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MEMO

VIA EMAIL jcooksey@stonefieldeng.com

To:	**J. Reid Cooksey, Stonefield** **EROP, LLC**
From:	**Jacob Swanson, PE** **Salman Ahmad** **Fleis & VandenBrink**
Date:	**March 23, 2023**
Re:	**Proposed Car Wash Development** **Rochester Hills, Michigan** **Traffic Impact Study**

1 INTRODUCTION

This memorandum presents the results of the Traffic Impact Study (TIS) for the proposed Whitewater Express car wash development in Rochester Hills, Michigan. The project site is located at 2737 S. Adams Road, on a vacant property adjacent to the south side of S. Adams Road, between Forester Boulevard and Marketplace Circle, as shown on the attached **Figure 1**. Site access is proposed via one (1) full access driveway on S. Adams Road, aligned opposite the existing Meijer gas station driveway. S. Adams Road is under the jurisdiction of the Road Commission for Oakland County (RCOC). The purpose of this TIS is to evaluate the impact of the proposed development on the adjacent roadway network, as part of the site plan approval and driveway permitting processes in the City of Rochester Hills.

The scope of work for this study was developed based on Fleis & VandenBrink's (F&V) knowledge of the study area, understanding of the development program, accepted traffic engineering practices, and information published by the Institute of Transportation Engineers (ITE). In addition, the City of Rochester Hills and RCOC provided input regarding the scope of work for this analysis. The study analyses were completed using Synchro/SimTraffic (Version 11). Sources of data for this study include F&V subconsultant Quality Counts, LLC (QC), Southeast Michigan Council of Governments (SEMCOG), RCOC, MDOT, and ITE.

2 BACKGROUND

2.1 EXISTING ROAD NETWORK

Vehicle transportation for the study area is provided via S. Adams Road. The lane uses and traffic control at the study intersections are shown on the attached **Figure 2** and the study roadways are further described below. For the purposes of this study, all minor streets and site driveways are assumed to have an operating speed of 25 miles per hour (mph), unless otherwise noted.

S. Adams Road generally runs in east and west directions, adjacent to the north side of the project site. The study section of S. Adams Road is classified as an *Other Principal Arterial* and is under the jurisdiction of RCOC. The study section of roadway has a posted speed limit of 45 mph and an Annual Average Daily Traffic (AADT) volume of approximately 18,000 vehicles per day (SEMCOG, 2016). S. Adams Road provides a typical five-lane cross-section, adjacent to the project site, with two (2) lanes in each direction and a center two-way left-turn lane (TWLTL). At the signalized intersection with Forester Boulevard, S. Adams Road widens to provides an exclusive westbound right-turn lane.

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Forester Boulevard generally runs in the east and west directions, west of the project site, terminating at the signalized intersection with S. Adams Road. Forester Boulevard is classified as a *Local Road* and has a posted speed limit of 25 mph. The study section of Forester Boulevard is a median divided, four-lane cross-section, with two (2) lanes in each direction. At the study intersection with S. Adams Road, Forester Boulevard serves as the southbound approach and provides an exclusive left- and right-turn lanes.

Marketplace Circle generally runs in the north and south directions, northeast of the project site. Marketplace Circle is classified as a *Local Road* and has a posted speed limit of 30 mph. The study section of Marketplace Circle provides a typical two-lane cross-section with one (1) lane in each direction. At the study intersection with S. Adams Road, Marketplace Circle widens to provide exclusive left- and right-turn lanes.

2.2 Existing Traffic Volumes

F&V subconsultant QC collected existing Turning Movement Count (TMC) data on Thursday, February 9, 2023, during the PM (4:00 PM-6:00 PM) peak period and Saturday, February 11, 2023 during the SAT (11:00 AM-1:00 PM) peak period, at the following study intersections:

- S. Adams Road & Forester Boulevard
- S. Adams Road & Marketplace Circle
- S. Adams Road & Meijer Gas Station Driveway

During collection of the turning movement counts, Peak Hour Factors (PHFs), pedestrian and bicycle volumes, and commercial truck percentages were recorded and used in the traffic analysis. The peak hours of the study intersections were utilized and the through volumes were carried through the roadway network and balanced upwards at the proposed site driveway. Therefore, the traffic volumes used in the analysis and shown on the attached traffic volume figures may not match the raw traffic volumes shown in the data collection.

The peak hour for the adjacent roadway network were observed to generally occur on weekdays between 4:00 PM to 5:00 PM and on Saturdays between 12:00 PM to 1:00 PM. F&V collected an inventory of existing lane use and traffic controls, as shown on the attached **Figure 2**. Additionally, F&V obtained the current signal timing permits from RCOC for the signalized study intersection of S. Adams Road & Forester Boulevard. The existing 2023 peak hour traffic volumes used in the analysis are shown on the attached **Figure 3**.

3 Existing Conditions

Existing peak hour vehicle delays and Levels of Service (LOS) were calculated at the study intersections using Synchro/SimTraffic (Version 11) traffic analysis software. This analysis was based on the existing lane use and traffic control shown on the attached **Figure 2**, the existing peak hour traffic volumes shown on the attached **Figure 3**, and the methodologies presented in the *Highway Capacity Manual, 6th Edition* (HCM6). Descriptions of LOS "A" through "F" as defined in the HCM6, are attached. Typically, LOS D is considered acceptable, with LOS A representing minimal delay and LOS F indicating failing conditions.

Additionally, the signalized study intersection of S. Adams Road & Forester Boulevard operates with the Sydney Coordinated Adaptive Traffic System (SCATS); as a result, the signal will perform real time optimizations to accommodate the traffic volumes observed by the approach lane detectors. Therefore, the base timings were input and the signal timing was optimized for each scenario, in order to reflect true signal operations. The existing conditions results are attached and summarized in **Table 1**.

Table 1: Existing Intersection Operations

	Intersection	Control	Approach	Existing Conditions			
				PM Peak		SAT Peak	
				Delay (s/veh)	LOS	Delay (s/veh)	LOS
1	S. Adams Road & Forester Boulevard	Signalized	EBL	2.5	A	2.7	A
			EBT	2.0	A	2.0	A
			WBT	4.0	A	4.0	A
			WBR	1.8	A	2.1	A
			SBL	54.8	D	42.4	D
			SBR	52.6	D	40.5	D
			Overall	**4.7**	**A**	**4.3**	**A**

	Intersection	Control	Approach	Existing Conditions			
				PM Peak		SAT Peak	
				Delay (s/veh)	LOS	Delay (s/veh)	LOS
2	S. Adams Road & Meijer Gas Station Driveway	Stop (Minor)	EBL	9.0	A	9.1	A
			WB	Free			
			SB	13.6	B	13.4	B
3	S. Adams Road & Marketplace Circle	Stop (Minor)	EBL	9.4	A	9.7	A
			WB	Free			
			SBL	18.1	C	24.5	C
			SBR	11.3	B	11.7	B

The results of the existing conditions analysis indicates that all approaches and movements at the study intersections are currently operating acceptably, at LOS D or better, during both the PM and SAT peak periods. Review of SimTraffic network simulations also indicated acceptable operations throughout the study roadway network during both peak periods. Any vehicle queues at the signalized intersection were observed to be serviced within each cycle length, leaving no residual queueing. Additionally, vehicles at the stop-controlled study intersections were observed to find adequate gaps within the through traffic along S. Adams Road, without experiencing significant delays or excessive vehicle queuing.

4 Background Conditions (2024 No Build)

Historical population and employment community profile data was obtained for the City of Rochester Hills from the Southeast Michigan Council of Government (SEMCOG), in order to calculate a background growth rate to project the existing 2023 traffic volumes to the site buildout year of 2024. Population and employment projections from 2010 to 2045 were reviewed and indicated an average annual growth of 0.33% and 0.2%, respectively. In addition to the background traffic growth, it is important to account for traffic that will be generated by developments within the vicinity of the study area that are currently under construction or will be within the buildout year. At the time of this study, no planned background developments were identified by the City of Rochester Hills or RCOC, within the vicinity of the project site. Therefore, a conservative annual background growth rate of **0.5%** per year was applied to the existing peak hour traffic volumes to forecast the background (2024) traffic volume ***without the proposed development***, as shown on the attached **Figure 4**.

Background peak hour vehicle delays and LOS ***without the proposed development*** were calculated at the study intersections based on the existing lane use and traffic control shown on the attached **Figure 2**, the background peak hour traffic volumes shown on the attached **Figure 4**, and the methodologies presented in the HCM6. The results of the background conditions analysis are attached and summarized in **Table 2**.

Table 2: Background Intersection Operations

	Intersection	Control	Approach	Existing Conditions				Background Conditions				Difference			
				PM Peak		SAT Peak		PM Peak		SAT Peak		PM Peak		SAT Peak	
				Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
1	S. Adams Road & Forester Blvd	Signal	EBL	2.5	A	2.7	A	2.5	A	2.7	A	0.0	-	0.0	-
			EBT	2.0	A	2.0	A	2.0	A	2.0	A	0.0	-	0.0	-
			WBT	4.0	A	4.0	A	4.0	A	4.0	A	0.0	-	0.0	-
			WBR	1.8	A	2.1	A	1.8	A	2.1	A	0.0	-	0.0	-
			SBL	54.8	D	42.4	D	54.8	D	42.4	D	0.0	-	0.0	-
			SBR	52.6	D	40.5	D	52.6	D	40.5	D	0.0	-	0.0	-
			Overall	**4.7**	**A**	**4.3**	**A**	**4.7**	**A**	**4.3**	**A**	**0.0**	**-**	**0.0**	**-**
2	S. Adams Road & Meijer Gas Station Drive	Stop (Minor)	EBL	9.0	A	9.1	A	9.0	A	9.1	A	0.0	-	0.0	-
			WB	Free				Free				Free			
			SB	13.6	B	13.4	B	13.6	B	13.4	B	0.0	-	0.0	-

Intersection		Control	Approach	Existing Conditions				Background Conditions				Difference			
				PM Peak		SAT Peak		PM Peak		SAT Peak		PM Peak		SAT Peak	
				Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
3	S. Adams Road & Marketplace Circle	Stop (Minor)	EBL	9.4	A	9.7	A	9.5	A	9.7	A	0.1	-	0.0	-
			WB	Free				Free				Free			
			SBL	18.1	C	24.5	C	18.3	C	24.9	C	0.2	-	0.4	-
			SBR	11.3	B	11.7	B	11.3	B	11.7	B	0.0	-	0.0	-

The results of the background conditions analysis indicates that all approaches and movements at the study intersections will continue to operate acceptably at LOS D or better during both peak periods, in a manner similar to the existing conditions analysis, with minimal increases in delays. Review of SimTraffic network simulation also indicates acceptable operations during both peak periods, similar to those observations made during existing conditions.

5 SITE TRIP GENERATION

The number of peak hour (weekday PM and Saturday) and daily vehicle trips that would be generated by the proposed development were calculated using the rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual, 11th Edition*. The proposed site plan includes the development of a Whitewater Express Car Wash; therefore, "Automated Car Wash" (ITE LUC #948) was determined to be the most appropriate land use. ITE does not provide trip generation information for the SAT peak hour; therefore, the PM peak hour trip generation projections were applied to the SAT peak hour, in order to provide a conservative evaluation for this TIS analysis. The site trip generation forecast utilized for the proposed development is summarized in **Table 3**.

Table 3: Site Trip Generation Summary

Land Use	ITE Code	Amount	Units	Average Daily Traffic (vpd)	PM Peak Hour (vph)			SAT Peak Hour (vph)		
					In	Out	Total	In	Out	Total
Automated Car Wash	948	1	Tunnel	780	39	39	78	39	39	78
Pass-By: 50%				390	19	19	38	19	19	38
New Trips				390	20	20	40	20	20	40

As is typical of commercial developments, a portion of the trips generated are from vehicles on the adjacent roadway that will pass the site on the way from an origin to their ultimate destination. Therefore, not all traffic at the site driveways is necessarily new traffic added to the street system. This percentage of the trips generated by the development are considered "pass-by" trips and do not add new traffic to the adjacent street system. These trips are therefore reduced from the total external trips generated by a study site. Car washes and similar type land uses such as gas stations, generally cater to adjacent street traffic volumes; however, there is no published data available for calculating pass-by trips for the car wash land use by ITE in the *Trip Generation Manual, 11th Edition*. Therefore, in order to provide a conservative analysis, a 50% pass-by trip reduction was applied to this land use.

6 SITE TRIP DISTRIBUTION

The vehicular trips that would be generated by the proposed development were assigned to the study roads based on the proposed site access plan and driveway configurations, the existing peak hour traffic patterns in the adjacent roadway network, and the methodologies published by ITE. The ITE trip distribution methodology assumes that new trips will enter the network and access the development, then leave the development and return to their direction of origin, whereas pass-by trips will enter and exit the development in their original direction of travel. The site trip distributions utilized in the analysis are summarized in **Table 4**.

Table 4: Site Trip Distribution

To/From	Via	New Trips		Pass-By Trips	
		PM	SAT	PM	SAT
East	S. Adams Road	37%	36%	51% (EB)	50% (EB)
West	S. Adams Road	44%	40%	49% (WB)	50% (WB)
North	Marketplace Circle	20%	24%		
Total		**100%**	**100%**	**100%**	**100%**

The site-generated vehicular traffic volumes shown in **Table 3** were distributed to the study roadway network according to the distribution shown in **Table 4**. The site-generated trips shown on the attached **Figure 5** were added to the background peak hour traffic volumes shown on the attached **Figure 4**, in order to calculate the future peak hour traffic volumes, with the addition of the proposed development. Future peak hour traffic volumes are shown on the attached **Figure 6**.

7 FUTURE CONDITIONS (2024 BUILDOUT)

Future peak hour vehicle delays and LOS ***with the proposed development*** were calculated based on the proposed lane use and traffic controls shown on the attached **Figure 2**, the future peak hour traffic volumes shown on the attached **Figure 6**, and the methodologies presented in the HCM6. The results of the future conditions analysis are attached and summarized in **Table 5**.

Table 5: Future Intersection Operations

Intersection		Control	Approach	Background Conditions				Future Conditions				Difference			
				PM Peak		SAT Peak		PM Peak		SAT Peak		PM Peak		SAT Peak	
				Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
1	S. Adams Road & Forester Blvd	Signal	EBL	2.5	A	2.7	A	2.5	A	2.7	A	0.0	-	0.0	-
			EBT	2.0	A	2.0	A	2.0	A	2.0	A	0.0	-	0.0	-
			WBT	4.0	A	4.0	A	4.0	A	4.0	A	0.0	-	0.0	-
			WBR	1.8	A	2.1	A	1.8	A	2.1	A	0.0	-	0.0	-
			SBL	54.8	D	42.4	D	54.8	D	42.4	D	0.0	-	0.0	-
			SBR	52.6	D	40.5	D	52.6	D	40.5	D	0.0	-	0.0	-
			Overall	**4.7**	**A**	**4.3**	**A**	**4.7**	**A**	**4.3**	**A**	**0.0**	**-**	**0.0**	**-**
2	S. Adams Road & Meijer Gas Station Drive / Site Drive	Stop (Minor)	EBL	9.0	A	9.1	A	9.0	A	9.1	A	0.0	-	0.0	-
			WBL	N/A				7.9	A	7.9	A	N/A			
			SB	13.6	B	13.4	B	15.5	C	15.9	C	1.9	B→C	2.5	B→C
			NB	N/A				13.4	B	13.6	B	N/A			
3	S. Adams Road & Marketplace Circle	Stop (Minor)	EBL	9.5	A	9.7	A	9.5	A	9.8	A	0.0	-	0.1	-
			WB	Free				Free				Free			
			SBL	18.3	C	24.9	C	18.6	C	26.0	D	0.3	-	1.1	C→D
			SBR	11.3	B	11.7	B	11.4	B	11.9	B	0.1	-	0.2	-

The results of the future conditions analysis indicates that all the study intersection approaches and movements will continue to operate acceptably at LOS D or better during both peak periods, in a manner similar to the background conditions analysis, with minimal increases in delays. Additionally, the proposed site driveway is expected to operate acceptably, at LOS D or better during peak hours.

SimTraffic microsimulations also indicates acceptable operations throughout the study roadway network during both peak periods. All vehicles at the signalized study intersections were observed to be serviced within each cycle length, leaving no residual queueing. Additionally, egress traffic at the stop-controlled study intersections and proposed site driveways were observed to find adequate gaps within the through traffic along S. Adams Road, without experiencing significant delays or excessive vehicle queueing.

8 ACCESS MANAGEMENT

8.1 AUXILIARY TURN LANE EVALUATION

The RCOC auxiliary lane treatment criteria were evaluated at the proposed site driveway on S. Adams Road. There is an existing center two-way left-turn lane (TWLTL) on S. Adams Road, adjacent to the project site; therefore, the warranting criteria for an auxiliary left-turn lanes were not evaluated. This analysis was based on the future traffic volumes, as shown on the attached **Figure 6**. The results of the analysis are shown on the attached RCOC warranting chart and is summarized in **Table 6**.

Table 6: Auxiliary Turn Lane Analysis Summary

Intersection	PM Peak	SAT Peak	Recommendation
S. Adams Road & Site Drive	RT Taper	RT Taper	**Right Turn Taper**

The results of the auxiliary turn lane evaluation indicates that a right-turn deceleration taper is recommended on eastbound S. Adams Road at the proposed site driveway.

9 SITE CIRCULATION

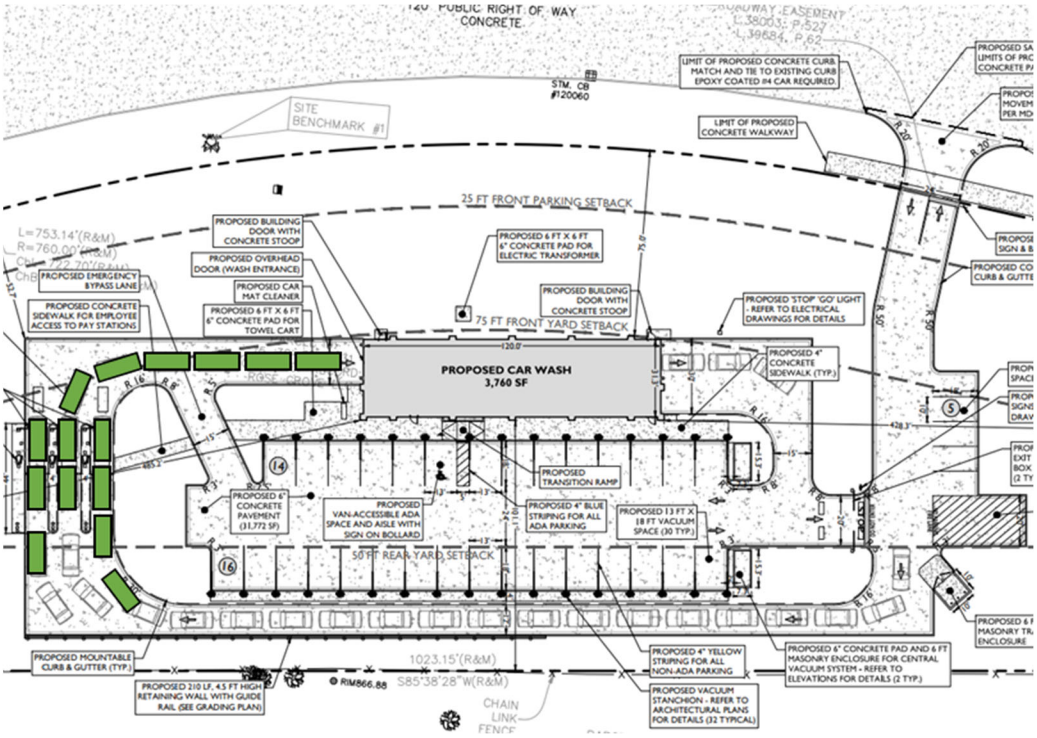
The projected car wash vehicle queuing was reviewed to determine if the proposed on-site queue length for the car wash is adequate to accommodate the projected operations. The proposed site includes three (3) drive-through lanes: Cash/Credit Card Payment (2 lanes) and App Payment (1 lane). The typical service rate for a car wash is 60 vehicles per hour, but they can process up to 90 vehicles per hour, as needed. For analysis purposes, it was assumed that the average Cash payment service rate is 60 seconds per vehicle and App payment is 30 seconds per vehicle. Once paid, the vehicles enter the queue for the car wash tunnel, which has a service rate of 18 seconds per vehicle. Additionally, it was assumed that the arriving vehicles were distributed equally among the three payment lanes.

An analysis was performed for each of the three types of queue lanes: Cash/Credit Card Payment, App Payment, and Car Wash Tunnel. The analysis was based on the trip generation data for this site and the service rate information as described herein. Since the service rates are higher than the projected demand for this site, a Poisson distribution analysis was performed to determine the projected queuing associated with random arrivals. The projected peak vehicle queue lengths are summarized in **Table 7** and shown on **Exhibit 1**. The projected vehicle queuing exhibit shows that the maximum anticipated arrivals can be adequately accommodated on site, without impacting internal site circulation or the study roadway network operations along S. Adams Road.

Table 7: Vehicle Queuing Analysis

CAR WASH STACKING SPACE CALCULATOR - CASH		CAR WASH STACKING SPACE CALCULATOR - APP		CAR WASH STACKING SPACE CALCULATOR - TUNNEL	
Number of Arrivals	26	Number of Arrivals	13	Number of Arrivals	39
Time per Vehicle (s)	60	Time per Vehicle (s)	30	Time per Vehicle (s)	18
Service Rate (veh/hr)	60	Service Rate (veh/hr)	120	Service Rate (veh/hr)	200
Peak Arrival (veh)	4	Peak Arrival (veh)	3	Peak Arrival (veh)	3
Vehicle Length	25	Vehicle Length	25	Vehicle Length	25
TOTAL QUEUE (ft)	**100**	**TOTAL QUEUE (ft)**	**75**	**TOTAL QUEUE (ft)**	**75**

Exhibit 1: Vehicle Queuing



10 CONCLUSIONS

The conclusions of this TIS are as follows:

1. **Existing Conditions (2023)**
   - The result of the existing conditions analysis indicates that all of the approaches and movements at the study intersections are currently operating acceptably, at LOS D or better during both peak hours.
   - Review of SimTraffic network simulations also indicated acceptable operations throughout the study roadway network during both peak periods, with minimal vehicle queueing observed.
2. **Background Conditions (2024 No Build)**
   - A conservative **0.5%** annual growth rate was utilized to project the existing 2023 traffic volumes to the buildout year of 2024.
   - The results of the background conditions analysis indicates that all approaches and movements at the study intersections will continue to operate acceptably, at LOS D or better during both peak periods, in a manner similar to the existing conditions analysis. Review of SimTraffic microsimulations also indicates acceptable operations, similar to those observations made during existing conditions.
3. **Future Conditions (2024 Build)**
   - The results of the future conditions analysis indicates that, with the addition of the site generated traffic volumes, the study intersections are expected to operate acceptably, at LOS D or better during both peak periods, in a manner similar to the background conditions analysis. Review of SimTraffic network simulations also indicated acceptable operations throughout the study roadway network and at the proposed site driveway during both peak periods.
4. **Auxiliary Turn Lane Evaluation**
   - The RCOC auxiliary turn lane warranting thresholds were evaluated at the proposed site driveway on S. Adams Road, based on the future buildout traffic volumes. The results indicate that an eastbound right-turn deceleration lane is warranted along S. Adams Road at the proposed Site Drive.

5. Site Circulation and Queuing

- The results of the projected vehicle queuing evaluation indicated that, during the peak operations of the car wash, the projected traffic volumes can be adequately accommodated on the site, without exceeding the internal site circulation and impacting the adjacent roadway network.

11 RECOMMENDATIONS

- A right-turn deceleration taper is recommended on eastbound S. Adams Road at the site driveway.

Any questions related to this memorandum, study, analysis, and results should be addressed to Fleis & VandenBrink.

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Michigan.

Digitally signed by Jacob Swanson
Date: 2023.03.23 11:31:11 -04'00'

Attached:
Figures 1 – 6
Proposed Site Plan
Traffic Volume Data
Signal Timing Permit
Synchro / SimTraffic Results
RCOC Turn Lane Warrant
Poisson Distributions

FIGURE 1

SITE LOCATION

WHITEWATER EXPRESS CAR WASH - ROCHESTER HILLS, MI

LEGEND

SITE SITE LOCATION

NORTH

SCALE: NOT TO SCALE

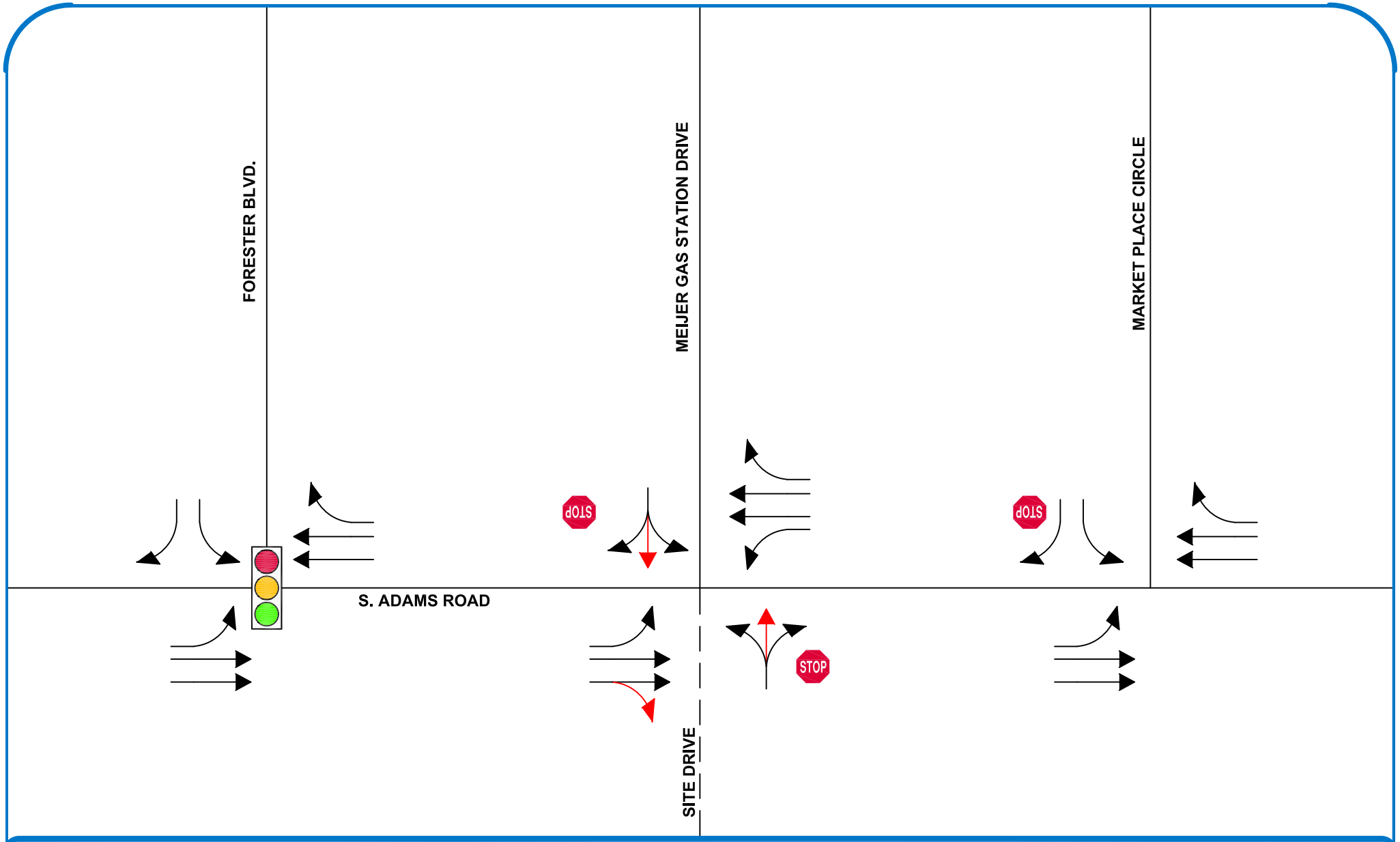


FIGURE 2

LANE USE AND TRAFFIC CONTROL

WHITEWATER EXPRESS CAR WASH - ROCHESTER HILLS, MI

LEGEND

- ROADS
- PROPOSED ROADS
- LANE USE
- PROPOSED LANE USE
- SIGNALIZED INTERSECTION
- UNSIGNALIZED INTERSECTION
- ROUNDABOUT INTERSECTION

