TRANSPORTATION IMPACT STUDY

7456 MCLEAN ROAD & 197 BROCK ROAD SOUTH

TOWNSHIP OF PUSLINCH
COUNTY OF WELLINGTON

PREPARED FOR:
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CROZIER

Revision Number	Date	Comments
Rev.0	September 2023	Issued for Client Review
Rev.1	October 2023	Issued for Submission
Rev.2	July 2025	Issued for 2nd Submission
Rev.3	February 2026	Issued for 3rd Submission
Rev.4	March 2026	Issued for 4th Submission

Executive Summary

C.F. Crozier & Associates Inc. (Crozier) was retained by Daaz Inc. to complete a Transportation Impact Study for a mixed-use commercial and gas station development situated at 7456 McLean Road & 197 Brock Road South, Township of Puslinch, County of Wellington.

The analysis undertaken herein was completed using the latest Site Plan prepared by Richard Ziegler Architects Inc., dated March 10, 2026. Any minor changes to the Site Plan will not materially affect the conclusions set out within this report.

The site is proposed to be re-zoned to a commercial development that would include the following:

- An eight-pump gas station with a 1-storey accessory retail/convenience store (235 m^2)
- A six-pump truck gas station

A 1-storey fast food restaurant (379 m^2) with drive-thru

- 41 vehicle parking spaces including 3 accessible spaces and 4 electric vehicle charging spaces
- 8 truck parking spaces
- 1 loading space
- 2 bicycle parking spaces
- To facilitate the development, one full moves site access is proposed via McLean Road and one restricted right-in, right-out access is proposed via Brock Road

Existing Conditions

Both study intersections are operating adequately with LOS "B" or better during the weekday a.m. and p.m., peak hours.

Under the 2025 existing conditions, the auxiliary storage lengths are not exceeding and have reserve capacity to accommodate future traffic volumes.

Future Background Conditions

The signalized intersection of Brock Road South at McLean Road is expected to continue to operate with a LOS "C" and "C" during the weekday a.m. and p.m. peak hours. A maximum volume-to-capacity ratio of 0.68 and 0.57 is expected during the weekday a.m. and weekday p.m. peak hours, respectively.

The signalized intersection of Brock Road South at Nicholas Beaver Road is expected to continue to operate with a LOS "B" and "B" during the weekday a.m. and p.m. peak hours, respectively. A maximum volume-to-capacity ratio of 0.54 and 0.56 is expected during the weekday a.m. and weekday p.m. peak hours, respectively.

Under the 2031 future background conditions, the queuing assessment results in an instance where the 95th percentile queues exceed the auxiliary turn lane storage length for the westbound left-turn at Brock Road South and McLean Road during the p.m. peak hour.

Site Generated Traffic

During the weekday a.m. peak hour, the site is expected to generate 172 primary and 222 pass-by trips. In the p.m. peak hour, projections are 173 primary and 202 pass-by trips. The trip distribution for the subject development was determined using existing travel patterns.

Future Total Conditions

In the 2031 horizon year, the intersection of Brock Road South at McLean Road is expected to decrease from operating at a LOS "C" and "C" to operate with a LOS "D" and "C" during the weekday a.m. and p.m. peak hours, respectively, when compared to 2031 Future Background conditions. A maximum volume-to-capacity ratio of 1.01 (0.33 increase from 2031 Future Background) and 0.75 (0.18 increase from 2031 Future Background) is expected during the weekday a.m. and weekday p.m. peak hours, respectively.

In the 2031 horizon year, the intersection of Brock Road South at Nicholas Beaver Road is expected to continue to operate with a "LOS "B" during the weekday a.m. and p.m. peak hours. A maximum volume-to-capacity ratio of 0.56 (0.02 increase from 2031 Future Background) and 0.57 (0.02 increase from 2031 Future Background) is expected during the weekday a.m. and weekday p.m. peak hours, respectively. These metrics indicate that the intersection is expected to operate efficiently with minimal delays and reserve capacity to accommodate future increases in traffic volume.

Both proposed Site accesses expected to operate acceptably with LOS "C" or better during the weekday a.m. and p.m., peak hours.

Similar to the 2031 future background conditions, the 2031 future total queuing assessment results in an instance where the 95th percentile queues exceed the auxiliary turn lane storage length for the westbound left-turn at Brock Road South and McLean Road during the p.m. peak hour.

Future Total Improvements

Signal timing adjustments were examined in an effort to mitigate projected delays, congestion, and queue concerns for 2031 at Brock Road South and McLean Road in the northbound and westbound left-turn lanes. The timings detailed for the future background scenario were subsequently applied to the 2031 future total scenario.

The results of the signal adjustments indicate that in the 2031 future total scenario, the intersection of Brock Road South at McLean Road operates at capacity with a maximum v/c ratio of 0.88 and 0.67 during the a.m. and p.m. peak hours, respectively.

Queue exceedances are also still present at Brock Road South and Nicholas Beaver Road. However, each instance of queue exceedance remains within 15 meters, or approximately two vehicles, of the designated storage length. This level of excess queuing, when it occurs, can be supported by the auxiliary turn lane taper with limited effect on through traffic. It is recommended that this movement be monitored for future storage lane expansion.

Site Access Review

No issues were identified regarding sight lines and access spacing at the proposed site accesses.

A vehicle maneuvering assessment was conducted and the subject development can accommodate most of the design vehicles expected to maneuver the site including MSU (Medium Single Unit) Trucks, GFL Garbage Truck, Pumper Fire Truck, and passenger vehicles. Some vehicle maneuvering issues were identified at the northeast corner of the site due to the turning radii provided at the Brock Road South Site Access and preceding internal turn not being sufficient for the WB-20 Truck and 8 Axle Fuel Tanker movements, respectively, as well as the west most truck gas pump not providing sufficient spacing for the WB-20 trucks to pass beside it to the west. It is noted that there is a lane to the east of the truck gas bar for the trucks to park in the designated spots and then traverse the site as needed. These aspects of the Site Plan will be revised as part of the future applications.

Parking and Loading Requirements

The development meets the parking requirements when compared to the Township of Puslinch's Comprehensive Zoning By-Law No. 023-18. These include regular, accessible, loading and bicycle parking spaces.

Surrogate Survey

The 4 Sinclair Boulevard site is the most representative comparator, reflecting similar land uses, scale, and operating characteristics, and demonstrated a parking surplus, indicating the proposed development is expected to operate within the planned parking supply. In contrast, the 40 Sportsworld Drive site could have elevated parking demand due to shared use with Moose Winooski's and Tranquility Park, its location within a busy commercial node, and its stronger regional draw, conditions that would not be expected at the subject site. Accordingly, the Sinclair findings support the conclusion that sufficient parking is expected to be provided.

In conclusion, the proposed commercial development at 7456 McLean Road & 197 Brock Road South in the Township of Puslinch, County of Wellington can be supported from a transportation operations and safety perspective for the Zoning By-Law Application.

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1.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) was retained by Daaz Inc. to complete a Transportation Impact Study for a mixed-use commercial and gas station development situated at 7456 McLean Road & 197 Brock Road South, Township of Puslinch, County of Wellington.

The purpose of the Transportation Impact Study is to evaluate the impacts of the proposed development on the surrounding road network and recommend transportation-related mitigation measures, if required.

A Terms of Reference (ToR) encompassing the scope of the Transportation Impact Study was circulated to the County of Wellington and the Township of Puslinch on November 23, 2022, and comments from the County were received on December 7, 2022. Correspondence from the County is included in **Appendix A**.

1.1 Development Lands

The subject lands cover an area of approximately 1.62 ha and consists of two adjacent properties (7456 McLean Road and 197 Brock Road South). The Site is currently comprised of vegetated/landscaped areas and is bounded by Dufferin Aggregates (aggregate pit) to the north, Brock Round to the east, McLean Road to the south, and St. Mary's Cement Inc. (aggregate pit) to the west.

Both properties (7456 McLean Road and 197 Brock Road South) are zoned as site-specific industrial with holding provisions and are within the designated Rural Employment area per the County of Wellington Official Plan.

The Site Location is included in **Figure 1**.

1.2 Development Proposal

The proposed development envisions the construction of A one-storey mixed-use commercial and gas station development; the proposed site statistics are displayed in **Table 1.**

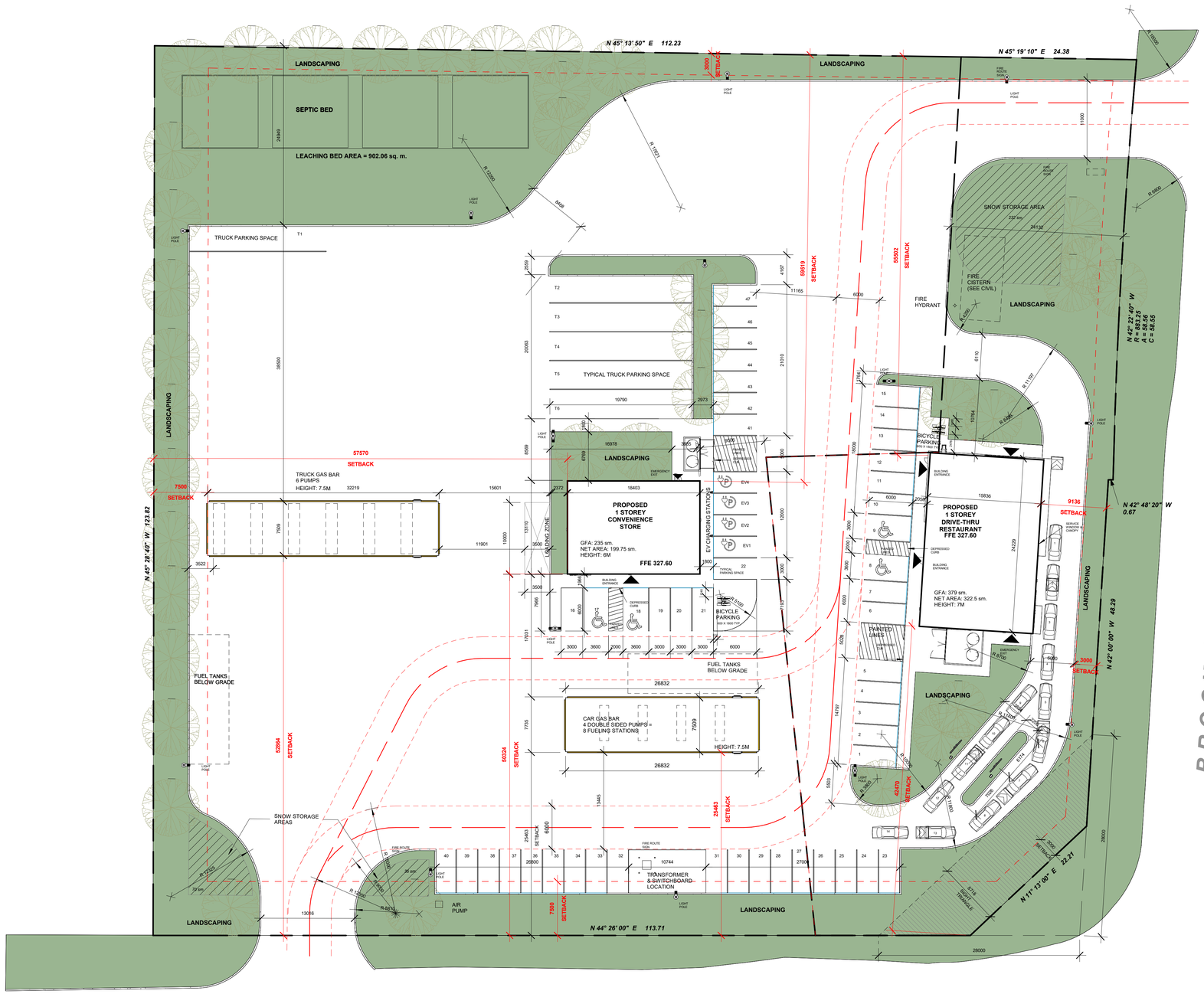
Table 1: Development Statistics

Land Use	Units
Vehicle Gas Pumps	8 Pumps
Truck Gas Pumps	6 Pumps
Convenience Store	235 m^2
Fast Food Restaurant with Drive Thru	379 m^2
Total Building GFA	**572 m^2**
Vehicle Parking Spaces	41 spaces (Including 3 accessible parking spaces and 4 electric vehicle parking spaces)
Truck Parking Spaces	8 spaces

To facilitate the development, one full moves site access is proposed via McLean Road and one restricted right-in, right-out access is proposed via Brock Road.

The most recent Site Plan prepared by Richard Ziegler Architects Inc. (dated March 10, 2026) is included as **Figure 2.**

Legend	7456 McLean Road & 197 Brock Road South	CROZIER CONSULTING ENGINEERS	Figure 1
Site Boundary	Site Location		Project No. 2792-7289 Date. 2026.02.13 Analyst. Ramy Kamal



HC ZONE REGULATIONS	REQUIRED	PROPOSED
PERMITTED USES	TABLE 8.1 ZONING BYLAW	GAS BAR(S), CONVENIENCE STORE AND RESTAURANT
LOT AREA (MIN)	0.4 HA	1.62 H
LOT FRONTAGE (MIN.)	20 M	101 M
FRONT YARD (MIN.)	3 M	9.3 M
INTERIOR SIDE YARD (MIN.)	3 M	7.5 M
EXTERIOR SIDE YARD (MIN.)	7.5 M	25.5 M
REAR YARD (MIN.)	3 M	55.5 M
RESTAURANT GFA		379 sm
RESTAURANT NET AREA		322.5 sm
CONVENIENCE STORE GFA		235 sm.
CONVENIENCE STORE NET...		199.75 sm.
GAS BAR CANOPY (CARS)		201 sm.
GAS BAR CANOPY (TRUCKS)		241 sm.
TOTAL BUILDING/STRUCTUR...		1,056 sm.
LOT COVERAGE (MAX.)	45%	6.50%
LANDSCAPED OPEN SPACE...	25%	27%

PARKING REQUIRED		
GAS BAR - CARS	(1 PER PUMP) = 8	SEE BELOW
GAS BAR - TRUCKS	(1 PER PUMP) = 6	6
CONVENIENCE STORE	(1 PER 20 sm.) = 10	SEE BELOW
RESTAURANT	(1 PER 10 sm.) = 33	SEE BELOW
TOTAL	57	57

VEHICLE PARKING SCHEDULE	
Per Table 5.3 of Zoning Bylaw	
TYPE OF PARKING SPACE	PROVIDED PARKING SPACE
ACCESSIBLE PARKING - TYP...	2
ACCESSIBLE PARKING - TYP...	2
TRUCK PARKING	6
TYPICAL PARKING SPACE	43
EV PARKING / CHARGING...	4
TOTAL	57

BICYCLE PARKING SCHEDULE	
Per Table 5.6 of Zoning Bylaw	
REQUIRED	PROVIDED
2 PER 1,000 sm. = 2	4

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SITE CONTEXT

NO.	ISSUANCE	DATE
6	REV. & ISSUED FOR PLANNING APPROVALS	2025.03.10
5	REV. & ISSUED FOR PLANNING APPROVALS	2026.03.03
4	REV. & ISSUED FOR PLANNING APPROVALS	2026.02.11
3	REV. & ISSUED FOR PLANNING APPROVALS	2025.11.12
2	REV. & ISSUED FOR PLANNING APPROVALS	2025.08.08
1	ISSUED FOR PLANNING APPROVALS	2025.08.05

THE GENERAL CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE ARCHITECT. DO NOT SCALE THE DRAWINGS. DO NOT USE THIS DRAWING FOR CONSTRUCTION UNLESS SIGNED AND SEALED BY THE ARCHITECT.

NORTH

STAMP

PROPOSED COMMERCIAL DEVELOPMENT

7456 McLEAN ROAD WEST & 197 BROCK ROAD SOUTH
TOWN OF PUSLINCH

SITE PLAN

SCALE	1 : 300	PROJECT NUMBER
DATE	2026-03-10 2:50:51 PM	202436
DRAWN	REZ	
CHECKED	REZ	
SHEET		REVISION

A101

FILE NAME: Y:\2024 Projects\202436 - 7456 McLeane Road, Puslinch\2.0 Design and Construction Documents Phase\Revit\7456 McLean Road_2026.03.09.rvt
PLOT DATE: 2026-03-10 2:50:53 PM

2.0 Existing Conditions

The following intersections were reviewed as part of the study area (per confirmation with Township and County staff):

- McLean Road and Brock Road South (Wellington Road 46)
- Brock Road South (Wellington Road 46) and Nicholas Beaver Road
- Proposed restricted right-in right-out site access via Brock Road South (Wellington Road 46)
- Proposed full-moves site access via McLean Road

The following section provides a description of the study area from a transportation context, as well as a traffic operations analysis of the study road network.

2.1 Study Road Network

The directional orientation of the study roadways is slightly skewed; however, it is generally understood that to/away from the lake are considered the north/south directions and parallel along the lake are considered the east/west directions. To ensure clarity and consistency in this report, Brock Road is designated as a north-south roadway, while McLean Road and Nicholas Beaver Road are designated as east-west roadways.

Brock Road South (Wellington Road 46) is a north/south roadway with a four-lane urban cross-section. Brock Road South operates as a Major Arterial under the County of Wellington's jurisdiction. The roadway has a posted speed limit of 70 km/h. Paved shoulders are provided on both sides of the roadway, no sidewalks or active transportation facilities are provided.

McLean Road is an east/west roadway with a two-lane cross-section. McLean Road operates as a Major Collector roadway under the Township of Puslinch's jurisdiction. The roadway has a posted speed limit of 60 km/h. This speed limit change is at the western edge of the property and the portion of the roadway between the sign and Brock Road is at a 50 km/h speed limit. Paved shoulders are provided on both sides of the roadway, no sidewalks or active transportation facilities are provided.

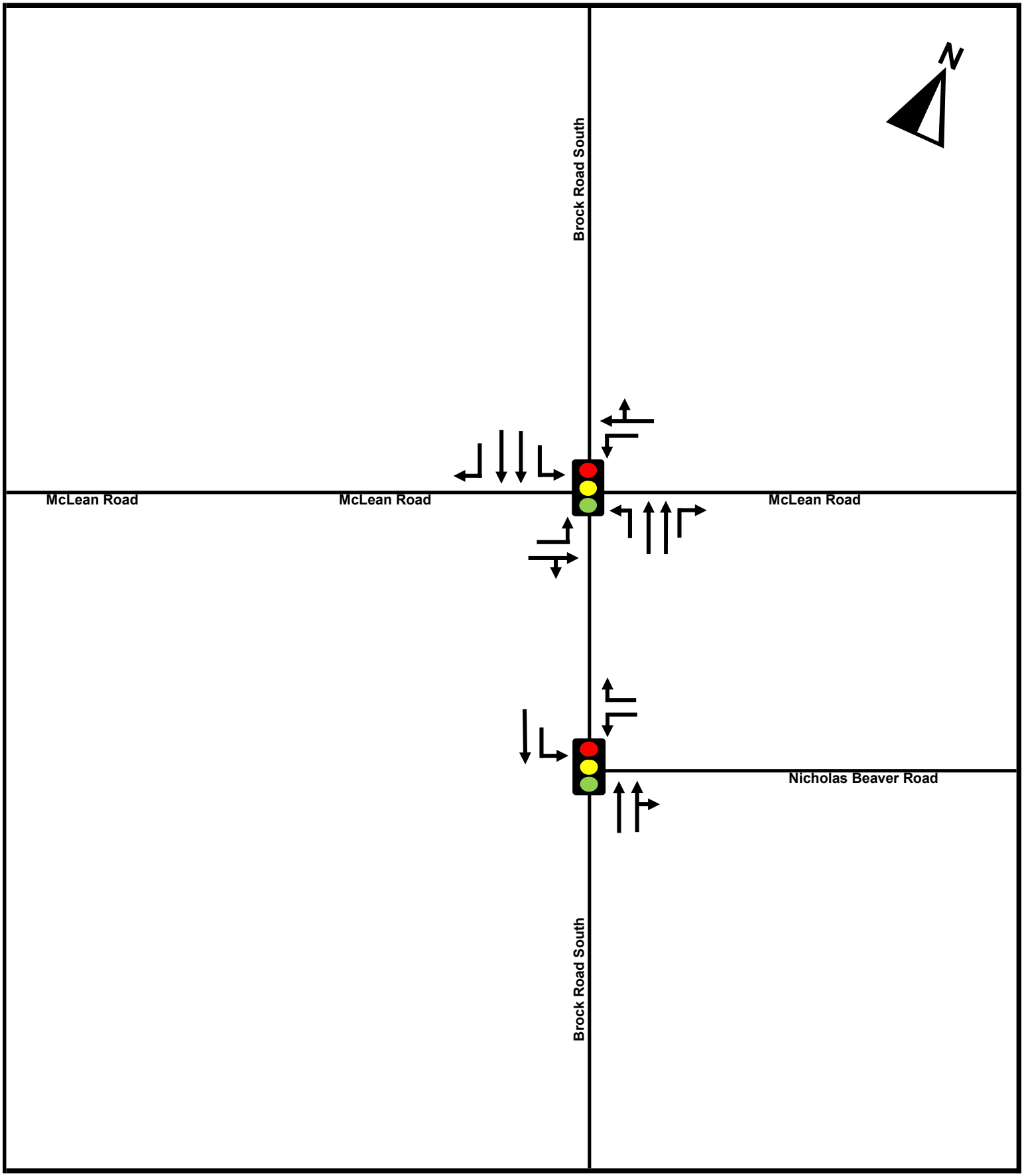
Nicholas Beaver Road is an east/west roadway with a two-lane cross-section. Nicholas Beaver Road operates as a Minor Collector under the Township of Puslinch's jurisdiction. The roadway has an assumed speed limit of 50 km/h. No sidewalks or active transportation facilities are provided.

Excerpts of the County of Wellington Road Master Action Plan are included in **Appendix B.**

2.2 Study Intersections

The intersection of **Brock Road South at McLean Road** is a four-legged signalized intersection. The southbound and northbound approach on Brock Road South both consist of a single auxiliary left-turn lane, a single auxiliary right-turn lane, and two through lanes. The eastbound and westbound approach on McLean Road both consist of a single auxiliary left-turn lane and one single through-right-turn lane.

The intersection of **Brock Road South at Nicholas Beaver Road** is a three-legged signalized intersection. The southbound approach on Brock Road South consists of a single auxiliary left-turn lane and two through lanes. The northbound approach on Brock Road South consists of one single through lane and one single through-right-turn lane. The westbound approach on Nicholas Beaver Road consists of a single auxiliary left-turn lane and one single auxiliary right-turn lane.



Legend	7456 McLean Road & 197 Brock Road South	CROZIER CONSULTING ENGINEERS	Figure 3
Stop Bar	2025 Existing Study Road Network		Project No. 2792-7289 Date. 2026.02.13 Analyst. Ramy Kamal

2.3 Transit Network

The Subject Lands are located on the northwest corner of the intersection of Brock Road South at McLean Road. Just opposite to the Subject Lands, on the southeast corner of the intersection, is the Brock Road at Mclean Road (Aberfoyle) Park & Ride. GO Transit operates 4 routes through that station connecting users to the Greater Toronto Area. **Table 2** outlines the existing transit routes, days of operation, peak hour headways, and the location of bus stops in the study area.

Table 2: Existing Transit Routes

Route	Direction	Span	Days of Operation	Peak Hour Headways (min)	Transit and Connecting Stops in Study Area
GO Transit, 17 Waterloo/Hamilton	Two-Way East-West	University of Waterloo to Hamilton GO	Monday – Friday	60 mins	Brock Road at McLean Road (Aberfoyle) Park & Ride) (350 m, 5 min walk)
GO Transit, 29 Guelph/Mississauga	Two-Way East-West	Guelph Central GO to Kipling Bus Terminal	Monday-Sunday	30 mins	
GO Transit, 48 Guelph – Hwy 407 Bus Terminal	Two-Way East-West	University of Guelph to Pickering GO	Monday – Friday	50 mins	
GO Transit, 25 Waterloo/Mississauga	Two-Way East-West	University of Waterloo to Square One	Monday-Sunday	60 mins	

As shown above, these buses provide commuters and visitors fast connectivity throughout the Greater Toronto Area. It is noted that the nature of this transit stop is so that it operates as a Park & Ride, transit users would be expected drive to the station as local transit routes are not available.

Appendix C contains relevant transit information.

2.4 Active Transportation Network

There are currently no sidewalks or active transportation facilities along the roadways, although sidewalks are provided at the intersections to facilitate safe pedestrian crossing. Otherwise, the Study Area roadways only feature paved shoulders within their ROW, the Study Area is considered primarily automobile transportation mode driven.

2.5 Traffic Data

In accordance with the Township Terms of Reference, new turning movement counts (TMC) for 2023 were collected at the following intersections by Spectrum Traffic Inc. at the associated timeframes as summarized in **Table 3**.

Signal timing plans for the study intersection were provided by Puslinch staff for modelling purposes, also provided in **Table 3**.

Table 3: Traffic Data

Intersection	TMC Date	Timing Plan Date
Brock Road South at McLean Road	May 02, 2023	November 04, 2013
Brock Road South at Nicholas Beaver Road	May 02, 2023	July 04, 2013

The traffic count data and signal timing plans are provided in **Appendix D.**

Existing traffic volumes are illustrated in **Figure 4**.

2.6 Establishing Existing Conditions Traffic Volumes

As the turning movement counts were conducted in 2023, the traffic volumes have been projected forward to 2025. This projection utilizes an annual growth rate of 2%, which was established through the terms of reference with both the Township and the County. In line with this updated traffic data, the future analysis horizon years for the study have also been revised to 2026 and 2031 to ensure consistency with the latest planning timelines and forecasted growth.

2.7 Traffic Modelling

The evaluation of intersections within this report is conducted based on the methodology outlined in the Highway Capacity Manual (2010), using Synchro 12 modelling software. Intersections are assessed using a Level of Service (LOS) metric, with ranges of intersection delays assigned a letter from "A" to "F". For stop-controlled intersections, a Level of Service "A" or "B" would typically be measured during off-peak hours when lesser traffic volumes are on the roadways. Levels of Service "C" through "F" would typically be observed during commuter peak hours when significant vehicle volumes would cause lengthy travel times.

The Level of Service definitions for signalized and stop-controlled intersections are included in **Appendix E**.

Additionally, queuing was analyzed in this study using Synchro's queues. The 95th percentile queue length metric, which represents the 95th percentile queue length of the peak hour traffic from Synchro's HCM reports, was considered in this study for the auxiliary turn storage lanes.

For modelling purposes, Peak Hour Factors were calculated using volumes from the existing counts per County of Wellington Guidelines. The Peak Hour Factors used are shown in **Table 4**.

Calculations for the Peak Hour factors can be found in **Appendix F**.

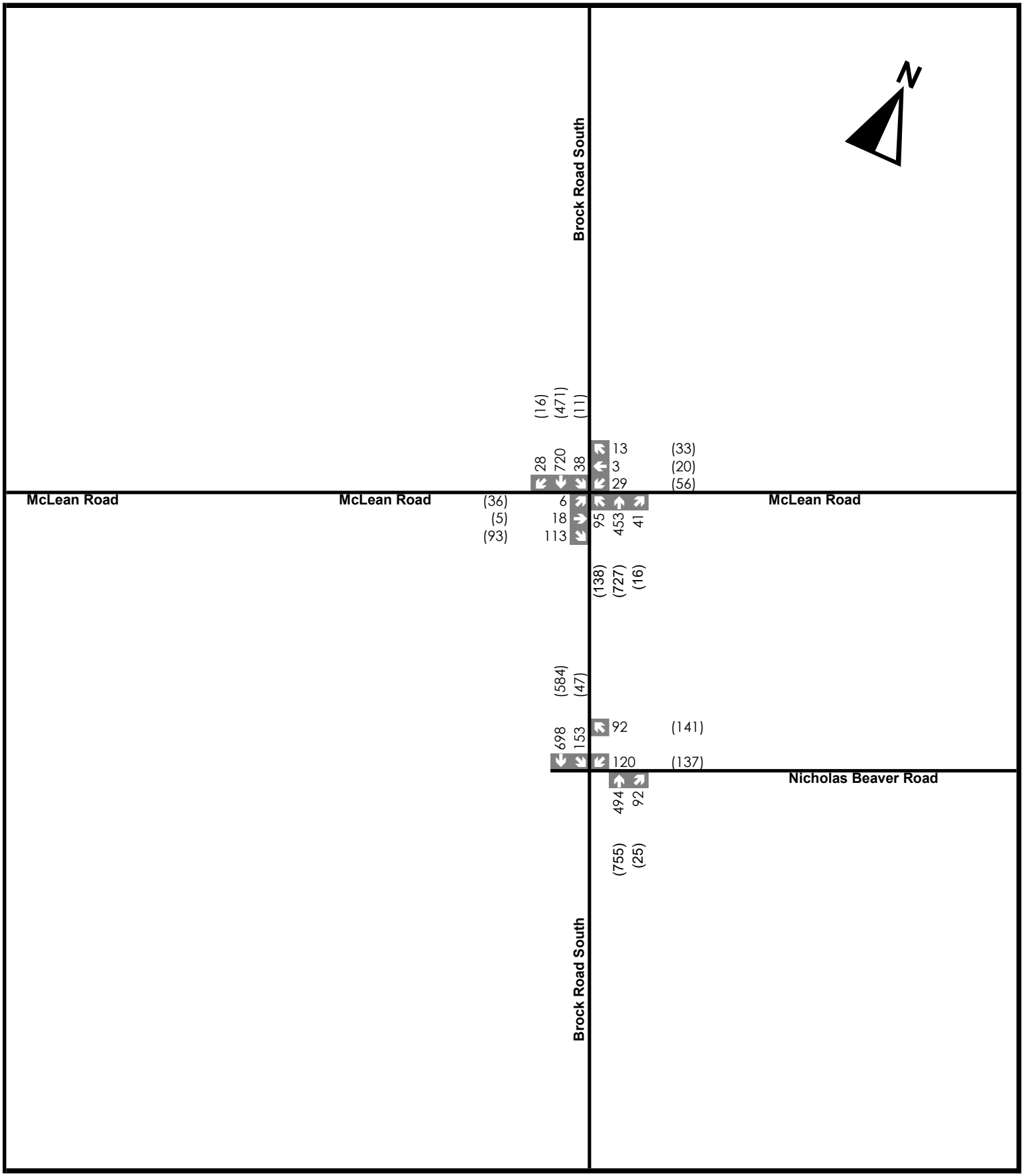
Table 4: Peak Hour Factors

Intersection	A.M.	P.M.
Brock Road South at McLean Road	0.88	0.95
Brock Road South at Nicholas Beaver Road	0.92	0.87

2.8 Intersection Operations

The traffic operations at the study intersections were analyzed based on observed traffic volumes during the weekday a.m. and p.m. peak hours, as illustrated in **Figure 4**. **Table 5** and **Table 6** summarize the existing traffic operations and queuing assessments within the study area, respectively.

Detailed capacity analyses are included in **Appendix G**.



Legend	7456 McLean Road & 197 Brock Road South	CROZIER CONSULTING ENGINEERS	Figure 4
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes	2025 Existing Volumes		Project No. 2792-7289 Date. 2026.02.13 Analyst. Ramy Kamal

Table 5: 2025 Existing Operations

Intersection (Control)	Movement	Performance Metrics					
		LOS[1]		Control Delay (s)		v/c ratio[2]	
		AM	PM	AM	PM	AM	PM
Brock Road South at McLean Road (Signalized)	**Overall**	**B**	**B**	**19.9**	**17.2**	**0.44**	**0.37**
	EBL	C	C	32.4	34.9	0.04	0.15
	EBTR	D	D	35.2	39.0	0.21	0.11
	WBL	C	C	27.3	31.5	0.17	0.25
	WBTR	C	D	30.0	36.6	0.03	0.11
	NBL	B	A	11.8	8.7	0.42	0.28
	NBT	B	B	15.4	13.2	0.33	0.40
	NBR	B	A	12.7	9.9	0.03	0.01
	SBL	B	B	13.0	13.1	0.10	0.05
	SBT	C	B	21.5	16.5	0.56	0.31
	SBR	B	B	15.1	13.8	0.02	0.01
Brock Road South at Nicholas Beaver Road (Signalized)	**Overall**	**B**	**B**	**13.0**	**14.7**	**0.42**	**0.47**
	WBL	D	D	43.9	46.2	0.54	0.59
	WBR	D	D	36.8	38.1	0.07	0.11
	NBTR	B	B	13.1	12.2	0.39	0.45
	SBL	A	A	5.7	5.5	0.29	0.14
	SBT	A	A	6.2	5.7	0.35	0.29

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU).
The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM 2000).

Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection. In addition, all v/c ratios greater than 0.85 for through or shared through/turn movements and v/c ratios greater than 0.90 for dedicated left or right turn movements are outlined and highlighted.

As indicated in **Table 5**, both intersections are currently operating acceptably with LOS "B" during the weekday a.m. and p.m. peak hours.

The signalized intersection of Brock Road South at McLean Road operates with a LOS "B" during the weekday a.m. and p.m. peak hours. A maximum volume-to-capacity ratio of 0.44 and 0.37 was observed during the weekday a.m. and weekday p.m. peak hours, respectively.

The signalized intersection of Brock Road South at Nicholas Beaver Road operates with a "LOS "B" during the weekday a.m. and p.m. peak hours. A maximum volume-to-capacity ratio of 0.42 and 0.47 was observed during the weekday a.m. and weekday p.m. peak hours, respectively.

Table 6 outlines the results of the 2025 existing conditions queuing assessment.

Table 6: 2025 Existing Queuing Assessment

Intersection	Performance Metrics			
	Movement	95th Percentile Queue Length (m)[1]		Auxiliary Lane Storage Length (m)
		AM	PM	
Brock Road South at McLean Road (Signalized)	EBL	3.9	12.3	**54.0**
	WBL	11.2	17.6	**55.0**
	NBL	17.9	23.2	**142.0**
	NBR	0.0	0.0	**66.0**
	SBL	8.2	3.5	**62.0**
	SBR	0.1	0.0	**62.0**
Brock Road South at Nicholas Beaver Road (Signalized)	WBL	45.0	50.4	**56.0**
	SBL	15.7	6.0	**21.0**

Note 1: 95th Percentile Queue Lengths were used from Synchro reports.

Under the 2025 existing conditions, the auxiliary storage lengths are not exceeding and have reserve capacity to accommodate future traffic volumes.

3.0 Future Background Conditions

3.1 Study Horizons

Following consultation with the Township and County and confirmation with Municipality and County Staff, the horizon years of 2026 (full build-out), 2031 (five-year horizon) was considered to be appropriate for analysis purposes.

3.2 Traffic Growth Rates

The County of Wellington confirmed the growth rate (compounded annually) to be used for all corridors and movements in the Study Area in the ToR response. The updated horizon years to reflect the re-submission of the TIS is provided in **Table 7**.

Table 7: Background Growth Rates

Intersection	Growth Rates	
	2025-2026	2026-2031
Brock Road South	2%	
Mclean Road		
Nicholas Beaver Drive		

The 2026 and 2031 future background traffic volumes are also illustrated in **Figure 5** and **Figure 6**, respectively.

3.3 Background Developments

Per consultation with the County of Wellington and the Township of Puslinch, five (5) background developments were identified as part of the study area. The background developments are summarized in **Table 8**.

Table 8: Summary of Background Developments

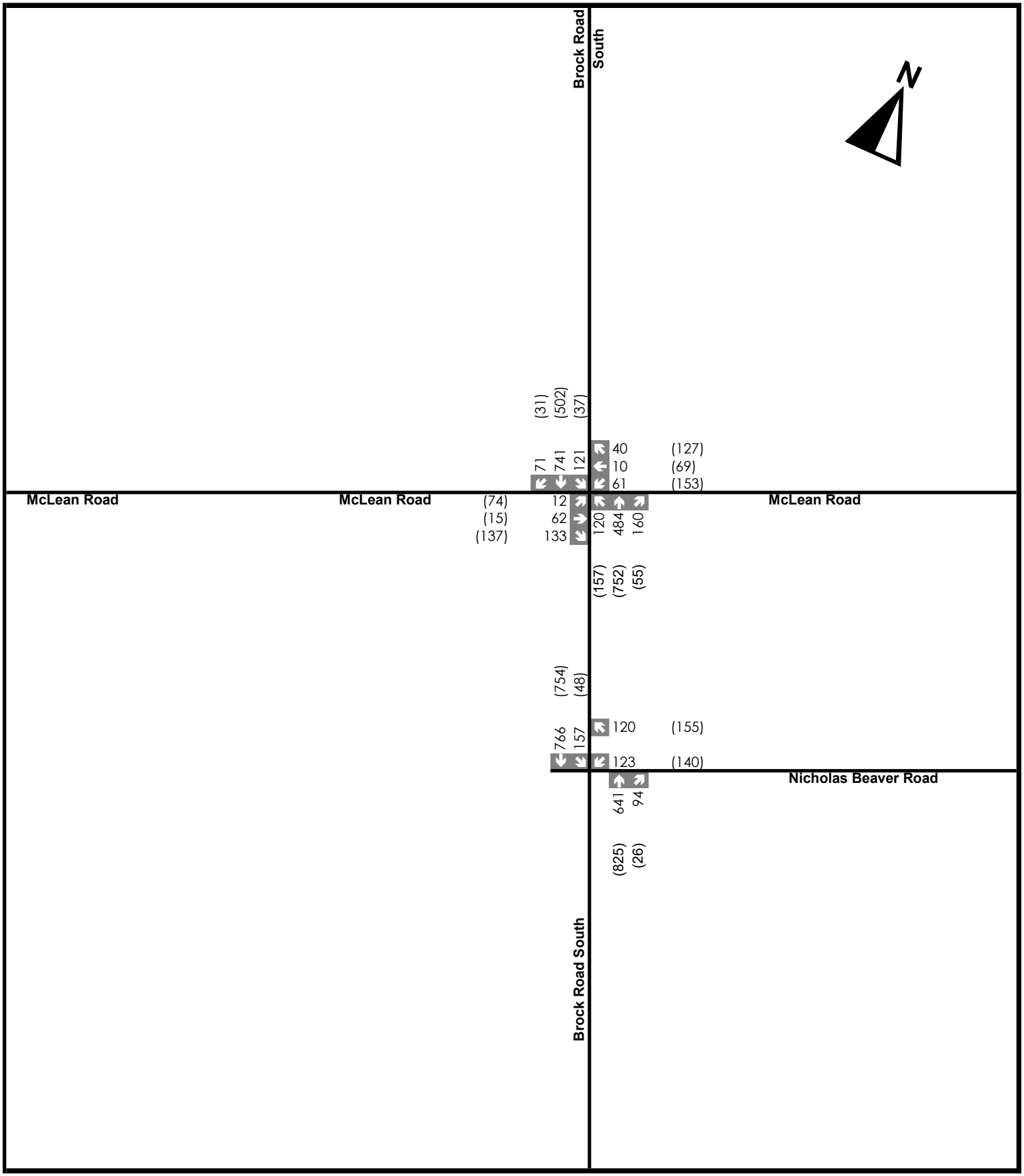
Developments	Land Use	Referenced TIS
7434 McLean Road (Adjacent Wheelking Site)	Industrial	Paradigm
Truckline Site (West of Wheelking)	Truck Distribution Terminal	Paradigm
128 Brock Road South	Manufacturing	Paradigm
7475 McLean Road East	Industrial	GHD
7504 McLean Road East	Industrial	Paradigm

Site generated trip figures for each background development site, as supplied by the Township and their peer reviewer, are available in **Appendix A**.

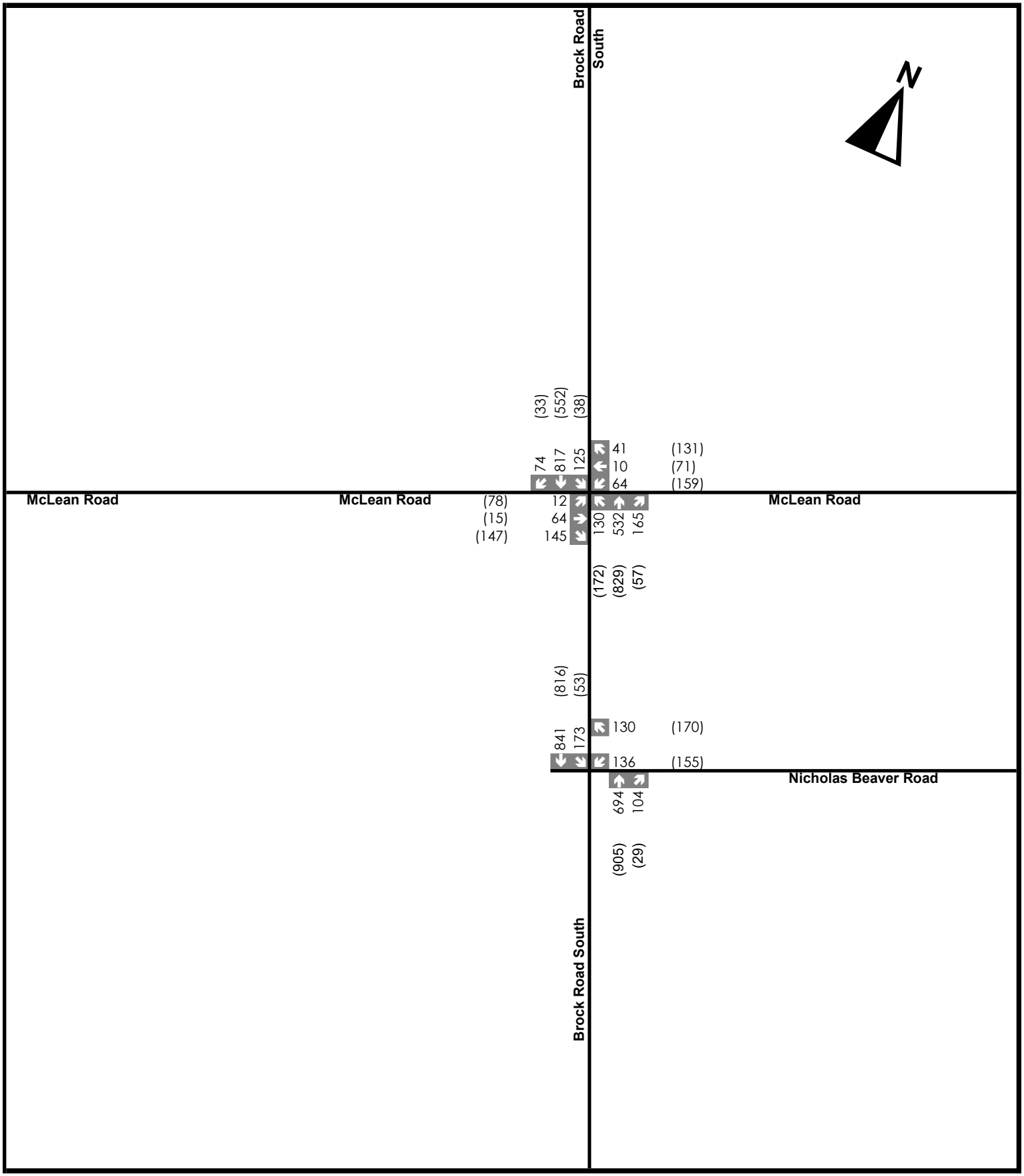
3.4 Future Roadway Improvements

The County of Wellington Road Master Action Plan (December 2021) highlights Brock Road (Wellington Road 46) as a roadway in need of improvement through widening and/or a road diet. However, no definitive improvements are planned and the proposed improvements outlined in the County of Wellington Road Master Action plan occur north of the subject lands, therefore they are not relevant to the study. No other improvements within the study horizons within the study area were noted.

Appendix B contains excerpts from the Wellington County Road Master Action Plan.



Legend	7456 McLean Road & 197 Brock Road South		Figure 5
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes	2026 Future Background Volumes	CROZIER CONSULTING ENGINEERS	Project No. 2792-7289 Date. 2026.02.13 Analyst. Ramy Kamal



Legend

xx A.M. Peak Hour Traffic Volumes
(xx) P.M. Peak Hour Traffic Volumes

7456 McLean Road & 197 Brock Road South

2031 Future Background Volumes

CROZIER CONSULTING ENGINEERS

Figure 6

Project No. 2792-7289
Date. 2026.02.13
Analyst. Ramy Kamal

3.5 Intersection Operations

Traffic operations at the study intersections were analyzed following addition of volumes from associated growth rates and background developments in the vicinity of the subject development.

The future background intersection operations at the study intersections were analyzed using the 2026 and 2031 future background traffic volumes illustrated previously in **Figure 5** and **Figure 6**, respectively.

Table 9 and **Table 10** summarizes the 2026 and 2031 future background Levels of Service, respectively. Detailed capacity analyses are included in **Appendix H**.

Table 9: 2026 Future Background Operations

Intersection (Control)	Movement	Performance Metrics					
		LOS[1]		Control Delay (s)		v/c ratio[2]	
		AM	PM	AM	PM	AM	PM
Brock Road South at McLean Road (Signalized)	**Overall**	**C**	**C**	**25.7**	**25.4**	**0.61**	**0.53**
	EBL	C	C	32.4	33.3	0.07	0.25
	EBTR	D	D	46.3	39.7	0.69	0.20
	WBL	C	C	26.7	28.4	0.33	0.48
	WBTR	C	D	27.7	36.7	0.08	0.47
	NBL	B	B	20.0	14.3	0.60	0.39
	NBT	C	C	22.7	22.7	0.43	0.52
	NBR	B	B	19.2	17.0	0.12	0.05
	SBL	B	B	14.8	17.6	0.33	0.19
	SBT	C	C	26.7	23.8	0.64	0.40
	SBR	B	B	18.6	19.6	0.05	0.03
Brock Road South at Nicholas Beaver Road (Signalized)	**Overall**	**B**	**B**	**13.9**	**14.5**	**0.49**	**0.51**
	WBL	D	D	44.2	46.2	0.56	0.60
	WBR	D	D	36.9	37.9	0.10	0.12
	NBTR	B	B	14.4	12.8	0.48	0.49
	SBL	A	A	6.4	5.9	0.35	0.16
	SBT	A	A	6.5	6.3	0.39	0.37

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU).
The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM 2000).

Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection. In addition, all v/c ratios greater than 0.85 for through or shared through/turn movements and v/c ratios greater than 0.90 for dedicated left or right turn movements are outlined and highlighted.

Table 10: 2031 Future Background Operations

Intersection (Control)	**Performance Metrics**						
	Movement	**LOS[1]**		**Control Delay** (s)		**v/c ratio[2]**	
		AM	**PM**	**AM**	**PM**	**AM**	**PM**
Brock Road South at McLean Road (Signalized)	**Overall**	**C**	**C**	**28.0**	**26.1**	**0.68**	**0.57**
	EBL	C	C	32.5	33.5	0.07	0.26
	EBTR	D	D	50.7	40.0	0.74	0.21
	WBL	C	C	27.2	28.7	0.35	0.51
	WBTR	C	D	27.7	37.0	0.08	0.49
	NBL	C	B	27.8	15.1	0.71	0.46
	NBT	C	C	23.7	23.9	0.47	0.57
	NBR	B	B	19.6	17.3	0.13	0.05
	SBL	B	B	15.5	18.2	0.36	0.22
	SBT	C	C	29.5	24.7	0.72	0.44
	SBR	B	B	19.2	19.9	0.05	0.03
Brock Road South at Nicholas Beaver Road (Signalized)	**Overall**	**B**	**B**	**14.6**	**15.3**	**0.54**	**0.56**
	WBL	D	D	46.1	48.2	0.61	0.65
	WBR	D	D	37.0	37.8	0.10	0.13
	NBTR	B	B	15.4	13.7	0.53	0.54
	SBL	A	A	7.2	6.7	0.40	0.19
	SBT	A	A	6.9	6.7	0.43	0.41

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU).
The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM 2000).

Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection. In addition, all v/c ratios greater than 0.85 for through or shared through/turn movements and v/c ratios greater than 0.90 for dedicated left or right turn movements are outlined and highlighted.

As indicated in **Table 10,** both intersections are expected to continue to operate acceptably with LOS "C" during the weekday a.m. and p.m. peak hours.

The signalized intersection of Brock Road South at McLean Road is expected to continue to operate with a LOS "C" during the weekday a.m. and p.m. peak hours. A maximum volume-to-capacity ratio of 0.68 and 0.57 is expected during the weekday a.m. and weekday p.m. peak hours, respectively.

The signalized intersection of Brock Road South at Nicholas Beaver Road is expected to continue to operate with a LOS "B" during the weekday a.m. and p.m. peak hours. A maximum volume-to-capacity ratio of 0.54 and 0.56 is expected during the weekday a.m. and weekday p.m. peak hours, respectively.

Table 11 and **Table 12** outline the results of the 2026 and 2031 future background queuing assessment, respectively.

Table 11: 2026 Future Background Queuing Assessment

Intersection	Performance Metrics			
	Movement	95th Percentile Queue Length (m)[1]		Auxiliary Lane Storage Length (m)
		AM	PM	
Brock Road South at McLean Road (Signalized)	EBL	6.0	20.8	**54.0**
	WBL	19.5	40.9	**55.0**
	NBL	24.9	31.6	**142.0**
	NBR	13.0	1.1	**66.0**
	SBL	23.8	9.8	**62.0**
	SBR	5.2	0.0	**62.0**
Brock Road South at Nicholas Beaver Road (Signalized)	WBL	46.2	51.4	**56.0**
	SBL	16.2	6.1	**21.0**

Note 1: 95th Percentile Queue Lengths were used from Synchro reports.

Table 12: 2031 Future Background Queuing Assessment

Intersection	Performance Metrics			
	Movement	95th Percentile Queue Length (m)[1]		Auxiliary Lane Storage Length (m)
		AM	PM	
Brock Road South at McLean Road (Signalized)	EBL	6.0	21.6	**54.0**
	WBL	20.4	42.1	**55.0**
	NBL	37.8	35.2	**142.0**
	NBR	13.2	1.6	**66.0**
	SBL	24.7	10.2	**62.0**
	SBR	5.7	0.0	**62.0**
Brock Road South at Nicholas Beaver Road (Signalized)	WBL	50.7	**56.6**	**56.0**
	SBL	17.8	6.5	**21.0**

Note 1: 95th Percentile Queue Lengths were used from Synchro reports.

Under the 2031 future background conditions, queuing assessment results in instances where the 95th percentile queues exceed the auxiliary turn lane storage length for the westbound left-turn at Brock Road South and McLean Road.

4.0 Site Generated Traffic

The proposed development will result in additional vehicles on the surrounding network that previously did not exist, and the following section outlines the methodology used to estimate the generation and distribution of trips expected to be generated by the proposed development.

4.1 ITE Trip Generation

The Institute of Transportation Engineers (ITE) Trip Generation Manual 11th Edition was used to forecast the number of trips generated by the proposed mixed-use commercial and gas station development. As the development proposes a commercial development with multiple land uses, the most appropriate land use was determined to be Truck Stop, Land Use Code (950), for the Truck Gas Station portion of the development, Convenience Store/Gas Station, Land Use Code (945), for the vehicle gas station and convenience store portion of the development, and Fast-Food Restaurant with Drive-Through Window, Land Use Code (934), for the restaurant portion of the development. Average rates were used for both land uses and peak periods, considering the R^2 values for the fitted curve equations are less than 0.6 or are not provided.

Per discussions with Township and County staff, the number of pumps were assumed to be six (6) for the truck gas station and eight (8) for the regular vehicle gas station.

Relevant excerpts from the ITE Trip Generation Manual 11th Edition are included in **Appendix I.**

Table 13 summarizes the number of trips forecasted to be generated by the proposed development.

Table 13: ITE Trip Generation

ITE Land Use Category	Units	Trip Type	A.M Peak Hour Trips Generated			P.M Peak Hour Trips Generated		
			IN	OUT	TOTAL	IN	OUT	TOTAL
Truck Gas Station - LUC 950 - Truck Stop	6 Pumps	Primary	15	16	**31**	21	18	**39**
		Pass-by	26	27	**53**	28	25	**53**
Vehicle Gas Station Pumps + Convenience Store - LUC 945 - Convenience Store/Gas Station	8 Pumps	Primary	25	25	**50**	33	33	**50**
		Pass-by	39	39	**71**	41	41	**82**
Fast Food Restaurant with Drive Thru - LUC 934 - Fast-Food Restaurant with Drive-Through Window	4,080 ft^2	Primary	47	44	**91**	35	33	**68**
		Pass-by	46	45	**91**	35	32	**67**
Combined Site		**Total Primary**	87	85	**172**	89	84	**173**
		Total Pass-by	111	111	**222**	104	98	**202**
		Total Trips	**198**	**196**	**394**	**193**	**182**	**375**

As shown in **Table 13**, during the weekday a.m. peak hour, the subject site is projected to generate 172 primary trips (87 inbound, 85 outbound) and 222 pass-by trips (111 inbound, 111 outbound). For the weekday p.m. peak hour, trip generation is anticipated to be 173 primary trips (89 inbound, 84 outbound) and 202 pass-by trips (104 inbound, 98 outbound).

4.2 Trip Distribution and Assignment

The Transportation Tomorrow Survey (TTS) is a comprehensive travel data survey conducted in the Greater Toronto and Hamilton Area. Data from the 2016 TTS is often used to determine the peak hour trip distribution at the site. However, due to the Study Area (GTA Zones 8317 and 8310) not being built out at the time of the survey in 2016 and a lack of commercial land use in the area, the data from TTS was deemed insufficient to be statistically significant.

As a result, the trip distribution for the Subject Development was determined using existing travel patterns. The primary trips were distributed to the boundary road network proportionally based on the recorded 2023 Turning Movement Counts at the intersections of Brock Road South at McLean Road and Brock Road South at Nicholas Beaver Road.

Table 14 summarizes the primary site trip distribution.

Table 14: Site Distribution

Entrance to Boundary Road Network (Eastbound traffic enters at "West via Countryside Drive")	A.M. Peak Hour		P.M. Peak Hour	
	In	Out	In	Out
North via Brock Road S	44.5%	26.8%	27.7%	44.3%
South via Brock Road S	33.2%	46.6%	43.3%	40.2%
East via McLean Road	2.5%	5.5%	6.1%	1.8%
West via McLean Road	7.8%	7.2%	7.4%	9.7%
East via Nicholas Beaver Road	12.0%	13.9%	15.5%	4.0%
Total	100%	100%	100%	100%

The pass-by percentages for each land use were acquired via ITE's Vehicle Pass-By Rate excel tables. It must be noted that due to the lack of trip rates for Land Use 950, the pass-by percentages for Land Use 944 were utilized.

Table 15 summarizes the pass-by rates for each land use in the development.

Table 15: Vehicle Pass-by Rates by Land Use

Direction	A.M.	P.M.
Truck Gas Station LUC 950 - Truck Stop[1]	63%	57%
Vehicle Gas Station Pumps + Convenience Store LUC 945 - Convenience Store/Gas Station	60%	56%
Fast Food Restaurant with Drive Thru LUC 934 - Fast-Food Restaurant with Drive-Through Window	50%	55%

Note 1: LUC 944's pass-by rate was utilized due to no data being provided for LUC 950.

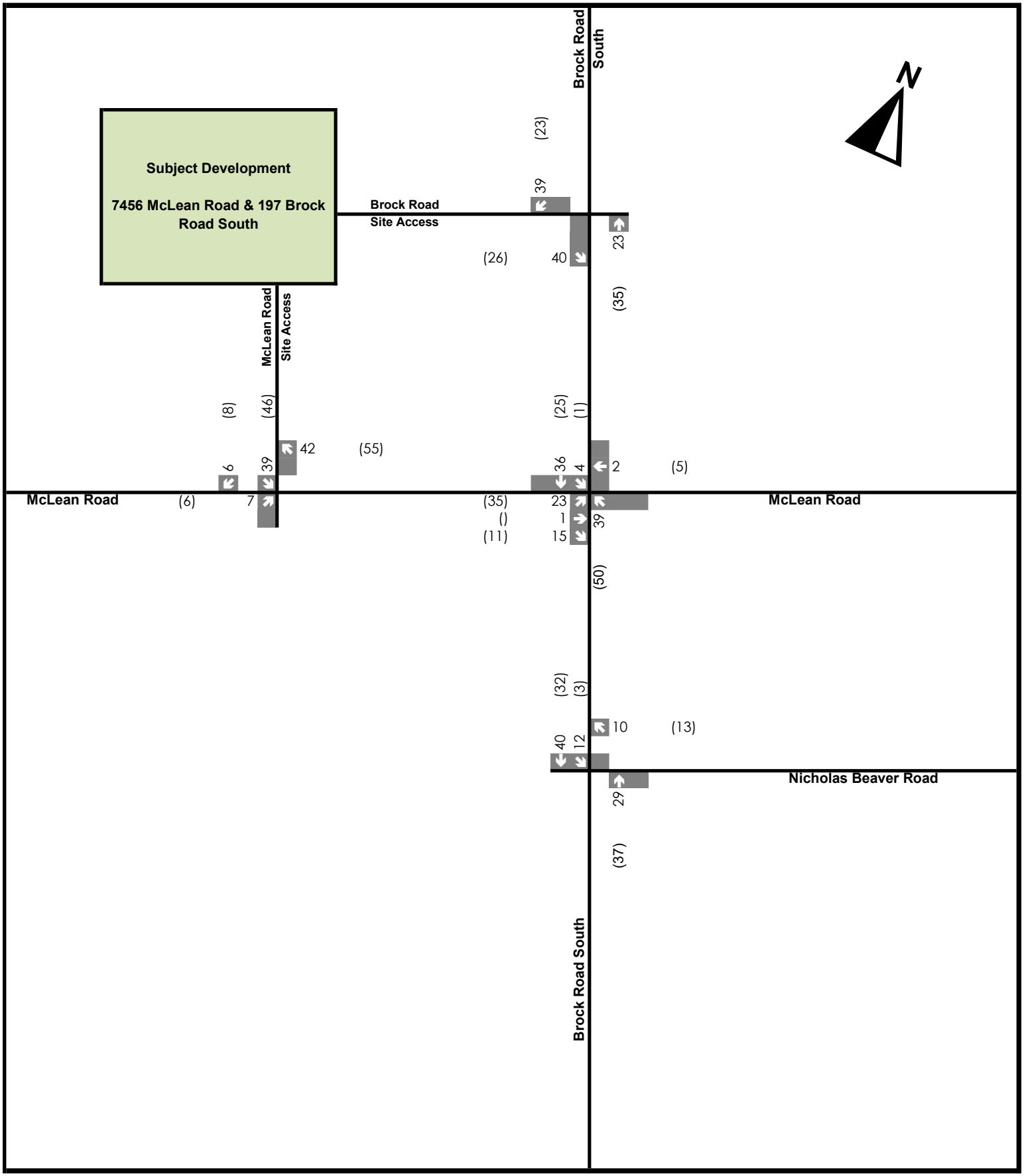
The pass-by trips were distributed to the boundary road network proportionally based on the recorded 2023 Turning Movement Counts at the intersection of Brock Road South at McLean Road using the through movements in each direction. **Table 16** summarizes the pass-by distribution for the proposed development.

Table 16: Pass-by Distribution

Direction	A.M.	P.M.
Northbound via Brock Road S	37.9%	59.5%
Southbound via Brock Road S	60.3%	38.5%
Eastbound via McLean Road	1.5%	0.4%
Westbound via McLean Road S	0.3%	1.6%
Total	100%	100%

The trip assignment for primary and pass-by trips were established by applying each of the distributions to the proposed development trips.

Figure 7 outlines the primary trips forecast for the proposed development, while **Figure 8** outlines the pass-by trips forecast for the proposed development.



