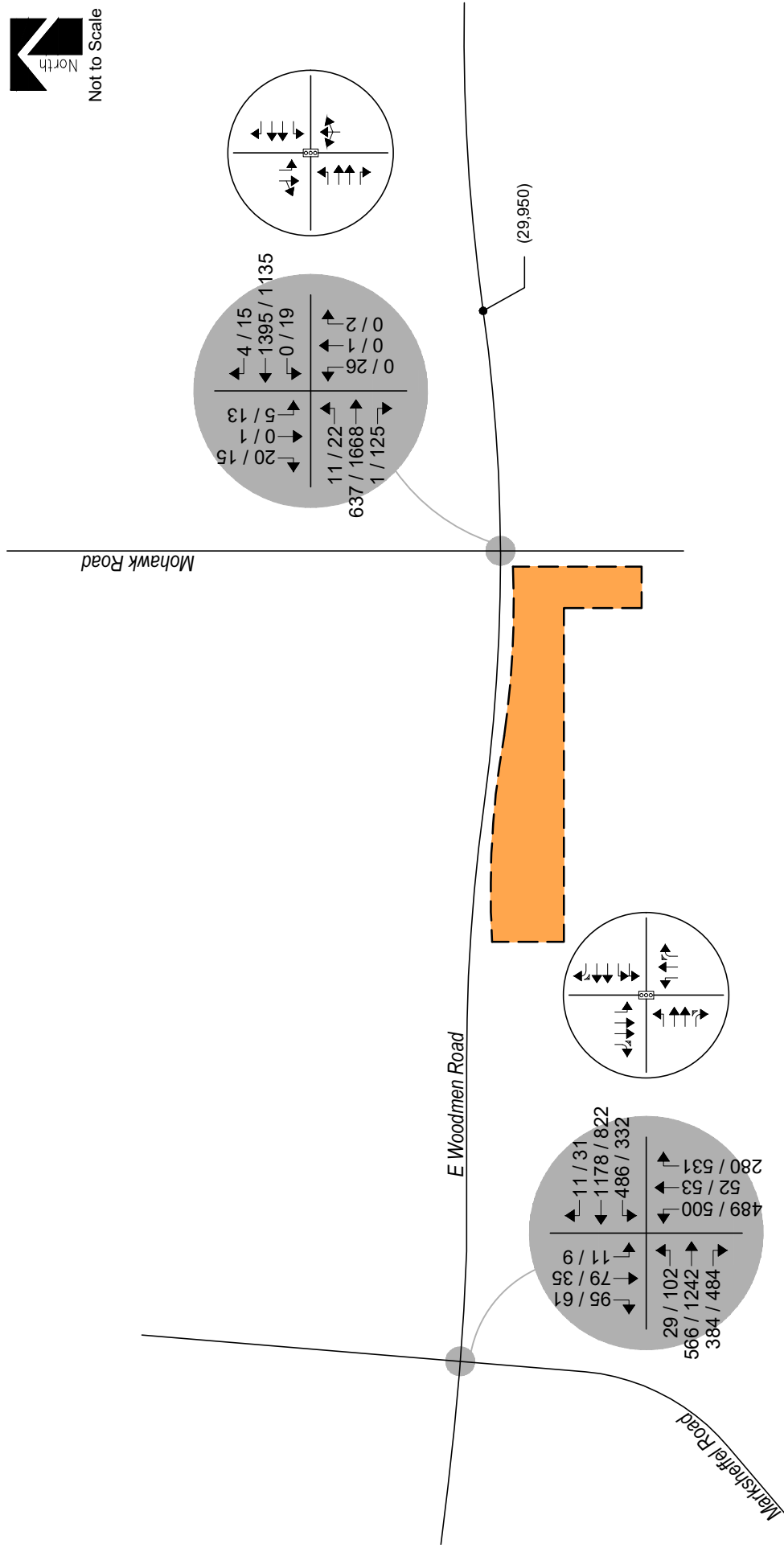
To account for projected increases in background traffic for Years 2023 and 2041, a compounded annual growth rate of approximately two percent was applied to existing traffic volumes. This annual growth rate is consistent with regional growth projections and the level of in-fill development expected within the area.

To account for projected traffic from adjacent developments not yet built, trip generations from the Percheron traffic impact study² were added to background traffic volumes. It is noted that additional traffic associated with the adjacent Woodmen East Commercial development is subject to change as site plans are further defined. As such, no additional volumes beyond the anticipated two percent regional growth were added for this development.

Pursuant to the non-committed area roadway improvements discussed in Section I, Year 2023 and Year 2041 background traffic conditions assume no roadway improvements to accommodate regional transportation demands. Year 2041 assumes existing signal timing parameters for Woodmen Road with Mohawk Road and Marksheffel Road with optimized intersection splits in effort to better long-term intersection performance. This assumption provides for a conservative analysis.

Projected background traffic volumes and intersection geometry for Years 2023 and 2041 are shown on Figure 4 and Figure 5, respectively.

² Percheron Traffic Impact Study, SM Rocha LLC, October 2021.



LEGEND

- Study Intersection Volumes
- Study Intersection Lane Geometry
- Development Site

Figure 4
BACKGROUND TRAFFIC - YEAR 2023
 Volumes & Intersection Geometry
 AM / PM Peak Hour
 (ADT) : Average Daily Traffic

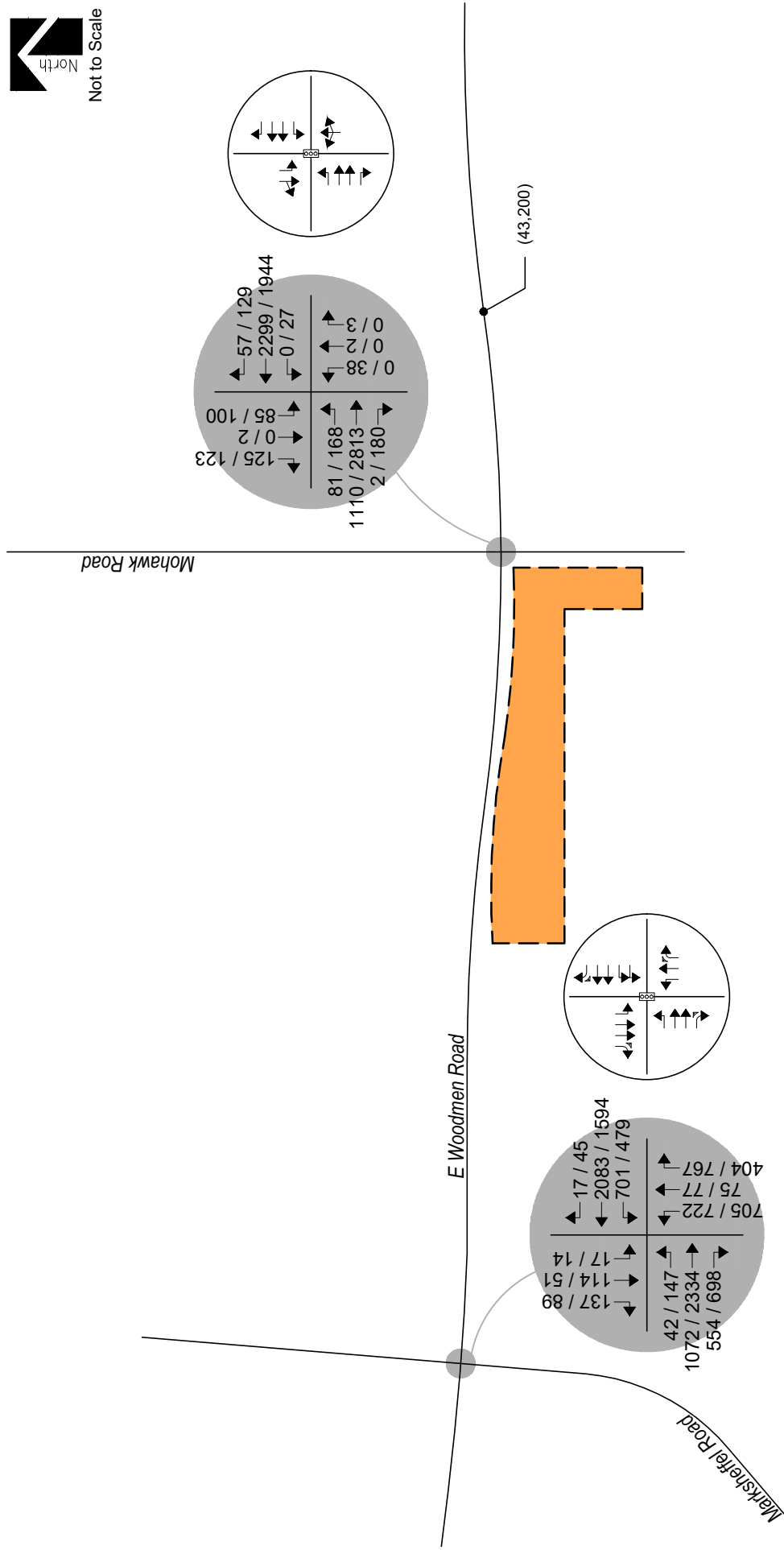


Figure 5
BACKGROUND TRAFFIC - YEAR 2041
 Volumes & Intersection Geometry
 AM / PM Peak Hour
 (ADT) : Average Daily Traffic

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As with existing traffic conditions, the operations of study intersections were analyzed under background conditions, without the proposed development, using the SYNCHRO computer program.

Background traffic level of service analysis results for Year 2023 are listed in Table 2. Year 2041 operational results are summarized in Table 3.

Definitions of levels of service are given in Appendix B. Intersection capacity worksheets are provided in Appendix C.

Table 2 – Intersection Capacity Analysis Summary – Background Traffic – Year 2023

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
Woodmen Road / Mohawk Road (Signalized)	A (2.0)	A (4.2)
Woodmen Road / Marksheffel Road (Signalized)	D (48.1)	D (53.8)

Key: Signalized Intersection: Level of Service (Control Delay in sec/veh)

Background Traffic Analysis Results – Year 2023

Year 2023 background traffic analysis indicates that the signalized intersection of Woodmen Road with Mohawk Road has overall operations at LOS A during both the AM and PM peak traffic hours.

The signalized intersection of Woodmen Road with Marksheffel Road has overall operations at LOS D during both the AM and PM peak traffic hours.

Table 3 – Intersection Capacity Analysis Summary – Background Traffic – Year 2041

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
Woodmen Road / Mohawk Road (Signalized)	B (19.0)	E (57.2)
Woodmen Road / Marksheffel Road (Signalized)	F (139.9)	F (216.3)

Key: Signalized Intersection: Level of Service (Control Delay in sec/veh)

Background Traffic Analysis Results – Year 2041

By Year 2041 and without the proposed development, the study intersection of Woodmen Road with Mohawk Road experiences LOS B operations during the AM peak traffic hour and LOS E operations during the PM peak traffic hour. The LOS E operation anticipated during the PM peak traffic period is primarily attributed to the eastbound left turning movement as well as the high eastbound through volumes. To mitigate the anticipated LOS E operation, it is recommended providing protected phasing to left turning movements. It is however noted that given the high east-west through volumes, long-term operations may be best improved with the widening of Woodmen Road from two to three through lanes in each direction.

The study intersection of Woodmen Road with Marksheffel Road experiences LOS F operations during both the AM and PM peak traffic hours. The LOS F operations anticipated during both peak traffic periods are primarily attributed to the westbound and northbound left turning movements as well as the high westbound and eastbound through volumes. To mitigate the anticipated LOS F operations, it is recommended providing dual northbound left turn lanes, as well as optimizing protected left turn phasing. It is however noted that given the high east-west through volumes, long-term operations may be best improved with the widening of Woodmen Road from two to three through lanes in each direction.

IV. Proposed Project Traffic

Trip Generation

Standard traffic generation characteristics compiled by the Institute of Transportation Engineers (ITE) in their report entitled Trip Generation Manual, 10th Edition, were applied to the proposed land use in order to estimate average daily traffic (ADT), AM Peak Hour, and PM Peak Hour vehicle trips. A vehicle trip is defined as a one-way vehicle movement from a point of origin to a point of destination.

The ITE land use code 220 (Multifamily Housing (Low-Rise)) was used for estimating trip generation because of its best fit to the proposed land use description.

Trip generation rates used in this study are presented in Table 4.

Table 4 – Trip Generation Rates

ITE CODE LAND USE UNIT			TRIP GENERATION RATES						
			24 HOUR	AM PEAK HOUR			PM PEAK HOUR		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
220	Multifamily Housing (Low-Rise)	DU	7.32	0.11	0.35	0.46	0.35	0.21	0.56

Key: DU = Dwelling Units.

Note: All data and calculations above are subject to being rounded to nearest value.

Table 5 illustrates projected average daily traffic (ADT), AM Peak Hour, and PM Peak Hour traffic volumes likely generated by the proposed development upon build-out.

Table 5 – Trip Generation Summary

ITE CODELAND USESIZE			TOTAL TRIPS GENERATED						
			24 HOUR	AM PEAK HOUR			PM PEAK HOUR		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
220	Multifamily Housing (Low-Rise)	487 DU	3,565	52	172	224	172	101	273
Total:			3,565	52	172	224	172	101	273

Note: All data and calculations above are subject to being rounded to nearest value.

Upon build-out, Table 5 illustrates that the proposed development has the potential to generate approximately 3,565 daily trips with 224 of those occurring during the morning peak hour and 273 during the afternoon peak hour.

Adjustments to Trip Generation Rates

A development of this type is not likely to attract trips from within area land uses nor pass-by or diverted link trips from the adjacent roadway system, therefore no trip reduction was taken in this analysis.

Trip Distribution

The overall directional distribution of site-generated traffic was determined based on the location of development site within the City, proposed and existing area land uses, allowed turning movements, and available roadway network.

Overall trip distribution patterns for the development are shown on Figure 6.

Trip Assignment

Traffic assignment is how generated and distributed vehicle trips are expected to be loaded onto the available roadway network.

Applying trip distribution patterns to site-generated traffic provides the overall site-generated trip assignments shown on Figure 6.

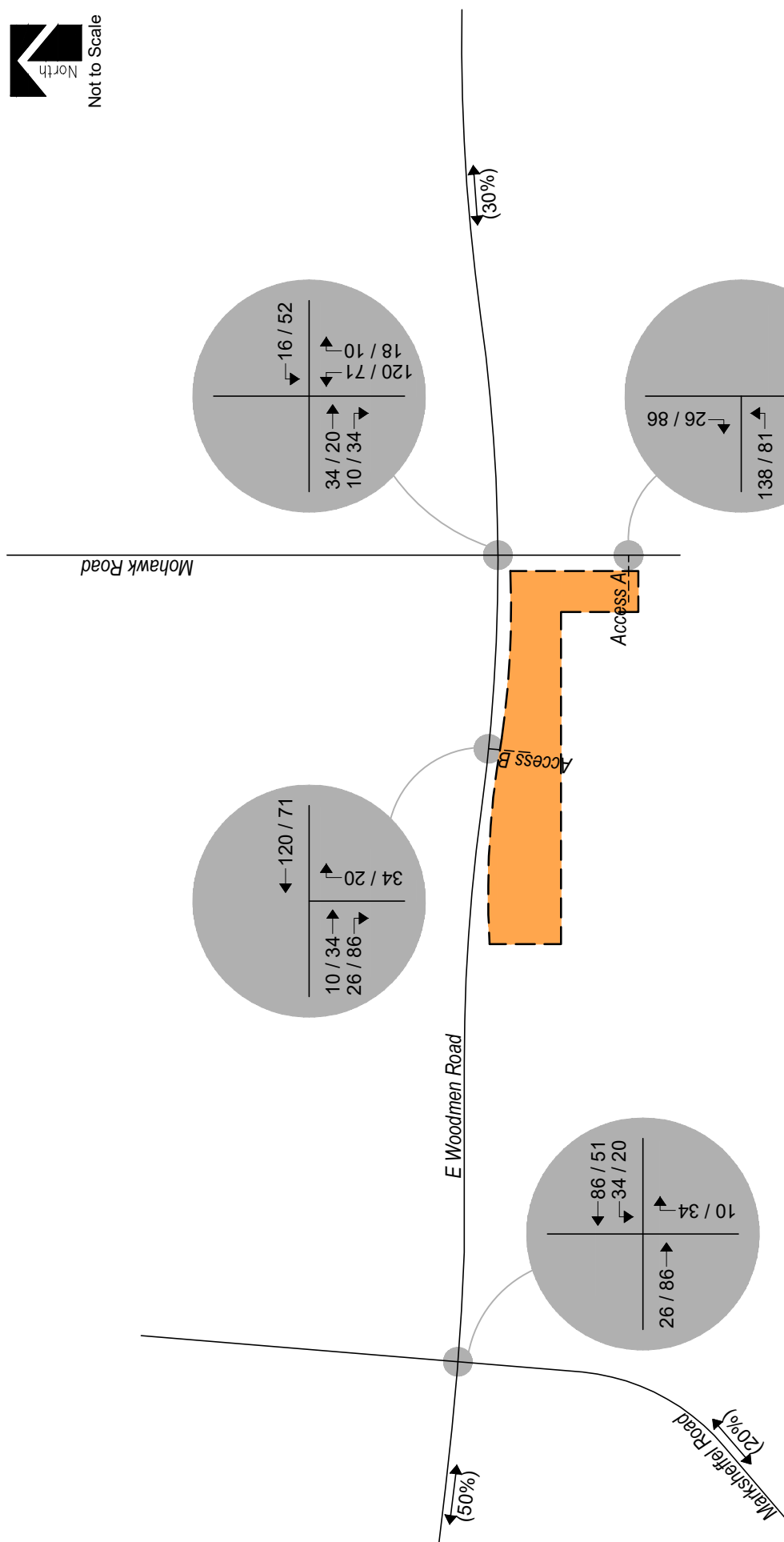


Figure 6
SITE DEVELOPMENT DISTRIBUTION
(%) : Overall
SITE-GENERATED
AM / PM Peak Hour
November 2021
Page 15

V. Future Traffic Conditions With Proposed Developments

Site-generated traffic was added to background traffic projections for Years 2023 and 2041 to develop total traffic projections. For analysis purposes, it was assumed that development construction would be completed by end of Year 2023.