NORTH

SCALE: NOT TO SCALE

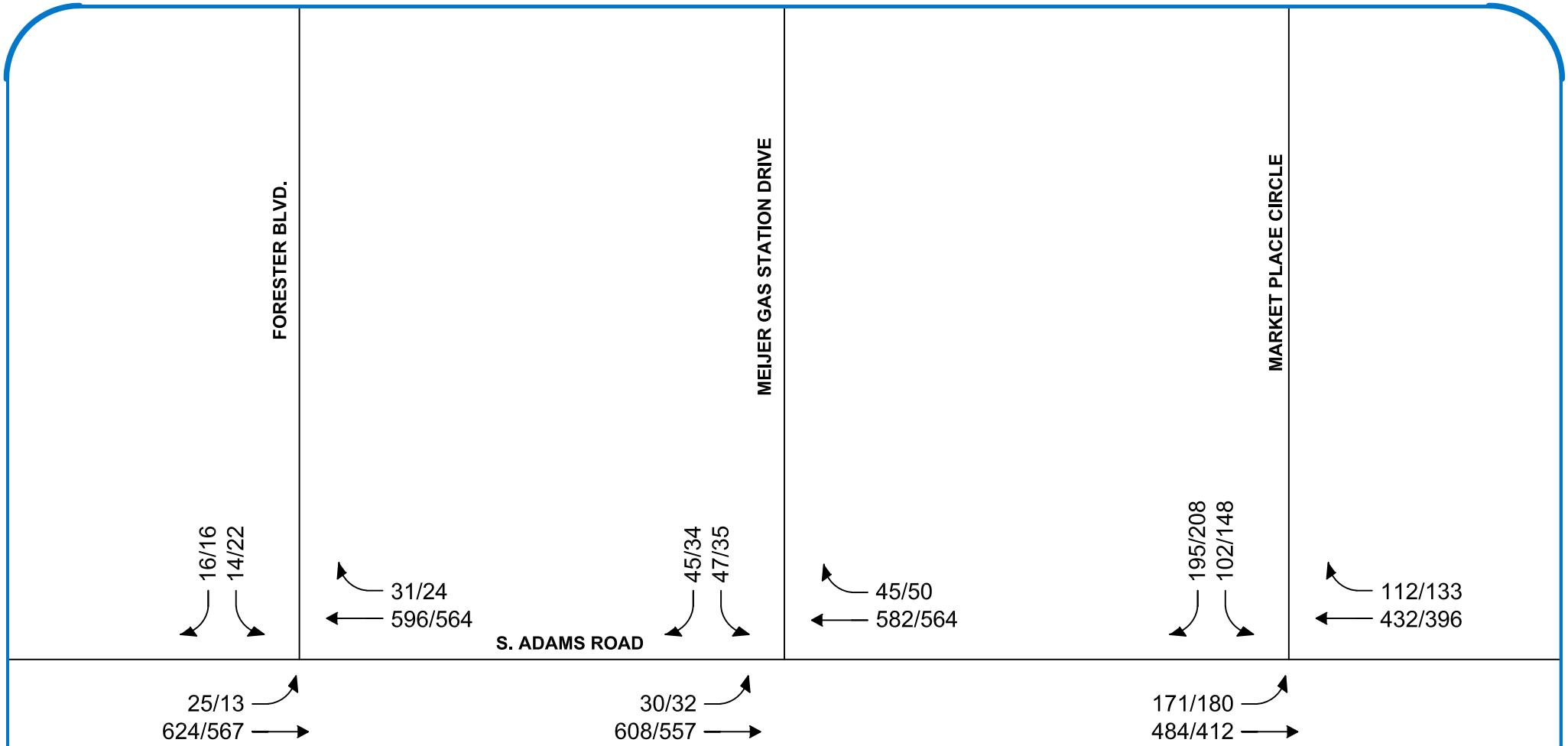


FIGURE 3

EXISTING TRAFFIC VOLUMES

WHITEWATER EXPRESS CAR WASH - ROCHESTER HILLS, MI

LEGEND

ROADS

PROPOSED ROADS

TRAFFIC VOLUMES (PM/SAT)

NORTH

SCALE: NOT TO SCALE

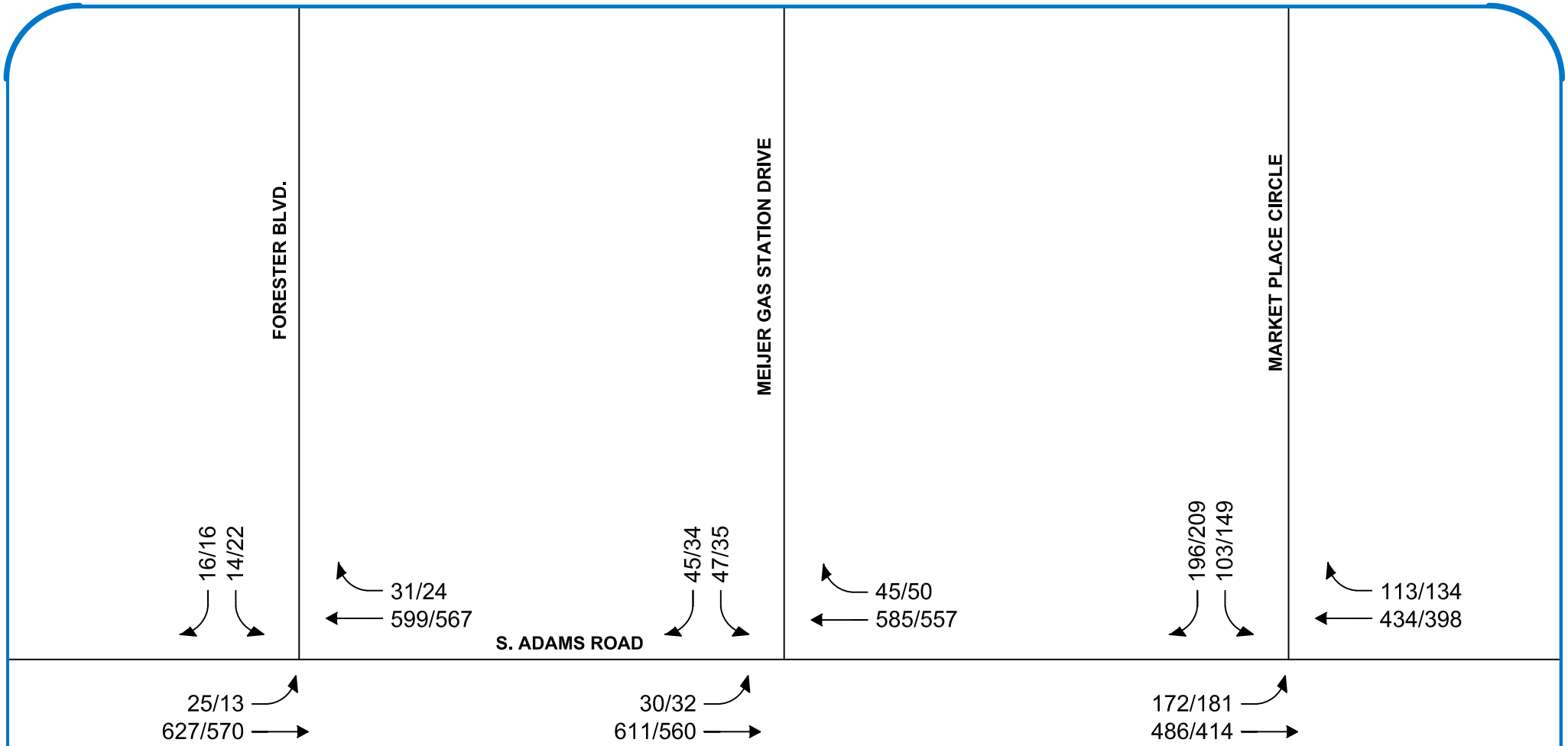


FIGURE 4

BACKGROUND TRAFFIC VOLUMES

WHITEWATER EXPRESS CAR WASH - ROCHESTER HILLS, MI

LEGEND

ROADS

PROPOSED ROADS

TRAFFIC VOLUMES (PM/SAT)

NORTH

SCALE: NOT TO SCALE

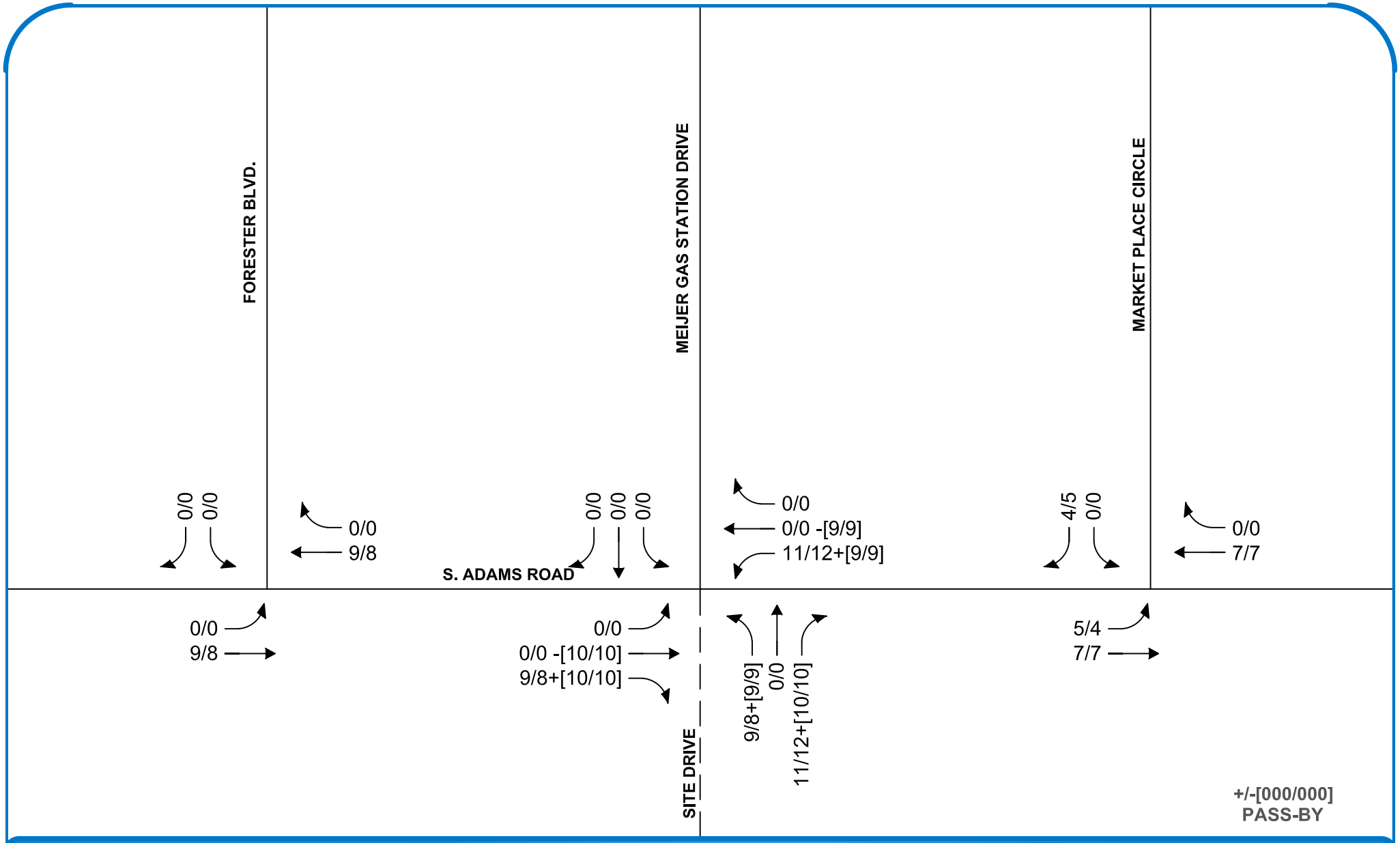


FIGURE 5

SITE-GENERATED TRAFFIC VOLUMES

WHITEWATER EXPRESS CAR WASH - ROCHESTER HILLS, MI

LEGEND

ROADS

PROPOSED ROADS

TRAFFIC VOLUMES (PM/SAT)

NORTH

SCALE: NOT TO SCALE

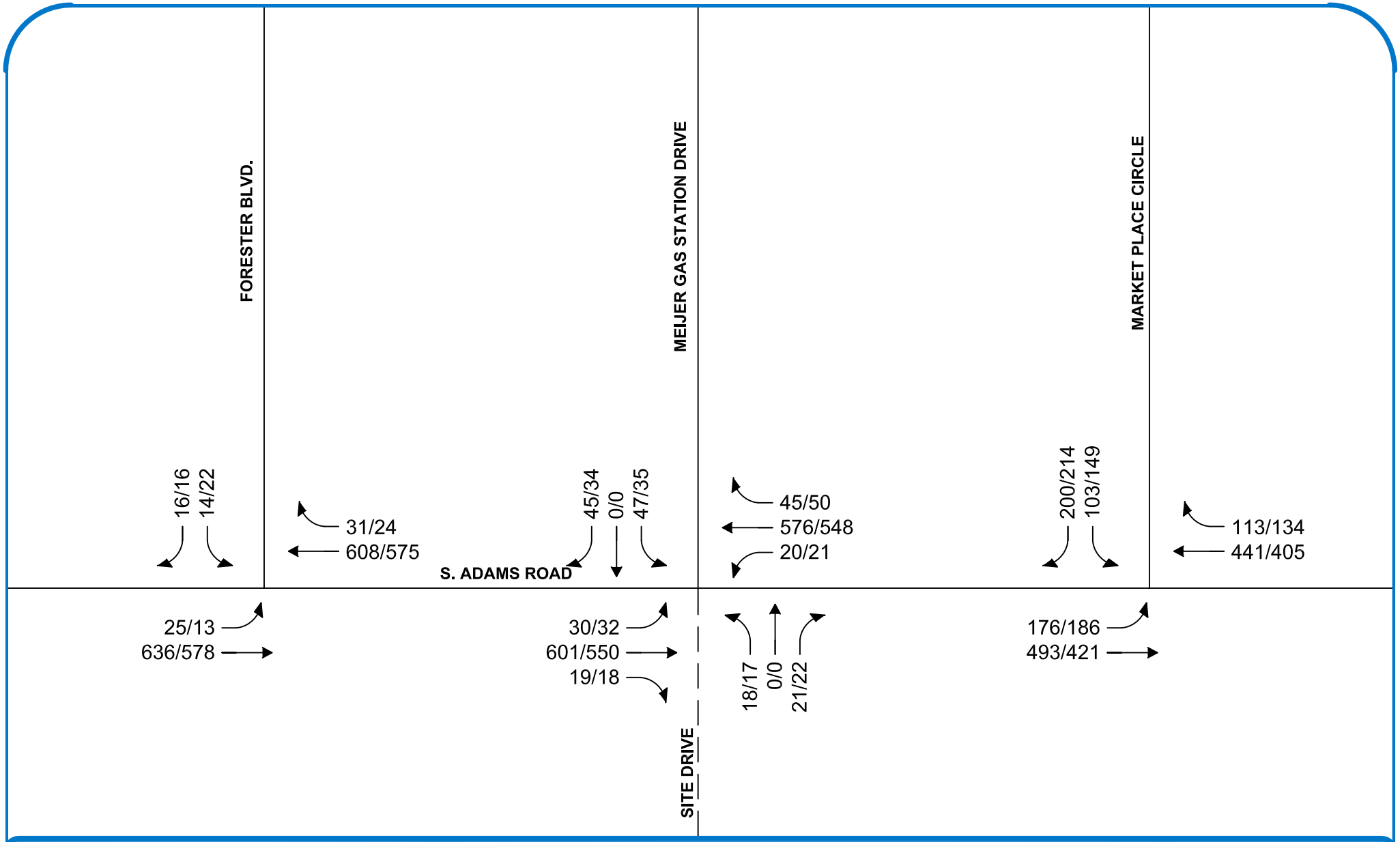


FIGURE 6

FUTURE TRAFFIC VOLUMES

WHITEWATER EXPRESS CAR WASH - ROCHESTER HILLS, MI

LEGEND

ROADS

PROPOSED ROADS

TRAFFIC VOLUMES (PM/SAT)

NORTH

SCALE: NOT TO SCALE

SITE DEVELOPMENT PLANS

FOR

WHITEWATER EXPRESS CAR WASH

PROPOSED CAR WASH

PARCEL ID: 15-30-302-031
2737 SOUTH ADAMS ROAD
CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN

OWNER

ROSE GROVE, LLC

APPLICANT

EROP, LLC
3130 NORTH KANDY LANE
DECATUR, ILLINOIS 62526
217-972-4296
JEFFJ@HYPERSHINECW.COM

ARCHITECT

REB ARCHITECTS
103 WIND HAVEN DR. SUITE 101
NICHOLASVILLE, KENTUCKY 40356
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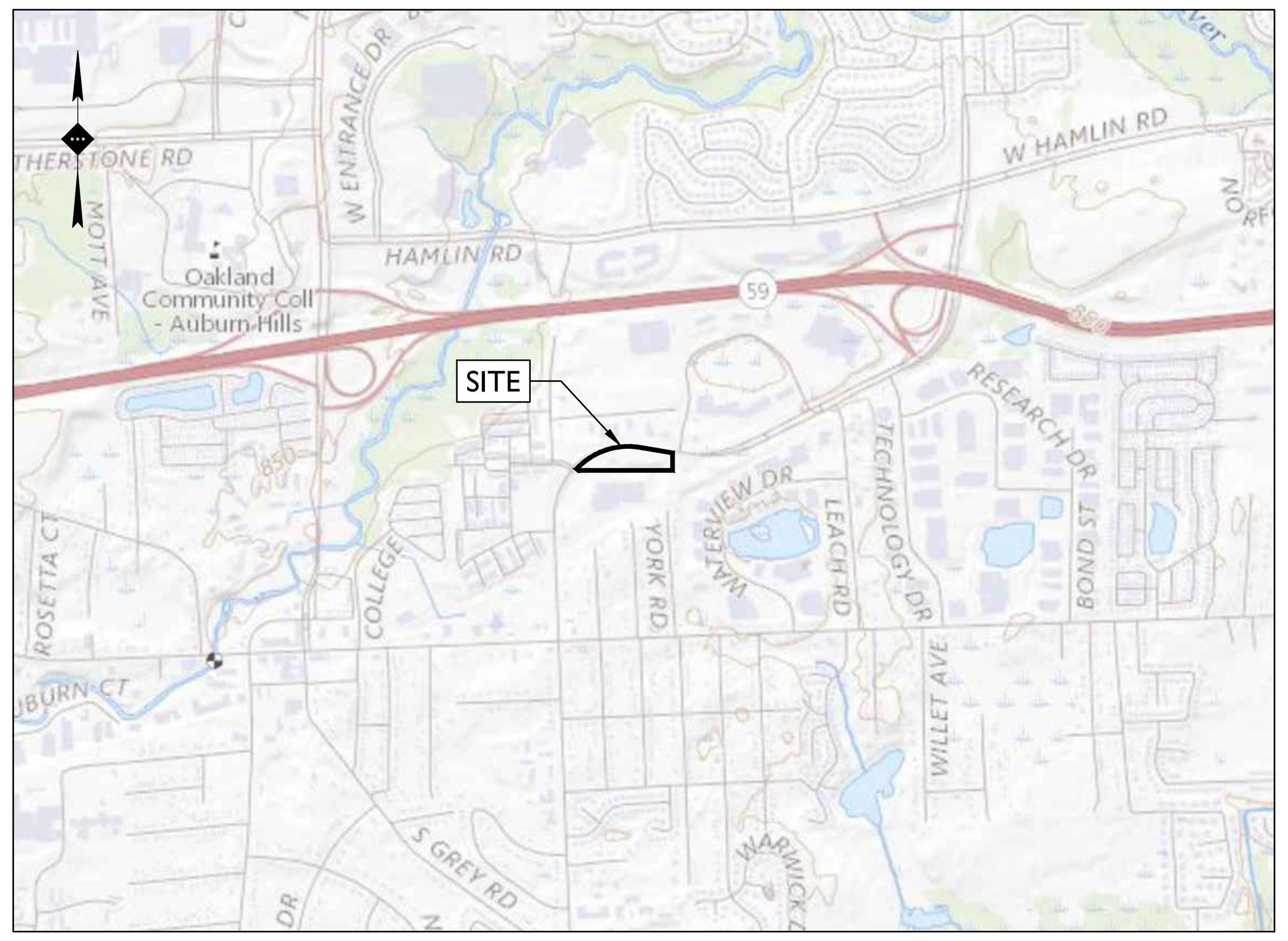


SOURCE: USGS ONLINE MAPPER

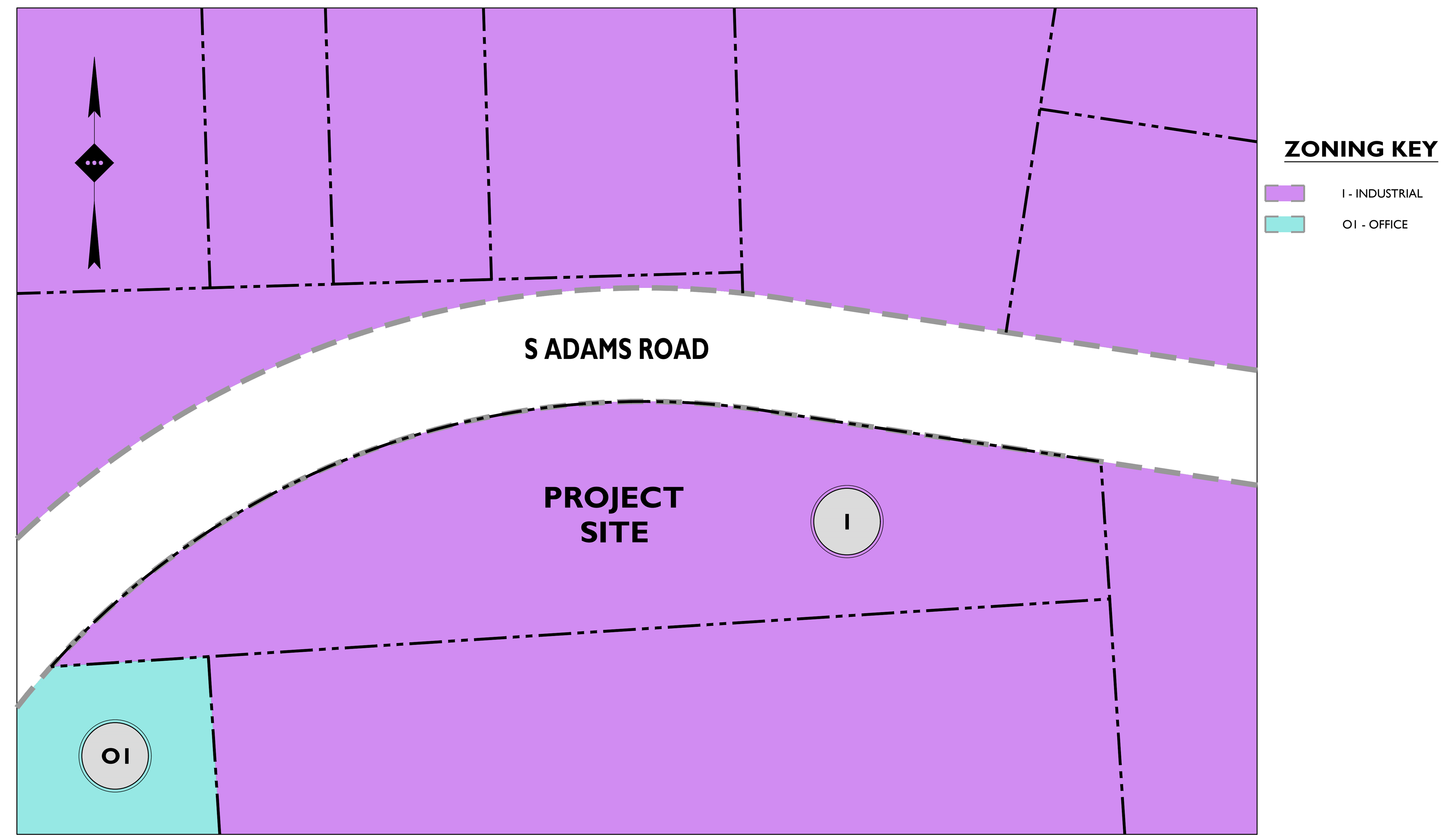
LOCATION MAP

SCALE: 1" = 2,000'±

SOURCE: GOOGLE EARTH PRO

AERIAL MAP

SCALE: 1" = 100'±



SOURCE:CITY OF ROCHESTER HILLS ZONING MAP

ZONING MAP

SCALE: 1" = 100'±

PLAN REFERENCE MATERIALS:

1. THIS PLAN SET REFERENCES THE FOLLOWING DOCUMENTS INCLUDING, BUT NOT LIMITED TO:
   - ALTA / NSPS LAND TITLE SURVEY PREPARED BY KEM-TEC & ASSOCIATES DATED 12/06/2022
   - ARCHITECTURAL PLANS PREPARED BY REB ARCHITECTS DATED XX/XX/2023
   - GEOTECHNICAL REPORT COMPETED BY G2 CONSULTING GROUP DATED XX/XX/2023
   - PHASE I ENVIRONMENTAL REPORT BY G2 CONSULTING GROUP DATED 12/06/2022
   - PHASE II ENVIRONMENTAL REPORT BY G2 CONSULTING GROUP DATED 01/31/2023
   - AERIAL MAP OBTAINED FROM GOOGLE EARTH PRO 01/24/2022
   - LOCATION MAP OBTAINED FROM USGS ONLINE MAPPER 01/24/2023
2. ALL REFERENCE MATERIAL LISTED ABOVE SHALL BE CONSIDERED A PART OF THIS PLAN SET AND ALL INFORMATION CONTAINED WITHIN THESE MATERIALS SHALL BE UTILIZED IN CONJUNCTION WITH THIS PLAN SET. THE CONTRACTOR IS RESPONSIBLE TO OBTAIN A COPY OF EACH REFERENCE AND REVIEW IT THOROUGHLY PRIOR TO THE START OF CONSTRUCTION.

811
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Call before you dig.

PLANS PREPARED BY:

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Phone 248.247.1115

ADDITIONAL SHEETS

DRAWING TITLE	SHEET #
ALTA / TOPOGRAPHIC SURVEY	1 OF 1
CITY WATER MAIN STANDARD DETAILS	1 OF 3
CITY WATER MAIN STANDARD DETAILS	2 OF 3
CITY WATER MAIN STANDARD DETAILS	3 OF 3
CITY SANITARY SEWER STANDARD DETAILS	1 OF 2
CITY SANITARY SEWER STANDARD DETAILS	2 OF 2
CITY STORM SYSTEM STANDARD DETAILS	1 OF 1
OAKLAND COUNTY WRC SESC DETAILS	1 OF 1

SHEET INDEX

ISSUE	DATE	BY	DESCRIPTION
1	02/16/2023	EM/RC	SUBMISSION FOR PLANNING COMMISSION APPROVAL

NOT APPROVED FOR CONSTRUCTION

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SITE DEVELOPMENT PLANS
EROP, LLC
PROPOSED CAR WASH
PARCEL ID: 15-30-302-031
2737 SOUTH ADAMS ROAD
CITY OF ROCHESTER HILLS
OAKLAND COUNTY, MICHIGAN

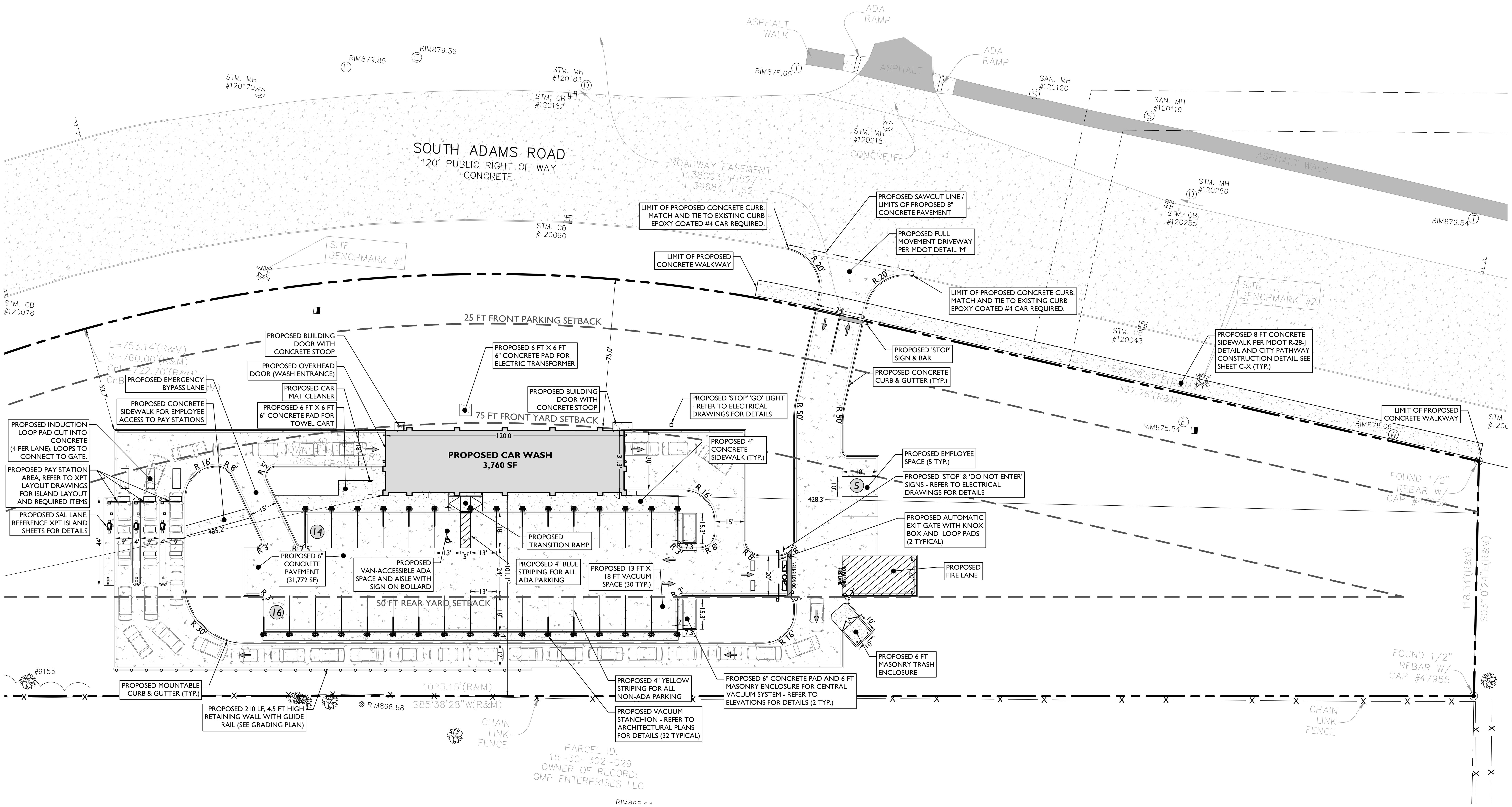
J. REID COOKSEY, P.E.
MICHIGAN LICENSE No. 6201069428
LICENSED PROFESSIONAL ENGINEER

STONEFIELD engineering & design

SCALE: AS SHOWN | PROJECT ID: DET-220436

TITLE: COVER SHEET

DRAWING: C-1



LAND USE AND ZONING

LAND USE AND ZONING			
PID: 70-15-30-302-031			
INDUSTRIAL (I)			
PROPOSED USE			
CAR WASH	PERMITTED USE *(PER CONSENT JUDGEMENT)*		
ZONING REQUIREMENT	**REQUIRED (I)**	**REQUIRED** *(PER CONSENT JUDGEMENT)*	**PROPOSED**
MINIMUM LOT AREA	N/A	N/A	163,152 SF (3.74 AC)
MAXIMUM BUILDING HEIGHT	42 FT (3 STORIES)	40 FT PLUS 5 FT PARAPET	22 FT (1 STORY)
MINIMUM FRONT YARD SETBACK	50 FT	75 FT (ADAMS ROAD)	75.0 FT
MINIMUM SIDE YARD SETBACK	50 FT	25 FT	428.3 FT
MINIMUM REAR YARD SETBACK	50 FT	50 FT	101.1 FT
MINIMUM FRONT PARKING SETBACK	N/A	25 FT	52.7 FT
MIN. PARKING LOT LANDSCAPING	5% (8,158 SF)	NONE	31% (5,427 SF)

OFF-STREET PARKING REQUIREMENTS

CODE SECTION	REQUIRED	PROPOSED
§ 5.138-11.204	CAR WASH: 1 SPACE PER EMPLOYEE (5 EMPLOYEES)(1 SPACE) = 5 SPACES	5 SPACES
§ 5.138-11.200.B	MAXIMUM PARKING: 25% EXCESS OF REQUIRED = 6 SPACES	5 SPACES
§ 5.138-11.204	STACKING: 4 SPACE PER WASH LINE 1 EXIT SPACE	28 STACKING SPACES (FROM PAYSTATIONS) 3 EXIT SPACES
§ 5.138-11.302	90° PARKING: 10 FT X 18 FT W/ 24 FT AISLE	10 FT X 18 FT W/ 24 FT AISLE

SYMBOL	DESCRIPTION
	PROPERTY LINE
	SETBACK LINE
	SAWCUT LINE
	PROPOSED CURB & GUTTER
	PROPOSED FLUSH CURB
	PROPOSED MOUNTABLE CURB
	PROPOSED SIGNS / BOLLARDS
	PROPOSED BUILDING
	PROPOSED CONCRETE
	PROPOSED AREA LIGHT
	PROPOSED BUILDING DOORS

PROPOSED SITE QUANTITIES

8" CONCRETE PAVEMENT	956 SF
8" CONCRETE PAVEMENT	32,522 SF
4" CONCRETE WALKWAY	4,610 SF
CONCRETE CURB & GUTTER	2,111 LF
MOUNTABLE CURB & GUTTER	493 LF
FLUSH CURB	21 LF
CONCRETE BOLLARD	4
ADA SIGN ON BOLLARD	1
TRAFFIC CONTROL SIGN	3
TRANSITION RAMP	1
TRASH ENCOSURE	1

THE TABLE ABOVE IS FOR MUNICIPAL REFERENCE ONLY. THE CONTRACTOR SHALL VERIFY ALL QUANTITIES PRIOR TO CONSTRUCTION.

