

TRANSPORTATION MEMORANDUM

For

Sunflower Landscapes
El Paso County, Colorado
PCD File No. VA265

June 2026
Revised August 2026

Prepared for:

Sunflower Landscapes
1925 Aeroplaza Drive
Colorado Springs, Colorado 80916

Prepared by:



SM ROCHA, LLC

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Project Engineer
Leo Ornelas, EIT

Engineer in Responsible Charge:
Brandon Wilson, PE

26-052670

Traffic Engineer's Statement

The attached traffic report and supporting information were prepared under my responsible charge and they comport with the standard of care. So far as is consistent with the standard of care, said report was prepared in general conformance with the criteria established by the County for traffic reports.



08/27/2026

Brandon Wilson, P.E. #68282

Date**Developer's Statement**

I, the Developer, have read and will comply with all commitments made on my behalf within this report.

Dustin Hamilton
Sunflower Landscapes
1925 Aeroplaza Drive
Colorado Springs, Colorado 80916

Date

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I. Introduction

Project Overview

This transportation memorandum is provided as a planning document and addresses the capacity, geometric, and control requirements associated with the development entitled Sunflower Landscapes. This analysis was prepared in accordance with Section B.1.2.C of the County's Engineering Criteria Manual (ECM)¹.

This proposed industrial development consists of a Sunflower Landscapes contractor equipment yard. The development is located near the northwest corner of Woodmen Road and Mohawk Road in El Paso County, Colorado.

Study Area

The study area to be examined in this analysis encompasses the Mohawk Road intersections with Woodmen Road, Woodmen Frontage Road, and includes proposed site access drives.

Figure 1 illustrates location of the site and study intersections.

Site Description

Land for the development is currently occupied by a single-family detached home. The area is surrounded by a mix of industrial, recreational, and residential land uses.

The proposed development will be phased and is understood to entail the new construction of a contractor equipment yard with an associated shop and office building developed over approximately five acres of land. Phase One will entail the reuse of the existing buildings on approximately 2 acres of land, while Phase Two will entail the new construction for the associated shop and office building.

Access to the development site is existing and provided via two full-movement access drives onto Mohawk Road. Both access drives will remain and will be gated.

For purposes of this study, it is anticipated that overall development construction would be completed by end of Year 2028.

General site and access locations are shown on Figure 1.

An overall site plan, as prepared by Sunflower Landscapes, is shown in Figure 2. This plan is provided for illustrative purposes only.

¹ El Paso County Engineering Criteria Manual, El Paso County, January 9, 2025.

A conceptual sight distance exhibit, illustrating approximate entering sight distance triangles, is included for reference in Appendix D. This two-dimensional exhibit does not consider the potential for landscaping, utility, nor vertical curve obstructions, and was prepared in accordance to Table 2-35 of the County's ECM and Section 9.5.3.2 of the American Association of State Highway and Transportation Officials' (AASHTO) A Policy on Geometric Design of Highway and Streets (Green Book)² and is provided for illustrative purposes only.

Unresolved Review 1 Comment:

A two-dimensional exhibit does not accurately reflect whether the required sight distance is met, the vertical profile must be considered. A statement must be included whether or not the sight distance is met.

The sight distance analysis may be performed at the site development plan application instead of the variance application. If the applicant is planning to postpone the sight distance analysis, please clearly state that in this report.

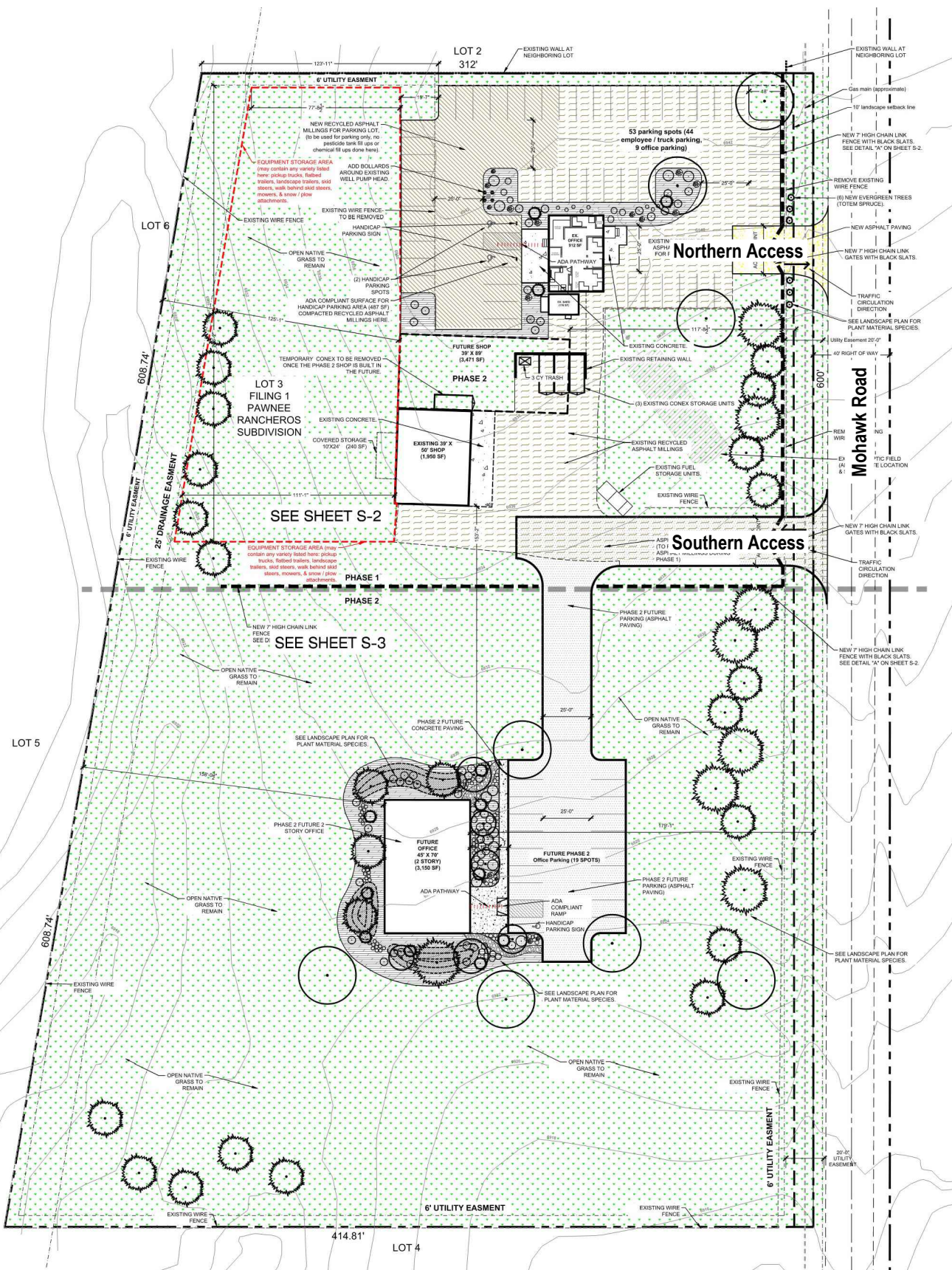
Please note the the sight distance analysis shall be reflective of the type of traffic utilizing the site.

Review 2 comment:

Please include what was written in the comment response in the report.

² A Policy on Geometric Design of Highways and Streets (7th Edition), American Association of State Highway and Transportation Officials, 2018.





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 Woodmen Frontage Road and Mohawk Road. A brief description of each roadway, based on Colorado Springs Major Thoroughfare Plan (MTP)³ and the County's Major Transportation Corridors Plan (MTCP)⁴, is provided below.

Woodmen Road is an east-west, City-owned, expressway roadway having six through lanes (three lanes in each direction) with exclusive turn lanes at the intersection within the study area. Woodmen Road provides a posted speed limit of 55 MPH.

Woodmen Frontage Road is an east-west, City-owned roadway having two through lanes (one lane in each direction) with shared turn lanes at the intersection within the study area. Woodmen Frontage Road provides a 35 MPH posted speed limit, but is unclassified in the municipal transportation plans. However, per the roadway's apparent cross-section, Woodmen Frontage Road is assumed to be classified as a collector roadway, but appears to accommodate the County's rural minor collector roadway cross-section.

Mohawk Road is a north-south, County-owned roadway having two through lanes (one lane in each direction) with a combination of shared and exclusive turn lanes at the intersections within the study area. Mohawk Road is unclassified in the municipal transportation plans. However, per Table 2-5 of the County's ECM and the roadway's apparent cross-section, Mohawk Road is assumed to be classified as a rural local roadway and provides a posted speed limit of 30 MPH.

The study intersection of Woodmen Road and Mohawk Road is 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.

Pursuant to the County's MTCP, Woodmen Road will be widened from four lanes to six lanes from Golden Sage Road to U.S. Highway 24. However, this improvement isn't anticipated until Year 2045 and therefore was not considered within this analysis.

³ Major Thoroughfare Plan, City of Colorado Springs, May 2025.

⁴ Major Transportation Corridors Plan, Felsburg Holt & Ullevig, July 18, 2024.

II. Existing Traffic Conditions

Morning (AM) and afternoon (PM) peak hour traffic counts were collected at the intersections of Mohawk Road with Woodmen Road and Woodmen Frontage Road. Average daily traffic (ADT) volumes were collected over a 24-hour period on Mohawk Road. Counts were collected on Tuesday, June 2, 2026, with AM peak hour counts being collected during the period of 7:00 a.m. to 9:00 a.m. and PM peak hour counts being collected during the period of 4:00 p.m. to 6:00 p.m.

Existing volumes and intersection geometry are shown in Figure 3. Traffic count data is included for reference in Appendix A.

Existing signal timing parameters for Woodmen Road and Mohawk Road were obtained from the City of Colorado Springs and used throughout this study to the best extent possible in order to remain consistent with existing signal coordination plans. City signal timing information received is included for reference in Appendix A.

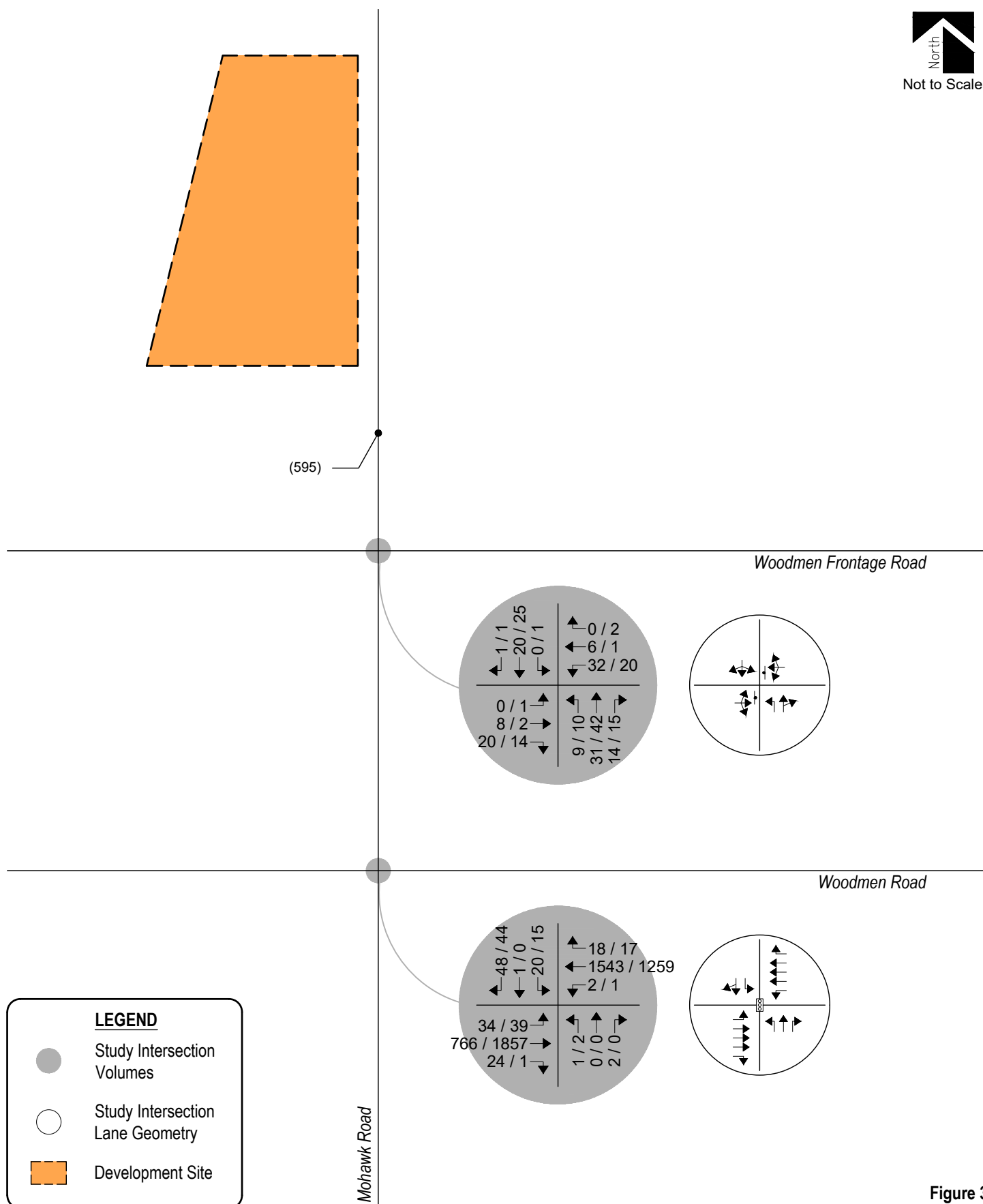


Figure 3
EXISTING TRAFFIC

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



SUNFLOWER LANDSCAPES
Transportation Memorandum

SM ROCHA, LLC
Traffic & Transportation Engineering

Peak Hour Intersection Levels of Service – Existing Traffic

The Signalized and Unsignalized Intersection Analysis techniques, as published in the Highway Capacity Manual (HCM), 7th Edition, by the Transportation Research Board and as incorporated into the SYNCHRO computer program, were used to analyze the study intersections for existing and future 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.

