

Traffic Impact Analysis:



lancaster
mobley

Stop N Save Development

Transportation Impact
Study

Salem, Oregon



RENEWS: 6/30/2024

Date:
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Executive Summary

1. A gas station and retail space are proposed to be located on a 0.67-acre property (Tax Lot 082W06AB100000) in Salem, Oregon. The restaurant/retail space will encompass approximately 4,315 square feet, and the proposed gas station will be comprised of 8 fueling positions and a 300 square foot building which houses the cashier. The development will construct a site access along the northern property line and share the existing western and southern site access with the property to the south.
2. The trip generation calculations show that the proposed project is projected to generate a total of 53 morning peak hour primary trips, 72 evening peak hour primary trips, and 1,062 average weekday primary trips.
3. No significant trends or crash patterns were identified at any of the study intersections that would be affected by the proposed development. Accordingly, no safety mitigation is recommended per the crash data analysis.
4. Preliminary traffic signal warrants are not projected to be met any of the unsignalized study intersections upon full buildout of the proposed development. Accordingly, no related mitigation is necessary or recommended.
5. Left-turn lanes are not projected to be met at the applicable intersections upon full buildout of the proposed development. Accordingly, no related mitigation is necessary or recommended.
6. All study intersections are currently operating acceptably per jurisdictional standards and are projected to continue operating acceptably through the 2024 site buildout year.



Project Description

Introduction

A gas station and retail space are proposed to be located on a 0.67-acre property (Tax Lot 082W06AB100000) in Salem, Oregon. The restaurant/retail space will encompass approximately 4,315 square feet, and the proposed gas station will be comprised of 8 fueling positions and a 300 square foot building which houses the cashier.

Based on correspondence with City of Salem, the report conducts safety and capacity/level of service analyses at the following intersections:

1. Hagers Grove Road SE at northern site access;
2. Hagers Grove Road SE at western site access;
3. Hagers Grove Road SE at southern site access; and
4. Lancaster Drive SE at Hagers Grove Road SE/Carson Drive SE.

The purpose of this study is to determine whether the transportation system within the vicinity of the site is capable of safely and efficiently supporting the existing and proposed uses, and to determine any mitigation that may be necessary to do so. Detailed information on traffic counts, trip generation calculations, safety analyses, and level of service calculations is included in the appendix to this report.

Location Description

The subject property is located east of Interstate 5 and south of Highway 22 (North Santiam Highway SE). The development will construct a site access along the northern property line and share the existing western and southern site access with the property to the south. Figure 1 on the following page shows the site vicinity with the subject site highlighted in red.





Figure 1: Vicinity Map

Vicinity Streets

The proposed development is expected to impact three roadways near the site. Table 1 provides a description of each vicinity roadway.

Table 1: Vicinity Roadway Descriptions

Street Name	Jurisdiction	Functional Classification	Cross-Section	Speed (MPH)	Curbs & Sidewalks	On-Street Parking	Bicycle Facilities
Lancaster Drive SE	City of Salem	Major Arterial	2-3 lanes	40 mph posted	Both sides	Not Permitted	Partial
Hagers Grove Road SE	City of Salem	Local Road	2 lanes	20 mph statutory	Partial both sides	Permitted	None
Carson Drive SE	City of Salem	Local Road	2 lanes	25 mph posted	Partial both sides	Permitted	None

Study Intersections

Based on coordination with City of Salem staff, four intersections were identified for analysis. A summarized description of these study intersections is provided in Table 2.

Table 2: Study Intersection Configurations

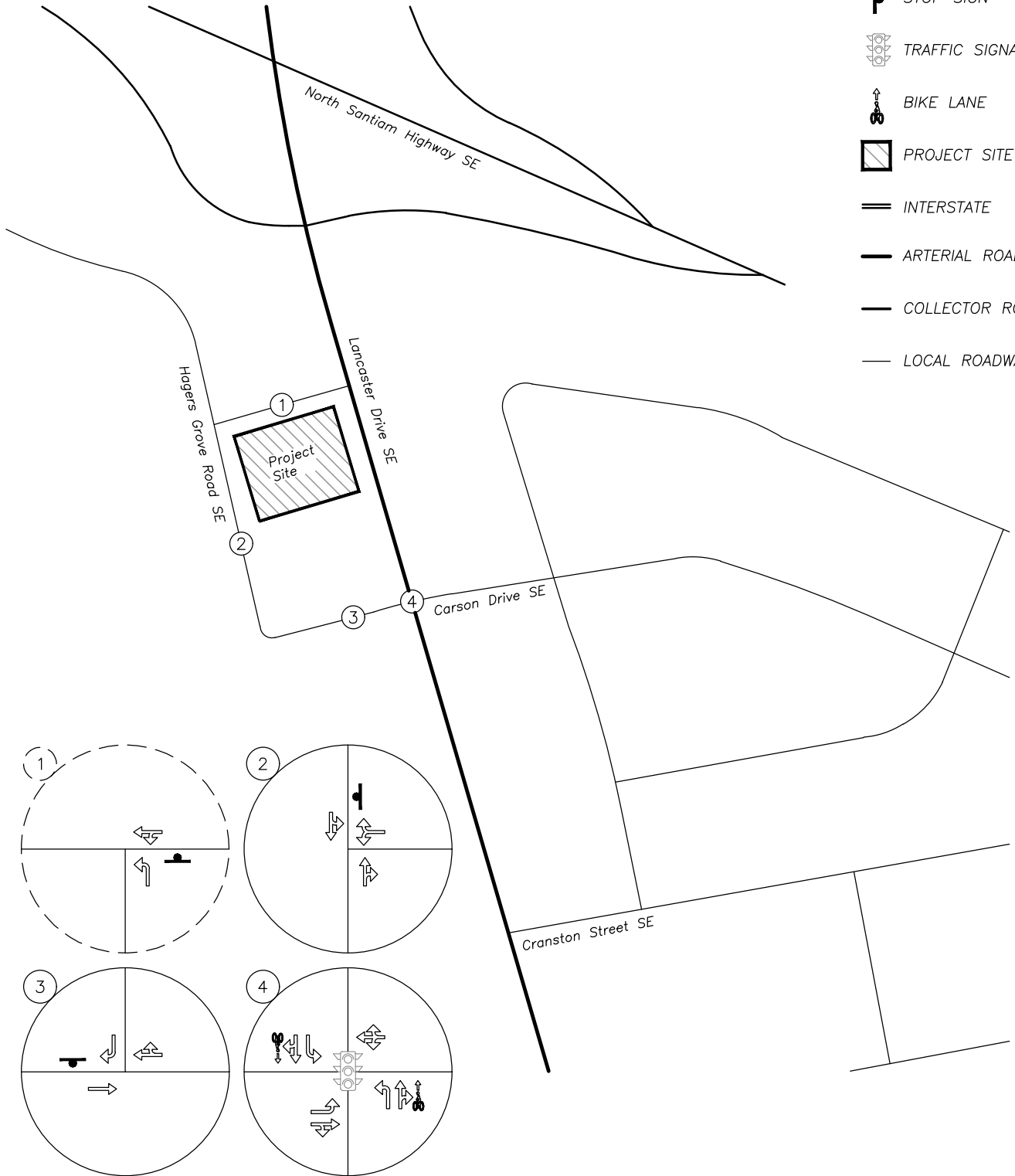
Intersection		Geometry	Traffic Control	Phasing/Stopped Approaches
1	Hagers Grove Road SE at northern site access	Three-Legged	Stop-Controlled	Northbound Stop-Controlled
2	Hagers Grove Road SE at western site access	Three-Legged	Stop-Controlled	Westbound Stop-Controlled
3	Hagers Grove Road SE at southern site access	Three-Legged	Stop-Controlled	Southbound Stop-Controlled
4	Lancaster Drive SE at Hagers Grove Road SE/Carson Drive SE	Four-Legged	Traffic Signal	Protected/Permitted with FYA North and Southbound Lefts, Permitted West and Eastbound Lefts

FYA = *flashing yellow arrow*

A vicinity map showing the project site, vicinity streets, and study intersection configurations is shown in Figure 2.

LEGEND

-  STUDY INTERSECTION
-  STOP SIGN
-  TRAFFIC SIGNAL
-  BIKE LANE
-  PROJECT SITE
-  INTERSTATE
-  ARTERIAL ROADWAY
-  COLLECTOR ROADWAY
-  LOCAL ROADWAY



no scale

Site Trips

Trip Generation

To estimate the number of trips that will be generated by the proposed use, trip rates from the *Trip Generation Manual*¹ were used. Trip generation for the proposed retail/restaurant use was estimated using data from land use code 932, *High Turnover Restaurant*, based on the building's gross floor area. Trip generation for the proposed gas station was estimated using data from land use code 944, *Gasoline Service Station*, based on the number of fueling positions.

Reductions at off-site intersections are taken to account for pass-by trips, which patronize retail/service uses within the site on the way to another destination. Since these trips would otherwise already be on the surrounding street system, they do not increase major-street volumes, but do affect turning movements at area intersections. Pass-by trip rates for land use codes 932 and 944 were used from the most recent edition of the *Trip Generation Manual*. Since no rate was given for land use code 932 during the morning peak hour, the evening pass-by rate was used for both peak hours.

The trip generation calculations show that the proposed project is projected to generate a total of 53 morning peak hour primary trips, 72 evening peak hour primary trips, and 1,062 average weekday primary trips. The trip generation estimates are summarized in Table 3. Detailed trip generation calculations are included as an attachment to this memorandum.

Table 3: Trip Generation Summary

		Morning Peak Hour			Evening Peak Hour			Weekday
Land Use – ITE Code	Size	In	Out	Total	In	Out	Total	Total
High Turnover Restaurant – 932	4,315 sq ft	22	19	41	24	15	39	462
Pass-by	(43%/43%)	-9	-9	-18	-8	-8	-16	-198
Gasoline Service Station – 944	8 FPs	41	41	82	55	56	111	1,376
Pass-by	(63%/57%)	-26	-26	-52	-31	-31	-62	-578
Total Trip Generation		63	60	123	79	71	150	1,838
Total Pass-By		-35	-35	-70	-39	-39	-78	-776
Primary Trips		28	25	53	40	32	72	1,062

¹ Institute of Transportation Engineers (ITE), Trip Generation Manual, 11th Edition, 2021.



Trip Distribution

The directional distribution of site trips to/from the project site was estimated based on locations of likely trip destinations, locations of major transportation facilities in the site vicinity, and existing travel patterns at study intersections.

The following trip distribution is projected:

- Approximately 70 percent of entering/exiting site trips will travel from/to the north along Lancaster Drive SE;
- Approximately 25 percent of entering/exiting site trips will travel from/to the south along Lancaster Drive SE;
- Approximately 5 percent of entering/exiting site trips will travel from/to the east along Carson Drive SE.

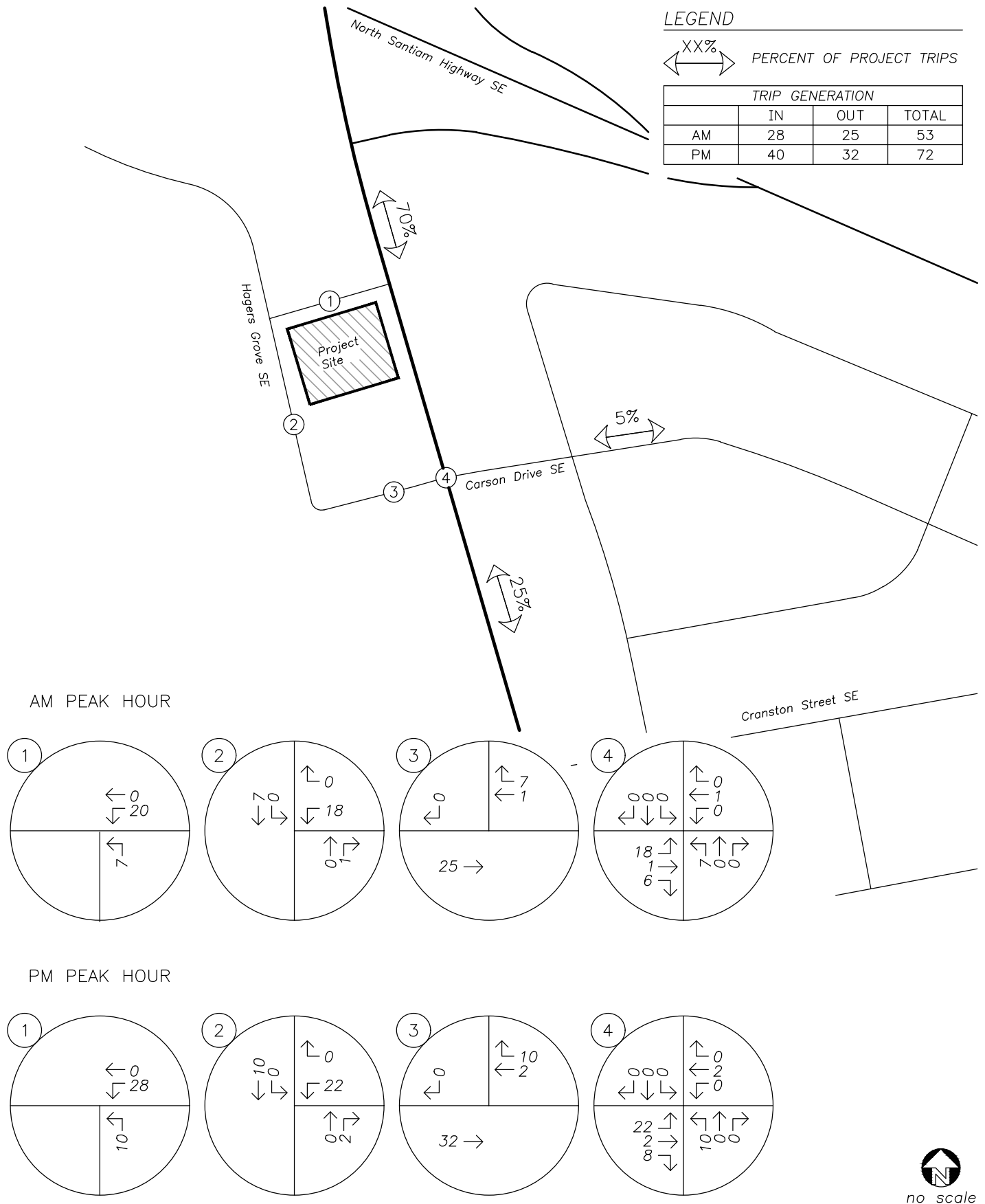
The trip distribution and assignment during the morning and evening peak hours is shown in Figure 3 for the primary trip generation and Figure 4 for the pass-by trip generation.



LEGEND

XX% PERCENT OF PROJECT TRIPS

TRIP GENERATION			
	IN	OUT	TOTAL
AM	28	25	53
PM	40	32	72



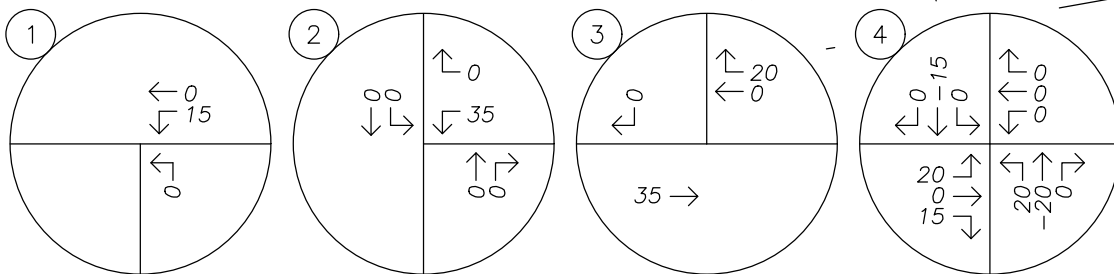
LEGEND

XX% PERCENT OF PASS-BY TRIPS

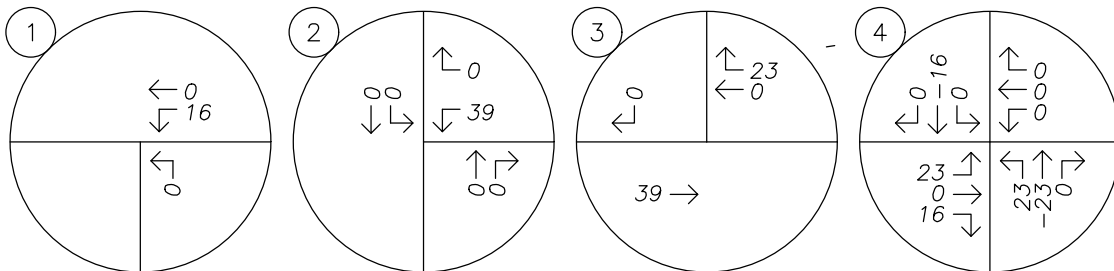
TRIP GENERATION			
	IN	OUT	TOTAL
AM	35	35	70
PM	39	39	78



AM PEAK HOUR



PM PEAK HOUR



no scale

Traffic Volumes

Existing Conditions

The ongoing COVID-19 pandemic is still causing a significant decrease in traffic due to closed or limited business operations and telecommuting. Therefore, historical data was used which was collected before the onset of the pandemic, with a growth rate applied to reflect the existing year 2022 traffic. This methodology was approved with the City during the scoping process.

Traffic counts were collected at all study intersections during the morning (between 7:00 AM and 9:00 AM) and evening (between 4:00 PM and 6:00 PM) peak hours on Wednesday, November 9th, 2016. Each intersection's peak hour was used for analysis. A compounded growth rate of two percent per year was applied to the 2016 traffic volumes to approximate year 2022 existing conditions.

Additionally, trips associated with the previously approved donut shop and convenience market were added as in-process traffic which would have been reflected in recent counts, had those been collected.

The existing traffic volumes at the study intersections during the morning and evening peak hours are shown in Figure 5.