GENERAL NOTES

1. THE CONTRACTOR SHALL VERIFY AND FAMILIARIZE THEMSELVES WITH THE EXISTING SITE CONDITIONS AND THE PROPOSED SCOPE OF WORK (INCLUDING DIMENSIONS, LAYOUT, ETC.) PRIOR TO INITIATING THE IMPROVEMENTS IDENTIFIED WITHIN THESE DOCUMENTS. SHOULD ANY DISCREPANCY BE FOUND BETWEEN THE EXISTING SITE CONDITIONS AND THE PROPOSED WORK THE CONTRACTOR SHALL NOTIFY STONEFIELD ENGINEERING & DESIGN, LLC. PRIOR TO THE START OF CONSTRUCTION.
2. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND ENSURE THAT ALL REQUIRED APPROVALS HAVE BEEN OBTAINED PRIOR TO THE START OF CONSTRUCTION. COPIES OF ALL REQUIRED PERMITS AND APPROVALS SHALL BE KEPT ON SITE AT ALL TIMES DURING CONSTRUCTION.
3. ALL CONTRACTORS WILL, TO THE FULLEST EXTENT PERMITTED BY LAW, INDEMNIFY AND HOLD HARMLESS STONEFIELD ENGINEERING & DESIGN, LLC. AND IT'S SUB-CONSULTANTS FROM AND AGAINST ANY DAMAGES AND LIABILITIES INCLUDING ATTORNEY'S FEES ARISING OUT OF CLAIMS BY EMPLOYEES OF THE CONTRACTOR IN ADDITION TO CLAIMS CONNECTED TO THE PROJECT AS A RESULT OF NOT CARRYING THE PROPER INSURANCE FOR WORKERS COMPENSATION, LIABILITY INSURANCE, AND LIMITS OF COMMERCIAL GENERAL LIABILITY INSURANCE.
4. THE CONTRACTOR SHALL NOT DEVIATE FROM THE PROPOSED IMPROVEMENTS IDENTIFIED WITHIN THIS PLAN SET UNLESS APPROVAL IS PROVIDED IN WRITING BY STONEFIELD ENGINEERING & DESIGN, LLC.
5. THE CONTRACTOR IS RESPONSIBLE TO DETERMINE THE MEANS AND METHODS OF CONSTRUCTION.
6. THE CONTRACTOR SHALL NOT PERFORM ANY WORK OR CAUSE DISTURBANCE ON A PRIVATE PROPERTY NOT CONTROLLED BY THE PERSON OR ENTITY WHO HAS AUTHORIZED THE WORK WITHOUT PRIOR WRITTEN CONSENT FROM THE OWNER OF THE PRIVATE PROPERTY.
7. THE CONTRACTOR IS RESPONSIBLE TO RESTORE ANY DAMAGED OR UNDERMINED STRUCTURE OR SITE FEATURE THAT IS IDENTIFIED TO REMAIN ON THE PLAN SET. ALL REPAIRS SHALL USE NEW MATERIALS TO RESTORE THE FEATURE TO ITS EXISTING CONDITION AT THE CONTRACTORS EXPENSE.
8. CONTRACTOR IS RESPONSIBLE TO PROVIDE THE APPROPRIATE SHOP DRAWINGS, PRODUCT DATA, AND OTHER REQUIRED SUBMITTALS FOR REVIEW. STONEFIELD ENGINEERING & DESIGN, LLC. WILL REVIEW THE SUBMITTALS IN ACCORDANCE WITH THE DESIGN INTENT AS REFLECTED WITHIN THE PLAN SET.
9. THE CONTRACTOR IS RESPONSIBLE FOR TRAFFIC CONTROL IN ACCORDANCE WITH MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
10. THE CONTRACTOR IS REQUIRED TO PERFORM ALL WORK IN THE PUBLIC RIGHT-OF-WAY IN ACCORDANCE WITH THE APPROPRIATE GOVERNING AUTHORITY AND SHALL BE RESPONSIBLE FOR THE PROCUREMENT OF STREET OPENING PERMITS.
11. THE CONTRACTOR IS REQUIRED TO RETAIN AN OSHA CERTIFIED SAFETY INSPECTOR TO BE PRESENT ON SITE AT ALL TIMES DURING CONSTRUCTION & DEMOLITION ACTIVITIES.
12. SHOULD AN EMPLOYEE OF STONEFIELD ENGINEERING & DESIGN, LLC. BE PRESENT ON SITE AT ANY TIME DURING CONSTRUCTION, IT DOES NOT RELIEVE THE CONTRACTOR OF ANY OF THE RESPONSIBILITIES AND REQUIREMENTS LISTED IN THE NOTES WITHIN THIS PLAN SET.

30' 0' 30' 60'
GRAPHIC SCALE IN FEET
1" = 30'

ISSUE	DATE	BY	DESCRIPTION
1	02/16/2023	EMR/C	SUBMISSION FOR PLANNING COMMISSION APPROVAL

NOT APPROVED FOR CONSTRUCTION

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SITE DEVELOPMENT PLANS

EROP, LLC
PROPOSED CAR WASH

PARCEL ID: 15-30-302-031
2737 SOUTH ADAMS ROAD
CITY OF ROCHESTER HILLS
OAKLAND COUNTY, MICHIGAN

STONEFIELD engineering & design

SCALE: 1" = 30' PROJECT ID: DET-220436

TITLE: SITE PLAN

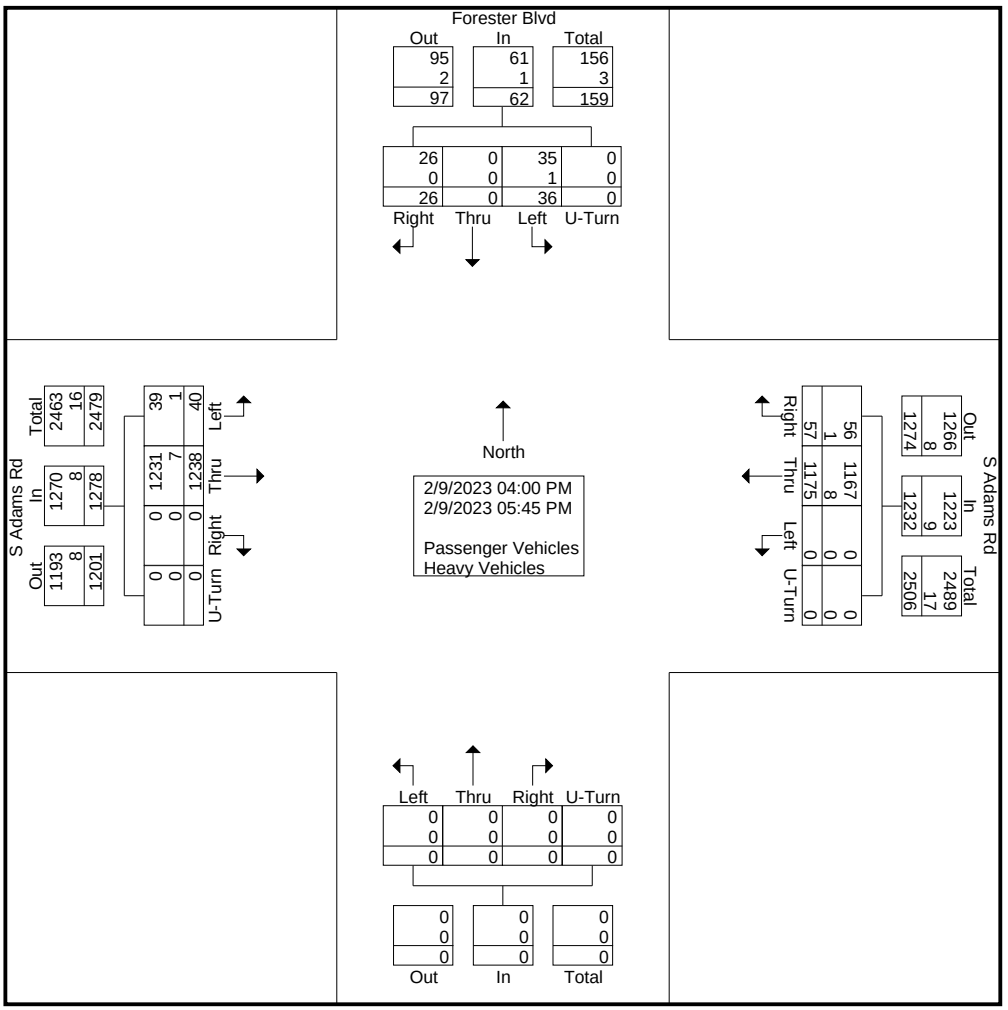
DRAWING: C-3

Quality Counts

File Name : 16087101 - Forester Blvd -- S Adams Rd
Site Code : 16087101
Start Date : 2/9/2023
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

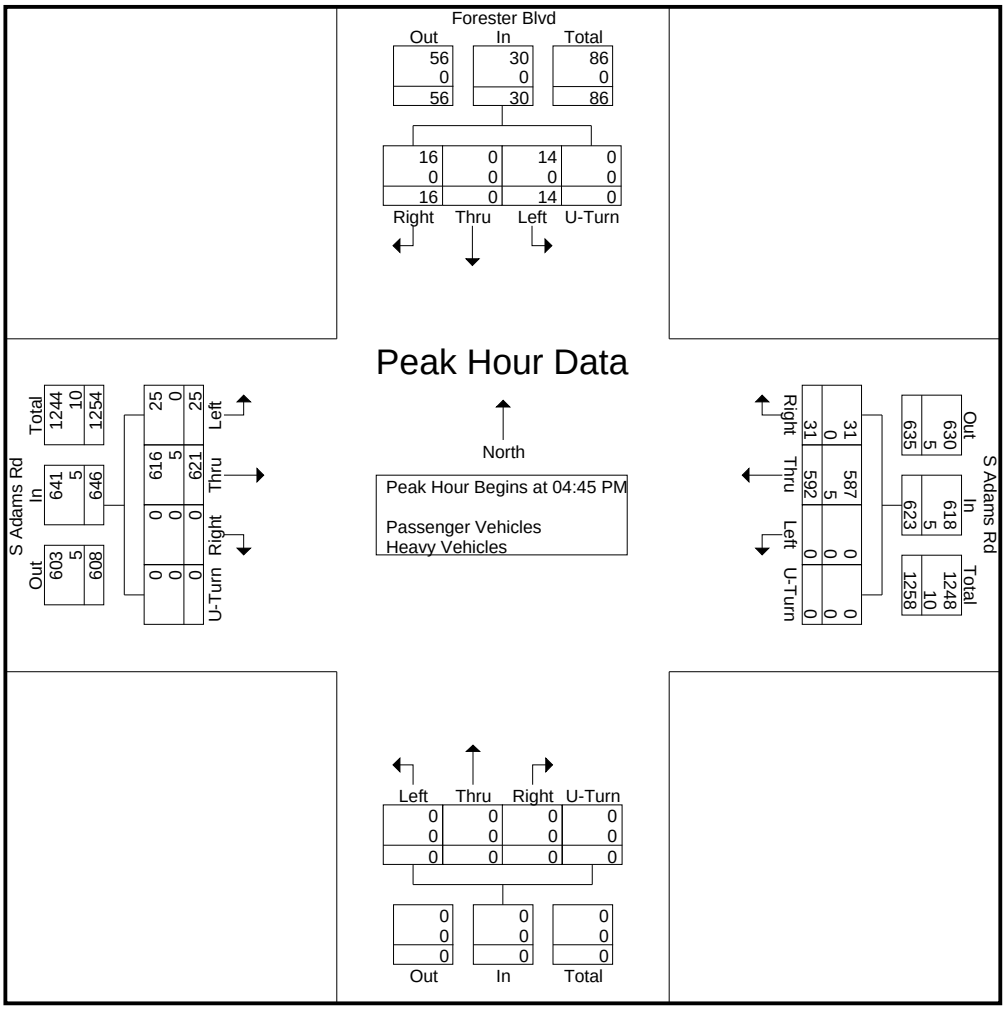
	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Forester Blvd Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
04:00 PM	3	150	0	0	153	0	162	6	0	168	0	0	0	0	0	6	0	1	0	7	328
04:15 PM	1	161	0	0	162	0	146	6	0	152	0	0	0	0	0	5	0	2	0	7	321
04:30 PM	4	151	0	0	155	0	143	7	0	150	0	0	0	0	0	5	0	4	0	9	314
04:45 PM	9	153	0	0	162	0	156	5	0	161	0	0	0	0	0	2	0	0	0	2	325
Total	17	615	0	0	632	0	607	24	0	631	0	0	0	0	0	18	0	7	0	25	1288
05:00 PM	8	139	0	0	147	0	162	12	0	174	0	0	0	0	0	4	0	4	0	8	329
05:15 PM	3	165	0	0	168	0	144	8	0	152	0	0	0	0	0	3	0	4	0	7	327
05:30 PM	5	164	0	0	169	0	130	6	0	136	0	0	0	0	0	5	0	8	0	13	318
05:45 PM	7	155	0	0	162	0	132	7	0	139	0	0	0	0	0	6	0	3	0	9	310
Total	23	623	0	0	646	0	568	33	0	601	0	0	0	0	0	18	0	19	0	37	1284
Grand Total	40	1238	0	0	1278	0	1175	57	0	1232	0	0	0	0	0	36	0	26	0	62	2572
Apprch %	3.1	96.9	0	0		0	95.4	4.6	0		0	0	0	0		58.1	0	41.9	0		
Total %	1.6	48.1	0	0	49.7	0	45.7	2.2	0	47.9	0	0	0	0	0	1.4	0	1	0	2.4	
Passenger Vehicles	39	1231	0	0	1270	0	1167	56	0	1223	0	0	0	0	0	35	0	26	0	61	2554
% Passenger Vehicles	97.5	99.4	0	0	99.4	0	99.3	98.2	0	99.3	0	0	0	0	0	97.2	0	100	0	98.4	99.3
Heavy Vehicles	1	7	0	0	8	0	8	1	0	9	0	0	0	0	0	1	0	0	0	1	18
% Heavy Vehicles	2.5	0.6	0	0	0.6	0	0.7	1.8	0	0.7	0	0	0	0	0	2.8	0	0	0	1.6	0.7



Quality Counts

File Name : 16087101 - Forester Blvd -- S Adams Rd
Site Code : 16087101
Start Date : 2/9/2023
Page No : 2

	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Forester Blvd Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	**9**	153	0	0	162	0	156	5	0	161	0	0	0	0	0	2	0	0	0	2	325
05:00 PM	8	139	0	0	147	0	**162**	**12**	0	**174**	0	0	0	0	0	4	0	4	0	8	**329**
05:15 PM	3	**165**	0	0	168	0	144	8	0	152	0	0	0	0	0	3	0	4	0	7	327
05:30 PM	5	164	0	0	**169**	0	130	6	0	136	0	0	0	0	0	**5**	0	**8**	0	**13**	318
Total Volume	25	621	0	0	646	0	592	31	0	623	0	0	0	0	0	14	0	16	0	30	1299
% App. Total	3.9	96.1	0	0		0	95	5	0		0	0	0	0		46.7	0	53.3	0		
PHF	.694	.941	.000	.000	.956	.000	.914	.646	.000	.895	.000	.000	.000	.000	.000	.700	.000	.500	.000	.577	.987
Passenger Vehicles	25	616	0	0	641	0	587	31	0	618	0	0	0	0	0	14	0	16	0	30	1289
% Passenger Vehicles	100	99.2	0	0	99.2	0	99.2	100	0	99.2	0	0	0	0	0	100	0	100	0	100	99.2
Heavy Vehicles	0	5	0	0	5	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	10
% Heavy Vehicles	0	0.8	0	0	0.8	0	0.8	0	0	0.8	0	0	0	0	0	0	0	0	0	0	0.8

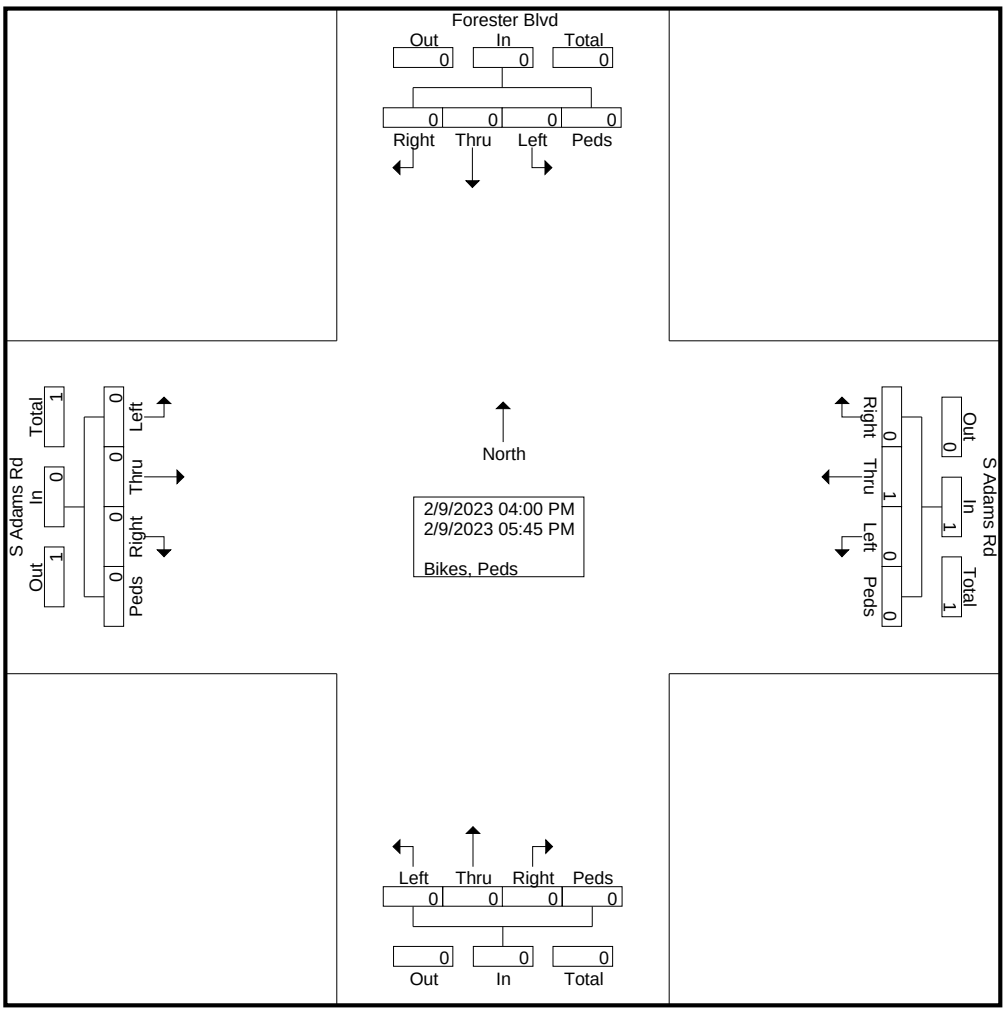


Quality Counts

File Name : 16087101 - Forester Blvd -- S Adams Rd
Site Code : 16087101
Start Date : 2/9/2023
Page No : 1

Groups Printed- Bikes, Peds

	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Forester Blvd Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Apprch %	0	0	0	0		0	100	0	0		0	0	0	0		0	0	0	0		
Total %	0	0	0	0	0	0	100	0	0	100	0	0	0	0	0	0	0	0	0	0	



Quality Counts

File Name : 16087101 - Forester Blvd -- S Adams Rd
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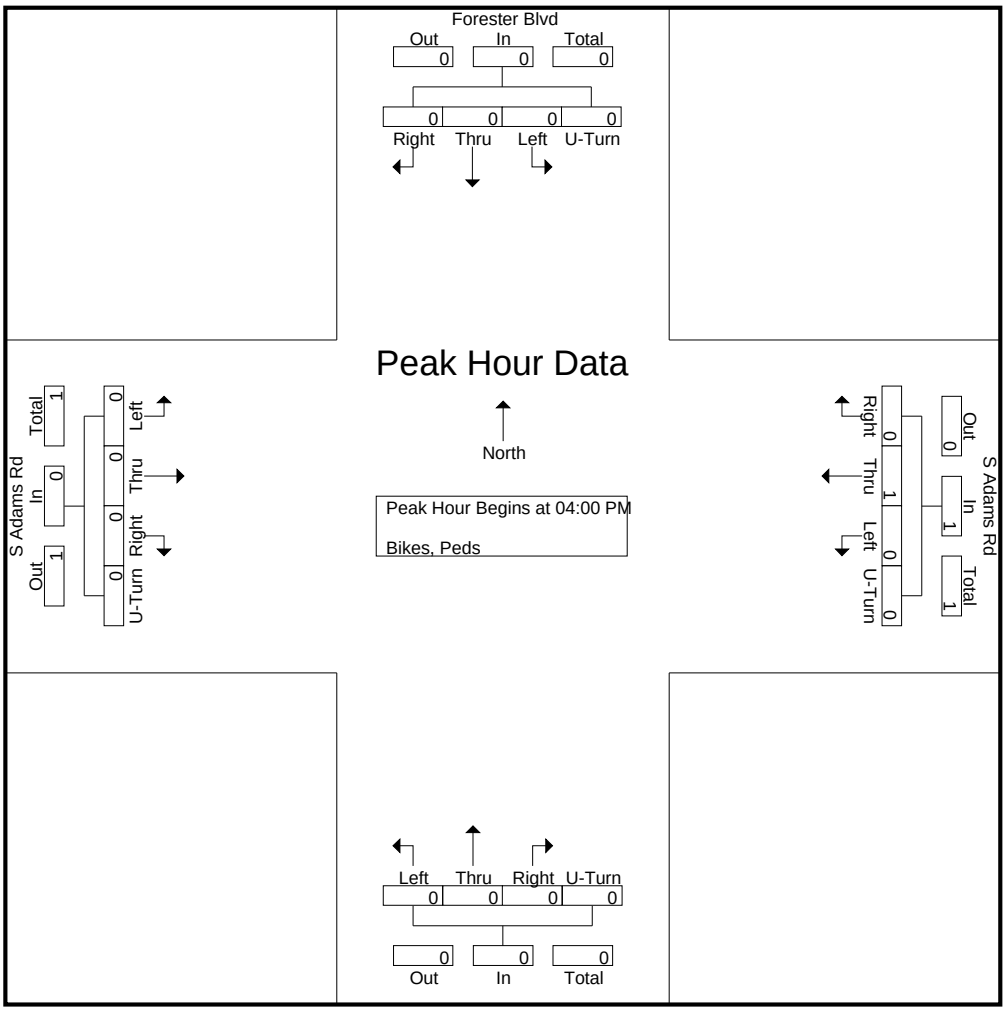
	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Forester Blvd Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	**1**
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
% App. Total	0	0	0	0		0	100	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250

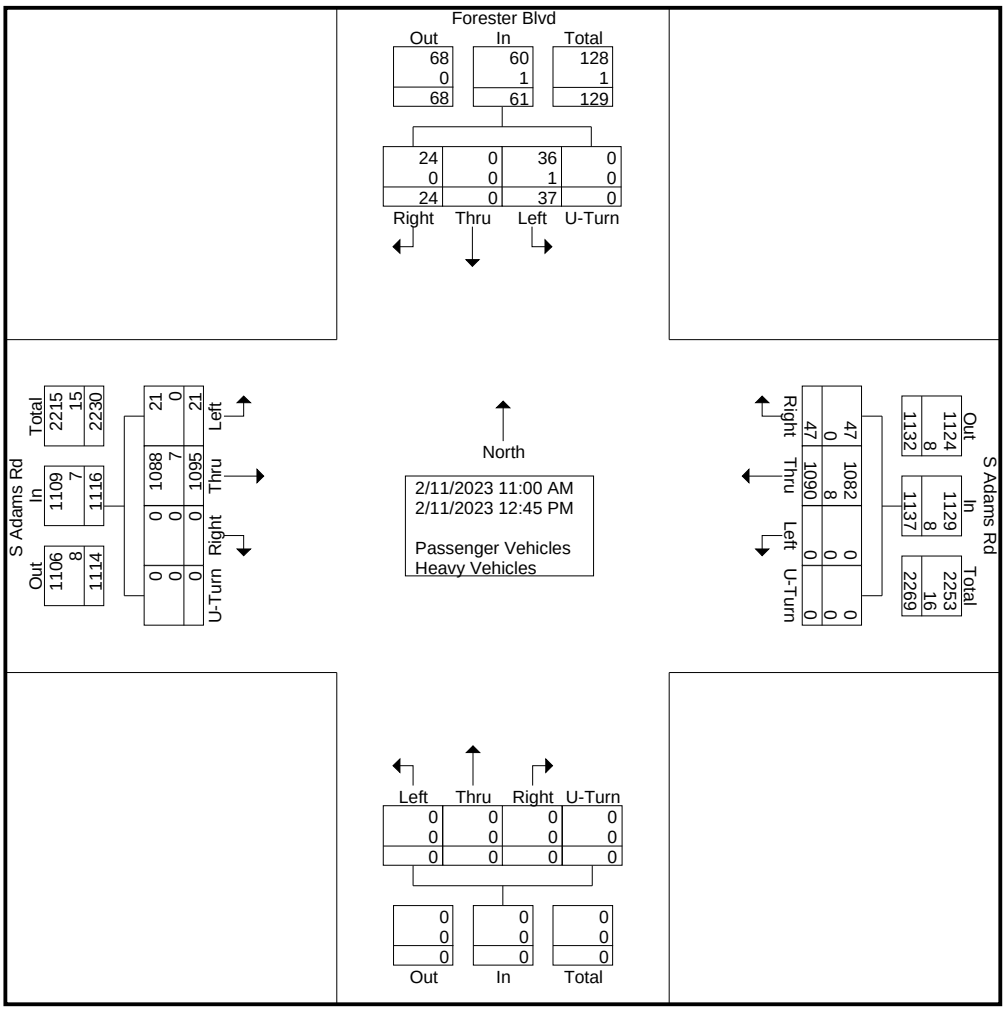


Quality Counts

File Name : 16087102 - Forester Blvd -- S Adams Rd
Site Code : 16087102
Start Date : 2/11/2023
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

