

MEMO

VIA EMAIL: jordan@alrigusa.com

To: Jordan Chapman
ALRIG USA Acquisitions, LLC

From: Julie M. Kroll, PE, PTOE
Mary Ollis, EIT
Fleis & VandenBrink

Date: June 26, 2023
Revised July 27, 2023

Re: Proposed Chick-fil-A Development
Plainfield, Indiana
Traffic Impact Study

1 INTRODUCTION

This memorandum presents the results of the Traffic Impact Study (TIS) for the proposed development in the Town of Plainfield, Indiana. The project site is located at 6102 Cambridge Way, as shown on the attached **Figure 1**. The property is currently occupied by vacant “Bob Evans” restaurant, which will be razed with the construction of the proposed development. The proposed site plan includes a Chick-fil-A fast food restaurant with drive-through. Site access is proposed via two (2) existing site access points on Cambridge Way; one (1) ingress only driveway and one (1) egress only driveway. Cambridge Way is under the jurisdiction of the Town of Plainfield, Indiana and as part of the site plan approval, the Town has requested a TIS for this project.

This TIS has been completed to evaluate the impact of the proposed development on the adjacent roadway network. The scope was developed based on Fleis & VandenBrink’s (F&V) understanding of the development program, accepted traffic engineering practice, Town of Plainfield requirements, and professional experience. The study analyses were completed using Synchro/SimTraffic (Version 11) traffic analysis software. Sources of data for this study include F&V subconsultant Gewalt Hamilton Associates, Inc. (GHA), Institute of Transportation Engineers (ITE), the Federal Highway Administration (FHWA), Indiana Department of Transportation (INDOT), and the Town of Plainfield.

2 BACKGROUND DATA

2.1 EXISTING ROAD NETWORK

The lane use 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, minor streets and site driveways were assumed to have an operating speed of 25 miles per hour (mph), unless otherwise noted.

Cambridge Way generally runs in the north and south directions, adjacent to the east side of the project site. The study section of Cambridge Way is classified as a *Local Road* and has a posted speed limit of 30 mph. The study section of Cambridge Way, adjacent to the project site, generally provides a four-lane cross-section, with two (2) southbound through lanes, one (1) northbound through lane, and a center Two-Way Left-Turn Lane (TWLTL). Proposed restriping of Cambridge Way is recommended, as shown in the attached **Figure 3**.

Manchester Drive generally runs in the east and west directions, east of the project site. Manchester Drive is classified as a *Local Road* and has a posted speed limit of 30 mph. Manchester Drive connects to Clarks Creek Road, which runs north/south east of the project site and provides access for the adjacent land uses to access Perry Road from the west and to the east.

2.2 EXISTING TRAFFIC VOLUMES

F&V subconsultant GHA, collected existing weekday Turning Movement Count (TMC) data on Tuesday, May 23, 2023, during the AM (6:00 AM to 9:00 AM), MD (11:00 AM to 1:00 PM), and PM (4:00 PM to 6:00 PM) peak hours at the following study intersections:

- Cambridge Way & Manchester Drive
- Perry Road & Clarks Creek Road
- Manchester Drive & Clarks Creek Road

During collection of the turning movement counts, Peak Hour Factors (PHFs), pedestrian and bike 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. ‘Dummy nodes’ were also utilized in the Synchro models to account for sink and source locations; 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 network peak periods for the adjacent streets were observed to occur during the AM, MD, and PM peak hours, from 7:15 AM to 8:15 AM, 12:00 PM to 1:00 PM, and from 4:30 PM to 5:30 PM, respectively. F&V collected an inventory of the existing lane use and traffic controls, as shown on the attached **Figure 2**. Additionally, F&V obtained the current signal timing permits for the signalized intersections of Perry Road & Clarks Creek Road. The existing 2023 peak hour traffic volumes utilized in this TIS analysis are shown on the attached **Figure 3**. All applicable background data referenced in this memorandum is attached.

3 EXISTING CONDITIONS (2023)

The existing peak hour vehicle delays and Levels of Service (LOS) were calculated at the study intersections using Synchro (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, SimTraffic network simulations were reviewed to evaluate network operations and vehicle queues. The results for the existing conditions analysis are attached and shown in **Table 1**.

Table 1: Existing Intersection Operations

Intersection	Control	Approach	Existing Conditions					
			AM Peak		MD Peak		PM Peak	
			Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
1 Perry Road & Clarks Creek Road	Signalized	EBL	13.8	B	16.1	B	14.3	B
		EBTR	18.4	B	20.0	B	17.2	B
		WBL	13.3	B	14.0	B	12.6	B
		WBTR	13.6	B	15.5	B	15.2	B
		NBL	14.0	B	15.1	B	15.1	B
		NBTR	10.4	B	11.0	B	10.9	B
		SB	20.4	C	21.1	C	21.7	C
		Overall	16.8	B	16.7	B	15.6	B
2 Clarks Creek Road & Manchester Drive	TWSC (Manchester)	EB	10.4	B	10.6	B	10.1	B
		WB	8.8	A	9.2	A	8.6	A
		NBL	0.0*	A	0.0*	A	0.0*	A
		SBL	7.3	A	7.4	A	7.3	A
3 Cambridge Way & Manchester Drive	TWSC (Manchester)	WB	8.6	A	9.5	A	9.8	A
		NB	Free					
		SBL	7.6	A	7.6	A	7.4	A

*Indicates no vehicle volume present

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 the AM, MD, and PM peak hours.

Review of SimTraffic network simulation also indicates acceptable operations during all the peak periods. All vehicle queues present at the signalized intersection were observed to be serviced within each cycle length, leaving minimal residual queuing; additionally, vehicles at the stop-controlled study intersections were observed to find adequate gaps within through traffic and were not observed to experience long delays or excessive vehicle queuing.

4 BACKGROUND CONDITIONS (2025 NO BUILD)

4.1 BACKGROUND GROWTH RATE

Historical population data was obtained for the Town of Plainfield from the 2020 US census records in order to calculate a background growth rate to project the existing 2023 traffic volumes to the site buildout year of 2025. Additionally, the Town provided a study that was completed in 2022 which included previously collected traffic data, volume forecasts, and improvement recommendations for this area. Population projections were reviewed, which indicated a projected average annual growth of 1.68%. Therefore, a conservative annual background growth rate of **2.0%** per year was applied to the existing peak hour traffic volumes to forecast the background 2025 traffic volumes, **without the proposed development**. The projected background growth rate is consistent with the expectations of the Town for increased traffic volumes in the vicinity of the project area.

4.2 BACKGROUND INTERSECTION OPERATIONS

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**.

The results of the background conditions analysis indicates that all approaches and movements at the study intersection are expected to continue operating acceptably, at LOS D or better during all peak periods, in a manner similar to the existing conditions analysis. Review of SimTraffic network simulation also indicates acceptable operations during all peak periods, with minimal vehicle queuing observed, similar to the observations made during the existing conditions analysis.

Table 2: Background Intersection Operations

Intersection	Control	Approach	Background Conditions					
			AM Peak		MD Peak		PM Peak	
			Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
1 Perry Road & Clarks Creek Road	Signalized	EBL	13.9	B	16.3	B	14.5	B
		EBTR	18.6	B	20.4	C	17.5	B
		WBL	13.4	B	14.0	B	12.8	B
		WBTR	13.6	B	15.6	B	15.4	B
		NBL	14.3	B	15.2	B	15.2	B
		NBTR	10.6	B	11.0	B	10.9	B
		SB	20.7	C	21.2	C	21.7	C
		Overall	16.9	B	17.0	B	15.8	B
2 Clarks Creek Road & Manchester Drive	TWSC (Manchester)	EB	10.5	B	10.7	B	10.1	B
		WB	8.8	A	9.2	A	8.6	A
		NBL	0.0*	A	0.0*	A	0.0*	A
		SBL	7.3	A	7.4	A	7.3	A
3 Cambridge Way & Manchester Drive	TWSC (Manchester)	WB	8.6	A	9.5	A	9.8	A
		NB	Free					
		SBL	7.6	A	7.6	A	7.5	A

*Indicates no vehicle volume present

5 SITE TRIP GENERATION

The proposed development includes an approximately 5,028 SF Chick-fil-A fast-food restaurant with drive-through. The number of morning (AM), midday (MD), and afternoon (PM) peak hour vehicle trips that would be generated by the proposed Chick-fil-A development was forecast based on data from three (3) proportionally

sized Chick-fil-A facilities in Michigan located in Caledonia, Kalamazoo, and Okemos; the trip generation data is attached for reference. The trip generation used in this analysis is summarized in **Table 3**.

Table 3: Site Trip Generation

Land Use	Amount	Units	AM Peak Hour (vph)			MD Peak Hour (vph)			PM Peak Hour (vph)		
			In	Out	Total	In	Out	Total	In	Out	Total
Chick-fil-A	5,028	SF	54	55	109	194	194	388	162	161	323
<i>Pass-By (50% AM, 55% MD, 55% PM)</i>			27	27	54	106	106	212	89	89	178
New Trips			27	28	55	88	88	176	73	72	145

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 an ultimate destination. Therefore, not all traffic at the site driveways is necessarily new traffic added to the street system. This percentage of the trips 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. “Diverted-link” trips are similar to “pass-by” trips; however, the diverted-link trips were assumed to be generated by traffic traveling on Perry Road and diverted to the site before returning in their direction of travel. Therefore, these trips will result in additional trips to the adjacent roadway network. The percentage of “pass-by” and “diverted-link” trips were provided by Kittelson & Associates for use in this analysis.

The percentage of pass-by trips used in this analysis was determined based on the rates published by ITE in the *Trip Generation Manual, 11th Edition*. However, ITE does not provide MD pass-by data for Fast-Food Restaurant with Drive-Through (ITE #934); therefore, the PM peak hour pass-by data was utilized.

6 SITE TRIP DISTRIBUTION

The vehicular trips that would be generated by the proposed development were assigned to the study roadway network based on the proposed site access plan, 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 and continue on their original direction of travel. The site trip distributions utilized in this analysis are summarized in **Table 4**.

Table 4: Site Trip Distribution

New Trips						Pass-By Trips		
AM	MD	PM	To/From	via	Direction	AM	MD	PM
12%	22%	22%	East	Perry Road	Eastbound	83%	55%	37%
30%	24%	19%	West	Perry Road	Westbound	17%	45%	63%
6%	7%	9%	North	Quaker Boulevard				
52%	47%	50%	South	Quaker Boulevard				
100%	100%	100%	Total			100%	100%	100%

The vehicular traffic volumes shown in **Table 3** were distributed to the study 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 (2025)

7.1 SITE ACCESS

The vehicle and pedestrian site access on Cambridge Way was reviewed to determine how the existing roadway geometry could be restriped to accommodate the proposed operation of the site development and better utilize the existing roadway. Key findings of this review are summarized below and the recommended geometry is shown on the attached site plan.

A. Potential for a dedicated southbound right-turn lane on Cambridge Way at the site driveway

- The southbound approach on Cambridge Way provides two-through lanes, which narrow to one-through lane south of Manchester Drive. The additional southbound through lane could be restriped to provide a dedicated southbound through lane for the proposed Chick-fil-A. It is anticipated that this lane will be utilized as a de facto right-turn lane and by designating the lane accordingly, reducing the potential for rear-end and side-swipe crashes.

B. Consider restriping Cambridge Way to accommodate the existing and proposed uses

- The Cambridge Way cross section adjacent to the project site between Manchester Drive and Perry Road provides approximately 60ft of pavement. The existing cross section and pavement markings were reviewed to determine if the existing roadway width could be restriped to better accommodate the existing and proposed land uses.
- Review of the existing pavement markings shows that the southbound left-turn lane can remain as-is. A back-to-back left-turn was reviewed as an option, however in order to accommodate the existing uses on Cambridge Way, it is recommended to maintain the existing center left-turn lane.
- The Town has identify concerns with the proximity of the egress site access driveway from the adjacent Manchester Way intersection. In order to encourage the use of southbound left-turn lane, center line hardening is recommended. This will reduce the potential of vehicles traversing the intersection on a diagonal.

Exhibit 1: Example of Centerline Left-turn Lane Hardening



C. Pedestrian crossing improvements and additional pedestrian crossing facilities

- It is anticipated that with the addition of the Chick-fil-A, pedestrian activity will increase, especially with the numerous hotels in the area. Therefore, it is recommended to provide an E/W pedestrian crossing across the south leg of Cambridge Way, south of Manchester Drive.

Recommendations

- Restripe Cambridge Way adjacent to the project site to provide a dedicated southbound right-turn lane and a dedicated northbound left-turn lane into the project site.
- Provide a marked pedestrian crosswalk on the south leg of Cambridge Way at Manchester Drive.

7.2 FUTURE INTERSECTION OPERATIONS

Future peak hour vehicle delays and LOS **with the proposed development** were calculated based on the proposed lane use and traffic control shown on the attached **Figure 2**, 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	Future Conditions					
			AM Peak		MD Peak		PM Peak	
			Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
1 Perry Road & Clarks Creek Rd.	Signal	EBL	15.1	B	19.1	B	18.2	B
		EBTR	20.3	C	24.3	C	22.2	C
		WBL	14.2	B	15.4	B	14.3	B
		WBTR	14.2	B	16.4	B	16.8	B
		NBL	14.7	B	17.6	B	17.3	B
		NBTR	11.0	B	12.2	B	11.6	B
		SB	21.1	C	22.2	C	22.6	C
		Overall	17.8	B	18.4	B	17.7	B
2 Clarks Creek Rd. & Manchester Dr.	Stop (Minor)	EB	11.4	B	15.7	C	13.9	B
		WB	8.8	A	9.4	A	8.7	A
		NBL	0.0*	A	0.0*	A	0.0*	A
		SBL	7.3	A	7.4	A	7.3	A
3 Cambridge Way & Manchester Dr.	Stop (Minor)	WB	8.7	A	10.9	B	11.1	B
		NB	Free					
		SBL	7.8	A	8.2	A	7.8	A
4 Cambridge Way & Egress Site Dr.	Stop (Minor)	EBR	8.8	A	9.7	A	9.6	A
		NB	Free					
		SB	Free					
5 Cambridge Way & Ingress Site Dr.	Ingress ONLY	EB	Ingress Only					
		NBL	7.5	A	8.0	A	8.0	A
		SB	Free					

* Indicates no vehicle volume present

The results of the future conditions analysis indicates that all approaches and movements at the study intersection are expected to continue operating acceptably, at LOS D or better during all peak periods, in a manner similar to the background conditions analysis. Review of SimTraffic network simulations also indicates acceptable operations during all peak periods, with minimal vehicle queuing observed, similar to the observations made during background conditions analysis. Additionally, the egress vehicles at the proposed Egress Site Drive were able to find adequate gaps within the through traffic without experiencing significant delays or extensive vehicle queuing during all peak periods.

8 ACCESS MANAGEMENT

8.1 SITE ACCESS QUEUEING ON CAMBRIDGE WAY

The proposed Egress Site Drive is located north of the Cambridge Way & Manchester Drive intersection. The southbound left-turn lane queue length was evaluated to determine the projected southbound left-turn vehicle queue lengths and the potential impact to the site driveway operations. This evaluation was performed utilizing SimTraffic microsimulations to determine both the vehicles queuing and the percent time blocking as summarized in **Table 6** and shown on **Exhibit 2**. The results of the evaluation show:

- The proposed Site Drive location has adequate available storage length to accommodate egress right-turns without impacting the site circulation.
- The peak vehicle queues on Cambridge Way do not extend past the site driveway during the AM, MD, and PM peak hour. Therefore, egress vehicles will have the ability to find adequate gaps to make right-turning movements onto Cambridge Way/Manchester Drive.

Table 6: Site Driveway Left-Turn Queueing Summary

Peak Period	Southbound Left-Turn at Manchester Dr.		Egress Right-Turn at Site Drive		% Time Blocked	Time Blocked
	Avg. Queue (ft)	95th % Queue (ft)	Avg. Queue (ft)	95th % Queue (ft)		
AM	5	28	24	48	0%	0 min
MD	19	55	42	67	0%	0 min
PM	12	41	40	65	0%	0 min

Exhibit 2: Cambridge Way & Manchester Drive Intersection 95th % Queue Lengths



8.2 SITE CIRCULATION AND DRIVE-THROUGH QUEUEING

The site circulation and queuing for Chick-fil-A is very unique. To ensure that adequate on-site queuing is provided, Chick-fil-A has designed their stores to accommodate their operations. In times of additional demand, Chick-fil-A has an on-site queuing plan with extra staffing to accommodate the peak operations.

A queuing analysis was performed to evaluate the projected operations of this site to determine the peak drive-through queuing for the development. F&V collected data at the existing Chick-fil-A restaurant located in Novi, near the Twelve-Oaks Mall, on Wednesday August 24th, 2022, and Saturday August 27th, 2022. The data collection result summary is attached and summarized below.

The data collection included:

- Order time, Chick-fil-A employees take patrons orders while vehicles are in line, rather than the traditional order board. During peak times, the vehicles roll through the ordering process and do not stop at an order board.
- Service rate calculations for the pick-up window: Time to pull up to the drive-through window, receive order, and pull away.
- Customer data collected and verified through orders showed 70% percentage of site generated trips use drive-through.

The calculated vehicle queue lengths for the proposed operations are summarized in **Table 7**.

Table 7: Queue Length Calculations

STACKING SPACE CALCULATOR	
Number of Arrivals	136
Peak Period Time (minutes)	60
% Arrivals during peak period	100%
Time per Vehicle (s)	36
Vehicle Stacking Length (FT)	20
Service Rate	100
Arrival Rate	136
TOTAL QUEUE (Veh)	36
TOTAL QUEUE (ft)	720

Drive-through queue lengths were observed and recorded in order to provide a comparison between the calculated vehicle queueing and the actual restaurant operations. A summary of the site-generated drive-through queueing information observed during the weekday mid-day (11:00 AM to 1:00 PM), weekday afternoon (5:00 PM to 6:00 PM), and Saturday mid-day (11:00 AM to 3:00 PM) peak periods is summarized in **Table 8**.

Table 8: Weekday Field Review Drive-Through Queueing Summary

Queue Length (cars)	Mid-Day	PM	SAT
50% Percentile	14	13	27
85% Percentile	21	18	35
95% Percentile	24	27	37
Average	15	13	25
Maximum (Veh)	29	28	40
Maximum (ft)	580	560	800

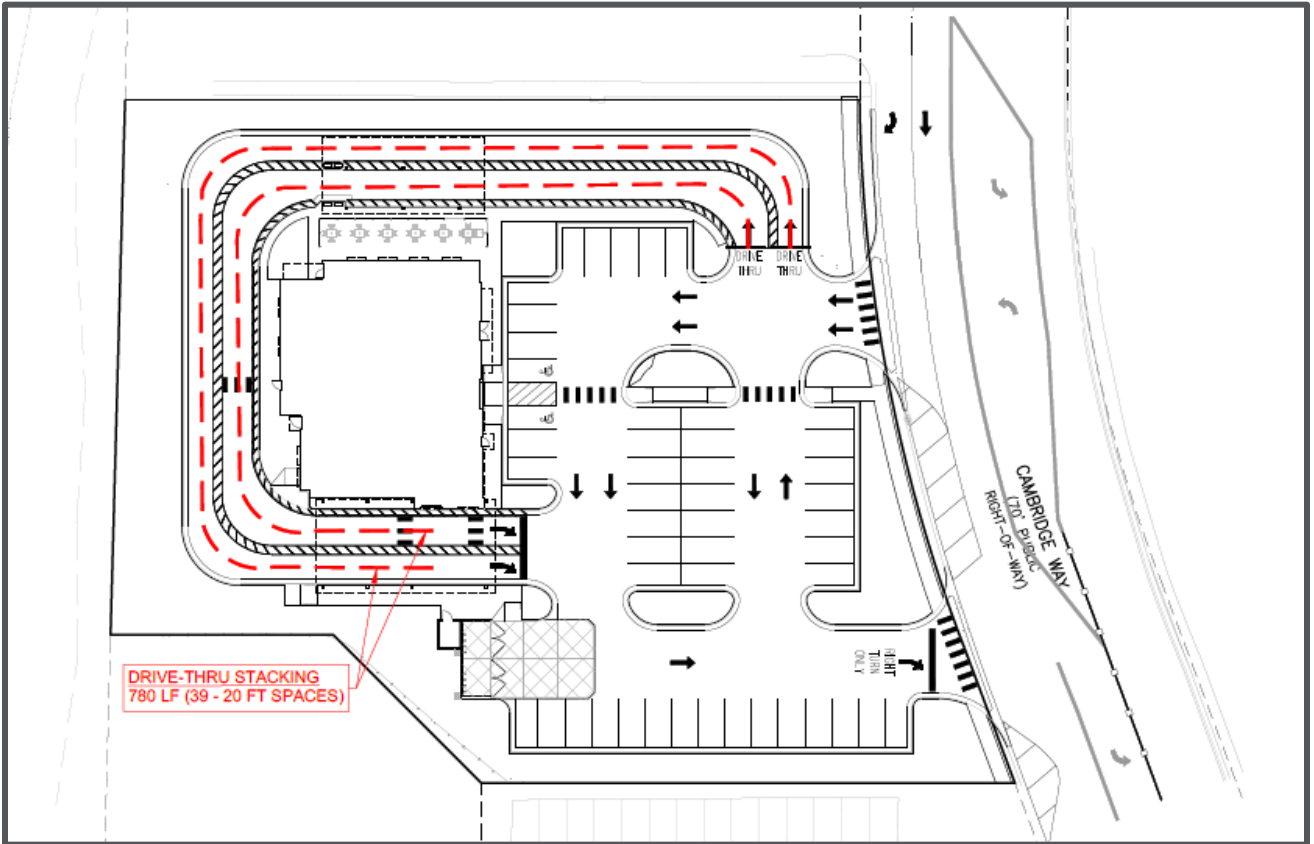
Summary

The proposed site plan includes enough vehicle queueing storage for approximately 780-LF of stacking available, within the drive-through area and internal lanes. Therefore, the proposed development can adequately accommodate the expected vehicle queueing. The drive-through queueing plan is shown on **Exhibit 3**.

- During peak time periods, Chick-fil-A utilizes employees stationed outside along the drive-through queue, with menu tablets to take patrons orders, eliminating the need for the menu kiosk and providing additional queueing storage space. This also helps to expedite the ordering and payment process, thus increasing the service rate.
- The drive-through queueing area can accommodate approximately 780-LF of stacking, with the lanes extending further into the parking lot for additional stacking storage as necessary to accommodate additional vehicle demand.
- Comparison indicates that the calculated operations are expected to be representative of the operations observed, in the field review, for a similar Chick-fil-A site.
- The proposed site plan can accommodate approximately 39 vehicles, at 20-ft per vehicle, which would accommodate a 95% queue length during the peak Saturday operations.

Therefore, the projected potential drive-through queue lengths can be adequately accommodated on site without impacting operations on the adjacent roadway network.

Exhibit 3: Drive-Through Queuing Site Plan



9 CONCLUSIONS

The conclusions of this TIS are as follows:

9.1 OPERATIONAL ANALYSIS SUMMARY

The existing AM, MD and PM peak hour vehicle delays and Levels of Service (LOS) were calculated at the study intersections using Synchro (Version 11) traffic analysis software. The results of the analyses were based on the existing and proposed lane use, traffic control shown, and traffic volumes shown on the attached figures, and the methodologies presented in the *Highway Capacity Manual, 6th Edition* (HCM6).

Existing (2023) Conditions

- All of the study intersection approaches and movements are currently operating acceptably, at a LOS D or better, during both the AM, MD and PM peak hours. Review of SimTraffic network simulation also indicates acceptable operations during all of the peak periods.

Background (2025) Conditions

- With the additional background traffic volumes, the results indicates that all approaches and movements at the study intersection are expected to continue operating in a manner similar to the existing conditions analysis, with minor increases in delays. Review of SimTraffic network simulation also indicates acceptable operations during all of the peak periods, similar to those observed during the existing conditions analysis.

Trip Generation

- The number of weekday peak hour (AM, MD and PM) vehicle trips that would be generated by the proposed Chick-fil-A development was forecast based on data from three (3) proportionally sized Chick-fil-A facilities in Michigan located in Caledonia, Kalamazoo, and Okemos; trip generation data attached for reference. The percentage of pass-by trips used in this analysis was determined based on the rates published by ITE in the *Trip Generation Manual, 11th Edition*.

Site Access Review

- The vehicle and pedestrian site access on Cambridge Way was reviewed to determine how the existing roadway geometry could be restriped to accommodate the proposed operation of the site development and better utilize the existing roadway. Key findings and recommendations of this review are as follows:
 - Restripe Cambridge Way adjacent to the project site to provide a dedicated southbound right-turn lane and a dedicated northbound left-turn lane into the project site.
 - Provide a marked pedestrian crosswalk on the south leg of Cambridge Way at Manchester Drive.

Future (2025) Conditions

- The result of the future conditions analysis indicates that all study intersection approaches and movements are expected to continue operating in a manner similar to the background conditions analysis, with minor increases in delays. Review of SimTraffic network simulation also indicates acceptable operations during all of the peak periods, similar to those observed during the background conditions analysis.

9.2 ACCESS MANAGEMENT

- The peak vehicle queues on Cambridge Way will not extend past the site driveway during the AM, MD, and PM peak hour. Therefore, egress vehicles will have the ability to find adequate gaps to make right-turning movements onto Cambridge Way/Manchester Drive.
- The drive-through queueing area provided can accommodate approximately 780-LF of stacking, with the lanes extending further into the parking lot for additional stacking storage as necessary to accommodate additional vehicle demand. The proposed site plan can accommodate approximately 39 vehicles, at 20-ft per vehicle, which is greater than the maximum vehicle queue observed during field reviews. Therefore, the expected drive-through queue lengths can be adequately accommodated on site without impacting operations on the adjacent roadway network.

10 RECOMMENDATIONS

The recommendations of this TIS are as follows:

- Restripe Cambridge Way to provide a southbound right-turn lane into the project site.
- Provide centerline hardening on Cambridge Way for approximately 75-ft north of Manchester Drive to inhibit vehicles from making egress left-turns at the site driveway and encourage the use of the center left-turn lane to access Manchester Drive.
- Provide a marked pedestrian crosswalk on the south leg of Cambridge Way at Manchester Drive.

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

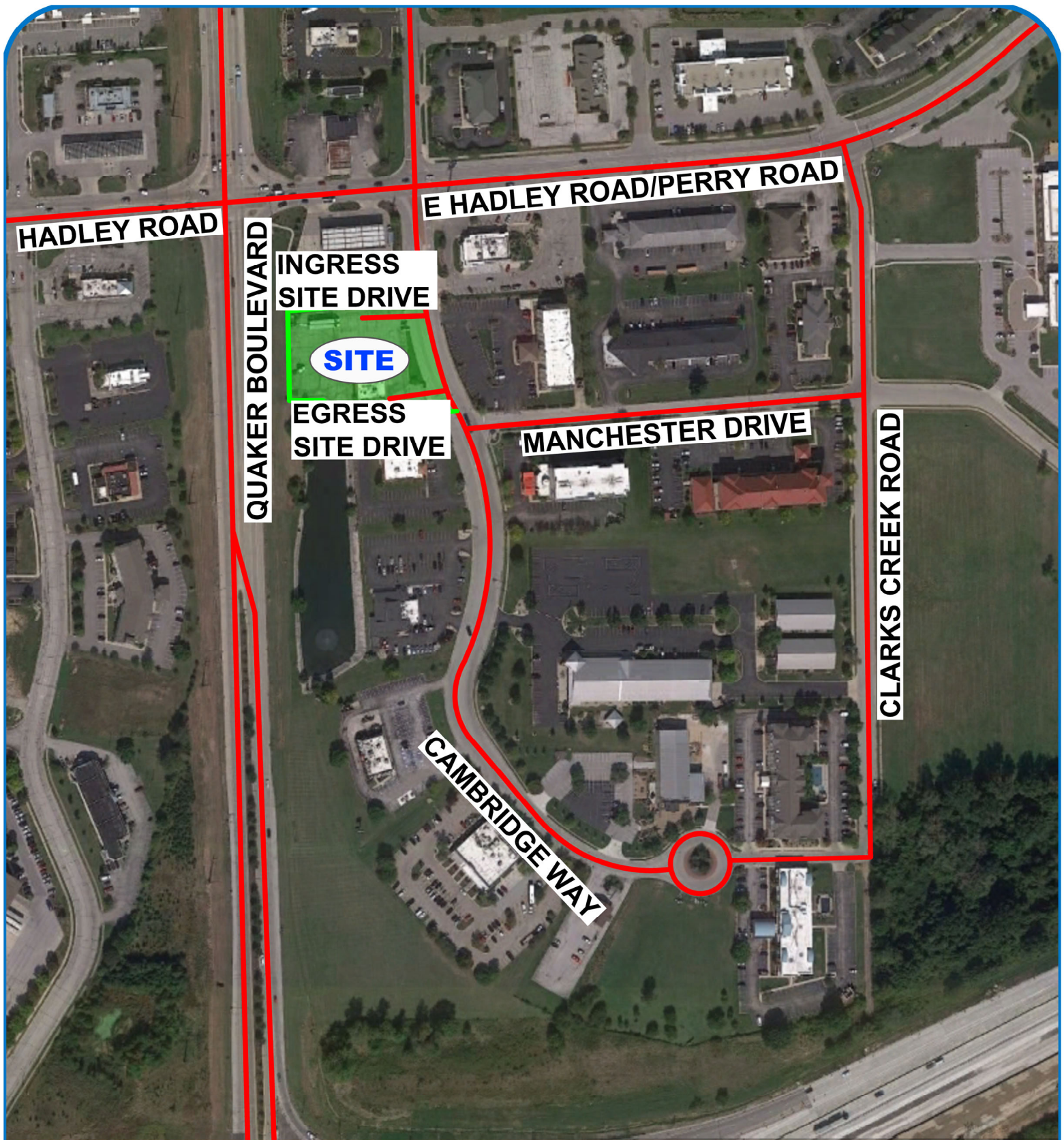


I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Indiana.