Pursuant to Section B.4.1.A of the County's ECM, the design objective of each scenario of this study shall be level of service "D". 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 (7.4)	A (6.5)
Woodmen Frontage Road / Mohawk Road (Stop-Controlled)		
Eastbound Left, Through, and Right	A	A
Westbound Left, Through, and Right	A	A
Northbound Left	A	A
Southbound Left, Through, and Right	A	A

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

Existing Traffic Analysis Results

Under existing conditions, operational analysis shows that all study intersections have overall operations at LOS A during 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 Year 2028, a compounded annual growth rate was determined using population growth estimates provided by the County's MTCP, which anticipates a 10-year growth rate between one and two percent. Therefore, in order to provide for a conservative analysis, a growth rate of two percent was applied to existing traffic volumes.

To account for projected traffic from adjacent developments not yet built, trip generations from the Woodmen & Mohawk Residential⁵, the Percheron Master Plan Amendment⁶, and the Woodmen East Commercial Center Traffic Impact Analysis⁷ were added to background traffic volumes.

Pursuant to the committed area roadway improvements discussed in Section I, Year 2028 background traffic conditions assume no roadway improvements to accommodate regional transportation demands. This assumption provides for a conservative analysis. However, in coordination with City of Colorado Springs Traffic Engineering, the City has plans to adjust the signal timing parameters for the Woodmen Road and Mohawk Road intersection. As such, Year 2028 background traffic conditions assume existing signal timing parameters for the intersection with optimized splits in effort to better presumed short-term intersection performance.

Projected background traffic volumes and intersection geometry for Year 2028 are shown in Figure 4.

⁵ Woodmen & Mohawk Residential: Traffic Impact Study, SM ROCHA, LLC, July 2022.

⁶ Percheron Master Plan Amendment: Traffic Impact Study, SM ROCHA, LLC, October 2025.

⁷ Woodmen East Commercial Center: Traffic Impact Analysis, LSC Transportation Consultants, December 8, 2021.

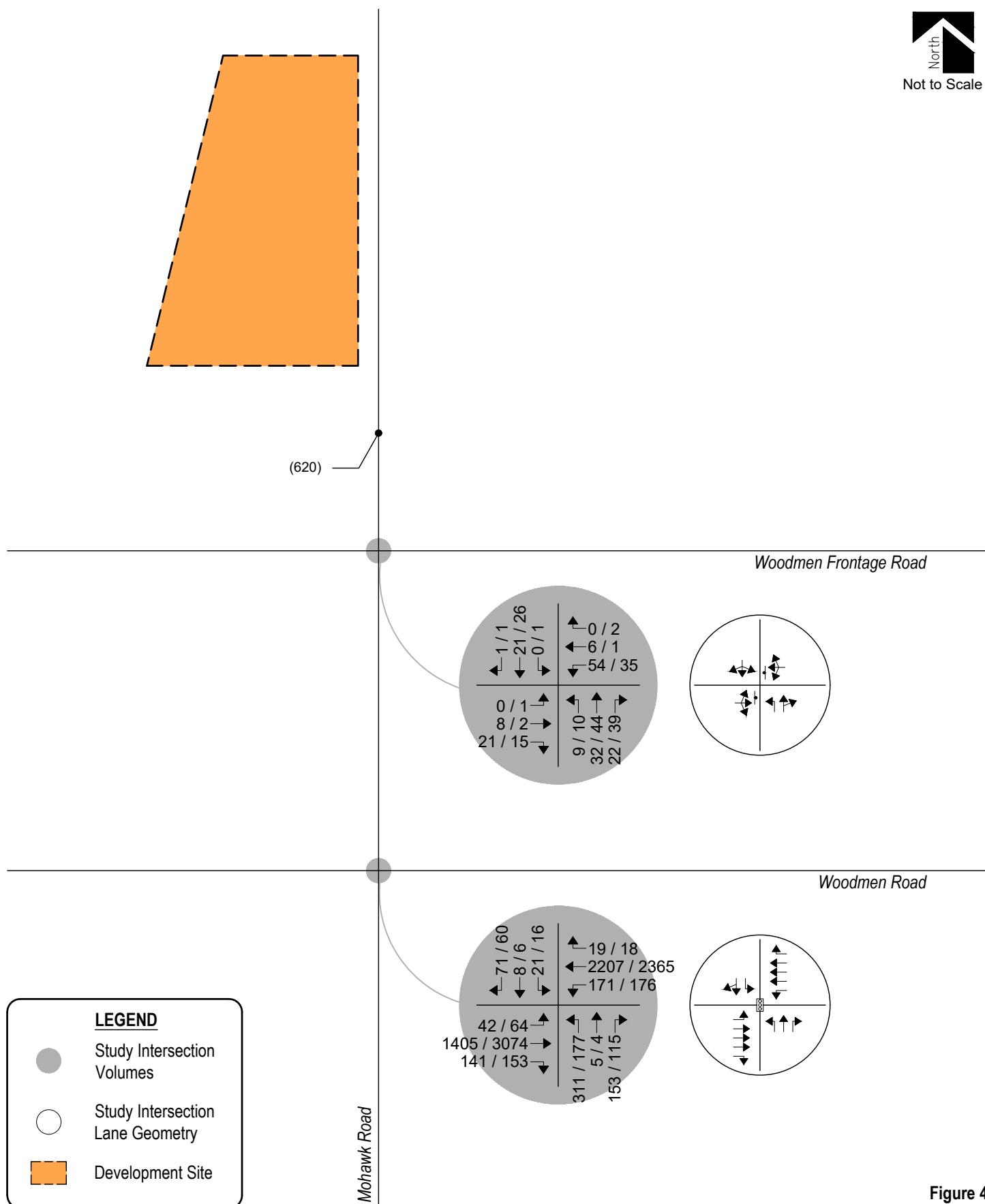


Figure 4
BACKGROUND TRAFFIC - YEAR 2028
Volumes & Intersection Geometry
AM / PM Peak Traffic Hour
(ADT) : Average Daily Traffic



Peak Hour Intersection Levels of Service – Background Traffic

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 2028 are listed in Table 2.

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 2028

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
Woodmen Road / Mohawk Road (Signalized)	C (24.9)	C (33.1)
Woodmen Frontage Road / Mohawk Road (Stop-Controlled)		
Eastbound Left, Through, and Right	A	A
Westbound Left, Through, and Right	A	A
Northbound Left	A	A
Southbound Left, Through, and Right	A	A

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

Background Traffic Analysis Results – Year 2028

By Year 2028 and upon development build-out of the surrounding area, traffic analysis indicates that the signalized intersection of Woodmen Road with Mohawk Road will experience overall operations at LOS C during either peak traffic hour.

It is recognized, however, that the left turning movements in all directions are shown to operate at capacity, or be over-capacity, resulting in LOS E and F operations. However, provision of dual eastbound and westbound left turn decelerations lanes, in combination with widening Mohawk Road to support two receiving lanes in both directions, and upon optimizing signal timing parameters, was not shown to improve the capacity nor vehicular delay for the left turn movements.

While LOS D is recognized as the common goal for intersection operations, the latest HCM describes how signalized intersections that experience LOS E operations are still within capacity but experience an average delay of 55 to 80 seconds. Therefore, considering how future traffic projections were determined by applying a conservative growth rate higher than that reported by the County's MTCP (as described in Section III), the projected intersection operations shown in Table 2 and Appendix C are considered to be adequate.

Unsignalized intersections within the study area operate with turning movements at LOS A during both AM and PM peak traffic periods.

If ITE is not deemed to be accurate for any of the proposed land uses then it should not be used for this traffic study. As mentioned in the comment review meeting on 7/26/2026 after the V2 review, a local trip generation study can be conducted in conjunction with obtaining data from the currently operating site and from other comparable land uses to generate a local trip rate.

Proposed Project Traffic

If ITE wasn't used, please revise these statements and clearly state what was used for the trip generation.

Trip Generation

Standard traffic generation characteristics compiled by the Institute of Transportation Engineers (ITE) in their report entitled Trip Generation Manual, 12th Edition, were applied to the existing and proposed land uses 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 codes 151 (Mini-Warehouse), 210 (Single-Family Detached Housing), and 712 (Small Office Building) were considered for estimating trip generation because of their conservative rates and best fit to the existing and proposed land use descriptions. However, ITE's Trip Generation Manual may not provide accurate traffic generation information specific for a contractor equipment yard. As such, proposed development phasing and facility operations, as described by the developer, were also considered in order to estimate average daily and weekday peak hour trip information.

Development phasing information is as follows:

- Phase One (~2 acres)
 - Reuse of existing buildings
 - 48 total employees
 - 2 designers
 - 2 mechanics
 - 3 project managers
 - 1 information technology (IT) personnel
 - 1 irrigation technician
 - 38 remaining employees splits into 10 crews
- Phase Two (~3 acres)
 - New shop and office building
 - 95 total employees (inclusive of 48 employees from Phase One)

This is not a sufficient replacement for collecting data and developing trip generation rates. Data collection and engineering analysis is required if not using ITE.

Facility operations information is as follows:

- Standard operating hours Monday through Thursday from 7:00 a.m. to 5:00 p.m., and on Friday from 7:00 a.m. to 4:00 p.m.
- Crews work Monday through Thursday
- Peak hour of generator travel from 6:30 a.m. to 8:00 a.m., and from 4:00 p.m. to 5:30 p.m.

ITE trip generation rates used in this study are presented in Table 3.

Table 3 – Trip Generation Rates

ITE CODELAND USEUNIT			TRIP GENERATION RATES						
			24 HOUR	AM PEAK HOUR			PM PEAK HOUR		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
210	Single-Family Detached Housing	DU	9.09	0.19	0.51	0.70	0.58	0.35	0.93
712	Small Office Building	KSF	14.39	1.36	0.28	1.64	0.73	1.43	2.16

Key: KSF = Thousand Square Feet Gross Floor Area. DU = Dwelling Units.

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

48 employees X 2 is already 96 trips without accounting for work vehicles leaving in the am and returning in the pm. Please revise this to be accurate. The traffic study must account the trip rate without considering employee carpooling.

ed ADT, AM Peak Hour, and PM Peak Hour traffic volumes likely generated ment upon build-out.

These numbers do not seem correlate with the employee information provided.

Table 4 – Trip Generation Summary

ITE CODELAND USESIZE			TOTAL TRIPS GENERATED						
			24 HOUR	AM PEAK HOUR			PM PEAK HOUR		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
<u>Site Development - Existing</u>									
210	Single-Family Detached Housing	1 DU	9	0	1	1	1	0	1
Existing Total:			9	0	1	1	1	0	1
<u>Site Development - Proposed Phase One</u>									
-	On-Site Employees	10 EMP	20	10	0	10	0	10	10
-	Off-Site Employees	10 CRW	60	10	20	30	20	10	30
Phase One Total:			80	20	20	40	20	20	40
<u>Site Development - Proposed Phase Two</u>									
712	Small Office Building	6.3 KSF	91	9	2	10	5	9	14
Phase Two Total:			251	48	42	89	45	48	93
Build-Out Total:			331	67	62	129	65	67	132
Difference Total (Existing - Build-Out):			322	67	61	128	64	67	131

Key: CRW = Crews. DU = Dwelling Units. EMP = Employees. KSF = Thousand Square Feet Gross Floor Area.

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

Upon build-out, Table 4 illustrates that the proposed development has the potential to generate approximately 331 daily vehicle trips with 129 of those occurring during the morning peak hour and 132 during the afternoon peak hour. Compared to the existing land uses, this represents a potential increase in site traffic generation of approximately 322 daily trips with 128 of those occurring during the morning peak hour and 131 during the afternoon peak hour.

There is no explanation for how the phase 1 trip generation was calculated and it does not appear to be calculated from the ITE trip rates. Please include explanation as to how this was calculated.

In addition, please include what on-site and off-site employees are referring to and what 10 Employees and 10 crew is referring to.

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.

It is important to note that approximately 25 percent of the workers on-site are seasonal employees. Because of this, approximately 25 percent of trips will be reduced from the period of November to late April. Despite this, no trip reduction was taken for this analysis. This approach continues to allow for a conservative analysis.