Pursuant to area roadway improvement discussions provided in Section III, Year 2023 and Year 2041 total traffic conditions assume no roadway improvements to accommodate regional transportation demands. Roadway improvements associated with site development are expected to be limited to site access and frontage as required by the governing agency.

Projected Year 2023 total traffic volumes and intersection geometry are shown in Figure 7.

Figure 8 shows projected total traffic volumes and intersection geometry for Year 2041.



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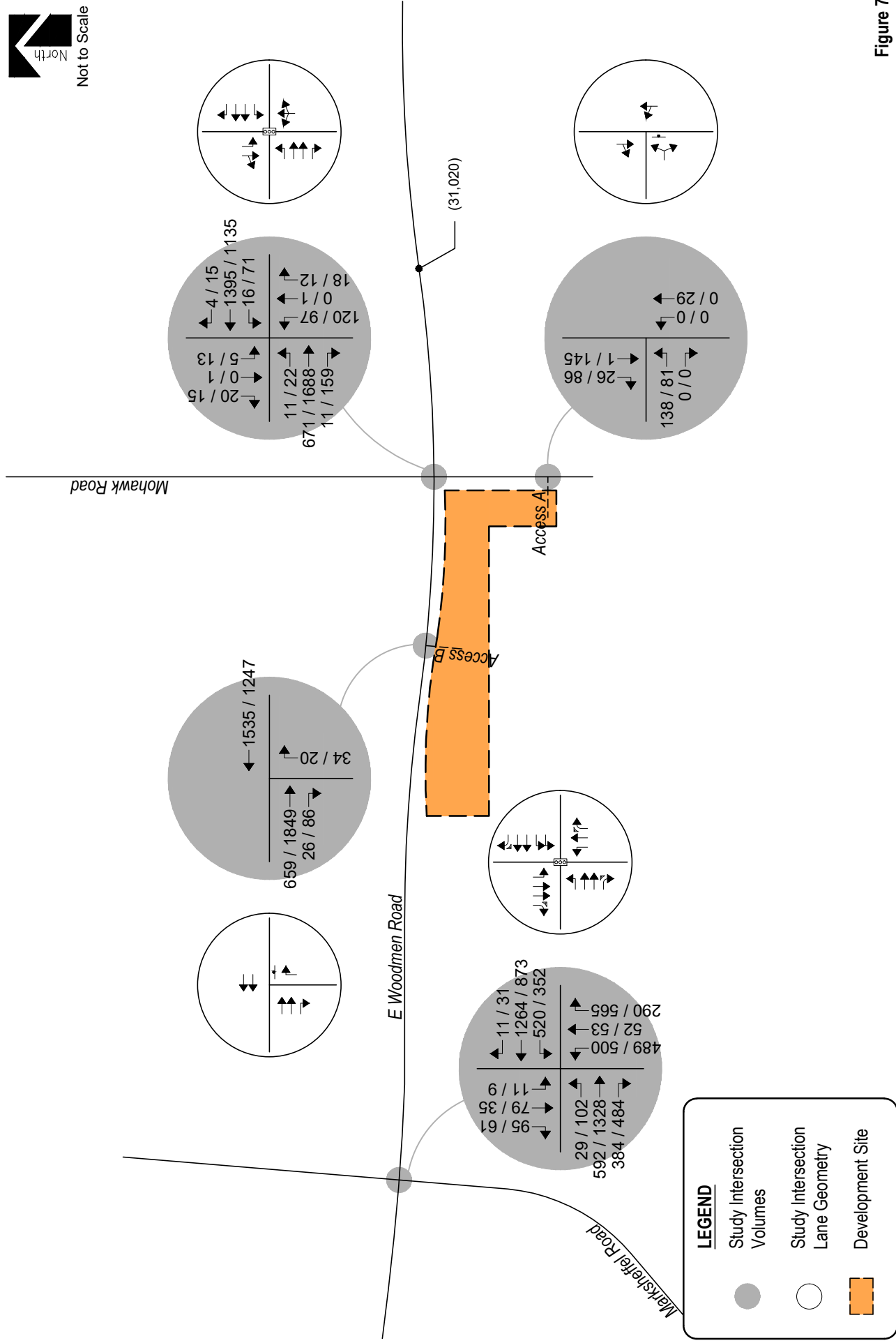


Figure 7
TOTAL TRAFFIC - YEAR 2023
Volumes & Intersection Geometry
AM / PM Peak Hour
(ADT) : Average Daily Traffic



Not to Scale

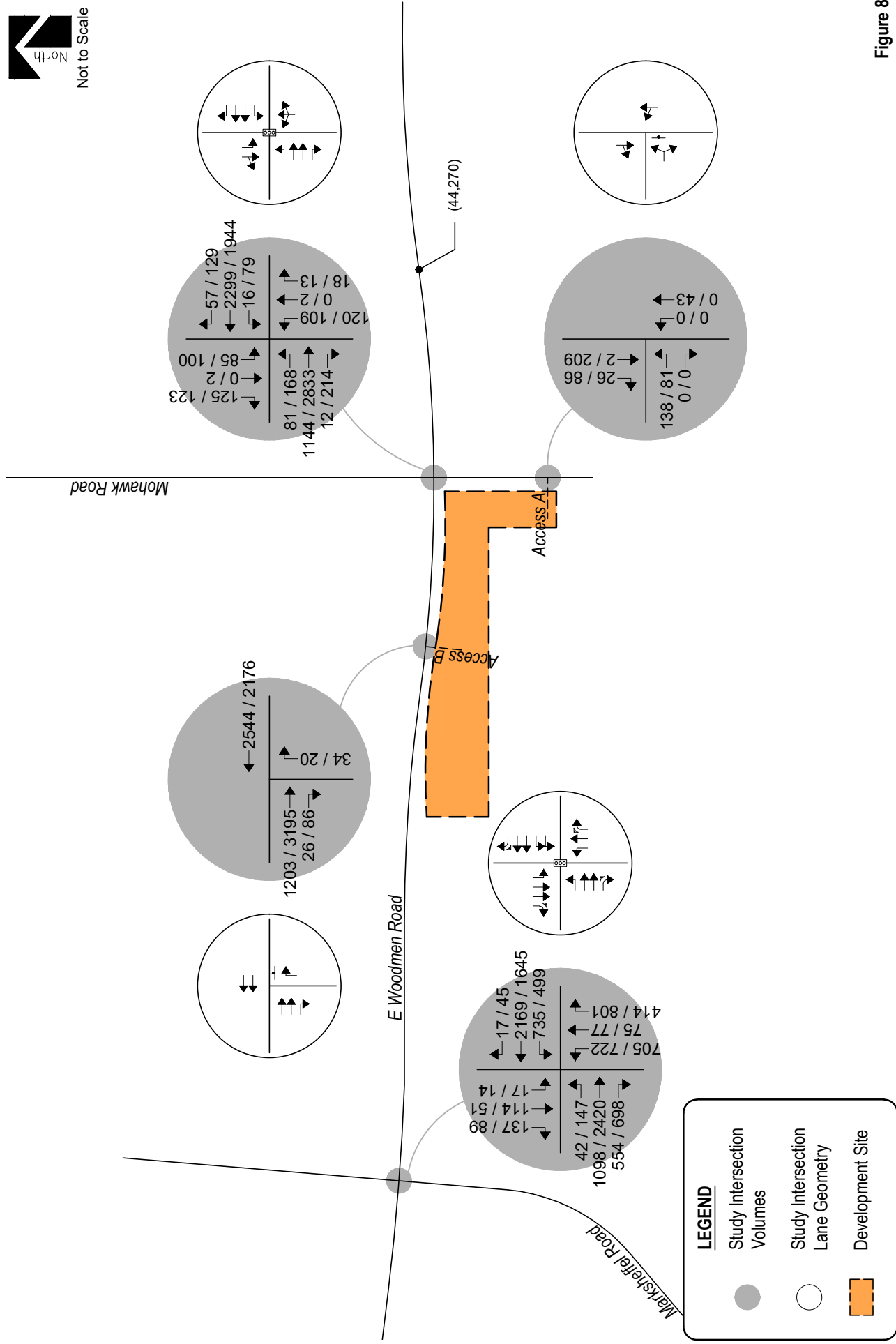


Figure 8
TOTAL TRAFFIC - YEAR 2041
Volumes & Intersection Geometry
AM / PM Peak Hour
(ADT) : Average Daily Traffic

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VI. Project Impacts

The analyses and procedures described in this study were performed in accordance with the Highway Capacity Manual (HCM) and are based upon the worst-case conditions that occur during a typical weekday upon build-out of site development and analyzed land uses. Therefore, study intersections are likely to operate with traffic conditions better than those described within this study, which represent the peak hours of weekday operations only.

Peak Hour Intersection Levels of Service

As with background traffic, the operations of the study intersections were analyzed under projected total traffic conditions using the SYNCHRO computer program. Total traffic level of service analysis results for Years 2023 and 2041 are summarized in Table 6 and Table 7, respectively.

Definitions of levels of service are given in Appendix B. Intersection capacity worksheets are provided in Appendix C.

Table 6 – Intersection Capacity Analysis Summary – Total Traffic – Year 2023

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
Woodmen Road / Mohawk Road (Signalized)	A (8.3)	A (9.2)
Woodmen Road / Marksheffel Road (Signalized)	D (47.2)	E (55.6)
Mohawk Road / Access A (Stop-Controlled) Eastbound Left and Right Northbound Left and Through	A A	B A
Woodmen Road / Access B (Stop-Controlled) Northbound Right	B	C

Key: Signalized Intersection: Level of Service (Control Delay in sec/veh)
Stop-Controlled Intersection: Level of Service

Table 7 – Intersection Capacity Analysis Summary – Total Traffic – Year 2041

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
Woodmen Road / Mohawk Road (Signalized)	C (23.8)	E (72.7)
Woodmen Road / Marksheffel Road (Signalized)	F (151.0)	F (265.1)
Mohawk Road / Access A (Stop-Controlled) Eastbound Left and Right Northbound Left and Through	A A	B A
Woodmen Road / Access B (Stop-Controlled) Northbound Right	B	F

Key: Signalized Intersection: Level of Service (Control Delay in sec/veh)
 Stop-Controlled Intersection: Level of Service

Total Traffic Analysis Results Upon Development Build-Out

Table 7 illustrates how, by Year 2041 and upon development build-out, the signalized intersection of Woodmen Road with Mohawk Road shows an overall LOS C operation during the morning peak traffic hour and LOS E operation during the afternoon peak traffic hour. The LOS E operation anticipated during the PM peak traffic period is primarily attributed to the eastbound left turning movement as well as the high eastbound through volumes. To mitigate the anticipated LOS E operation, it is recommended providing protected phasing to left turning movements. It is however noted that given the high east-west through volumes, long-term operations may be best improved with the widening of Woodmen Road from two to three through lanes in each direction. Compared to the background traffic analysis, the traffic generated by the proposed development is not expected to significantly change the operations of the study intersection.

The signalized intersection of Woodmen Road with Marksheffel Road is projected to have both morning and afternoon peak traffic hour operations at LOS F. The LOS F operations anticipated during both peak traffic periods are primarily attributed to the westbound and northbound left turning movements as well as the high westbound and eastbound through volumes. To mitigate the anticipated LOS F operations, it is recommended providing dual northbound left turn lanes, as well as optimizing protected left turn phasing. It is however noted that given the high east-west through volumes, long-term operations may be best improved with the widening of Woodmen Road from two to three through lanes in each direction.

The stop-controlled intersection of Mohawk Road with Access A is projected to have turning movement operations at LOS A for the morning peak traffic hour and LOS B or better for the afternoon peak traffic hour.

The stop-controlled intersection of Woodmen Road with Access B is projected to have turning movement operations at LOS B for the morning peak traffic hour and LOS F for the afternoon peak traffic hour. The LOS F operation is attributed to the high through traffic volumes along Woodmen Road and the stop-controlled nature of the intersection.

It is to be noted that it is not uncommon for unsignalized movements to or from an arterial roadway, in urban areas, to operate with noticeable delays during peak traffic hours. It is, however, likely that turn movements will operate better than the results obtained with this HCM Two Way Stop Control (TWSC) level of service analysis would indicate, as the HCM analysis may not accurately account for the effect of vehicle platooning and gaps caused by upstream signals. The upstream signal control at Woodmen Road and Mohawk Road will tend to create additional gaps in the traffic stream for turning movements at Access B and may provide mitigation to the LOS F operation projected during the afternoon peak traffic hour.

These intersection operations are similar to background conditions.

Queue Length Analysis

Queue lengths for proposed site accesses were analyzed using Year 2041 total traffic conditions. The analysis yields estimate of 95th percentile queue lengths, which have only a five percent probability of being exceeded during the analysis time period. Queue lengths were modeled and are included with the Synchro worksheets in Appendix C.

No significant queues at the proposed site accesses were indicated. The greatest on-site queue length anticipated occurs at Access B during the afternoon peak hour. The queue length is approximately one to two vehicles for the northbound right turn movement.

Auxiliary Lane Analysis

Auxiliary lanes for site development accesses are to be based on the City's Engineering Criteria Manual (Standards)³.

Considering development build-out, an evaluation of auxiliary lane requirements, pursuant to Section 8.0, Tables 2 and 3 of the City's Standards, reveals that right turn deceleration and acceleration lanes at Access B along Woodmen Road are required since the development's projected peak hour right turn ingress and egress volumes exceeds the City thresholds of 10 vehicles per hour.

³ Engineering Criteria Manual, Section III: Traffic Criteria Manual, City of Colorado Springs City Engineering, July 2010.

VII. Conclusion

This traffic impact study addressed the capacity, geometric, and control requirements associated with the development entitled Woodmen & Mohawk Residential. This proposed residential development consists of a multifamily housing subdivision. The development is located at the southwest corner of the intersections of E Woodmen Road with Mohawk Road in Colorado Springs, Colorado.

The study area examined in this analysis encompassed the E Woodmen Road intersections with Mohawk Road and Marksheffel Road, and proposed site accesses.

Analysis was conducted for critical AM Peak Hour and PM Peak Hour traffic operations for existing traffic conditions, Year 2023 and Year 2041 background traffic conditions, and Year 2023 and Year 2041 total traffic conditions.

Under existing conditions, operational analysis shows that the signalized intersection of Woodmen Road with Mohawk Road has overall operations at LOS A during both the morning and afternoon peak traffic hours. The signalized intersection of Woodmen Road with Marksheffel Road has overall operations at LOS D during both the morning and afternoon peak traffic hours.

Year 2023 background traffic analysis indicates that the signalized intersection of Woodmen Road with Mohawk Road has overall operations at LOS A during both the AM and PM peak traffic hours. The signalized intersection of Woodmen Road with Marksheffel Road has overall operations at LOS D during both the AM and PM peak traffic hours.

By Year 2041 and without the proposed development, the study intersection of Woodmen Road with Mohawk Road experiences LOS B operations during the AM peak traffic hour and LOS E operations during the PM peak traffic hour. The LOS E operation anticipated during the PM peak traffic period is primarily attributed to the eastbound left turning movement as well as the high eastbound through volumes. The study intersection of Woodmen Road with Marksheffel Road experiences LOS F operations during both the AM and PM peak traffic hours. The LOS F operations anticipated during both peak traffic periods are primarily attributed to the westbound and northbound left turning movements as well as the high westbound and eastbound through volumes. It is noted that given the high east-west through volumes, long-term operations along Woodmen Road may be best improved with the widening of Woodmen Road from two to three through lanes in each direction.

Analysis of future traffic conditions indicates that the addition of site-generated traffic is expected to create no negative impact to traffic operations for the existing and surrounding roadway system upon consideration of the various roadway and intersection control improvements assumed within this analysis. With all conservative assumptions defined in this analysis, the study intersections are projected to operate at future levels of service comparable to Year 2041 background traffic conditions. Proposed site accesses have long-term operations at LOS B or better during peak traffic periods and upon build-out. Exceptions include northbound right turning movement at Access B which operates at LOS F during the afternoon peak traffic hour. The LOS F operation is attributed to the high through traffic volumes along Woodmen Road and the stop-controlled nature of the intersection.