A handwritten signature in blue ink that reads "Julie M. Kroll".

Digitally signed by Julie M. Kroll
Date: 2023.07.27 09:09:50 -04'00'

Attached: Figures 1-6
Proposed Site Plan
Traffic Volume Data
Signal Timing Permit
Synchro / SimTraffic Results
Chick-fil-A TIS References (Rowe)



HADLEY ROAD

E HADLEY ROAD/PERRY ROAD

QUAKER BOULEVARD

INGRESS
SITE DRIVE

SITE

EGRESS
SITE DRIVE

MANCHESTER DRIVE

CLARKS CREEK ROAD

CAMBRIDGE WAY



FIGURE 1
SITE LOCATION MAP

CHICK-FIL-A TIA - PLAINFIELD, IN

LEGEND

SITE SITE LOCATION



NORTH
SCALE: NOT TO SCALE

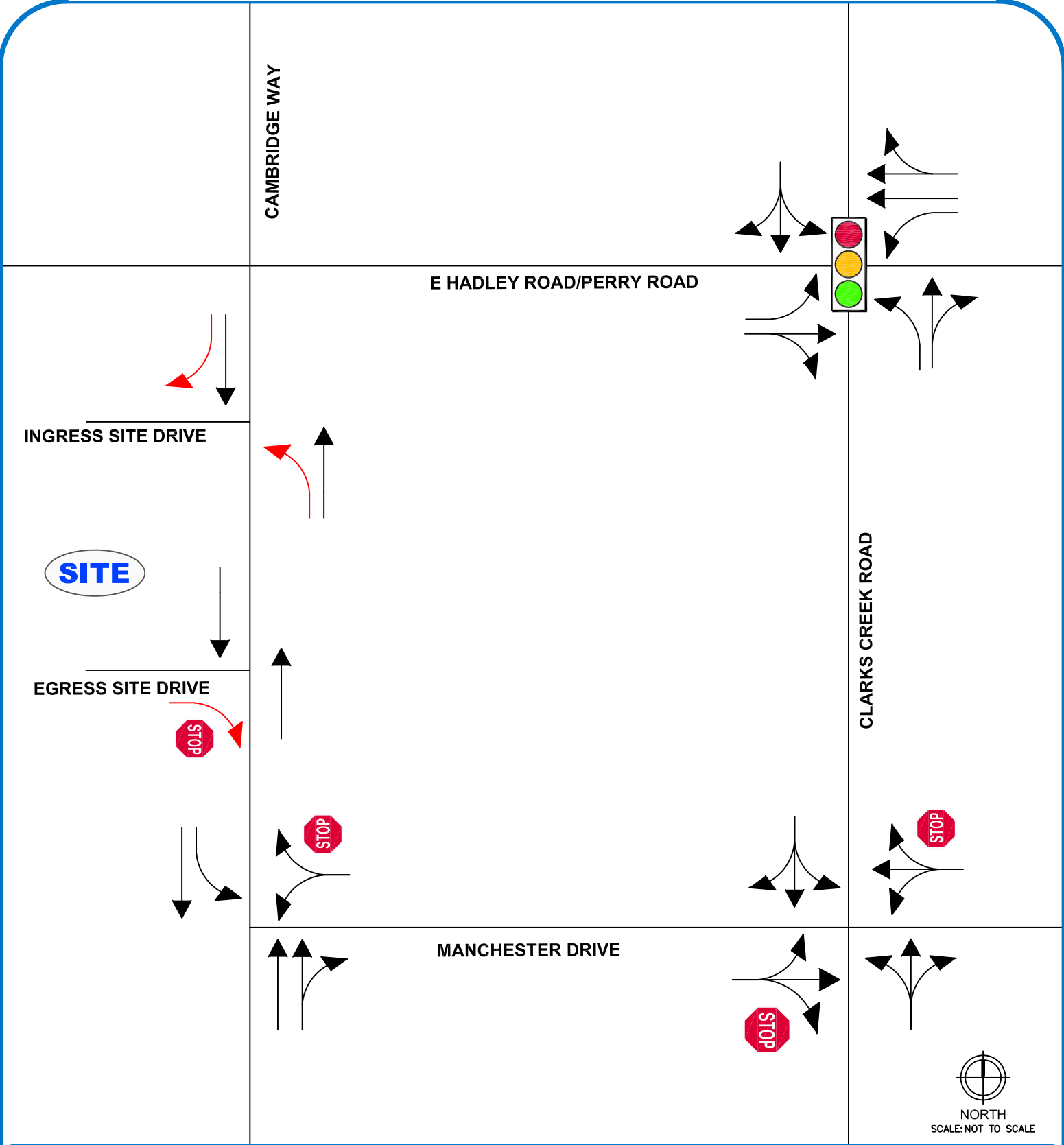


FIGURE 2
LANE USE AND TRAFFIC VOLUMES

CHICK-FIL-A TIA - PLAINFIELD, IN



LEGEND

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



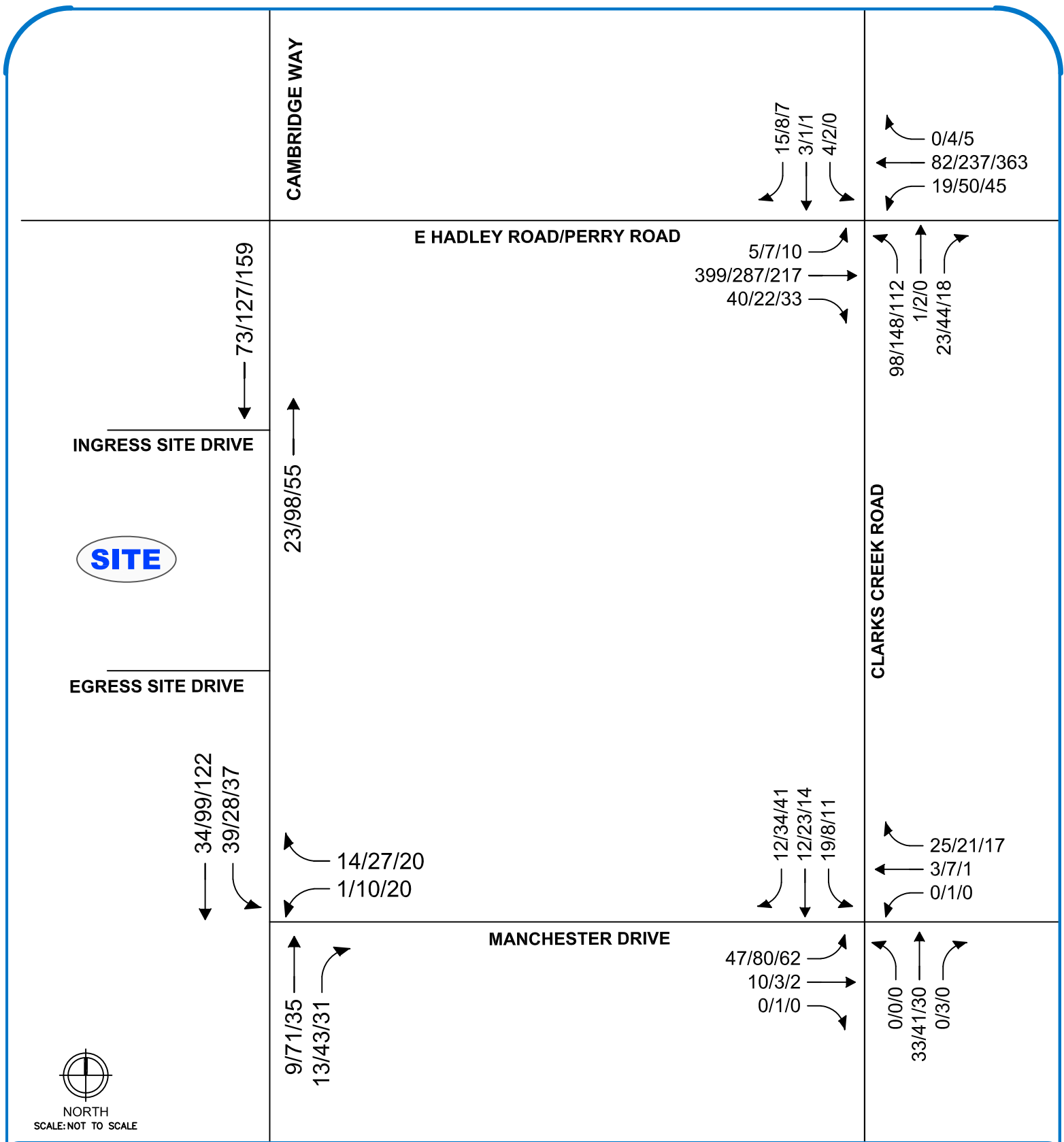


FIGURE 3
EXISTING TRAFFIC
VOLUMES

CHICK-FIL-A TIA - PLAINFIELD, IN



LEGEND

- ROADS
- - - PROPOSED ROADS
- TRAFFIC VOLUMES (AM/MD/PM)

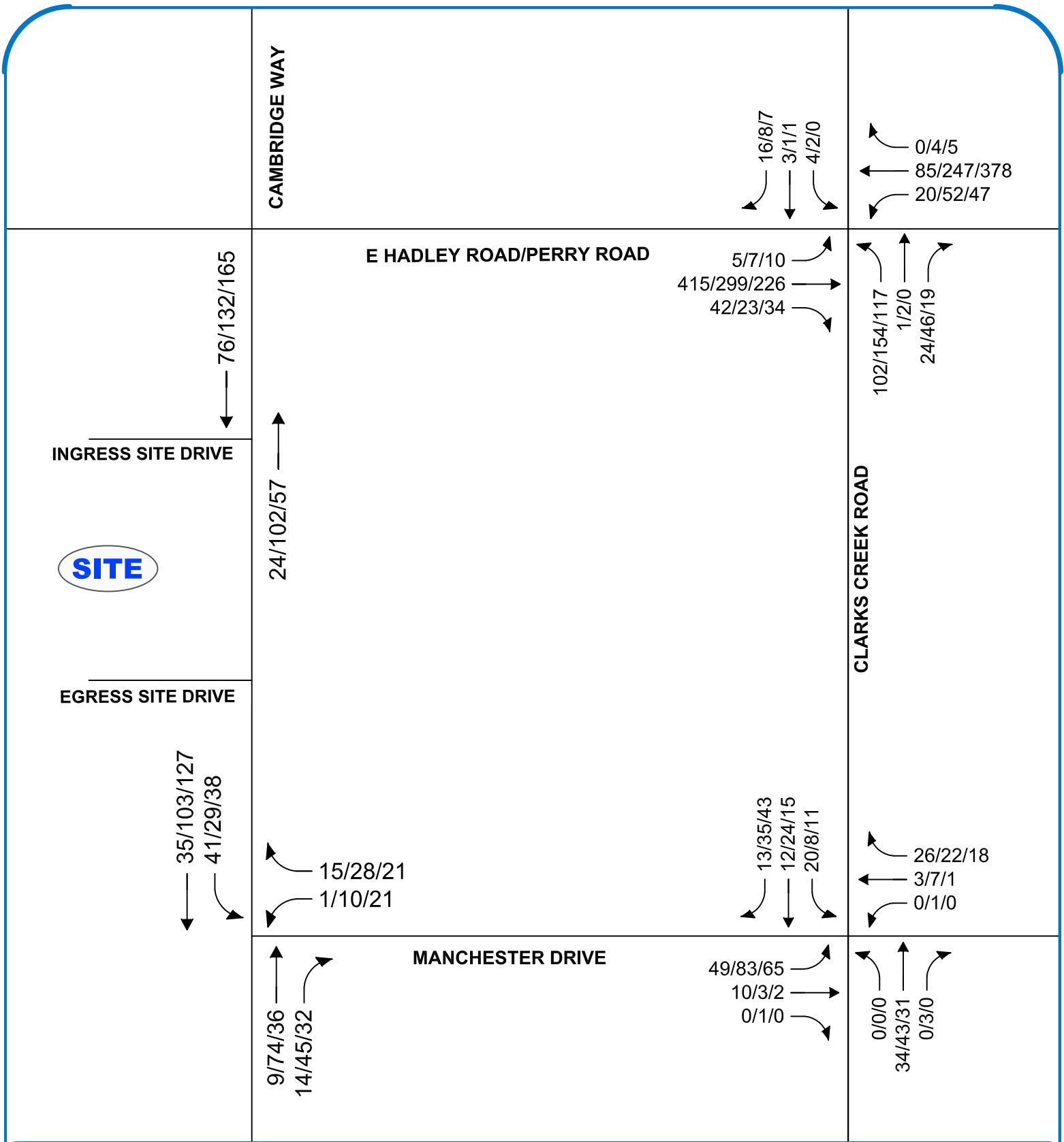


FIGURE 4
BACKGROUND TRAFFIC
VOLUMES

CHICK-FIL-A TIA - PLAINFIELD, IN

LEGEND

- ROADS
- - - PROPOSED ROADS
- ↑↓ TRAFFIC VOLUMES (AM/MD/PM)

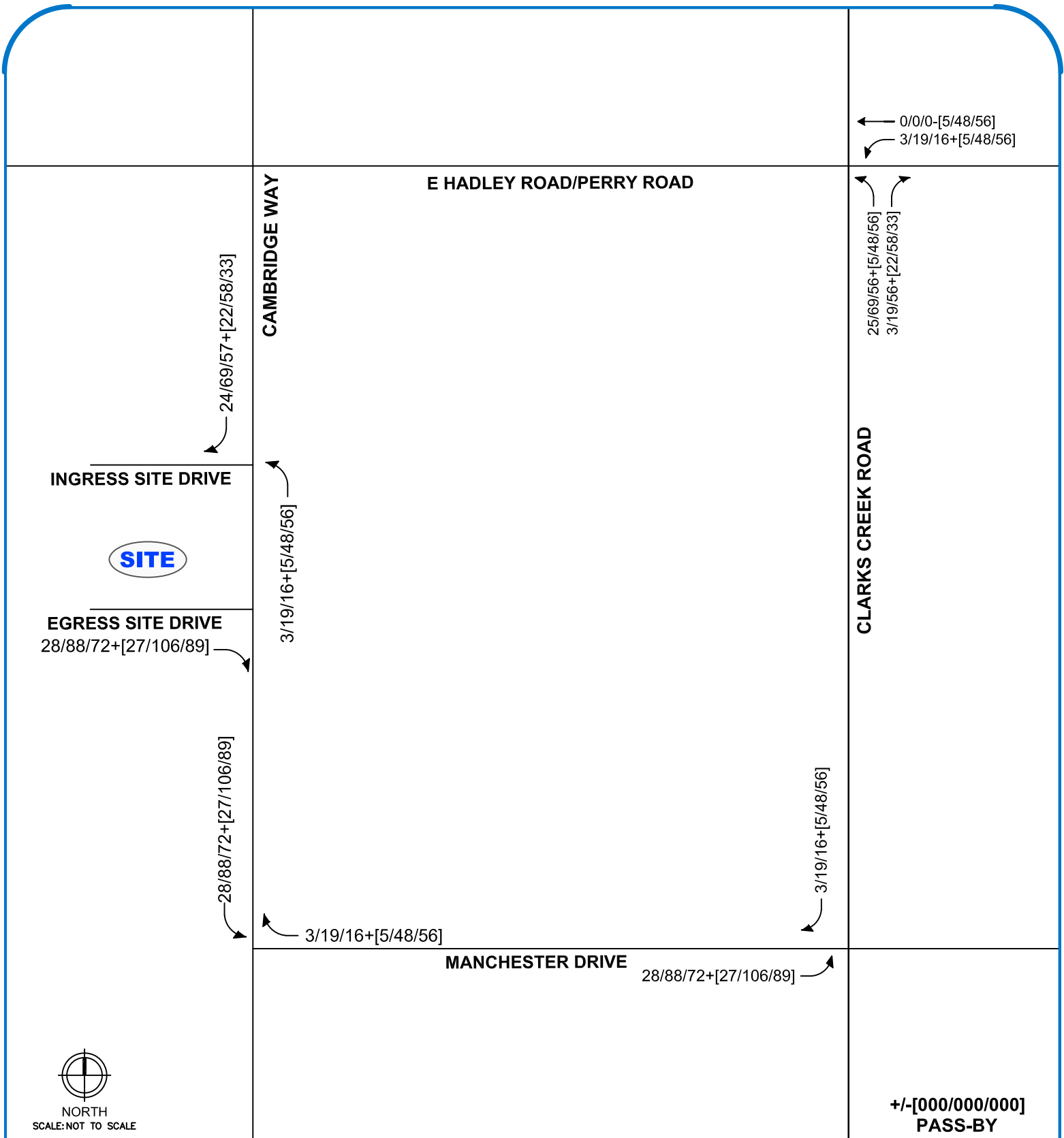


FIGURE 5
SITE-GENERATED
TRAFFIC VOLUMES
CHICK-FIL-A TIA - PLAINFIELD, IN

LEGEND

- ROADS
- - - PROPOSED ROADS
- TRAFFIC VOLUMES (AM/MD/PM)

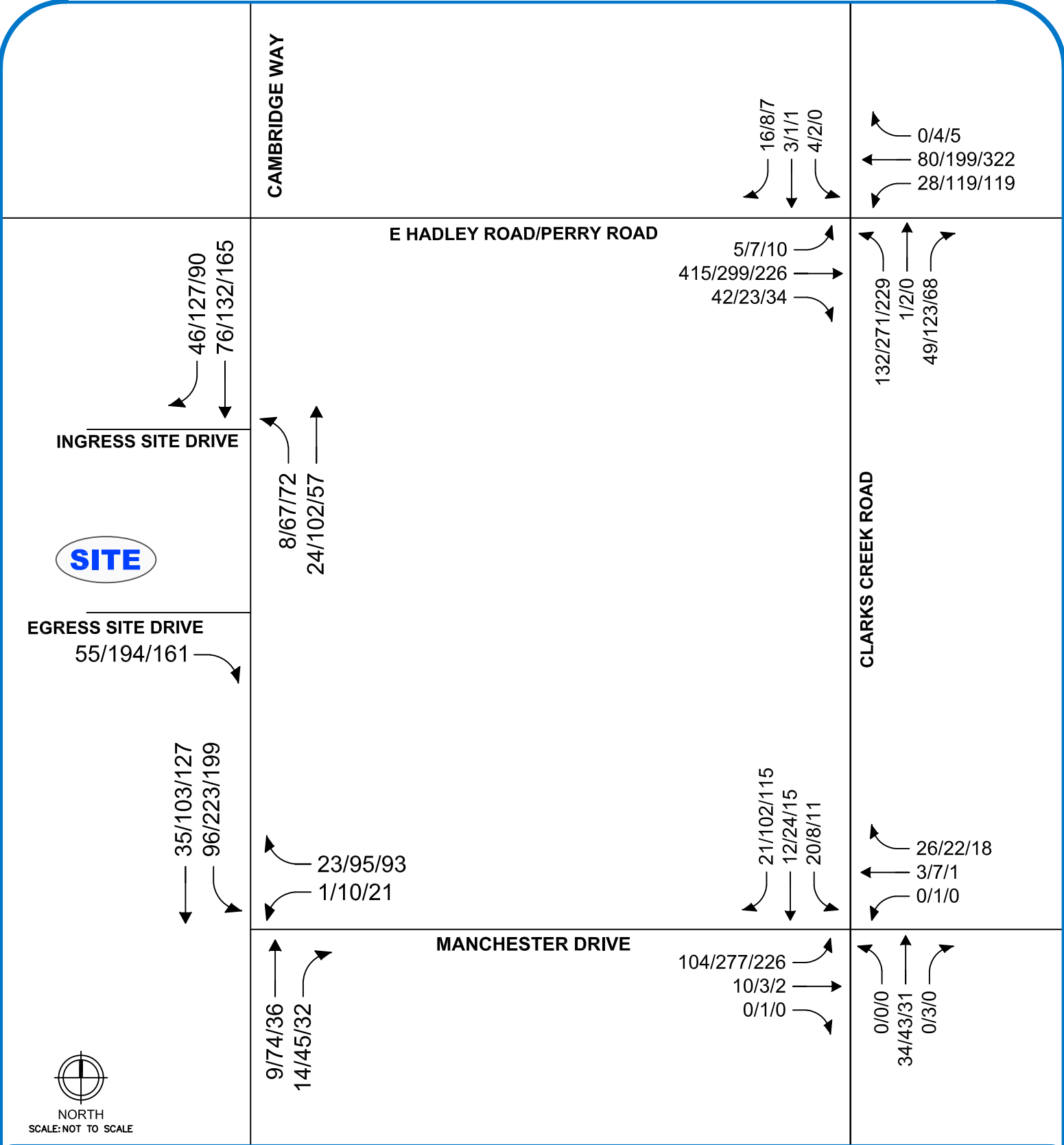


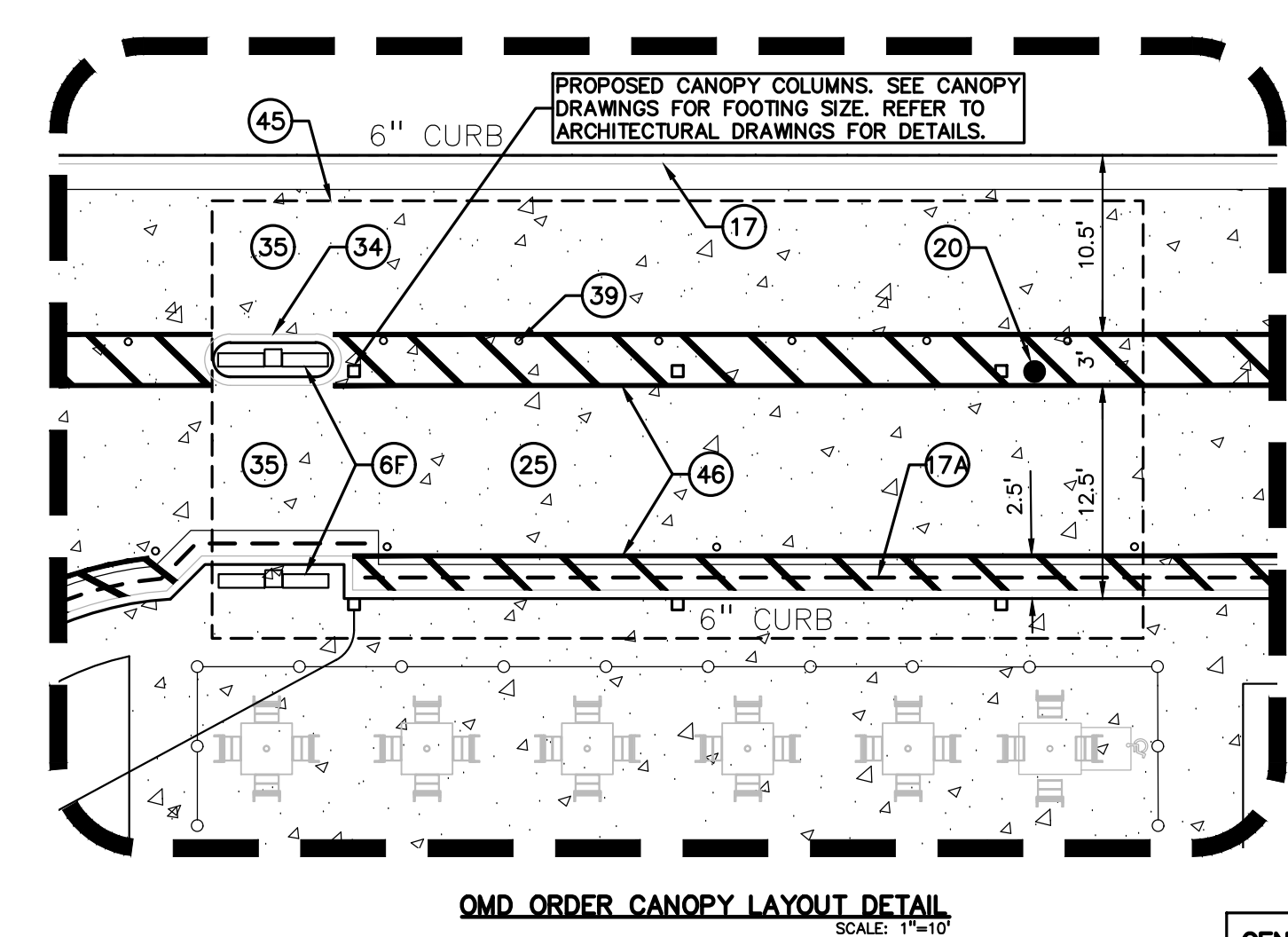
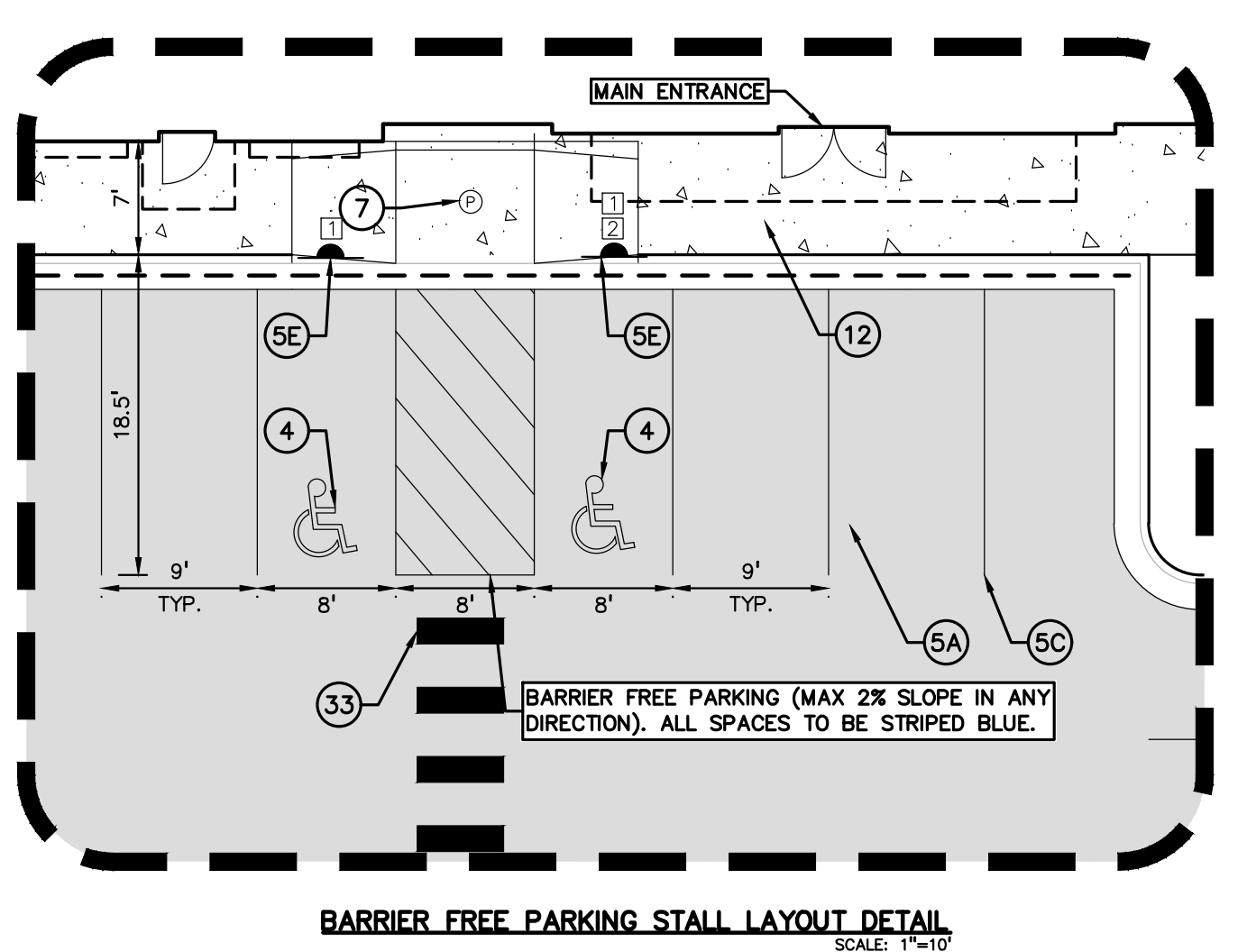
FIGURE 6
FUTURE TRAFFIC VOLUMES
 CHICK-FIL-A TIA - PLAINFIELD, IN



- LEGEND**
- ROADS
 - - - PROPOSED ROADS
 - TRAFFIC VOLUMES (AM/MD/PM)

