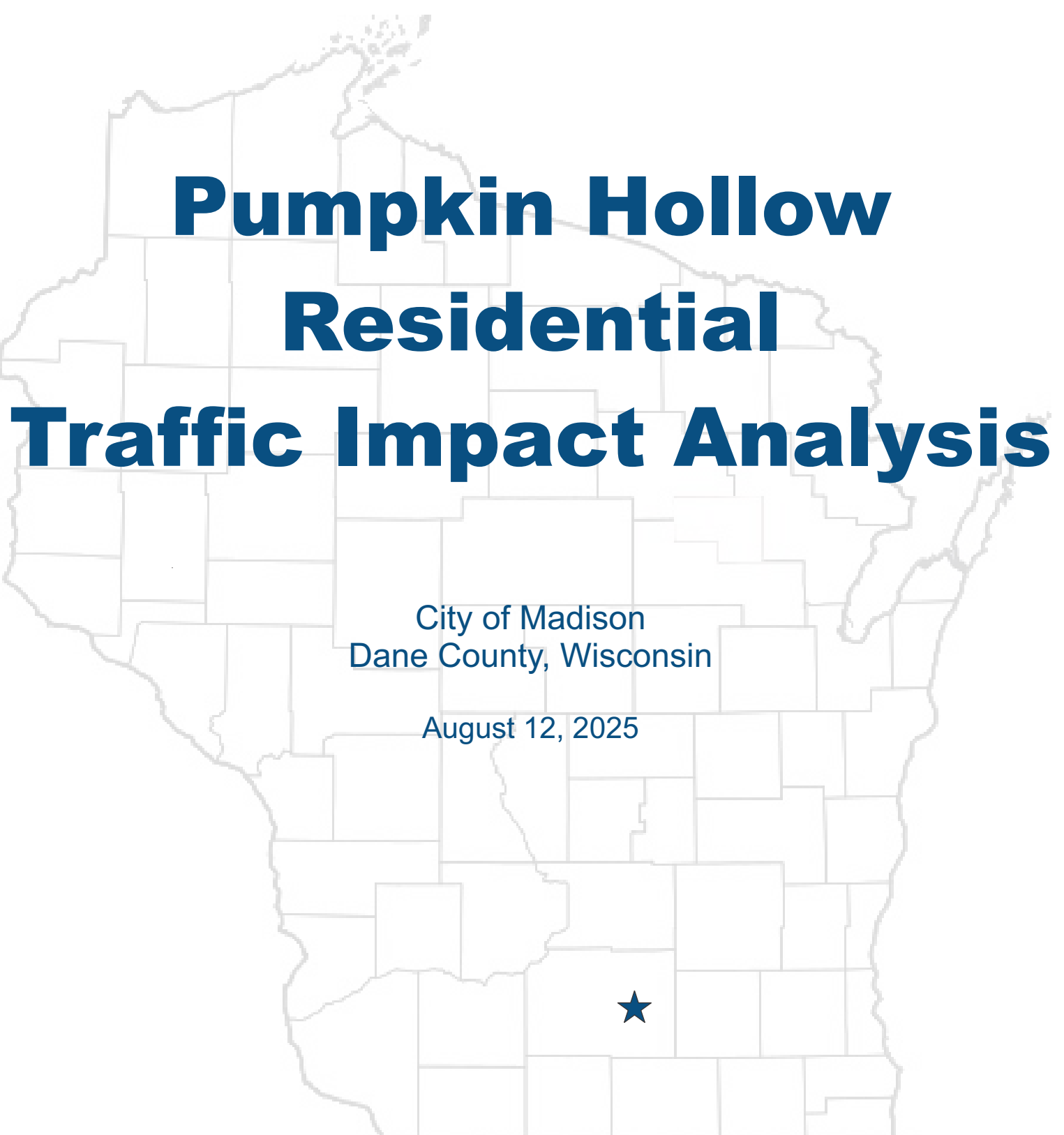




Pumpkin Hollow Residential Traffic Impact Analysis

City of Madison
Dane County, Wisconsin

August 12, 2025



TRAFFIC IMPACT ANALYSIS

DATE: August 12, 2025

TO: Aaron E. Koch, P.E.
Pinnacle Engineering Group

FROM: Don Lee, P.E.
John A Bieberitz, P.E., PTOE
Traffic Analysis & Design, Inc.

SUBJECT: **Pumpkin Hollow Residential Development**
Portage Road at Hoepker Road
City of Madison, Dane County, WI

INTRODUCTION

The Pumpkin Hollow residential development is being proposed to be located on a 27-acre parcel in the southeast corner of the Hoepker Road intersection with Portage Road in the City of Madison, Dane County, Wisconsin (Exhibit 1). Access to the site is proposed via a single full access roadway connection along Hoepker Road (Exhibit 2). This traffic impact analysis (TIA) report was prepared to address the weekday morning and weekday evening peak hour traffic impacts of the proposed development traffic on the adjacent transportation system.

STUDY AREA

Study Intersections

The study area for this TIA includes the following existing and proposed intersections:

- Hoepker Road with Portage Road (all-way stop control)
- Hoepker Road with proposed access drive (one-way stop control)

Each intersection is shown on the study area map on Exhibit 1. A transportation detail illustrating existing intersection lane configurations and speed limits is shown in Exhibit 3.

Study Area Roadways

Hoepker Road is a two-lane undivided east/west major collector with a posted speed limit of 35 miles per hour (mph) west of Portage Road and 45-mph to the east. There are currently no WisDOT annual average daily traffic (AADT) volumes on Hoepker Road; however, AADT volumes of approximately 8,500 vehicles per day (vpd) to the west of Portage Road and 7,900-vpd east of Portage Road were extrapolated from six hours (6 to 9 am and 3 to 6 pm) of peak hour turning movements collected as part of this study. Sidewalks and bicycle lanes are not currently provided along either side of Hoepker Road through the project limits.

Portage Road is a two-lane undivided north/south major collector with a posted speed limit of 45-mph. There are currently no WisDOT AADT volumes on Portage Road; however, AADT volumes of approximately 1,400-vpd to the north of Hoepker Road and 2,600-vpd south of Hoepker Road were extrapolated from six hours (6 to 9 am and 3 to 6 pm) of peak hour turning movements collected as part of this study. Sidewalks and bicycle lanes are not currently provided along either side of Portage Road through the project limits.

DATA COLLECTION

Existing Traffic Counts

Weekday morning (6:00 to 9:00 a.m.) and weekday evening (3:00 to 6:00 p.m.) turning movement traffic counts were conducted by TADI in mid-December of 2024 at the Hoepker Road intersection with Portage Road.

Based on the turning movement traffic counts, the peak traffic hours at the study intersections were determined to occur from 7:30-8:30 a.m. (AM peak hour) and from 4:15-5:15 p.m. (PM peak hour). The traffic volume counts were compiled for these peak hours and are shown on Exhibit 4 as the “Existing Traffic Volumes”. The full traffic count data collected for this study, showing calculated peak hour factors and percent heavy trucks, is included in Appendix A.

PROPOSED DEVELOPMENT

Site Description

The proposed residential development is expected to include 210 single family attached units (combination of rental duplexes, townhouses, and cottages). A community pool is also proposed near the north end of the site and sidewalks are provided throughout the site. Access to the site is proposed via a single full access roadway connection along Hoepker Road. The residential development is planned to be constructed and operational in the next several years and is therefore included in the Full Build (with development) traffic volumes.

Trip Generation

To address any potential future traffic impacts at the study area intersections, it is necessary to identify the hourly volume of traffic generated by anticipated development. Traffic volumes expected to be generated are based on the size and type of the proposed uses and on trip rates and fitted curve equations as published in the Institute of Transportation Engineers’ (ITE) *Trip Generation Manual, 11th Edition*. Even though all units are rental units, to provide for a worst-case (highest traffic generation) scenario, ITE land use (LU) 215 was utilized for this study instead of LU220 (multi-family apartments). A trip generation comparison table is provided in Appendix B of this report to show the difference. Due to the nature of the land use type, the proposed development is not expected to include linked trips or pass-by trips. Linked trips occur when a motorist visits one or more tenants or land use within a development site. Pass-by trips occur when motorists already on the roadway system stop at the site prior to continuing on their intended route.

The trip generation table developed for the proposed residential development is shown on Exhibit 5A. As shown, the proposed development is expected to generate about 1,550 total

trips (775 in/775 out) over a typical weekday, with 105 new trips (35 in/70 out) expected during the weekday AM peak hour and 120 trips (70 in/50 out) expected during the weekday PM peak hour.

Pedestrians and bicyclists may use their respective modes to access the proposed residential development; however, to allow for a conservative (highest vehicular volume) analysis, these modes were assumed to make up a relatively small portion of the overall trips to/from the study area. For the purpose of this TIA, all trips to/from the proposed development site were assumed to occur via motor vehicle.

Trip Distribution

The trip distribution for the proposed development, listed below and shown in table format in Exhibit 5A and graphically in Exhibit 5B, was determined based on the existing traffic counts, the type of proposed land uses and the location of existing populations within the immediate study area.

- 5% to/from the north on Portage Road
- 15% to/from the south on Portage Road
- 35% to/from the east on Hoepker Road
- 45% to/from the west on Hoepker Road

Traffic Assignment

The proposed residential development new trips were assigned to the study intersections based on the above trip distributions. The traffic assignment is shown on Exhibit 6.

The new trips (Exhibit 6) were added to the Existing traffic volumes (Exhibit 4) to generate the “Full Build” traffic volumes. The “Full Build ” traffic volumes are shown on Exhibit 7.

PEAK HOUR TRAFFIC OPERATIONS & QUEUES

The study intersections were analyzed using the Synchro 12 traffic analysis model (outputs based on the Highway Capacity Manual, 7th Edition) and the peak hour turning movement volumes estimated for the study area intersections. Intersection operation is defined by “level of service.” Level of Service (LOS) is a quantitative measure that refers to the overall quality of flow at an intersection ranging from very good, represented by LOS ‘A,’ to very poor, represented by LOS ‘F.’ For the purposes of this study, LOS D or better was used to define acceptable peak hour operating conditions. The LOS descriptions for signalized and unsignalized intersections are in Table 1.

Table 1. LOS Descriptions

LOS	Signalized Intersections Control Delay/Vehicle (sec/veh)	Unsignalized Intersections Avg. Control Delay (sec/veh)	Relative Delay
A	≤10	≤10	Short Delays
	Free-flow traffic operations at average travel speeds. Vehicles completely unimpeded in ability to maneuver. Minimal delay at signalized intersections		
B	> 10 - 20	> 10 - 15	
	Reasonably unimpeded traffic operations at average travel speeds. Vehicle maneuverability slightly restricted. Low traffic delays.		
C	> 20 - 35	> 15 - 25	
	Stable traffic operations. Lane changes becoming more restricted. Travel speeds reduced to half of average free flow travel speeds. Longer		
D	> 35 - 55	> 25 - 35	Moderate Delays
	Small increases in traffic flow can cause increased delays. Delays likely attributable to increased traffic, reduced signal progression, and adverse		
E	> 55 - 80	> 35 - 50	
	Significant delays. Travel speeds reduced to one-third of average free flow travel speed.		
F	> 80	> 50	Long Delays
	Extremely low speeds. Intersection congestion. Long delays. Extensive traffic queues at intersections.		

Source: Highway Capacity Manual, Transportation Research Board, Washington, D.C., 2010

The capacity analysis tables in the following sections show the peak hour LOS, delays (in seconds per vehicle), and queues (in feet) for both the Existing traffic condition and for the Full Build traffic condition. The Synchro capacity analysis worksheets for all analysis scenarios are located in Appendix C.

Existing Traffic Operations

Table 2 shows the results of the weekday morning and weekday evening peak hour operational analysis at the existing study area intersection. The existing study intersection was evaluated using the existing geometrics and traffic control as shown on Exhibit 3, and the Existing traffic volumes shown in Exhibit 4.

Table 2. Existing Traffic Peak Hour Operations

Intersection	Peak Hour	Metric	Level of Service (LOS) per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Node 100: Portage Road & Hoepker Road <i>All-Way Stop Control</i>	AM	Lanes->	1			1			1	1		1		1
		LOS	B			B			B	A		A		B
		Delay	10.9			12.4			10.0	9.2		9.6		10.0
	PM	Queue	45'			70'			25'	25'		25'		25'
		LOS	C			B			B	B		B		B
		Delay	23.9			14.3			11.7	11.0		10.7		10.3
		Queue	185'			75'			25'	25'		25'		25'

(-) indicates a movement that is prohibited or does not exist; (*) indicates a freeflow movement.

Delay is reported in seconds. Queue is the maximum of the 50th & 95th percentile queue, measured in feet.

As shown in Table 2, all turning movements at the existing study area intersection are currently operating acceptably at LOS C or better during the weekday morning and weekday evening peak hours under the Existing traffic volume conditions.

Full Build Traffic Operations

The proposed site access drive was evaluated with stop control on the development site approaches. Table 3 shows the results of the weekday morning and weekday evening peak hour operational analysis at the study area intersections with the proposed development fully built out with a full access drive onto Hoepker Road. The study intersections were evaluated using the Full Build traffic volumes as shown in Exhibit 7.

Table 3. Full Build Traffic Peak Hour Operations

Intersection	Peak Hour	Metric	Level of Service (LOS) per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Node 100: Portage Road & Hoepker Road <i>All-Way Stop Control</i>	AM	Lanes->	1			1			1	1		1		1
		LOS	B			B			B	A		A		B
		Delay	11.8			14.7			10.3	9.6		9.9		10.4
	PM	Queue	55'			95'			25'	25'		25'		25'
		LOS	D			C			B	B		B		B
		Delay	30.9			16.6			12.1	11.7		11.1		10.7
		Queue	235'			95'			25'	25'		25'		25'
Node 300: Hoepker Road & North Drive <i>One-Way Stop Control</i>	AM	Lanes->	-	1		1		-	1			-		
		LOS	-	*		A		-	B			-		
		Delay	-	*		7.8		-	13.4			-		
	PM	Queue	-	*		25'		-	25'			-		
		LOS	-	*		A		-	C			-		
		Delay	-	*		8.7		-	16.2			-		
		Queue	-	*		25'		-	25'			-		

(-) indicates a movement that is prohibited or does not exist; (*) indicates a freeflow movement.

Delay is reported in seconds. Queue is the maximum of the 50th & 95th percentile queue, measured in feet.