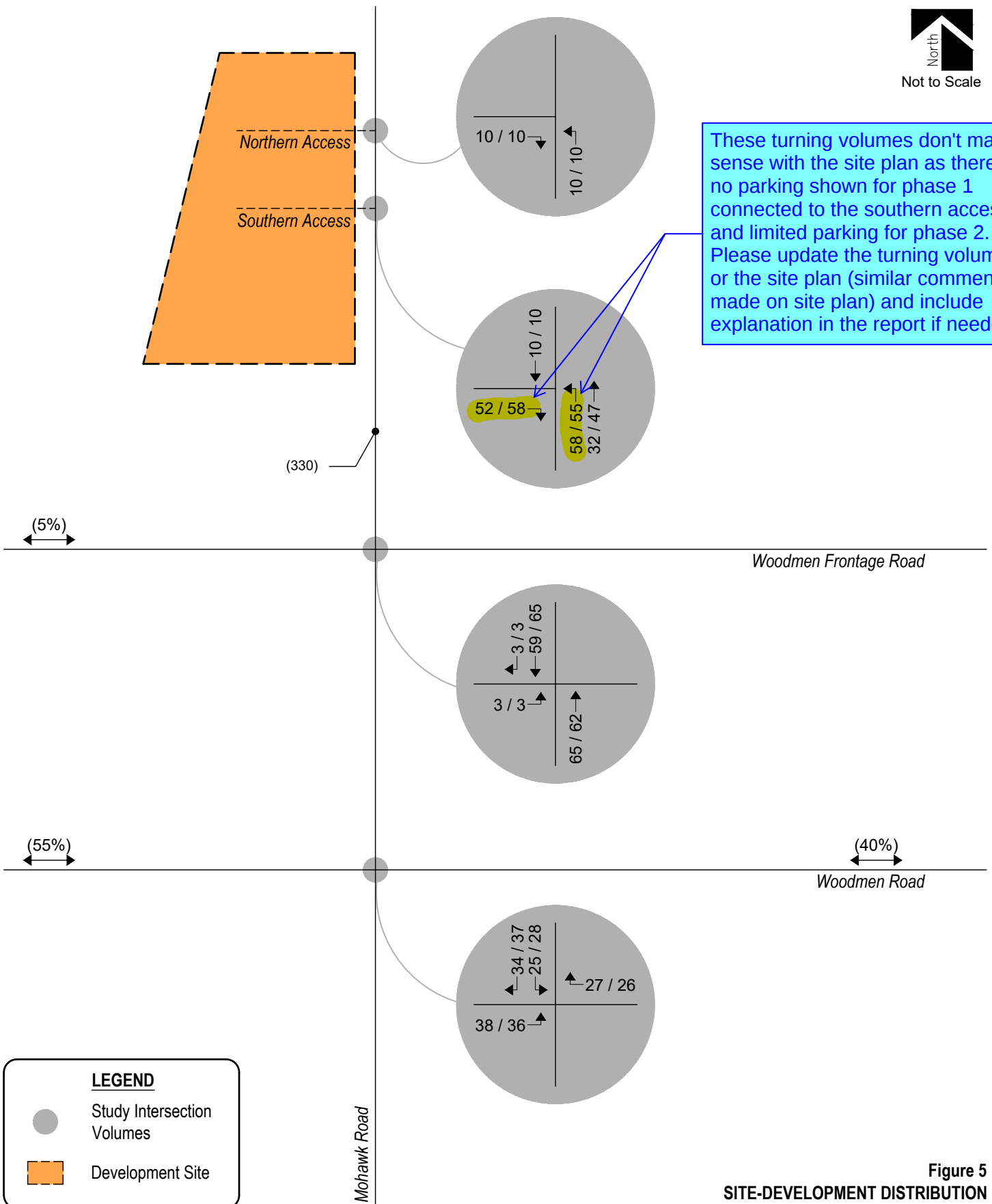
Trip Distribution

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

Overall trip distribution patterns for the development are shown on Figure 5.

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 5.



These turning volumes don't make sense with the site plan as there is no parking shown for phase 1 connected to the southern access and limited parking for phase 2. Please update the turning volumes or the site plan (similar comment made on site plan) and include explanation in the report if needed.

Figure 5
SITE-DEVELOPMENT DISTRIBUTION
(%) : Overall
SITE-GENERATED TRIPS
AM / PM Peak Hour
(ADT) : Average Daily Traffic

V. Future Traffic Conditions With Proposed Development

Total traffic is the traffic projected to be on area roadways with consideration of the proposed development. Total traffic includes background traffic projections for Year 2028 with consideration of site-generated traffic. For analysis purposes, it was assumed that development construction would be completed by end of Year 2028.

Pursuant to area roadway improvement discussions provided in Section III, Year 2028 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.

Total Traffic Auxiliary Lane Analysis

An auxiliary lane analysis, using Year 2028 total traffic volumes, was conducted for the proposed site access drives onto Mohawk Road.

Pursuant to Section 2.3.7.D of the County's ECM, exclusive left turn deceleration lanes are required along minor arterial and lower classified roadways for any access whose projected peak hour left turning volumes meet or exceed 25 vehicles per hour (VPH). Additionally, exclusive right turn deceleration lanes are required along minor arterial and lower classified roadways for any access whose projected peak hour right turning volumes meet or exceed 50 VPH.

Considering development build-out, an evaluation of auxiliary lane requirements reveals that a northbound left turn deceleration lane along Mohawk Road **may be** required at Southern Access. On the contrary, a left turn deceleration lane is not warranted at Northern Access.

Similarly, a southbound right turn deceleration lane is not required at Northern Access nor at Southern Access since the development's projected peak hour right turn ingress volumes do not exceed the County's threshold.

Projected Year 2028 total traffic volumes and intersection geometry are shown in Figure 6.

A turn lane is required per the ECM. Please revise text to be accurate and references in future sections to required improvement.

Construction Drawings and FAE will be required at the site development plan for the required turn lane.

The developer is responsible for this improvement.

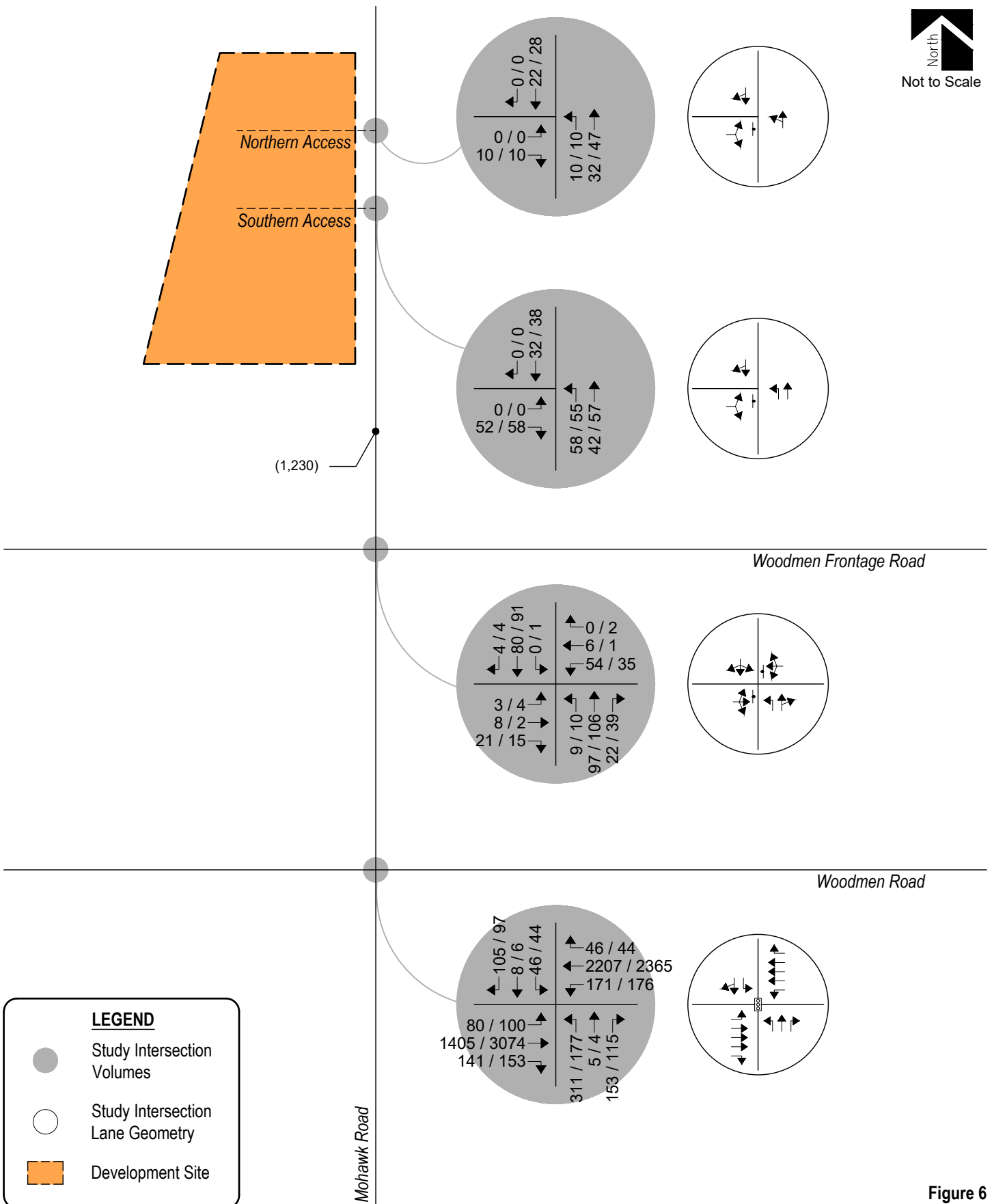


Figure 6
TOTAL TRAFFIC - YEAR 2028
Volumes & Intersection Geometry
AM / PM Peak Traffic Hour
(ADT) : Average Daily Traffic

Peak Hour Intersection Levels of Service – Total Traffic

As with background traffic, the operations of the study intersections were analyzed under projected total traffic conditions using the SYNCHRO computer program. The analyses and procedures were performed in accordance with the latest 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.

Total traffic level of service analysis results for Year 2028 are summarized in Table 5.

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

Table 5 – Intersection Capacity Analysis Summary – Total Traffic – Year 2028

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
Woodmen Road / Mohawk Road (Signalized)	C (26.6)	C (34.6)
Woodmen Frontage Road / Mohawk Road (Stop-Controlled)		
Eastbound Left, Through, and Right	A	A
Westbound Left, Through, and Right	B	B
Northbound Left	A	A
Southbound Left, Through, and Right	A	A
Mohawk Road / Southern Access (Stop-Controlled)		
Eastbound Left and Right	A	A
Northbound Left	A	A
Mohawk Road / Northern Access (Stop-Controlled)		
Eastbound Left and Right	A	A
Northbound Left and Through	A	A

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

The discussions from the last report on the mitigated scenarios for signal timing were removed and there is no explanation associated with this. If the City has already updated the signal timing, please state that. If you have received proposed timing from coordination with the City or if the timing was modified independently to achieve the best LOS, please state that and retain the previously included analysis of the existing and mitigated intersection operations with explanation in the narrative so that the existing operations can be documented as well as the proposed modifications.

Total Traffic Analysis Results Upon Development Build-Out

Table 5 illustrates how, by Year 2028 and upon development build-out, the signalized intersection of Woodmen Road with Mohawk Road maintains overall LOS C operations during both peak traffic hours. Therefore, when 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.

It is emphasized that the left turning movements in all directions are shown to operate at capacity, or be over-capacity, resulting in LOS E and F operations. However, provision of dual eastbound and westbound left turn decelerations lanes, in combination with widening Mohawk Road to support two receiving lanes in both directions, and upon optimizing signal timing parameters, was not shown to improve the capacity nor vehicular delay for the left turn movements. Therefore, the signalized intersection should be monitored further by County Staff as area development occurs to determine when, or if, mitigating improvements are appropriate.

While LOS D is recognized as the common goal for intersection operations, the latest HCM describes how signalized intersections that experience LOS E operations are still within capacity but experience an average delay of 55 to 80 seconds. Therefore, considering how future traffic projections were determined by applying a conservative growth rate higher than that reported by the County's MTCP (as described in Section III), the projected intersection operations shown in Table 5 and Appendix C are considered to be adequate.

The stop-controlled intersections within the study area are projected to have turning movement operations at LOS A for both the morning and afternoon peak traffic hours.

These intersection operations are similar to background conditions.

VI. Project Impacts

It is emphasized that the analyses and procedures described in this study were performed in accordance with the latest 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.

Multi-Modal Assessment

In accordance with Section B.2.4.D of the County's ECM, an assessment to adequacy of pedestrian and bicycle facilities within the study area was considered.

Due to the rural characteristics of the development site and surrounding area, this area currently does not accommodate pedestrians nor bicyclists with detached sidewalks, trails, nor bike lanes. It is important to note that, pursuant to existing roadway characteristics provided in Section I, typical roadway cross-sections defined within the County's ECM, and per the assumed classification, Mohawk Road is not expected to provide sidewalks nor bicycle lanes adjacent the development area due to the County's plans to maintain the rural characteristic of the surrounding area roadways.

Queue Length Analysis

Queue lengths for the study intersections were analyzed using Year 2028 background and 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. An average vehicle length of 25 feet was assumed. Queue lengths were modeled and are included with the Synchro worksheets in Appendix C.

Table 6 summarizes the 95th percentile queue results in comparison to the projected storage requirements for turn movements within study area for Year 2028.

Table 6 – Turn Lane Queues and Storage Requirements – Total Traffic – Year 2028

Intersection	Turn Movement	Existing Turn Lane Length (feet)	Background 2028		Total 2028		Recommended Turn Lane Length (feet)	
			AM Peak Hour (feet)	PM Peak Hour (feet)	AM Peak Hour (feet)	PM Peak Hour (feet)		
Signalized Intersections								
Woodmen Road / Mohawk Road	EB	L	300'	75'	100'	131'	144'	300'
		T	-	376'	1087'	376'	1087'	-
		R	400'	37'	23'	37'	23'	400'
	WB	L	315'	217'	308'	217'	308'	315'
		T	-	617'	554'	617'	554'	-
		R	375'	0'	0'	4'	2'	375'
	NB	L	165' x2	185'	168'	189'	171'	165' x2
		T	-	15'	15'	15'	15'	-
		R	165'	61'	61'	61'	61'	165'
	SB	L	35'	40'	38'	72'	85'	35'
T,R		-	52'	53'	60'	64'	-	
Stop-Controlled Intersections								
Woodmen Frontage Road / Mohawk Road	EB	L,T,R	-	3'	3'	3'	3'	-
	WB	L,T,R	-	5'	5'	8'	5'	-
	NB	L	25'	0'	0'	0'	0'	25'
		T,R	-	0'	0'	0'	0'	-
	SB	L,T,R	-	0'	0'	0'	0'	-
Mohawk Road / Southern Access	EB	L,R	-	-	-	5'	5'	-
	NB	L	-	-	-	3'	3'	-
		T	-	-	-	0'	0'	-
	SB	T,R	-	-	-	0'	0'	-
Mohawk Road / Northern Access	EB	L,R	-	-	-	0'	0'	-
	NB	L,T	-	-	-	0'	0'	-
	SB	T,R	-	-	-	0'	0'	-

Note: Turn Lane Length does not include taper length.