BENCHMARK INFORMATION	
ORIGINATING BENCHMARK L-61 (PID: KA0040) 1.2 MILES SOUTHEAST FROM PLAINFIELD	
ABOUT 1.2 MILES ALONG STATE HIGHWAY 267 FROM ITS JUNCTION WITH U.S. HIGHWAY 40 AT PLAINFIELD, AT A CROSS ROAD, 45 FEET WEST OF AND ABOUT LEVEL WITH THE CENTER LINE OF THE HIGHWAY, 26 FEET NORTH OF THE CENTER LINE OF THE ENTRANCE TO THE EDWARD CUMMINGS FARM, 14 FEET NORTHWEST OF THE NORTH END OF A 12-INCH CORRUGATED PIPE CULVERT, 7 FEET WEST OF TELEPHONE POLE NO. 36-H 62, 4 FEET WEST OF A CONCRETE FENCE CORNER POST, AND 2 FEET EAST OF A WHITE WOODEN WITNESS POST. A STANDARD DISK, STAMPED L 61 1946 AND SET IN THE TOP OF A CONCRETE POST PROJECTING 8 INCHES ABOVE GROUND.	
ELEV: 715.41 (NAVD 88)	
KEY NOTES:	
1 DIRECTIONAL ARROW (DETAIL #1, C-400 & DETAIL #6, C-402)	20 CONCRETE BOLLARD (DETAIL #5, C-402)
2 DRIVE-THRU GRAPHICS (DETAIL #2, C-400)	21 TYPICAL PAVEMENT SECTION (REFER TO PAVING PLAN LEGEND)
3 STOP LINE GRAPHICS (DETAIL #2, C-400)	21A PAVEMENT EDGE DETAIL (DETAIL #11, C-401)
4 PAINTED BARRIER FREE PARKING SYMBOL	21B CONCRETE APRON SECTION
5A STANDARD PARKING STALL (9'x18') PER CODE (DETAIL #3, C-400)	22 ALUMINUM HANDRAIL (DETAIL #6, C-402)
5B STANDARD 60 DEGREE PARKING STALL (DETAIL #4, C-400)	23 TYPICAL STAIR HANDRAIL (DETAIL #9, C-403)
5C 4" SOLID WHITE STRIPING	24 CONCRETE APRON @ TRASH ENCLOSURE (DETAIL #12, C-401)
5D SOLID YELLOW STRIPING	25 CONCRETE PAVING @ DRIVE-THRU LANE (DETAIL #2, C-402)
5E BOLLARD MOUNTED SIGN (DETAIL #5, C-400)	26 TRANSVERSE & LONGITUDINAL CONTRACTION JOINT (DETAIL #10, C-401)
6 DIRECTIONAL SIGNAGE (DETAIL #7 & #8, C-400)	27 TRANSVERSE & LONGITUDINAL DOWELED CONTRACTION JOINT (DETAIL #7, C-401)
ALL SIGNS SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" BY THE U.S. DEPARTMENT OF TRANSPORTATION. (SEE SIGN LEGEND)	
6A CHICK-FIL-A Pylon SIGN, SEE SIGNAGE PACKAGE	28 CONTRACTION JOINT (DETAIL #6, C-401)
6B WALL MOUNTED "CHICK-FIL-A" SIGN, SEE SIGNAGE PACKAGE	29 MEVED CONTRACTION JOINT (DETAIL #8, C-402)
6C CHICK-FIL-A Exit SIGN, SEE SIGNAGE PACKAGE	30 LONGITUDINAL GUT JUMP (DETAIL #1, C-402)
6D CHICK-FIL-A MONUMENT SIGN, SEE SIGNAGE PACKAGE	31 EXPANSION JOINT (DETAIL #6, C-401)
6E CLEARANCE BAR (DETAIL #10, C-403), SEE SIGNAGE PACKAGE	32 DRIVE-THRU DIRECTIONAL GRAPHICS
6F MENU ORDER BOARDS, SEE SIGNAGE PACKAGE	33 CROSSWALK DETAIL (DETAIL #7, C-402)
6G FLAGPOLE, 50', SEE SIGNAGE PACKAGE	34 DRIVE-THRU ORDER POINT ISLAND CURB (DETAIL #7, C-403)
7 SIDEWALK ADA COMPLIANT RAMP (SEE RAMP LEGEND) (DETAIL #3, C-401)	35 MENU BOARD LOOP DETECTION SYSTEM (DETAIL #5 & #6, C-403)
8 HANDICAP RAMP W/ FLARED SIDES (IN-SIDEWALK) (DETAIL #1, C-403)	36 ENTRY DOOR FROST SLAB (DETAIL #1, C-403)
8A HANDICAP RAMP W/ SHORT FLARED SIDES (DETAIL #1, C-403)	37 GREASE TRAP
9 RETURNED CURB HANDICAP RAMP	38 PROPOSED TRANSFORMER
10 UTILITY STRUCTURE RIM, TYP.	39 MAGNETIC LANE DELINEATORS
11 TYPICAL CONCRETE SIDEWALK, 5' MIN. (DETAIL #9, C-400)	40 LANDSCAPE AREA (REFER TO LANDSCAPE PLANS FOR DETAILS)
12 SIDEWALK W/ CURB & GUTTER (DETAIL #10, C-400)	41 TYPICAL LOCATION FOR OUTDOOR TABLES (SEE EQUIPMENT SCHEDULE)
12A INTEGRAL CURB & 7" WIDE SIDEWALK	42 SIDEWALK FOR CASH PAYMENT ZONE
13 DRIVE-THRU PLAN (DETAIL #8, C-403)	43 CONCRETE SPILLWAY
14 DRIVE-THRU ISOMETRIC (DETAIL #9, C-403)	44 BIKE RACK
15 SOLID PLASTIC WHEEL STOP (DETAIL #5, C-401)	45 ORDER MENU DELIVERY CANOPY (REFER TO ARCH. PLAN FOR DETAILS)
16 GRAVEL DRAINAGE STRIP	46 DRIVE-THRU LANE STRIPING
17 24" CONCRETE CURB & GUTTER (DETAIL #11, C-400)	47 FACE-TO-FACE DRIVE-THRU CANOPY SYSTEMS (REFER TO ARCH. PLANS FOR DETAILS)
17A 24" CONCRETE CURB & REVERSE GUTTER (DETAIL #11, C-400)	48 DETAIL-M GUTTER PAN
18 ROLL-OVER/MOUNTABLE CURB (DETAIL #11, C-403)	49 RETAINING WALL
19 REFUSE ENCLOSURE FOUNDATION (DETAIL #2, C-403)	50 SITE LIGHTING (REFER TO PHOTOMETRIC PLAN)
	51 ROLL CURB AND GUTTER (REFER TO TOWN OF PLAINFIELD DETAIL SHEET 03)

LAND DESCRIPTION	
LOT NUMBERED TWO (2) IN CAMBRIDGE SQUARE WEST, PHASE 1, A SUBDIVISION IN THE TOWN OF PLAINFIELD, HENDRICKS COUNTY, INDIANA, AS PER PLAT THEREOF AS RECORDED MARCH 4, 1988 IN PLAT BOOK 15, PAGES 34-35 AND SURVEYOR'S CERTIFICATE OF ERROR RECORDED MARCH 23, 1988 AS BOOK 114, PAGE 66 IN THE OFFICE OF THE RECORDER OF HENDRICKS COUNTY, INDIANA.	



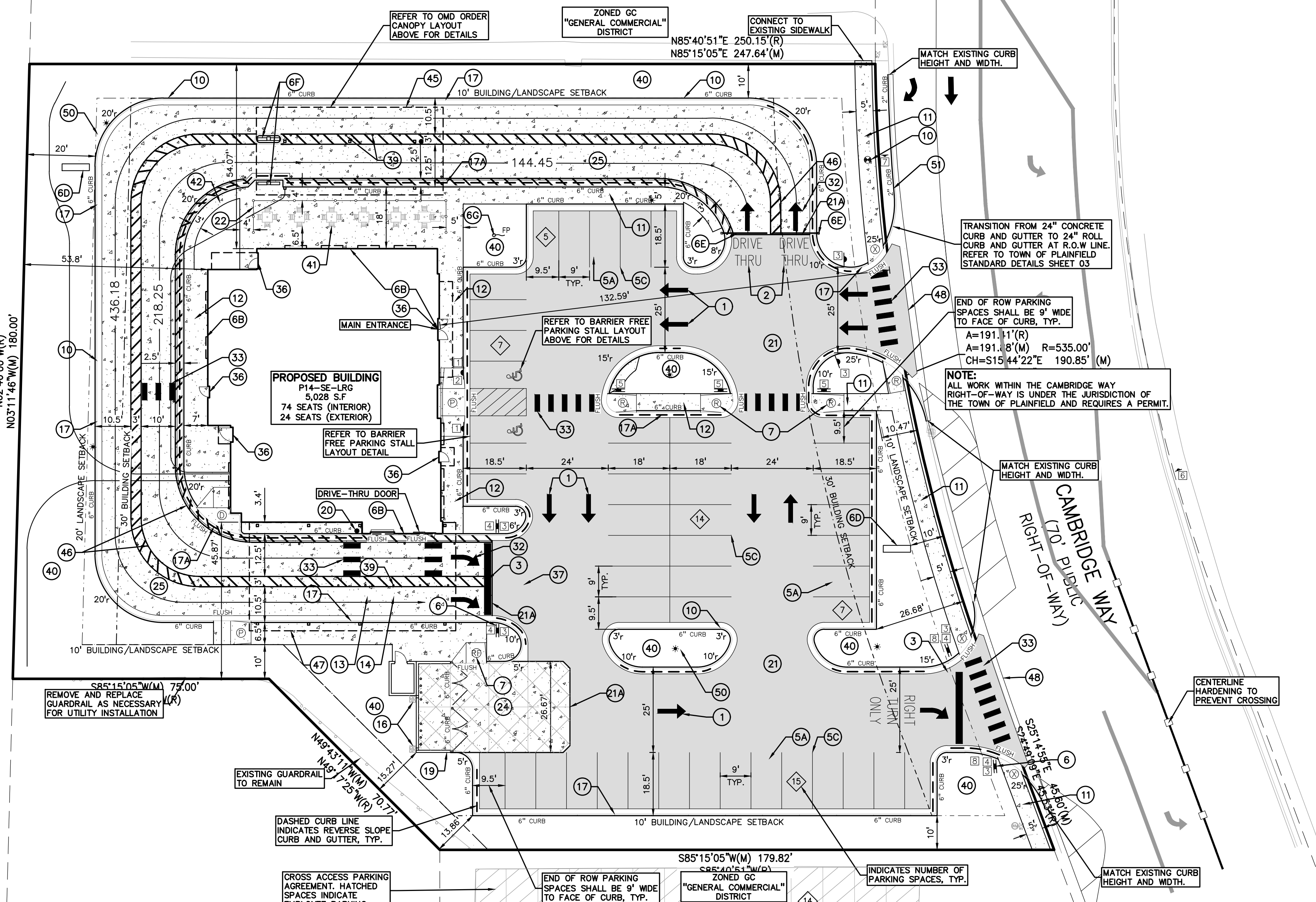
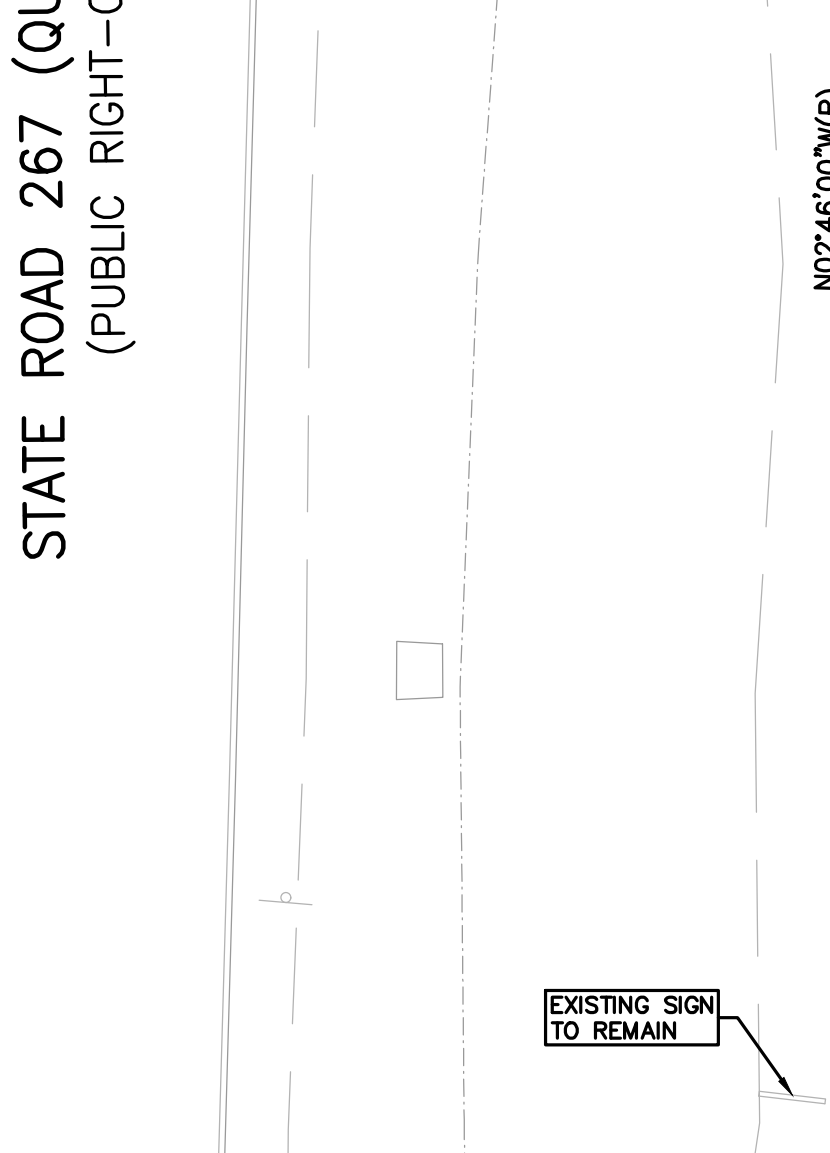
PAVING PLAN LEGEND:	
CONCRETE PAVEMENT (DETAIL #12, C-400)	
ASPHALT PAVEMENT (DETAIL #3, C-402)	
CONCRETE CURB AND GUTTER (DETAIL #11, C-400)	
REVERSE GUTTER PAN (DETAIL #11, C-400)	
PARKING SPACE COUNTS	
SIDEWALK RAMP LEGEND:	
SIDEWALK RAMP "TYPE R"	
SIDEWALK RAMP "TYPE RF"	
SIDEWALK RAMP "TYPE D"	
SIDEWALK RAMP "TYPE P"	
CURB CUT ONLY (NO RAMP)	

SIGN LEGEND:	
1	NOTES "RESERVED PARKING" 24" X 30" (TYP.) DETAIL #6, C-400
2	NOTES "VAN ACCESSIBLE" 18" X 12" (TYP.) DETAIL #6, C-400
3	NOTES "DO NOT ENTER" 18" X 18" (TYP.) DETAIL #7, C-400
4	NOTES "STOP" 30" X 30" (TYP.) DETAIL #6, C-400
5	NOTES "PEDESTRIAN CROSSWALK" 24" X 30" (TYP.) DETAIL #7, C-400
6	NOTES "LEFT LANE MUST TURN LEFT" 30" X 30" (TYP.) REFER TO C-500 FOR DETAIL
7	NOTES "RIGHT LANE MUST TURN RIGHT" 30" X 30" (TYP.) REFER TO C-500 FOR DETAIL
8	NOTES "RIGHT TURN ONLY" 24" X 18" (TYP.) REFER TO C-400 FOR DETAIL

GENERAL NOTES:
THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.

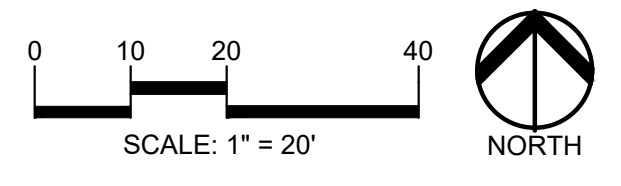
- ALL DIMENSIONS SHOWN ARE TO BACK OF CURB, FACE OF SIDEWALK, OUTSIDE FACE OF BUILDING, PROPERTY LINE, CENTER OF MANHOLE/CATCH BASIN OR CENTERLINE OF PIPE UNLESS OTHERWISE NOTED.
- REFER TO SHEETS C-400 THROUGH C-403 FOR ON-SITE PAVING DETAILS.

SITE DATA TABLE:			
SITE AREA: 1.30 ACRES (56,844 SQ.FT.) NET AND GROSS			
ZONING: GC (GENERAL COMMERCIAL)			
PROPOSED USE: RESTAURANT (5,028 S.F.)			
BUILDING INFORMATION:			
MAXIMUM ALLOWABLE BUILDING HEIGHT = 75 FEET			
PROPOSED BUILDING HEIGHT = 21 FEET			
BUILDING FOOTPRINT AREA = 5,028 SQ.FT.			
BUILDING LOT COVERAGE = 5,028/ 56,844 = 8.8%			
BUILDING SETBACK REQUIREMENTS:			
FRONT (EAST/WEST):	REQUIRED: 30'/30'	PROPOSED: 132.59'/53.90'	
SIDE (NORTH):	10'	54.07'	
REAR (SOUTH):	10'	45.87'	
LANDSCAPE SETBACK REQUIREMENTS:			
FRONT (EAST/WEST):	REQUIRED: 10'/20'	PROPOSED: 10.47'/20'	
SIDE (NORTH):	10'	10'	
REAR (SOUTH):	10'	10'	
PARKING CALCULATIONS:			
RESTAURANT REQUIRED PARKING = 1 SPACE PER 5 SEATS			
PROPOSED SEATS = 89 SEATS			
PARKING REQUIRED = 98/5 = 20 SPACES REQUIRED			
PARKING PROVIDED = 48 SPACES ON-SITE INCLUDING 2 BARRIER FREE SPACES			
14 SPACES ON ADJACENT SITE FOR EMPLOYEE PARKING			
= 62 TOTAL SPACES PROVIDED			
STACKING SPACES REQUIRED = 5 SPACES PRIOR TO ORDERING STATION AND AT LEAST ONE AFTER EXITING LAST PICK UP WINDOW			
STACKING SPACES PROVIDED = 43 (9'x20') STACKING SPACES PROVIDED			



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www.peagroup.com



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PLAINFIELD
6102 CAMBRIDGE WAY
PLAINFIELD, IN 46168

FSR#05219

REVISION SCHEDULE		
NO.	DATE	DESCRIPTION
1	7/26/2023	TRAFFIC UPDATES

CONSULTANT PROJECT #	2022-1054
PRINTED FOR	SPA
DATE	APRIL 14, 2023
DRAWN BY	LGD

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SHEET PRELIMINARY SITE PLAN

SHEET NUMBER **C-200**

File Path
3/15/2021
S:\PROJECTS\2022\2022-1054_CFA_PLAINFIELD_05219\DWG\SITE_PLAN\03 - C-200-SITE-221054.dwg

Cambridge & Manchester - TMC

Tue May 23, 2023

Full Length (6 AM-9 AM, 11 AM-1 PM, 4 PM-6 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070421, Location: 39.673651, -86.369289



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Access Eastbound					Manchester Westbound					Cambridge Northbound					Cambridge Southbound					Int	
	Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U		App
2023-05-23 6:00AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	2
6:15AM	0	0	0	1	1	1	0	5	0	6	0	0	0	0	0	4	2	0	0	6	13	
6:30AM	0	0	0	0	0	0	0	5	0	5	0	2	0	0	2	6	6	0	0	12	19	
6:45AM	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	9	9	0	1	19	23	
Hourly Total	0	0	0	1	1	1	0	14	0	15	0	3	0	0	3	19	17	1	1	38	57	
7:00AM	0	0	0	0	0	0	0	2	0	2	0	4	0	0	4	7	12	0	0	19	25	
7:15AM	0	0	0	0	0	0	0	0	0	0	0	1	4	0	5	7	9	0	0	16	21	
7:30AM	0	0	0	0	0	0	0	5	0	5	0	3	1	0	4	10	1	0	0	11	20	
7:45AM	0	0	0	0	0	1	0	0	0	1	0	2	2	0	4	9	4	0	0	13	18	
Hourly Total	0	0	0	0	0	1	0	7	0	8	0	10	7	0	17	33	26	0	0	59	84	
8:00AM	0	0	0	0	0	0	0	9	0	9	0	3	6	0	9	13	20	0	0	33	51	
8:15AM	0	0	0	0	0	1	0	1	0	2	0	3	1	0	4	11	9	0	0	20	26	
8:30AM	0	0	0	0	0	0	0	4	0	4	0	5	3	0	8	6	13	0	0	19	31	
8:45AM	0	0	0	0	0	0	0	3	0	3	0	2	5	0	7	7	13	0	0	20	30	
Hourly Total	0	0	0	0	0	1	0	17	0	18	0	13	15	0	28	37	55	0	0	92	138	
11:00AM	0	0	0	0	0	5	0	13	0	18	0	7	1	0	8	10	17	0	0	27	53	
11:15AM	0	0	0	0	0	4	0	9	0	13	0	7	6	0	13	2	22	0	0	24	50	
11:30AM	0	0	0	0	0	5	0	8	0	13	0	5	8	0	13	0	32	0	0	32	58	
11:45AM	0	0	0	0	0	4	1	5	0	10	0	18	9	0	27	2	33	1	0	36	73	
Hourly Total	0	0	0	0	0	18	1	35	0	54	0	37	24	0	61	14	104	1	0	119	234	
12:00PM	0	0	0	0	0	3	0	12	0	15	0	21	14	0	35	9	31	0	0	40	90	
12:15PM	0	1	0	0	1	2	0	3	0	5	0	15	14	0	29	8	23	1	0	32	67	
12:30PM	0	0	0	0	0	2	0	7	0	9	1	15	8	0	24	5	23	0	0	28	61	
12:45PM	0	0	0	0	0	3	0	5	0	8	0	20	7	0	27	6	22	0	0	28	63	
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4:00PM	0	0	0	0	0	0	0	4	0	4	0	13	6	0	19	6	21	0	0	27	50	
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4:45PM	0	0	0	0	0	8	0	3	0	11	0	10	8	0	18	12	29	0	0	41	70	
Hourly Total	0	0	0	0	0	10	0	14	0	24	0	47	29	0	76	33	114	0	0	147	247	
5:00PM	0	0	0	0	0	4	0	4	0	8	0	9	8	0	17	12	33	1	0	46	71	
5:15PM	0	0	0	0	0	7	0	7	0	14	0	5	7	0	12	3	26	0	0	29	55	
5:30PM	0	0	0	0	0	1	0	5	0	6	0	12	3	0	15	5	33	0	0	38	59	
5:45PM	0	2	0	0	2	1	1	4	0	6	0	13	12	0	25	13	25	0	0	38	71	
Hourly Total	0	2	0	0	2	13	1	20	0	34	0	39	30	0	69	33	117	1	0	151	256	
Total	0	3	0	1	4	54	2	134	0	190	1	220	148	0	369	197	532	4	1	734	1297	
% Approach	0%	75.0%	0%	25.0%	-	28.4%	1.1%	70.5%	0%	-	0.3%	59.6%	40.1%	0%	-	26.8%	72.5%	0.5%	0.1%	-	-	
% Total	0%	0.2%	0%	0.1%	0.3%	4.2%	0.2%	10.3%	0%	14.6%	0.1%	17.0%	11.4%	0%	28.5%	15.2%	41.0%	0.3%	0.1%	56.6%	-	
Lights	0	3	0	1	4	53	2	129	0	184	1	214	142	0	357	173	514	4	1	692	1237	
% Lights	0%	100%	0%	100%	100%	98.1%	100%	96.3%	0%	96.8%	100%	97.3%	95.9%	0%	96.7%	87.8%	96.6%	100%	100%	94.3%	95.4%	
Single-Unit Trucks	0	0	0	0	0	0	0	4	0	4	0	5	3	0	8	18	17	0	0	35	47	
% Single-Unit Trucks	0%	0%	0%	0%	0%	0%	0%	3.0%	0%	2.1%	0%	2.3%	2.0%	0%	2.2%	9.1%	3.2%	0%	0%	4.8%	3.6%	
Articulated Trucks	0	0	0	0	0	1	0	1	0	2	0	1	2	0	3	6	1	0	0	7	12	
% Articulated Trucks	0%	0%	0%	0%	0%	1.9%	0%	0.7%	0%	1.1%	0%	0.5%	1.4%	0%	0.8%	3.0%	0.2%	0%	0%	1.0%	0.9%	
Buses	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	
% Buses	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.7%	0%	0.3%	0%	0%	0%	0%	0%	0.1%	
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Bicycles on Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	

* L: Left, R: Right, T: Thru, U: U-Turn

Cambridge & Manchester - TMC

Tue May 23, 2023

Full Length (6 AM-9 AM, 11 AM-1 PM, 4 PM-6 PM)

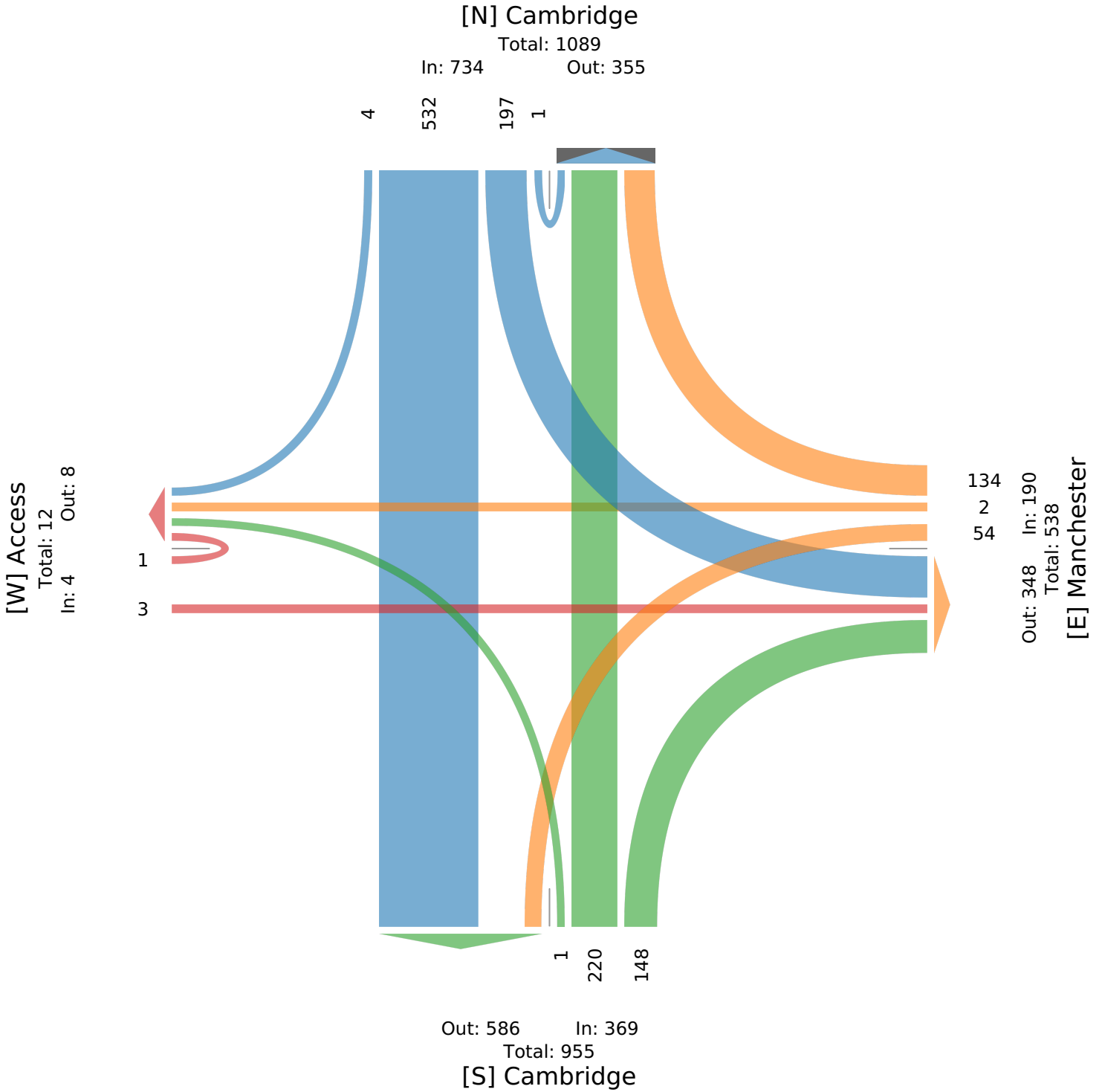
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All Movements

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Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Cambridge & Manchester - TMC

Tue May 23, 2023

Forced Peak (7:15 AM - 8:15 AM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070421, Location: 39.673651, -86.369289



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Access Eastbound					Manchester Westbound					Cambridge Northbound					Cambridge Southbound					Int
	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	
2023-05-23 7:15AM	0	0	0	0	0	0	0	0	0	0	0	1	4	0	5	7	9	0	0	16	21
7:30AM	0	0	0	0	0	0	0	5	0	5	0	3	1	0	4	10	1	0	0	11	20
7:45AM	0	0	0	0	0	1	0	0	0	1	0	2	2	0	4	9	4	0	0	13	18
8:00AM	0	0	0	0	0	0	0	9	0	9	0	3	6	0	9	13	20	0	0	33	51
Total	0	0	0	0	0	1	0	14	0	15	0	9	13	0	22	39	34	0	0	73	110
% Approach	0%	0%	0%	0%	-	6.7%	0%	93.3%	0%	-	0%	40.9%	59.1%	0%	-	53.4%	46.6%	0%	0%	-	-
% Total	0%	0%	0%	0%	0%	0.9%	0%	12.7%	0%	13.6%	0%	8.2%	11.8%	0%	20.0%	35.5%	30.9%	0%	0%	66.4%	-
PHF	-	-	-	-	-	0.250	-	0.389	-	0.417	-	0.750	0.542	-	0.611	0.750	0.425	-	-	0.553	0.539
Lights	0	0	0	0	0	1	0	14	0	15	0	7	11	0	18	33	26	0	0	59	92
% Lights	0%	0%	0%	0%	-	100%	0%	100%	0%	100%	0%	77.8%	84.6%	0%	81.8%	84.6%	76.5%	0%	0%	80.8%	83.6%
Single-Unit Trucks	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	4	7	0	0	11	12
% Single-Unit Trucks	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	11.1%	0%	0%	4.5%	10.3%	20.6%	0%	0%	15.1%	10.9%
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2	1	0	0	3	5
% Articulated Trucks	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	11.1%	7.7%	0%	9.1%	5.1%	2.9%	0%	0%	4.1%	4.5%
Buses	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
% Buses	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	7.7%	0%	4.5%	0%	0%	0%	0%	0%	0.9%
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