Background Conditions

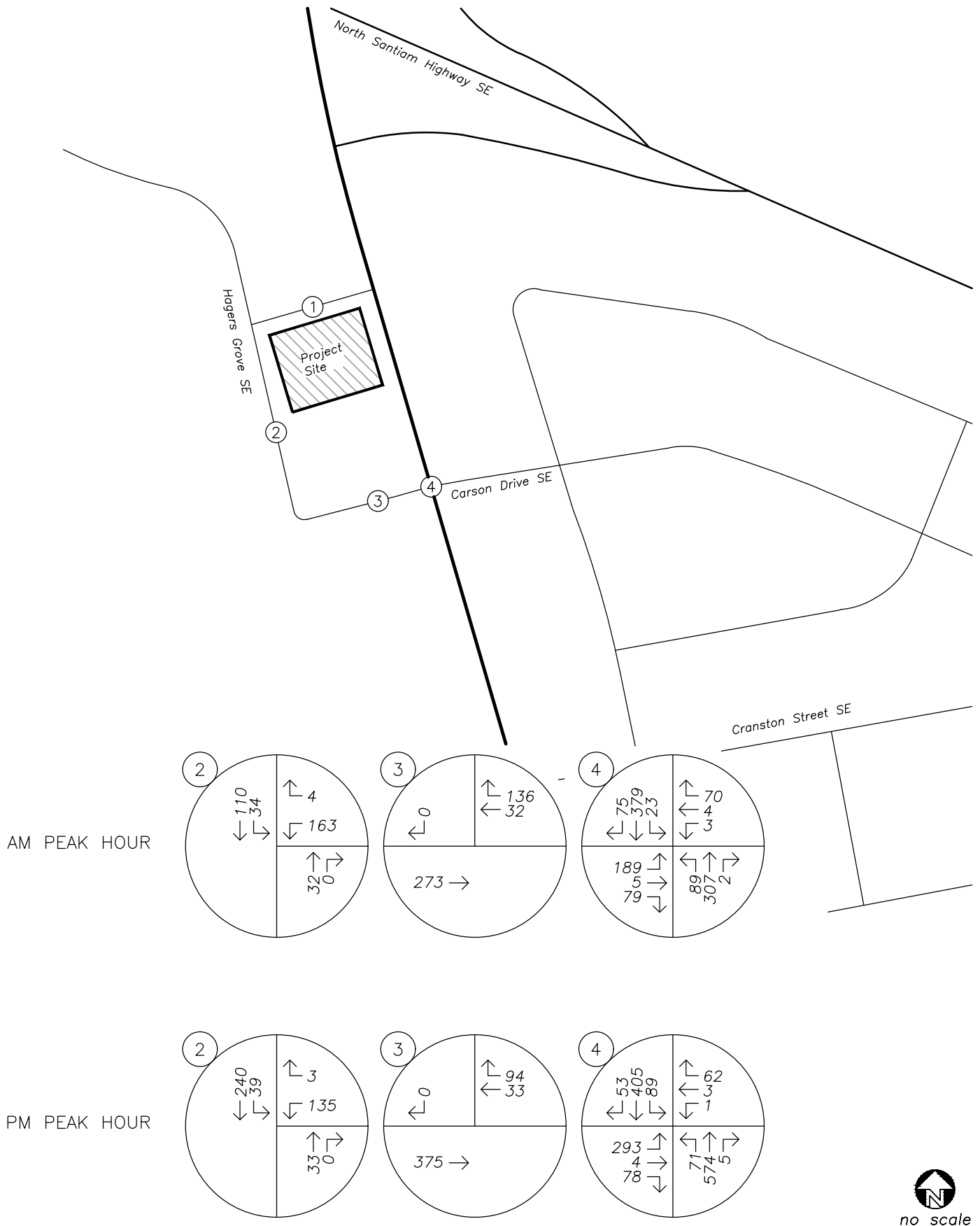
To provide analysis of the impact of the proposed development on the existing transportation facilities, an estimation of future traffic volumes is required. To calculate future traffic volumes for the year 2024 conditions, a compounded growth rate of two percent per year was applied. A build-out condition of two years was assumed.

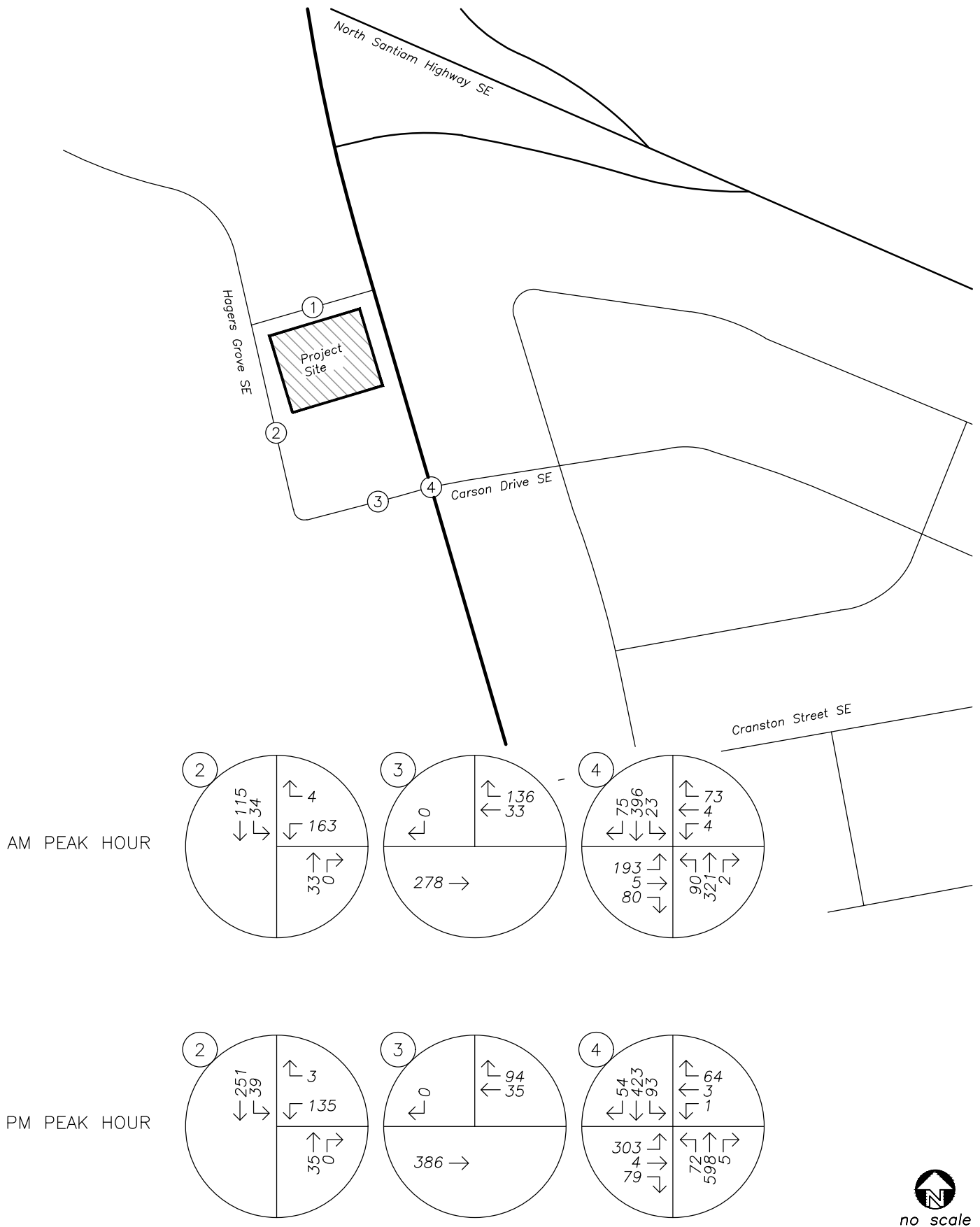
The background traffic volumes at the study intersections during the morning and evening peak hours are shown in Figure 6.

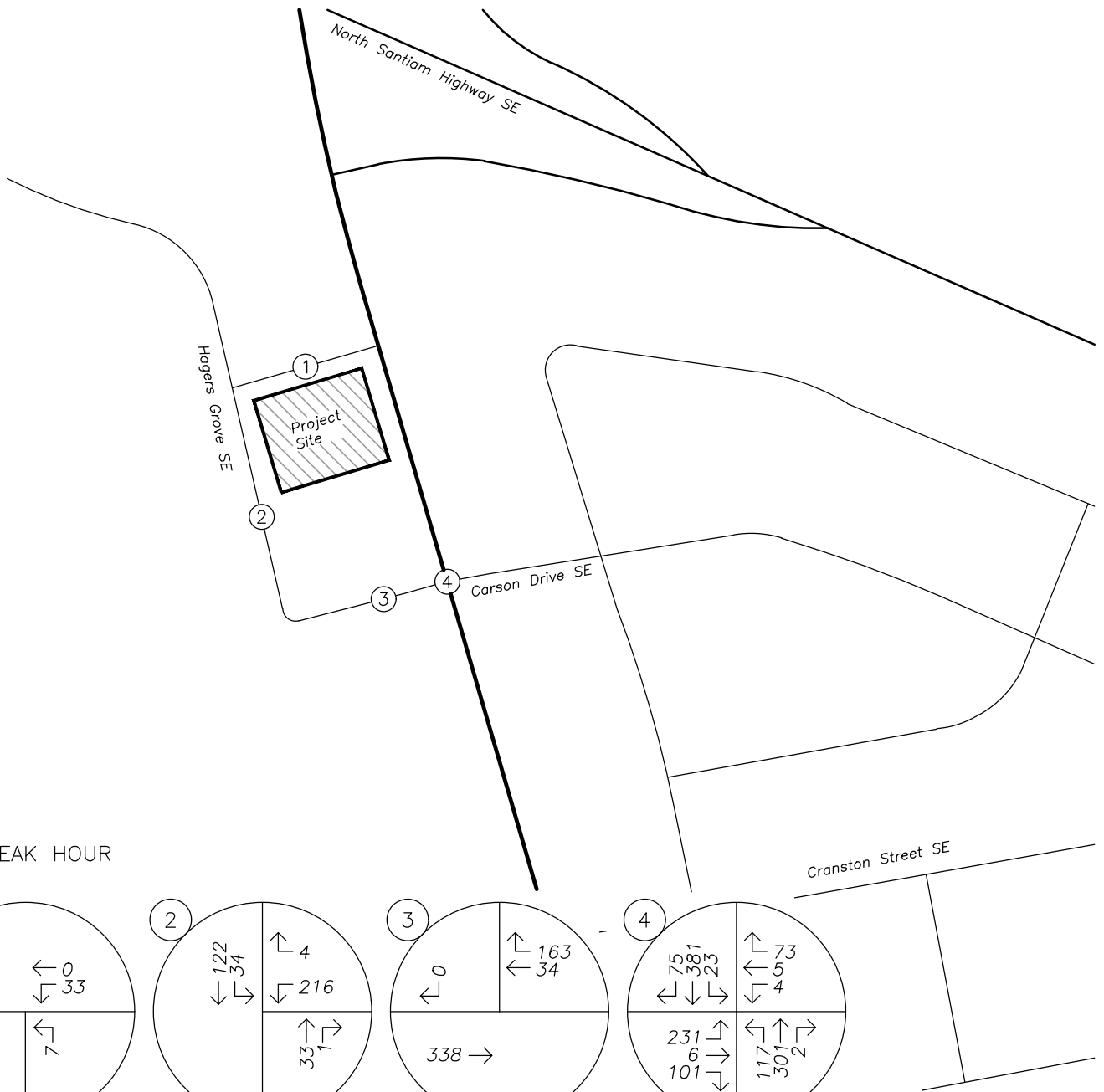
Buildout Conditions

Peak hour trips calculated to be generated by the proposed development, as described earlier within the *Site Trips* section, were added to the projected year 2024 background traffic volumes to obtain the expected 2024 site buildout volumes.

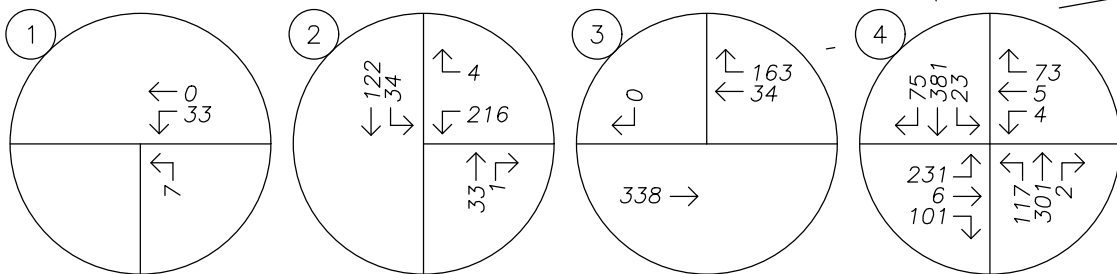
The buildout traffic volumes at the study intersections during the morning and evening peak hours are shown in Figure 7.



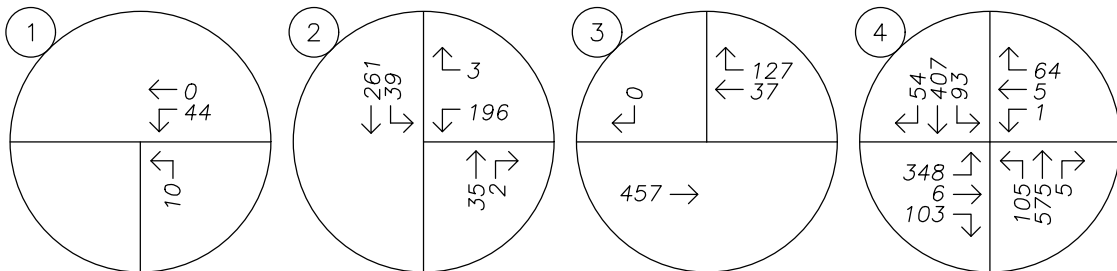




AM PEAK HOUR



PM PEAK HOUR



no scale

Safety Analysis

Crash History Review

Using data obtained from ODOT's Crash Data System, a review of approximately five years of the most recent available crash history (January 2016 through December 2020) was performed at the study intersections. The crash data was evaluated based on the number of crashes, the type of collisions, and the severity of the collisions. Crash severity is based on injuries sustained by people involved in the crash, and includes five categories:

- Property Damage Only (PDO)
- Possible Injury (Injury C)
- Non-Incapacitating Injury (Injury B)
- Incapacitating Injury (Injury A)
- Fatality or Fatal Injury

Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the evening peak period represents approximately 10 percent of the annual average daily traffic (AADT) at the intersection.

Table 4 provides a summary of crash types while Table 5 summarizes crash severities and rates for each of the study intersections. Detailed crash data is provided in the appendix to this report.

Table 4: Crash Type Summary

Intersection		Crash Type								Total Crashes
		Turn	Rear End	Angle	Fixed Object	Side Swipe	Ped	Bike	Other	
4	Hagers Grove Road SE at Lancaster Drive SE	2	2	1	0	0	0	0	0	5

Table 5: Crash Severity and Rate Summary

Intersection		Severity					Total Crashes	Peak Hour Volume	Crash Rate
		PDO	C	B	A	Fatal			
4	Hagers Grove Road SE at Lancaster Drive SE	3	2	0	0	0	5	1,771	0.15

Based on review of the most recent five years of available crash data, no significant trends or crash patterns were identified at any of study intersections that would be affected by the proposed development. Accordingly, no safety mitigation is recommended per crash data analysis.



Preliminary Traffic Signal Warrant Analysis

Traffic signal warrants were examined for all unsignalized intersections based on the methodologies in the Manual on Uniform Traffic Control Devices (MUTCD) published by the Federal Highway Administration in 2009. Volumes were used from the year 2024 buildout conditions. Warrant 1, Eight Hour Vehicular Volumes, was evaluated based on the common assumption that traffic counted during the evening peak hour represents ten percent of the ADT. Detailed information on the traffic signal warrant analysis is included in the attached appendix.

Preliminary traffic signal warrants are not projected to be met any of the unsignalized study intersections upon full buildout of the proposed development.

Left-Turn Lane Warrants

A left-turn refuge lane is primarily a safety consideration for the major-street, removing left-turning vehicles from the through traffic stream. The left-turn lane warrants were examined for all intersections in which site trips are expected to increase the major street left turn movement using methodologies provided within the National Cooperative Highway Research Program's (NCHRP) Report 457. Turn lane warrants were evaluated based on the number of advancing and opposing vehicles as well as the number of turning vehicles, the travel speed, and the number of through lanes.

Left-turn lane warrants are not projected to be met at the applicable study intersection under the year 2024 buildout scenario.



Operational Analysis

Intersection Capacity Analysis

A capacity and delay analysis were conducted for each of the study intersections per the unsignalized intersection analysis methodologies in the *Highway Capacity Manual* (HCM)². Intersections are generally evaluated based on the average control delay experienced by vehicles and are assigned a grade according to their operation. The level of service (LOS) of an intersection can range from LOS A, which indicates very little, or no delay experienced by vehicles, to LOS F, which indicates a high degree of congestion and delay.

Performance Standards

According to the City of Salem's Transportation System Plan (TSP), the City shall allow its existing streets and intersections to function at LOS E during the morning and evening peak travel hours. However, traffic impacts created by new development, as identified in a traffic impact analysis, must be mitigated to maintain peak hour LOS D or better

Delay & Capacity Analysis

The LOS, delay, and v/c results of the capacity analysis are shown in Table 6 for the evening peak hour. Detailed calculations as well as tables showing the relationship between delay and LOS are included in the appendix to this report.

² Transportation Research Board, *Highway Capacity Manual 6th Edition*, 2016.



Table 6: Capacity Analysis Summary

Intersection & Condition	AM Peak Hour			PM Peak Hour		
	LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
1. Hagers Grove Road SE at Northern Site Access						
Year 2024 Buildout Conditions	A	9	0.01	A	9	0.01
2. Hagers Grove Road SE at Western Site Access						
Year 2022 Existing Conditions	B	11	0.24	B	13	0.25
Year 2024 Background Conditions	B	12	0.25	B	13	0.25
Year 2024 Buildout Conditions	B	12	0.33	B	15	0.37
3. Hagers Grove Road SE at Southern Site Access						
Year 2022 Existing Conditions	A	9	0.01	A	9	0.01
Year 2024 Background Conditions	A	9	0.01	A	9	0.01
Year 2024 Buildout Conditions	A	9	0.01	A	9	0.01
4. Hagers Grove Road SE at Lancaster Drive SE						
Year 2022 Existing Conditions	B	14	0.77	B	14	0.82
Year 2024 Background Conditions	B	15	0.79	B	14	0.85
Year 2024 Buildout Conditions	B	16	0.86	B	17	0.89

Based on the results of the operational analysis, all study intersections are currently operating acceptably per jurisdictional standards and are projected to continue operating acceptably through the 2024 site buildout year. No operational mitigation is necessary or recommended at these intersections.