As shown in Table 3, with the additional traffic from the proposed development, all turning movements at the study intersections are expected to continue to operate acceptably at LOS D or better during the weekday morning and weekday evening peak hours under the full build traffic volume conditions.

TURN LANE AND BYPASS LANE ANALYSIS

The need for a dedicated left- and/or right-turn lane along Hoepker Road at the proposed access drive was evaluated as part of this study.

Left-turn Lane Analysis - Facilities Development Manual

FDM Section 11-25-5, Table 5.2, provides guidance on warranting left-turn lanes at intersections on two-lane highways. Based on the volume criteria provided and using a design speed of 5-mph over the posted speed, or 50-mph, a dedicated westbound left-turn lane is not expected to be warranted along Hoepker Road under full build traffic volume conditions; however, it is close to being met. Advancing (eastbound through) volumes along Hoepker Road would need to increase by less than 5 vehicles during the peak hours for the warrant to be met. Therefore, a dedicated left-turn lane should be considered for westbound traffic along Hoepker Road.

Right-turn Lane Analysis - NCHRP Report 457

As referenced in the *FDM*, *NCHRP Report 457* provides guidance for inclusion of a right-turn lane on a high-speed roadway based on the expected peak hour right-turn volume in relation to the major road peak hour through volume as well as the 85th percentile speed limit. Since the posted speed limit on Hoepker Road is 45-mph, a 50-mph speed was assumed for the 85th percentile speed. As shown in the graph in Appendix D, the right-turn warrant along Hoepker Road is expected to be met. For the hourly advancing volumes along Hoepker Road of 550 vehicles and a maximum of about 45 right-turn movements expected during the highest peak hour, a dedicated right-turn lane along Hoepker Road is warranted at the proposed access roadway connection. Therefore, a dedicated right-turn lane should be constructed for eastbound traffic along Hoepker Road.

Full Build Traffic Operations – With Modifications

Turn lane modifications are recommended at the proposed full access drive onto Hoepker Road. Table 4 shows the results of the weekday morning and weekday evening peak hour operational analysis at the study area intersections with the proposed development fully built out with a full access drive onto Hoepker Road including turn lane modifications. The study intersections were evaluated using the Full Build traffic volumes as shown in Exhibit 7 and the recommended modifications as shown in Exhibit 8.

Table 4. Full Build (with Modifications) Traffic Peak Hour Operations

Intersection	Peak Hour	Metric	Level of Service (LOS) per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Node 100: Portage Road & Hoepker Road <i>All-Way Stop Control</i>	AM	Lanes->	1			1			1	1		1		1
		LOS	B			B			B	A		A		B
		Delay	11.8			14.7			10.3	9.6		9.9		10.4
	PM	Queue	55'			95'			25'	25'		25'		25'
		LOS	D			C			B	B		B		B
		Delay	30.9			16.6			12.1	11.7		11.1		10.7
		Queue	235'			95'			25'	25'		25'		25'
	PM	Lanes->	-	1	1	1	1	-	1					
		LOS	-	*	*	A	*	-	B					
		Delay	-	*	*	7.8	*	-	13.2					
		Queue	-	*	*	25'	*	-	25'					
		LOS	-	*	*	A	*	-	C					
		Delay	-	*	*	8.8	*	-	17.5					
		Queue	-	*	*	25'	*	-	25'					
Node 300: Hoepker Road & North Drive <i>One-Way Stop Control</i>	AM	Lanes->	-	1	1	1	1	-	1					
		LOS	-	*	*	A	*	-	B					
		Delay	-	*	*	7.8	*	-	13.2					
	PM	Queue	-	*	*	25'	*	-	25'					
		LOS	-	*	*	A	*	-	C					
		Delay	-	*	*	8.8	*	-	17.5					
		Queue	-	*	*	25'	*	-	25'					
	PM	Lanes->	-	1	1	1	1	-	1					
		LOS	-	*	*	A	*	-	B					
		Delay	-	*	*	7.8	*	-	13.2					

(-) indicates a movement that is prohibited or does not exist; (*) indicates a freeflow movement.

Delay is reported in seconds. Queue is the maximum of the 50th & 95th percentile queue, measured in feet.

As shown in Table 4, with the additional traffic from the proposed development and the recommended turn lane modifications, all turning movements at the study intersections are expected to continue to operate acceptably at LOS D or better during the weekday morning and weekday evening peak hours under the full build traffic volume conditions. Delays for any specific movement at the Portage Road intersection with Hoepker Road are expected to increase by 7 seconds or less and queues for any movement at the Portage Road intersection with Hoepker Road are expected to increase by 2 vehicles or less.

RECOMMENDATION MODIFICATONS

Recommended modifications are expected to be necessary at the study area intersections to allow for acceptable and safe operations under the Full Build traffic volume conditions. *Modifications are for jurisdictional consideration and are not legally binding. The City of Madison reserves the right to determine alternative solutions.*

Node 100: Hoepker Road with Portage Road

- *Existing Traffic:* No modifications
- *Full Build Traffic:* No modifications

Node 300: Hoepker Road with Proposed Access Drive

- *Existing Traffic:* No modifications
- *Full Build Traffic:*
 - Provide a full access roadway connection onto Hoepker Road as shown on the conceptual site plan.
 - Provide a dedicated westbound left-turn lane at the new access drive.
 - Provide a dedicated eastbound right-turn lane at the new access drive.
- Provide stop sign control on the south access drive approach.

CONCLUSION

Based on the projected traffic volumes and with the recommended modifications as shown on Exhibit 8, a single access drive connection is expected to operate acceptably with stop control on the development site approach under full build conditions with the recommended modifications recommended in this study. All movements at the study area intersections are expected to operate safely and efficiently with the planned geometric and traffic control conditions depicted in this TIA through the opening year and with full buildout and full occupancy of the proposed development.

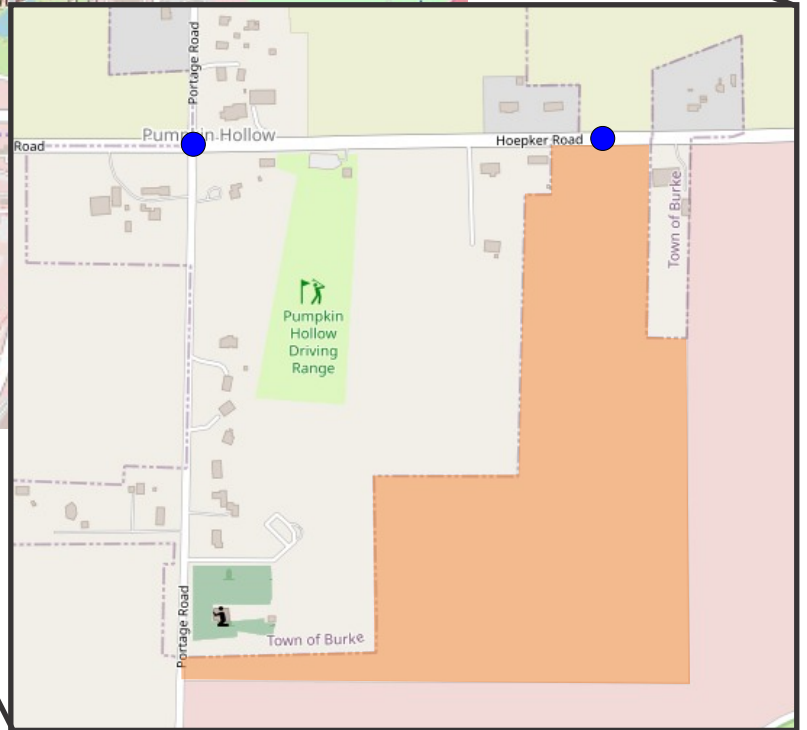
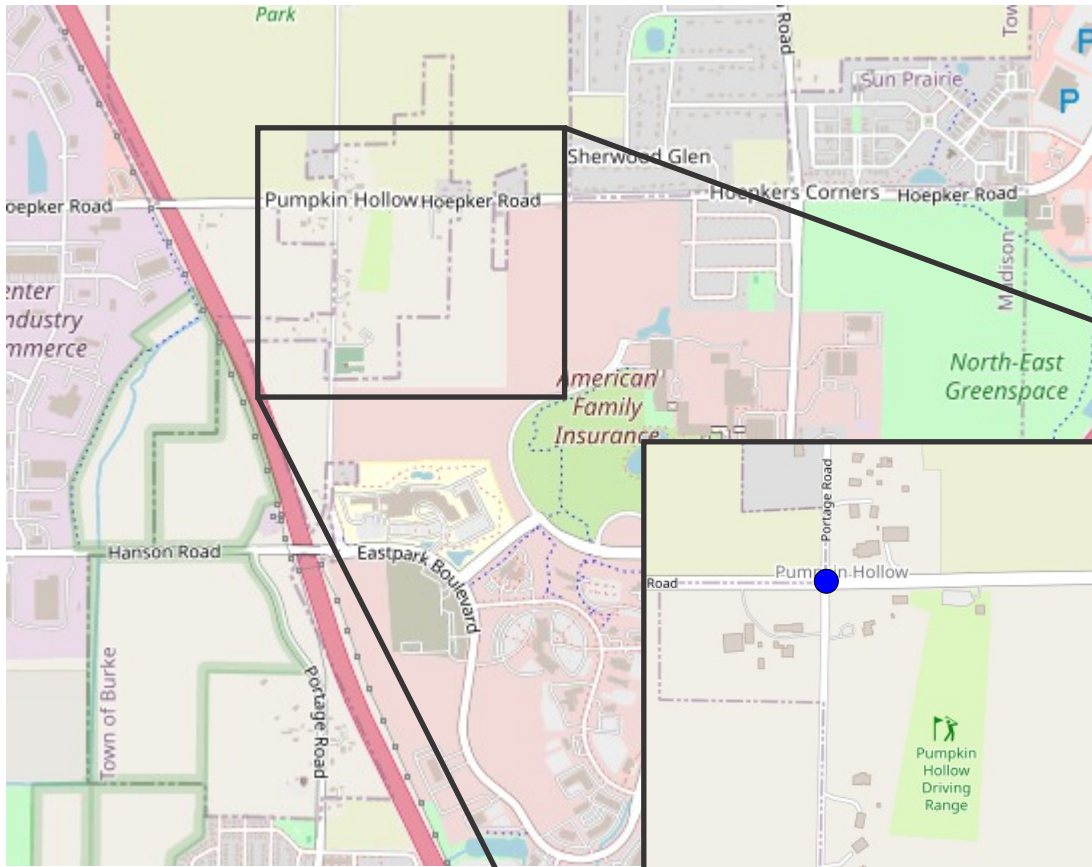
Appendices

Appendix A - Traffic Counts

Appendix B – Trip Generation Comparison Table

Appendix C – Existing & Full Build Traffic Synchro Analysis

Appendix D – Turn Lane Warrant Calculations & Graphs



LEGEND

- Study Area Intersection
- Proposed Site Location



LEGEND

	AMENITY - CLUBHOUSE LEASING		DUPLEX - 2BR & 2BR
	AMENITY - CLUBHOUSE FITNESS		DUPLEX STACKED - 2BR
	AMENITY - POOLHOUSE		COTTAGE W/ GARAGE - 2BR
	AMENITY - MAINTENANCE		COTTAGE W/ GARAGE - 2BR
	GARAGE		TOWNHOUSE TWIN - 2BR
	DUPLEX STACKED - 1BR		TOWNHOUSE 3 PACK - 3BR
	DUPLEX - 1BR & 2BR		



LEO AT PUMPKIN HOLLOW, WI

SITE PLAN - 08/08/2025
SCALE 1" = 100'



LEGEND

-  Stop Sign Control
-  Existing Lane Configuration
- XX' Existing Turn Bay Length (in Feet)



LEGEND

- XX AM Weekday Peak Hour (7:30 - 8:30 AM)
- (XX) PM Weekday Peak Hour (4:15 - 5:15 PM)
- Negligible Traffic Volumes (Fewer than 3 vph)

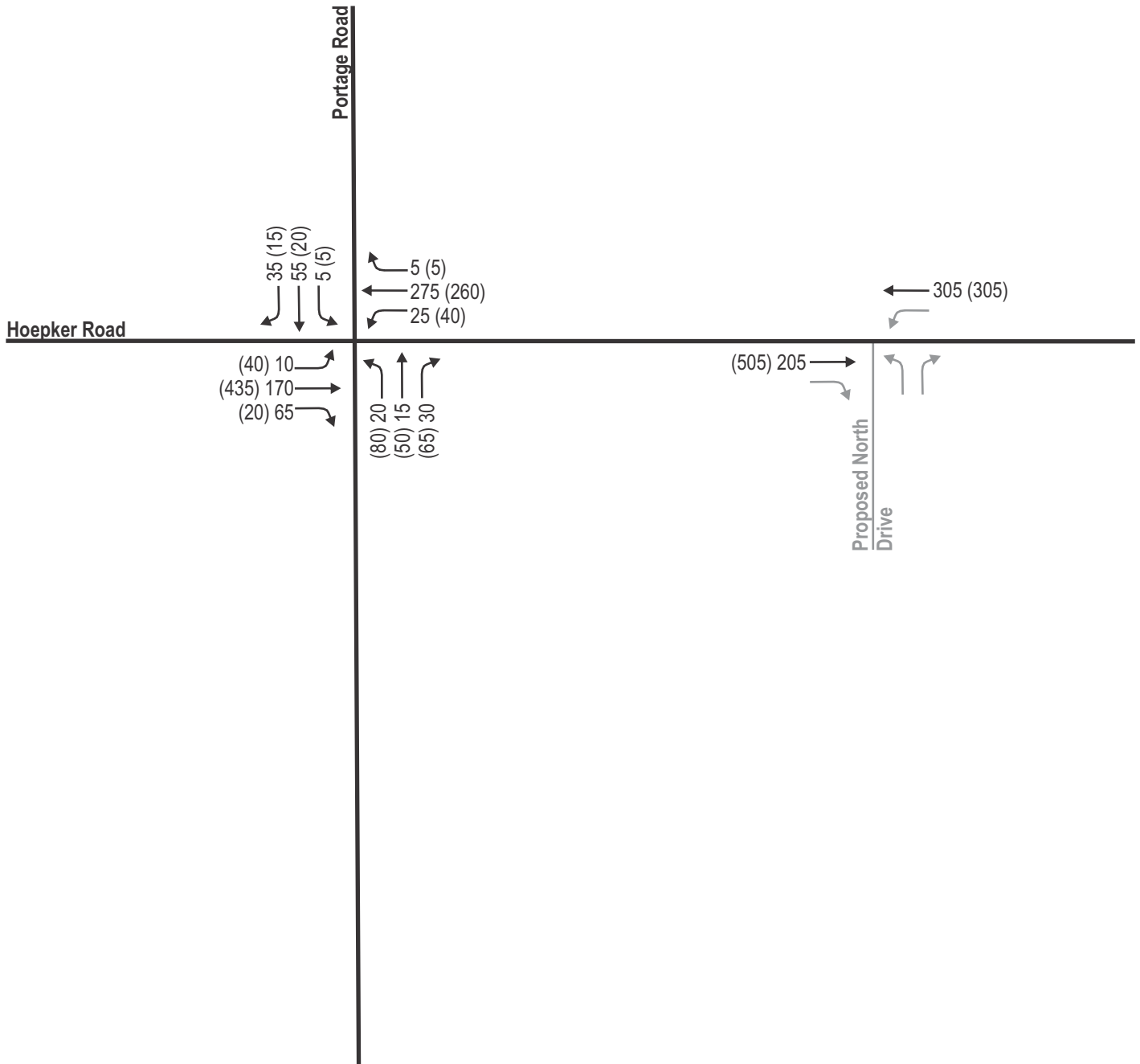


Exhibit 5A
On-Site Trip Generation Table¹

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak			PM Peak		
				In	Out	Total	In	Out	Total
Single-Family Attached Housing	215	210 Units	1,550 FCE	35 (31%)	70 (69%)	105 FCE	70 (57%)	50 (43%)	120 FCE
Total New Trips			1,550	35	70	105	70	50	120

¹ ITE Trip Rates (X.XX) and/or Fitted Curve Equations (FCE) are from the ITE Trip Generation Manual, 11th Edition.