*L: Left, R: Right, T: Thru, U: U-Turn

Cambridge & Manchester - TMC

Tue May 23, 2023

Forced Peak (7:15 AM - 8:15 AM)

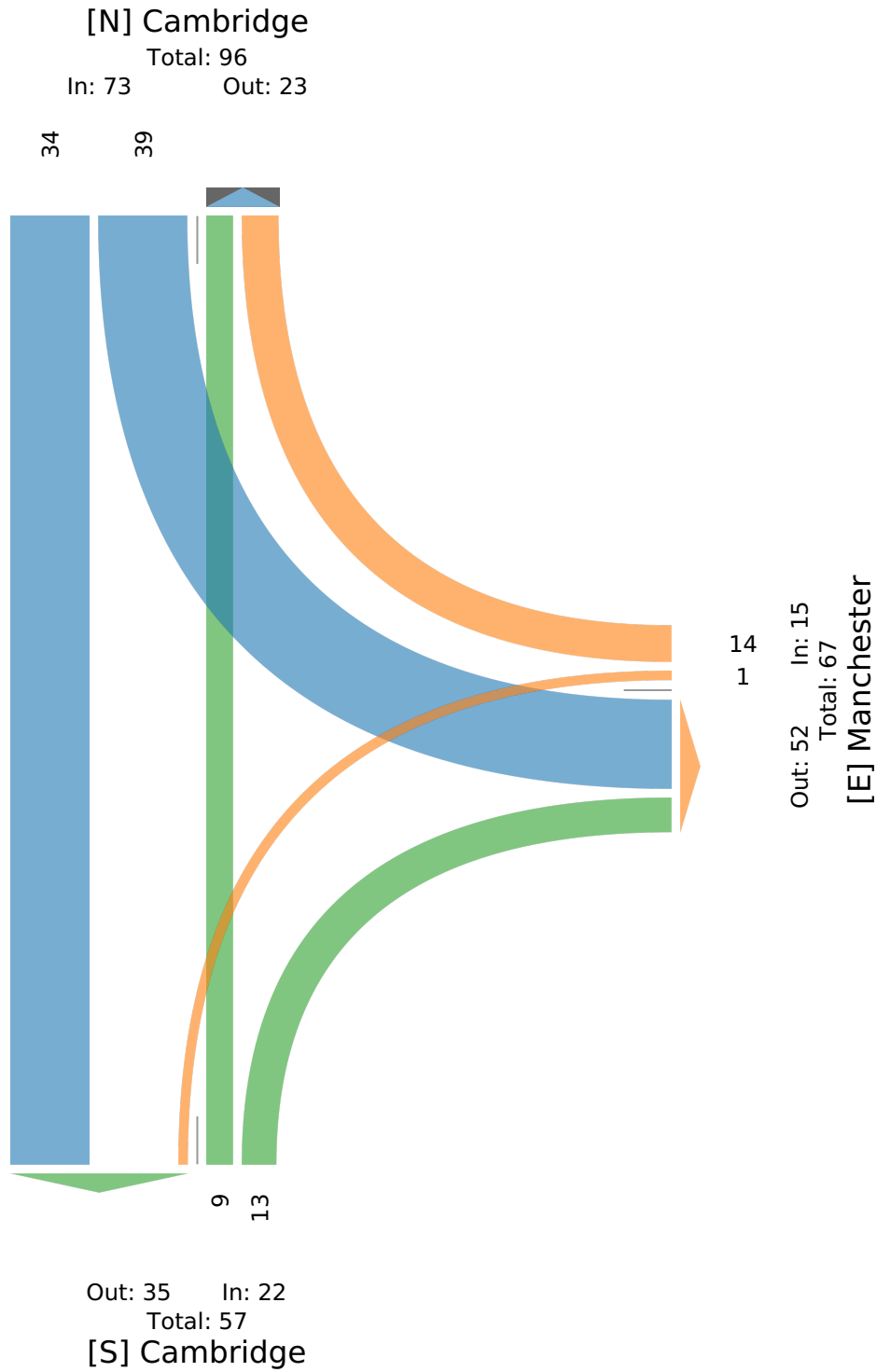
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070421, Location: 39.673651, -86.369289



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Cambridge & Manchester - TMC

Tue May 23, 2023

Forced Peak (12 PM - 1 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070421, Location: 39.673651, -86.369289



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Access Eastbound					Manchester Westbound					Cambridge Northbound					Cambridge Southbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2023-05-23 12:00PM	0	0	0	0	0	3	0	12	0	15	0	21	14	0	35	9	31	0	0	40	90
12:15PM	0	1	0	0	1	2	0	3	0	5	0	15	14	0	29	8	23	1	0	32	67
12:30PM	0	0	0	0	0	2	0	7	0	9	1	15	8	0	24	5	23	0	0	28	61
12:45PM	0	0	0	0	0	3	0	5	0	8	0	20	7	0	27	6	22	0	0	28	63
Total	0	1	0	0	1	10	0	27	0	37	1	71	43	0	115	28	99	1	0	128	281
% Approach	0%	100%	0%	0%	-	27.0%	0%	73.0%	0%	-	0.9%	61.7%	37.4%	0%	-	21.9%	77.3%	0.8%	0%	-	-
% Total	0%	0.4%	0%	0%	0.4%	3.6%	0%	9.6%	0%	13.2%	0.4%	25.3%	15.3%	0%	40.9%	10.0%	35.2%	0.4%	0%	45.6%	-
PHF	-	0.250	-	-	0.250	0.833	-	0.563	-	0.617	0.250	0.845	0.768	-	0.821	0.778	0.798	0.250	-	0.800	0.781
Lights	0	1	0	0	1	10	0	26	0	36	1	70	39	0	110	23	96	1	0	120	267
% Lights	0%	100%	0%	0%	100%	100%	0%	96.3%	0%	97.3%	100%	98.6%	90.7%	0%	95.7%	82.1%	97.0%	100%	0%	93.8%	95.0%
Single-Unit Trucks	0	0	0	0	0	0	0	1	0	1	0	1	3	0	4	5	3	0	0	8	13
% Single-Unit Trucks	0%	0%	0%	0%	0%	0%	0%	3.7%	0%	2.7%	0%	1.4%	7.0%	0%	3.5%	17.9%	3.0%	0%	0%	6.3%	4.6%
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
% Articulated Trucks	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2.3%	0%	0.9%	0%	0%	0%	0%	0%	0.4%
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

*L: Left, R: Right, T: Thru, U: U-Turn

Cambridge & Manchester - TMC

Tue May 23, 2023

Forced Peak (12 PM - 1 PM)

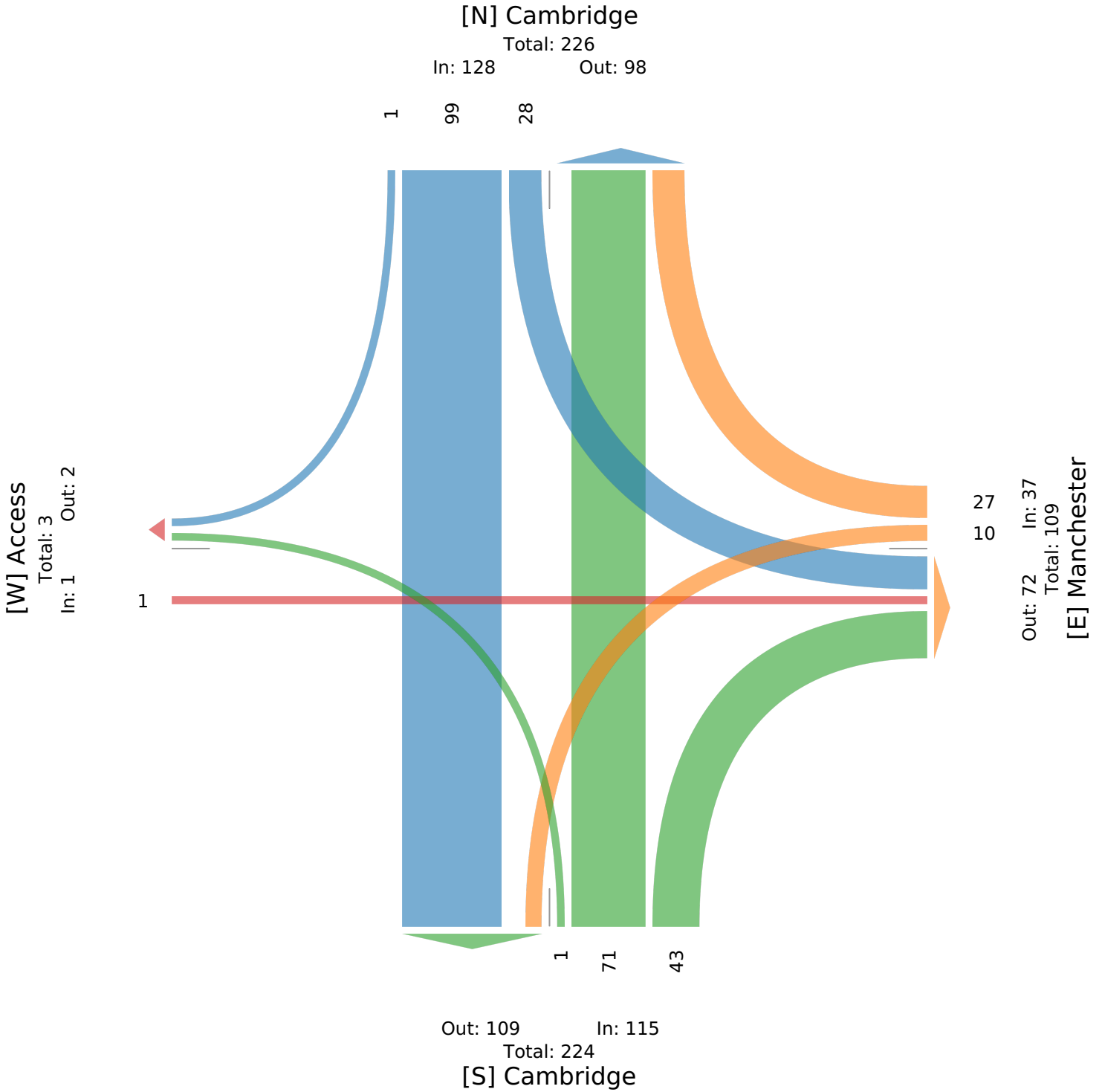
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070421, Location: 39.673651, -86.369289



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Cambridge & Manchester - TMC

Tue May 23, 2023

Forced Peak (4:30 PM - 5:30 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070421, Location: 39.673651, -86.369289



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Access Eastbound					Manchester Westbound					Cambridge Northbound					Cambridge Southbound					Int
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2023-05-23 4:30PM	0	0	0	0	0	1	0	6	0	7	0	11	8	0	19	10	34	0	0	44	70
4:45PM	0	0	0	0	0	8	0	3	0	11	0	10	8	0	18	12	29	0	0	41	70
5:00PM	0	0	0	0	0	4	0	4	0	8	0	9	8	0	17	12	33	1	0	46	71
5:15PM	0	0	0	0	0	7	0	7	0	14	0	5	7	0	12	3	26	0	0	29	55
Total	0	0	0	0	0	20	0	20	0	40	0	35	31	0	66	37	122	1	0	160	266
% Approach	0%	0%	0%	0%	-	50.0%	0%	50.0%	0%	-	0%	53.0%	47.0%	0%	-	23.1%	76.3%	0.6%	0%	-	-
% Total	0%	0%	0%	0%	0%	7.5%	0%	7.5%	0%	15.0%	0%	13.2%	11.7%	0%	24.8%	13.9%	45.9%	0.4%	0%	60.2%	-
PHF	-	-	-	-	-	0.625	-	0.714	-	0.714	-	0.795	0.969	-	0.868	0.771	0.897	0.250	-	0.870	0.937
Lights	0	0	0	0	0	20	0	19	0	39	0	35	31	0	66	33	122	1	0	156	261
% Lights	0%	0%	0%	0%	-	100%	0%	95.0%	0%	97.5%	0%	100%	100%	0%	100%	89.2%	100%	100%	0%	97.5%	98.1%
Single-Unit Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	3
% Single-Unit Trucks	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8.1%	0%	0%	0%	1.9%	1.1%
Articulated Trucks	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	2
% Articulated Trucks	0%	0%	0%	0%	-	0%	0%	5.0%	0%	2.5%	0%	0%	0%	0%	0%	2.7%	0%	0%	0%	0.6%	0.8%
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

*L: Left, R: Right, T: Thru, U: U-Turn

Cambridge & Manchester - TMC

Tue May 23, 2023

Forced Peak (4:30 PM - 5:30 PM)

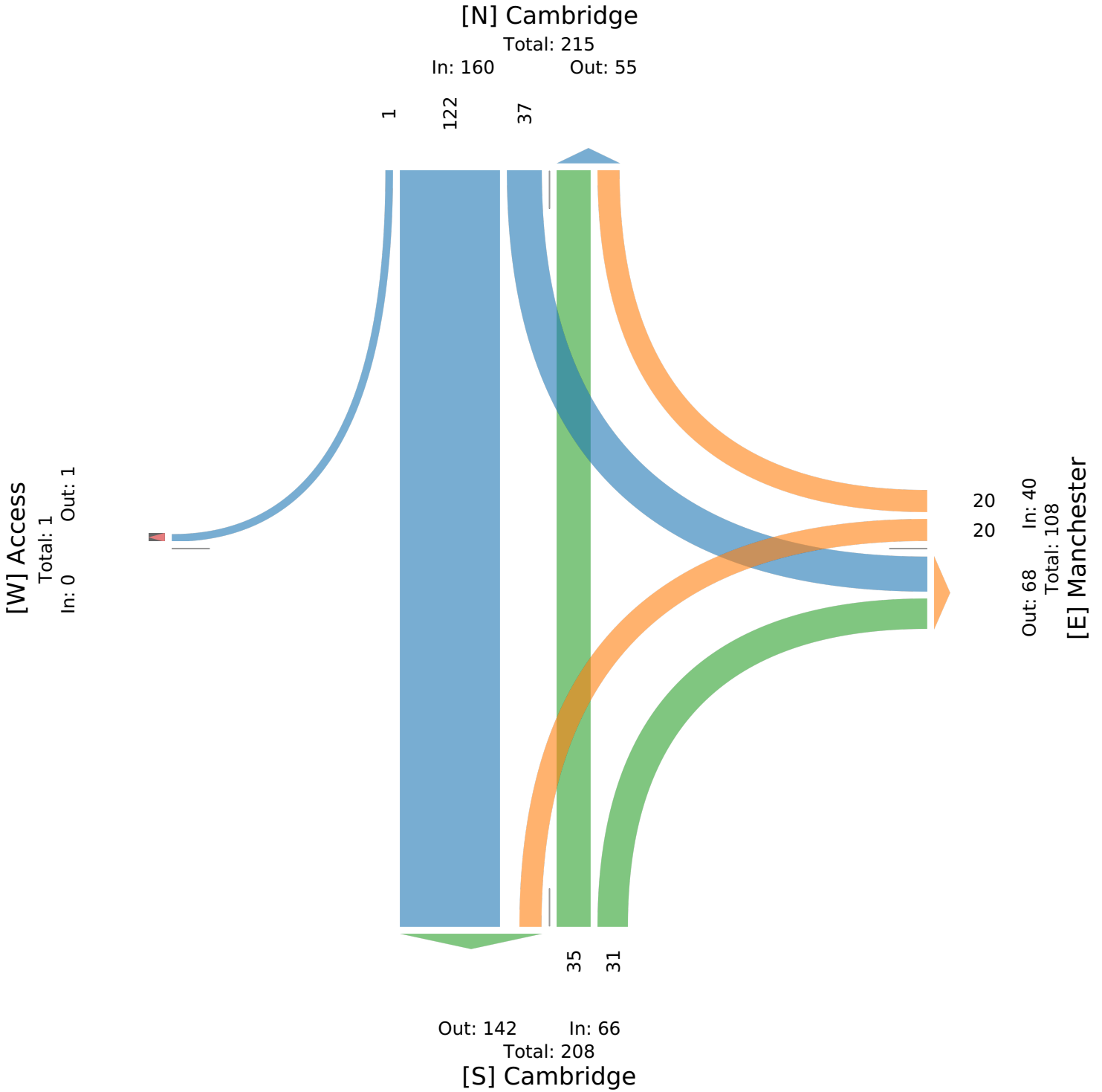
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070421, Location: 39.673651, -86.369289



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Manchester & Clarks Creek - TMC

Tue May 23, 2023

Full Length (6 AM-9 AM, 11 AM-1 PM, 4 PM-6 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070422, Location: 39.6738, -86.366344



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Manchester Eastbound					Manchester Westbound					Clarks Creek Northbound					Clarks Creek Southbound					Int
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2023-05-23 6:00AM	1	0	0	0	1	0	0	2	0	2	0	8	0	0	8	4	0	0	0	4	15
6:15AM	6	0	0	0	6	0	0	4	0	4	0	7	0	0	7	4	1	5	0	10	27
6:30AM	14	1	0	0	15	0	0	5	0	5	0	15	0	0	15	1	0	3	0	4	39
6:45AM	6	6	0	0	12	0	0	3	0	3	0	11	0	0	11	5	2	3	0	10	36
Hourly Total	27	7	0	0	34	0	0	14	0	14	0	41	0	0	41	14	3	11	0	28	117
7:00AM	3	0	0	0	3	0	0	4	0	4	0	4	0	0	4	6	3	1	0	10	21
7:15AM	9	3	0	0	12	0	1	6	0	7	0	8	0	0	8	4	1	1	0	6	33
7:30AM	11	0	0	0	11	0	0	9	0	9	0	11	0	0	11	3	2	5	0	10	41
7:45AM	9	2	0	0	11	0	0	6	0	6	0	10	0	0	10	7	4	1	0	12	39
Hourly Total	32	5	0	0	37	0	1	25	0	26	0	33	0	0	33	20	10	8	0	38	134
8:00AM	18	5	0	0	23	0	2	4	0	6	0	4	0	0	4	5	5	5	0	15	48
8:15AM	12	2	0	0	14	0	1	2	0	3	0	4	0	0	4	4	2	4	0	10	31
8:30AM	11	2	0	1	14	0	0	3	0	3	0	7	1	0	8	1	2	3	0	6	31
8:45AM	14	1	0	0	15	0	1	1	0	2	0	3	0	0	3	2	2	1	0	5	25
Hourly Total	55	10	0	1	66	0	4	10	0	14	0	18	1	0	19	12	11	13	0	36	135
11:00AM	9	2	0	0	11	0	10	2	0	12	0	7	0	0	7	2	5	10	0	17	47
11:15AM	9	3	0	0	12	0	1	6	0	7	0	3	0	0	3	5	9	14	0	28	50
11:30AM	13	1	0	0	14	0	3	4	0	7	0	9	0	0	9	1	3	14	0	18	48
11:45AM	11	1	0	0	12	0	0	3	0	3	0	7	0	0	7	2	4	10	0	16	38
Hourly Total	42	7	0	0	49	0	14	15	0	29	0	26	0	0	26	10	21	48	0	79	183
12:00PM	25	0	1	0	26	1	5	5	0	11	0	15	0	0	15	2	10	13	0	25	77
12:15PM	21	3	0	0	24	0	1	3	0	4	0	10	0	0	10	1	5	5	0	11	49
12:30PM	17	0	0	0	17	0	0	3	0	3	0	10	3	0	13	3	3	9	0	15	48
12:45PM	17	0	0	0	17	0	1	10	0	11	0	6	0	0	6	2	5	7	0	14	48
Hourly Total	80	3	1	0	84	1	7	21	0	29	0	41	3	0	44	8	23	34	0	65	222
4:00PM	12	1	0	0	13	1	0	8	0	9	0	8	2	0	10	5	4	3	0	12	44
4:15PM	13	0	0	0	13	0	0	2	0	2	0	5	0	0	5	0	6	5	0	11	31
4:30PM	16	0	0	0	16	0	1	5	0	6	0	6	0	0	6	0	1	10	0	11	39
4:45PM	15	0	0	0	15	0	0	5	0	5	0	9	0	0	9	6	1	11	0	18	47
Hourly Total	56	1	0	0	57	1	1	20	0	22	0	28	2	0	30	11	12	29	0	52	161
5:00PM	22	2	0	0	24	0	0	7	0	7	0	6	0	0	6	0	9	5	0	14	51
5:15PM	9	0	0	0	9	0	0	0	0	0	0	9	0	0	9	5	3	15	0	23	41
5:30PM	6	0	0	0	6	0	1	3	0	4	1	4	0	0	5	7	11	4	0	22	37
5:45PM	20	1	0	0	21	0	1	1	0	2	0	4	0	0	4	6	7	8	0	21	48
Hourly Total	57	3	0	0	60	0	2	11	0	13	1	23	0	0	24	18	30	32	0	80	177
Total	349	36	1	1	387	2	29	116	0	147	1	210	6	0	217	93	110	175	0	378	1129
% Approach	90.2%	9.3%	0.3%	0.3%	-	1.4%	19.7%	78.9%	0%	-	0.5%	96.8%	2.8%	0%	-	24.6%	29.1%	46.3%	0%	-	-
% Total	30.9%	3.2%	0.1%	0.1%	34.3%	0.2%	2.6%	10.3%	0%	13.0%	0.1%	18.6%	0.5%	0%	19.2%	8.2%	9.7%	15.5%	0%	33.5%	-
Lights	318	33	1	1	353	2	29	111	0	142	1	204	6	0	211	90	109	169	0	368	1074
% Lights	91.1%	91.7%	100%	100%	91.2%	100%	100%	95.7%	0%	96.6%	100%	97.1%	100%	0%	97.2%	96.8%	99.1%	96.6%	0%	97.4%	95.1%
Single-Unit Trucks	24	1	0	0	25	0	0	3	0	3	0	4	0	0	4	2	1	4	0	7	39
% Single-Unit Trucks	6.9%	2.8%	0%	0%	6.5%	0%	0%	2.6%	0%	2.0%	0%	1.9%	0%	0%	1.8%	2.2%	0.9%	2.3%	0%	1.9%	3.5%
Articulated Trucks	6	2	0	0	8	0	0	2	0	2	0	2	0	0	2	1	0	2	0	3	15
% Articulated Trucks	1.7%	5.6%	0%	0%	2.1%	0%	0%	1.7%	0%	1.4%	0%	1.0%	0%	0%	0.9%	1.1%	0%	1.1%	0%	0.8%	1.3%
Buses	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Buses	0.3%	0%	0%	0%	0.3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.1%
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

*L: Left, R: Right, T: Thru, U: U-Turn

Manchester & Clarks Creek - TMC

Tue May 23, 2023

Full Length (6 AM-9 AM, 11 AM-1 PM, 4 PM-6 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070422, Location: 39.6738, -86.366344



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Clarks Creek

Total: 1053

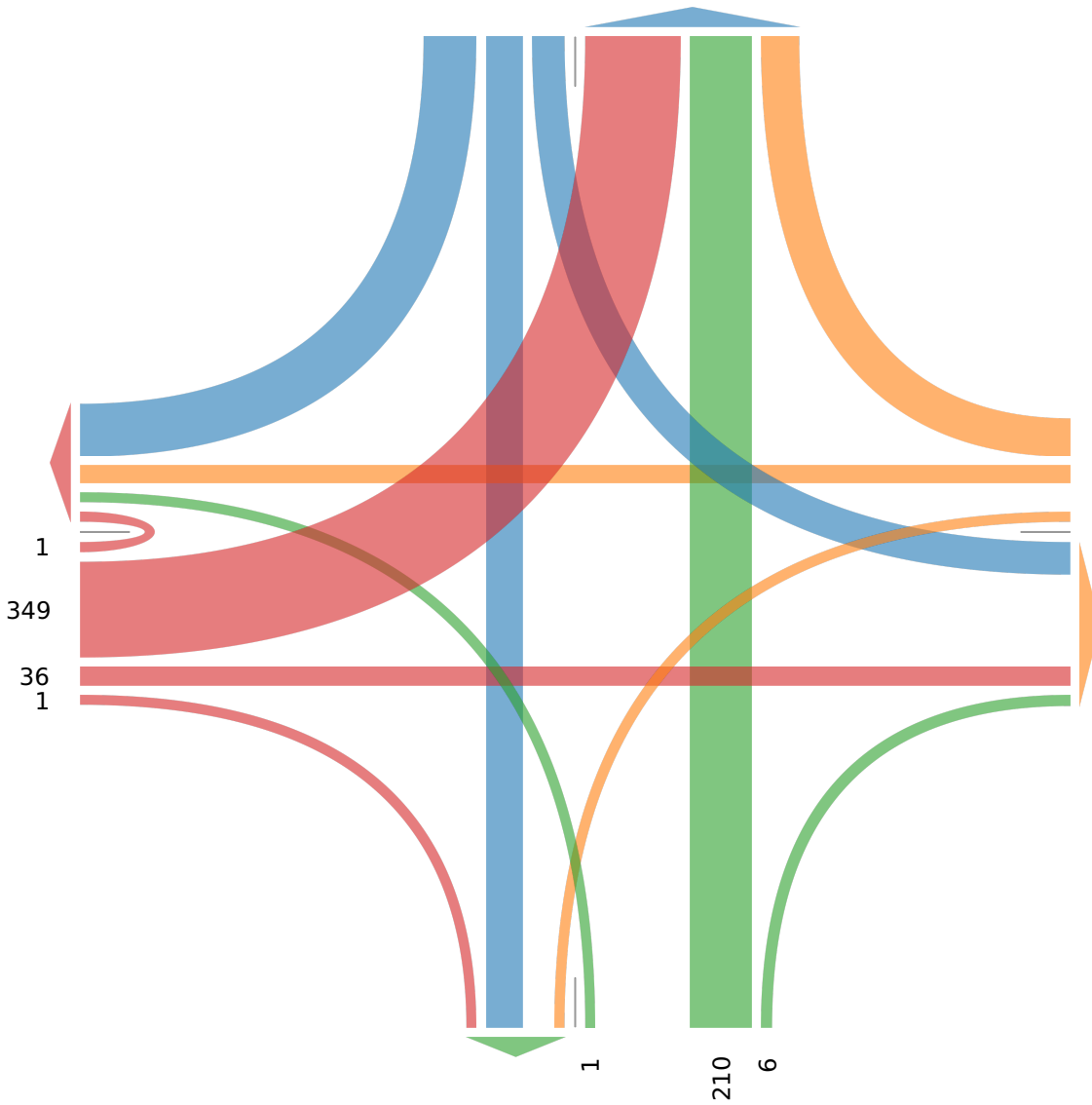
In: 378

Out: 675

175
110
93

[W] Manchester

Total: 593
In: 387
Out: 206



116
29
2
Out: 135 In: 147
Total: 282
[E] Manchester

Out: 113 In: 217
Total: 330
[S] Clarks Creek

Manchester & Clarks Creek - TMC

Tue May 23, 2023

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070422, Location: 39.6738, -86.366344



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Manchester Eastbound					Manchester Westbound					Clarks Creek Northbound					Clarks Creek Southbound					Int
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2023-05-23 7:15AM	9	3	0	0	12	0	1	6	0	7	0	8	0	0	8	4	1	1	0	6	33
7:30AM	11	0	0	0	11	0	0	9	0	9	0	11	0	0	11	3	2	5	0	10	41
7:45AM	9	2	0	0	11	0	0	6	0	6	0	10	0	0	10	7	4	1	0	12	39
8:00AM	18	5	0	0	23	0	2	4	0	6	0	4	0	0	4	5	5	5	0	15	48
Total	47	10	0	0	57	0	3	25	0	28	0	33	0	0	33	19	12	12	0	43	161
% Approach	82.5%	17.5%	0%	0%	-	0%	10.7%	89.3%	0%	-	0%	100%	0%	0%	-	44.2%	27.9%	27.9%	0%	-	-
% Total	29.2%	6.2%	0%	0%	35.4%	0%	1.9%	15.5%	0%	17.4%	0%	20.5%	0%	0%	20.5%	11.8%	7.5%	7.5%	0%	26.7%	-
PHF	0.653	0.500	-	-	0.620	-	0.375	0.694	-	0.778	-	0.750	-	-	0.750	0.679	0.600	0.600	-	0.717	0.839
Lights	40	8	0	0	48	0	3	24	0	27	0	31	0	0	31	18	12	12	0	42	148
% Lights	85.1%	80.0%	0%	0%	84.2%	0%	100%	96.0%	0%	96.4%	0%	93.9%	0%	0%	93.9%	94.7%	100%	100%	0%	97.7%	91.9%
Single-Unit Trucks	5	0	0	0	5	0	0	1	0	1	0	1	0	0	1	1	0	0	0	1	8
% Single-Unit Trucks	10.6%	0%	0%	0%	8.8%	0%	0%	4.0%	0%	3.6%	0%	3.0%	0%	0%	3.0%	5.3%	0%	0%	0%	2.3%	5.0%
Articulated Trucks	1	2	0	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	4
% Articulated Trucks	2.1%	20.0%	0%	0%	5.3%	0%	0%	0%	0%	0%	0%	3.0%	0%	0%	3.0%	0%	0%	0%	0%	0%	2.5%
Buses	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Buses	2.1%	0%	0%	0%	1.8%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.6%
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

*L: Left, R: Right, T: Thru, U: U-Turn

Manchester & Clarks Creek - TMC

Tue May 23, 2023

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070422, Location: 39.6738, -86.366344