Conclusions

Key findings include:

- No significant trends or crash patterns were identified at any of the study intersections that would be affected by the proposed development. Accordingly, no safety mitigation is recommended per the crash data analysis.
- Preliminary traffic signal warrants are not projected to be met any of the unsignalized study intersections upon full buildout of the proposed development. Accordingly, no related mitigation is necessary or recommended.
- Left-turn lanes are not projected to be met at the applicable intersections upon full buildout of the proposed development. Accordingly, no related mitigation is necessary or recommended.
- All study intersections are currently operating acceptably per jurisdictional standards and are projected to continue operating acceptably through the 2024 site buildout year.



Appendix A – Site Data

Site Plan

Trip Generation Calculations

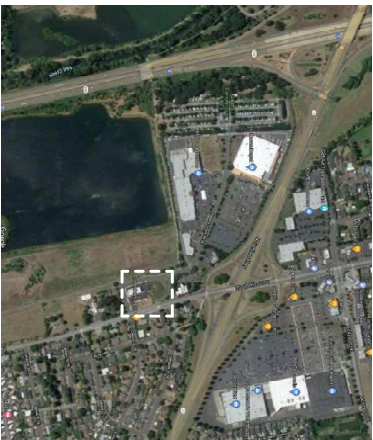


Stop-N-Save Gas

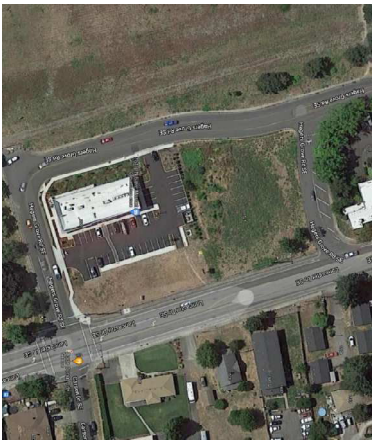
New Gas Station and C-Store

3997 Carson Dr SE Salem OR 97317

VICINITY IMAGE:



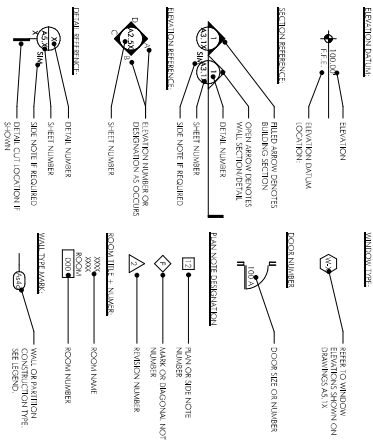
SITE IMAGE:



DRAWINGS LIST:

Sheet Number	Sheet Name	Sheet Number	Sheet Name	Sheet Number	Sheet Name
00.01	COVER SHEET	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES
00.02	PROPOSED WORK	01.09/2020	PROPOSED WORK	01.09/2020	PROPOSED WORK
00.03	PROPOSED WORK	01.09/2020	PROPOSED WORK	01.09/2020	PROPOSED WORK
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01.80	GENERAL NOTES	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES
01.81	GENERAL NOTES	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES
01.82	GENERAL NOTES	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES
01.83	GENERAL NOTES	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES
01.84	GENERAL NOTES	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES
01.85	GENERAL NOTES	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES
01.86	GENERAL NOTES	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES
01.87	GENERAL NOTES	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES
01.88	GENERAL NOTES	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES
01.89	GENERAL NOTES	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES
01.90	GENERAL NOTES	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES
01.91	GENERAL NOTES	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES
01.92	GENERAL NOTES	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES
01.93	GENERAL NOTES	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES
01.94	GENERAL NOTES	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES
01.95	GENERAL NOTES	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES
01.96	GENERAL NOTES	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES
01.97	GENERAL NOTES	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES
01.98	GENERAL NOTES	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES
01.99	GENERAL NOTES	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES
02.00	GENERAL NOTES	01.09/2020	GENERAL NOTES	01.09/2020	GENERAL NOTES

SYMBOL LEGEND:



PROJECT TEAM:

OWNER:
Indefinite Development
Stop N Save No. 12
2433 NW Broadway St., Albany, OR 97321
P: 503.999.6545 E: hbour@indefinite.com

ARCHITECT:
STUDIO 3 ARCHITECTURE, Inc.
275 Court Street SE, Salem, OR 97303-3442
P: 503.390.0500
Project Architect: D. 971.229.0207
E: hbour@studio3architecture.com
W: www.studio3architecture.com

CIVIL ENGINEERING:
WESTECH ENGINEERING, Inc.
3841 Fairview Industrial Dr., Suite 100 Salem, OR 97302
P: 503.585.2474 E: jwells@westech-eng.com

LANDSCAPE ARCHITECT:
LANDRUS DESIGNS, LLC
1012 Pine Street Silverton, OR 97381
Laura A. Anderson, L.A.
P: 503.784.6494 E: laura_a_anderson@hotmail.com

STRUCTURAL ENGINEERING:

Stop-N-Save Gas
New Gas Station

3997 Carson Dr SE Salem OR 97317

GO.01

SHEET:

STUDIO

3

ARCHITECTURE

IN CORPORATION

2433 NW Broadway St., Albany, OR 97321

P: 503.999.6545 E: hbour@indefinite.com

PROJECT # 2020-109

DATE 01/17/2022

REVISIONS

REFUELING CANOPY - DESIGN BUILD NOTES:

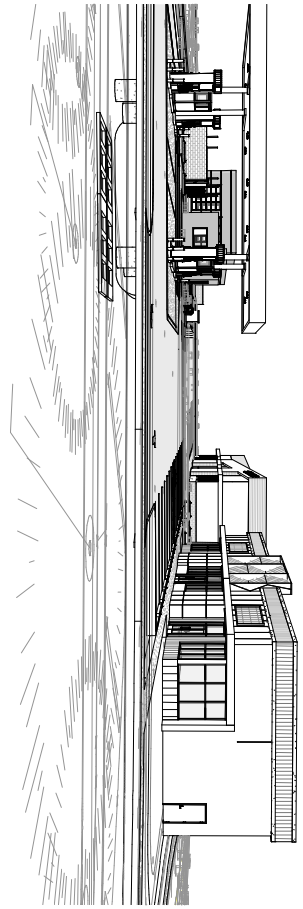
- PROJECT # 2020-109
DATE: 01/17/2022
REVISIONS

Stop-N-Save Gas New Gas Station

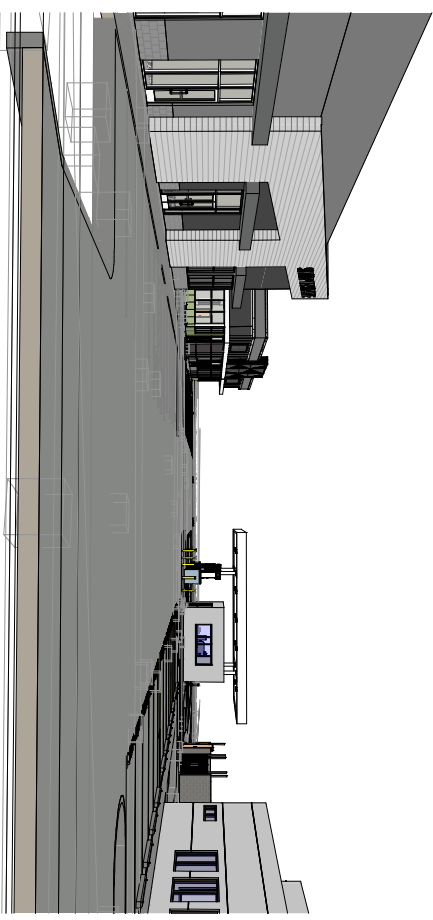
3997 Carson Dr SE Salem OR 97317

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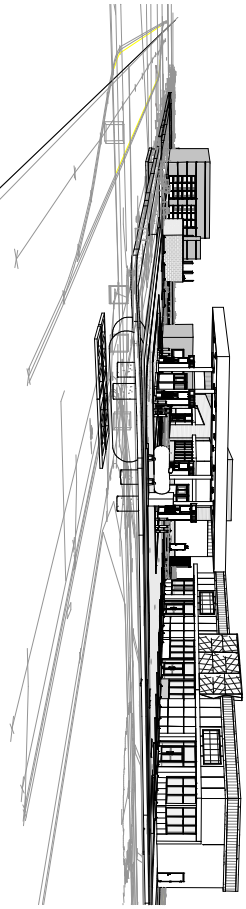
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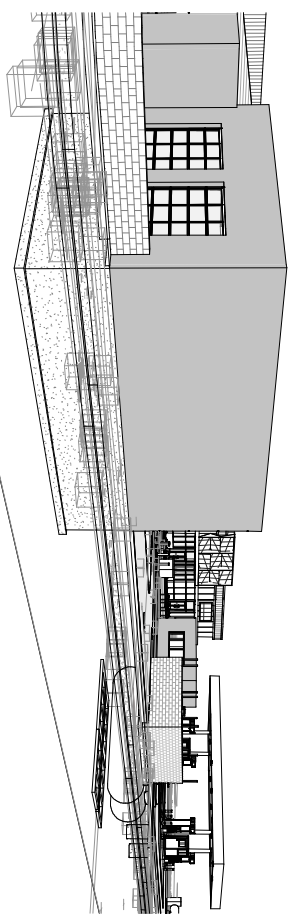
2 3D View 4



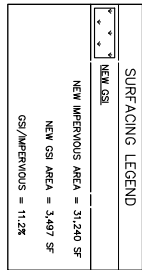
1 3D View 3

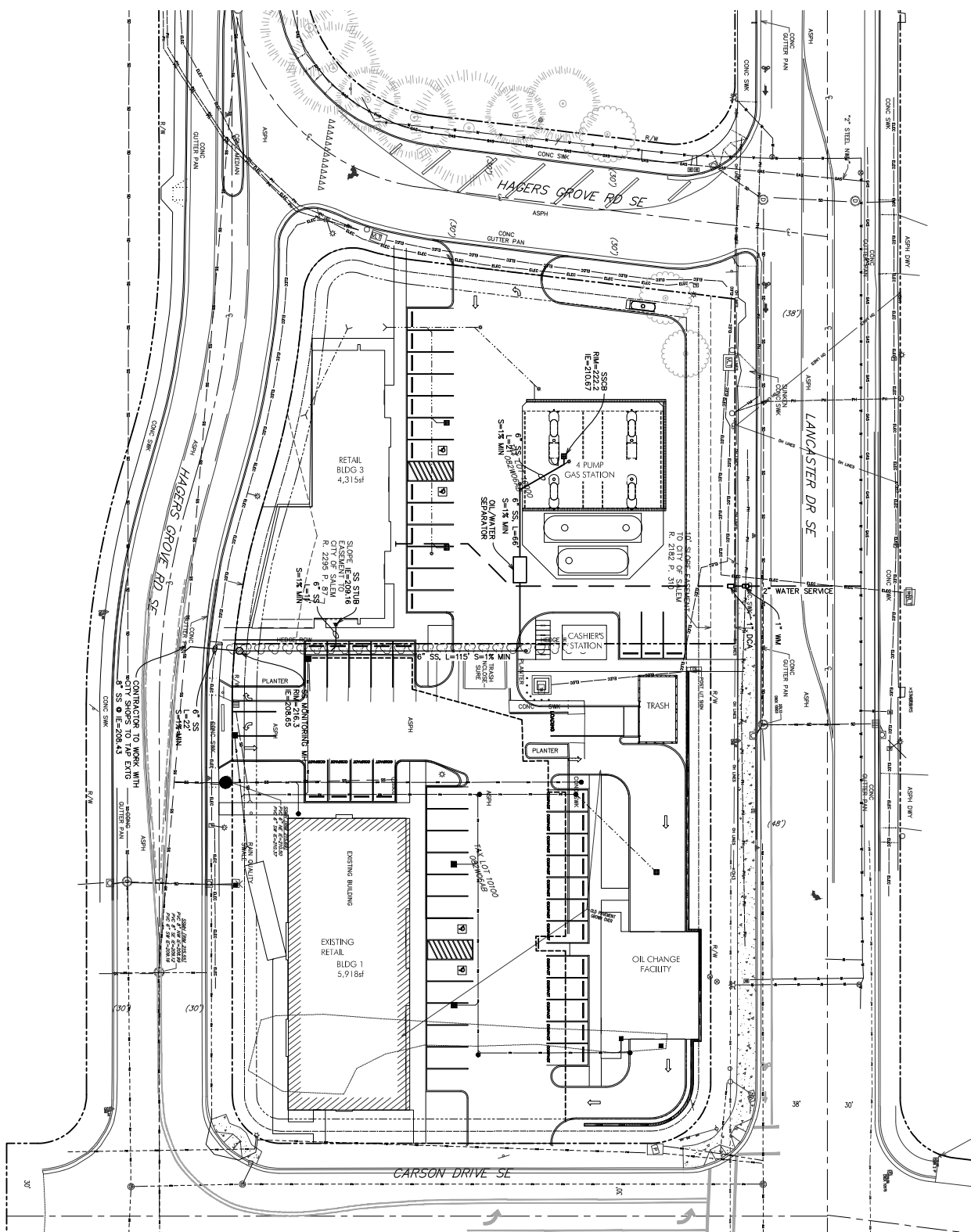


3 3D View 2



4 3D View 1





[illegible][illegible]

BUILDINGS	12,372.00	18.29%
UNUSING	13,681.45	20.47%
ACQUISITING	31,044.56	45.79%
ACCESSORY STRUCTURES	448.00	0.66%
CONCRETE STRUCTURES	5,281.94	7.79%
CONCRETE CURBS	745.16	1.10%
CONCRETE RE-FUELING PAD	4,024.80	5.94%
MISCELLANEOUS	0.00	0.00%
	67,798.91	100.00%

SITE PLAN NOTES:

- 1 PROPERTY LINE
- 2 RIGHT-OF-WAY DELINEATION
- 3 BUILDINGS SETBACK LINE
- 4 VEHICLE USE AREA SETBACK LINE
- 5 NEW DRIVEWAY PERMIT, LEFT OUT, LEFT IN, ONLY
- 6 DRIVEWAY PERMIT, WHEN DRIVEWAY TO 36-57' WIDE TO PROVIDE LEFT AND RIGHT OUT LANE.
- 7 FEDESTRIAN CONNECTION POINT TO NEW OR EXISTING CITY SIDEWALK.

- THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE OWNER OR ITS REPRESENTATIVE'S, THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES OCCURRING BY THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES.
- REFER TO CHD DRAWINGS FOR EXISTING. SITE IS BEING TO MEET THE LAWS OF THE STATE AND FEDERAL GOVERNMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE OWNER OR ITS REPRESENTATIVE'S, THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK.
- JOINTS IN CONCRETE SHALL BE NOTED AS ALL OTHER JOINTS SHALL BE SPANNED JOINTS. ALL OTHER JOINTS SHALL BE NOTED AS ALL OTHER JOINTS SHALL BE SPANNED JOINTS. ALL OTHER JOINTS SHALL BE NOTED AS ALL OTHER JOINTS SHALL BE SPANNED JOINTS.

SITE NO.	67-2981 #	15544c	BIR PARKING • 1 SPACES RFR 3.00 d / w/ additional 4 SPACES
ZONING:	CR	Commercial Retail	• THEREFORE PROVIDE 4 BIR PARKING SPACES.
COMPLETION PLAN:	COM		
BUILDING AREAS:			LOADING SPACES: • 12 SPACES BETWEEN 5.000 ft TO 0.60.00 d
• BUCI RETAIL	5.976 d		ROVER SPACE
• BUSZ RETAIL	4.315 d		• RETAIL SPACE SIZE: 12'x21' / 12'x21' WITH ACCESS TO STREET ONLY

[illegible]

- 1 PROPERTY LINE
- 2 HO-IT OR WAIN DEDICATION
- 3 BUILDINGS SETBACK LINE
- 4 VEHICLE USE AREA SETBACK LINE
- 5 NEW DRIVEWAY PAVT. LEFT OUT, LEFT IN, ONLY
- 6 DRIVEWAY PAVT. W/DRN DRIVEWAY TO 36-47' WIDTH TO PROVIDE LEFT AND RIGHT OUT LANES.
- 7 PEDESTRIAN CONNECTION POINT TO NEW OR EXISTING CITY SIDEWALK



1 SITE PLAN - EXISTING CONDITIONS

High-Turnover (Sit-Down) Restaurant (932)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 37