Legend

xx A.M. Peak Hour Traffic Volumes
(xx) P.M. Peak Hour Traffic Volumes

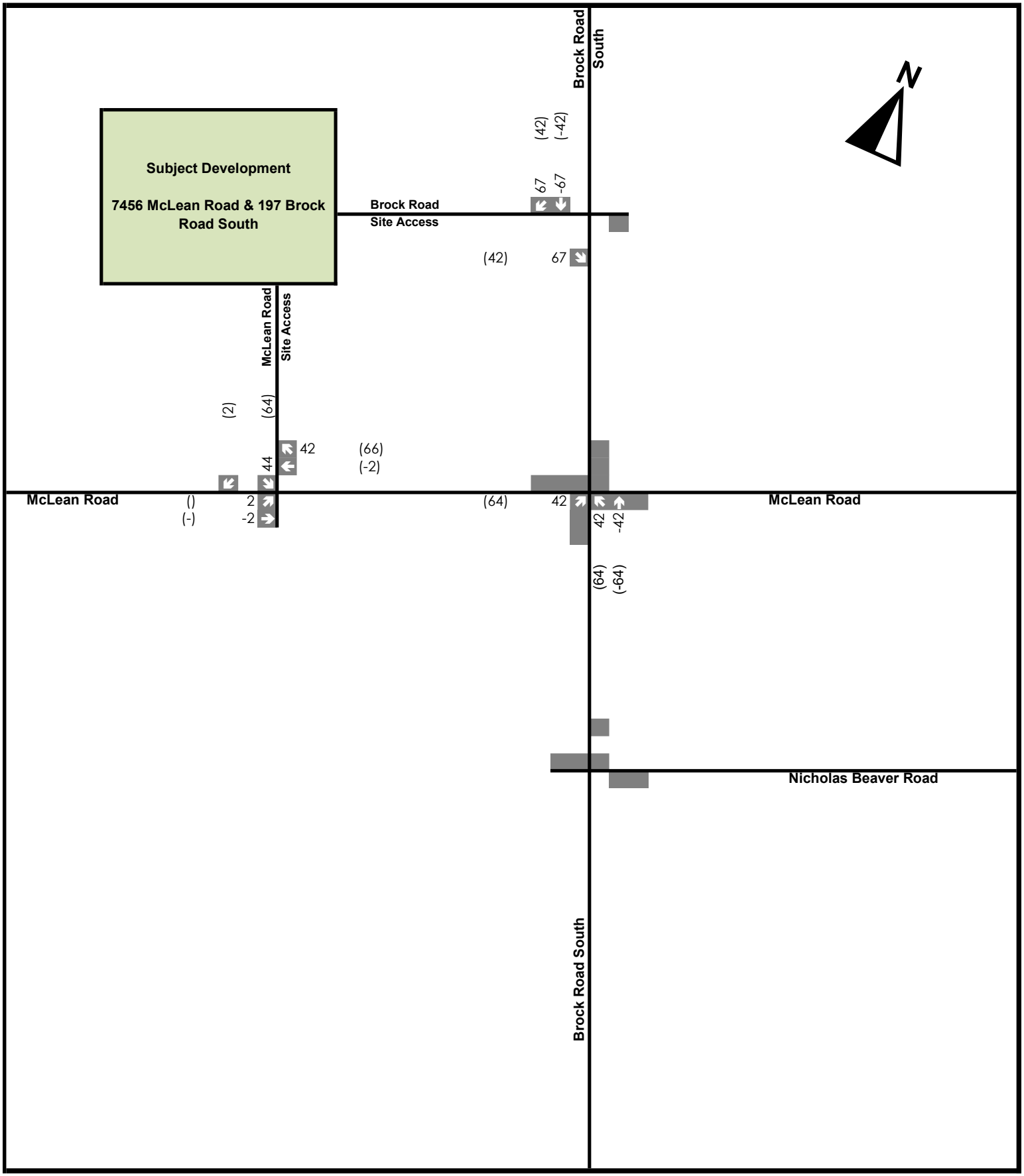
7456 McLean Road & 197 Brock Road South

Primary Trip Assignment

CROZIER CONSULTING ENGINEERS

Figure 7

Project No. 2792-7289
Date. 2026.02.13
Analyst. Ramy Kamal



Legend	7456 McLean Road & 197 Brock Road South		Figure 8
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes	Pass-By Trip Assignment	CROZIER CONSULTING ENGINEERS	Project No. 2792-7289 Date. 2026.02.13 Analyst. Ramy Kamal

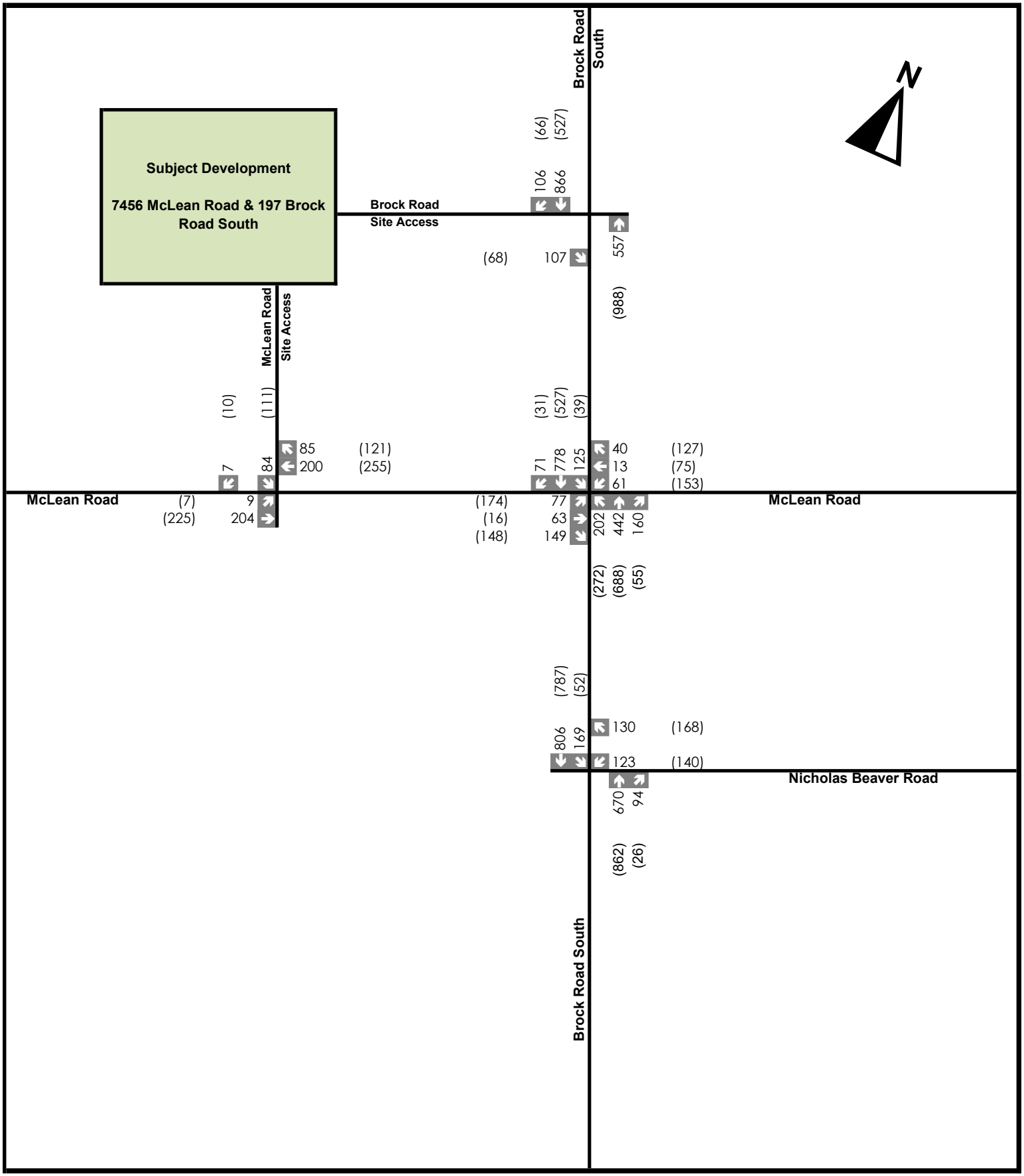
5.0 Future Total Traffic Conditions

5.1 Intersection Operations

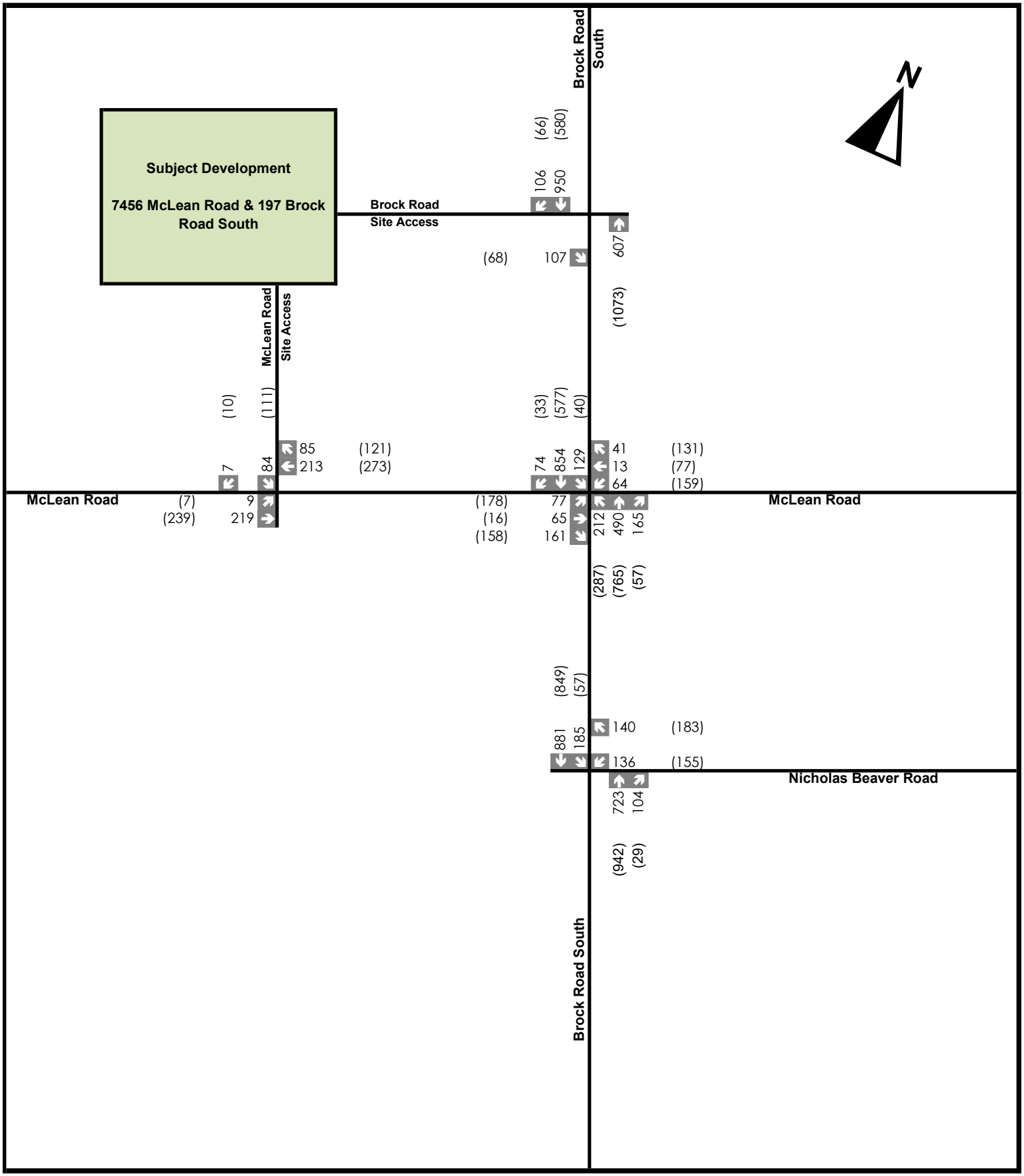
Traffic operations at the study intersections were analyzed with the addition of the site generated traffic to the future background traffic. The total 2026 and 2031 traffic volumes are illustrated in **Figure 9** and **Figure 10**, respectively.

Table 17 and **Table 18** summarizes the 2026 and future total traffic operations for the study intersections, respectively.

Detailed capacity analyses are included in **Appendix J**.



Legend	7456 McLean Road & 197 Brock Road South		Figure 9
xx A.M. Peak Hour Traffic Percent (xx) P.M. Peak Hour Traffic Percent	2026 Future Total Volumes	CROZIER CONSULTING ENGINEERS	Project No. 2792-7289 Date. 2026.02.13 Analyst. Ramy Kamal



Legend

xx A.M. Peak Hour Traffic Percent
(xx) P.M. Peak Hour Traffic Percent

7456 McLean Road & 197 Brock Road South

2031 Future Total Volumes

CROZIER CONSULTING ENGINEERS

Figure 10

Project No. 2792-7289
Date. 2026.02.13
Analyst. Ramy Kamal

Table 17: 2026 Future Total Operations

Intersection (Control)	Movement	Performance Metrics					
		LOS[1]		Control Delay (s)		v/c ratio[2]	
		AM	PM	AM	PM	AM	PM
Brock Road South at McLean Road (Signalized)	**Overall**	**C**	**C**	**33.0**	**27.1**	**0.90**	**0.69**
	EBL	C	C	29.2	31.9	0.30	0.49
	EBTR	**E**	D	**61.5**	40.3	0.82	0.21
	WBL	C	C	30.9	31.1	0.36	0.50
	WBTR	D	D	35.3	50.2	0.12	0.69
	NBL	**F**	C	**83.4**	20.2	**1.02**	0.69
	NBT	C	C	21.1	21.8	0.38	0.47
	NBR	B	B	18.4	16.9	0.12	0.05
	SBL	B	B	14.2	17.5	0.31	0.18
	SBT	C	C	26.7	24.1	0.67	0.42
	SBR	B	B	18.1	19.7	0.05	0.03
Brock Road South at Nicholas Beaver Road (Signalized)	**Overall**	**B**	**B**	**14.1**	**14.7**	**0.51**	**0.52**
	WBL	D	D	44.2	46.0	0.56	0.60
	WBR	D	D	37.0	37.9	0.10	0.13
	NBTR	B	B	14.8	13.1	0.51	0.51
	SBL	A	A	6.8	6.2	0.38	0.18
	SBT	A	A	6.6	6.5	0.41	0.39
Brock Road South at Proposed Right-in/Right Out Site Access (Stop)	**Overall**	**B**	**B**	**0.9**	**0.5**	**0.37**	**0.32**
	EBR	B	B	14.5	11.0	0.23	0.11
	NBT	A	A	0.0	0.0	0.18	0.32
	SBT	A	A	0.0	0.0	0.37	0.22
	SBTR	A	A	0.0	0.0	0.25	0.15
McLean Road at Proposed Site Access (Stop)	**Overall**	**B**	**C**	**2.1**	**2.6**	**0.18**	**0.27**
	EBLT	A	A	0.4	0.3	0.01	0.01
	WBTR	A	A	0.0	0.0	0.18	0.24
	SBLR	B	C	12.9	15.1	0.18	0.27

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU).
The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM 2000).

Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection. In addition, all v/c ratios greater than 0.85 for through or shared through/turn movements and v/c ratios greater than 0.90 for dedicated left or right turn movements are outlined and highlighted.

Table 18: 2031 Future Total Operations

Intersection (Control)	Movement	Performance Metrics					
		LOS[1]		Control Delay (s)		v/c ratio[2]	
		AM	PM	AM	PM	AM	PM
Brock Road South at McLean Road (Signalized)	**Overall**	**D**	**C**	**39.3**	**28.3**	**1.01**	**0.75**
	EBL	C	C	29.3	32.0	0.30	0.51
	EBTR	**E**	D	**72.9**	40.4	**0.88**	0.22
	WBL	C	C	31.3	31.5	0.39	0.53
	WBTR	D	D	35.3	51.6	0.13	0.71
	NBL	**F**	C	**132.0**	26.1	**1.16**	0.77
	NBT	C	C	21.9	22.9	0.43	0.53
	NBR	B	B	18.6	17.1	0.13	0.05
	SBL	B	B	14.4	17.9	0.34	0.21
	SBT	C	C	28.7	24.9	0.73	0.46
	SBR	B	B	18.2	19.8	0.05	0.03
Brock Road South at Nicholas Beaver Road (Signalized)	**Overall**	**B**	**B**	**14.9**	**15.4**	**0.56**	**0.57**
	WBL	D	D	46.1	47.9	0.61	0.65
	WBR	D	D	37.1	37.8	0.11	0.14
	NBTR	B	B	16.0	14.0	0.55	0.56
	SBL	A	A	7.7	7.1	0.44	0.22
	SBT	A	A	7.1	6.8	0.45	0.42
Brock Road South at Proposed Right-in/Right Out Site Access (Stop)	**Overall**	**C**	**B**	**0.9**	**0.4**	**0.41**	**0.34**
	EBR	C	B	15.4	11.3	0.25	0.11
	NBT	A	A	0.0	0.0	0.19	0.34
	SBT	A	A	0.0	0.0	0.41	0.25
	SBTR	A	A	0.0	0.0	0.27	0.17
McLean Road at Proposed Site Access (Stop)	**Overall**	**B**	**C**	**2.1**	**2.6**	**0.19**	**0.28**
	EBLT	A	A	0.4	0.3	0.01	0.01
	WBTR	A	A	0.0	0.0	0.19	0.25
	SBLR	B	C	13.3	15.8	0.19	0.28

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU). The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM 2000).

Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection. In addition, all v/c ratios greater than 0.85 for through or shared through/turn movements and v/c ratios greater than 0.90 for dedicated left or right turn movements are outlined and highlighted.

As indicated in **Table 18,** in the 2031 future total scenario, the signalized intersection of Brock Road South at McLean Road is expected to decrease from operating at a LOS "C" and "C" to operate with a LOS "D" and "C" during the weekday a.m. and p.m. peak hours, respectively, when compared to 2031 Future Background conditions. A maximum volume-to-capacity ratio of 1.01 (0.33 increase from 2031 Future Background) and 0.75 (0.18 increase from 2031 Future Background) is expected during the weekday a.m. and weekday p.m. peak hours, respectively.

The signalized intersection of Brock Road South at Nicholas Beaver Road is expected to continue to operate with a "LOS "B" during the weekday a.m. and p.m. peak hours. A maximum volume-to-capacity ratio of 0.56 (0.02 increase from 2031 Future Background) and 0.57 (0.02 increase from 2031 Future Background) is expected during the weekday a.m. and weekday p.m. peak hours, respectively. These metrics indicate that the intersection is expected to operate efficiently with minimal delays and reserve capacity to accommodate future increases in traffic volume.

Both proposed Site accesses expected to operate acceptably with LOS "C" or better during the weekday a.m. and p.m., peak hours.

Table 19 and **Table 20** outline the results of the 2026 and 2031 future total queuing assessment.

Table 19: 2026 Future Total Queuing Assessment

Intersection	Performance Metrics			
	Movement	95th Percentile Queue Length (m)[1]		Auxiliary Lane Storage Length (m)
		AM	PM	
Brock Road South at McLean Road (Signalized)	EBL	23.5	43.8	**54.0**
	WBL	19.5	40.6	**55.0**
	NBL	75.9	60.5	**142.0**
	NBR	13.0	1.1	**66.0**
	SBL	24.5	10.3	**62.0**
	SBR	5.2	0.0	**62.0**
Brock Road South at Nicholas Beaver Road (Signalized)	WBL	46.2	51.4	**56.0**
	SBL	17.5	6.5	**21.0**

Note 1: 95th Percentile Queue Lengths were used from Synchro reports.

Table 20: 2031 Future Total Queuing Assessment

Intersection	Performance Metrics			
	Movement	95th Percentile Queue Length (m)[1]		Auxiliary Lane Storage Length (m)
		AM	PM	
Brock Road South at McLean Road (Signalized)	EBL	23.5	44.7	**54.0**
	WBL	20.4	42.1	**55.0**
	NBL	90.8	78.1	**142.0**
	NBR	13.2	1.6	**66.0**
	SBL	25.4	10.8	**62.0**
	SBR	5.7	0.0	**62.0**
Brock Road South at Nicholas Beaver Road (Signalized)	WBL	50.7	**56.5**	**56.0**
	SBL	19.0	7.0	**21.0**

Note 1: 95th Percentile Queue Lengths were used from Synchro reports.

Similar to the 2031 future background conditions, the 2031 future total queuing assessment results in an instance where the 95th percentile queues exceed the auxiliary turn lane storage length for the westbound left-turn at Brock Road South and McLean Road during the p.m. peak hour.

5.2 Future Total Recommendations

In an effort to mitigate projected delays and lower critical v/c ratios, signal timing adjustments were examined at the intersection of Brock Road South and McLean Road in the northbound left-turn and eastbound through/right-turn lanes under the 2031 future total a.m. scenario. A summary of the proposed signal timing plan changes is provided in **Table 18**.

Detailed adjusted signal timing future total capacity analyses are included in **Appendix K**.

Table 21: Proposed Signal Timing Plan

Intersection	Cycle Length	Splits				
		Movement	Minimum Initial	Minimum Split	Total Split	Recall Mode
Brock Road South at McLean Road (Signalized)	120.0	**EBL**	5.0	9.0	14.0	None
		EBTR	15.0	22.0	35.0	None
		WBL	5.0	9.0	16.0	None
		WBTR	15.0	22.0	37.0	None
		NBL	8.0	12.0	21.0	Max
		NBT	40.0	47.0	57.0	Max
		NBR	40.0	47.0	57.0	Max
		SBL	8.0	12.0	12.0	None
		SBT	40.0	47.0	48.0	Min
		SBR	40.0	47.0	48.0	Min

The results of the adjusted signal timing at the intersection are shown in **Table 22** and **Table 23**.

Table 22: 2031 Future Total Operations – Signal Timings Adjusted

Intersection (Control)	Movement	Performance Metrics					
		LOS[1]		Control Delay		v/c ratio[2]	
		AM	PM	AM	PM	AM	PM
Brock Road South at McLean Road (Signalized)	**Overall**	**D**	**C**	**35.1**	**27.7**	**0.88**	**0.67**
	EBL	C	D	33.9	42.1	0.32	0.65
	EBTR	**E**	D	**56.1**	41.3	0.76	0.22
	WBL	C	D	34.2	40.2	0.42	0.65
	WBTR	D	D	36.2	46.9	0.11	0.62
	NBL	**E**	B	**73.7**	19.7	**0.96**	0.63
	NBT	C	B	20.7	19.3	0.39	0.47
	NBR	B	B	17.9	14.6	0.13	0.05
	SBL	B	B	19.3	19.3	0.37	0.19
	SBT	D	C	35.0	26.2	0.79	0.47
	SBR	C	C	22.3	21.3	0.05	0.03

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU).
The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM 2000).

Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection. In addition, all v/c ratios greater than 0.85 for through or shared through/turn movements and v/c ratios greater than 0.90 for dedicated left or right turn movements are outlined and highlighted.

Table 23: 2031 Future Total Queuing Assessment – Signal Timings Adjusted

Intersection	Movement	Performance Metrics		
		95th Percentile Queue Length (m)[1]		Auxiliary Lane Storage Length (m)
		AM	PM	
Brock Road South at McLean Road (Signalized)	EBL	25.7	50.3	**54.0**
	WBL	22.3	**47.3**	**55.0**
	NBL	95.1	55.1	**142.0**
	NBR	13.2	1.2	**66.0**
	SBL	28.5	9.8	**62.0**
	SBR	0.3	0.0	**62.0**
Brock Road South at Nicholas Beaver Road (Signalized)	WBL	50.7	**56.5**	**56.0**
	SBL	19.0	7.0	**21.0**

Note 1: 95th Percentile Queue Lengths were used from Synchro reports.

The results of the signal adjustments in **Table 22** indicate that in the 2031 future total scenario, the intersection of Brock Road South at McLean Road operates at capacity with a maximum v/c ratio of 0.88 and 0.67 during the a.m. and p.m. peak hours, respectively.

Queue exceedances are also still present at Brock Road South and Nicholas Beaver Road. However, each instance of queue exceedance remains within 15 meters, or approximately two (2) vehicles, of the designated storage length. This level of excess queuing, when it occurs, can be supported by the auxiliary turn lane taper or the two-way left turn lane with limited effect on through traffic. It is recommended that these movements be monitored for future storage lane expansion.

These metrics indicate that the intersection is expected to operate adequately with acceptable delays and reserve capacity to accommodate future increases in traffic volume.

6.0 Site Access Review

Given the primary land-use for the development, gas station, the access to Brock Road is vital from an economic standpoint. To facilitate the development, one full moves site access is proposed via McLean Road and one restricted right-in/right-out (RIRO) access is proposed via Brock Road. This RIRO access is supported by the County's peer reviewer given that the concrete median along Brock Road was extended from the intersection with McLean Road northward beyond the proposed access in order to restrict the movements.

This section analyzes the proposed site accesses for the subject development from a safety perspective.

6.1 Sight Distance Assessment

The available sightlines at the proposed site access were measured and compared to the standards set out in the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR), June 2017. Sight distance was measured from the Site access using the following assumptions:

- A standard driver eye height of 1.08 m for a passenger car and 2.4 m for a truck, and
- A 4.4 m setback from the approximate extension of the outer curb to represent a vehicle waiting to exit the Site.

Intersection sight distance is calculated using Equation 9.9.1 from the GDGCR as outlined below:

$$ISD = 0.278 * V\ major * tg$$

Where:
ISD *= Intersection Sight Distance*
V *major = design speed of roadway (km/h)*
tg *= assumed time gap for vehicles to turn from stop onto roadway (s)*

Table 24 outlines the sight distance requirements for the proposed site access. **Figure 11** illustrates the sight lines at the site.

Table 24: Sight Distance Analysis

Feature	McLean Road Access	Brock Road Access
Access Type	Full moves	Right-In Right-Out
Posted Speed Limit	50 km/h	70 km/h
Assumed Design Speed	70 km/h	90 km/h
Base Time Gap (right turn)	Right Turn: 6.5 s Left turn: 7.5 s	Right Turn: 6.5 s
Additional Time Gap	None	None
Grade of Roadway	Less than 3%	Less than 3%
Horizontal Alignment of Roadway	Straight	Straight
Required Car Sight Distance	Left direction: 130 m Right direction: 170 m	Left direction: 165 m
Available Car Sight Distance	Left direction[1]: 200 + m Right direction[2]: 175 m	Left direction: 300 + m
Required Truck Sight Distance	Left direction: 175 m Right direction: 225 m	Left direction: 265 m
Available Truck Sight Distance	Left direction[1]: 200 + m Right direction[2]: 225 m	Left direction: 300 + m

Note 1: The McLean Road Site Access is spaced approximately 100m away from the intersection of McLean Road and Brock Road South. Sight lines through the intersection are clear and unobstructed, turning vehicles are expected to turn from Brock Road at speeds much lower than the design speed.
Note 2: This value is based on field observations.

As outlined in **Table 24**, Brock Road and McLean Road are, for the most part, straight, relatively flat, with no visible obstructions noted. There are no sightline concerns along Brock Road. There is a relatively small vertical curve to the west of the site along Mclean Road that limits the available sight distance for vehicles that are turning left out of the site. Per a site visit, this sight distance was approximately measured at 170 and 225 metres from the approximate location of the site access using the eye height values of the passenger car and truck respectively.

However, the calculations above are based on a design speed of 70 km/h which is 20 km/h higher than the posted speed. If the design speed was examined at 10 km/h over the posted speed, as vehicles are slowing down as they approach the Brock Road and McLean Road intersection, then the maximum required sight distance would be approximately 125 and 191 metres for the passenger car and truck respectively,

Due to the how close the field measured values are to the requirements; signage could be installed along McLean Road to warn vehicles about the trucks exiting and increase drivers' alertness for vehicles exiting the site. As the current speed limit sign is approximately located at the site entrance, the 50 km/h speed limit sign could be posted west of the entrance. This would help ensure that vehicles are aware of the speed that they should be travelling along this road. It is also worth noting that this access location is as far away from the Mclean Road and Brock Road intersection as the site will allow. **Figure 11** illustrates the sight lines at the site.

N

50 0m 50 100

SCALE: 1:1500

Legend

Passenger car

Minimum Sight Distance

Measured Sight Distance

No.	ISSUE	DATE: MMM/DD/YYYY
0	ISSUED FOR 1ST SUBMISSION	10/20/2023
1	ISSUED FOR 2ND SUBMISSION	07/31/2025
2	ISSUED FOR 3RD SUBMISSION	02/13/2026
3	ISSUED FOR 4TH SUBMISSION	03/17/2026

Engineer

Engineer

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

Project

BLACK–HART CONSTRUCTION INC.
7456 MCLEAN ROAD & 197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH, COUNTY OF WELLINGTON

Drawing

PASSENGER VEHICLE
SIGHT DISTANCE ANALYSIS

CROZIER CONSULTING ENGINEERS
211 YONGE STREET
SUITE 301
TORONTO, ON, M5B 1M4
416-477-3392 T
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

Drawn By	Design By	Project	
B.L.			2377–6556
Check By	Check By	Scale	Drawing
R.K.	I.L.	1:1500	FIG 11a

N

50 0m 50 100
SCALE: 1:1500

Legend

Truck

Passenger car

Minimum Sight Distance

Measured Sight Distance

No.	ISSUE	DATE: MM/DD/YYYY
0	ISSUED FOR 1ST SUBMISSION	10/20/2023
1	ISSUED FOR 2ND SUBMISSION	07/31/2025
2	ISSUED FOR 3RD SUBMISSION	02/13/2026
3	ISSUED FOR 4TH SUBMISSION	03/17/2026

Engineer

Engineer

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

Project

BLACK–HART CONSTRUCTION INC.
7456 MCLEAN ROAD & 197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH, COUNTY OF WELLINGTON

Drawing

PASSENGER VEHICLE
SIGHT DISTANCE ANALYSIS

CROZIER CONSULTING ENGINEERS
211 Yonge Street
Suite 301
Toronto, ON, M5B 1M4
416-477-3392 T
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

Drawn By	Design By	Project	
B.L.			2377–6556
Check By	Check By	Scale	Drawing
R.K.	I.L.	1:1500	FIG 11b

6.2 Access Spacing

Brock Road Site Access

Brock Road is classified as a County Road under the jurisdiction of the County of Wellington and operates as a Major Arterial. As such, TAC site access requirements were assessed under those conditions.

Per Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR) Section 8.2, direct property access at a major arterial roadway should be restricted, as such, a restricted RIRO access is proposed.

Per TAC GDGCR Figure 8.8.2, a driveway or public lane along an arterial road should be located at a minimum clearance of 70 metres from a signalized intersection and a minimum clearance of 35 metres from a stop-controlled intersection. As the proposed access is over 105 metres from the Brock Road at McLean Road signalized intersection to the south, over 400m from the Brock Road at Gilmour Road/Private Access signalized intersection to the north, as well as over 350 m from the nearest stop-controlled access north of the Site, the proposed site access at Brock Road is supportable from this perspective.

McLean Road Site Access

McLean Road is classified as a Major Collector roadway under the Township of Puslinch's jurisdiction. As such, TAC site access requirements were assessed under those conditions.

Per TAC GDGCR Figure 8.8.2, a driveway or public lane along a collector road should be located at a minimum clearance of 55 metres from a signalized intersection and a minimum clearance of 25 metres from a stop-controlled intersection. As the proposed access is over 100 metres from the Brock Road at McLean Road signalized intersection to the east, over 250m from McLean Road at Kerr Crescent stop-controlled intersection to the west, the proposed site access at McLean Road is supportable from this perspective.

7.0 Maneuvering Assessment

A maneuvering assessment was conducted to ensure the proposed site design provides adequate space for the design vehicles expected at the site. The maneuvers of these design vehicles are elaborated upon in the following section.

7.1 Loading Vehicles

A maneuvering assessment was conducted for loading vehicles using a MSU (Medium Single Unit) Truck design vehicle, WB-20 Truck, and an 8 Axle Fuel Tanker. **Figure 12** and **Figure 13** illustrates the MSU Truck entering and exiting the site in both directions, as well as entering and exiting the proposed loading spaces at each building. **Figure 14** and **Figure 15** illustrate the WB-20 Truck entering the site and accessing the Truck gas pumps before exiting the site. **Figure 16** shows the 8 Axle Fuel Tanker navigating the proposed tanker route within the site. These figures show the expected maneuvers of the trucks both as they enter or exit the site and as they maneuver throughout the site. Per the comments, the movements for the scale are shown.

Waste Vehicles

Since the proposed development is intended for commercial uses, waste collection is intended to be undergone privately, a GFL Garbage Truck 10m in length was used. **Figure 17** and **Figure 18** illustrates the GFL Garbage Truck entering and exiting the site, as well as entering and exiting the proposed loading space.

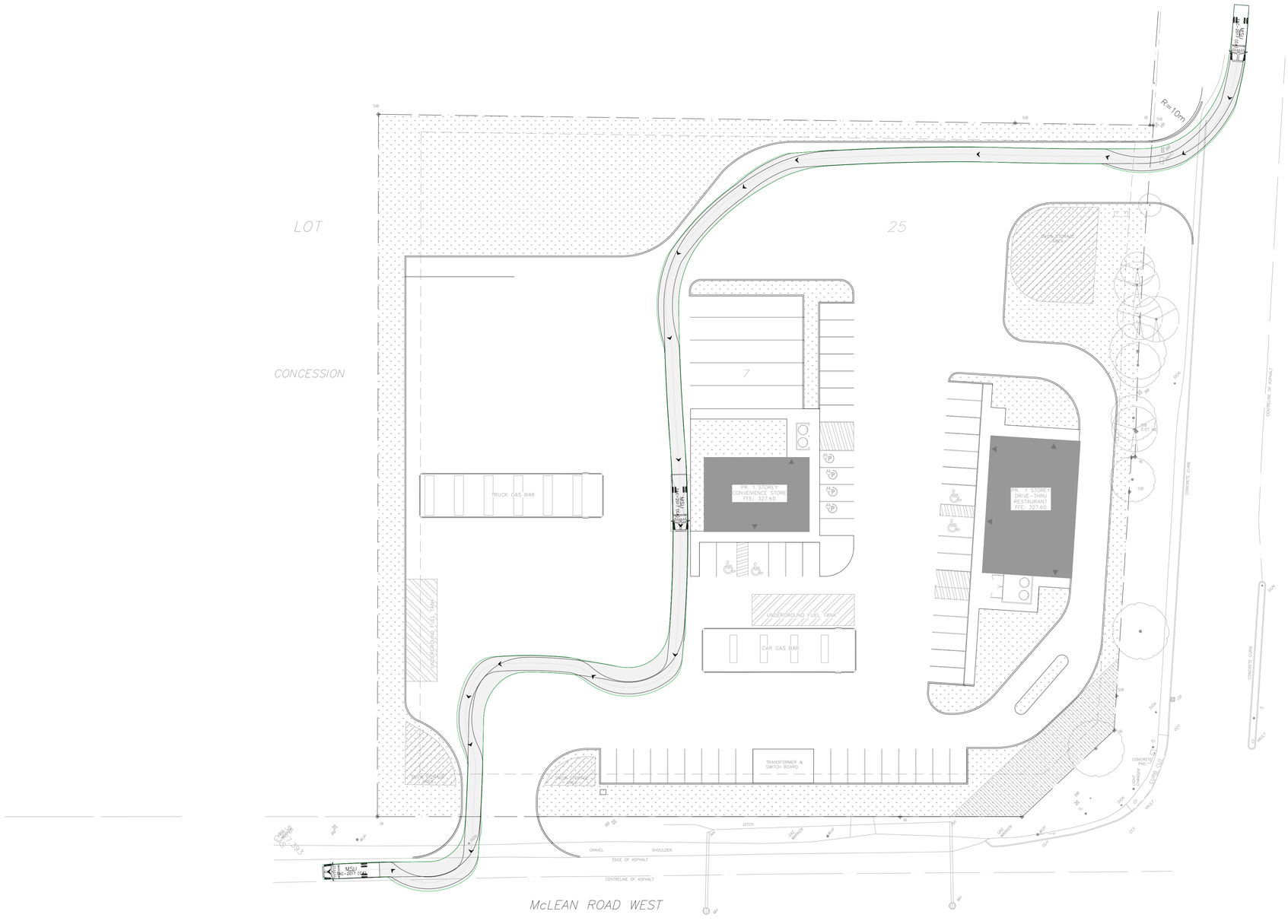
7.2 Emergency Vehicles

A maneuvering assessment was conducted for emergency vehicles using a Pumper Fire Truck 13.4 metres in length. As shown in **Figure 19** and **Figure 20**, the fire truck is able to enter the site using both site accesses and can safely maneuver the proposed fire route in either direction safely entering and exiting the site.

7.3 Passenger Vehicles

A maneuvering assessment was conducted using a Passenger TAC (P-TAC) vehicle as shown in **Figure 21**, which demonstrates that passenger vehicles can enter and exit critical parking spots within a three-point turning movement, as well as restaurant drive through. No issues were identified with any of the proposed parking spaces or site accesses from a maneuverability perspective.

Based on the assessments above, the development can be supported from a maneuverability perspective.



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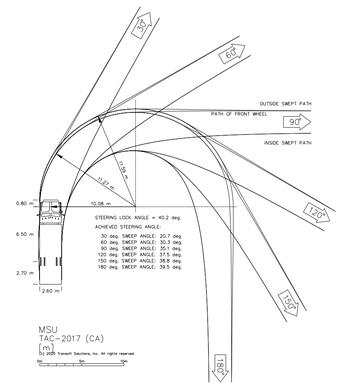
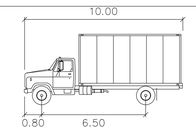
FOR REVIEW

NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



VEHICLE PROFILE



MSU

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Steering Angle	: 40.2

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR REVIEW	08/31/2023
2	ISSUED FOR SUBMISSION	10/19/2023
3	ISSUED FOR SUBMISSION	08/01/2025
4	ISSUED FOR COORDINATION	12/01/2025
5	ISSUED FOR SUBMISSION	01/26/2026
6	ISSUED FOR SUBMISSION	03/17/2026

Project

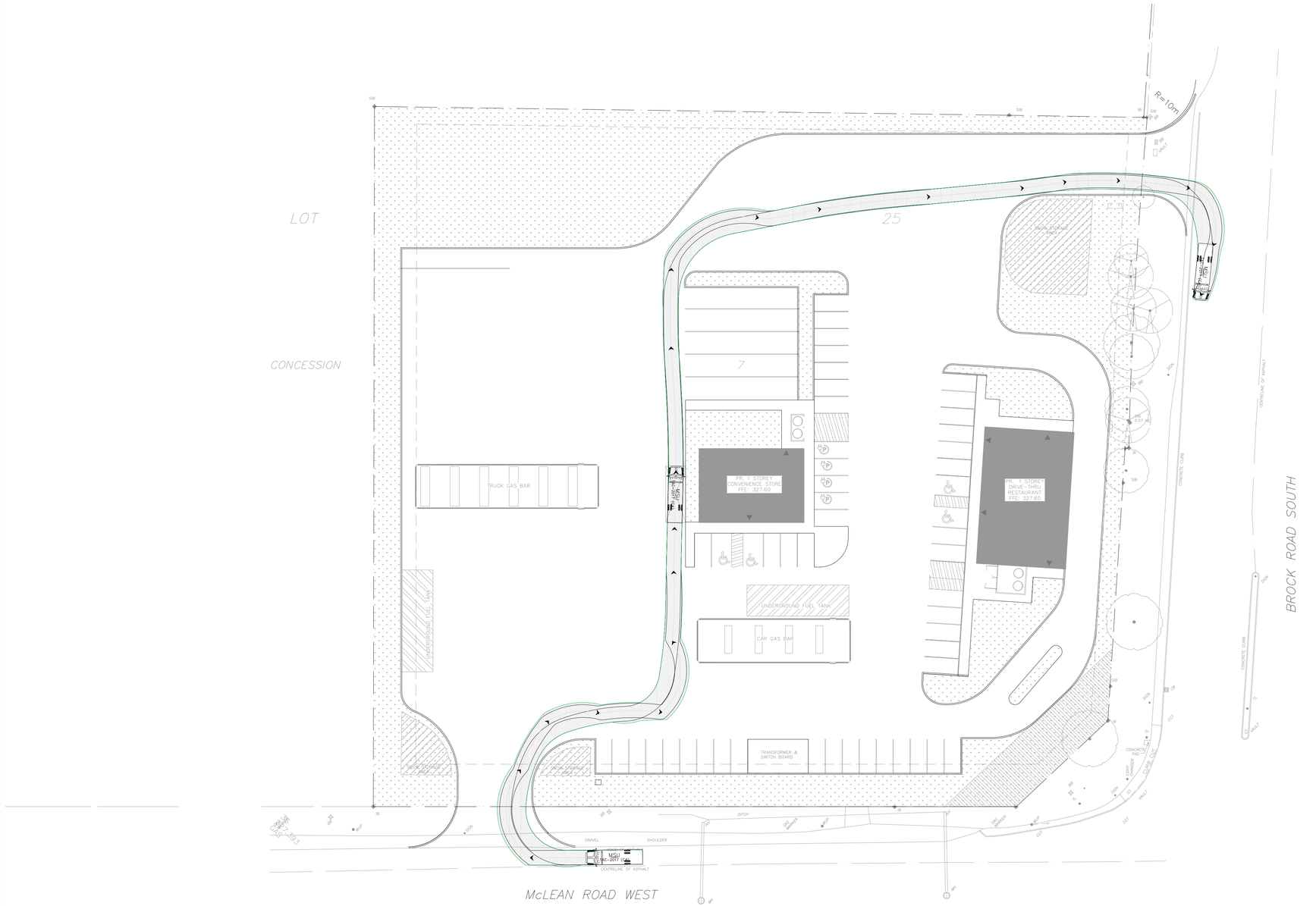
7456 McLEAN ROAD WEST AND
197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH

Drawing

VEHICLE MANEUVERING ANALYSIS
MEDIUM SINGLE UNIT (MSU) TRUCK

CROZIER
CONSULTING ENGINEERS

Drawn	I.A./M.P./I.M.	Design	M.P./I.M.	Project No.	2792-7289
Check	R.K./I.L.	Check	R.K./I.L.	Scale	1:400
				Dwg.	FIG12



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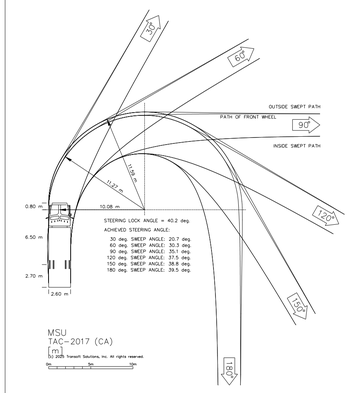
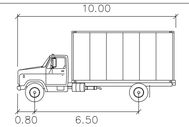
FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



VEHICLE PROFILE



MSU

	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.2

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR REVIEW	08/31/2023
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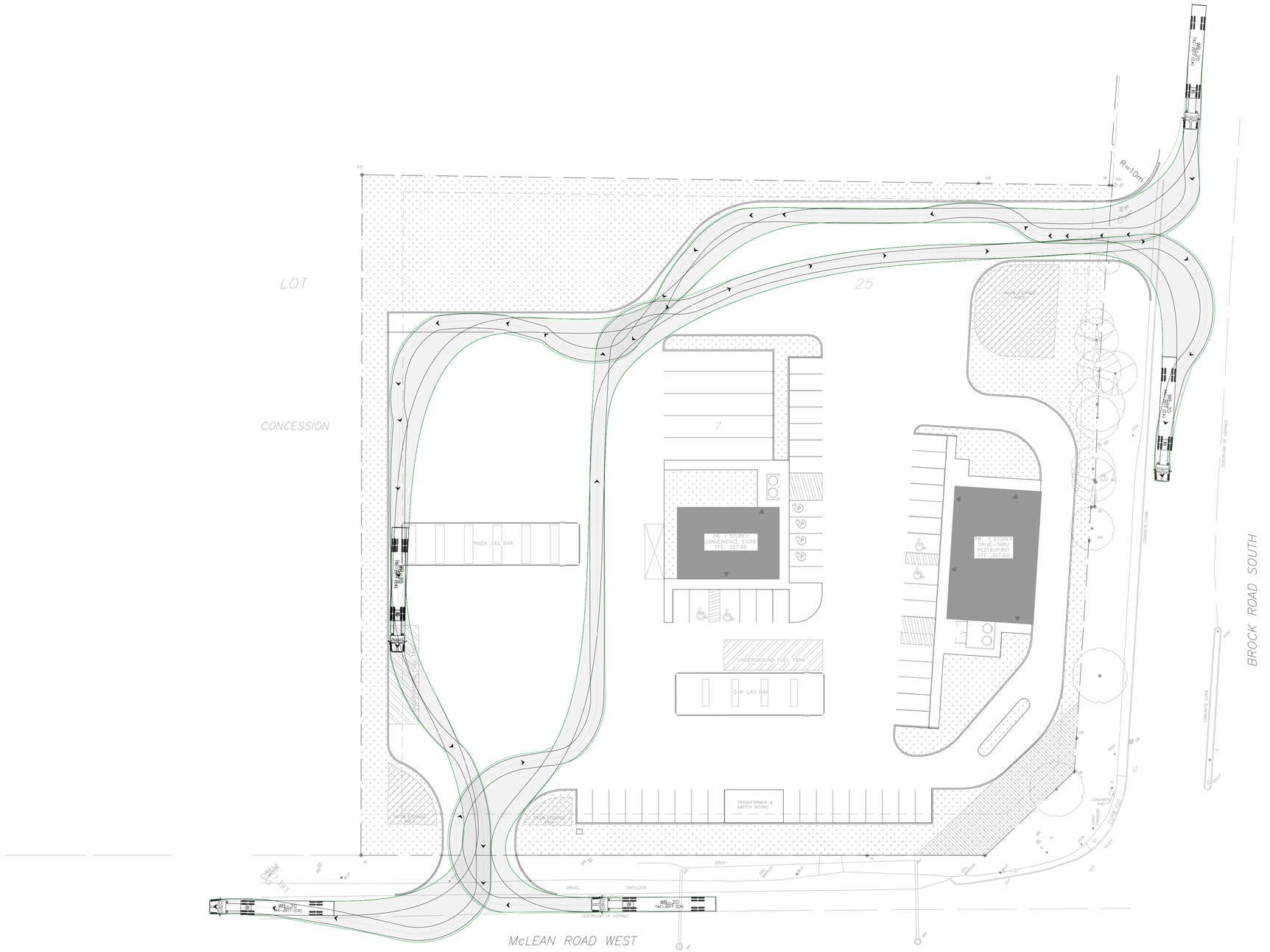
5	ISSUED FOR SUBMISSION	01/26/2026
6	ISSUED FOR SUBMISSION	03/17/2026

Project
7456 McLEAN ROAD WEST AND
197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH

Drawing
VEHICLE MANEUVERING ANALYSIS
MEDIUM SINGLE UNIT (MSU) TRUCK

CROZIER
CONSULTING ENGINEERS

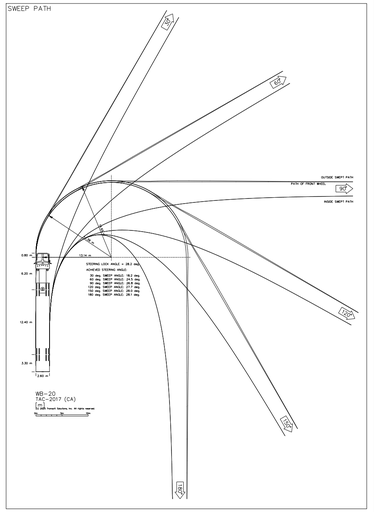
Drawn: I.A./M.P./I.M.	Design: M.P./I.M.	Project No.	2792-7289
Check: R.K./I.L.	Check: R.K./I.L.	Scale: 1:400	Dwg. FIG13



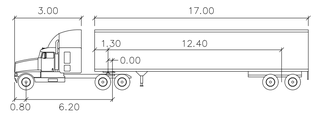
FOR REVIEW

NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



VEHICLE PROFILE



WB–20

meters

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Trailer Width	: 2.60	Steering Angle	: 28.2
Tractor Track	: 2.60	Articulating Angle	: 70.0
Trailer Track	: 2.60		

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR REVIEW	08/31/2023
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6	ISSUED FOR SUBMISSION	03/17/2026

Project

7456 McLEAN ROAD WEST AND
197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH

Drawing

VEHICLE MANEUVERING ANALYSIS
WB–20 TRUCK

CROZIER
CONSULTING ENGINEERS

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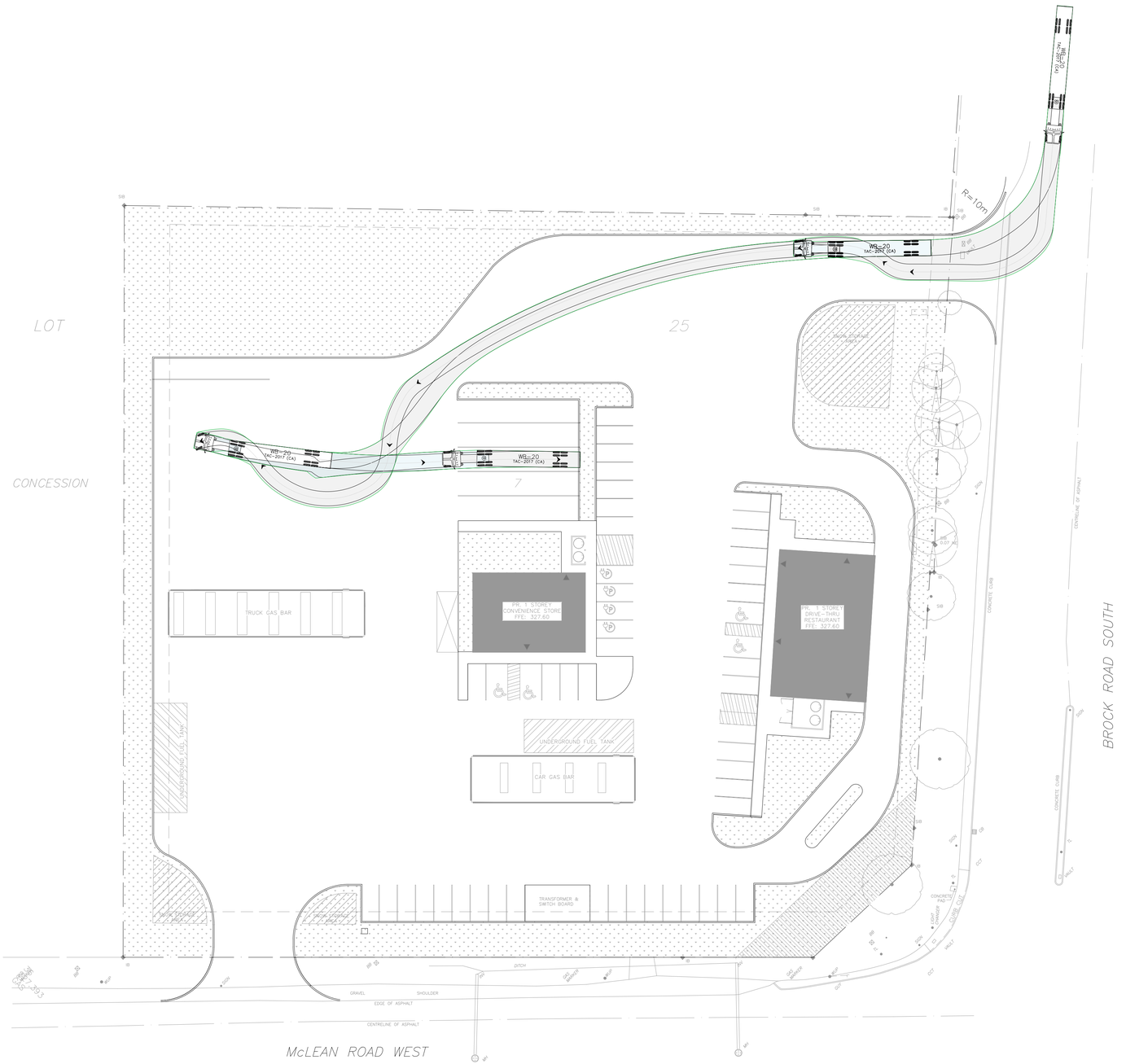
Check	R.K./I.L.	Check	R.K./I.L.	Scale	1:400
				Dwg.	FIG14



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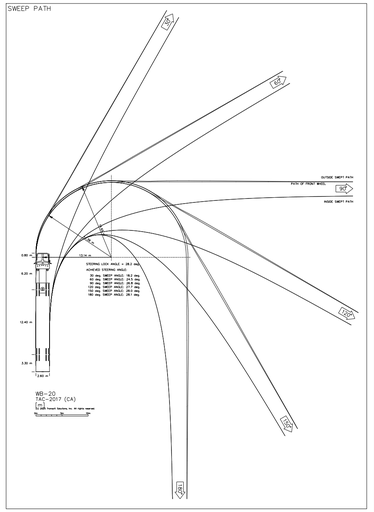
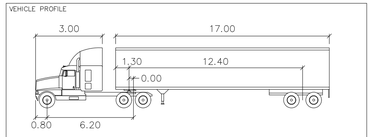
SCALE: 1:400

FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



VEHICLE PROFILE



WB-20

meters

Tractor Width	: 2.60	Lock to Lock Time	: 6.0
Trailer Width	: 2.60	Steering Angle	: 28.2
Tractor Track	: 2.60	Articulating Angle	: 70.0
Trailer Track	: 2.60		

No.	ISSUE	DATE: MM/DD/YYYY
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3	ISSUED FOR SUBMISSION	08/01/2025
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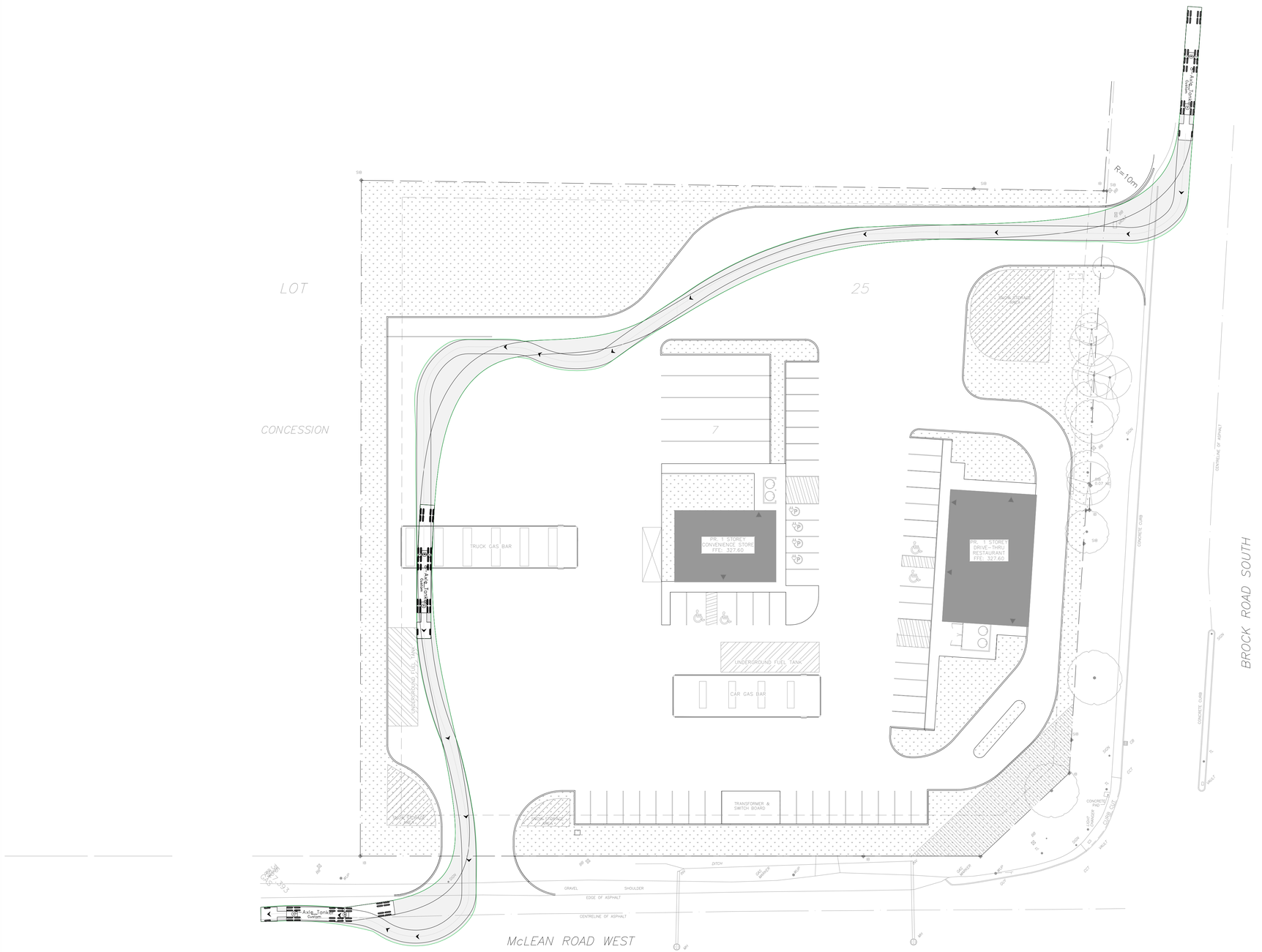
5	ISSUED FOR SUBMISSION	01/26/2026
6	ISSUED FOR SUBMISSION	03/17/2026

Project
7456 McLEAN ROAD WEST AND
197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH

Drawing
VEHICLE MANEUVERING ANALYSIS
WB-20 TRUCK

CROZIER
CONSULTING ENGINEERS

Drawn I.A./M.P./I.M.	Design M.P./I.M.	Project No.	2792-7289
Check R.K./I.L.	Check R.K./I.L.	Scale 1:400	Dwg. FIG15



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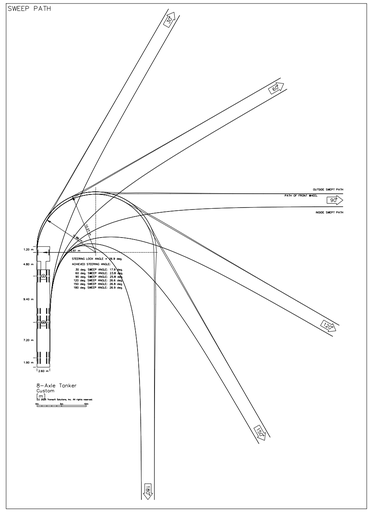
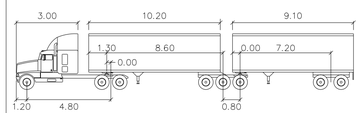
FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



VEHICLE PROFILE



8-Axle Tanker

	meters		
Tractor Width	: 2.60	Lock to Lock Time	: 6.0
Trailer Width	: 2.60	Steering Angle	: 26.9
Tractor Track	: 2.60	Articulating Angle	: 70.0
Trailer Track	: 2.60		

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR REVIEW	08/31/2023
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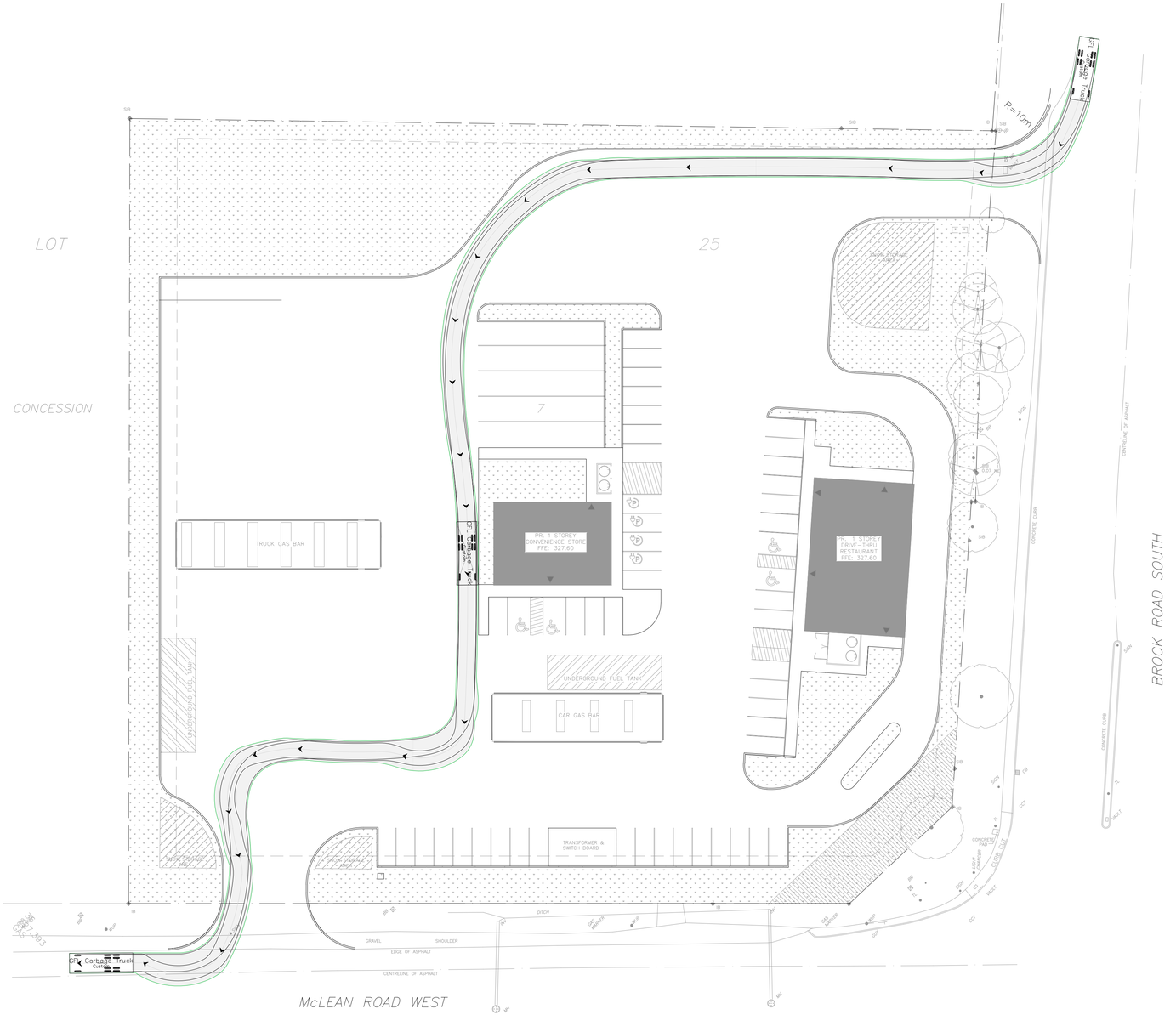
4	ISSUED FOR COORDINATION	12/01/2025
5	ISSUED FOR SUBMISSION	01/26/2026
6	ISSUED FOR SUBMISSION	03/17/2026

Project
7456 McLEAN ROAD WEST AND
197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH

Drawing
VEHICLE MANEUVERING ANALYSIS
8-AXLE FUEL TANKER

CROZIER
CONSULTING ENGINEERS

Drawn I.A./M.P./I.M.	Design M.P./I.M.	Project No.	2792-7289
Check R.K./I.L.	Check R.K./I.L.	Scale 1:400	Dwg. FIG16



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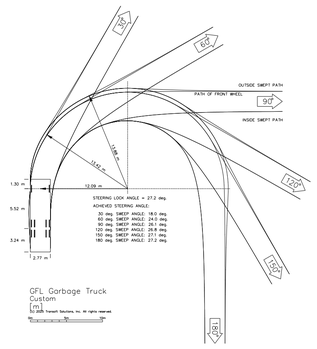
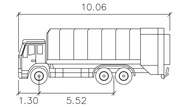
SCALE: 1:400

FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



VEHICLE PROFILE



GFL Garbage Truck

	meters
Width	: 2.77
Track	: 2.77
Lock to Lock Time	: 6.0
Steering Angle	: 27.2

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR REVIEW	08/31/2023
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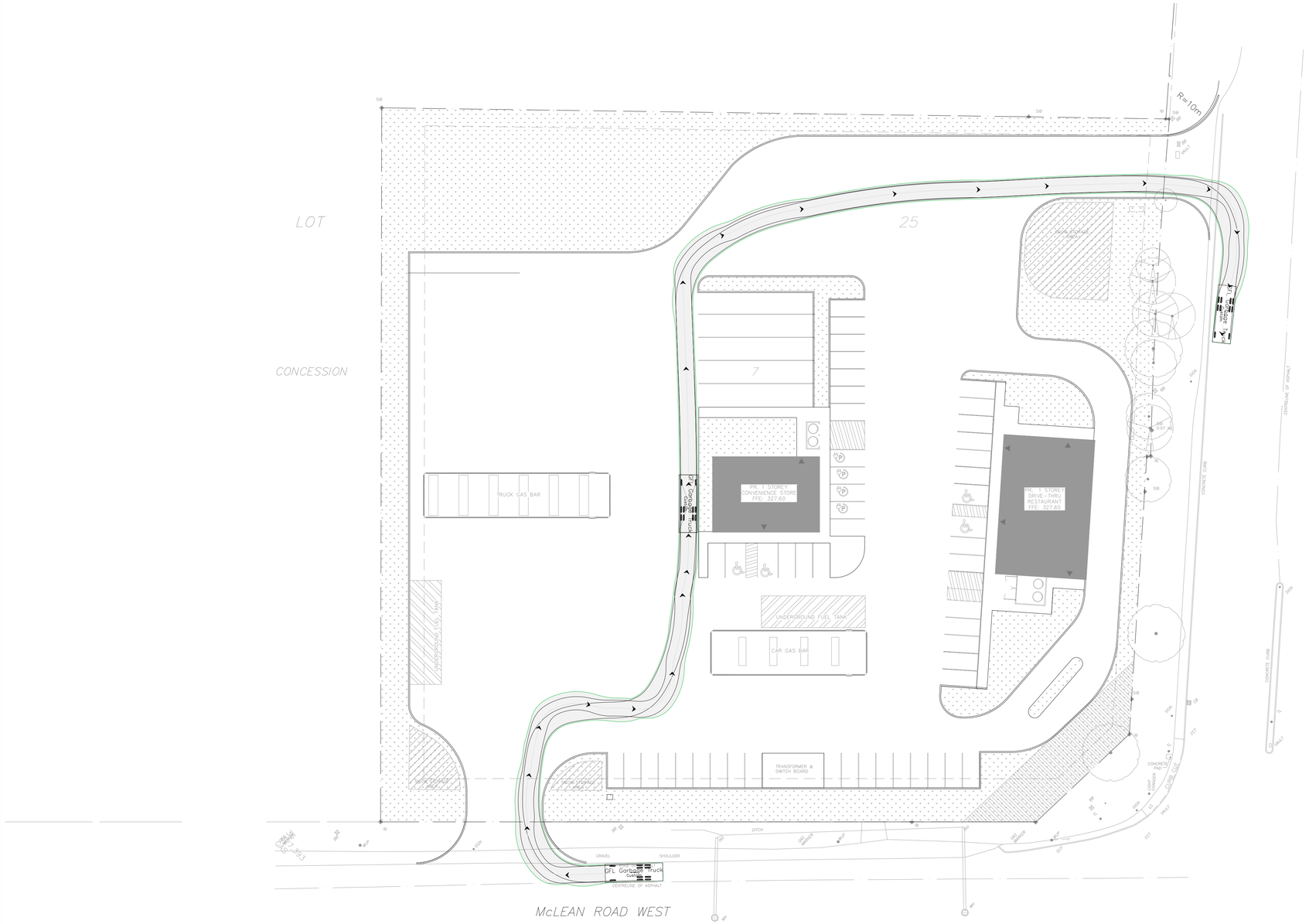
6	ISSUED FOR SUBMISSION	03/17/2026