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Clarks Creek

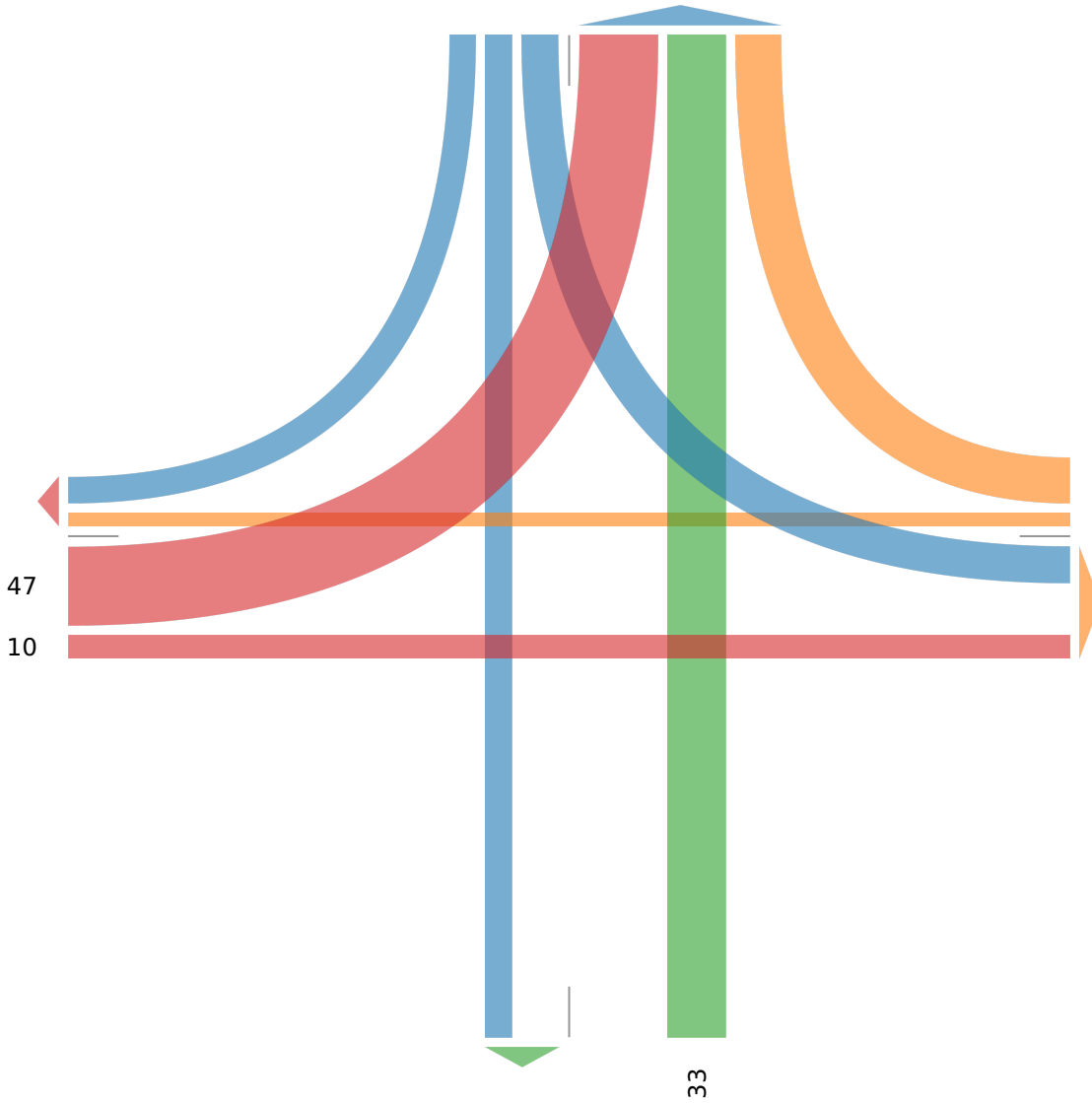
Total: 148

In: 43

Out: 105

12 12 19

[W] Manchester
Total: 72
In: 57 Out: 15



Out: 29 In: 28
Total: 57
[E] Manchester

Out: 12 In: 33
Total: 45
[S] Clarks Creek

Manchester & Clarks Creek - TMC

Tue May 23, 2023

Midday Peak (12 PM - 1 PM) - Overall Peak Hour

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070422, Location: 39.6738, -86.366344



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Manchester Eastbound					Manchester Westbound					Clarks Creek Northbound					Clarks Creek Southbound					Int
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2023-05-23 12:00PM	25	0	1	0	26	1	5	5	0	11	0	15	0	0	15	2	10	13	0	25	77
12:15PM	21	3	0	0	24	0	1	3	0	4	0	10	0	0	10	1	5	5	0	11	49
12:30PM	17	0	0	0	17	0	0	3	0	3	0	10	3	0	13	3	3	9	0	15	48
12:45PM	17	0	0	0	17	0	1	10	0	11	0	6	0	0	6	2	5	7	0	14	48
Total	80	3	1	0	84	1	7	21	0	29	0	41	3	0	44	8	23	34	0	65	222
% Approach	95.2%	3.6%	1.2%	0%	-	3.4%	24.1%	72.4%	0%	-	0%	93.2%	6.8%	0%	-	12.3%	35.4%	52.3%	0%	-	-
% Total	36.0%	1.4%	0.5%	0%	37.8%	0.5%	3.2%	9.5%	0%	13.1%	0%	18.5%	1.4%	0%	19.8%	3.6%	10.4%	15.3%	0%	29.3%	-
PHF	0.800	0.250	0.250	-	0.808	0.250	0.350	0.525	-	0.659	-	0.683	0.250	-	0.733	0.667	0.575	0.654	-	0.650	0.721
Lights	71	3	1	0	75	1	7	20	0	28	0	40	3	0	43	7	23	33	0	63	209
% Lights	88.8%	100%	100%	0%	89.3%	100%	100%	95.2%	0%	96.6%	0%	97.6%	100%	0%	97.7%	87.5%	100%	97.1%	0%	96.9%	94.1%
Single-Unit Trucks	8	0	0	0	8	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	10
% Single-Unit Trucks	10.0%	0%	0%	0%	9.5%	0%	0%	0%	0%	0%	0%	2.4%	0%	0%	2.3%	0%	0%	2.9%	0%	1.5%	4.5%
Articulated Trucks	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	3
% Articulated Trucks	1.3%	0%	0%	0%	1.2%	0%	0%	4.8%	0%	3.4%	0%	0%	0%	0%	0%	12.5%	0%	0%	0%	1.5%	1.4%
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

*L: Left, R: Right, T: Thru, U: U-Turn

Manchester & Clarks Creek - TMC

Tue May 23, 2023

Midday Peak (12 PM - 1 PM) - Overall Peak Hour

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070422, Location: 39.6738, -86.366344



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Clarks Creek

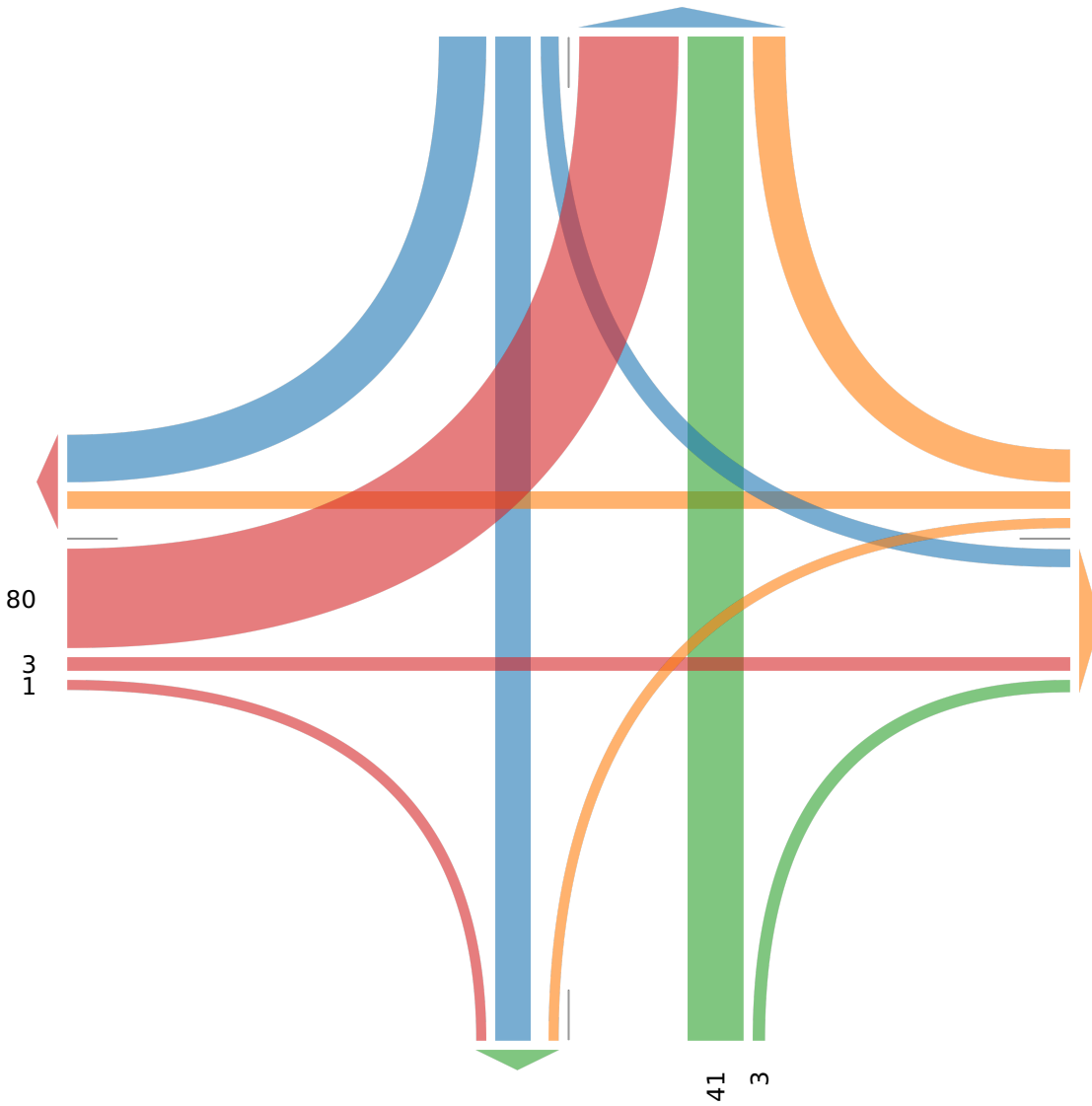
Total: 207

In: 65 Out: 142

34 23 8

[W] Manchester

Total: 125
In: 84 Out: 41



Out: 25 In: 44
Total: 69

[S] Clarks Creek

Out: 14 In: 29
Total: 43
[E] Manchester

Manchester & Clarks Creek - TMC

Tue May 23, 2023

PM Peak (4:30 PM - 5:30 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070422, Location: 39.6738, -86.366344



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Manchester Eastbound					Manchester Westbound					Clarks Creek Northbound					Clarks Creek Southbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2023-05-23 4:30PM	16	0	0	0	16	0	1	5	0	6	0	6	0	0	6	0	1	10	0	11	39
4:45PM	15	0	0	0	15	0	0	5	0	5	0	9	0	0	9	6	1	11	0	18	47
5:00PM	22	2	0	0	24	0	0	7	0	7	0	6	0	0	6	0	9	5	0	14	51
5:15PM	9	0	0	0	9	0	0	0	0	0	0	9	0	0	9	5	3	15	0	23	41
Total	62	2	0	0	64	0	1	17	0	18	0	30	0	0	30	11	14	41	0	66	178
% Approach	96.9%	3.1%	0%	0%	-	0%	5.6%	94.4%	0%	-	0%	100%	0%	0%	-	16.7%	21.2%	62.1%	0%	-	-
% Total	34.8%	1.1%	0%	0%	36.0%	0%	0.6%	9.6%	0%	10.1%	0%	16.9%	0%	0%	16.9%	6.2%	7.9%	23.0%	0%	37.1%	-
PHF	0.705	0.250	-	-	0.667	-	0.250	0.607	-	0.643	-	0.833	-	-	0.833	0.458	0.389	0.683	-	0.717	0.873
Lights	59	1	0	0	60	0	1	17	0	18	0	30	0	0	30	11	14	40	0	65	173
% Lights	95.2%	50.0%	0%	0%	93.8%	0%	100%	100%	0%	100%	0%	100%	0%	0%	100%	100%	100%	97.6%	0%	98.5%	97.2%
Single-Unit Trucks	2	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
% Single-Unit Trucks	3.2%	50.0%	0%	0%	4.7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1.7%
Articulated Trucks	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
% Articulated Trucks	1.6%	0%	0%	0%	1.6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2.4%	0%	1.5%	1.1%
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

*L: Left, R: Right, T: Thru, U: U-Turn

Manchester & Clarks Creek - TMC

Tue May 23, 2023

PM Peak (4:30 PM - 5:30 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070422, Location: 39.6738, -86.366344



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Clarks Creek

Total: 175

In: 66

Out: 109

41

14

11

[W] Manchester

Total: 106

In: 64 Out: 42

62

2

17

1

Out: 13 In: 18

Total: 31

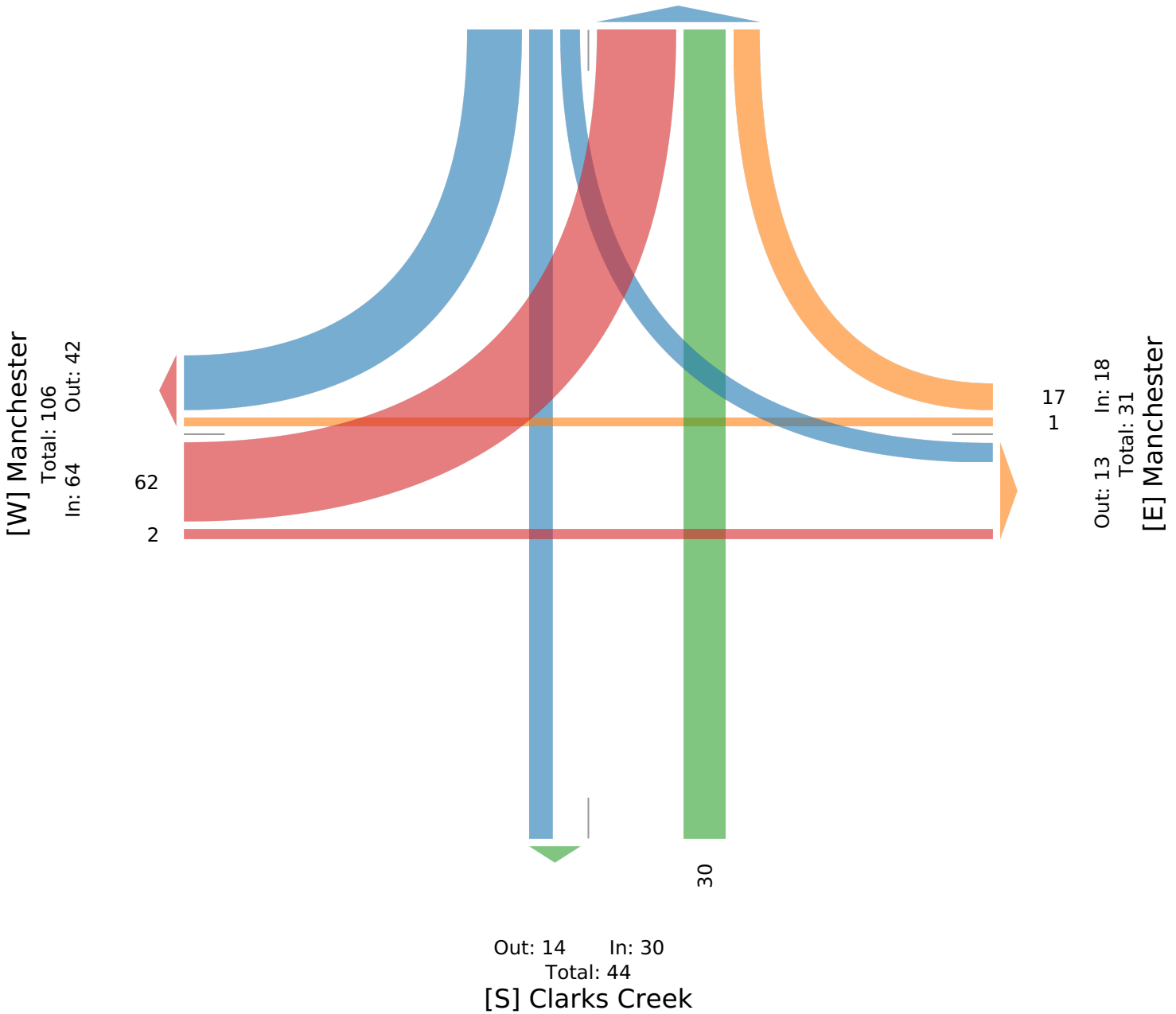
[E] Manchester

Out: 14 In: 30

Total: 44

[S] Clarks Creek

30



Clarks Creek & Perry Road - TMC

Tue May 23, 2023

Full Length (6 AM-9 AM, 11 AM-1 PM, 4 PM-6 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070423, Location: 39.675264, -86.366497



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Perry Eastbound					Perry Westbound					Clarks Northbound					Clarks Southbound					Int
	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	
2023-05-23 6:00AM	0	47	4	0	51	0	12	0	0	12	11	0	0	0	11	4	0	1	0	5	79
6:15AM	0	82	6	0	88	5	17	0	0	22	11	0	6	0	17	0	0	2	0	2	129
6:30AM	0	95	1	0	96	2	23	0	0	25	23	0	12	0	35	2	0	5	0	7	163
6:45AM	0	159	8	0	167	2	21	0	0	23	14	0	9	0	23	2	0	3	0	5	218
Hourly Total	0	383	19	0	402	9	73	0	0	82	59	0	27	0	86	8	0	11	0	19	589
7:00AM	0	75	8	0	83	2	18	0	0	20	12	0	0	0	12	2	0	8	0	10	125
7:15AM	2	102	8	0	112	2	20	0	0	22	25	0	3	0	28	1	0	7	0	8	170
7:30AM	1	105	4	0	110	6	21	0	0	27	29	1	6	0	36	0	0	3	0	3	176
7:45AM	1	115	12	0	128	6	27	0	0	33	21	0	6	0	27	1	2	3	0	6	194
Hourly Total	4	397	32	0	433	16	86	0	0	102	87	1	15	0	103	4	2	21	0	27	665
8:00AM	1	77	16	0	94	5	14	0	0	19	23	0	8	0	31	2	1	2	0	5	149
8:15AM	3	61	19	0	83	2	35	1	0	38	17	0	1	0	18	2	3	1	0	6	145
8:30AM	2	64	3	0	69	7	18	2	0	27	20	0	6	0	26	1	5	5	0	11	133
8:45AM	1	55	1	0	57	3	29	1	0	33	16	0	5	0	21	2	1	0	0	3	114
Hourly Total	7	257	39	0	303	17	96	4	0	117	76	0	20	0	96	7	10	8	0	25	541
11:00AM	2	63	4	0	69	12	69	0	0	81	13	1	6	0	20	0	1	0	0	1	171
11:15AM	2	58	5	0	65	28	58	0	0	86	12	1	10	0	23	0	0	2	0	2	176
11:30AM	1	66	8	0	75	16	71	0	0	87	26	0	12	0	38	0	0	3	0	3	203
11:45AM	6	74	9	0	89	8	59	1	0	68	16	0	4	0	20	0	0	0	0	0	177
Hourly Total	11	261	26	0	298	64	257	1	0	322	67	2	32	0	101	0	1	5	0	6	727
12:00PM	2	74	4	0	80	23	71	0	0	94	35	2	14	0	51	0	0	3	0	3	228
12:15PM	1	82	7	1	91	7	51	2	0	60	32	0	12	0	44	2	0	2	0	4	199
12:30PM	3	73	6	0	82	11	75	0	0	86	30	0	8	0	38	0	0	3	0	3	209
12:45PM	1	58	5	0	64	9	40	2	0	51	51	0	10	0	61	0	1	0	0	1	177
Hourly Total	7	287	22	1	317	50	237	4	0	291	148	2	44	0	194	2	1	8	0	11	813
4:00PM	3	45	10	0	58	6	77	0	0	83	25	0	6	0	31	0	0	3	0	3	175
4:15PM	3	59	10	0	72	8	70	1	0	79	18	0	4	0	22	0	0	2	0	2	175
4:30PM	1	58	5	0	64	9	109	2	0	120	28	0	4	0	32	0	0	1	0	1	217
4:45PM	0	55	7	0	62	13	80	2	0	95	26	0	5	0	31	0	0	1	0	1	189
Hourly Total	7	217	32	0	256	36	336	5	0	377	97	0	19	0	116	0	0	7	0	7	756
5:00PM	8	57	9	0	74	9	102	1	0	112	36	0	6	0	42	0	0	5	0	5	233
5:15PM	1	47	12	1	61	14	72	0	0	86	22	0	3	0	25	0	1	0	0	1	173
5:30PM	11	60	16	0	87	15	80	1	0	96	12	0	7	0	19	0	1	5	0	6	208
5:45PM	0	70	19	1	90	11	66	1	0	78	19	0	9	0	28	0	0	4	0	4	200
Hourly Total	20	234	56	2	312	49	320	3	0	372	89	0	25	0	114	0	2	14	0	16	814
Total	56	2036	226	3	2321	241	1405	17	0	1663	623	5	182	0	810	21	16	74	0	111	4905
% Approach	2.4%	87.7%	9.7%	0.1%	-	14.5%	84.5%	1.0%	0%	-	76.9%	0.6%	22.5%	0%	-	18.9%	14.4%	66.7%	0%	-	-
% Total	1.1%	41.5%	4.6%	0.1%	47.3%	4.9%	28.6%	0.3%	0%	33.9%	12.7%	0.1%	3.7%	0%	16.5%	0.4%	0.3%	1.5%	0%	2.3%	-
Lights	55	1867	220	3	2145	235	1245	17	0	1497	587	4	179	0	770	21	16	74	0	111	4523
% Lights	98.2%	91.7%	97.3%	100%	92.4%	97.5%	88.6%	100%	0%	90.0%	94.2%	80.0%	98.4%	0%	95.1%	100%	100%	100%	0%	100%	92.2%
Single-Unit Trucks	0	57	2	0	59	4	46	0	0	50	27	1	2	0	30	0	0	0	0	0	139
% Single-Unit Trucks	0%	2.8%	0.9%	0%	2.5%	1.7%	3.3%	0%	0%	3.0%	4.3%	20.0%	1.1%	0%	3.7%	0%	0%	0%	0%	0%	2.8%
Articulated Trucks	1	94	3	0	98	2	102	0	0	104	9	0	0	0	9	0	0	0	0	0	211
% Articulated Trucks	1.8%	4.6%	1.3%	0%	4.2%	0.8%	7.3%	0%	0%	6.3%	1.4%	0%	0%	0%	1.1%	0%	0%	0%	0%	0%	4.3%
Buses	0	15	0	0	15	0	12	0	0	12	0	0	0	0	0	0	0	0	0	0	27
% Buses	0%	0.7%	0%	0%	0.6%	0%	0.9%	0%	0%	0.7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.6%
Bicycles on Road	0	3	1	0	4	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	5
% Bicycles on Road	0%	0.1%	0.4%	0%	0.2%	0%	0%	0%	0%	0%	0%	0%	0.5%	0%	0.1%	0%	0%	0%	0%	0%	0.1%

*L: Left, R: Right, T: Thru, U: U-Turn

Clarks Creek & Perry Road - TMC

Tue May 23, 2023

Full Length (6 AM-9 AM, 11 AM-1 PM, 4 PM-6 PM)

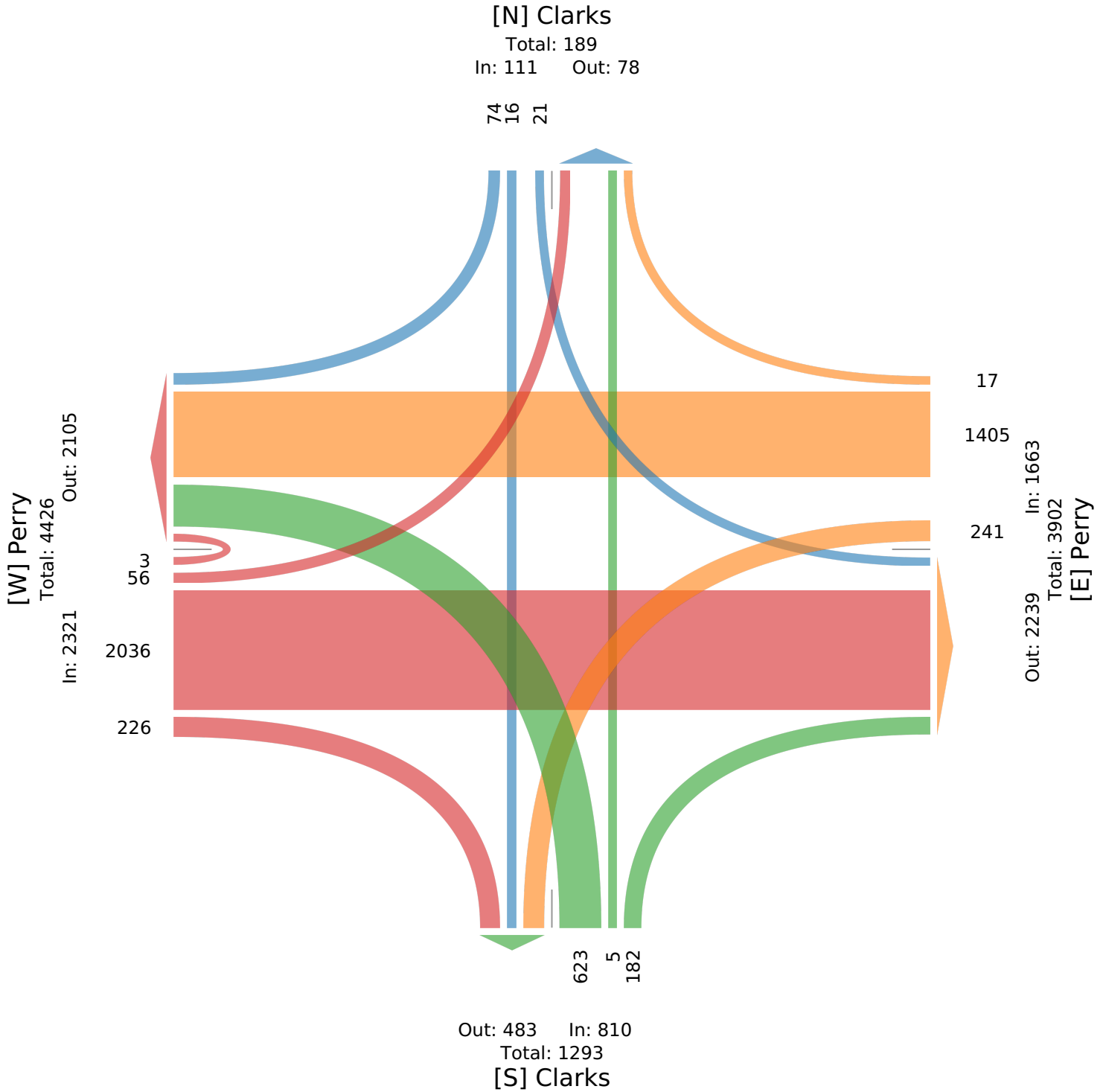
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070423, Location: 39.675264, -86.366497



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Clarks Creek & Perry Road - TMC

Tue May 23, 2023

Forced Peak (7:15 AM - 8:15 AM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070423, Location: 39.675264, -86.366497



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Perry Eastbound					Perry Westbound					Clarks Northbound					Clarks Southbound					Int
	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	
2023-05-23 7:15AM	2	102	8	0	112	2	20	0	0	22	25	0	3	0	28	1	0	7	0	8	170
7:30AM	1	105	4	0	110	6	21	0	0	27	29	1	6	0	36	0	0	3	0	3	176
7:45AM	1	115	12	0	128	6	27	0	0	33	21	0	6	0	27	1	2	3	0	6	194
8:00AM	1	77	16	0	94	5	14	0	0	19	23	0	8	0	31	2	1	2	0	5	149
Total	5	399	40	0	444	19	82	0	0	101	98	1	23	0	122	4	3	15	0	22	689
% Approach	1.1%	89.9%	9.0%	0%	-	18.8%	81.2%	0%	0%	-	80.3%	0.8%	18.9%	0%	-	18.2%	13.6%	68.2%	0%	-	-
% Total	0.7%	57.9%	5.8%	0%	64.4%	2.8%	11.9%	0%	0%	14.7%	14.2%	0.1%	3.3%	0%	17.7%	0.6%	0.4%	2.2%	0%	3.2%	-
PHF	0.625	0.867	0.625	-	0.867	0.792	0.759	-	-	0.765	0.845	0.250	0.719	-	0.847	0.500	0.375	0.536	-	0.688	0.888
Lights	5	373	39	0	417	19	61	0	0	80	93	1	22	0	116	4	3	15	0	22	635
% Lights	100%	93.5%	97.5%	0%	93.9%	100%	74.4%	0%	0%	79.2%	94.9%	100%	95.7%	0%	95.1%	100%	100%	100%	0%	100%	92.2%
Single-Unit Trucks	0	11	0	0	11	0	7	0	0	7	4	0	1	0	5	0	0	0	0	0	23
% Single-Unit Trucks	0%	2.8%	0%	0%	2.5%	0%	8.5%	0%	0%	6.9%	4.1%	0%	4.3%	0%	4.1%	0%	0%	0%	0%	0%	3.3%
Articulated Trucks	0	15	1	0	16	0	13	0	0	13	1	0	0	0	1	0	0	0	0	0	30
% Articulated Trucks	0%	3.8%	2.5%	0%	3.6%	0%	15.9%	0%	0%	12.9%	1.0%	0%	0%	0%	0.8%	0%	0%	0%	0%	0%	4.4%
Buses	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
% Buses	0%	0%	0%	0%	0%	0%	1.2%	0%	0%	1.0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.1%
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