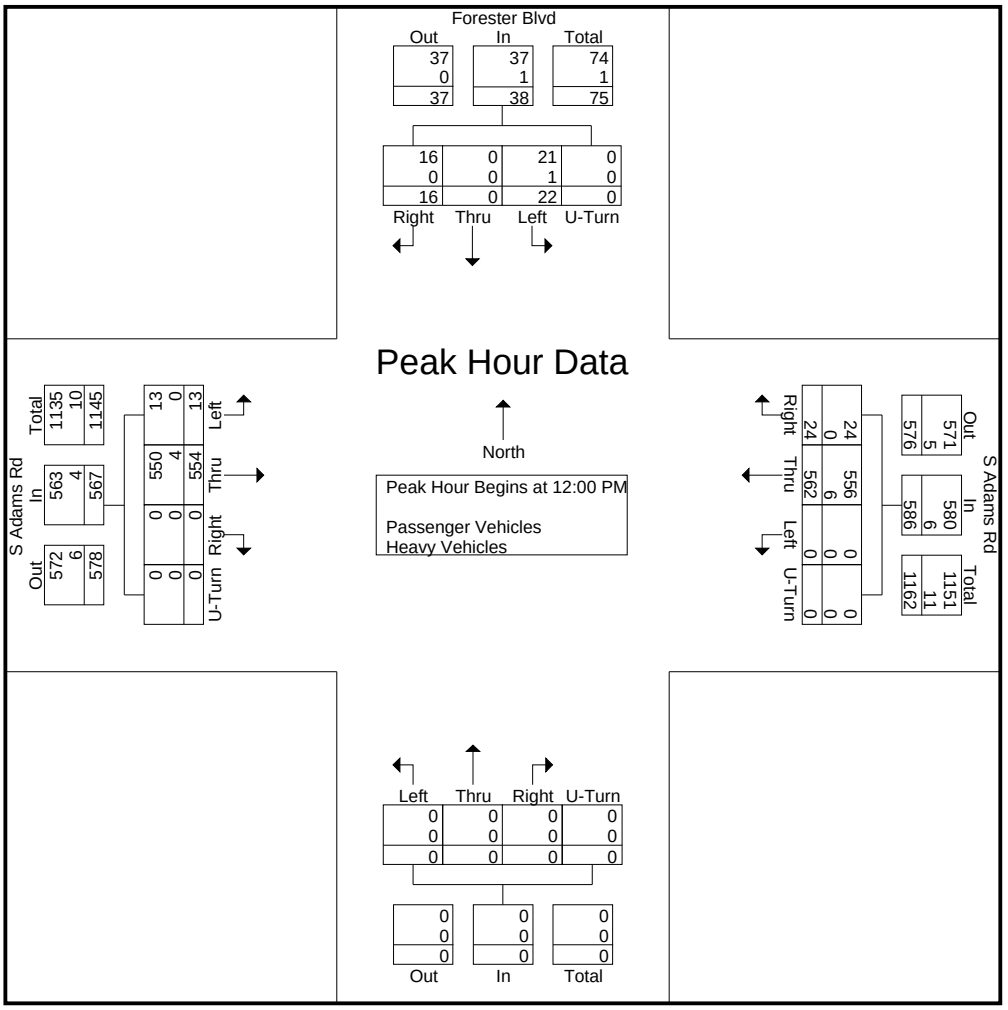
	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Forester Blvd Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
11:00 AM	0	134	0	0	134	0	124	2	0	126	0	0	0	0	0	4	0	2	0	6	266
11:15 AM	3	132	0	0	135	0	134	7	0	141	0	0	0	0	0	7	0	2	0	9	285
11:30 AM	4	145	0	0	149	0	137	6	0	143	0	0	0	0	0	3	0	3	0	6	298
11:45 AM	1	130	0	0	131	0	133	8	0	141	0	0	0	0	0	1	0	1	0	2	274
Total	8	541	0	0	549	0	528	23	0	551	0	0	0	0	0	15	0	8	0	23	1123
12:00 PM	2	117	0	0	119	0	130	2	0	132	0	0	0	0	0	8	0	3	0	11	262
12:15 PM	4	151	0	0	155	0	129	9	0	138	0	0	0	0	0	4	0	3	0	7	300
12:30 PM	4	153	0	0	157	0	149	3	0	152	0	0	0	0	0	5	0	6	0	11	320
12:45 PM	3	133	0	0	136	0	154	10	0	164	0	0	0	0	0	5	0	4	0	9	309
Total	13	554	0	0	567	0	562	24	0	586	0	0	0	0	0	22	0	16	0	38	1191
Grand Total	21	1095	0	0	1116	0	1090	47	0	1137	0	0	0	0	0	37	0	24	0	61	2314
Apprch %	1.9	98.1	0	0		0	95.9	4.1	0		0	0	0	0		60.7	0	39.3	0		
Total %	0.9	47.3	0	0	48.2	0	47.1	2	0	49.1	0	0	0	0	0	1.6	0	1	0	2.6	
Passenger Vehicles	21	1088	0	0	1109	0	1082	47	0	1129	0	0	0	0	0	36	0	24	0	60	2298
% Passenger Vehicles	100	99.4	0	0	99.4	0	99.3	100	0	99.3	0	0	0	0	0	97.3	0	100	0	98.4	99.3
Heavy Vehicles	0	7	0	0	7	0	8	0	0	8	0	0	0	0	0	1	0	0	0	1	16
% Heavy Vehicles	0	0.6	0	0	0.6	0	0.7	0	0	0.7	0	0	0	0	0	2.7	0	0	0	1.6	0.7



Quality Counts

File Name : 16087102 - Forester Blvd -- S Adams Rd
Site Code : 16087102
Start Date : 2/11/2023
Page No : 2

	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Forester Blvd Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	2	117	0	0	119	0	130	2	0	132	0	0	0	0	0	**8**	0	3	0	**11**	262
12:15 PM	**4**	151	0	0	155	0	129	9	0	138	0	0	0	0	0	4	0	3	0	7	300
12:30 PM	4	**153**	0	0	**157**	0	149	3	0	152	0	0	0	0	0	5	0	**6**	0	11	**320**
12:45 PM	3	133	0	0	136	0	**154**	**10**	0	**164**	0	0	0	0	0	5	0	4	0	9	309
Total Volume	13	554	0	0	567	0	562	24	0	586	0	0	0	0	0	22	0	16	0	38	1191
% App. Total	2.3	97.7	0	0		0	95.9	4.1	0		0	0	0	0		57.9	0	42.1	0		
PHF	.813	.905	.000	.000	.903	.000	.912	.600	.000	.893	.000	.000	.000	.000	.000	.688	.000	.667	.000	.864	.930
Passenger Vehicles	13	550	0	0	563	0	556	24	0	580	0	0	0	0	0	21	0	16	0	37	1180
% Passenger Vehicles	100	99.3	0	0	99.3	0	98.9	100	0	99.0	0	0	0	0	0	95.5	0	100	0	97.4	99.1
Heavy Vehicles	0	4	0	0	4	0	6	0	0	6	0	0	0	0	0	1	0	0	0	1	11
% Heavy Vehicles	0	0.7	0	0	0.7	0	1.1	0	0	1.0	0	0	0	0	0	4.5	0	0	0	2.6	0.9

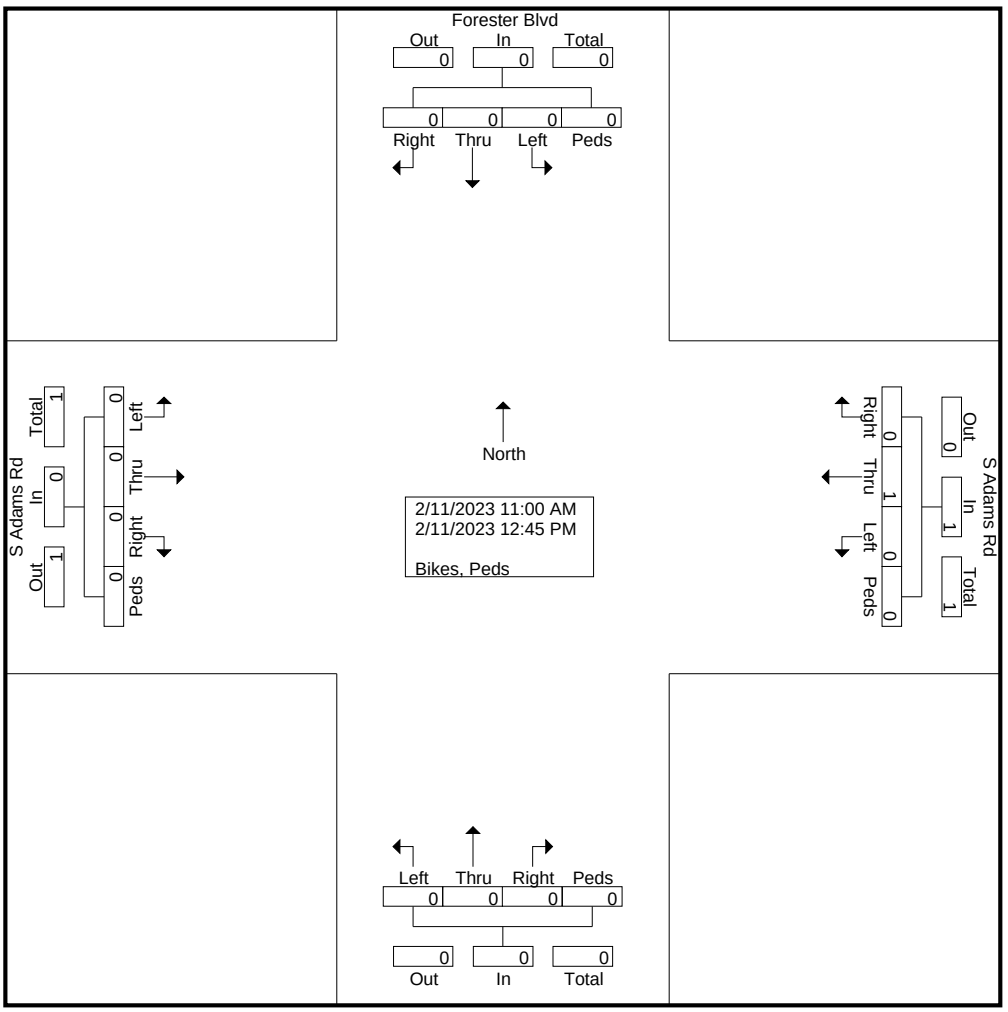


Quality Counts

File Name : 16087102 - Forester Blvd -- S Adams Rd
Site Code : 16087102
Start Date : 2/11/2023
Page No : 1

Groups Printed- Bikes, Peds

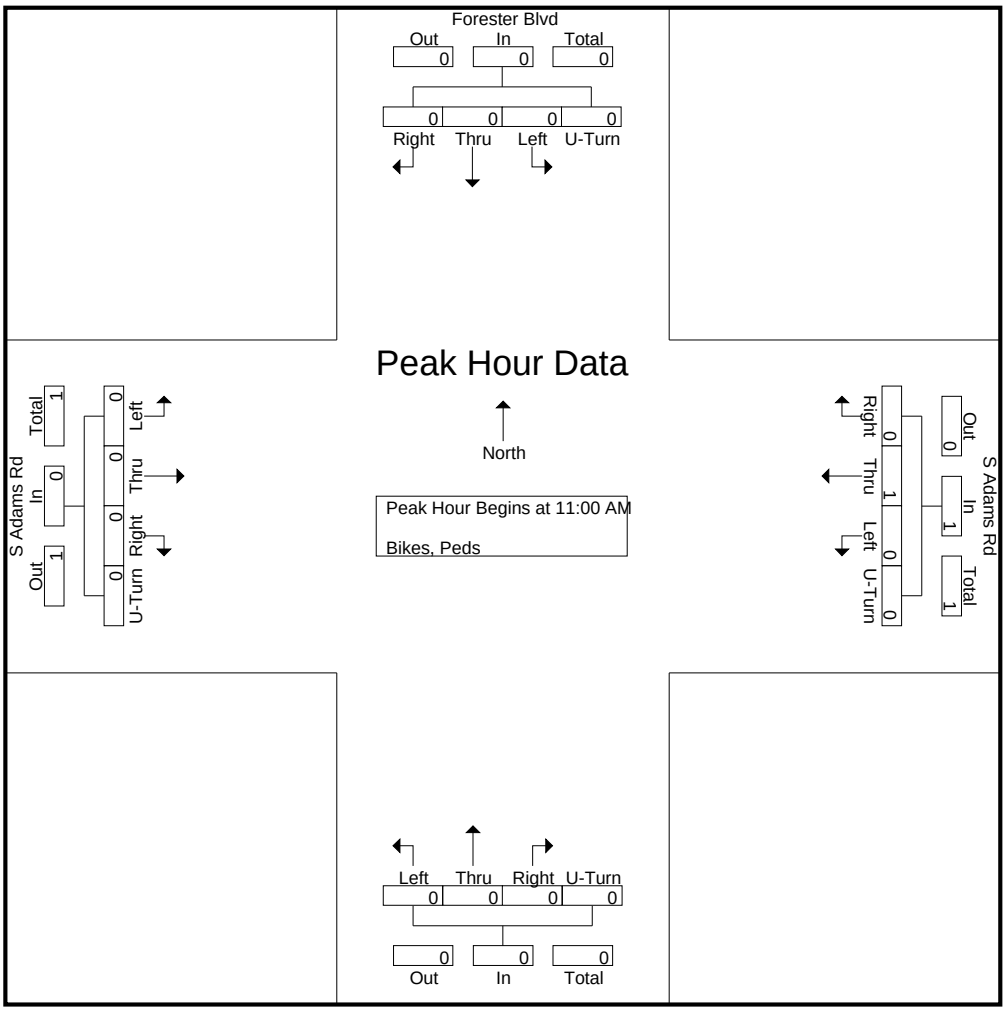
	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Forester Blvd Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Apprch %	0	0	0	0		0	100	0	0		0	0	0	0		0	0	0	0		
Total %	0	0	0	0	0	0	100	0	0	100	0	0	0	0	0	0	0	0	0	0	



Quality Counts

File Name : 16087102 - Forester Blvd -- S Adams Rd
Site Code : 16087102
Start Date : 2/11/2023
Page No : 2

	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Forester Blvd Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	**1**
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
% App. Total	0	0	0	0		0	100	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250

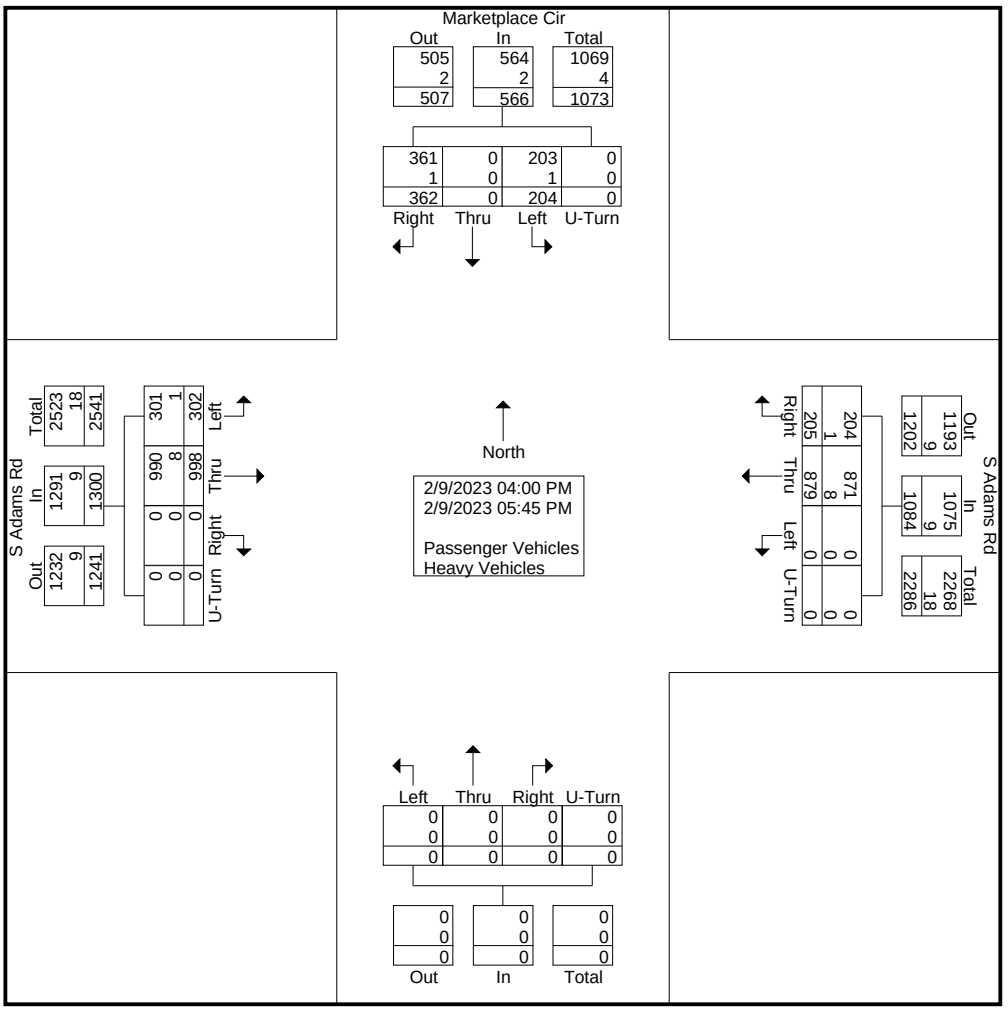


Quality Counts

File Name : 16087103 - Marketplace Cir -- S Adams Rd
Site Code : 16087103
Start Date : 2/9/2023
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

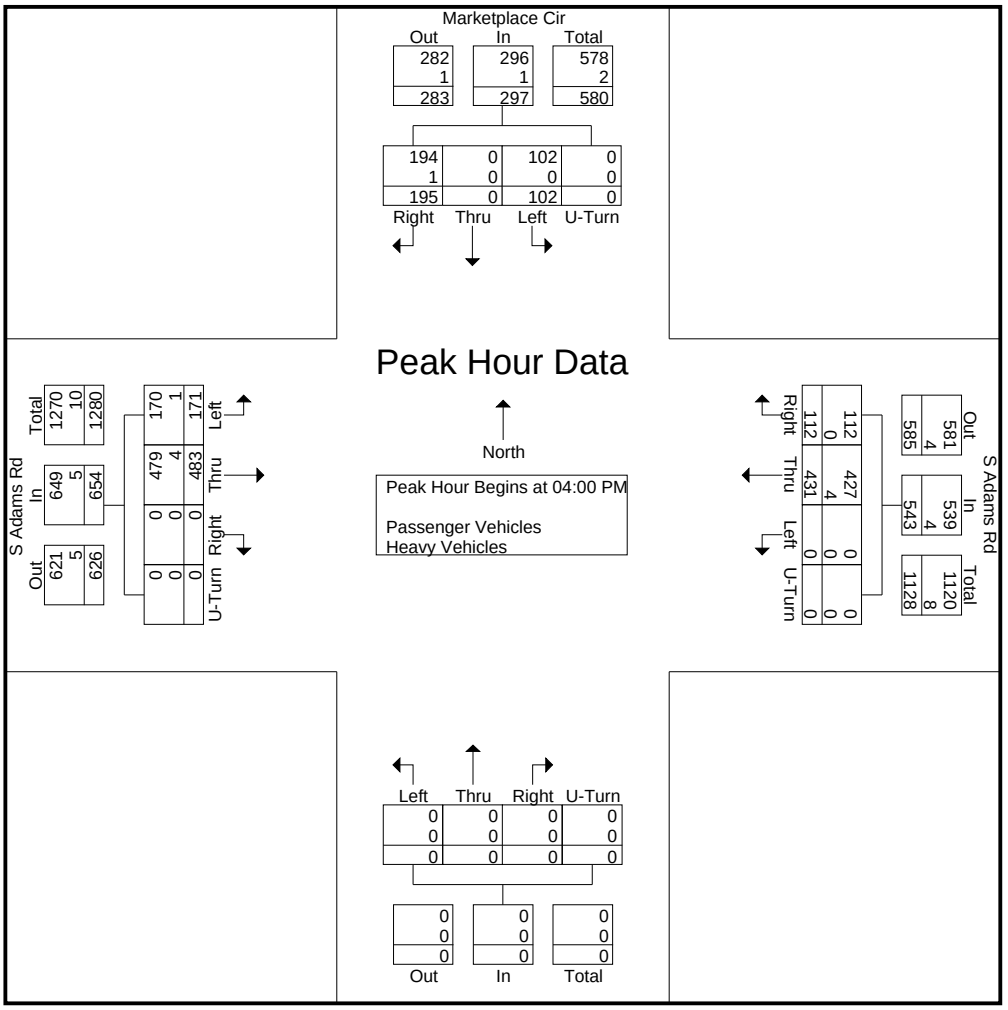
	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Marketplace Cir Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
04:00 PM	39	119	0	0	158	0	111	25	0	136	0	0	0	0	0	25	0	48	0	73	367
04:15 PM	45	127	0	0	172	0	119	27	0	146	0	0	0	0	0	26	0	45	0	71	389
04:30 PM	37	117	0	0	154	0	97	31	0	128	0	0	0	0	0	26	0	51	0	77	359
04:45 PM	50	120	0	0	170	0	104	29	0	133	0	0	0	0	0	25	0	51	0	76	379
Total	171	483	0	0	654	0	431	112	0	543	0	0	0	0	0	102	0	195	0	297	1494
05:00 PM	29	108	0	0	137	0	125	18	0	143	0	0	0	0	0	31	0	53	0	84	364
05:15 PM	31	140	0	0	171	0	115	33	0	148	0	0	0	0	0	29	0	38	0	67	386
05:30 PM	31	146	0	0	177	0	107	20	0	127	0	0	0	0	0	14	0	40	0	54	358
05:45 PM	40	121	0	0	161	0	101	22	0	123	0	0	0	0	0	28	0	36	0	64	348
Total	131	515	0	0	646	0	448	93	0	541	0	0	0	0	0	102	0	167	0	269	1456
Grand Total	302	998	0	0	1300	0	879	205	0	1084	0	0	0	0	0	204	0	362	0	566	2950
Apprch %	23.2	76.8	0	0		0	81.1	18.9	0		0	0	0	0		36	0	64	0		
Total %	10.2	33.8	0	0	44.1	0	29.8	6.9	0	36.7	0	0	0	0	0	6.9	0	12.3	0	19.2	
Passenger Vehicles	301	990	0	0	1291	0	871	204	0	1075	0	0	0	0	0	203	0	361	0	564	2930
% Passenger Vehicles	99.7	99.2	0	0	99.3	0	99.1	99.5	0	99.2	0	0	0	0	0	99.5	0	99.7	0	99.6	99.3
Heavy Vehicles	1	8	0	0	9	0	8	1	0	9	0	0	0	0	0	1	0	1	0	2	20
% Heavy Vehicles	0.3	0.8	0	0	0.7	0	0.9	0.5	0	0.8	0	0	0	0	0	0.5	0	0.3	0	0.4	0.7



Quality Counts

File Name : 16087103 - Marketplace Cir -- S Adams Rd
Site Code : 16087103
Start Date : 2/9/2023
Page No : 2

	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Marketplace Cir Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	39	119	0	0	158	0	111	25	0	136	0	0	0	0	0	25	0	48	0	73	367
04:15 PM	45	**127**	0	0	**172**	0	**119**	27	0	**146**	0	0	0	0	0	**26**	0	45	0	71	**389**
04:30 PM	37	117	0	0	154	0	97	**31**	0	128	0	0	0	0	0	26	0	**51**	0	**77**	359
04:45 PM	**50**	120	0	0	170	0	104	29	0	133	0	0	0	0	0	25	0	51	0	76	379
Total Volume	171	483	0	0	654	0	431	112	0	543	0	0	0	0	0	102	0	195	0	297	1494
% App. Total	26.1	73.9	0	0		0	79.4	20.6	0		0	0	0	0		34.3	0	65.7	0		
PHF	.855	.951	.000	.000	.951	.000	.905	.903	.000	.930	.000	.000	.000	.000	.000	.981	.000	.956	.000	.964	.960
Passenger Vehicles	170	479	0	0	649	0	427	112	0	539	0	0	0	0	0	102	0	194	0	296	1484
% Passenger Vehicles	99.4	99.2	0	0	99.2	0	99.1	100	0	99.3	0	0	0	0	0	100	0	99.5	0	99.7	99.3
Heavy Vehicles	1	4	0	0	5	0	4	0	0	4	0	0	0	0	0	0	0	1	0	1	10
% Heavy Vehicles	0.6	0.8	0	0	0.8	0	0.9	0	0	0.7	0	0	0	0	0	0	0	0.5	0	0.3	0.7

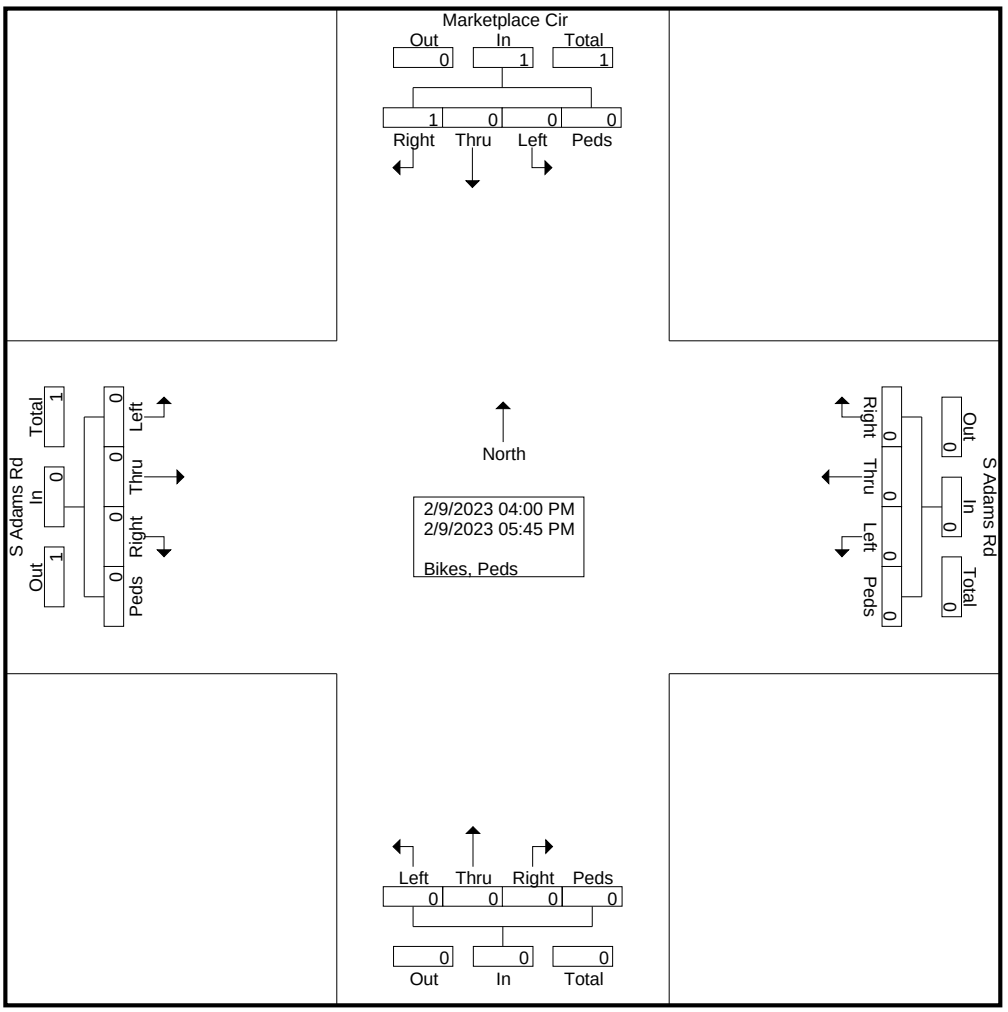


Quality Counts

File Name : 16087103 - Marketplace Cir -- S Adams Rd
Site Code : 16087103
Start Date : 2/9/2023
Page No : 1

Groups Printed- Bikes, Peds

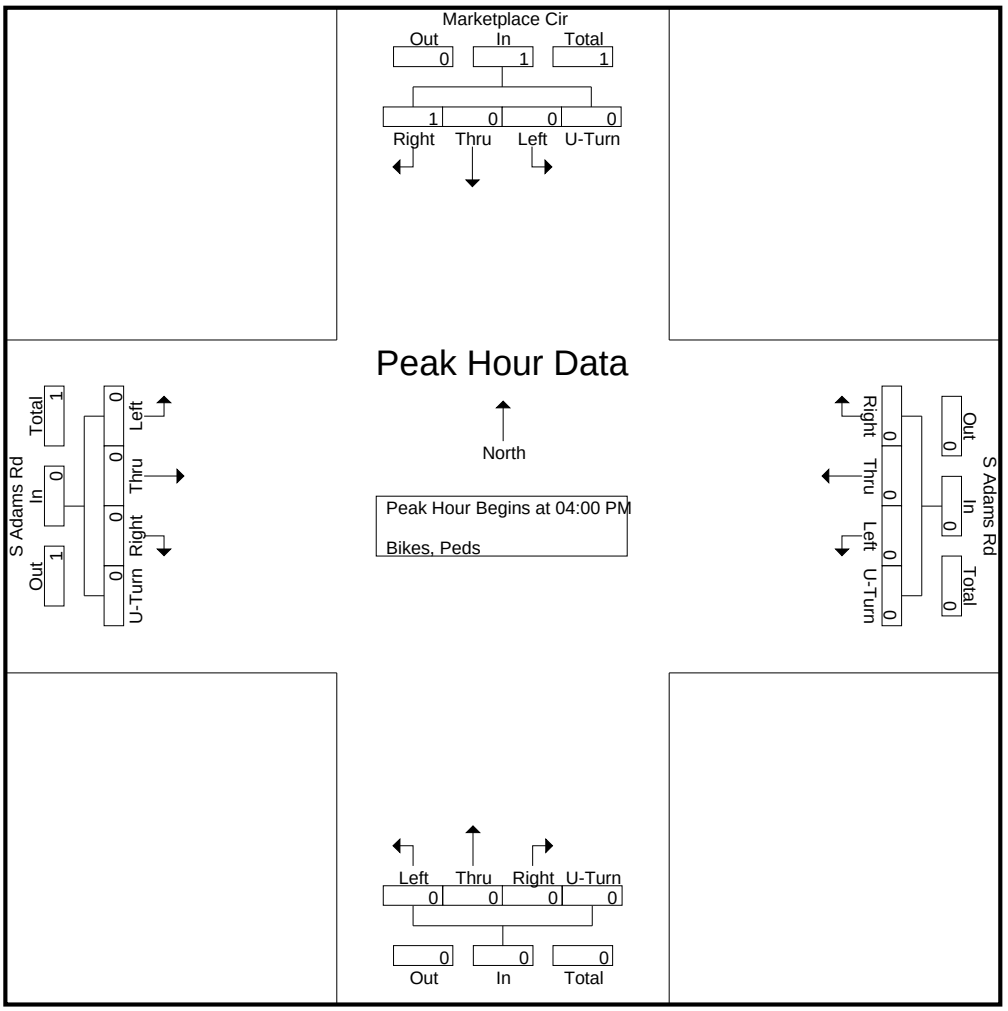
	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Marketplace Cir Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Apprch %	0	0	0	0		0	0	0	0		0	0	0	0		0	0	100	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	100	



Quality Counts

File Name : 16087103 - Marketplace Cir -- S Adams Rd
Site Code : 16087103
Start Date : 2/9/2023
Page No : 2

	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Marketplace Cir Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	**1**	**1**
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250