Project
7456 McLEAN ROAD WEST AND
197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH

Drawing
VEHICLE MANEUVERING ANALYSIS
WASTE COLLECTION

CROZIER
CONSULTING ENGINEERS

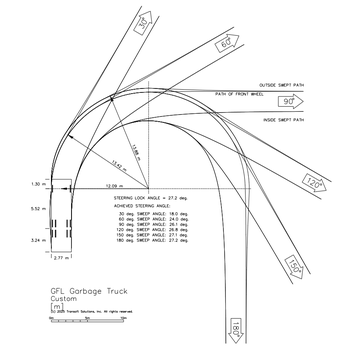
Drawn I.A./M.P./I.M.	Design M.P./I.M.	Project No.	2792-7289
Check R.K./I.L.	Check R.K./I.L.	Scale 1:400	Dwg. FIG17



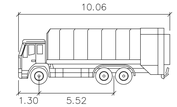
FOR REVIEW

NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



VEHICLE PROFILE



GFL Garbage Truck

	meters
Width	: 2.77
Track	: 2.77
Lock to Lock Time	: 6.0
Steering Angle	: 27.2

No.	ISSUE	DATE: MM/DD/YYYY
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6	ISSUED FOR SUBMISSION	03/17/2026

Project

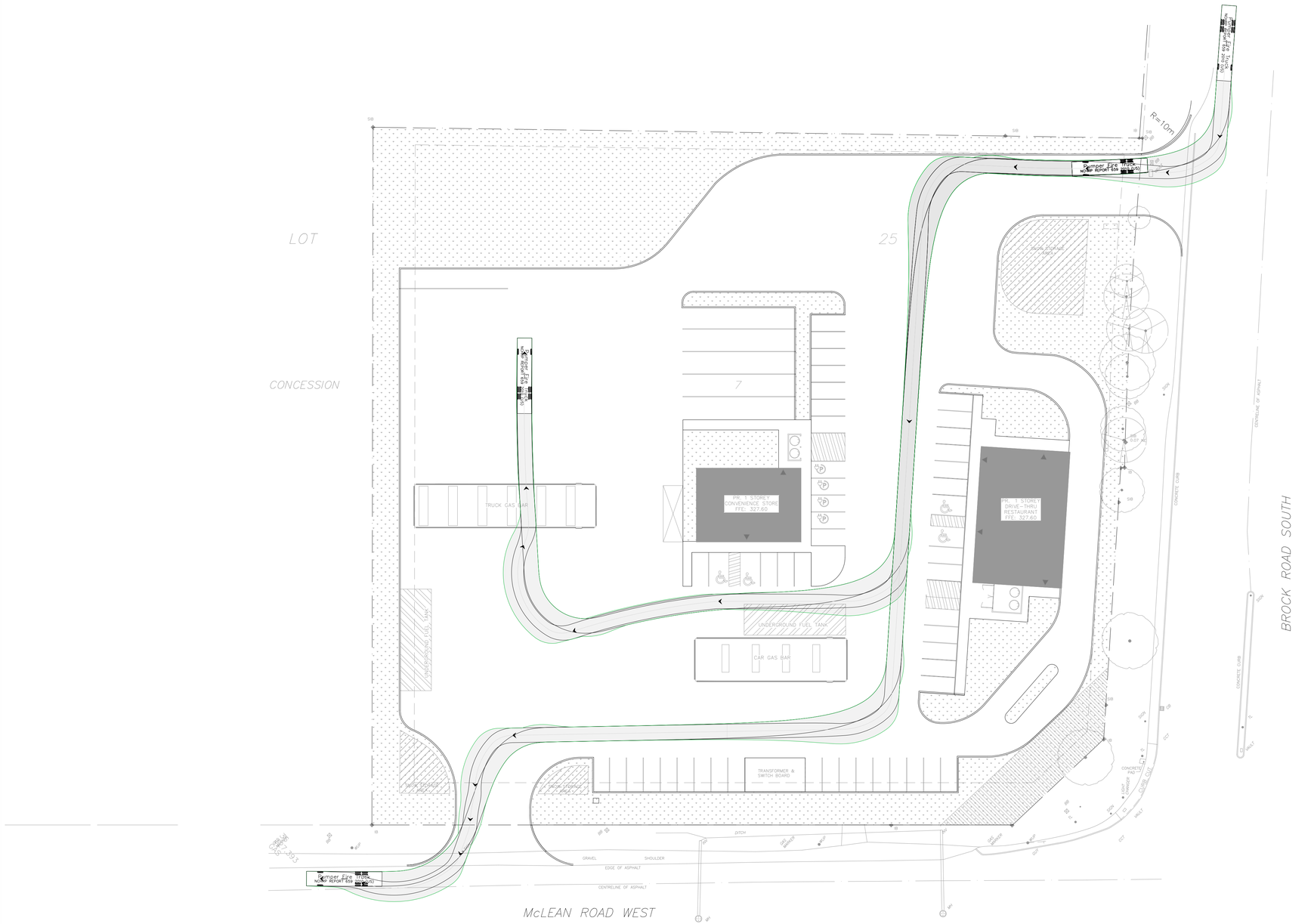
7456 McLEAN ROAD WEST AND
197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH

Drawing

VEHICLE MANEUVERING ANALYSIS
WASTE COLLECTION

CROZIER
CONSULTING ENGINEERS

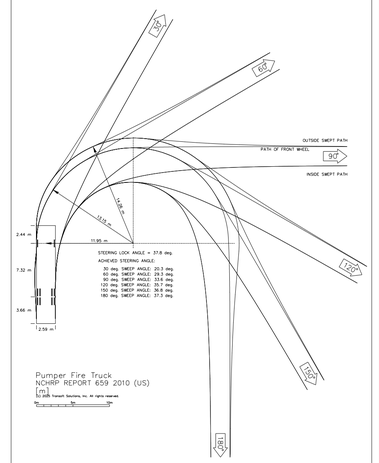
Drawn: I.A./M.P./I.M.	Design: M.P./I.M.	Project No.: 2792-7289	
Check: R.K./I.L.	Check: R.K./I.L.	Scale: 1:400	Dwg.: FIG18



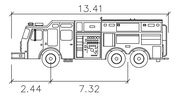
FOR REVIEW

NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



VEHICLE PROFILE



Pumper Fire Truck

	meters
Width	: 2.59
Track	: 2.59
Lock to Lock Time	: 6.0
Steering Angle	: 37.8

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR REVIEW	08/31/2023
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5	ISSUED FOR SUBMISSION	01/26/2026
6	ISSUED FOR SUBMISSION	03/17/2026

Project

7456 McLEAN ROAD WEST AND
197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH

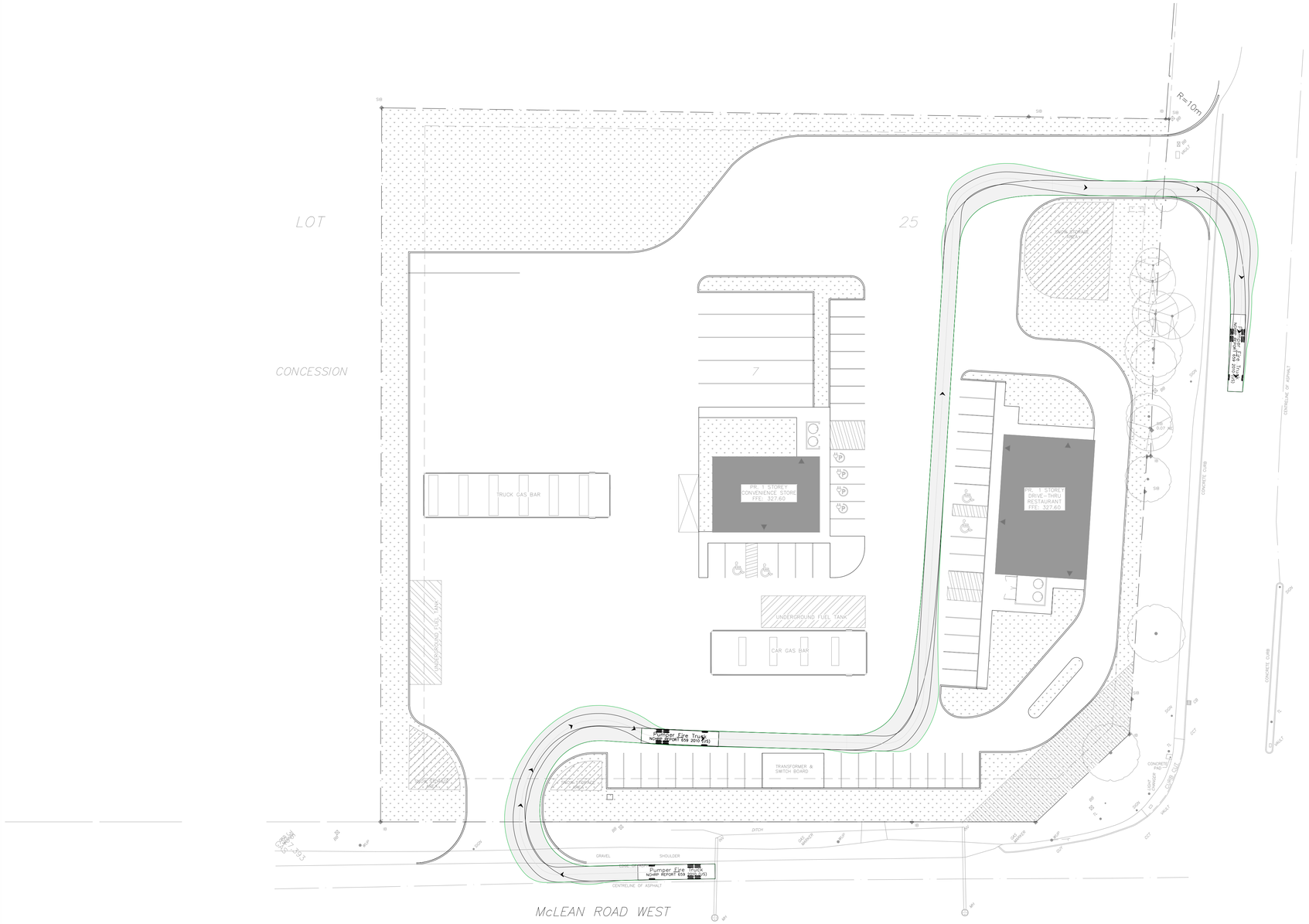
Drawing

VEHICLE MANEUVERING ANALYSIS
FIRE TRUCK

CROZIER
CONSULTING ENGINEERS

Drawn: I.A./M.P./I.M.	Design: M.P./I.M.	Project No.	2792-7289
Check: R.K./I.L.	Check: R.K./I.L.	Scale: 1:400	Dwg. FIG19

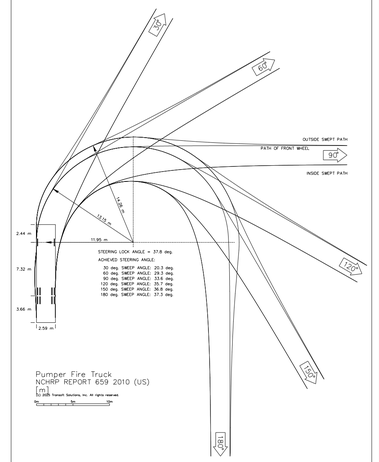
10 0m 10 20 30
SCALE: 1:400



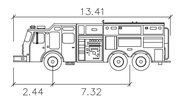
10 0m 10 20 30
SCALE: 1:400

FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



VEHICLE PROFILE



Pumper Fire Truck

	meters
Width	: 2.59
Track	: 2.59
Lock to Lock Time	: 6.0
Steering Angle	: 37.8

No.	ISSUE	DATE: MM/DD/YYYY
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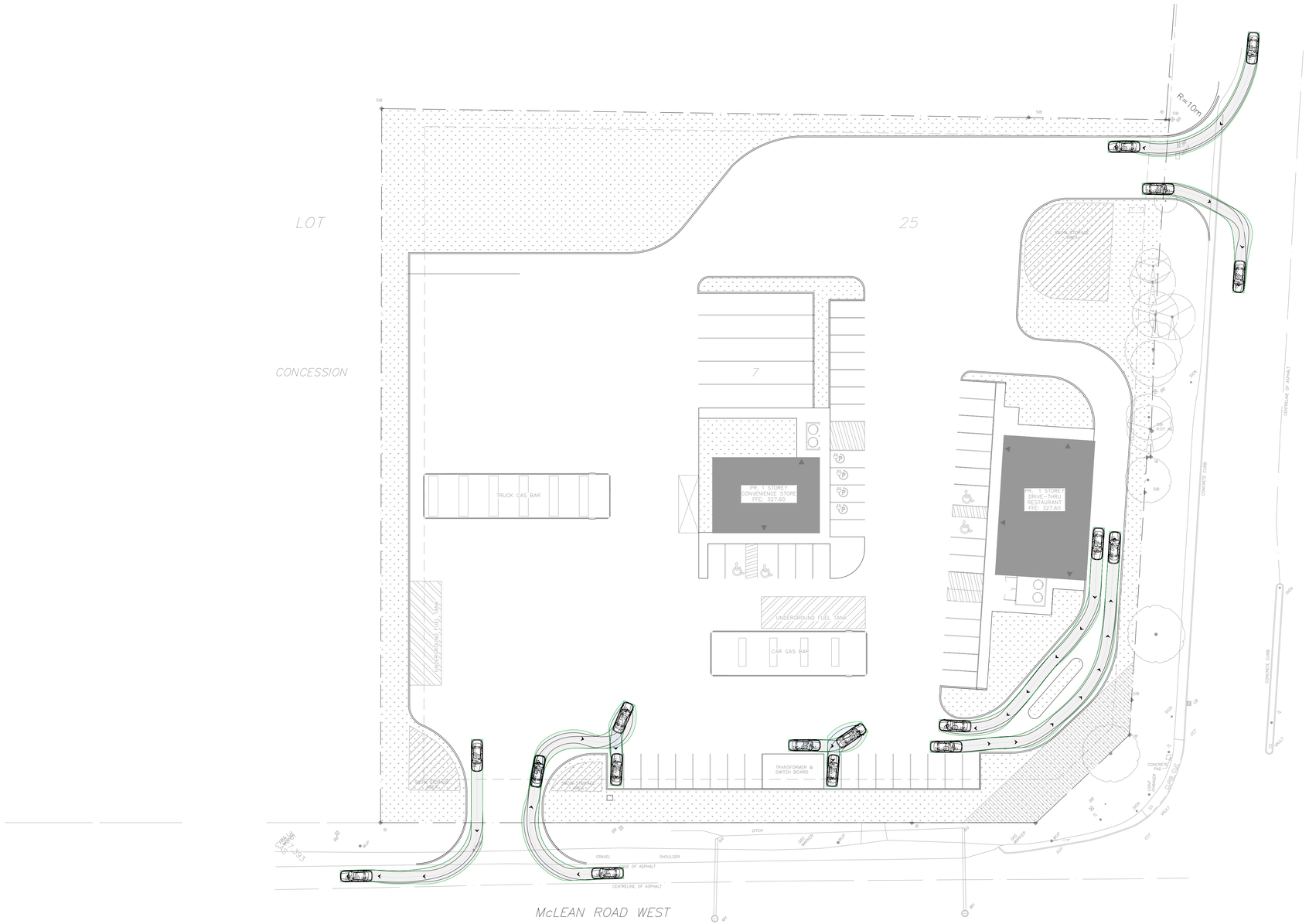
3	ISSUED FOR SUBMISSION	08/01/2025
4	ISSUED FOR COORDINATION	12/01/2025
5	ISSUED FOR SUBMISSION	01/26/2026
6	ISSUED FOR SUBMISSION	03/17/2026

Project
7456 McLEAN ROAD WEST AND
197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH

Drawing
VEHICLE MANEUVERING ANALYSIS
FIRE TRUCK

CROZIER
CONSULTING ENGINEERS

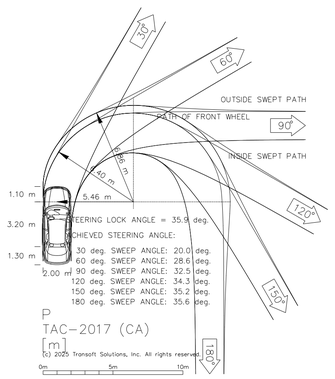
Drawn I.A./M.P./I.M.	Design M.P./I.M.	Project No.	2792-7289
Check R.K./I.L.	Check R.K./I.L.	Scale 1:400	Dwg. FIG20



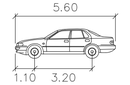
10 0m 10 20 30
SCALE: 1:400

FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



VEHICLE PROFILE



P

	meters
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Track	: 2.00
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR REVIEW	08/31/2023
2	ISSUED FOR SUBMISSION	10/19/2023
3	ISSUED FOR SUBMISSION	08/01/2025
4	ISSUED FOR COORDINATION	12/01/2025
5	ISSUED FOR SUBMISSION	01/26/2026
6	ISSUED FOR SUBMISSION	03/17/2026

Project
7456 McLEAN ROAD WEST AND
197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH

Drawing
VEHICLE MANEUVERING ANALYSIS
PASSENGER CAR

CROZIER
CONSULTING ENGINEERS

Drawn: I.A./M.P./I.M.	Design: M.P./I.M.	Project No.: 2792-7289	
Check: R.K./I.L.	Check: R.K./I.L.	Scale: 1:400	Dwg.: FIG21

8.0 Parking and Loading Review

Section 5 of the Township of Puslinch's Comprehensive Zoning By-Law No. 023-18 was reviewed to determine the parking and loading requirements of the proposed development.

8.1 Auto Parking Space Requirements

Section 5.2.2 and Section 5.2.4 of the Township of Puslinch's Comprehensive Zoning By-Law No. 023-18 was reviewed to determine the auto parking of the proposed development, respectively. A summary of the proposed parking and required shared auto parking at the development can be found in **Table 25**. Please note that the Zoning By-Law uses the Net Floor Area rather than the Gross Floor Area for its calculations.

Table 25: Zoning By-Law Parking Review

Land Use	Zoning By-Law Land Use	Zoning By-Law Parking Rate	Gas Bar Pumps/ Net Floor Area (m^2)	Required Parking Spaces
Vehicle Parking Space Requirement				
Convenience Store	Retail Store	1 space per /20 m^2 GFA	199.75 m^2	10
Drive-Thru Restaurant[1]	Restaurant[1]	1 space per /10 m^2 GFA	322.5 m^2	33
Vehicle Gas Bar	Gas Bar	1 space per gas bar pump	8 pumps	8
Total Vehicle Parking Spaces Required				**51**
Total Vehicle Parking Spaces Proposed (Surplus/Deficit)				**51 (0)**
Truck Gas Bar	Gas Bar	1 space per gas bar pump	6 pumps	6
Total Truck Gas Bar Parking Spaces Required				**6**
Total Truck Gas Bar Parking Spaces Proposed (Surplus/Deficit)				**6 (0)**

Note 1: The Township of Puslinch does not provide a land use category for a drive-thru restaurant within a gas station as part of its Comprehensive Zoning By-Law No. 023-18. It is noted that the closest category listed in the Zoning By-Law to the proposed drive-thru restaurant is "restaurant" which requires a rate of 1 parking space per 10 m^2.

Section 5.2.4 of the zoning by-law was examined to assess shared parking needs for the restaurant and convenience store. Parking requirements were calculated for different times of day, as shown in **Table 26**.

It was noted in the comments that some of the parking spaces for the restaurant could be marked to be used for mobile orders or for drive-thru pick-up orders. However, those spaces would stem from the operational requirements of the restaurant operator and would be taken from the proposed supply.

Table 26: Percentage of Required Parking Permitted to be Shared

Period	Weekday			Saturday		
	Restaurant	Retail Store	Parking Required (including Gas requirements)	Restaurant	Retail Store	Parking Required (including Gas requirements)
Morning	20%	75%	**29**	30%	80%	**32**
Noon	90%	80%	**52**	90%	100%	**54**
Afternoon	30%	90%	**33**	50%	100%	**41**
Evening	100%	90%	**56**	100%	50%	**52**
Updated Total Vehicle Parking Space Required (Shared)						**56**
Total Vehicle Parking Spaces Proposed (Surplus/Deficit)						**57 (+1)**

As shown in **Table 26**, the proposed auto parking rate for the mixed-use commercial and gas station development meets the Township's Zoning By-law requirements.

The truck parking is sufficient when compared to the Township's Zoning By-law requirements.

Relevant excerpts from the Township of Puslinch's Comprehensive Zoning By-Law No. 023-18 can be found in **Appendix L**.

8.2 Accessible Parking Space Requirements

Section 5.2.14 of the Township of Puslinch's Comprehensive Zoning By-Law No. 023-18 was reviewed to determine the accessible parking space requirements of the proposed development. A summary of the proposed parking and required parking at the development can be found in **Table 27**.

Table 27: Zoning By-Law Accessible Parking Spaces Review

Zoning By-Law Accessible Parking Spaces Rate	Zoning By-Law Parking Spaces Supply Requirement	Total Parking Spaces Proposed	Required Accessible Parking Spaces
For developments with a parking space supply requirement between 26 and 100 spaces - 1 + 3% of total number of parking spaces on lot is required	57	578	3 spaces
Total Accessible Parking Spaces Proposed (Surplus/Deficit)			**4 (+1)**

As shown in **Table 27**, the proposed accessible parking space supply for the proposed gas station meets the Township's Zoning By-Law requirements.

Relevant excerpts from the Township of Puslinch's Comprehensive Zoning By-Law No. 023-18 can be found in **Appendix L**.

8.3 Bicycle Parking Space Requirements

Section 5.2.15 of the Township of Puslinch's Comprehensive Zoning By-Law No. 023-18 was reviewed to determine the bicycle parking space requirements of the proposed development. A summary of the proposed parking and required parking at the development can be found in **Table 28**.

Table 28: Zoning By-Law Bicycle Parking Space Review

Land Use	Zoning By-Law Space Rate	Net Floor Area (m^2)	Required Bicycle Spaces
Convenience Store	The greater of 2 spaces or 1 space/1000 m^2	199.75 m^2	-
Drive-Thru Restaurant		322.5 m^2	-
Total Bicycle Spaces Required		**522.25 m^2**	**4**
Total Bicycle Parking Spaces Proposed (Surplus/Deficit)			**4 (+0)**

As shown in **Table 28**, the proposed bicycle parking space supply for the proposed gas station development is meets the bicycle parking spaces requirement when compared to the Township's Zoning By-Law requirements.

Relevant excerpts from the Township of Puslinch's Comprehensive Zoning By-Law No. 023-18 can be found in **Appendix L.**

8.4 Loading Requirements

Section 5.1.2 of the Township of Puslinch's Comprehensive Zoning By-Law No. 023-18 was reviewed to determine the loading requirements of the proposed development. A summary of the proposed parking and required parking at the development can be found in **Table 29**.

Table 29: Zoning By-Law Loading Review

Land Use	Zoning By-Law Loading Rate	Net Floor Area (m^2)	Required Loading Spaces
Convenience Store	For buildings with a Net Floor Area between 250 m^2 and 2500 m^2 - 1 loading space is required	199.75 m^2	-
Drive-Thru Restaurant[1]		322.5 m^2	-
Total Loading Spaces Required		**522.25 m^2**	**1**
Total Truck Parking Spaces Proposed (Surplus/Deficit)			**1 (+0)**

As shown in **Table 29,** the proposed loading space supply for the proposed gas station development meets the Township's Zoning By-Law requirements.

Relevant excerpts from the Township of Puslinch's Comprehensive Zoning By-Law No. 023-18 can be found in **Appendix L**.

8.5 Stacking Lanes Requirement

The Township of Puslinch's Comprehensive Zoning By-Law No. 023-18 does not specify stacking lane requirements. As a result, stacking lane requirements from surrounding townships were reviewed for reference. A summary of comparable zoning by-law stacking lane requirements and the proposed site provisions is provided in **Table 30.**

Table 30: Zoning By-Law Stacking Lane Review

Townships (Zoning By-Law)	Zoning By-Law Minimum Stacking Spaces	Total Stacking Lane Proposed (Surplus/Deficit)
Township of Guelph/Eramosa (40/2016)	10	14 **(+4)**
Township of Centre Wellington (2009-045)	10	
Town of Milton (144-2003)	10	

As shown in **Table 30**, the proposed development includes 14 stacking spaces, which represents a surplus of four (4) spaces relative to the 10-space requirement observed across the referenced townships. These 14 spaces represent the spaces that are available in the drive thru before the queues would interfere with the vehicles maneuvering in the site and the stacking queue lengths at other locations are examined in **Section 9.0.**

9.0 Surrogate Demand Survey

The Township of Puslinch and the County of Wellington requested that parking and stacking surveys be undertaken at two comparable sites, including a gas station and McDonald's at 4 Sinclair Boulevard in Brantford and a McDonald's at 40 Sportsworld Drive in Kitchener. The results of the survey analyses are summarized in the sections that follow.

9.1 4 Sinclair Boulevard, Brantford

The site includes an eight-pump gas station with an associated convenience store, as well as a McDonald's restaurant with a dedicated drive-through stacking lane. **Table 31** summarizes the key site statistics.

Table 31: 4 Sinclair Blvd – Site Statistics

Land Use	Units
Vehicle Gas Pumps	8 Pumps
Convenience Store	164 m^2
Fast Food Restaurant with Drive Thru	343 m^2
Total Building GFA	**507 m^2**
Vehicle Parking Spaces	78 spaces Additional: 4 accessible parking spaces; 2 mobile order; 2 waiting for order spaces.

Parking Survey

Parking counts were undertaken by Ontario Traffic Inc. on Friday, January 9, 2026, and Saturday, January 10, 2025, between 6:30 a.m. and 6:30 p.m. The site contains 78 regular parking spaces, 4 accessible spaces, 2 mobile order spaces and 2 waiting for order spaces. **Table 32** summarizes the observed parking demand survey compared to the developments' proposed parking spaces.

Table 32: 4 Sinclair Blvd – Parking Survey

	Friday January 9, 2026	**Saturday January 10, 2026**
Peak Parking Spaces Utilized (4 Sinclair Boulevard)	**36** (11:45 – 12:00 p.m.)	**23** (11:30 – 11:45 a.m.)
Total Parking Spaces Provided	**78 spaces**	
Proposed Parking Spaces (7456 McLean & 197 Brock Rd S)	**44 spaces**	
(Surplus/Deficit)	**+8 spaces**	**+21 spaces**

Per **Table 32**, the peak parking demand observed at the comparable gas station and McDonald's site was 36 vehicles on Friday and 23 vehicles on Saturday. Based on these findings, the proposed development would provide a surplus of 8 parking spaces on Friday and 21 parking spaces on Saturday relative to observed peak demand.

Stacking Survey

Similarly, a stacking survey of the McDonald's drive-through was conducted at the request of the Township and County. The queuing survey recorded the number of vehicles at five-minute intervals at each stage of the drive-through process, including the order kiosk, payment window, and pick-up window. **Table 33** summarizes the maximum observed queues by day and corresponding time period.

Table 33: 4 Sinclair Blvd – Stacking Survey

Establishment	Day	Maximum Queue	Time of the Day	Proposed Queue Length	(Surplus/Deficit)
McDonald's (4 Sinclair Boulevard)	Friday January 9, 2026	14	7:25 a.m.	14	+0
	Saturday January 10, 2026	6	9:30 a.m.; 10:55 a.m.; 12:35 p.m.; 1:10 p.m.; and 1:30 p.m.		+8

As summarized in **Table 33**, the drive-through stacking survey indicates that the maximum queue occurs on Saturday afternoon, with a total of 14 vehicles. This demand is consistent with the proposed development, which is designed to accommodate a maximum drive-through queue of 14 vehicles, thereby adequately addressing anticipated stacking requirements. **Appendix M** contains the parking and queueing survey numbers.

9.2 40 Sportsworld Drive, Kitchener

The McDonald's component consists of a 485 m² gross floor area building and provides a total of 80 parking spaces, including 70 standard spaces, two accessible spaces, six mobile order spaces, and two short-term waiting-for-order spaces.

Parking Survey

Parking counts were undertaken by Ontario Traffic Inc. on Friday, January 9, 2026, and Saturday, January 10, 2025, between 6:30 a.m. and 6:30 p.m. The site contains 70 regular parking spaces, 2 accessible spaces, 6 mobile order spaces and 2 waiting for order spaces. **Table 34** summarizes the observed parking demand survey compared to the developments' proposed parking spaces.

Table 34: 40 Sportsworld Drive – Parking Survey

	Friday January 9, 2026	Saturday January 10, 2026
Peak Parking Spaces Utilized (40 Sportsworld Drive)	**57** (11:45 – 12:00 p.m.)	**59** (1:15 – 1:30 p.m.)
Total Parking Spaces Provided	**70 spaces**	
Proposed Parking Spaces (7456 McLean & 197 Brock Rd S)	**44 spaces**	
(Surplus/Deficit)	**-13 spaces**	**-15 spaces**

Per **Table 34**, the peak parking demand observed at the McDonald's site was 57 vehicles on Friday and 59 vehicles on Saturday. Based on these observations, the proposed development would experience a deficiency of 13 parking spaces on Friday and 15 parking spaces on Saturday relative to the observed peak demand. However, it should be noted that there are other restaurants in the plaza as well as significant retail uses and there is no guarantee that overflow from these other uses did not utilize some of the spaces in the count.

Stacking Survey

Similarly, a stacking survey of the McDonald's drive-through was conducted at the request of the Township and County. The queuing survey recorded the number of vehicles at five-minute intervals at each stage of the drive-through process, including the order kiosk, payment window, and pick-up window. **Table 35** summarizes the maximum observed queues by day and corresponding time period.

Table 35: 40 Sportsworld Drive – Stacking Survey

Establishment	Day	Maximum Queue	Time of the Day	Proposed Queue Length	(Surplus/Deficit)
McDonald's (40 Sportsworld Drive)	Friday January 9, 2026	11	6:30 a.m.; 6:45 a.m.; 7:20 a.m.; and 8:00 a.m.	14	**+3**
	Saturday January 10, 2026	9	10:20 a.m.; 1:05 p.m.; 2:55 p.m.; and 5:50 p.m.		**+5**

As shown in **Table 35,** the drive-through stacking survey indicates that the maximum queue occurs on Saturday afternoon, with a total of 11 vehicles. In comparison, the proposed development is designed to accommodate 14 queued vehicles, providing a surplus of 3 stacking spaces beyond the observed peak demand. **Appendix M** contains the parking and queueing survey numbers.

9.3 Summary

Based on the surrogate parking demand surveys, the 4 Sinclair Boulevard site is considered the most representative comparator for the proposed development, as it reflects similar land use components, site scale, and operational characteristics, including a gas station, convenience retail, and a McDonald's with drive-through operating as a single integrated development. The observed parking demand at this location demonstrated a surplus relative to the proposed parking supply, indicating that similar developments are expected to operate within the proposed parking provision. In contrast, the 40 Sportsworld Drive site functions within a larger multi-tenant plaza, where parking demand is influenced by shared parking with adjacent uses, most notably Moose Winooski's and Tranquility Park. This context could result in higher background parking utilization that would not be expected at the proposed site. Accordingly, the Sinclair Boulevard location represents a more appropriate benchmark, supporting the conclusion that the proposed development is expected to provide sufficient on-site parking to accommodate anticipated demand.

10.0 Conclusion

The findings and recommendations of the Transportation Impact Study are summarized below:

Existing Conditions

Both study intersections are operating adequately with LOS "B" or better during the weekday a.m. and p.m., peak hours.

Under the 2025 existing conditions, the auxiliary storage lengths are not exceeding and have reserve capacity to accommodate future traffic volumes.

Future Background Conditions

The signalized intersection of Brock Road South at McLean Road is expected to continue to operate with a LOS "C" and "C" during the weekday a.m. and p.m. peak hours. A maximum volume-to-capacity ratio of 0.68 and 0.57 is expected during the weekday a.m. and weekday p.m. peak hours, respectively.

The signalized intersection of Brock Road South at Nicholas Beaver Road is expected to continue to operate with a LOS "B" and "B" during the weekday a.m. and p.m. peak hours, respectively. A maximum volume-to-capacity ratio of 0.54 and 0.56 is expected during the weekday a.m. and weekday p.m. peak hours, respectively.

Under the 2031 future background conditions, the queuing assessment results in an instance where the 95th percentile queues exceed the auxiliary turn lane storage length for the westbound left-turn at Brock Road South and McLean Road during the p.m. peak hour.

Site Generated Traffic

During the weekday a.m. peak hour, the site is expected to generate 172 primary and 222 pass-by trips. In the p.m. peak hour, projections are 173 primary and 202 pass-by trips.

Future Total Conditions

In the 2031 horizon year, the intersection of Brock Road South at McLean Road is expected to decrease from operating at a LOS "C" and "C" to operate with a LOS "D" and "C" during the weekday a.m. and p.m. peak hours, respectively, when compared to 2031 Future Background conditions. A maximum volume-to-capacity ratio of 1.01 (0.33 increase from 2031 Future Background) and 0.75 (0.18 increase from 2031 Future Background) is expected during the weekday a.m. and weekday p.m. peak hours, respectively.

In the 2031 horizon year, the intersection of Brock Road South at Nicholas Beaver Road is expected to continue to operate with a "LOS "B" during the weekday a.m. and p.m. peak hours. A maximum volume-to-capacity ratio of 0.56 (0.02 increase from 2031 Future Background) and 0.57 (0.02 increase from 2031 Future Background) is expected during the weekday a.m. and weekday p.m. peak hours, respectively. These metrics indicate that the intersection is expected to operate efficiently with minimal delays and reserve capacity to accommodate future increases in traffic volume.

Both proposed Site accesses expected to operate acceptably with LOS "C" or better during the weekday a.m. and p.m., peak hours.

Similar to the 2031 future background conditions, the 2031 future total queuing assessment results in an instance where the 95th percentile queues exceed the auxiliary turn lane storage length for the westbound left-turn at Brock Road South and McLean Road during the p.m. peak hour.

Future Total Improvements

Signal timing adjustments were examined in an effort to mitigate projected delays, congestion, and queue length concerns for 2031 at Brock Road South and McLean Road in the northbound and westbound left-turn lanes. The timings detailed for the future background scenario were the same as applied to the 2031 future total scenario.

The results of the signal adjustments indicate that in the 2031 future total scenario, the intersection of Brock Road South at McLean Road operates at capacity with a maximum v/c ratio of 0.88 and 0.67 during the a.m. and p.m. peak hours, respectively.

Queue exceedances are also still present at Brock Road South and Nicholas Beaver Road. However, each instance of queue exceedance remains within 15 meters, or approximately two vehicles, of the designated storage length. This level of excess queuing, when it occurs, can be supported by the auxiliary turn lane taper with limited effect on through traffic. It is recommended that this movement be monitored for future storage lane expansion.

Site Access Review

No issues were identified regarding sight lines and access spacing at the proposed site accesses.

The development proposes a parking supply surplus and meets the loading space requirements when compared to the Township of Puslinch's Comprehensive Zoning By-Law.

A vehicle maneuvering assessment was conducted and the subject development can accommodate most of the design vehicles expected to maneuver the site including MSU (Medium Single Unit) Trucks, GFL Garbage Truck, Pumper Fire Truck, and passenger vehicles. Some maneuvering issues were identified regarding the WB-20 Truck and 8 Axle Fuel Tanker movements but the McLean Road access allowed all vehicles to enter the site.

Parking and Loading Requirements

The development meets the parking requirements when compared to the Township of Puslinch's Comprehensive Zoning By-Law No. 023-18. These include regular, accessible, loading and bicycle parking spaces.

Surrogate Survey

The 4 Sinclair Boulevard site is the most representative comparator, reflecting similar land uses, scale, and operating characteristics, and demonstrated a parking surplus, indicating the proposed development is expected to operate within the planned parking supply. In contrast, the 40 Sportsworld Drive site could have elevated parking demand due to shared use with Moose Winooski's and Tranquility Park, its location within a busy commercial node, and its stronger regional draw, conditions that would not be expected at the subject site. Accordingly, the Sinclair findings support the conclusion that sufficient parking is expected to be provided. Both surrogate surveys support the stacking storage length.

In consideration that the proposed site does not materially impact the boundary road network due to the small number of site-generated traffic, the site access is expected to operate with minimal delays and offers sufficient sight lines, the proposed development can be supported from a transportation perspective for the Zoning By-Law Application.

We trust that this letter satisfies any transportation related concerns associated with the proposed development. Should you have any questions or require any further information, please do not hesitate to contact the undersigned.

Respectfully submitted,

C.F. CROZIER & ASSOCIATES INC.

[redacted]

Ian Lindley, MASc., P.Eng.
Project Engineer, Transportation

C.F. CROZIER & ASSOCIATES INC

[redacted]

Engineering Intern, Transportation

RK:IL/cj

J:\2700\2792 - Daaz Inc\7289 - 7456 McLean Rd W & 197 Brock Rd S\Reports\Transportation\2026.02.13 _(2792-7456) McLean and 197 Brock (3rd Submission) _Final.docx

Appendix A

Terms of Reference Correspondence

Ramy Kamal

From: Ramy Kamal
Sent: July 30, 2025 12:11 PM
To: Ramy Kamal
Subject: FW: 7456 McLean Road West & 197 Brock Road South Comment Inquiries
Attachments: Trip Gen 7504 McLean Rd E.pdf; Trip Gen 7545 McLean E.pdf; Trip Gen Truckline TO BE UPDATED.pdf; Trip Gen 128 Brock Rd S.pdf

---

From: Lynne Banks <lbanks@puslinch.ca>
Sent: July 25, 2025 10:28 AM
To: Ian Lindley <ilindley@cfcrozier.ca>
Subject: FW: 7456 McLean Road West & 197 Brock Road South Comment Inquiries

Hi Ian -

Please see comments from the Township's traffic consultant, Julia Salvini, below.

If I can assist further, please let me know.

Regards –

Lynne

Lynne Banks
Development and Legislative Coordinator
Township of Puslinch
7404 Wellington Rd 34, Puslinch ON N0B 2J0
519-763-1226 ext. 226 Fax 519-736-5846 www.puslinch.ca

From: Julia Salvini <julia@salviniconsulting.com>
Sent: July 24, 2025 5:11 PM
To: Lynne Banks <lbanks@puslinch.ca>
Cc: Pasquale Costanzo <pasqualec@wellington.ca>
Subject: RE: 7456 McLean Road West & 197 Brock Road South Comment Inquiries

Hi Lynne,

Here is some further information in response to the questions we received from Ian. Pasquale, I welcome anything you may want to add. And Ian is welcome to reach out if he has any questions.

Thanks,
Julia

Queuing Requirement
The Township does not have a zoning by-law queuing requirement for drive-through facilities. Subject to what others at the Township may have to say, I think relying on the Town of Milton bylaw for guidance is a good approach. I think it would also be appropriate for the applicant to ask the operator if they have any standards of their own that they use. For example, I'm sure McDonald's has a standard they generally use for their sites.

Adjacent Parcel
My understanding is that the two landowners are still talking about a joint access of some kind to McLean Road. On March 6 of this year I reviewed a plan with two driveway connections illustrated from this site to a future shared connection on the Wheelking site. At the time I commented that the southerly of the two driveway was very close to

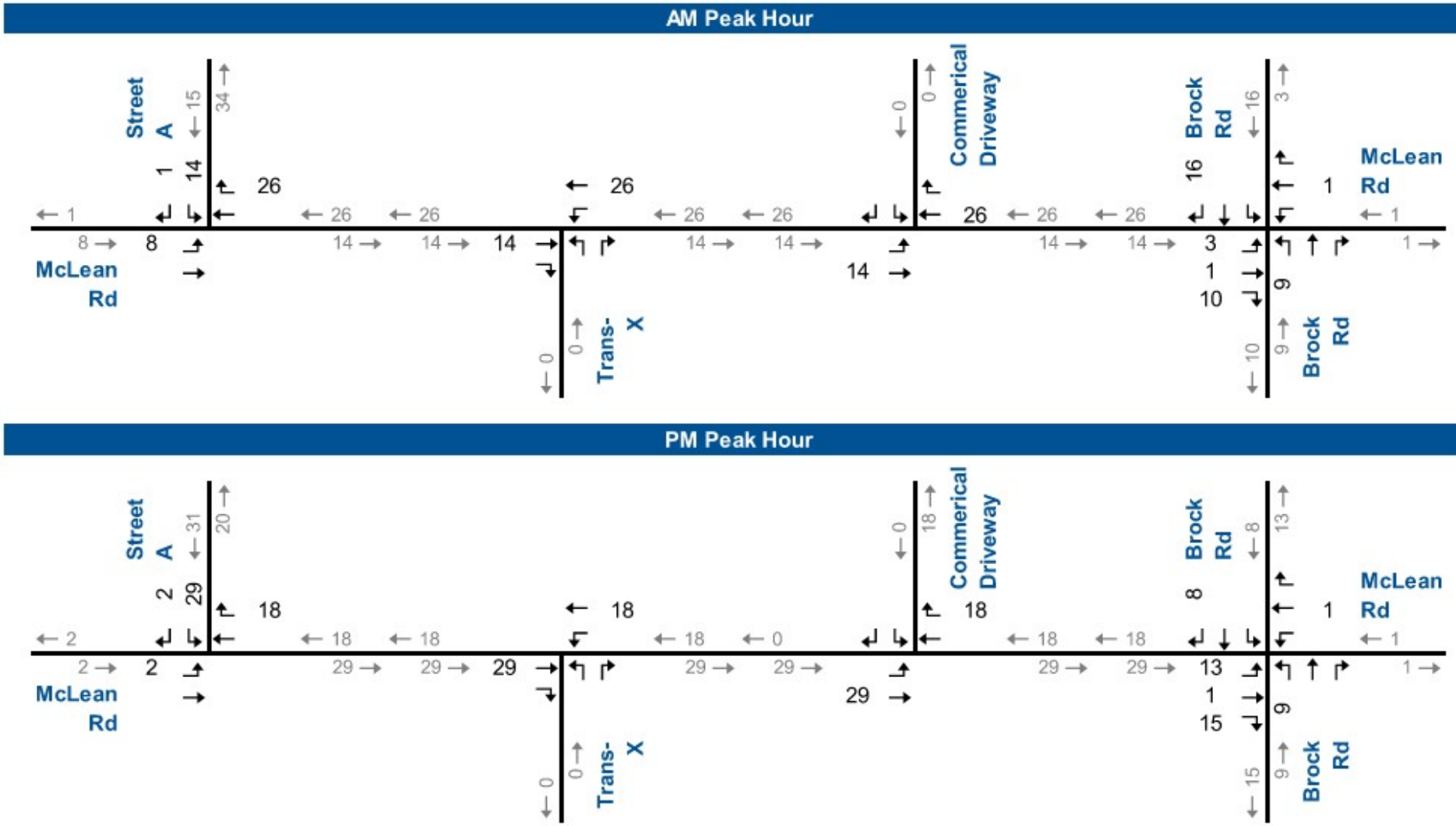
McLean Road and if it was needed for circulation may have to be restricted to right turns. Someone else at the Township may have more current information on those discussions.

Background Traffic

Background traffic should include the following sites

- 7434 McLean Road West (adjacent Wheelking site)
- Truckline site to the west of Wheelking
- 128 Brock Road South
- 7475 McLean Road East
- 7504 McLean Road East

I'm including several attached files illustrating the site traffic for the various developments. Below I've included an excerpt for the Wheelking site at 7434 McLean W.



Site Generated Traffic Volumes

Industrial Development, Puslinch TIS
210444

Figure 2

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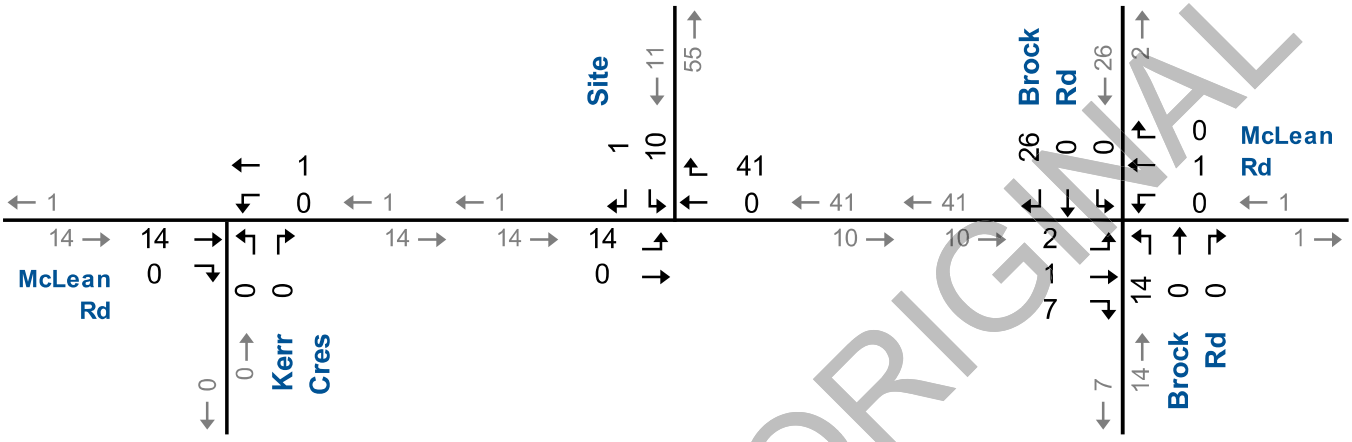
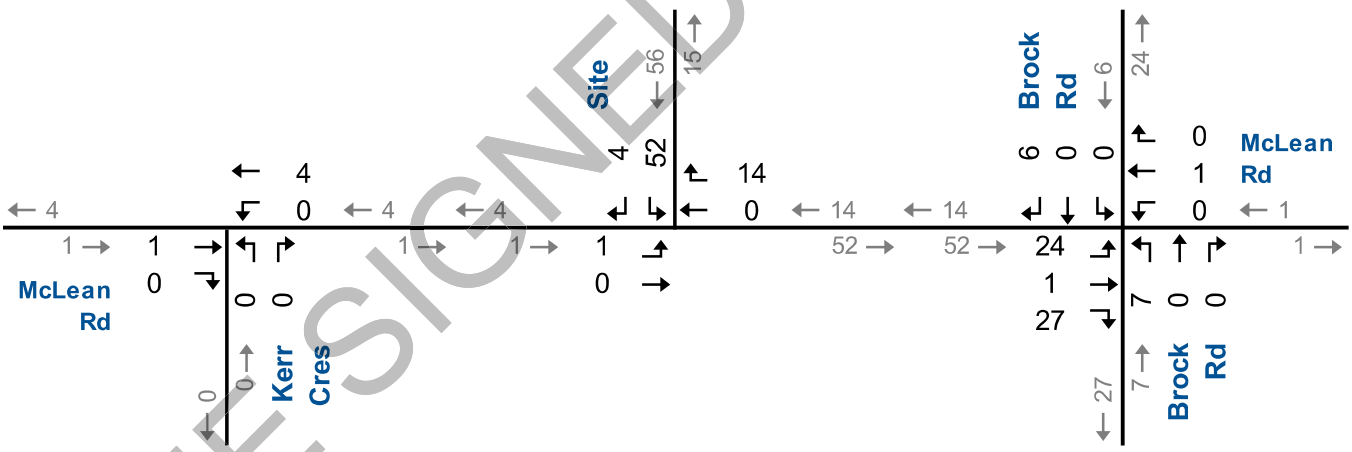
AM Peak Hour



PM Peak Hour



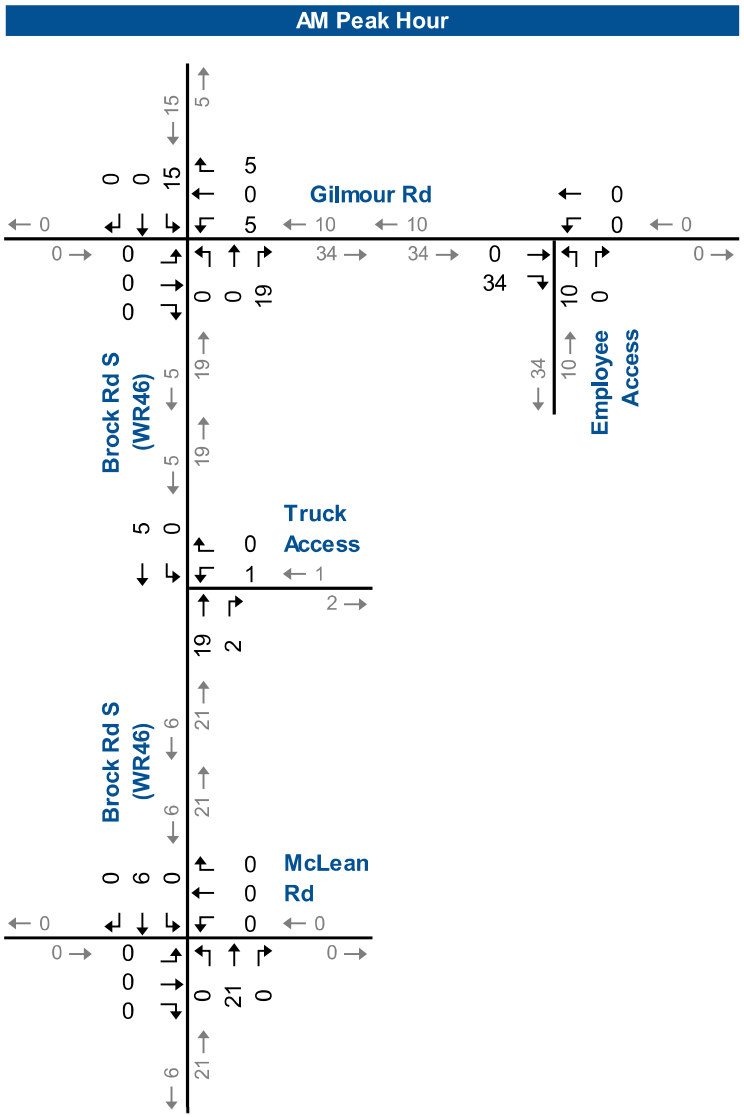
SEE SIGNED ORIGINAL

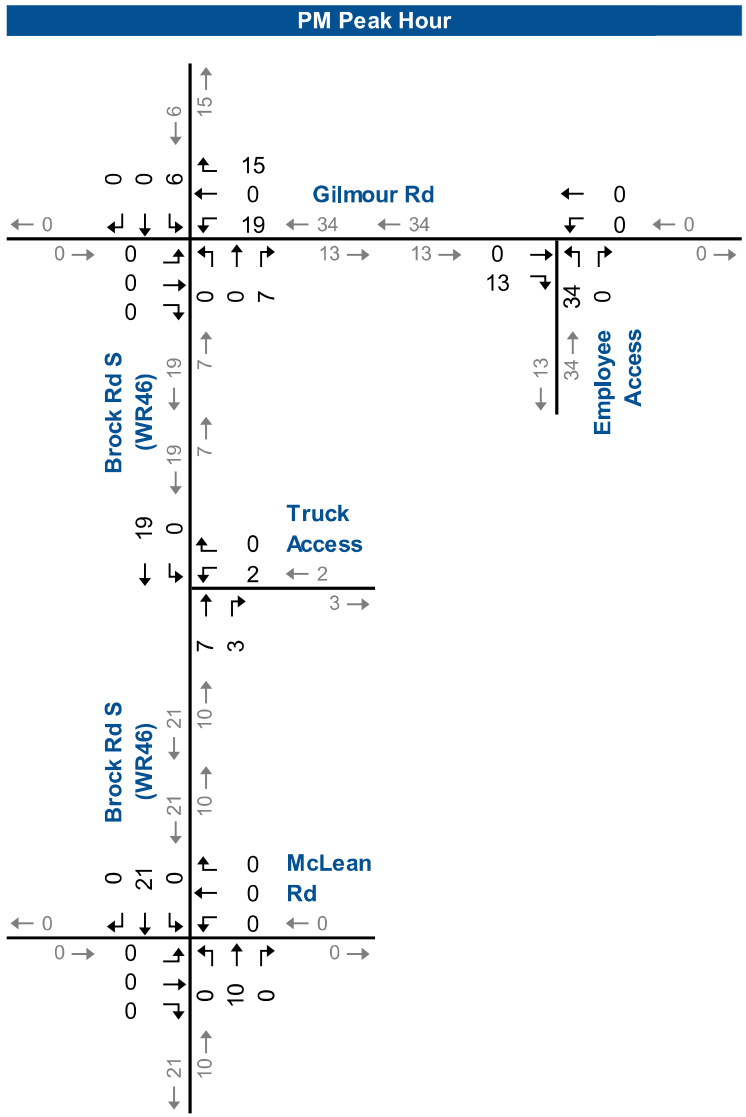
paradigm TRANSPORTATION SOLUTIONS LIMITED

Site Generated Traffic Volumes

Truck Distribution Terminal, Puslinch TIS
210766

Figure 3.2





Site Generated Traffic Volumes

128 Brock Road South, Puslinch
220579

Figure 3.2

5.3 Site Trip Distribution and Assignment

The site traffic was assigned to the road network based on the existing traffic patterns and local transportation context. The existing travel patterns were derived separately for passenger vehicle and truck trips based on the inbound and outbound movements at the intersection of Brock Street and McLean Road during the a.m. and p.m. peak hours. Taking into consideration that McLean Road dead-ends east of the site, all site traffic was assigned to/from the west to Brock Road South. Both vehicles and trucks were assigned to the study area separately.

Trip distribution percentages for passenger vehicles are shown in **Figure 6** while **Figure 7** shows the distribution percentages for heavy trucks.

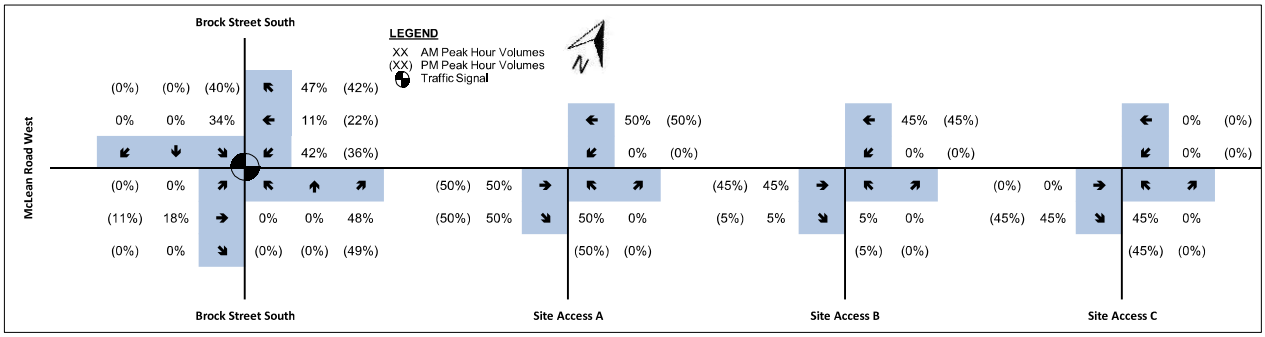


Figure 6 Trip Distribution Percentages (Passenger Vehicles)

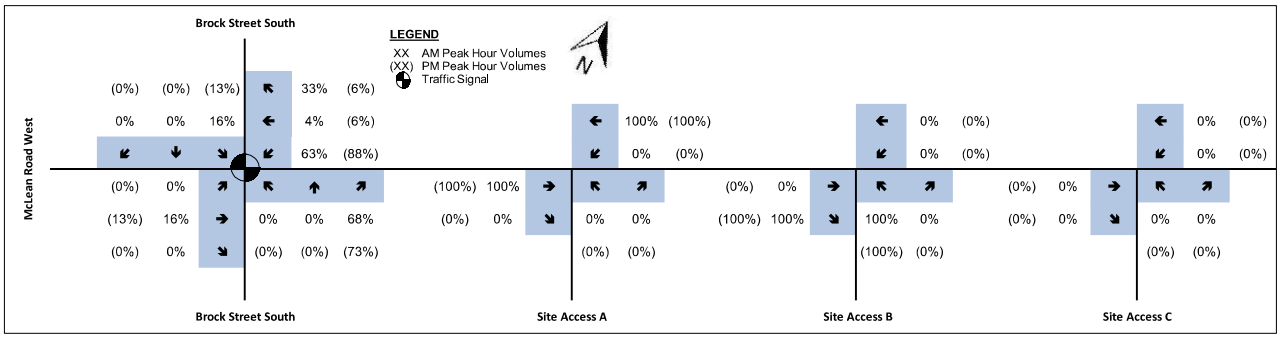


Figure 7 Trip Distribution Percentages (Heavy Trucks)

The estimated site trips generated by the proposed development as assigned to the site accesses and study intersections for the weekday a.m. and p.m. peak hours are provided in **Figure 8, Figure 9,** and **Figure 10**.

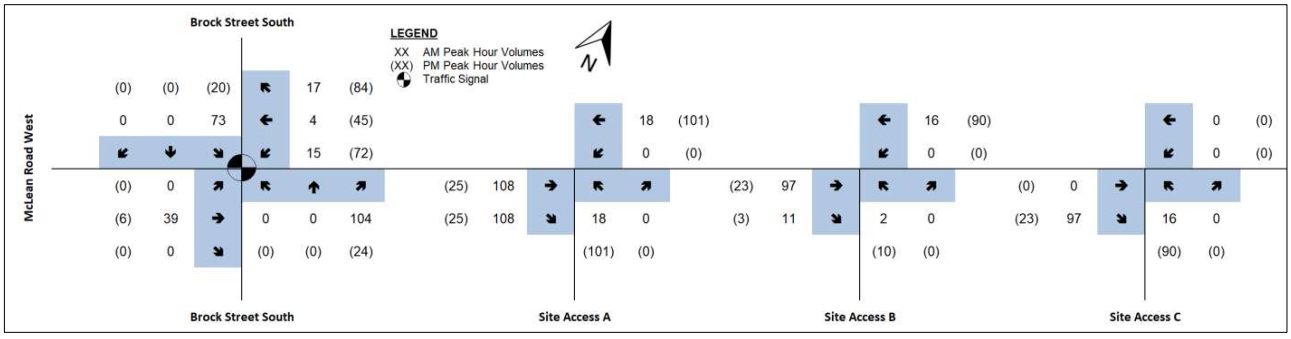


Figure 8 Estimated Site Trips (Passenger Vehicles)

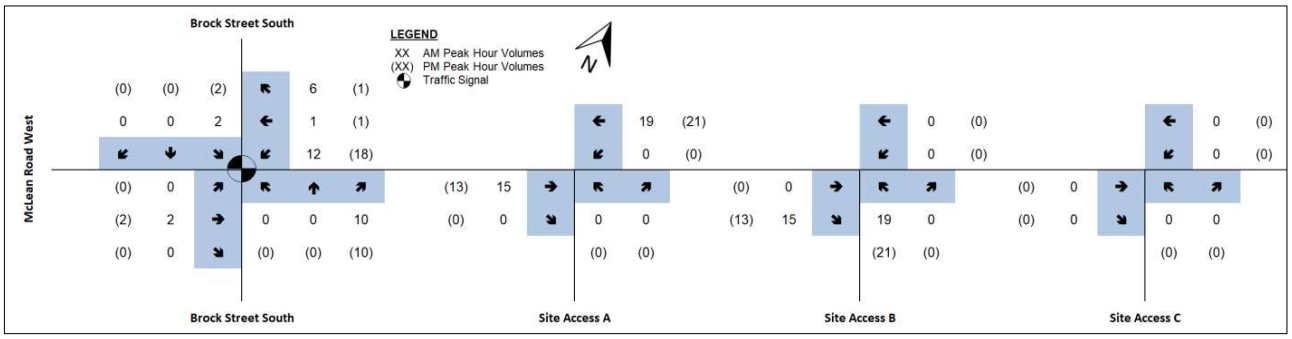


Figure 9 Estimated Site Trips (Heavy Trucks)

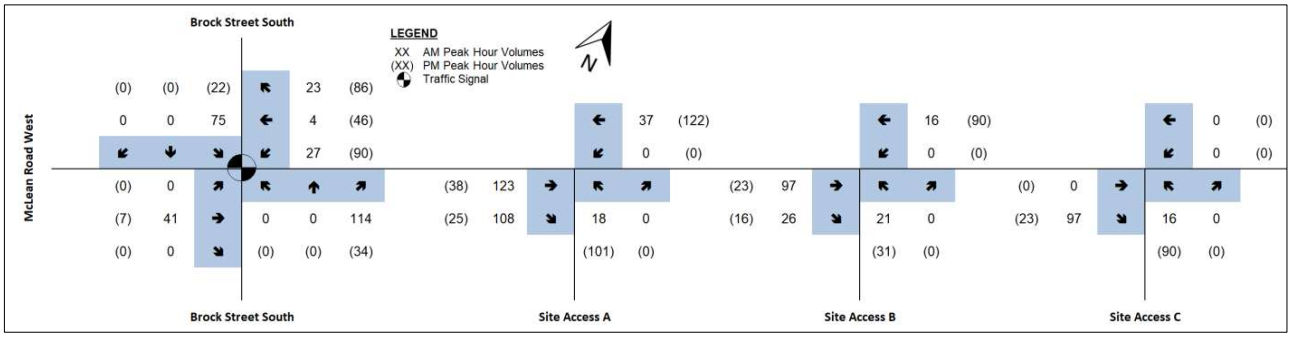


Figure 10 Estimated Site Trips (Combined)

6. Future Total Traffic

6.1 Future Total Traffic

The future total traffic conditions for the study peak hours in the 2027 planning horizon was derived by combining the projected future background traffic with the corresponding estimate of total site generated traffic.

Figure 11 summarizes the future total traffic volumes for the 2027 planning horizon year during the weekday a.m. and p.m. peak hours.