Key: x2 = Dual Turn Lanes.

As Table 6 shows, the majority of turn lane lengths at the study intersections have sufficient storage to accommodate future traffic volumes. However, at the Woodmen Road and Mohawk Road intersection, vehicle queuing for the southbound left turn movement is indicated to exceed its existing left turn deceleration lane length.

It is acknowledged that existing conditions of the area may limit the availability for this projected queue to be accommodated. For example, the segment of Mohawk Road between Woodmen Road and Woodmen Frontage Road only allows approximately 115 feet of roadway striping. And while 115 feet of storage for the southbound left turn movement would resolve potential vehicle queuing, provision of the back-to-back left turn movement associated with the northbound left turn deceleration lane at Woodmen Frontage Road prevents the southbound left turn deceleration lane at Woodmen Road from being extended any further.

It is to be noted that significant vehicle queuing exists during background traffic conditions without the proposed development at the intersection of Woodmen Road and Mohawk Road. As previously mentioned, increasing eastbound and westbound signal split timing by taking away from northbound and southbound split timing is a possible measure of mitigation to poor operations and projected vehicle queuing. This mitigating scenario is shown to allow for 432 feet of vehicle queuing for the northbound left turn movement during either peak traffic hour.

Development Impacts

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 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 2028 background traffic conditions.

Recommended Improvements

Roadway and intersection improvement recommendations were assessed pursuant to roadway descriptions in Section I, projected peak hour traffic volumes, level of service results, projected 95th percentile queue lengths, and per requirements defined within the County's ECM.

When considering Year 2028 total traffic conditions, failing operations were reported for individual left turning movements at the Woodmen Road and Mohawk Road intersection. These extended delays are a result of said left turning movements being at or over-capacity. However, this analysis found no mitigations that would allow LOS D operations, or better, for all turning movements. Therefore, since this condition occurs without the proposed development, it is our recommendation that the study intersection be monitored further by County Staff as area development occurs to determine what, if any, mitigating improvements are necessary.

In effort to alleviate projected vehicle queuing for the southbound left turn movement at the Woodmen Road and Mohawk Road intersection, the segment of Mohawk Road between Woodmen Road and Woodmen Frontage Road is recommended to be restriped. Recommendations include removing the northbound left turn deceleration lane approach at Woodmen Frontage Road to allow the southbound left turn deceleration lane approaching Woodmen Road to be lengthened to accommodate projected vehicle queuing. It is noted, however, that this recommendation does not impact operational results discussed above.

Include a discussion regarding the required NB, LT lane on Mohawk Road for the southern access as it is required based on the provided turning volumes.

VII. Conclusion

This transportation memorandum addressed the capacity, geometric, and control requirements associated with the development entitled Sunflower Landscapes. This proposed industrial development consisted of a Sunflower Landscapes contractor equipment yard. The development is located near the northwest corner of Woodmen Road and Mohawk Road in El Paso County, Colorado.

The study area to be examined in this analysis encompassed the Mohawk Road intersections with Woodmen Road and Woodmen Frontage Road and includes the proposed site access drives.

Analysis was conducted for critical AM Peak Hour and PM Peak Hour traffic operations for existing traffic conditions, Year 2028 background traffic conditions, and Year 2028 total traffic conditions.

Analysis of existing traffic conditions indicates that all intersections operate under LOS A conditions during both the morning and afternoon peak traffic hours.

Under Year 2028 background traffic conditions, operational analysis shows that the signalized intersection is projected to experience overall LOS C operations during the morning and afternoon peak traffic periods. The stop-controlled intersection of Woodmen Frontage Road with Mohawk Road is anticipated to have turn movement operations at LOS A during both peak traffic periods.

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. With all conservative assumptions defined in this analysis, the study intersections are projected to operate at future levels of service comparable to Year 2028 background traffic conditions. Proposed site access drives project long-term operations at LOS A during peak traffic periods and upon build-out.

Recommended improvements to the study area roadways and intersections include the restriping of Mohawk Road between Woodmen Road and Woodmen Frontage Road to alleviate anticipated vehicle queuing. This includes the removal of the northbound left turn lane at Woodmen Frontage Road to be able to lengthen the southbound left turn lane at Woodmen Road.

Same comment as
above regarding
required improvements.

APPENDIX A

**Traffic Count Data
Signal Timing Information**



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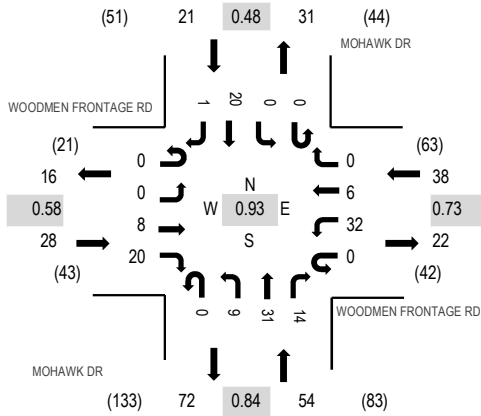
Location: 2 MOHAWK DR & WOODMEN FRONTAGE RD AM

Date: Tuesday, June 2, 2026

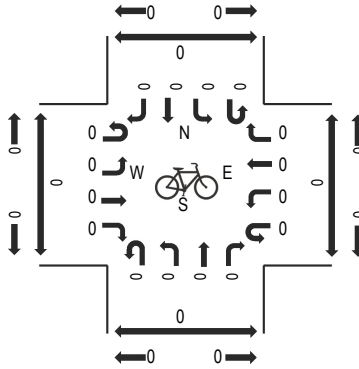
Peak Hour: 07:30 AM - 08:30 AM

Peak 15-Minutes: 07:30 AM - 07:45 AM

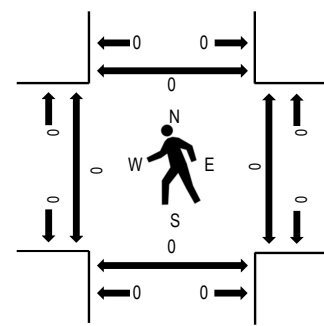
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	WOODMEN FRONTAGE RD Eastbound				WOODMEN FRONTAGE RD Westbound				MOHAWK DR Northbound				MOHAWK DR Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	1	1	0	4	0	0	0	1	2	3	0	0	15	0	27	118	0	0	0	0
7:15 AM	0	0	2	2	0	6	0	0	0	1	2	5	0	0	5	0	23	126	0	0	0	0
7:30 AM	0	0	4	8	0	9	0	0	0	3	5	4	0	0	5	0	38	141	0	0	0	0
7:45 AM	0	0	1	6	0	7	1	0	0	2	5	4	0	0	4	0	30	134	0	0	0	0
8:00 AM	0	0	0	3	0	7	1	0	0	3	9	4	0	0	7	1	35	122	0	0	0	0
8:15 AM	0	0	3	3	0	9	4	0	0	1	12	2	0	0	4	0	38		0	0	0	0
8:30 AM	0	1	0	5	0	7	2	0	0	0	3	6	0	1	6	0	31		0	0	0	0
8:45 AM	0	0	1	2	0	5	1	0	0	0	5	1	0	0	3	0	18		0	0	0	0
Count Total	0	1	12	30	0	54	9	0	0	11	43	29	0	1	49	1	240		0	0	0	0
Peak Hour	0	0	8	20	0	32	6	0	0	9	31	14	0	0	20	1	141		0	0	0	0



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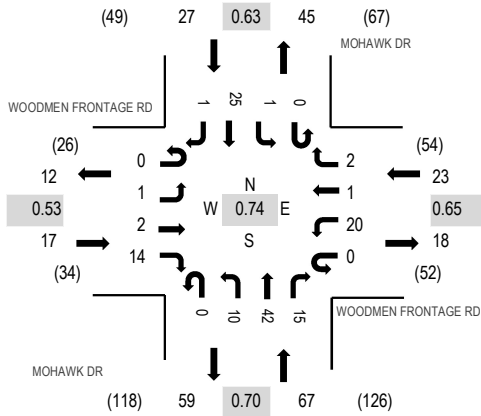
Location: 2 MOHAWK DR & WOODMEN FRONTAGE RD PM

Date: Tuesday, June 2, 2026

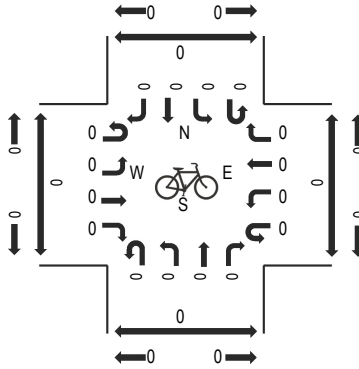
Peak Hour: 05:00 PM - 06:00 PM

Peak 15-Minutes: 05:45 PM - 06:00 PM

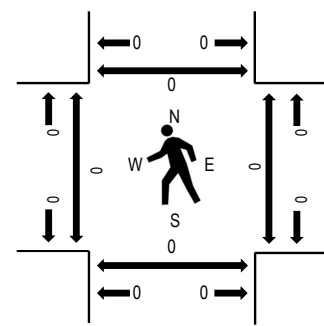
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	WOODMEN FRONTAGE RD Eastbound				WOODMEN FRONTAGE RD Westbound				MOHAWK DR Northbound				MOHAWK DR Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	0	3	2	0	7	0	1	0	3	8	4	0	0	4	0	32	129	0	0	0	0
4:15 PM	0	0	2	4	0	10	1	1	0	3	3	10	0	0	2	0	36	124	0	0	0	0
4:30 PM	0	0	1	2	0	4	0	0	0	4	5	6	0	0	5	0	27	118	0	0	0	0
4:45 PM	0	0	0	3	0	7	0	0	0	3	4	6	0	2	9	0	34	123	0	0	0	0
5:00 PM	0	0	0	3	0	2	1	0	0	1	10	3	0	1	6	0	27	134	0	0	0	0
5:15 PM	0	0	0	2	0	2	0	0	0	2	8	1	0	0	14	1	30		0	0	0	0
5:30 PM	0	1	2	5	0	3	0	0	0	4	9	5	0	0	3	0	32		0	0	0	0
5:45 PM	0	0	0	4	0	13	0	2	0	3	15	6	0	0	2	0	45		0	0	0	0
Count Total	0	1	8	25	0	48	2	4	0	23	62	41	0	3	45	1	263		0	0	0	0
Peak Hour	0	1	2	14	0	20	1	2	0	10	42	15	0	1	25	1	134		0	0	0	0



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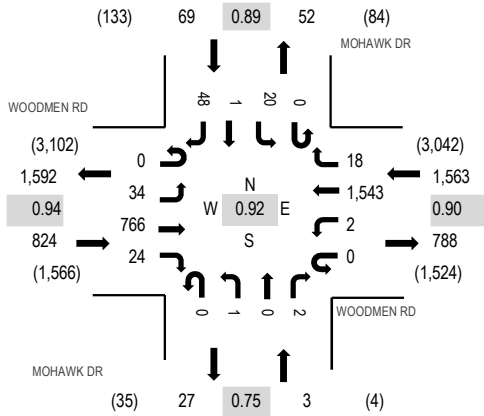
Location: 1 MOHAWK DR & WOODMEN RD AM

Date: Tuesday, June 2, 2026

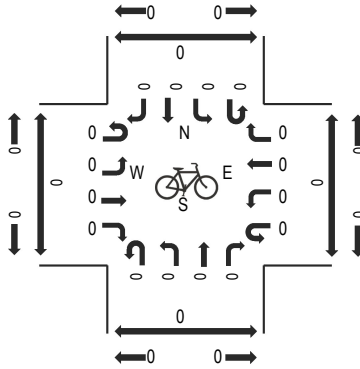
Peak Hour: 07:30 AM - 08:30 AM

Peak 15-Minutes: 07:30 AM - 07:45 AM

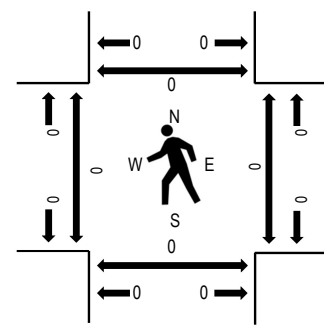
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	WOODMEN RD Eastbound				WOODMEN RD Westbound				MOHAWK DR Northbound				MOHAWK DR Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	2	170	2	0	0	336	3	0	0	0	1	0	1	0	17	532	2,434	0	0	0	0
7:15 AM	0	8	172	1	0	0	396	2	0	0	0	0	0	4	0	11	594	2,449	0	0	0	0
7:30 AM	0	9	197	2	0	0	437	3	0	0	0	1	0	3	0	17	669	2,459	0	0	0	0
7:45 AM	0	7	210	1	0	1	400	2	0	0	0	1	0	8	1	8	639	2,404	0	0	0	0
8:00 AM	0	10	173	8	0	1	328	8	0	0	0	0	0	8	0	11	547	2,311	0	0	0	0
8:15 AM	0	8	186	13	0	0	378	5	0	1	0	0	0	1	0	12	604		0	0	0	0
8:30 AM	0	6	187	1	0	1	395	3	0	0	0	0	0	9	1	11	614		0	0	0	0
8:45 AM	0	4	187	2	0	0	339	4	0	0	0	0	0	5	0	5	546		0	0	0	0
Count Total	0	54	1,482	30	0	3	3,009	30	0	1	0	3	0	39	2	92	4,745		0	0	0	0
Peak Hour	0	34	766	24	0	2	1,543	18	0	1	0	2	0	20	1	48	2,459		0	0	0	0