APPENDIX A

Traffic Count Data

LSC Transportation Consultants, Inc.
545 E Pikes Peak Ave, Suite 210
Colorado Springs, CO 80905
719-633-2868

File Name : Marksheffel Rd - Woodmen Rd AM 8-21 AM
Site Code : S214630
Start Date : 8/3/2021
Page No : 1

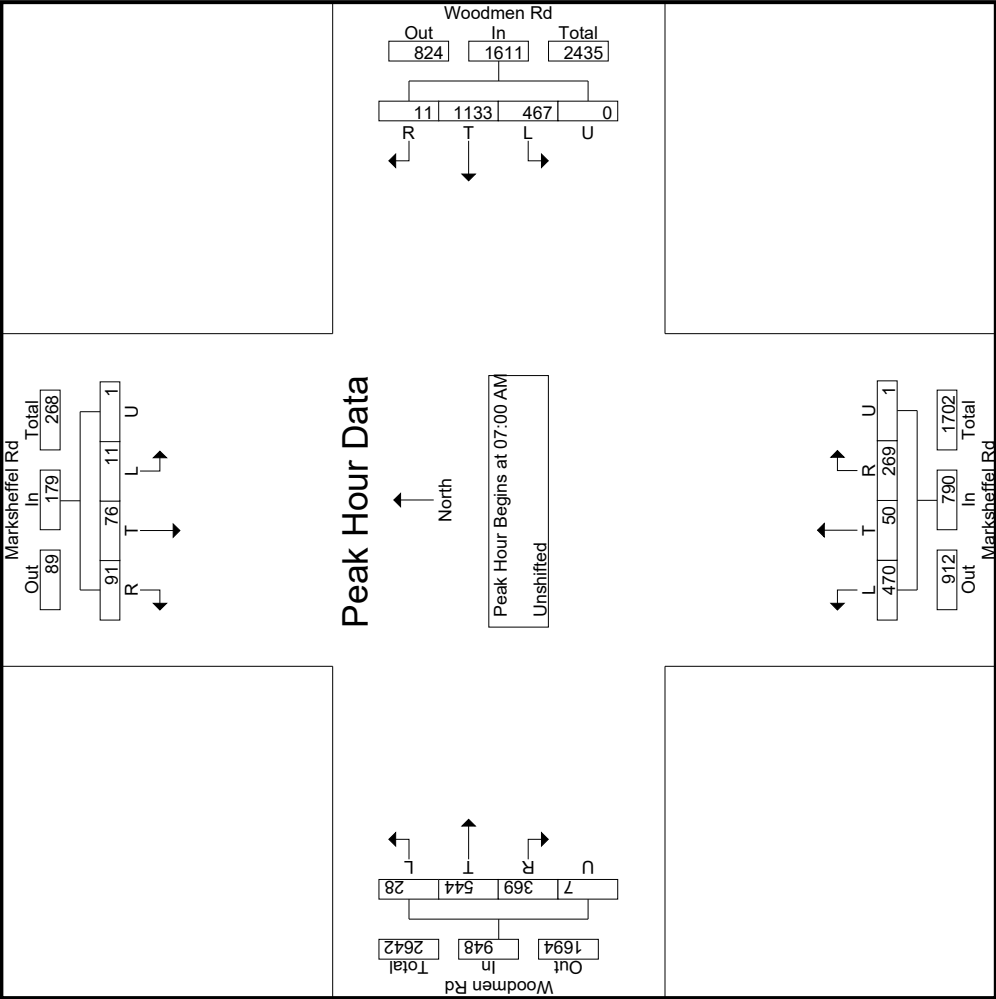
Groups Printed- Unshifted

	Marksheffel Rd Southbound					Woodmen Rd Westbound					Marksheffel Rd Northbound					Woodmen Rd Eastbound					
Start Time	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	Int. Total
06:30 AM	1	12	14	0	27	52	251	0	0	303	90	6	34	0	130	2	109	86	2	199	659
06:45 AM	2	9	15	0	26	65	213	3	0	281	124	11	56	0	191	10	148	81	1	240	738
Total	3	21	29	0	53	117	464	3	0	584	214	17	90	0	321	12	257	167	3	439	1397
07:00 AM	2	16	14	0	32	88	269	4	0	361	106	5	54	0	165	2	121	93	1	217	775
07:15 AM	4	28	15	1	48	119	302	4	0	425	114	11	76	0	201	7	125	90	0	222	896
07:30 AM	1	17	25	0	43	135	334	1	0	470	119	13	69	1	202	7	154	98	2	261	976
07:45 AM	4	15	37	0	56	125	228	2	0	355	131	21	70	0	222	12	144	88	4	248	881
Total	11	76	91	1	179	467	1133	11	0	1611	470	50	269	1	790	28	544	369	7	948	3528
08:00 AM	0	7	23	0	30	54	238	3	0	295	120	13	70	0	203	8	140	78	1	227	755
08:15 AM	2	3	19	0	24	79	213	1	0	293	115	20	56	0	191	9	112	65	2	188	696
Grand Total	16	107	162	1	286	717	2048	18	0	2783	919	100	485	1	1505	57	1053	679	13	1802	6376
Apprch %	5.6	37.4	56.6	0.3		25.8	73.6	0.6	0		61.1	6.6	32.2	0.1		3.2	58.4	37.7	0.7		
Total %	0.3	1.7	2.5	0	4.5	11.2	32.1	0.3	0	43.6	14.4	1.6	7.6	0	23.6	0.9	16.5	10.6	0.2	28.3	

LSC Transportation Consultants, Inc.
 545 E Pikes Peak Ave, Suite 210
 Colorado Springs, CO 80905
 719-633-2868

File Name : Marksheffel Rd - Woodmen Rd AM 8-21 AM
 Site Code : S214630
 Start Date : 8/3/2021
 Page No : 2

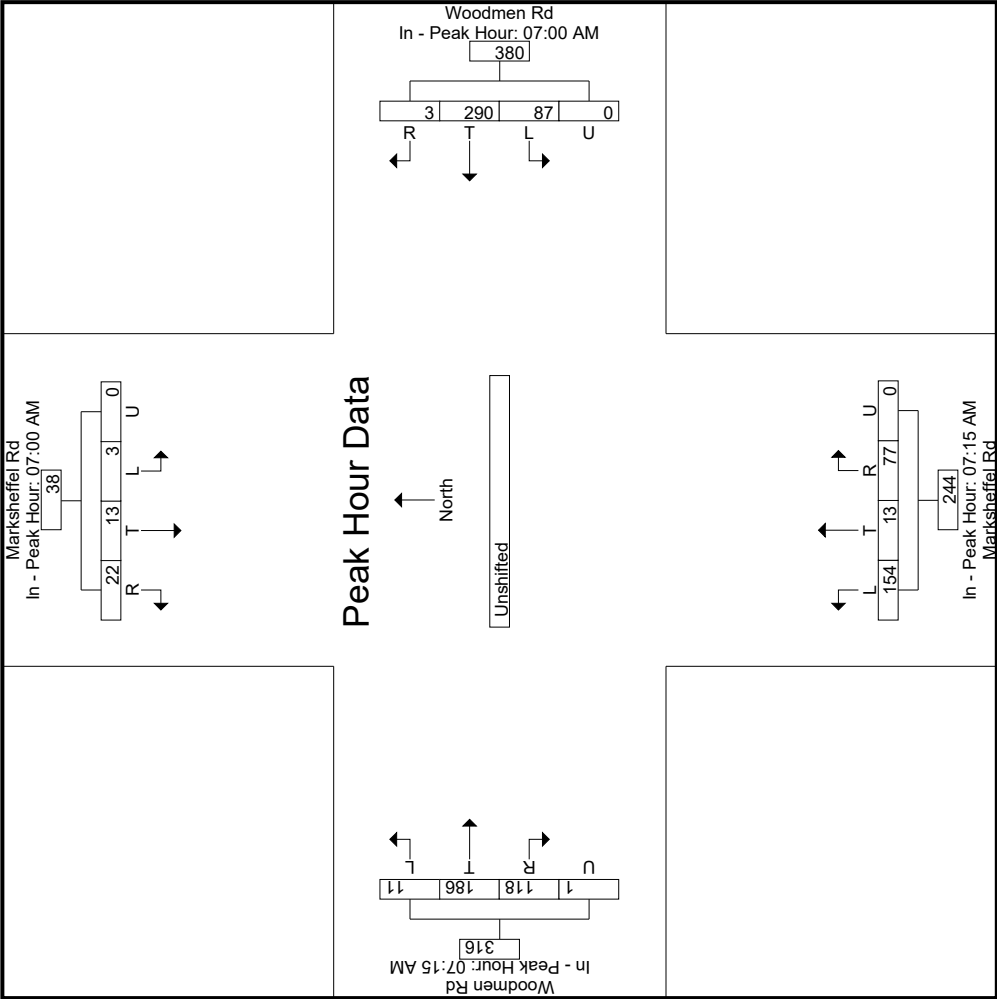
Start Time	Marksheffel Rd Southbound				Woodmen Rd Westbound				Marksheffel Rd Northbound				Woodmen Rd Eastbound			
	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 7:00:00 AM																
7:00:00 AM	2	16	14	0	32	88	269	4	0	361	106	5	54	0	165	
7:15:00 AM	4	28	15	1	48	119	302	4	0	425	114	11	76	0	201	
7:30:00 AM	1	17	25	0	43	135	334	1	0	470	119	13	69	1	202	
7:45:00 AM	4	15	37	0	56	125	228	2	0	355	131	21	70	0	222	
Total Volume	11	76	91	1	179	467	1133	11	0	1611	470	50	269	1	790	
% App. Total	6.1	42.5	50.8	0.6	.799	29	70.3	0.7	0		59.5	6.3	34.1	0.1		
PHF	.688	.679	.615	.250		.865	.848	.688	.000	.857	.897	.595	.885	.250	.890	
											.583	.883	.941	.438	.908	.904



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File Name : Marksheffel Rd - Woodmen Rd AM 8-21 AM
Site Code : S214630
Start Date : 8/3/2021
Page No : 4

	Marksheffel Rd Southbound					Woodmen Rd Westbound					Marksheffel Rd Northbound					Woodmen Rd Eastbound					
Start Time	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	7:00:00 AM					7:00:00 AM					7:15:00 AM					7:15:00 AM					
+0 mins.	2	16	14	0	32	88	269	4	0	361	114	11	76	0	201	7	125	90	0	222	
+5 mins.	4	28	15	1	48	119	302	4	0	425	119	13	69	1	202	7	154	98	2	261	
+10 mins.	1	17	25	0	43	135	334	1	0	470	131	21	70	0	222	12	144	88	4	248	
+15 mins.	4	15	37	0	56	125	228	2	0	355	120	13	70	0	203	8	140	78	1	227	
Total Volume	11	76	91	1	179	467	1133	11	0	1611	484	58	285	1	828	34	563	354	7	958	
% App. Total	6.1	42.5	50.8	0.6		29	70.3	0.7	0		58.5	7	34.4	0.1		3.5	58.8	37	0.7		
PHF	.688	.679	.615	.250	.799	.865	.848	.688	.000	.857	.924	.690	.938	.250	.932	.708	.914	.903	.438	.918	



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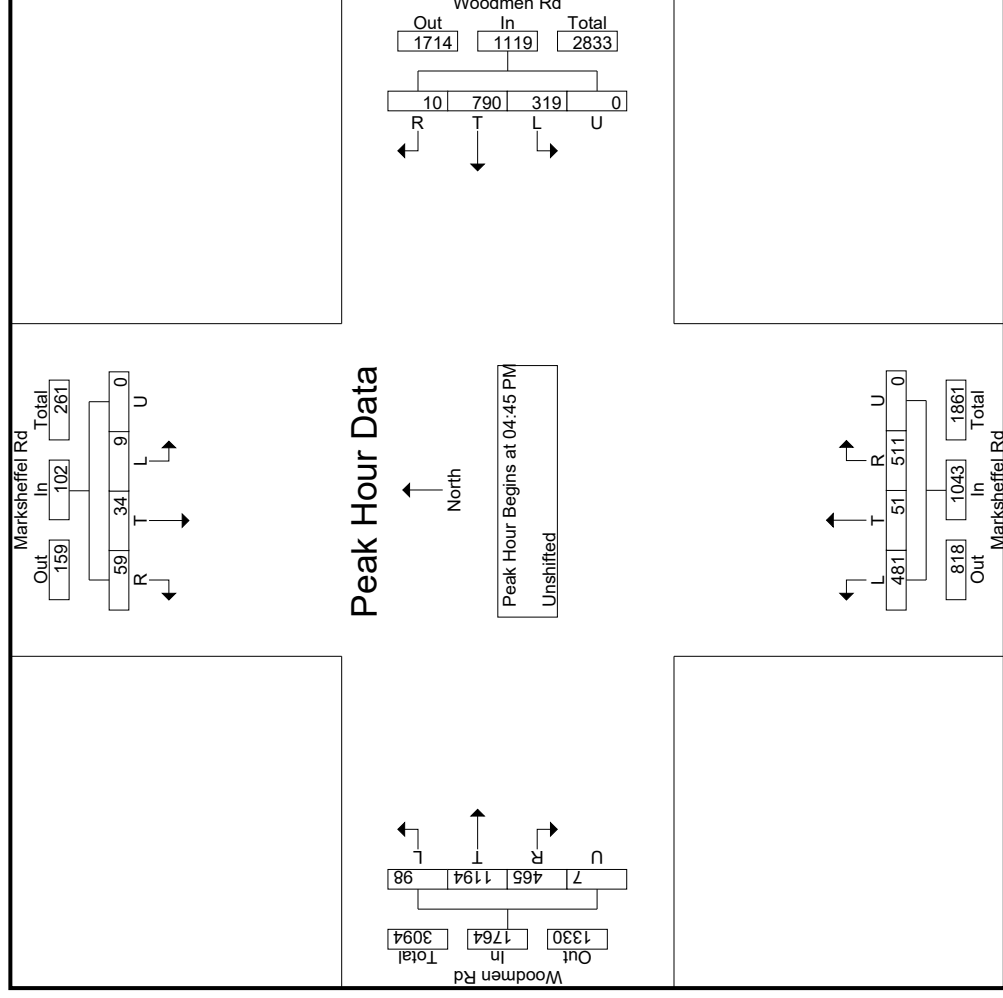
File Name : Marksheffel Rd - Woodmen Rd AM 8-21 PM
 Site Code : S214630
 Start Date : 8/3/2021
 Page No : 1

Groups Printed- Unshifted

Groups Limited - Unsignalized																						
Marksheffel Rd Southbound						Woodmen Rd Westbound						Marksheffel Rd Northbound						Woodmen Rd Eastbound				
Start Time	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	Int. Total	
	3	9	20	0	32	64	231	3	1	299	111	16	108	4	239	14	244	98	1	357	927	
	3	11	12	0	26	92	208	1	0	301	124	9	104	0	237	15	295	114	0	424	988	
	04:30 PM	2	2	10	0	14	135	206	0	0	341	94	22	89	0	205	10	308	111	0	429	989
	04:45 PM	2	10	17	0	29	65	179	3	0	247	143	17	141	0	301	16	278	94	2	390	967
	Total	10	32	59	0	101	356	824	7	1	1188	472	64	442	4	982	55	1125	417	3	1600	3871
05:00 PM	1	7	14	0	22	126	191	3	0	320	110	11	100	0	221	27	265	133	2	427	990	
05:15 PM	3	14	14	0	31	76	184	2	0	262	135	14	135	0	284	27	303	117	2	449	1026	
05:30 PM	3	3	14	0	20	52	236	2	0	290	93	9	135	0	237	28	348	121	1	498	1045	
05:45 PM	2	7	19	0	28	56	167	1	0	224	104	10	155	2	271	20	301	117	5	443	966	
Total	9	31	61	0	101	310	778	8	0	1096	442	44	525	2	1013	102	1217	488	10	1817	4027	
Grand Total	19	63	120	0	202	666	1602	15	1	2284	914	108	967	6	1995	157	2342	905	13	3417	7898	
Apprch %	9.4	31.2	59.4	0		29.2	70.1	0.7	0		45.8	5.4	48.5	0.3		4.6	68.5	26.5	0.4			
Total %	0.2	0.8	1.5	0	2.6	8.4	20.3	0.2	0	28.9	11.6	1.4	12.2	0.1	25.3	2	29.7	11.5	0.2	43.3		