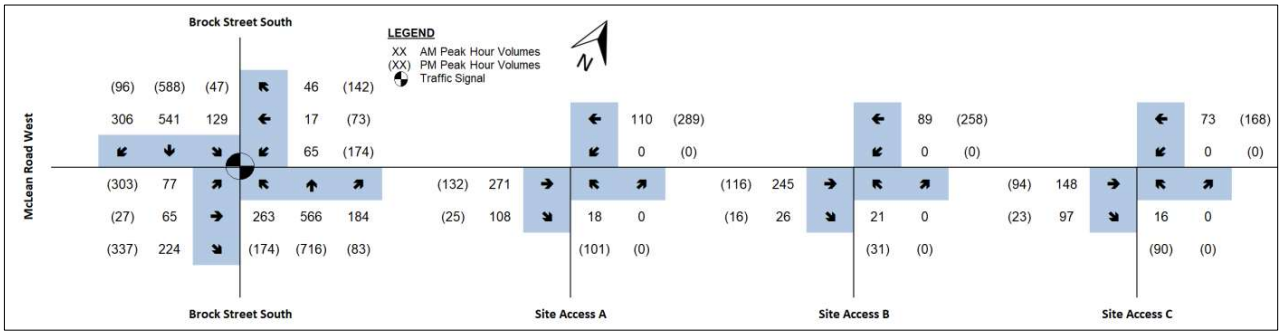
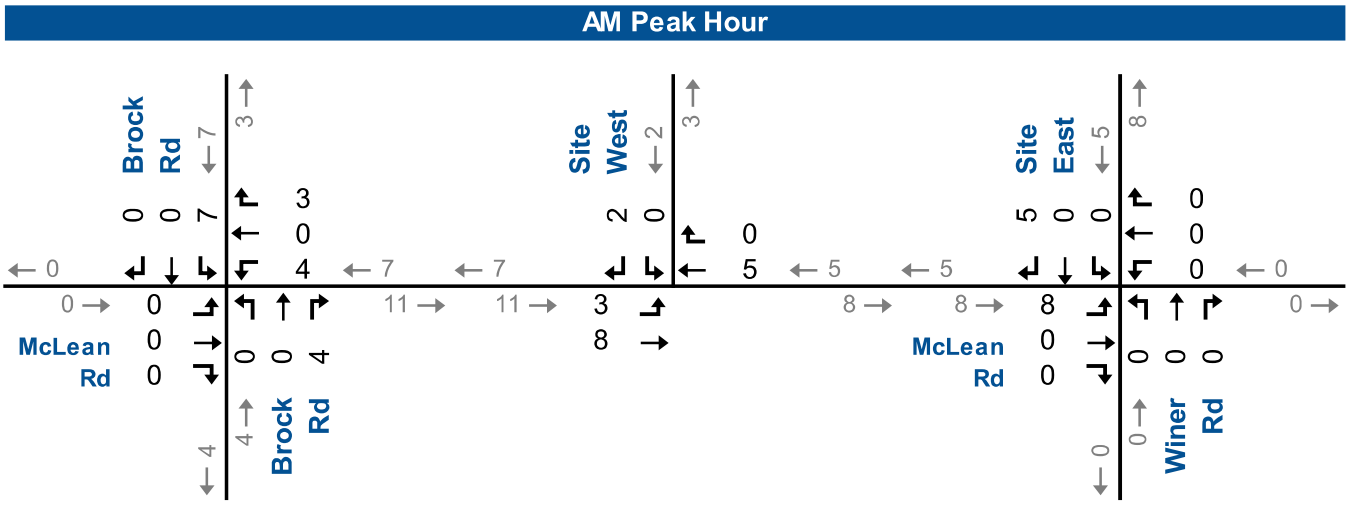
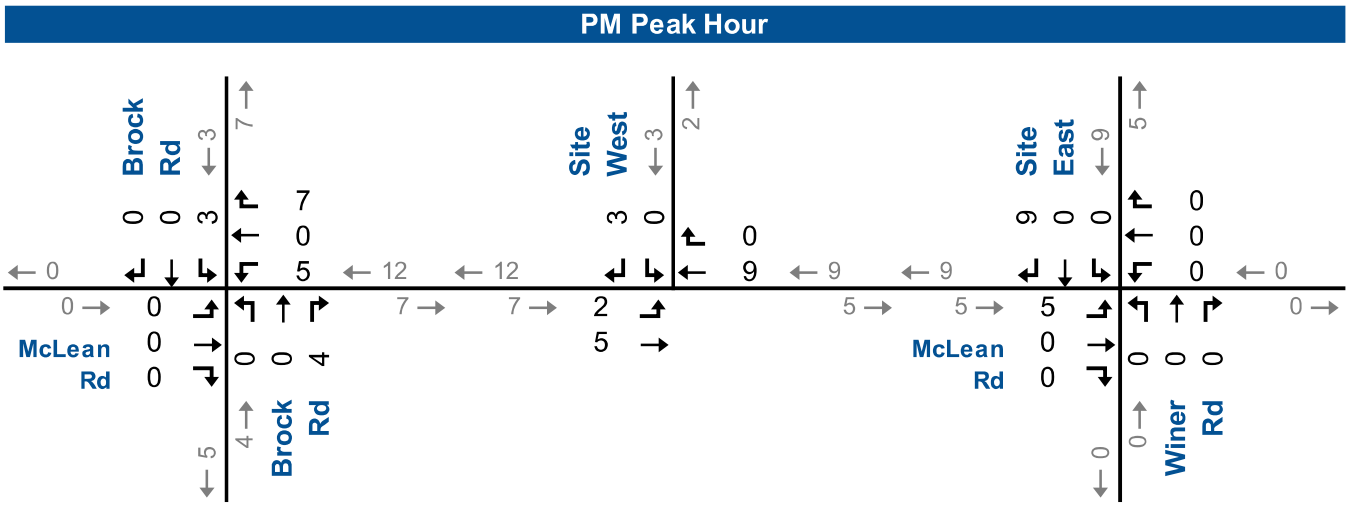


Figure 11 2027 Future Total Traffic

7. Intersection Capacity Analysis

The capacity analysis identifies how well the intersections and driveways are operating and how they are expected to operate in the future. The analysis contained within this report utilized the Highway Capacity Manual (HCM) 2000





Site Generated Traffic Volumes

7504 McLean Road Puslinch
240189

Figure 3.2

Theshantha De Silva

From: Brandon Bradt
Sent: Wednesday, April 12, 2023 3:56 PM
To: Theshantha De Silva
Subject: FW: FW: Transportation Terms of Reference - 7456 McLean Road and 197 Brock Road South
Attachments: Signal Timing - WR46@Mclean.pdf; Signal Timing - WR46@Nicholas Beaver.pdf

FYI

Brandon Bradt, M.Eng. CEM, P.Eng.
Manager (Planning), Transportation
DID: 416.842.0033

From: Kooistra, Tim <tkooistra@dillon.ca>
Sent: December 7, 2022 10:58 AM
To: Brandon Bradt <bbradt@cfcrozier.ca>
Cc: Pasquale Costanzo <pasqualec@wellington.ca>; Ariel Yerushalmi <ayerushalmi@cfcrozier.ca>; mfowler@puslinch.ca
Subject: Re: FW: Transportation Terms of Reference - 7456 McLean Road and 197 Brock Road South

Good afternoon Brandon,

Thank you for reaching out regarding the planned Transportation Impact Assessment you are looking to prepare for a proposed development found at 7456 McLean Road in the Township of Puslinch, noting that this development is located on the northwest quadrant of the McLean Road and Brock Road (Wellington Road 46) intersection.

As you may be aware, Dillon Consulting Limited has been retained by the County of Wellington to review the proposed scope of work for various traffic impact studies that may impact the County road network and associated intersections. As a result, this response is being provided on behalf of the County of Wellington for your consideration.

The scope you have identified is generally acceptable, noting that the following needs to be considered in the study and also within the development plan.

- In accordance with the County of Wellington's Official Plan (Section 9.8.1, item c), no driveway access to Brock Road (Wellington Road 46) will be permitted. As a result, only one driveway access to McLean Road will be able to be provided to the site and all trips generated by the site will need to be assigned via this sole driveway access. As a result, all on-site vehicle maneuvering analyses will need to consider entering and exiting the site to/from McLean Road only.
- The study area must also include the signalized intersection of Brock Road (Wellington Road 46) and Nicholas Beaver Road found south of the proposed development.
- A 2.0% per annum growth rate (compounded annually) needs to be applied to all movements and corridors within the study area.
- The Township of Puslinch will need to be contacted to identify any other background developments and/or associated traffic impact studies that have been previously submitted as they may impact the future traffic volumes that need to be considered in the study.
- No changes to geometry or traffic control are anticipated within the study area.
- The signal timing plans for the two Brock Road South (Wellington Road 46) intersections that need to be assessed (at Nicolas Beaver Road & McLean Road) have been attached to this email.

- No turning movement count data is available for these two study area intersections, as a result, new data will need to be collected.

Thank you,

Tim

Tim Kooistra, C.E.T.
Dillon Consulting Limited
130 Dufferin Avenue Suite 1400
London, Ontario, N6A 5R2
T - 519.438.1288 ext. 1330
F - 519.672.8209
M - 519.851.5403
TKooistra@dillon.ca
www.dillon.ca

From: Brandon Bradt <bbradt@cfcrozier.ca>
Sent: Wednesday, November 23, 2022 4:46 PM
To: mfowler@puslinch.ca; Pasquale Costanzo <pasqualec@wellington.ca>
Cc: Ariel Yerushalmi <ayerushalmi@cfcrozier.ca>
Subject: Transportation Terms of Reference - 7456 McLean Road and 197 Brock Road South

CAUTION: This email originated from outside the organization. Do not click links or open attachments unless you know the contents to be safe.

Good Afternoon Mike and Pasquele,

Lynne Banks passed along your info to reach out to regarding a Terms of Reference we have prepared for the Township and County's review prior to us conducting our Traffic Impact Study to support a Zoning By-law Amendment and Site Plan Application for the site located 7456 McLean Road. We also note that no comments have been provided yet by County Transportation staff based on the pre-con notes summary.

If you could both review the Terms of Reference below or pass it along to the correct colleague for review it would greatly appreciated so that we can begin our study.

The site is proposed to be re-zoned to a commercial development that would include the following:

- A 1-storey fast food restaurant (220 m2) with drive-thru and 24 regular parking spaces.
- A 1-storey transport terminal building (1,008 m2) with 15 trailer parking spaces and 12 regular parking spaces.
- An eight-pump gas station with a 1-storey accessory retail/convenience store (180 m2).
- A stormwater management pond.
- An internal paved area with driveways connecting the two proposed full-moves accesses via McLean Road and Brock Road South.

For additional detail please refer to the preliminary Site Plan attached here but note that it is subject to change prior to the submission.

Furthermore, it is noted that while the site is situated near Highway 401 which is part of the Ministry of Ontario (MTO) jurisdiction, but it is not part of the MTO permit control area. Hence, MTO involvement is not expected, and only the County's Guidelines are planned to be used to prepare the TIS.

Study Methodology for the Traffic Impact Study

The following intersections are proposed to be analyzed as part of the study scope:

- McLean Road and Brock Road South
- McLean Road at Site Access
- Brock Road South at Site Access

We kindly request that you please confirm that the noted intersections are sufficient for the study.

We currently do not possess the traffic counts necessary to conduct the study. We request that any counts in the County's possession could be shared for use in the study if they are deemed applicable. Additionally, please provide any collision data at the intersections within the last 5 years that should be reviewed in the TIS.

Alternatively, we can collect new traffic counts for the study intersections using a third-party provider. The counts would be collected for one day on a Tuesday, Wednesday or Thursday for during the A.M. and P.M. periods (6:30-9:30 and 16:00-19:00, respectively).

Please confirm that new parking counts can be collected subject to the parameters above should there be no recent and applicable traffic data at the study intersections.

Analysis Periods and Scenarios

The weekday A.M. and P.M. peak hours will be analyzed as part of the study per the County TIS Guidelines. Furthermore, the following horizon years for will be analyzed, consistent with the County's TIS Guidelines:

- 2023 existing conditions
- 2024 full build-out year
- 5-year horizon beyond build-out (2029)

Future Background Traffic Growth

Per the County of Wellington's standards, a growth rate of 2% will be applied to background traffic movements. Please advise whether the assumed growth rate is sufficient, or alternatively provide an appropriate growth rate to reflect expected growth in the region.

Background Developments and Transportation Improvements

We have reviewed the County of Wellington's website to determine if there are any additional background developments that should be considered within the horizon of the study and did not find any significant developments to include.

Please confirm that there are no active developments to be included as background development in the TIS. If there are developments that need to be considered, please provide the associated transportation impact studies that should be included in our analysis.

Further, please advise whether there are any roadway, transit, or active transportation improvements planned within the vicinity of the site.

Analysis Procedure

The County of Wellington's Traffic Impact Study Guidelines will be used as guidance regarding roadway analysis.

Standard metrics of assessment including delay, Level of Service (LOS), capacity, and 95th percentile queues will be analyzed using Synchro 11.0 analysis software with all outputs in the HCM 2000 format.

Parameters for Synchro inputs will conform to the County's Synchro guidelines, and any unspecified values will be left as defaults. Peak hour factors will be calculated by intersection based on the existing traffic data. The Synchro model shall reflect existing and future proposed geometric characteristics of the road network based on any planned improvements.

Trip Generation and Distribution

Trip generation for the proposed development will be forecasted using the Trip Generation Manual, 11th Edition, prepared by the Institute of Transportation Engineers (ITE):

- Land Use Category 934: Fast-Food Restaurant with Drive-Through Window
- Land Use Category 030: Intermodal Truck Terminal
- Land Use Category 945: Convenience Store/Gas Station

In the case that this is not the intended use of the land, or that a more accurate Land Use Category is to be used, please let us know. It is noted that appropriate pass-by trip reductions will be used according to the ITE Manual for the convenience and fast-food uses but no internal synergy or TDM reductions will be proposed to ensure a conservative assessment of vehicle trips.

Data from the 2016 Transportation Tomorrow Survey (TTS) will be used to determine the trip distribution for the associated peak periods.

Site Access Review

We will be reviewing the site access locations and type of control, as well as to confirm sightlines, access spacing, and driveway design based on the TAC Geometric Design Guide for Canadian Roads (GDGCR). The need for auxiliary turn lanes will also be assessed according to TAC GDGCR.

Vehicle Maneuvering Analysis

Vehicle maneuvering analysis will be conducted using AutoTurn software to confirm that expected design vehicles on site will not have any maneuvering conflicts or encroachments. The design vehicles expected on site include:

- Passenger vehicles maneuvering in and out of critical parking spaces, as well as the drive-through area
- WB-20 trucks circulating and exiting/entering the site, and maneuvering the loading spaces
- Waste trucks circulating the site and maneuvering in and out of loading spaces
- Fire truck circulating and entering/exiting the site

Summary

We request the following information for inclusion in the study, along with any comments that arise with regards to the above Terms of Reference.

Please provide:

- Confirmation that the collection of 2023 traffic counts for the intersections of study is acceptable. Otherwise, please provide data for use in the study or advise on an appropriate method of obtaining existing conditions traffic data.
- Confirmation of a general 2% growth rate along the corridors in the study. This includes turning movements at major intersections.
- Confirmation of the proposed ITE land use codes.
- Confirmation that there are no relevant background developments to be included in our analysis. If there are, please provide the completed TIS reports for inclusion in the background analysis.
- Please provide details of any planned roadway or transit improvements in the surrounding study area within the horizon years, if there are any.

Please let us know if there are any questions or concerns.

Kind Regards,

Brandon Bradt, M.Eng.CEM, P.Eng. | Project Manager, Transportation
211 Yonge Street, Suite 600 | Toronto, ON M5B 1M4
T: 416.842.0033

Crozier Connections:

Read our latest news and announcements here.

Brandon Bradt, M.Eng. CEM, P.Eng. | Project Manager
211 Yonge Street, Suite 600 | Toronto, ON M5B 1M4
T: 416.477.3392

Crozier Connections:

Read our latest news and announcements here.

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Appendix B

County Road Master Action Plan

WELLINGTON COUNTY

ROAD Master Action Plan | December 2021

DILLON CONSULTING

11.2.3 Modifications to Active Transportation Network

The County of Wellington Active Transportation Plan was also reviewed to identify any potential modifications to the existing or planned active transportation network for each of the 22 intersections. **Table 32** presents the active transportation components that align with the short-term intersection improvements.

Table 32: Short-term Intersection Improvements

#	Major Road	Minor Road	Alignment with ATP
1	WR 18	WR 26	The ATP has not proposed active transportation infrastructure for this area
2	WR 124	WR 24	The ATP has not proposed active transportation infrastructure for this area
3	WR 7	WR 12	Include signed route on WR 12, if already implemented, during construction of roundabout
4	WR 8	WR 9	The ATP has not proposed active transportation infrastructure for this area
5	WR 7	WR 18	Include paved shoulders on WR 18 during construction of roundabout
6	WR 46	Fox Run Bridle Path	The ATP has not proposed active transportation infrastructure for this area
7	WR 30	Township Road 3	Include paved shoulders on WR 30 during roundabout construction
8	WR 16	WR 109	Maintain signed route on WR 16, if already implemented, during re-alignment construction
9	WR 22	WR 29	Include paved shoulders on WR 29 and WR 22 (east) during realignment construction
10	WR 18	WR 29	Include paved shoulders on WR 18 and WR 29 during intersection improvements
11	WR 24	WR 42	Include paved shoulders on WR 42 during intersection improvements
12	WR 18	2 Line	The ATP has not proposed active transportation infrastructure for this area
13	WR 19	2 Line	Existing paved shoulders on WR 19 should remain to connect to Spine Off-Road Route to south
14	WR 52	Ninth Line	Include paved shoulders on WR 52 and Ninth Line in the conversion to all-way stop

#	Major Road	Minor Road	Alignment with ATP
15	WR 18 (Geddes Street)	David Street	Maintain signed route with sharrows on WR 18 and signed route on WR 18, if already implemented, when converting to all stop-way control
16	WR 22 (East)	WR 26	Include paved shoulders on WR 26 and WR 22 during intersection improvements
17	WR 8	WR 17	Include paved shoulders on WR 17 during intersection improvements
18	WR 8	WR 10	The ATP has not proposed active transportation infrastructure for this area
19	WR 7	WR 11	Maintain Signed Route on WR 11, if already implemented, during intersection improvements
20	WR 7	WR 10	The ATP has not proposed active transportation infrastructure for this area
21	WR 44	Eramosa-Milton Townline	The ATP has not proposed active transportation infrastructure for this area
22	WR 25	WR 124	Include paved shoulders on WR 25 during intersection improvements

11.3 Wellington Road 46 – Strategic Traffic Analysis

A review of the existing and future traffic conditions (i.e., capacity and performance) on Wellington Road 46 (WR 46) was also completed as part of the RMAP to assess the potential effects of a proposed 'road diet' through the community of Aberfoyle within Wellington County.

The proposed road diet on Wellington Road 46 through Aberfoyle would see a conversion of the existing four-lane cross-section, two travel lanes in each direction between Wellington Road 34 and Gilmour Road, to a single travel lane in each direction **Figure 29.**

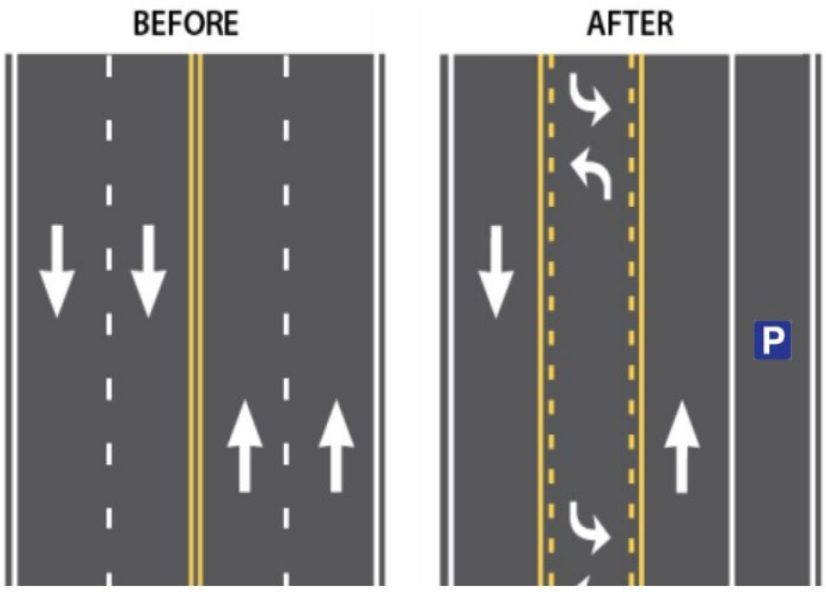


Figure 29: Aberfoyle Road Diet

11.3.1 Approach

Observed volumes from 2017 to 2018 were used to identify existing conditions. The estimated link volumes were then compared to planning level lane capacities to identify the capacity performance of the different sections of Wellington Road 46.

Future conditions (2041) were established using a County-wide strategic forecasting tool that accounts for background growth, area population and employment growth, and available local secondary plans in the County (see **Section 4.4** for methodology). Link volumes are estimated for Wellington Road 46 and compared to the planning level lane capacities.

Having established the forecast conditions for Wellington Road 46 specifically, a review of the strategic corridor capacity is undertaken. This includes reviewing the conditions on adjacent and parallel facilities. As part of this analysis, the City of Guelph's strategic travel demand model (VISUM) was used to assess the travel markets within the corridor. The market review allows an assessment of the potential diversion of traffic if capacity conditions were to change on Wellington Road 46 (i.e. if the capacity were reduced through the application of a road diet).

11.3.2 Assessment

A detailed technical analysis was undertaken, which is documented in **Appendix L**. Some of the most relevant highlights are provided below.

11.3.2.1 Existing Conditions

Table 33 summarizes the existing conditions on Wellington Road 46. Under existing conditions, Wellington Road 46 has sufficient capacity to carry the existing demand between Wellington Road 34 and Highway 401. However, between Maltby Road to Wellington Road 34, where the cross section of Wellington Road 46 is reduced to two-lanes, volumes are approaching levels where the flow is unstable and minor incidents can cause delays.

11.3.2.2 Future Conditions

Table 34 summarizes the existing conditions on Wellington Road 46. Under total future volume conditions, Wellington Road 46 has sufficient capacity to carry the forecast existing demand between Wellington Road 34 and Highway 401. However, there is a significant capacity deficiency (V/C ratio of 1.28) between Maltby Road to Wellington Road 34, where the cross section of Wellington Road 46 is reduced to two-lanes.

Table 33: Existing Conditions: Wellington Road 46

Section	Number of Travel Lanes (2-way)	Lane Capacity (veh/hr)	Directional Capacity (veh/hr)	Existing AADT	DHV (%)	Directional Split (%)	PM Peak Hour	V/C Ratio
Maltby Road to County Road 34	2	1,200	1,200	19,381	9%	55%	960	0.80
County Road 34 to McLean Road	4	1,200	2,400	19,392	8.5%	60%	990	0.41
McLean Road to Highway 401	4	1,200	2,400	23,560	7.5%	55%	970	0.40

Note: V/C Range: < 0.70 = Good Capacity, 0.70 – 0.85 = Approaching Capacity, > 0.85 = Over Capacity Conditions

Table 34: 2041 Total Future Volume Conditions: Wellington Road 46

Section	Number of Travel Lanes (2-way)	Lane Capacity (veh/hr)	Directional Capacity (veh/hr)	Existing AADT	DHV (%)	Directional Split (%)	PM Peak Hour	V/C Ratio
Maltby Road to County Road 34	2	1,200	1,200	31,149	9%	55%	1,540	1.28
County Road 34 to McLean Road	4	1,200	2,400	30,525	8.5%	60%	1,550	0.65
McLean Road to Highway 401	4	1,200	2,400	35,068	7.5%	55%	1,440	0.60

Note: V/C Range: < 0.70 = Good Capacity, 0.70 – 0.85 = Approaching Capacity, > 0.85 = Over Capacity Conditions

11.3.2.3 Strategic Review

Reductions in capacity (i.e. the road diet) on Wellington Road 46 between Wellington Road 34 and Gilmour Road will extend the identified capacity constraint further south to Gilmour Road. Under such capacity constraints, it is likely that traffic would divert from Wellington Road 46 to parallel routes. To achieve satisfactory capacity conditions, approximately 550 - 700 peak hour vehicles would need to divert from Wellington Road 46.

Table 35 and **Table 36** summarize the screenline results for the PM peak hour for the existing and total future volume conditions respectively.

Table 35: Aberfoyle Screenline Results: Existing Conditions

Roadway Name	Direction	Capacity # of Lanes	Capacity Per Lane	Capacity Total	PM Peak Hour Volume	PM Peak Hour V/C
Hanlon Expressway (Highway 6)	NB	2	1,500	3,000	1,170	0.39
Concession Road 7	NB	1	1,000	1,000	120	0.12
Wellington Road 46	NB	2	1,200	2,400	990	0.41
Victoria Road	NB	1	800	800	140	0.18
Total	NB	6	N/A	7,200	2,420	0.34

Note: V/C Range: < 0.70 = Good Capacity, 0.70 – 0.85 = Approaching Capacity, > 0.85 = Over Capacity Conditions

Table 36: Aberfoyle Screenline Results: 2041 Total Future Volume Conditions

Roadway Name	Direction	Capacity # of Lanes	Capacity Per Lane	Capacity Total	PM Peak Hour Volume	PM Peak Hour V/C
Hanlon Expressway (Highway 6)	NB	2	1,800	3,600	1,880	0.52
Concession Road 7	NB	1	1,000	1,000	60	0.06
Wellington Road 46	NB	2	1,200	2,400	1,550	0.65
Victoria Road	NB	1	1,000	1,000	460	0.46
Total	**NB**	**6**	**N/A**	**8,000**	**3,950**	**0.49**

Note: V/C Range: < 0.70 = Good Capacity, 0.70 – 0.85 = Approaching Capacity, > 0.85 = Over Capacity Conditions

Overall, there is a significant amount of available capacity across the Aberfoyle screenline in both the existing (V/C ratio of 0.34) and total future volume (V/C ratio of 0.49) scenarios. Even when the capacity is reduced on Wellington Road 46 to simulate the proposed road diet condition, the capacity across the Aberfoyle screenline is still well within the 'Good' range (V/C ratio of 0.58), as illustrated in **Table 37.**

Table 37: Aberfoyle Screenline Results: Total Future Volumes – Road Diet

Roadway Name	Direction	Capacity # of Lanes	Capacity Per Lane	Capacity Total	PM Peak Hour Volume	PM Peak Hour V/C
Hanlon Expressway (Highway 6)	NB	2	1,800	3,600	1,880	0.52
Concession Road 7	NB	1	1,000	1,000	60	0.06
Wellington Road 46	NB	1	1,200	1,200	1,550	1.29
Victoria Road	NB	1	1,000	1,000	460	0.46
Total	**NB**	**5**	**N/A**	**6,800**	**3,950**	**0.58**

Note: V/C Range: < 0.70 = Good Capacity, 0.70 – 0.85 = Approaching Capacity, > 0.85 = Over Capacity Conditions

However, the use of Concession Road 7 and Victoria Road as alternative roadways to Wellington Road 46 to travel between Guelph and Highway 401/Highway 6 would increase travel on McLean Road and Gilmour Road in order for vehicles to connect to Concession Road 7 and Victoria Road respectively. Increasing commuter travel volumes on McLean Road and Gilmour Road is not desirable given their current roles and functions, and based on their surrounding land uses (industrial and residential respectively).

Assuming that additional commuter traffic on McLean Road and Gilmour Road (diverted trips) is undesirable, the Hanlon Expressway is the most appropriate alternative to absorb the diverted traffic resulting from the proposed vehicle capacity reduction (road diet) on Wellington Road 46. Therefore, an assessment that exclusively considers the Hanlon Expressway and Wellington Road 46 within the total future volume road diet scenario was undertaken. The Aberfoyle screenline is forecast to have a V/C ratio of 0.71 (as illustrated in Table 8) which is in the "Approaching Capacity" range. A screenline V/C ratio of 0.71 would indicate that both the Hanlon Expressway and Wellington Road 46 could experience some period of unstable flow during portions of the peak hour.

The Ontario Ministry of Transportation (MTO) is moving forward with a Preliminary Design Review and Detailed Design under the Class Environmental Assessment (EA) for improvements to Highway 6 (from Highway 401 to Maltby Road) and Highway 401 (Wellington Road 36 to Wellington Road 35). As part of this review analysis did consider these future improvements and their impacts on area flows. It was concluded that while there will be some diversion away from WR 46 as a result of the planned improvements by the Ministry, specifically the Morriston By-Pass, it is not significant enough to suggest that lane/capacity reductions on WR 46 will result in satisfactory operating conditions. There is no appreciable benefit of the by-pass to trips that already prefer to use the Wellington Road 46 route over Hanlon Expressway to facilitate their trip (i.e., trips to and from the east on Highway 401).

11.3.3 Conclusions and Recommendations

Based on the foregoing analysis, the following conclusions are reached:

- Wellington Road 46 is operating within capacity for the existing conditions.
- By 2041, the two-lane section of Wellington Road is forecast to experience significant congestion between Maltby Road and County Road 34.
- A reduction in capacity of the section of Wellington Road 46 between Gilmour Road and Wellington Road 34 would result in significant capacity constraints. Approximately 550-700 peak hour vehicles would need to divert to result in adequate operating conditions on Wellington Road 46
- The broader strategic corridor network has capacity to absorb the 550-700 peak hour peak hour vehicles, but diversion of this magnitude is not forecast to occur due to origin-destination of trips and associated travel time and distance increases.
- While the Morriston By-Pass is likely to result in some reduction in volume in the Wellington Road 46 corridor, it will not be significant enough to justify reduced capacity on Wellington Road 46.
- While Hanlon Expressway is the more appropriate road for the trips to divert to and is forecast to have the available capacity, the assessment of the travel market for Wellington Road 46 shows using this route would result in increases in travel distance and travel time. It is more likely that trips would use the Victoria Road via Gilmour Road to bypass the constrained sections of Wellington Road 46.
- Any reduction in capacity (i.e., implementation of a road diet) on Wellington Road 46 through Aberfoyle will result in a significant increase on non-County roadways (Gilmour Road and Victoria Road). The design and environment for these roads is not suited to accommodate the changed role and function.
- Overall, a road diet through the community of Aberfoyle within Wellington County could be accommodated from a strategic capacity perspective but the commensurate impacts on the adjacent municipal network is not desirable from an operational and road safety perspective.
- A future review and study is required once future infrastructure and service is implemented (Ministry of Transportation improvements to the Hanlon Expressway, including a new interchange and Morriston By-Pass; All-day, two-way rail service on Kitchener line). This study could take the form of an area specific Master Plan or a

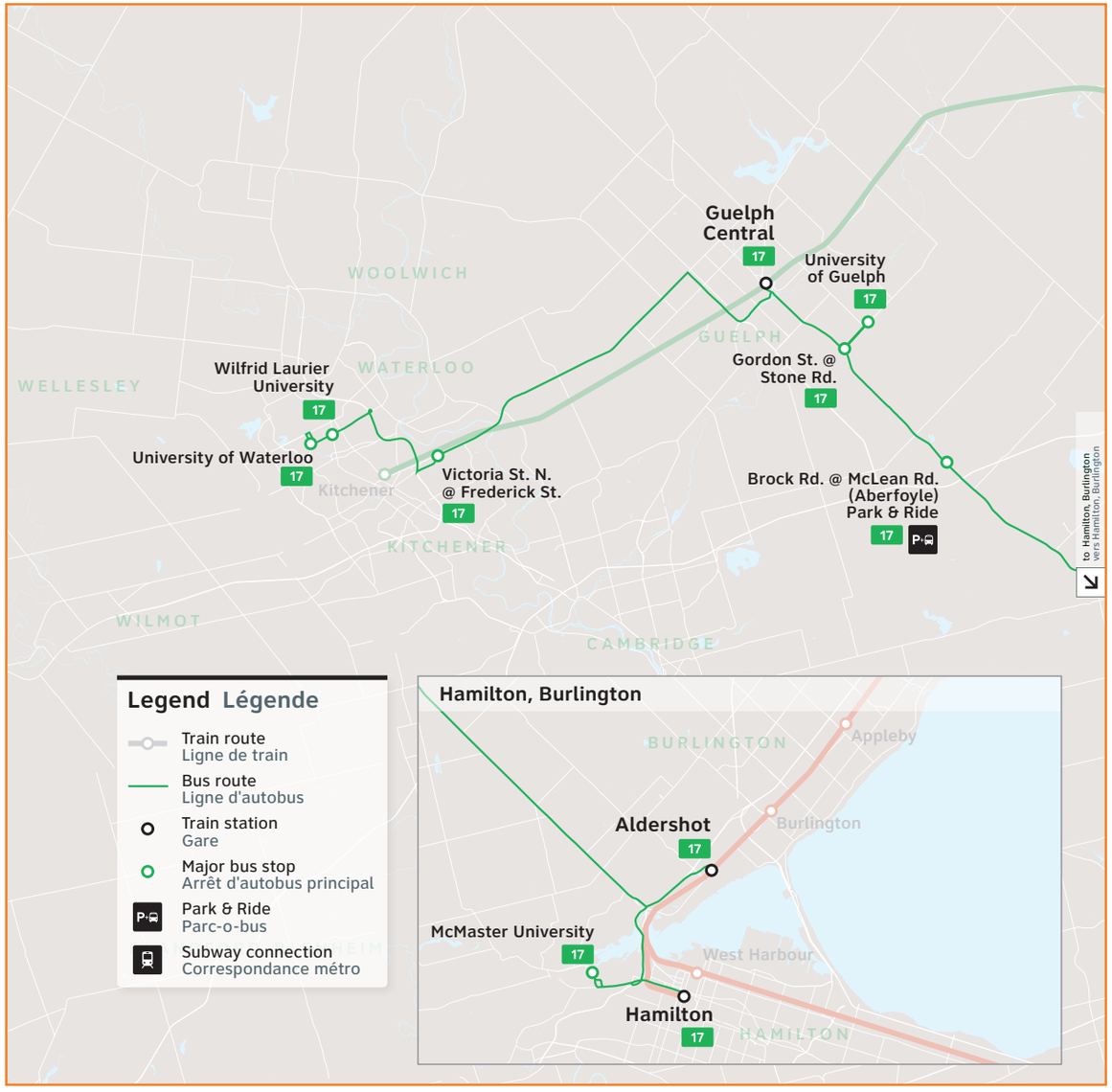
Municipal Class EA where alternative methods and alternative design concepts would be fully explored (i.e., impacts and costs).

Appendix C

Transit Maps and Schedules

17 Route number / Nombre d'itinéraire

Waterloo/Hamilton



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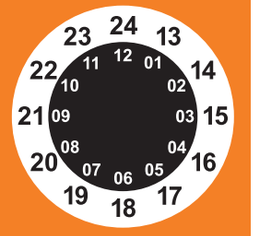

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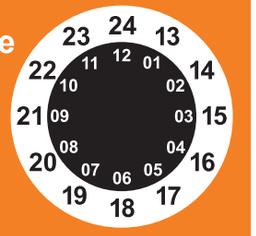

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			University of Waterloo	**Wilfrid Laurier University**	**Victoria St. @ Frederick St.**	**Guelph Central GO**	**University of Guelph**	**Ⓟ Brock Rd. @ McLean Rd.**	**Ⓟ Aldershot GO**	**McMaster University**	**Hamilton GO Centre**
17	17030		05 00	05 03	05 14	05 47	05 57	06 12	06 43	07 00	07 20
17	17060		05 55	05 58	06 09	06 44	06 54	07 11	07 43	08 00	08 20
17	17120		06 50	06 53	07 05	07 41	07 51	08 11	08 43	09 00	09 20
17	17180		07 55	07 58	08 10	08 46	08 56	09 13	09 45	10 02	10 20
17	17230		08 55	08 58	09 10	09 46	09 56	10 13	10 45	11 02	11 20
17	17270		09 55	09 58	10 10	10 46	10 56	11 13	11 45	12 02	12 20
17	17310		10 55	11 03	11 15	11 49	11 59	12 16	12 47	13 04	13 20
17	17350		11 55	12 03	12 15	12 49	12 59	13 16	13 47	14 04	14 20
17	17390		12 50	12 58	13 10	13 46	13 56	14 13	14 45	15 02	15 20
17	17430		13 45	13 53	14 05	14 41	14 51	15 11	15 43	16 00	16 20
17	17470		14 45	14 53	15 05	15 41	15 51	16 11	16 43	17 00	17 20
17	17520		15 45	15 53	16 05	16 41	16 51	17 11	17 43	18 00	18 20
17	17590		16 50	16 58	17 10	17 46	17 56	18 13	18 45	19 02	19 20
17	17650		17 55	18 03	18 15	18 51	19 01	19 18	19 50	20 05	20 20
17	17700		19 00	19 08	19 20	19 54	20 04	20 19	20 50	21 05	21 20
17	17740		20 00	20 08	20 19	20 50	21 00	21 15	21 45	22 00	22 15

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			Hamilton GO Centre	**McMaster University**	**Ⓟ Aldershot GO**	**Ⓟ Brock Rd. @ McLean Rd.**	**University of Guelph**	**Guelph Central GO**	**Victoria St. @ Frederick St.**	**Wilfrid Laurier University**	**University of Waterloo**
17	17071		05 55	06 09	06 22	06 53	07 09	07 19	07 55	08 08	08 20
17	17131		06 55	07 12	07 27	07 58	08 14	08 24	09 00	09 13	09 25
17	17191		08 00	08 17	08 32	09 03	09 19	09 29	10 05	10 18	10 30
17	17241		09 00	09 17	09 32	10 03	10 19	10 29	11 05	11 18	11 30
17	17281		10 00	10 17	10 32	11 03	11 19	11 29	12 05	12 18	12 30
17	17321		11 00	11 17	11 32	12 03	12 19	12 29	13 05	13 18	13 30
17	17361		12 00	12 17	12 32	13 03	13 19	13 29	14 05	14 18	14 30
17	17401		13 00	13 19	13 34	14 06	14 24	14 34	15 10	15 23	15 35
17	17441		14 00	14 19	14 34	15 06	15 24	15 34	16 10	16 23	16 35
17	17481		15 00	15 19	15 34	16 06	16 24	16 34	17 10	17 23	17 35
17	17541		16 00	16 19	16 34	17 06	17 24	17 34	18 10	18 23	18 35
17	17601		17 00	17 19	17 34	18 05	18 21	18 31	19 05	19 18	19 30
17	17661		18 00	18 17	18 32	19 03	19 18	19 28	20 00	20 13	20 25
17	17701		19 00	19 17	19 32	20 03	20 18	20 28	21 00	21 13	21 25
17	17741		20 00	20 17	20 32	21 02	21 17	21 27	21 58	22 10	22 20
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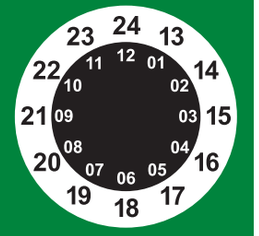

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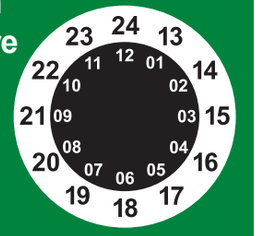
De midi à minuit:
12 01 - 24 00



Légende

Horaire des autobus

Service d'autobus GO accessible aux personnes utilisant des aides à la mobilité à cet endroit.

Stationnement disponible.

Pour consulter les horaires les plus récents et les mises à jour, veuillez visiter gotransit.com/schedules.

Notes

Vélos

1. Les vélos ne sont pas autorisés dans la gare Union ou à bord des trains du lundi au vendredi, pendant l'heure de pointe (6:30-9:30) et pendant l'heure de pointe du soir (15:30-18:30).

2. Les vélos pliables sont permis à bord des trains en tout temps.

Monday to Friday (except holidays)
Du lundi au vendredi (sauf les jours fériés)

EASTBOUND / EN DIRECTION EST

Route Number / Numéro du trajet	Trip Number / Numéro du parcours	Zone→	Guelph 39 Dp	Guelph 39	Puslinch 39	Milton 24	Mississauga 21	Mississauga 21	Mississauga 20	Mississauga 25	Mississauga 25	Etobicoke 3 Ar
			Guelph Central GO	University of Guelph	Brock Rd. @ McLean Rd. (Aberfoyle)	Regional Rd. 25 @ Hwy. 401	Winston Churchill Transitway Station	Erin Mills Transitway Station	Square One	Dixie Transitway Station	Renforth Transitway Station	Kipling Bus Terminal
29	29130		05 15	05 25	05 40	05 56	06 17	06 20	06 30	06 37	06 42	06 55
29	29190		06 15	06 25	06 45	07 01	07 22	07 25	07 35	07 42	07 47	08 00
29	29240		07 10	07 20	07 40	07 59	08 22	08 25	08 35	08 42	08 47	09 00
29	29280		08 05	08 15	08 35	08 54	09 17	09 20	09 35	09 42	09 47	10 00
29	29320		09 10	09 20	09 40	09 56	10 17	10 20	10 35	10 42	10 47	11 00
29	29360		10 15	10 25	10 45	11 01	11 17	11 20	11 35	11 42	11 47	12 00
29	29400		11 15	11 30	11 50	12 06	12 22	12 25	12 40	12 47	12 52	13 05
29	29440		12 15	12 30	12 50	13 06	13 22	13 25	13 40	13 47	13 52	14 05
29	29480		13 10	13 25	13 45	14 01	14 17	14 20	14 35	14 42	14 47	15 05
29	29540		14 10	14 25	14 45	15 01	15 17	15 20	15 35	15 42	15 47	16 05
29	29570		14 35	14 50	15 10	15 26	15 47	15 50	16 05	16 12	16 17	16 35
29	29600		15 05	15 20	15 40	15 56	16 17	16 20	16 35	16 42	16 47	17 05
29	29630		15 30	15 45	16 05	16 21	16 42	16 45	17 00	17 07	17 12	17 30
29	29660		16 05	16 20	16 40	16 56	17 17	17 20	17 35	17 42	17 47	18 05
29	29680		16 30	16 45	17 05	17 21	17 42	17 45	18 00	18 07	18 12	18 30
29	29700		17 05	17 20	17 40	17 56	18 17	18 20	18 35	18 42	18 47	19 05
29	29720		17 35	17 50	18 10	18 26	18 47	18 50	19 05	19 12	19 17	19 35
29	29740		18 05	18 20	18 40	18 56	19 17	19 20	19 35	19 42	19 47	20 00
29	29760		18 35	18 50	19 10	19 26	19 47	19 50	20 05	20 12	20 17	20 30
29	29780		19 15	19 25	19 45	20 01	20 22	20 25	20 40	20 47	20 42	21 05
29	29820		20 20	20 30	20 45	21 01	21 17	21 20	21 35	21 42	21 47	22 00
29	29850		21 20	21 30	21 45	22 01	22 17	22 20	22 35	22 42	22 47	23 00
29	29880		22 20	22 30	22 45	23 01	23 17	23 20	23 35	23 42	23 47	00 00

WESTBOUND / EN DIRECTION OUEST

Route Number / Numéro du trajet	Trip Number / Numéro du parcours	Zone→	Etobicoke 3	Mississauga 25	Mississauga 25	Mississauga 20 Dp	Mississauga 21	Mississauga 21	Milton 24	Puslinch 39	Guelph 39	Guelph 39 Ar
			Kipling Bus Terminal	Renforth Transitway Station	Dixie Transitway Station	Square One	Erin Mills Transitway Station	Winston Churchill Transitway Station	Regional Rd. 25 @ Hwy. 401	Brock Rd. @ McLean Rd. (Aberfoyle)	University of Guelph	Guelph Central GO
29	29121		06 25	06 35	06 40	06 50	06 58	07 01	07 23	07 40	07 55	08 10
29	29151		06 55	07 05	07 10	07 20	07 28	07 31	07 53	08 10	08 25	08 40
29	29181		07 25	07 35	07 40	07 50	07 58	08 01	08 23	08 40	08 55	09 10
29	29211		07 55	08 05	08 10	08 20	08 28	08 31	08 53	09 10	09 25	09 40
29	29231		08 25	08 35	08 40	08 50	08 58	09 01	09 23	09 23	09 40	10 10
29	29251		08 55	09 05	09 10	09 20	09 28	09 31	09 53	10 10	10 25	10 35
29	29291		09 55	10 05	10 10	10 20	10 28	10 31	10 53	11 10	11 25	11 35
29	29331		10 55	11 05	11 10	11 20	11 28	11 31	11 53	12 10	12 30	12 40
29	29371		11 55	12 05	12 10	12 20	12 28	12 31	12 53	13 10	13 30	13 40
29	29411		12 55	13 05	13 10	13 20	13 28	13 31	13 55	14 15	14 35	14 45
29	29421		13 25	13 35	13 40	13 50	13 58	14 01	14 25	14 45	15 05	15 15
29	29451		13 55	14 05	14 10	14 20	14 28	14 31	14 55	15 15	15 35	15 45
29	29461		14 25	14 35	14 40	14 50	14 58	15 01	15 25	15 45	16 05	16 15
29	29501		14 55	15 05	15 10	15 20	15 28	15 31	15 55	16 15	16 35	16 45
29	29511		15 20	15 32	15 37	15 50	15 58	16 01	16 25	16 45	17 05	17 15
29	29561		15 50	16 02	16 07	16 20	16 28	16 31	16 55	17 15	17 35	17 45
29	29621		16 50	17 02	17 07	17 20	17 28	17 31	17 55	18 15	18 35	18 45
29	29671		17 50	18 02	18 07	18 20	18 28	18 31	18 55	19 15	19 30	19 40
29	29711		18 55	19 05	19 10	19 20	19 28	19 31	19 53	20 10	20 25	20 35
29	29751		19 55	20 05	20 10	20 20	20 28	20 31	20 53	21 10	21 25	21 35
29	29791		20 55	21 05	21 10	21 20	21 28	21 31	21 53	22 10	22 25	22 35
29	29831		21 55	22 05	22 10	22 20	22 28	22 31	22 53	23 10	23 25	23 35
29	29891		23 55	00 05	00 10	00 20	00 28	00 31	00 53	01 10	01 25	01 35

Saturday and Sunday
Samedi et dimanche

EASTBOUND / EN DIRECTION EST

Route Number / Numéro du trajet	Trip Number / Numéro du parcours	Zone→	Guelph 39 Dp	Guelph 39	Puslinch 39	Milton 24	Mississauga 21	Mississauga 20	Mississauga 25	Mississauga 25	Etobicoke 20 Ar
			Guelph Central GO	University of Guelph	Brock Rd. @ McLean Rd. (Aberfoyle) P&R	Regional Rd. 25 @ Hwy. 401 P&R	Winston Churchill Transitway Station	Erin Mills Transitway Station	Square One	Dixie Transitway Station	Renforth Transitway Station	Kipling Bus Terminal
29	29190		06 45	06 55	07 10	07 26	07 42	07 45	07 55	08 02	08 07	08 20
29	29240		07 40	07 50	08 05	08 21	08 39	08 42	08 55	09 02	09 07	09 20
29	29280		08 35	08 45	09 05	09 21	09 39	09 42	09 55	10 02	10 07	10 20
29	29320		09 30	09 45	10 05	10 21	10 39	10 42	10 55	11 02	11 07	11 20
29	29360		10 30	10 45	11 05	11 21	11 39	11 42	11 55	12 02	12 07	12 20
29	29400		11 30	11 45	12 05	12 21	12 39	12 42	12 55	13 02	13 07	13 20
29	29440		12 30	12 45	13 05	13 21	13 39	13 42	13 55	14 02	14 07	14 20
29	29480		13 30	13 45	14 05	14 21	14 42	14 45	15 00	15 07	15 12	15 25
29	29540		14 30	14 45	15 05	15 21	15 42	15 45	16 00	16 07	16 12	16 25
29	29600		15 30	15 45	16 05	16 21	16 42	16 45	17 00	17 07	17 12	17 25
29	29660		16 30	16 45	17 05	17 21	17 42	17 45	18 00	18 07	18 12	18 25
29	29700		17 30	17 45	18 05	18 21	18 39	18 42	18 55	19 02	19 07	19 20
29	29740		18 30	18 45	19 05	19 21	19 39	19 42	19 55	20 02	20 07	20 20
29	29780		19 30	19 45	20 05	20 21	20 39	20 42	20 55	21 02	21 07	21 20
29	29820		20 40	20 50	21 05	21 21	21 39	21 42	21 55	22 02	22 07	22 20
29	29880		22 40	22 50	23 05	23 21	23 39	23 42	23 55	00 02	00 07	00 20

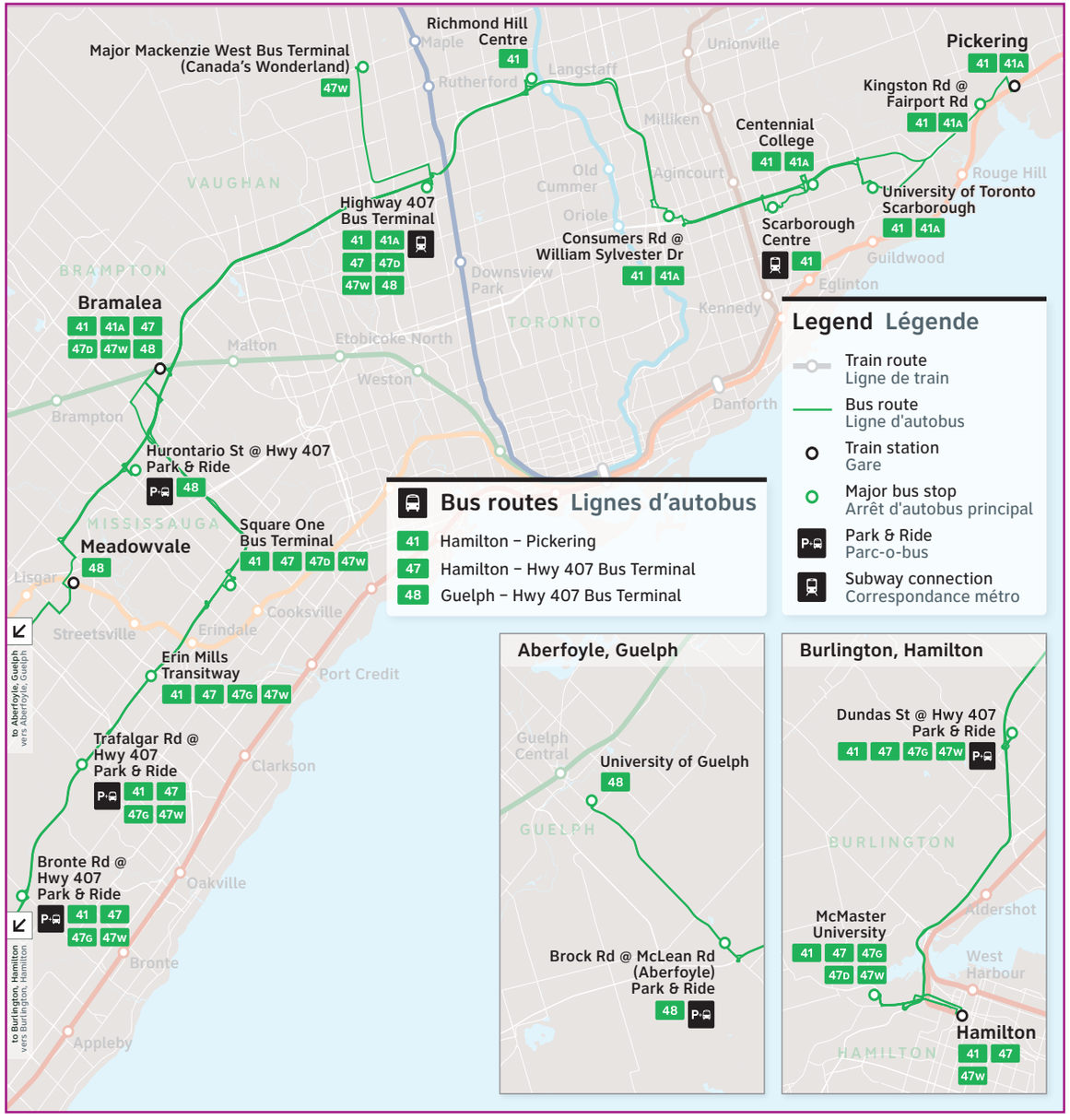
WESTBOUND / EN DIRECTION OUEST

Route Number / Numéro du trajet	Trip Number / Numéro du parcours	Zone→	Mississauga 25 Dp	Mississauga 25	Mississauga 25	Mississauga 20	Mississauga 21	Mississauga 21	Milton 24	Puslinch 39	Guelph 39	Guelph 39 Ar
			Kipling Bus Terminal	Renforth Transitway Station	Dixie Transitway Station	Square One	Erin Mills Transitway Station	Winston Churchill Transitway Station	Regional Rd. 25 @ Hwy. 401 P&R	Brock Rd. @ McLean Rd. (Aberfoyle) P&R	University of Guelph	Guelph Central GO
29	29211		08 00	08 10	08 15	08 25	08 33	08 36	08 58	09 15	09 30	09 40
29	29251		09 00	09 10	09 15	09 25	09 33	09 36	09 58	10 15	10 30	10 40
29	29291		10 00	10 10	10 15	10 25	10 33	10 36	10 58	11 15	11 35	11 45
29	29331		11 00	11 10	11 15	11 25	11 33	11 36	11 58	12 15	12 35	12 45
29	29371		12 00	12 10	12 15	12 25	12 33	12 36	12 58	13 15	13 35	13 45
29	29411		13 00	13 10	13 15	13 25	13 33	13 36	13 58	14 15	14 35	14 45
29	29451		14 00	14 10	14 15	14 25	14 33	14 36	14 58	15 15	15 35	15 45
29	29501		15 00	15 10	15 15	15 25	15 33	15 36	15 58	16 15	16 35	16 45
29	29561		16 00	16 10	16 15	16 25	16 33	16 36	16 58	17 15	17 35	17 45
29	29621		17 00	17 10	17 15	17 25	17 33	17 36	17 58	18 15	18 35	18 45
29	29671		18 00	18 10	18 15	18 25	18 33	18 36	18 58	19 15	19 35	19 45
29	29711		19 00	19 10	19 15	19 25	19 33	19 36	19 58	20 15	20 35	20 45
29	29751		20 00	20 10	20 15	20 25	20 33	20 36	20 58	21 15	21 35	21 45
29	29791		21 00	21 10	21 15	21 25	21 33	21 36	21 58	22 15	22 35	22 45
29	29831		22 00	22 10	22 15	22 25	22 33	22 36	22 58	23 15	23 30	23 40
29	29891		00 00	00 10	00 15	00 25	00 33	00 36	00 58	01 15	01 30	01 40

41-47-48

Route number
Numéro du trajet

Hamilton/Pickering



CONTACT US

1-888-438-6646
416-869-3200
TTY: #711 or call
1-800-855-0511

gotransit.com/schedules

@GOtransitBus

See Something?
Say Something.
24/7 Transit Safety Dispatch:
1-877-297-0642

prestocard.ca

Sign-up for email or text alerts/ Inscrivez-vous pour recevoir des alertes par courriel ou message texte.
gotransit.com/OnTheGO

Hamilton/ Pickering

GO Bus Schedule/
Horaire des autobus GO

METROLINX

41 47 48

- Hamilton
- Burlington
- Oakville
- Mississauga
- Brampton
- Vaughan
- Richmond Hill
- Scarborough
- Pickering

Daily / Quotidiennement
Includes GO Bus routes 41, 45, 47, 48 / Inclut les trajets 41, 45, 47, 48 d'autobus GO

Effective / À partir de:
6 MAY MAI 2023

How to read our schedules

Step 1
Find the station or terminal you are departing from. Stops are listed across the top in the order they are served.

Step 2
The upper left corner tells you what day the schedule is for and the direction of travel.

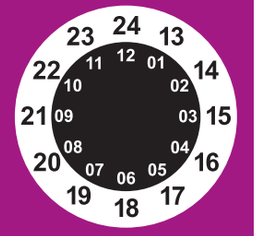
Step 3
Look across the rows for available departure times.

Step 4
Not all trains or buses stop at every station. If you see → the train or bus will not stop at that station.

Schedule times shown in 24-hour clock

Midnight to noon
00 01 - 12 00

Noon to midnight
12 01 - 24 00



Legend

- Bus trips
- → Trip does not serve this location.
- GO Bus service is accessible to passengers using mobility devices at this location.
- Parking available.

Bicycles

1. Bicycles are not allowed in Union Station or on-board trains during morning rush hour (6:30-9:30) and evening rush hour (15:30-18:30), Monday to Friday.

2. Foldable bicycles are allowed on-board trains at all times.

Notes

For the latest schedule information and updates, please visit gotransit.com/schedules.

Comment lire nos horaires

Étape 1
Trouvez votre gare ou terminus de départ. La liste des arrêts est donnée en haut dans l'ordre dans lequel ils sont desservis.

Étape 2
Le coin supérieur gauche vous indique le jour pour lequel l'horaire est donné et la direction de circulation.

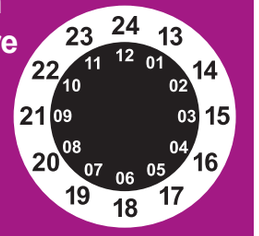
Étape 3
Regardez dans les rangées pour obtenir les heures de départ offertes.

Étape 4
Les trains ou les autobus ne s'arrêtent pas tous à chaque gare. Si vous voyez le symbole → le train ou l'autobus ne s'arrêtera pas à cette gare.

Indications selon un système horaire de 24 heures

De minuit à midi:
00 01 - 12 00

De midi à minuit:
12 01 - 24 00



Légende

- Horaire des autobus
- → Trajet ne sert pas cette station.
- Service d'autobus GO accessible aux personnes utilisant des aides à la mobilité à cet endroit.
- Stationnement disponible.

Vélos

1. Les vélos ne sont pas autorisés dans la gare Union ou à bord des trains du lundi au vendredi, pendant l'heure de pointe (6:30-9:30) et pendant l'heure de pointe du soir (15:30-18:30).

2. Les vélos pliables sont permis à bord des trains en tout temps.

Notes

Pour consulter les horaires les plus récents et les mises à jour, veuillez visiter gotransit.com/schedules.