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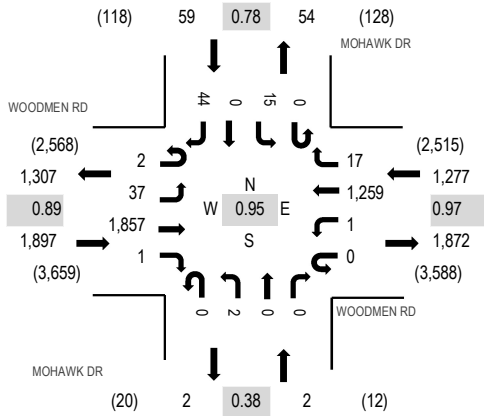
Location: 1 MOHAWK DR & WOODMEN RD PM

Date: Tuesday, June 2, 2026

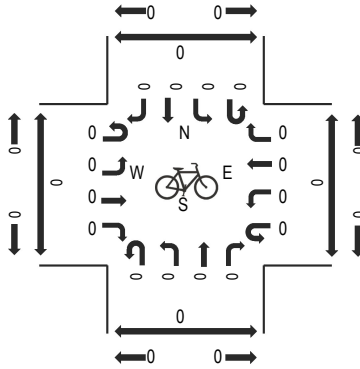
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 05:15 PM - 05:30 PM

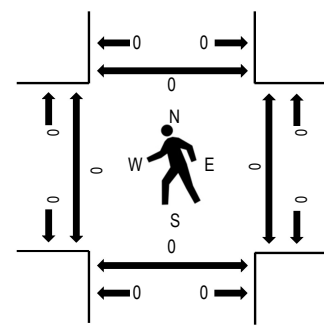
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	WOODMEN RD Eastbound				WOODMEN RD Westbound				MOHAWK DR Northbound				MOHAWK DR Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	1	7	404	2	0	0	325	8	0	2	0	0	0	4	0	9	762	3,158	0	0	0	0
4:15 PM	1	9	433	2	0	0	327	7	0	0	0	0	0	3	0	13	795	3,175	0	0	0	0
4:30 PM	0	8	484	0	0	0	315	6	0	0	0	0	0	4	0	7	824	3,235	0	0	0	0
4:45 PM	0	10	430	0	0	1	311	5	0	1	0	0	0	3	0	16	777	3,220	0	0	0	0
5:00 PM	1	10	419	0	0	0	335	3	0	0	0	0	0	2	0	9	779	3,146	0	0	0	0
5:15 PM	1	9	524	1	0	0	298	3	0	1	0	0	0	6	0	12	855		0	0	0	0
5:30 PM	5	14	449	5	0	2	318	3	0	1	0	1	0	4	0	7	809		0	0	0	0
5:45 PM	0	17	408	5	0	2	237	9	0	4	0	2	0	8	0	11	703		0	0	0	0
Count Total	9	84	3,551	15	0	5	2,466	44	0	9	0	3	0	34	0	84	6,304		0	0	0	0
Peak Hour	2	37	1,857	1	0	1	1,259	17	0	2	0	0	0	15	0	44	3,235		0	0	0	0

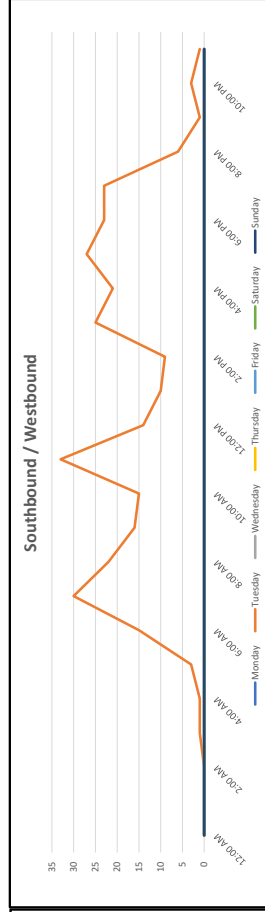
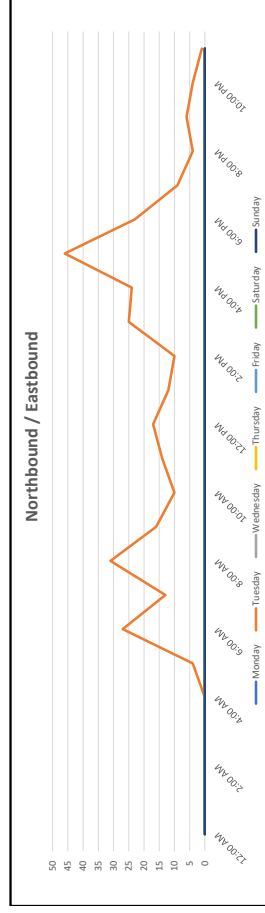
Vehicle Volume Report - Hourly

Site Description: MOHAWK RD N.O. WOODMEN FRONTAGE RD

Site Number: 3

Start Date: 06/02/2026

End Date: 06/02/2026

[illegible]

Intersection 644 at Woodmen Rd and Mohawk Rd - Timing table, page 1

Page 1	Phases											
	1	2	3	4	5	6	7	8	9	10	11	12
Min Green	5	10	0	6	5	10	0	6	0	0	0	0
Passage Time I	1.5	1.5	0.0	1.5	1.5	1.5	0.0	1.5	0.0	0.0	0.0	0.0
Passage Time II	1.5	1.5	0.0	1.5	1.5	1.5	0.0	1.5	0.0	0.0	0.0	0.0
Max Green I	12	40	0	15	12	40	0	15	0	0	0	0
Max Green II	12	40	0	15	12	40	0	15	0	0	0	0
Yellow Clearance	3.0	5.5	0.0	6.0	3.0	5.5	0.0	6.0	0.0	0.0	0.0	0.0
Red Clearance	2.0	2.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0
Added Initial	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Added Initial	0	0	0	0	0	0	0	0	0	0	0	0
Time Before Reduction	0	0	0	0	0	0	0	0	0	0	0	0
Cars Before Reduction	0	0	0	0	0	0	0	0	0	0	0	0
Time To Reduce	0	0	0	0	0	0	0	0	0	0	0	0
Min Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Green Time	0	0	0	0	0	0	0	0	0	0	0	0
Red Revert Time	0.0	5.0	0.0	5.0	0.0	5.0	0.0	5.0	0.0	0.0	0.0	0.0
Advance Walk Time	0	0	0	0	0	0	0	0	0	0	0	0
Walk Time	0	7	0	7	0	7	0	7	0	0	0	0
Pedestrian Clearance	0	23	0	52	0	26	0	50	0	0	0	0
Handicap Walk	0	12	0	12	0	12	0	12	0	0	0	0
Handicap Ped Clearance	0	26	0	60	0	30	0	58	0	0	0	0
Woodmen Rd	X	X			X	X						
Mohawk Rd				X				X				
Compass Direction	W	E		S	E	W		N				
Through, Turn or XPed	Left,prt	Thru		Thru	Left,prt	Thru		Thru				

Intersection 644 at Woodmen Rd and Mohawk Rd - Sequence table, page 1

Page 1	Ring 1 Phases				Ring 2 Phases				Ring 3 Phases			
	1	2	3	4	5	6	7	8	9	10	11	12
State 1	Vehicle				Vehicle							
Barrier 1												
State 2		V & P				V & P						
Barrier 2	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
State 3				V & P				V & P				
Barrier 3	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
State 4												
Barrier 4												
State 5												
Barrier 5												
State 6												
Barrier 6												
State 7												
Barrier 7												
State 8												
Barrier 8												
State 9												
Barrier 9												
State 10												
Barrier 10												
State 11												
Barrier 11												
State 12												
Barrier 12												

Intersection 644 at Woodmen Rd and Mohawk Rd - Phases control table, page 1

Page 1	Vehicle Phases		Ped Phases
	111 123456789012		111 123456789012
Min Recalls		Ped Recalls	
Max Recalls	2 6	Handicap Ped Recalls	
Recall If Maxed		Soft Ped Recalls	
Dual Entry	4 8	Don't Recall (FDW Offset)	2 4 6 8
Do Not Skip		Allow Walk Reduction	
Simultaneous Gap Out		Hold In Walk	
Restricted Phases		Allow Ped Re-service	2 6
Sequential Initial Timing		Rest In Walk	No
Max Timer Starts For Call			
Reduction Starts For Call			
Red To Avoid Left Turn Trap			
Rest In Red	No		

Intersection 644 at Woodmen Rd and Mohawk Rd - Coordination table, plans 3-4

Alternate Maxes														

Intersection 644 at Woodmen Rd and Mohawk Rd - Coordination table, plans 5-6

Alternate Maxes														

Intersection 644 at Woodmen Rd and Mohawk Rd - Schedule table, events 1-25

Event Num	Enabled	Event Type	Event Parameters			Start			Duration			Stop		Repetition		Priority
			Param 1	Param 2		Mon	Day	Hour	Min	Sec	Minutes	Mon	Day	Repeat	Intervals	
1	Yes	Run Plan	Plan 2	Ofst #1		1	1	05	00	00	300	12	31	Weekly	MTWTF	Low
2	Yes	Run Plan	Plan 3	Ofst #1		1	1	10	00	00	240	12	31	Weekly	MTWTF	Low
3	Yes	Run Plan	Plan 4	Ofst #1		1	1	14	00	00	480	12	31	Weekly	MTWTF	Very Low
4	Yes	Run Plan	Plan 5	Ofst #1		1	1	10	00	00	600	12	31	Weekly	S	Low
5	Yes	Run Plan	Plan 6	Ofst #1		1	1	06	00	00	240	12	31	Weekly	S	Medium
6	Yes	Run Plan	Plan 6	Ofst #1		1	1	18	00	00	240	12	31	Weekly	S	Medium
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
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19																
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22																
23																
24																
25																

APPENDIX B

Level of Service Definitions

The following information is referenced from the Highway Capacity Manual: A Guide for Multimodal Mobility Analysis, 7th Edition, Transportation Research Board, 2022: Chapter 19 – Signalized Intersections.

Motorized Vehicle 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.

Control Delay (s/veh)	LOS by Volume-to-Capacity Ratio ^a	
	$v/c \leq 1.0$	$v/c > 1.0$
≤ 10	A	F
$> 10 - 20$	B	F
$> 20 - 35$	C	F
$> 35 - 55$	D	F
$> 55 - 80$	E	F
> 80	F	F

Note: ^a For approach-based and intersectionwide assessments, LOS is defined solely by control delay.

The following information is referenced from the Highway Capacity Manual: A Guide for Multimodal Mobility Analysis, 7th Edition, Transportation Research Board, 2022: Chapter 20 – Two-Way Stop-Controlled Intersections, Chapter 21 – All-Way Stop-Controlled Intersections, and Chapter 22 - Roundabouts.

Motorized Vehicle Level of Service (LOS) for Unsignalized & Roundabout Intersections

LOS is a quantitative stratification of performance measure(s) representing quality of service. Quality of service describes how well a transportation facility or service operates from a traveler's perspective. LOS is measured on an A – F scale, with LOS A representing the best operating conditions from a traveler's perspective.

Control Delay (s/veh)	<u>LOS by Volume-to-Capacity Ratio^a</u>	
	$v/c \leq 1.0$	$v/c > 1.0$
0 – 10	A	F
> 10 – 15	B	F
> 15 – 25	C	F
> 25 – 35	D	F
> 35 – 50	E	F
> 50	F	F

Note: The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole.

^a For approaches and intersectionwide assessment, LOS is defined solely by control delay.

APPENDIX C

Capacity Worksheets

Timings

1: Mohawk Road & Woodmen Road

Existing Traffic Conditions

AM Peak Traffic Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	766	24	2	1543	18	1	0	2	20	1	48
Future Volume (vph)	34	766	24	2	1543	18	1	0	2	20	1	48
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	3433	1863	1583	1770	1589	0
Flt Permitted	0.950			0.950			0.722			0.757		
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	2609	1863	1583	1410	1589	0
Satd. Flow (RTOR)			99			99			326		52	
Lane Group Flow (vph)	37	833	26	2	1677	20	1	0	2	22	53	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm		Perm	Perm	NA	
Protected Phases	5	2		1	6			8				4
Permitted Phases			2			6	8		8	4		
Detector Phase	5	2	2	1	6	6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	17.5	17.5	10.0	17.5	17.5	14.0	14.0	14.0	14.0	14.0	
Total Split (s)	17.0	77.0	77.0	17.0	77.0	77.0	16.0	16.0	16.0	16.0	16.0	
Total Split (%)	15.5%	70.0%	70.0%	15.5%	70.0%	70.0%	14.5%	14.5%	14.5%	14.5%	14.5%	
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	5.5	6.0	6.0	6.0	6.0	6.0	
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	
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	
Total Lost Time (s)	5.0	7.5	7.5	5.0	7.5	7.5	8.0	8.0	8.0	8.0	8.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	C-Max	C-Max	None	None	None	None	None	
Act Effect Green (s)	7.8	89.5	89.5	5.7	83.4	83.4	7.0		7.0	7.0	7.0	
Actuated g/C Ratio	0.07	0.81	0.81	0.05	0.76	0.76	0.06		0.06	0.06	0.06	
v/c Ratio	0.30	0.20	0.02	0.02	0.44	0.02	0.01		0.00	0.24	0.35	
Control Delay (s/veh)	53.9	3.5	0.0	50.0	7.4	0.0	47.0		0.0	55.4	20.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	
Total Delay (s/veh)	53.9	3.5	0.0	50.0	7.4	0.0	47.0		0.0	55.4	20.8	
LOS	D	A	A	D	A	A	D		A	E	C	
Approach Delay (s/veh)		5.5			7.3			15.7			30.9	
Approach LOS		A			A			B			C	
Queue Length 50th (ft)	26	42	0	1	189	0	0		0	15	1	
Queue Length 95th (ft)	59	91	0	10	248	0	3		0	42	41	
Internal Link Dist (ft)		438			432			595			160	
Turn Bay Length (ft)	300		400	315		375	195		150	35		
Base Capacity (vph)	193	4138	1306	193	3854	1223	189		417	102	163	
Starvation Cap Reductn	0	0	0	0	0	0	0		0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0		0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0		0	0	0	
Reduced v/c Ratio	0.19	0.20	0.02	0.01	0.44	0.02	0.01		0.00	0.22	0.33	