*L: Left, R: Right, T: Thru, U: U-Turn

Clarks Creek & Perry Road - TMC

Tue May 23, 2023

Forced Peak (7:15 AM - 8:15 AM)

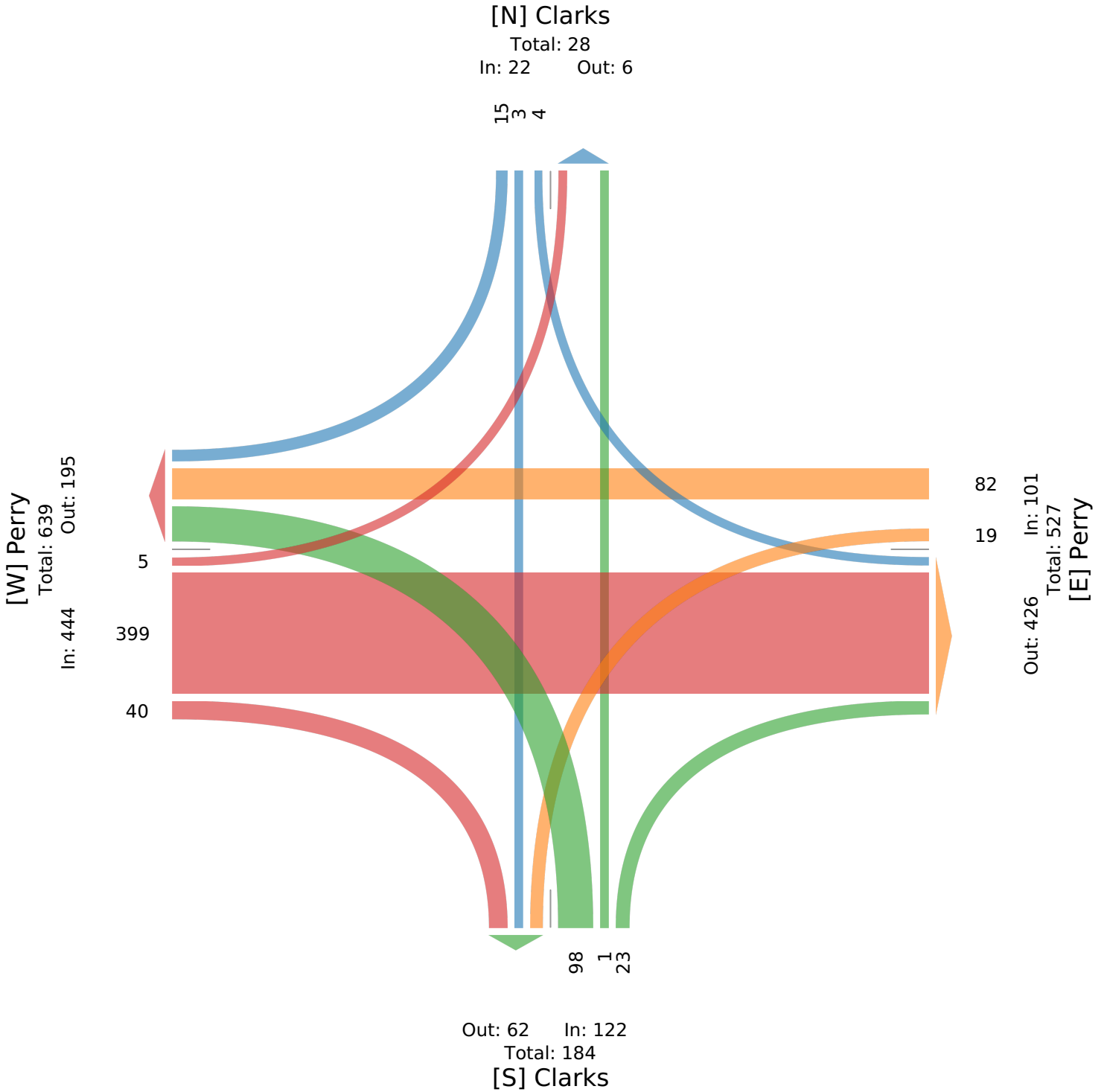
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070423, Location: 39.675264, -86.366497



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Clarks Creek & Perry Road - TMC

Tue May 23, 2023

Forced Peak (12 PM - 1 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070423, Location: 39.675264, -86.366497



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Perry Eastbound					Perry Westbound					Clarks Northbound					Clarks Southbound						
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int	
2023-05-23 12:00PM	2	74	4	0	80	23	71	0	0	94	35	2	14	0	51	0	0	3	0	3	228	
12:15PM	1	82	7	1	91	7	51	2	0	60	32	0	12	0	44	2	0	2	0	4	199	
12:30PM	3	73	6	0	82	11	75	0	0	86	30	0	8	0	38	0	0	3	0	3	209	
12:45PM	1	58	5	0	64	9	40	2	0	51	51	0	10	0	61	0	1	0	0	1	177	
Total	7	287	22	1	317	50	237	4	0	291	148	2	44	0	194	2	1	8	0	11	813	
% Approach	2.2%	90.5%	6.9%	0.3%	-	17.2%	81.4%	1.4%	0%	-	76.3%	1.0%	22.7%	0%	-	18.2%	9.1%	72.7%	0%	-	-	
% Total	0.9%	35.3%	2.7%	0.1%	39.0%	6.2%	29.2%	0.5%	0%	35.8%	18.2%	0.2%	5.4%	0%	23.9%	0.2%	0.1%	1.0%	0%	1.4%	-	
PHF	0.583	0.875	0.786	0.250	0.871	0.543	0.790	0.500	-	0.774	0.725	0.250	0.786	-	0.795	0.250	0.250	0.667	-	0.688	0.891	
Lights	7	263	22	1	293	48	206	4	0	258	137	2	43	0	182	2	1	8	0	11	744	
% Lights	100%	91.6%	100%	100%	92.4%	96.0%	86.9%	100%	0%	88.7%	92.6%	100%	97.7%	0%	93.8%	100%	100%	100%	0%	100%	91.5%	
Single-Unit Trucks	0	7	0	0	7	1	10	0	0	11	9	0	1	0	10	0	0	0	0	0	0	28
% Single-Unit Trucks	0%	2.4%	0%	0%	2.2%	2.0%	4.2%	0%	0%	3.8%	6.1%	0%	2.3%	0%	5.2%	0%	0%	0%	0%	0%	3.4%	
Articulated Trucks	0	16	0	0	16	1	21	0	0	22	2	0	0	0	2	0	0	0	0	0	40	
% Articulated Trucks	0%	5.6%	0%	0%	5.0%	2.0%	8.9%	0%	0%	7.6%	1.4%	0%	0%	0%	1.0%	0%	0%	0%	0%	0%	4.9%	
Buses	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
% Buses	0%	0.3%	0%	0%	0.3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.1%	
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Bicycles on Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	

*L: Left, R: Right, T: Thru, U: U-Turn

Clarks Creek & Perry Road - TMC

Tue May 23, 2023

Forced Peak (12 PM - 1 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070423, Location: 39.675264, -86.366497



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Clarks
Total: 24
In: 11 Out: 13

8-1 2

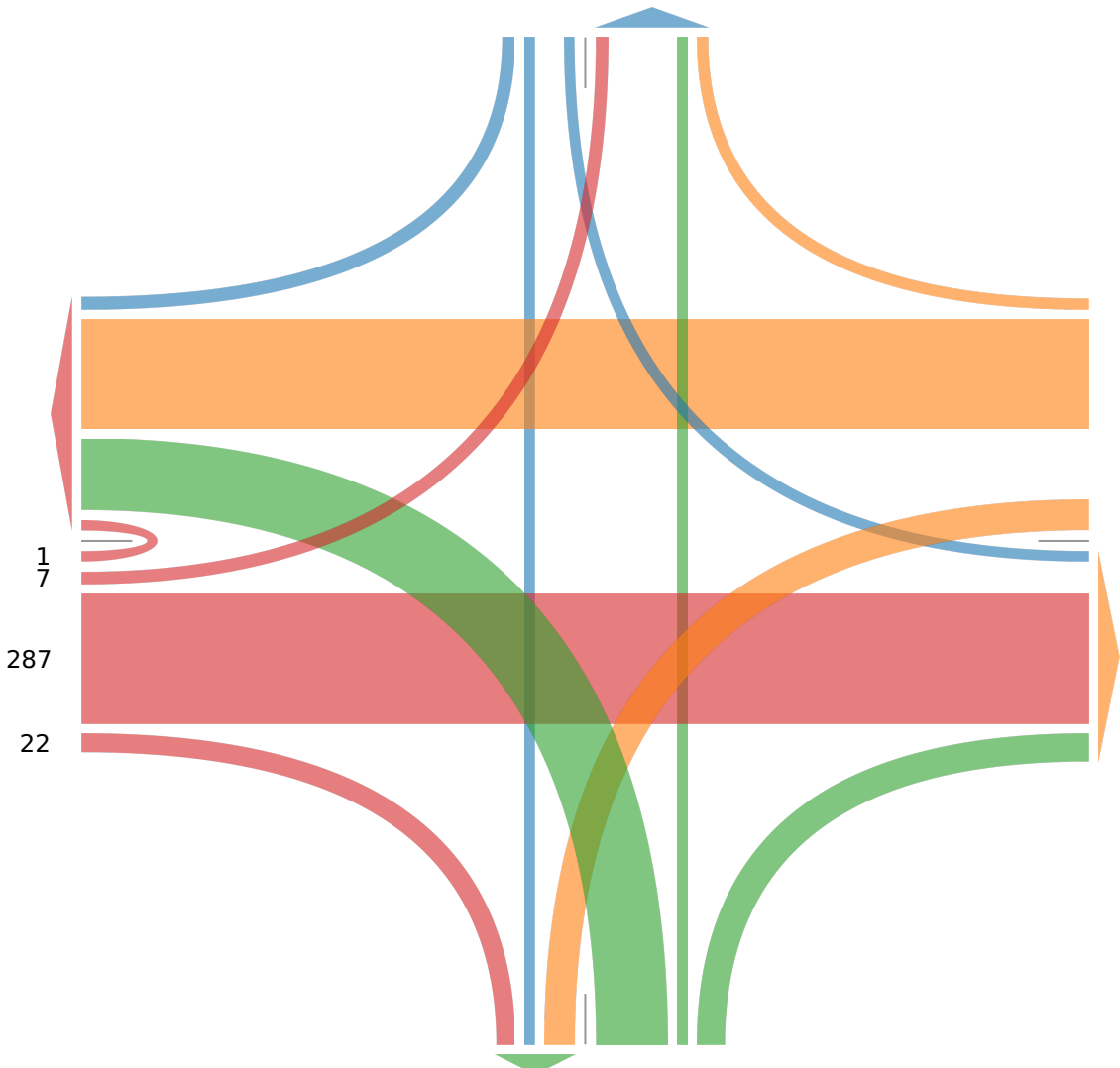
[W] Perry
Total: 711
In: 317 Out: 394

1
7
287
22

4
237

In: 291
Total: 624
Out: 333
[E] Perry

148
2
44
Out: 73 In: 194
Total: 267
[S] Clarks



Clarks Creek & Perry Road - TMC

Tue May 23, 2023

Forced Peak (4:30 PM - 5:30 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070423, Location: 39.675264, -86.366497



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Perry Eastbound					Perry Westbound					Clarks Northbound					Clarks Southbound					Int
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2023-05-23 4:30PM	1	58	5	0	64	9	109	2	0	120	28	0	4	0	32	0	0	1	0	1	217
4:45PM	0	55	7	0	62	13	80	2	0	95	26	0	5	0	31	0	0	1	0	1	189
5:00PM	8	57	9	0	74	9	102	1	0	112	36	0	6	0	42	0	0	5	0	5	233
5:15PM	1	47	12	1	61	14	72	0	0	86	22	0	3	0	25	0	1	0	0	1	173
Total	10	217	33	1	261	45	363	5	0	413	112	0	18	0	130	0	1	7	0	8	812
% Approach	3.8%	83.1%	12.6%	0.4%	-	10.9%	87.9%	1.2%	0%	-	86.2%	0%	13.8%	0%	-	0%	12.5%	87.5%	0%	-	-
% Total	1.2%	26.7%	4.1%	0.1%	32.1%	5.5%	44.7%	0.6%	0%	50.9%	13.8%	0%	2.2%	0%	16.0%	0%	0.1%	0.9%	0%	1.0%	-
PHF	0.313	0.935	0.688	0.250	0.882	0.804	0.833	0.625	-	0.860	0.778	-	0.750	-	0.774	-	0.250	0.350	-	0.400	0.871
Lights	10	196	33	1	240	44	350	5	0	399	109	0	18	0	127	0	1	7	0	8	774
% Lights	100%	90.3%	100%	100%	92.0%	97.8%	96.4%	100%	0%	96.6%	97.3%	0%	100%	0%	97.7%	0%	100%	100%	0%	100%	95.3%
Single-Unit Trucks	0	6	0	0	6	0	4	0	0	4	2	0	0	0	2	0	0	0	0	0	12
% Single-Unit Trucks	0%	2.8%	0%	0%	2.3%	0%	1.1%	0%	0%	1.0%	1.8%	0%	0%	0%	1.5%	0%	0%	0%	0%	0%	1.5%
Articulated Trucks	0	8	0	0	8	1	9	0	0	10	1	0	0	0	1	0	0	0	0	0	19
% Articulated Trucks	0%	3.7%	0%	0%	3.1%	2.2%	2.5%	0%	0%	2.4%	0.9%	0%	0%	0%	0.8%	0%	0%	0%	0%	0%	2.3%
Buses	0	7	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
% Buses	0%	3.2%	0%	0%	2.7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.9%
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

*L: Left, R: Right, T: Thru, U: U-Turn

Clarks Creek & Perry Road - TMC

Tue May 23, 2023

Forced Peak (4:30 PM - 5:30 PM)

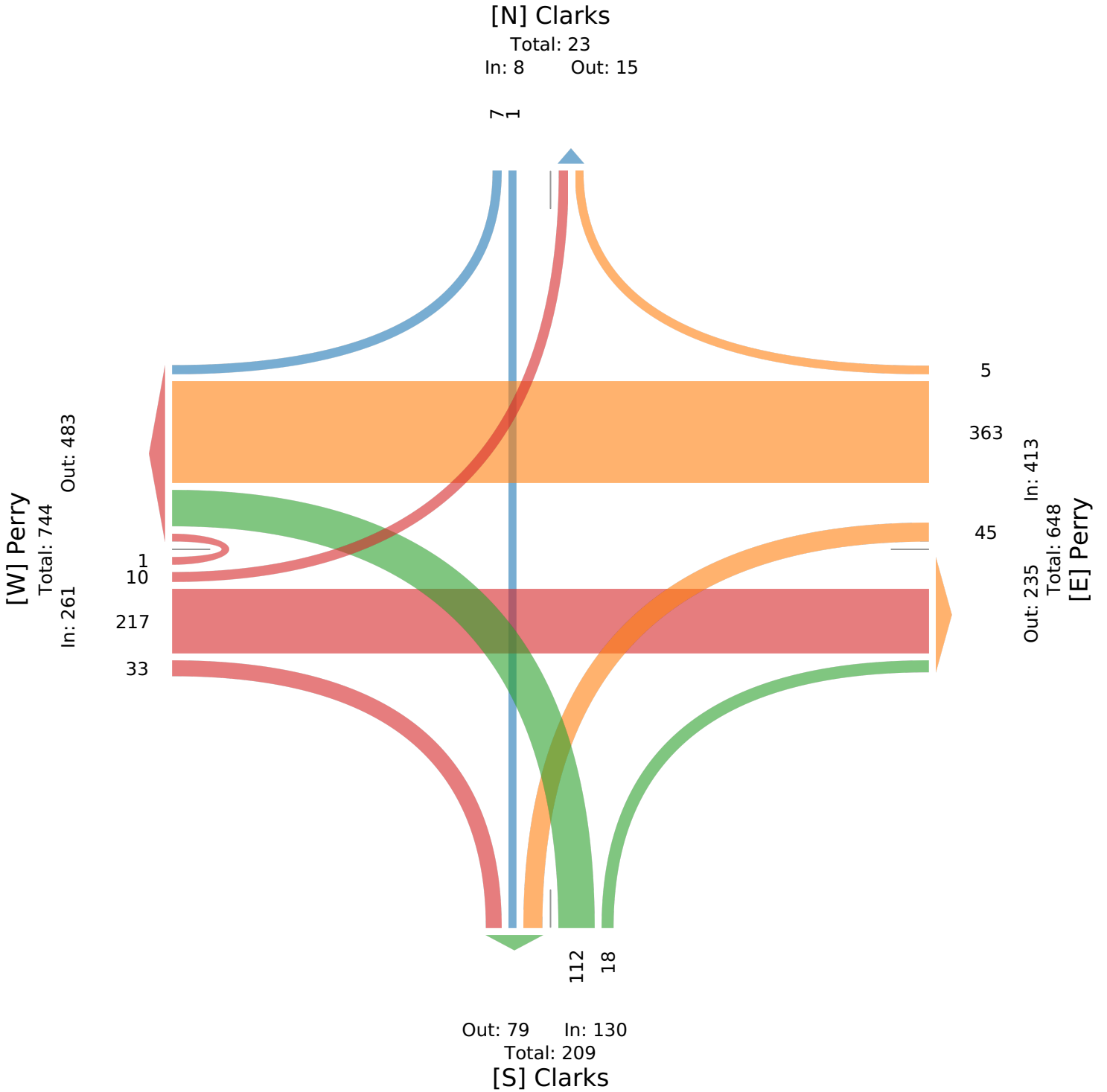
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Bicycles on Road)

All Movements

ID: 1070423, Location: 39.675264, -86.366497



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



INTERSECTION: Perry & Clarks Creek

ENTERED BY: R-I

CONTROLLER

MAIN MENU			CONTROLLER SUBMENU	
1. CONTROLLER	4. NIC/TOD	7. STATUS DISP.	1. TIMING DATA	4. START/FLASH DATA
2. COORDINATOR	5. TELEMETRY	8. UTILITIES	2. OVERLAP DATA	5. OPTION DATA
3. PREEMPTOR	6. DETECTORS	9. OPTIONS	3. RECALL DATA	

TIMING DATA	EBLT	WB	SBLT	NB	WBLT	EB	NBLT	SB
PHASE	1	2	3	4	5	6	7	8
MIN GRN	8	10	8	8	8	10	8	8
WALK		4		4		4		4
PED CLR		7	7	15		12		7
VEH EXT								
MAX EXT								
MAX1	15	25	15	20	15	30	15	20
MAX2	35	35	35	35	35	35	35	35
MAX3								
YELLOW	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
RED CLR	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
RED RVT								
ACT B4								
SEC/ACT								
MAX INI								
TIME B4								
CARS WT								
TTREDUC								
MIN GAP								
CS MGRN								

MAIN MENU			CONTROLLER SUBMENU	
1. CONTROLLER	4. NIC/TOD	7. STATUS DISP.	1. TIMING DATA	4. START/FLASH DATA
2. COORDINATOR	5. TELEMETRY	8. UTILITIES	2. OVERLAP DATA	5. OPTION DATA
3. PREEMPTOR	6. DETECTORS	9. OPTIONS	3. RECALL DATA	

OVERLAP DATA	1	2	3	4	5	6	7	8
OVERLAP A								
STANDARD								
PROTECTED								
PERMISSIVE								
OVERLAP B								
STANDARD								
PROTECTED								
PERMISSIVE								
OVERLAP C								
STANDARD								
PROTECTED								
PERMISSIVE								
OVERLAP D								
STANDARD								
PROTECTED								
PERMISSIVE								

ENABLE TIMED OVERLAPS	1	2	3	4	5	6	7	8
OVERLAP A								
OVERLAP B								
OVERLAP C								
OVERLAP D								

TIMED OVERLAPS	A	B	C	D
OVERLAP A				
OVERLAP B				
OVERLAP C				
OVERLAP D				

DETECTOR TYPE	1	2	3	4	5	6	7	8
EXP DETECTOR	1	2	3	4	5	6	7	8
DETECTOR TYPE								

PHASE ASSIGNMENT	1	2	3	4	5	6	7	8
DETECTOR 1	X							
DETECTOR 2					X			
DETECTOR 3		X						
DETECTOR 4							X	
DETECTOR 5				X				
DETECTOR 6								
DETECTOR 7								
DETECTOR 8								

RECALL DATA	1	2	3	4	5	6	7	8
PHASES IN USE	X	X	X	X	X	X		X
LOCKING MEMORY								
VEHICLE RECALL		X				X		
PED RECALL								
RECALL TO MAX								
SOFT RECALL								

MAIN MENU			CONTROLLER SUBMENU	
1. CONTROLLER	4. NIC/TOD	7. STATUS DISP.	1. TIMING DATA	4. START/FLASH DATA
2. COORDINATOR	5. TELEMETRY	8. UTILITIES	2. OVERLAP DATA	5. OPTION DATA
3. PREEMPTOR	6. DETECTORS	9. OPTIONS	3. RECALL DATA	

START/FLASH DATA	1	2	3	4	5	6	7	8
POWER START		X				X		
EXTERNAL START		X				X		
RMT FLASH PHASES								

INTERVAL	GREEN	YELLOW	RED	YELLOW OVERLAP	POWER START TIMING
POWER START	X				ALL RED
EXTERNAL START	X				FLASH

MAIN MENU			CONTROLLER SUBMENU	
1. CONTROLLER	4. NIC/TOD	7. STATUS DISP.	1. TIMING DATA	4. START/FLASH DATA
2. COORDINATOR	5. TELEMETRY	8. UTILITIES	2. OVERLAP DATA	5. OPTION DATA
3. PREEMPTOR	6. DETECTORS	9. OPTIONS	3. RECALL DATA	

OPTION DATA	1	2	3	4	5	6	7	8
GUAR PASSAGE								
NONACTUATED I								
NONACTUATED II								
DUAL ENTRY								
COND SERVICE								
COND RESERVICE								
ACT REST IN WALK								
FLASHING WALK								

DUAL ENTRY	BACKUP PROTECTION GROUP 1	FIVE SECTION LEFT TURN HEADS
COND SERVICE	BACKUP PROTECTION GROUP 2	LEFT TURN HEADS
PED CLR PROTECT	SIMULTANEOUS GAP GROUP 1	1-6
SPARE	SIMULTANEOUS GAP GROUP 2	3-8
		5-2
		7-4

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 of 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

HCM 6th Signalized Intersection Summary
 1: Clarks Creek Road & Perry Road

Existing Conditions
 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	399	40	19	82	0	98	1	23	4	3	15
Future Volume (veh/h)	5	399	40	19	82	0	98	1	23	4	3	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1589	1589	1589	1826	1826	1826	1900	1900	1900
Adj Flow Rate, veh/h	6	459	46	25	106	0	115	1	27	6	4	22
Peak Hour Factor	0.87	0.87	0.87	0.77	0.77	0.77	0.85	0.85	0.85	0.69	0.69	0.69
Percent Heavy Veh, %	6	6	6	21	21	21	5	5	5	0	0	0
Cap, veh/h	457	721	72	295	792	0	582	19	523	106	30	103
Arrive On Green	0.01	0.23	0.23	0.05	0.26	0.00	0.13	0.35	0.35	0.09	0.09	0.09
Sat Flow, veh/h	1725	3159	315	1513	3098	0	1739	56	1500	184	326	1123
Grp Volume(v), veh/h	6	249	256	25	106	0	115	0	28	32	0	0
Grp Sat Flow(s),veh/h/ln	1725	1721	1754	1513	1509	0	1739	0	1556	1633	0	0
Q Serve(g_s), s	0.1	6.3	6.3	0.6	1.3	0.0	2.5	0.0	0.6	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	6.3	6.3	0.6	1.3	0.0	2.5	0.0	0.6	0.8	0.0	0.0
Prop In Lane	1.00		0.18	1.00		0.00	1.00		0.96	0.19		0.69
Lane Grp Cap(c), veh/h	457	392	400	295	792	0	582	0	542	239	0	0
V/C Ratio(X)	0.01	0.63	0.64	0.08	0.13	0.00	0.20	0.00	0.05	0.13	0.00	0.00
Avail Cap(c_a), veh/h	760	863	880	508	1515	0	681	0	943	560	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.8	16.7	16.7	13.2	13.5	0.0	13.8	0.0	10.3	20.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.7	1.7	0.1	0.1	0.0	0.2	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.3	2.3	0.2	0.4	0.0	0.9	0.0	0.2	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.8	18.4	18.4	13.3	13.6	0.0	14.0	0.0	10.4	20.4	0.0	0.0
LnGrp LOS	B	B	B	B	B	A	B	A	B	C	A	A
Approach Vol, veh/h		511			131			143				32
Approach Delay, s/veh		18.3			13.5			13.3				20.4
Approach LOS		B			B			B				C
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	8.3	16.9	12.3	10.4	6.6	18.6		22.7				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	24.0	9.0	14.0	9.0	24.0		29.0				
Max Q Clear Time (g_c+I1), s	2.6	8.3	4.5	2.8	2.1	3.3		2.6				
Green Ext Time (p_c), s	0.0	2.6	0.1	0.1	0.0	0.5		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				16.8								
HCM 6th LOS				B								

HCM 6th TWSC
2: Clarks Creek Road & Manchester Drive

Existing Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	6.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	47	10	0	0	3	25	0	33	0	19	12	12
Future Vol, veh/h	47	10	0	0	3	25	0	33	0	19	12	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	62	62	62	78	78	78	75	75	75	72	72	72
Heavy Vehicles, %	16	16	16	4	4	4	6	6	6	2	2	2
Mvmt Flow	76	16	0	0	4	32	0	44	0	26	17	17

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	140	122	26	130	130	44	34	0	0	44	0	0
Stage 1	78	78	-	44	44	-	-	-	-	-	-	-
Stage 2	62	44	-	86	86	-	-	-	-	-	-	-
Critical Hdwy	7.26	6.66	6.36	7.14	6.54	6.24	4.16	-	-	4.12	-	-
Critical Hdwy Stg 1	6.26	5.66	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.26	5.66	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.644	4.144	3.444	3.536	4.036	3.336	2.254	-	-	2.218	-	-
Pot Cap-1 Maneuver	799	743	1011	838	757	1020	1552	-	-	1564	-	-
Stage 1	897	803	-	965	854	-	-	-	-	-	-	-
Stage 2	915	831	-	917	820	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	761	730	1011	813	744	1020	1552	-	-	1564	-	-
Mov Cap-2 Maneuver	761	730	-	813	744	-	-	-	-	-	-	-
Stage 1	897	789	-	965	854	-	-	-	-	-	-	-
Stage 2	882	831	-	883	806	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.4	8.8	0	3.2
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1552	-	-	755	981	1564	-	-
HCM Lane V/C Ratio	-	-	-	0.122	0.037	0.017	-	-
HCM Control Delay (s)	0	-	-	10.4	8.8	7.3	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.1	0.1	-	-

HCM 6th TWSC
 3: Cambridge Way & Manchester Drive

Existing Conditions
 AM Peak Hour

Intersection						
Int Delay, s/veh	3.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	14	9	13	39	34
Future Vol, veh/h	1	14	9	13	39	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	61	61	60	60
Heavy Vehicles, %	0	0	18	18	19	19
Mvmt Flow	2	23	15	21	65	57




















Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	213	18	0	0	36
Stage 1	26	-	-	-	-
Stage 2	187	-	-	-	-
Critical Hdwy	6.6	6.9	-	-	4.385
Critical Hdwy Stg 1	5.8	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.3805
Pot Cap-1 Maneuver	771	1063	-	-	1465
Stage 1	999	-	-	-	-
Stage 2	850	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	737	1063	-	-	1465
Mov Cap-2 Maneuver	737	-	-	-	-
Stage 1	999	-	-	-	-
Stage 2	813	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.6	0	4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1033	1465
HCM Lane V/C Ratio	-	-	0.024	0.044
HCM Control Delay (s)	-	-	8.6	7.6
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1