Monday to Friday (except holidays)
Du lundi au vendredi (sauf les jours fériés)

EASTBOUND / EN DIRECTION EST

Route Number / Numéro du trajet	Zone →	Guelph 39 Dp	Puslinch 39	Hamilton 18	Hamilton 18	Burlington 16	Oakville 14	Oakville 13	Mississauga 22	Mississauga 22	Mississauga 21	Mississauga 20	Brampton 32	Vaughan 19 Ar	Vaughan 19 Dp	Richmond Hill 60	North York 5	Scarborough 7	Scarborough 89	Scarborough 89	Pickering 91	Pickering 91 Ar
Trip Number / Numéro du parcours		University of Guelph	Brock Rd. @ McLean Rd. (Aberfoyle)	Hamilton GO Centre	McMaster University	Dundas St. @ Hwy. 407	Bronte Rd. @ Hwy. 407	Trafalgar Rd. @ Hwy. 407	Meadowvale GO	Hurontario St. @ Hwy. 407	Erin Mills Transitway Station	Square One	Bramalea GO	Hwy. 407 Bus Terminal	Hwy. 407 Bus Terminal	Richmond Hill Centre	Consumers Rd. Business Park	Scarborough Centre Bus Terminal	Centennial College	University of Toronto Scarborough	Kingston Rd. @ Fairport Rd.	Pickering GO
41	41020			04 40	04 52	05 09	05 16	05 24	→	→	05 32	05 45	06 02	06 20	06 25	06 35	06 53	07 05	07 12	07 22	07 33	07 40
48	48100	05 00	05 15	→	→	→	→	→	05 50	06 04	→	→	06 15	06 35								
41	41030			05 05	05 17	05 37	05 44	05 52	→	→	06 00	06 15	06 32	06 50	06 55	07 05	07 25	07 40	07 47	08 02	08 13	08 20
41A	41042											06 20	06 37	06 57	06 57	→	07 20	→	07 37	07 52	08 03	08 10
41A	41044											06 35	06 52	07 12	07 12	→	07 35	→	07 52	08 07	08 18	08 25
41	41050			05 30	05 42	06 02	06 10	06 19	→	→	06 27	06 43	07 00	07 20	07 25	07 35	07 58	08 15	08 22	08 37	08 48	08 55
48	48160	05 50	06 05	→	→	→	→	→	06 45	06 59	→	→	07 10	07 30								
41A	41052											06 55	07 15	07 35	07 35	→	08 01	→	08 17	08 32	08 43	08 50
47	47060			05 45	05 57	06 17	06 25	06 34	→	→	06 42	07 00	07 20	07 40								
41A	41062											07 10	07 30	07 50	07 50	→	08 16	→	08 32	08 47	08 58	09 05
41	41060			06 00	06 12	06 32	06 40	06 49	→	→	06 57	07 15	07 35	07 55	08 00	08 10	08 33	08 50	08 57	09 12	09 23	09 30
41A	41072											07 25	07 45	08 05	08 05	→	08 31	→	08 47	09 02	09 13	09 20
47	47080			06 15	06 27	06 47	06 55	07 04	→	→	07 12	07 30	07 50	08 10								
41A	41092											07 40	08 00	08 20	08 20	→	08 46	→	09 02	09 17	09 28	09 35
48	48220	06 35	06 50	→	→	→	→	→	07 35	07 54	→	→	08 05	08 25								
41	41100			06 30	06 42	07 05	07 13	07 22	→	→	07 32	07 50	08 10	08 30	08 35	08 45	09 05	09 20	09 27	09 42	09 53	10 00
47	47110			06 45	06 57	07 20	07 28	07 37	→	→	07 47	08 05	08 25	08 45								
41A	41112											08 15	08 35	08 55	08 55	→	09 20	→	09 35	09 47	09 58	10 05
41	41120			07 00	07 12	07 35	07 43	07 52	→	→	08 02	08 20	08 40	09 00	09 05	09 15	09 35	09 50	09 57	10 12	10 23	10 30
47	47140			07 15	07 32	07 55	08 03	08 12	→	→	08 22	08 40	09 00	09 20								
41A	41132											08 45	09 05	09 25	09 25	→	09 50	→	10 05	10 17	10 28	10 35
41	41140			07 30	07 47	08 10	08 18	08 27	→	→	08 37	08 55	09 15	09 35	09 40	09 50	10 10	10 25	10 32	10 42	10 53	11 00
48	48260	07 25	07 40	→	→	→	→	→	08 35	08 54	→	→	09 05	09 25								
41A	41152											09 10	09 30	09 50	09 50	→	10 14	→	10 29	10 37	10 48	10 55
41	41170			07 55	08 12	08 35	08 43	08 52	→	→	09 02	09 20	09 40	10 00	10 05	10 15	10 35	10 50	10 57	11 07	11 18	11 25
41A	41192											09 35	09 55	10 15	10 15	→	10 39	→	10 54	11 02	11 13	11 20
48	48300	08 35	08 50	→	→	→	→	→	09 35	09 54	→	→	10 05	10 25								
41	41210			08 30	08 47	09 10	09 17	09 25	→	→	09 35	09 50	10 07	10 25	10 30	10 40	11 00	11 15	11 22	11 32	11 43	11 50
41A	41212											10 05	10 22	10 40	10 40	→	11 04	→	11 19	11 27	11 38	11 45
41	41230			08 55	09 12	09 35	09 42	09 50	→	→	10 00	10 15	10 32	10 50	10 55	11 05	11 25	11 40	11 47	11 57	12 08	12 15
41A	41252											10 40	10 57	11 15	11 15	→	11 39	→	11 54	12 07	12 18	12 25
41	41260			09 30	09 47	10 07	10 14	10 22	→	→	10 30	10 45	11 02	11 20	11 25	11 35	11 53	12 05	12 12	12 27	12 38	12 45
48	48340	09 50	10 05	→	→	→	→	→	10 45	10 59	→	→	11 10	11 30								
41A	41272											11 10	11 27	11 45	11 45	→	12 09	→	12 24	12 37	12 48	12 55
41	41280			10 00	10 17	10 37	10 44	10 52	→	→	11 00	11 15	11 32	11 50	11 55	12 05	12 23	12 35	12 42	12 57	13 08	13 15
41A	41292											11 35	11 55	12 15	12 15	→	12 37	→	12 52	13 07	13 18	13 25
41	41300			10 25	10 42	11 02	11 09	11 17	→	→	11 25	11 40	12 00	12 20	12 25	12 35	12 53	13 05	13 12	13 27	13 38	13 45
48	48380	10 45	11 00	→	→	→	→	→	11 40	11 59	→	→	12 10	12 30								
41A	41320											12 10	12 30	12 50	12 50	→	13 12	→	13 27	13 42	13 53	14 00
41	41320			11 00	11 17	11 37	11 44	11 52	→	→	12 00	12 15	12 35	12 55	13 00	13 10	13 28	13 40	13 57	14 02	14 13	14 20
41	41340			11 25	11 42	12 02	12 09	12 17	→	→	12 25	12 40	13 00	13 20	13 25	13 35	13 53	14 05	14 12	14 27	14 38	14 45
47	47360			11 40	11 57	12 17	12 24	12 32	→	→	12 40	12 55	13 15	13 35								
48	48420	11 45	12 00	→	→	→	→	→	12 40	12 59	→	→	13 10	13 30								
41	41360			11 55	12 12	12 32	12 39	12 47	→	→	12 55	13 10	13 30	13 50	13 55	14 05	14 25	14 40	14 47	15 02	15 13	15 20
47	47380			12 10	12 27	12 47	12 54	13 02	→	→	13 10	13 25	13 45	14 05								
41	41380			12 25	12 42	13 02	13 09	13 17	→	→	13 25	13 40	14 00	14 20	14 25	14 35	14 55	15 10	15 17	15 32	15 43	15 50
48	48460	12 45	13 00	→	→	→	→	→	13 40	13 59	→	→	14 10	14 30								
47	47400			12 40	12 57	13 17	13 24	13 32	→	→	13 40	13 55	14 15	14 35								
41	41400			12 55	13 12	13 32	13 39	13 47	→	→	13 55	14 10	14 30	14 50	14 55	15 05	15 25	15 40	15 47	16 02	16 13	16 20
41	41420			13 25	13 42	14 02	14 09	14 17	→	→	14 25	14 40	15 00	15 20	15 25	15 35	15 55	16 10	16 17	16 32	16 43	16 50
47	47430			13 40	13 57	14 17	14 24	14 32	→	→	14 40	14 55	15 15	15 35								
48	48510	13 45	14 00	→	→	→	→	→	14 40	14 59	→	→	15 10	15 30								
41	41430			13 55	14 12	14 32	14 39	14 47	→	→	14 55	15 10	15 30	15 50	15 55	16 05	16 28	16 45	16 52	17 07	17 20	17 30
47	47440			14 10	14 29	14 49	14 57	15 05	→	→	15 15	15 30	15 50	16 10								
47D	47446				14 45	→	→	→	→	→	→	15 25	15 45	16 05								

Monday to Friday (except holidays)
Du lundi au vendredi (sauf les jours fériés)

EASTBOUND / EN DIRECTION EST

Route Number / Numéro du trajet	Zone →	Guelph 39 Dp	Puslinch 39	Hamilton 18	Hamilton 18	Burlington 16	Oakville 14	Oakville 13	Mississauga 22	Mississauga 22	Mississauga 21	Mississauga 20	Brampton 32	Vaughan 19 Ar	Vaughan 19 Dp	Richmond Hill 60	North York 5	Scarborough 7	Scarborough 89	Scarborough 89	Pickering 91	Pickering 91 Ar
Trip Number / Numéro du parcours		University of Guelph	Brock Rd. @ McLean Rd. (Aberfoyle)	Hamilton GO Centre	McMaster University	Dundas St. @ Hwy. 407	Bronte Rd. @ Hwy. 407	Trafalgar Rd. @ Hwy. 407	Meadowvale GO	Hurontario St. @ Hwy. 407	Erin Mills Transitway Station	Square One	Bramalea GO	Hwy. 407 Bus Terminal	Hwy. 407 Bus Terminal	Richmond Hill Centre	Consumers Rd. Business Park	Scarborough Centre Bus Terminal	Centennial College	University of Toronto Scarborough	Kingston Rd. @ Fairport Rd.	Pickering GO
41	41450			14 25	14 44	15 04	15 12	15 20	→	→	15 30	15 45	16 05	16 25	16 30	16 40	17 03	17 20	17 27	17 42	17 55	18 05
47	47460			14 40	14 59	15 19	15 27	15 35	→	→	15 45	16 00	16 25	16 45								
48	48570	14 35	14 50	→	→	→	→	→	15 40	15 59	→	→	16 10	16 30								
47D	47466				15 15	→	→	→	→	→	→	15 55	16 20	16 40								
41	41470			14 55	15 14	15 34	15 42	15 50	→	→	16 00	16 15	16 40	17 00	17 05	17 15	17 38	17 55	18 02	18 17	18 30	18 40
47D	47482				15 30	→	→	→	→	→	→	16 10	16 35	16 55								
47	47490			15 10	15 29	15 49	15 57	16 05	→	→	16 15	16 30	16 55	17 15								
47D	47492				15 45	→	→	→	→	→	→	16 25	16 50	17 10								
41	41490			15 25	15 44	16 04	16 12	16 20	→	→	16 30	16 45	17 10	17 30	17 35	17 45	18 08	18 25	18 32	18 47	19 00	19 10
47D	47512				16 00	→	→	→	→	→	→	16 40	17 05	17 25								
48	48630	15 35	15 50	→	→	→	→	→	16 40	16 59	→	→	17 10	17 30								
47	47520			15 40	15 59	16 19	16 27	16 35	→	→	16 45	17 00	17 25	17 45								
47D	47522				16 15	→	→	→	→	→	→	16 55	17 20	17 40								
41	41530			15 55	16 14	16 34	16 42	16 50	→	→	17 00	17 15	17 40	18 00	18 05	18 15	18 38	18 55	19 02	19 17	19 30	19 40
47D	47526				16 25	→	→	→	→	→	→	17 05	17 30	17 50								
47	47540			16 10	16 31	16 54	17 02	17 10	→	→	17 20	17 35	18 00	18 20								
47D	47552				16 45	→	→	→	→	→	→	17 25	17 50	18 10								
48	48680	16 35	16 50	→	→	→	→	→	17 35	17 54	→	→	18 05	18 25								
41	41550			16 25	16 46	17 09	17 17	17 25	→	→	17 35	17 50	18 15	18 35	18 40	18 50	19 10	19 25	19 32	19 47	19 58	20 05
47D	47556				17 05	→	→	→	→	→	→	17 45	18 10	18 30								
47	47560			16 40	17 01	17 24	17 32	17 40	→	→	17 50	18 05	18 30	18 50								
47D	47562				17 15	→	→	→	→	→	→	17 55	18 20	18 40								
41	41580			16 55	17 16	17 39	17 47	17 55	→	→	18 05	18 20	18 40	19 00	19 05	19 15	19 35	19 50	19 57	20 12	20 23	20 30
47D	47602				17 35	→	→	→	→	→	→	18 15	18 35	18 55								
47	47600			17 10	17 31	17 54	18 02	18 10	→	→	18 20	18 35	19 00	19 20								
47G	47604				17 45	18 08	18 16	18 24	→	→	18 35											
47D	47608				17 50	→	→	→	→	→	→	18 30	18 50	19 10								
48	48720	17 40	17 55	→	→	→	→	→	18 40	18 59	→	→	19 07	19 25								
41	41620			17 35	17 56	18 19	18 27	18 35	→	→	18 45	19 00	19 17	19 35	19 40	19 50	20 10	20 25	20 32	20 42	20 53	21 00
47	47620			17 50	18 11	18 34	18 42	18 50	→	→	19 00	19 15	19 32	19 50								
47D	47642				18 25	→	→	→	→	→	→	19 05	19 22	19 40								
41	41650			18 05	18 26	18 46	18 54	19 02	→	→	19 10	19 25	19 42	20 00	20 05	20 15	20 33	20 45	20 52	21 02	21 13	21 20
47	47650			18 20	18 41	19 01	19 09	19 17	→	→	19 25	19 40	19 57	20 15								
41	41680			18 35	18 56	19 16	19 24	19 32	→	→	19 40	19 55	20 12	20 30	20 35	20 45	21 03	21 15	21 22	21 32	21 43	21 50
47	47690			18 50	19 11	19 31	19 39	19 47	→	→	19 55	20 10	20 27	20 45								
48	48760	18 50	19 05	→	→	→	→	→	19 45	19 59	→	→	20 07	20 25								
41	41700			19 00	19 21	19 41	19 49	19 57	→	→	20 05	20 20	20 37	20 55	21 00	21 10	21 28	21 40	21 47	21 57	22 08	22 15
47	47790			19 30	19 47	20 07	20 14	20 22	→	→	20 30	20 45	21 02	21 20								
48	48800	19 50	20 05	→	→	→	→	→	20 45	20 59	→	→	21 07	21 25								
41	41740			20 00	20 17	20 37	20 44	20 52	→	→	21 00	21 15	21 32	21 50	21 55	22 05	22 23	22 35	22 42	22 52	23 03	23 10
48	48830	20 50	21 05	→	→	→	→	→	21 45	21 59	→	→	22 07	22 25								
47	47830			20 30	20 47	21 07	21 14	21 22	→	→	21 30	21 45	22 02	22 20								
41	41780			21 00	21 17	21 37	21 44	21 52	→	→	22 00	22 15	22 32	22 50	22 55	23 05	23 23	23 35	23 41	23 50	00 00	00 05
47	47860			21 30	21 47	22 07	22 14	22 22	→	→	22 30	22 45	23 02	23 20								
48	48860	21 55	22 10	→	→	→	→	→	22 45	22 59	→	→	23 07	23 25								
41	41820			22 00	22 17	22 37	22 44	22 52	→	→	23 00	23 15	23 32	23 50	23 55	00 05	00 20	00 30	00 36	00 45	00 55	01 00
48	48890	22 55	23 10	→	→	→	→	→	23 45	23 59	→	→	00 07	00 25								
47	47910			23 00	23 12	23 32	23 39	23 47	→	→	23 55	00 10	00 27	00 45								

Monday to Friday (except holidays)
Du lundi au vendredi (sauf les jours fériés)

WESTBOUND / EN DIRECTION OUEST

Route Number / Numéro du trajet	Trip Number / Numéro du parcours	Zone→	Pickering 91 Dp	Pickering 91	Scarborough 89	Scarborough 89	Scarborough 7	North York 5	Richmond Hill 60	Vaughan 19 Ar	Vaughan 19 Dp	Brampton 32	Mississauga 20	Mississauga 21	Mississauga 22	Mississauga 22	Oakville 13	Oakville 14	Burlington 16	Hamilton 18	Hamilton 18	Puslinch 39	Guelph 39 Ar
			Pickering GO	Pickering GO	Kingston Rd. @ Fairport Rd.	University of Toronto Scarborough	Centennial College	Scarborough Centre Bus Terminal	Consumers Rd. Business Park	Richmond Hill Centre	Hwy. 407 Bus Terminal	Hwy. 407 Bus Terminal	Bramalea GO	Square One	Erin Mills Transitway Station	Hurontario St. @ Hwy. 407	Meadowvale GO	Trafalgar Rd. @ Hwy. 407	Bronte Rd. @ Hwy. 407	Dundas St. @ Hwy. 407	McMaster University	Hamilton GO Centre	Brock Rd. @ McLean Rd. (Aberfoyle)	University of Guelph
47	47021										04 40	04 55	05 20	05 28	→	→	05 35	05 43	05 51	06 10	06 25		
47	47061										05 40	05 55	06 20	06 28	→	→	06 38	06 46	06 56	07 15	07 30		
48	48061										05 45	06 00	→	→	06 12	06 35	→	→	→	→	→	07 05	07 25
47	47071										06 00	06 15	06 40	06 48	→	→	06 58	07 06	07 16	07 40	07 55		
47G	47035													07 00	→	→	07 10	07 18	07 28	07 50			
41	41041		05 00	05 05	05 15	05 25	05 35	05 47	06 02	06 15	06 20	06 35	07 00	07 08	→	→	07 18	07 26	07 36	08 00	08 15		
47D	47043										06 25	06 47	07 10	→	→	→	→	→	→	07 50			
47	47081										06 35	06 50	07 15	07 23	→	→	07 33	07 41	07 51	08 15	08 30		
48	48121										06 45	07 02	→	→	07 17	07 40	→	→	→	→	→	08 20	08 40
47D	47053										06 45	07 02	07 30	→	→	→	→	→	→	08 10			
47G	47055													07 30	→	→	07 40	07 48	07 58	08 20			
41	41061		05 25	05 30	05 40	05 52	06 05	06 17	06 32	06 45	06 50	07 07	07 35	07 43	→	→	07 53	08 01	08 11	08 40	08 55		
47	47091										07 05	07 22	07 50	07 58	→	→	08 08	08 16	08 26	08 55	09 10		
47D	47093										07 10	07 27	07 55	→	→	→	→	→	→	08 35			
41	41091		05 50	05 55	06 05	06 17	06 30	06 42	06 57	07 10	07 15	07 32	08 00	08 08	→	→	08 18	08 26	08 36	09 05	09 20		
47D	47103										07 25	07 42	08 10	→	→	→	→	→	→	08 50			
47	47111										07 30	07 47	08 15	08 23	→	→	08 33	08 41	08 51	09 20	09 35		
48	48181										07 45	08 02	→	→	08 17	08 40	→	→	→	→	→	09 25	09 45
47D	47113										07 45	08 02	08 30	→	→	→	→	→	→	09 10			
41	41111		06 25	06 30	06 40	06 52	07 05	07 17	07 32	07 45	07 50	08 07	08 35	08 43	→	→	08 53	09 01	09 11	09 40	09 55		
47D	47123										08 05	08 22	08 50	→	→	→	→	→	→	09 30			
47	47131										08 15	08 32	09 00	09 08	→	→	09 18	09 26	09 36	10 05	10 20		
41	41141		06 55	07 00	07 12	07 26	07 40	07 55	08 12	08 25	08 30	08 47	09 15	09 23	→	→	09 33	09 41	09 51	10 20	10 35		
47D	47153										08 40	08 55	09 20	→	→	→	→	→	→	10 00			
48	48231										08 45	09 02	→	→	09 17	09 40	→	→	→	→	→	10 15	10 35
47	47181										08 45	09 00	09 25	09 33	→	→	09 43	09 51	10 01	10 25	10 40		
41	41161		07 25	07 30	07 42	07 56	08 10	08 25	08 42	08 55	09 00	09 15	09 40	09 48	→	→	09 58	10 06	10 16	10 40	10 55		
47D	47183										09 10	09 25	09 25	→	→	→	→	→	→	10 30			
47	47201										09 15	09 30	09 55	10 03	→	→	10 13	10 21	10 31	10 55	11 10		
41	41191		07 55	08 00	08 12	08 26	08 40	08 55	09 12	09 25	09 30	09 45	10 10	10 18	→	→	10 28	10 36	10 46	11 10	11 25		
47D	47203										09 40	09 55	10 20	→	→	→	→	→	→	11 00			
48	48271										09 45	10 00	→	→	10 12	10 35	→	→	→	→	→	11 10	11 30
47	47211										09 45	10 00	10 25	10 33	→	→	10 43	10 51	11 01	11 25	11 40		
41	41211		08 25	08 30	08 42	08 56	09 10	09 25	09 42	09 55	10 00	10 15	10 40	10 48	→	→	10 58	11 06	11 16	11 40	11 55		
47	47221										10 15	10 30	10 55	11 03	→	→	11 13	11 21	11 31	11 55	12 10		
41	41241		09 00	09 05	09 15	09 27	09 40	09 52	10 07	10 20	10 25	10 40	11 05	11 13	→	→	11 23	11 31	11 41	12 05	12 20		
47	47251										10 40	10 55	11 20	11 28	→	→	11 38	11 46	11 56	12 20	12 35		
48	48311										10 45	11 00	→	→	11 12	11 35	→	→	→	→	→	12 10	12 30
41	41261		09 35	09 40	09 50	10 02	10 15	10 27	10 42	10 55	11 00	11 15	11 40	11 48	→	→	11 58	12 06	12 16	12 40	12 55		
41	41281		10 10	10 15	10 25	10 37	10 50	11 02	11 17	11 30	11 35	11 50	12 15	12 23	→	→	12 33	12 41	12 51	13 15	13 30		
48	48351										11 45	12 00	→	→	12 12	12 35	→	→	→	→	→	13 10	13 30
41	41301		10 40	10 45	10 55	11 07	11 20	11 32	11 47	12 00	12 05	12 20	12 45	12 53	→	→	13 03	13 11	13 21	13 45	14 00		
41	41321		11 10	11 15	11 25	11 37	11 50	12 02	12 17	12 30	12 35	12 50	13 15	13 23	→	→	13 33	13 41	13 51	14 15	14 30		
48	48391										12 45	13 00	→	→	13 12	13 35	→	→	→	→	→	14 10	14 30
41	41341		11 40	11 45	11 55	12 07	12 20	12 32	12 47	13 00	13 05	13 20	13 45	13 53	→	→	14 03	14 11	14 21	14 45	15 00		
41	41361		12 05	12 10	12 20	12 32	12 45	12 57	13 12	13 25	13 30	13 45	14 10	14 18	→	→	14 28	14 36	14 46	15 10	15 25		
48	48431										13 45	14 00	→	→	14 12	14 35	→	→	→	→	→	15 15	15 35
41	41371		12 30	12 35	12 45	12 57	13 10	13 22	13 37	13 50	13 55	14 10	14 35	14 43	→	→	14 53	15 01	15 11	15 35	15 50		
41	41391		13 00	13 05	13 15	13 27	13 40	13 52	14 07	14 20	14 25	14 40	15 10	15 18	→	→	15 28	15 36	15 46	16 10	16 25		

Monday to Friday (except holidays)
Du lundi au vendredi (sauf les jours fériés)

WESTBOUND / EN DIRECTION OUEST

Route Number / Numéro du trajet	Trip Number / Numéro du parcours	Zone→	Pickering 91 Dp	Pickering 91	Scarborough 89	Scarborough 89	Scarborough 7	North York 5	Richmond Hill 60	Vaughan 19 Ar	Vaughan 19 Dp	Brampton 32	Mississauga 20	Mississauga 21	Mississauga 22	Mississauga 22	Oakville 13	Oakville 14	Burlington 16	Hamilton 18	Hamilton 18	Puslinch 39	Guelph 39 Ar
			Pickering GO	Pickering GO	Kingston Rd. @ Fairport Rd.	University of Toronto Scarborough	Centennial College	Scarborough Centre Bus Terminal	Consumers Rd. Business Park	Richmond Hill Centre	Hwy. 407 Bus Terminal	Hwy. 407 Bus Terminal	Bramalea GO	Square One	Erin Mills Transitway Station	Hurontario St. @ Hwy. 407	Meadowvale GO	Trafalgar Rd. @ Hwy. 407	Bronte Rd. @ Hwy. 407	Dundas St. @ Hwy. 407	McMaster University	Hamilton GO Centre	Brock Rd. @ McLean Rd. (Aberfoyle)	University of Guelph
48	48471										14 45	15 05	→	→	15 17	15 40	→	→	→	→	→	16 20	16 40
41	41411		13 25	13 30	13 40	13 52	14 05	14 17	14 32	14 45	14 50	15 05	15 35	15 43	→	→	15 53	16 01	16 11	16 40	16 55		
41A	41423		13 35	13 40	13 50	14 02	→	14 17	→	14 40	14 40	14 55	15 25										
41	41431		13 50	13 55	14 05	14 17	14 30	14 42	14 57	15 10	15 15	15 30	16 05	16 13	→	→	16 23	16 31	16 41	17 10	17 25		
41A	41443		14 20	14 25	14 37	14 51	→	15 06	→	15 30	15 30	15 45	16 20										
48	48531										15 45	16 05	→	→	16 17	16 40	→	→	→	→	→	17 20	17 40
41	41451		14 25	14 30	14 42	14 56	15 10	15 22	15 37	15 50	15 55	16 15	16 50	16 58	→	→	17 08	17 16	17 26	17 55	18 10		
41A	41463		14 45	14 50	15 02	15 16	→	15 32	→	16 00	16 00	16 20	16 55										
47	47561										16 15	16 35	17 10	17 18	→	→	17 28	17 36	17 46	18 15	18 30		
41	41471		14 55	15 00	15 12	15 26	15 40	15 53	16 12	16 25	16 30	16 55	17 30	17 38	→	→	17 48	17 56	18 06	18 35	18 50		
41A	41493		15 20	15 25	15 37	15 51	→	16 10	→	16 40	16 40	17 05	17 35										
47	47591										16 45	17 10	17 45	17 53	→	→	18 03	18 11	18 21	18 50	19 05		
48	48591										16 45	17 10	→	→	17 22	17 45	→	→	→	→	→	18 25	18 45
41	41501		15 25	15 30	15 42	15 56	16 10	16 23	16 42	16 55	17 00	17 25	18 00	18 08	→	→	18 18	18 26	18 36	19 05	19 20		
41A	41513		15 55	16 00	16 12	16 26	→	16 45	→	17 15	17 15	17 40	18 10										
47	47621										17 20	17 45	18 20	18 28	→	→	18 38	18 46	18 56	19 25	19 40		
41	41521		16 00	16 05	16 17	16 31	16 45	16 58	17 17	17 30	17 35	18 00	18 30	18 38	→	→	18 48	18 56	19 06	19 30	19 45		
48	48651										17 45	18 05	→	→	18 17	18 40	→	→	→	→	→	19 15	19 35
41A	41533		16 25	16 30	16 45	17 00	→	17 20	→	17 45	17 45	18 05	18 35										
47	47651										17 50	18 15	18 45	18 53	→	→	19 03	19 11	19 21	19 45	20 00		
41	41541		16 30	16 35	16 50	17 05	17 20	17 33	17 52	18 05	18 10	18 30	19 00	19 08	→	→	19 18	19 26	19 36	19 55	20 10		
41A	41573		16 55	17 00	17 15	17 30	→	17 50	→	18 15	18 15	18 35	19 05										
47	47671										18 25	18 45	19 15	19 23	→	→	19 33	19 41	19 51	20 10	20 25		
41	41601		17 05	17 10	17 25	17 40	17 55	18 07	18 22	18 35	18 40	18 55	19 25	19 33	→	→	19 43	19 51	20 01	20 20	20 35		
48	48691										18 45	19 00	→	→	19 12	19 35	→	→	→	→	→	20 10	20 30
41A	41633		17 30	17 35	17 47	18 01	→	18 20	→	18 45	18 45	19 05	19 30										
41	41641		17 35	17 40	17 52	18 06	18 20	18 32	18 47	19 00	19 05	19 20	19 50	19 58	→	→	20 08	20 16	20 26	20 45	21 00		
41A	41663		18 05	18 10	18 22	18 36	→	18 51	→	19 15	19 15	19 30	19 55										
41	41671		18 10	18 15	18 27	18 41	18 55	19 07	19 22	19 35	19 40	19 55	20 25	20 33	→	→	20 43	20 51	21 01	21 20	21 35		
48	48731										19 45	20 00	→	→	20 12	20 35	→	→	→	→	→	21 05	21 25
41A	41703		19 05	19 10	19 20	19 32	→	19 47	→	20 10	20 10	20 25	20 50										
41	41711		19 10	19 15	19 25	19 37	19 50	20 02	20 17	20 30	20 35	20 50	21 15	21 23	→	→	21 33	21 41	21 51	22 10	22 25		
48	48771										20 45	21 00	→	→	21 12	21 35	→	→	→	→	→	22 05	22 25
41A	41743		20 05	20 10	20 20	20 32	→	20 47	→	21 10	21 10	21 25	21 50										
41	41751		20 10	20 15	20 25	20 37	20 50	21 02	21 17	21 30	21 35	21 50	22 15	22 23	→	→	22 33	22 41	22 51	23 10	23 25		
48	48811										21 45	22 00	→	→	22 12	22 30	→	→	→	→	→	23 00	23 20
41	41781		21 10	21 15	21 25	21 35	21 45	21 55	22 07	22 20	22 25	22 40	23 05	23 13	→	→	23 20	23 28	23 36	23 55	00 10		
48	48841										22 45	23 00	→	→	23 12	23 30	→	→	→	→	→	00 00	00 20
41	41811		22 10	22 15	22 25	22 35	22 45	22 55	23 07	23 20	23 25	23 40	00 05	00 13	→	→	00 20	00 28	00 36	00 55	01 10		
48	48871										23 45	00 00	→	→	00 12	00 30	→	→	→	→	→	01 00	01 20
47	47881										00 10	00 25	00 50	00 58	→	→	01 05	01 13	01 21	01 40	01 55		
48	48901										00 45	01 00	→	→	01 12	01 30	→	→	→	→	→	02 00	02 20
47	47921										01 10	01 25	01 50	01 58	→	→	02 05	02 13	02 21	02 40	02 55		

Saturday and Sunday
Samedi et dimanche

EASTBOUND / EN DIRECTION EST

Route Number / Numéro du trajet	Trip Number / Numéro du parcours	Zone→	Hamilton 18 Dp	Hamilton 18	Burlington 16	Oakville 14	Oakville 13	Mississauga 21	Mississauga 20	Brampton 32	Vaughan 19	Vaughan 19 Ar
			Hamilton GO Centre	**McMaster University**	**Dundas St. @ Hwy. 407**	**Bronte Rd. @ Hwy. 407**	**Trafalgar Rd. @ Hwy. 407**	**Erin Mills Transitway Station**	**Square One**	**Bramalea GO**	**Hwy. 407 Bus Terminal**	**Major Mackenzie W. Terminal**
47	47090		04 40	04 52	05 09	05 16	05 24	05 32	05 45	06 02	06 20	
47	47120		05 10	05 22	05 39	05 46	05 54	06 02	06 15	06 32	06 50	
47	47160		05 40	05 52	06 09	06 16	06 24	06 32	06 45	07 02	07 20	
47W	47180		06 10	06 22	06 39	06 46	06 54	07 02	07 15	07 32	07 50	08 05
47	47210		06 40	06 52	07 09	07 16	07 24	07 32	07 45	08 02	08 20	
47W	47230		07 05	07 22	07 39	07 46	07 54	08 02	08 15	08 32	08 50	09 05
47	47250		07 35	07 52	08 09	08 16	08 24	08 32	08 45	09 02	09 20	
47W	47270		08 05	08 22	08 39	08 46	08 54	09 02	09 15	09 32	09 50	10 05
47	47290		08 30	08 47	09 07	09 14	09 22	09 30	09 45	10 02	10 20	
47W	47310		09 00	09 17	09 37	09 44	09 52	10 00	10 15	10 32	10 50	11 05
47	47330		09 30	09 47	10 07	10 14	10 22	10 30	10 45	11 02	11 20	
47W	47350		10 00	10 17	10 37	10 44	10 52	11 00	11 15	11 32	11 50	12 05
47	47370		10 30	10 47	11 07	11 14	11 22	11 30	11 45	12 02	12 20	
47W	47390		11 00	11 17	11 37	11 44	11 52	12 00	12 15	12 32	12 50	13 10
47	47410		11 30	11 47	12 07	12 14	12 22	12 30	12 45	13 02	13 20	
47W	47430		12 00	12 17	12 37	12 44	12 52	13 00	13 15	13 32	13 50	14 10
47	47450		12 30	12 47	13 07	13 14	13 22	13 30	13 45	14 02	14 20	
47W	47470		13 00	13 17	13 37	13 44	13 52	14 00	14 15	14 32	14 50	15 10
47	47500		13 30	13 47	14 07	14 14	14 22	14 30	14 45	15 02	15 20	
47W	47530		13 55	14 15	14 35	14 43	14 51	15 00	15 15	15 32	15 50	16 10
47	47560		14 25	14 45	15 05	15 13	15 21	15 30	15 45	16 02	16 20	
47W	47590		14 55	15 15	15 35	15 43	15 51	16 00	16 15	16 32	16 50	17 10
47	47620		15 25	15 45	16 05	16 13	16 21	16 30	16 45	17 02	17 20	
47W	47650		15 55	16 15	16 35	16 43	16 51	17 00	17 15	17 32	17 50	18 10
47	47670		16 25	16 45	17 05	17 13	17 21	17 30	17 45	18 02	18 20	
47W	47690		16 55	17 15	17 35	17 43	17 51	18 00	18 15	18 32	18 50	19 05
47	47710		17 25	17 45	18 05	18 13	18 21	18 30	18 45	19 02	19 20	
47W	47730		17 55	18 15	18 35	18 43	18 51	19 00	19 15	19 32	19 50	20 05
47	47750		18 25	18 45	19 05	19 13	19 21	19 30	19 45	20 02	20 20	
47W	47770		18 55	19 15	19 35	19 43	19 51	20 00	20 15	20 32	20 50	21 05
47	47790		19 30	19 47	20 07	20 14	20 22	20 30	20 45	21 02	21 20	
47W	47810		20 00	20 17	20 37	20 44	20 52	21 00	21 15	21 32	21 50	22 05
47	47840		21 00	21 17	21 37	21 44	21 52	22 00	22 15	22 32	22 50	22 50
47	47880		22 00	22 17	22 37	22 44	22 52	23 00	23 15	23 32	23 50	23 50
47	47910		23 05	23 17	23 37	23 44	23 52	00 00	00 15	00 32	00 50	00 50

Saturday and Sunday
Samedi et dimanche

WESTBOUND / EN DIRECTION OUEST

Route Number / Numéro du trajet	Trip Number / Numéro du parcours	Zone→	Vaughan 19 Dp	Vaughan 19	Brampton 32	Mississauga 20	Mississauga 21	Oakville 13	Oakville 14	Burlington 16	Hamilton 18	Hamilton 18 Ar
			Major Mackenzie W. Terminal	**Hwy. 407 Bus Terminal**	**Bramalea GO**	**Square One**	**Erin Mills Transitway Station**	**Trafalgar Rd. @ Hwy. 407**	**Bronte Rd. @ Hwy. 407**	**Dundas St. @ Hwy. 407**	**McMaster University**	**Hamilton GO Centre**
47	47111			06 40	06 55	07 20	07 28	07 35	07 43	07 51	08 10	08 25
47	47141			07 10	07 25	07 50	07 58	08 05	08 13	08 21	08 40	08 55
47	47201			08 10	08 25	08 50	08 58	09 05	09 13	09 21	09 40	09 55
47W	47231		08 25	08 40	08 55	09 20	09 28	09 35	09 43	09 51	10 10	10 25
47	47251			09 10	09 25	09 50	09 58	10 05	10 13	10 21	10 40	10 55
47W	47271		09 25	09 40	09 55	10 20	10 28	10 35	10 43	10 51	11 10	11 25
47	47291			10 10	10 25	10 50	10 58	11 05	11 13	11 21	11 40	11 55
47W	47311		10 25	10 40	10 55	11 20	11 28	11 35	11 43	11 53	12 15	12 30
47	47331			11 10	11 25	11 50	11 58	12 05	12 13	12 23	12 45	13 00
47W	47351		11 25	11 40	11 55	12 20	12 28	12 35	12 43	12 53	13 15	13 30
47	47371			12 10	12 25	12 55	13 03	13 10	13 18	13 28	13 50	14 05
47W	47391		12 25	12 40	12 55	13 25	13 03	13 40	13 48	13 58	14 20	14 35
47	47411			13 10	13 25	13 55	14 03	14 10	14 18	14 28	14 50	15 05
47W	47431		13 25	13 40	13 55	14 25	14 33	14 40	14 48	14 58	15 20	15 35
47	47451			14 10	14 25	14 55	15 03	15 10	15 18	15 28	15 50	16 05
47W	47471		14 25	14 40	14 55	15 25	15 33	15 40	15 48	15 58	16 20	16 35
47	47491			15 10	15 25	15 55	16 03	16 10	16 18	16 28	16 50	17 05
47W	47521		15 25	15 40	15 55	16 25	16 33	16 40	16 48	16 58	17 20	17 35
47	47551			16 10	16 25	16 55	17 03	17 12	17 20	17 30	17 55	18 10
47W	47581		16 25	16 40	16 55	17 25	17 33	17 42	17 50	18 00	18 25	18 40
47	47611			17 10	17 25	17 55	18 03	18 12	18 20	18 30	18 55	19 10
47W	47641		17 25	17 40	17 55	18 25	18 33	18 42	18 50	19 00	19 25	19 40
47	47671			18 10	18 25	18 55	19 03	19 12	19 20	19 30	19 55	20 10
47W	47691		18 25	18 40	18 55	19 25	19 33	19 42	19 50	20 00	20 25	20 40
47	47711			19 10	19 25	19 55	20 03	20 12	20 20	20 30	20 55	21 10
47W	47731		19 25	19 40	19 55	20 20	20 28	20 37	20 45	20 55	21 20	21 35
47	47751			20 10	20 25	20 50	20 58	21 07	21 15	21 25	21 50	22 05
47W	47781		20 25	20 40	20 55	21 20	21 28	21 37	21 45	21 55	22 20	22 35
47	47791			21 10	21 25	21 50	21 58	22 05	22 13	22 23	22 45	23 00
47W	47811		21 25	21 40	21 55	22 20	22 28	22 35	22 43	22 51	23 10	23 25
47	47831			22 10	22 25	22 50	22 58	23 05	23 13	23 21	23 40	23 55
47W	47841		22 25	22 40	22 55	23 20	23 28	23 35	23 43	23 51	00 10	00 25
47	47851			23 10	23 25	23 50	23 58	00 05	00 13	00 21	00 40	00 55
47	47881			00 10	00 25	00 50	00 58	01 05	01 13	01 21	01 40	01 55
47	47911			01 10	01 25	01 50	01 58	02 05	02 13	02 21	02 40	02 55

Appendix D

Traffic Data

Turning Movement Counts

Spectrum

Turning Movement Count
Location Name: MCLEAN RD W & BROCK RD S (WELLINGTON RD 46)
Date: Tue, May 02, 2023 Deployment Lead: Walter Fugaj

Crozier & Associates
Suite 100 2800 HIGH POINT DRIVE
MILTON ONTARIO, L9T 6P4
CANADA

Turning Movement Count (1 . MCLEAN RD W & BROCK RD S (WELLINGTON RD 46))

Start Time	N Approach BROCK RD S (WELLINGTON RD 46)						E Approach MCLEAN RD W						S Approach BROCK RD S (WELLINGTON RD 46)						W Approach MCLEAN RD W						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
06:30:00	4	151	10	0	0	165	1	1	6	0	0	8	13	47	14	0	0	74	27	5	1	0	0	33	280	
06:45:00	5	139	12	0	0	156	6	1	7	0	0	14	12	54	26	0	0	92	34	9	1	0	0	44	306	
07:00:00	5	129	5	0	0	139	8	3	9	0	0	20	15	87	15	0	0	117	24	4	1	0	0	29	305	
07:15:00	6	176	7	0	0	189	3	3	5	0	0	11	4	93	23	0	0	120	18	6	1	0	0	25	345	1236
07:30:00	9	164	7	0	0	180	4	0	12	0	0	16	10	85	27	0	3	122	28	7	2	0	0	37	355	1311
07:45:00	6	199	17	0	0	222	4	1	6	0	0	11	11	123	20	0	0	154	28	6	0	0	0	34	421	1426
08:00:00	5	153	7	0	0	165	2	1	7	0	0	10	10	102	13	0	0	125	29	1	1	0	0	31	331	1452
08:15:00	6	176	5	0	0	187	2	0	2	0	0	4	8	125	31	0	0	164	23	3	2	0	0	28	383	1490
08:30:00	4	154	6	0	0	164	4	1	7	0	0	12	6	99	21	0	0	126	24	3	3	0	0	30	332	1467
08:45:00	8	127	7	0	0	142	0	0	5	0	0	5	9	106	26	0	0	141	27	3	0	0	0	30	318	1364
09:00:00	3	104	3	0	0	110	3	4	9	0	0	16	11	78	16	0	0	105	27	2	3	0	0	32	263	1296
09:15:00	4	103	3	0	0	110	3	1	5	0	0	9	7	84	11	0	0	102	22	1	3	0	0	26	247	1160
BREAK																										
16:00:00	0	91	3	0	0	94	19	15	18	0	0	52	3	138	20	0	0	161	31	2	11	0	0	44	351	
16:15:00	6	132	3	0	0	141	4	1	10	0	0	15	4	157	26	0	1	187	29	1	4	0	1	34	377	
16:30:00	3	119	4	0	0	126	9	4	19	0	0	32	5	180	27	0	0	212	25	1	14	0	0	40	410	
16:45:00	3	116	2	0	0	121	4	2	6	0	0	12	2	188	30	0	0	220	21	1	7	0	0	29	382	1520
17:00:00	3	85	1	0	0	89	14	12	18	0	0	44	4	173	49	0	0	226	14	1	9	0	0	24	383	1552
17:15:00	2	128	1	0	0	131	3	1	4	0	0	8	2	171	30	0	0	203	19	3	5	0	0	27	369	1544
17:30:00	4	89	2	0	0	95	6	3	10	0	0	19	4	151	35	0	0	190	12	1	9	0	0	22	326	1460
17:45:00	2	96	6	0	1	104	3	1	4	0	0	8	6	152	37	0	0	195	14	2	1	0	0	17	324	1402
18:00:00	5	101	0	0	0	106	3	3	5	0	0	11	5	168	36	1	1	210	11	1	4	0	0	16	343	1362
18:15:00	4	92	1	0	0	97	3	5	5	0	0	13	2	141	10	1	3	154	13	1	3	0	0	17	281	1274
18:30:00	2	63	1	0	0	66	2	0	7	0	0	9	1	127	10	0	0	138	7	0	3	0	0	10	223	1171
18:45:00	2	56	4	0	0	62	1	2	8	0	0	11	1	110	13	0	0	124	8	4	2	0	0	14	211	1058
Grand Total	101	2943	117	0	1	3161	111	65	194	0	0	370	155	2939	566	2	8	3662	515	68	90	0	1	673	**7866**	-
Approach%	3.2%	93.1%	3.7%	0%		-	30%	17.6%	52.4%	0%		-	4.2%	80.3%	15.5%	0.1%		-	76.5%	10.1%	13.4%	0%		-	**-**	-
Totals %	1.3%	37.4%	1.5%	0%		40.2%	1.4%	0.8%	2.5%	0%		4.7%	2%	37.4%	7.2%	0%		46.6%	6.5%	0.9%	1.1%	0%		8.6%	**-**	-
Heavy	11	244	25	0		-	27	14	93	0		-	28	242	158	0		-	194	14	10	0		-	**-**	-
Heavy %	10.9%	8.3%	21.4%	0%		-	24.3%	21.5%	47.9%	0%		-	18.1%	8.2%	27.9%	0%		-	37.7%	20.6%	11.1%	0%		-	**-**	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-

Spectrum

Turning Movement Count
Location Name: MCLEAN RD W & BROCK RD S (WELLINGTON RD 46)
Date: Tue, May 02, 2023 Deployment Lead: Walter Fugaj

Crozier & Associates
Suite 100 2800 HIGH POINT DRIVE
MILTON ONTARIO, L9T 6P4
CANADA

Peak Hour: 07:30 AM - 08:30 AM **Weather: Mist (1.86 °C)**

Start Time	N Approach BROCK RD S (WELLINGTON RD 46)						E Approach MCLEAN RD W						S Approach BROCK RD S (WELLINGTON RD 46)						W Approach MCLEAN RD W						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
07:30:00	9	164	7	0	0	180	4	0	12	0	0	16	10	85	27	0	3	122	28	7	2	0	0	37	355
07:45:00	6	199	17	0	0	222	4	1	6	0	0	11	11	123	20	0	0	154	28	6	0	0	0	34	421
08:00:00	5	153	7	0	0	165	2	1	7	0	0	10	10	102	13	0	0	125	29	1	1	0	0	31	331
08:15:00	6	176	5	0	0	187	2	0	2	0	0	4	8	125	31	0	0	164	23	3	2	0	0	28	383
Grand Total	26	692	36	0	0	754	12	2	27	0	0	41	39	435	91	0	3	565	108	17	5	0	0	130	**1490**
Approach%	3.4%	91.8%	4.8%	0%		-	29.3%	4.9%	65.9%	0%		-	6.9%	77%	16.1%	0%		-	83.1%	13.1%	3.8%	0%		-	**-**
Totals %	1.7%	46.4%	2.4%	0%		50.6%	0.8%	0.1%	1.8%	0%		2.8%	2.6%	29.2%	6.1%	0%		37.9%	7.2%	1.1%	0.3%	0%		8.7%	**-**
PHF	0.72	0.87	0.53	0		0.85	0.75	0.5	0.56	0		0.64	0.89	0.87	0.73	0		0.86	0.93	0.61	0.63	0		0.88	**-**
Heavy	0	69	4	0		73	5	2	17	0		24	4	62	48	0		114	51	2	2	0		55	**-**
Heavy %	0%	10%	11.1%	0%		9.7%	41.7%	100%	63%	0%		58.5%	10.3%	14.3%	52.7%	0%		20.2%	47.2%	11.8%	40%	0%		42.3%	**-**
Lights	26	623	32	0		681	7	0	10	0		17	35	373	43	0		451	57	15	3	0		75	**-**
Lights %	100%	90%	88.9%	0%		90.3%	58.3%	0%	37%	0%		41.5%	89.7%	85.7%	47.3%	0%		79.8%	52.8%	88.2%	60%	0%		57.7%	**-**
Single-Unit Trucks	0	14	1	0		15	0	0	2	0		2	1	23	4	0		28	5	0	0	0		5	**-**
Single-Unit Trucks %	0%	2%	2.8%	0%		2%	0%	0%	7.4%	0%		4.9%	2.6%	5.3%	4.4%	0%		5%	4.6%	0%	0%	0%		3.8%	**-**
Buses	0	6	2	0		8	4	0	5	0		9	0	4	1	0		5	1	0	0	0		1	**-**
Buses %	0%	0.9%	5.6%	0%		1.1%	33.3%	0%	18.5%	0%		22%	0%	0.9%	1.1%	0%		0.9%	0.9%	0%	0%	0%		0.8%	**-**
Articulated Trucks	0	49	1	0		50	1	2	10	0		13	3	35	43	0		81	45	2	2	0		49	**-**
Articulated Trucks %	0%	7.1%	2.8%	0%		6.6%	8.3%	100%	37%	0%		31.7%	7.7%	8%	47.3%	0%		14.3%	41.7%	11.8%	40%	0%		37.7%	**-**
Bicycles on Road	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%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	100%		-	-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

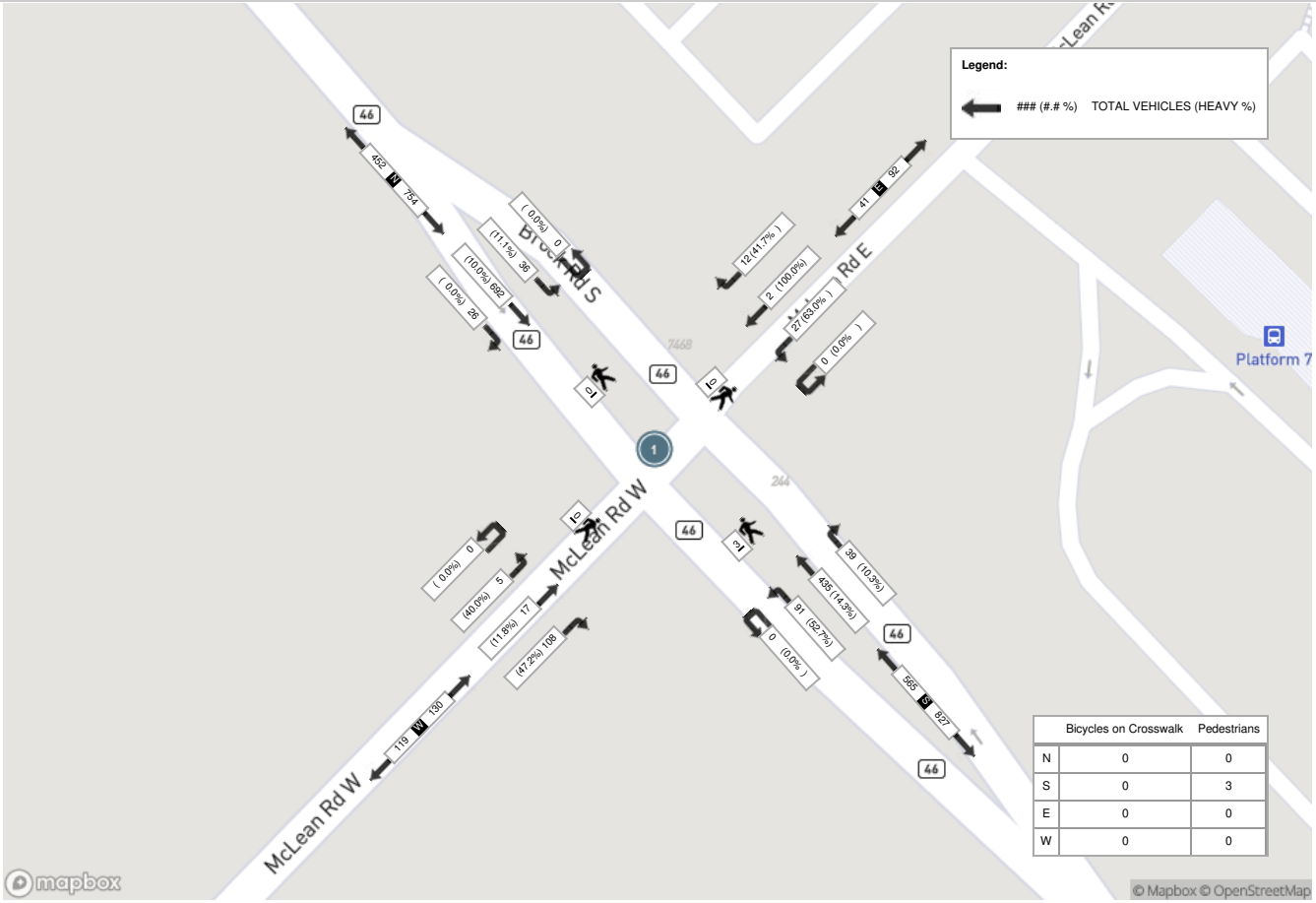
Crozier & Associates
Suite 100 2800 HIGH POINT DRIVE
MILTON ONTARIO, L9T 6P4
CANADA

Peak Hour: 04:15 PM - 05:15 PM Weather: Light Rain (4.44 °C)

Start Time	N Approach BROCK RD S (WELLINGTON RD 46)						E Approach MCLEAN RD W						S Approach BROCK RD S (WELLINGTON RD 46)						W Approach MCLEAN RD W						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:15:00	6	132	3	0	0	141	4	1	10	0	0	15	4	157	26	0	1	187	29	1	4	0	1	34	377
16:30:00	3	119	4	0	0	126	9	4	19	0	0	32	5	180	27	0	0	212	25	1	14	0	0	40	410
16:45:00	3	116	2	0	0	121	4	2	6	0	0	12	2	188	30	0	0	220	21	1	7	0	0	29	382
17:00:00	3	85	1	0	0	89	14	12	18	0	0	44	4	173	49	0	0	226	14	1	9	0	0	24	383
Grand Total	15	452	10	0	0	477	31	19	53	0	0	103	15	698	132	0	1	845	89	4	34	0	1	127	**1552**
Approach%	3.1%	94.8%	2.1%	0%		-	30.1%	18.4%	51.5%	0%		-	1.8%	82.6%	15.6%	0%		-	70.1%	3.1%	26.8%	0%		-	**-**
Totals %	1%	29.1%	0.6%	0%		30.7%	2%	1.2%	3.4%	0%		6.6%	1%	45%	8.5%	0%		54.4%	5.7%	0.3%	2.2%	0%		8.2%	**-**
PHF	0.63	0.86	0.63	0		0.85	0.55	0.4	0.7	0		0.59	0.75	0.93	0.67	0		0.93	0.77	1	0.61	0		0.79	**-**
Heavy	4	31	5	0		40	6	1	18	0		25	4	30	14	0		48	24	1	2	0		27	**-**
Heavy %	26.7%	6.9%	50%	0%		8.4%	19.4%	5.3%	34%	0%		24.3%	26.7%	4.3%	10.6%	0%		5.7%	27%	25%	5.9%	0%		21.3%	**-**
Lights	11	421	5	0		437	25	18	35	0		78	11	668	118	0		797	65	3	32	0		100	**-**
Lights %	73.3%	93.1%	50%	0%		91.6%	80.6%	94.7%	66%	0%		75.7%	73.3%	95.7%	89.4%	0%		94.3%	73%	75%	94.1%	0%		78.7%	**-**
Single-Unit Trucks	2	11	3	0		16	1	1	1	0		3	3	12	6	0		21	5	1	2	0		8	**-**
Single-Unit Trucks %	13.3%	2.4%	30%	0%		3.4%	3.2%	5.3%	1.9%	0%		2.9%	20%	1.7%	4.5%	0%		2.5%	5.6%	25%	5.9%	0%		6.3%	**-**
Buses	1	2	2	0		5	5	0	9	0		14	0	0	0	0		0	0	0	0	0		0	**-**
Buses %	6.7%	0.4%	20%	0%		1%	16.1%	0%	17%	0%		13.6%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	1	18	0	0		19	0	0	8	0		8	1	18	8	0		27	19	0	0	0		19	**-**
Articulated Trucks %	6.7%	4%	0%	0%		4%	0%	0%	15.1%	0%		7.8%	6.7%	2.6%	6.1%	0%		3.2%	21.3%	0%	0%	0%		15%	**-**
Bicycles on Road	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%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	1	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	50%		-	-	-	-	50%		**-**

Crozier & Associates
Suite 100 2800 HIGH POINT DRIVE
MILTON ONTARIO, L9T 6P4
CANADA

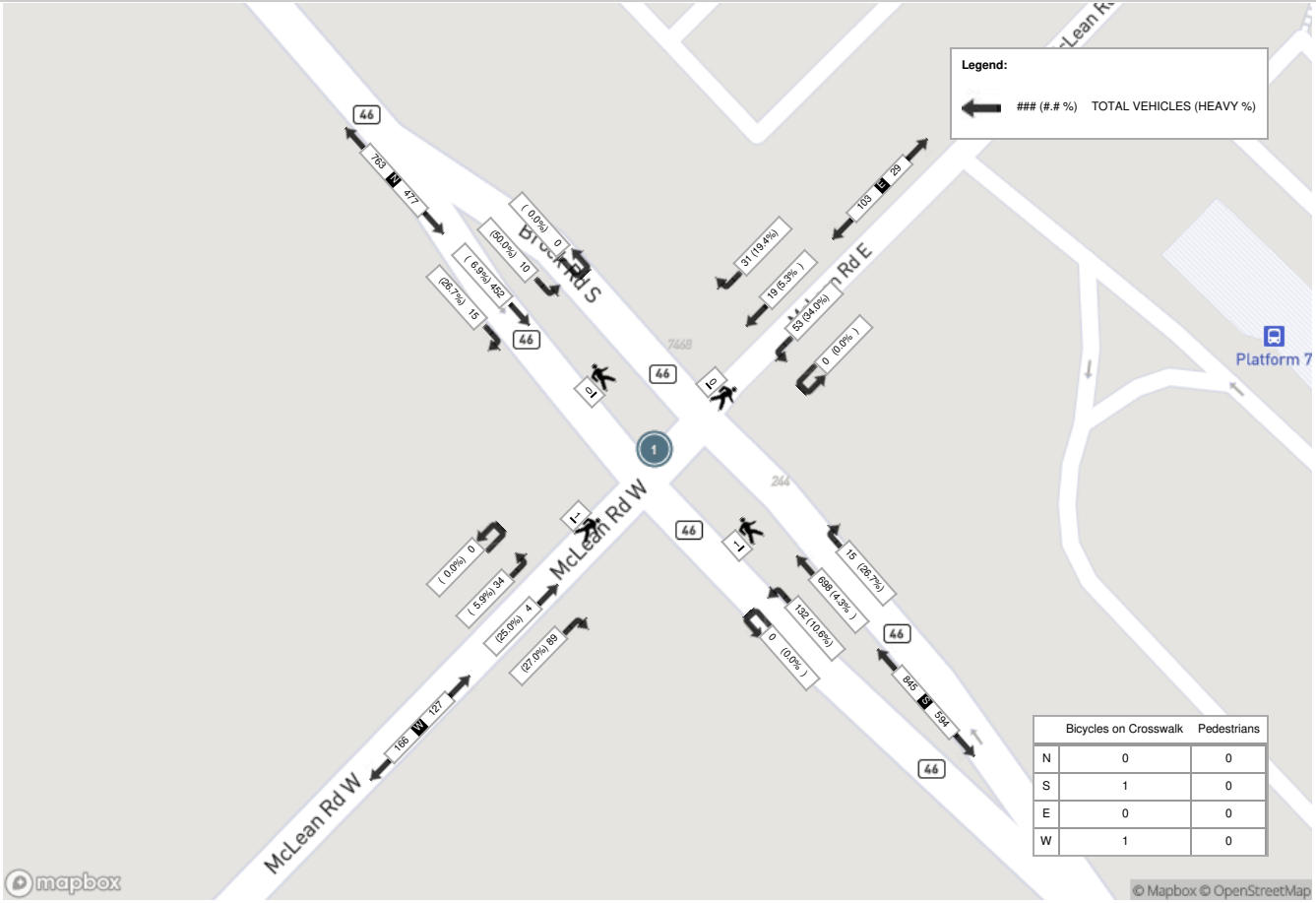
Peak Hour: 07:30 AM - 08:30 AM **Weather: Mist (1.86 °C)**



	Bicycles on Crosswalk	Pedestrians
N	0	0
S	0	3
E	0	0
W	0	0

Crozier & Associates
Suite 100 2800 HIGH POINT DRIVE
MILTON ONTARIO, L9T 6P4
CANADA

Peak Hour: 04:15 PM - 05:15 PM **Weather: Light Rain (4.44 °C)**



Crozier & Associates
Suite 100 2800 HIGH POINT DRIVE
MILTON ONTARIO, L9T 6P4
CANADA

Turning Movement Count (2 . NICHOLAS BEAVER RD & BROCK RD S (WELLINGTON RD 46))

Start Time	N Approach BROCK RD S (WELLINGTON RD 46)					E Approach NICHOLAS BEAVER RD					S Approach BROCK RD S (WELLINGTON RD 46)					Int. Total (15 min)	Int. Total (1 hr)
	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	UTurn S:S	Peds S:	Approach Total		
06:30:00	114	61	0	0	175	16	25	0	0	41	31	59	0	0	90	306	
06:45:00	113	58	0	0	171	17	21	0	1	38	43	73	0	0	116	325	
07:00:00	143	33	0	0	176	44	39	0	0	83	9	84	0	0	93	352	
07:15:00	165	30	0	0	195	22	43	0	3	65	19	91	0	0	110	370	1353
07:30:00	162	37	0	0	199	26	20	0	1	46	16	103	0	0	119	364	1411
07:45:00	186	46	0	0	232	25	23	0	0	48	24	127	0	0	151	431	1517
08:00:00	163	32	0	0	195	13	41	0	0	54	28	100	0	0	128	377	1542
08:15:00	159	32	0	0	191	24	31	0	2	55	20	144	0	0	164	410	1582
08:30:00	154	35	0	0	189	29	20	0	0	49	18	106	0	0	124	362	1580
08:45:00	123	35	0	0	158	21	36	0	0	57	15	115	0	0	130	345	1494
09:00:00	123	30	0	0	153	20	30	0	2	50	13	96	0	0	109	312	1429
09:15:00	109	21	0	0	130	25	26	0	0	51	17	75	0	0	92	273	1292
BREAK																	
16:00:00	122	17	0	0	139	39	47	0	2	86	10	136	0	0	146	371	
16:15:00	142	21	0	0	163	31	32	0	0	63	4	148	0	0	152	378	
16:30:00	174	7	0	0	181	37	40	0	0	77	6	201	0	0	207	465	
16:45:00	126	6	0	0	132	17	21	0	0	38	9	189	0	0	198	368	1582
17:00:00	119	11	0	0	130	50	38	0	1	88	5	187	0	0	192	410	1621
17:15:00	136	9	0	0	145	12	22	0	0	34	9	182	0	0	191	370	1613
17:30:00	107	13	0	0	120	19	22	0	0	41	4	177	0	0	181	342	1490
17:45:00	107	11	0	0	118	10	20	0	0	30	15	181	0	0	196	344	1466
18:00:00	99	12	0	0	111	19	21	0	1	40	7	187	0	0	194	345	1401
18:15:00	99	8	0	0	107	14	24	0	0	38	7	142	0	0	149	294	1325
18:30:00	76	7	0	0	83	5	13	0	0	18	9	136	0	0	145	246	1229
18:45:00	62	8	0	0	70	7	14	0	0	21	6	111	0	0	117	208	1093
Grand Total	3083	580	0	0	3663	542	669	0	13	1211	344	3150	0	0	3494	**8368**	-
Approach%	84.2%	15.8%	0%		-	44.8%	55.2%	0%		-	9.8%	90.2%	0%		-	**-**	-
Totals %	36.8%	6.9%	0%		43.8%	6.5%	8%	0%		14.5%	4.1%	37.6%	0%		41.8%	**-**	-
Heavy	477	50	0		-	45	109	0		-	97	419	0		-	**-**	-
Heavy %	15.5%	8.6%	0%		-	8.3%	16.3%	0%		-	28.2%	13.3%	0%		-	**-**	-
Bicycles	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-
Bicycle %	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-

Crozier & Associates
Suite 100 2800 HIGH POINT DRIVE
MILTON ONTARIO, L9T 6P4
CANADA

Peak Hour: 07:30 AM - 08:30 AM Weather: Mist (1.86 °C)

Start Time	N Approach BROCK RD S (WELLINGTON RD 46)					E Approach NICHOLAS BEAVER RD					S Approach BROCK RD S (WELLINGTON RD 46)					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
07:30:00	162	37	0	0	199	26	20	0	1	46	16	103	0	0	119	364
07:45:00	186	46	0	0	232	25	23	0	0	48	24	127	0	0	151	431
08:00:00	163	32	0	0	195	13	41	0	0	54	28	100	0	0	128	377
08:15:00	159	32	0	0	191	24	31	0	2	55	20	144	0	0	164	410
Grand Total	670	147	0	0	817	88	115	0	3	203	88	474	0	0	562	**1582**
Approach%	82%	18%	0%		-	43.3%	56.7%	0%		-	15.7%	84.3%	0%		-	**-**
Totals %	42.4%	9.3%	0%		51.6%	5.6%	7.3%	0%		12.8%	5.6%	30%	0%		35.5%	**-**
PHF	0.9	0.8	0		0.88	0.85	0.7	0		0.92	0.79	0.82	0		0.86	**-**
Heavy	126	9	0		135	17	25	0		42	19	104	0		123	**-**
Heavy %	18.8%	6.1%	0%		16.5%	19.3%	21.7%	0%		20.7%	21.6%	21.9%	0%		21.9%	**-**
Lights	544	138	0		682	71	90	0		161	69	370	0		439	**-**
Lights %	81.2%	93.9%	0%		83.5%	80.7%	78.3%	0%		79.3%	78.4%	78.1%	0%		78.1%	**-**
Single-Unit Trucks	17	4	0		21	10	18	0		28	10	20	0		30	**-**
Single-Unit Trucks %	2.5%	2.7%	0%		2.6%	11.4%	15.7%	0%		13.8%	11.4%	4.2%	0%		5.3%	**-**
Buses	11	0	0		11	0	0	0		0	0	10	0		10	**-**
Buses %	1.6%	0%	0%		1.3%	0%	0%	0%		0%	0%	2.1%	0%		1.8%	**-**
Articulated Trucks	98	5	0		103	7	7	0		14	9	74	0		83	**-**
Articulated Trucks %	14.6%	3.4%	0%		12.6%	8%	6.1%	0%		6.9%	10.2%	15.6%	0%		14.8%	**-**
Pedestrians	-	-	-	0	-	-	-	-	3	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	0%		-	-	-	100%		-	-	-	0%		**-**

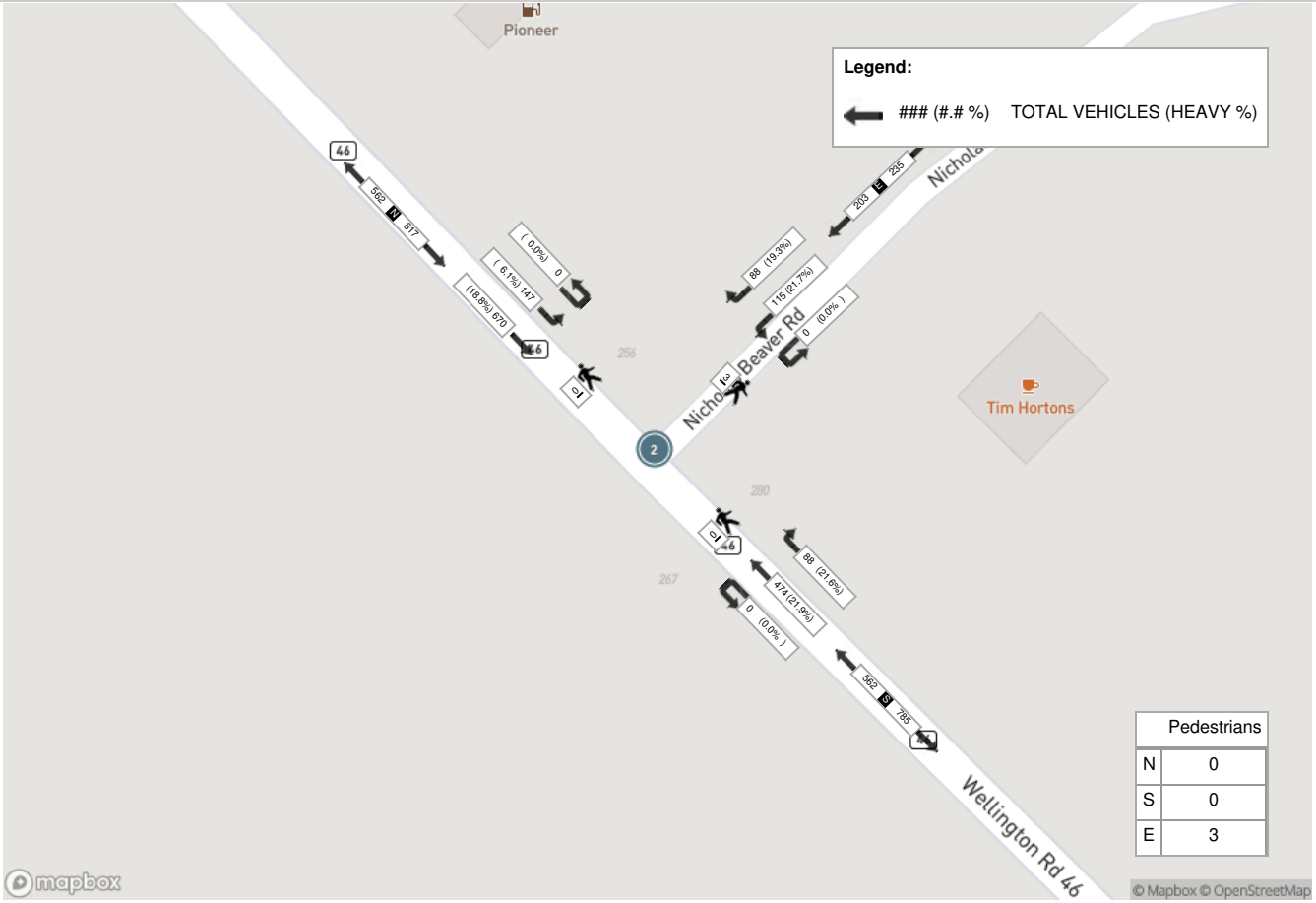
Crozier & Associates
Suite 100 2800 HIGH POINT DRIVE
MILTON ONTARIO, L9T 6P4
CANADA

Peak Hour: 04:15 PM - 05:15 PM Weather: Light Rain (4.44 °C)

Start Time	N Approach BROCK RD S (WELLINGTON RD 46)					E Approach NICHOLAS BEAVER RD					S Approach BROCK RD S (WELLINGTON RD 46)					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
16:15:00	142	21	0	0	163	31	32	0	0	63	4	148	0	0	152	378
16:30:00	174	7	0	0	181	37	40	0	0	77	6	201	0	0	207	465
16:45:00	126	6	0	0	132	17	21	0	0	38	9	189	0	0	198	368
17:00:00	119	11	0	0	130	50	38	0	1	88	5	187	0	0	192	410
Grand Total	561	45	0	0	606	135	131	0	1	266	24	725	0	0	749	**1621**
Approach%	92.6%	7.4%	0%		-	50.8%	49.2%	0%		-	3.2%	96.8%	0%		-	**-**
Totals %	34.6%	2.8%	0%		37.4%	8.3%	8.1%	0%		16.4%	1.5%	44.7%	0%		46.2%	**-**
PHF	0.81	0.54	0		0.84	0.68	0.82	0		0.76	0.67	0.9	0		0.9	**-**
Heavy	62	9	0		71	8	12	0		20	16	46	0		62	**-**
Heavy %	11.1%	20%	0%		11.7%	5.9%	9.2%	0%		7.5%	66.7%	6.3%	0%		8.3%	**-**
Lights	499	36	0		535	127	119	0		246	8	679	0		687	**-**
Lights %	88.9%	80%	0%		88.3%	94.1%	90.8%	0%		92.5%	33.3%	93.7%	0%		91.7%	**-**
Single-Unit Trucks	10	7	0		17	4	8	0		12	6	17	0		23	**-**
Single-Unit Trucks %	1.8%	15.6%	0%		2.8%	3%	6.1%	0%		4.5%	25%	2.3%	0%		3.1%	**-**
Buses	9	0	0		9	0	0	0		0	0	6	0		6	**-**
Buses %	1.6%	0%	0%		1.5%	0%	0%	0%		0%	0%	0.8%	0%		0.8%	**-**
Articulated Trucks	43	2	0		45	4	4	0		8	10	23	0		33	**-**
Articulated Trucks %	7.7%	4.4%	0%		7.4%	3%	3.1%	0%		3%	41.7%	3.2%	0%		4.4%	**-**
Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	0%		-	-	-	100%		-	-	-	0%		**-**

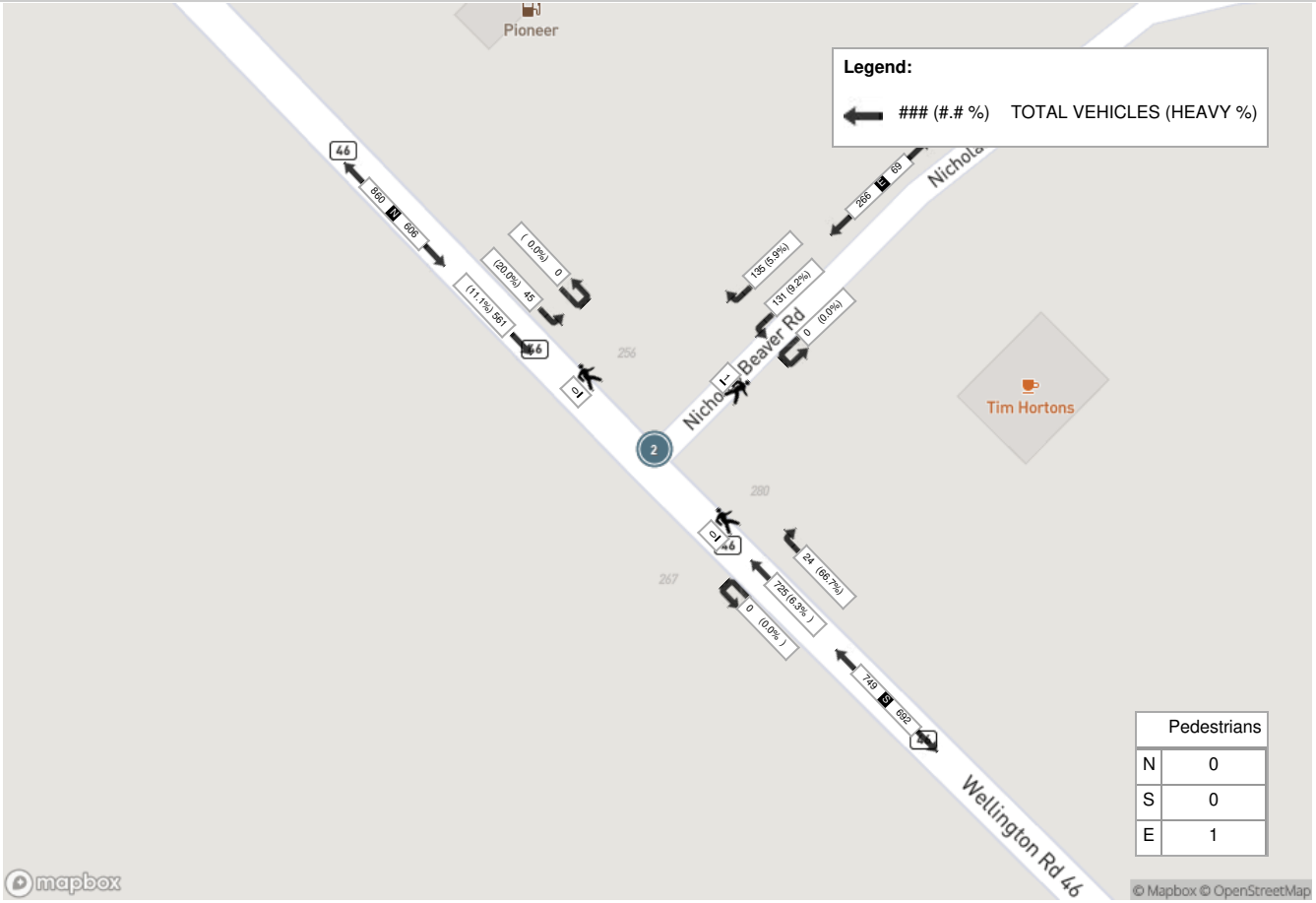
Crozier & Associates
Suite 100 2800 HIGH POINT DRIVE
MILTON ONTARIO, L9T 6P4
CANADA

Peak Hour: 07:30 AM - 08:30 AM Weather: Mist (1.86 °C)



Crozier & Associates
Suite 100 2800 HIGH POINT DRIVE
MILTON ONTARIO, L9T 6P4
CANADA

Peak Hour: 04:15 PM - 05:15 PM Weather: Light Rain (4.44 °C)



Signal Timing Plans

Wellington County 1-12 46 & Mclean rd 11/4/2013 15:30

Configuration

Controller Sequence Priority

	1	2	3	4	5	6	7	8	9	10	11	12
Ring 1 Phases . .	1	2	3	4	9	10	0	0	0	0	0	0
Ring 2 Phases . .	5	6	7	8	11	12	0	0	0	0	0	0

Phase

	1	2	3	4	5	6	7	8	9	10	11	12
In Use.	X	X	.	X	X	X	.	X	.	.	.	.
Exclusive Ped . .	.	.	.	.	.	.	.	.	.	.	.	.
Direction												

Overlap

	A	B	C	D
Direction . . .				