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 77 (70%), Referenced to phase 6:WBT, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Timings

1: Mohawk Road & Woodmen Road

Existing Traffic Conditions

AM Peak Traffic Hour

Maximum v/c Ratio: 0.44

Intersection Signal Delay (s/veh): 7.4

Intersection LOS: A

Intersection Capacity Utilization 50.5%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Mohawk Road & Woodmen Road

 Ø1 17 s	 Ø2 77 s	 Ø4 16 s
 Ø5 17 s	 Ø6 (R) 77 s	 Ø8 16 s

Intersection												
Int Delay, s/veh	4.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	0	8	20	32	6	0	9	31	14	0	20	1
Future Vol, veh/h	0	8	20	32	6	0	9	31	14	0	20	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	25	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	9	22	35	7	0	10	34	15	0	22	1
Major/Minor	Minor2		Minor1		Major1		Major2		Major2		Major2	
Conflicting Flow All	79	91	22	87	84	41	23	0	0	49	0	0
Stage 1	22	22	-	61	61	-	-	-	-	-	-	-
Stage 2	57	68	-	26	23	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	910	799	1055	899	806	1030	1592	-	-	1558	-	-
Stage 1	996	877	-	950	844	-	-	-	-	-	-	-
Stage 2	955	838	-	991	876	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	897	794	1055	865	802	1030	1592	-	-	1558	-	-
Mov Cap-2 Maneuver	897	794	-	865	802	-	-	-	-	-	-	-
Stage 1	996	877	-	945	839	-	-	-	-	-	-	-
Stage 2	942	833	-	961	876	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB		SB		SB	
HCM Ctrl Dly, s/v	8.85		9.43		1.21		0					
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1592	-	-	964	855	1558	-	-				
HCM Lane V/C Ratio	0.006	-	-	0.032	0.048	-	-	-				
HCM Ctrl Dly (s/v)	7.3	-	-	8.9	9.4	0	-	-				
HCM Lane LOS	A	-	-	A	A	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0	-	-				

Timings

1: Mohawk Road & Woodmen Road

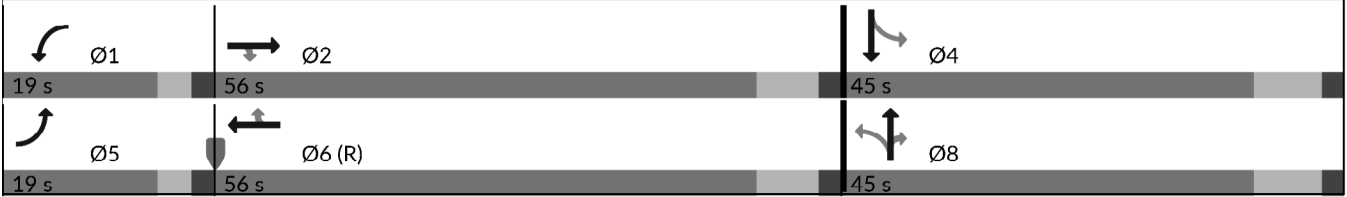
Existing Traffic Conditions

PM Peak Traffic Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	1857	1	1	1259	17	2	0	0	15	0	44
Future Volume (vph)	39	1857	1	1	1259	17	2	0	0	15	0	44
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	3433	1863	1863	1770	1583	0
Flt Permitted	0.950			0.950			0.726			0.757		
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	2624	1863	1863	1410	1583	0
Satd. Flow (RTOR)			91			91					252	
Lane Group Flow (vph)	42	2018	1	1	1368	18	2	0	0	16	48	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm		Perm	Perm	NA	
Protected Phases	5	2		1	6			8				4
Permitted Phases			2			6	8		8	4		
Detector Phase	5	2	2	1	6	6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	17.5	17.5	10.0	17.5	17.5	14.0	14.0	14.0	14.0	14.0	
Total Split (s)	19.0	56.0	56.0	19.0	56.0	56.0	45.0	45.0	45.0	45.0	45.0	
Total Split (%)	15.8%	46.7%	46.7%	15.8%	46.7%	46.7%	37.5%	37.5%	37.5%	37.5%	37.5%	
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	5.5	6.0	6.0	6.0	6.0	6.0	
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	
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	
Total Lost Time (s)	5.0	7.5	7.5	5.0	7.5	7.5	8.0	8.0	8.0	8.0	8.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	None	None	None	C-Max	C-Max	None	None	None	None	None	
Act Effect Green (s)	8.3	99.5	99.5	5.6	90.5	90.5	7.1			7.1	7.1	
Actuated g/C Ratio	0.07	0.83	0.83	0.05	0.75	0.75	0.06			0.06	0.06	
v/c Ratio	0.34	0.48	0.00	0.01	0.36	0.01	0.01			0.19	0.15	
Control Delay (s/veh)	60.1	4.7	0.0	55.0	7.1	0.0	52.0			58.4	0.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0	
Total Delay (s/veh)	60.1	4.7	0.0	55.0	7.1	0.0	52.0			58.4	0.9	
LOS	E	A	A	D	A	A	D			E	A	
Approach Delay (s/veh)		5.9			7.0			52.0			15.3	
Approach LOS		A			A			D			B	
Queue Length 50th (ft)	32	141	0	1	142	0	1			12	0	
Queue Length 95th (ft)	69	292	0	7	197	0	5			36	0	
Internal Link Dist (ft)		418			402			595			160	
Turn Bay Length (ft)	300		400	315		375	195			35		
Base Capacity (vph)	206	4214	1327	206	3833	1215	809			434	662	
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	0.20	0.48	0.00	0.00	0.36	0.01	0.00			0.04	0.07	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 72 (60%), Referenced to phase 6:WBT, Start of Green												
Natural Cycle: 60												
Control Type: Actuated-Coordinated												

Maximum v/c Ratio: 0.48	
Intersection Signal Delay (s/veh): 6.5	Intersection LOS: A
Intersection Capacity Utilization 56.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Mohawk Road & Woodmen Road



Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙ ↘				↕	
Traffic Vol, veh/h	1	2	14	20	1	2	10	42	15	1	25	1
Future Vol, veh/h	1	2	14	20	1	2	10	42	15	1	25	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	25	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	2	15	22	1	2	11	46	16	1	27	1
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	98	114	28	106	106	54	28	0	0	62	0	0
Stage 1	30	30	-	76	76	-	-	-	-	-	-	-
Stage 2	68	84	-	30	30	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	884	777	1048	874	784	1013	1585	-	-	1541	-	-
Stage 1	987	870	-	934	832	-	-	-	-	-	-	-
Stage 2	942	825	-	986	870	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	874	771	1048	852	778	1013	1585	-	-	1541	-	-
Mov Cap-2 Maneuver	874	771	-	852	778	-	-	-	-	-	-	-
Stage 1	986	870	-	927	826	-	-	-	-	-	-	-
Stage 2	933	820	-	969	869	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Ctrl Dly, s/v	8.69		9.31		1.09		0.27					
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1585	-	-	994	860	66	-	-				
HCM Lane V/C Ratio	0.007	-	-	0.019	0.029	0.001	-	-				
HCM Ctrl Dly (s/v)	7.3	-	-	8.7	9.3	7.3	0	-				
HCM Lane LOS	A	-	-	A	A	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-				

Timings

Background Traffic Conditions - Year 2028

1: Mohawk Road & Woodmen Road

AM Peak Traffic Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	1405	141	171	2207	19	311	5	153	21	8	71
Future Volume (vph)	42	1405	141	171	2207	19	311	5	153	21	8	71
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	3433	1863	1583	1770	1613	0
Flt Permitted	0.950			0.950			0.701			0.754		
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	2533	1863	1583	1405	1613	0
Satd. Flow (RTOR)			153			91			166		77	
Lane Group Flow (vph)	46	1527	153	186	2399	21	338	5	166	23	86	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8				4
Permitted Phases			2			6	8		8	4		
Detector Phase	5	2	2	1	6	6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	17.5	17.5	10.0	17.5	17.5	14.0	14.0	14.0	14.0	14.0	
Total Split (s)	15.0	64.0	64.0	26.0	75.0	75.0	30.0	30.0	30.0	30.0	30.0	
Total Split (%)	12.5%	53.3%	53.3%	21.7%	62.5%	62.5%	25.0%	25.0%	25.0%	25.0%	25.0%	
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	5.5	6.0	6.0	6.0	6.0	6.0	
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	
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	
Total Lost Time (s)	5.0	7.5	7.5	5.0	7.5	7.5	8.0	8.0	8.0	8.0	8.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Max	Max	None	C-Max	C-Max	None	None	None	None	None	
Act Effect Green (s)	8.2	62.6	62.6	17.1	73.6	73.6	19.8	19.8	19.8	19.8	19.8	
Actuated g/C Ratio	0.07	0.52	0.52	0.14	0.61	0.61	0.17	0.17	0.17	0.17	0.17	
v/c Ratio	0.38	0.58	0.17	0.74	0.77	0.02	0.81	0.02	0.42	0.10	0.26	
Control Delay (s/veh)	62.0	21.6	3.2	66.2	20.5	0.1	63.7	40.6	9.6	42.4	13.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)	62.0	21.6	3.2	66.2	20.5	0.1	63.7	40.6	9.6	42.4	13.4	
LOS	E	C	A	E	C	A	E	D	A	D	B	
Approach Delay (s/veh)		21.1			23.6			45.9			19.5	
Approach LOS		C			C			D			B	
Queue Length 50th (ft)	35	301	0	141	517	0	131	3	0	15	6	
Queue Length 95th (ft)	75	376	37	217	617	0	185	15	61	40	52	
Internal Link Dist (ft)		438			412			595			160	
Turn Bay Length (ft)	300		400	315		375	165		165	35		
Base Capacity (vph)	147	2650	898	309	3118	1006	464	341	425	257	358	
Starvation Cap Reductn	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	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.31	0.58	0.17	0.60	0.77	0.02	0.73	0.01	0.39	0.09	0.24	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

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

Natural Cycle: 80

Control Type: Actuated-Coordinated

Timings

1: Mohawk Road & Woodmen Road

Background Traffic Conditions - Year 2028

AM Peak Traffic Hour

Maximum v/c Ratio: 0.81

Intersection Signal Delay (s/veh): 24.9

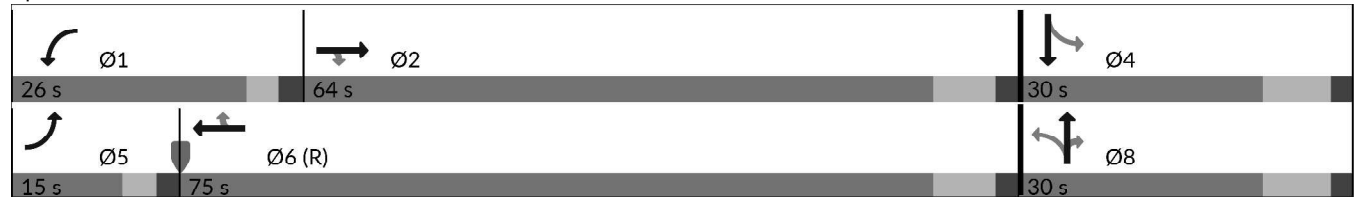
Intersection LOS: C

Intersection Capacity Utilization 79.4%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 1: Mohawk Road & Woodmen Road



Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↵		↵		↕	
Traffic Vol, veh/h	0	8	21	54	6	0	9	32	22	0	21	1
Future Vol, veh/h	0	8	21	54	6	0	9	32	22	0	21	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	25	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	9	23	59	7	0	10	35	24	0	23	1
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	81	102	23	93	90	47	24	0	0	59	0	0
Stage 1	23	23	-	66	66	-	-	-	-	-	-	-
Stage 2	58	78	-	27	24	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	907	788	1053	890	800	1023	1591	-	-	1545	-	-
Stage 1	995	876	-	944	840	-	-	-	-	-	-	-
Stage 2	954	830	-	990	875	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	894	784	1053	856	795	1023	1591	-	-	1545	-	-
Mov Cap-2 Maneuver	894	784	-	856	795	-	-	-	-	-	-	-
Stage 1	995	876	-	938	835	-	-	-	-	-	-	-
Stage 2	941	825	-	959	875	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Ctrl Dly, s/v	8.87		9.59		1.04		0					
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1591	-	-	962	849	1545	-	-				
HCM Lane V/C Ratio	0.006	-	-	0.033	0.077	-	-	-				
HCM Ctrl Dly (s/v)	7.3	-	-	8.9	9.6	0	-	-				
HCM Lane LOS	A	-	-	A	A	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0	-	-				