HCM 6th Signalized Intersection Summary
1: Clarks Creek Road & Perry Road

Background Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	415	42	20	85	0	102	1	24	4	3	16
Future Volume (veh/h)	5	415	42	20	85	0	102	1	24	4	3	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1589	1589	1589	1826	1826	1826	1900	1900	1900
Adj Flow Rate, veh/h	6	477	48	26	110	0	120	1	28	6	4	23
Peak Hour Factor	0.87	0.87	0.87	0.77	0.77	0.77	0.85	0.85	0.85	0.69	0.69	0.69
Percent Heavy Veh, %	6	6	6	21	21	21	5	5	5	0	0	0
Cap, veh/h	460	737	74	293	813	0	582	19	523	104	30	106
Arrive On Green	0.01	0.23	0.23	0.05	0.27	0.00	0.13	0.35	0.35	0.09	0.09	0.09
Sat Flow, veh/h	1725	3158	317	1513	3098	0	1739	54	1502	175	320	1138
Grp Volume(v), veh/h	6	259	266	26	110	0	120	0	29	33	0	0
Grp Sat Flow(s),veh/h/ln	1725	1721	1754	1513	1509	0	1739	0	1556	1633	0	0
Q Serve(g_s), s	0.1	6.6	6.7	0.6	1.3	0.0	2.6	0.0	0.6	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	6.6	6.7	0.6	1.3	0.0	2.6	0.0	0.6	0.9	0.0	0.0
Prop In Lane	1.00		0.18	1.00		0.00	1.00		0.97	0.18		0.70
Lane Grp Cap(c), veh/h	460	402	409	293	813	0	582	0	542	240	0	0
V/C Ratio(X)	0.01	0.65	0.65	0.09	0.14	0.00	0.21	0.00	0.05	0.14	0.00	0.00
Avail Cap(c_a), veh/h	757	848	864	499	1487	0	674	0	926	550	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.9	16.8	16.9	13.2	13.5	0.0	14.1	0.0	10.5	20.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.7	1.7	0.1	0.1	0.0	0.2	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.4	2.5	0.2	0.4	0.0	0.9	0.0	0.2	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.9	18.6	18.6	13.4	13.6	0.0	14.3	0.0	10.6	20.7	0.0	0.0
LnGrp LOS	B	B	B	B	B	A	B	A	B	C	A	A
Approach Vol, veh/h		531			136			149				33
Approach Delay, s/veh		18.5			13.5			13.5				20.7
Approach LOS		B			B			B				C
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	8.4	17.4	12.4	10.5	6.6	19.1		23.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	24.0	9.0	14.0	9.0	24.0		29.0				
Max Q Clear Time (g_c+I1), s	2.6	8.7	4.6	2.9	2.1	3.3		2.6				
Green Ext Time (p_c), s	0.0	2.7	0.1	0.1	0.0	0.5		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				16.9								
HCM 6th LOS				B								

HCM 6th TWSC
2: Clarks Creek Road & Manchester Drive

Background Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	6.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	49	10	0	0	3	26	0	34	0	20	12	13
Future Vol, veh/h	49	10	0	0	3	26	0	34	0	20	12	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	62	62	62	78	78	78	75	75	75	72	72	72
Heavy Vehicles, %	16	16	16	4	4	4	6	6	6	2	2	2
Mvmt Flow	79	16	0	0	4	33	0	45	0	28	17	18

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	146	127	26	135	136	45	35	0	0	45	0	0
Stage 1	82	82	-	45	45	-	-	-	-	-	-	-
Stage 2	64	45	-	90	91	-	-	-	-	-	-	-
Critical Hdwy	7.26	6.66	6.36	7.14	6.54	6.24	4.16	-	-	4.12	-	-
Critical Hdwy Stg 1	6.26	5.66	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.26	5.66	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.644	4.144	3.444	3.536	4.036	3.336	2.254	-	-	2.218	-	-
Pot Cap-1 Maneuver	792	738	1011	832	751	1019	1551	-	-	1563	-	-
Stage 1	893	800	-	964	853	-	-	-	-	-	-	-
Stage 2	913	831	-	912	816	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	752	725	1011	807	737	1019	1551	-	-	1563	-	-
Mov Cap-2 Maneuver	752	725	-	807	737	-	-	-	-	-	-	-
Stage 1	893	786	-	964	853	-	-	-	-	-	-	-
Stage 2	879	831	-	877	801	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.5	8.8	0	3.3
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1551	-	-	747	980	1563	-
HCM Lane V/C Ratio	-	-	-	0.127	0.038	0.018	-
HCM Control Delay (s)	0	-	-	10.5	8.8	7.3	0
HCM Lane LOS	A	-	-	B	A	A	A
HCM 95th %tile Q(veh)	0	-	-	0.4	0.1	0.1	-

HCM 6th TWSC
3: Cambridge Way & Manchester Drive

Background Conditions
AM Peak Hour

Intersection						
Int Delay, s/veh	3.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↕↔		↕	↕
Traffic Vol, veh/h	1	15	9	14	41	35
Future Vol, veh/h	1	15	9	14	41	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	61	61	60	60
Heavy Vehicles, %	0	0	18	18	19	19
Mvmt Flow	2	25	15	23	68	58





















Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	221	19	0	0	38
Stage 1	27	-	-	-	-
Stage 2	194	-	-	-	-
Critical Hdwy	6.6	6.9	-	-	4.385
Critical Hdwy Stg 1	5.8	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.3805
Pot Cap-1 Maneuver	762	1061	-	-	1462
Stage 1	998	-	-	-	-
Stage 2	844	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	726	1061	-	-	1462
Mov Cap-2 Maneuver	726	-	-	-	-
Stage 1	998	-	-	-	-
Stage 2	804	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.6	0	4.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1031	1462
HCM Lane V/C Ratio	-	-	0.026	0.047
HCM Control Delay (s)	-	-	8.6	7.6
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1

HCM 6th Signalized Intersection Summary
1: Clarks Creek Road & Perry Road

Background Conditions
MD Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	299	23	52	247	4	154	2	46	2	1	8
Future Volume (veh/h)	7	299	23	52	247	4	154	2	46	2	1	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1781	1781	1737	1737	1737	1811	1811	1811	1900	1900	1900
Adj Flow Rate, veh/h	8	344	26	68	321	5	192	2	58	3	1	12
Peak Hour Factor	0.87	0.87	0.87	0.77	0.77	0.77	0.80	0.80	0.80	0.69	0.69	0.69
Percent Heavy Veh, %	8	8	8	11	11	11	6	6	6	0	0	0
Cap, veh/h	361	616	46	388	907	14	598	19	542	97	27	125
Arrive On Green	0.02	0.19	0.19	0.10	0.27	0.27	0.14	0.36	0.36	0.10	0.10	0.10
Sat Flow, veh/h	1697	3191	240	1654	3326	52	1725	51	1491	144	262	1218
Grp Volume(v), veh/h	8	182	188	68	159	167	192	0	60	16	0	0
Grp Sat Flow(s),veh/h/ln	1697	1692	1738	1654	1650	1728	1725	0	1543	1624	0	0
Q Serve(g_s), s	0.2	5.0	5.1	1.6	4.0	4.0	4.6	0.0	1.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	5.0	5.1	1.6	4.0	4.0	4.6	0.0	1.3	0.4	0.0	0.0
Prop In Lane	1.00		0.14	1.00		0.03	1.00		0.97	0.19		0.75
Lane Grp Cap(c), veh/h	361	327	336	388	450	471	598	0	560	249	0	0
V/C Ratio(X)	0.02	0.56	0.56	0.18	0.35	0.35	0.32	0.00	0.11	0.06	0.00	0.00
Avail Cap(c_a), veh/h	627	784	805	516	764	800	648	0	864	513	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.3	18.9	18.9	13.8	15.2	15.2	14.9	0.0	10.9	21.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.5	1.5	0.2	0.5	0.5	0.3	0.0	0.1	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.9	1.9	0.5	1.4	1.4	1.6	0.0	0.4	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.3	20.4	20.4	14.0	15.6	15.6	15.2	0.0	11.0	21.2	0.0	0.0
LnGrp LOS	B	C	C	B	B	B	B	A	B	C	A	A
Approach Vol, veh/h		378			394			252				16
Approach Delay, s/veh		20.3			15.4			14.2				21.2
Approach LOS		C			B			B				C
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	11.0	16.0	13.5	11.3	6.9	20.1		24.8				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	24.0	9.0	14.0	9.0	24.0		29.0				
Max Q Clear Time (g_c+I1), s	3.6	7.1	6.6	2.4	2.2	6.0		3.3				
Green Ext Time (p_c), s	0.0	1.9	0.1	0.0	0.0	1.6		0.3				
Intersection Summary												
HCM 6th Ctrl Delay				17.0								
HCM 6th LOS				B								

HCM 6th TWSC
2: Clarks Creek Road & Manchester Drive

Background Conditions
MD Peak Hour

Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	83	3	1	1	7	22	0	43	3	8	24	35
Future Vol, veh/h	83	3	1	1	7	22	0	43	3	8	24	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	66	66	66	73	73	73	65	65	65
Heavy Vehicles, %	11	11	11	3	3	3	2	2	2	3	3	3
Mvmt Flow	102	4	1	2	11	33	0	59	4	12	37	54

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	171	151	64	152	176	61	91	0	0	63	0	0
Stage 1	88	88	-	61	61	-	-	-	-	-	-	-
Stage 2	83	63	-	91	115	-	-	-	-	-	-	-
Critical Hdwy	7.21	6.61	6.31	7.13	6.53	6.23	4.12	-	-	4.13	-	-
Critical Hdwy Stg 1	6.21	5.61	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.21	5.61	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.599	4.099	3.399	3.527	4.027	3.327	2.218	-	-	2.227	-	-
Pot Cap-1 Maneuver	773	724	976	813	716	1001	1504	-	-	1533	-	-
Stage 1	898	805	-	948	842	-	-	-	-	-	-	-
Stage 2	903	825	-	914	798	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	734	718	976	804	710	1001	1504	-	-	1533	-	-
Mov Cap-2 Maneuver	734	718	-	804	710	-	-	-	-	-	-	-
Stage 1	898	799	-	948	842	-	-	-	-	-	-	-
Stage 2	862	825	-	901	792	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.7		9.2		0		0.9	
HCM LOS	B		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1504	-	-	736	907	1533	-	-
HCM Lane V/C Ratio	-	-	-	0.146	0.05	0.008	-	-
HCM Control Delay (s)	0	-	-	10.7	9.2	7.4	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0.2	0	-	-

HCM 6th TWSC
 3: Cambridge Way & Manchester Drive

Background Conditions
 MD Peak Hour

Intersection						
Int Delay, s/veh	2.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↕		↔	↕
Traffic Vol, veh/h	10	28	74	45	29	103
Future Vol, veh/h	10	28	74	45	29	103
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	62	62	82	82	80	80
Heavy Vehicles, %	3	3	4	4	6	6
Mvmt Flow	16	45	90	55	36	129




















Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	319	73	0	0	145
Stage 1	118	-	-	-	-
Stage 2	201	-	-	-	-
Critical Hdwy	6.645	6.945	-	-	4.19
Critical Hdwy Stg 1	5.845	-	-	-	-
Critical Hdwy Stg 2	5.445	-	-	-	-
Follow-up Hdwy	3.5285	3.3285	-	-	2.257
Pot Cap-1 Maneuver	659	972	-	-	1410
Stage 1	892	-	-	-	-
Stage 2	829	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	642	972	-	-	1410
Mov Cap-2 Maneuver	642	-	-	-	-
Stage 1	892	-	-	-	-
Stage 2	807	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	1.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	856	1410
HCM Lane V/C Ratio	-	-	0.072	0.026
HCM Control Delay (s)	-	-	9.5	7.6
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1

HCM 6th Signalized Intersection Summary
1: Clarks Creek Road & Perry Road

Background Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	226	34	47	378	5	117	0	19	0	1	7
Future Volume (veh/h)	10	226	34	47	378	5	117	0	19	0	1	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1781	1781	1856	1856	1856	1870	1870	1870	1900	1900	1900
Adj Flow Rate, veh/h	11	257	39	55	440	6	152	0	25	0	2	12
Peak Hour Factor	0.88	0.88	0.88	0.86	0.86	0.86	0.77	0.77	0.77	0.60	0.60	0.60
Percent Heavy Veh, %	8	8	8	3	3	3	2	2	2	0	0	0
Cap, veh/h	338	610	91	441	962	13	488	0	531	0	16	95
Arrive On Green	0.02	0.21	0.21	0.09	0.27	0.27	0.14	0.00	0.34	0.00	0.07	0.07
Sat Flow, veh/h	1697	2952	442	1767	3561	49	1781	0	1585	0	235	1411
Grp Volume(v), veh/h	11	146	150	55	218	228	152	0	25	0	0	14
Grp Sat Flow(s),veh/h/ln	1697	1692	1702	1767	1763	1847	1781	0	1585	0	0	1646
Q Serve(g_s), s	0.2	3.6	3.7	1.1	5.0	5.0	3.4	0.0	0.5	0.0	0.0	0.4
Cycle Q Clear(g_c), s	0.2	3.6	3.7	1.1	5.0	5.0	3.4	0.0	0.5	0.0	0.0	0.4
Prop In Lane	1.00		0.26	1.00		0.03	1.00		1.00	0.00		0.86
Lane Grp Cap(c), veh/h	338	350	352	441	476	499	488	0	531	0	0	111
V/C Ratio(X)	0.03	0.42	0.43	0.12	0.46	0.46	0.31	0.00	0.05	0.00	0.00	0.13
Avail Cap(c_a), veh/h	615	839	844	617	874	916	563	0	950	0	0	476
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	14.5	16.7	16.7	12.6	14.7	14.7	14.8	0.0	10.9	0.0	0.0	21.2
Incr Delay (d2), s/veh	0.0	0.8	0.8	0.1	0.7	0.7	0.4	0.0	0.0	0.0	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.3	1.3	0.4	1.8	1.8	1.2	0.0	0.2	0.0	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.5	17.5	17.5	12.8	15.4	15.4	15.2	0.0	10.9	0.0	0.0	21.7
LnGrp LOS	B	B	B	B	B	B	B	A	B	A	A	C
Approach Vol, veh/h		307			501			177				14
Approach Delay, s/veh		17.4			15.1			14.6				21.7
Approach LOS		B			B			B				C
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	10.2	16.0	13.0	9.3	7.1	19.1		22.2				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	24.0	9.0	14.0	9.0	24.0		29.0				
Max Q Clear Time (g_c+I1), s	3.1	5.7	5.4	2.4	2.2	7.0		2.5				
Green Ext Time (p_c), s	0.0	1.5	0.1	0.0	0.0	2.3		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				15.8								
HCM 6th LOS				B								

HCM 6th TWSC
2: Clarks Creek Road & Manchester Drive

Background Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	5.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	65	2	0	0	1	18	0	31	0	11	15	43
Future Vol, veh/h	65	2	0	0	1	18	0	31	0	11	15	43
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	67	67	67	64	64	64	83	83	83	72	72	72
Heavy Vehicles, %	6	6	6	0	0	0	0	0	0	2	2	2
Mvmt Flow	97	3	0	0	2	28	0	37	0	15	21	60

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	133	118	51	120	148	37	81	0	0	37	0	0
Stage 1	81	81	-	37	37	-	-	-	-	-	-	-
Stage 2	52	37	-	83	111	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.56	6.26	7.1	6.5	6.2	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.16	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	3.354	3.5	4	3.3	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	830	765	1006	860	747	1041	1529	-	-	1574	-	-
Stage 1	918	820	-	984	868	-	-	-	-	-	-	-
Stage 2	951	856	-	930	807	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	800	757	1006	851	740	1041	1529	-	-	1574	-	-
Mov Cap-2 Maneuver	800	757	-	851	740	-	-	-	-	-	-	-
Stage 1	918	812	-	984	868	-	-	-	-	-	-	-
Stage 2	924	856	-	917	799	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.1		8.6		0		1.2	
HCM LOS	B		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1529	-	-	799	1019	1574	-	-
HCM Lane V/C Ratio	-	-	-	0.125	0.029	0.01	-	-
HCM Control Delay (s)	0	-	-	10.1	8.6	7.3	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.1	0	-	-

HCM 6th TWSC
 3: Cambridge Way & Manchester Drive

Background Conditions
 PM Peak Hour

Intersection						
Int Delay, s/veh	2.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↓		Y	↑
Traffic Vol, veh/h	21	21	36	32	38	127
Future Vol, veh/h	21	21	36	32	38	127
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	71	71	87	87	87	87
Heavy Vehicles, %	3	3	0	0	3	3
Mvmt Flow	30	30	41	37	44	146

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	294	39	0	0	78
Stage 1	60	-	-	-	-
Stage 2	234	-	-	-	-
Critical Hdwy	6.645	6.945	-	-	4.145
Critical Hdwy Stg 1	5.845	-	-	-	-
Critical Hdwy Stg 2	5.445	-	-	-	-
Follow-up Hdwy	3.5285	3.3285	-	-	2.2285
Pot Cap-1 Maneuver	683	1021	-	-	1513
Stage 1	953	-	-	-	-
Stage 2	801	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	663	1021	-	-	1513
Mov Cap-2 Maneuver	663	-	-	-	-
Stage 1	953	-	-	-	-
Stage 2	778	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	1.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	804	1513
HCM Lane V/C Ratio	-	-	0.074	0.029
HCM Control Delay (s)	-	-	9.8	7.5
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1

HCM 6th Signalized Intersection Summary
 1: Clarks Creek Road & Perry Road

Existing Conditions
 MD Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	287	22	50	237	4	148	2	44	2	1	8
Future Volume (veh/h)	7	287	22	50	237	4	148	2	44	2	1	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1781	1781	1737	1737	1737	1811	1811	1811	1900	1900	1900
Adj Flow Rate, veh/h	8	330	25	65	308	5	185	2	55	3	1	12
Peak Hour Factor	0.87	0.87	0.87	0.77	0.77	0.77	0.80	0.80	0.80	0.69	0.69	0.69
Percent Heavy Veh, %	8	8	8	11	11	11	6	6	6	0	0	0
Cap, veh/h	366	620	47	392	903	15	596	20	539	98	26	123
Arrive On Green	0.02	0.19	0.19	0.09	0.27	0.27	0.14	0.36	0.36	0.10	0.10	0.10
Sat Flow, veh/h	1697	3190	240	1654	3324	54	1725	54	1489	147	259	1218
Grp Volume(v), veh/h	8	174	181	65	153	160	185	0	57	16	0	0
Grp Sat Flow(s),veh/h/ln	1697	1692	1738	1654	1650	1727	1725	0	1543	1624	0	0
Q Serve(g_s), s	0.2	4.8	4.8	1.5	3.8	3.8	4.4	0.0	1.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	4.8	4.8	1.5	3.8	3.8	4.4	0.0	1.3	0.4	0.0	0.0
Prop In Lane	1.00		0.14	1.00		0.03	1.00		0.96	0.19		0.75
Lane Grp Cap(c), veh/h	366	329	338	392	448	469	596	0	558	247	0	0
V/C Ratio(X)	0.02	0.53	0.54	0.17	0.34	0.34	0.31	0.00	0.10	0.06	0.00	0.00
Avail Cap(c_a), veh/h	634	789	811	525	770	806	648	0	870	516	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.1	18.6	18.6	13.8	15.0	15.0	14.8	0.0	10.9	21.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.3	1.3	0.2	0.4	0.4	0.3	0.0	0.1	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.8	1.8	0.5	1.3	1.3	1.6	0.0	0.4	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.1	19.9	20.0	14.0	15.5	15.5	15.1	0.0	11.0	21.1	0.0	0.0
LnGrp LOS	B	B	B	B	B	B	B	A	B	C	A	A
Approach Vol, veh/h		363			378			242				16
Approach Delay, s/veh		19.9			15.2			14.1				21.1
Approach LOS		B			B			B				C
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	10.8	16.0	13.4	11.2	6.9	20.0		24.6				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	24.0	9.0	14.0	9.0	24.0		29.0				
Max Q Clear Time (g_c+I1), s	3.5	6.8	6.4	2.4	2.2	5.8		3.3				
Green Ext Time (p_c), s	0.0	1.8	0.1	0.0	0.0	1.6		0.3				
Intersection Summary												
HCM 6th Ctrl Delay				16.7								
HCM 6th LOS				B								

HCM 6th TWSC
2: Clarks Creek Road & Manchester Drive

Existing Conditions
MD Peak Hour

Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	80	3	1	1	7	21	0	41	3	8	23	34
Future Vol, veh/h	80	3	1	1	7	21	0	41	3	8	23	34
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	66	66	66	73	73	73	65	65	65
Heavy Vehicles, %	11	11	11	3	3	3	2	2	2	3	3	3
Mvmt Flow	99	4	1	2	11	32	0	56	4	12	35	52

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	165	145	61	146	169	58	87	0	0	60	0	0
Stage 1	85	85	-	58	58	-	-	-	-	-	-	-
Stage 2	80	60	-	88	111	-	-	-	-	-	-	-
Critical Hdwy	7.21	6.61	6.31	7.13	6.53	6.23	4.12	-	-	4.13	-	-
Critical Hdwy Stg 1	6.21	5.61	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.21	5.61	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.599	4.099	3.399	3.527	4.027	3.327	2.218	-	-	2.227	-	-
Pot Cap-1 Maneuver	780	730	979	820	722	1005	1509	-	-	1537	-	-
Stage 1	901	807	-	951	845	-	-	-	-	-	-	-
Stage 2	907	828	-	917	802	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	743	724	979	811	716	1005	1509	-	-	1537	-	-
Mov Cap-2 Maneuver	743	724	-	811	716	-	-	-	-	-	-	-
Stage 1	901	801	-	951	845	-	-	-	-	-	-	-
Stage 2	867	828	-	904	796	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.6		9.2		0		0.9	
HCM LOS	B		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1509	-	-	744	909	1537	-	-
HCM Lane V/C Ratio	-	-	-	0.139	0.048	0.008	-	-
HCM Control Delay (s)	0	-	-	10.6	9.2	7.4	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0.2	0	-	-

HCM 6th TWSC
3: Cambridge Way & Manchester Drive

Existing Conditions
MD Peak Hour

Intersection						
Int Delay, s/veh	2.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↕		↔	↕
Traffic Vol, veh/h	10	27	71	43	28	99
Future Vol, veh/h	10	27	71	43	28	99
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	62	62	82	82	80	80
Heavy Vehicles, %	3	3	4	4	6	6
Mvmt Flow	16	44	87	52	35	124





















Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	307	70	0	0	139
Stage 1	113	-	-	-	-
Stage 2	194	-	-	-	-
Critical Hdwy	6.645	6.945	-	-	4.19
Critical Hdwy Stg 1	5.845	-	-	-	-
Critical Hdwy Stg 2	5.445	-	-	-	-
Follow-up Hdwy	3.5285	3.3285	-	-	2.257
Pot Cap-1 Maneuver	670	976	-	-	1417
Stage 1	897	-	-	-	-
Stage 2	835	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	653	976	-	-	1417
Mov Cap-2 Maneuver	653	-	-	-	-
Stage 1	897	-	-	-	-
Stage 2	814	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	1.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	861	1417
HCM Lane V/C Ratio	-	-	0.069	0.025
HCM Control Delay (s)	-	-	9.5	7.6
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1

HCM 6th Signalized Intersection Summary
 1: Clarks Creek Road & Perry Road

Existing Conditions
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	217	33	45	363	5	112	0	18	0	1	7
Future Volume (veh/h)	10	217	33	45	363	5	112	0	18	0	1	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1781	1781	1856	1856	1856	1870	1870	1870	1900	1900	1900
Adj Flow Rate, veh/h	11	247	38	52	422	6	145	0	23	0	2	12
Peak Hour Factor	0.88	0.88	0.88	0.86	0.86	0.86	0.77	0.77	0.77	0.60	0.60	0.60
Percent Heavy Veh, %	8	8	8	3	3	3	2	2	2	0	0	0
Cap, veh/h	345	614	93	444	958	14	484	0	527	0	15	92
Arrive On Green	0.02	0.21	0.21	0.08	0.27	0.27	0.14	0.00	0.33	0.00	0.06	0.06
Sat Flow, veh/h	1697	2946	447	1767	3559	51	1781	0	1585	0	235	1411
Grp Volume(v), veh/h	11	141	144	52	209	219	145	0	23	0	0	14
Grp Sat Flow(s),veh/h/ln	1697	1692	1701	1767	1763	1846	1781	0	1585	0	0	1646
Q Serve(g_s), s	0.2	3.4	3.5	1.0	4.7	4.7	3.2	0.0	0.5	0.0	0.0	0.4
Cycle Q Clear(g_c), s	0.2	3.4	3.5	1.0	4.7	4.7	3.2	0.0	0.5	0.0	0.0	0.4
Prop In Lane	1.00		0.26	1.00		0.03	1.00		1.00	0.00		0.86
Lane Grp Cap(c), veh/h	345	353	355	444	475	497	484	0	527	0	0	107
V/C Ratio(X)	0.03	0.40	0.41	0.12	0.44	0.44	0.30	0.00	0.04	0.00	0.00	0.13
Avail Cap(c_a), veh/h	625	847	851	628	882	924	564	0	959	0	0	481
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	14.3	16.4	16.4	12.5	14.5	14.5	14.8	0.0	10.8	0.0	0.0	21.1
Incr Delay (d2), s/veh	0.0	0.7	0.8	0.1	0.6	0.6	0.3	0.0	0.0	0.0	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.2	1.2	0.4	1.7	1.7	1.2	0.0	0.1	0.0	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.3	17.1	17.2	12.6	15.2	15.1	15.1	0.0	10.9	0.0	0.0	21.7
LnGrp LOS	B	B	B	B	B	B	B	A	B	A	A	C
Approach Vol, veh/h		296			480			168				14
Approach Delay, s/veh		17.0			14.9			14.5				21.7
Approach LOS		B			B			B				C
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	16.0	12.8	9.1	7.1	18.9		22.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	24.0	9.0	14.0	9.0	24.0		29.0				
Max Q Clear Time (g_c+I1), s	3.0	5.5	5.2	2.4	2.2	6.7		2.5				
Green Ext Time (p_c), s	0.0	1.4	0.1	0.0	0.0	2.2		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				15.6								
HCM 6th LOS				B								

HCM 6th TWSC
2: Clarks Creek Road & Manchester Drive

Existing Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	62	2	0	0	1	17	0	30	0	11	14	41
Future Vol, veh/h	62	2	0	0	1	17	0	30	0	11	14	41
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	67	67	67	64	64	64	83	83	83	72	72	72
Heavy Vehicles, %	6	6	6	0	0	0	0	0	0	2	2	2
Mvmt Flow	93	3	0	0	2	27	0	36	0	15	19	57

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	129	114	48	115	142	36	76	0	0	36	0	0
Stage 1	78	78	-	36	36	-	-	-	-	-	-	-
Stage 2	51	36	-	79	106	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.56	6.26	7.1	6.5	6.2	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.16	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	3.354	3.5	4	3.3	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	835	769	1010	867	753	1042	1536	-	-	1575	-	-
Stage 1	921	822	-	985	869	-	-	-	-	-	-	-
Stage 2	952	857	-	935	811	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	807	761	1010	857	745	1042	1536	-	-	1575	-	-
Mov Cap-2 Maneuver	807	761	-	857	745	-	-	-	-	-	-	-
Stage 1	921	814	-	985	869	-	-	-	-	-	-	-
Stage 2	926	857	-	922	803	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.1		8.6		0		1.2	
HCM LOS	B		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1536	-	-	805	1019	1575	-	-
HCM Lane V/C Ratio	-	-	-	0.119	0.028	0.01	-	-
HCM Control Delay (s)	0	-	-	10.1	8.6	7.3	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.1	0	-	-

HCM 6th TWSC
 3: Cambridge Way & Manchester Drive

Existing Conditions
 PM Peak Hour

Intersection						
Int Delay, s/veh	2.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↑		↑	↑
Traffic Vol, veh/h	20	20	35	31	37	122
Future Vol, veh/h	20	20	35	31	37	122
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	71	71	87	87	87	87
Heavy Vehicles, %	3	3	0	0	3	3
Mvmt Flow	28	28	40	36	43	140























Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	284	38	0	0	76
Stage 1	58	-	-	-	-
Stage 2	226	-	-	-	-
Critical Hdwy	6.645	6.945	-	-	4.145
Critical Hdwy Stg 1	5.845	-	-	-	-
Critical Hdwy Stg 2	5.445	-	-	-	-
Follow-up Hdwy	3.5285	3.3285	-	-	2.2285
Pot Cap-1 Maneuver	692	1023	-	-	1515
Stage 1	955	-	-	-	-
Stage 2	808	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	673	1023	-	-	1515
Mov Cap-2 Maneuver	673	-	-	-	-
Stage 1	955	-	-	-	-
Stage 2	785	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	1.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	812	1515
HCM Lane V/C Ratio	-	-	0.069	0.028
HCM Control Delay (s)	-	-	9.8	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1

HCM 6th Signalized Intersection Summary
1: Clarks Creek Road & Perry Road

Future Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (veh/h)	5	415	42	28	80	0	132	1	49	4	3	16
Future Volume (veh/h)	5	415	42	28	80	0	132	1	49	4	3	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1589	1589	1589	1826	1826	1826	1900	1900	1900
Adj Flow Rate, veh/h	6	477	48	36	104	0	155	1	58	6	4	23
Peak Hour Factor	0.87	0.87	0.87	0.77	0.77	0.77	0.85	0.85	0.85	0.69	0.69	0.69
Percent Heavy Veh, %	6	6	6	21	21	21	5	5	5	0	0	0
Cap, veh/h	444	718	72	299	836	0	603	10	557	98	39	129
Arrive On Green	0.01	0.23	0.23	0.06	0.28	0.00	0.14	0.37	0.37	0.11	0.11	0.11
Sat Flow, veh/h	1725	3158	317	1513	3098	0	1739	26	1525	147	349	1141
Grp Volume(v), veh/h	6	259	266	36	104	0	155	0	59	33	0	0
Grp Sat Flow(s),veh/h/ln	1725	1721	1754	1513	1509	0	1739	0	1551	1637	0	0
Q Serve(g_s), s	0.1	7.1	7.2	0.9	1.3	0.0	3.6	0.0	1.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	7.1	7.2	0.9	1.3	0.0	3.6	0.0	1.3	0.9	0.0	0.0
Prop In Lane	1.00		0.18	1.00		0.00	1.00		0.98	0.18		0.70
Lane Grp Cap(c), veh/h	444	391	399	299	836	0	603	0	566	266	0	0
V/C Ratio(X)	0.01	0.66	0.67	0.12	0.12	0.00	0.26	0.00	0.10	0.12	0.00	0.00
Avail Cap(c_a), veh/h	720	792	807	466	1389	0	664	0	863	513	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.1	18.3	18.3	14.0	14.1	0.0	14.5	0.0	10.9	20.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.9	1.9	0.2	0.1	0.0	0.2	0.0	0.1	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.7	2.7	0.3	0.4	0.0	1.3	0.0	0.4	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.1	20.3	20.3	14.2	14.2	0.0	14.7	0.0	11.0	21.1	0.0	0.0
LnGrp LOS	B	C	C	B	B	A	B	A	B	C	A	A
Approach Vol, veh/h		531			140			214				33
Approach Delay, s/veh		20.2			14.2			13.7				21.1
Approach LOS		C			B			B				C
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	17.9	13.2	11.9	6.7	20.4		25.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	24.0	9.0	14.0	9.0	24.0		29.0				
Max Q Clear Time (g_c+I1), s	2.9	9.2	5.6	2.9	2.1	3.3		3.3				
Green Ext Time (p_c), s	0.0	2.7	0.1	0.1	0.0	0.5		0.3				
Intersection Summary												
HCM 6th Ctrl Delay				17.8								
HCM 6th LOS				B								