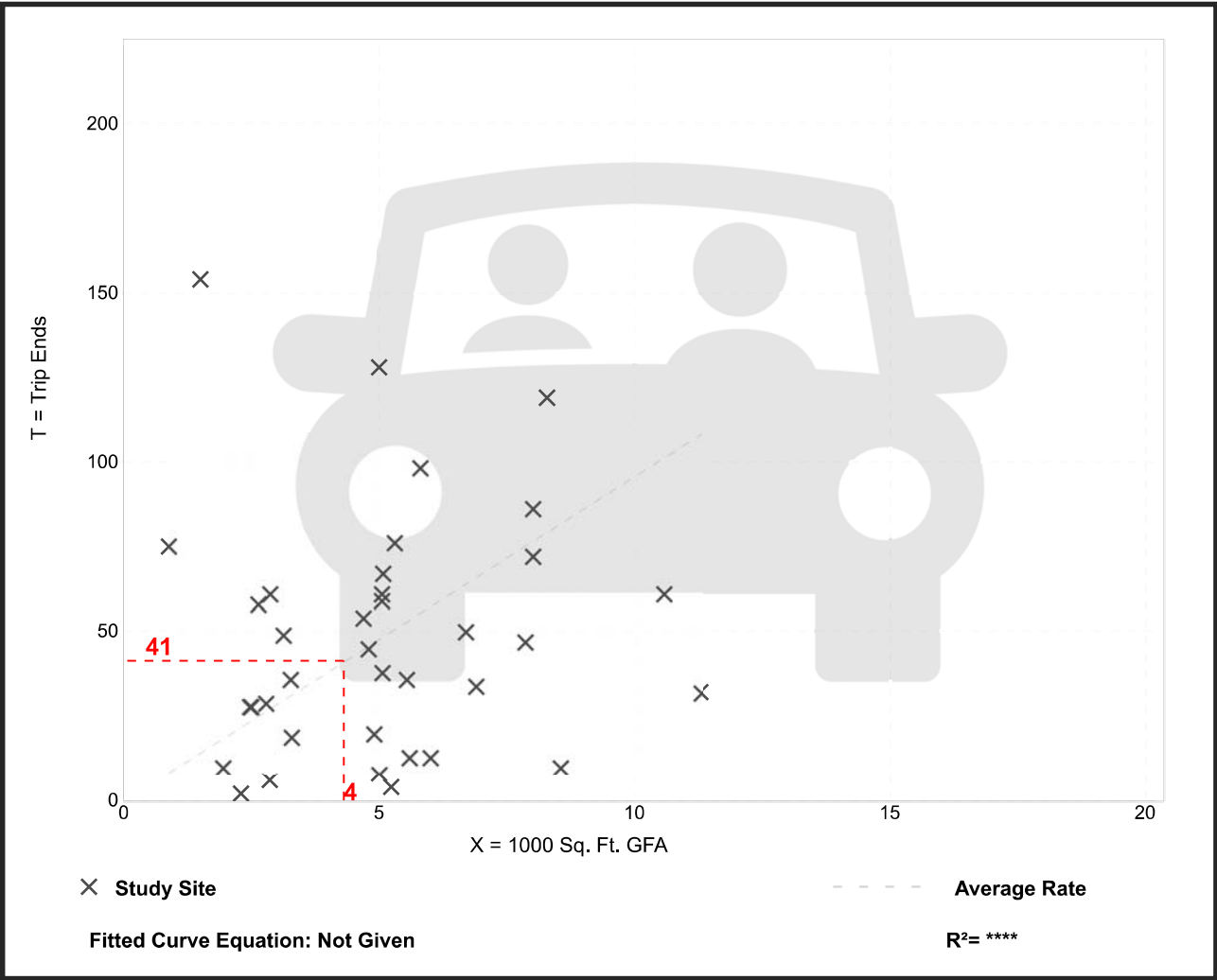
Avg. 1000 Sq. Ft. GFA: 5

Directional Distribution: 55% entering, 45% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
9.57	0.76 - 102.39	11.61

Data Plot and Equation



High-Turnover (Sit-Down) Restaurant (932)

Vehicle Trip Ends vs:

1000 Sq. Ft. GFA

On a:

Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location:

General Urban/Suburban

Number of Studies:

104

Avg. 1000 Sq. Ft. GFA:

6

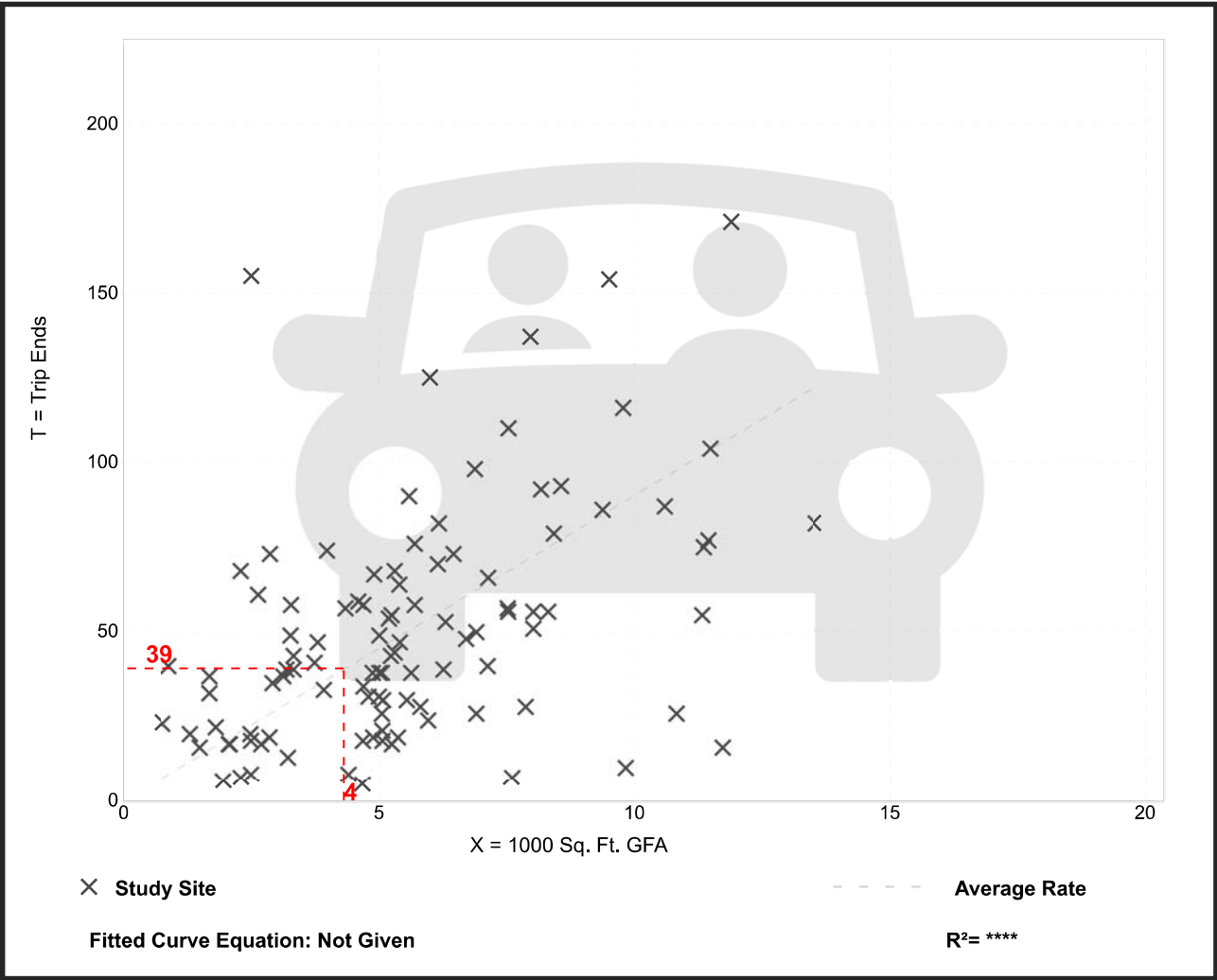
Directional Distribution:

61% entering, 39% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
9.05	0.92 - 62.00	6.18

Data Plot and Equation



Gasoline/Service Station (944)

Vehicle Trip Ends vs:

Vehicle Fueling Positions

On a:

Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location:

General Urban/Suburban

Number of Studies:

53

Avg. Num. of Vehicle Fueling Positions:

9

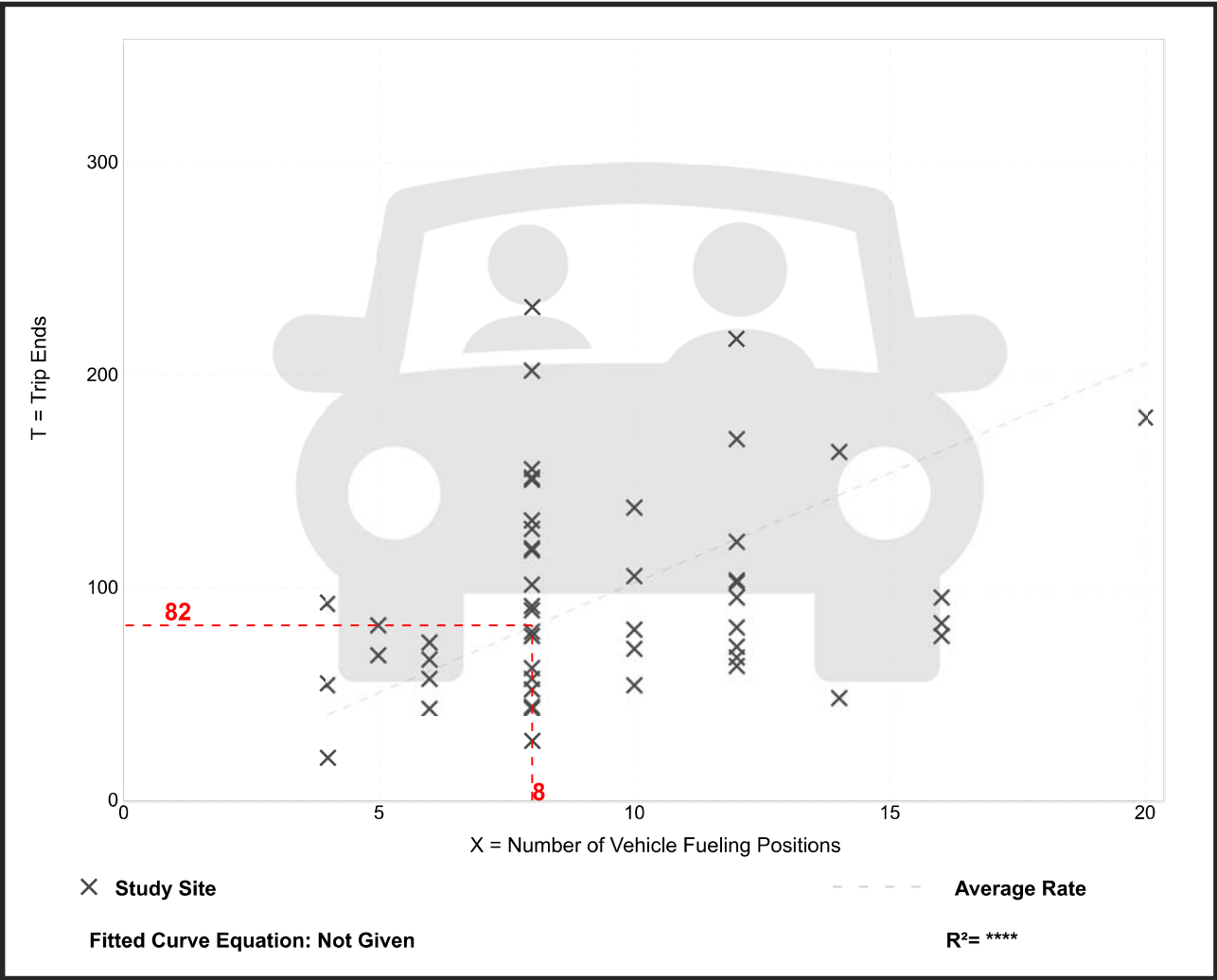
Directional Distribution:

50% entering, 50% exiting

Vehicle Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
10.28	3.50 - 29.00	5.36

Data Plot and Equation



Vehicle Trip Ends vs: Vehicle Fueling Positions
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Directional Distribution: 50% entering, 50% exiting

Average Rate	Range of Rates	Standard Deviation
13.91	4.25 - 75.50	6.93

A scatter plot showing the relationship between the number of vehicle fueling positions (X-axis) and the number of trip ends (Y-axis). The X-axis ranges from 0 to 20, and the Y-axis ranges from 0 to 300. A dashed line represents the average rate. A large, light gray silhouette of a car is overlaid on the plot, with two circular areas representing the front and rear seats. The front seat area is centered around X=8 and Y=100, and the rear seat area is centered around X=12 and Y=150. The text '111' is written in red near the Y-axis, and '8' is written in red near the X-axis. The legend indicates that 'X' represents a Study Site and the dashed line represents the Average Rate. The fitted curve equation is not given, and the R-squared value is ****.

Vehicle Pass-By Rates by Land Use

Source: ITE *Trip Generation Manual*, 11th Edition

Land Use Code		944									
Land Use		Gasoline/Service Station									
Setting		General Urban/Suburban									
Time Period		Weekday AM Peak Period									
# Data Sites		12									
Average Pass-By Rate		63%									
Pass-By Characteristics for Individual Sites											
					Non-Pass-By Trips			Adj Street Peak			
Vehicle Fueling Positions		State or Province	Survey Year	# Interviews	Pass-By Trip (%)	Primary (%)	Diverted (%)	Total (%)	Hour Volume	Source	
6		Maryland	1992	21	67	14	19	33	900	25	
6		Maryland	1992	21	43	28	29	57	870	25	
8		Maryland	1992	46	87	13	0	13	2235	25	
8		Maryland	1992	35	78	9	13	22	7080	25	
8		Kentucky	1993	61	60	15	25	40	4000	2	
8		Kentucky	1993	48	68	13	19	32	1307	2	
8		Kentucky	1993	—	56	22	22	44	1211	2	
8		Maryland	1992	36	47	14	39	53	3095	25	
8		Maryland	1992	46	75	0	25	25	3770	25	
10		Kentucky	1993	47	67	11	22	33	1105	2	
10		Kentucky	1993	—	46	42	12	54	1211	2	
12		Maryland	1992	36	61	8	31	39	3480	25	

Vehicle Pass-By Rates by Land Use

Source: ITE *Trip Generation Manual*, 11th Edition

Land Use Code		944								
Land Use		Gasoline/Service Station								
Setting		General Urban/Suburban								
Time Period		Weekday PM Peak Period								
# Data Sites		17								
Average Pass-By Rate		57%								
		Pass-By Characteristics for Individual Sites								
Vehicle Fueling Positions	State or Province	Survey Year	# Interviews	Pass-By Trip (%)	Non-Pass-By Trips			Adj Street Peak Hour Volume	Source	
6	Maryland	1992	18	61	6	33	39	2510	25	
6	Maryland	1992	26	58	11	31	42	1020	25	
8	Maryland	1992	47	62	23	15	38	2635	25	
8	Kentucky	1993	83	52	8	40	48	4965	2	
8	Kentucky	1993	60	53	20	27	47	1491	2	
8	Kentucky	1993	—	72	7	21	28	2657	2	
8	Maryland	1992	36	67	14	19	33	3095	25	
8	Maryland	1992	46	46	11	43	54	3770	25	
8	Maryland	1992	35	54	3	43	46	7080	25	
10	Kentucky	1993	—	57	19	24	43	1812	2	
10	Kentucky	1993	—	55	16	29	45	2657	2	
12	Maryland	1992	52	38	10	52	62	3835	25	
12	Pennsylvania	2009	—	66	—	—	34	—	19	
12	Pennsylvania	2009	—	51	—	—	49	—	19	
12	Pennsylvania	2009	—	40	—	—	60	—	19	
12	Pennsylvania	2009	—	61	—	—	39	—	19	
12	New Jersey	2009	—	73	—	—	27	—	19	

Appendix B – Traffic Data

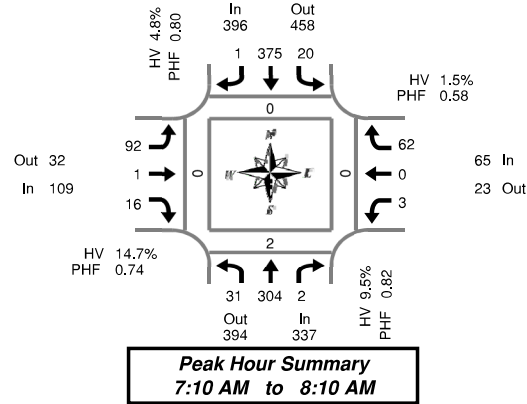
Traffic Counts



Total Vehicle Summary



Clay Carney
(503) 833-2740



Lancaster Dr SE & Hagers Grove Rd SE

Wednesday, November 09, 2016

7:00 AM to 9:00 AM

5-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Lancaster Dr SE				Southbound Lancaster Dr SE				Eastbound Hagers Grove Rd SE				Westbound Hagers Grove Rd SE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	21	0	0	1	20	1	0	6	0	1	0	0	0	7	0	57	0	0	0	0
7:05 AM	2	19	0	0	3	20	0	0	5	0	2	0	0	0	7	0	58	0	0	0	0
7:10 AM	4	26	0	0	1	29	0	0	4	0	1	0	0	0	7	0	72	0	0	0	0
7:15 AM	2	18	1	0	2	25	0	0	10	0	0	0	0	0	5	0	63	0	1	0	0
7:20 AM	1	26	0	0	2	30	0	0	4	0	1	0	0	0	2	0	66	0	0	0	0
7:25 AM	4	25	0	0	2	23	0	0	7	0	2	0	0	0	7	0	70	0	0	0	0
7:30 AM	2	27	1	0	0	30	0	0	5	0	3	0	0	0	3	0	71	0	0	0	0
7:35 AM	2	38	0	0	1	37	0	0	5	1	2	0	1	0	8	0	95	0	0	0	0
7:40 AM	4	24	0	0	0	32	0	0	14	0	0	0	0	0	14	0	88	0	0	0	0
7:45 AM	2	33	0	0	3	42	0	0	11	0	2	0	0	0	5	0	98	0	1	0	0
7:50 AM	1	26	0	0	1	36	0	0	8	0	2	0	0	0	1	0	75	0	0	0	0
7:55 AM	4	18	0	0	1	40	1	0	8	0	0	0	0	0	5	0	77	0	0	0	0
8:00 AM	2	18	0	0	4	28	0	0	9	0	2	0	1	0	1	0	65	0	0	0	0
8:05 AM	3	25	0	0	3	23	0	0	7	0	1	0	1	0	4	0	67	0	0	0	0
8:10 AM	3	15	1	0	1	22	0	0	6	0	2	0	0	0	3	0	53	0	0	0	0
8:15 AM	2	20	0	0	1	18	0	0	11	0	2	0	0	0	5	0	59	0	0	0	1
8:20 AM	2	21	1	0	0	21	0	0	11	0	2	0	0	0	4	0	62	0	0	0	0
8:25 AM	5	21	0	1	1	28	0	0	11	0	5	0	0	0	6	0	77	0	0	0	0
8:30 AM	2	17	0	0	1	28	1	0	8	1	1	0	0	0	3	0	62	0	0	0	0
8:35 AM	5	24	1	0	1	19	0	0	9	1	2	0	1	0	4	0	67	0	0	0	0
8:40 AM	0	29	1	0	4	24	1	0	11	0	2	0	0	0	1	0	73	0	0	1	0
8:45 AM	3	29	0	0	2	17	1	0	14	0	3	0	0	1	5	0	75	0	0	0	0
8:50 AM	5	28	0	0	2	29	0	0	10	0	0	0	0	0	3	0	77	0	0	0	0
8:55 AM	3	27	0	0	3	17	0	0	9	0	4	0	0	0	2	0	65	0	0	0	0
Total Survey	63	575	6	1	40	638	5	0	203	3	42	0	4	1	112	0	1,692	0	2	1	1