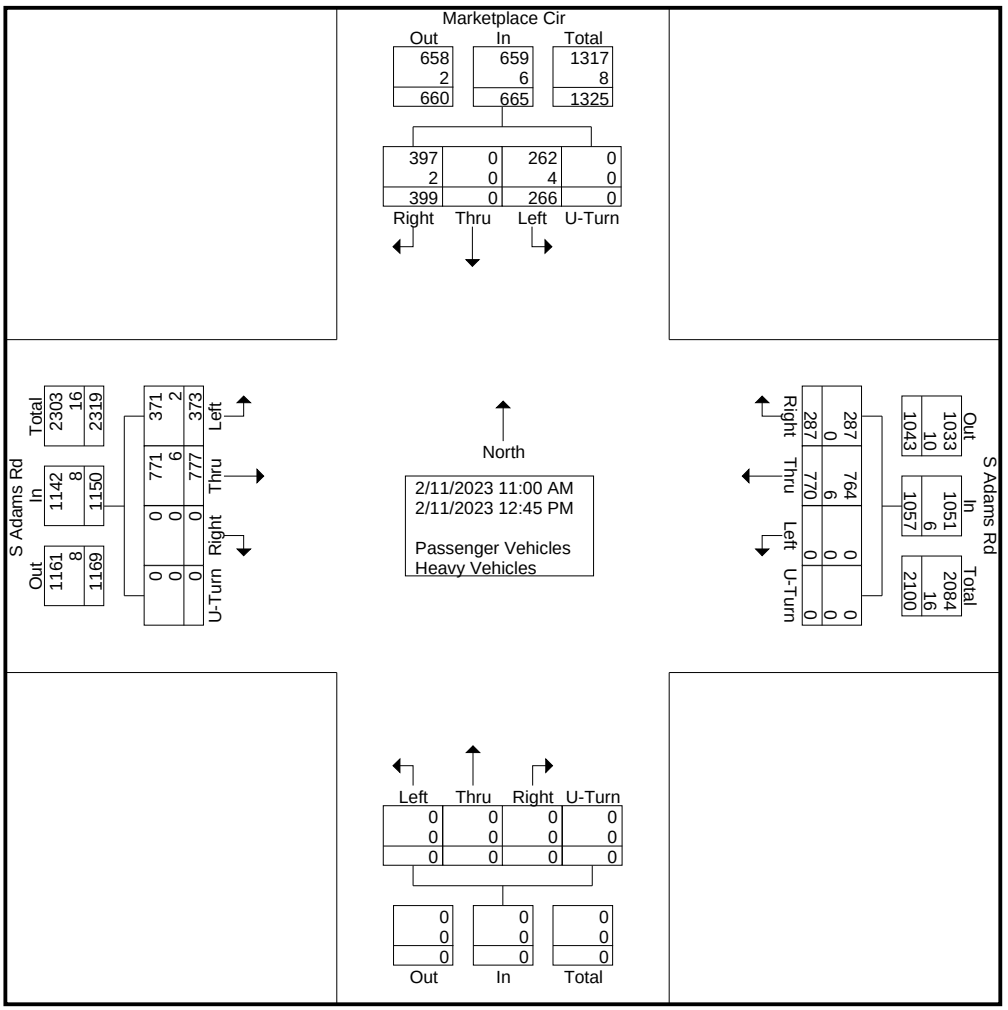


Quality Counts

File Name : 16087104 - Marketplace Cir -- S Adams Rd
Site Code : 16087104
Start Date : 2/11/2023
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

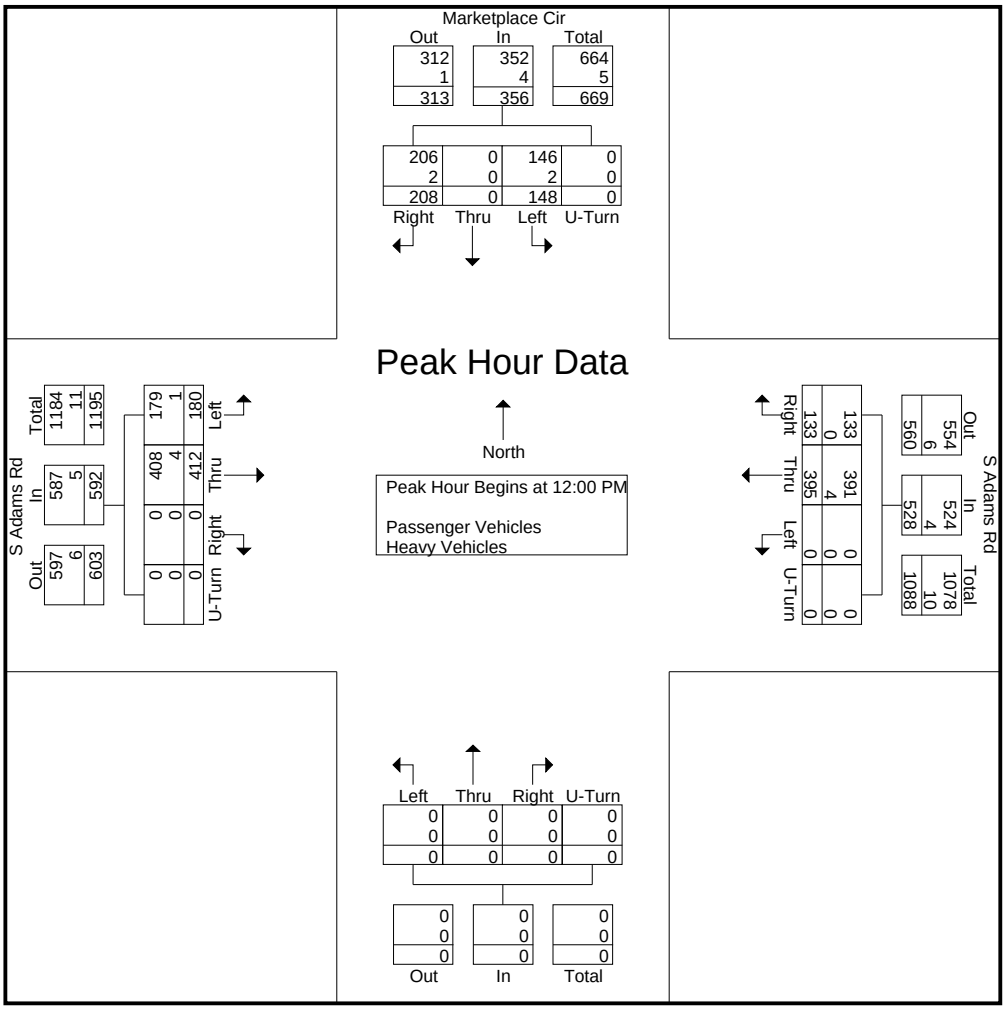
	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Marketplace Cir Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
11:00 AM	38	104	0	0	142	0	85	51	0	136	0	0	0	0	0	24	0	46	0	70	348
11:15 AM	49	88	0	0	137	0	99	34	0	133	0	0	0	0	0	23	0	46	0	69	339
11:30 AM	53	92	0	0	145	0	95	27	0	122	0	0	0	0	0	36	0	49	0	85	352
11:45 AM	53	81	0	0	134	0	96	42	0	138	0	0	0	0	0	35	0	50	0	85	357
Total	193	365	0	0	558	0	375	154	0	529	0	0	0	0	0	118	0	191	0	309	1396
12:00 PM	39	82	0	0	121	0	92	35	0	127	0	0	0	0	0	30	0	46	0	76	324
12:15 PM	43	121	0	0	164	0	88	25	0	113	0	0	0	0	0	34	0	53	0	87	364
12:30 PM	54	110	0	0	164	0	102	35	0	137	0	0	0	0	0	37	0	52	0	89	390
12:45 PM	44	99	0	0	143	0	113	38	0	151	0	0	0	0	0	47	0	57	0	104	398
Total	180	412	0	0	592	0	395	133	0	528	0	0	0	0	0	148	0	208	0	356	1476
Grand Total	373	777	0	0	1150	0	770	287	0	1057	0	0	0	0	0	266	0	399	0	665	2872
Apprch %	32.4	67.6	0	0		0	72.8	27.2	0		0	0	0	0		40	0	60	0		
Total %	13	27.1	0	0	40	0	26.8	10	0	36.8	0	0	0	0	0	9.3	0	13.9	0	23.2	
Passenger Vehicles	371	771	0	0	1142	0	764	287	0	1051	0	0	0	0	0	262	0	397	0	659	2852
% Passenger Vehicles	99.5	99.2	0	0	99.3	0	99.2	100	0	99.4	0	0	0	0	0	98.5	0	99.5	0	99.1	99.3
Heavy Vehicles	2	6	0	0	8	0	6	0	0	6	0	0	0	0	0	4	0	2	0	6	20
% Heavy Vehicles	0.5	0.8	0	0	0.7	0	0.8	0	0	0.6	0	0	0	0	0	1.5	0	0.5	0	0.9	0.7



Quality Counts

File Name : 16087104 - Marketplace Cir -- S Adams Rd
Site Code : 16087104
Start Date : 2/11/2023
Page No : 2

	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Marketplace Cir Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	39	82	0	0	121	0	92	35	0	127	0	0	0	0	0	30	0	46	0	76	324
12:15 PM	43	**121**	0	0	**164**	0	88	25	0	113	0	0	0	0	0	34	0	53	0	87	364
12:30 PM	**54**	110	0	0	164	0	102	35	0	137	0	0	0	0	0	37	0	52	0	89	390
12:45 PM	44	99	0	0	143	0	**113**	**38**	0	**151**	0	0	0	0	0	**47**	0	**57**	0	**104**	**398**
Total Volume	180	412	0	0	592	0	395	133	0	528	0	0	0	0	0	148	0	208	0	356	1476
% App. Total	30.4	69.6	0	0		0	74.8	25.2	0		0	0	0	0		41.6	0	58.4	0		
PHF	.833	.851	.000	.000	.902	.000	.874	.875	.000	.874	.000	.000	.000	.000	.000	.787	.000	.912	.000	.856	.927
Passenger Vehicles	179	408	0	0	587	0	391	133	0	524	0	0	0	0	0	146	0	206	0	352	1463
% Passenger Vehicles	99.4	99.0	0	0	99.2	0	99.0	100	0	99.2	0	0	0	0	0	98.6	0	99.0	0	98.9	99.1
Heavy Vehicles	1	4	0	0	5	0	4	0	0	4	0	0	0	0	0	2	0	2	0	4	13
% Heavy Vehicles	0.6	1.0	0	0	0.8	0	1.0	0	0	0.8	0	0	0	0	0	1.4	0	1.0	0	1.1	0.9

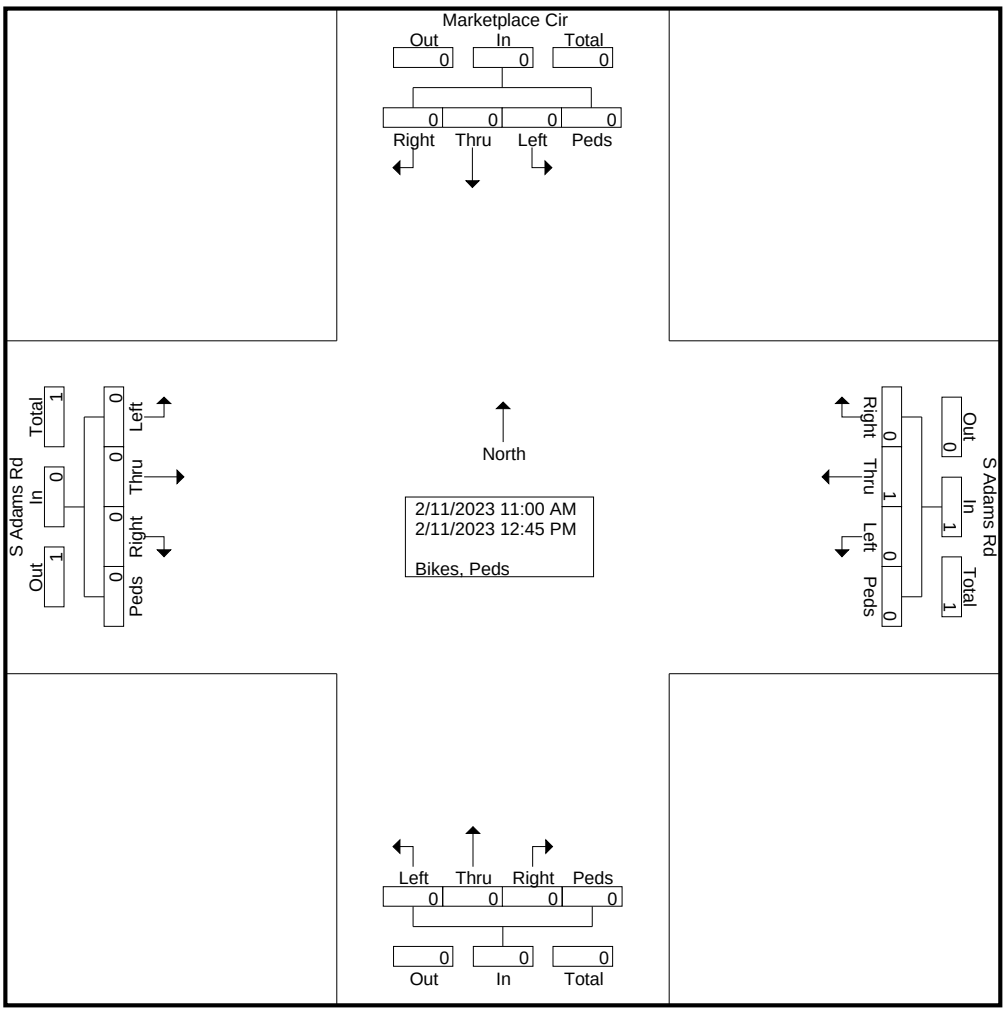


Quality Counts

File Name : 16087104 - Marketplace Cir -- S Adams Rd
Site Code : 16087104
Start Date : 2/11/2023
Page No : 1

Groups Printed- Bikes, Peds

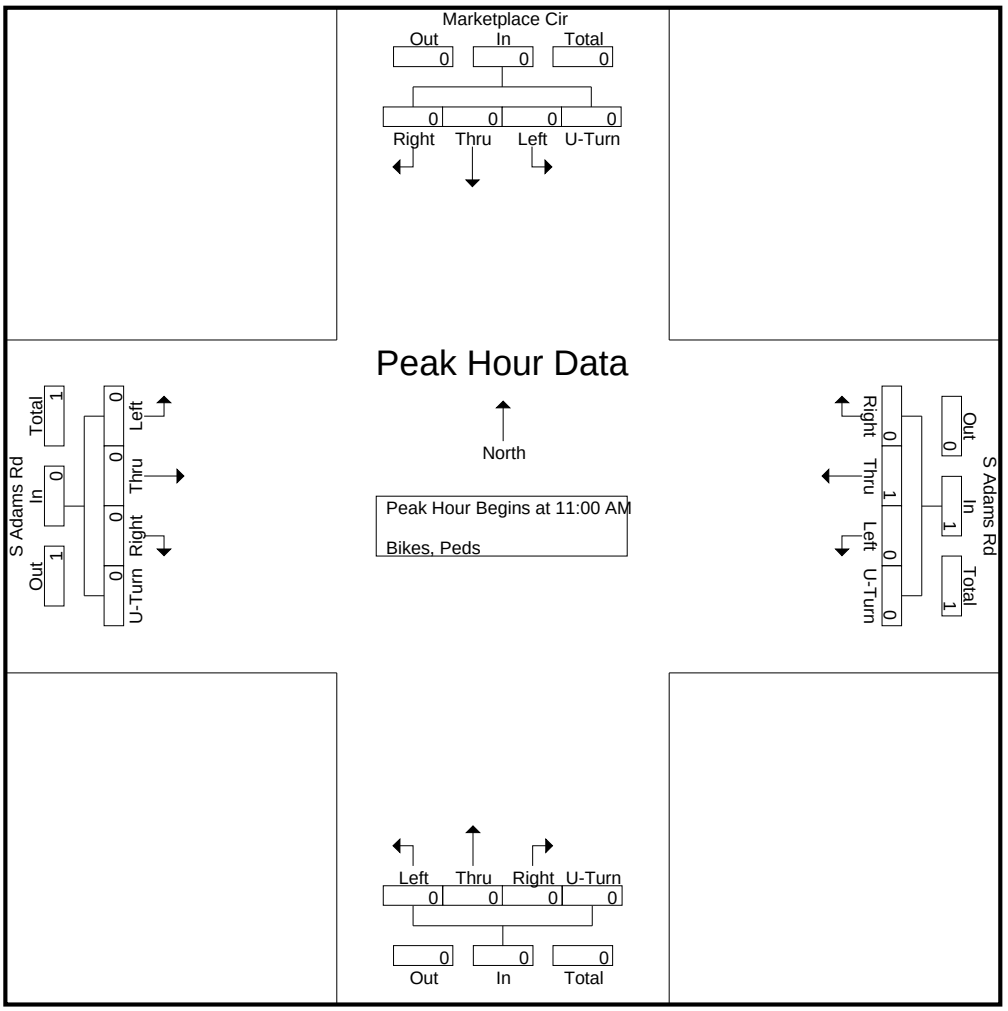
	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Marketplace Cir Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Apprch %	0	0	0	0		0	100	0	0		0	0	0	0		0	0	0	0		
Total %	0	0	0	0	0	0	100	0	0	100	0	0	0	0	0	0	0	0	0	0	



Quality Counts

File Name : 16087104 - Marketplace Cir -- S Adams Rd
Site Code : 16087104
Start Date : 2/11/2023
Page No : 2

	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Marketplace Cir Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	**1**
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
% App. Total	0	0	0	0		0	100	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250

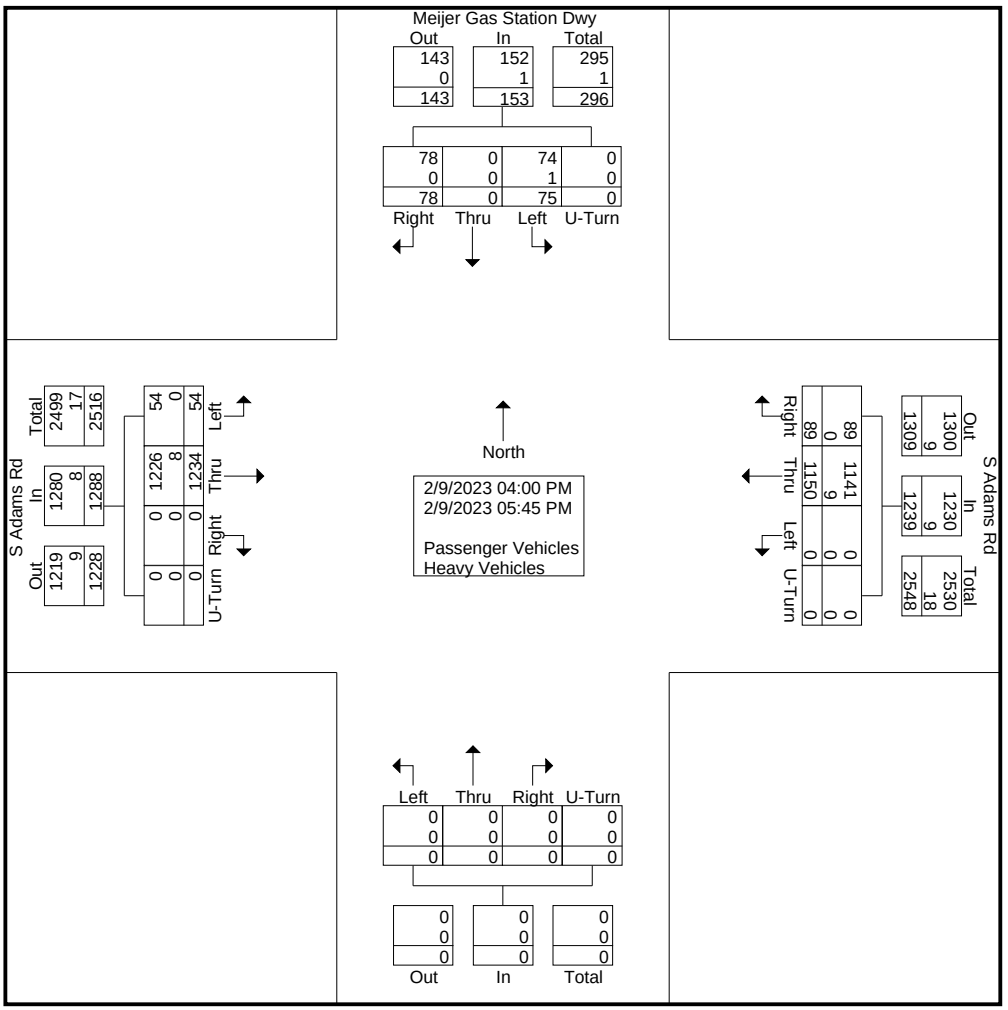


Quality Counts

File Name : 16087105 - Meijer Gas Station Dwy -- S Adams Rd
Site Code : 16087105
Start Date : 2/9/2023
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

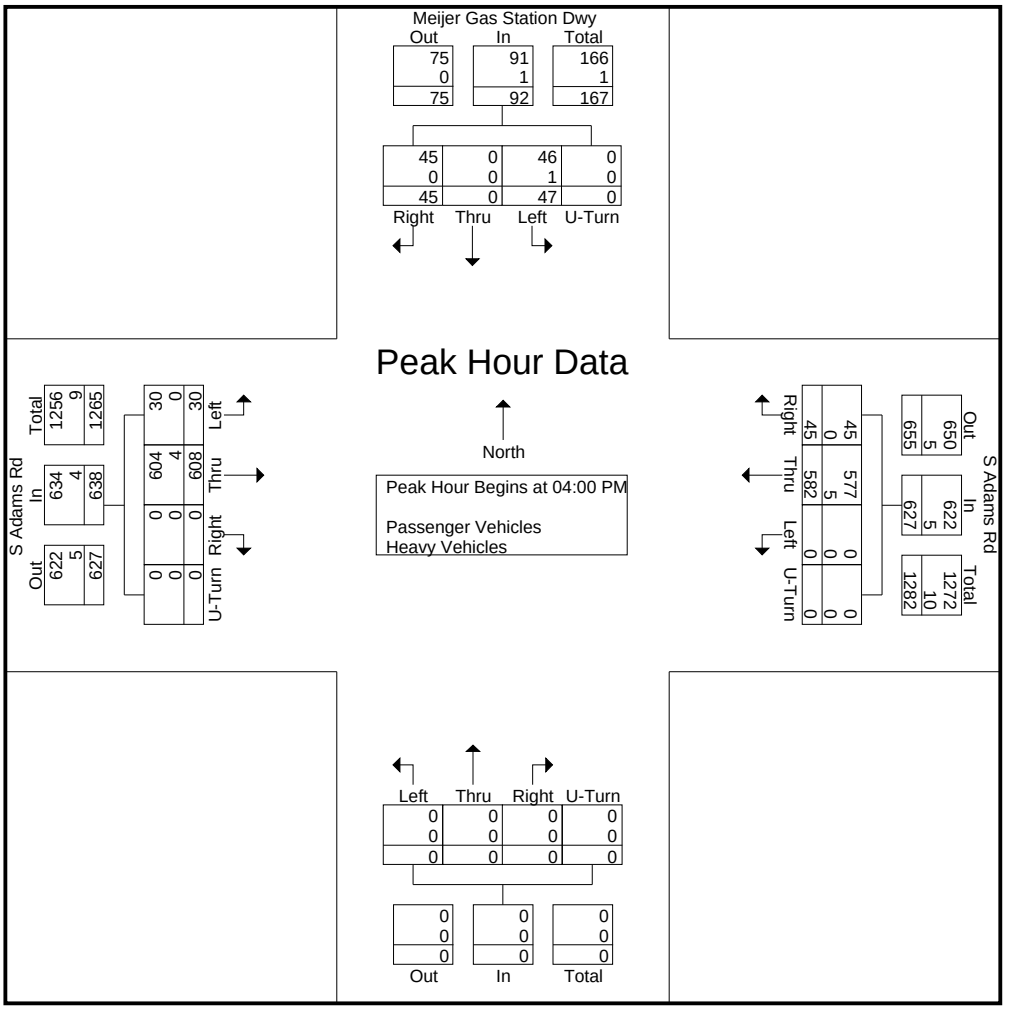
	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Meijer Gas Station Dwy Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
04:00 PM	9	153	0	0	162	0	153	10	0	163	0	0	0	0	0	12	0	16	0	28	353
04:15 PM	6	157	0	0	163	0	145	16	0	161	0	0	0	0	0	13	0	9	0	22	346
04:30 PM	9	146	0	0	155	0	139	9	0	148	0	0	0	0	0	7	0	12	0	19	322
04:45 PM	6	152	0	0	158	0	145	10	0	155	0	0	0	0	0	15	0	8	0	23	336
Total	30	608	0	0	638	0	582	45	0	627	0	0	0	0	0	47	0	45	0	92	1357
05:00 PM	10	139	0	0	149	0	163	16	0	179	0	0	0	0	0	8	0	14	0	22	350
05:15 PM	5	158	0	0	163	0	144	9	0	153	0	0	0	0	0	8	0	11	0	19	335
05:30 PM	3	167	0	0	170	0	130	14	0	144	0	0	0	0	0	5	0	2	0	7	321
05:45 PM	6	162	0	0	168	0	131	5	0	136	0	0	0	0	0	7	0	6	0	13	317
Total	24	626	0	0	650	0	568	44	0	612	0	0	0	0	0	28	0	33	0	61	1323
Grand Total	54	1234	0	0	1288	0	1150	89	0	1239	0	0	0	0	0	75	0	78	0	153	2680
Apprch %	4.2	95.8	0	0		0	92.8	7.2	0		0	0	0	0		49	0	51	0		
Total %	2	46	0	0	48.1	0	42.9	3.3	0	46.2	0	0	0	0	0	2.8	0	2.9	0	5.7	
Passenger Vehicles	54	1226	0	0	1280	0	1141	89	0	1230	0	0	0	0	0	74	0	78	0	152	2662
% Passenger Vehicles	100	99.4	0	0	99.4	0	99.2	100	0	99.3	0	0	0	0	0	98.7	0	100	0	99.3	99.3
Heavy Vehicles	0	8	0	0	8	0	9	0	0	9	0	0	0	0	0	1	0	0	0	1	18
% Heavy Vehicles	0	0.6	0	0	0.6	0	0.8	0	0	0.7	0	0	0	0	0	1.3	0	0	0	0.7	0.7



Quality Counts

File Name : 16087105 - Meijer Gas Station Dwy -- S Adams Rd
Site Code : 16087105
Start Date : 2/9/2023
Page No : 2

	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Meijer Gas Station Dwy Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	**9**	153	0	0	162	0	**153**	10	0	**163**	0	0	0	0	0	12	0	**16**	0	**28**	**353**
04:15 PM	6	**157**	0	0	**163**	0	145	**16**	0	161	0	0	0	0	0	13	0	9	0	22	346
04:30 PM	9	146	0	0	155	0	139	9	0	148	0	0	0	0	0	7	0	12	0	19	322
04:45 PM	6	152	0	0	158	0	145	10	0	155	0	0	0	0	0	**15**	0	8	0	23	336
Total Volume	30	608	0	0	638	0	582	45	0	627	0	0	0	0	0	47	0	45	0	92	1357
% App. Total	4.7	95.3	0	0		0	92.8	7.2	0		0	0	0	0		51.1	0	48.9	0		
PHF	.833	.968	.000	.000	.979	.000	.951	.703	.000	.962	.000	.000	.000	.000	.000	.783	.000	.703	.000	.821	.961
Passenger Vehicles	30	604	0	0	634	0	577	45	0	622	0	0	0	0	0	46	0	45	0	91	1347
% Passenger Vehicles	100	99.3	0	0	99.4	0	99.1	100	0	99.2	0	0	0	0	0	97.9	0	100	0	98.9	99.3
Heavy Vehicles	0	4	0	0	4	0	5	0	0	5	0	0	0	0	0	1	0	0	0	1	10
% Heavy Vehicles	0	0.7	0	0	0.6	0	0.9	0	0	0.8	0	0	0	0	0	2.1	0	0	0	1.1	0.7

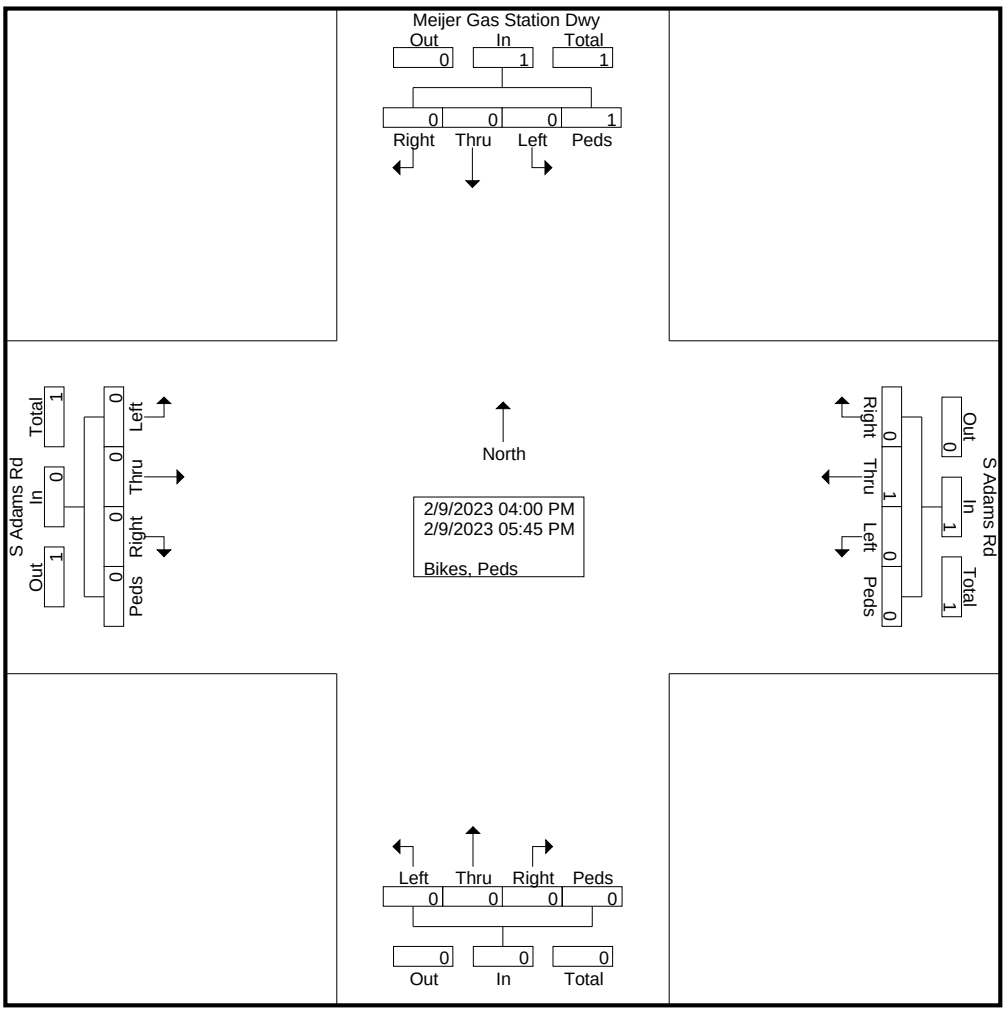


Quality Counts

File Name : 16087105 - Meijer Gas Station Dwy -- S Adams Rd
Site Code : 16087105
Start Date : 2/9/2023
Page No : 1