Timings

Background Traffic Conditions - Year 2028

1: Mohawk Road & Woodmen Road

PM Peak Traffic Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 				 	
Traffic Volume (vph)	64	3074	153	176	2365	18	177	4	115	16	6	60
Future Volume (vph)	64	3074	153	176	2365	18	177	4	115	16	6	60
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	3433	1863	1583	1770	1611	0
Flt Permitted	0.950			0.950			0.710			0.755		
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	2566	1863	1583	1406	1611	0
Satd. Flow (RTOR)			166			91			125		65	
Lane Group Flow (vph)	70	3341	166	191	2571	20	192	4	125	17	72	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8				4
Permitted Phases			2			6	8		8	4		
Detector Phase	5	2	2	1	6	6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	17.5	17.5	10.0	17.5	17.5	14.0	14.0	14.0	14.0	14.0	
Total Split (s)	19.0	86.0	86.0	18.0	85.0	85.0	16.0	16.0	16.0	16.0	16.0	
Total Split (%)	15.8%	71.7%	71.7%	15.0%	70.8%	70.8%	13.3%	13.3%	13.3%	13.3%	13.3%	
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	5.5	6.0	6.0	6.0	6.0	6.0	
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	
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	
Total Lost Time (s)	5.0	7.5	7.5	5.0	7.5	7.5	8.0	8.0	8.0	8.0	8.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Max	Max	None	C-Max	C-Max	None	None	None	None	None	
Act Effect Green (s)	10.1	78.5	78.5	13.0	83.6	83.6	8.0	8.0	8.0	8.0	8.0	
Actuated g/C Ratio	0.08	0.65	0.65	0.11	0.70	0.70	0.07	0.07	0.07	0.07	0.07	
v/c Ratio	0.47	1.00	0.15	1.00	0.73	0.02	1.12	0.03	0.56	0.18	0.43	
Control Delay (s/veh)	62.0	37.8	1.5	119.0	13.7	0.1	156.0	53.0	19.7	57.8	23.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)	62.0	37.8	1.5	119.0	13.7	0.1	156.0	53.0	19.7	57.8	23.6	
LOS	E	D	A	F	B	A	F	D	B	E	C	
Approach Delay (s/veh)		36.6			20.8			101.6			30.1	
Approach LOS		D			C			F			C	
Queue Length 50th (ft)	53	~906	0	153	438	0	~89	3	0	13	5	
Queue Length 95th (ft)	100	#1087	23	#308	554	0	#168	15	61	38	53	
Internal Link Dist (ft)		438			402			595			160	
Turn Bay Length (ft)	300		400	315		375	165		165	35		
Base Capacity (vph)	206	3326	1092	191	3544	1130	171	124	222	93	168	
Starvation Cap Reductn	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	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.34	1.00	0.15	1.00	0.73	0.02	1.12	0.03	0.56	0.18	0.43	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 72 (60%), Referenced to phase 6:WBT, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Timings

Background Traffic Conditions - Year 2028

1: Mohawk Road & Woodmen Road

PM Peak Traffic Hour

Maximum v/c Ratio: 1.12

Intersection Signal Delay (s/veh): 33.1

Intersection LOS: C

Intersection Capacity Utilization 97.9%

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: 1: Mohawk Road & Woodmen Road

 Ø1	 Ø2	 Ø4
18 s	86 s	16 s
 Ø5	 Ø6 (R)	 Ø8
19 s	85 s	16 s

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙		↘		↕	
Traffic Vol, veh/h	1	2	15	35	1	2	10	44	39	1	26	1
Future Vol, veh/h	1	2	15	35	1	2	10	44	39	1	26	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	25	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	2	16	38	1	2	11	48	42	1	28	1
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	101	143	29	122	122	69	29	0	0	90	0	0
Stage 1	31	31	-	91	91	-	-	-	-	-	-	-
Stage 2	70	112	-	32	32	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	880	748	1046	852	768	994	1584	-	-	1505	-	-
Stage 1	986	869	-	916	820	-	-	-	-	-	-	-
Stage 2	940	803	-	985	869	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	870	743	1046	830	762	994	1584	-	-	1505	-	-
Mov Cap-2 Maneuver	870	743	-	830	762	-	-	-	-	-	-	-
Stage 1	985	869	-	910	814	-	-	-	-	-	-	-
Stage 2	930	797	-	966	868	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Ctrl Dly, s/v	8.71		9.53		0.78		0.26					
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1584	-	-	990	836	64	-	-				
HCM Lane V/C Ratio	0.007	-	-	0.02	0.049	0.001	-	-				
HCM Ctrl Dly (s/v)	7.3	-	-	8.7	9.5	7.4	0	-				
HCM Lane LOS	A	-	-	A	A	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0	-	-				

Timings

Total Traffic Conditions - Year 2028

1: Mohawk Road & Woodmen Road

AM Peak Traffic Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	1405	141	171	2207	46	311	5	153	46	8	105
Future Volume (vph)	80	1405	141	171	2207	46	311	5	153	46	8	105
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	3433	1863	1583	1770	1604	0
Flt Permitted	0.950			0.950			0.678			0.754		
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	2450	1863	1583	1405	1604	0
Satd. Flow (RTOR)			153			91			166		114	
Lane Group Flow (vph)	87	1527	153	186	2399	50	338	5	166	50	123	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8				4
Permitted Phases			2			6	8		8	4		
Detector Phase	5	2	2	1	6	6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	17.5	17.5	10.0	17.5	17.5	14.0	14.0	14.0	14.0	14.0	
Total Split (s)	15.0	64.0	64.0	26.0	75.0	75.0	30.0	30.0	30.0	30.0	30.0	
Total Split (%)	12.5%	53.3%	53.3%	21.7%	62.5%	62.5%	25.0%	25.0%	25.0%	25.0%	25.0%	
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	5.5	6.0	6.0	6.0	6.0	6.0	
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	
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	
Total Lost Time (s)	5.0	7.5	7.5	5.0	7.5	7.5	8.0	8.0	8.0	8.0	8.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Max	Max	None	C-Max	C-Max	None	None	None	None	None	
Act Effect Green (s)	9.3	62.2	62.2	17.1	70.0	70.0	20.2	20.2	20.2	20.2	20.2	
Actuated g/C Ratio	0.08	0.52	0.52	0.14	0.58	0.58	0.17	0.17	0.17	0.17	0.17	
v/c Ratio	0.64	0.58	0.17	0.74	0.81	0.05	0.82	0.02	0.41	0.21	0.34	
Control Delay (s/veh)	74.1	21.9	3.2	66.2	23.1	0.5	64.8	40.4	9.5	44.6	11.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)	74.1	21.9	3.2	66.2	23.1	0.5	64.8	40.4	9.5	44.6	11.8	
LOS	E	C	A	E	C	A	E	D	A	D	B	
Approach Delay (s/veh)		22.8			25.7			46.6			21.3	
Approach LOS		C			C			D			C	
Queue Length 50th (ft)	67	304	0	141	545	0	131	3	0	34	6	
Queue Length 95th (ft)	#131	376	37	217	617	4	#189	15	61	72	60	
Internal Link Dist (ft)		438			412			595			160	
Turn Bay Length (ft)	300		400	315		375	165		165	35		
Base Capacity (vph)	148	2635	894	309	2966	961	449	341	425	257	387	
Starvation Cap Reductn	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	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.59	0.58	0.17	0.60	0.81	0.05	0.75	0.01	0.39	0.19	0.32	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 6:WBT, Start of Green												
Natural Cycle: 80												
Control Type: Actuated-Coordinated												

Timings

Total Traffic Conditions - Year 2028

1: Mohawk Road & Woodmen Road

AM Peak Traffic Hour

Maximum v/c Ratio: 0.82

Intersection Signal Delay (s/veh): 26.6

Intersection LOS: C

Intersection Capacity Utilization 79.7%

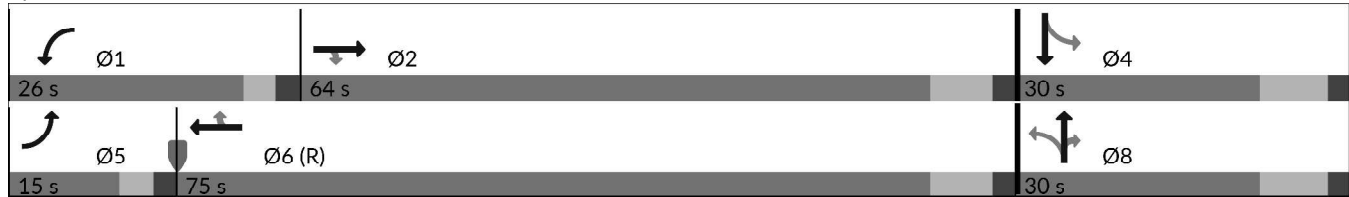
ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Mohawk Road & Woodmen Road



Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↙	↘		↕		
Traffic Vol, veh/h	3	8	21	54	6	0	9	97	22	0	80	4
Future Vol, veh/h	3	8	21	54	6	0	9	97	22	0	80	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	25	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	9	23	59	7	0	10	105	24	0	87	4
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	217	238	89	228	228	117	91	0	0	129	0	0
Stage 1	89	89	-	137	137	-	-	-	-	-	-	-
Stage 2	128	149	-	91	91	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	739	663	969	727	671	935	1504	-	-	1456	-	-
Stage 1	918	821	-	866	783	-	-	-	-	-	-	-
Stage 2	875	774	-	916	819	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	727	659	969	696	667	935	1504	-	-	1456	-	-
Mov Cap-2 Maneuver	727	659	-	696	667	-	-	-	-	-	-	-
Stage 1	918	821	-	861	778	-	-	-	-	-	-	-
Stage 2	862	769	-	885	819	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Ctrl Dly, s/v	9.45		10.73		0.52		0					
HCM LOS	A		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1504	-	-	843	693	1456	-	-				
HCM Lane V/C Ratio	0.007	-	-	0.041	0.094	-	-	-				
HCM Ctrl Dly (s/v)	7.4	-	-	9.5	10.7	0	-	-				
HCM Lane LOS	A	-	-	A	B	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0	-	-				

Intersection						
Int Delay, s/veh	4.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	52	58	42	32	0
Future Vol, veh/h	0	52	58	42	32	0
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	-	115	-	-	-
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	0	57	63	46	35	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	207	35	35	0	-	0
Stage 1	35	-	-	-	-	-
Stage 2	172	-	-	-	-	-
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	782	1038	1577	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	858	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	751	1038	1577	-	-	-
Mov Cap-2 Maneuver	751	-	-	-	-	-
Stage 1	948	-	-	-	-	-
Stage 2	858	-	-	-	-	-
Approach	EB	NB		SB		
HCM Ctrl Dly, s/v	8.67	4.28		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1577	-	1038	-	-	
HCM Lane V/C Ratio	0.04	-	0.054	-	-	
HCM Ctrl Dly (s/v)	7.4	-	8.7	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-	

Intersection						
Int Delay, s/veh	2.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	10	10	32	22	0
Future Vol, veh/h	0	10	10	32	22	0
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	0	11	11	35	24	0
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	80	24	24	0	-	0
Stage 1	24	-	-	-	-	-
Stage 2	57	-	-	-	-	-
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	922	1053	1591	-	-	-
Stage 1	999	-	-	-	-	-
Stage 2	966	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	915	1053	1591	-	-	-
Mov Cap-2 Maneuver	915	-	-	-	-	-
Stage 1	992	-	-	-	-	-
Stage 2	966	-	-	-	-	-
Approach	EB		NB		SB	
HCM Ctrl Dly, s/v	8.46		1.73		0	
HCM LOS	A					
Minor Lane/Major Mvmt	NBL		NBT	EBLn1	SBT	SBR
Capacity (veh/h)	429		-	1053	-	-
HCM Lane V/C Ratio	0.007		-	0.01	-	-
HCM Ctrl Dly (s/v)	7.3		0	8.5	-	-
HCM Lane LOS	A		A	A	-	-
HCM 95th %tile Q(veh)	0		-	0	-	-

Timings

Total Traffic Conditions - Year 2028

1: Mohawk Road & Woodmen Road

PM Peak Traffic Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	3074	153	176	2365	44	177	4	115	44	6	97
Future Volume (vph)	100	3074	153	176	2365	44	177	4	115	44	6	97
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	3433	1863	1583	1770	1600	0
Flt Permitted	0.950			0.950			0.685			0.755		
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	2475	1863	1583	1406	1600	0
Satd. Flow (RTOR)			166			91			125		105	
Lane Group Flow (vph)	109	3341	166	191	2571	48	192	4	125	48	112	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8		8	4		
Detector Phase	5	2	2	1	6	6	8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	10.0	17.5	17.5	10.0	17.5	17.5	14.0	14.0	14.0	14.0	14.0	
Total Split (s)	19.0	86.0	86.0	18.0	85.0	85.0	16.0	16.0	16.0	16.0	16.0	
Total Split (%)	15.8%	71.7%	71.7%	15.0%	70.8%	70.8%	13.3%	13.3%	13.3%	13.3%	13.3%	
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	5.5	6.0	6.0	6.0	6.0	6.0	
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	
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	
Total Lost Time (s)	5.0	7.5	7.5	5.0	7.5	7.5	8.0	8.0	8.0	8.0	8.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Max	Max	None	C-Max	C-Max	None	None	None	None	None	
Act Effect Green (s)	11.8	78.5	78.5	13.0	79.7	79.7	8.0	8.0	8.0	8.0	8.0	
Actuated g/C Ratio	0.10	0.65	0.65	0.11	0.66	0.66	0.07	0.07	0.07	0.07	0.07	
v/c Ratio	0.63	1.00	0.15	1.00	0.76	0.04	1.16	0.03	0.56	0.52	0.55	
Control Delay (s/veh)	67.5	37.8	1.5	119.0	16.0	0.3	169.6	53.0	19.7	74.0	22.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)	67.5	37.8	1.5	119.0	16.0	0.3	169.6	53.0	19.7	74.0	22.4	
LOS	E	D	A	F	B	A	F	D	B	E	C	
Approach Delay (s/veh)		37.0			22.7			109.8			37.9	
Approach LOS		D			C			F			D	
Queue Length 50th (ft)	83	~906	0	153	473	0	~92	3	0	37	5	
Queue Length 95th (ft)	144	#1087	23	#308	554	2	#171	15	61	#85	64	
Internal Link Dist (ft)		438			402			595			160	
Turn Bay Length (ft)	300		400	315		375	165		165	35		
Base Capacity (vph)	206	3326	1092	191	3375	1081	165	124	222	93	204	
Starvation Cap Reductn	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	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.53	1.00	0.15	1.00	0.76	0.04	1.16	0.03	0.56	0.52	0.55	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 6:WBT, Start of Green												
Natural Cycle: 130												
Control Type: Actuated-Coordinated												

Timings

Total Traffic Conditions - Year 2028

1: Mohawk Road & Woodmen Road

PM Peak Traffic Hour

Maximum v/c Ratio: 1.16

Intersection Signal Delay (s/veh): 34.6

Intersection LOS: C

Intersection Capacity Utilization 97.9%

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: 1: Mohawk Road & Woodmen Road