15-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Lancaster Dr SE				Southbound Lancaster Dr SE				Eastbound Hagers Grove Rd SE				Westbound Hagers Grove Rd SE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	6	66	0	0	5	69	1	0	15	0	4	0	0	0	21	0	187	0	0	0	0
7:15 AM	7	69	1	0	6	78	0	0	21	0	3	0	0	0	14	0	199	0	1	0	0
7:30 AM	8	89	1	0	1	99	0	0	24	1	5	0	1	0	25	0	254	0	0	0	0
7:45 AM	7	77	0	0	5	118	1	0	27	0	4	0	0	0	11	0	250	0	1	0	0
8:00 AM	8	58	1	0	8	73	0	0	22	0	5	0	2	0	8	0	185	0	0	0	0
8:15 AM	9	62	1	1	2	67	0	0	33	0	9	0	0	0	15	0	198	0	0	0	1
8:30 AM	7	70	2	0	6	71	2	0	28	2	5	0	1	0	8	0	202	0	0	1	0
8:45 AM	11	84	0	0	7	63	1	0	33	0	7	0	0	1	10	0	217	0	0	0	0
Total Survey	63	575	6	1	40	638	5	0	203	3	42	0	4	1	112	0	1,692	0	2	1	1

Peak Hour Summary

7:10 AM to 8:10 AM

By Approach	Northbound Lancaster Dr SE				Southbound Lancaster Dr SE				Eastbound Hagers Grove Rd SE				Westbound Hagers Grove Rd SE				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	337	394	731	0	396	458	854	0	109	32	141	0	65	23	88	0	907	0	2	0	0
%HV	9.5%				4.8%				14.7%				1.5%				7.5%				
PHF	0.82				0.80				0.74				0.58				0.81				

By Movement	Northbound Lancaster Dr SE				Southbound Lancaster Dr SE				Eastbound Hagers Grove Rd SE				Westbound Hagers Grove Rd SE				Total				
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total					
Volume	31	304	2	337	20	375	1	396	92	1	16	109	3	0	62	65	907				
%HV	9.7%	9.5%	0.0%	9.5%	10.0%	4.5%	0.0%	4.8%	14.1%	0.0%	18.8%	14.7%	0.0%	0.0%	1.6%	1.5%	7.5%				
PHF	0.86	0.80	0.50	0.82	0.63	0.79	0.25	0.80	0.70	0.25	0.57	0.74	0.38	0.00	0.57	0.58	0.81				

Rolling Hour Summary

7:00 AM to 9:00 AM

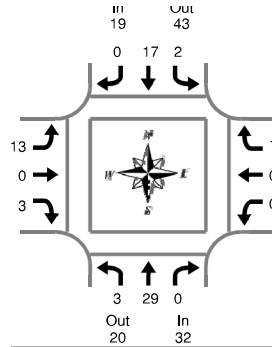
Interval Start Time	Northbound Lancaster Dr SE				Southbound Lancaster Dr SE				Eastbound Hagers Grove Rd SE				Westbound Hagers Grove Rd SE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	28	301	2	0	17	364	2	0	87	1	16	0	1	0	71	0	890	0	2	0	0
7:15 AM	30	293	3	0	20	368	1	0	94	1	17	0	3	0	58	0	888	0	2	0	0
7:30 AM	32	286	3	1	16	357	1	0	106	1	23	0	3	0	59	0	887	0	1	0	1
7:45 AM	31	267	4	1	21	329	3	0	110	2	23	0	3	0	42	0	835	0	1	1	1
8:00 AM	35	274	4	1	23	274	3	0	116	2	26	0	3	1	41	0	802	0	0	1	1

Heavy Vehicle Summary



Clay Carney
(503) 833-2740

Out 3
In 16



Lancaster Dr SE & Hagers Grove Rd SE

Wednesday, November 09, 2016

7:00 AM to 9:00 AM

Peak Hour Summary
7:10 AM to 8:10 AM

Heavy Vehicle 5-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Lancaster Dr SE				Southbound Lancaster Dr SE				Eastbound Hagers Grove Rd SE				Westbound Hagers Grove Rd SE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
7:05 AM	1	1	0	2	0	2	0	2	0	0	0	0	0	0	0	0	4
7:10 AM	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	3
7:15 AM	0	1	0	1	0	1	0	1	1	0	0	1	0	0	0	0	3
7:20 AM	1	1	0	2	0	2	0	2	0	0	0	0	0	0	0	0	4
7:25 AM	0	3	0	3	0	0	0	0	1	0	0	1	0	0	0	0	4
7:30 AM	0	1	0	1	0	1	0	1	0	0	1	1	0	0	0	0	3
7:35 AM	1	4	0	5	1	1	0	2	1	0	0	1	0	0	0	0	8
7:40 AM	0	1	0	1	0	0	0	0	2	0	0	2	0	0	0	0	3
7:45 AM	1	5	0	6	1	2	0	3	2	0	1	3	0	0	0	0	12
7:50 AM	0	3	0	3	0	2	0	2	2	0	0	2	0	0	0	0	7
7:55 AM	0	3	0	3	0	3	0	3	1	0	0	1	0	0	0	0	7
8:00 AM	0	2	0	2	0	1	0	1	1	0	1	2	0	0	0	0	5
8:05 AM	0	4	0	4	0	2	0	2	2	0	0	2	0	0	1	1	9
8:10 AM	0	3	0	3	0	1	0	1	2	0	0	2	0	0	0	0	6
8:15 AM	0	2	0	2	0	1	0	1	1	0	0	1	0	0	0	0	4
8:20 AM	1	4	0	5	0	3	0	3	1	0	0	1	0	0	0	0	9
8:25 AM	0	3	0	3	0	3	0	3	2	0	0	2	0	0	0	0	8
8:30 AM	0	5	0	5	0	3	0	3	1	1	0	2	0	0	0	0	10
8:35 AM	1	1	0	2	0	3	0	3	0	0	0	0	0	0	0	0	5
8:40 AM	0	5	1	6	1	2	0	3	2	0	0	2	0	0	0	0	11
8:45 AM	0	4	0	4	1	1	0	2	2	0	1	3	0	0	0	0	9
8:50 AM	2	10	0	12	0	3	0	3	1	0	0	1	0	0	0	0	16
8:55 AM	0	3	0	3	1	4	0	5	3	0	1	4	0	0	0	0	12
Total Survey	8	72	1	81	5	43	0	48	28	1	5	34	0	0	1	1	164

Heavy Vehicle 15-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Lancaster Dr SE				Southbound Lancaster Dr SE				Eastbound Hagers Grove Rd SE				Westbound Hagers Grove Rd SE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	1	4	0	5	0	4	0	4	0	0	0	0	0	0	0	0	9
7:15 AM	1	5	0	6	0	3	0	3	2	0	0	2	0	0	0	0	11
7:30 AM	1	6	0	7	1	2	0	3	3	0	1	4	0	0	0	0	14
7:45 AM	1	11	0	12	1	7	0	8	5	0	1	6	0	0	0	0	26
8:00 AM	0	9	0	9	0	4	0	4	5	0	1	6	0	0	1	1	20
8:15 AM	1	9	0	10	0	7	0	7	4	0	0	4	0	0	0	0	21
8:30 AM	1	11	1	13	1	8	0	9	3	1	0	4	0	0	0	0	26
8:45 AM	2	17	0	19	2	8	0	10	6	0	2	8	0	0	0	0	37
Total Survey	8	72	1	81	5	43	0	48	28	1	5	34	0	0	1	1	164

Heavy Vehicle Peak Hour Summary

7:10 AM to 8:10 AM

By Approach	Northbound Lancaster Dr SE			Southbound Lancaster Dr SE			Eastbound Hagers Grove Rd SE			Westbound Hagers Grove Rd SE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	32	20	52	19	43	62	16	3	19	1	2	3	68
PHF	0.67			0.59			0.57			0.25			0.65

By Movement	Northbound Lancaster Dr SE				Southbound Lancaster Dr SE				Eastbound Hagers Grove Rd SE				Westbound Hagers Grove Rd SE				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	3	29	0	32	2	17	0	19	13	0	3	16	0	0	1	1	68
PHF	0.38	0.66	0.00	0.67	0.25	0.61	0.00	0.59	0.54	0.00	0.75	0.57	0.00	0.00	0.25	0.25	0.65

Heavy Vehicle Rolling Hour Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Lancaster Dr SE				Southbound Lancaster Dr SE				Eastbound Hagers Grove Rd SE				Westbound Hagers Grove Rd SE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	4	26	0	30	2	16	0	18	10	0	2	12	0	0	0	0	60
7:15 AM	3	31	0	34	2	16	0	18	15	0	3	18	0	0	1	1	71
7:30 AM	3	35	0	38	2	20	0	22	17	0	3	20	0	0	1	1	81
7:45 AM	3	40	1	44	2	26	0	28	17	1	2	20	0	0	1	1	93
8:00 AM	4	46	1	51	3	27	0	30	18	1	3	22	0	0	1	1	104

Peak Hour Summary

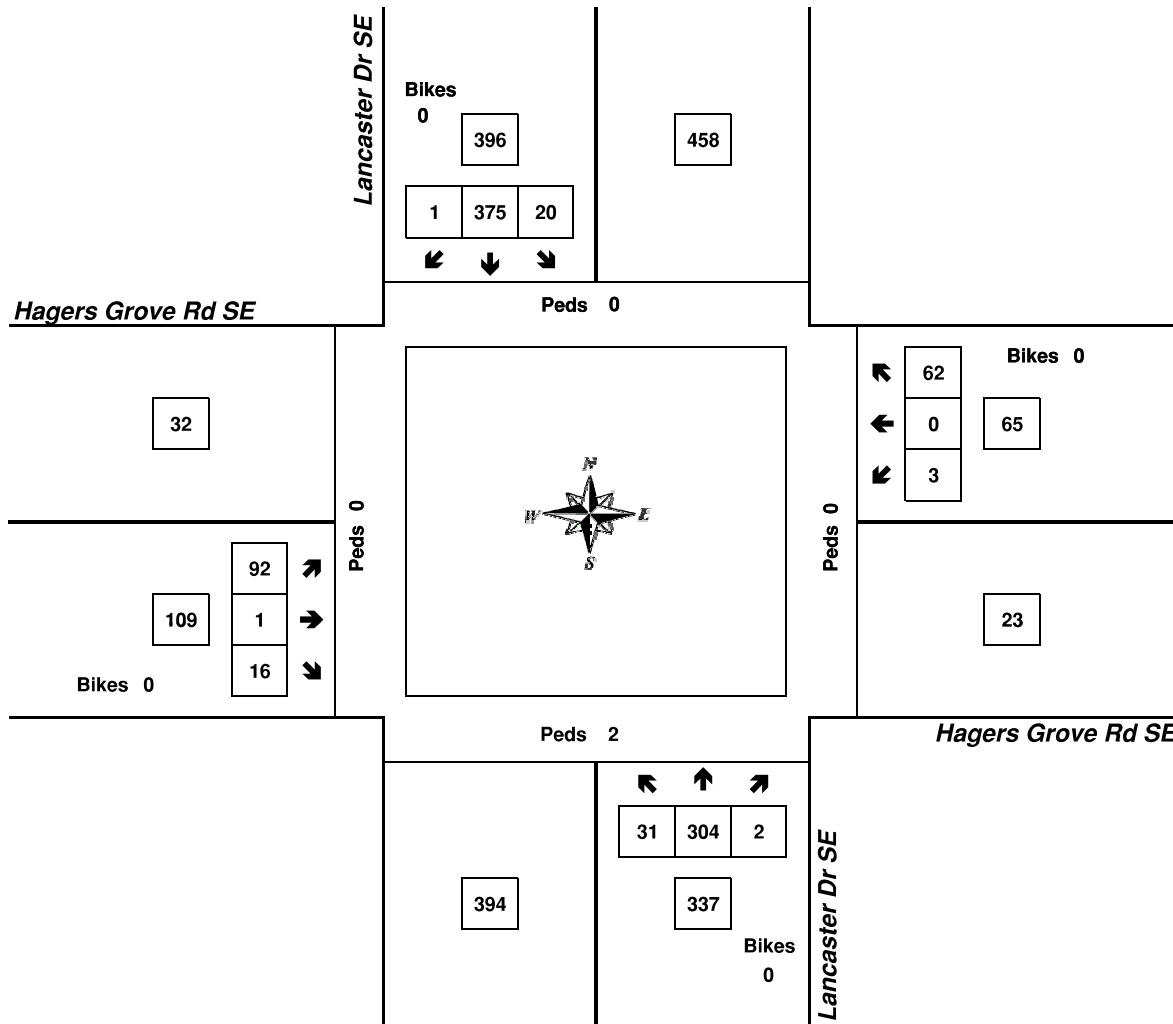


Clay Carney
(503) 833-2740

Lancaster Dr SE & Hagers Grove Rd SE

7:10 AM to 8:10 AM

Wednesday, November 09, 2016



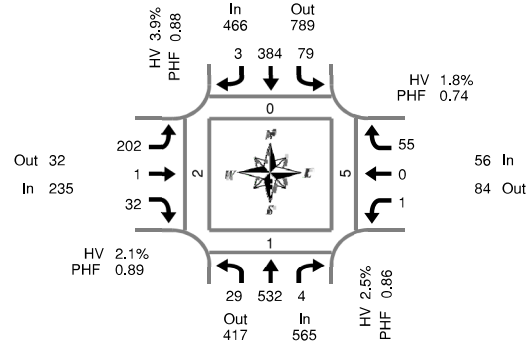
Approach	PHF	HV%	Volume
EB	0.74	14.7%	109
WB	0.58	1.5%	65
NB	0.82	9.5%	337
SB	0.80	4.8%	396
Intersection	0.81	7.5%	907

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary



Clay Carney
(503) 833-2740



Lancaster Dr SE & Hagers Grove Rd SE

Wednesday, November 09, 2016

4:00 PM to 6:00 PM

Peak Hour Summary
4:15 PM to 5:15 PM

5-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Lancaster Dr SE				Southbound Lancaster Dr SE				Eastbound Hagers Grove Rd SE				Westbound Hagers Grove Rd SE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	4	16	0	0	8	32	0	0	14	0	7	0	0	0	1	3	0	1	0	0	0
4:05 PM	3	27	0	0	4	43	0	0	15	0	2	0	0	0	6	0	100	0	0	0	0
4:10 PM	2	39	0	0	6	34	1	0	17	0	5	0	1	0	2	0	107	0	0	0	0
4:15 PM	4	39	1	0	8	23	0	0	20	1	4	0	0	0	3	0	103	0	0	0	0
4:20 PM	4	35	0	0	5	31	0	0	16	0	2	0	0	0	7	0	100	0	0	0	0
4:25 PM	2	51	1	0	7	40	1	0	19	0	4	0	0	0	9	0	134	0	0	0	0
4:30 PM	2	49	0	0	9	39	0	0	14	0	2	0	0	0	2	0	117	0	0	4	0
4:35 PM	1	26	0	0	6	27	0	0	24	0	3	1	1	0	7	0	95	0	0	0	0
4:40 PM	2	53	2	0	6	28	0	0	16	0	5	0	0	0	3	0	115	0	0	1	0
4:45 PM	2	63	0	0	5	26	1	0	12	0	3	0	0	0	5	0	117	0	0	0	0
4:50 PM	3	39	0	0	4	26	0	0	18	0	2	0	0	0	5	0	97	0	1	0	2
4:55 PM	3	47	0	0	11	31	0	0	13	0	4	0	0	0	2	0	111	0	0	0	0
5:00 PM	1	44	0	0	9	39	1	0	25	0	1	0	0	0	5	0	125	0	0	0	0
5:05 PM	3	40	0	0	5	37	0	0	6	0	2	0	0	0	4	0	97	0	0	0	0
5:10 PM	2	46	0	0	4	37	0	0	19	0	0	0	0	0	3	0	111	0	0	0	0
5:15 PM	4	30	1	0	3	27	0	0	5	0	5	0	2	0	7	0	84	2	0	2	0
5:20 PM	1	30	2	0	13	47	0	0	12	0	3	0	0	0	3	0	111	0	0	0	0
5:25 PM	2	33	0	0	6	26	0	0	15	0	4	0	0	0	2	0	88	0	0	0	0
5:30 PM	1	38	0	0	8	21	0	0	14	0	3	0	0	0	3	0	88	0	0	0	0
5:35 PM	2	30	0	0	8	30	1	0	13	0	4	0	0	0	5	0	93	0	1	0	0
5:40 PM	4	30	1	0	2	24	1	0	13	0	3	0	0	1	3	0	82	0	0	0	0
5:45 PM	2	26	0	0	11	48	0	0	10	0	2	0	0	0	3	0	102	0	0	0	0
5:50 PM	0	14	0	0	4	26	0	0	15	0	2	0	0	0	2	0	63	0	0	1	0
5:55 PM	3	28	0	0	8	26	1	0	11	0	1	0	0	0	4	0	82	0	2	0	0
Total Survey	57	873	8	0	160	768	7	0	356	1	73	1	4	2	98	0	2,407	3	4	8	2

15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Lancaster Dr SE				Southbound Lancaster Dr SE				Eastbound Hagers Grove Rd SE				Westbound Hagers Grove Rd SE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	9	82	0	0	18	109	1	0	46	0	14	0	1	1	11	0	292	1	0	0	0
4:15 PM	10	125	2	0	20	94	1	0	55	1	10	0	0	0	19	0	337	0	0	0	0
4:30 PM	5	128	2	0	21	94	0	0	54	0	10	1	1	0	12	0	327	0	0	5	0
4:45 PM	8	149	0	0	20	83	1	0	43	0	9	0	0	0	12	0	325	0	1	0	2
5:00 PM	6	130	0	0	18	113	1	0	50	0	3	0	0	0	12	0	333	0	0	0	0
5:15 PM	7	93	3	0	22	100	0	0	32	0	12	0	2	0	12	0	283	2	0	2	0
5:30 PM	7	98	1	0	18	75	2	0	40	0	10	0	0	1	11	0	263	0	1	0	0
5:45 PM	5	68	0	0	23	100	1	0	36	0	5	0	0	0	9	0	247	0	2	1	0
Total Survey	57	873	8	0	160	768	7	0	356	1	73	1	4	2	98	0	2,407	3	4	8	2