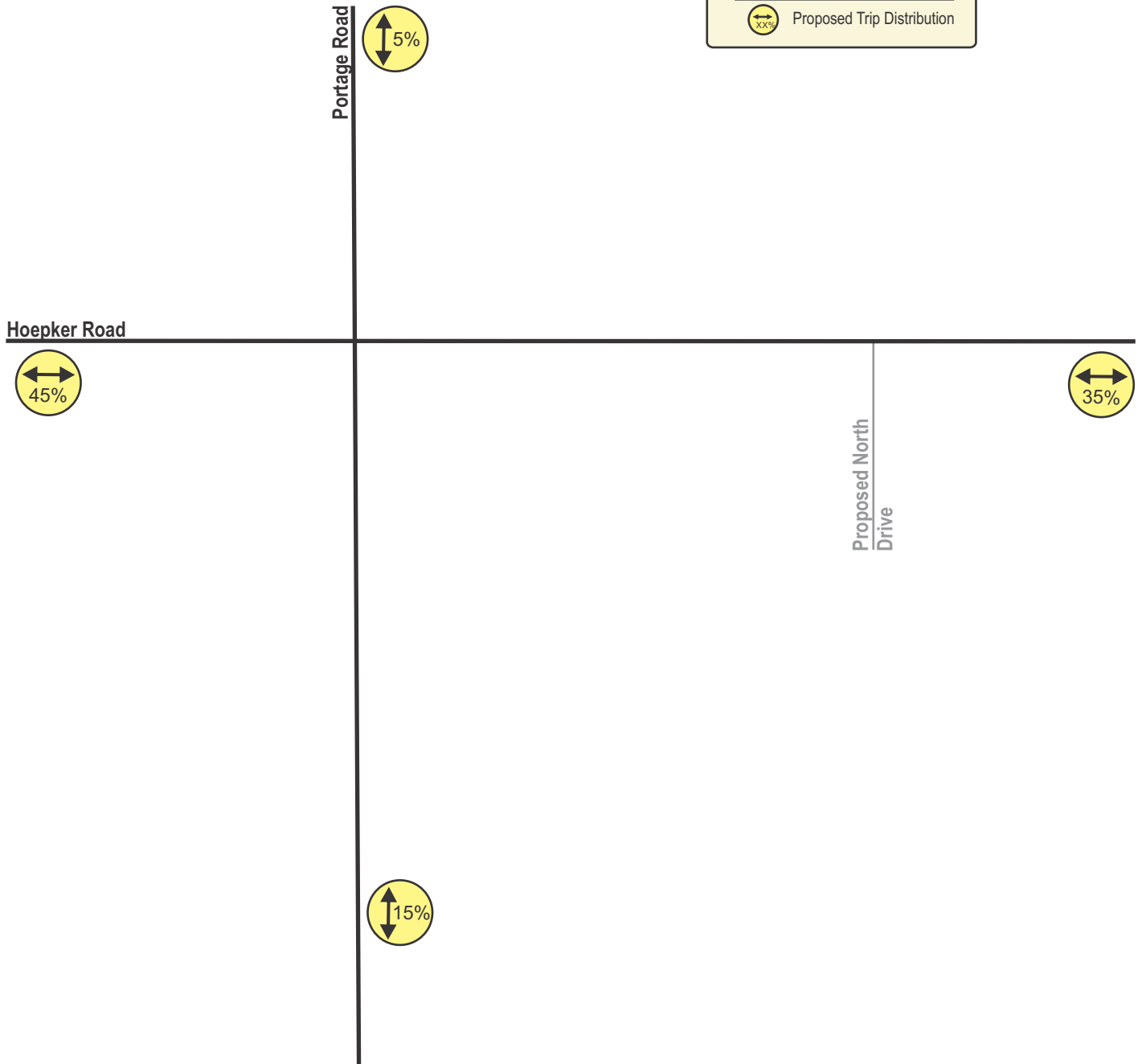
TRIP DISTRIBUTION (New Trips)

North on Portage Road	5%	75	5	5	5	0
South on Portage Road	15%	230	5	10	10	10
East on Hoepker Road	35%	545	10	25	25	15
West on Hoepker Road	45%	700	15	30	30	25
	100%	1550	35	70	70	50

LEGEND

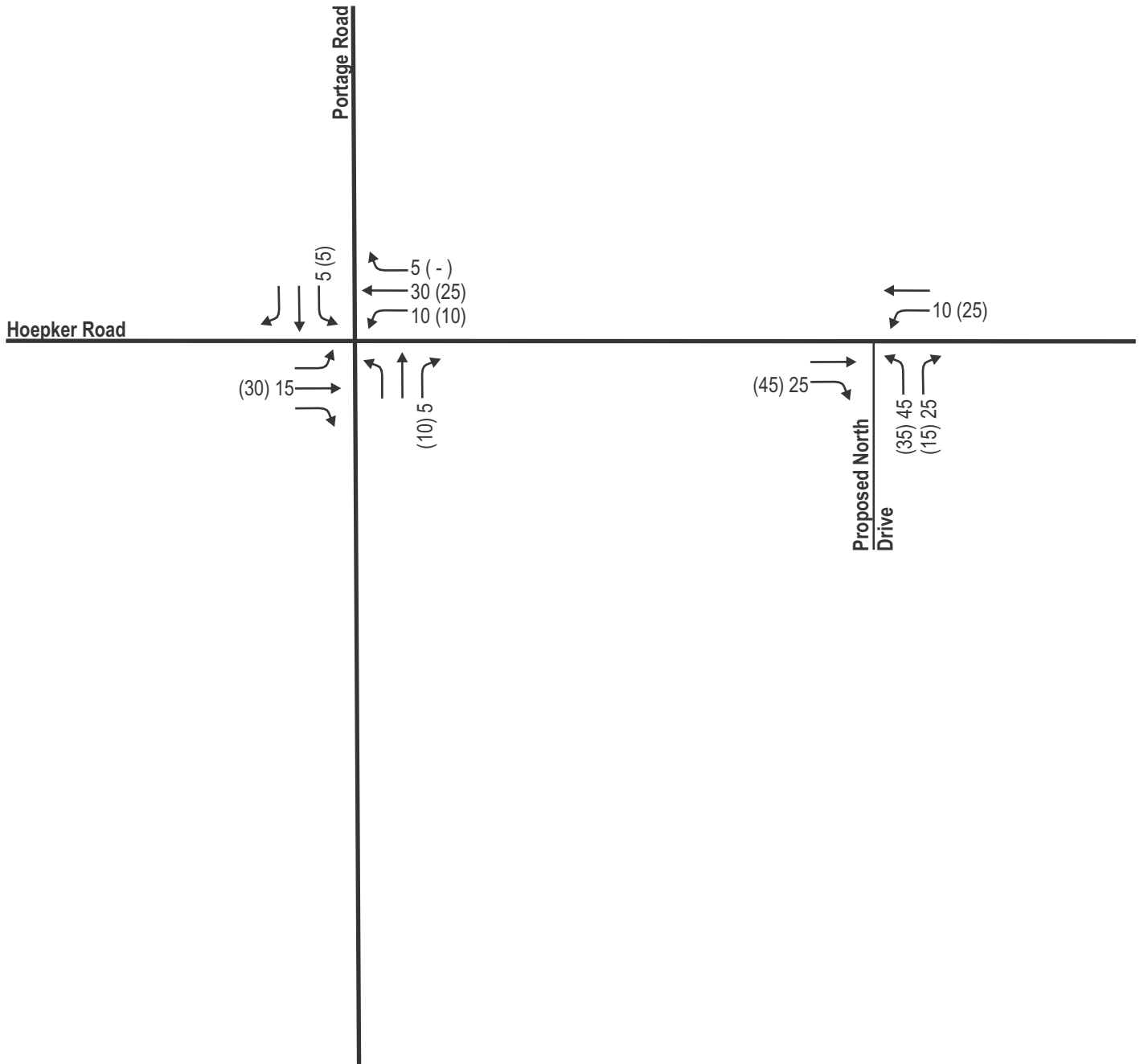


Proposed Trip Distribution



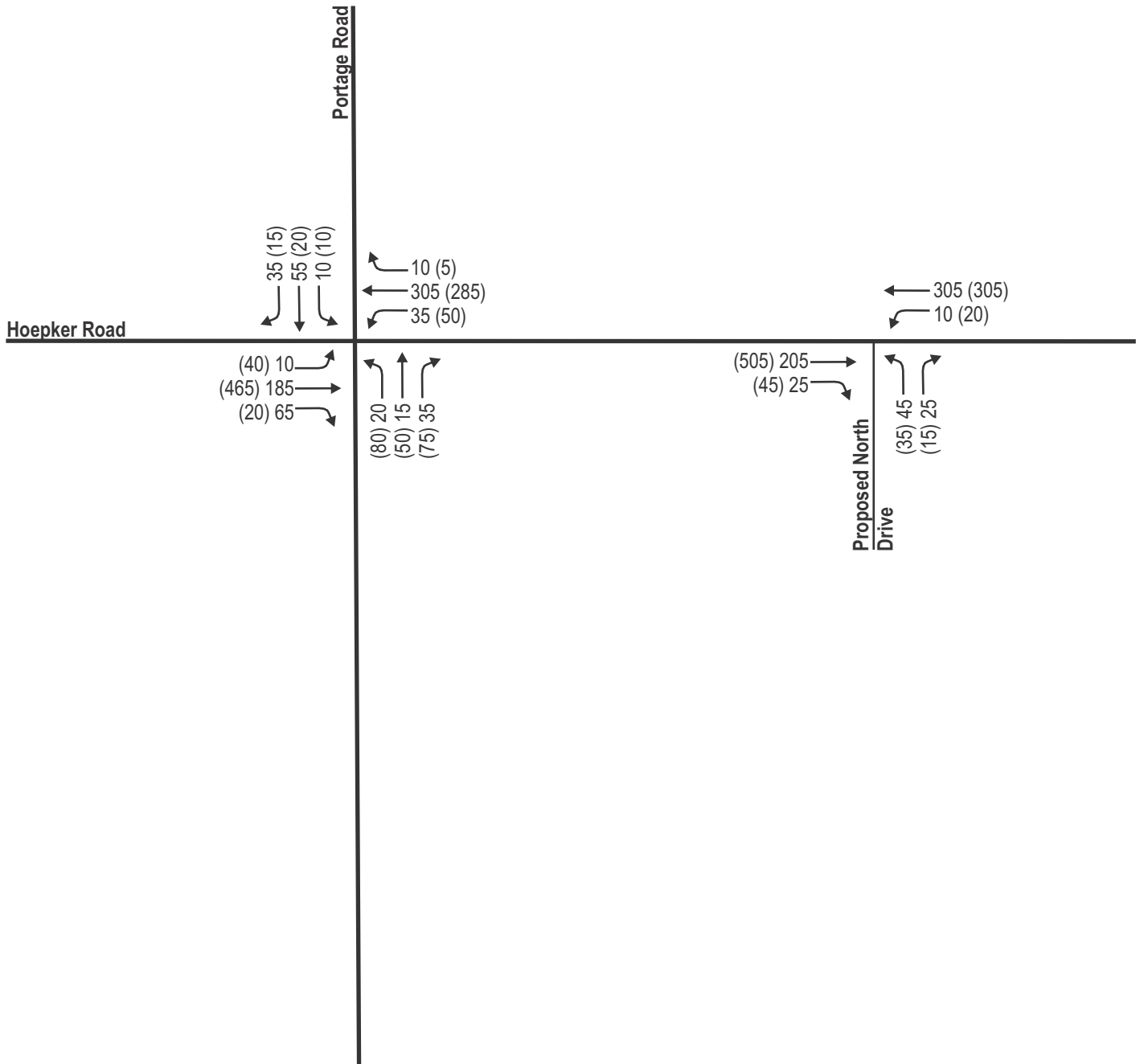
LEGEND

- XX AM Weekday Peak Hour (7:30 - 8:30 AM)
- (XX) PM Weekday Peak Hour (4:15 - 5:15 PM)
- Negligible Traffic Volumes (Fewer than 3 vph)