719-633-2868

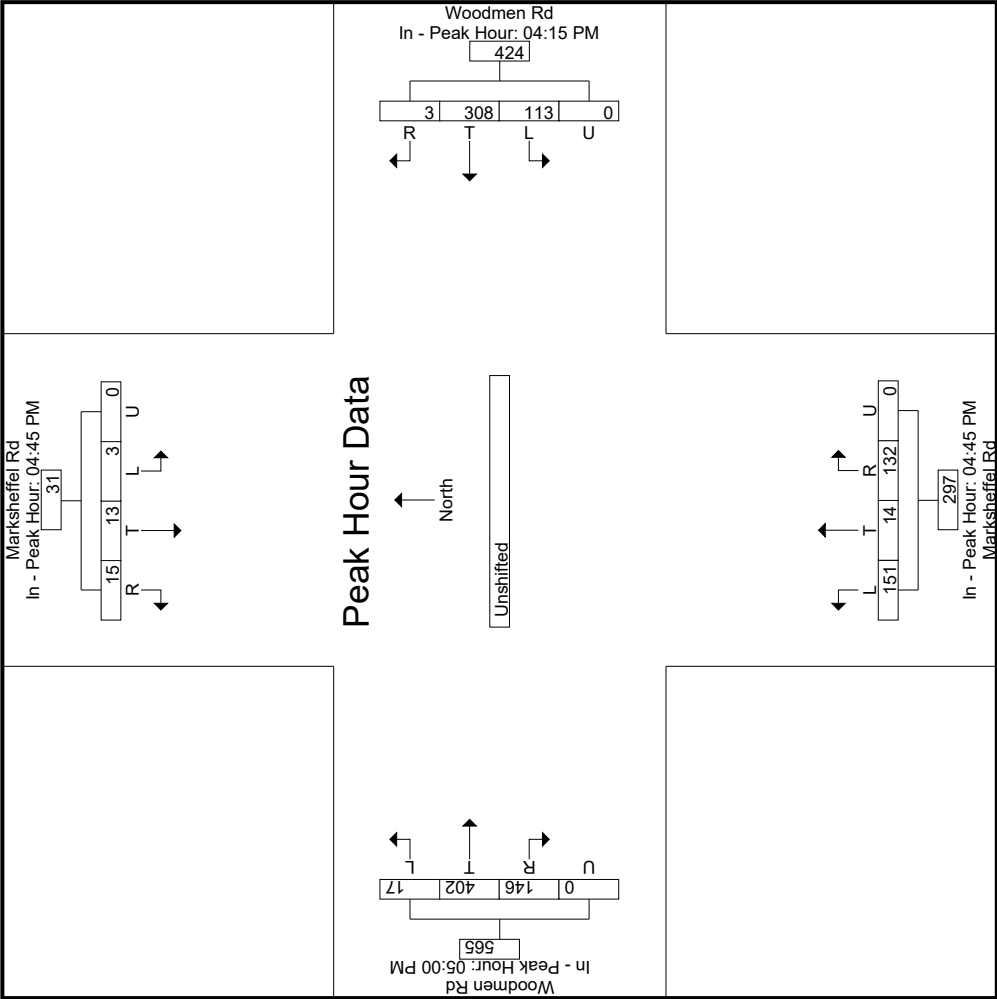
Page No : 3



719-633-2868

Page No : 4

Peak Hour for Each Approach Begins at:



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File Name : Mohawk Rd - Woodmen Rd AM
Site Code : S214630
Start Date : 7/22/2021
Page No : 1

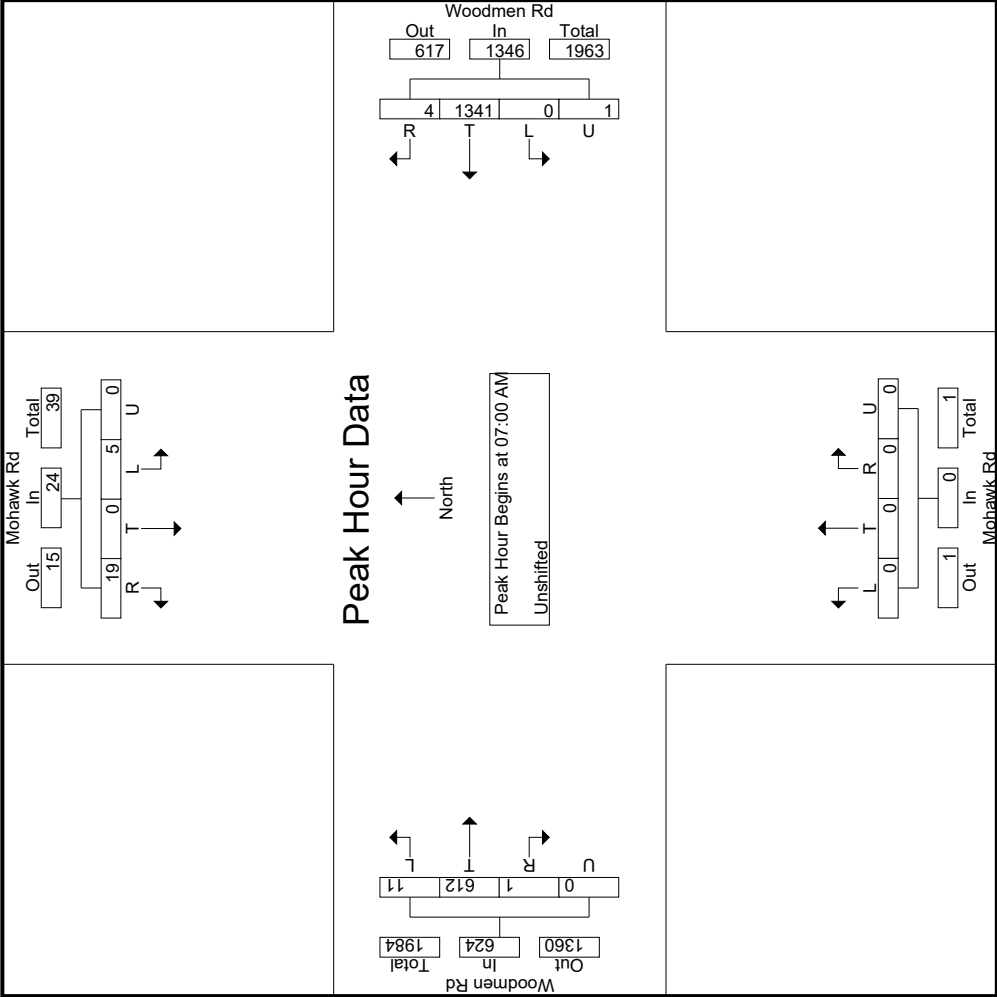
Groups Printed- Unshifted

Start Time	Mohawk Rd Southbound				Woodmen Rd Westbound				Mohawk Rd Northbound				Woodmen Rd Eastbound			
	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	Int. Total
06:30 AM	0	0	4	0	4	2	303	0	0	305	1	0	0	0	1	459
06:45 AM	1	0	0	0	1	0	278	3	1	282	1	0	0	0	1	451
Total	1	0	4	0	5	2	581	3	1	587	2	0	0	0	2	910
07:00 AM	1	0	2	0	3	0	320	2	0	322	0	0	0	0	0	444
07:15 AM	1	0	3	0	4	0	376	0	1	377	0	0	0	0	0	537
07:30 AM	0	0	10	0	10	0	360	1	0	361	0	0	0	0	0	529
07:45 AM	3	0	4	0	7	0	285	1	0	286	0	0	0	0	0	484
Total	5	0	19	0	24	0	1341	4	1	1346	0	0	0	0	0	1994
08:00 AM	1	0	1	0	2	0	258	1	0	259	0	0	0	0	0	441
08:15 AM	4	0	3	0	7	1	286	4	1	292	0	0	0	0	0	492
Grand Total	11	0	27	0	38	3	2466	12	3	2484	2	0	0	0	2	3837
Apprch %	28.9	0	71.1	0		0.1	99.3	0.5	0.1		100	0	0	0		
Total %	0.3	0	0.7	0	1	0.1	64.3	0.3	0.1	64.7	0.1	0	0	0	0.1	34.2

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File Name : Mohawk Rd - Woodmen Rd AM
 Site Code : S214630
 Start Date : 7/22/2021
 Page No : 2

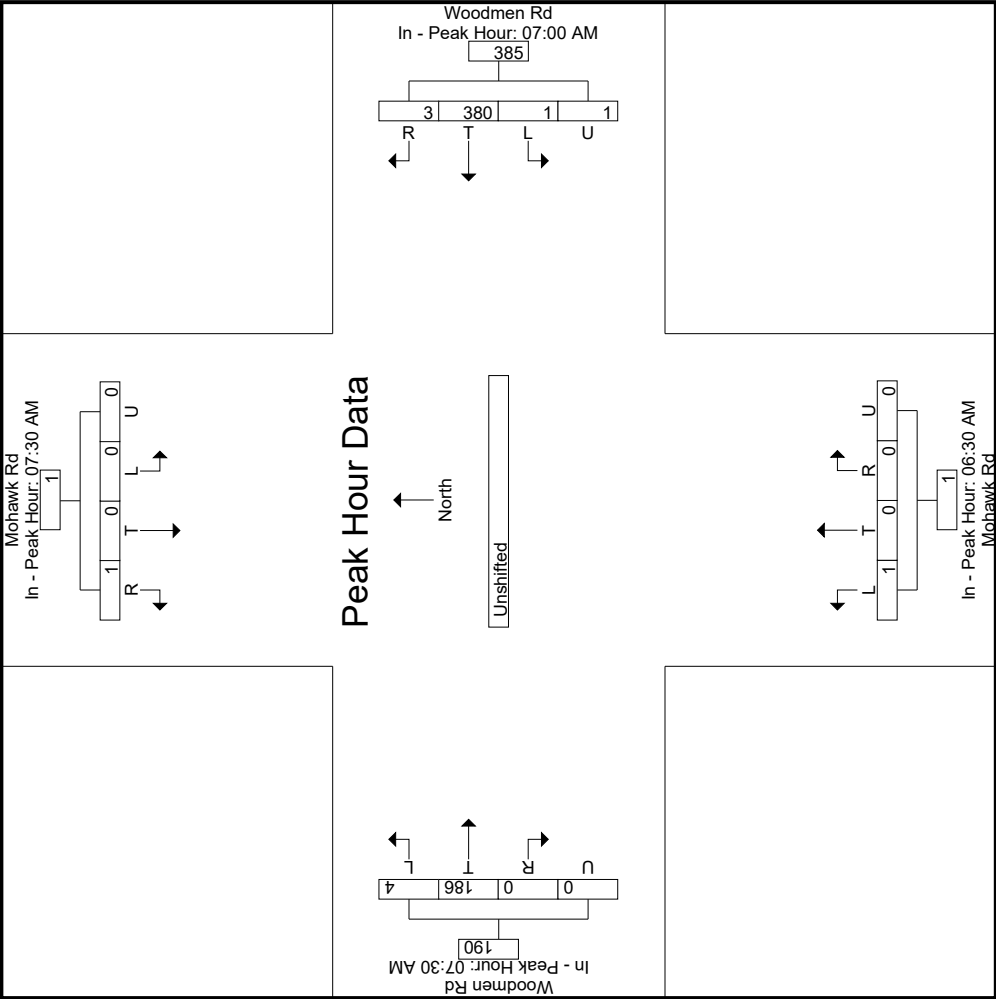
Start Time	Mohawk Rd Southbound				Woodmen Rd Westbound				Mohawk Rd Northbound				Woodmen Rd Eastbound			
	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 7:00:00 AM																
7:00:00 AM	1	0	2	0	3	0	320	2	0	322	0	0	0	0	0	444
7:15:00 AM	1	0	3	0	4	0	376	0	1	377	0	0	0	0	156	537
7:30:00 AM	0	0	10	0	10	0	360	1	0	361	0	0	0	0	158	529
7:45:00 AM	3	0	4	0	7	0	285	1	0	286	0	0	0	0	191	484
Total Volume	5	0	19	0	24	0	1341	4	1	1346	0	0	0	0	624	1994
% App. Total	20.8	0	79.2	0		0	99.6	0.3	0.1		0	0	0	0		
PHF	.417	.000	.475	.000	.600	.000	.892	.500	.250	.893	.000	.000	.000	.000	.817	.928



719-633-2868

Page No : 4

Peak Hour for Each Approach Begins at:



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File Name : Mohawk Rd - Woodmen Rd PM
 Site Code : S214630
 Start Date : 7/22/2021
 Page No : 1

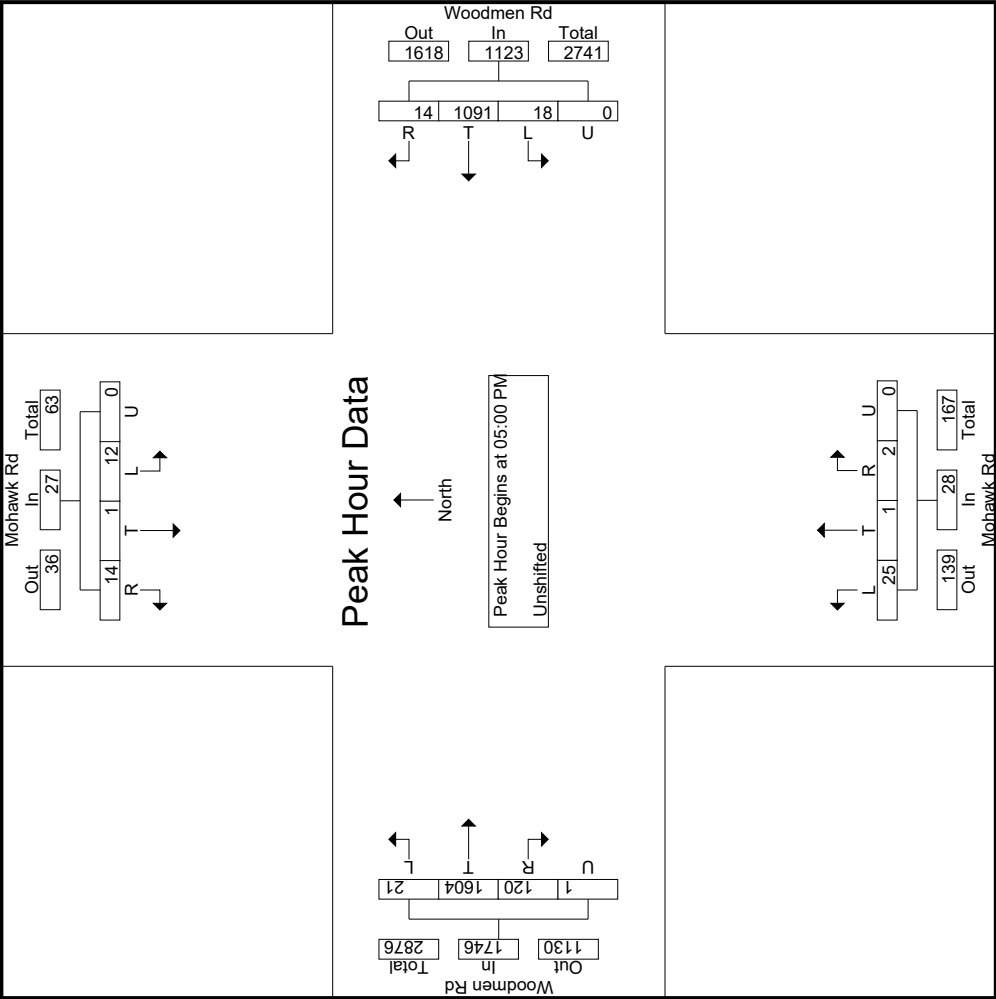
Groups Printed- Unshifted

Groups Limited - Uninsured																							
Mohawk Rd Southbound						Woodmen Rd Westbound						Mohawk Rd Northbound						Woodmen Rd Eastbound					
Start Time	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	Int. Total		
	3	0	4	0	7	2	295	2	0	299	6	0	0	0	6	10	347	32	0	389	701		
	6	1	7	0	14	6	266	3	1	276	14	0	5	0	19	6	327	39	0	372	681		
	1	1	2	0	4	2	324	5	0	331	6	1	1	0	8	6	389	6	0	401	744		
	6	0	3	0	9	1	250	0	0	251	3	0	2	0	5	6	337	5	1	349	614		
	16	2	16	0	34	11	1135	10	1	1157	29	1	8	0	38	28	1400	82	1	1511	2740		
05:00 PM	3	0	6	0	9	0	295	3	0	298	2	1	0	0	3	4	406	5	0	415	725		
05:15 PM	1	0	3	0	4	0	276	6	0	282	7	0	0	0	7	5	421	10	0	436	729		
05:30 PM	5	1	2	0	8	7	283	4	0	294	7	0	0	0	7	8	386	49	1	444	753		
05:45 PM	3	0	3	0	6	11	237	1	0	249	9	0	2	0	11	4	391	56	0	451	717		
Total	12	1	14	0	27	18	1091	14	0	1123	25	1	2	0	28	21	1604	120	1	1746	2924		
Grand Total	28	3	30	0	61	29	2226	24	1	2280	54	2	10	0	66	49	3004	202	2	3257	5664		
Apprch %	45.9	4.9	49.2	0		1.3	97.6	1.1	0		81.8	3	15.2	0		1.5	92.2	6.2	0.1				
Total %	0.5	0.1	0.5	0	1.1	0.5	39.3	0.4	0	40.3	1	0	0.2	0	1.2	0.9	53	3.6	0	57.5			