Groups Printed- Bikes, Peds

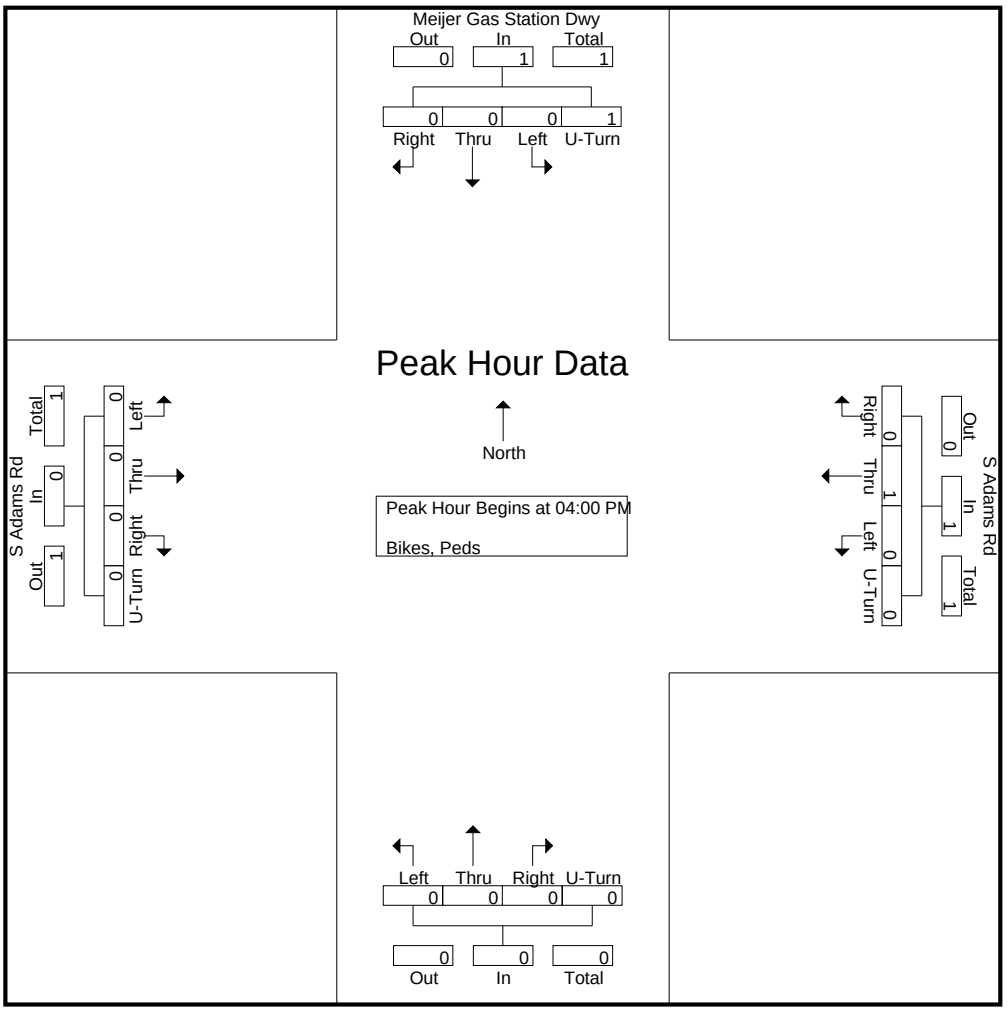
	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Meijer Gas Station Dwy Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	1	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	1	2
Apprch %	0	0	0	0		0	100	0	0		0	0	0	0		0	0	0	100		
Total %	0	0	0	0	0	0	50	0	0	50	0	0	0	0	0	0	0	0	50	50	



Quality Counts

File Name : 16087105 - Meijer Gas Station Dwy -- S Adams Rd
Site Code : 16087105
Start Date : 2/9/2023
Page No : 2

	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Meijer Gas Station Dwy Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	**1**
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	**1**	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	1	2
% App. Total	0	0	0	0		0	100	0	0		0	0	0	0		0	0	0	100		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.500

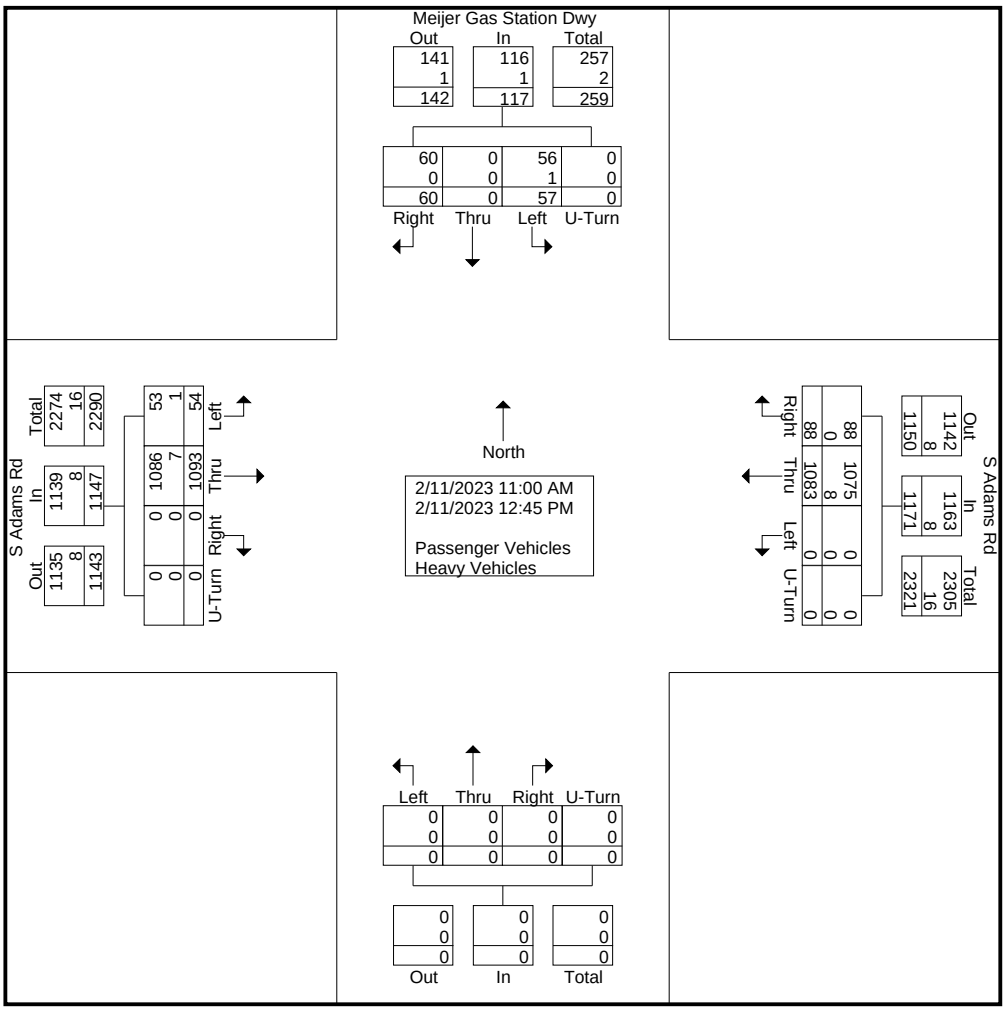


Quality Counts

File Name : 16087106 - Meijer Gas Station Dwy -- S Adams Rd
Site Code : 16087106
Start Date : 2/11/2023
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

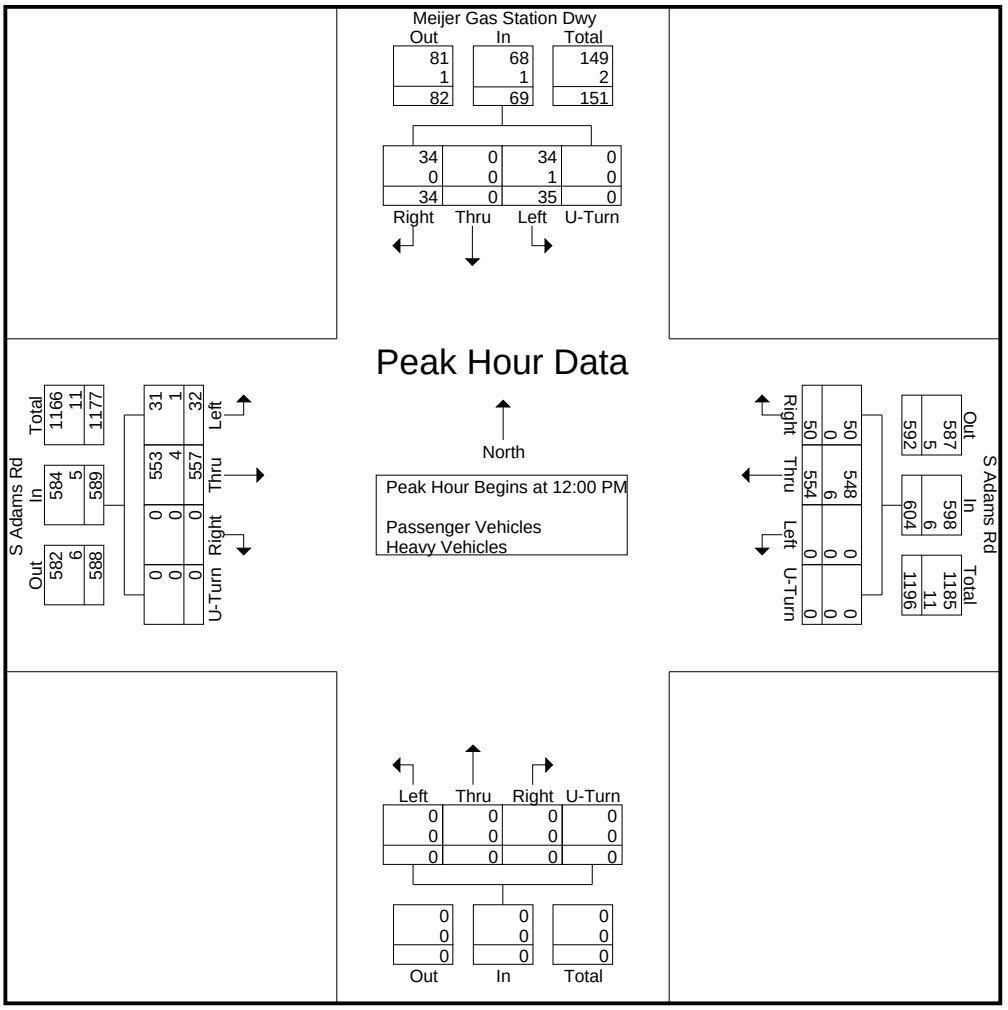
	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Meijer Gas Station Dwy Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
11:00 AM	9	132	0	0	141	0	123	8	0	131	0	0	0	0	0	8	0	7	0	15	287
11:15 AM	2	135	0	0	137	0	135	10	0	145	0	0	0	0	0	7	0	5	0	12	294
11:30 AM	5	141	0	0	146	0	135	9	0	144	0	0	0	0	0	6	0	8	0	14	304
11:45 AM	6	128	0	0	134	0	136	11	0	147	0	0	0	0	0	1	0	6	0	7	288
Total	22	536	0	0	558	0	529	38	0	567	0	0	0	0	0	22	0	26	0	48	1173
12:00 PM	10	115	0	0	125	0	123	15	0	138	0	0	0	0	0	9	0	10	0	19	282
12:15 PM	7	156	0	0	163	0	129	14	0	143	0	0	0	0	0	8	0	9	0	17	323
12:30 PM	12	149	0	0	161	0	141	12	0	153	0	0	0	0	0	12	0	11	0	23	337
12:45 PM	3	137	0	0	140	0	161	9	0	170	0	0	0	0	0	6	0	4	0	10	320
Total	32	557	0	0	589	0	554	50	0	604	0	0	0	0	0	35	0	34	0	69	1262
Grand Total	54	1093	0	0	1147	0	1083	88	0	1171	0	0	0	0	0	57	0	60	0	117	2435
Apprch %	4.7	95.3	0	0		0	92.5	7.5	0		0	0	0	0		48.7	0	51.3	0		
Total %	2.2	44.9	0	0	47.1	0	44.5	3.6	0	48.1	0	0	0	0	0	2.3	0	2.5	0	4.8	
Passenger Vehicles	53	1086	0	0	1139	0	1075	88	0	1163	0	0	0	0	0	56	0	60	0	116	2418
% Passenger Vehicles	98.1	99.4	0	0	99.3	0	99.3	100	0	99.3	0	0	0	0	0	98.2	0	100	0	99.1	99.3
Heavy Vehicles	1	7	0	0	8	0	8	0	0	8	0	0	0	0	0	1	0	0	0	1	17
% Heavy Vehicles	1.9	0.6	0	0	0.7	0	0.7	0	0	0.7	0	0	0	0	0	1.8	0	0	0	0.9	0.7



Quality Counts

File Name : 16087106 - Meijer Gas Station Dwy -- S Adams Rd
Site Code : 16087106
Start Date : 2/11/2023
Page No : 2

	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Meijer Gas Station Dwy Southbound					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	10	115	0	0	125	0	123	**15**	0	138	0	0	0	0	0	9	0	10	0	19	282
12:15 PM	7	**156**	0	0	**163**	0	129	14	0	143	0	0	0	0	0	8	0	9	0	17	323
12:30 PM	**12**	149	0	0	161	0	141	12	0	153	0	0	0	0	0	**12**	0	**11**	0	**23**	**337**
12:45 PM	3	137	0	0	140	0	**161**	9	0	**170**	0	0	0	0	0	6	0	4	0	10	320
Total Volume	32	557	0	0	589	0	554	50	0	604	0	0	0	0	0	35	0	34	0	69	1262
% App. Total	5.4	94.6	0	0		0	91.7	8.3	0		0	0	0	0		50.7	0	49.3	0		
PHF	.667	.893	.000	.000	.903	.000	.860	.833	.000	.888	.000	.000	.000	.000	.000	.729	.000	.773	.000	.750	.936
Passenger Vehicles	31	553	0	0	584	0	548	50	0	598	0	0	0	0	0	34	0	34	0	68	1250
% Passenger Vehicles	96.9	99.3	0	0	99.2	0	98.9	100	0	99.0	0	0	0	0	0	97.1	0	100	0	98.6	99.0
Heavy Vehicles	1	4	0	0	5	0	6	0	0	6	0	0	0	0	0	1	0	0	0	1	12
% Heavy Vehicles	3.1	0.7	0	0	0.8	0	1.1	0	0	1.0	0	0	0	0	0	2.9	0	0	0	1.4	1.0

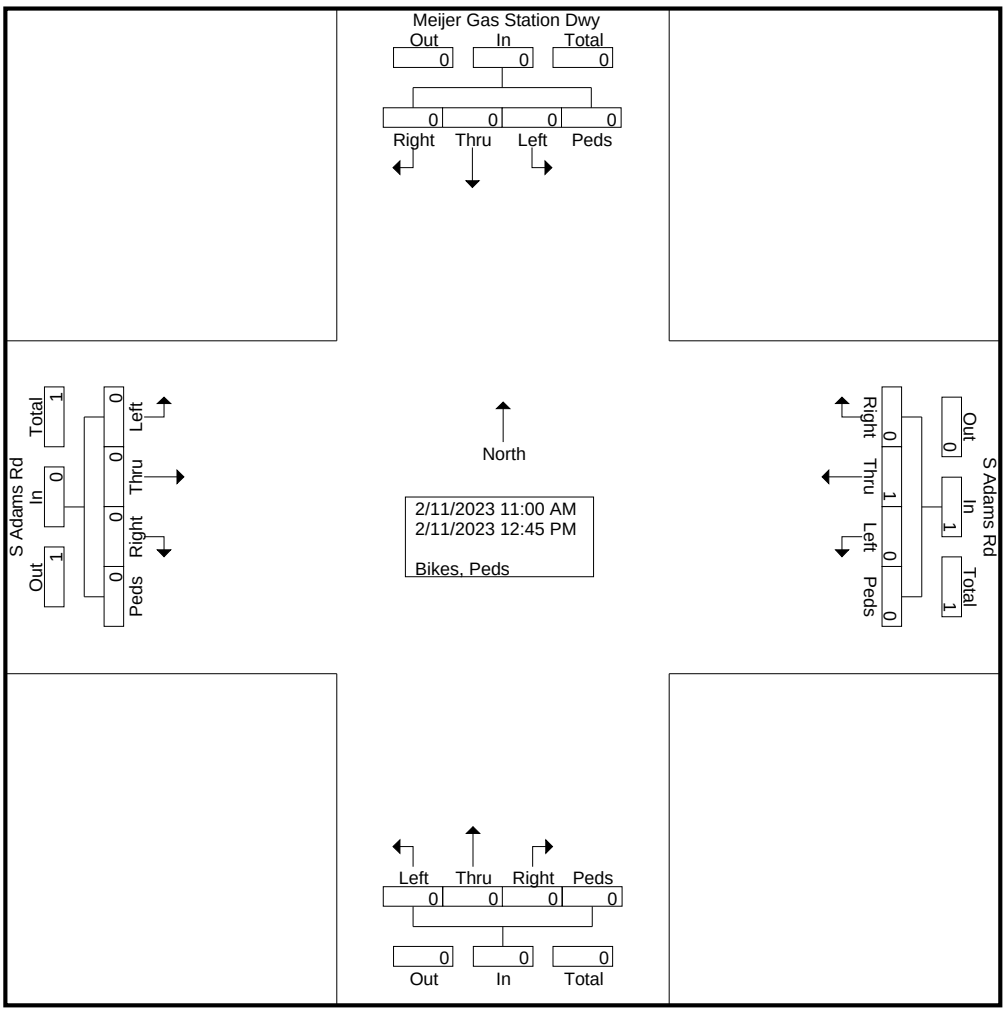


Quality Counts

File Name : 16087106 - Meijer Gas Station Dwy -- S Adams Rd
Site Code : 16087106
Start Date : 2/11/2023
Page No : 1

Groups Printed- Bikes, Peds

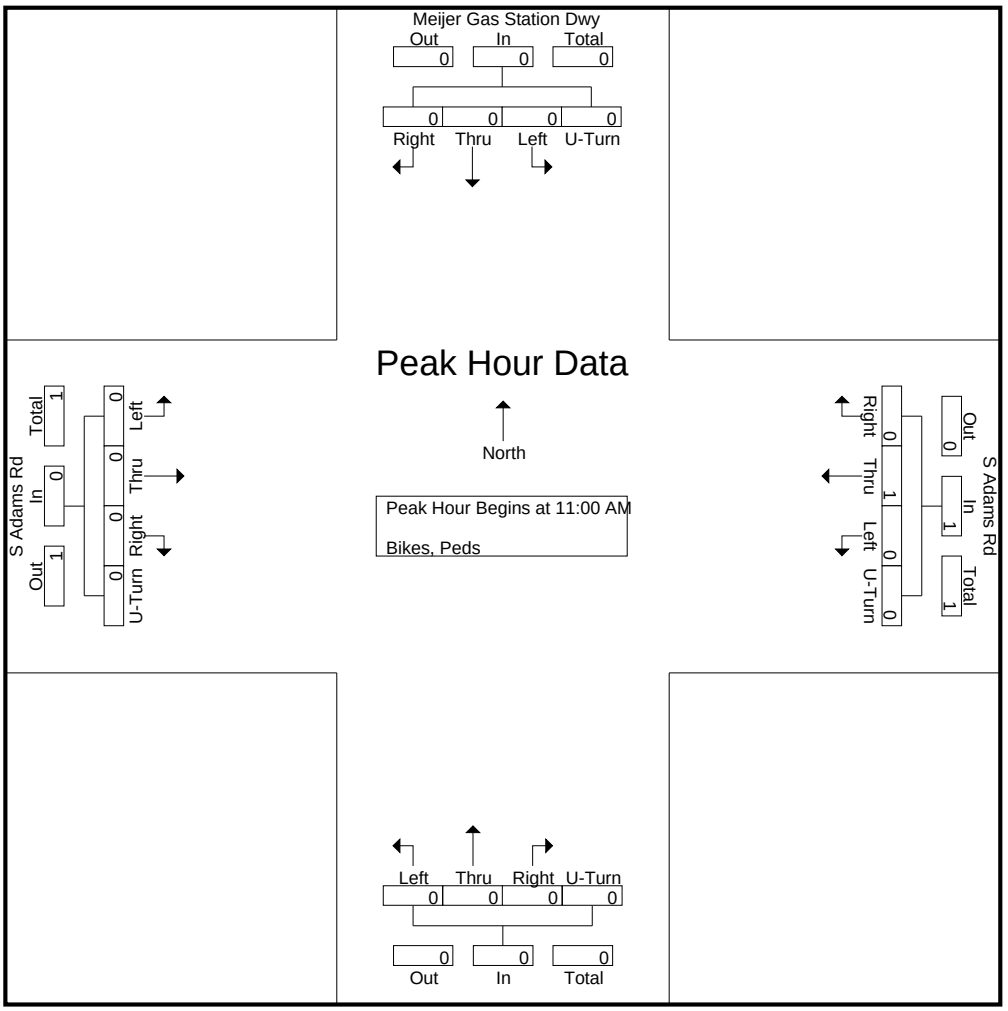
	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Meijer Gas Station Dwy Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Apprch %	0	0	0	0		0	100	0	0		0	0	0	0		0	0	0	0		
Total %	0	0	0	0	0	0	100	0	0	100	0	0	0	0	0	0	0	0	0	0	



Quality Counts

File Name : 16087106 - Meijer Gas Station Dwy -- S Adams Rd
Site Code : 16087106
Start Date : 2/11/2023
Page No : 2

	S Adams Rd Eastbound					S Adams Rd Westbound					Northbound					Meijer Gas Station Dwy Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:00 AM																					
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	**1**
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
% App. Total	0	0	0	0		0	100	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250



Crash and Road Data

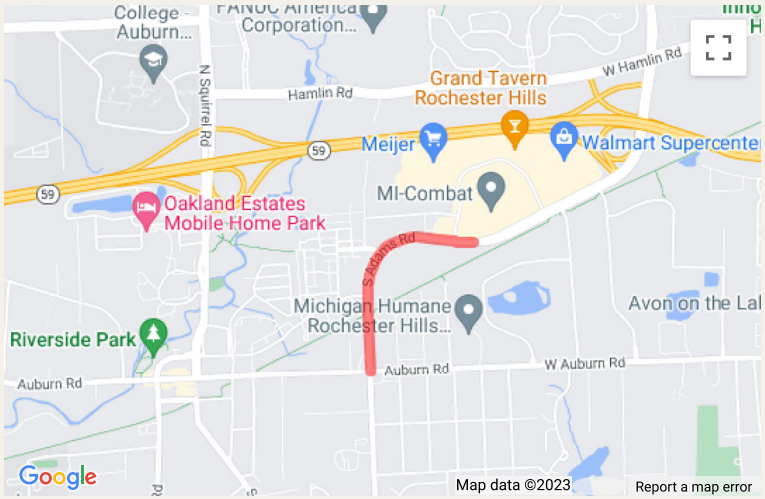
Road Segment Report

Adams Rd, (PR Number 4415861)

From:	Auburn Rd 6.685 BMP
To:	Adams Rd 7.366 EMP
Jurisdiction:	County
FALINK ID:	18546
Community:	City of Rochester Hills , City of Auburn Hills
County:	Oakland
Functional Class:	3 - Other Principal Arterial
Direction:	1 Way
Length:	0.681 miles
Number of Lanes:	5
Posted Speed:	0 (source:)
Route Classification:	Not a route
Annual Crash Average 2017-2021:	10
Traffic Volume (2016)*:	18,000 (Observed AADT)
Pavement Type (2021):	Concrete
Pavement Rating (2021):	Good
Short Range (TIP) Projects:	No TIP projects for this segment.
Long Range (RTP) Projects:	(4305) Study

* AADT values are derived from **Traffic Counts**

Street View



SEMCOG | Southeast Michigan Council of Governments

Community Profiles

YOU ARE VIEWING DATA FOR:

City of Rochester Hills

1000 Rochester Hills Dr
Rochester Hills, MI
48309-3033
https://www.rochesterhills.org/

SEMCOG MEMBER

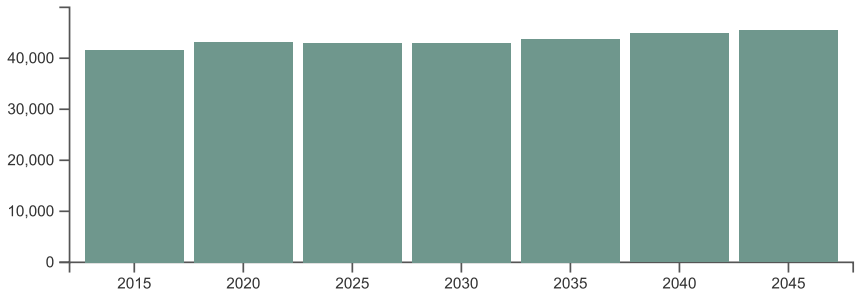
Census 2020 Population:
76,300
Area: 32.9 square miles

VIEW COMMUNITY EXPLORER MAP VIEW 2020 CENSUS MAP

Economy & Jobs

Link to American Community Survey (ACS) Profiles: **Select a Year** 2021 **Economic**

Forecasted Jobs



Source: **SEMCOG 2045 Regional Development Forecast**

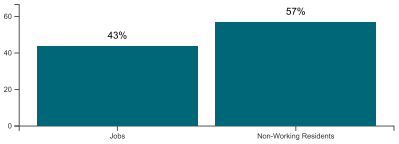
Forecasted Jobs by Industry Sector

Forecasted Jobs By Industry Sector	2015	2020	2025	2030	2035	2040	2045	Change 2015-2045	Pct Change 2015-2045
Natural Resources, Mining, & Construction	1,755	2,005	1,907	1,886	1,911	1,938	1,967	212	12.1%
Manufacturing	5,018	4,705	4,429	4,098	3,886	3,704	3,505	-1,513	-30.2%
Wholesale Trade	1,437	1,484	1,482	1,465	1,465	1,464	1,454	17	1.2%
Retail Trade	6,186	6,284	5,952	5,927	5,740	5,662	5,599	-587	-9.5%
Transportation, Warehousing, & Utilities	699	723	721	719	730	743	756	57	8.2%
Information & Financial Activities	3,877	4,008	3,960	3,911	3,955	3,973	3,952	75	1.9%
Professional and Technical Services & Corporate HQ	3,552	3,647	3,850	4,080	4,551	5,061	5,412	1,860	52.4%
Administrative, Support, & Waste Services	3,708	3,835	3,885	3,906	3,992	4,080	4,134	426	11.5%
Education Services	2,261	2,377	2,375	2,363	2,389	2,419	2,449	188	8.3%
Healthcare Services	6,774	7,303	7,578	7,758	8,230	8,705	9,124	2,350	34.7%
Leisure & Hospitality	3,951	4,433	4,527	4,572	4,660	4,776	4,818	867	21.9%
Other Services	1,982	2,041	1,993	1,956	1,950	1,937	1,910	-72	-3.6%
Public Administration	359	361	359	354	354	351	351	-8	-2.2%
Total Employment Numbers	41,559	43,206	43,018	42,995	43,813	44,813	45,431	3,872	9.3%

Source: **SEMCOG 2045 Regional Development Forecast**

Daytime Population

Daytime Population	ACS 2016
Jobs	28,136
Non-Working Residents	36,638
Age 15 and under	14,444
Not in labor force	20,456
Unemployed	1,738
Daytime Population	64,774



Source: **2012-2016 American Community Survey 5-Year Estimates** and **2012-2016 Census Transportation Planning Products Program (CTPP)**. For additional information, visit SEMCOG's **Interactive Commuting Patterns Map**

Note: The number of residents attending school outside Southeast Michigan is not available. Likewise, the number of students commuting into Southeast Michigan to attend school is also not known.

SEMCOG | Southeast Michigan Council of Governments

Community Profiles

YOU ARE VIEWING DATA FOR:

City of Rochester Hills

1000 Rochester Hills Dr
Rochester Hills, MI
48309-3033
https://www.rochesterhills.org/

SEMCOG MEMBER

Census 2020 Population:
76,300
Area: 32.9 square miles

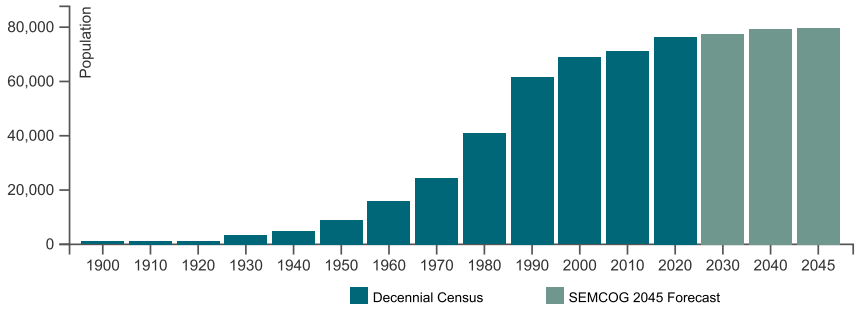
VIEW COMMUNITY EXPLORER MAP VIEW 2020 CENSUS MAP

Population and Households

Link to American Community Survey (ACS) Profiles: **Select a Year** 2021 **Social** | **Demographic**

Population and Household Estimates for Southeast Michigan, 2022

Population Forecast



Note for City of Rochester Hills : Incorporated in 1984 from Avon Charter Township. Population numbers prior to 1984 are of the township.