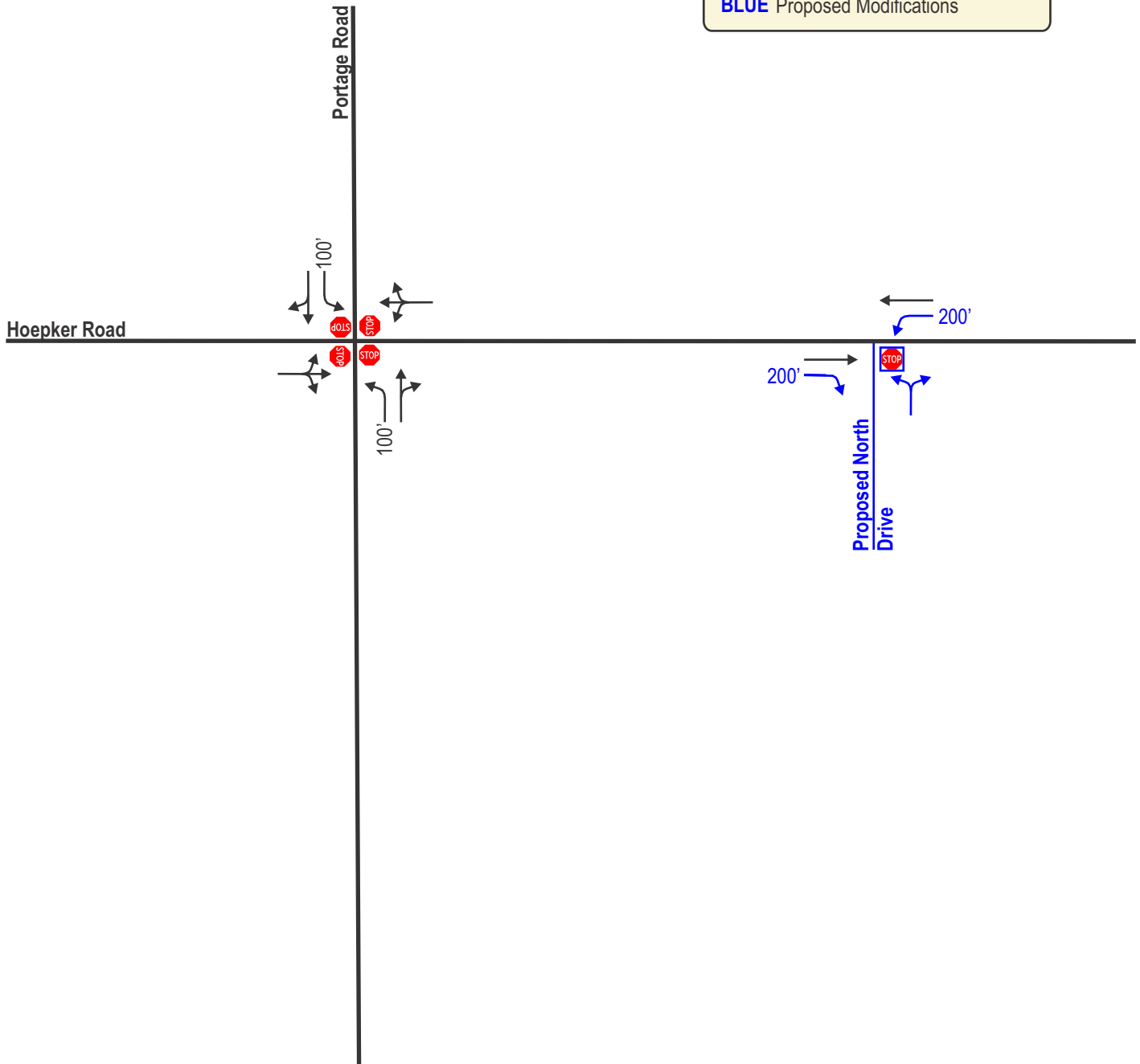
LEGEND

- XX AM Weekday Peak Hour (7:30 - 8:30 AM)
- (XX) PM Weekday Peak Hour (4:15 - 5:15 PM)
- Negligible Traffic Volumes (Fewer than 3 vph)



LEGEND

-  Stop Sign Control
- XX' Storage Length (In Feet)
-  Existing Lane Configuration
- BLUE** Proposed Modifications



Appendix
Trip Generation Comparison Table¹

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak			PM Peak		
				In	Out	Total	In	Out	Total
Single-Family Attached Housing	215	210 Units	1,550 FCE	35 (31%)	70 (69%)	105 FCE	70 (57%)	50 (43%)	120 FCE
Multifamily Housing (Low-Rise) (Not Close to Rail Transit)	220	210 Units	1,420 FCE	20 (24%)	70 (76%)	90 FCE	70 (63%)	40 (37%)	110 FCE
Total New Trips			130	15	0	15	0	10	10

¹ ITE Trip Rates (X.XX) and/or Fitted Curve Equations (FCE) are from the ITE Trip Generation Manual, 11th Edition.

Appendix A

Traffic

Existing Turning Movement Counts

Intersection Traffic Volume Report

Count Basics		Version 2024.10	Page 1 of 13
Start Date:	Monday, December 9, 2024	Weekday	Schools in Session
Total Number of Hours Counted:	6	Non-Holiday	No Special Events

Base Information, Observed (6) Hour and Estimated (24) Hour Volume Summaries

Major St: Hoepker Road

Minor St: Portage Road

Intersection of: Hoepker Road & Portage Road

IX_ID: 0

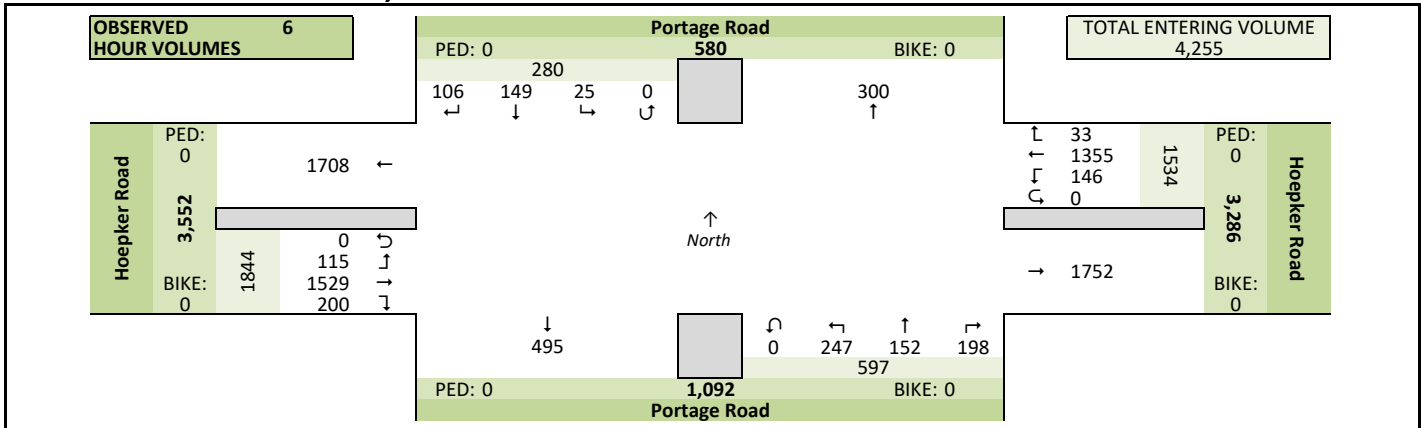
Site Information

Municipality	City of Madison		
County	13 - Dane	WisDOT Region	SW-M
Traffic Control	All-Way Stop		
Roadway Names	North Direction	↑	
North Leg	Portage Road		
East Leg	Hoepker Road		
South Leg	Portage Road		
West Leg	Hoepker Road		
Special Considerations			
Schools	In Session		
Holidays	None		
Special Events	None		
Special Pedestrians Observed			
	Pre-school children	None	
	Elementry school age children	None	
	Visually impaired (white cane/helper dog)	None	
	Elderly/disabled (except wheelchairs)	None	
	Wheelchairs/electric scooters	None	
	Other (describe)	None	None

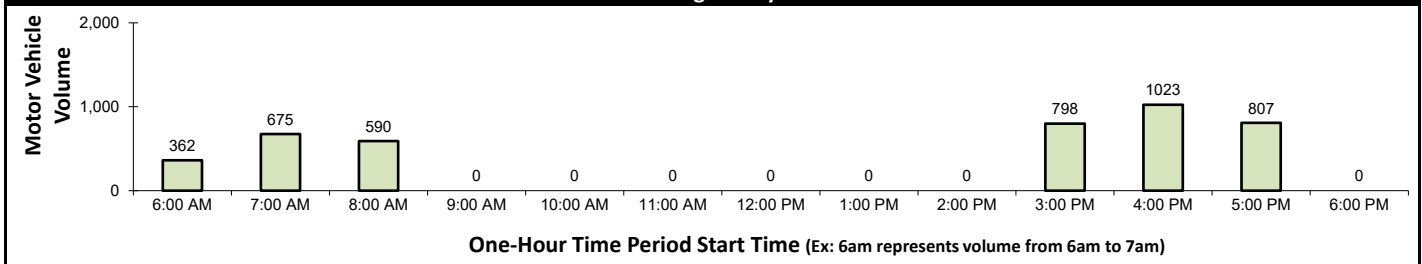
Count Information

Hrs Counted:					06:00 AM-09:00 AM and 03:00 PM-06:00 PM					
1st Day of Count		Monday, December 9, 2024				Weather				
AM Peak Period		Wednesday, December 11, 2024				Clear and Dry				
Midday Peak Period		Wednesday, December 11, 2024				Clear and Dry				
PM Peak Period		Monday, December 9, 2024				Clear and Dry				
Calculated Peak Hours										
	AM	7:30-8:30am		MD		PM	4:15-5:15pm			
Peak Hours Selected for Analysis										
	AM	7:30-8:30am		MD		PM	4:15-5:15pm			
Daily/Seasonal Adjustment Group				(1) Non-Interstate Low Truck %						
Count Expansion Group				(1) Non-Interstate Low Truck %						
Daily/Seasonal Adjustment Factor				1.031		Count Expansion Factor		2.329		
Company Name				TADI			Manual Adj.		1.000	
Observers	AM Peak Period		Amy Scheuerlein							
	Midday Peak Period		None							
	PM Peak Period		Amy Scheuerlein							
Comments		Wis DOT Daily & Seasonal Factors are final for 2012 through 2023, and 2024 uses 2023 final factors.								