719-633-2868

Page No : 2

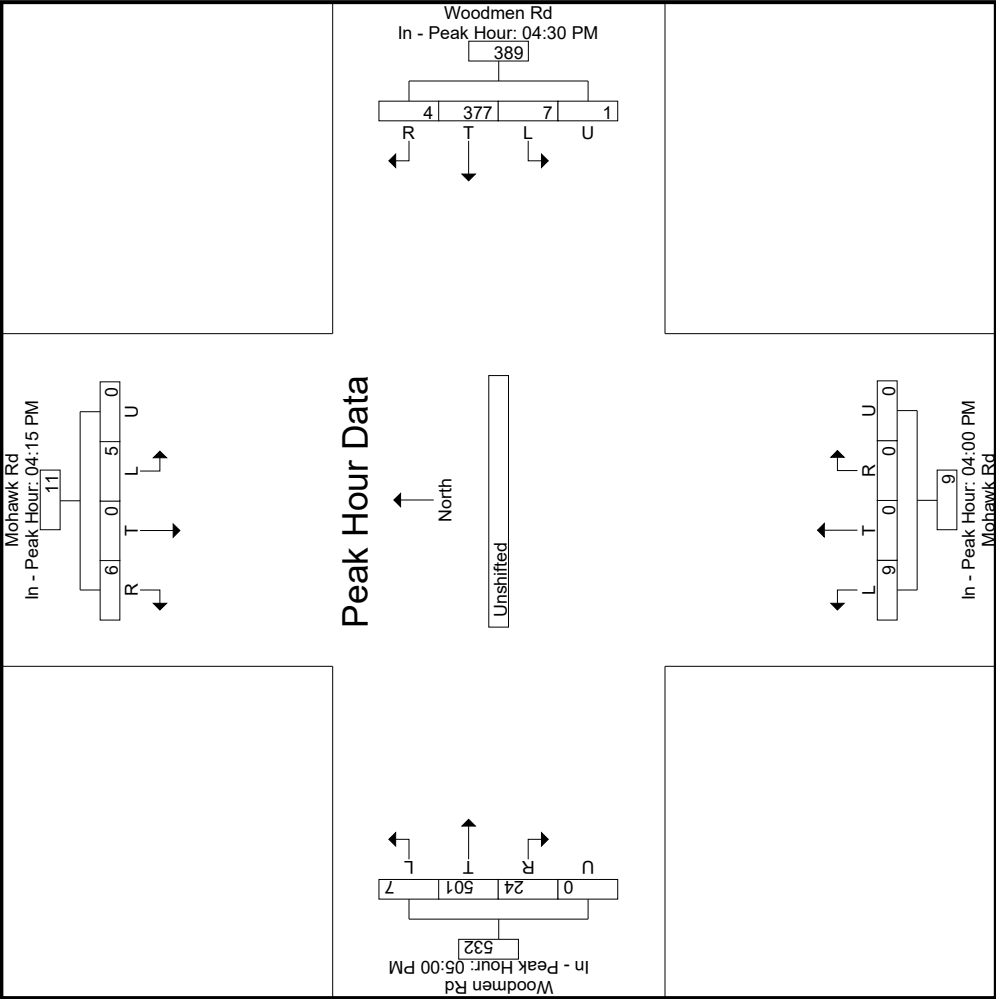
Start Time	Mohawk Rd Southbound				Woodmen Rd Westbound				Mohawk Rd Northbound				Woodmen Rd Eastbound			
	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	Int. Total
Peak Hour Analysis From 4:00:00 PM to 5:45:00 PM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 5:00:00 PM																
5:00:00 PM	3	0	6	0	9	0	295	3	0	298	2	1	0	0	3	
5:15:00 PM	1	0	3	0	4	0	276	6	0	282	7	0	0	0	7	725
5:30:00 PM	5	1	2	0	8	7	283	4	0	294	7	0	0	0	7	729
5:45:00 PM	3	0	3	0	6	11	237	1	0	249	9	0	2	0	11	753
Total Volume	12	1	14	0	27	18	1091	14	0	1123	25	1	2	0	28	717
% App. Total	44.4	3.7	51.9	0		1.6	97.2	1.2	0		89.3	3.6	7.1	0		2924
PHF	.600	.250	.583	.000	.750	.409	.925	.583	.000	.942	.694	.250	.250	.000	.636	.971
											.656	.952	.536	.250	.968	



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File Name : Mohawk Rd - Woodmen Rd PM
 Site Code : S214630
 Start Date : 7/22/2021
 Page No : 4

	Mohawk Rd Southbound					Woodmen Rd Westbound					Mohawk Rd Northbound					Woodmen Rd Eastbound					
Start Time	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	Int. Total
Peak Hour Analysis From 4:00:00 PM to 5:45:00 PM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	4:15:00 PM					4:30:00 PM					4:00:00 PM					5:00:00 PM					
+0 mins.	6	1	7	0	14	2	324	5	0	331	6	0	0	0	6	4	406	5	0	415	
+5 mins.	1	1	2	0	4	1	250	0	0	251	14	0	5	0	19	5	421	10	0	436	
+10 mins.	6	0	3	0	9	0	295	3	0	298	6	1	1	0	8	8	386	49	1	444	
+15 mins.	3	0	6	0	9	0	276	6	0	282	3	0	2	0	5	4	391	56	0	451	
Total Volume	16	2	18	0	36	3	1145	14	0	1162	29	1	8	0	38	21	1604	120	1	1746	
% App. Total	44.4	5.6	50	0		0.3	98.5	1.2	0		76.3	2.6	21.1	0		1.2	91.9	6.9	0.1		
PHF	.667	.500	.643	.000	.643	.375	.883	.583	.000	.878	.518	.250	.400	.000	.500	.656	.952	.536	.250	.968	



APPENDIX B

Level of Service Definitions

The following information can be found in the Highway Capacity Manual, Transportation Research Board, 2016: Chapter 19 – Signalized Intersections and Chapter 20 – Two-Way Stop Controlled Intersections.

Automobile Level of Service (LOS) for Signalized Intersections

Levels of service are defined to represent reasonable ranges in control delay.

LOS A

Describes operations with a control delay of 10 s/veh or less and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.

LOS B

Describes operations with control delay between 10 and 20 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.

LOS C

Describes operations with control delay between 20 and 35 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual *cycle failures* (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.

LOS D

Describes operations with control delay between 35 and 55 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.

LOS E

Describes operations with control delay between 55 and 80 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.

LOS F

Describes operations with control delay exceeding 80 s/veh or a volume-to-capacity ratio greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

Level of Service (LOS) for Unsignalized TWSC Intersections

Level of Service ($v/c \leq 1.0$)	Average Control Delay (s/veh)
A	0 - 10
B	> 10 - 15
C	> 15 - 25
D	> 25 - 35
E	> 35 - 50
F	> 50

APPENDIX C






















Capacity Worksheets

Timings

1: Mohawk Road & Woodmen Road

Existing Traffic Volumes

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	612	1	0	1341	4	0	0	0	5	0	19
Future Volume (vph)	11	612	1	0	1341	4	0	0	0	5	0	19
Satd. Flow (prot)	1770	3539	1583	1863	3539	1583	0	1863	0	1770	1583	0
Flt Permitted	0.172											
Satd. Flow (perm)	320	3539	1583	1863	3539	1583	0	1863	0	1863	1583	0
Satd. Flow (RTOR)			22			22					65	
Lane Group Flow (vph)	12	665	1	0	1458	4	0	0	0	5	21	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm				Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2		2	6		6	4			8		
Detector Phase	2	2	2	6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0		24.0	24.0	
Total Split (s)	75.0	75.0	75.0	75.0	75.0	75.0	25.0	25.0		25.0	25.0	
Total Split (%)	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	25.0%	25.0%		25.0%	25.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0		5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effect Green (s)	92.9	92.9	92.9		92.9	92.9				6.0	6.0	
Actuated g/C Ratio	0.93	0.93	0.93		0.93	0.93				0.06	0.06	
v/c Ratio	0.04	0.20	0.00		0.44	0.00				0.04	0.13	
Control Delay	1.2	0.7	0.0		1.8	0.0				44.8	1.8	
Queue Delay	0.0	0.0	0.0		0.0	0.0				0.0	0.0	
Total Delay	1.2	0.7	0.0		1.8	0.0				44.8	1.8	
LOS	A	A	A		A	A				D	A	
Approach Delay		0.7			1.8						10.1	
Approach LOS		A			A						B	
Queue Length 50th (ft)	0	0	0		0	0				3	0	
Queue Length 95th (ft)	m1	23	m0		136	0				15	0	
Internal Link Dist (ft)		873			747			700			747	
Turn Bay Length (ft)	460		400			375				35		
Base Capacity (vph)	297	3289	1473		3289	1473				372	368	
Starvation Cap Reductn	0	0	0		0	0				0	0	
Spillback Cap Reductn	0	0	0		0	0				0	0	
Storage Cap Reductn	0	0	0		0	0				0	0	
Reduced v/c Ratio	0.04	0.20	0.00		0.44	0.00				0.01	0.06	
Intersection Summary												
Cycle Length: 100												
Actuated Cycle Length: 100												
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 60												
Control Type: Actuated-Coordinated												

Timings 1: Mohawk Road & Woodmen Road

Existing Traffic Volumes
AM Peak Hour

Maximum v/c Ratio: 0.44

Intersection Signal Delay: 1.5

Intersection LOS: A





Intersection Capacity Utilization 50.4%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 1: Mohawk Road & Woodmen Road

























 Ø2 (R)	 Ø4
75 s	25 s
 Ø5 (R)	 Ø8
75 s	25 s

Timings

2: Marksheffel Road & Woodmen Road

Existing Traffic Volumes

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	544	369	467	1133	11	470	50	269	11	76	91
Future Volume (vph)	28	544	369	467	1133	11	470	50	269	11	76	91
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	1863	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.491			0.722		
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	915	1863	1583	1345	3539	1583
Satd. Flow (RTOR)			401			196			292			251
Lane Group Flow (vph)	30	591	401	508	1232	12	511	54	292	12	83	99
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6	4		4	8		8
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	24.0	24.0	10.0	24.0	24.0	10.0	24.0	24.0	10.0	24.0	24.0
Total Split (s)	10.0	30.0	30.0	25.0	45.0	45.0	20.0	35.0	35.0	10.0	25.0	25.0
Total Split (%)	10.0%	30.0%	30.0%	25.0%	45.0%	45.0%	20.0%	35.0%	35.0%	10.0%	25.0%	25.0%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effect Green (s)	7.2	35.5	35.5	19.7	52.4	52.4	28.7	25.7	25.7	13.7	7.7	7.7
Actuated g/C Ratio	0.07	0.36	0.36	0.20	0.52	0.52	0.29	0.26	0.26	0.14	0.08	0.08
v/c Ratio	0.23	0.47	0.49	0.75	0.66	0.01	1.31	0.11	0.47	0.06	0.30	0.28
Control Delay	47.6	27.5	5.1	43.3	21.7	0.0	186.5	30.3	6.7	26.6	46.1	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.6	27.5	5.1	43.3	21.7	0.0	186.5	30.3	6.7	26.6	46.1	2.0
LOS	D	C	A	D	C	A	F	C	A	C	D	A
Approach Delay		19.3			27.8			115.4			22.4	
Approach LOS		B			C			F			C	
Queue Length 50th (ft)	18	151	0	158	316	0	~335	26	0	5	26	0
Queue Length 95th (ft)	47	225	69	202	466	m0	#609	63	70	19	50	0
Internal Link Dist (ft)		873			747			805			348	
Turn Bay Length (ft)	480		370	450		340	280		195	240		160
Base Capacity (vph)	128	1257	820	728	1853	922	391	540	666	205	672	504
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.47	0.49	0.70	0.66	0.01	1.31	0.10	0.44	0.06	0.12	0.20

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Timings

2: Marksheffel Road & Woodmen Road

Existing Traffic Volumes

AM Peak Hour

Maximum v/c Ratio: 1.31

Intersection Signal Delay: 44.9

Intersection LOS: D

Intersection Capacity Utilization 82.4%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

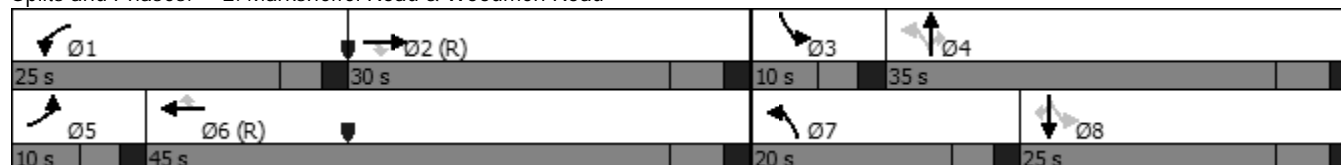
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

Splits and Phases: 2: Marksheffel Road & Woodmen Road
























Timings

1: Mohawk Road & Woodmen Road

Existing Traffic Volumes

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	1604	120	18	1094	14	25	1	2	12	1	14
Future Volume (vph)	21	1604	120	18	1094	14	25	1	2	12	1	14
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	0	1767	0	1770	1600	0
Flt Permitted	0.231			0.121				0.736		0.738		
Satd. Flow (perm)	430	3539	1583	225	3539	1583	0	1359	0	1375	1600	0
Satd. Flow (RTOR)			130			18		2			15	
Lane Group Flow (vph)	23	1743	130	20	1189	15	0	30	0	13	16	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2		2	6		6	4			8		
Detector Phase	2	2	2	6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0		24.0	24.0	
Total Split (s)	95.0	95.0	95.0	95.0	95.0	95.0	25.0	25.0		25.0	25.0	
Total Split (%)	79.2%	79.2%	79.2%	79.2%	79.2%	79.2%	20.8%	20.8%		20.8%	20.8%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0		5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effect Green (s)	107.9	107.9	107.9	107.9	107.9	107.9		7.9		7.7	7.7	
Actuated g/C Ratio	0.90	0.90	0.90	0.90	0.90	0.90		0.07		0.06	0.06	
v/c Ratio	0.06	0.55	0.09	0.10	0.37	0.01		0.33		0.15	0.14	
Control Delay	1.7	3.3	0.3	3.0	2.1	0.7		59.7		55.3	26.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	1.7	3.3	0.3	3.0	2.1	0.7		59.7		55.3	26.3	
LOS	A	A	A	A	A	A		E		E	C	
Approach Delay		3.1			2.1			59.7			39.3	
Approach LOS		A			A			E			D	
Queue Length 50th (ft)	1	78	0	2	83	0		21		10	1	
Queue Length 95th (ft)	m3	186	m0	8	126	3		52		30	23	
Internal Link Dist (ft)		873			747			700			747	
Turn Bay Length (ft)	460		400	460		375				35		
Base Capacity (vph)	386	3182	1436	202	3182	1425		228		229	279	
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	0.06	0.55	0.09	0.10	0.37	0.01		0.13		0.06	0.06	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 60												
Control Type: Actuated-Coordinated												

Timings

1: Mohawk Road & Woodmen Road

Existing Traffic Volumes

PM Peak Hour

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 3.6

Intersection LOS: A





Intersection Capacity Utilization 61.7%

ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 1: Mohawk Road & Woodmen Road

























 Ø2 (L)	 Ø4
95 s	25 s
 Ø5 (R)	 Ø8
95 s	25 s

Timings

2: Marksheffel Road & Woodmen Road

Existing Traffic Volumes

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	1194	465	319	790	30	481	51	511	9	34	59
Future Volume (vph)	98	1194	465	319	790	30	481	51	511	9	34	59
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	1863	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.502			0.721		
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	935	1863	1583	1343	3539	1583
Satd. Flow (RTOR)			505			164			340			164
Lane Group Flow (vph)	107	1298	505	347	859	33	523	55	555	10	37	64
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6	4		4	8		8
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	24.0	24.0	10.0	24.0	24.0	10.0	24.0	24.0	10.0	24.0	24.0
Total Split (s)	20.0	50.0	50.0	20.0	50.0	50.0	25.0	40.0	40.0	10.0	25.0	25.0
Total Split (%)	16.7%	41.7%	41.7%	16.7%	41.7%	41.7%	20.8%	33.3%	33.3%	8.3%	20.8%	20.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effect Green (s)	12.1	54.8	54.8	16.3	59.1	59.1	32.9	29.9	29.9	13.9	9.2	9.2
Actuated g/C Ratio	0.10	0.46	0.46	0.14	0.49	0.49	0.27	0.25	0.25	0.12	0.08	0.08
v/c Ratio	0.60	0.80	0.51	0.75	0.49	0.04	1.32	0.12	0.86	0.06	0.14	0.24
Control Delay	65.5	34.4	4.2	58.7	29.2	0.1	197.1	33.5	29.5	29.7	50.3	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.5	34.4	4.2	58.7	29.2	0.1	197.1	33.5	29.5	29.7	50.3	2.0
LOS	E	C	A	E	C	A	F	C	C	C	D	A
Approach Delay		28.2			36.7			107.1			20.6	
Approach LOS		C			D			F			C	
Queue Length 50th (ft)	80	452	0	133	251	0	-444	32	168	6	14	0
Queue Length 95th (ft)	138	#688	72	#207	406	1	#663	65	320	17	29	0
Internal Link Dist (ft)		873			747			805			348	
Turn Bay Length (ft)	480		370	450		340	280		195	240		160
Base Capacity (vph)	221	1617	997	475	1741	862	395	527	692	173	560	388
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.80	0.51	0.73	0.49	0.04	1.32	0.10	0.80	0.06	0.07	0.16

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Timings

2: Marksheffel Road & Woodmen Road

Existing Traffic Volumes

PM Peak Hour

Maximum v/c Ratio: 1.32

Intersection Signal Delay: 50.7

Intersection LOS: D

Intersection Capacity Utilization 89.6%

ICU Level of Service E

Analysis Period (min) 15









~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: Marksheffel Road & Woodmen Road






















 Ø1	 Ø2 (R)	 Ø3	 Ø4
20 s	50 s	10 s	40 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
20 s	50 s	25 s	25 s