HCM 6th TWSC
2: Clarks Creek Road & Manchester Drive

Future Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	7.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	104	10	0	0	3	26	0	34	0	20	12	21
Future Vol, veh/h	104	10	0	0	3	26	0	34	0	20	12	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	62	62	62	78	78	78	75	75	75	72	72	72
Heavy Vehicles, %	16	16	16	4	4	4	6	6	6	2	2	2
Mvmt Flow	168	16	0	0	4	33	0	45	0	28	17	29

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	152	133	32	141	147	45	46	0	0	45	0	0
Stage 1	88	88	-	45	45	-	-	-	-	-	-	-
Stage 2	64	45	-	96	102	-	-	-	-	-	-	-
Critical Hdwy	7.26	6.66	6.36	7.14	6.54	6.24	4.16	-	-	4.12	-	-
Critical Hdwy Stg 1	6.26	5.66	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.26	5.66	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.644	4.144	3.444	3.536	4.036	3.336	2.254	-	-	2.218	-	-
Pot Cap-1 Maneuver	784	733	1003	824	741	1019	1536	-	-	1563	-	-
Stage 1	886	795	-	964	853	-	-	-	-	-	-	-
Stage 2	913	831	-	906	807	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	745	720	1003	798	728	1019	1536	-	-	1563	-	-
Mov Cap-2 Maneuver	745	720	-	798	728	-	-	-	-	-	-	-
Stage 1	886	781	-	964	853	-	-	-	-	-	-	-
Stage 2	879	831	-	871	792	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	11.4		8.8		0		2.8	
HCM LOS	B		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1536	-	-	743	979	1563	-
HCM Lane V/C Ratio	-	-	-	0.247	0.038	0.018	-
HCM Control Delay (s)	0	-	-	11.4	8.8	7.3	0
HCM Lane LOS	A	-	-	B	A	A	A
HCM 95th %tile Q(veh)	0	-	-	1	0.1	0.1	-

HCM 6th TWSC
3: Cambridge Way & Manchester Drive

Future Conditions
AM Peak Hour

Intersection						
Int Delay, s/veh	5.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↕		↔	↕
Traffic Vol, veh/h	1	23	9	14	96	35
Future Vol, veh/h	1	23	9	14	96	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	60	60	61	61	60	60
Heavy Vehicles, %	0	0	18	18	19	19
Mvmt Flow	2	38	15	23	160	58

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	405	19	0	0	38
Stage 1	27	-	-	-	-
Stage 2	378	-	-	-	-
Critical Hdwy	6.6	6.9	-	-	4.385
Critical Hdwy Stg 1	5.8	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.3805
Pot Cap-1 Maneuver	592	1061	-	-	1462
Stage 1	998	-	-	-	-
Stage 2	697	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	527	1061	-	-	1462
Mov Cap-2 Maneuver	527	-	-	-	-
Stage 1	998	-	-	-	-
Stage 2	621	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	5.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1018	1462
HCM Lane V/C Ratio	-	-	0.039	0.109
HCM Control Delay (s)	-	-	8.7	7.8
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.4

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↕↕	↕↕	
Traffic Vol, veh/h	0	55	0	32	76	0
Future Vol, veh/h	0	55	0	32	76	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	60	0	35	83	0

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	42	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	1019	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %			-
Mov Cap-1 Maneuver	-	1019	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

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

Minor Lane/Major Mvmt	NBT EBLn1	SBT
Capacity (veh/h)	- 1019	-
HCM Lane V/C Ratio	- 0.059	-
HCM Control Delay (s)	- 8.8	-
HCM Lane LOS	- A	-
HCM 95th %tile Q(veh)	- 0.2	-

HCM 6th TWSC
5: Cambridge Way & Ingress Site Drive

Future Conditions
AM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	8	24	76	46
Future Vol, veh/h	0	0	8	24	76	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	9	26	83	50























Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	127	83	133	0	0
Stage 1	83	-	-	-	-
Stage 2	44	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	868	976	1452	-	-
Stage 1	940	-	-	-	-
Stage 2	978	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	863	976	1452	-	-
Mov Cap-2 Maneuver	828	-	-	-	-
Stage 1	934	-	-	-	-
Stage 2	978	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	1.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1452	-	-	-	-
HCM Lane V/C Ratio	0.006	-	-	-	-
HCM Control Delay (s)	7.5	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

HCM 6th Signalized Intersection Summary
 1: Clarks Creek Road & Perry Road

Future Conditions
 MD Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (veh/h)	7	299	23	119	199	4	271	2	123	2	1	8
Future Volume (veh/h)	7	299	23	119	199	4	271	2	123	2	1	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1781	1781	1737	1737	1737	1811	1811	1811	1900	1900	1900
Adj Flow Rate, veh/h	8	344	26	155	258	5	339	2	154	3	1	12
Peak Hour Factor	0.87	0.87	0.87	0.77	0.77	0.77	0.80	0.80	0.80	0.69	0.69	0.69
Percent Heavy Veh, %	8	8	8	11	11	11	6	6	6	0	0	0
Cap, veh/h	337	552	41	402	937	18	631	8	591	88	38	158
Arrive On Green	0.02	0.17	0.17	0.13	0.28	0.28	0.16	0.39	0.39	0.13	0.13	0.13
Sat Flow, veh/h	1697	3191	240	1654	3312	64	1725	20	1518	112	294	1217
Grp Volume(v), veh/h	8	182	188	155	128	135	339	0	156	16	0	0
Grp Sat Flow(s),veh/h/ln	1697	1692	1738	1654	1650	1725	1725	0	1538	1623	0	0
Q Serve(g_s), s	0.2	5.8	5.8	4.0	3.5	3.5	9.0	0.0	4.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.2	5.8	5.8	4.0	3.5	3.5	9.0	0.0	4.0	0.5	0.0	0.0
Prop In Lane	1.00		0.14	1.00		0.04	1.00		0.99	0.19		0.75
Lane Grp Cap(c), veh/h	337	293	301	402	467	488	631	0	598	284	0	0
V/C Ratio(X)	0.02	0.62	0.63	0.39	0.27	0.28	0.54	0.00	0.26	0.06	0.00	0.00
Avail Cap(c_a), veh/h	572	702	721	450	685	716	631	0	771	458	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.1	22.2	22.2	14.8	16.1	16.1	16.7	0.0	12.0	22.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	2.1	2.1	0.6	0.3	0.3	0.9	0.0	0.2	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	2.2	2.3	1.4	1.2	1.3	3.5	0.0	1.2	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.1	24.3	24.3	15.4	16.4	16.4	17.6	0.0	12.2	22.2	0.0	0.0
LnGrp LOS	B	C	C	B	B	B	B	A	B	C	A	A
Approach Vol, veh/h		378			418			495			16	
Approach Delay, s/veh		24.2			16.0			15.9			22.2	
Approach LOS		C			B			B			C	
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	13.3	16.0	15.0	13.5	7.0	22.4		28.5				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	24.0	9.0	14.0	9.0	24.0		29.0				
Max Q Clear Time (g_c+I1), s	6.0	7.8	11.0	2.5	2.2	5.5		6.0				
Green Ext Time (p_c), s	0.1	1.8	0.0	0.0	0.0	1.3		0.9				
Intersection Summary												
HCM 6th Ctrl Delay				18.4								
HCM 6th LOS				B								

HCM 6th TWSC
2: Clarks Creek Road & Manchester Drive

Future Conditions
MD Peak Hour

Intersection												
Int Delay, s/veh	9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	277	3	1	1	7	22	0	43	3	8	24	102
Future Vol, veh/h	277	3	1	1	7	22	0	43	3	8	24	102
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	66	66	66	73	73	73	65	65	65
Heavy Vehicles, %	11	11	11	3	3	3	2	2	2	3	3	3
Mvmt Flow	342	4	1	2	11	33	0	59	4	12	37	157

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	223	203	116	203	279	61	194	0	0	63	0	0
Stage 1	140	140	-	61	61	-	-	-	-	-	-	-
Stage 2	83	63	-	142	218	-	-	-	-	-	-	-
Critical Hdwy	7.21	6.61	6.31	7.13	6.53	6.23	4.12	-	-	4.13	-	-
Critical Hdwy Stg 1	6.21	5.61	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.21	5.61	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.599	4.099	3.399	3.527	4.027	3.327	2.218	-	-	2.227	-	-
Pot Cap-1 Maneuver	714	678	912	753	627	1001	1379	-	-	1533	-	-
Stage 1	842	764	-	948	842	-	-	-	-	-	-	-
Stage 2	903	825	-	859	721	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	677	672	912	744	621	1001	1379	-	-	1533	-	-
Mov Cap-2 Maneuver	677	672	-	744	621	-	-	-	-	-	-	-
Stage 1	842	757	-	948	842	-	-	-	-	-	-	-
Stage 2	862	825	-	846	715	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.7		9.4		0		0.4	
HCM LOS	C		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1379	-	-	678	867	1533	-
HCM Lane V/C Ratio	-	-	-	0.512	0.052	0.008	-
HCM Control Delay (s)	0	-	-	15.7	9.4	7.4	0
HCM Lane LOS	A	-	-	C	A	A	A
HCM 95th %tile Q(veh)	0	-	-	2.9	0.2	0	-

HCM 6th TWSC
3: Cambridge Way & Manchester Drive

Future Conditions
MD Peak Hour

Intersection						
Int Delay, s/veh	5.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↕		↔	↕
Traffic Vol, veh/h	10	95	74	45	223	103
Future Vol, veh/h	10	95	74	45	223	103
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	62	62	82	82	80	80
Heavy Vehicles, %	3	3	4	4	6	6
Mvmt Flow	16	153	90	55	279	129

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	805	73	0	0	145
Stage 1	118	-	-	-	-
Stage 2	687	-	-	-	-
Critical Hdwy	6.645	6.945	-	-	4.19
Critical Hdwy Stg 1	5.845	-	-	-	-
Critical Hdwy Stg 2	5.445	-	-	-	-
Follow-up Hdwy	3.5285	3.3285	-	-	2.257
Pot Cap-1 Maneuver	334	972	-	-	1410
Stage 1	892	-	-	-	-
Stage 2	496	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	268	972	-	-	1410
Mov Cap-2 Maneuver	268	-	-	-	-
Stage 1	892	-	-	-	-
Stage 2	398	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.9	0	5.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	777	1410
HCM Lane V/C Ratio	-	-	0.218	0.198
HCM Control Delay (s)	-	-	10.9	8.2
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.8	0.7

HCM 6th TWSC
4: Cambridge Way & Egress Site Drive

Future Conditions
MD Peak Hour

Intersection						
Int Delay, s/veh	3.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↕↕	↕↕	
Traffic Vol, veh/h	0	194	0	169	132	0
Future Vol, veh/h	0	194	0	169	132	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	211	0	184	143	0

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	-	72	-	0	0
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-
Pot Cap-1 Maneuver	0	975	0	-	0
Stage 1	0	-	0	-	0
Stage 2	0	-	0	-	0
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	-	975	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT EBLn1	SBT
Capacity (veh/h)	- 975	-
HCM Lane V/C Ratio	- 0.216	-
HCM Control Delay (s)	- 9.7	-
HCM Lane LOS	- A	-
HCM 95th %tile Q(veh)	- 0.8	-

HCM 6th TWSC
5: Cambridge Way & Ingress Site Drive

Future Conditions
MD Peak Hour

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↑	↔
Traffic Vol, veh/h	0	0	67	102	132	127
Future Vol, veh/h	0	0	67	102	132	127
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	73	111	143	138




















Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	400	143	281	0	-	0
Stage 1	143	-	-	-	-	-
Stage 2	257	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	606	905	1282	-	-	-
Stage 1	884	-	-	-	-	-
Stage 2	786	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	571	905	1282	-	-	-
Mov Cap-2 Maneuver	629	-	-	-	-	-
Stage 1	834	-	-	-	-	-
Stage 2	786	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	3.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1282	-	-	-	-
HCM Lane V/C Ratio	0.057	-	-	-	-
HCM Control Delay (s)	8	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-	-

HCM 6th Signalized Intersection Summary
1: Clarks Creek Road & Perry Road

Future Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	226	34	119	322	5	229	0	68	0	1	7
Future Volume (veh/h)	10	226	34	119	322	5	229	0	68	0	1	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1781	1781	1781	1856	1856	1856	1870	1870	1870	1900	1900	1900
Adj Flow Rate, veh/h	11	257	39	138	374	6	297	0	88	0	2	12
Peak Hour Factor	0.88	0.88	0.88	0.86	0.86	0.86	0.77	0.77	0.77	0.60	0.60	0.60
Percent Heavy Veh, %	8	8	8	3	3	3	2	2	2	0	0	0
Cap, veh/h	335	523	78	454	995	16	559	0	600	0	27	160
Arrive On Green	0.02	0.18	0.18	0.13	0.28	0.28	0.16	0.00	0.38	0.00	0.11	0.11
Sat Flow, veh/h	1697	2952	442	1767	3551	57	1781	0	1585	0	235	1411
Grp Volume(v), veh/h	11	146	150	138	185	195	297	0	88	0	0	14
Grp Sat Flow(s),veh/h/ln	1697	1692	1702	1767	1763	1845	1781	0	1585	0	0	1646
Q Serve(g_s), s	0.3	4.4	4.5	3.2	4.8	4.8	7.8	0.0	2.1	0.0	0.0	0.4
Cycle Q Clear(g_c), s	0.3	4.4	4.5	3.2	4.8	4.8	7.8	0.0	2.1	0.0	0.0	0.4
Prop In Lane	1.00		0.26	1.00		0.03	1.00		1.00	0.00		0.86
Lane Grp Cap(c), veh/h	335	300	301	454	494	517	559	0	600	0	0	186
V/C Ratio(X)	0.03	0.49	0.50	0.30	0.38	0.38	0.53	0.00	0.15	0.00	0.00	0.08
Avail Cap(c_a), veh/h	567	719	723	514	749	784	559	0	814	0	0	408
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	18.2	20.9	21.0	14.0	16.4	16.4	16.3	0.0	11.5	0.0	0.0	22.4
Incr Delay (d2), s/veh	0.0	1.2	1.3	0.4	0.5	0.5	1.0	0.0	0.1	0.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.7	1.7	1.1	1.8	1.8	3.0	0.0	0.7	0.0	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.2	22.1	22.2	14.3	16.8	16.8	17.3	0.0	11.6	0.0	0.0	22.6
LnGrp LOS	B	C	C	B	B	B	B	A	B	A	A	C
Approach Vol, veh/h		307			518			385				14
Approach Delay, s/veh		22.1			16.2			16.0				22.6
Approach LOS		C			B			B				C
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	13.1	16.0	15.0	12.4	7.3	21.8		27.4				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	24.0	9.0	14.0	9.0	24.0		29.0				
Max Q Clear Time (g_c+I1), s	5.2	6.5	9.8	2.4	2.3	6.8		4.1				
Green Ext Time (p_c), s	0.1	1.5	0.0	0.0	0.0	1.9		0.5				
Intersection Summary												
HCM 6th Ctrl Delay				17.7								
HCM 6th LOS				B								

HCM 6th TWSC
2: Clarks Creek Road & Manchester Drive

Future Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	8.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	226	2	0	0	1	18	0	31	0	11	15	115
Future Vol, veh/h	226	2	0	0	1	18	0	31	0	11	15	115
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	67	67	67	64	64	64	83	83	83	72	72	72
Heavy Vehicles, %	6	6	6	0	0	0	0	0	0	2	2	2
Mvmt Flow	337	3	0	0	2	28	0	37	0	15	21	160

Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	183	168	101	170	248	37	181	0	0	37	0	0
Stage 1	131	131	-	37	37	-	-	-	-	-	-	-
Stage 2	52	37	-	133	211	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.56	6.26	7.1	6.5	6.2	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.16	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4.054	3.354	3.5	4	3.3	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	769	718	943	798	658	1041	1407	-	-	1574	-	-
Stage 1	863	780	-	984	868	-	-	-	-	-	-	-
Stage 2	951	856	-	875	731	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	741	710	943	788	651	1041	1407	-	-	1574	-	-
Mov Cap-2 Maneuver	741	710	-	788	651	-	-	-	-	-	-	-
Stage 1	863	771	-	984	868	-	-	-	-	-	-	-
Stage 2	924	856	-	862	723	-	-	-	-	-	-	-

Approach	EB		WB			NB			SB		
HCM Control Delay, s	13.9		8.7			0			0.6		
HCM LOS	B		A								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1407	-	-	741 1009	1574	-	-
HCM Lane V/C Ratio	-	-	-	0.459 0.029	0.01	-	-
HCM Control Delay (s)	0	-	-	13.9 8.7	7.3	0	-
HCM Lane LOS	A	-	-	B A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	2.4 0.1	0	-	-

HCM 6th TWSC
3: Cambridge Way & Manchester Drive

Future Conditions
PM Peak Hour

Intersection						
Int Delay, s/veh	5.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T		T	T
Traffic Vol, veh/h	21	93	36	32	199	127
Future Vol, veh/h	21	93	36	32	199	127
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	71	71	87	87	87	87
Heavy Vehicles, %	3	3	0	0	3	3
Mvmt Flow	30	131	41	37	229	146

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	664	39	0	0	78
Stage 1	60	-	-	-	-
Stage 2	604	-	-	-	-
Critical Hdwy	6.645	6.945	-	-	4.145
Critical Hdwy Stg 1	5.845	-	-	-	-
Critical Hdwy Stg 2	5.445	-	-	-	-
Follow-up Hdwy	3.5285	3.3285	-	-	2.2285
Pot Cap-1 Maneuver	407	1021	-	-	1513
Stage 1	953	-	-	-	-
Stage 2	542	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	346	1021	-	-	1513
Mov Cap-2 Maneuver	346	-	-	-	-
Stage 1	953	-	-	-	-
Stage 2	460	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.1	0	4.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	751	1513
HCM Lane V/C Ratio	-	-	0.214	0.151
HCM Control Delay (s)	-	-	11.1	7.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.8	0.5

HCM 6th TWSC
4: Cambridge Way & Egress Site Drive

Future Conditions
PM Peak Hour

Intersection						
Int Delay, s/veh	3.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↕↕	↕↕	
Traffic Vol, veh/h	0	161	0	129	165	0
Future Vol, veh/h	0	161	0	129	165	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	175	0	140	179	0

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	90	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	950	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %			-
Mov Cap-1 Maneuver	-	950	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT EBLn1	SBT
Capacity (veh/h)	- 950	-
HCM Lane V/C Ratio	- 0.184	-
HCM Control Delay (s)	- 9.6	-
HCM Lane LOS	- A	-
HCM 95th %tile Q(veh)	- 0.7	-

HCM 6th TWSC
5: Cambridge Way & Ingress Site Drive

Future Conditions
PM Peak Hour

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↑	↔
Traffic Vol, veh/h	0	0	72	57	165	90
Future Vol, veh/h	0	0	72	57	165	90
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	78	62	179	98

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	397	179	277	0	-	0
Stage 1	179	-	-	-	-	-
Stage 2	218	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	608	864	1286	-	-	-
Stage 1	852	-	-	-	-	-
Stage 2	818	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	571	864	1286	-	-	-
Mov Cap-2 Maneuver	630	-	-	-	-	-
Stage 1	800	-	-	-	-	-
Stage 2	818	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	4.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1286	-	-	-	-
HCM Lane V/C Ratio	0.061	-	-	-	-
HCM Control Delay (s)	8	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-	-

Intersection: 1: Clarks Creek Road & Perry Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	LTR
Maximum Queue (ft)	20	127	69	70	70	40	120	59	47
Average Queue (ft)	2	58	21	16	21	2	56	25	14
95th Queue (ft)	12	106	53	47	54	18	96	52	40
Link Distance (ft)		827	827		729	729		215	279
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	500				500				125
Storage Blk Time (%)							0		
Queuing Penalty (veh)							0		

Intersection: 2: Clarks Creek Road & Manchester Drive

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	100	56	12
Average Queue (ft)	47	20	1
95th Queue (ft)	81	47	8
Link Distance (ft)	377	326	224
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Cambridge Way & Manchester Drive

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	28	50
Average Queue (ft)	12	5
95th Queue (ft)	31	28
Link Distance (ft)	340	60
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Cambridge Way & Egress Site Drive

Movement	EB
Directions Served	R
Maximum Queue (ft)	59
Average Queue (ft)	24
95th Queue (ft)	48
Link Distance (ft)	334
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Cambridge Way & Ingress Site Drive

Movement	NB
Directions Served	L
Maximum Queue (ft)	6
Average Queue (ft)	0
95th Queue (ft)	4
Link Distance (ft)	143
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 0

Intersection: 1: Clarks Creek Road & Perry Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	LTR
Maximum Queue (ft)	28	160	126	98	107	66	181	166	43
Average Queue (ft)	3	64	23	47	35	18	100	49	11
95th Queue (ft)	17	115	66	89	77	52	168	129	35
Link Distance (ft)		827	827		729	729		215	279
Upstream Blk Time (%)							0	1	
Queuing Penalty (veh)							0	2	
Storage Bay Dist (ft)	500			500			125		
Storage Blk Time (%)							7	0	
Queuing Penalty (veh)							10	1	

Intersection: 2: Clarks Creek Road & Manchester Drive

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	133	43	12
Average Queue (ft)	62	21	1
95th Queue (ft)	103	46	9
Link Distance (ft)	377	326	224
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Cambridge Way & Manchester Drive

Movement	WB	NB	SB	SB
Directions Served	LR	TR	L	T
Maximum Queue (ft)	84	4	71	6
Average Queue (ft)	29	0	19	0
95th Queue (ft)	57	3	55	6
Link Distance (ft)	340	516	60	60
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			1	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Cambridge Way & Egress Site Drive

Movement	EB
Directions Served	R
Maximum Queue (ft)	83
Average Queue (ft)	42
95th Queue (ft)	67
Link Distance (ft)	334
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Cambridge Way & Ingress Site Drive

Movement	NB
Directions Served	L
Maximum Queue (ft)	40
Average Queue (ft)	13
95th Queue (ft)	39
Link Distance (ft)	143
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 13

Intersection: 1: Clarks Creek Road & Perry Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	
Directions Served	L	T	TR	L	T	TR	L	TR	LTR	
Maximum Queue (ft)	36	105	62	98	110	79	149	68	38	
Average Queue (ft)	5	49	19	42	43	27	83	26	6	
95th Queue (ft)	22	93	49	78	88	63	134	54	27	
Link Distance (ft)		827	827		729	729		215	279	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	500				500				125	
Storage Blk Time (%)							1	0		
Queuing Penalty (veh)							1	0		

Intersection: 2: Clarks Creek Road & Manchester Drive

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	103	40	12
Average Queue (ft)	50	14	0
95th Queue (ft)	81	40	6
Link Distance (ft)	377	326	224
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Cambridge Way & Manchester Drive

Movement	WB	SB	SB
Directions Served	LR	L	T
Maximum Queue (ft)	72	52	16
Average Queue (ft)	29	12	1
95th Queue (ft)	50	41	10
Link Distance (ft)	340	60	60
Upstream Blk Time (%)		0	0
Queuing Penalty (veh)		0	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Cambridge Way & Egress Site Drive

Movement	EB	NB
Directions Served	R	T
Maximum Queue (ft)	78	3
Average Queue (ft)	40	0
95th Queue (ft)	65	2
Link Distance (ft)	334	60
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Cambridge Way & Ingress Site Drive

Movement	NB	SB
Directions Served	L	R
Maximum Queue (ft)	36	4
Average Queue (ft)	12	0
95th Queue (ft)	37	3
Link Distance (ft)	143	314
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 1



Memorandum

To: Mr. Brandon Schram

From: Jill M. Bauer, PE, PTOE and Jeffery A. Morden, PE, PTOE

Date: September 9, 2021

RE: Trip Generation and Drive-Through Queue Analysis for Chick-Fil-A

ROWE Professional Services Company has completed a trip generation analysis and a drive-through queue length analysis to determine the absolute maximum and average maximum vehicle queue length for Chick-Fil-A developments in Michigan.

ROWE collected vehicle entrance/exit data and vehicle queue data on Thursday, August 26, 2021 during the weekday AM (7 a.m. to 9 a.m.) and PM (4 p.m. to 6 p.m.) peak hours and Saturday, August 28, 2021 for the Midday (12 p.m. to 2 p.m.) and PM (5 p.m. to 7 p.m.) peak hours at the following three (3) Chick-Fil-A sites located in Caledonia, Kalamazoo, and Okemos, MI:

1. M-6 and Kalamazoo Avenue (Caledonia, MI)
2. Main Street and Drake Road (Kalamazoo, MI)
3. Grand River Road (Okemos, MI)

Trip Generation Analysis

The peak hour trip generation analysis was conducted for the weekday AM and PM peak hours, and Saturday Midday and PM peak hours. The number of vehicles entering and exiting the restaurant at the driveways were counted in 15-minute intervals throughout the analysis periods. Table 1 presents the site locations peak hours and size for each location.

Table 1: Site Location Peak Hours and Size

Location	Weekday		Weekend		Size (SF)
	AM Peak	PM Peak	MD Peak	PM Peak	
Caledonia	7:30-8:30 a.m.	5:00-6:00 p.m.	12:45-1:45 p.m.	5:45-6:45 p.m.	4,877
Kalamazoo	8:00-9:00 a.m.	5:00-6:00 p.m.	12:45-1:45 p.m.	5:30-6:30 p.m.	4,996
Okemos	8:00-9:00 a.m.	5:00-6:00 p.m.	12:45-1:45 p.m.	5:00-6:00 p.m.	4,730

The average number of total trips for the weekday AM peak hour is 106 trips (53 in, 53 out). The average number of total trips for weekday PM peak hour is 315 trips (158 in, 157 out). The average number of total trips for the Saturday Midday peak hour is 376 trips (186 in, and 190 out). The average number of total trips for the Saturday PM peak hour is 304 trips (152 in, 152 out). Table 2 presents the trip generation for the three site locations. The highlighted row presents the peak

trip generation numbers for the peak hour. The full results of the trip generation analysis are included with this memorandum.

Table 2: Trip Generation

		Caledonia			Kalamazoo ¹			Okemos			Average ²		
		In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Weekday (8-26-21)	7a-8a	76	68	144	18	7	25	37	35	72	44	37	80
	8a-9a	79	77	156	34	28	62	40	45	85	51	50	101
	AM Peak	84	87	171	34	28	62	40	45	85	53	53	106
	4p-5p	121	122	243	136	127	263	125	144	269	127	131	258
	5p-6p	163	148	311	142	146	288	170	177	347	158	157	315
	PM Peak	163	148	311	142	146	288	170	177	347	158	157	315
Weekend (8-28-21)	12p-1p	157	157	314	170	157	327	197	202	399	175	172	347
	1p-2p	164	171	335	164	169	333	215	219	434	181	186	367
	Midday Peak	171	168	339	168	173	341	218	229	447	186	190	376
	5p-6p	106	100	206	125	139	264	200	201	401	144	147	290
	6p-7p	109	108	217	121	135	256	178	200	378	136	148	284
	PM Peak	118	115	233	138	140	278	200	201	401	152	152	304

¹ Location does not open until 8:00 a.m.

² Straight Average

The results of this analysis support previously observed trip generation at Chick-fil-A locations in neighboring states.

Drive-Through Queue Analysis

The peak hour drive-through queue analysis was conducted for the weekday AM and PM peak hours, and Saturday Midday and PM peak hours. The number of vehicles in the drive-through queue were counted throughout the analysis periods. The peak hour times and size of the study locations based on trip generation can be found in Table 1. The results of the queue analysis revealed, for weekday AM peak hour, the absolute maximum queue was 12 vehicles with an average queue of 8 vehicles. For the weekday PM peak hour, the absolute maximum queue was 41 with an average queue of 30 vehicles. For the Saturday Midday peak hour, the absolute maximum queue was 41 with an average queue of 31. For the Saturday PM peak hour, the absolute maximum queue was 38 vehicles with an average queue of 32 vehicle. The full results of the queue length analysis are shown in Table 4.

Table 4: Maximum Vehicle Queue (Vehicles)

		Caledonia	Kalamazoo ¹	Okemos	Average ²
Weekday (8-26-21)	7:00-8:00 a.m.	8	4	7	6
	8:00-9:00 a.m.	12	7	5	8
	AM Peak	12	7	5	8
	4:00-5:00 p.m.	14	36	24	25
	5:00-6:00 p.m.	30	41	19	30
	PM Peak	30	41	19	30
Weekend (8-28-21)	12:00-1:00 p.m.	25	37	28	30
	1:00-2:00 p.m.	23	41	27	30
	MD Peak	25	41	27	31
	5:00-6:00 p.m.	12	32	26	23
	6:00-7:00 p.m.	32	38	25	32
	PM Peak	32	38	26	32

¹ Location does not open until 8:00 a.m.

² Straight Average

Based on these results, it is recommended the proposed Chick-Fil-A restaurant should be able to accommodate 32 vehicles in the main drive-through queue area and should have an overflow area that can accommodate at least 9 additional vehicles without impeding operations of the parking lot.