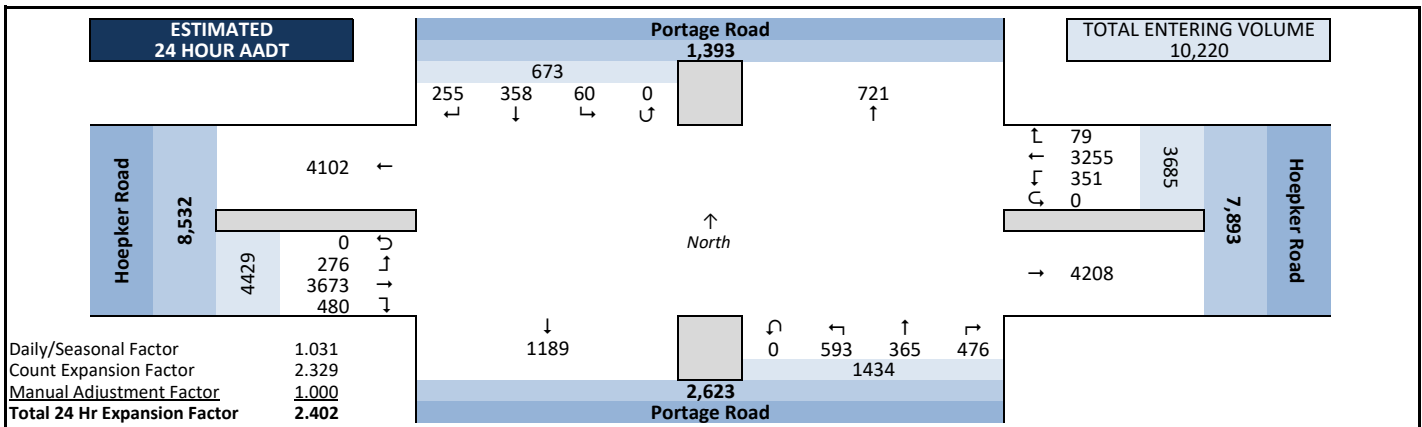
Observed 6 Hour Volume Summary



Total Entering Hourly Volume



Estimated 24 Hour AADT



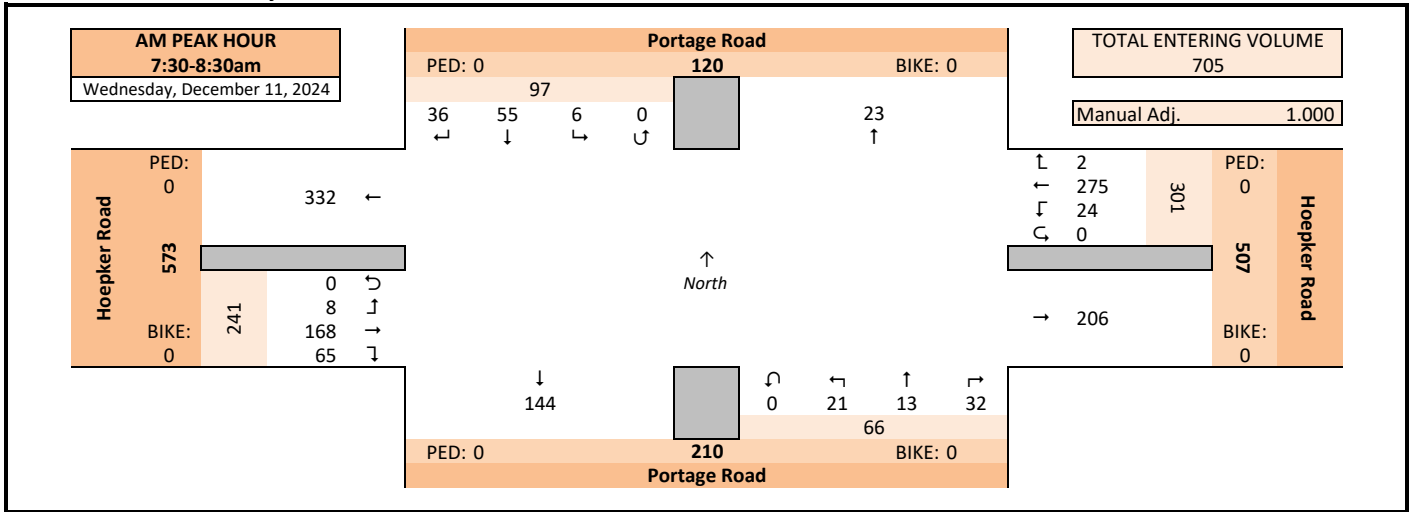
Intersection Traffic Volume Report

Peak Hour Volume Graphical Summary

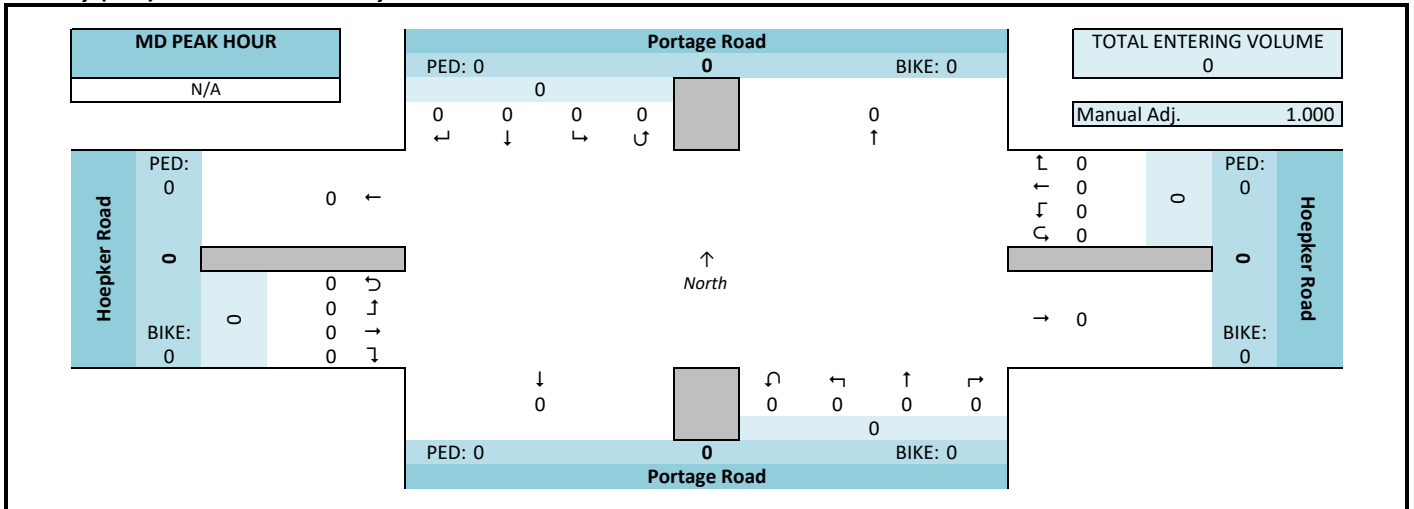
Hoepker Road & Portage Road

AM Peak Hour Summary

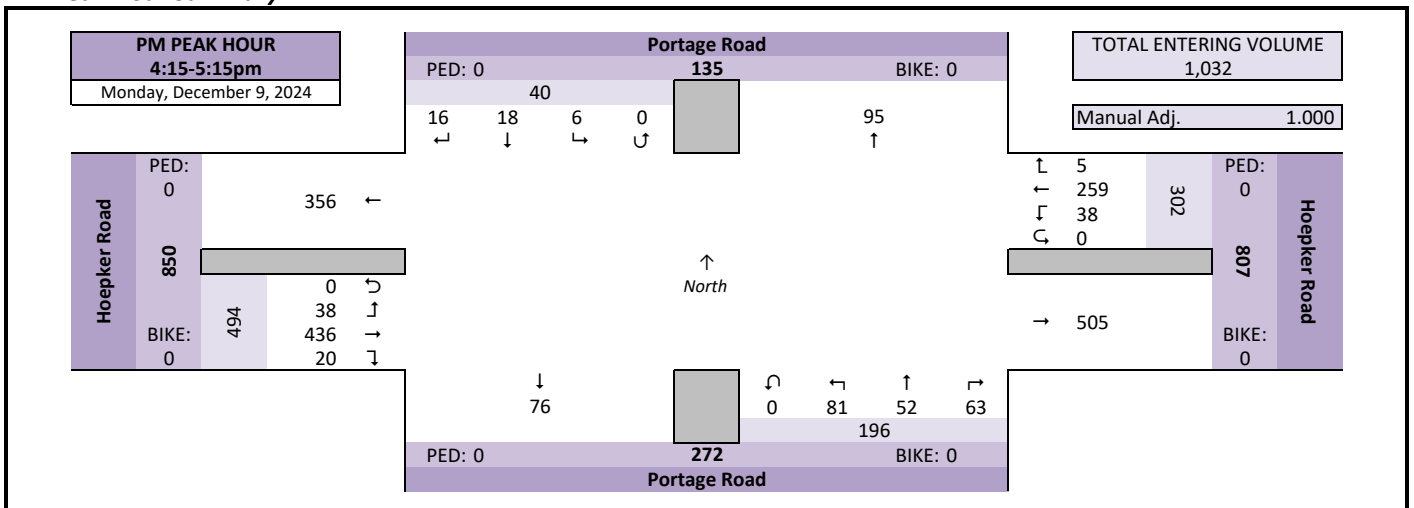
Count Basics		Page 2 of 13	
Start Date:	Monday, December 9, 2024	Weekday	Schools in Session
Total Number of Hours Counted:	6	Non-Holiday	No Special Events



Midday (MD) Peak Hour Summary



PM Peak Hour Summary



Intersection Traffic Volume Report

Peak Hour Volume Summary

Hoepker Road & Portage Road

Count Basics			Page 3 of 13
Start Date:	Monday, December 9, 2024	Weekday:	Schools in Session
Total Number of Hours Counted:	6	Non-Holiday	No Special Events

Peak Hour Volumes, Truck Percentages, and PHFs

Wednesday, December 11, 2024		↓					←					↑					→					
AM Peak Hour	AM Peak Hour	From North					From East					From South					From West					
	Start Time	Portage Road					Hoepker Road					Portage Road					Hoepker Road					Totals
		Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
	7:30 AM	11	16	2	0	29	0	81	6	0	87	10	0	6	0	16	21	41	0	0	62	194
	7:45 AM	11	17	1	0	29	2	87	11	0	100	5	6	4	0	15	22	42	3	0	67	211
	8:00 AM	7	17	1	0	25	0	57	3	0	60	7	1	5	0	13	14	44	3	0	61	159
	8:15 AM	7	5	2	0	14	0	50	4	0	54	10	6	6	0	22	8	41	2	0	51	141
	Peak Hour Volume	36	55	6	0	97	2	275	24	0	301	32	13	21	0	66	65	168	8	0	241	705
	Rounded Hourly Volume	35	55	5	0	95	0	275	25	0	300	30	15	20	0	65	65	170	10	0	245	705
	% Single Unit Trucks	0.0	3.6	0.0	0.0	2.1	0.0	0.4	4.2	0.0	0.7	3.1	7.7	0.0	0.0	3.0	0.0	2.4	12.5	0.0	2.1	1.6
% Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0	1.5	0.0	0.6	0.0	0.0	0.4	0.3	
% Trucks (Total)	0.0	3.6	0.0	0.0	2.1	0.0	0.4	4.2	0.0	0.7	3.1	7.7	4.8	0.0	4.5	0.0	3.0	12.5	0.0	2.5	1.8	
Peak Hour Factor (PHF)	0.82	0.81	0.75	0.00	0.84	0.25	0.79	0.55	0.00	0.75	0.80	0.54	0.87	0.00	0.75	0.74	0.95	0.67	0.00	0.90	0.84	

[illegible]

Monday, December 9, 2024		↓					←					↑					→					Totals
		From North					From East					From South					From West					
PM Peak Hour	PM Peak Hour	Portage Road					Hoepker Road					Portage Road					Hoepker Road					
	Start Time	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
	4:15 PM	6	7	0	0	13	2	60	9	0	71	12	10	16	0	38	6	122	9	0	137	259
	4:30 PM	6	4	4	0	14	1	66	11	0	78	15	15	33	0	63	5	106	10	0	121	276
	4:45 PM	3	3	1	0	7	0	64	6	0	70	17	14	17	0	48	5	104	9	0	118	243
	5:00 PM	1	4	1	0	6	2	69	12	0	83	19	13	15	0	47	4	104	10	0	118	254
	Peak Hour Volume	16	18	6	0	40	5	259	38	0	302	63	52	81	0	196	20	436	38	0	494	1032
	Rounded Hourly Volume	15	20	5	0	40	5	260	40	0	305	65	50	80	0	195	20	435	40	0	495	1035
	% Single Unit Trucks	6.2	0.0	0.0	0.0	2.5	0.0	3.1	2.6	0.0	3.0	0.0	0.0	2.5	0.0	1.0	0.0	0.2	0.0	0.0	0.2	1.3
	% Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.1
% Trucks (Total)	6.2	0.0	0.0	0.0	2.5	0.0	3.1	2.6	0.0	3.0	0.0	0.0	2.5	0.0	1.0	0.0	0.5	0.0	0.0	0.4	1.4	
Peak Hour Factor (PHF)	0.67	0.64	0.37	0.00	0.71	0.62	0.94	0.79	0.00	0.91	0.83	0.87	0.61	0.00	0.78	0.83	0.89	0.95	0.00	0.90	0.93	

Peak Hour Pedestrian and Bicyclist Volumes

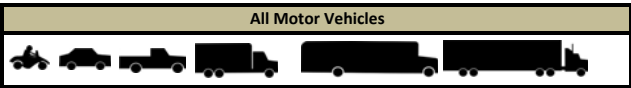
[illegible]

Intersection Traffic Volume Report

Hourly Volume Summary - Motor Vehicle Data

Hoepker Road & Portage Road

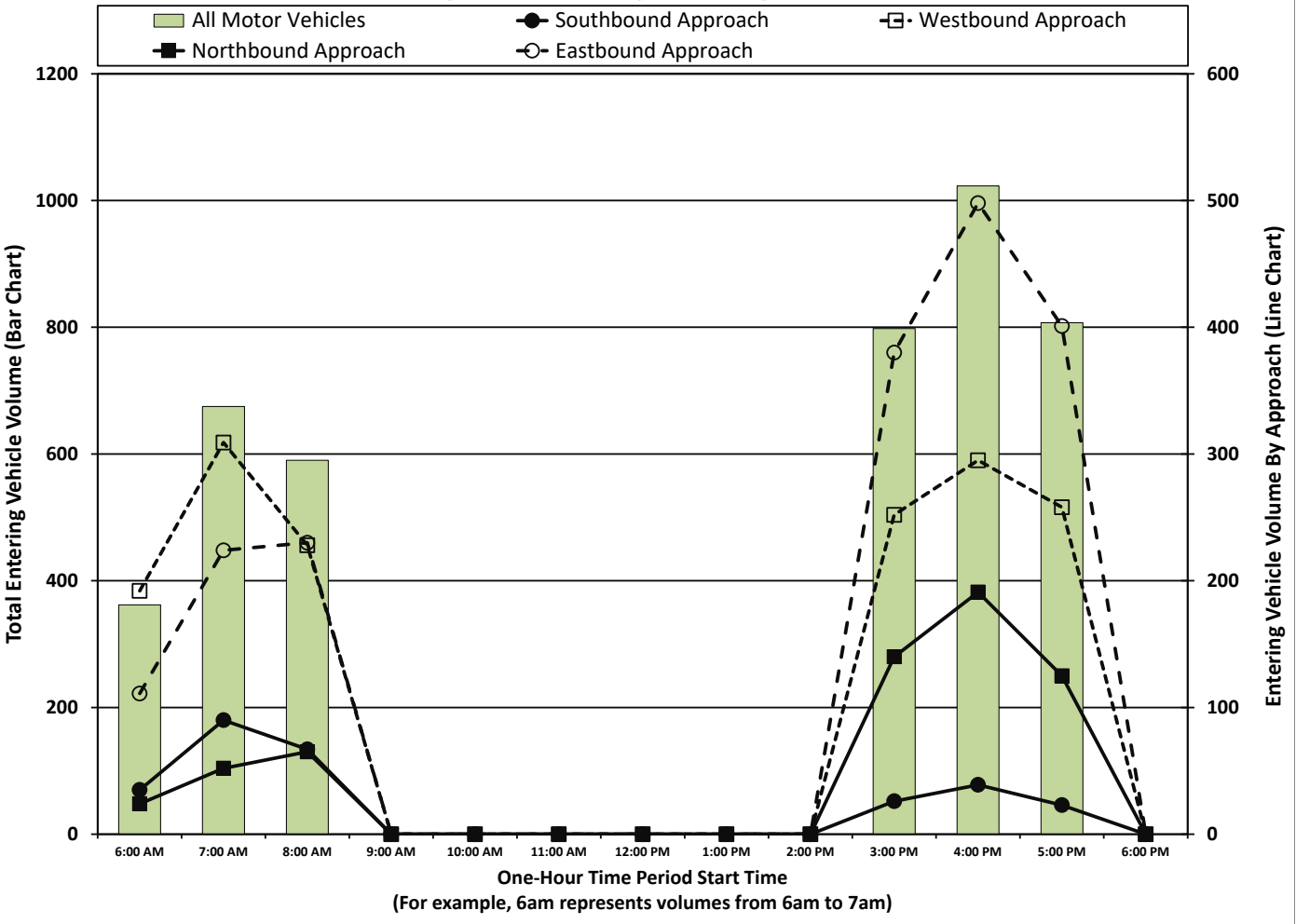
Count Basics			Page 4 of 13	
Start Date:	Monday, December 9, 2024	Weekday	Schools in Session	
Total Number of Hours Counted:	6	Non-Holiday	No Special Events	



One-Hour Motor Vehicle Data

One-Hour Time Period Start Time		From North					From East					From South					From West					Total Vehicle Volume	Directional Volume Totals	
		Portage Road					Hoepker Road					Portage Road					Hoepker Road							
		Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total		E/W	N/S
AM	6:00 AM	16	18	1	0	35	2	177	13	0	192	8	7	9	0	24	24	83	4	0	111	362	303	59
	7:00 AM	35	51	4	0	90	4	282	23	0	309	21	13	18	0	52	74	142	8	0	224	675	533	142
	8:00 AM	21	41	5	0	67	6	198	24	0	228	30	11	24	0	65	47	176	7	0	230	590	458	132
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MD	10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:00 PM	11	11	4	0	26	9	216	27	0	252	36	37	67	0	140	24	326	30	0	380	798	632	166
	4:00 PM	17	15	7	0	39	6	257	32	0	295	55	50	86	0	191	19	442	37	0	498	1023	793	230
	5:00 PM	6	13	4	0	23	6	225	27	0	258	48	34	43	0	125	12	360	29	0	401	807	659	148
6:00 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals		106	149	25	0	280	33	1355	146	0	1534	198	152	247	0	597	200	1529	115	0	1844	4255	3378	877