Timings

1: Mohawk Road & Woodmen Road

Background Traffic Volumes

AM Peak Hour - Year 2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	637	1	0	1395	4	0	0	0	5	0	20
Future Volume (vph)	11	637	1	0	1395	4	0	0	0	5	0	20
Satd. Flow (prot)	1770	3539	1583	1863	3539	1583	0	1863	0	1770	1583	0
Flt Permitted	0.159											
Satd. Flow (perm)	296	3539	1583	1863	3539	1583	0	1863	0	1863	1583	0
Satd. Flow (RTOR)			22			22					58	
Lane Group Flow (vph)	12	692	1	0	1516	4	0	0	0	5	22	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm				Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2		2	6		6	4			8		
Detector Phase	2	2	2	6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0		24.0	24.0	
Total Split (s)	75.0	75.0	75.0	75.0	75.0	75.0	25.0	25.0		25.0	25.0	
Total Split (%)	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	25.0%	25.0%		25.0%	25.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0		5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effect Green (s)	89.6	89.6	89.6		89.6	89.6				6.0	6.0	
Actuated g/C Ratio	0.90	0.90	0.90		0.90	0.90				0.06	0.06	
v/c Ratio	0.05	0.22	0.00		0.48	0.00				0.04	0.15	
Control Delay	1.4	1.0	0.0		2.4	0.0				44.8	2.1	
Queue Delay	0.0	0.0	0.0		0.0	0.0				0.0	0.0	
Total Delay	1.4	1.0	0.0		2.4	0.0				44.8	2.1	
LOS	A	A	A		A	A				D	A	
Approach Delay		1.0			2.4						10.0	
Approach LOS		A			A						B	
Queue Length 50th (ft)	1	22	0		105	0				3	0	
Queue Length 95th (ft)	m1	24	m0		145	0				15	2	
Internal Link Dist (ft)		873			747			700			747	
Turn Bay Length (ft)	460		400			375				35		
Base Capacity (vph)	265	3170	1420		3170	1420				372	363	
Starvation Cap Reductn	0	0	0		0	0				0	0	
Spillback Cap Reductn	0	0	0		0	0				0	0	
Storage Cap Reductn	0	0	0		0	0				0	0	
Reduced v/c Ratio	0.05	0.22	0.00		0.48	0.00				0.01	0.06	
Intersection Summary												
Cycle Length: 100												
Actuated Cycle Length: 100												
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 60												
Control Type: Actuated-Coordinated												

Timings

1: Mohawk Road & Woodmen Road

Background Traffic Volumes

AM Peak Hour - Year 2023

Maximum v/c Ratio: 0.48

Intersection Signal Delay: 2.0

Intersection LOS: A





Intersection Capacity Utilization 51.9%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 1: Mohawk Road & Woodmen Road

























 Ø2 (L)		 Ø4
75 s		25 s
 Ø5 (R)		 Ø8
75 s		25 s

Timings

2: Marksheffel Road & Woodmen Road

Background Traffic Volumes

AM Peak Hour - Year 2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	566	384	486	1178	11	489	52	280	11	79	95
Future Volume (vph)	29	566	384	486	1178	11	489	52	280	11	79	95
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	1863	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.490			0.720		
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	913	1863	1583	1341	3539	1583
Satd. Flow (RTOR)			417			196			304			251
Lane Group Flow (vph)	32	615	417	528	1280	12	532	57	304	12	86	103
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6	4		4	8		8
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	24.0	24.0	10.0	24.0	24.0	10.0	24.0	24.0	10.0	24.0	24.0
Total Split (s)	10.0	30.0	30.0	25.0	45.0	45.0	20.0	35.0	35.0	10.0	25.0	25.0
Total Split (%)	10.0%	30.0%	30.0%	25.0%	45.0%	45.0%	20.0%	35.0%	35.0%	10.0%	25.0%	25.0%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effect Green (s)	7.3	34.8	34.8	20.4	52.2	52.2	28.8	25.8	25.8	13.8	7.8	7.8
Actuated g/C Ratio	0.07	0.35	0.35	0.20	0.52	0.52	0.29	0.26	0.26	0.14	0.08	0.08
v/c Ratio	0.25	0.50	0.51	0.75	0.69	0.01	1.36	0.12	0.48	0.06	0.31	0.29
Control Delay	47.7	28.5	5.2	42.4	22.7	0.0	207.5	30.3	6.7	26.5	46.1	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	28.5	5.2	42.4	22.7	0.0	207.5	30.3	6.7	26.5	46.1	2.1
LOS	D	C	A	D	C	A	F	C	A	C	D	A
Approach Delay		20.0			28.3			127.9			22.4	
Approach LOS		B			C			F			C	
Queue Length 50th (ft)	20	161	0	163	364	0	~362	27	0	5	27	0
Queue Length 95th (ft)	48	238	72	208	498	m0	#639	66	70	18	51	0
Internal Link Dist (ft)		873			747			805			348	
Turn Bay Length (ft)	480		370	450		340	280		195	240		160
Base Capacity (vph)	129	1230	822	740	1846	919	391	540	674	206	672	504
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.50	0.51	0.71	0.69	0.01	1.36	0.11	0.45	0.06	0.13	0.20

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Timings

2: Marksheffel Road & Woodmen Road

Background Traffic Volumes

AM Peak Hour - Year 2023

Maximum v/c Ratio: 1.36

Intersection Signal Delay: 48.1

Intersection LOS: D

Intersection Capacity Utilization 84.7%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

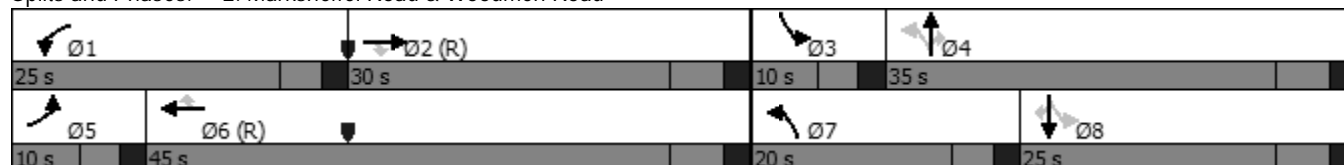
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

Splits and Phases: 2: Marksheffel Road & Woodmen Road
























Timings

1: Mohawk Road & Woodmen Road

Background Traffic Volumes

PM Peak Hour - Year 2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	1668	125	19	1135	15	26	1	2	13	1	15
Future Volume (vph)	22	1668	125	19	1135	15	26	1	2	13	1	15
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	0	1767	0	1770	1600	0
Flt Permitted	0.219			0.110				0.734		0.737		
Satd. Flow (perm)	408	3539	1583	205	3539	1583	0	1355	0	1373	1600	0
Satd. Flow (RTOR)			136			18		2			16	
Lane Group Flow (vph)	24	1813	136	21	1234	16	0	31	0	14	17	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2		2	6		6	4			8		
Detector Phase	2	2	2	6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0		24.0	24.0	
Total Split (s)	95.0	95.0	95.0	95.0	95.0	95.0	25.0	25.0		25.0	25.0	
Total Split (%)	79.2%	79.2%	79.2%	79.2%	79.2%	79.2%	20.8%	20.8%		20.8%	20.8%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0		5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effect Green (s)	107.8	107.8	107.8	107.8	107.8	107.8		8.0		7.8	7.8	
Actuated g/C Ratio	0.90	0.90	0.90	0.90	0.90	0.90		0.07		0.06	0.06	
v/c Ratio	0.07	0.57	0.09	0.11	0.39	0.01		0.34		0.16	0.14	
Control Delay	1.9	4.4	0.4	3.4	2.2	0.8		60.0		55.5	25.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	1.9	4.4	0.4	3.4	2.2	0.8		60.0		55.5	25.6	
LOS	A	A	A	A	A	A		E		E	C	
Approach Delay		4.1			2.2			60.0			39.1	
Approach LOS		A			A			E			D	
Queue Length 50th (ft)	1	82	0	2	88	0		22		10	1	
Queue Length 95th (ft)	m3	230	m0	9	134	3		54		32	24	
Internal Link Dist (ft)		873			747			700			747	
Turn Bay Length (ft)	460		400	460		375				35		
Base Capacity (vph)	366	3180	1436	184	3180	1424		227		228	280	
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	0.07	0.57	0.09	0.11	0.39	0.01		0.14		0.06	0.06	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 65												
Control Type: Actuated-Coordinated												

Timings

1: Mohawk Road & Woodmen Road

Background Traffic Volumes

PM Peak Hour - Year 2023

Maximum v/c Ratio: 0.57

Intersection Signal Delay: 4.2

Intersection LOS: A





Intersection Capacity Utilization 63.6%

ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 1: Mohawk Road & Woodmen Road

























 Ø2 (L)	 Ø4
95 s	25 s
 Ø5 (R)	 Ø8
95 s	25 s

Timings

2: Marksheffel Road & Woodmen Road

Background Traffic Volumes

PM Peak Hour - Year 2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	1242	484	332	822	31	500	53	531	9	35	61
Future Volume (vph)	102	1242	484	332	822	31	500	53	531	9	35	61
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	1863	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.508			0.719		
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	946	1863	1583	1339	3539	1583
Satd. Flow (RTOR)			526			164			339			164
Lane Group Flow (vph)	111	1350	526	361	893	34	543	58	577	10	38	66
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6	4		4	8		8
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	24.0	24.0	10.0	24.0	24.0	10.0	24.0	24.0	10.0	24.0	24.0
Total Split (s)	20.0	50.0	50.0	20.0	50.0	50.0	25.0	40.0	40.0	10.0	25.0	25.0
Total Split (%)	16.7%	41.7%	41.7%	16.7%	41.7%	41.7%	20.8%	33.3%	33.3%	8.3%	20.8%	20.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effect Green (s)	12.3	53.9	53.9	16.7	58.3	58.3	33.4	30.4	30.4	14.4	9.7	9.7
Actuated g/C Ratio	0.10	0.45	0.45	0.14	0.49	0.49	0.28	0.25	0.25	0.12	0.08	0.08
v/c Ratio	0.62	0.85	0.53	0.75	0.52	0.04	1.36	0.12	0.88	0.06	0.13	0.24
Control Delay	65.9	37.5	4.3	58.5	30.6	0.1	209.4	33.1	33.1	29.1	49.5	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.9	37.5	4.3	58.5	30.6	0.1	209.4	33.1	33.1	29.1	49.5	2.0
LOS	E	D	A	E	C	A	F	C	C	C	D	A
Approach Delay		30.3			37.6			114.4			20.2	
Approach LOS		C			D			F			C	
Queue Length 50th (ft)	83	486	0	138	270	0	-474	34	192	6	15	0
Queue Length 95th (ft)	142	#733	75	#220	428	1	#696	68	#392	17	30	0
Internal Link Dist (ft)		873			747			805			348	
Turn Bay Length (ft)	480		370	450		340	280		195	240		160
Base Capacity (vph)	221	1588	1000	486	1720	853	400	534	696	178	560	388
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.85	0.53	0.74	0.52	0.04	1.36	0.11	0.83	0.06	0.07	0.17

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Timings

2: Marksheffel Road & Woodmen Road

Background Traffic Volumes

PM Peak Hour - Year 2023

Maximum v/c Ratio: 1.36

Intersection Signal Delay: 53.8

Intersection LOS: D

Intersection Capacity Utilization 92.3%

ICU Level of Service F

Analysis Period (min) 15









~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: Marksheffel Road & Woodmen Road






















 Ø1	 Ø2 (R)	 Ø3	 Ø4
20 s	50 s	10 s	40 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
20 s	50 s	25 s	25 s

Timings

1: Mohawk Road & Woodmen Road

Background Traffic Volumes

AM Peak Hour - Year 2041

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	1110	2	0	2299	57	0	0	0	85	0	125
Future Volume (vph)	81	1110	2	0	2299	57	0	0	0	85	0	125
Satd. Flow (prot)	1770	3539	1583	1863	3539	1583	0	1863	0	1770	1583	0
Flt Permitted	0.052									0.757		
Satd. Flow (perm)	97	3539	1583	1863	3539	1583	0	1863	0	1410	1583	0
Satd. Flow (RTOR)			22			62					33	
Lane Group Flow (vph)	88	1207	2	0	2499	62	0	0	0	92	136	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm				Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2		2	6		6	4			8		
Detector Phase	2	2	2	6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0		24.0	24.0	
Total Split (s)	76.0	76.0	76.0	76.0	76.0	76.0	24.0	24.0		24.0	24.0	
Total Split (%)	76.0%	76.0%	76.0%	76.0%	76.0%	76.0%	24.0%	24.0%		24.0%	24.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0		5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effect Green (s)	77.0	77.0	77.0		77.0	77.0				12.0	12.0	
Actuated g/C Ratio	0.77	0.77	0.77		0.77	0.77				0.12	0.12	
v/c Ratio	1.19	0.44	0.00		0.92	0.05				0.54	0.62	
Control Delay	161.2	8.0	0.5		17.3	1.2				52.3	43.1	
Queue Delay	0.0	0.0	0.0		0.0	0.0				0.0	0.0	
Total Delay	161.2	8.0	0.5		17.3	1.2				52.3	43.1	
LOS	F	A	A		B	A				D	D	
Approach Delay		18.4			16.9						46.8	
Approach LOS		B			B						D	
Queue Length 50th (ft)	~64	191	0		527	0				56	63	
Queue Length 95th (ft)	m#86	m189	m0		#1003	10				101	118	
Internal Link Dist (ft)		873			747			700			747	
Turn Bay Length (ft)	460		400			375				35		
Base Capacity (vph)	74	2723	1223		2723	1232				267	327	
Starvation Cap Reductn	0	0	0		0	0				0	0	
Spillback Cap Reductn	0	0	0		0	0				0	0	
Storage Cap Reductn	0	0	0		0	0				0	0	
Reduced v/c Ratio	1.19	0.44	0.00		0.92	0.05				0.34	0.42	
Intersection Summary												
Cycle Length: 100												
Actuated Cycle Length: 100												
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 140												
Control Type: Actuated-Coordinated												

Timings

1: Mohawk Road & Woodmen Road

Background Traffic Volumes

AM Peak Hour - Year 2041

Maximum v/c Ratio: 1.19

Intersection Signal Delay: 19.0

Intersection LOS: B

Intersection Capacity Utilization 84.2%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.





Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

Splits and Phases: 1: Mohawk Road & Woodmen Road

























 Ø2 (L)	 Ø4
76 s	24 s
 Ø5 (R)	 Ø8
76 s	24 s

Timings

2: Marksheffel Road & Woodmen Road

Background Traffic Volumes

AM Peak Hour - Year 2041

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	1072	554	701	2083	17	705	75	404	17	114	137
Future Volume (vph)	42	1072	554	701	2083	17	705	75	404	17	114	137
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	1863	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.495			0.704		
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	922	1863	1583	1311	3539	1583
Satd. Flow (RTOR)			495			196			296			251
Lane Group Flow (vph)	46	1165	602	762	2264	18	766	82	439	18	124	149
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6	4		4	8		8
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	24.0	24.0	10.0	24.0	24.0	10.0	24.0	24.0	10.0	24.0	24.0
Total Split (s)	10.0	40.0	40.0	18.0	48.0	48.0	18.0	32.0	32.0	10.0	24.0	24.0
Total Split (%)	10.0%	40.0%	40.0%	18.0%	48.0%	48.0%	18.0%	32.0%	32.0%	10.0%	24.0%	24.0%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effect Green (s)	7.0	34.0	34.0	20.1	49.2	49.2	29.9	24.9	24.9	16.9	10.9	10.9
Actuated g/C Ratio	0.07	0.34	0.34	0.20	0.49	0.49	0.30	0.25	0.25	0.17	0.11	0.11
v/c Ratio	0.37	0.97	0.70	1.11	1.30	0.02	1.98	0.18	0.71	0.07	0.32	0.38
Control Delay	53.9	52.7	10.3	97.2	165.5	0.0	475.9	30.8	18.3	24.0	41.9	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.9	52.7	10.3	97.2	165.5	0.0	475.9	30.8	18.3	24.0	41.9	2.7
LOS	D	D	B	F	F	A	F	C	B	C	D	A
Approach Delay		38.6			147.4			291.4			20.7	
Approach LOS		D			F			F			C	
Queue Length 50th (ft)	28	381	48	~244	~1018	0	~777	40	75	8	40	0
Queue Length 95th (ft)	#77	#526	173	m#432	#1240	m0	#946	79	193	22	62	0
Internal Link Dist (ft)		873			747			805			348	
Turn Bay Length (ft)	480		370	450		340	280		195	240		160
Base Capacity (vph)	123	1203	864	688	1740	877	386	487	632	245	637	490
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.97	0.70	1.11	1.30	0.02	1.98	0.17	0.69	0.07	0.19	0.30

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Timings

2: Marksheffel Road & Woodmen Road

Background Traffic Volumes

AM Peak Hour - Year 2041

Maximum v/c Ratio: 1.98

Intersection Signal Delay: 139.9

Intersection LOS: F

Intersection Capacity Utilization 121.6%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

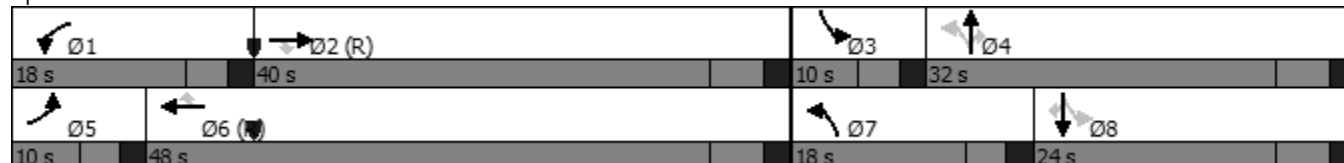
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

Splits and Phases: 2: Marksheffel Road & Woodmen Road
























Timings

1: Mohawk Road & Woodmen Road

Background Traffic Volumes

PM Peak Hour - Year 2041

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	168	2813	180	27	1944	129	38	2	3	100	2	123
Future Volume (vph)	168	2813	180	27	1944	129	38	2	3	100	2	123
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	0	1767	0	1770	1587	0
Flt Permitted	0.058			0.042				0.487		0.770		
Satd. Flow (perm)	108	3539	1583	78	3539	1583	0	899	0	1434	1587	0
Satd. Flow (RTOR)			196			140		2			24	
Lane Group Flow (vph)	183	3058	196	29	2113	140	0	46	0	109	136	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2		2	6		6	4			8		
Detector Phase	2	2	2	6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0		24.0	24.0	
Total Split (s)	96.0	96.0	96.0	96.0	96.0	96.0	24.0	24.0		24.0	24.0	
Total Split (%)	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	20.0%	20.0%		20.0%	20.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0		5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effect Green (s)	94.8	94.8	94.8	94.8	94.8	94.8		14.2		14.2	14.2	
Actuated g/C Ratio	0.79	0.79	0.79	0.79	0.79	0.79		0.12		0.12	0.12	
v/c Ratio	2.15	1.09	0.15	0.48	0.76	0.11		0.43		0.64	0.65	
Control Delay	542.4	67.2	1.3	36.3	9.4	0.8		58.3		67.2	55.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	542.4	67.2	1.3	36.3	9.4	0.8		58.3		67.2	55.7	
LOS	F	E	A	D	A	A		E		E	E	
Approach Delay		88.7			9.2			58.3			60.8	
Approach LOS		F			A			E			E	
Queue Length 50th (ft)	~201	~946	8	6	374	0		32		82	84	
Queue Length 95th (ft)	m#127	m262	m2	#66	558	14		69		138	146	
Internal Link Dist (ft)		873			747			700			747	
Turn Bay Length (ft)	460		400	460		375				35		
Base Capacity (vph)	85	2796	1292	61	2796	1280		144		227	271	
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	2.15	1.09	0.15	0.48	0.76	0.11		0.32		0.48	0.50	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 150												
Control Type: Actuated-Coordinated												

Timings

1: Mohawk Road & Woodmen Road

Background Traffic Volumes

PM Peak Hour - Year 2041

Maximum v/c Ratio: 2.15

Intersection Signal Delay: 57.2

Intersection LOS: E

Intersection Capacity Utilization 112.1%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.





Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

Splits and Phases: 1: Mohawk Road & Woodmen Road

























 Ø2 (L) 96 s	 Ø4 24 s
 Ø6 (R) 96 s	 Ø8 24 s

Timings

2: Marksheffel Road & Woodmen Road

Background Traffic Volumes

PM Peak Hour - Year 2041

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	147	2334	698	479	1594	45	722	77	767	14	51	89
Future Volume (vph)	147	2334	698	479	1594	45	722	77	767	14	51	89
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	1863	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.595			0.702		
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	1108	1863	1583	1308	3539	1583
Satd. Flow (RTOR)			476			164			196			164
Lane Group Flow (vph)	160	2537	759	521	1733	49	785	84	834	15	55	97
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6	4		4	8		8
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	24.0	24.0	10.0	24.0	24.0	10.0	24.0	24.0	10.0	24.0	24.0
Total Split (s)	12.0	58.0	58.0	16.0	62.0	62.0	19.0	36.0	36.0	10.0	27.0	27.0
Total Split (%)	10.0%	48.3%	48.3%	13.3%	51.7%	51.7%	15.8%	30.0%	30.0%	8.3%	22.5%	22.5%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effect Green (s)	7.0	52.0	52.0	11.0	56.0	56.0	41.0	36.0	36.0	27.0	21.0	21.0
Actuated g/C Ratio	0.06	0.43	0.43	0.09	0.47	0.47	0.34	0.30	0.30	0.22	0.18	0.18
v/c Ratio	1.55	1.65	0.79	1.66	1.05	0.06	1.73	0.15	1.36	0.05	0.09	0.24
Control Delay	328.2	324.4	17.5	338.3	73.4	0.1	362.6	33.5	201.0	27.6	42.0	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	328.2	324.4	17.5	338.3	73.4	0.1	362.6	33.5	201.0	27.6	42.0	1.5
LOS	F	F	B	F	E	A	F	C	F	C	D	A
Approach Delay		257.2			131.8			267.2			17.2	
Approach LOS		F			F			F			B	
Queue Length 50th (ft)	~175	~1501	196	~304	~758	0	~898	45	~710	8	18	0
Queue Length 95th (ft)	#315	#1633	387	#413	#925	m0	#1136	95	#1040	23	38	2
Internal Link Dist (ft)		873			747			805			348	
Turn Bay Length (ft)	480		370	450		340	280		195	240		160
Base Capacity (vph)	103	1533	955	314	1651	826	455	559	612	313	619	412
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.55	1.65	0.79	1.66	1.05	0.06	1.73	0.15	1.36	0.05	0.09	0.24

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Timings

2: Marksheffel Road & Woodmen Road

Background Traffic Volumes

PM Peak Hour - Year 2041

Maximum v/c Ratio: 1.73

Intersection Signal Delay: 216.3

Intersection LOS: F

Intersection Capacity Utilization 139.0%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.









Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

Splits and Phases: 2: Marksheffel Road & Woodmen Road






















 Ø1 16 s		 Ø2 (R) 58 s		 Ø3 10 s		 Ø4 36 s	
 Ø5 12 s		 Ø6 (R) 62 s		 Ø7 19 s		 Ø8 27 s	

Timings

1: Mohawk Road & Woodmen Road

Total Traffic Volumes

AM Peak Hour - Year 2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	671	11	16	1395	4	120	0	18	5	0	20
Future Volume (vph)	11	671	11	16	1395	4	120	0	18	5	0	20
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	0	1752	0	1770	1583	0
Flt Permitted	0.139			0.371				0.739		0.773		
Satd. Flow (perm)	259	3539	1583	691	3539	1583	0	1352	0	1440	1583	0
Satd. Flow (RTOR)			22			22		33			58	
Lane Group Flow (vph)	12	729	12	17	1516	4	0	150	0	5	22	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2		2	6		6	4			8		
Detector Phase	2	2	2	6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0		24.0	24.0	
Total Split (s)	75.0	75.0	75.0	75.0	75.0	75.0	25.0	25.0		25.0	25.0	
Total Split (%)	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	25.0%	25.0%		25.0%	25.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0		5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effect Green (s)	75.1	75.1	75.1	75.1	75.1	75.1		13.9		13.9	13.9	
Actuated g/C Ratio	0.75	0.75	0.75	0.75	0.75	0.75		0.14		0.14	0.14	
v/c Ratio	0.06	0.27	0.01	0.03	0.57	0.00		0.70		0.03	0.08	
Control Delay	4.3	3.1	0.7	4.5	7.1	0.0		47.9		34.0	0.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	4.3	3.1	0.7	4.5	7.1	0.0		47.9		34.0	0.6	
LOS	A	A	A	A	A	A		D		C	A	
Approach Delay		3.1			7.0			47.9			6.8	
Approach LOS		A			A			D			A	
Queue Length 50th (ft)	1	32	0	2	185	0		72		3	0	
Queue Length 95th (ft)	m3	81	m1	10	302	0		131		13	2	
Internal Link Dist (ft)		873			747			700			747	
Turn Bay Length (ft)	460		400	460		375				35		
Base Capacity (vph)	194	2658	1194	518	2658	1194		296		288	363	
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	0.06	0.27	0.01	0.03	0.57	0.00		0.51		0.02	0.06	
Intersection Summary												
Cycle Length: 100												
Actuated Cycle Length: 100												
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 60												
Control Type: Actuated-Coordinated												

Timings

1: Mohawk Road & Woodmen Road

Total Traffic Volumes

AM Peak Hour - Year 2023

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 8.3

Intersection LOS: A





Intersection Capacity Utilization 62.1%

ICU Level of Service B

Analysis Period (min) 15

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

























Splits and Phases: 1: Mohawk Road & Woodmen Road

 Ø2 (L)		 Ø4
75 s		25 s
 Ø5 (L)		 Ø8
75 s		25 s

Timings

2: Marksheffel Road & Woodmen Road

Total Traffic Volumes
AM Peak Hour - Year 2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	592	384	520	1264	11	489	52	290	11	79	95
Future Volume (vph)	29	592	384	520	1264	11	489	52	290	11	79	95
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	1863	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.490			0.720		
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	913	1863	1583	1341	3539	1583
Satd. Flow (RTOR)			417			196			315			251
Lane Group Flow (vph)	32	643	417	565	1374	12	532	57	315	12	86	103
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6	4		4	8		8
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	24.0	24.0	10.0	24.0	24.0	10.0	24.0	24.0	10.0	24.0	24.0
Total Split (s)	10.0	30.0	30.0	25.0	45.0	45.0	20.0	35.0	35.0	10.0	25.0	25.0
Total Split (%)	10.0%	30.0%	30.0%	25.0%	45.0%	45.0%	20.0%	35.0%	35.0%	10.0%	25.0%	25.0%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effect Green (s)	7.3	33.4	33.4	21.8	52.2	52.2	28.8	25.8	25.8	13.8	7.8	7.8
Actuated g/C Ratio	0.07	0.33	0.33	0.22	0.52	0.52	0.29	0.26	0.26	0.14	0.08	0.08
v/c Ratio	0.25	0.54	0.52	0.76	0.74	0.01	1.36	0.12	0.49	0.06	0.31	0.29
Control Delay	47.7	30.3	5.5	37.9	23.6	0.0	207.5	30.3	6.8	26.5	46.1	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	30.3	5.5	37.9	23.6	0.0	207.5	30.3	6.8	26.5	46.1	2.1
LOS	D	C	A	D	C	A	F	C	A	C	D	A
Approach Delay		21.4			27.6			126.4			22.4	
Approach LOS		C			C			F			C	
Queue Length 50th (ft)	20	174	0	176	416	0	~362	27	0	5	27	0
Queue Length 95th (ft)	48	257	75	206	#577	m0	#639	66	72	18	51	0
Internal Link Dist (ft)		873			747			805			348	
Turn Bay Length (ft)	480		370	450		340	280		195	240		160
Base Capacity (vph)	129	1181	806	771	1846	919	391	540	682	206	672	504
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.54	0.52	0.73	0.74	0.01	1.36	0.11	0.46	0.06	0.13	0.20

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Timings

2: Marksheffel Road & Woodmen Road

Total Traffic Volumes

AM Peak Hour - Year 2023

Maximum v/c Ratio: 1.36

Intersection Signal Delay: 47.2

Intersection LOS: D

Intersection Capacity Utilization 87.0%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

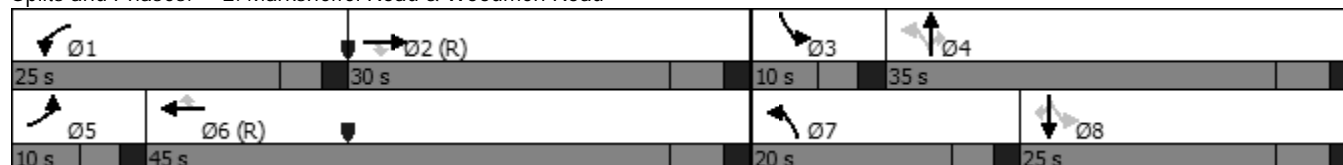
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.




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

Splits and Phases: 2: Marksheffel Road & Woodmen Road



HCM 6th TWSC 3: Mohawk Road & Access A

Total Traffic Volumes
AM Peak Hour - Year 2023

Intersection						
Int Delay, s/veh	7.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	138	0	0	0	1	26
Future Vol, veh/h	138	0	0	0	1	26
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, %	2	2	2	2	2	2
Mvmt Flow	150	0	0	0	1	28

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	15	15	29	0	-	0
Stage 1	15	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	1004	1065	1584	-	-	-
Stage 1	1008	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1004	1065	1584	-	-	-
Mov Cap-2 Maneuver	1004	-	-	-	-	-
Stage 1	1008	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1584	-	1004	-	-
HCM Lane V/C Ratio	-	-	0.149	-	-
HCM Control Delay (s)	0	-	9.2	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

HCM 6th TWSC
4: Access B & Woodmen Road

Total Traffic Volumes
AM Peak Hour - Year 2023






















Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗		↑↑		↗
Traffic Vol, veh/h	659	26	0	1535	0	34
Future Vol, veh/h	659	26	0	1535	0	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	500	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	716	28	0	1668	0	37
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	358
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	638
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	638
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		11	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	638	-	-	-		
HCM Lane V/C Ratio	0.058	-	-	-		
HCM Control Delay (s)	11	-	-	-		
HCM Lane LOS	B	-	-	-		
HCM 95th %tile Q(veh)	0.2	-	-	-		

Timings

1: Mohawk Road & Woodmen Road

Total Traffic Volumes

PM Peak Hour - Year 2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	1688	159	71	1135	15	97	1	12	13	1	15
Future Volume (vph)	22	1688	159	71	1135	15	97	1	12	13	1	15
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	0	1758	0	1770	1600	0
Flt Permitted	0.206			0.092				0.739		0.778		
Satd. Flow (perm)	384	3539	1583	171	3539	1583	0	1356	0	1449	1600	0
Satd. Flow (RTOR)			173			18		4			16	
Lane Group Flow (vph)	24	1835	173	77	1234	16	0	119	0	14	17	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2		2	6		6	4			8		
Detector Phase	2	2	2	6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0		24.0	24.0	
Total Split (s)	95.0	95.0	95.0	95.0	95.0	95.0	25.0	25.0		25.0	25.0	
Total Split (%)	79.2%	79.2%	79.2%	79.2%	79.2%	79.2%	20.8%	20.8%		20.8%	20.8%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0		5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effect Green (s)	94.0	94.0	94.0	94.0	94.0	94.0		15.0		15.0	15.0	
Actuated g/C Ratio	0.78	0.78	0.78	0.78	0.78	0.78		0.12		0.12	0.12	
v/c Ratio	0.08	0.66	0.14	0.58	0.45	0.01		0.69		0.08	0.08	
Control Delay	3.7	7.8	0.5	27.8	5.3	1.5		68.0		44.8	20.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	3.7	7.8	0.5	27.8	5.3	1.5		68.0		44.8	20.2	
LOS	A	A	A	C	A	A		E		D	C	
Approach Delay		7.1			6.5			68.0			31.3	
Approach LOS		A			A			E			C	
Queue Length 50th (ft)	3	202	0	20	141	0		86		10	1	
Queue Length 95th (ft)	m3	m294	m0	#123	211	5		145		29	22	
Internal Link Dist (ft)		873			747			700			747	
Turn Bay Length (ft)	460		400	460		375				35		
Base Capacity (vph)	300	2772	1277	133	2772	1243		229		241	280	
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	0.08	0.66	0.14	0.58	0.45	0.01		0.52		0.06	0.06	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 65												
Control Type: Actuated-Coordinated												

Timings

1: Mohawk Road & Woodmen Road

Total Traffic Volumes

PM Peak Hour - Year 2023

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 9.2

Intersection LOS: A

Intersection Capacity Utilization 77.8%

ICU Level of Service D





Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

























Splits and Phases: 1: Mohawk Road & Woodmen Road

 Ø2 (L)	 Ø4
95 s	25 s
 Ø6 (R)	 Ø8
95 s	25 s

Timings

2: Marksheffel Road & Woodmen Road

Total Traffic Volumes
PM Peak Hour - Year 2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	1328	484	352	873	31	500	53	565	9	35	61
Future Volume (vph)	102	1328	484	352	873	31	500	53	565	9	35	61
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	1863	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.524			0.719		
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	976	1863	1583	1339	3539	1583
Satd. Flow (RTOR)			519			164			338			164
Lane Group Flow (vph)	111	1443	526	383	949	34	543	58	614	10	38	66
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6	4		4	8		8
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	24.0	24.0	10.0	24.0	24.0	10.0	24.0	24.0	10.0	24.0	24.0
Total Split (s)	20.0	50.0	50.0	20.0	50.0	50.0	25.0	40.0	40.0	10.0	25.0	25.0
Total Split (%)	16.7%	41.7%	41.7%	16.7%	41.7%	41.7%	20.8%	33.3%	33.3%	8.3%	20.8%	20.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effect Green (s)	12.3	52.0	52.0	17.2	57.0	57.0	34.7	31.7	31.7	15.7	11.0	11.0
Actuated g/C Ratio	0.10	0.43	0.43	0.14	0.48	0.48	0.29	0.26	0.26	0.13	0.09	0.09
v/c Ratio	0.62	0.94	0.54	0.78	0.56	0.04	1.31	0.12	0.92	0.05	0.12	0.22
Control Delay	65.9	46.9	4.7	57.6	36.8	0.1	189.9	31.9	38.8	27.9	47.8	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.9	46.9	4.7	57.6	36.8	0.1	189.9	31.9	38.8	27.9	47.8	1.8
LOS	E	D	A	E	D	A	F	C	D	C	D	A
Approach Delay		37.2			41.7			106.0			19.4	
Approach LOS		D			D			F			B	
Queue Length 50th (ft)	83	578	3	146	350	0	-433	33	226	6	14	0
Queue Length 95th (ft)	142	#812	81	#241	455	m0	#691	68	#457	17	30	0
Internal Link Dist (ft)		873			747			805			348	
Turn Bay Length (ft)	480		370	450		340	280		195	240		160
Base Capacity (vph)	221	1534	980	493	1681	838	414	547	704	193	560	388
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.94	0.54	0.78	0.56	0.04	1.31	0.11	0.87	0.05	0.07	0.17

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Timings

2: Marksheffel Road & Woodmen Road

Total Traffic Volumes

PM Peak Hour - Year 2023

Maximum v/c Ratio: 1.31

Intersection Signal Delay: 55.6

Intersection LOS: E

Intersection Capacity Utilization 95.3%

ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

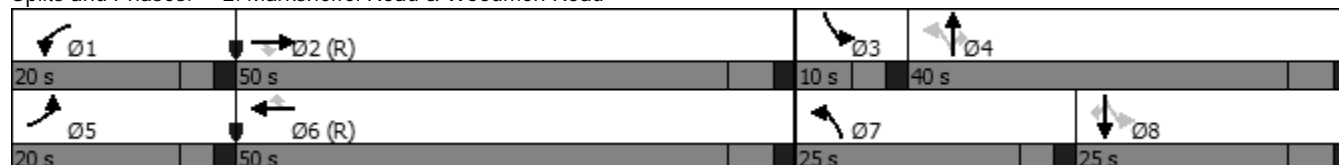
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.