Population and Households

Population and Households	Census 2020	Census 2010	Change 2010-2020	Pct Change 2010-2020	SEMCOG Jul 2022	SEMCOG 2045
Total Population	76,300	70,995	5,305	7.5%	77,065	79,709
Group Quarters Population	1,280	1,181	99	8.4%	1,236	1,494
Household Population	75,020	69,814	5,206	7.5%	75,829	78,215
Housing Units	31,208	29,494	1,714	5.8%	31,995	-
Households (Occupied Units)	29,711	27,578	2,133	7.7%	30,049	32,471
Residential Vacancy Rate	4.8%	6.5%	-1.7%	-	6.1%	-
Average Household Size	2.52	2.53	-0.01	-	2.52	2.41

Source: **U.S. Census Bureau** and **SEMCOG 2045 Regional Development Forecast**

Components of Population Change

Components of Population Change	2000-2005 Avg.	2006-2010 Avg.	2011-2018 Avg.
Natural Increase (Births - Deaths)	384	233	176
Births	950	755	751
Deaths	566	522	575
Net Migration (Movement In - Movement Out)	-368	185	269
Population Change (Natural Increase + Net Migration)	16	418	445

Source: **Michigan Department of Community Health Vital Statistics**, **U.S. Census Bureau**, and SEMCOG

OAKLAND COUNTY ROAD COMMISSION
TRAFFIC - SAFETY DEPARTMENT
SIGNAL WORK ORDER

LOCATION: Adams & Forester (N. of Auburn) DATE: 7-16-15

CITY/TOWNSHIP: Rochester Hills BY: T. Creech

COUNTY#: 1257 STATE#: _____ CHARGES: 78012570

PLEASE PERFORM THE FOLLOWING:

_____ ELECTRICAL DEVICE: ____ INSTALL _____ MODERNIZE _____ MAINTENANCE

ROAD COMMISSION FOR OAKLAND COUNTY

_____ UNDERGROUND: _____

_____ EDISON OK: _____ YES _____ NO JOB#: _____

JUL 30 2015

_____ COORDINATE W/DISTRICT 7: _____

TRAFFIC OPERATIONS

DIAL..	1	1	1	1		2	2	2	2		3	3	3	3		4	4	4	4
SPLIT.	1	2	3	4		1	2	3	4		1	2	3	4		1	2	3	4
_____ CHANGE TIMING.....																			
_____ CHANGE OFFSET.....																			
_____ CHANGE CYCLE LENGTH.....																			
_____ ADD DIAL/SPLIT.....																			

X CHANGE BREAKOUT OR EPROM: Change Pers → Rev 3 (All red, Ped Times)

X CHANGE HOURS OF OPERATION:

OLD: M-F: 6 am to 9 pm; Sat & Sun: 9am to 7pm

NEW: M-F: 7 am to 7pm; Sat & Sun: 9 am to 7pm

_____ REPROGRAM TBC

_____ INSTALL INTERCONNECT: _____ TBC _____ MINITROL _____ TONE

_____ MBT OK: _____ YES _____ NO

_____ NO CHANGE - RECORD CORRECTION

X OTHER: * Requires a checksum change *.

APPROVED BY: _____ DATE: 7/21/15

DATE INSTALLED: 7-27-15

INSTALLED BY: Richardson, Rea

INTERSECTION :- 1257 Adams and Forester
DESCRIPTION PROMS :- X00020R / F4808
CONTROLLER TYPE :- STANDARD PERSONALITY CONTROLLER
SOFTWARE:- MOD 52 SCATS w/fya (Version s30)

PHYSICAL INPUTS :-
1. NB ADAMS LT (NL)
2. NB ADAMS LT ADV (NL)
3. NB ADAMS C (LK)
4. NB ADAMS R (LK)
5. SB ADAMS L (LK)
6. SB ADAMS C (LK)
7. SB ADAMS R (LK)
8. FORESTER L (LK)
9. FORESTER R (LK)

NOTE: ALL DETECTORS ARE SOLO CAMERAS.

PED 6: ADAMS PED WEST (WA) P.B.
PED 8: FORESTER PED SOUTH (WB) P.B.

APPROACHES :-
A APPR 1 : NB ADAMS
A APPR 2 : SB ADAMS

B APPR 1 : FORESTER

C APPR 1 : NB ADAMS LT
C APPR 2 : NB ADAMS

FLEXIDATA:-

SEQUENCE	A,B,C	A,B,C
AUTO REL		
R- REL	A	A
R+ REL	B	B
Q- REL	C	C
Q+ REL		
LOOKAHEAD		

PEDESTRIANS:-
1. P1
2. P2
3. P3
4. P4
5. P5
6. P6 (ADAMS WEST)
7. P7
8. P8 (FORESTER SOUTH)

SPECIAL FEATURES :-
Controller Software must be 2070/M52 S15 or later (VC=5)
The personality revision number is currently 3 (=C).

Ped outputs mapped to phases as follows: ped 6 = 22, ped 8 = 24.
VC5 software reports them as mapped.

Left turn is permissive to NCHRP flshing yellow recommendation. Signal group 11 provides flashing yellow (green aspect), yellow and red, i.e. upper aspects of 4 section turn display. Signal group 5 provides the green (bottom) aspect, i.e. turn arrow.

A STAGE HAS A PERMANENT DEMAND
DEMAND FOR STAGES B and C IN FLEXI AND ISOLATED. SET Z- TO DISABLE.

Signal Group 5 non-locked detectors will not call stage C directly. If XSF7 is set signal Group 5 detectors will call stage B and then stage C.

Flash rate for FYA is set with Timesettings 28 and 29.
TSM28=0.6 (on rate), TSM29=0.4 (off rate)

Backpanel for size P44-12 cabinet:

Load Switch 2:	NB Adams	A	FLA
Load Switch 5:	NB Adams LT; EB Forester RT	AL & CR	-
	G: NB LT green arrow and EB RT green arrow		
	Y: EB RT yellow arrow		
Load Switch 6:	SB Adams	B	FLA
Load Switch 8:	EB Forestor; SB Adams RT (G,A)	C & BR	FLR
Load Switch 11:	NB Adams LT	AL	FLA
(OLC)	G: flashing yellow arrow, Y: yellow arrow, R: red arrow		
Load Switch 10:	Adams Ped West	WA	
Load Switch 12:	Forester Ped South	WB	

Jumpers:
195-196,197-198,199-200,235-236,237-238,239-240,241-242,243-244,245-224,
246-247,249-250,251-230,252-253,261-262,263-264,265-266,267-268,273-274,
321-PB1,325-326,327-328,329-PB1,343-PB1,347-PB1,351-PB1,356-379,367-368,
369-370,371-372,373-374,375-376,377-378,387-PB1,391-392,393-394,395-PB1,
400-401,298-302.

Signal Monitor: 2-5, 2-6, 2-11, 5-11, 6-11.
All switches OFF EXCEPT: Dual Select A&B; G&Y Enable;
FYA 5-11 Enable; SSM 2, 6, 8, 11.
Minimum Flash = 4 + 2 + 1.

```
*******************************
* CONTROLLER INFORMATION SHEET *
*     FOR SITE NO. 1257       *
*         T. CREECH           *
*       16-Jul-2015           *
*******************************
```

Checksums: Times EF / 357

Pers C5 / 305

Total 2A / 052

FLEXILINK PLAN DATA

Intersection # 1257 **State #** _____ **Date:** 07/16/15 **Prepared By:** T. Creech

Intersection: Adams and Forester (North of Auburn) **City:** Rochester Hills

Hours of operation: M-F: 7am to 7pm; Sat & Sun: 9am to 7pm **Approved By:** R. Jones

Hours of flash: M-F: 7pm to 7am; Sat & Sun: 7pm to 9am

		PL0	PL1	PL2	PL3	PL4	PL5	PL6	PL7	PL8
0	CL		90	120	120					
1	A		0	0	0					
2	B		54	82	82					
3	C		76	106	106					
4	D									
5	E									
6	F									
7	G									
8	R-									
9	R+									
10	Of (Y-)		51	22	92					
11	Y+	C								
12	Z-									
13	Z+									
14	Q-									
15	Q+									
16	XH									
17	XL									

NOTE: STAGES WITH ONE SECOND PHASE TIMES ARE SKIPPED
BLANK ENTRIES ARE DEFAULT VALUES = 0 FOR ENTRIES #0 - #7, #16 - #17
254 FOR ENTRIES #8 - #15 'C' ENTRY MEANS CONTINOUS = 255

							Timers		
Phase	**Direction**	**Min**	**Max**	**ECO**	**Amber**	**All Red**	**Gap**	**Hdwy**	**Waste**
A	Adams	10.0	40.0		4.3	1.7	3.0	1.0	6.0
B	Forester	7.0	20.0		3.5	2.5	3.0	1.0	6.0
C	NB Adams Thru & LT	4.0	15.0		4.3	1.7	3.0	1.0	6.0
D									
E									
F									
G									

	Day	Hours	Plan#
SC1	8	7:00	2
SC2	8	9:00	1
SC3	8	15:00	3
SC4	8	19:00	0
SC5	13	9:00	1
SC6	13	19:00	0
SC7	14	0:00	0
SC8			
SC9			
SC10			

Pedestrian Crossing Times

Direction	Walk	CL 1	CL 2
Adams Ped West (Ped 6)	7.0	20.0	3.0
Forester Ped South (Ped 8)	7.0	15.0	3.0

Flash rate Timesettings TSM28=0.6 (on rate); TSM29=0.4 (off rate)

Normal Operating Mode

Isolated	Flexilink	Masterlink	Master Isolated	Flexi Isolated
		X		

DAY OF WEEK CODE NUMBER

0	End of Schedule	4	WED	8	MON-FRI	12	MON,FRI,SAT
1	SUN	5	THUR	9	MON-SAT	13	SAT,SUN
2	MON	6	FRI	10	TUE,WED,THU	14	EVERY DAY
3	TUE	7	SAT	11	MON,FRI	15	NEVER

Autoscope SOLO

Mod 50

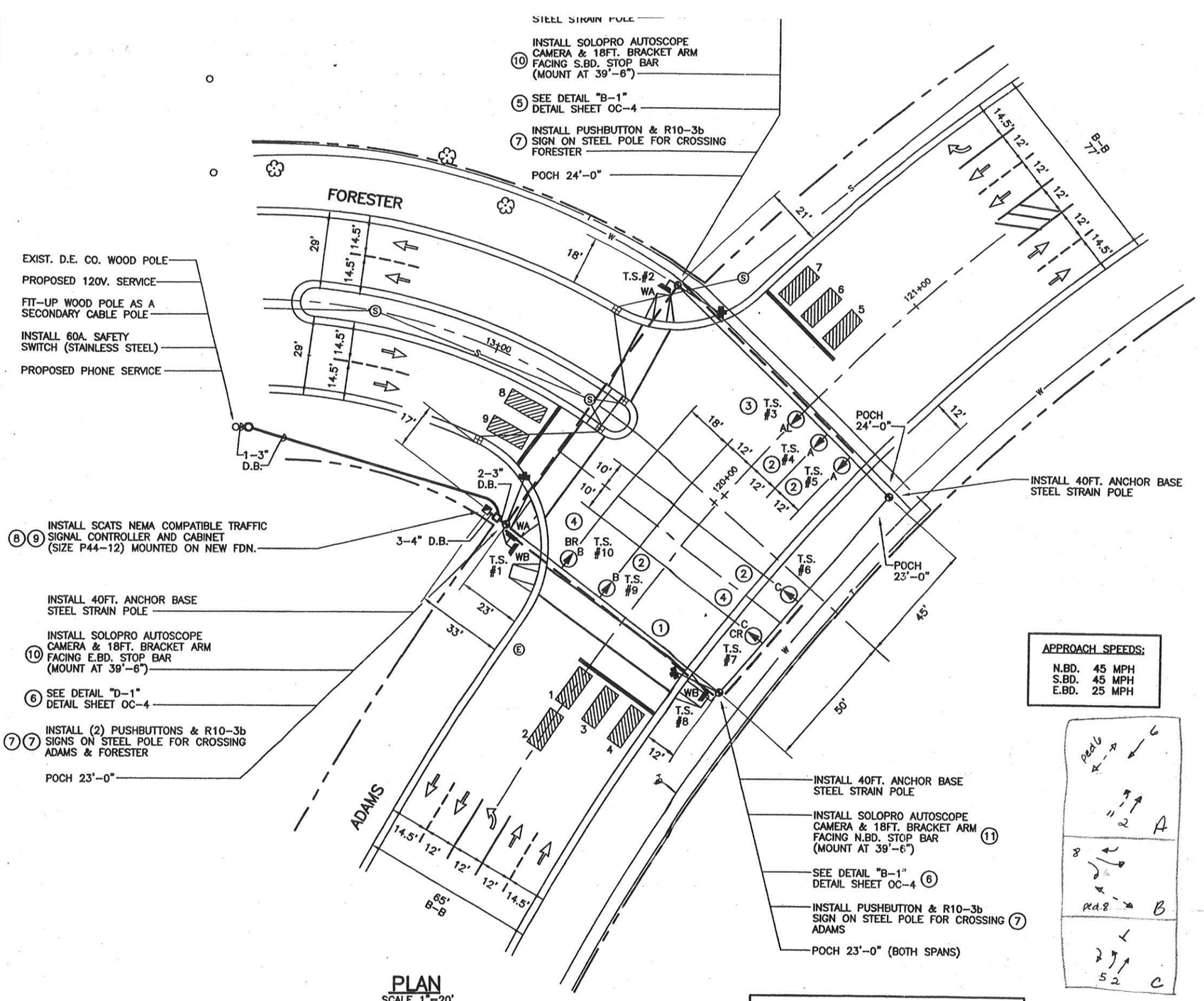
Mini-Hub II Detector Port Master
Front Panel Input/Output Pin Assignment

The Mini-Hub II has inputs and outputs available through the front panel **Input/ Output** connector and through the back edge connector. The pin assignments for the Mini-Hub II front connector are listed in the following table. Edge connector pins are identified by **NUMBER** on the component (front) side of the board. Edge connector pins are identified by **LETTER** on the backside of board.

Co. 1257

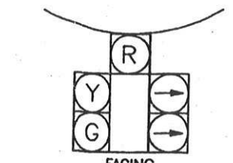
Cam #	Mini-Hub II conn.	Edge conn.	Front Harness	Description	D-Conn. Term #	D- Conn. Detector Descript.	On Print Detector number	Phase
1	Output 1 LED	F	1	NB Adams LT	1	Det.9	1	5
1	Output 2 LED	W	14	NB Adams LT ADV	2	Det.10	2	5
1	Output 3 LED	S	2	NB Adams C	3	Det.11	3	2
1	Output 4 LED	Y	15	NB Adams R	4	Det.12	4	2
2	Output 5 LED	(JP1)4	3	SB Adams L	5	Det.13	5	6
2	Output 6 LED	(JP7)5	16	SB Adams C	6	Det.14	6	6
2	Output 7 LED	(JP2)8	4	SB Adams R	7	Det.15	7	6
3	Output 8 LED	(JP8)9	17	Forester L	8	Det.16	8	8
3	Output 9 LED	(JP3)13	5	Forester R	9	Det.17	9	8
	Output 10 LED	(JP9)14	18					
	Output 11 LED	(JP4)17	6					
	Output 12 LED	(JP10)18	19					
	Output 13 LED		7					
	Output 14 LED		20					
	Output 15 LED		8					
	Output 16 LED		21					
	Input 1 LED	(JP5)1	9					
	Input 2 LED	(JP11)2	22	L.S.2 (195)				
	Input 3 LED	(JP6)3	10					
	Input 4 LED	(JP12)10	23					
	Input 5 LED		11	L.S.5-11 (247) Red				
	Input 6 LED		24	L.S.6 (234)				
	Input 7 LED		12					
	Input 8 LED	(withJP14*)	25	L.S.8 (261)				

*Input 8 with JP14 inserted becomes 24VDC through Input/ Output Connector on front panel.
Logic Ground is the GREY (pin 13) wire form Input/ Output connector on front panel.



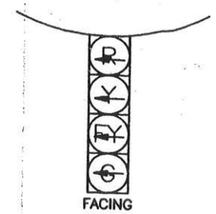
PLAN
SCALE 1"=20'

N



FACING
WEST - T.S.#7
NORTH - T.S.#10

INSTALL 1-WAY, 5-SECTION T.S.



FACING
SOUTH
T.S.#3

INSTALL 1-WAY, 4-SECTION LEFT TURN T.S.

INSTALL PIPE EXTENSIONS AS SHOWN:

T.S.#4 = 12" PIPE EXTENSION
T.S.#5 = 12" PIPE EXTENSION

SPAN WIRE POLE CONTACT HEIGHTS AS SHOWN ON PLAN (FROM RD. GRADE) MAY REQUIRE ADJUSTING AS DIRECTED BY THE FIELD ENGINEER. (INCLUDED IN THE INSTALLATION OF SPAN WIRE ON THIS CONTRACT.)

APPROACH SPEEDS:

N.BD. 45 MPH
S.BD. 45 MPH
E.BD. 25 MPH

LIST OF MATERIALS		
NO.	ITEM	QUANTITIES
(1)	Span Wire, Box	1 Ea
(2)	TS, One Way Span Wire Mtd (LED)	4 Ea
(3)	TS, One Way Span Wire Mtd, Four Sect (LED)	1 Ea
(4)	TS, One Way Span Wire Mtd, Five Sect (LED)	2 Ea
(5)	TS, Pedestrian, One Way Bracket Arm Mtd (LED)	2 Ea
(6)	TS, Pedestrian, Two Way Bracket Arm Mtd (LED)	1 Ea
(7)	Pushbutton & Sign	4 Ea
(8)	Controller and Cabinet, Solid State Actuated	1 Ea
(9)	Controller and Cabinet, Solid State Actuated, Delivered	1 Ea
(10)	Autoscope Camera (Solo Pro)	3 Ea
	Conduit, DB, 1, 1 1/2" inch	10 Ft
	Conduit, DB, 1, 3 inch	105 Ft
	Conduit, DB, 2, 3 inch	5 Ft
	Conduit, DB, 3, 4 inch	5 Ft
	Hh, Round	1 Ea
	Hh, Square	1 Ea
	Controller Fdn, Base Mount	1 Ea
	Strain Pole, Steel, Anchor Base, 40 feet	4 Ea
	Strain Pole, Steel, Anchor Fdn	4 Ea
	Bracket Arm, Clamp On, 18 feet	3 Ea
	Safety Switch	1 Ea
	Wood Pole, Fit Up, Sec Cable Pole	1 Ea
	Cable, Sec, 600V, 1, 2/C#4 W/#6 GROUND	150 Ft

NOTE:

1. BUILD 1-1 1/2" D.B. CONDUIT FROM ALL FOUNDATIONS TO NEAREST HANDHOLE FOR GROUND WIRE.

CONTACT MR. DENNY ESCHENBURG, D.E. CO. (1-586-412-3191) PRIOR TO INSTALLATION OF TRAFFIC SIGNALS. NO CHARGES.

LOAD	AMPS	WATTS
SIGNALS	0	0
CASE SIGNS	0	0

ROAD COMMISSION OF OAKLAND COUNTY
TRAFFIC-SAFETY DEPARTMENT

T.S. AT ADAMS & FORESTER

CO 1257 ATS

MANSELL ASSOCIATES INC.
ENGINEERING CONSULTANTS
33608 Grand River
Farmington, MI. 48335
(248) 473-7070

Level of Service Criteria for Stop Sign Controlled Intersections

The level of service criteria are given in Exhibit 20-2. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in queue.

The average total delay for any particular controlled movement is a function three (capacity) factors: distribution of gaps in the major-street traffic stream, driver judgment in selecting gaps through which to execute the desired maneuvers, and the follow-up headways required by each driver in a queue.

The basic capacity model assumes gaps in the conflicting movements are randomly distributed. When traffic signals are present on the major street, upstream of the subject intersection, flows may not be random but will likely have some platoon structure. Although the procedures in this chapter provide a method for approximating the operations of a TWSC intersection with an upstream signal, the operations of such an intersection is arguably best handled by including it in a complete simulation

Exhibit 20-2. Level of Service Criteria for Stop-Controlled Intersections (Motor Vehciles)

LEVEL OF SERVICE	AVERAGE CONTROL DELAY (sec/veh)
A	$\leq$ 10
B	> 10 and $\leq$ 15
C	> 15 and $\leq$ 25
D	> 25 and $\leq$ 35
E	> 35 and $\leq$ 50
F	> 50

Average total delay less than 10 sec/veh is defined as Level of Service (LOS) A. Follow-up times of less than 5 sec have been measured when there is no conflicting traffic for a minor street movement, so control delays of less than 10 sec/veh are appropriate for low flow conditions. A total delay of 50 sec/veh is assumed as the break point between LOS E and F.

The LOS criteria for TWSC intersections differ somewhat from the criteria used in Chapter 19 for signalized intersections, primarily because user perceptions differ among transportation facility types. The expectation is that a signalized intersection is designed to carry higher traffic volumes and will present greater delay than an unsignalized intersection. Additionally, several driver behavior considerations combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, where drivers on the minor approaches to unsignalized intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized than signalized intersections. For these reasons, it is considered that the total delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection.

LOS F exists when there are insufficient gaps of suitable size to allow a side street demand to cross safely through a major street traffic stream. This level of service is generally evident from extremely long total delays experienced by side street traffic and by queueing on the minor approaches. The method, however, is based on a constant critical gap size - that is, the critical gap remains constant, no matter how long the side street motorist waits. LOS F may also appear in the form of side street vehicles' selecting smaller-than-usual gaps. In such cases, safety may be a problem and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior. The latter is more difficult to observe on the field than queueing, which is more obvious.

Source: Highway Capacity Manual, 6th Edition. Transportation Research Board, National Research Council

Level of Service for Signalized Intersections

Level of service for signalized intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. LOS can be characterized for the entire intersection, each intersection approach, and each lane group. Specifically, level-of-service (LOS) criteria are stated in terms of the average stopped delay per vehicle. The criteria are given in Exhibit 19-8. Delay may be measured in the field or estimated using procedures presented later in this chapter. Delay is a complex measure and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group in question.

LOS A describes operations with a control delay of 10 s/veh or less. This level is typically assigned when the volume-to-capacity ratio is low and either progression is extremely favorable or the cycle length is very short. If LOS A is the result of favorable progression, most vehicles arrive during a green indication and travel through the intersection without stopping.

LOS B describes operations with control delay between 10 and 20 s/veh. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.

Exhibit 19.8. Level-of-Service Criteria for Signalized Intersections (Motorized Vehicles)

LEVEL OF SERVICE	STOPPED DELAY PER VEHICLE (SEC)
A	≤10.0
B	> 10.0 and ≤20.0
C	> 20.0 and ≤ 35.0
D	> 35.0 and ≤ 55.0
E	> 55.0 and ≤ 80.0
F	>80.0

1. If the v/c ratio for a lane group exceeds 1.0, a LOS F is assigned to the individual lane group. LOS for approach-based and intersection-wide assessments are determined solely by the control delay.

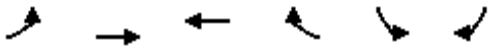
LOS C describes operations with control delay between 20 and 35 s/veh. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual *cycle failures* (i.e. one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number if vehicle stopping is significant, although many vehicles still pass through the intersection without stopping.

LOS D describes operations with control delay between 35 and 55 s/veh. This level is typically assigned when when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.

LOS E describes operations with control delay between 55 and 80 s/veh. This level is typically assigned when when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.

LOS F describes operations with control delay exceeding 80 s/veh or a volume-to-capacity ratio greater than 1.0. This level, considered to be unacceptable to most drivers, often occurs with over-saturation, that is, when arrival flow rates exceed the capacity of the intersection. This level is typically assigned when the volume-to-capacity ratio is high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

Source: Highway Capacity Manual, 6th Edition. Transportation Research Board, National Research Council



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	624	596	31	14	16
Future Volume (veh/h)	25	624	596	31	14	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1984	1984	1984	1984	2000	2000
Adj Flow Rate, veh/h	26	657	662	34	23	27
Peak Hour Factor	0.95	0.95	0.90	0.90	0.60	0.60
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	643	3173	2912	1397	111	132
Arrive On Green	0.02	0.84	0.77	0.77	0.06	0.06
Sat Flow, veh/h	1890	3870	3870	1682	1905	1695
Grp Volume(v), veh/h	26	657	662	34	23	27
Grp Sat Flow(s),veh/h/ln	1890	1885	1885	1682	1905	1695
Q Serve(g_s), s	0.3	4.0	5.8	0.4	1.4	1.8
Cycle Q Clear(g_c), s	0.3	4.0	5.8	0.4	1.4	1.8
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	643	3173	2912	1397	111	132
V/C Ratio(X)	0.04	0.21	0.23	0.02	0.21	0.21
Avail Cap(c_a), veh/h	827	3173	2912	1397	286	287
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	2.5	1.8	3.8	1.8	53.9	51.9
Incr Delay (d2), s/veh	0.0	0.1	0.2	0.0	0.9	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.7	1.7	0.2	0.7	1.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	2.5	2.0	4.0	1.8	54.8	52.6
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		683	696		50	
Approach Delay, s/veh		2.0	3.8		53.6	
Approach LOS		A	A		D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		107.0		13.0	8.3	98.7
Change Period (Y+Rc), s		* 6		6.0	* 6	* 6
Max Green Setting (Gmax), s		* 90		18.0	* 14	* 70
Max Q Clear Time (g_c+I1), s		6.0		3.8	2.3	7.8
Green Ext Time (p_c), s		4.6		0.1	0.0	4.8

Intersection Summary	
HCM 6th Ctrl Delay	4.7
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	30	608	582	45	47	45
Future Vol, veh/h	30	608	582	45	47	45
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	500	-	-	25	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	82	82
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	32	640	613	47	57	55

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	661	0	-	0	998	308
Stage 1	-	-	-	-	614	-
Stage 2	-	-	-	-	384	-
Critical Hdwy	4.12	-	-	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	2.21	-	-	-	3.51	3.31
Pot Cap-1 Maneuver	930	-	-	-	*427	691
Stage 1	-	-	-	-	*505	-
Stage 2	-	-	-	-	*802	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	929	-	-	-	*411	690
Mov Cap-2 Maneuver	-	-	-	-	*433	-
Stage 1	-	-	-	-	*487	-
Stage 2	-	-	-	-	*801	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	13.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	929	-	-	-	529
HCM Lane V/C Ratio	0.034	-	-	-	0.212
HCM Control Delay (s)	9	-	-	-	13.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

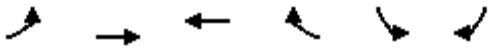
Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	171	484	432	112	102	195
Future Vol, veh/h	171	484	432	112	102	195
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	500	-	-	200	250	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	93	93	95	95
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	180	509	465	120	107	205

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	585	0	-	0	1080	233
Stage 1	-	-	-	-	465	-
Stage 2	-	-	-	-	615	-
Critical Hdwy	4.12	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	993	-	-	-	320	775
Stage 1	-	-	-	-	604	-
Stage 2	-	-	-	-	739	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	993	-	-	-	262	775
Mov Cap-2 Maneuver	-	-	-	-	382	-
Stage 1	-	-	-	-	495	-
Stage 2	-	-	-	-	739	-

Approach	EB	WB	SB
HCM Control Delay, s	2.5	0	13.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	993	-	-	-	382	775
HCM Lane V/C Ratio	0.181	-	-	-	0.281	0.265
HCM Control Delay (s)	9.4	-	-	-	18.1	11.3
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.7	-	-	-	1.1	1.1



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	567	564	24	22	16
Future Volume (veh/h)	13	567	564	24	22	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1984	1984	1984	1984	1953	1953
Adj Flow Rate, veh/h	14	630	634	27	26	19
Peak Hour Factor	0.90	0.90	0.89	0.89	0.86	0.86
Percent Heavy Veh, %	1	1	1	1	3	3
Cap, veh/h	636	3070	2769	1323	98	109
Arrive On Green	0.01	0.81	0.73	0.73	0.05	0.05
Sat Flow, veh/h	1890	3870	3870	1682	1860	1655
Grp Volume(v), veh/h	14	630	634	27	26	19
Grp Sat Flow(s),veh/h/ln	1890	1885	1885	1682	1860	1655
Q Serve(g_s), s	0.2	3.4	4.8	0.3	1.2	1.0
Cycle Q Clear(g_c), s	0.2	3.4	4.8	0.3	1.2	1.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	636	3070	2769	1323	98	109
V/C Ratio(X)	0.02	0.21	0.23	0.02	0.27	0.17
Avail Cap(c_a), veh/h	800	3070	2769	1323	310	298
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	2.7	1.9	3.8	2.1	41.0	39.7
Incr Delay (d2), s/veh	0.0	0.2	0.2	0.0	1.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.5	1.3	0.1	0.6	0.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	2.7	2.0	4.0	2.1	42.4	40.5
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		644	661		45	
Approach Delay, s/veh		2.0	3.9		41.6	
Approach LOS		A	A		D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		79.3		10.7	7.2	72.1
Change Period (Y+Rc), s		* 6		6.0	* 6	* 6
Max Green Setting (Gmax), s		* 63		15.0	* 9	* 48
Max Q Clear Time (g_c+I1), s		5.4		3.2	2.2	6.8
Green Ext Time (p_c), s		4.4		0.1	0.0	4.4

Intersection Summary	
HCM 6th Ctrl Delay	4.3
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	32	557	554	50	35	34
Future Vol, veh/h	32	557	554	50	35	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	500	-	-	25	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	89	89	75	75
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	36	619	622	56	47	45

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	678	0	-	0	1004	311
Stage 1	-	-	-	-	622	-
Stage 2	-	-	-	-	382	-
Critical Hdwy	4.12	-	-	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	2.21	-	-	-	3.51	3.31
Pot Cap-1 Maneuver	917	-	-	-	*392	688
Stage 1	-	-	-	-	*500	-
Stage 2	-	-	-	-	*825	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	917	-	-	-	*377	688
Mov Cap-2 Maneuver	-	-	-	-	*421	-
Stage 1	-	-	-	-	*481	-
Stage 2	-	-	-	-	*825	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	13.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	917	-	-	-	521
HCM Lane V/C Ratio	0.039	-	-	-	0.177
HCM Control Delay (s)	9.1	-	-	-	13.4
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	180	412	396	133	148	208
Future Vol, veh/h	180	412	396	133	148	208
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	500	-	-	200	250	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	87	87	86	86
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	200	458	455	153	172	242

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	608	0	-	0	1084	228
Stage 1	-	-	-	-	455	-
Stage 2	-	-	-	-	629	-
Critical Hdwy	4.12	-	-	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	2.21	-	-	-	3.51	3.31
Pot Cap-1 Maneuver	973	-	-	-	285	778
Stage 1	-	-	-	-	609	-
Stage 2	-	-	-	-	655	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	973	-	-	-	226	778
Mov Cap-2 Maneuver	-	-	-	-	353	-
Stage 1	-	-	-	-	484	-
Stage 2	-	-	-	-	655	-