Graphical Summary of Hourly Volumes



15-Minute Semi-Truck Data

Count Basics			Page 8 of 13
Start Date:	Monday, December 9, 2024	Weekday	Schools in Session
Total Number of Hours Counted:	6	Non-Holiday	No Special Events

15-Minute Semi-Truck Data

Semi-Trucks


15-Minute Semi-Truck Data

[illegible]

Peak Hour Semi-Truck Volume Summary

Hourly Time Period Start Time	From North					From East					From South					From West					Total Hourly Volume
	Portage Road					Hoepker Road					Portage Road					Hoepker Road					
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
AM 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	1
MD 12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1

Intersection Traffic Volume Report

15-Minute Heavy Vehicle Data

Hoepker Road & Portage Road

Count Basics			Page 9 of 13
Start Date:	Monday, December 9, 2024	Weekday	Schools in Session
Total Number of Hours Counted:	6	Non-Holiday	No Special Events



15-Minute Heavy Vehicle Data

15-Minute Time Period Start Time		From North					From East					From South					From West					15-Min Totals	Hourly Sum
		Portage Road					Hoepker Road					Portage Road					Hoepker Road						
		Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total		
AM Peak Period	6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
	6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	8
	6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	
	6:45 AM	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	1	0	0	0	1	3	10
	7:00 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	1	0	1	4	11
	7:15 AM	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	2	12
	7:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	13
	7:45 AM	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	0	1	1	0	2	4	16
	8:00 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	5	19
	8:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	1	0	0	1	3	
	8:30 AM	0	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	2	0	0	2	4	
	8:45 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	5	0	0	5	7	
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Midday Peak Period	10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
PM Peak Period	2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	3:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	10
	3:15 PM	1	0	0	0	1	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	3	13
	3:30 PM	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	3	11
	3:45 PM	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	0	0	0	0	0	3	13
	4:00 PM	0	0	0	0	0	0	3	0	0	3	0	0	1	0	1	0	0	0	0	0	4	15
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	14
	4:30 PM	1	0	0	0	1	0	2	0	0	2	0	0	2	0	2	0	0	0	0	0	5	21
	4:45 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	1	0	0	1	5	18
	5:00 PM	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	0	0	0	0	0	3	13
	5:15 PM	0	1	0	0	1	0	6	0	0	6	0	0	0	0	0	0	1	0	0	1	8	
	5:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2	
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Totals		2	3	1	0	6	0	33	4	0	37	2	2	5	0	9	1	17	2	0	20	72	

Peak Hour Heavy Vehicle Volume Summary

Hourly Time Period Start Time	From North Portage Road					From East Hoepker Road					From South Portage Road					From West Hoepker Road					Total Hourly Volume
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
AM 7:30 AM	0	2	0	0	2	0	1	1	0	2	1	1	1	0	3	0	5	1	0	6	13
MD 12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM 4:15 PM	1	0	0	0	1	0	8	1	0	9	0	0	2	0	2	0	2	0	0	2	14

Intersection Traffic Volume Report

15-Minute Pedestrian and Bicyclist Data

Hoepker Road & Portage Road

Count Basics			Page 11 of 13
Start Date:	Monday, December 9, 2024	Weekday	Schools in Session
Total Number of Hours Counted:	6	Non-Holiday	No Special Events



15-Minute Pedestrian and Bicyclist Data

15-Minute Time Period Start Time	Crossing 			Crossing 			Crossing 			Crossing 			15-Min Totals	Hourly Sum
	North Approach			East Approach			South Approach			West Approach				
	Portage Road			Hoepker Road			Portage Road			Hoepker Road				
	Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total		
AM Peak Period	6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Midday Peak Period	10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
PM Peak Period	2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	

Special Pedestrians

Pedestrian Type	None	1 or 2	A Few	Several	Many	Unknown
Pre-school Children	x					
Elementary School Age Children	x					
Visually Impaired (white cane/help)	x					
Elderly/Disabled (except wheelchair)	x					
Wheelchairs/Electric Scooters	x					
Other (None)	x					

15-Minute Adult & Children Count (Manual Entry)

Adults & Children

15-Minute Adult & Children Pedestrian Data

15-Minute Time Period Start Time		Crossing 			Crossing 			Crossing 			Crossing 			15-Min Totals	Hourly Sum
		North Approach			East Approach			South Approach			West Approach				
		Portage Road			Hoepker Road			Portage Road			Hoepker Road				
		Adults	Children	Total	Adults	Children	Total	Adults	Children	Total	Adults	Children	Total		
AM Peak Period	6:00 AM	0		0	0		0	0		0	0		0	0	0
	6:15 AM	0		0	0		0	0		0	0		0	0	0
	6:30 AM	0		0	0		0	0		0	0		0	0	0
	6:45 AM	0		0	0		0	0		0	0		0	0	0
	7:00 AM	0		0	0		0	0		0	0		0	0	0
	7:15 AM	0		0	0		0	0		0	0		0	0	0
	7:30 AM	0		0	0		0	0		0	0		0	0	0
	7:45 AM	0		0	0		0	0		0	0		0	0	0
	8:00 AM	0		0	0		0	0		0	0		0	0	0
	8:15 AM	0		0	0		0	0		0	0		0	0	0
	8:30 AM	0		0	0		0	0		0	0		0	0	0
	8:45 AM	0		0	0		0	0		0	0		0	0	0
	9:00 AM	0		0	0		0	0		0	0		0	0	0
	9:15 AM	0		0	0		0	0		0	0		0	0	0
	9:30 AM	0		0	0		0	0		0	0		0	0	0
9:45 AM	0		0	0		0	0		0	0		0	0	0	
Midday Peak Period	10:00 AM	0		0	0		0	0		0	0		0	0	0
	10:15 AM	0		0	0		0	0		0	0		0	0	0
	10:30 AM	0		0	0		0	0		0	0		0	0	0
	10:45 AM	0		0	0		0	0		0	0		0	0	0
	11:00 AM	0		0	0		0	0		0	0		0	0	0
	11:15 AM	0		0	0		0	0		0	0		0	0	0
	11:30 AM	0		0	0		0	0		0	0		0	0	0
	11:45 AM	0		0	0		0	0		0	0		0	0	0
	12:00 PM	0		0	0		0	0		0	0		0	0	0
	12:15 PM	0		0	0		0	0		0	0		0	0	0
	12:30 PM	0		0	0		0	0		0	0		0	0	0
	12:45 PM	0		0	0		0	0		0	0		0	0	0
	1:00 PM	0		0	0		0	0		0	0		0	0	0
	1:15 PM	0		0	0		0	0		0	0		0	0	0
	1:30 PM	0		0	0		0	0		0	0		0	0	0
1:45 PM	0		0	0		0	0		0	0		0	0	0	
PM Peak Period	2:00 PM	0		0	0		0	0		0	0		0	0	0
	2:15 PM	0		0	0		0	0		0	0		0	0	0
	2:30 PM	0		0	0		0	0		0	0		0	0	0
	2:45 PM	0		0	0		0	0		0	0		0	0	0
	3:00 PM	0		0	0		0	0		0	0		0	0	0
	3:15 PM	0		0	0		0	0		0	0		0	0	0
	3:30 PM	0		0	0		0	0		0	0		0	0	0
	3:45 PM	0		0	0		0	0		0	0		0	0	0
	4:00 PM	0		0	0		0	0		0	0		0	0	0
	4:15 PM	0		0	0		0	0		0	0		0	0	0
	4:30 PM	0		0	0		0	0		0	0		0	0	0
	4:45 PM	0		0	0		0	0		0	0		0	0	0
	5:00 PM	0		0	0		0	0		0	0		0	0	0
	5:15 PM	0		0	0		0	0		0	0		0	0	0
	5:30 PM	0		0	0		0	0		0	0		0	0	0
	5:45 PM	0		0	0		0	0		0	0		0	0	0
	6:00 PM	0		0	0		0	0		0	0		0	0	0
	6:15 PM	0		0	0		0	0		0	0		0	0	0
	6:30 PM	0		0	0		0	0		0	0		0	0	0
	6:45 PM	0		0	0		0	0		0	0		0	0	0
	7:00 PM	0		0	0		0	0		0	0		0	0	0
	7:15 PM	0		0	0		0	0		0	0		0	0	0
	7:30 PM	0		0	0		0	0		0	0		0	0	0
	7:45 PM	0		0	0		0	0		0	0		0	0	0
8:00 PM	0		0	0		0	0		0	0		0	0	0	
8:15 PM	0		0	0		0	0		0	0		0	0	0	
8:30 PM	0		0	0		0	0		0	0		0	0	0	
8:45 PM	0		0	0		0	0		0	0		0	0	0	
9:00 PM	0		0	0		0	0		0	0		0	0	0	
9:15 PM	0		0	0		0	0		0	0		0	0	0	
9:30 PM	0		0	0		0	0		0	0		0	0	0	
9:45 PM	0		0	0		0	0		0	0		0	0	0	
Totals		0	0	0	0	0	0	0	0	0	0	0	0	0	

15-Minute Bicycle Turning Movement Count (Manual Entry)

Bicyclists



15-Minute Time Period Start Time	↙					←					↑					→					15-Min Totals	Hourly Sum
	From North					From East					From South					From West						
	Portage Road					Hoepker Road					Portage Road					Hoepker Road						
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total		
AM Peak Period	6:00 AM				0					0					0					0	0	0
	6:15 AM				0					0					0					0	0	0
	6:30 AM				0					0					0					0	0	0
	6:45 AM				0					0					0					0	0	0
	7:00 AM				0					0					0					0	0	0
	7:15 AM				0					0					0					0	0	0
	7:30 AM				0					0					0					0	0	0
	7:45 AM				0					0					0					0	0	0
	8:00 AM				0					0					0					0	0	0
	8:15 AM				0					0					0					0	0	0
	8:30 AM				0					0					0					0	0	0
	8:45 AM				0					0					0					0	0	0
	9:00 AM				0					0					0					0	0	0
	9:15 AM				0					0					0					0	0	0
	9:30 AM				0					0					0					0	0	0
9:45 AM				0					0					0					0	0	0	
Midday Peak Period	10:00 AM				0					0					0					0	0	0
	10:15 AM				0					0					0					0	0	0
	10:30 AM				0					0					0					0	0	0
	10:45 AM				0					0					0					0	0	0
	11:00 AM				0					0					0					0	0	0
	11:15 AM				0					0					0					0	0	0
	11:30 AM				0					0					0					0	0	0
	11:45 AM				0					0					0					0	0	0
	12:00 PM				0					0					0					0	0	0
	12:15 PM				0					0					0					0	0	0
	12:30 PM				0					0					0					0	0	0
	12:45 PM				0					0					0					0	0	0
	1:00 PM				0					0					0					0	0	0
	1:15 PM				0					0					0					0	0	0
	1:30 PM				0					0					0					0	0	0
1:45 PM				0					0					0					0	0	0	
PM Peak Period	2:00 PM				0					0					0					0	0</	

[illegible]

Appendix B

Trip Generation Comparison

Appendix
Trip Generation Comparison Table¹

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak			PM Peak		
				In	Out	Total	In	Out	Total
Single-Family Attached Housing	215	210 Units	1,550 FCE	35 (31%)	70 (69%)	105 FCE	70 (57%)	50 (43%)	120 FCE
Multifamily Housing (Low-Rise) (Not Close to Rail Transit)	220	210 Units	1,420 FCE	20 (24%)	70 (76%)	90 FCE	70 (63%)	40 (37%)	110 FCE
Total New Trips			130	15	0	15	0	10	10

¹ ITE Trip Rates (X.XX) and/or Fitted Curve Equations (FCE) are from the ITE Trip Generation Manual, 11th Edition.

Appendix C

Peak Hour Analysis Outputs

Existing Traffic

Full Build Traffic

Full Build Traffic with modifications

Lanes, Volumes, Timings
100: Portage Road & Hoepker Road

AM Peak
12/20/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	170	65	25	275	5	20	15	30	5	55	35
Future Volume (vph)	10	170	65	25	275	5	20	15	30	5	55	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.964			0.998			0.900			0.941	
Flt Protected		0.998			0.996		0.950			0.950		
Satd. Flow (prot)	0	1775	0	0	1870	0	1719	1629	0	1770	1753	0
Flt Permitted		0.998			0.996		0.950			0.950		
Satd. Flow (perm)	0	1775	0	0	1870	0	1719	1629	0	1770	1753	0
Link Speed (mph)		35			45			45			45	
Link Distance (ft)		997			1612			2012			1125	
Travel Time (s)		19.4			24.4			30.5			17.0	
Confl. Peds. (#/hr)	1		1	1		1	1		1	1		1
Confl. Bikes (#/hr)			1			1			1			1
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	2%	2%	2%
Adj. Flow (vph)	12	202	77	30	327	6	24	18	36	6	65	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	291	0	0	363	0	24	54	0	6	107	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	39.2%											
Analysis Period (min)	15											
ICU Level of Service A												

Intersection	
Intersection Delay, s/veh	11.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	170	65	25	275	5	20	15	30	5	55	35
Future Vol, veh/h	10	170	65	25	275	5	20	15	30	5	55	35
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	3	3	3	1	1	1	5	5	5	2	2	2
Mvmt Flow	12	202	77	30	327	6	24	18	36	6	65	42
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay, s/veh	10.9	12.4	9.4	10
HCM LOS	B	B	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	4%	8%	100%	0%
Vol Thru, %	0%	33%	69%	90%	0%	61%
Vol Right, %	0%	67%	27%	2%	0%	39%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	45	245	305	5	90
LT Vol	20	0	10	25	5	0
Through Vol	0	15	170	275	0	55
RT Vol	0	30	65	5	0	35
Lane Flow Rate	24	54	292	363	6	107
Geometry Grp	5	5	2	2	5	5
Degree of Util (X)	0.046	0.088	0.387	0.485	0.011	0.179
Departure Headway (Hd)	6.92	5.935	4.781	4.812	6.8	6.013
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	520	607	741	741	529	600
Service Time	4.625	3.64	2.879	2.905	4.503	3.717
HCM Lane V/C Ratio	0.046	0.089	0.394	0.49	0.011	0.178
HCM Control Delay, s/veh	10	9.2	10.9	12.4	9.6	10
HCM Lane LOS	A	A	B	B	A	A
HCM 95th-tile Q	0.1	0.3	1.8	2.7	0	0.6