Load Switch Channel/Driver Group Assign (Info Only):

Load Switch (MMU) Channel	Signal Driver Phase/ Ovlap	Group Ped
1	1	.
2	2	.
3	3	.
4	4	.
5	5	.
6	6	.
7	7	.
8	8	.
9	2	X
10	4	X
11	6	X
12	8	X
13	A	.
14	B	.
15	C	.
16	D	.

Configuration Continued

```
               Enable BIU: 1  2  3  4  5  6  7  8
Terminal/Facilities. . . . . .  .  .  .  .  .  .  .
Detector Rack. . . . . .  .  .  .  .  .  .  .  .

Type 2 Runs as Type 1. . .  .
MMU Disable. . . . . .  X
Diagnostic Enable. . . . .  .
Peer-Peer Comm Enable. . .  .

                             1    2    3    4    5    6    7    8    9   10
Peer To Peer Addresses . . 255  255  255  255  255  255  255  255  255  255


Port 2:

Port 2 Protocol . . . . . Terminal
Port 2 Enable . . . . . YES
AB3418 Address. . . . . 0
AB3418 Group Address. . . . . 0
AB3418 Response Delay . . . . . 0
AB3418 Single Flag Enable . . . NO
AB3418 Drop-Out Time. . . . . 0
AB3418 TOD SF Select. . . . . 0
Data Rate . . . . . 1200 bps
Data, Parity, Stop. . . . . 8, 0, 1


Port 3:

Port 3 Protocol . . . . . Telemetry
Port 3 Enable . . . . . NO
Telemetry Address . . . . . 0
System Detector 9-16 Address. . 0
Telemetry Response Delay. . . . 6000
AB3418 Address. . . . . 0
AB3418 Group Address. . . . . 0
AB3418 Response Delay . . . . . 0
AB3418 Single Flag Enable . . . NO
AB3418 Drop-Out Time. . . . . 0
AB3418 TOD SF Select. . . . . 0
Duplex. . . . . Full
Data Rate . . . . . 1200 bps
Data, Parity, Stop. . . . . 8, 0, 1
```

Configuration Continued

Event Enabling	Alarm Enabling
Critical RFE'S (MMU/TF)	ALARM 1 . . . . .
Non-Critical RFE'S (DET/TEST) . . .	ALARM 2 . . . . .
Detector Errors	ALARM 3 . . . . .
Coordination Errors	ALARM 4 . . . . .
MMU Flash Faults.	ALARM 5 . . . . .
Local Flash Faults.	ALARM 6 . . . . .
Preempt	ALARM 7 . . . . .
Power On/Off.	ALARM 8 . . . . .
Low Battery	ALARM 9 . . . . .
	ALARM 10. . . . .
	ALARM 11. . . . .
	ALARM 12. . . . .
	ALARM 13. . . . .
	ALARM 14. . . . .
	ALARM 15. . . . .
	ALARM 16. . . . .

Supervisor Access Code. . . ****
Data Change Access Code . . ****

MMU Compatibility Program (Info Only)

Channel Is Allowed to Time With Channel

	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2
1 . . .	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2 . . .	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
3 . . .	.	.	.	.	.	.	.	.	.	.	.	.	.		
4 . . .	.	.	.	.	.	.	.	.	.	.	.	.			
5 . . .	.	.	.	.	.	.	.	.	.	.	.				
6 . . .	.	.	.	.	.	.	.	.	.	.					
7 . . .	.	.	.	.	.	.	.	.	.						
8 . . .	.	.	.	.	.	.	.	.							
9 . . .	.	.	.	.	.	.	.								
10. . .	.	.	.	.	.	.									
11. . .	.	.	.	.	.										
12. . .	.	.	.	.											
13. . .	.	.	.												
14. . .	.	.													
15. . .	.														

Version Info:

Software Assy.	Part No.	Version
Boot	27831	2.83
Program	45561	7.9
Application		. 3
Help	27891	6.23
Configuration	27908	C000

Wellington County 1-12 46 & Mclean rd 11/4/2013 15:30

By-Phase Timing Data

	Phase											
Direction	1	2	3	4	5	6	7	8	9	10	11	12
Minimum Green	8	40	5	15	8	40	5	15	5	5	5	5
Bike Min Green	0	0	0	0	0	0	0	0	0	0	0	0
Cond Serv Min Grn	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	5	0	5	0	5	0	5	0	10	0	10
Ped Clearance	0	7	0	7	0	7	0	7	0	16	0	16
Veh Extension	3.0	5.0	5.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0	5.0	5.0
Alt Veh Exten	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Extension	0	0	0	0	0	0	0	0	0	0	0	0
Max 1	14	40	35	24	14	40	35	24	35	35	35	35
Max 2	40	40	40	20	40	40	40	20	40	40	40	40
Max 3	0	0	0	0	0	0	0	0	0	0	0	0
Det. Fail Max	0	0	0	0	0	0	0	0	0	0	0	0
Yellow Change	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0	3.0	3.0	3.0	3.0
Red Clearance	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0	1.0	1.0	1.0	1.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act. B4 Init	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Actuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Initial	30	30	30	30	30	30	30	30	30	30	30	30
Time B4 Reduction	0	0	0	0	0	0	0	0	0	0	0	0
Cars Waiting	0	0	0	0	0	0	0	0	0	0	0	0
Time To Reduce	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Wellington County 1-12 46 & Mclean rd 11/4/2013 15:30

No-Serve Phases

	Phase Cannot Serve With Phase										
Phase	12	11	10	9	8	7	6	5	4	3	2
1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	
3	.	.	.	.	.	.	.	.	.		
4	.	.	.	.	.	.	.	.			
5	.	.	.	.	.	.	.				
6	.	.	.	.	.	.					
7	.	.	.	.	.						
8	.	.	.	.							
9	.	.	.								
10	.	.									
11	.										

Ped Carryover

Ped Start Phase	Carry Over Phase
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0

Wellington County 1-12 46 & Mclean rd 11/4/2013 15:30

Vehicle/Ped Phase as Overlap

Ped Phase As Overlap Consists of Ped Phases

Ped Ovlap Phase	1	2	3	4	5	6	7	8	9	10	11	12
1	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.
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11	.	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.	.

Veh Phase As Overlap Consists of Veh Phases

Veh Ovlap Phase	1	2	3	4	5	6	7	8	9	10	11	12
1	X	.	.	.	.	.	.	.	.	.	.	.
2	.	X	.	.	.	.	.	.	.	.	.	.
3	.	.	X	.	.	.	.	.	.	.	.	.
4	.	.	.	X	.	.	.	.	.	.	.	.
5	.	.	.	.	X	.	.	.	.	.	.	.
6	.	.	.	.	.	X	.	.	.	.	.	.
7	.	.	.	.	.	.	X	.	.	.	.	.
8	.	.	.	.	.	.	.	X	.	.	.	.
9	.	.	.	.	.	.	.	.	X	.	.	.
10	.	.	.	.	.	.	.	.	.	X	.	.
11	.	.	.	.	.	.	.	.	.	.	X	.
12	.	.	.	.	.	.	.	.	.	.	.	X

Overlap Data

Overlap A	Phase: 1	2	3	4	5	6	7	8	9	10	11	12
Standard.												
Protected												
Permitted												
Enable Lag.												
Enable Lead												
Spare												
Advance Green Timer				0.0								

	Green	Yellow	Red
Lag/Lead Timers	0.0	0.0	0.0

Overlap B	Phase: 1	2	3	4	5	6	7	8	9	10	11	12
Standard.												
Protected												
Permitted												
Enable Lag.												
Enable Lead												
Spare												
Advance Green Timer				0.0								

	Green	Yellow	Red
Lag/Lead Timers	0.0	0.0	0.0

Overlap C	Phase: 1	2	3	4	5	6	7	8	9	10	11	12
Standard.												
Protected												
Permitted												
Enable Lag.												
Enable Lead												
Spare												
Advance Green Timer				0.0								

	Green	Yellow	Red
Lag/Lead Timers	0.0	0.0	0.0

Overlap D	Phase: 1	2	3	4	5	6	7	8	9	10	11	12
Standard.												
Protected												
Permitted												
Enable Lag.												
Enable Lead												
Spare												
Advance Green Timer				0.0								

	Green	Yellow	Red
Lag/Lead Timers	0.0	0.0	0.0

Power Start, Remote Flash

	Phase												Overlap			
	1	2	3	4	5	6	7	8	9	10	11	12	A	B	C	D
Power Start		X														
External Start		X														
Into Remote Flash		X														
Exit Remote Flash		X														
Remote Flash Yellow																
Flash Together		X		X		X		X		X		X		X		X

Initialization Interval:

Power Start	Yellow
External Start	Yellow

Power Start All Red Time	0
Power Start Flash Time	0

Remote Flash Options:

Out of Flash Yellow	NO
Out of Flash All Red	NO
Minimum Recall	NO
Alternate Flash	NO
Flash Thru Load Switches	NO
Cycle Through Phases	NO

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Option Data

	Phase											
	1	2	3	4	5	6	7	8	9	10	11	12
Guaranteed Passage												
Call To NonActuated 1		X				X						
Call To NonActuated 2				X				X				
Dual Entry		X		X		X		X		X		X
Conditional Service	X		X		X		X		X		X	
Conditional Reservice												
Actuated Rest in Walk												
Flashing Walk												

Enable Programmable Options

Dual Entry	ON	Backup Protection Group 1	ON
Conditional Service	OFF	Backup Protection Group 2	OFF
Ped Clearance Protection	OFF	Backup Protection Group 3	OFF
Special Preempt Overlap Flash	OFF	Simultaneous Gap Group 1	OFF
Cond Service Det Cross Switch	OFF	Simultaneous Gap Group 2	OFF
Lock Detectors in Red Only	OFF	Simultaneous Gap Group 3	OFF

Five Section Left Turn Control

Phases:	5-2	7-4	1-6	3-8	11-10	9-12
Left Turn Head						

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Recall Data, Dimming

	Phase											
	1	2	3	4	5	6	7	8	9	10	11	12
Locking Detector. . . .	.	.	.	.	.	.	.	.	.	.	.	.
Vehicle Recall.	.	X	.	.	.	X	.	.	.	.	.	.
Pedestrian Recall . . .	.	.	.	.	.	.	.	.	.	.	.	.
Recall To Max	.	.	.	.	.	.	.	.	.	.	.	.
Soft Recall	.	.	.	.	.	.	.	.	.	.	.	.
Don't Rest Here	.	.	.	.	.	.	.	.	.	.	.	.
Ped Dark if No Call . .	.	.	.	.	.	.	.	.	.	.	.	.

Dimming:

	Load Switch															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Green/Walk. . . .	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Yellow/Ped Clear.	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Red/Don't Walk. .	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

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Detector Type/Timers

Det.	Locking Memory	Log Enable	Timers Extend	Timers Delay	Don't Reset Extend	Type
1	NO	NO	0.0	0	.	1 - Extend/Delay
2	NO	NO	0.0	0	.	1 - Extend/Delay
3	NO	NO	0.0	0	.	1 - Extend/Delay
4	NO	NO	0.0	7	.	1 - Extend/Delay
5	NO	NO	0.0	0	.	1 - Extend/Delay
6	NO	NO	0.0	0	.	1 - Extend/Delay
7	NO	NO	0.0	0	.	1 - Extend/Delay
8	NO	NO	0.0	7	.	1 - Extend/Delay
9	NO	NO	0.0	0	.	0 - Normal
10	NO	NO	0.0	0	.	0 - Normal
11	NO	NO	0.0	0	.	0 - Normal
12	NO	NO	0.0	0	.	0 - Normal
13	NO	NO	0.0	0	.	0 - Normal
14	NO	NO	0.0	0	.	0 - Normal
15	NO	NO	0.0	0	.	0 - Normal
16	NO	NO	0.0	0	.	0 - Normal
17	NO	NO	0.0	0	.	0 - Normal
18	NO	NO	0.0	0	.	0 - Normal
19	NO	NO	0.0	0	.	0 - Normal
20	NO	NO	0.0	0	.	0 - Normal
21	NO	NO	0.0	0	.	0 - Normal
22	NO	NO	0.0	0	.	0 - Normal
23	NO	NO	0.0	0	.	0 - Normal
24	NO	NO	0.0	0	.	0 - Normal
25	NO	NO	0.0	0	.	0 - Normal
26	NO	NO	0.0	0	.	0 - Normal
27	NO	NO	0.0	0	.	0 - Normal
28	NO	NO	0.0	0	.	0 - Normal
29	NO	NO	0.0	0	.	0 - Normal
30	NO	NO	0.0	0	.	0 - Normal
31	NO	NO	0.0	0	.	0 - Normal
32	NO	NO	0.0	0	.	0 - Normal

Detector Names

Det 1: Detector 1	Det 17: Detector 17
Det 2: Detector 2	Det 18: Detector 18
Det 3: Detector 3	Det 19: Detector 19
Det 4: Detector 4	Det 20: Detector 20
Det 5: Detector 5	Det 21: Detector 21
Det 6: Detector 6	Det 22: Detector 22
Det 7: Detector 7	Det 23: Detector 23
Det 8: Detector 8	Det 24: Detector 24
Det 9: Detector 9	Det 25: Detector 25
Det 10: Detector 10	Det 26: Detector 26
Det 11: Detector 11	Det 27: Detector 27
Det 12: Detector 12	Det 28: Detector 28
Det 13: Detector 13	Det 29: Detector 29
Det 14: Detector 14	Det 30: Detector 30
Det 15: Detector 15	Det 31: Detector 31
Det 16: Detector 16	Det 32: Detector 32

Detector Type/Timers

33	NO	NO	0.0	0	.	0 - Normal
34	NO	NO	0.0	0	.	0 - Normal
35	NO	NO	0.0	0	.	0 - Normal
36	NO	NO	0.0	0	.	0 - Normal
37	NO	NO	0.0	0	.	0 - Normal
38	NO	NO	0.0	0	.	0 - Normal
39	NO	NO	0.0	0	.	0 - Normal
40	NO	NO	0.0	0	.	0 - Normal
41	NO	NO	0.0	0	.	0 - Normal
42	NO	NO	0.0	0	.	0 - Normal
43	NO	NO	0.0	0	.	0 - Normal
44	NO	NO	0.0	0	.	0 - Normal
45	NO	NO	0.0	0	.	0 - Normal
46	NO	NO	0.0	0	.	0 - Normal
47	NO	NO	0.0	0	.	0 - Normal
48	NO	NO	0.0	0	.	0 - Normal
49	NO	NO	0.0	0	.	0 - Normal
50	NO	NO	0.0	0	.	0 - Normal
51	NO	NO	0.0	0	.	0 - Normal
52	NO	NO	0.0	0	.	0 - Normal
53	NO	NO	0.0	0	.	0 - Normal
54	NO	NO	0.0	0	.	0 - Normal
55	NO	NO	0.0	0	.	0 - Normal
56	NO	NO	0.0	0	.	0 - Normal
57	NO	NO	0.0	0	.	0 - Normal
58	NO	NO	0.0	0	.	0 - Normal
59	NO	NO	0.0	0	.	0 - Normal
60	NO	NO	0.0	0	.	0 - Normal
61	NO	NO	0.0	0	.	0 - Normal
62	NO	NO	0.0	0	.	0 - Normal
63	NO	NO	0.0	0	.	0 - Normal
64	NO	NO	0.0	0	.	0 - Normal

Detector Names

Det 33: Detector 33	Det 49: Detector 49
Det 34: Detector 34	Det 50: Detector 50
Det 35: Detector 35	Det 51: Detector 51
Det 36: Detector 36	Det 52: Detector 52
Det 37: Detector 37	Det 53: Detector 53
Det 38: Detector 38	Det 54: Detector 54
Det 39: Detector 39	Det 55: Detector 55
Det 40: Detector 40	Det 56: Detector 56
Det 41: Detector 41	Det 57: Detector 57
Det 42: Detector 42	Det 58: Detector 58
Det 43: Detector 43	Det 59: Detector 59
Det 44: Detector 44	Det 60: Detector 60
Det 45: Detector 45	Det 61: Detector 61
Det 46: Detector 46	Det 62: Detector 62
Det 47: Detector 47	Det 63: Detector 63
Det 48: Detector 48	Det 64: Detector 64

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Detector Phase Assignment

	Phase											
Det.	1	2	3	4	5	6	7	8	9	10	11	12
1	X	.	.	.	.	.	.	.	.	.	.	.
2	.	X	.	.	.	.	.	.	.	.	.	.
3	.	.	X	.	.	.	.	.	.	.	.	.
4	.	.	.	X	.	.	.	.	.	.	.	.
5	.	.	.	.	X	.	.	.	.	.	.	.
6	.	.	.	.	.	X	.	.	.	.	.	.
7	.	.	.	.	.	.	X	.	.	.	.	.
8	.	.	.	.	.	.	.	X	.	.	.	.
9	.	.	.	.	.	.	.	.	X	.	.	.
10	.	.	.	.	.	.	.	.	.	X	.	.
11	.	.	.	.	.	.	.	.	.	.	X	.
12	.	.	.	.	.	.	.	.	.	.	.	X
13	.	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.	.
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32	.	.	.	.	.	.	.	.	.	.	.	.

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Detector Cross Switching

	Phase											
Det.	1	2	3	4	5	6	7	8	9	10	11	12
1	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.
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7	.	.	.	.	.	.	.	.	.	.	.	.
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32	.	.	.	.	.	.	.	.	.	.	.	.

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Detector Cross Switching

	Phase											
Det.	1	2	3	4	5	6	7	8	9	10	11	12
33	.	.	.	.	.	.	.	.	.	.	.	.
34	.	.	.	.	.	.	.	.	.	.	.	.
35	.	.	.	.	.	.	.	.	.	.	.	.
36	.	.	.	.	.	.	.	.	.	.	.	.
37	.	.	.	.	.	.	.	.	.	.	.	.
38	.	.	.	.	.	.	.	.	.	.	.	.
39	.	.	.	.	.	.	.	.	.	.	.	.
40	.	.	.	.	.	.	.	.	.	.	.	.
41	.	.	.	.	.	.	.	.	.	.	.	.
42	.	.	.	.	.	.	.	.	.	.	.	.
43	.	.	.	.	.	.	.	.	.	.	.	.
44	.	.	.	.	.	.	.	.	.	.	.	.
45	.	.	.	.	.	.	.	.	.	.	.	.
46	.	.	.	.	.	.	.	.	.	.	.	.
47	.	.	.	.	.	.	.	.	.	.	.	.
48	.	.	.	.	.	.	.	.	.	.	.	.
49	.	.	.	.	.	.	.	.	.	.	.	.
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64	.	.	.	.	.	.	.	.	.	.	.	.

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Ped/SD Local Assign,Log Interval

	Phase Ped Detector											
	1	2	3	4	5	6	7	8	9	10	11	12
Is Ped Detector No. . . .	1	2	3	4	5	6	7	8	9	10	11	12

	*Local System Detector No.															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Is Local Detector No. . .	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Detector Log Interval . . 0

*NOTE: System master designations cross referenced to local system detector numbers are:

- SDA1 = 1 & 9
- SDA2 = 2 & 10
- SDB1 = 3 & 11
- SDB2 = 4 & 12
- SDC1 = 5 & 13
- SDC2 = 6 & 14
- SDD1 = 7 & 15
- SDD2 = 8 & 16

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Diagnostic Plans/Fail Action

	Detector															
Plan	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
*Fail Action	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Detector															
Plan	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
*Fail Action	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*NOTE: 0 = No Action, 1 = Min Recall, 2 = Max Recall in Effect
3 = Detector Fail Max Tiime from By-Phase Timing Data

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Diagnostic Plans/Fail Action

	Detector															
Plan	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
1 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
*Fail Action	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Detector															
Plan	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
1 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
*Fail Action	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*NOTE: 0 = No Action, 1 = Min Recall, 2 = Max Recall in Effect
3 = Detector Fail Max Tiime from By-Phase Timing Data

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Ped Diagnostic Plans

Plan		1	2	3	4	5	6	7	8	9	10	11	12
1	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1
2	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1
3	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1
4	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1
5	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1
6	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1
7	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1
8	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1

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Detector Diagnostic Intervals

Diagnostic Number	*No-Activity Diagnostic Interval	*Max Presence Diagnostic Interval	Erratic Counts
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0
19	0	0	0
20	0	0	0
21	0	0	0
22	0	0	0
23	0	0	0
24	0	0	0
25	0	0	0
26	0	0	0
27	0	0	0
28	0	0	0
29	0	0	0
30	0	0	0
31	0	0	0
32	0	0	0

*NOTE: Scaling is specified in each detector diagnostic plan.

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Speed Detectors

	Local Speed Detector							
One Detector Speed:	1	2	3	4	5	6	7	8
Local Detector Number. . . .	0	0	0	0	0	0	0	0
Vehicle Length	0	0	0	0	0	0	0	0
Loop Length.	0	0	0	0	0	0	0	0
Two Detector Speed:								
Local Detector Number. . . .	0	0	0	0	0	0	0	0
Speed Trap Length.	0	0	0	0	0	0	0	0

	Local Speed Detector							
One Detector Speed:	9	10	11	12	13	14	15	16
Local Detector Number. . . .	0	0	0	0	0	0	0	0
Vehicle Length	0	0	0	0	0	0	0	0
Loop Length.	0	0	0	0	0	0	0	0
Two Detector Speed:								
Local Detector Number. . . .	0	0	0	0	0	0	0	0
Speed Trap Length.	0	0	0	0	0	0	0	0

Units. . . . . Inches

NOTE: Speed Detector 1 = STA, Speed Detector 2 = STB

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Coordinator Manual Command and Options

Manual Enable . . . . . Pattern 0

Split Units . . . . . Percent OffsetUnits . . . . . Percent
Interconnect Format . STD Interconnect Source . NIC
Transition. . . . . SMOOTH Dwell Period. 0
Resync Count. 0

Actuated Coord Phase . . . . Actuated Walk Rest . . . .
Inhibit Max Timing . . . . . Max 2 Select . . . . . .
Floating Force Off . . . . . Multisync. . . . . .

Split Demand:	Call	Time	Cyc Count	Phase 1	2	3	4	5	6	7	8	9	10	11	12
Demand 1 . .	0		0	.	.	.	.	.	.	.	.	.	.	.	.
Demand 2 . .	0		0	.	.	.	.	.	.	.	.	.	.	.	.

	Phase 1	2	3	4	5	6	7	8	9	10	11	12
Auto Permissive Min Green .	0	0	0	0	0	0	0	0	0	0	0	0

	A	B	C	D	E	F
Free Alternate Sequence . .	.	.	.	.	.	.

Coordination Patterns

Preemptors

Preemptor 1

Active	Det Lock	Ped Dark
Priority Preemption	Yel-Red To Grn	Ped Active
Outputs Only During Hold	Flash All Outputs	Zero Ped Clr Time
Terminate Overlap ASAP	Terminate Phases	Ped Clr Thru Yel
Don't Override Flash	Duration Time 0	
Flash During Hold	Delay Time 0	
No CVM in Flash	Inhibit Time 0	
Fast Flash Grn on Hold Phase	Min Ped Clear 0	
Enable Max Time	Max Time 0	
	Exit Max 0	
	Min Hold Time 0	
	Hold Delay Time 0	

	Green	Yellow	Red
Minimum	0	0.0	0.0
Track Clear	0	0.0	0.0
Hold		0.0	0.0

Phase/Overlap	1	2	3	4	5	6	7	8	9	10	11	12/	A	B	C	D
Terminate Overlap																
Track Clearance Phase																
Hold Phases																
Exit Phases																
Exit Calls on Phase																

Out of Flash Color for Exit Phases . . . . Green

Preemptor 2

Active	Det Lock	Ped Dark
Priority Preemption	Yel-Red To Grn	Ped Active
Outputs Only During Hold	Flash All Outputs	Zero Ped Clr Time
Terminate Overlap ASAP	Terminate Phases	Ped Clr Thru Yel
Don't Override Flash	Duration Time 0	
Flash During Hold	Delay Time 0	
No CVM in Flash	Inhibit Time 0	
Fast Flash Grn on Hold Phase	Min Ped Clear 0	
Enable Max Time	Max Time 0	
	Exit Max 0	
	Min Hold Time 0	
	Hold Delay Time 0	

	Green	Yellow	Red
Minimum	0	0.0	0.0
Track Clear	0	0.0	0.0
Hold		0.0	0.0

Phase/Overlap	1	2	3	4	5	6	7	8	9	10	11	12/	A	B	C	D
Terminate Overlap																
Track Clearance Phase																
Hold Phases																
Exit Phases																
Exit Calls on Phase																

Out of Flash Color for Exit Phases . . . . Green
Linked Preemptor 0

Preemptors

Preemptor 3

Active	Det Lock	Ped Dark
Priority Preemption	Yel-Red To Grn	Ped Active
Outputs Only During Hold	Flash All Outputs	Zero Ped Clr Time
Terminate Overlap ASAP	Terminate Phases	Ped Clr Thru Yel
Don't Override Flash	Duration Time 0	
Flash During Hold	Delay Time 0	
No CVM in Flash	Inhibit Time 0	
Fast Flash Grn on Hold Phase	Min Ped Clear 0	
Enable Max Time	Max Time 0	
	Exit Max 0	
	Min Hold Time 0	
	Hold Delay Time 0	

	Green	Yellow	Red
Minimum	0	0.0	0.0
Track Clear	0	0.0	0.0
Hold		0.0	0.0

Phase/Overlap	1	2	3	4	5	6	7	8	9	10	11	12/	A	B	C	D
Terminate Overlap																
Track Clearance Phase																
Hold Phases																
Exit Phases																
Exit Calls on Phase																

Out of Flash Color for Exit Phases . . . . Green
Linked Preemptor 0

Preemptor 4

Active	Det Lock	Ped Dark
Priority Preemption	Yel-Red To Grn	Ped Active
Outputs Only During Hold	Flash All Outputs	Zero Ped Clr Time
Terminate Overlap ASAP	Terminate Phases	Ped Clr Thru Yel
Don't Override Flash	Duration Time 0	
Flash During Hold	Delay Time 0	
No CVM in Flash	Inhibit Time 0	
Fast Flash Grn on Hold Phase	Min Ped Clear 0	
Enable Max Time	Max Time 0	
	Exit Max 0	
	Min Hold Time 0	
	Hold Delay Time 0	

	Green	Yellow	Red
Minimum	0	0.0	0.0
Track Clear	0	0.0	0.0
Hold		0.0	0.0

Phase/Overlap	1	2	3	4	5	6	7	8	9	10	11	12/	A	B	C	D
Terminate Overlap																
Track Clearance Phase																
Hold Phases																
Exit Phases																
Exit Calls on Phase																

Out of Flash Color for Exit Phases . . . . Green
Linked Preemptor 0

Preemptors

Preemptor 5

Active	Det Lock.	Ped Dark . . . . .
Priority Preemption.	Yel-Red To Grn. . .	Ped Active . . . . .
Outputs Only During Hold . . .	Flash All Outputs .	Zero Ped Clr Time. .
Terminate Overlap ASAP	Terminate Phases. .	Ped Clr Thru Yel . .
Don't Override Flash	Duration Time. . . 0	
Flash During Hold.	Delay Time 0	
No CVM in Flash.	Inhibit Time . . . 0	
Fast Flash Grn on Hold Phase. .	Min Ped Clear. . . 0	
Enable Max Time.	Max Time 0	
	Exit Max 0	
	Min Hold Time. . . 0	
	Hold Delay Time. . 0	

	Green	Yellow	Red
Minimum	0	0.0	0.0
Track Clear	0	0.0	0.0
Hold.		0.0	0.0

Phase/Overlap	1	2	3	4	5	6	7	8	9	10	11	12/	A	B	C	D
Terminate Overlap																
Track Clearance Phase																
Hold Phases																
Exit Phases																
Exit Calls on Phase																

Out of Flash Color for Exit Phases . . . . Green

Linked Preemptor 0

Preemptor 6

Active	Det Lock.	Ped Dark . . . . .
Priority Preemption.	Yel-Red To Grn. . .	Ped Active . . . . .
Outputs Only During Hold . . .	Flash All Outputs .	Zero Ped Clr Time. .
Terminate Overlap ASAP	Terminate Phases. .	Ped Clr Thru Yel . .
Don't Override Flash	Duration Time. . . 0	
Flash During Hold.	Delay Time 0	
No CVM in Flash.	Inhibit Time . . . 0	
Fast Flash Grn on Hold Phase. .	Min Ped Clear. . . 0	
Enable Max Time.	Max Time 0	
	Exit Max 0	
	Min Hold Time. . . 0	
	Hold Delay Time. . 0	

	Green	Yellow	Red
Minimum	0	0.0	0.0
Track Clear	0	0.0	0.0
Hold.		0.0	0.0

Phase/Overlap	1	2	3	4	5	6	7	8	9	10	11	12/	A	B	C	D
Terminate Overlap																
Track Clearance Phase																
Hold Phases																
Exit Phases																
Exit Calls on Phase																

Out of Flash Color for Exit Phases . . . . Green

Linked Preemptor 0

Bus Preemptors

	Bus Preemptor 1	2	3	4
Preemptor Active	.	.	.	.
Detector Lock	.	.	.	.
Maximum Time	0	0	0	0
Reservice Time	0	0	0	0
Delay Time	0	0	0	0
Inhibit Time	0	0	0	0
Entrance Green	0	0	0	0
Entrance Ped Clearance	0	0	0	0
Entrance Yellow	0.0	0.0	0.0	0.0
Entrance Red	0.0	0.0	0.0	0.0
Minimum Hold Time	0	0	0	0

	Hold Phases 1	2	3	4	5	6	7	8	9	10	11	12
Preemptor 1	.	.	.	.	.	.	.	.	.	.	.	.
Preemptor 2	.	.	.	.	.	.	.	.	.	.	.	.
Preemptor 3	.	.	.	.	.	.	.	.	.	.	.	.
Preemptor 4	.	.	.	.	.	.	.	.	.	.	.	.

NIC/TOD Clock/Calendar

Manual NIC Program Step 0

Manual TOD Program Step 0

NIC Resync Time 0000

Sync Reference is . . . . . Reference Time

Week 1 Begins on 1st Sunday . . . . . NO If NO, then week containing Jan. 1

Disable Daylight Savings Time . . . . . NO

Daylight Savings
Begins Last Sunday in March . . . . . NO If NO, then Second Sunday as per 2007 DST Law

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TOD Weekly/Yearly

Weekly Program Numbers

	1	2	3	4	5	6	7	8	9	10	
Sunday . . .	1	1	1	1	1	1	1	1	1	1	Program No.
Monday . . .	1	1	1	1	1	1	1	1	1	1	Program No.
Tuesday. . .	1	1	1	1	1	1	1	1	1	1	Program No.
Wednesday. .	1	1	1	1	1	1	1	1	1	1	Program No.
Thursday . .	1	1	1	1	1	1	1	1	1	1	Program No.
Friday . . .	1	1	1	1	1	1	1	1	1	1	Program No.
Saturday . .	1	1	1	1	1	1	1	1	1	1	Program No.

Week of Year

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Prog	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Prog	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
Prog	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Holiday Programs

Holiday	Type	Month	Day of Week/ Day of Month	Week of Year/ Year	Program
1	Fixed	0	0	0	0
2	Fixed	0	0	0	0
3	Fixed	0	0	0	0
4	Fixed	0	0	0	0
5	Fixed	0	0	0	0
6	Fixed	0	0	0	0
7	Fixed	0	0	0	0
8	Fixed	0	0	0	0
9	Fixed	0	0	0	0
10	Fixed	0	0	0	0
11	Fixed	0	0	0	0
12	Fixed	0	0	0	0
13	Fixed	0	0	0	0
14	Fixed	0	0	0	0
15	Fixed	0	0	0	0
16	Fixed	0	0	0	0
17	Fixed	0	0	0	0
18	Fixed	0	0	0	0
19	Fixed	0	0	0	0
20	Fixed	0	0	0	0
21	Fixed	0	0	0	0
22	Fixed	0	0	0	0
23	Fixed	0	0	0	0
24	Fixed	0	0	0	0
25	Fixed	0	0	0	0
26	Fixed	0	0	0	0
27	Fixed	0	0	0	0
28	Fixed	0	0	0	0
29	Fixed	0	0	0	0
30	Fixed	0	0	0	0
31	Fixed	0	0	0	0
32	Fixed	0	0	0	0
33	Fixed	0	0	0	0
34	Fixed	0	0	0	0
35	Fixed	0	0	0	0
36	Fixed	0	0	0	0

NIC Program Steps

Step	Program	Step Begins	Pattern	Override

TOD Program Steps

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Configuration

Controller Sequence Priority

	1	2	3	4	5	6	7	8	9	10	11	12
Ring 1 Phases . .	1	2	3	4	9	10	0	0	0	0	0	0
Ring 2 Phases . .	5	6	7	8	11	12	0	0	0	0	0	0

Phase

	1	2	3	4	5	6	7	8	9	10	11	12
In Use.	X	X	.	.	.	X	.	X	.	.	.	.
Exclusive Ped . .	.	.	.	.	.	.	.	.	.	.	.	.
Direction												

Overlap

	A	B	C	D
Direction . . .				

Load Switch Channel/Driver Group Assign (Info Only):

Load Switch (MMU) Channel	Signal Driver Phase/ Ovlap	Group Ped
1	3	.
2	2	.
3	3	.
4	4	.
5	5	.
6	6	.
7	7	.
8	8	.
9	2	X
10	4	X
11	6	X
12	8	X
13	A	.
14	B	.
15	C	.
16	D	.

Configuration Continued

Enable BIU:	1	2	3	4	5	6	7	8
Terminal/Facilities.								
Detector Rack.								

Type 2 Runs as Type 1. . .	
MMU Disable.	X
Diagnostic Enable.	
Peer-Peer Comm Enable. . .	

	1	2	3	4	5	6	7	8	9	10
Peer To Peer Addresses . .	255	255	255	255	255	255	255	255	255	255

Port 2:

Port 2 Protocol	Terminal
Port 2 Enable	YES
AB3418 Address.	0
AB3418 Group Address.	0
AB3418 Response Delay	0
AB3418 Single Flag Enable . . .	NO
AB3418 Drop-Out Time.	0
AB3418 TOD SF Select.	0
Data Rate	1200 bps
Data, Parity, Stop.	8, 0, 1

Port 3:

Port 3 Protocol	Telemetry
Port 3 Enable	NO
Telemetry Address	0
System Detector 9-16 Address. .	0
Telemetry Response Delay. . . .	8700
AB3418 Address.	0
AB3418 Group Address.	0
AB3418 Response Delay	0
AB3418 Single Flag Enable . . .	NO
AB3418 Drop-Out Time.	0
AB3418 TOD SF Select.	0
Duplex.	Full
Data Rate	1200 bps
Data, Parity, Stop.	8, 0, 1

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Configuration Continued

Event Enabling		Alarm Enabling	
Critical RFE'S (MMU/TF)	X	ALARM 1	X
Non-Critical RFE'S (DET/TEST)	X	ALARM 2	X
Detector Errors	X	ALARM 3	X
Coordination Errors	X	ALARM 4	.
MMU Flash Faults.	X	ALARM 5	.
Local Flash Faults.	X	ALARM 6	.
Preempt	X	ALARM 7	.
Power On/Off.	X	ALARM 8	.
Low Battery	X	ALARM 9	.
		ALARM 10.	.
		ALARM 11.	.
		ALARM 12.	.
		ALARM 13.	.
		ALARM 14.	.
		ALARM 15.	.
		ALARM 16.	.

Supervisor Access Code. . . ****
Data Change Access Code . . ****

MMU Compatibility Program (Info Only)

Channel	Is Allowed to Time With Channel														
	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2
1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
3	.	.	.	.	.	.	.	.	.	.	.	.	.		
4	.	.	.	.	.	.	.	.	.	.	.	.			
5	.	.	.	.	.	.	.	.	.	.	.				
6	.	.	.	.	.	.	.	.	.	.					
7	.	.	.	.	.	.	.	.	.						
8	.	.	.	.	.	.	.	.							
9	.	.	.	.	.	.	.								
10	.	.	.	.	.	.									
11	.	.	.	.	.										
12	.	.	.	.											
13	.	.	.												
14	.	.													
15	.														

Version Info:

Software Assy.	Part No.	Version
Boot	27831	2.83
Program	45561	7.9
Application		. 3
Help	27891	6.23
Configuration	27908	C000

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By-Phase Timing Data

	Phase											
Direction	1	2	3	4	5	6	7	8	9	10	11	12
Minimum Green	10	35	5	5	5	35	5	15	5	5	5	5
Bike Min Green	0	0	0	0	0	0	0	0	0	0	0	0
Cond Serv Min Grn	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	5	0	5	0	5	0	3	0	10	0	10
Ped Clearance	0	7	0	7	0	7	0	7	0	16	0	16
Veh Extension	5.0	0.0	5.0	5.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0
Alt Veh Exten	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Extension	0	0	0	0	0	0	0	0	0	0	0	0
Max 1	35	45	35	20	35	45	35	25	35	35	35	35
Max 2	40	50	40	40	40	50	40	30	40	40	40	40
Max 3	0	0	0	0	0	0	0	40	0	0	0	0
Det. Fail Max	0	0	0	0	0	0	0	0	0	0	0	0
Yellow Change	3.0	5.0	3.0	3.0	3.0	5.0	3.0	4.0	3.0	3.0	3.0	3.0
Red Clearance	1.0	2.0	1.0	1.0	1.0	2.0	1.0	2.0	1.0	1.0	1.0	1.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act. B4 Init	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Actuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Initial	30	30	30	30	30	30	30	30	30	30	30	30
Time B4 Reduction	0	0	0	0	0	0	0	0	0	0	0	0
Cars Waiting	0	0	0	0	0	0	0	0	0	0	0	0
Time To Reduce	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

No-Serve Phases

	Phase Cannot Serve With Phase										
Phase	12	11	10	9	8	7	6	5	4	3	2
1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	
3	.	.	.	.	.	.	.	.	.		
4	.	.	.	.	.	.	.	.			
5	.	.	.	.	.	.	.				
6	.	.	.	.	.	.					
7	.	.	.	.	.						
8	.	.	.	.							
9	.	.	.								
10	.	.									
11	.										

Ped Carryover

Ped Start Phase	Carry Over Phase
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0

Vehicle/Ped Phase as Overlap

Ped Ovlap Phase	Ped Phase As Overlap Consists of Ped Phases											
	1	2	3	4	5	6	7	8	9	10	11	12
1	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.	.

Veh Ovlap Phase	Veh Phase As Overlap Consists of Veh Phases											
	1	2	3	4	5	6	7	8	9	10	11	12
1	X	.	.	.	.	.	.	.	.	.	.	.
2	.	X	.	.	.	.	.	.	.	.	.	.
3	.	.	X	.	.	.	.	.	.	.	.	.
4	.	.	.	X	.	.	.	.	.	.	.	.
5	.	.	.	.	X	.	.	.	.	.	.	.
6	.	.	.	.	.	X	.	.	.	.	.	.
7	.	.	.	.	.	.	X	.	.	.	.	.
8	.	.	.	.	.	.	.	X	.	.	.	.
9	.	.	.	.	.	.	.	.	X	.	.	.
10	.	.	.	.	.	.	.	.	.	X	.	.
11	.	.	.	.	.	.	.	.	.	.	X	.
12	.	.	.	.	.	.	.	.	.	.	.	X

Overlap Data

Overlap A	Phase: 1	2	3	4	5	6	7	8	9	10	11	12
Standard.												
Protected												
Permitted												
Enable Lag.												
Enable Lead												
Spare												
Advance Green Timer				0.0								

	Green	Yellow	Red
Lag/Lead Timers	0.0	0.0	0.0

Overlap B	Phase: 1	2	3	4	5	6	7	8	9	10	11	12
Standard.												
Protected												
Permitted												
Enable Lag.												
Enable Lead												
Spare												
Advance Green Timer				0.0								

	Green	Yellow	Red
Lag/Lead Timers	0.0	0.0	0.0

Overlap C	Phase: 1	2	3	4	5	6	7	8	9	10	11	12
Standard.												
Protected												
Permitted												
Enable Lag.												
Enable Lead												
Spare												
Advance Green Timer				0.0								

	Green	Yellow	Red
Lag/Lead Timers	0.0	0.0	0.0

Overlap D	Phase: 1	2	3	4	5	6	7	8	9	10	11	12
Standard.												
Protected												
Permitted												
Enable Lag.												
Enable Lead												
Spare												
Advance Green Timer				0.0								

	Green	Yellow	Red
Lag/Lead Timers	0.0	0.0	0.0

Power Start, Remote Flash

	Phase																	
	1	2	3	4	5	6	7	8	9	10	11	12	Overlap					
													A		B		C	D
Power Start	.	X	.	.	.	X	.	.	.	.	.	.						
External Start	.	X	.	.	.	X	.	.	.	.	.	.						
Into Remote Flash	.	X	.	.	.	X	.	.	.	.	.	.						
Exit Remote Flash	.	X	.	.	.	X	.	.	.	.	.	.						
Remote Flash Yellow	.	.	.	.	.	.	.	.	.	.	.	.						
Flash Together	.	X	.	X	.	X	.	X	.	X	.	X	.		X		.	X

Initialization Interval:

Power Start	Yellow
External Start	Yellow

Power Start All Red Time	0
Power Start Flash Time	0

Remote Flash Options:

Out of Flash Yellow	NO
Out of Flash All Red	NO
Minimum Recall	NO
Alternate Flash	NO
Flash Thru Load Switches	NO
Cycle Through Phases	NO

Option Data

	Phase											
	1	2	3	4	5	6	7	8	9	10	11	12
Guaranteed Passage												
Call To NonActuated 1		X				X						
Call To NonActuated 2				X				X				
Dual Entry		X		X		X		X		X		X
Conditional Service	X		X		X		X		X		X	
Conditional Reservice												
Actuated Rest in Walk												
Flashing Walk												

Enable Programmable Options

Dual Entry	OFF	Backup Protection Group 1	OFF
Conditional Service	OFF	Backup Protection Group 2	OFF
Ped Clearance Protection	OFF	Backup Protection Group 3	OFF
Special Preempt Overlap Flash	OFF	Simultaneous Gap Group 1	OFF
Cond Service Det Cross Switch	OFF	Simultaneous Gap Group 2	OFF
Lock Detectors in Red Only	OFF	Simultaneous Gap Group 3	OFF

Five Section Left Turn Control

Phases:	5-2	7-4	1-6	3-8	11-10	9-12
Left Turn Head						

Recall Data, Dimming

	Phase											
	1	2	3	4	5	6	7	8	9	10	11	12
Locking Detector. . . .	.	.	.	.	.	.	.	.	.	.	.	.
Vehicle Recall.	.	X	.	.	.	X	.	.	.	.	.	.
Pedestrian Recall . . .	.	.	.	.	.	.	.	.	.	.	.	.
Recall To Max	.	.	.	.	.	.	.	.	.	.	.	.
Soft Recall	.	.	.	.	.	.	.	.	.	.	.	.
Don't Rest Here	.	.	.	.	.	.	.	.	.	.	.	.
Ped Dark if No Call . .	.	.	.	.	.	.	.	.	.	.	.	.

Dimming:

	Load Switch															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Green/Walk. . . .	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Yellow/Ped Clear.	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Red/Don't Walk. .	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

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Detector Type/Timers

Det.	Locking Memory	Log Enable	Timers Extend	Timers Delay	Don't Reset Extend	Type
1	NO	NO	0.0	0	.	0 - Normal
2	NO	NO	0.0	0	.	0 - Normal
3	NO	NO	0.0	0	.	0 - Normal
4	NO	NO	0.0	7	.	1 - Extend/Delay
5	NO	NO	0.0	0	.	0 - Normal
6	NO	NO	0.0	0	.	0 - Normal
7	NO	NO	0.0	0	.	0 - Normal
8	NO	NO	0.0	5	.	1 - Extend/Delay
9	NO	NO	0.0	0	.	0 - Normal
10	NO	NO	0.0	0	.	0 - Normal
11	NO	NO	0.0	0	.	0 - Normal
12	NO	NO	0.0	0	.	0 - Normal
13	NO	NO	0.0	0	.	0 - Normal
14	NO	NO	0.0	0	.	0 - Normal
15	NO	NO	0.0	0	.	0 - Normal
16	NO	NO	0.0	0	.	0 - Normal
17	NO	NO	0.0	0	.	0 - Normal
18	NO	NO	0.0	0	.	0 - Normal
19	NO	NO	0.0	0	.	0 - Normal
20	NO	NO	0.0	0	.	0 - Normal
21	NO	NO	0.0	0	.	0 - Normal
22	NO	NO	0.0	0	.	0 - Normal
23	NO	NO	0.0	0	.	0 - Normal
24	NO	NO	0.0	0	.	0 - Normal
25	NO	NO	0.0	0	.	0 - Normal
26	NO	NO	0.0	0	.	0 - Normal
27	NO	NO	0.0	0	.	0 - Normal
28	NO	NO	0.0	0	.	0 - Normal
29	NO	NO	0.0	0	.	0 - Normal
30	NO	NO	0.0	0	.	0 - Normal
31	NO	NO	0.0	0	.	0 - Normal
32	NO	NO	0.0	0	.	0 - Normal

Detector Names

Det 1: Detector 1	Det 17: Detector 17
Det 2: Detector 2	Det 18: Detector 18
Det 3: Detector 3	Det 19: Detector 19
Det 4: Detector 4	Det 20: Detector 20
Det 5: Detector 5	Det 21: Detector 21
Det 6: Detector 6	Det 22: Detector 22
Det 7: Detector 7	Det 23: Detector 23
Det 8: Detector 8	Det 24: Detector 24
Det 9: Detector 9	Det 25: Detector 25
Det 10: Detector 10	Det 26: Detector 26
Det 11: Detector 11	Det 27: Detector 27
Det 12: Detector 12	Det 28: Detector 28
Det 13: Detector 13	Det 29: Detector 29
Det 14: Detector 14	Det 30: Detector 30
Det 15: Detector 15	Det 31: Detector 31
Det 16: Detector 16	Det 32: Detector 32

Detector Type/Timers

33	NO	NO	0.0	0	.	0 - Normal
34	NO	NO	0.0	0	.	0 - Normal
35	NO	NO	0.0	0	.	0 - Normal
36	NO	NO	0.0	0	.	0 - Normal
37	NO	NO	0.0	0	.	0 - Normal
38	NO	NO	0.0	0	.	0 - Normal
39	NO	NO	0.0	0	.	0 - Normal
40	NO	NO	0.0	0	.	0 - Normal
41	NO	NO	0.0	0	.	0 - Normal
42	NO	NO	0.0	0	.	0 - Normal
43	NO	NO	0.0	0	.	0 - Normal
44	NO	NO	0.0	0	.	0 - Normal
45	NO	NO	0.0	0	.	0 - Normal
46	NO	NO	0.0	0	.	0 - Normal
47	NO	NO	0.0	0	.	0 - Normal
48	NO	NO	0.0	0	.	0 - Normal
49	NO	NO	0.0	0	.	0 - Normal
50	NO	NO	0.0	0	.	0 - Normal
51	NO	NO	0.0	0	.	0 - Normal
52	NO	NO	0.0	0	.	0 - Normal
53	NO	NO	0.0	0	.	0 - Normal
54	NO	NO	0.0	0	.	0 - Normal
55	NO	NO	0.0	0	.	0 - Normal
56	NO	NO	0.0	0	.	0 - Normal
57	NO	NO	0.0	0	.	0 - Normal
58	NO	NO	0.0	0	.	0 - Normal
59	NO	NO	0.0	0	.	0 - Normal
60	NO	NO	0.0	0	.	0 - Normal
61	NO	NO	0.0	0	.	0 - Normal
62	NO	NO	0.0	0	.	0 - Normal
63	NO	NO	0.0	0	.	0 - Normal
64	NO	NO	0.0	0	.	0 - Normal

Detector Names

Det 33: Detector 33	Det 49: Detector 49
Det 34: Detector 34	Det 50: Detector 50
Det 35: Detector 35	Det 51: Detector 51
Det 36: Detector 36	Det 52: Detector 52
Det 37: Detector 37	Det 53: Detector 53
Det 38: Detector 38	Det 54: Detector 54
Det 39: Detector 39	Det 55: Detector 55
Det 40: Detector 40	Det 56: Detector 56
Det 41: Detector 41	Det 57: Detector 57
Det 42: Detector 42	Det 58: Detector 58
Det 43: Detector 43	Det 59: Detector 59
Det 44: Detector 44	Det 60: Detector 60
Det 45: Detector 45	Det 61: Detector 61
Det 46: Detector 46	Det 62: Detector 62
Det 47: Detector 47	Det 63: Detector 63
Det 48: Detector 48	Det 64: Detector 64

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Detector Phase Assignment

	Phase											
Det.	1	2	3	4	5	6	7	8	9	10	11	12
1	X	.	.	.	.	.	.	.	.	.	.	.
2	.	X	.	.	.	.	.	.	.	.	.	.
3	.	.	X	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	X	.	.	.	.
5	.	.	.	.	X	.	.	.	.	.	.	.
6	.	.	.	.	.	X	.	.	.	.	.	.
7	.	.	.	.	.	.	X	.	.	.	.	.
8	.	.	.	.	.	.	.	X	.	.	.	.
9	.	.	.	.	.	.	.	.	X	.	.	.
10	.	.	.	.	.	.	.	.	.	X	.	.
11	.	.	.	.	.	.	.	.	.	.	X	.
12	.	.	.	.	.	.	.	.	.	.	.	X
13	.	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.	.
20	.	.	.	.	.	.	.	.	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.	.
25	.	.	.	.	.	.	.	.	.	.	.	.
26	.	.	.	.	.	.	.	.	.	.	.	.
27	.	.	.	.	.	.	.	.	.	.	.	.
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32	.	.	.	.	.	.	.	.	.	.	.	.

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Detector Cross Switching

	Phase											
Det.	1	2	3	4	5	6	7	8	9	10	11	12
1	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.	.
20	.	.	.	.	.	.	.	.	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.	.
25	.	.	.	.	.	.	.	.	.	.	.	.
26	.	.	.	.	.	.	.	.	.	.	.	.
27	.	.	.	.	.	.	.	.	.	.	.	.
28	.	.	.	.	.	.	.	.	.	.	.	.
29	.	.	.	.	.	.	.	.	.	.	.	.
30	.	.	.	.	.	.	.	.	.	.	.	.
31	.	.	.	.	.	.	.	.	.	.	.	.
32	.	.	.	.	.	.	.	.	.	.	.	.

Detector Cross Switching

	Phase											
Det.	1	2	3	4	5	6	7	8	9	10	11	12
33	.	.	.	.	.	.	.	.	.	.	.	.
34	.	.	.	.	.	.	.	.	.	.	.	.
35	.	.	.	.	.	.	.	.	.	.	.	.
36	.	.	.	.	.	.	.	.	.	.	.	.
37	.	.	.	.	.	.	.	.	.	.	.	.
38	.	.	.	.	.	.	.	.	.	.	.	.
39	.	.	.	.	.	.	.	.	.	.	.	.
40	.	.	.	.	.	.	.	.	.	.	.	.
41	.	.	.	.	.	.	.	.	.	.	.	.
42	.	.	.	.	.	.	.	.	.	.	.	.
43	.	.	.	.	.	.	.	.	.	.	.	.
44	.	.	.	.	.	.	.	.	.	.	.	.
45	.	.	.	.	.	.	.	.	.	.	.	.
46	.	.	.	.	.	.	.	.	.	.	.	.
47	.	.	.	.	.	.	.	.	.	.	.	.
48	.	.	.	.	.	.	.	.	.	.	.	.
49	.	.	.	.	.	.	.	.	.	.	.	.
50	.	.	.	.	.	.	.	.	.	.	.	.
51	.	.	.	.	.	.	.	.	.	.	.	.
52	.	.	.	.	.	.	.	.	.	.	.	.
53	.	.	.	.	.	.	.	.	.	.	.	.
54	.	.	.	.	.	.	.	.	.	.	.	.
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62	.	.	.	.	.	.	.	.	.	.	.	.
63	.	.	.	.	.	.	.	.	.	.	.	.
64	.	.	.	.	.	.	.	.	.	.	.	.

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Ped/SD Local Assign,Log Interval

	Phase Ped Detector											
	1	2	3	4	5	6	7	8	9	10	11	12
Is Ped Detector No. . . .	1	2	3	4	5	6	7	8	9	10	11	12

	*Local System Detector No.															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Is Local Detector No. . .	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Detector Log Interval . . 0

*NOTE: System master designations cross referenced to local system detector numbers are:

- SDA1 = 1 & 9
- SDA2 = 2 & 10
- SDB1 = 3 & 11
- SDB2 = 4 & 12
- SDC1 = 5 & 13
- SDC2 = 6 & 14
- SDD1 = 7 & 15
- SDD2 = 8 & 16

Diagnostic Plans/Fail Action

	Detector															
Plan	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
*Fail Action	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Detector															
Plan	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
*Fail Action	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*NOTE: 0 = No Action, 1 = Min Recall, 2 = Max Recall in Effect
3 = Detector Fail Max Tiime from By-Phase Timing Data

Diagnostic Plans/Fail Action

	Detector															
Plan	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
1 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
*Fail Action	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Detector															
Plan	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
1 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8 Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scaling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
*Fail Action	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*NOTE: 0 = No Action, 1 = Min Recall, 2 = Max Recall in Effect
3 = Detector Fail Max Tiime from By-Phase Timing Data

Ped Diagnostic Plans

Plan		1	2	3	4	5	6	7	8	9	10	11	12
1	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1
2	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1
3	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1
4	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1
5	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1
6	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1
7	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1
8	Diagnostic	0	0	0	0	0	0	0	0	0	0	0	0
	Scaling	1	1	1	1	1	1	1	1	1	1	1	1

Detector Diagnostic Intervals

Diagnostic Number	*No-Activity Diagnostic Interval	*Max Presence Diagnostic Interval	Erratic Counts
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0
19	0	0	0
20	0	0	0
21	0	0	0
22	0	0	0
23	0	0	0
24	0	0	0
25	0	0	0
26	0	0	0
27	0	0	0
28	0	0	0
29	0	0	0
30	0	0	0
31	0	0	0
32	0	0	0

*NOTE: Scaling is specified in each detector diagnostic plan.