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	17
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	973	-	-	-	353	778
HCM Lane V/C Ratio	0.206	-	-	-	0.488	0.311
HCM Control Delay (s)	9.7	-	-	-	24.5	11.7
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.8	-	-	-	2.6	1.3

Intersection: 1: S. Adams Road & Forester Blvd

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (ft)	47	102	43	57	66	28	57	37
Average Queue (ft)	11	38	9	26	25	1	10	9
95th Queue (ft)	35	80	34	57	58	10	35	27
Link Distance (ft)		905	905	755	755			611
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	500					175	200	
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: S. Adams Road & Meijer Gas Station Drive

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	39	93
Average Queue (ft)	10	35
95th Queue (ft)	32	69
Link Distance (ft)		338
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	500	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: S. Adams Road & Marketplace Circle

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	102	18	144	64
Average Queue (ft)	40	0	49	32
95th Queue (ft)	76	6	109	54
Link Distance (ft)				381
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	500	200	250	
Storage Blk Time (%)			0	
Queuing Penalty (veh)			0	

Zone Summary

Zone wide Queuing Penalty: 0

Intersection: 1: S. Adams Road & Forester Blvd

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (ft)	30	78	44	55	82	11	74	24
Average Queue (ft)	7	19	5	12	17	1	18	8
95th Queue (ft)	26	61	24	42	55	7	53	24
Link Distance (ft)		905	905	755	755			611
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	500					175	200	
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: S. Adams Road & Meijer Gas Station Drive

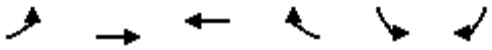
Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	34	55
Average Queue (ft)	12	26
95th Queue (ft)	34	48
Link Distance (ft)		338
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	500	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: S. Adams Road & Marketplace Circle

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	90	18	153	66
Average Queue (ft)	40	1	71	34
95th Queue (ft)	71	10	133	57
Link Distance (ft)				381
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	500	200	250	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 0



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	627	599	31	14	16
Future Volume (veh/h)	25	627	599	31	14	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1984	1984	1984	1984	2000	2000
Adj Flow Rate, veh/h	26	660	666	34	23	27
Peak Hour Factor	0.95	0.95	0.90	0.90	0.60	0.60
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	641	3173	2912	1397	111	132
Arrive On Green	0.02	0.84	0.77	0.77	0.06	0.06
Sat Flow, veh/h	1890	3870	3870	1682	1905	1695
Grp Volume(v), veh/h	26	660	666	34	23	27
Grp Sat Flow(s),veh/h/ln	1890	1885	1885	1682	1905	1695
Q Serve(g_s), s	0.3	4.0	5.9	0.4	1.4	1.8
Cycle Q Clear(g_c), s	0.3	4.0	5.9	0.4	1.4	1.8
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	641	3173	2912	1397	111	132
V/C Ratio(X)	0.04	0.21	0.23	0.02	0.21	0.21
Avail Cap(c_a), veh/h	825	3173	2912	1397	286	287
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	2.5	1.8	3.8	1.8	53.9	51.9
Incr Delay (d2), s/veh	0.0	0.1	0.2	0.0	0.9	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.8	1.7	0.2	0.7	1.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	2.5	2.0	4.0	1.8	54.8	52.6
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		686	700		50	
Approach Delay, s/veh		2.0	3.9		53.6	
Approach LOS		A	A		D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		107.0		13.0	8.3	98.7
Change Period (Y+Rc), s		* 6		6.0	* 6	* 6
Max Green Setting (Gmax), s		* 90		18.0	* 14	* 70
Max Q Clear Time (g_c+I1), s		6.0		3.8	2.3	7.9
Green Ext Time (p_c), s		4.7		0.1	0.0	4.8

Intersection Summary	
HCM 6th Ctrl Delay	4.7
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	30	611	585	45	47	45
Future Vol, veh/h	30	611	585	45	47	45
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	500	-	-	25	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	82	82
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	32	643	616	47	57	55

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	664	0	-	0	1003	309
Stage 1	-	-	-	-	617	-
Stage 2	-	-	-	-	386	-
Critical Hdwy	4.12	-	-	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	2.21	-	-	-	3.51	3.31
Pot Cap-1 Maneuver	928	-	-	-	*423	690
Stage 1	-	-	-	-	*503	-
Stage 2	-	-	-	-	*802	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	927	-	-	-	*407	689
Mov Cap-2 Maneuver	-	-	-	-	*431	-
Stage 1	-	-	-	-	*485	-
Stage 2	-	-	-	-	*801	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	13.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	927	-	-	-	528
HCM Lane V/C Ratio	0.034	-	-	-	0.212
HCM Control Delay (s)	9	-	-	-	13.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

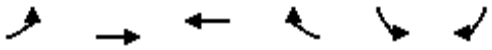
Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	172	486	434	113	103	196
Future Vol, veh/h	172	486	434	113	103	196
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	500	-	-	200	250	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	93	93	95	95
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	181	512	467	122	108	206

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	589	0	-	0	1085	234
Stage 1	-	-	-	-	467	-
Stage 2	-	-	-	-	618	-
Critical Hdwy	4.12	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	989	-	-	-	316	774
Stage 1	-	-	-	-	603	-
Stage 2	-	-	-	-	737	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	989	-	-	-	258	774
Mov Cap-2 Maneuver	-	-	-	-	379	-
Stage 1	-	-	-	-	493	-
Stage 2	-	-	-	-	737	-

Approach	EB	WB	SB
HCM Control Delay, s	2.5	0	13.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	989	-	-	-	379	774
HCM Lane V/C Ratio	0.183	-	-	-	0.286	0.267
HCM Control Delay (s)	9.5	-	-	-	18.3	11.3
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.7	-	-	-	1.2	1.1



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	570	567	24	22	16
Future Volume (veh/h)	13	570	567	24	22	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1984	1984	1984	1984	1953	1953
Adj Flow Rate, veh/h	14	633	637	27	26	19
Peak Hour Factor	0.90	0.90	0.89	0.89	0.86	0.86
Percent Heavy Veh, %	1	1	1	1	3	3
Cap, veh/h	634	3070	2769	1323	98	109
Arrive On Green	0.01	0.81	0.73	0.73	0.05	0.05
Sat Flow, veh/h	1890	3870	3870	1682	1860	1655
Grp Volume(v), veh/h	14	633	637	27	26	19
Grp Sat Flow(s),veh/h/ln	1890	1885	1885	1682	1860	1655
Q Serve(g_s), s	0.2	3.4	4.9	0.3	1.2	1.0
Cycle Q Clear(g_c), s	0.2	3.4	4.9	0.3	1.2	1.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	634	3070	2769	1323	98	109
V/C Ratio(X)	0.02	0.21	0.23	0.02	0.27	0.17
Avail Cap(c_a), veh/h	798	3070	2769	1323	310	298
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	2.7	1.9	3.8	2.1	41.0	39.7
Incr Delay (d2), s/veh	0.0	0.2	0.2	0.0	1.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.5	1.3	0.1	0.6	0.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	2.7	2.0	4.0	2.1	42.4	40.5
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		647	664		45	
Approach Delay, s/veh		2.0	3.9		41.6	
Approach LOS		A	A		D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		79.3		10.7	7.2	72.1
Change Period (Y+Rc), s		* 6		6.0	* 6	* 6
Max Green Setting (Gmax), s		* 63		15.0	* 9	* 48
Max Q Clear Time (g_c+I1), s		5.4		3.2	2.2	6.9
Green Ext Time (p_c), s		4.4		0.1	0.0	4.5

Intersection Summary	
HCM 6th Ctrl Delay	4.3
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	32	560	557	50	35	34
Future Vol, veh/h	32	560	557	50	35	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	500	-	-	25	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	89	89	75	75
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	36	622	626	56	47	45

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	682	0	-	0	1009	313
Stage 1	-	-	-	-	626	-
Stage 2	-	-	-	-	383	-
Critical Hdwy	4.12	-	-	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	2.21	-	-	-	3.51	3.31
Pot Cap-1 Maneuver	913	-	-	-	*389	686
Stage 1	-	-	-	-	*498	-
Stage 2	-	-	-	-	*825	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	913	-	-	-	*374	686
Mov Cap-2 Maneuver	-	-	-	-	*419	-
Stage 1	-	-	-	-	*479	-
Stage 2	-	-	-	-	*825	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	13.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	913	-	-	-	518
HCM Lane V/C Ratio	0.039	-	-	-	0.178
HCM Control Delay (s)	9.1	-	-	-	13.4
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	181	414	398	134	149	209
Future Vol, veh/h	181	414	398	134	149	209
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	500	-	-	200	250	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	87	87	86	86
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	201	460	457	154	173	243

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	611	0	-	0	1089	229
Stage 1	-	-	-	-	457	-
Stage 2	-	-	-	-	632	-
Critical Hdwy	4.12	-	-	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	2.21	-	-	-	3.51	3.31
Pot Cap-1 Maneuver	971	-	-	-	282	777
Stage 1	-	-	-	-	607	-
Stage 2	-	-	-	-	653	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	971	-	-	-	224	777
Mov Cap-2 Maneuver	-	-	-	-	351	-
Stage 1	-	-	-	-	481	-
Stage 2	-	-	-	-	653	-

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	17.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	971	-	-	-	351	777
HCM Lane V/C Ratio	0.207	-	-	-	0.494	0.313
HCM Control Delay (s)	9.7	-	-	-	24.9	11.7
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.8	-	-	-	2.6	1.3

Intersection: 1: S. Adams Road & Forester Blvd

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (ft)	40	92	47	66	81	26	44	29
Average Queue (ft)	12	37	7	23	26	2	9	8
95th Queue (ft)	36	78	29	56	64	13	31	25
Link Distance (ft)		905	905	755	755			611
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	500					175	200	
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: S. Adams Road & Meijer Gas Station Drive

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	38	80
Average Queue (ft)	8	33
95th Queue (ft)	30	62
Link Distance (ft)		338
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	500	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: S. Adams Road & Marketplace Circle

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	116	9	132	66
Average Queue (ft)	41	0	48	31
95th Queue (ft)	82	4	97	54
Link Distance (ft)				381
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	500	200	250	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 0

Intersection: 1: S. Adams Road & Forester Blvd

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (ft)	37	85	49	61	65	20	60	24
Average Queue (ft)	7	21	6	13	15	1	17	9
95th Queue (ft)	27	67	30	46	50	9	47	26
Link Distance (ft)		905	905	755	755			611
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	500					175	200	
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: S. Adams Road & Meijer Gas Station Drive

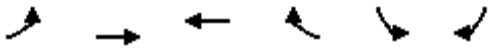
Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	31	65
Average Queue (ft)	11	28
95th Queue (ft)	33	55
Link Distance (ft)		338
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	500	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: S. Adams Road & Marketplace Circle

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	97	14	204	126
Average Queue (ft)	41	0	69	36
95th Queue (ft)	76	6	152	85
Link Distance (ft)				381
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	500	200	250	
Storage Blk Time (%)			1	
Queuing Penalty (veh)			2	

Zone Summary

Zone wide Queuing Penalty: 2



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	636	608	31	14	16
Future Volume (veh/h)	25	636	608	31	14	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1984	1984	1984	1984	2000	2000
Adj Flow Rate, veh/h	26	669	676	34	23	27
Peak Hour Factor	0.95	0.95	0.90	0.90	0.60	0.60
Percent Heavy Veh, %	1	1	1	1	0	0
Cap, veh/h	635	3173	2912	1397	111	132
Arrive On Green	0.02	0.84	0.77	0.77	0.06	0.06
Sat Flow, veh/h	1890	3870	3870	1682	1905	1695
Grp Volume(v), veh/h	26	669	676	34	23	27
Grp Sat Flow(s),veh/h/ln	1890	1885	1885	1682	1905	1695
Q Serve(g_s), s	0.3	4.1	6.0	0.4	1.4	1.8
Cycle Q Clear(g_c), s	0.3	4.1	6.0	0.4	1.4	1.8
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	635	3173	2912	1397	111	132
V/C Ratio(X)	0.04	0.21	0.23	0.02	0.21	0.21
Avail Cap(c_a), veh/h	819	3173	2912	1397	286	287
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	2.5	1.8	3.8	1.8	53.9	51.9
Incr Delay (d2), s/veh	0.0	0.2	0.2	0.0	0.9	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.8	1.7	0.2	0.7	1.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	2.5	2.0	4.0	1.8	54.8	52.6
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		695	710		50	
Approach Delay, s/veh		2.0	3.9		53.6	
Approach LOS		A	A		D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		107.0		13.0	8.3	98.7
Change Period (Y+Rc), s		* 6		6.0	* 6	* 6
Max Green Setting (Gmax), s		* 90		18.0	* 14	* 70
Max Q Clear Time (g_c+I1), s		6.1		3.8	2.3	8.0
Green Ext Time (p_c), s		4.7		0.1	0.0	4.9

Intersection Summary	
HCM 6th Ctrl Delay	4.7
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	601	19	20	576	45	18	0	21	47	0	45
Future Vol, veh/h	30	601	19	20	576	45	18	0	21	47	0	45
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	500	-	-	500	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	92	92	92	82	82	82
Heavy Vehicles, %	1	1	1	1	1	1	2	2	2	1	1	1
Mvmt Flow	32	633	20	21	606	47	20	0	23	57	0	55

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	654	0	0	653	0	0	1052	1403	327	1030	1366	304
Stage 1	-	-	-	-	-	-	707	707	-	649	649	-
Stage 2	-	-	-	-	-	-	345	696	-	381	717	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.54	6.54	6.94	7.52	6.52	6.92
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.52	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.52	5.52	-
Follow-up Hdwy	2.21	-	-	2.21	-	-	3.52	4.02	3.32	3.51	4.01	3.31
Pot Cap-1 Maneuver	936	-	-	1272	-	-	348	200	*848	*367	214	695
Stage 1	-	-	-	-	-	-	728	653	-	*427	466	-
Stage 2	-	-	-	-	-	-	644	441	-	*802	647	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	935	-	-	1272	-	-	308	190	*848	*343	203	694
Mov Cap-2 Maneuver	-	-	-	-	-	-	308	190	-	*343	203	-
Stage 1	-	-	-	-	-	-	703	631	-	*412	458	-
Stage 2	-	-	-	-	-	-	583	433	-	*754	625	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.2	13.4	15.5
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	469	935	-	-	1272	-	-	456
HCM Lane V/C Ratio	0.09	0.034	-	-	0.017	-	-	0.246
HCM Control Delay (s)	13.4	9	-	-	7.9	-	-	15.5
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0.1	-	-	1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

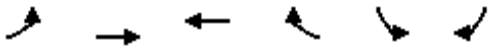
Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	176	493	441	113	103	200
Future Vol, veh/h	176	493	441	113	103	200
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	500	-	-	200	250	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	93	93	95	95
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	185	519	474	122	108	211

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	596	0	-	0	1104	237
Stage 1	-	-	-	-	474	-
Stage 2	-	-	-	-	630	-
Critical Hdwy	4.12	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.21	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	983	-	-	-	306	771
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	724	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	983	-	-	-	249	771
Mov Cap-2 Maneuver	-	-	-	-	372	-
Stage 1	-	-	-	-	486	-
Stage 2	-	-	-	-	724	-

Approach	EB	WB	SB
HCM Control Delay, s	2.5	0	13.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	983	-	-	-	372	771
HCM Lane V/C Ratio	0.188	-	-	-	0.291	0.273
HCM Control Delay (s)	9.5	-	-	-	18.6	11.4
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.7	-	-	-	1.2	1.1



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	578	575	24	22	16
Future Volume (veh/h)	13	578	575	24	22	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1984	1984	1984	1984	1953	1953
Adj Flow Rate, veh/h	14	642	646	27	26	19
Peak Hour Factor	0.90	0.90	0.89	0.89	0.86	0.86
Percent Heavy Veh, %	1	1	1	1	3	3
Cap, veh/h	629	3070	2769	1323	98	109
Arrive On Green	0.01	0.81	0.73	0.73	0.05	0.05
Sat Flow, veh/h	1890	3870	3870	1682	1860	1655
Grp Volume(v), veh/h	14	642	646	27	26	19
Grp Sat Flow(s),veh/h/ln	1890	1885	1885	1682	1860	1655
Q Serve(g_s), s	0.2	3.4	4.9	0.3	1.2	1.0
Cycle Q Clear(g_c), s	0.2	3.4	4.9	0.3	1.2	1.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	629	3070	2769	1323	98	109
V/C Ratio(X)	0.02	0.21	0.23	0.02	0.27	0.17
Avail Cap(c_a), veh/h	814	3070	2769	1323	310	298
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	2.7	1.9	3.8	2.1	41.0	39.7
Incr Delay (d2), s/veh	0.0	0.2	0.2	0.0	1.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.5	1.3	0.1	0.6	0.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	2.7	2.0	4.0	2.1	42.4	40.5
LnGrp LOS	A	A	A	A	D	D
Approach Vol, veh/h		656	673		45	
Approach Delay, s/veh		2.0	4.0		41.6	
Approach LOS		A	A		D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		79.3		10.7	7.2	72.1
Change Period (Y+Rc), s		* 6		6.0	* 6	* 6
Max Green Setting (Gmax), s		* 63		15.0	* 10	* 47
Max Q Clear Time (g_c+I1), s		5.4		3.2	2.2	6.9
Green Ext Time (p_c), s		4.5		0.1	0.0	4.5

Intersection Summary	
HCM 6th Ctrl Delay	4.3
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	550	18	21	548	50	17	0	22	35	0	34
Future Vol, veh/h	32	550	18	21	548	50	17	0	22	35	0	34
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	500	-	-	500	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	89	89	89	92	92	92	75	75	75
Heavy Vehicles, %	1	1	1	1	1	1	2	2	2	1	1	1
Mvmt Flow	36	611	20	24	616	56	18	0	24	47	0	45

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	672	0	0	631	0	0	1049	1413	316	1042	1367	308
Stage 1	-	-	-	-	-	-	693	693	-	664	664	-
Stage 2	-	-	-	-	-	-	356	720	-	378	703	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.54	6.54	6.94	7.52	6.52	6.92
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.52	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.52	5.52	-
Follow-up Hdwy	2.21	-	-	2.21	-	-	3.52	4.02	3.32	3.51	4.01	3.31
Pot Cap-1 Maneuver	921	-	-	1250	-	-	322	187	*872	*329	204	691
Stage 1	-	-	-	-	-	-	688	631	-	*419	459	-
Stage 2	-	-	-	-	-	-	634	430	-	*825	626	-
Platoon blocked, %		-	-	1	-	-	1	1	1	1	1	
Mov Cap-1 Maneuver	921	-	-	1250	-	-	288	176	*872	*306	192	691
Mov Cap-2 Maneuver	-	-	-	-	-	-	288	176	-	*306	192	-
Stage 1	-	-	-	-	-	-	661	607	-	*403	450	-
Stage 2	-	-	-	-	-	-	581	422	-	*771	601	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.3	13.6	15.9
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	463	921	-	-	1250	-	-	422
HCM Lane V/C Ratio	0.092	0.039	-	-	0.019	-	-	0.218
HCM Control Delay (s)	13.6	9.1	-	-	7.9	-	-	15.9
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0.1	-	-	0.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	186	421	405	134	149	214
Future Vol, veh/h	186	421	405	134	149	214
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	500	-	-	200	250	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	87	87	86	86
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	207	468	466	154	173	249

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	620	0	-	0	1114	233
Stage 1	-	-	-	-	466	-
Stage 2	-	-	-	-	648	-
Critical Hdwy	4.12	-	-	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	2.21	-	-	-	3.51	3.31
Pot Cap-1 Maneuver	963	-	-	-	271	772
Stage 1	-	-	-	-	601	-
Stage 2	-	-	-	-	639	-
Platoon blocked, %		-	-	-	1	
Mov Cap-1 Maneuver	963	-	-	-	213	772
Mov Cap-2 Maneuver	-	-	-	-	341	-
Stage 1	-	-	-	-	472	-
Stage 2	-	-	-	-	639	-

Approach	EB	WB	SB
HCM Control Delay, s	3	0	17.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	963	-	-	-	341	772
HCM Lane V/C Ratio	0.215	-	-	-	0.508	0.322
HCM Control Delay (s)	9.8	-	-	-	26	11.9
HCM Lane LOS	A	-	-	-	D	B
HCM 95th %tile Q(veh)	0.8	-	-	-	2.7	1.4

Intersection: 1: S. Adams Road & Forester Blvd

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (ft)	38	96	53	73	96	20	44	29
Average Queue (ft)	12	42	11	28	28	1	8	7
95th Queue (ft)	36	84	37	62	69	9	29	23
Link Distance (ft)		905	905	744	744			611
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	500					175	200	
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: Site Drive/Meijer Gas Station Drive & S. Adams Road

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (ft)	36	26	58	93
Average Queue (ft)	9	5	24	34
95th Queue (ft)	29	22	49	70
Link Distance (ft)			183	336
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	500	500		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: S. Adams Road & Marketplace Circle

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	92	18	129	72
Average Queue (ft)	43	2	51	30
95th Queue (ft)	75	11	103	58
Link Distance (ft)				381
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	500	200	250	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 0

Intersection: 1: S. Adams Road & Forester Blvd

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (ft)	27	96	40	62	53	10	69	29
Average Queue (ft)	7	20	3	14	14	1	16	9
95th Queue (ft)	25	66	20	48	44	7	46	26
Link Distance (ft)		905	905	744	744			611
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	500					175	200	
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: Site Drive/Meijer Gas Station Drive & S. Adams Road

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (ft)	31	27	55	82
Average Queue (ft)	8	6	24	30
95th Queue (ft)	28	23	49	61
Link Distance (ft)			183	336
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	500	500		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: S. Adams Road & Marketplace Circle

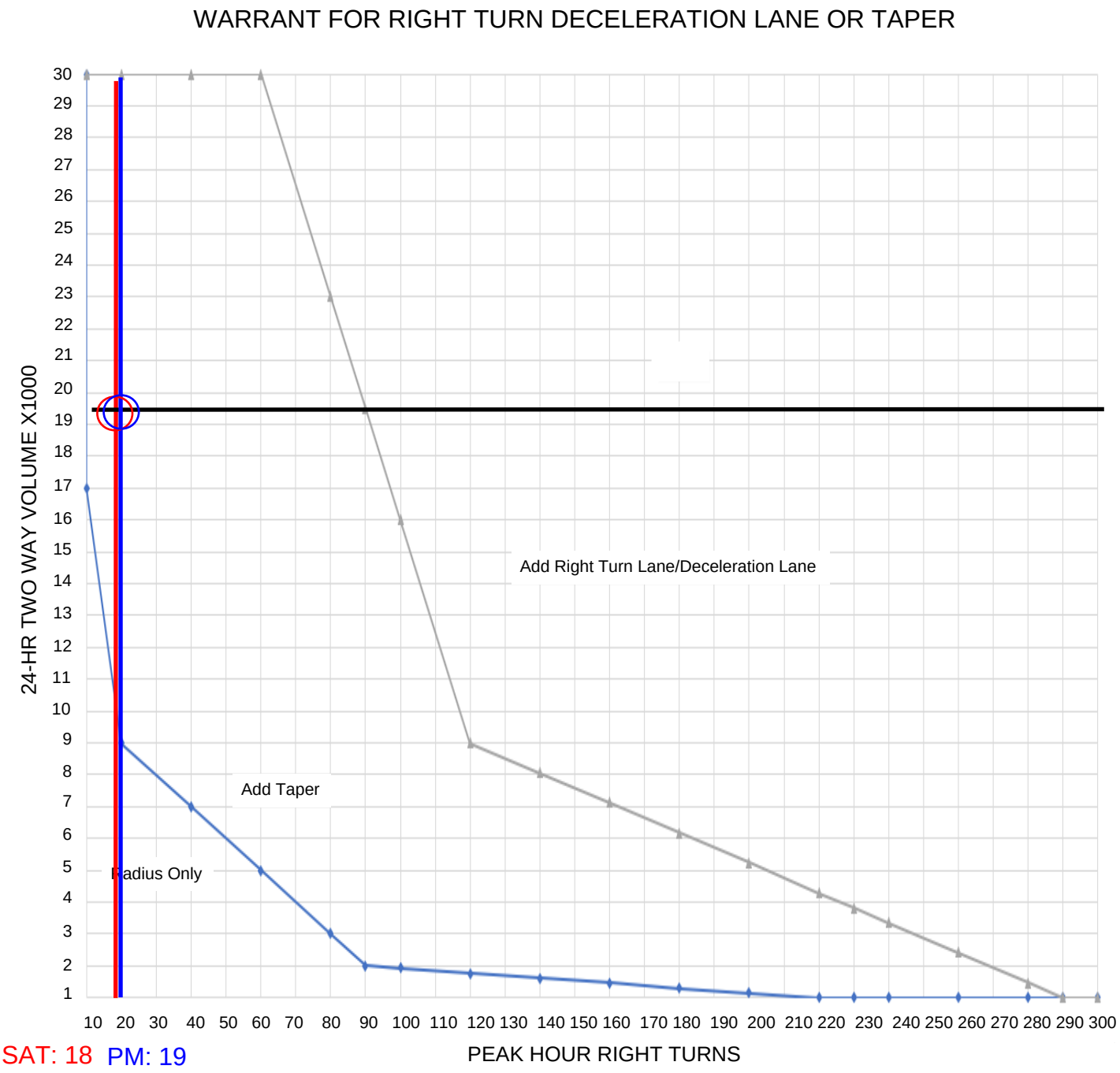
Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	96	18	188	76
Average Queue (ft)	39	1	75	35
95th Queue (ft)	72	8	147	60
Link Distance (ft)				381
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	500	200	250	
Storage Blk Time (%)			0	
Queuing Penalty (veh)			0	

Zone Summary

Zone wide Queuing Penalty: 0

S. Adams Road and Site Drive (RT Warrant)

FIGURE 6-3



SAT: 18 PM: 19

2016 ADT = 18,000 vpd
0.5% @ 8yrs = +733 vpd
Car wash = +780 vpd
2024 ADT = 19,513 vpd

RT TAPER TREATMENT RECOMMENDED

Hypershine Car Wash-Cash Lane
95th Percentile Probability - Drive Through Queue Length (# of Vehicles)

Volume = 26 vph
service rate = 60 veh/hr
λ = 0.433333

	1	2	3	4	5	6	7	8	9	
λ^x	No Veh in Cycle	X	X!	P = (e^(-λ))(λ^x)/X!	ΣP	P* # Cycle containing Volume in 1	Σ Cycles in 6	Volume in Cycle (1*6)	Σ volume	Poisson Queue
1.0000	0	0	1	64.83%	64.83%	39	39	0	0	NO
0.4333	1	1	1	28.09%	92.93%	17	56	17	17	NO
0.1878	2	2	2	6.09%	99.02%	4	11	7	24	NO
0.0814	3	3	6	0.88%	99.90%	1	12	2	26	NO
0.0353	4	4	24	0.10%	99.99%	0	12	0	26	MET
0.0153	5	5	120	0.01%	100.00%	0	12	0	26	MET
0.0066	6	6	720	0.00%	100.00%	0	12	0	26	MET
0.0029	7	7	5040	0.00%	100.00%	0	12	0	26	MET
0.0012	8	8	40320	0.00%	100.00%	0	12	0	26	MET
0.0005	9	9	362880	0.00%	100.00%	0	12	0	26	MET
0.0002	10	10	3628800	0.00%	100.00%	0	12	0	26	MET
0.0001	11	11	39916800	0.00%	100.00%	0	12	0	26	MET

Hypershine Car Wash-FastPass Lane
95th Percentile Probability - Drive Through Queue Length (# of Vehicles)

Volume = 13 vph
service rate = 120 veh/hr
$\lambda =$ 0.108333

	1	2	3	4	5	6	7	8	9	
λ^x	No Veh in Cycle	X	X!	P = (e^(-λ))(λ^x)/X!	ΣP	P* # Cycle containing Volume in 1	Σ Cycles in 6	Volume in Cycle (1*6)	Σ volume	Poisson Queue
1.0000	0	0	1	89.73%	89.73%	108	108	0	0	NO
0.1083	1	1	1	9.72%	99.45%	12	119	12	12	NO
0.0117	2	2	2	0.53%	99.98%	1	11	1	13	NO
0.0013	3	3	6	0.02%	100.00%	0	11	0	13	MET
0.0001	4	4	24	0.00%	100.00%	0	11	0	13	MET
0.0000	5	5	120	0.00%	100.00%	0	11	0	13	MET
0.0000	6	6	720	0.00%	100.00%	0	11	0	13	MET
0.0000	7	7	5040	0.00%	100.00%	0	11	0	13	MET
0.0000	8	8	40320	0.00%	100.00%	0	11	0	13	MET
0.0000	9	9	362880	0.00%	100.00%	0	11	0	13	MET
0.0000	10	10	3628800	0.00%	100.00%	0	11	0	13	MET
0.0000	11	11	39916800	0.00%	100.00%	0	11	0	13	MET

Hypershine Car Wash-Car Wash Tunnel
95th Percentile Probability - Drive Through Queue Length (# of Vehicles)

Volume = 39 vph
service rate = 200 veh/hr
λ = 0.195

	1	2	3	4	5	6	7	8	9	
λ^x	No Veh in Cycle	X	X!	P = (e^(-λ))(λ^x)/X!	ΣP	P* # Cycle containing Volume in 1	Σ Cycles in 6	Volume in Cycle (1*6)	Σ volume	Poisson Queue
1.0000	0	0	1	82.28%	82.28%	165	165	0	0	NO
0.1950	1	1	1	16.05%	98.33%	32	197	32	32	NO
0.0380	2	2	2	1.56%	99.89%	3	11	6	38	NO
0.0074	3	3	6	0.10%	99.99%	0	11	1	39	MET
0.0014	4	4	24	0.00%	100.00%	0	11	0	39	MET
0.0003	5	5	120	0.00%	100.00%	0	11	0	39	MET
0.0001	6	6	720	0.00%	100.00%	0	11	0	39	MET
0.0000	7	7	5040	0.00%	100.00%	0	11	0	39	MET
0.0000	8	8	40320	0.00%	100.00%	0	11	0	39	MET
0.0000	9	9	362880	0.00%	100.00%	0	11	0	39	MET
0.0000	10	10	3628800	0.00%	100.00%	0	11	0	39	MET
0.0000	11	11	39916800	0.00%	100.00%	0	11	0	39	MET