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

Splits and Phases: 2: Marksheffel Road & Woodmen Road



HCM 6th TWSC 3: Mohawk Road & Access A

Total Traffic Volumes
PM Peak Hour - Year 2023

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	81	0	0	29	145	86
Future Vol, veh/h	81	0	0	29	145	86
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, %	2	2	2	2	2	2
Mvmt Flow	88	0	0	32	158	93

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	237	205	251	0	-	0
Stage 1	205	-	-	-	-	-
Stage 2	32	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	814	907	1330	-	-	-
Stage 1	867	-	-	-	-	-
Stage 2	991	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	814	907	1330	-	-	-
Mov Cap-2 Maneuver	814	-	-	-	-	-
Stage 1	867	-	-	-	-	-
Stage 2	991	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1330	-	814	-	-
HCM Lane V/C Ratio	-	-	0.108	-	-
HCM Control Delay (s)	0	-	10	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

HCM 6th TWSC
4: Access B & Woodmen Road

Total Traffic Volumes
PM Peak Hour - Year 2023






















Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗		↑↑		↗
Traffic Vol, veh/h	1849	86	0	1247	0	20
Future Vol, veh/h	1849	86	0	1247	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	500	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2010	93	0	1355	0	22
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1005
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	240
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	240
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		21.5	
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	240	-	-	-		
HCM Lane V/C Ratio	0.091	-	-	-		
HCM Control Delay (s)	21.5	-	-	-		
HCM Lane LOS	C	-	-	-		
HCM 95th %tile Q(veh)	0.3	-	-	-		

Timings

1: Mohawk Road & Woodmen Road

Total Traffic Volumes

AM Peak Hour - Year 2041

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	1144	12	16	2299	57	120	0	18	85	0	125
Future Volume (vph)	81	1144	12	16	2299	57	120	0	18	85	0	125
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	0	1752	0	1770	1583	0
Flt Permitted	0.054			0.198				0.575		0.763		
Satd. Flow (perm)	101	3539	1583	369	3539	1583	0	1052	0	1421	1583	0
Satd. Flow (RTOR)			22			62		33			33	
Lane Group Flow (vph)	88	1243	13	17	2499	62	0	150	0	92	136	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2		2	6		6	4			8		
Detector Phase	2	2	2	6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0		24.0	24.0	
Total Split (s)	76.0	76.0	76.0	76.0	76.0	76.0	24.0	24.0		24.0	24.0	
Total Split (%)	76.0%	76.0%	76.0%	76.0%	76.0%	76.0%	24.0%	24.0%		24.0%	24.0%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0		5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effect Green (s)	74.1	74.1	74.1	74.1	74.1	74.1		14.9		14.9	14.9	
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.74	0.74		0.15		0.15	0.15	
v/c Ratio	1.19	0.47	0.01	0.06	0.95	0.05		0.81		0.44	0.52	
Control Delay	159.2	9.5	3.9	5.2	23.2	1.4		62.6		43.9	35.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	159.2	9.5	3.9	5.2	23.2	1.4		62.6		43.9	35.5	
LOS	F	A	A	A	C	A		E		D	D	
Approach Delay		19.3			22.5			62.6			38.9	
Approach LOS		B			C			E			D	
Queue Length 50th (ft)	~65	208	1	3	661	0		72		53	60	
Queue Length 95th (ft)	m#86	m198	m1	10	#1021	11		#156		99	116	
Internal Link Dist (ft)		873			747			700			747	
Turn Bay Length (ft)	460		400	460		375				35		
Base Capacity (vph)	74	2621	1178	273	2621	1188		226		269	327	
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	1.19	0.47	0.01	0.06	0.95	0.05		0.66		0.34	0.42	
Intersection Summary												
Cycle Length: 100												
Actuated Cycle Length: 100												
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 130												
Control Type: Actuated-Coordinated												

Timings

1: Mohawk Road & Woodmen Road

Total Traffic Volumes

AM Peak Hour - Year 2041

Maximum v/c Ratio: 1.19

Intersection Signal Delay: 23.8

Intersection LOS: C

Intersection Capacity Utilization 96.1%

ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.





Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

























Splits and Phases: 1: Mohawk Road & Woodmen Road

 Ø2 (L) 76 s	 Ø4 24 s
 Ø5 (R) 76 s	 Ø8 24 s

Timings

2: Marksheffel Road & Woodmen Road

Total Traffic Volumes
AM Peak Hour - Year 2041

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	1098	554	735	2169	17	705	75	414	17	114	137
Future Volume (vph)	42	1098	554	735	2169	17	705	75	414	17	114	137
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	1863	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.497			0.704		
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	926	1863	1583	1311	3539	1583
Satd. Flow (RTOR)			495			196			295			251
Lane Group Flow (vph)	46	1193	602	799	2358	18	766	82	450	18	124	149
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6	4		4	8		8
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	24.0	24.0	10.0	24.0	24.0	10.0	24.0	24.0	10.0	24.0	24.0
Total Split (s)	10.0	40.0	40.0	18.0	48.0	48.0	18.0	32.0	32.0	10.0	24.0	24.0
Total Split (%)	10.0%	40.0%	40.0%	18.0%	48.0%	48.0%	18.0%	32.0%	32.0%	10.0%	24.0%	24.0%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effect Green (s)	6.9	34.0	34.0	19.9	49.1	49.1	30.1	25.1	25.1	17.1	11.1	11.1
Actuated g/C Ratio	0.07	0.34	0.34	0.20	0.49	0.49	0.30	0.25	0.25	0.17	0.11	0.11
v/c Ratio	0.38	0.99	0.70	1.17	1.36	0.02	1.97	0.18	0.73	0.07	0.32	0.37
Control Delay	54.4	57.8	10.3	121.5	188.7	0.0	470.4	30.6	19.3	23.8	41.6	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.4	57.8	10.3	121.5	188.7	0.0	470.4	30.6	19.3	23.8	41.6	2.7
LOS	D	E	B	F	F	A	F	C	B	C	D	A
Approach Delay		42.1			170.7			286.3			20.6	
Approach LOS		D			F			F			C	
Queue Length 50th (ft)	28	394	48	~285	~1077	0	~776	40	84	8	40	0
Queue Length 95th (ft)	#77	#547	173	m#444	m#1254	m0	#946	79	205	22	62	0
Internal Link Dist (ft)		873			747			805			348	
Turn Bay Length (ft)	480		370	450		340	280		195	240		160
Base Capacity (vph)	121	1203	864	682	1738	877	388	487	631	247	637	490
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.99	0.70	1.17	1.36	0.02	1.97	0.17	0.71	0.07	0.19	0.30

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Timings

2: Marksheffel Road & Woodmen Road

Total Traffic Volumes

AM Peak Hour - Year 2041

Maximum v/c Ratio: 1.97

Intersection Signal Delay: 151.0

Intersection LOS: F

Intersection Capacity Utilization 124.0%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

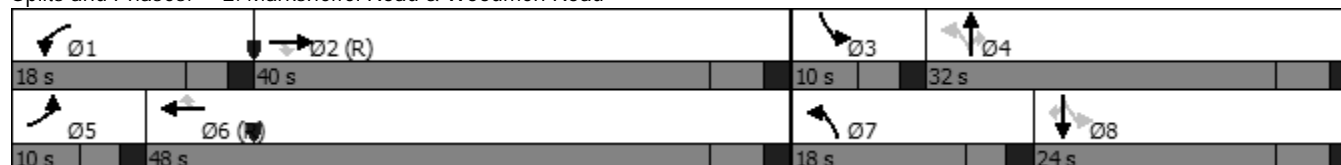
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.




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

Splits and Phases: 2: Marksheffel Road & Woodmen Road



HCM 6th TWSC 3: Mohawk Road & Access A

Total Traffic Volumes
AM Peak Hour - Year 2041

Intersection						
Int Delay, s/veh	7.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	138	0	0	0	2	26
Future Vol, veh/h	138	0	0	0	2	26
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, %	2	2	2	2	2	2
Mvmt Flow	150	0	0	0	2	28

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	16	16	30	0	-	0
Stage 1	16	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	1002	1063	1583	-	-	-
Stage 1	1007	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1002	1063	1583	-	-	-
Mov Cap-2 Maneuver	1002	-	-	-	-	-
Stage 1	1007	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1583	-	1002	-	-
HCM Lane V/C Ratio	-	-	0.15	-	-
HCM Control Delay (s)	0	-	9.2	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

HCM 6th TWSC
4: Access B & Woodmen Road






















Total Traffic Volumes
AM Peak Hour - Year 2041

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗		↑↑		↗
Traffic Vol, veh/h	1203	26	0	2544	0	34
Future Vol, veh/h	1203	26	0	2544	0	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	500	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1308	28	0	2765	0	37
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	654
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	409
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	409
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		14.7	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	409	-	-	-		
HCM Lane V/C Ratio	0.09	-	-	-		
HCM Control Delay (s)	14.7	-	-	-		
HCM Lane LOS	B	-	-	-		
HCM 95th %tile Q(veh)	0.3	-	-	-		

Timings

1: Mohawk Road & Woodmen Road

Total Traffic Volumes
PM Peak Hour - Year 2041

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	168	2833	214	79	1944	129	109	2	13	100	2	123
Future Volume (vph)	168	2833	214	79	1944	129	109	2	13	100	2	123
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	0	1760	0	1770	1587	0
Flt Permitted	0.055			0.043				0.514		0.780		
Satd. Flow (perm)	102	3539	1583	80	3539	1583	0	944	0	1453	1587	0
Satd. Flow (RTOR)			233			140		3			23	
Lane Group Flow (vph)	183	3079	233	86	2113	140	0	134	0	109	136	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2		2	6		6	4			8		
Detector Phase	2	2	2	6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0		24.0	24.0	
Total Split (s)	95.0	95.0	95.0	95.0	95.0	95.0	25.0	25.0		25.0	25.0	
Total Split (%)	79.2%	79.2%	79.2%	79.2%	79.2%	79.2%	20.8%	20.8%		20.8%	20.8%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0		5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effect Green (s)	93.0	93.0	93.0	93.0	93.0	93.0		16.0		16.0	16.0	
Actuated g/C Ratio	0.78	0.78	0.78	0.78	0.78	0.78		0.13		0.13	0.13	
v/c Ratio	2.35	1.12	0.18	1.39	0.77	0.11		1.05		0.56	0.59	
Control Delay	623.9	84.1	0.4	273.8	10.7	0.9		141.1		59.2	50.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	623.9	84.1	0.4	273.8	10.7	0.9		141.1		59.2	50.2	
LOS	F	F	A	F	B	A		F		E	D	
Approach Delay		106.8			19.8			141.1			54.2	
Approach LOS		F			B			F			D	
Queue Length 50th (ft)	~229	~1005	0	~41	418	0		103		80	82	
Queue Length 95th (ft)	m#116	m234	m0	#154	582	15		#216		137	146	
Internal Link Dist (ft)		873			747			700			747	
Turn Bay Length (ft)	460		400	460		375				35		
Base Capacity (vph)	78	2741	1278	62	2741	1257		159		242	283	
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	2.35	1.12	0.18	1.39	0.77	0.11		0.84		0.45	0.48	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 150												
Control Type: Actuated-Coordinated												

Timings

1: Mohawk Road & Woodmen Road

Total Traffic Volumes

PM Peak Hour - Year 2041

Maximum v/c Ratio: 2.35

Intersection Signal Delay: 72.7

Intersection LOS: E

Intersection Capacity Utilization 115.7%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.





Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

























Splits and Phases: 1: Mohawk Road & Woodmen Road

 Ø2 (L) 95 s	 Ø4 25 s
 Ø5 (R) 95 s	 Ø8 25 s

Timings

2: Marksheffel Road & Woodmen Road

Total Traffic Volumes
PM Peak Hour - Year 2041

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	147	2420	698	499	1645	45	722	77	801	14	51	89
Future Volume (vph)	147	2420	698	499	1645	45	722	77	801	14	51	89
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	1863	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.586			0.702		
Satd. Flow (perm)	1770	3539	1583	3433	3539	1583	1092	1863	1583	1308	3539	1583
Satd. Flow (RTOR)			410			164			332			164
Lane Group Flow (vph)	160	2630	759	542	1788	49	785	84	871	15	55	97
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2			6	4		4	8		8
Detector Phase	5	2	2	1	6	6	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	24.0	24.0	10.0	24.0	24.0	10.0	24.0	24.0	10.0	24.0	24.0
Total Split (s)	20.0	50.0	50.0	20.0	50.0	50.0	25.0	40.0	40.0	10.0	25.0	25.0
Total Split (%)	16.7%	41.7%	41.7%	16.7%	41.7%	41.7%	20.8%	33.3%	33.3%	8.3%	20.8%	20.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0	5.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effect Green (s)	13.9	44.0	44.0	15.0	45.1	45.1	45.0	40.0	40.0	25.0	19.0	19.0
Actuated g/C Ratio	0.12	0.37	0.37	0.12	0.38	0.38	0.38	0.33	0.33	0.21	0.16	0.16
v/c Ratio	0.78	2.03	0.90	1.26	1.35	0.07	1.50	0.14	1.16	0.05	0.10	0.25
Control Delay	76.6	489.4	31.8	170.0	196.0	0.1	265.3	30.4	111.8	25.9	43.8	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.6	489.4	31.8	170.0	196.0	0.1	265.3	30.4	111.8	25.9	43.8	1.7
LOS	E	F	C	F	F	A	F	C	F	C	D	A
Approach Delay		373.0			186.1			177.1			17.7	
Approach LOS		F			F			F			B	
Queue Length 50th (ft)	121	~1680	293	~274	~994	0	~844	43	~594	7	19	0
Queue Length 95th (ft)	#220	#1810	#569	m#383	#1135	m0	#1083	91	#907	22	39	2
Internal Link Dist (ft)		873			747			805			348	
Turn Bay Length (ft)	480		370	450		340	280		195	240		160
Base Capacity (vph)	221	1297	840	429	1328	696	522	621	748	291	560	388
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	2.03	0.90	1.26	1.35	0.07	1.50	0.14	1.16	0.05	0.10	0.25

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Timings

2: Marksheffel Road & Woodmen Road

Total Traffic Volumes

PM Peak Hour - Year 2041

Maximum v/c Ratio: 2.03

Intersection Signal Delay: 265.1

Intersection LOS: F

Intersection Capacity Utilization 142.0%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

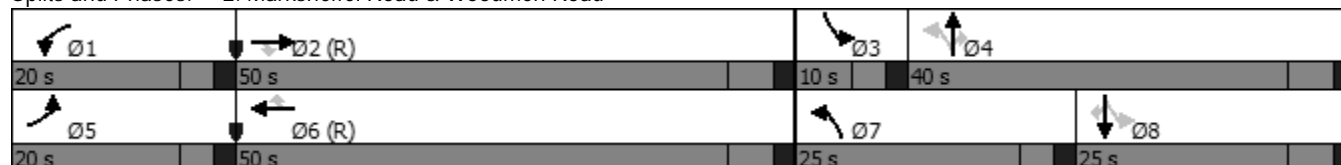
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.




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

Splits and Phases: 2: Marksheffel Road & Woodmen Road



HCM 6th TWSC 3: Mohawk Road & Access A

Total Traffic Volumes
PM Peak Hour - Year 2041

Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	81	0	0	43	209	86
Future Vol, veh/h	81	0	0	43	209	86
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, %	2	2	2	2	2	2
Mvmt Flow	88	0	0	47	227	93

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	321	274	320	0	-	0
Stage 1	274	-	-	-	-	-
Stage 2	47	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	752	858	1257	-	-	-
Stage 1	821	-	-	-	-	-
Stage 2	975	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	752	858	1257	-	-	-
Mov Cap-2 Maneuver	752	-	-	-	-	-
Stage 1	821	-	-	-	-	-
Stage 2	975	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1257	-	752	-	-
HCM Lane V/C Ratio	-	-	0.117	-	-
HCM Control Delay (s)	0	-	10.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

HCM 6th TWSC
4: Access B & Woodmen Road

Total Traffic Volumes
PM Peak Hour - Year 2041

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗		↑↑		↗
Traffic Vol, veh/h	3195	86	0	2176	0	20
Future Vol, veh/h	3195	86	0	2176	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	500	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3473	93	0	2365	0	22
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1737
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	76
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	76
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		70.3	
HCM LOS					F	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	76	-	-	-		
HCM Lane V/C Ratio	0.286	-	-	-		
HCM Control Delay (s)	70.3	-	-	-		
HCM Lane LOS	F	-	-	-		
HCM 95th %tile Q(veh)	1	-	-	-		