 Ø1	 Ø2	 Ø4
18 s	86 s	16 s
 Ø5	 Ø6 (R)	 Ø8
19 s	85 s	16 s

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↙	↘		↕		
Traffic Vol, veh/h	4	2	15	35	1	2	10	106	39	1	91	4
Future Vol, veh/h	4	2	15	35	1	2	10	106	39	1	91	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	25	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	2	16	38	1	2	11	115	42	1	99	4
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	241	283	101	260	264	136	103	0	0	158	0	0
Stage 1	103	103	-	158	158	-	-	-	-	-	-	-
Stage 2	138	179	-	102	105	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	713	626	954	693	642	912	1489	-	-	1422	-	-
Stage 1	903	810	-	844	767	-	-	-	-	-	-	-
Stage 2	866	751	-	904	808	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	705	621	954	673	636	912	1489	-	-	1422	-	-
Mov Cap-2 Maneuver	705	621	-	673	636	-	-	-	-	-	-	-
Stage 1	902	809	-	838	761	-	-	-	-	-	-	-
Stage 2	856	745	-	885	807	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Ctrl Dly, s/v	9.34		10.63		0.48		0.08					
HCM LOS	A		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1489	-	-	853	681	19	-	-				
HCM Lane V/C Ratio	0.007	-	-	0.027	0.061	0.001	-	-				
HCM Ctrl Dly (s/v)	7.4	-	-	9.3	10.6	7.5	0	-				
HCM Lane LOS	A	-	-	A	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0	-	-				

Intersection

Int Delay, s/veh 4.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	52	58	42	32	0
Future Vol, veh/h	0	52	58	42	32	0
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	-	115	-	-	-
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	0	57	63	46	35	0

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	207	35	35
Stage 1	35	-	-
Stage 2	172	-	-
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	782	1038	1577
Stage 1	988	-	-
Stage 2	858	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	751	1038	1577
Mov Cap-2 Maneuver	751	-	-
Stage 1	948	-	-
Stage 2	858	-	-

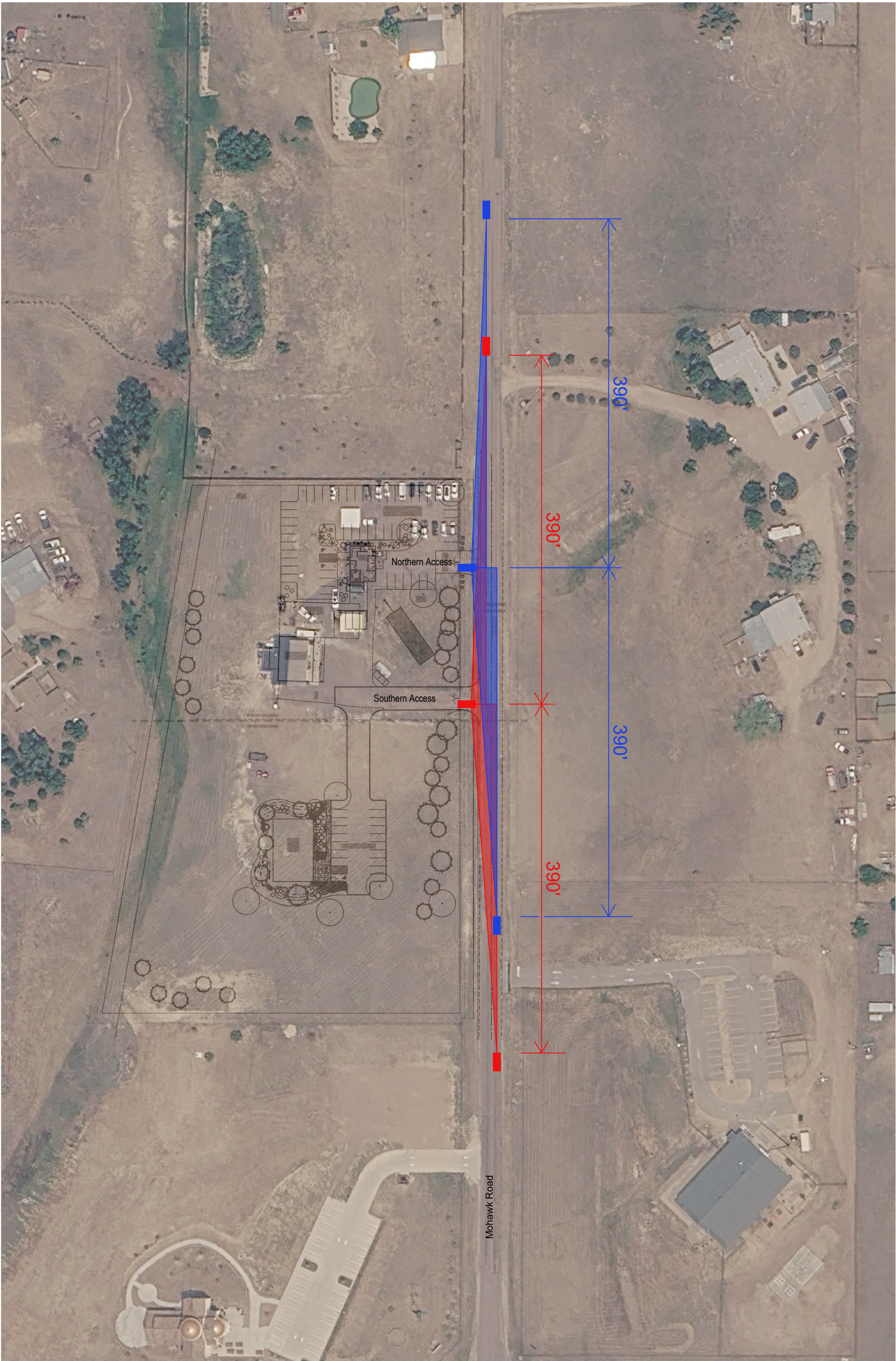
Approach	EB	NB	SB
HCM Ctrl Dly, s/v	8.67	4.28	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1577	-	1038	-	-
HCM Lane V/C Ratio	0.04	-	0.054	-	-
HCM Ctrl Dly (s/v)	7.4	-	8.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection						
Int Delay, s/veh	2.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	10	10	32	22	0
Future Vol, veh/h	0	10	10	32	22	0
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	0	11	11	35	24	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	80	24	24	0	-	0
Stage 1	24	-	-	-	-	-
Stage 2	57	-	-	-	-	-
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	922	1053	1591	-	-	-
Stage 1	999	-	-	-	-	-
Stage 2	966	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	915	1053	1591	-	-	-
Mov Cap-2 Maneuver	915	-	-	-	-	-
Stage 1	992	-	-	-	-	-
Stage 2	966	-	-	-	-	-
Approach	EB	NB		SB		
HCM Ctrl Dly, s/v	8.46	1.73		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	429	-	1053	-	-	
HCM Lane V/C Ratio	0.007	-	0.01	-	-	
HCM Ctrl Dly (s/v)	7.3	0	8.5	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

APPENDIX D

Sight Distance Exhibit



SUNFLOWER LANDSCAPES
Conceptual Sight Distance Exhibit

SM ROCHA, LLC
Traffic & Transportation Engineering

August 2026



V3_Traffic Impact Study.pdf Markup Summary

Joseph Sandstrom (21)



Subject: Cloud+
Page Label: 6
Author: Joseph Sandstrom
Date: 9/15/2026 1:49:32 PM
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Unresolved Review 1 Comment:
A two-dimensional exhibit does not accurately reflect whether the required sight distance is met, the vertical profile must be considered. A statement must be included whether or not the sight distance is met.

The sight distance analysis may be performed at the site development plan application instead of the variance application. If the applicant is planning to postpone the sight distance analysis, please clearly state that in this report.

Please note the the sight distance analysis shall be reflective of the type of traffic utilizing the site.

Review 2 comment:
Please include what was written in the comment response in the report.



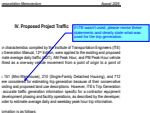
Subject: Callout
Page Label: 16
Author: Joseph Sandstrom
Date: 9/15/2026 1:50:57 PM
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If ITE is not deemed to be accurate for any of the proposed land uses then it should not be used for this traffic study. As mentioned in the comment review meeting on 7/26/2026 after the V2 review, a local trip generation study can be conducted in conjunction with obtaining data from the currently operating site and from other comparable land uses to generate a local trip rate.

codes 151 (Mini-Warehouse) were considered for the existing and proposed development phases to provide accurate traffic generation data.

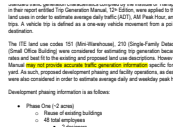
Subject: Highlight
Page Label: 16
Author: Joseph Sandstrom
Date: 9/14/2026 11:35:24 AM
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were considered



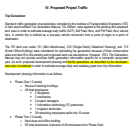
Subject: Callout
Page Label: 16
Author: Joseph Sandstrom
Date: 9/15/2026 1:45:10 PM
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If ITE wasn't used, please revise these statements and clearly state what was used for the trip generation.



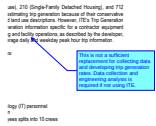
Subject: Highlight
Page Label: 16
Author: Joseph Sandstrom
Date: 9/14/2026 11:36:34 AM
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may not provide accurate traffic generation information



Subject: Highlight
Page Label: 16
Author: Joseph Sandstrom
Date: 9/14/2026 11:37:05 AM
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facility operations, as described by the developer, were also considered



Subject: Callout
Page Label: 16
Author: Joseph Sandstrom
Date: 9/14/2026 11:41:29 AM
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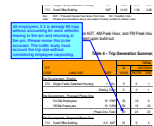
This is not a sufficient replacement for collecting data and developing trip generation rates. Data collection and engineering analysis is required if not using ITE.



Subject: Cloud+
Page Label: 17
Author: Joseph Sandstrom
Date: 9/15/2026 7:24:14 AM
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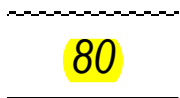
There is no explanation for how the phase 1 trip generation was calculated and it does not appear to be calculated from the ITE trip rates. Please include explanation as to how this was calculated.

In addition, please include what on-site and off-site employees are referring to and what 10 Employees and 10 crew is referring to.



Subject: Callout
Page Label: 17
Author: Joseph Sandstrom
Date: 9/15/2026 1:44:38 PM
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48 employees X 2 is already 96 trips without accounting for work vehicles leaving in the am and returning in the pm. Please revise this to be accurate. The traffic study must account the trip rate without considering employee carpooling.

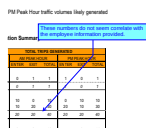


Subject: Highlight
Page Label: 17
Author: Joseph Sandstrom
Date: 9/14/2026 12:00:45 PM
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80

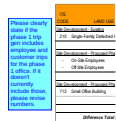
9	0	1	1	0	1
9	0	1	1	0	1
20	10	0	10	0	10
80	10	20	0	20	10
30	20	20	40	20	40
80	0	0	10	0	10
200	40	40	20	40	20
200	40	40	20	40	20
100	40	40	40	40	100

Subject: Highlight
Page Label: 17
Author: Joseph Sandstrom
Date: 9/14/2026 12:04:32 PM
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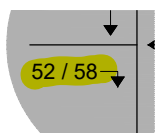
Subject: Callout
Page Label: 17
Author: Joseph Sandstrom
Date: 9/15/2026 7:22:00 AM
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These numbers do not seem correlate with the employee information provided.

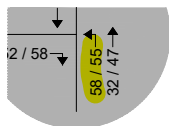


Subject: Text Box
Page Label: 17
Author: Joseph Sandstrom
Date: 9/15/2026 7:22:24 AM
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Please clearly state if the phase 1 trip gen includes employee and customer trips for the phase 1 office. If it doesn't currently include those, please revise numbers.



Subject: Highlight
Page Label: 19
Author: Joseph Sandstrom
Date: 9/15/2026 7:46:46 AM
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Subject: Highlight
Page Label: 19
Author: Joseph Sandstrom
Date: 9/15/2026 7:46:48 AM
Status:
Color: ■
Layer:
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Subject: Callout
Page Label: 19
Author: Joseph Sandstrom
Date: 9/15/2026 1:46:33 PM
Status:
Color: ■
Layer:
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These turning volumes don't make sense with the site plan as there is no parking shown for phase 1 connected to the southern access and limited parking for phase 2. Please update the turning volumes or the site plan (similar comment made on site plan) and include explanation in the report if needed.



Subject: Callout
Page Label: 20
Author: Joseph Sandstrom
Date: 9/15/2026 1:53:59 PM
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A turn lane is required per the ECM. Please revise text to be accurate and references in future sections to required improvement.

Construction Drawings and FAE will be required at the site development plan for the required turn lane.

The developer is responsible for this improvement.

auxiliary lane
ad may be rec
d at Northern A

Subject: Highlight
Page Label: 20
Author: Joseph Sandstrom
Date: 9/14/2026 1:33:10 PM
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may be



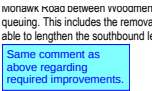
Subject: Text Box
Page Label: 22
Author: Joseph Sandstrom
Date: 9/15/2026 9:57:11 AM
Status:
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The discussions from the last report on the mitigated scenarios for signal timing were removed and there is no explanation associated with this. If the City has already updated the signal timing, please state that. If you have received proposed timing from coordination with the City or if the timing was modified independently to achieve the best LOS, please state that and retain the previously included analysis of the existing and mitigated intersection operations with explanation in the narrative so that the existing operations can be documented as well as the proposed modifications.



Subject: Text Box
Page Label: 26
Author: Joseph Sandstrom
Date: 9/15/2026 1:54:27 PM
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Include a discussion regarding the required NB, LT lane on Mohawk Road for the southern access as it is required based on the provided turning volumes.



Subject: Callout
Page Label: 27
Author: Joseph Sandstrom
Date: 9/15/2026 1:54:53 PM
Status:
Color: 
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Same comment as above regarding required improvements.