Lanes, Volumes, Timings
200: Portage Road & South Drive

AM Peak
12/20/2024

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	65	0	0	145
Future Volume (vph)	0	0	65	0	0	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						
Flt Protected						
Satd. Flow (prot)	1881	0	1810	0	0	1863
Flt Permitted						
Satd. Flow (perm)	1881	0	1810	0	0	1863
Link Speed (mph)	25		45			45
Link Distance (ft)	1136		963			2012
Travel Time (s)	31.0		14.6			30.5
Confl. Peds. (#/hr)	1	1		1	1	
Confl. Bikes (#/hr)		1		1		
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	1%	1%	5%	5%	2%	2%
Adj. Flow (vph)	0	0	77	0	0	173
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	77	0	0	173
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	18.0%		ICU Level of Service A			
Analysis Period (min)	15					

HCM 7th TWSC
200: Portage Road & South Drive

AM Peak
12/20/2024

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	65	0	0	145
Future Vol, veh/h	0	0	65	0	0	145
Conflicting Peds, #/hr	1	1	0	1	1	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	84	84	84	84	84	84
Heavy Vehicles, %	1	1	5	5	2	2
Mvmt Flow	0	0	77	0	0	173

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	252	79	0
Stage 1	78	-	-
Stage 2	174	-	-
Critical Hdwy	6.41	6.21	-
Critical Hdwy Stg 1	5.41	-	-
Critical Hdwy Stg 2	5.41	-	-
Follow-up Hdwy	3.509	3.309	-
Pot Cap-1 Maneuver	739	984	-
Stage 1	947	-	-
Stage 2	859	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	737	982	-
Mov Cap-2 Maneuver	737	-	-
Stage 1	946	-	-
Stage 2	858	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1518
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s/veh)	-	-	0	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0

Lanes, Volumes, Timings
300: North Drive & Hoepker Road

AM Peak
12/20/2024

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (vph)	205	0	0	305	0	0
Future Volume (vph)	205	0	0	305	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						
Flt Protected						
Satd. Flow (prot)	1845	0	0	1881	1881	0
Flt Permitted						
Satd. Flow (perm)	1845	0	0	1881	1881	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	1612			1161	904	
Travel Time (s)	24.4			17.6	24.7	
Confl. Peds. (#/hr)		1	1		1	1
Confl. Bikes (#/hr)		1				1
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	3%	3%	1%	1%	1%	1%
Adj. Flow (vph)	244	0	0	363	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	244	0	0	363	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	26.4%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	205	0	0	305	0	0
Future Vol, veh/h	205	0	0	305	0	0
Conflicting Peds, #/hr	0	1	1	0	1	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	3	3	1	1	1	1
Mvmt Flow	244	0	0	363	0	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	245	0	609
Stage 1	-	-	-	-	245
Stage 2	-	-	-	-	364
Critical Hdwy	-	-	4.11	-	6.41
Critical Hdwy Stg 1	-	-	-	-	5.41
Critical Hdwy Stg 2	-	-	-	-	5.41
Follow-up Hdwy	-	-	2.209	-	3.509
Pot Cap-1 Maneuver	-	-	1327	-	460
Stage 1	-	-	-	-	798
Stage 2	-	-	-	-	705
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1326	-	459
Mov Cap-2 Maneuver	-	-	-	-	459
Stage 1	-	-	-	-	797
Stage 2	-	-	-	-	704

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1326	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s/veh)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Lanes, Volumes, Timings
100: Portage Road & Hoepker Road

PM Peak
12/20/2024

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	435	20	40	260	5	80	50	65	5	20	15
Future Volume (vph)	40	435	20	40	260	5	80	50	65	5	20	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.994			0.998			0.915			0.937	
Flt Protected		0.996			0.993		0.950			0.950		
Satd. Flow (prot)	0	1862	0	0	1828	0	1787	1721	0	1752	1728	0
Flt Permitted		0.996			0.993		0.950			0.950		
Satd. Flow (perm)	0	1862	0	0	1828	0	1787	1721	0	1752	1728	0
Link Speed (mph)		35			45			45			45	
Link Distance (ft)		997			1612			2012			1125	
Travel Time (s)		19.4			24.4			30.5			17.0	
Confl. Peds. (#/hr)	1		1	1		1	1		1	1		1
Confl. Bikes (#/hr)			1			1			1			1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	3%	3%	3%
Adj. Flow (vph)	43	468	22	43	280	5	86	54	70	5	22	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	533	0	0	328	0	86	124	0	5	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	49.2%											
Analysis Period (min)	15											
ICU Level of Service A												

Intersection	
Intersection Delay, s/veh	18.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	435	20	40	260	5	80	50	65	5	20	15
Future Vol, veh/h	40	435	20	40	260	5	80	50	65	5	20	15
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	3	3	3	1	1	1	3	3	3
Mvmt Flow	43	468	22	43	280	5	86	54	70	5	22	16
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay, s/veh	23.9	14.3	11.3	10.4
HCM LOS	C	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	8%	13%	100%	0%
Vol Thru, %	0%	43%	88%	85%	0%	57%
Vol Right, %	0%	57%	4%	2%	0%	43%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	80	115	495	305	5	35
LT Vol	80	0	40	40	5	0
Through Vol	0	50	435	260	0	20
RT Vol	0	65	20	5	0	15
Lane Flow Rate	86	124	532	328	5	38
Geometry Grp	5	5	2	2	5	5
Degree of Util (X)	0.176	0.221	0.774	0.507	0.012	0.073
Departure Headway (Hd)	7.364	6.446	5.232	5.568	7.82	6.996
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	486	555	692	646	456	509
Service Time	5.129	4.211	3.277	3.621	5.602	4.778
HCM Lane V/C Ratio	0.177	0.223	0.769	0.508	0.011	0.075
HCM Control Delay, s/veh	11.7	11	23.9	14.3	10.7	10.3
HCM Lane LOS	B	B	C	B	B	B
HCM 95th-tile Q	0.6	0.8	7.4	2.9	0	0.2

Lanes, Volumes, Timings
200: Portage Road & South Drive

PM Peak
12/20/2024

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	195	0	0	80
Future Volume (vph)	0	0	195	0	0	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						
Flt Protected						
Satd. Flow (prot)	1881	0	1881	0	0	1845
Flt Permitted						
Satd. Flow (perm)	1881	0	1881	0	0	1845
Link Speed (mph)	25		45			45
Link Distance (ft)	1136		963			2012
Travel Time (s)	31.0		14.6			30.5
Confl. Peds. (#/hr)	1	1		1	1	
Confl. Bikes (#/hr)		1		1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	1%	1%	3%	3%
Adj. Flow (vph)	0	0	210	0	0	86
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	210	0	0	86
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	20.7%		ICU Level of Service A			
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	195	0	0	80
Future Vol, veh/h	0	0	195	0	0	80
Conflicting Peds, #/hr	1	1	0	1	1	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	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	3	3
Mvmt Flow	0	0	210	0	0	86

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	298	212	0
Stage 1	211	-	-
Stage 2	87	-	-
Critical Hdwy	6.41	6.21	-
Critical Hdwy Stg 1	5.41	-	-
Critical Hdwy Stg 2	5.41	-	-
Follow-up Hdwy	3.509	3.309	-
Pot Cap-1 Maneuver	696	831	-
Stage 1	827	-	-
Stage 2	939	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	694	829	-
Mov Cap-2 Maneuver	694	-	-
Stage 1	826	-	-
Stage 2	938	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1353
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s/veh)	-	-	0	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0

Lanes, Volumes, Timings
300: North Drive & Hoepker Road

PM Peak
12/20/2024

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (vph)	505	0	0	305	0	0
Future Volume (vph)	505	0	0	305	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						
Flt Protected						
Satd. Flow (prot)	1881	0	0	1845	1881	0
Flt Permitted						
Satd. Flow (perm)	1881	0	0	1845	1881	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	1612			1161	904	
Travel Time (s)	24.4			17.6	24.7	
Confl. Peds. (#/hr)		1	1		1	1
Confl. Bikes (#/hr)		1				1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	3%	3%	1%	1%
Adj. Flow (vph)	543	0	0	328	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	543	0	0	328	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	36.9%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	505	0	0	305	0	0
Future Vol, veh/h	505	0	0	305	0	0
Conflicting Peds, #/hr	0	1	1	0	1	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	3	3	1	1
Mvmt Flow	543	0	0	328	0	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	544	0	873
Stage 1	-	-	-	-	544
Stage 2	-	-	-	-	329
Critical Hdwy	-	-	4.13	-	6.41
Critical Hdwy Stg 1	-	-	-	-	5.41
Critical Hdwy Stg 2	-	-	-	-	5.41
Follow-up Hdwy	-	-	2.227	-	3.509
Pot Cap-1 Maneuver	-	-	1020	-	322
Stage 1	-	-	-	-	584
Stage 2	-	-	-	-	731
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1019	-	321
Mov Cap-2 Maneuver	-	-	-	-	321
Stage 1	-	-	-	-	583
Stage 2	-	-	-	-	731

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1019	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s/veh)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Lanes, Volumes, Timings
100: Portage Road & Hoepker Road

AM Peak
08/08/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	185	65	35	305	10	20	15	35	10	55	35
Future Volume (vph)	10	185	65	35	305	10	20	15	35	10	55	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.966			0.996			0.895			0.941	
Flt Protected		0.998			0.995		0.950			0.950		
Satd. Flow (prot)	0	1778	0	0	1864	0	1719	1620	0	1770	1753	0
Flt Permitted		0.998			0.995		0.950			0.950		
Satd. Flow (perm)	0	1778	0	0	1864	0	1719	1620	0	1770	1753	0
Link Speed (mph)		35			45			45			45	
Link Distance (ft)		997			1612			2012			1125	
Travel Time (s)		19.4			24.4			30.5			17.0	
Confl. Peds. (#/hr)	1		1	1		1	1		1	1		1
Confl. Bikes (#/hr)			1			1			1			1
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	2%	2%	2%
Adj. Flow (vph)	12	220	77	42	363	12	24	18	42	12	65	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	309	0	0	417	0	24	60	0	12	107	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	45.6%											
Analysis Period (min)	15											
ICU Level of Service A												

Intersection	
Intersection Delay, s/veh	12.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	185	65	35	305	10	20	15	35	10	55	35
Future Vol, veh/h	10	185	65	35	305	10	20	15	35	10	55	35
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	3	3	3	1	1	1	5	5	5	2	2	2
Mvmt Flow	12	220	77	42	363	12	24	18	42	12	65	42
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay, s/veh	11.8	14.7	9.8	10.4
HCM LOS	B	B	A	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	4%	10%	100%	0%
Vol Thru, %	0%	30%	71%	87%	0%	61%
Vol Right, %	0%	70%	25%	3%	0%	39%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	50	260	350	10	90
LT Vol	20	0	10	35	10	0
Through Vol	0	15	185	305	0	55
RT Vol	0	35	65	10	0	35
Lane Flow Rate	24	60	310	417	12	107
Geometry Grp	5	5	2	2	5	5
Degree of Util (X)	0.047	0.102	0.431	0.58	0.023	0.186
Departure Headway (Hd)	7.153	6.142	5.016	5.01	7.023	6.235
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	500	582	718	725	509	574
Service Time	4.904	3.891	3.05	3.01	4.771	3.982
HCM Lane V/C Ratio	0.048	0.103	0.432	0.575	0.024	0.186
HCM Control Delay, s/veh	10.3	9.6	11.8	14.7	9.9	10.4
HCM Lane LOS	B	A	B	B	A	B
HCM 95th-tile Q	0.1	0.3	2.2	3.8	0.1	0.7

Lanes, Volumes, Timings
300: North Drive & Hoepker Road

AM Peak
08/08/2025

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	205	25	10	305	45	25
Future Volume (vph)	205	25	10	305	45	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.985				0.952	
Flt Protected				0.998	0.969	
Satd. Flow (prot)	1817	0	0	1877	1735	0
Flt Permitted				0.998	0.969	
Satd. Flow (perm)	1817	0	0	1877	1735	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	1612			1161	904	
Travel Time (s)	24.4			17.6	24.7	
Confl. Peds. (#/hr)		1	1		1	1
Confl. Bikes (#/hr)		1				1
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	3%	3%	1%	1%	1%	1%
Adj. Flow (vph)	244	30	12	363	54	30
Shared Lane Traffic (%)						
Lane Group Flow (vph)	274	0	0	375	84	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	35.2%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	1.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	205	25	10	305	45	25
Future Vol, veh/h	205	25	10	305	45	25
Conflicting Peds, #/hr	0	1	1	0	1	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	3	3	1	1	1	1
Mvmt Flow	244	30	12	363	54	30
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	275	0	648	261
Stage 1	-	-	-	-	260	-
Stage 2	-	-	-	-	388	-
Critical Hdwy	-	-	4.11	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.209	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	1294	-	437	780
Stage 1	-	-	-	-	786	-
Stage 2	-	-	-	-	688	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1293	-	431	779
Mov Cap-2 Maneuver	-	-	-	-	431	-
Stage 1	-	-	-	-	785	-
Stage 2	-	-	-	-	679	-
Approach	EB		WB		NB	
HCM Ctrl Dly, s/v	0		0.25		13.38	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	513	-	-	57	-	
HCM Lane V/C Ratio	0.163	-	-	0.009	-	
HCM Ctrl Dly (s/v)	13.4	-	-	7.8	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.6	-	-	0	-	