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Speed Detectors

	Local Speed Detector							
One Detector Speed:	1	2	3	4	5	6	7	8
Local Detector Number. . . .	0	0	0	0	0	0	0	0
Vehicle Length	0	0	0	0	0	0	0	0
Loop Length.	0	0	0	0	0	0	0	0
Two Detector Speed:								
Local Detector Number. . . .	0	0	0	0	0	0	0	0
Speed Trap Length.	0	0	0	0	0	0	0	0

	Local Speed Detector							
One Detector Speed:	9	10	11	12	13	14	15	16
Local Detector Number. . . .	0	0	0	0	0	0	0	0
Vehicle Length	0	0	0	0	0	0	0	0
Loop Length.	0	0	0	0	0	0	0	0
Two Detector Speed:								
Local Detector Number. . . .	0	0	0	0	0	0	0	0
Speed Trap Length.	0	0	0	0	0	0	0	0

Units. . . . . Inches

NOTE: Speed Detector 1 = STA, Speed Detector 2 = STB

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Coordinator Manual Command and Options

Manual Enable . . . . . Pattern 0

Split Units . . . . . Percent OffsetUnits . . . . . Percent
Interconnect Format . STD Interconnect Source . NIC
Transition. . . . . SMOOTH Dwell Period. 0
Resync Count. 0

Actuated Coord Phase . . . . Actuated Walk Rest . . . .
Inhibit Max Timing . . . . . Max 2 Select . . . . . .
Floating Force Off . . . . . Multisync. . . . . .

Split Demand:	Call	Time	Cyc Count	Phase 1	2	3	4	5	6	7	8	9	10	11	12
Demand 1 . .	0		0	.	.	.	.	.	.	.	.	.	.	.	.
Demand 2 . .	0		0	.	.	.	.	.	.	.	.	.	.	.	.

	Phase 1	2	3	4	5	6	7	8	9	10	11	12
Auto Permissive Min Green .	0	0	0	0	0	0	0	0	0	0	0	0

	A	B	C	D	E	F
Free Alternate Sequence . .	.	.	.	.	.	.

Coordination Patterns

Preemptors

Preemptor 1

Active	Det Lock	Ped Dark
Priority Preemption	Yel-Red To Grn	Ped Active
Outputs Only During Hold	Flash All Outputs	Zero Ped Clr Time
Terminate Overlap ASAP	Terminate Phases	Ped Clr Thru Yel
Don't Override Flash	Duration Time 0	
Flash During Hold	Delay Time 0	
No CVM in Flash	Inhibit Time 0	
Fast Flash Grn on Hold Phase	Min Ped Clear 0	
Enable Max Time	Max Time 0	
	Exit Max 0	
	Min Hold Time 0	
	Hold Delay Time 0	

	Green	Yellow	Red
Minimum	0	0.0	0.0
Track Clear	0	0.0	0.0
Hold		0.0	0.0

Phase/Overlap	1	2	3	4	5	6	7	8	9	10	11	12/	A	B	C	D
Terminate Overlap																
Track Clearance Phase																
Hold Phases																
Exit Phases																
Exit Calls on Phase																

Out of Flash Color for Exit Phases . . . . Green

Preemptor 2

Active	Det Lock	Ped Dark
Priority Preemption	Yel-Red To Grn	Ped Active
Outputs Only During Hold	Flash All Outputs	Zero Ped Clr Time
Terminate Overlap ASAP	Terminate Phases	Ped Clr Thru Yel
Don't Override Flash	Duration Time 0	
Flash During Hold	Delay Time 0	
No CVM in Flash	Inhibit Time 0	
Fast Flash Grn on Hold Phase	Min Ped Clear 0	
Enable Max Time	Max Time 0	
	Exit Max 0	
	Min Hold Time 0	
	Hold Delay Time 0	

	Green	Yellow	Red
Minimum	0	0.0	0.0
Track Clear	0	0.0	0.0
Hold		0.0	0.0

Phase/Overlap	1	2	3	4	5	6	7	8	9	10	11	12/	A	B	C	D
Terminate Overlap																
Track Clearance Phase																
Hold Phases																
Exit Phases																
Exit Calls on Phase																

Out of Flash Color for Exit Phases . . . . Green
Linked Preemptor 0

Preemptors

Preemptor 3

Active	Det Lock.	Ped Dark . . . . .
Priority Preemption.	Yel-Red To Grn. . .	Ped Active . . . . .
Outputs Only During Hold . . .	Flash All Outputs .	Zero Ped Clr Time. .
Terminate Overlap ASAP	Terminate Phases. .	Ped Clr Thru Yel . .
Don't Override Flash	Duration Time. . . 0	
Flash During Hold.	Delay Time 0	
No CVM in Flash.	Inhibit Time . . . 0	
Fast Flash Grn on Hold Phase. .	Min Ped Clear. . . 0	
Enable Max Time.	Max Time 0	
	Exit Max 0	
	Min Hold Time. . . 0	
	Hold Delay Time. . 0	

	Green	Yellow	Red
Minimum	0	0.0	0.0
Track Clear	0	0.0	0.0
Hold.		0.0	0.0

Phase/Overlap	1	2	3	4	5	6	7	8	9	10	11	12/	A	B	C	D
Terminate Overlap																
Track Clearance Phase																
Hold Phases																
Exit Phases																
Exit Calls on Phase																

Out of Flash Color for Exit Phases . . . . Green

Linked Preemptor 0

Preemptor 4

Active	Det Lock.	Ped Dark . . . . .
Priority Preemption.	Yel-Red To Grn. . .	Ped Active . . . . .
Outputs Only During Hold . . .	Flash All Outputs .	Zero Ped Clr Time. .
Terminate Overlap ASAP	Terminate Phases. .	Ped Clr Thru Yel . .
Don't Override Flash	Duration Time. . . 0	
Flash During Hold.	Delay Time 0	
No CVM in Flash.	Inhibit Time . . . 0	
Fast Flash Grn on Hold Phase. .	Min Ped Clear. . . 0	
Enable Max Time.	Max Time 0	
	Exit Max 0	
	Min Hold Time. . . 0	
	Hold Delay Time. . 0	

	Green	Yellow	Red
Minimum	0	0.0	0.0
Track Clear	0	0.0	0.0
Hold.		0.0	0.0

Phase/Overlap	1	2	3	4	5	6	7	8	9	10	11	12/	A	B	C	D
Terminate Overlap																
Track Clearance Phase																
Hold Phases																
Exit Phases																
Exit Calls on Phase																

Out of Flash Color for Exit Phases . . . . Green

Linked Preemptor 0

Preemptors

Preemptor 5

Active	Det Lock.	Ped Dark . . . . .
Priority Preemption.	Yel-Red To Grn. . .	Ped Active . . . . .
Outputs Only During Hold . . .	Flash All Outputs .	Zero Ped Clr Time. .
Terminate Overlap ASAP	Terminate Phases. .	Ped Clr Thru Yel . .
Don't Override Flash	Duration Time. . . 0	
Flash During Hold.	Delay Time 0	
No CVM in Flash.	Inhibit Time . . . 0	
Fast Flash Grn on Hold Phase. .	Min Ped Clear. . . 0	
Enable Max Time.	Max Time 0	
	Exit Max 0	
	Min Hold Time. . . 0	
	Hold Delay Time. . 0	

	Green	Yellow	Red
Minimum	0	0.0	0.0
Track Clear	0	0.0	0.0
Hold.		0.0	0.0

Phase/Overlap	1	2	3	4	5	6	7	8	9	10	11	12/	A	B	C	D
Terminate Overlap																
Track Clearance Phase																
Hold Phases																
Exit Phases																
Exit Calls on Phase																

Out of Flash Color for Exit Phases . . . . Green

Linked Preemptor 0

Preemptor 6

Active	Det Lock.	Ped Dark . . . . .
Priority Preemption.	Yel-Red To Grn. . .	Ped Active . . . . .
Outputs Only During Hold . . .	Flash All Outputs .	Zero Ped Clr Time. .
Terminate Overlap ASAP	Terminate Phases. .	Ped Clr Thru Yel . .
Don't Override Flash	Duration Time. . . 0	
Flash During Hold.	Delay Time 0	
No CVM in Flash.	Inhibit Time . . . 0	
Fast Flash Grn on Hold Phase. .	Min Ped Clear. . . 0	
Enable Max Time.	Max Time 0	
	Exit Max 0	
	Min Hold Time. . . 0	
	Hold Delay Time. . 0	

	Green	Yellow	Red
Minimum	0	0.0	0.0
Track Clear	0	0.0	0.0
Hold.		0.0	0.0

Phase/Overlap	1	2	3	4	5	6	7	8	9	10	11	12/	A	B	C	D
Terminate Overlap																
Track Clearance Phase																
Hold Phases																
Exit Phases																
Exit Calls on Phase																

Out of Flash Color for Exit Phases . . . . Green

Linked Preemptor 0

Bus Preemptors

	Bus Preemptor 1	2	3	4
Preemptor Active	.	.	.	.
Detector Lock	.	.	.	.
Maximum Time	0	0	0	0
Reservice Time	0	0	0	0
Delay Time	0	0	0	0
Inhibit Time	0	0	0	0
Entrance Green	0	0	0	0
Entrance Ped Clearance	0	0	0	0
Entrance Yellow	0.0	0.0	0.0	0.0
Entrance Red	0.0	0.0	0.0	0.0
Minimum Hold Time	0	0	0	0

	Hold Phases 1	2	3	4	5	6	7	8	9	10	11	12
Preemptor 1	.	.	.	.	.	.	.	.	.	.	.	.
Preemptor 2	.	.	.	.	.	.	.	.	.	.	.	.
Preemptor 3	.	.	.	.	.	.	.	.	.	.	.	.
Preemptor 4	.	.	.	.	.	.	.	.	.	.	.	.

NIC/TOD Clock/Calendar

Manual NIC Program Step 0

Manual TOD Program Step 0

NIC Resync Time 0000

Sync Reference is . . . . . Reference Time

Week 1 Begins on 1st Sunday . . . . . NO If NO, then week containing Jan. 1

Disable Daylight Savings Time . . . . . NO

Daylight Savings
Begins Last Sunday in March . . . . . NO If NO, then Second Sunday as per 2007 DST Law

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TOD Weekly/Yearly

Weekly Program Numbers

	1	2	3	4	5	6	7	8	9	10	
Sunday . . .	2	1	1	1	1	1	1	1	1	1	Program No.
Monday . . .	1	1	1	1	1	1	1	1	1	1	Program No.
Tuesday. . .	1	1	1	1	1	1	1	1	1	1	Program No.
Wednesday. .	1	1	1	1	1	1	1	1	1	1	Program No.
Thursday . .	1	1	1	1	1	1	1	1	1	1	Program No.
Friday . . .	1	1	1	1	1	1	1	1	1	1	Program No.
Saturday . .	2	1	1	1	1	1	1	1	1	1	Program No.

Week of Year

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Prog	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Prog	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
Prog	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Holiday Programs

Holiday	Type	Month	Day of Week/ Day of Month	Week of Year/ Year	Program
1	Fixed	0	0	0	0
2	Fixed	0	0	0	0
3	Fixed	0	0	0	0
4	Fixed	0	0	0	0
5	Fixed	0	0	0	0
6	Fixed	0	0	0	0
7	Fixed	0	0	0	0
8	Fixed	0	0	0	0
9	Fixed	0	0	0	0
10	Fixed	0	0	0	0
11	Fixed	0	0	0	0
12	Fixed	0	0	0	0
13	Fixed	0	0	0	0
14	Fixed	0	0	0	0
15	Fixed	0	0	0	0
16	Fixed	0	0	0	0
17	Fixed	0	0	0	0
18	Fixed	0	0	0	0
19	Fixed	0	0	0	0
20	Fixed	0	0	0	0
21	Fixed	0	0	0	0
22	Fixed	0	0	0	0
23	Fixed	0	0	0	0
24	Fixed	0	0	0	0
25	Fixed	0	0	0	0
26	Fixed	0	0	0	0
27	Fixed	0	0	0	0
28	Fixed	0	0	0	0
29	Fixed	0	0	0	0
30	Fixed	0	0	0	0
31	Fixed	0	0	0	0
32	Fixed	0	0	0	0
33	Fixed	0	0	0	0
34	Fixed	0	0	0	0
35	Fixed	0	0	0	0
36	Fixed	0	0	0	0

NIC Program Steps

Step	Program	Step Begins	Pattern	Override

TOD Program Steps

Step 1 Program 1 Step Begins 0615

Flash. . . . . Dimming Enable. . . . . .
Red Rest . . . . . Alt Veh Extension . . . .
Spare 5. . . . . Det Log Enable. . . . . .
Spare 3. . . . . Spare 4 . . . . . .
Type 0 Dly Enable. . . Spare 2 . . . . . .
Det Diag Plan. . . . 0

	Phase Number											
	1	2	3	4	5	6	7	8	9	10	11	12
Max 2 Enable	.	.	.	.	.	.	.	.	.	.	.	.
Max 3 Enable	.	.	.	.	.	.	.	.	.	.	.	.
Veh Recall	X	.	.	.	.	.	.	.	.	.	.	.
Veh Max Recall	.	.	.	.	.	.	.	.	.	.	.	.
Ped Recall	.	.	.	.	.	.	.	.	.	.	.	.
Cond Service Inhibit	.	.	.	.	.	.	.	.	.	.	.	.
Phase Omit	.	.	.	.	.	.	.	.	.	.	.	.
Special Function	.	.	.	.	.	.	.	.				

	A	B	C	D	E	F
Alt Sequence	.	.	.	.	.	.

Step 2 Program 1 Step Begins 0915

Flash. . . . . Dimming Enable. . . . . .
Red Rest . . . . . Alt Veh Extension . . . .
Spare 5. . . . . Det Log Enable. . . . . .
Spare 3. . . . . Spare 4 . . . . . .
Type 0 Dly Enable. . . Spare 2 . . . . . .
Det Diag Plan. . . . 0

	Phase Number											
	1	2	3	4	5	6	7	8	9	10	11	12
Max 2 Enable	.	.	.	.	.	.	.	.	.	.	.	.
Max 3 Enable	.	.	.	.	.	.	.	.	.	.	.	.
Veh Recall	.	.	.	.	.	.	.	.	.	.	.	.
Veh Max Recall	.	.	.	.	.	.	.	.	.	.	.	.
Ped Recall	.	.	.	.	.	.	.	.	.	.	.	.
Cond Service Inhibit	.	.	.	.	.	.	.	.	.	.	.	.
Phase Omit	X	.	.	.	.	.	.	.	.	.	.	.
Special Function	.	.	.	.	.	.	.	.				

	A	B	C	D	E	F
Alt Sequence	.	.	.	.	.	.

TOD Program Steps

Step 3 Program 1 Step Begins 1700

Flash. . . . . .
Red Rest . . . . . .
Spare 5. . . . . .
Spare 3. . . . . .
Type 0 Dly Enable. . .
Det Diag Plan. . . . 0

Dimming Enable. . . . . .
Alt Veh Extension . . . .
Det Log Enable. . . . . .
Spare 4 . . . . . .
Spare 2 . . . . . .

	Phase Number											
	1	2	3	4	5	6	7	8	9	10	11	12
Max 2 Enable	.	.	.	.	.	.	.	X	.	.	.	.
Max 3 Enable	.	.	.	.	.	.	.	X	.	.	.	.
Veh Recall	.	.	.	.	.	.	.	.	.	.	.	.
Veh Max Recall	.	.	.	.	.	.	.	.	.	.	.	.
Ped Recall	.	.	.	.	.	.	.	.	.	.	.	.
Cond Service Inhibit. . . .	.	.	.	.	.	.	.	.	.	.	.	.
Phase Omit	.	.	.	.	.	.	.	.	.	.	.	.
Special Function	.	.	.	.	.	.	.	.				

	A	B	C	D	E	F
Alt Sequence	.	.	.	.	.	.

Step 4 Program 1 Step Begins 1900

Flash. . . . . .
Red Rest . . . . . .
Spare 5. . . . . .
Spare 3. . . . . .
Type 0 Dly Enable. . .
Det Diag Plan. . . . 0

Dimming Enable. . . . . .
Alt Veh Extension . . . .
Det Log Enable. . . . . .
Spare 4 . . . . . .
Spare 2 . . . . . .

	Phase Number											
	1	2	3	4	5	6	7	8	9	10	11	12
Max 2 Enable	.	.	.	.	.	.	.	.	.	.	.	.
Max 3 Enable	.	.	.	.	.	.	.	.	.	.	.	.
Veh Recall	.	.	.	.	.	.	.	.	.	.	.	.
Veh Max Recall	.	.	.	.	.	.	.	.	.	.	.	.
Ped Recall	.	.	.	.	.	.	.	.	.	.	.	.
Cond Service Inhibit. . . .	.	.	.	.	.	.	.	.	.	.	.	.
Phase Omit	.	.	.	.	.	.	.	.	.	.	.	.
Special Function	.	.	.	.	.	.	.	.				

	A	B	C	D	E	F
Alt Sequence	.	.	.	.	.	.

Appendix E

Level of Service Definitions

Level of Service Definitions

Signalized Intersections

Level of Service	Control Delay per Vehicle (seconds)	Interpretation
A	≤ 10	EXCELLENT. Extremely favourable progression with most vehicles arriving during the green phase. Most vehicles do not stop and short cycle lengths may contribute to low delay.
B	> 10 and ≤ 20	VERY GOOD. Very good progression and/or short cycle lengths with slightly more vehicles stopping than LOS "A" causing slightly higher levels of average delay.
C	> 20 and ≤ 35	GOOD. Fair progression and longer cycle lengths lead to a greater number of vehicles stopping than LOS "B".
D	> 35 and ≤ 55	FAIR. Congestion becomes noticeable with higher average delays resulting from a combination of long cycle lengths, high volume-to-capacity ratios and unfavourable progression.
E	> 55 and ≤ 80	POOR. Lengthy delays values are indicative of poor progression, long cycle lengths and high volume-to-capacity ratios. Individual cycle failures are common with individual movement failures also common.
F	> 80	UNSATISFACTORY. Indicative of oversaturated conditions with vehicular demand greater than the capacity of the intersection.

Adapted from Highway Capacity Manual 2000, Transportation Research Board

Level of Service Definitions

Two-Way Stop Controlled Intersections

Level of Service	Control Delay per Vehicle (seconds)	Interpretation
A	≤ 10	EXCELLENT. Large and frequent gaps in traffic on the main roadway. Queuing on the minor street is rare.
B	> 10 and ≤ 15	VERY GOOD. Many gaps exist in traffic on the main roadway. Queuing on the minor street is minimal.
C	> 15 and ≤ 25	GOOD. Fewer gaps exist in traffic on the main roadway. Delay on minor approach becomes more noticeable.
D	> 25 and ≤ 35	FAIR. Infrequent and shorter gaps in traffic on the main roadway. Queue lengths develop on the minor street.
E	> 35 and ≤ 50	POOR. Very infrequent gaps in traffic on the main roadway. Queue lengths become noticeable.
F	> 50	UNSATISFACTORY. Very few gaps in traffic on the main roadway. Excessive delay with significant queue lengths on the minor street.

Adapted from Highway Capacity Manual 2000, Transportation Research Board

Appendix F

Peak Hour Factor Calculations

Peak Hour Factor Calculation from TMC Reports

Intersection	AM			PM		
	Peak 15 Min	Peak 60 Min	**PHF**	Peak 15 Min	Peak 60 Min	**PHF**
Brock Road South at McLean Road	421	1490	**0.88**	410	1552	**0.95**
Brock Road South at Nicholas Beaver Road	431	1582	**0.92**	465	1621	**0.87**

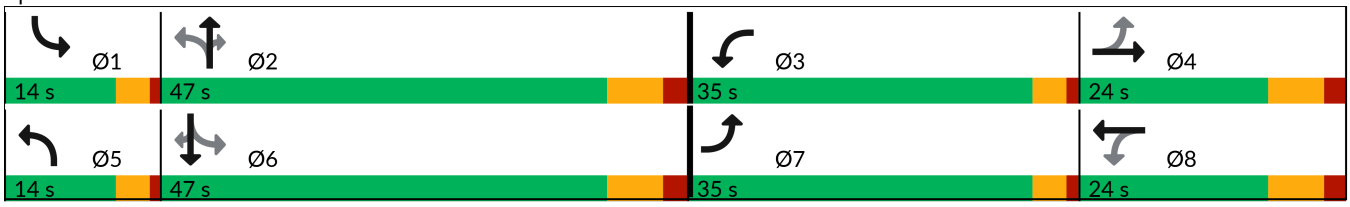
Appendix G

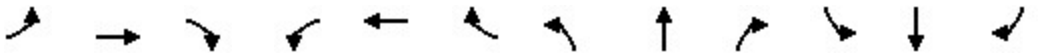
2023 Existing Synchro Reports

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	6	18	29	3	95	453	41	38	720	28
Future Volume (vph)	6	18	29	3	95	453	41	38	720	28
Lane Group Flow (vph)	7	148	33	18	108	515	47	43	818	32
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	15.0	5.0	15.0	8.0	40.0	40.0	8.0	40.0	40.0
Minimum Split (s)	9.0	22.0	9.0	22.0	12.0	47.0	47.0	12.0	47.0	47.0
Total Split (s)	35.0	24.0	35.0	24.0	14.0	47.0	47.0	14.0	47.0	47.0
Total Split (%)	29.2%	20.0%	29.2%	20.0%	11.7%	39.2%	39.2%	11.7%	39.2%	39.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
v/c Ratio	0.03	0.50	0.15	0.07	0.40	0.31	0.06	0.08	0.55	0.04
Control Delay (s/veh)	22.2	16.2	24.2	16.9	13.3	16.1	0.1	9.1	21.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	22.2	16.2	24.2	16.9	13.3	16.1	0.1	9.1	21.8	0.1
Queue Length 50th (m)	0.9	3.4	4.4	0.4	8.8	34.8	0.0	3.3	63.6	0.0
Queue Length 95th (m)	3.9	21.5	11.2	6.5	17.9	49.3	0.0	8.2	86.1	0.0
Internal Link Dist (m)		106.5		215.4		432.3			100.5	
Turn Bay Length (m)	54.0		55.0		142.0		66.0	62.0		62.0
Base Capacity (vph)	446	315	380	272	280	1645	814	559	1477	786
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.47	0.09	0.07	0.39	0.31	0.06	0.08	0.55	0.04

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 92.3
Natural Cycle: 90
Control Type: Semi Act-Uncoord

Splits and Phases: 1: Brock Rd. S./Brock Rd.S. & Mclean Rd. W./Mclean Rd.W.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	18	113	29	3	13	95	453	41	38	720	28
Future Volume (vph)	6	18	113	29	3	13	95	453	41	38	720	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1289	1143		1105	1096		1180	3167	1468	1626	3282	1615
Flt Permitted	0.75	1.00		0.53	1.00		0.24	1.00	1.00	0.46	1.00	1.00
Satd. Flow (perm)	1012	1143		614	1096		301	3167	1468	791	3282	1615
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	7	20	128	33	3	15	108	515	47	43	818	32
RTOR Reduction (vph)	0	106	0	0	12	0	0	0	24	0	0	18
Lane Group Flow (vph)	7	42	0	33	6	0	108	515	23	43	818	14
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	40%	12%	47%	63%	100%	42%	53%	14%	10%	11%	10%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	18.3	16.7		26.7	21.1		56.5	48.0	48.0	47.8	43.3	43.3
Effective Green, g (s)	18.3	16.7		26.7	21.1		56.5	48.0	48.0	47.8	43.3	43.3
Actuated g/C Ratio	0.19	0.17		0.27	0.22		0.58	0.49	0.49	0.49	0.45	0.45
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	5.0	3.0		5.0	3.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	195	196		198	237		258	1563	724	427	1462	719
v/s Ratio Prot	0.00	c0.04		c0.01	0.01		c0.04	0.16		0.00	c0.25	
v/s Ratio Perm	0.01			0.04			0.20		0.02	0.04		0.01
v/c Ratio	0.04	0.21		0.17	0.03		0.42	0.33	0.03	0.10	0.56	0.02
Uniform Delay, d1	32.2	34.6		26.4	30.0		10.7	14.9	12.7	12.9	19.9	15.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.6		0.8	0.0		1.1	0.6	0.1	0.1	1.6	0.1
Delay (s)	32.4	35.2		27.3	30.0		11.8	15.4	12.7	13.0	21.5	15.1
Level of Service	C	D		C	C		B	B	B	B	C	B
Approach Delay (s/veh)		35.0			28.2			14.7			20.8	
Approach LOS		D			C			B			C	

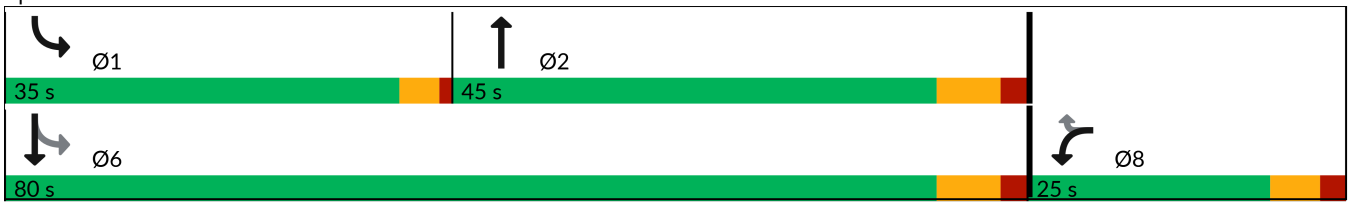
Intersection Summary			
HCM 2000 Control Delay (s/veh)	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	97.2	Sum of lost time (s)	22.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	120	92	494	153	698
Future Volume (vph)	120	92	494	153	698
Lane Group Flow (vph)	130	100	637	166	759
Turn Type	Prot	Perm	NA	pm+pt	NA
Protected Phases	8		2	1	6
Permitted Phases		8		6	
Detector Phase	8	8	2	1	6
Switch Phase					
Minimum Initial (s)	15.0	15.0	35.0	10.0	35.0
Minimum Split (s)	21.0	21.0	42.0	14.0	42.0
Total Split (s)	25.0	25.0	45.0	35.0	80.0
Total Split (%)	23.8%	23.8%	42.9%	33.3%	76.2%
Yellow Time (s)	4.0	4.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	4.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	Max	None	Max
v/c Ratio	0.54	0.33	0.39	0.28	0.35
Control Delay (s/veh)	48.6	10.8	13.1	5.3	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	48.6	10.8	13.1	5.3	6.4
Queue Length 50th (m)	25.3	0.0	34.2	8.2	27.2
Queue Length 95th (m)	45.0	14.3	52.7	15.7	40.2
Internal Link Dist (m)	497.7		346.3		432.3
Turn Bay Length (m)	56.0			21.0	
Base Capacity (vph)	273	332	1637	798	2157
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.30	0.39	0.21	0.35

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 102.8
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 2: Brock Rd. S. & Nicholas Beaver Rd.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	120	92	494	92	153	698
Future Volume (vph)	120	92	494	92	153	698
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		4.0	7.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1480	1357	2875		1701	3034
Flt Permitted	0.95	1.00	1.00		0.36	1.00
Satd. Flow (perm)	1480	1357	2875		649	3034
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	100	537	100	166	759
RTOR Reduction (vph)	0	84	10	0	0	0
Lane Group Flow (vph)	130	16	627	0	166	759
Confl. Peds. (#/hr)				3	3	
Heavy Vehicles (%)	22%	19%	22%	22%	6%	19%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	16.7	16.7	58.3		73.2	73.2
Effective Green, g (s)	16.7	16.7	58.3		73.2	73.2
Actuated g/C Ratio	0.16	0.16	0.57		0.71	0.71
Clearance Time (s)	6.0	6.0	7.0		4.0	7.0
Vehicle Extension (s)	5.0	5.0	0.2		5.0	0.2
Lane Grp Cap (vph)	240	220	1628		573	2158
v/s Ratio Prot	c0.09		c0.22		0.03	c0.25
v/s Ratio Perm		0.01			0.18	
v/c Ratio	0.54	0.07	0.39		0.29	0.35
Uniform Delay, d1	39.6	36.5	12.4		5.1	5.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.3	0.3	0.7		0.6	0.5
Delay (s)	43.9	36.8	13.1		5.7	6.2
Level of Service	D	D	B		A	A
Approach Delay (s/veh)	40.8		13.1			6.1
Approach LOS	D		B			A

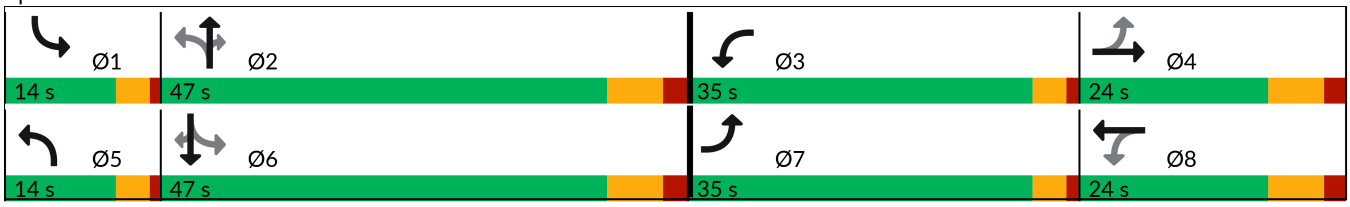
Intersection Summary			
HCM 2000 Control Delay (s/veh)	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	102.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

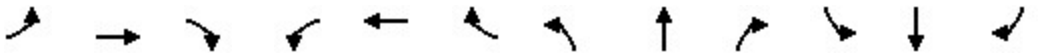
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	36	5	56	20	138	727	16	11	471	16
Future Volume (vph)	36	5	56	20	138	727	16	11	471	16
Lane Group Flow (vph)	38	103	59	56	145	765	17	12	496	17
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	15.0	5.0	15.0	8.0	40.0	40.0	8.0	40.0	40.0
Minimum Split (s)	9.0	22.0	9.0	22.0	12.0	47.0	47.0	12.0	47.0	47.0
Total Split (s)	35.0	24.0	35.0	24.0	14.0	47.0	47.0	14.0	47.0	47.0
Total Split (%)	29.2%	20.0%	29.2%	20.0%	11.7%	39.2%	39.2%	11.7%	39.2%	39.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
v/c Ratio	0.11	0.36	0.21	0.17	0.26	0.36	0.02	0.04	0.31	0.03
Control Delay (s/veh)	22.9	12.9	24.5	19.2	10.6	14.2	0.1	9.6	19.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	22.9	12.9	24.5	19.2	10.6	14.2	0.1	9.6	19.1	0.1
Queue Length 50th (m)	5.1	0.9	8.1	3.6	12.2	42.8	0.0	0.9	34.9	0.0
Queue Length 95th (m)	12.3	16.1	17.6	14.8	23.2	78.2	0.0	3.5	50.6	0.0
Internal Link Dist (m)		106.5		215.4		432.3			100.5	
Turn Bay Length (m)	54.0		55.0		142.0		66.0	62.0		62.0
Base Capacity (vph)	601	315	472	347	562	2136	824	364	1596	644
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.33	0.13	0.16	0.26	0.36	0.02	0.03	0.31	0.03

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 92.7
Natural Cycle: 90
Control Type: Semi Act-Uncoord

Splits and Phases: 1: Brock Rd. S./Brock Rd.S. & Mclean Rd. W./Mclean Rd.W.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	5	93	56	20	33	138	727	16	11	471	16
Future Volume (vph)	36	5	93	56	20	33	138	727	16	11	471	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.86		1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1703	1266		1346	1514		1625	3471	1272	1203	3374	1241
Flt Permitted	0.72	1.00		0.56	1.00		0.42	1.00	1.00	0.36	1.00	1.00
Satd. Flow (perm)	1291	1266		790	1514		713	3471	1272	458	3374	1241
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	38	5	98	59	21	35	145	765	17	12	496	17
RTOR Reduction (vph)	0	86	0	0	30	0	0	0	8	0	0	9
Lane Group Flow (vph)	38	17	0	59	26	0	145	765	9	12	496	8
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	6%	25%	27%	34%	5%	19%	11%	4%	27%	50%	7%	27%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	17.7	12.2		23.5	15.1		60.7	55.2	55.2	48.7	47.2	47.2
Effective Green, g (s)	17.7	12.2		23.5	15.1		60.7	55.2	55.2	48.7	47.2	47.2
Actuated g/C Ratio	0.18	0.12		0.24	0.15		0.61	0.56	0.56	0.49	0.48	0.48
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	5.0	3.0		5.0	3.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	252	155		233	230		523	1929	707	235	1603	589
v/s Ratio Prot	0.01	0.01		c0.02	0.02		c0.03	c0.22		0.00	0.15	
v/s Ratio Perm	0.02			c0.04			0.14		0.01	0.02		0.01
v/c Ratio	0.15	0.11		0.25	0.11		0.28	0.40	0.01	0.05	0.31	0.01
Uniform Delay, d1	34.3	38.7		30.3	36.3		8.4	12.6	9.9	13.0	16.0	13.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.3		1.2	0.2		0.3	0.6	0.0	0.1	0.5	0.0
Delay (s)	34.9	39.0		31.5	36.6		8.7	13.2	9.9	13.1	16.5	13.8
Level of Service	C	D		C	D		A	B	A	B	B	B
Approach Delay (s/veh)		37.9			34.0			12.4			16.4	
Approach LOS		D			C			B			B	

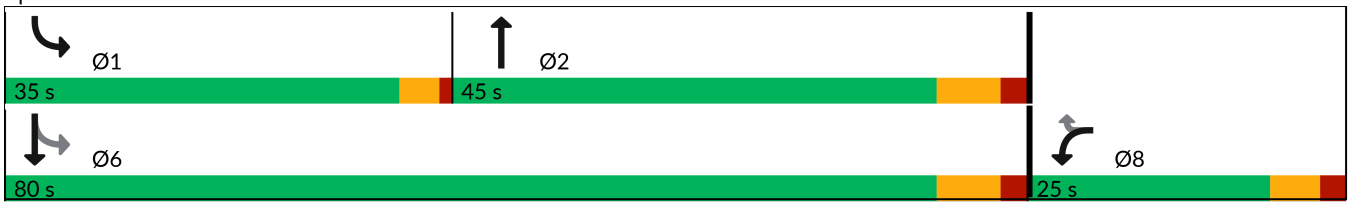
Intersection Summary			
HCM 2000 Control Delay (s/veh)	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	99.3	Sum of lost time (s)	22.0
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	137	141	755	47	584
Future Volume (vph)	137	141	755	47	584
Lane Group Flow (vph)	157	162	897	54	671
Turn Type	Prot	Perm	NA	pm+pt	NA
Protected Phases	8		2	1	6
Permitted Phases		8		6	
Detector Phase	8	8	2	1	6
Switch Phase					
Minimum Initial (s)	15.0	15.0	35.0	10.0	35.0
Minimum Split (s)	21.0	21.0	42.0	14.0	42.0
Total Split (s)	25.0	25.0	45.0	35.0	80.0
Total Split (%)	23.8%	23.8%	42.9%	33.3%	76.2%
Yellow Time (s)	4.0	4.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	4.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	Max	None	Max
v/c Ratio	0.59	0.42	0.45	0.13	0.29
Control Delay (s/veh)	49.5	9.6	12.9	4.7	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	49.5	9.6	12.9	4.7	6.0
Queue Length 50th (m)	30.9	0.0	53.8	2.6	23.5
Queue Length 95th (m)	50.4	16.2	69.6	6.0	32.3
Internal Link Dist (m)	497.7		346.3		432.3
Turn Bay Length (m)	56.0			21.0	
Base Capacity (vph)	301	409	2012	630	2319
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.52	0.40	0.45	0.09	0.29

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 104.4
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 2: Brock Rd. S. & Nicholas Beaver Rd.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	137	141	755	25	47	584
Future Volume (vph)	137	141	755	25	47	584
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		4.0	7.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1656	1524	3325		1504	3252
Flt Permitted	0.95	1.00	1.00		0.26	1.00
Satd. Flow (perm)	1656	1524	3325		413	3252
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	157	162	868	29	54	671
RTOR Reduction (vph)	0	136	2	0	0	0
Lane Group Flow (vph)	157	26	895	0	54	671
Confl. Peds. (#/hr)				1	1	
Heavy Vehicles (%)	9%	6%	6%	67%	20%	11%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	16.9	16.9	63.2		75.3	75.3
Effective Green, g (s)	16.9	16.9	63.2		75.3	75.3
Actuated g/C Ratio	0.16	0.16	0.60		0.72	0.72
Clearance Time (s)	6.0	6.0	7.0		4.0	7.0
Vehicle Extension (s)	5.0	5.0	0.2		5.0	0.2
Lane Grp Cap (vph)	266	244	1997		379	2327
v/s Ratio Prot	c0.09		c0.27		0.01	c0.21
v/s Ratio Perm		0.02			0.09	
v/c Ratio	0.59	0.11	0.45		0.14	0.29
Uniform Delay, d1	40.9	37.7	11.5		5.2	5.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	5.2	0.4	0.7		0.4	0.3
Delay (s)	46.2	38.1	12.2		5.5	5.7
Level of Service	D	D	B		A	A
Approach Delay (s/veh)	42.1		12.2			5.7
Approach LOS	D		B			A

Intersection Summary			
HCM 2000 Control Delay (s/veh)	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	105.2	Sum of lost time (s)	17.0
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Appendix H

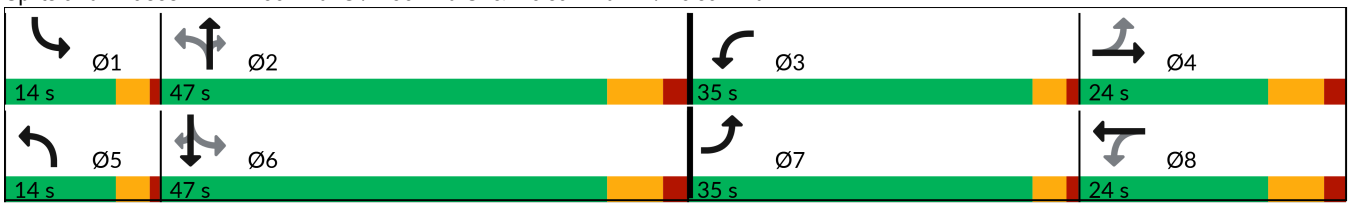
2026 Future Background Synchro Reports

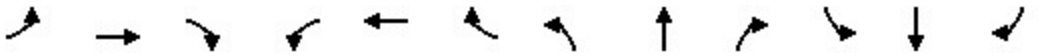
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	12	62	61	10	120	484	160	121	741	71
Future Volume (vph)	12	62	61	10	120	484	160	121	741	71
Lane Group Flow (vph)	14	221	69	56	136	550	182	138	842	81
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	15.0	5.0	15.0	8.0	40.0	40.0	8.0	40.0	40.0
Minimum Split (s)	9.0	22.0	9.0	22.0	12.0	47.0	47.0	12.0	47.0	47.0
Total Split (s)	35.0	24.0	35.0	24.0	14.0	47.0	47.0	14.0	47.0	47.0
Total Split (%)	29.2%	20.0%	29.2%	20.0%	11.7%	39.2%	39.2%	11.7%	39.2%	39.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
v/c Ratio	0.05	0.81	0.30	0.17	0.56	0.42	0.25	0.30	0.62	0.11
Control Delay (s/veh)	21.8	50.6	25.9	13.0	21.2	22.6	4.2	12.7	26.5	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	21.8	50.6	25.9	13.0	21.2	22.6	4.2	12.7	26.5	2.4
Queue Length 50th (m)	1.9	29.5	9.7	1.5	12.9	42.3	0.0	12.7	72.6	0.0
Queue Length 95th (m)	6.0	#70.4	19.5	12.2	24.9	60.0	13.0	23.8	97.2	5.2
Internal Link Dist (m)		106.5		215.4		432.3			100.5	
Turn Bay Length (m)	54.0		55.0		142.0		66.0	62.0		62.0
Base Capacity (vph)	456	278	375	338	248	1322	719	472	1355	731
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.79	0.18	0.17	0.55	0.42	0.25	0.29	0.62	0.11

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 97.7
Natural Cycle: 90
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Brock Rd. S./Brock Rd.S. & Mclean Rd. W./Mclean Rd.W.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	62	133	61	10	40	120	484	160	121	741	71
Future Volume (vph)	12	62	133	61	10	40	120	484	160	121	741	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.90		1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1289	1238		1106	1089		1180	3167	1468	1626	3282	1615
Flt Permitted	0.72	1.00		0.39	1.00		0.23	1.00	1.00	0.40	1.00	1.00
Satd. Flow (perm)	978	1238		457	1089		282	3167	1468	687	3282	1615
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	14	70	151	69	11	45	136	550	182	138	842	81
RTOR Reduction (vph)	0	61	0	0	33	0	0	0	108	0	0	49
Lane Group Flow (vph)	14	160	0	69	23	0	136	550	74	138	842	32
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	40%	12%	47%	63%	100%	42%	53%	14%	10%	11%	10%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	20.8	19.0		32.8	27.0		50.4	40.8	40.8	49.6	40.4	40.4
Effective Green, g (s)	20.8	19.0		32.8	27.0		50.4	40.8	40.8	49.6	40.4	40.4
Actuated g/C Ratio	0.21	0.19		0.33	0.27		0.50	0.40	0.40	0.49	0.40	0.40
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	5.0	3.0		5.0	3.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	207	233		211	291		226	1281	594	423	1315	647
v/s Ratio Prot	0.00	c0.13		c0.03	0.02		c0.06	0.17		0.03	c0.26	
v/s Ratio Perm	0.01			0.07			0.24		0.05	0.13		0.02
v/c Ratio	0.07	0.69		0.33	0.08		0.60	0.43	0.12	0.33	0.64	0.05
Uniform Delay, d1	32.1	38.1		24.9	27.6		15.5	21.6	18.8	14.3	24.3	18.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	8.2		1.9	0.1		4.5	1.1	0.4	0.5	2.4	0.1
Delay (s)	32.4	46.3		26.7	27.7		20.0	22.7	19.2	14.8	26.7	18.6
Level of Service	C	D		C	C		B	C	B	B	C	B
Approach Delay (s/veh)		45.5			27.2			21.5			24.6	
Approach LOS		D			C			C			C	

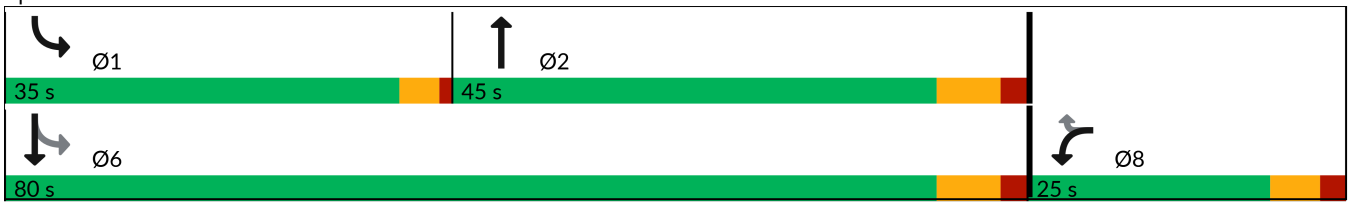
Intersection Summary			
HCM 2000 Control Delay (s/veh)	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.8	Sum of lost time (s)	22.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	123	120	641	157	766
Future Volume (vph)	123	120	641	157	766
Lane Group Flow (vph)	134	130	799	171	833
Turn Type	Prot	Perm	NA	pm+pt	NA
Protected Phases	8		2	1	6
Permitted Phases		8		6	
Detector Phase	8	8	2	1	6
Switch Phase					
Minimum Initial (s)	15.0	15.0	35.0	10.0	35.0
Minimum Split (s)	21.0	21.0	42.0	14.0	42.0
Total Split (s)	25.0	25.0	45.0	35.0	80.0
Total Split (%)	23.8%	23.8%	42.9%	33.3%	76.2%
Yellow Time (s)	4.0	4.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	4.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	Max	None	Max
v/c Ratio	0.56	0.39	0.49	0.34	0.39
Control Delay (s/veh)	49.0	10.5	14.8	5.9	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	49.0	10.5	14.8	5.9	6.7
Queue Length 50th (m)	26.2	0.0	47.4	8.6	31.3
Queue Length 95th (m)	46.2	16.4	71.1	16.2	45.4
Internal Link Dist (m)	497.7		346.3		432.3
Turn Bay Length (m)	56.0			21.0	
Base Capacity (vph)	273	356	1639	741	2154
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.49	0.37	0.49	0.23	0.39

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 102.8
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 2: Brock Rd. S. & Nicholas Beaver Rd.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	123	120	641	94	157	766
Future Volume (vph)	123	120	641	94	157	766
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		4.0	7.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1480	1357	2890		1702	3034
Flt Permitted	0.95	1.00	1.00		0.29	1.00
Satd. Flow (perm)	1480	1357	2890		519	3034
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	130	697	102	171	833
RTOR Reduction (vph)	0	109	7	0	0	0
Lane Group Flow (vph)	134	21	792	0	171	833
Confl. Peds. (#/hr)				3	3	
Heavy Vehicles (%)	22%	19%	22%	22%	6%	19%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	16.8	16.8	58.1		73.0	73.0
Effective Green, g (s)	16.8	16.8	58.1		73.0	73.0
Actuated g/C Ratio	0.16	0.16	0.57		0.71	0.71
Clearance Time (s)	6.0	6.0	7.0		4.0	7.0
Vehicle Extension (s)	5.0	5.0	0.2		5.0	0.2
Lane Grp Cap (vph)	241	221	1633		493	2154
v/s Ratio Prot	c0.09		c0.27		0.04	c0.27
v/s Ratio Perm		0.02			0.21	
v/c Ratio	0.56	0.10	0.48		0.35	0.39
Uniform Delay, d1	39.6	36.5	13.4		5.6	6.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.7	0.4	1.0		0.9	0.5
Delay (s)	44.2	36.9	14.4		6.4	6.5
Level of Service	D	D	B		A	A
Approach Delay (s/veh)	40.6		14.4			6.5
Approach LOS	D		B			A

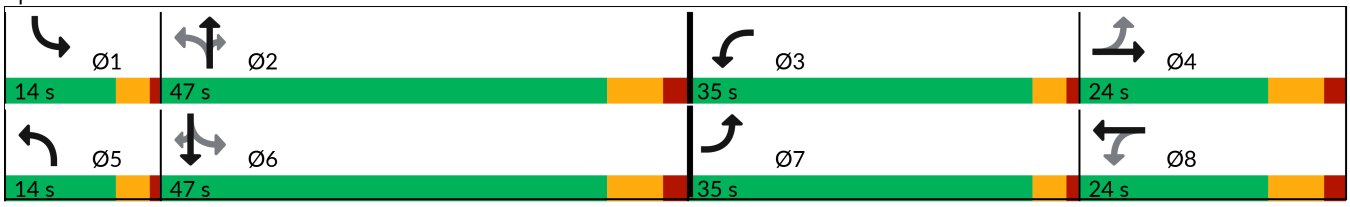
Intersection Summary			
HCM 2000 Control Delay (s/veh)	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	102.8	Sum of lost time (s)	17.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

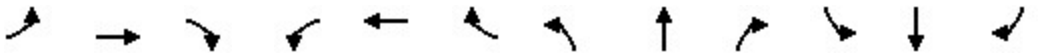
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	74	15	153	69	157	752	55	37	502	31
Future Volume (vph)	74	15	153	69	157	752	55	37	502	31
Lane Group Flow (vph)	78	160	161	207	165	792	58	39	528	33
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	15.0	5.0	15.0	8.0	40.0	40.0	8.0	40.0	40.0
Minimum Split (s)	9.0	22.0	9.0	22.0	12.0	47.0	47.0	12.0	47.0	47.0
Total Split (s)	35.0	24.0	35.0	24.0	14.0	47.0	47.0	14.0	47.0	47.0
Total Split (%)	29.2%	20.0%	29.2%	20.0%	11.7%	39.2%	39.2%	11.7%	39.2%	39.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
v/c Ratio	0.21	0.52	0.45	0.53	0.38	0.51	0.09	0.15	0.40	0.06
Control Delay (s/veh)	23.2	15.8	27.5	30.9	15.2	23.5	0.7	13.5	24.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	23.2	15.8	27.5	30.9	15.2	23.5	0.7	13.5	24.7	0.2
Queue Length 50th (m)	10.7	3.0	24.0	27.3	16.5	66.3	0.0	3.6	41.9	0.0
Queue Length 95th (m)	20.8	23.8	40.9	53.4	31.6	96.5	1.1	9.8	62.2	0.0
Internal Link Dist (m)		106.5		215.4		432.3			100.5	
Turn Bay Length (m)	54.0		55.0		142.0		66.0	62.0		62.0
Base Capacity (vph)	593	331	452	391	435	1562	632	276	1311	548
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.48	0.36	0.53	0.38	0.51	0.09	0.14	0.40	0.06

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 103.1
Natural Cycle: 90
Control Type: Semi Act-Uncoord

Splits and Phases: 1: Brock Rd. S./Brock Rd.S. & Mclean Rd. W./Mclean Rd.W.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	15	137	153	69	127	157	752	55	37	502	31
Future Volume (vph)	74	15	137	153	69	127	157	752	55	37	502	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1703	1279		1346	1504		1625	3471	1272	1203	3374	1241
Flt Permitted	0.63	1.00		0.47	1.00		0.37	1.00	1.00	0.30	1.00	1.00
Satd. Flow (perm)	1126	1279		661	1504		633	3471	1272	381	3374	1241
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	78	16	144	161	73	134	165	792	58	39	528	33
RTOR Reduction (vph)	0	122	0	0	50	0	0	0	32	0	0	20
Lane Group Flow (vph)	78	38	0	161	157	0	165	792	26	39	528	13
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	6%	25%	27%	34%	5%	19%	11%	4%	27%	50%	7%	27%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	24.7	15.9		36.2	23.4		55.3	46.4	46.4	46.6	41.7	41.7
Effective Green, g (s)	24.7	15.9		36.2	23.4		55.3	46.4	46.4	46.6	41.7	41.7
Actuated g/C Ratio	0.23	0.15		0.34	0.22		0.52	0.44	0.44	0.44	0.40	0.40
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	5.0	3.0		5.0	3.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	311	192		332	333		422	1526	559	206	1333	490
v/s Ratio Prot	0.02	0.03		c0.07	0.10		c0.04	c0.23		0.01	0.16	
v/s Ratio Perm	0.04			c0.09			0.17		0.02	0.07		0.01
v/c Ratio	0.25	0.20		0.48	0.47		0.39	0.52	0.05	0.19	0.40	0.03
Uniform Delay, d1	32.4	39.2		26.0	35.7		13.7	21.4	16.9	17.2	22.9	19.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.5		2.3	1.1		0.6	1.3	0.2	0.4	0.9	0.1
Delay (s)	33.3	39.7		28.4	36.7		14.3	22.7	17.0	17.6	23.8	19.6
Level of Service	C	D		C	D		B	C	B	B	C	B
Approach Delay (s/veh)		37.6			33.1			21.0			23.1	
Approach LOS		D			C			C			C	

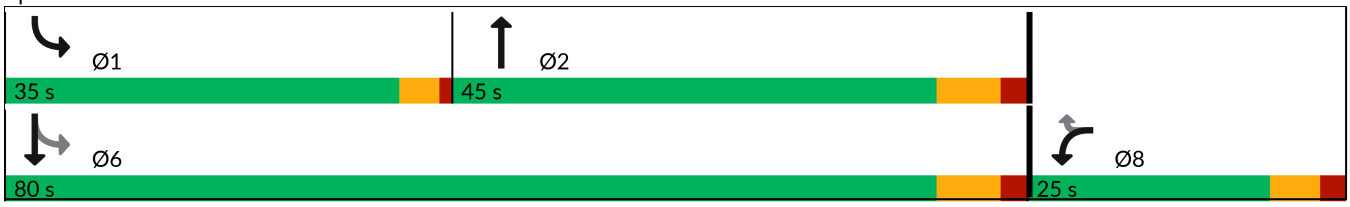
Intersection Summary			
HCM 2000 Control Delay (s/veh)	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	105.5	Sum of lost time (s)	22.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	140	155	825	48	754
Future Volume (vph)	140	155	825	48	754
Lane Group Flow (vph)	161	178	978	55	867
Turn Type	Prot	Perm	NA	pm+pt	NA
Protected Phases	8		2	1	6
Permitted Phases		8		6	
Detector Phase	8	8	2	1	6
Switch Phase					
Minimum Initial (s)	15.0	15.0	35.0	10.0	35.0
Minimum Split (s)	21.0	21.0	42.0	14.0	42.0
Total Split (s)	25.0	25.0	45.0	35.0	80.0
Total Split (%)	23.8%	23.8%	42.9%	33.3%	76.2%
Yellow Time (s)	4.0	4.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	4.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	Max	None	Max
v/c Ratio	0.60	0.45	0.49	0.14	0.37
Control Delay (s/veh)	49.9	9.6	13.5	4.8	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	49.9	9.6	13.5	4.8	6.6
Queue Length 50th (m)	31.7	0.0	61.3	2.7	33.2
Queue Length 95th (m)	51.4	16.8	78.0	6.1	44.1
Internal Link Dist (m)	497.7		346.3		432.3
Turn Bay Length (m)	56.0			21.0	
Base Capacity (vph)	302	423	2009	610	2314
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.53	0.42	0.49	0.09	0.37

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 104.1
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 2: Brock Rd. S. & Nicholas Beaver Rd.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	140	155	825	26	48	754
Future Volume (vph)	140	155	825	26	48	754
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		4.0	7.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1656	1524	3329		1504	3252
Flt Permitted	0.95	1.00	1.00		0.23	1.00
Satd. Flow (perm)	1656	1524	3329		368	3252
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	161	178	948	30	55	867
RTOR Reduction (vph)	0	149	1	0	0	0
Lane Group Flow (vph)	161	29	977	0	55	867
Confl. Peds. (#/hr)				1	1	
Heavy Vehicles (%)	9%	6%	6%	67%	20%	11%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	17.0	17.0	62.8		74.8	74.8
Effective Green, g (s)	17.0	17.0	62.8		74.8	74.8
Actuated g/C Ratio	0.16	0.16	0.60		0.71	0.71
Clearance Time (s)	6.0	6.0	7.0		4.0	7.0
Vehicle Extension (s)	5.0	5.0	0.2		5.0	0.2
Lane Grp Cap (vph)	268	247	1994		349	2321
v/s Ratio Prot	c0.10		c0.29		0.01	c0.27
v/s Ratio Perm		0.02			0.10	
v/c Ratio	0.60	0.12	0.49		0.16	0.37
Uniform Delay, d1	40.7	37.5	11.9		5.5	5.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	5.5	0.4	0.9		0.4	0.5
Delay (s)	46.2	37.9	12.8		5.9	6.3
Level of Service	D	D	B		A	A
Approach Delay (s/veh)	41.9		12.8			6.3
Approach LOS	D		B			A

Intersection Summary			
HCM 2000 Control Delay (s/veh)	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	104.8	Sum of lost time (s)	17.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		

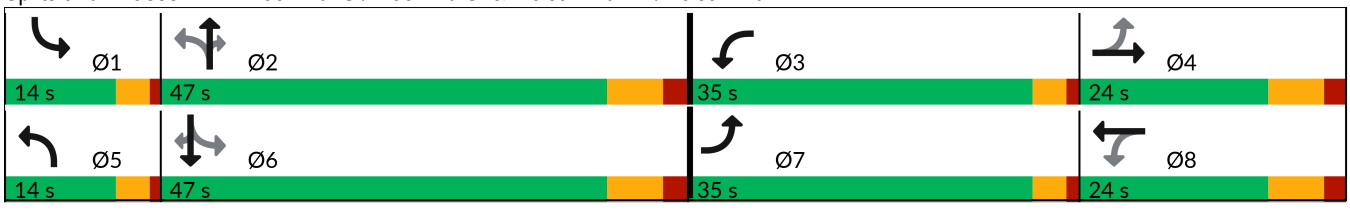
c Critical Lane Group

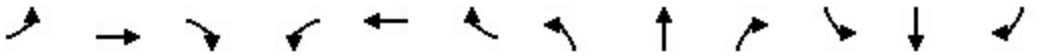
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	12	64	64	10	130	532	165	125	817	74
Future Volume (vph)	12	64	64	10	130	532	165	125	817	74
Lane Group Flow (vph)	14	238	73	58	148	605	188	142	928	84
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	15.0	5.0	15.0	8.0	40.0	40.0	8.0	40.0	40.0
Minimum Split (s)	9.0	22.0	9.0	22.0	12.0	47.0	47.0	12.0	47.0	47.0
Total Split (s)	35.0	24.0	35.0	24.0	14.0	47.0	47.0	14.0	47.0	47.0
Total Split (%)	29.2%	20.0%	29.2%	20.0%	11.7%	39.2%	39.2%	11.7%	39.2%	39.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
v/c Ratio	0.05	0.86	0.32	0.17	0.67	0.46	0.26	0.33	0.69	0.12
Control Delay (s/veh)	21.7	56.2	26.4	12.7	29.4	23.5	4.2	13.2	28.6	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	21.7	56.2	26.4	12.7	29.4	23.5	4.2	13.2	28.6	2.7
Queue Length 50th (m)	1.9	32.9	10.3	1.6	14.3	47.8	0.0	13.1	83.3	0.0
Queue Length 95th (m)	6.0	#78.6	20.4	12.2	#37.8	67.1	13.2	24.7	110.7	5.7
Internal Link Dist (m)		106.5		215.4		432.3			100.5	
Turn Bay Length (m)	54.0		55.0		142.0		66.0	62.0		62.0
Base Capacity (vph)	453	278	369	340	220	1317	720	442	1337	722
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.86	0.20	0.17	0.67	0.46	0.26	0.32	0.69	0.12

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 98.7
Natural Cycle: 90
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Brock Rd. S./Brock Rd.S. & Mclean Rd. W./Mclean Rd.W.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	64	145	64	10	41	130	532	165	125	817	74
Future Volume (vph)	12	64	145	64	10	41	130	532	165	125	817	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.90		1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1289	1232		1106	1091		1180	3167	1468	1626	3282	1615
Flt Permitted	0.72	1.00		0.36	1.00		0.18	1.00	1.00	0.37	1.00	1.00
Satd. Flow (perm)	976	1232		422	1091		225	3167	1468	631	3282	1615
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	14	73	165	73	11	47	148	605	188	142	928	84
RTOR Reduction (vph)	0	64	0	0	34	0	0	0	112	0	0	51
Lane Group Flow (vph)	14	174	0	73	24	0	148	605	76	142	928	33
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	40%	12%	47%	63%	100%	42%	53%	14%	10%	11%	10%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	21.3	19.5		33.6	27.8		51.2	41.1	41.1	49.4	40.2	40.2
Effective Green, g (s)	21.3	19.5		33.6	27.8		51.2	41.1	41.1	49.4	40.2	40.2
Actuated g/C Ratio	0.21	0.19		0.33	0.27		0.50	0.40	0.40	0.48	0.39	0.39
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	5.0	3.0		5.0	3.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	209	235		206	297		207	1277	592	395	1294	637
v/s Ratio Prot	0.00	c0.14		c0.03	0.02		c0.07	0.19		0.03	0.28	
v/s Ratio Perm	0.01			0.08			c0.29		0.05	0.14		0.02
v/c Ratio	0.07	0.74		0.35	0.08		0.71	0.47	0.13	0.36	0.72	0.05
Uniform Delay, d1	32.2	38.8		25.0	27.5		16.7	22.4	19.1	15.0	26.0	19.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	11.9		2.2	0.1		11.1	1.3	0.4	0.6	3.4	0.2
Delay (s)	32.5	50.7		27.2	27.7		27.8	23.7	19.6	15.5	29.5	19.2
Level of Service	C	D		C	C		C	C	B	B	C	B
Approach Delay (s/veh)		49.7			27.4			23.5			27.0	
Approach LOS		D			C			C			C	

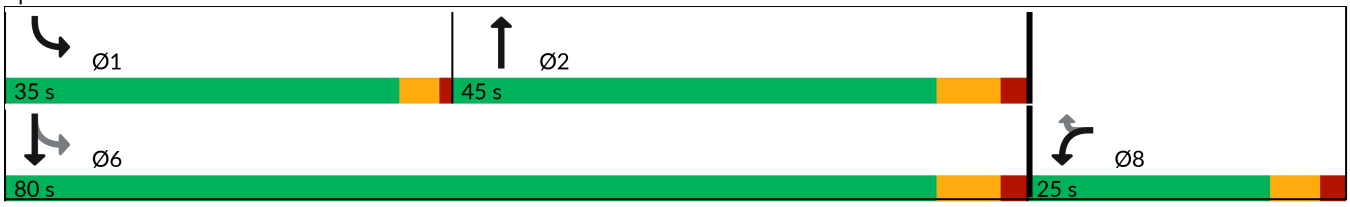
Intersection Summary			
HCM 2000 Control Delay (s/veh)	28.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	101.9	Sum of lost time (s)	22.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	136	130	694	173	841
Future Volume (vph)	136	130	694	173	841
Lane Group Flow (vph)	148	141	867	188	914
Turn Type	Prot	Perm	NA	pm+pt	NA
Protected Phases	8		2	1	6
Permitted Phases		8		6	
Detector Phase	8	8	2	1	6
Switch Phase					
Minimum Initial (s)	15.0	15.0	35.0	10.0	35.0
Minimum Split (s)	21.0	21.0	42.0	14.0	42.0
Total Split (s)	25.0	25.0	45.0	35.0	80.0
Total Split (%)	23.8%	23.8%	42.9%	33.3%	76.2%
Yellow Time (s)	4.0	4.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	4.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	Max	None	Max
v/c Ratio	0.61	0.41	0.53	0.39	0.43
Control Delay (s/veh)	51.2	10.4	15.8	6.6	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	51.2	10.4	15.8	6.6	7.1
Queue Length 50th (m)	29.2	0.0	55.2	10.0	37.1
Queue Length 95th (m)	50.7	16.9	80.4	17.8	51.4
Internal Link Dist (m)	497.7		346.3		432.3
Turn Bay Length (m)	56.0			21.0	
Base Capacity (vph)	272	365	1626	717	2149
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.54	0.39	0.53	0.26	0.43