Peak Hour Summary

4:15 PM to 5:15 PM

By Approach	Northbound Lancaster Dr SE				Southbound Lancaster Dr SE				Eastbound Hagers Grove Rd SE				Westbound Hagers Grove Rd SE				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	565	417	982	0	466	789	1,255	0	235	32	267	1	56	84	140	0	1,322	0	1	5	2
%HV	2.5%				3.9%				2.1%				1.8%				2.9%				
PHF	0.86				0.88				0.89				0.74				0.94				

By Movement	Northbound Lancaster Dr SE				Southbound Lancaster Dr SE				Eastbound Hagers Grove Rd SE				Westbound Hagers Grove Rd SE				Total				
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total					
Volume	29	532	4	565	79	384	3	466	202	1	32	235	1	0	55	56	1,322				
%HV	3.4%	2.4%	0.0%	2.5%	2.5%	4.2%	0.0%	3.9%	2.0%	0.0%	3.1%	2.1%	#####	0.0%	0.0%	1.8%	2.9%				
PHF	0.73	0.86	0.50	0.86	0.79	0.85	0.75	0.88	0.89	0.25	0.73	0.89	0.25	0.00	0.72	0.74	0.94				

Rolling Hour Summary

4:00 PM to 6:00 PM

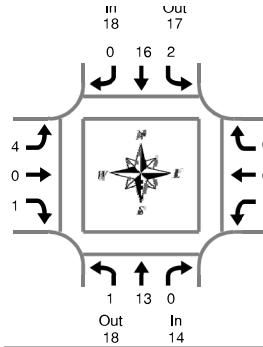
Interval Start Time	Northbound Lancaster Dr SE				Southbound Lancaster Dr SE				Eastbound Hagers Grove Rd SE				Westbound Hagers Grove Rd SE				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	32	484	4	0	79	380	3	0	198	1	43	1	2	1	54	0	1,281	1	1	5	2
4:15 PM	29	532	4	0	79	384	3	0	202	1	32	1	1	0	55	0	1,322	0	1	5	2
4:30 PM	26	500	5	0	81	390	2	0	179	0	34	1	3	0	48	0	1,268	2	1	7	2
4:45 PM	28	470	4	0	78	371	4	0	165	0	34	0	2	1	47	0	1,204	2	2	2	2
5:00 PM	25	389	4	0	81	388	4	0	158	0	30	0	2	1	44	0	1,126	2	3	3	0

Heavy Vehicle Summary



Clay Carney
(503) 833-2740

Out 1
In 5



Lancaster Dr SE & Hagers Grove Rd SE

Wednesday, November 09, 2016

4:00 PM to 6:00 PM

Peak Hour Summary
4:15 PM to 5:15 PM

Heavy Vehicle 5-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Lancaster Dr SE				Southbound Lancaster Dr SE				Eastbound Hagers Grove Rd SE				Westbound Hagers Grove Rd SE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	1	0	1	1	5	0	6	1	0	0	1	0	0	0	0	8
4:05 PM	0	2	0	2	0	3	0	3	2	0	0	2	0	0	0	0	7
4:10 PM	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	2
4:15 PM	0	0	0	0	0	0	0	0	1	0	1	2	0	0	0	0	2
4:20 PM	0	1	0	1	0	4	0	4	0	0	0	0	0	0	0	0	5
4:25 PM	1	1	0	2	0	2	0	2	1	0	0	1	0	0	0	0	5
4:30 PM	0	2	0	2	1	1	0	2	0	0	0	0	0	0	0	0	4
4:35 PM	0	1	0	1	0	1	0	1	0	0	0	0	1	0	0	1	3
4:40 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	1	1	0	2	1	0	0	1	0	0	0	0	3
4:50 PM	0	3	0	3	0	3	0	3	0	0	0	0	0	0	0	0	6
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	3	0	3	0	1	0	1	0	0	0	0	0	0	0	0	4
5:05 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
5:10 PM	0	1	0	1	0	3	0	3	0	0	0	0	0	0	0	0	4
5:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:20 PM	0	2	1	3	0	0	0	0	0	0	0	0	0	0	0	0	3
5:25 PM	0	0	0	0	0	1	0	1	2	0	0	2	0	0	1	1	4
5:30 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
5:50 PM	0	0	0	0	0	5	0	5	0	0	0	0	0	0	0	0	5
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	1	21	1	23	3	32	1	36	9	0	1	10	1	0	1	2	71

Heavy Vehicle 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Lancaster Dr SE				Southbound Lancaster Dr SE				Eastbound Hagers Grove Rd SE				Westbound Hagers Grove Rd SE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	4	0	4	1	8	1	10	3	0	0	3	0	0	0	0	17
4:15 PM	1	2	0	3	0	6	0	6	2	0	1	3	0	0	0	0	12
4:30 PM	0	4	0	4	1	2	0	3	0	0	0	0	1	0	0	1	8
4:45 PM	0	3	0	3	1	4	0	5	1	0	0	1	0	0	0	0	9
5:00 PM	0	4	0	4	0	4	0	4	1	0	0	1	0	0	0	0	9
5:15 PM	0	3	1	4	0	1	0	1	2	0	0	2	0	0	1	1	8
5:30 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
5:45 PM	0	0	0	0	0	6	0	6	0	0	0	0	0	0	0	0	6
Total Survey	1	21	1	23	3	32	1	36	9	0	1	10	1	0	1	2	71

Heavy Vehicle Peak Hour Summary

4:15 PM to 5:15 PM

By Approach	Northbound Lancaster Dr SE			Southbound Lancaster Dr SE			Eastbound Hagers Grove Rd SE			Westbound Hagers Grove Rd SE			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	14	18	32	18	17	35	5	1	6	1	2	3	38
PHF	0.58			0.56			0.42			0.25			0.68

By Movement	Northbound Lancaster Dr SE				Southbound Lancaster Dr SE				Eastbound Hagers Grove Rd SE				Westbound Hagers Grove Rd SE				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	13	0	14	2	16	0	18	4	0	1	5	1	0	0	1	38
PHF	0.25	0.54	0.00	0.58	0.50	0.57	0.00	0.56	0.50	0.00	0.25	0.42	0.25	0.00	0.00	0.25	0.68

Heavy Vehicle Rolling Hour Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Lancaster Dr SE				Southbound Lancaster Dr SE				Eastbound Hagers Grove Rd SE				Westbound Hagers Grove Rd SE				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	1	13	0	14	3	20	1	24	6	0	1	7	1	0	0	1	46
4:15 PM	1	13	0	14	2	16	0	18	4	0	1	5	1	0	0	1	38
4:30 PM	0	14	1	15	2	11	0	13	4	0	0	4	1	0	1	2	34
4:45 PM	0	11	1	12	1	10	0	11	4	0	0	4	0	0	1	1	28
5:00 PM	0	8	1	9	0	12	0	12	3	0	0	3	0	0	1	1	25

Peak Hour Summary

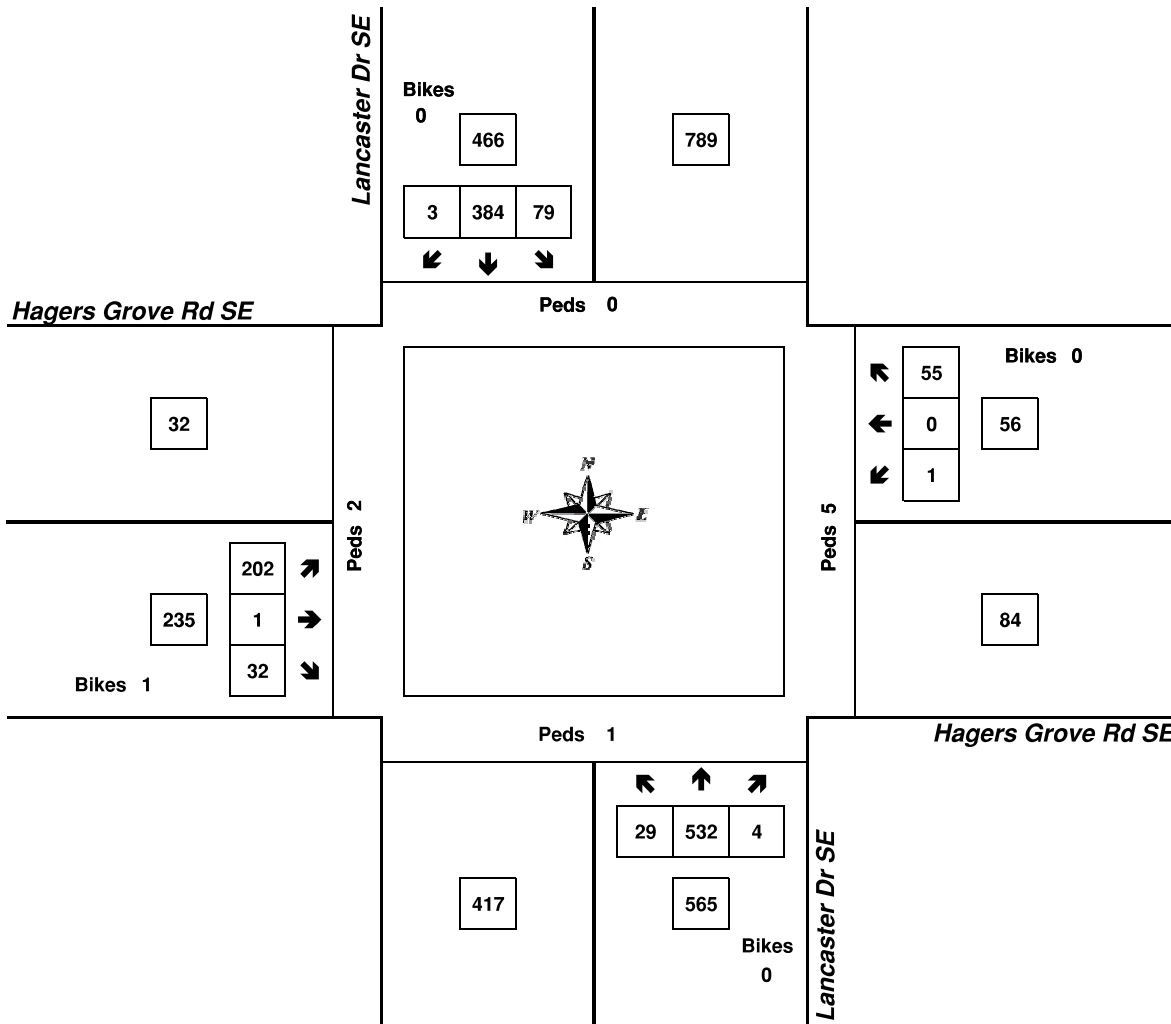


Clay Carney
(503) 833-2740

Lancaster Dr SE & Hagers Grove Rd SE

4:15 PM to 5:15 PM

Wednesday, November 09, 2016



Approach	PHF	HV%	Volume
EB	0.89	2.1%	235
WB	0.74	1.8%	56
NB	0.86	2.5%	565
SB	0.88	3.9%	466
Intersection	0.94	2.9%	1,322

Count Period: 4:00 PM to 6:00 PM

Appendix C - Safety

Crash History Data

Preliminary Signal Warrants

Left-turn Lane Warrants



OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING
HAGERS GROVE at CARSON DR, City of Salem, Marion County, 01/01/2016 to 12/31/2020
1 - 3 of 3 Crash records shown.

S	D	M	SER#	P	R	J	S	W	D	A	T	E	CLASS	CITY STREET	INT-TYPE	INT-REL	TRAF-	OFFRD	WTHR	CRASH	SECT	USE	MOVE	FROM	PRTC	INT	A	S	E	LICNS	PED	ERRR	ACT	EVENT	CAUSE
NO	DPT	E	L	G	N	H	R	T	IME	FROM	SECOND STREET	DIRECT	LOCEN	(#LANES)	CONTL	DRWAY	LIGHT	SVRTY	VA TYPE	OWNER	TO	P# TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE				
05242	N	N	N						11/26/2016	19	CARSON DR	INTER	3-LEG	N		N	CLR	ANGI-OTH	01 NONE	9	TURN-R													02	
NONE									SA	0	HAGERS GROVE	CN			YIELD	N	DRY	TURN	N/A		SE-N				01	DRVR	NONE	00	Unk	UNK	000	000	00		
N									1P	44 54 40.65 -122 58		02		0		N	DAY	PDO		FSNGR CAR													000	000	00
N									44 54 40.65 -122 58	48.24										02 NONE	9	STRGHT	S -N		01	DRVR	NONE	00	Unk	UNK	000	000	00		
																				N/A													000	000	00
																				FSNGR CAR													000	000	00
01825	N	N	N						06/21/2020	19	CARSON DR	INTER	3-LEG	N		N	CLR	ANGI-OTH	01 NONE	9	TURN-R													02	
NONE									SU	0	HAGERS GROVE	CN			YIELD	N	DRY	TURN	N/A		SE-N				01	DRVR	NONE	00	Unk	UNK	000	000	00		
N									10A	44 54 40.62 -122 58		02		0		N	DAY	PDO		FSNGR CAR													000	000	00
N									44 54 40.62 -122 58	48.22										02 NONE	9	STRGHT	S -N										000	000	00
																				N/A					01	DRVR	NONE	00	Unk	UNK	000	000	00		
																				FSNGR CAR													000	000	00
01286	N	N	N						06/19/2020	19	CARSON DR	INTER	3-LEG	N		N	UNK	ANGI-OTH	01 NONE	9	TURN-R													02	
NONE									SU	0	HAGERS GROVE	CN			YIELD	N	UNK	TURN	N/A		SE-N				01	DRVR	NONE	00	Unk	UNK	000	000	00		
N									5P	44 54 40.63 -122 58		02		0		N	DAY	PDO		FSNGR CAR													000	000	00
N									44 54 40.63 -122 58	48.24										02 NONE	9	STRGHT	S -N										000	000	00
																				N/A													000	000	00
																				FSNGR CAR													000	000	00

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because substantial of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

OREGON...DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

S	D	M
P	R	J S W DATE
CLASS	CITY STREET	INT-TYPE
INVEST E A U I C O DAY	FIRST STREET	(MEDIAN)
RD DET E L G N H R TIME	SECOND STREET	INT-BEL
LOC7C? D C S V L K LAT	DIRECT FROM	TRAF-
LBS	LOC7N (#LANES) CONTL	OFRD WITHR CRASH
	DRAWY LIGHT SVCTV	TBLR QTY MOVE
V# TYPE TO P# TYPE SVCTV E X RES LOC ERROR ACT EVENT CAUSE		

[illegible]

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 81.120. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because substantial crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

Traffic Signal Warrant Analysis



Project: Stop N Save Development
Date: 7/6/2022
Scenario: Year 2024 Buildout

Major Street:	Hagers Grove Road SE	Minor Street:	Northern Site Access
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	44	PM Peak Hour Volumes:	10

Warrant Used:

 X 100 percent of standard warrants used
 70 percent of standard warrants used due to 85th percentile speed in excess
of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
		100%	70%	100%	70%
<u>Major St.</u>	<u>Minor St.</u>	<u>Warrants</u>	<u>Warrants</u>	<u>Warrants</u>	<u>Warrants</u>
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	440	8,850	
Minor Street*	100	2,650	No
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	440	13,300	
Minor Street*	100	1,350	No
<i>Combination Warrant</i>			
Major Street	440	10,640	
Minor Street*	100	2,120	No

* Minor street right-turning traffic volumes reduced by 25%

Traffic Signal Warrant Analysis



Project: Stop N Save Development
 Date: 7/6/2022
 Scenario: Year 2024 Buildout

Major Street:	Hagers Grove Road SE	Minor Street:	Western Site Access
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	337	PM Peak Hour Volumes:	198

Warrant Used:

 X 100 percent of standard warrants used
 70 percent of standard warrants used due to 85th percentile speed in excess
 of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
		100%	70%	100%	70%
<u>Major St.</u>	<u>Minor St.</u>	<u>Warrants</u>	<u>Warrants</u>	<u>Warrants</u>	<u>Warrants</u>
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500

<u>WARRANT 1, CONDITION B</u>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	3,370	8,850	
Minor Street*	1,980	2,650	No
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	3,370	13,300	
Minor Street*	1,980	1,350	No
<i>Combination Warrant</i>			
Major Street	3,370	10,640	
Minor Street*	1,980	2,120	No

* Minor street right-turning traffic volumes reduced by 25%

Traffic Signal Warrant Analysis



Project: Stop N Save Development
 Date: 7/6/2022
 Scenario: Year 2024 Buildout

Major Street:	Hager Grove Road SE	Minor Street:	Southern Site Access
Number of Lanes:	3	Number of Lanes:	1
PM Peak Hour Volumes:	621	PM Peak Hour Volumes:	1

Warrant Used:

 X 100 percent of standard warrants used
 70 percent of standard warrants used due to 85th percentile speed in excess
 of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
		100%	70%	100%	70%
<u>Major St.</u>	<u>Minor St.</u>	<u>Warrants</u>	<u>Warrants</u>	<u>Warrants</u>	<u>Warrants</u>
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500

<u>WARRANT 1, CONDITION B</u>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	6,210	10,600	
Minor Street*	10	2,650	No
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	6,210	15,900	
Minor Street*	10	1,350	No
<i>Combination Warrant</i>			
Major Street	6,210	12,720	
Minor Street*	10	2,120	No

* Minor street right-turning traffic volumes reduced by 85% of the capacity

Left-Turn Lane Warrant Analysis



Project: Stop N Save Development
Intersection: Hagers Grove Rd SE at Western Site Access
Date: 7/6/2022
Scenario: 2024 buildout conditions PM (SB)