Lanes, Volumes, Timings
100: Portage Road & Hoepker Road

PM Peak
08/08/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	465	20	50	285	5	80	50	75	10	20	15
Future Volume (vph)	40	465	20	50	285	5	80	50	75	10	20	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.998			0.910			0.937	
Flt Protected		0.996			0.993		0.950			0.950		
Satd. Flow (prot)	0	1864	0	0	1828	0	1787	1712	0	1752	1728	0
Flt Permitted		0.996			0.993		0.950			0.950		
Satd. Flow (perm)	0	1864	0	0	1828	0	1787	1712	0	1752	1728	0
Link Speed (mph)		35			45			45			45	
Link Distance (ft)		997			1612			2012			1125	
Travel Time (s)		19.4			24.4			30.5			17.0	
Confl. Peds. (#/hr)	1		1	1		1	1		1	1		1
Confl. Bikes (#/hr)			1			1			1			1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	3%	3%	3%
Adj. Flow (vph)	43	500	22	54	306	5	86	54	81	11	22	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	565	0	0	365	0	86	135	0	11	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	50.1%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection	
Intersection Delay, s/veh	22.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	465	20	50	285	5	80	50	75	10	20	15
Future Vol, veh/h	40	465	20	50	285	5	80	50	75	10	20	15
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	3	3	3	1	1	1	3	3	3
Mvmt Flow	43	500	22	54	306	5	86	54	81	11	22	16
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay, s/veh	30.9	16.6	11.9	10.8
HCM LOS	D	C	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	8%	15%	100%	0%
Vol Thru, %	0%	40%	89%	84%	0%	57%
Vol Right, %	0%	60%	4%	1%	0%	43%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	80	125	525	340	10	35
LT Vol	80	0	40	50	10	0
Through Vol	0	50	465	285	0	20
RT Vol	0	75	20	5	0	15
Lane Flow Rate	86	134	565	366	11	38
Geometry Grp	5	5	2	2	5	5
Degree of Util (X)	0.182	0.249	0.845	0.582	0.025	0.077
Departure Headway (Hd)	7.602	6.657	5.386	5.727	8.214	7.387
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	470	536	666	625	438	488
Service Time	5.388	4.442	3.452	3.804	5.914	5.087
HCM Lane V/C Ratio	0.183	0.25	0.848	0.586	0.025	0.078
HCM Control Delay, s/veh	12.1	11.7	30.9	16.6	11.1	10.7
HCM Lane LOS	B	B	D	C	B	B
HCM 95th-tile Q	0.7	1	9.4	3.7	0.1	0.2

Lanes, Volumes, Timings
300: North Drive & Hoepker Road

PM Peak
08/08/2025

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↗	↘
Traffic Volume (vph)	505	45	20	305	35	15
Future Volume (vph)	505	45	20	305	35	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.989				0.960	
Flt Protected				0.997	0.966	
Satd. Flow (prot)	1860	0	0	1839	1745	0
Flt Permitted				0.997	0.966	
Satd. Flow (perm)	1860	0	0	1839	1745	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	1612			1161	904	
Travel Time (s)	24.4			17.6	24.7	
Confl. Peds. (#/hr)		1	1		1	1
Confl. Bikes (#/hr)		1				1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	3%	3%	1%	1%
Adj. Flow (vph)	543	48	22	328	38	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	591	0	0	350	54	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	42.8%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	1.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	505	45	20	305	35	15
Future Vol, veh/h	505	45	20	305	35	15
Conflicting Peds, #/hr	0	1	1	0	1	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	3	3	1	1
Mvmt Flow	543	48	22	328	38	16
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	592	0	940	569
Stage 1	-	-	-	-	568	-
Stage 2	-	-	-	-	372	-
Critical Hdwy	-	-	4.13	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.227	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	979	-	294	523
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	699	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	978	-	285	522
Mov Cap-2 Maneuver	-	-	-	-	285	-
Stage 1	-	-	-	-	568	-
Stage 2	-	-	-	-	680	-
Approach	EB		WB		NB	
HCM Ctrl Dly, s/v	0		0.54		18.01	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	330	-	-	111	-	
HCM Lane V/C Ratio	0.163	-	-	0.022	-	
HCM Ctrl Dly (s/v)	18	-	-	8.8	0	
HCM Lane LOS	C	-	-	A	A	
HCM 95th %tile Q(veh)	0.6	-	-	0.1	-	

Lanes, Volumes, Timings
100: Portage Road & Hoepker Road

AM Peak
08/11/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	185	65	35	305	10	20	15	35	10	55	35
Future Volume (vph)	10	185	65	35	305	10	20	15	35	10	55	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.966			0.996			0.895			0.941	
Flt Protected		0.998			0.995		0.950			0.950		
Satd. Flow (prot)	0	1778	0	0	1864	0	1719	1620	0	1770	1753	0
Flt Permitted		0.998			0.995		0.950			0.950		
Satd. Flow (perm)	0	1778	0	0	1864	0	1719	1620	0	1770	1753	0
Link Speed (mph)		35			45			45			45	
Link Distance (ft)		997			1612			2012			1125	
Travel Time (s)		19.4			24.4			30.5			17.0	
Confl. Peds. (#/hr)	1		1	1		1	1		1	1		1
Confl. Bikes (#/hr)			1			1			1			1
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	5%	5%	5%	2%	2%	2%
Adj. Flow (vph)	12	220	77	42	363	12	24	18	42	12	65	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	309	0	0	417	0	24	60	0	12	107	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	45.6%											
Analysis Period (min)	15											
ICU Level of Service A												

Intersection	
Intersection Delay, s/veh	12.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	185	65	35	305	10	20	15	35	10	55	35
Future Vol, veh/h	10	185	65	35	305	10	20	15	35	10	55	35
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	3	3	3	1	1	1	5	5	5	2	2	2
Mvmt Flow	12	220	77	42	363	12	24	18	42	12	65	42
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay, s/veh	11.8	14.7	9.8	10.4
HCM LOS	B	B	A	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	4%	10%	100%	0%
Vol Thru, %	0%	30%	71%	87%	0%	61%
Vol Right, %	0%	70%	25%	3%	0%	39%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	50	260	350	10	90
LT Vol	20	0	10	35	10	0
Through Vol	0	15	185	305	0	55
RT Vol	0	35	65	10	0	35
Lane Flow Rate	24	60	310	417	12	107
Geometry Grp	5	5	2	2	5	5
Degree of Util (X)	0.047	0.102	0.431	0.58	0.023	0.186
Departure Headway (Hd)	7.153	6.142	5.016	5.01	7.023	6.235
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	500	582	718	725	509	574
Service Time	4.904	3.891	3.05	3.01	4.771	3.982
HCM Lane V/C Ratio	0.048	0.103	0.432	0.575	0.024	0.186
HCM Control Delay, s/veh	10.3	9.6	11.8	14.7	9.9	10.4
HCM Lane LOS	B	A	B	B	A	B
HCM 95th-tile Q	0.1	0.3	2.2	3.8	0.1	0.7

Lanes, Volumes, Timings
300: North Drive & Hoepker Road

AM Peak
08/11/2025

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	205	25	10	305	45	25
Future Volume (vph)	205	25	10	305	45	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		200	200		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.952	
Flt Protected			0.950		0.969	
Satd. Flow (prot)	1845	1568	1787	1881	1735	0
Flt Permitted			0.950		0.969	
Satd. Flow (perm)	1845	1568	1787	1881	1735	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	1612			1161	904	
Travel Time (s)	24.4			17.6	24.7	
Confl. Peds. (#/hr)		1	1		1	1
Confl. Bikes (#/hr)		1				1
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	3%	3%	1%	1%	1%	1%
Adj. Flow (vph)	244	30	12	363	54	30
Shared Lane Traffic (%)						
Lane Group Flow (vph)	244	30	12	363	84	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	27.1%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	1.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↖	↑	↘	↗
Traffic Vol, veh/h	205	25	10	305	45	25
Future Vol, veh/h	205	25	10	305	45	25
Conflicting Peds, #/hr	0	1	1	0	1	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	3	3	1	1	1	1
Mvmt Flow	244	30	12	363	54	30
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	275	0	633	246
Stage 1	-	-	-	-	245	-
Stage 2	-	-	-	-	388	-
Critical Hdwy	-	-	4.11	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.209	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	1294	-	445	795
Stage 1	-	-	-	-	798	-
Stage 2	-	-	-	-	688	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1293	-	440	794
Mov Cap-2 Maneuver	-	-	-	-	440	-
Stage 1	-	-	-	-	797	-
Stage 2	-	-	-	-	681	-
Approach	EB	WB		NB		
HCM Ctrl Dly, s/v	0	0.25		13.17		
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	524	-	-	1293	-	
HCM Lane V/C Ratio	0.159	-	-	0.009	-	
HCM Ctrl Dly (s/v)	13.2	-	-	7.8	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.6	-	-	0	-	

Lanes, Volumes, Timings
100: Portage Road & Hoepker Road

PM Peak
08/11/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	465	20	50	285	5	80	50	75	10	20	15
Future Volume (vph)	40	465	20	50	285	5	80	50	75	10	20	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	100		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.998			0.910			0.937	
Flt Protected		0.996			0.993		0.950			0.950		
Satd. Flow (prot)	0	1864	0	0	1828	0	1787	1712	0	1752	1728	0
Flt Permitted		0.996			0.993		0.950			0.950		
Satd. Flow (perm)	0	1864	0	0	1828	0	1787	1712	0	1752	1728	0
Link Speed (mph)		35			45			45			45	
Link Distance (ft)		997			1612			2012			1125	
Travel Time (s)		19.4			24.4			30.5			17.0	
Confl. Peds. (#/hr)	1		1	1		1	1		1	1		1
Confl. Bikes (#/hr)			1			1			1			1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	3%	3%	3%
Adj. Flow (vph)	43	500	22	54	306	5	86	54	81	11	22	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	565	0	0	365	0	86	135	0	11	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	50.1%											
Analysis Period (min)	15											
ICU Level of Service A												

Intersection	
Intersection Delay, s/veh	22.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	465	20	50	285	5	80	50	75	10	20	15
Future Vol, veh/h	40	465	20	50	285	5	80	50	75	10	20	15
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	3	3	3	1	1	1	3	3	3
Mvmt Flow	43	500	22	54	306	5	86	54	81	11	22	16
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay, s/veh	30.9	16.6	11.9	10.8
HCM LOS	D	C	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	8%	15%	100%	0%
Vol Thru, %	0%	40%	89%	84%	0%	57%
Vol Right, %	0%	60%	4%	1%	0%	43%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	80	125	525	340	10	35
LT Vol	80	0	40	50	10	0
Through Vol	0	50	465	285	0	20
RT Vol	0	75	20	5	0	15
Lane Flow Rate	86	134	565	366	11	38
Geometry Grp	5	5	2	2	5	5
Degree of Util (X)	0.182	0.249	0.845	0.582	0.025	0.077
Departure Headway (Hd)	7.602	6.657	5.386	5.727	8.214	7.387
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	470	536	666	625	438	488
Service Time	5.388	4.442	3.452	3.804	5.914	5.087
HCM Lane V/C Ratio	0.183	0.25	0.848	0.586	0.025	0.078
HCM Control Delay, s/veh	12.1	11.7	30.9	16.6	11.1	10.7
HCM Lane LOS	B	B	D	C	B	B
HCM 95th-tile Q	0.7	1	9.4	3.7	0.1	0.2

Lanes, Volumes, Timings
300: North Drive & Hoepker Road

PM Peak
08/11/2025

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	505	45	20	305	35	15
Future Volume (vph)	505	45	20	305	35	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		200	200		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.960	
Flt Protected			0.950		0.966	
Satd. Flow (prot)	1881	1599	1752	1845	1745	0
Flt Permitted			0.950		0.966	
Satd. Flow (perm)	1881	1599	1752	1845	1745	0
Link Speed (mph)	45			45	25	
Link Distance (ft)	1612			1161	904	
Travel Time (s)	24.4			17.6	24.7	
Confl. Peds. (#/hr)		1	1		1	1
Confl. Bikes (#/hr)		1				1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	3%	3%	1%	1%
Adj. Flow (vph)	543	48	22	328	38	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	543	48	22	328	54	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	36.9%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	1.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↘	↑	↘	↗
Traffic Vol, veh/h	505	45	20	305	35	15
Future Vol, veh/h	505	45	20	305	35	15
Conflicting Peds, #/hr	0	1	1	0	1	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	3	3	1	1
Mvmt Flow	543	48	22	328	38	16
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	592	0	916	545
Stage 1	-	-	-	-	544	-
Stage 2	-	-	-	-	372	-
Critical Hdwy	-	-	4.13	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.227	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	979	-	304	540
Stage 1	-	-	-	-	584	-
Stage 2	-	-	-	-	699	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	978	-	296	539
Mov Cap-2 Maneuver	-	-	-	-	296	-
Stage 1	-	-	-	-	583	-
Stage 2	-	-	-	-	683	-
Approach	EB		WB		NB	
HCM Ctrl Dly, s/v	0		0.54		17.45	
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	343	-	-	978	-	
HCM Lane V/C Ratio	0.157	-	-	0.022	-	
HCM Ctrl Dly (s/v)	17.5	-	-	8.8	-	
HCM Lane LOS	C	-	-	A	-	
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-	

Appendix D

Turn Lane Warrant Calculations & Graphs

Left-turn Lane Analysis

Right-turn Lane Analysis

OPERATIONAL WARRANTS FOR LEFT-TURN LANES AT INTERSECTIONS ON TWO-LANE HIGHWAYS

Project: Pumpkin Hollow Residential
 Scenario: Full Build - Access on Hoepker only
 Analyst: DJL
 Date: 8/6/2025

Location	Operating Speed (mph)	Opposing Volume (veh/hr)	Advancing Volume (veh/hr)	Left-Turn Volume (veh/hr)	Calculated Left-Turn Percentage**	Advancing Volume Threshold* (veh/hr)	Is Advancing Volume Threshold Met?	By How Much?
Hoepker @ Prop Road - AM Peak ¹	50	225	315	20	6.3%	494	NO	short 179 veh/hr
Hoepker @ Prop Road - PM Peak	50	550	325	20	6.2%	348	NO	short 23 veh/hr

* Advanced volume threshold based on exponential trendlines fit to the data in WisDOT FDM 11-25 Table 5.1. As a result, thresholds may differ slightly from data provided in Table 5.1.

** Calculated left-turn percentage must be between 5 and 40 percent to provide threshold.

Notes

Operating speed is posted speed limit plus 5-mph.

Opposing volume = Opposing Through and Right

Advancing Volume = Advancing Left, Through, and Right

¹ For AM Peak volumes, 20 left-turning vehicles were shown (actual is 10) in order for threshold to be shown. Left-turn warrant at 10 is not met.

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

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	50
Major-road volume (one direction), veh/h:	550
Right-turn volume, veh/h:	45

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	22
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Add right-turn bay.	