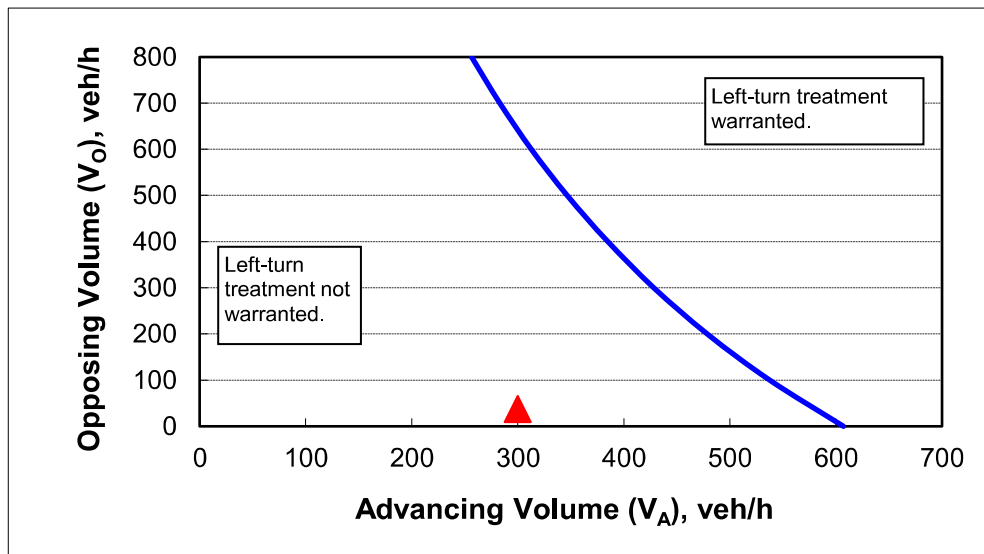
2-lane roadway (English)

INPUT

Variable	Value
85 th percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	13%
Advancing volume (V_A), veh/h:	300
Opposing volume (V_O), veh/h:	37

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	580
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis



Project: Stop N Save Development
Intersection: Hagers Grove Rd SE at Western Site Access
Date: 7/6/2022
Scenario: 2024 buildout conditions AM (SB)

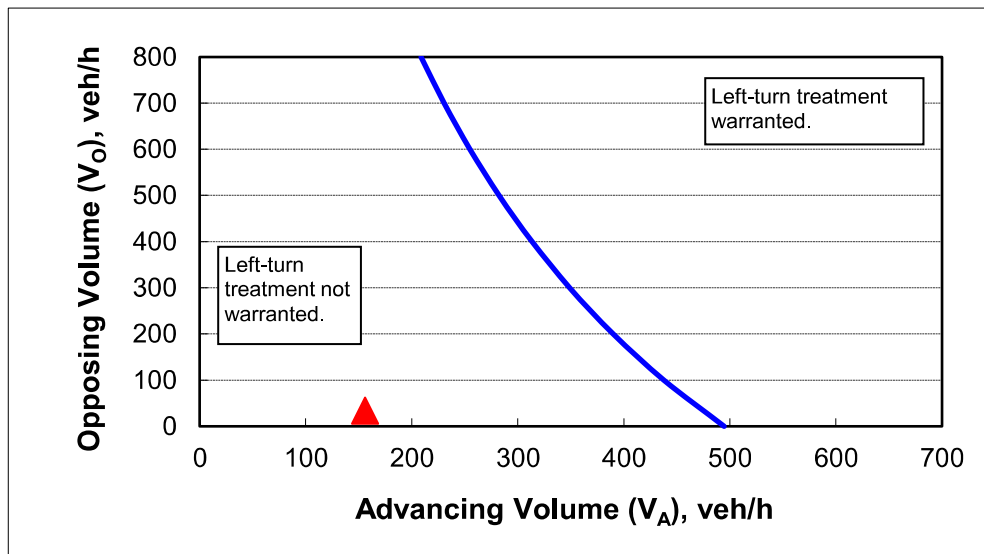
2-lane roadway (English)

INPUT

Variable	Value
85 th percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	22%
Advancing volume (V_A), veh/h:	156
Opposing volume (V_O), veh/h:	34

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	474
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Appendix D – Operations

Capacity Reports



HCM 6th TWSC

2: Hagers Grove Road & Western Access

05/23/2022

Intersection

Int Delay, s/veh 6.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	163	4	32	0	34	110
Future Vol, veh/h	163	4	32	0	34	110
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	177	4	35	0	37	120

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	229	35	0
Stage 1	35	-	-
Stage 2	194	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	759	1038	-
Stage 1	987	-	-
Stage 2	839	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	740	1038	-
Mov Cap-2 Maneuver	740	-	-
Stage 1	962	-	-
Stage 2	839	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	1.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	745	1576
HCM Lane V/C Ratio	-	-	0.244	0.023
HCM Control Delay (s)	-	-	11.4	7.3
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	1	0.1

HCM 6th TWSC

3: Hagers Grove Road & Southern Access

05/23/2022

Intersection

Int Delay, s/veh 0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	273	32	136	0	0
Future Vol, veh/h	0	273	32	136	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	297	35	148	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	- 0 - 109
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - 6.22
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - 3.318
Pot Cap-1 Maneuver	0	-	- 0 945
Stage 1	0	-	- 0 -
Stage 2	0	-	- 0 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	- - 945
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	-	0
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	-

HCM 6th Signalized Intersection Summary

4: Lancaster Drive SE & Hagers Grove Road/Carson Drive SE

05/23/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	189	5	79	3	4	70	89	307	2	23	379	75
Future Volume (veh/h)	189	5	79	3	4	70	89	307	2	23	379	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1589	1589	1589	1772	1772	1772	1660	1660	1660	1730	1730	1730
Adj Flow Rate, veh/h	233	6	98	4	5	86	110	379	2	28	468	93
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	15	15	15	2	2	2	10	10	10	5	5	5
Cap, veh/h	450	18	301	92	29	323	133	726	4	33	526	105
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.08	0.44	0.44	0.02	0.38	0.38
Sat Flow, veh/h	1106	78	1275	20	123	1367	1581	1649	9	1647	1401	278
Grp Volume(v), veh/h	233	0	104	95	0	0	110	0	381	28	0	561
Grp Sat Flow(s),veh/h/ln	1106	0	1353	1510	0	0	1581	0	1658	1647	0	1680
Q Serve(g_s), s	5.5	0.0	2.7	0.0	0.0	0.0	2.9	0.0	7.1	0.7	0.0	13.4
Cycle Q Clear(g_c), s	7.7	0.0	2.7	2.2	0.0	0.0	2.9	0.0	7.1	0.7	0.0	13.4
Prop In Lane	1.00		0.94	0.04		0.91	1.00		0.01	1.00		0.17
Lane Grp Cap(c), veh/h	450	0	320	444	0	0	133	0	730	33	0	631
V/C Ratio(X)	0.52	0.00	0.33	0.21	0.00	0.00	0.83	0.00	0.52	0.86	0.00	0.89
Avail Cap(c_a), veh/h	835	0	791	964	0	0	369	0	1395	231	0	1256
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.2	0.0	13.5	13.3	0.0	0.0	19.3	0.0	8.7	20.9	0.0	12.5
Incr Delay (d2), s/veh	0.3	0.0	0.2	0.1	0.0	0.0	4.8	0.0	0.2	20.0	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	0.7	0.7	0.0	0.0	1.1	0.0	1.7	0.4	0.0	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.5	0.0	13.7	13.4	0.0	0.0	24.1	0.0	8.9	40.9	0.0	14.3
LnGrp LOS	B	A	B	B	A	A	C	A	A	D	A	B
Approach Vol, veh/h	337			95			491			589		
Approach Delay, s/veh	15.0			13.4			12.3			15.6		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	21.1		14.1	4.8	23.8		14.1				
Change Period (Y+Rc), s	4.0	5.0		4.0	4.0	5.0		4.0				
Max Green Setting (Gmax), s	10.0	32.0		25.0	6.0	36.0		25.0				
Max Q Clear Time (g_c+l1), s	4.9	15.4		4.2	2.7	9.1		9.7				
Green Ext Time (p_c), s	0.0	0.7		0.1	0.0	0.4		0.3				
Intersection Summary												
HCM 6th Ctrl Delay	14.2											
HCM 6th LOS	B											

HCM 6th TWSC

2: Hagers Grove Road & Western Access

07/06/2022

Intersection						
Int Delay, s/veh	4.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	135	3	33	0	39	240
Future Vol, veh/h	135	3	33	0	39	240
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	147	3	36	0	42	261
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	381	36	0	0	36	0
Stage 1	36	-	-	-	-	-
Stage 2	345	-	-	-	-	-
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	621	1037	-	-	1575	-
Stage 1	986	-	-	-	-	-
Stage 2	717	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	602	1037	-	-	1575	-
Mov Cap-2 Maneuver	602	-	-	-	-	-
Stage 1	955	-	-	-	-	-
Stage 2	717	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	12.8	0	1			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	608	1575	-	
HCM Lane V/C Ratio	-	-	0.247	0.027	-	
HCM Control Delay (s)	-	-	12.8	7.3	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	1	0.1	-	

HCM 6th TWSC

3: Hagers Grove Road & Southern Access

07/06/2022

Intersection

Int Delay, s/veh 0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	375	33	94	0	1
Future Vol, veh/h	0	375	33	94	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	408	36	102	0	1

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	- 0 - 87
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - 6.22
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - 3.318
Pot Cap-1 Maneuver	0	-	- 0 971
Stage 1	0	-	- 0 -
Stage 2	0	-	- 0 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	- - 971
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	971
HCM Lane V/C Ratio	-	-	-	0.001
HCM Control Delay (s)	-	-	-	8.7
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0

HCM 6th Signalized Intersection Summary

4: Lancaster Drive SE & Hagers Grove Road/Carson Drive SE

07/06/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	293	4	78	1	3	62	71	574	5	89	405	53
Future Volume (veh/h)	293	4	78	1	3	62	71	574	5	89	405	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1758	1758	1758	1744	1744	1744
Adj Flow Rate, veh/h	312	4	83	1	3	66	76	611	5	95	431	56
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	3	3	3	4	4	4
Cap, veh/h	515	19	393	81	22	388	367	678	6	292	605	79
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.04	0.39	0.39	0.05	0.40	0.40
Sat Flow, veh/h	1258	69	1438	5	82	1422	1674	1741	14	1661	1512	196
Grp Volume(v), veh/h	312	0	87	70	0	0	76	0	616	95	0	487
Grp Sat Flow(s),veh/h/ln	1258	0	1507	1508	0	0	1674	0	1755	1661	0	1708
Q Serve(g_s), s	8.7	0.0	2.0	0.0	0.0	0.0	1.2	0.0	15.2	1.6	0.0	11.0
Cycle Q Clear(g_c), s	10.3	0.0	2.0	1.6	0.0	0.0	1.2	0.0	15.2	1.6	0.0	11.0
Prop In Lane	1.00		0.95	0.01		0.94	1.00		0.01	1.00		0.11
Lane Grp Cap(c), veh/h	515	0	412	491	0	0	367	0	684	292	0	683
V/C Ratio(X)	0.61	0.00	0.21	0.14	0.00	0.00	0.21	0.00	0.90	0.33	0.00	0.71
Avail Cap(c_a), veh/h	856	0	820	898	0	0	505	0	1391	404	0	1346
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.7	0.0	12.9	12.7	0.0	0.0	9.0	0.0	13.2	10.4	0.0	11.6
Incr Delay (d2), s/veh	0.4	0.0	0.1	0.0	0.0	0.0	0.1	0.0	1.8	0.2	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	0.6	0.5	0.0	0.0	0.3	0.0	4.6	0.4	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.1	0.0	13.0	12.8	0.0	0.0	9.1	0.0	15.0	10.6	0.0	12.1
LnGrp LOS	B	A	B	B	A	A	A	A	B	B	A	B
Approach Vol, veh/h	399			70			692			582		
Approach Delay, s/veh	15.4			12.8			14.4			11.9		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	6.0	23.4	16.6		6.5	22.9	16.6					
Change Period (Y+Rc), s	4.0	5.0	4.0		4.0	5.0	4.0					
Max Green Setting (Gmax), s	5.8	36.2	25.0		5.6	36.4	25.0					
Max Q Clear Time (g_c+l1), s	3.2	13.0	3.6		3.6	17.2	12.3					
Green Ext Time (p_c), s	0.0	0.6	0.1		0.0	0.7	0.2					
Intersection Summary												
HCM 6th Ctrl Delay	13.7											
HCM 6th LOS	B											

HCM 6th TWSC

2: Hagers Grove Road & Western Access

05/23/2022

Intersection						
Int Delay, s/veh	6.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	163	4	33	0	34	115
Future Vol, veh/h	163	4	33	0	34	115
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	177	4	36	0	37	125
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	235	36	0	0	36	0
Stage 1	36	-	-	-	-	-
Stage 2	199	-	-	-	-	-
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	753	1037	-	-	1575	-
Stage 1	986	-	-	-	-	-
Stage 2	835	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	734	1037	-	-	1575	-
Mov Cap-2 Maneuver	734	-	-	-	-	-
Stage 1	961	-	-	-	-	-
Stage 2	835	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.5	0		1.7		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	739	1575	-	
HCM Lane V/C Ratio	-	-	0.246	0.023	-	
HCM Control Delay (s)	-	-	11.5	7.3	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	1	0.1	-	

HCM 6th TWSC

3: Hagers Grove Road & Southern Access

05/23/2022

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	278	33	136	0	0
Future Vol, veh/h	0	278	33	136	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	302	36	148	0	0
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	-	110
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	-	0	943
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	943
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	-		
HCM Lane V/C Ratio	-	-	-	-		
HCM Control Delay (s)	-	-	-	0		
HCM Lane LOS	-	-	-	A		
HCM 95th %tile Q(veh)	-	-	-	-		

HCM 6th Signalized Intersection Summary

4: Lancaster Drive SE & Hagers Grove Road/Carson Drive SE

05/23/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	193	5	80	4	4	73	90	321	2	23	396	75
Future Volume (veh/h)	193	5	80	4	4	73	90	321	2	23	396	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1589	1589	1589	1772	1772	1772	1660	1660	1660	1730	1730	1730
Adj Flow Rate, veh/h	238	6	99	5	5	90	111	396	2	28	489	93
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	15	15	15	2	2	2	10	10	10	5	5	5
Cap, veh/h	445	18	304	90	30	324	135	744	4	32	545	104
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.09	0.45	0.45	0.02	0.39	0.39
Sat Flow, veh/h	1102	77	1276	24	127	1359	1581	1650	8	1647	1413	269
Grp Volume(v), veh/h	238	0	105	100	0	0	111	0	398	28	0	582
Grp Sat Flow(s),veh/h/ln	1102	0	1353	1510	0	0	1581	0	1658	1647	0	1681
Q Serve(g_s), s	5.9	0.0	2.9	0.0	0.0	0.0	3.1	0.0	7.8	0.8	0.0	14.5
Cycle Q Clear(g_c), s	8.3	0.0	2.9	2.4	0.0	0.0	3.1	0.0	7.8	0.8	0.0	14.5
Prop In Lane	1.00		0.94	0.05		0.90	1.00		0.01	1.00		0.16
Lane Grp Cap(c), veh/h	445	0	323	444	0	0	135	0	748	32	0	648
V/C Ratio(X)	0.53	0.00	0.33	0.23	0.00	0.00	0.82	0.00	0.53	0.86	0.00	0.90
Avail Cap(c_a), veh/h	799	0	757	922	0	0	353	0	1335	221	0	1203
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.8	0.0	14.1	13.9	0.0	0.0	20.1	0.0	8.9	21.9	0.0	12.9
Incr Delay (d2), s/veh	0.4	0.0	0.2	0.1	0.0	0.0	4.7	0.0	0.2	20.8	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	0.8	0.7	0.0	0.0	1.1	0.0	1.9	0.4	0.0	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.2	0.0	14.3	14.0	0.0	0.0	24.8	0.0	9.1	42.7	0.0	14.8
LnGrp LOS	B	A	B	B	A	A	C	A	A	D	A	B
Approach Vol, veh/h	343			100			509			610		
Approach Delay, s/veh	15.6			14.0			12.5			16.1		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.8	22.2		14.7	4.9	25.2		14.7				
Change Period (Y+Rc), s	4.0	5.0		4.0	4.0	5.0		4.0				
Max Green Setting (Gmax), s	10.0	32.0		25.0	6.0	36.0		25.0				
Max Q Clear Time (g_c+l1), s	5.1	16.5		4.4	2.8	9.8		10.3				
Green Ext Time (p_c), s	0.0	0.7		0.2	0.0	0.4		0.3				
Intersection Summary												
HCM 6th Ctrl Delay	14.7											
HCM 6th LOS	B											

HCM 6th TWSC

2: Hagers Grove Road & Western Access

07/06/2022

Intersection

Int Delay, s/veh 4.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	135	3	35	0	39	251
Future Vol, veh/h	135	3	35	0	39	251
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	147	3	38	0	42	273

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	395	38	0
Stage 1	38	-	-
Stage 2	357	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	610	1034	-
Stage 1	984	-	-
Stage 2	708	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	591	1034	-
Mov Cap-2 Maneuver	591	-	-
Stage 1	953	-	-
Stage 2	708	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13	0	1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	597	1572
HCM Lane V/C Ratio	-	-	0.251	0.027
HCM Control Delay (s)	-	-	13	7.4
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	1	0.1

HCM 6th TWSC

3: Hagers Grove Road & Southern Access

07/06/2022

Intersection

Int Delay, s/veh 0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	386	35	94	0	1
Future Vol, veh/h	0	386	35	94	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	420	38	102	0	1

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	- 0 - 89
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - 6.22
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - 3.318
Pot Cap-1 Maneuver	0	-	- 0 969
Stage 1	0	-	- 0 -
Stage 2	0	-	- 0 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	- - 969
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	969
HCM Lane V/C Ratio	-	-	-	0.001
HCM Control Delay (s)	-	-	-	8.7
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0

HCM 6th Signalized Intersection Summary

4: Lancaster Drive SE & Hagers Grove Road/Carson Drive SE

07/06/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	303	4	79	1	3	64	72	598	5	93	423	54
Future Volume (veh/h)	303	4	79	1	3	64	72	598	5	93	423	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1758	1758	1758	1744	1744	1744
Adj Flow Rate, veh/h	322	4	84	1	3	68	77	636	5	99	450	57
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	3	3	3	4	4	4
Cap, veh/h	512	19	400	76	22	396	359	698	5	281	626	79
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.04	0.40	0.40	0.06	0.41	0.41
Sat Flow, veh/h	1256	68	1438	4	80	1424	1674	1742	14	1661	1517	192
Grp Volume(v), veh/h	322	0	88	72	0	0	77	0	641	99	0	507
Grp Sat Flow(s),veh/h/ln	1256	0	1507	1508	0	0	1674	0	1755	1661	0	1709
Q Serve(g_s), s	9.6	0.0	2.2	0.0	0.0	0.0	1.3	0.0	16.9	1.7	0.0	12.2
Cycle Q Clear(g_c), s	11.4	0.0	2.2	1.8	0.0	0.0	1.3	0.0	16.9	1.7	0.0	12.2
Prop In Lane	1.00		0.95	0.01		0.94	1.00		0.01	1.00		0.11
Lane Grp Cap(c), veh/h	512	0	420	494	0	0	359	0	704	281	0	705
V/C Ratio(X)	0.63	0.00	0.21	0.15	0.00	0.00	0.21	0.00	0.91	0.35	0.00	0.72
Avail Cap(c_a), veh/h	802	0	768	841	0	0	476	0	1303	378	0	1268
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.7	0.0	13.6	13.4	0.0	0.0	9.4	0.0	13.9	11.1	0.0	12.0
Incr Delay (d2), s/veh	0.5	0.0	0.1	0.0	0.0	0.0	0.1	0.0	2.0	0.3	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.0	0.7	0.5	0.0	0.0	0.3	0.0	5.3	0.4	0.0	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.1	0.0	13.7	13.5	0.0	0.0	9.5	0.0	15.9	11.3	0.0	12.5
LnGrp LOS	B	A	B	B	A	A	A	A	B	B	A	B
Approach Vol, veh/h	410			72			718			606		
Approach Delay, s/veh	16.4			13.5			15.2			12.4		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.2	25.2		17.7	6.7	24.7		17.7				
Change Period (Y+Rc), s	4.0	5.0		4.0	4.0	5.0		4.0				
Max Green Setting (Gmax), s	5.6	36.4		25.0	5.6	36.4		25.0				
Max Q Clear Time (g_c+l1), s	3.3	14.2		3.8	3.7	18.9		13.4				
Green Ext Time (p_c), s	0.0	0.6		0.1	0.0	0.8		0.2				
Intersection Summary												
HCM 6th Ctrl Delay	14.4											
HCM 6th LOS	B											

Intersection						
Int Delay, s/veh	1.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↔	↔	
Traffic Vol, veh/h	0	0	33	0	7	0
Future Vol, veh/h	0	0	33	0	7	0
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	36	0	8	0
Major/Minor		Major2		Minor1		
Conflicting Flow All		0	0	72	-	-
Stage 1		-	-	0	-	-
Stage 2		-	-	72	-	-
Critical Hdwy		4.12	-	6.42	-	-
Critical Hdwy Stg 1		-	-	-	-	-
Critical Hdwy Stg 2		-	-	5.42	-	-
Follow-up Hdwy		2.218	-	3.518	-	-
Pot Cap-1 Maneuver		-	-	932	0	-
Stage 1		-	-	-	0	-
Stage 2		-	-	951	0	-
Platoon blocked, %		-	-	-	-	-
Mov Cap-1 Maneuver		-	-	932	-	-
Mov Cap-2 Maneuver		-	-	932	-	-
Stage 1		-	-	-	-	-
Stage 2		-	-	951	-	-
Approach		WB		NB		
HCM Control Delay, s				8.9		
HCM LOS				A		
Minor Lane/Major Mvmt	NBLn1	WBL	WBT			
Capacity (veh/h)	932	-	-			
HCM Lane V/C Ratio	0.008	-	-			
HCM Control Delay (s)	8.9	-	-			
HCM Lane LOS	A	-	-			
HCM 95th %tile Q(veh)	0	-	-			

HCM 6th TWSC

2: Hagers Grove Road & Western Access

07/06/2022

Intersection						
Int Delay, s/veh	7.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	216	4	33	1	34	122
Future Vol, veh/h	216	4	33	1	34	122
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	235	4	36	1	37	133
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	244	37	0	0	37	0
Stage 1	37	-	-	-	-	-
Stage 2	207	-	-	-	-	-
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	744	1035	-	-	1574	-
Stage 1	985	-	-	-	-	-
Stage 2	828	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	725	1035	-	-	1574	-
Mov Cap-2 Maneuver	725	-	-	-	-	-
Stage 1	960	-	-	-	-	-
Stage 2	828	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	12.3	0		1.6		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 729		1574	-	
HCM Lane V/C Ratio	-	- 0.328		0.023	-	
HCM Control Delay (s)	-	- 12.3		7.3	0	
HCM Lane LOS	-	- B		A	A	
HCM 95th %tile Q(veh)	-	- 1.4		0.1	-	

HCM 6th TWSC

3: Hagers Grove Road & Southern Access

07/06/2022

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	338	34	163	0	1
Future Vol, veh/h	0	338	34	163	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	367	37	177	0	1
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	-	126
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	-	0	924
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	924
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		8.9		
HCM LOS	A					
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	924		
HCM Lane V/C Ratio	-	-	-	0.001		
HCM Control Delay (s)	-	-	-	8.9		
HCM Lane LOS	-	-	-	A		
HCM 95th %tile Q(veh)	-	-	-	0		

HCM 6th Signalized Intersection Summary

4: Lancaster Drive SE & Hagers Grove Road/Carson Drive SE

07/06/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	231	6	101	4	5	73	117	301	2	23	381	75
Future Volume (veh/h)	231	6	101	4	5	73	117	301	2	23	381	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1589	1589	1589	1772	1772	1772	1660	1660	1660	1730	1730	1730
Adj Flow Rate, veh/h	285	7	125	5	6	90	144	372	2	28	470	93
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	15	15	15	2	2	2	10	10	10	5	5	5
Cap, veh/h	476	20	354	85	40	373	319	713	4	432	520	103
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.08	0.43	0.43	0.02	0.37	0.37
Sat Flow, veh/h	1101	72	1281	22	143	1348	1581	1649	9	1647	1402	277
Grp Volume(v), veh/h	285	0	132	101	0	0	144	0	374	28	0	563
Grp Sat Flow(s),veh/h/ln	1101	0	1353	1513	0	0	1581	0	1658	1647	0	1680
Q Serve(g_s), s	8.4	0.0	3.7	0.0	0.0	0.0	2.5	0.0	7.9	0.5	0.0	15.2
Cycle Q Clear(g_c), s	10.9	0.0	3.7	2.5	0.0	0.0	2.5	0.0	7.9	0.5	0.0	15.2
Prop In Lane	1.00		0.95	0.05		0.89	1.00		0.01	1.00		0.17
Lane Grp Cap(c), veh/h	476	0	374	497	0	0	319	0	717	432	0	623
V/C Ratio(X)	0.60	0.00	0.35	0.20	0.00	0.00	0.45	0.00	0.52	0.06	0.00	0.90
Avail Cap(c_a), veh/h	631	0	565	708	0	0	379	0	918	589	0	923
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.2	0.0	13.9	13.4	0.0	0.0	10.6	0.0	10.0	9.3	0.0	14.2
Incr Delay (d2), s/veh	0.5	0.0	0.2	0.1	0.0	0.0	0.4	0.0	0.2	0.0	0.0	6.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	1.0	0.8	0.0	0.0	0.6	0.0	2.1	0.1	0.0	5.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.6	0.0	14.1	13.5	0.0	0.0	11.0	0.0	10.2	9.3	0.0	20.8
LnGrp LOS	B	A	B	B	A	A	B	A	B	A	A	C
Approach Vol, veh/h	417			101			518			591		
Approach Delay, s/veh	15.8			13.5			10.4			20.3		
Approach LOS	B			B			B			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.9	22.8		17.2	4.9	25.7		17.2				
Change Period (Y+Rc), s	4.0	5.0		4.0	4.0	5.0		4.0				
Max Green Setting (Gmax), s	5.7	26.3		20.0	5.5	26.5		20.0				
Max Q Clear Time (g_c+l1), s	4.5	17.2		4.5	2.5	9.9		12.9				
Green Ext Time (p_c), s	0.0	0.6		0.1	0.0	0.4		0.3				
Intersection Summary												
HCM 6th Ctrl Delay	15.6											
HCM 6th LOS	B											

HCM 6th TWSC

1: Site Access & Hagers Grove Road

07/06/2022

Intersection

Int Delay, s/veh 1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↔	↔	
Traffic Vol, veh/h	0	0	44	0	10	0
Future Vol, veh/h	0	0	44	0	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	48	0	11	0

Major/Minor	Major2	Minor1
Conflicting Flow All	0	96
Stage 1	-	0
Stage 2	-	96
Critical Hdwy	4.12	6.42
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	-	5.42
Follow-up Hdwy	2.218	3.518
Pot Cap-1 Maneuver	-	903
Stage 1	-	0
Stage 2	-	928
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	903
Mov Cap-2 Maneuver	-	903
Stage 1	-	-
Stage 2	-	928

Approach	WB	NB
HCM Control Delay, s		9
HCM LOS		A

Minor Lane/Major Mvmt	NBLn1	WBL	WBT
Capacity (veh/h)	903	-	-
HCM Lane V/C Ratio	0.012	-	-
HCM Control Delay (s)	9	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0	-	-

HCM 6th TWSC

2: Hagers Grove Road & Western Access

07/06/2022

Intersection						
Int Delay, s/veh	6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	196	3	35	2	39	261
Future Vol, veh/h	196	3	35	2	39	261
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	213	3	38	2	42	284
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	407	39	0	0	40	0
Stage 1	39	-	-	-	-	-
Stage 2	368	-	-	-	-	-
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	600	1033	-	-	1570	-
Stage 1	983	-	-	-	-	-
Stage 2	700	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	581	1033	-	-	1570	-
Mov Cap-2 Maneuver	581	-	-	-	-	-
Stage 1	952	-	-	-	-	-
Stage 2	700	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	14.7	0		1		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	585	1570	-	
HCM Lane V/C Ratio	-	-	0.37	0.027	-	
HCM Control Delay (s)	-	-	14.7	7.4	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	1.7	0.1	-	

HCM 6th TWSC

3: Hagers Grove Road & Southern Access

07/06/2022

Intersection

Int Delay, s/veh 0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	457	37	127	0	1
Future Vol, veh/h	0	457	37	127	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	497	40	138	0	1

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	- 0 - 109
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - 6.22
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - 3.318
Pot Cap-1 Maneuver	0	-	- - 0 945
Stage 1	0	-	- - 0 -
Stage 2	0	-	- - 0 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	- - 945
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	945
HCM Lane V/C Ratio	-	-	-	0.001
HCM Control Delay (s)	-	-	-	8.8
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0

HCM 6th Signalized Intersection Summary

4: Lancaster Drive SE & Hagers Grove Road/Carson Drive SE

07/06/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	348	6	103	1	5	64	105	575	5	93	407	54
Future Volume (veh/h)	348	6	103	1	5	64	105	575	5	93	407	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1758	1758	1758	1744	1744	1744
Adj Flow Rate, veh/h	370	6	110	1	5	68	112	612	5	99	433	57
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	3	3	3	4	4	4
Cap, veh/h	544	24	448	70	37	436	351	670	5	268	571	75
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.06	0.38	0.38	0.06	0.38	0.38
Sat Flow, veh/h	1254	78	1431	4	119	1392	1674	1741	14	1661	1509	199
Grp Volume(v), veh/h	370	0	116	74	0	0	112	0	617	99	0	490
Grp Sat Flow(s),veh/h/ln	1254	0	1509	1514	0	0	1674	0	1755	1661	0	1708
Q Serve(g_s), s	12.4	0.0	3.0	0.0	0.0	0.0	2.1	0.0	17.6	1.9	0.0	13.2
Cycle Q Clear(g_c), s	14.3	0.0	3.0	1.9	0.0	0.0	2.1	0.0	17.6	1.9	0.0	13.2
Prop In Lane	1.00		0.95	0.01		0.92	1.00		0.01	1.00		0.12
Lane Grp Cap(c), veh/h	544	0	472	543	0	0	351	0	675	268	0	646
V/C Ratio(X)	0.68	0.00	0.25	0.14	0.00	0.00	0.32	0.00	0.91	0.37	0.00	0.76
Avail Cap(c_a), veh/h	815	0	799	870	0	0	423	0	1109	350	0	1079
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.1	0.0	13.5	13.1	0.0	0.0	10.8	0.0	15.4	12.2	0.0	14.3
Incr Delay (d2), s/veh	0.6	0.0	0.1	0.0	0.0	0.0	0.2	0.0	4.6	0.3	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	0.9	0.6	0.0	0.0	0.6	0.0	6.3	0.5	0.0	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.7	0.0	13.6	13.2	0.0	0.0	10.9	0.0	20.1	12.6	0.0	15.0
LnGrp LOS	B	A	B	B	A	A	B	A	C	B	A	B
Approach Vol, veh/h	486			74			729			589		
Approach Delay, s/veh	16.7			13.2			18.7			14.6		
Approach LOS	B			B			B			B		
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	7.3	25.0	20.5		7.0	25.3	20.5					
Change Period (Y+Rc), s	4.0	5.0	4.0		4.0	5.0	4.0					
Max Green Setting (Gmax), s	5.6	33.4	28.0		5.6	33.4	28.0					
Max Q Clear Time (g_c+l1), s	4.1	15.2	3.9		3.9	19.6	16.3					
Green Ext Time (p_c), s	0.0	0.6	0.1		0.0	0.7	0.2					
Intersection Summary												
HCM 6th Ctrl Delay	16.7											
HCM 6th LOS	B											

Signalized Intersection V/C Calculation Summary

MORNING PEAK HOUR

Intersection 4: Hagers Grove Road SE & Carson Drive

Year 2022												Critical Intersection V/C:		
Critical Movement:	Protected/Permitted Left-Turn Phasing						Permitted Left-Turn Phasing							
Adjusted Flow Rate:	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT		WBR	Sum of Critical Flow Ratios:
Saturated Flow:	110	379	2	28	468	93	233	6	98	4	5		86	Cycle Length (seconds):
Flow Ratio:	1581	1649	9	1647	1401	278	1106	78	1275	20	123		1367	Lost Time per Phase (seconds):
	0.07	0.23	0.22	0.02	0.33	0.33	0.21	0.08	0.08	0.20	0.04	0.06	Number of Phases:	
0.40														
0.21														
0.61														
80														
4														
4														

Year 2024 Background												Critical Intersection V/C:	
Protected/Permitted Left-Turn Phasing						Permitted Left-Turn Phasing							
Critical Movement:	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT		WBR
Adjusted Flow Rate:	111	396	2	28	489	93	238	6	99	5	5		90
Saturated Flow:	1581	1650	8	1647	1413	269	1102	77	1276	24	127		1359
Flow Ratio:	0.07	0.24	0.25	0.02	0.35	0.35	0.22	0.08	0.08	0.21	0.04	0.07	
0.42													
0.22													
Sum of Critical Flow Ratios:												0.63	
Cycle Length (seconds):												80	
Lost Time per Phase (seconds):												4	
Number of Phases:												4	

Year 2024 Buildout												Critical Intersection V/C:	
Protected/Permitted Left-Turn Phasing						Permitted Left-Turn Phasing							
Critical Movement:	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT		WBR
Adjusted Flow Rate:	144	372	2	28	470	93	285	7	125	5	6		90
Saturated Flow:	1581	1649	9	1647	1403	277	1101	72	1281	22	142		1348
Flow Ratio:	0.09	0.23	0.22	0.02	0.33	0.34	0.26	0.10	0.10	0.23	0.04	0.07	
0.43													
0.26													
Sum of Critical Flow Ratios:												0.69	
Cycle Length (seconds):												80	
Lost Time per phase (seconds):												4	
Number of Phases:												4	

EVENING PEAK HOUR

Intersection 4: Hagers Grove Road SE & Carson Drive

Year 2022												Critical Intersection V/C:	
Critical Movement: Adjusted Flow Rate: Saturated Flow: Flow Ratio:	Protected/Permitted Left-Turn Phasing						Permitted Left-Turn Phasing						
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT		WBR
	76	611	5	95	431	56	312	4	83	1	3		66
	1674	1741	14	1661	1512	196	1258	69	1438	4	82		1422
0.05	0.35	0.36	0.06	0.29	0.29	0.25	0.06	0.06	0.25	0.04	0.05		
0.41													
0.25													
Sum of Critical Flow Ratios:												0.66	
Cycle Length (seconds):												80	
Lost Time per Phase (seconds):												4	
Number of Phases:												4	

Year 2024 Background												Critical Intersection V/C:	
Protected/Permitted Left-Turn Phasing						Permitted Left-Turn Phasing							
Critical Movement:	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT		WBR
Adjusted Flow Rate:	77	636	5	99	450	57	322	4	84	1	3		68
Saturated Flow:	1674	1742	14	1661	1517	192	1256	68	1438	4	80		1424
Flow Ratio:	0.05	0.37	0.36	0.06	0.30	0.30	0.26	0.06	0.06	0.25	0.04	0.05	
0.42													
0.26													
Sum of Critical Flow Ratios:												0.68	
Cycle Length (seconds):												80	
Lost Time per Phase (seconds):												4	
Number of Phases:												4	

Year 2024 Buildout												Critical Intersection V/C:	
Protected/Permitted Left-Turn Phasing						Permitted Left-Turn Phasing							
Critical Movement:	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT		WBR
Adjusted Flow Rate:	112	617	5	99	433	57	370	6	110	1	5		68
Saturated Flow:	1674	1741	14	1661	1511	198	1254	79	1430	4	119		1392
Flow Ratio:	0.07	0.35	0.36	0.06	0.29	0.29	0.30	0.08	0.08	0.25	0.04	0.05	
0.42													
0.30													
Sum of Critical Flow Ratios:												0.71	
Cycle Length (seconds):												80	
Lost Time per phase (seconds):												4	
Number of Phases:												4	

Notes:

Since NB and SB left-turn phases are protected, critical ring is either EBL+WBT or WBL+EBT - HCM6 does not show reductions for permitted left turns
Since EB and WB left-turn phases are permitted, critical ring is maximum of any lane group.