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 103.1
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 2: Brock Rd. S. & Nicholas Beaver Rd.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	136	130	694	104	173	841
Future Volume (vph)	136	130	694	104	173	841
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		4.0	7.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1480	1357	2889		1703	3034
Flt Permitted	0.95	1.00	1.00		0.26	1.00
Satd. Flow (perm)	1480	1357	2889		469	3034
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	148	141	754	113	188	914
RTOR Reduction (vph)	0	118	8	0	0	0
Lane Group Flow (vph)	148	23	859	0	188	914
Confl. Peds. (#/hr)				3	3	
Heavy Vehicles (%)	22%	19%	22%	22%	6%	19%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	17.0	17.0	57.8		73.0	73.0
Effective Green, g (s)	17.0	17.0	57.8		73.0	73.0
Actuated g/C Ratio	0.17	0.17	0.56		0.71	0.71
Clearance Time (s)	6.0	6.0	7.0		4.0	7.0
Vehicle Extension (s)	5.0	5.0	0.2		5.0	0.2
Lane Grp Cap (vph)	244	223	1621		466	2150
v/s Ratio Prot	c0.10		c0.30		0.04	c0.30
v/s Ratio Perm		0.02			0.24	
v/c Ratio	0.61	0.10	0.53		0.40	0.43
Uniform Delay, d1	39.9	36.5	14.1		6.0	6.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	6.2	0.4	1.2		1.2	0.6
Delay (s)	46.1	37.0	15.4		7.2	6.9
Level of Service	D	D	B		A	A
Approach Delay (s/veh)	41.6		15.4			6.9
Approach LOS	D		B			A

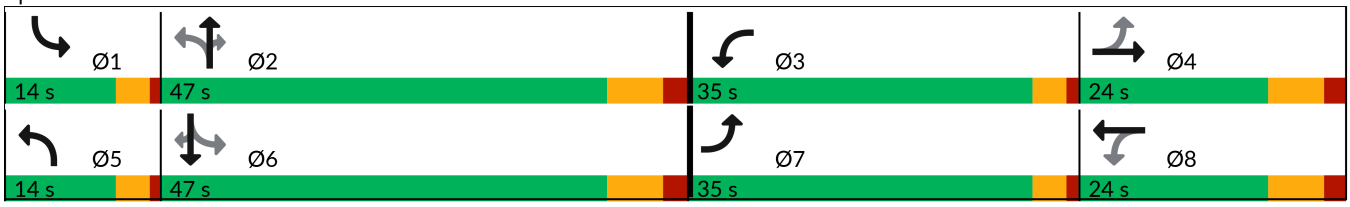
Intersection Summary			
HCM 2000 Control Delay (s/veh)	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

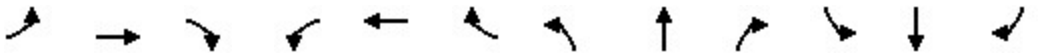
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	78	15	159	71	172	829	57	38	552	33
Future Volume (vph)	78	15	159	71	172	829	57	38	552	33
Lane Group Flow (vph)	82	171	167	213	181	873	60	40	581	35
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	15.0	5.0	15.0	8.0	40.0	40.0	8.0	40.0	40.0
Minimum Split (s)	9.0	22.0	9.0	22.0	12.0	47.0	47.0	12.0	47.0	47.0
Total Split (s)	35.0	24.0	35.0	24.0	14.0	47.0	47.0	14.0	47.0	47.0
Total Split (%)	29.2%	20.0%	29.2%	20.0%	11.7%	39.2%	39.2%	11.7%	39.2%	39.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
v/c Ratio	0.22	0.54	0.48	0.54	0.45	0.56	0.10	0.17	0.45	0.06
Control Delay (s/veh)	23.2	15.7	27.9	31.5	16.6	24.8	0.9	14.2	25.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	23.2	15.7	27.9	31.5	16.6	24.8	0.9	14.2	25.6	0.2
Queue Length 50th (m)	11.3	3.0	25.0	28.6	18.4	75.7	0.0	3.8	47.3	0.0
Queue Length 95th (m)	21.6	24.8	42.1	55.1	35.2	110.5	1.6	10.2	69.9	0.0
Internal Link Dist (m)		106.5		215.4		432.3			100.5	
Turn Bay Length (m)	54.0		55.0		142.0		66.0	62.0		62.0
Base Capacity (vph)	594	339	450	393	409	1557	630	251	1304	546
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.50	0.37	0.54	0.44	0.56	0.10	0.16	0.45	0.06

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 103.7
Natural Cycle: 90
Control Type: Semi Act-Uncoord

Splits and Phases: 1: Brock Rd. S./Brock Rd.S. & Mclean Rd. W./Mclean Rd.W.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	15	147	159	71	131	172	829	57	38	552	33
Future Volume (vph)	78	15	147	159	71	131	172	829	57	38	552	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.86		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1703	1277		1346	1504		1626	3471	1272	1203	3374	1241
Flt Permitted	0.62	1.00		0.44	1.00		0.34	1.00	1.00	0.26	1.00	1.00
Satd. Flow (perm)	1120	1277		623	1504		576	3471	1272	327	3374	1241
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	82	16	155	167	75	138	181	873	60	40	581	35
RTOR Reduction (vph)	0	132	0	0	50	0	0	0	34	0	0	21
Lane Group Flow (vph)	82	39	0	167	163	0	181	873	26	40	581	14
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	6%	25%	27%	34%	5%	19%	11%	4%	27%	50%	7%	27%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	25.0	16.0		36.7	23.7		55.4	46.5	46.5	46.6	41.7	41.7
Effective Green, g (s)	25.0	16.0		36.7	23.7		55.4	46.5	46.5	46.6	41.7	41.7
Actuated g/C Ratio	0.24	0.15		0.35	0.22		0.52	0.44	0.44	0.44	0.39	0.39
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	5.0	3.0		5.0	3.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	313	192		329	335		396	1521	557	184	1326	487
v/s Ratio Prot	0.02	0.03		c0.08	0.11		c0.04	c0.25		0.01	0.17	
v/s Ratio Perm	0.04			c0.10			0.20		0.02	0.09		0.01
v/c Ratio	0.26	0.21		0.51	0.49		0.46	0.57	0.05	0.22	0.44	0.03
Uniform Delay, d1	32.6	39.5		26.2	35.9		14.3	22.4	17.1	17.6	23.6	19.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.5		2.6	1.1		0.8	1.6	0.2	0.6	1.1	0.1
Delay (s)	33.5	40.0		28.7	37.0		15.1	23.9	17.3	18.2	24.7	19.9
Level of Service	C	D		C	D		B	C	B	B	C	B
Approach Delay (s/veh)		37.9			33.4			22.2			24.0	
Approach LOS		D			C			C			C	

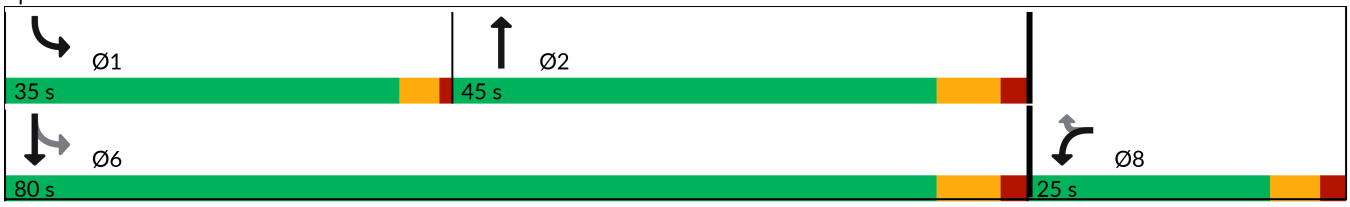
Intersection Summary			
HCM 2000 Control Delay (s/veh)	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	106.1	Sum of lost time (s)	22.0
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	155	170	905	53	816
Future Volume (vph)	155	170	905	53	816
Lane Group Flow (vph)	178	195	1073	61	938
Turn Type	Prot	Perm	NA	pm+pt	NA
Protected Phases	8		2	1	6
Permitted Phases		8		6	
Detector Phase	8	8	2	1	6
Switch Phase					
Minimum Initial (s)	15.0	15.0	35.0	10.0	35.0
Minimum Split (s)	21.0	21.0	42.0	14.0	42.0
Total Split (s)	25.0	25.0	45.0	35.0	80.0
Total Split (%)	23.8%	23.8%	42.9%	33.3%	76.2%
Yellow Time (s)	4.0	4.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	4.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	Max	None	Max
v/c Ratio	0.65	0.47	0.54	0.18	0.41
Control Delay (s/veh)	52.0	9.5	14.4	5.2	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	52.0	9.5	14.4	5.2	7.0
Queue Length 50th (m)	35.5	0.0	72.3	3.1	38.7
Queue Length 95th (m)	56.6	17.4	88.5	6.5	48.7
Internal Link Dist (m)	497.7		346.3		432.3
Turn Bay Length (m)	56.0			21.0	
Base Capacity (vph)	302	438	1999	588	2303
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.59	0.45	0.54	0.10	0.41

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 103.9
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 2: Brock Rd. S. & Nicholas Beaver Rd.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	155	170	905	29	53	816
Future Volume (vph)	155	170	905	29	53	816
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		4.0	7.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1656	1524	3329		1504	3252
Flt Permitted	0.95	1.00	1.00		0.20	1.00
Satd. Flow (perm)	1656	1524	3329		318	3252
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	178	195	1040	33	61	938
RTOR Reduction (vph)	0	163	1	0	0	0
Lane Group Flow (vph)	178	32	1072	0	61	938
Confl. Peds. (#/hr)				1	1	
Heavy Vehicles (%)	9%	6%	6%	67%	20%	11%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	17.3	17.3	62.4		74.4	74.4
Effective Green, g (s)	17.3	17.3	62.4		74.4	74.4
Actuated g/C Ratio	0.17	0.17	0.60		0.71	0.71
Clearance Time (s)	6.0	6.0	7.0		4.0	7.0
Vehicle Extension (s)	5.0	5.0	0.2		5.0	0.2
Lane Grp Cap (vph)	273	251	1984		316	2310
v/s Ratio Prot	c0.11		c0.32		0.01	c0.29
v/s Ratio Perm		0.02			0.12	
v/c Ratio	0.65	0.13	0.54		0.19	0.41
Uniform Delay, d1	40.9	37.3	12.6		6.1	6.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	7.3	0.5	1.1		0.6	0.5
Delay (s)	48.2	37.8	13.7		6.7	6.7
Level of Service	D	D	B		A	A
Approach Delay (s/veh)	42.7		13.7			6.7
Approach LOS	D		B			A

Intersection Summary			
HCM 2000 Control Delay (s/veh)	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	104.7	Sum of lost time (s)	17.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Appendix I

ITE Trip Generation Manual Excerpts

Land Use: 934
Fast-Food Restaurant with Drive-Through Window

Description

This land use includes any fast-food restaurant with a drive-through window. This type of restaurant is characterized by a large drive-through and large carry-out clientele, long hours of service (some are open for breakfast, all are open for lunch and dinner, some are open late at night or 24 hours a day) and high turnover rates for eat-in customers. The restaurant does not provide table service. A patron generally orders from a menu board and pays before receiving the meal. A typical duration of stay for an eat-in patron is less than 30 minutes. Fast casual restaurant (Land Use 930), high-turnover (sit-down) restaurant (Land Use 932), fast-food restaurant without drive-through window (Land Use 933), and fast-food restaurant with drive-through window and no indoor seating (Land Use 935) are related uses.

Additional Data

Users should exercise caution when applying statistics during the AM peak periods, as the sites contained in the database for this land use may or may not be open for breakfast. In cases where it was confirmed that the sites were not open for breakfast, data for the AM peak hour of the adjacent street traffic were removed from the database.

If the restaurant has outdoor seating, its area is not included in the overall gross floor area. For a restaurant that has significant outdoor seating, the number of seats may be more reliable than GFA as an independent variable on which to establish a trip generation rate.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alaska, Alberta (CAN), California, Colorado, Florida, Indiana, Kentucky, Maryland, Massachusetts, Minnesota, Montana, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Dakota, Texas, Vermont, Virginia, Washington, and Wisconsin.

Source Numbers

163, 164, 168, 180, 181, 241, 245, 278, 294, 300, 301, 319, 338, 340, 342, 358, 389, 438, 502, 552, 577, 583, 584, 617, 640, 641, 704, 715, 728, 810, 866, 867, 869, 885, 886, 927, 935, 962, 977, 1050, 1053, 1054

Fast-Food Restaurant with Drive-Through Window (934)

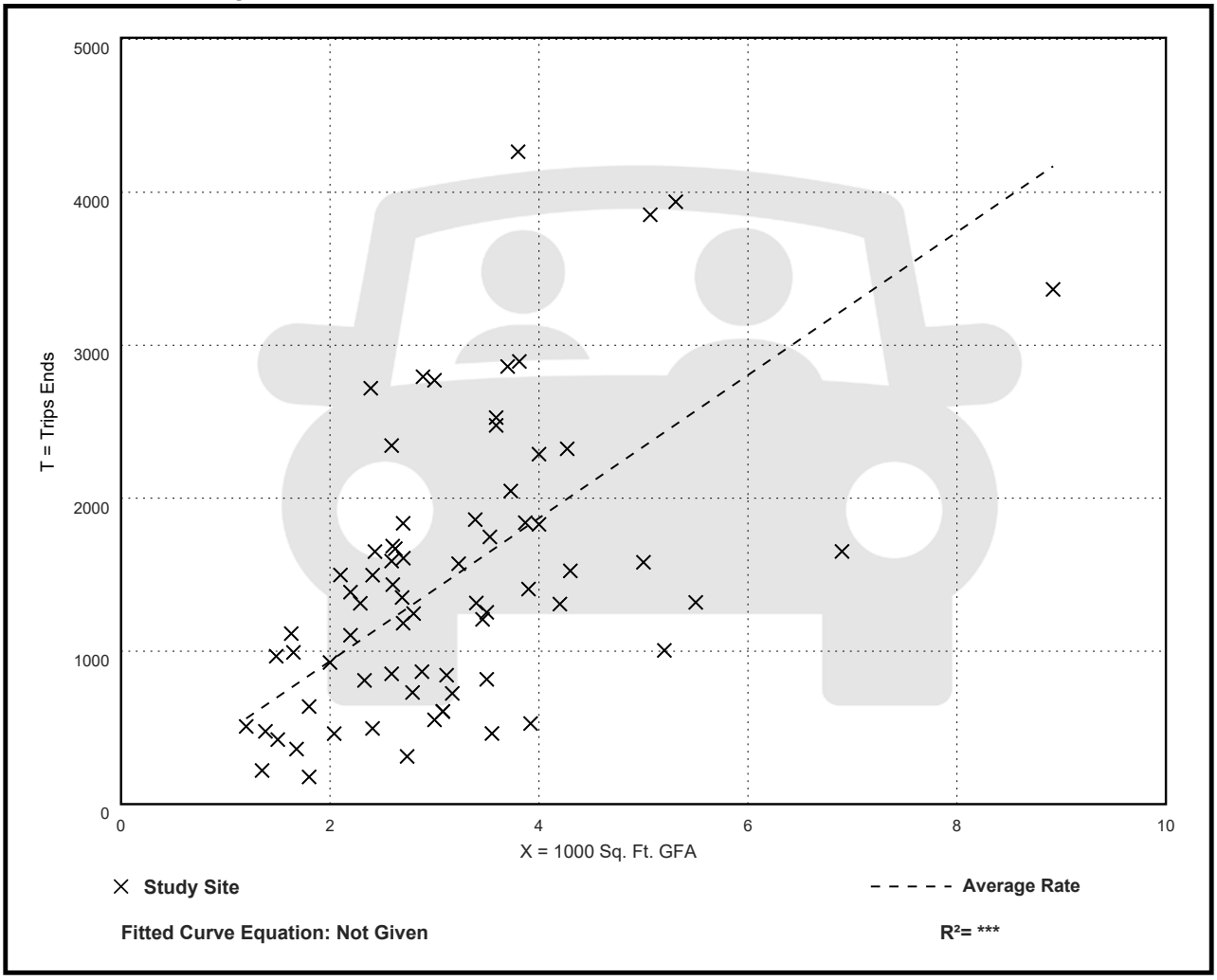
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 71
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
467.48	98.89 - 1137.66	238.62

Data Plot and Equation



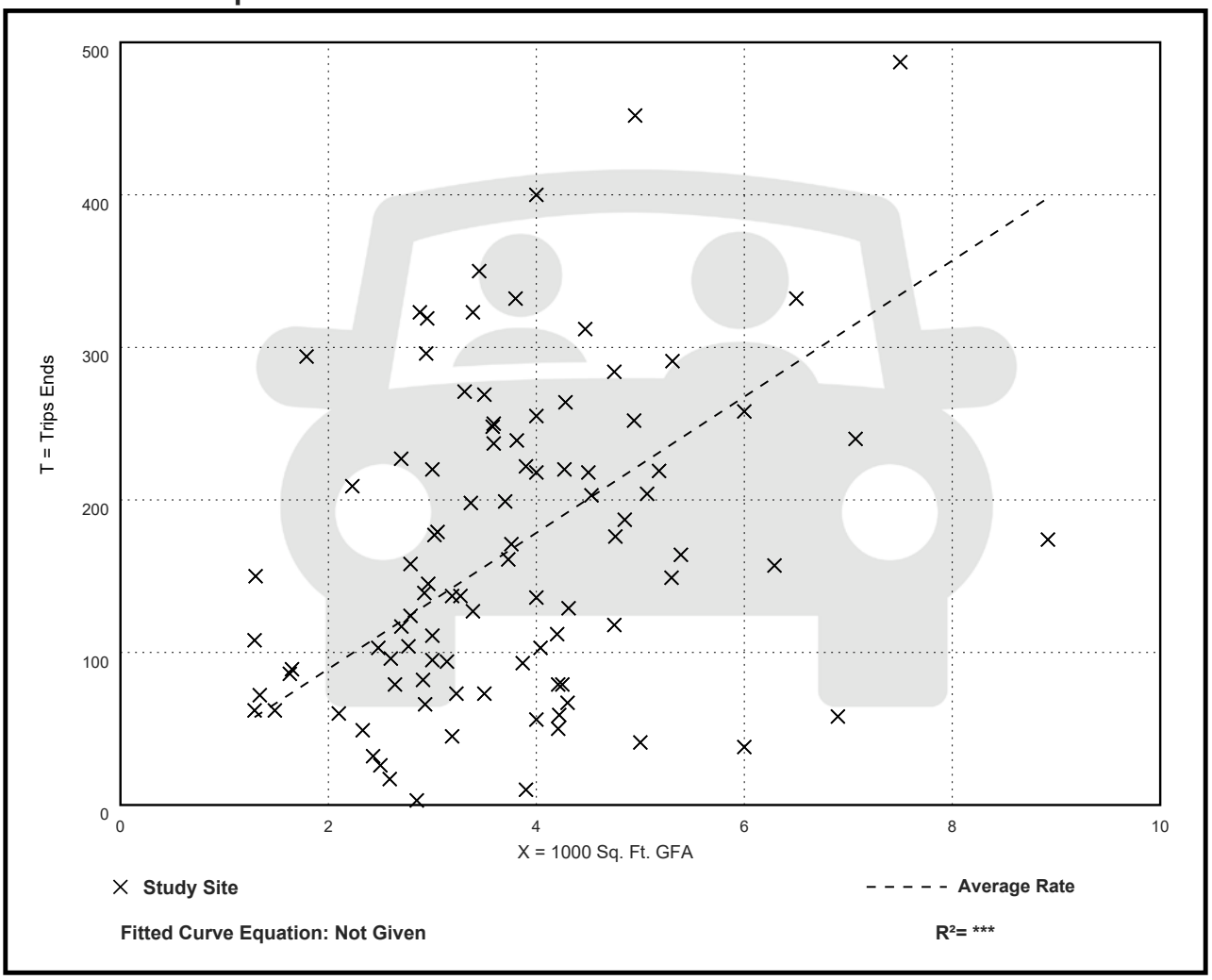
Fast-Food Restaurant with Drive-Through Window (934)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 96
Avg. 1000 Sq. Ft. GFA: 4
Directional Distribution: 51% entering, 49% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
44.61	1.05 - 164.25	27.14

Data Plot and Equation



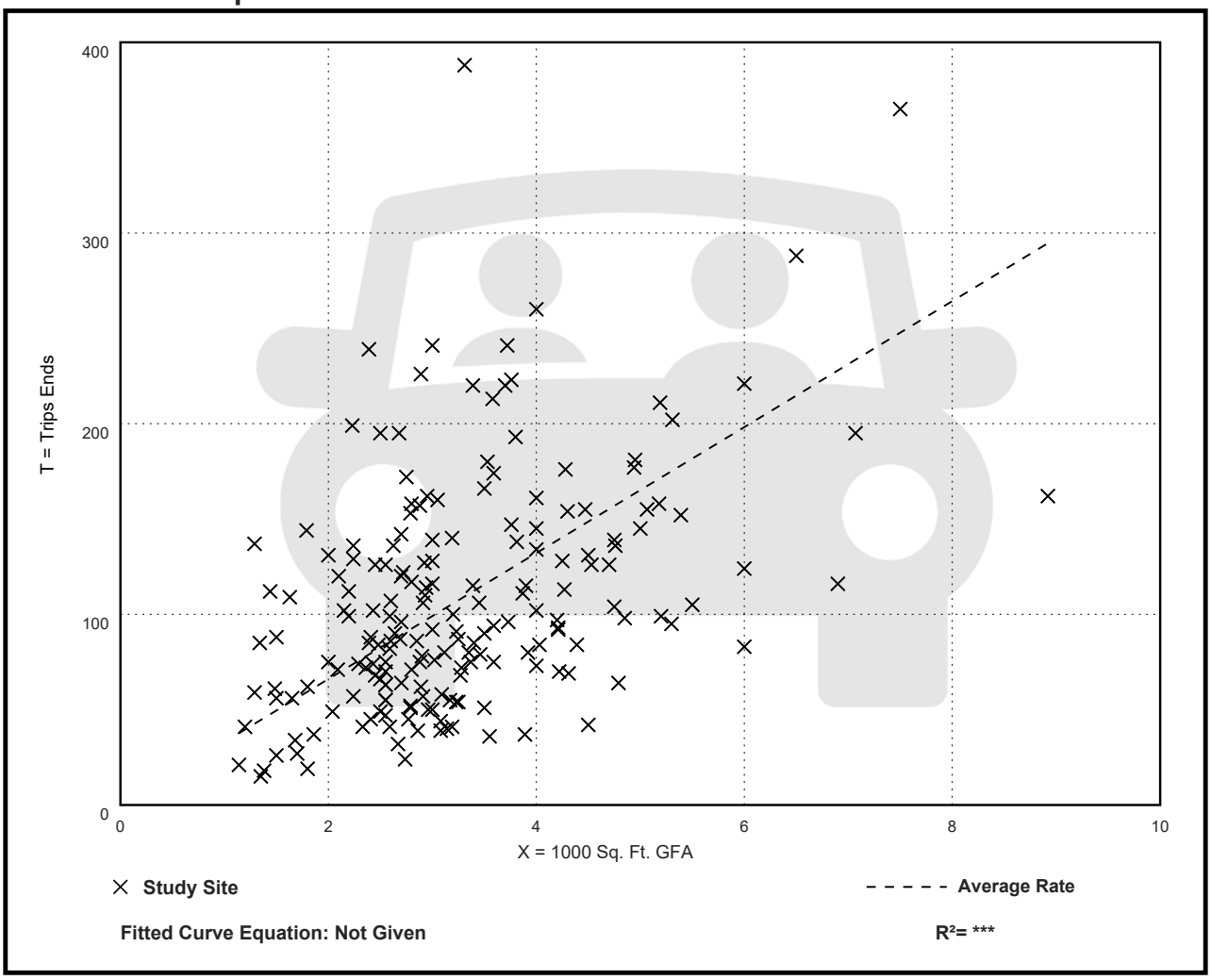
Fast-Food Restaurant with Drive-Through Window (934)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 190
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 52% entering, 48% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
33.03	8.77 - 117.22	17.59

Data Plot and Equation



Land Use: 945
Convenience Store/Gas Station

Description

A convenience store/gas station is a facility with a co-located convenience store and gas station. The convenience store sells grocery and other everyday items that a person may need or want as a matter of convenience. The gas station sells automotive fuels such as gasoline and diesel.

A convenience store/gas station is typically located along a major thoroughfare to optimize motorist convenience. Extended hours of operation (with many open 24 hours, 7 days a week) are common at these facilities.

The convenience store product mix typically includes pre-packaged grocery items, beverages, dairy products, snack foods, confectionary, tobacco products, over-the-counter drugs, and toiletries. A convenience store may sell alcohol, often limited to beer and wine. Coffee and pre-made sandwiches are also commonly sold at a convenience store. Made-to-order food orders are sometimes offered. Some stores offer limited seating.

The sites in this land use include both self-pump and attendant-pumped fueling positions and both pre-pay and post-pay operations.

Convenience store (Land Use 851), gasoline/service station (Land Use 944), and truck stop (Land Use 950) are related uses.

Land Use Subcategory

Multiple subcategories were added to this land use to allow for multi-variable evaluation of sites with single-variable data plots. All study sites are assigned to one of three subcategories, based on the number of vehicle fueling positions (VFP) at the site: between 2 and 8 VFP, between 9 and 15 VFP, and between 16 and 24 VFP. For each VFP range subcategory, data plots are presented with GFA as the independent variable for all time periods and trip types for which data are available. The use of both GFA and VFP (as the independent variable and land use subcategory, respectively) provides a significant improvement in the reliability of a trip generation estimate when compared to the single-variable data plots in prior editions of *Trip Generation Manual*.

Further, the study sites were also assigned to one of three other subcategories, based on the gross floor area (GFA) of the convenience store at the site: between 2,000 and 4,000 square feet, between 4,000 and 5,500 square feet, and between 5,500 and 10,000 square feet. For each GFA subcategory range, data plots are presented with VFP as the independent variable for all time periods and trip types for which data are available. The use of both VFP and GFA (as the independent variable and land use subcategory, respectively) provides a significant improvement in the reliability of a trip generation estimate when compared to the single-variable data plots in prior editions of *Trip Generation Manual*.

When analyzing the convenience store/gas station land use with each combination of GFA and VFP values as described above, the two sets of data plots will produce two estimates of site-generated trips. Both values can be considered when determining a site trip generation estimate.

Data plots are also provided for three additional independent variables: AM peak hour traffic on adjacent street, PM peak hour traffic on adjacent street, and employees. These independent variables are intended to be analyzed as single independent variables and do not have sub-categories associated with them. Within the data plots and within the ITETripGen web app, these plots are found under the land use subcategory "none."

Additional Data

ITE recognizes there are existing convenience store/gas station sites throughout North America that are larger than the sites presented in the data plots. However, the ITE database does not include any site with more than 24 VFP or any site with gross floor area greater than 10,000 square feet. Submission of trip generation data for larger sites is encouraged.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), Arkansas, California, Connecticut, Delaware, Florida, Indiana, Iowa, Kentucky, Maryland, Massachusetts, Minnesota, Nevada, New Hampshire, New Jersey, Pennsylvania, Rhode Island, South Dakota, Texas, Utah, Vermont, Washington, and Wisconsin.

Source Numbers

221, 245, 274, 288, 300, 340, 350, 351, 352, 355, 359, 385, 440, 617, 718, 810, 813, 844, 850, 853, 864, 865, 867, 869, 882, 883, 888, 904, 926, 927, 936, 938, 954, 960, 962, 977, 1004, 1024, 1025, 1027, 1052

Convenience Store/Gas Station - GFA (2-4k) (945)

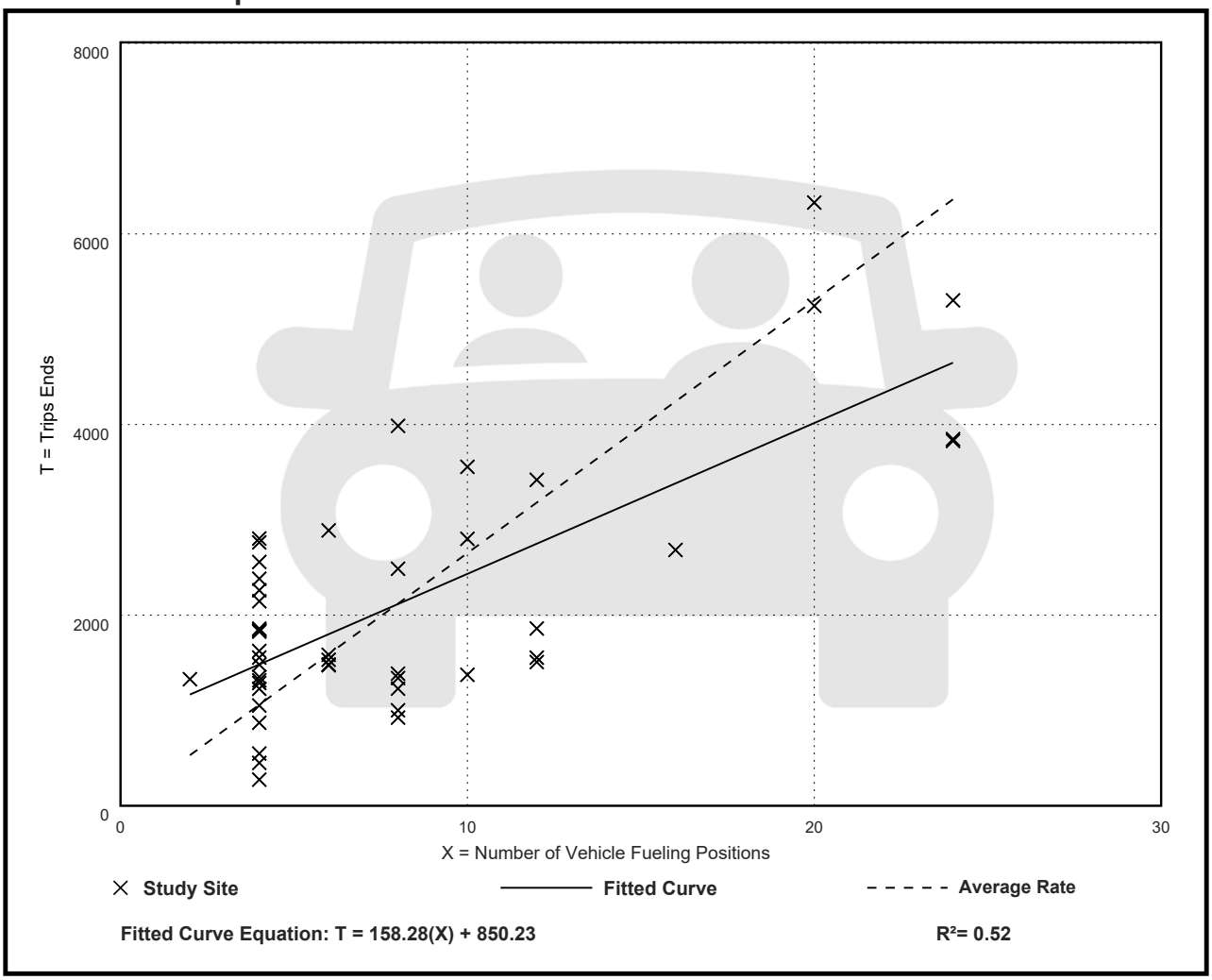
Vehicle Trip Ends vs: Vehicle Fueling Positions
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 48
Avg. Num. of Vehicle Fueling Positions: 8
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
265.12	68.50 - 701.00	142.37

Data Plot and Equation



Fitted Curve Equation: T = 158.28(X) + 850.23

R^2= 0.52

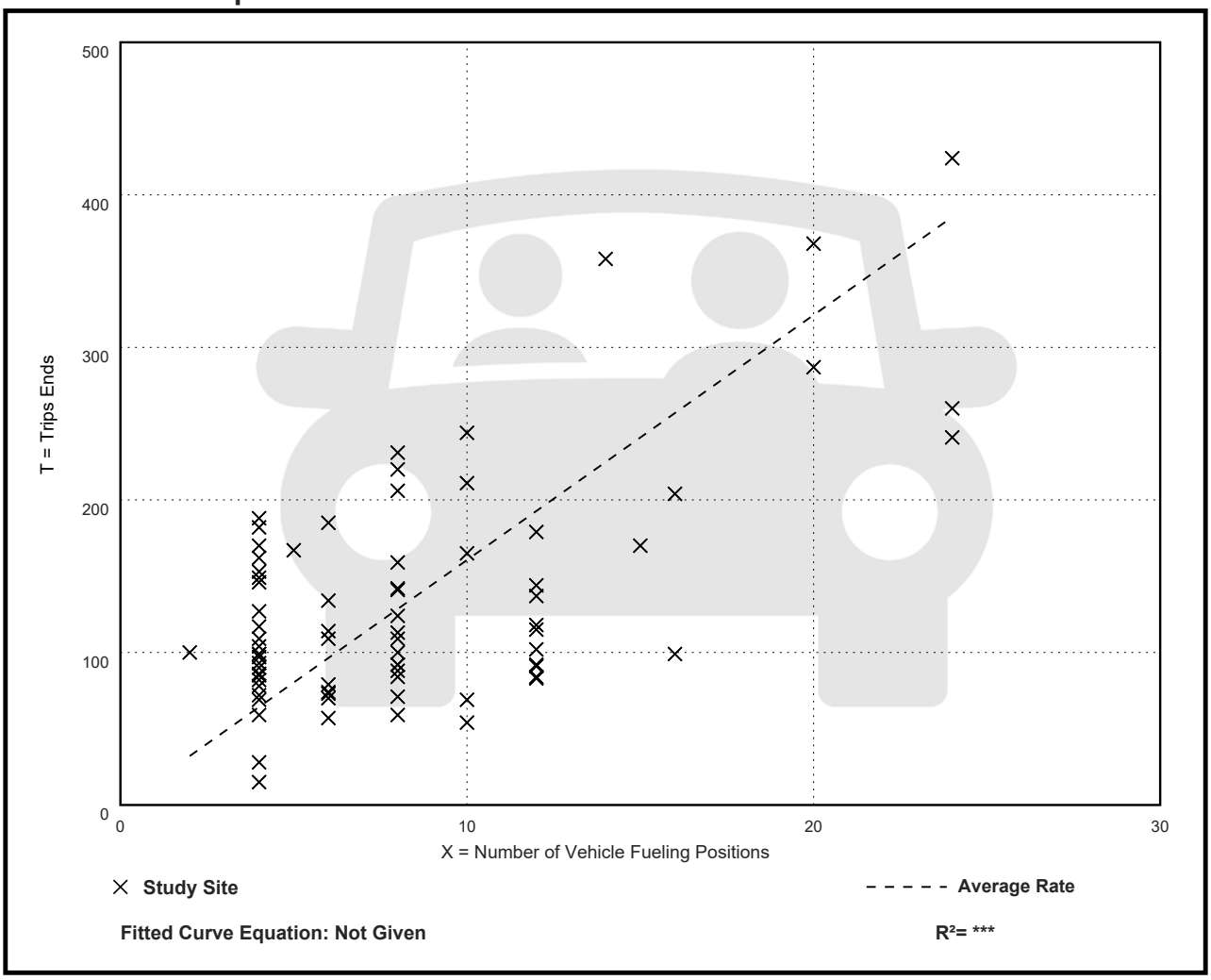
Convenience Store/Gas Station - GFA (2-4k) (945)

Vehicle Trip Ends vs: Vehicle Fueling Positions
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 76
Avg. Num. of Vehicle Fueling Positions: 8
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
16.06	3.75 - 50.00	8.79

Data Plot and Equation



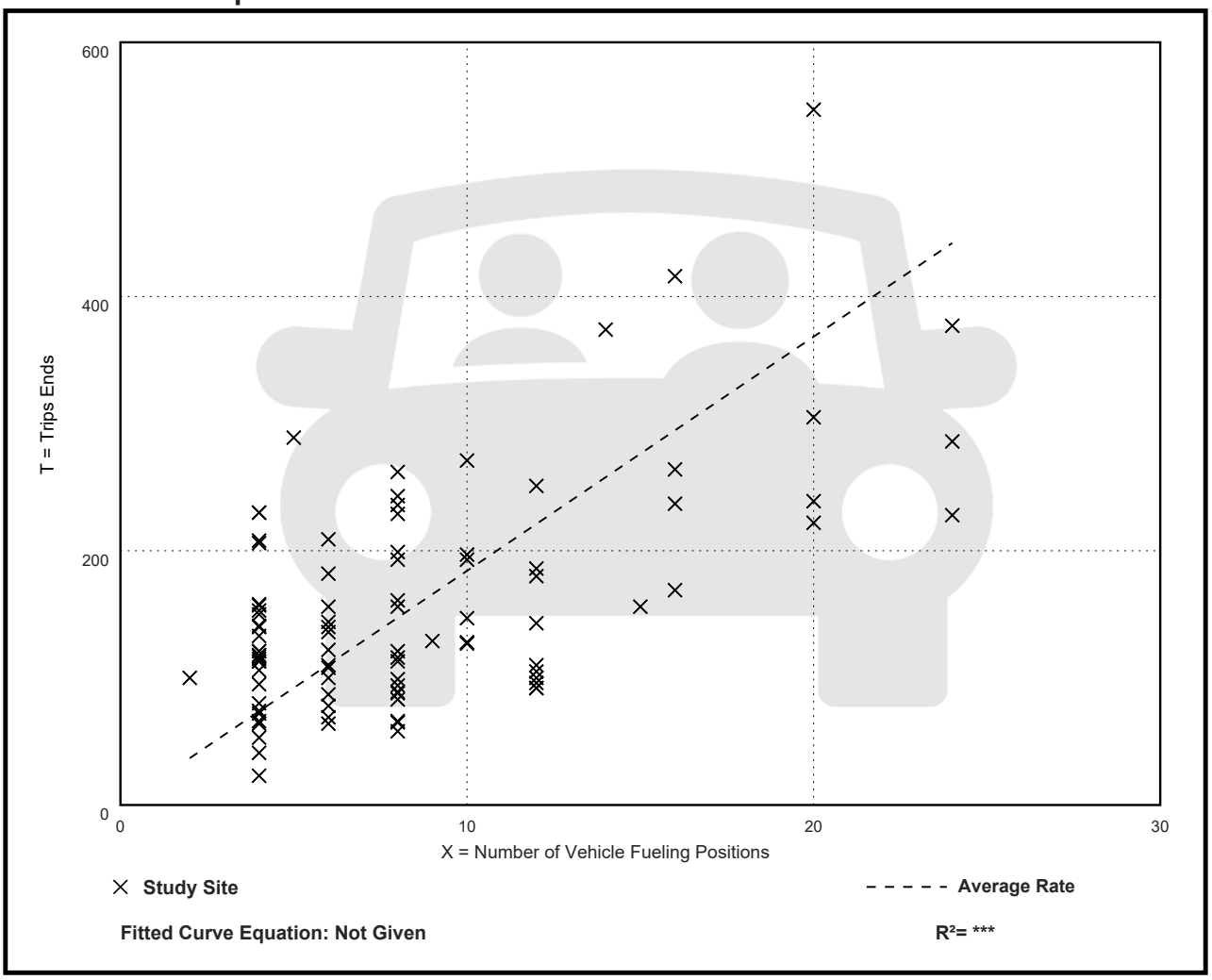
Convenience Store/Gas Station - GFA (2-4k) (945)

Vehicle Trip Ends vs: Vehicle Fueling Positions
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 93
Avg. Num. of Vehicle Fueling Positions: 8
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
18.42	5.75 - 57.80	10.16

Data Plot and Equation



Truck Stop
(950)

Truck Trip Ends vs: Vehicle Fueling Positions
On a: Weekday

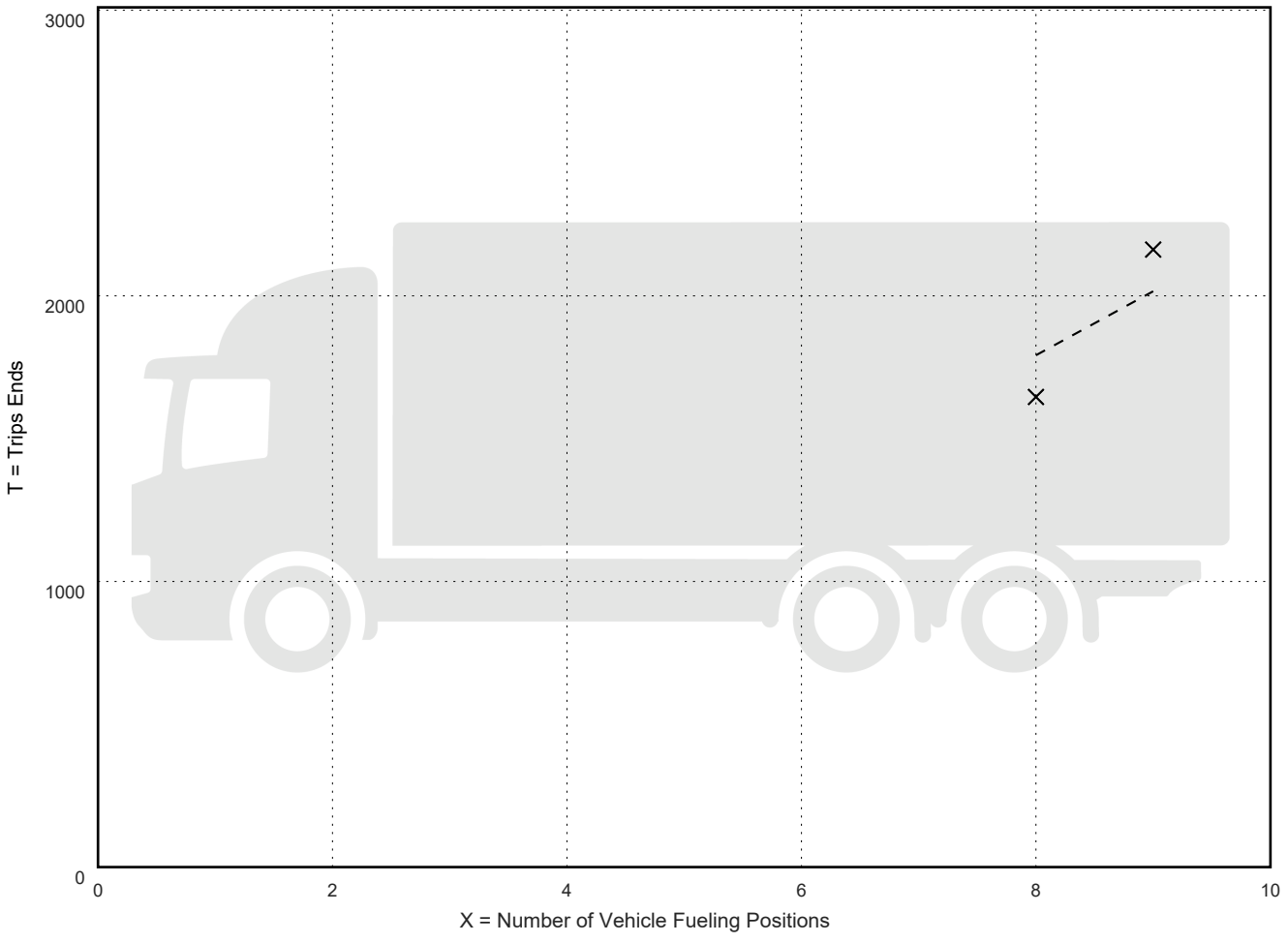
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. Num. of Vehicle Fueling Positions: 9
Directional Distribution: 50% entering, 50% exiting

Truck Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
224.00	205.75 - 240.22	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= ***

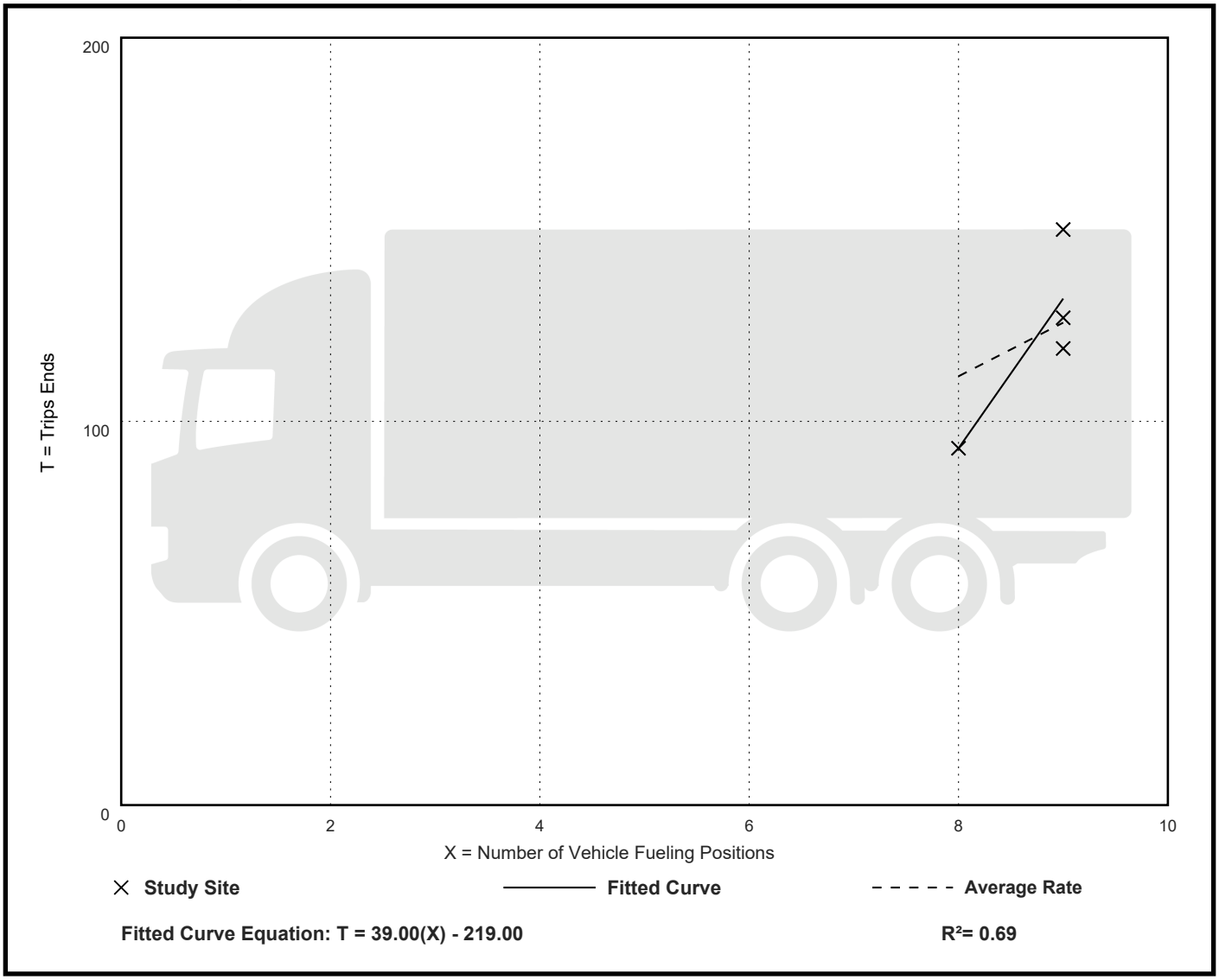
Truck Stop
(950)

Truck Trip Ends vs: Vehicle Fueling Positions
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 4
Avg. Num. of Vehicle Fueling Positions: 9
Directional Distribution: 49% entering, 51% exiting

Truck Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
13.97	11.63 - 16.67	2.09

Data Plot and Equation



Fitted Curve Equation: T = 39.00(X) - 219.00

R^2= 0.69

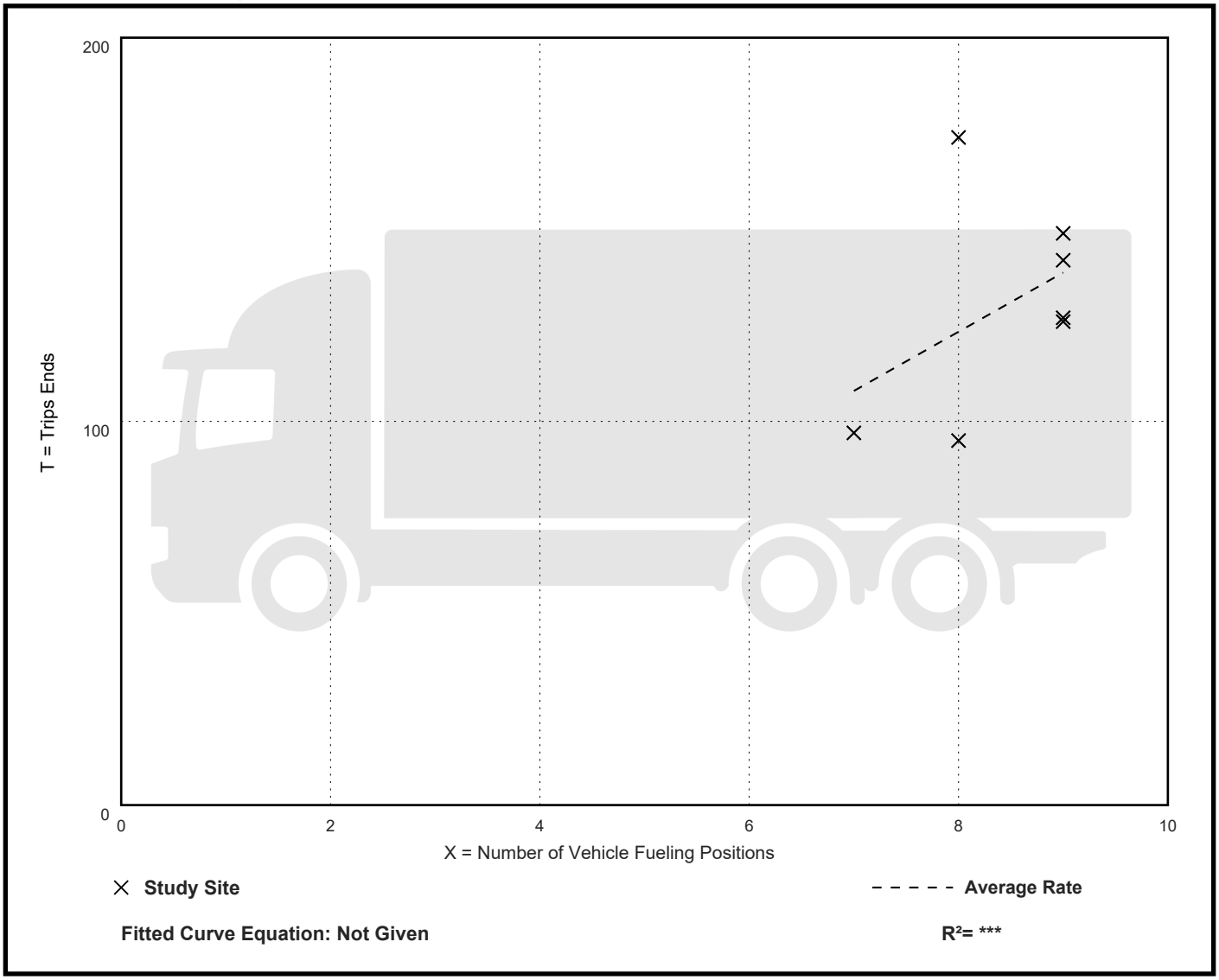
Truck Stop
(950)

Truck Trip Ends vs: Vehicle Fueling Positions
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 7
Avg. Num. of Vehicle Fueling Positions: 8
Directional Distribution: 53% entering, 47% exiting

Truck Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
15.42	11.88 - 21.75	3.10

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= *

Truck Stop
(950)

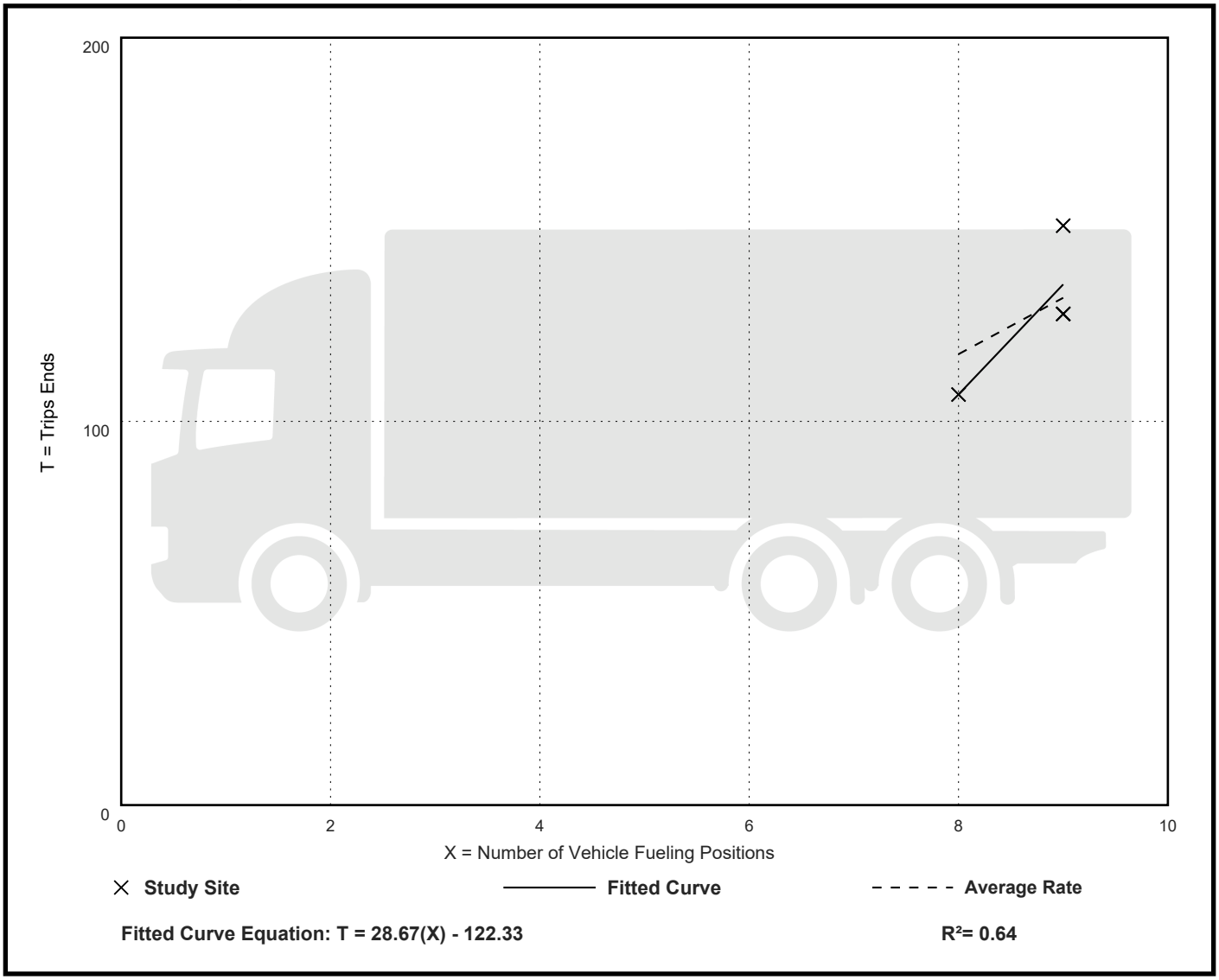
Truck Trip Ends vs: Vehicle Fueling Positions
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 4
Avg. Num. of Vehicle Fueling Positions: 9
Directional Distribution: 51% entering, 49% exiting

Truck Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
14.69	13.38 - 16.78	1.47

Data Plot and Equation



Fitted Curve Equation: T = 28.67(X) - 122.33

R^2= 0.64

Truck Stop
(950)

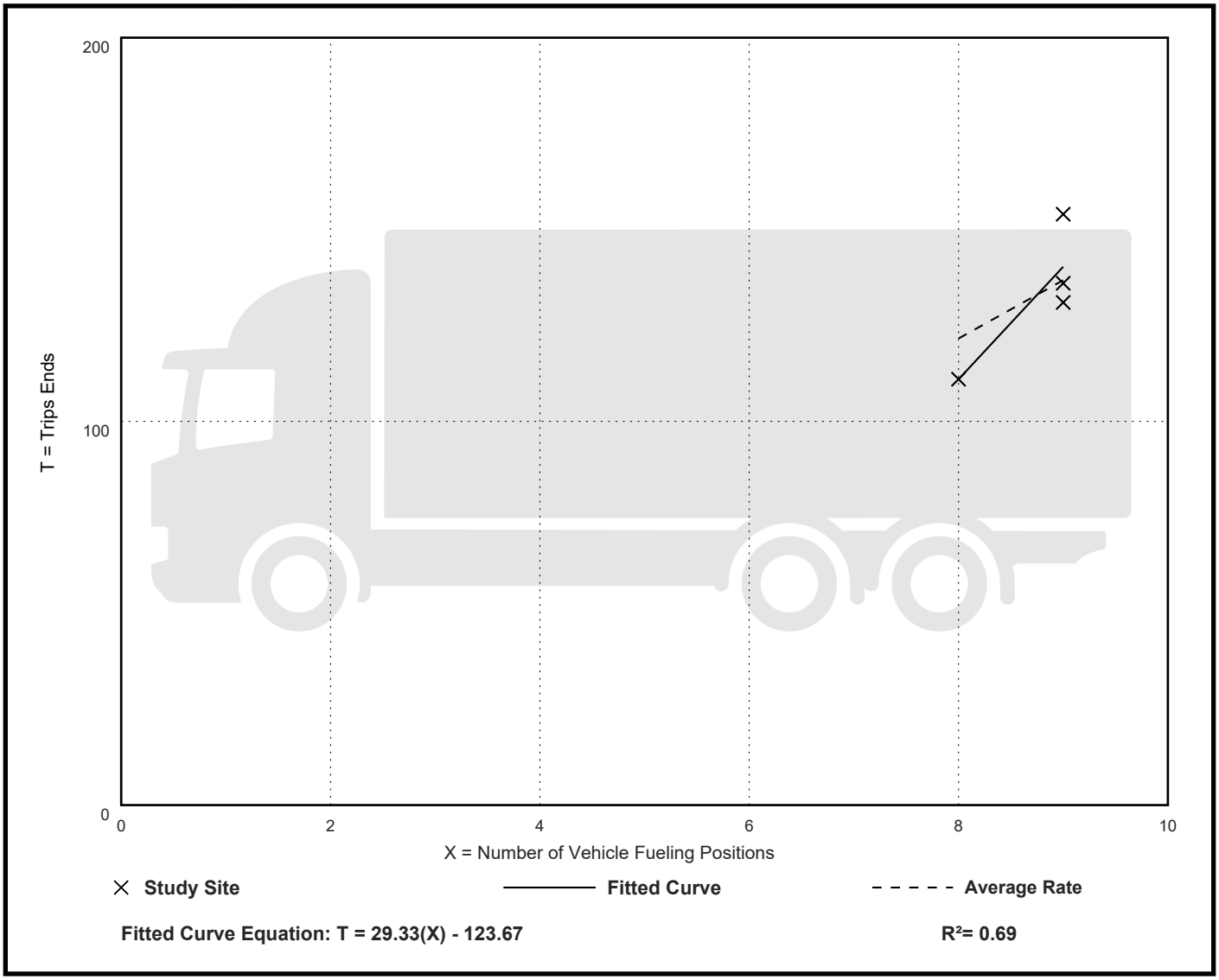
Truck Trip Ends vs: Vehicle Fueling Positions
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 4
Avg. Num. of Vehicle Fueling Positions: 9
Directional Distribution: 50% entering, 50% exiting

Truck Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
15.20	13.88 - 17.11	1.39

Data Plot and Equation



Fitted Curve Equation: T = 29.33(X) - 123.67

R^2= 0.69

Vehicle Pass-By Rates by Land Use

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

Land Use Code	934
Land Use	Fast-Food Restaurant with Drive-Through Window
Setting	General Urban/Suburban
Time Period	Weekday AM Peak Period
# Data Sites	5
Average Pass-By Rate	50%

Pass-By Characteristics for Individual Sites

GFA (000)	State or Province	Survey Year	# Interviews	Pass-By Trip (%)	Non-Pass-By Trips			Adj Street Peak Hour Volume	Source
					Primary (%)	Diverted (%)	Total (%)		
1.4	Kentucky	1993	—	62	22	16	38	1407	2
3	Kentucky	1993	—	43	14	43	57	2903	2
3.3	--	1996	—	68	—	—	32	—	21
3.6	Kentucky	1993	—	32	47	21	68	437	2
4.2	Indiana	1993	—	46	23	31	54	1049	2

Vehicle Pass-By Rates by Land Use

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

Land Use Code	934
Land Use	Fast-Food Restaurant with Drive-Through Window
Setting	General Urban/Suburban
Time Period	Weekday PM Peak Period
# Data Sites	11
Average Pass-By Rate	55%

Pass-By Characteristics for Individual Sites

GFA (000)	State or Province	Survey Year	# Interviews	Pass-By Trip (%)	Non-Pass-By Trips			Adj Street Peak Hour Volume	Source
					Primary (%)	Diverted (%)	Total (%)		
1.3	Kentucky	1993	—	68	22	10	32	2055	2
1.9	Kentucky	1993	33	67	24	9	33	2447	2
2.8	Florida	1995	47	66	—	—	34	—	30
2.9	Florida	1996	271	41	41	18	59	—	30
3	Kentucky	1993	—	31	31	38	69	4250	2
3.1	Florida	1995	28	71	—	—	29	—	30
3.1	Florida	1996	29	38	—	—	62	—	30
3.2	Florida	1996	202	40	39	21	60	—	30
3.3	—	1996	—	62	—	—	38	—	21
4.2	Indiana	1993	—	56	25	19	44	1632	2
4.3	Florida	1994	304	62	—	—	38	—	30

Vehicle Pass-By Rates by Land Use

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

Land Use Code	944
Land Use	Gasoline/Service Station
Setting	General Urban/Suburban
Time Period	Weekday AM Peak Period
# Data Sites	12
Average Pass-By Rate	63%

Pass-By Characteristics for Individual Sites

Vehicle Fueling Positions	State or Province	Survey Year	# Interviews	Pass-By Trip (%)	Non-Pass-By Trips			Adj Street Peak Hour Volume	Source
					Primary (%)	Diverted (%)	Total (%)		
6	Maryland	1992	21	67	14	19	33	900	25
6	Maryland	1992	21	43	28	29	57	870	25
8	Maryland	1992	46	87	13	0	13	2235	25
8	Maryland	1992	35	78	9	13	22	7080	25
8	Kentucky	1993	61	60	15	25	40	4000	2
8	Kentucky	1993	48	68	13	19	32	1307	2
8	Kentucky	1993	—	56	22	22	44	1211	2
8	Maryland	1992	36	47	14	39	53	3095	25
8	Maryland	1992	46	75	0	25	25	3770	25
10	Kentucky	1993	47	67	11	22	33	1105	2
10	Kentucky	1993	—	46	42	12	54	1211	2
12	Maryland	1992	36	61	8	31	39	3480	25

Vehicle Pass-By Rates by Land Use

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

Land Use Code	944
Land Use	Gasoline/Service Station
Setting	General Urban/Suburban
Time Period	Weekday PM Peak Period
# Data Sites	17
Average Pass-By Rate	57%

Pass-By Characteristics for Individual Sites

Vehicle Fueling Positions	State or Province	Survey Year	# Interviews	Pass-By Trip (%)	Non-Pass-By Trips			Adj Street Peak Hour Volume	Source
					Primary (%)	Diverted (%)	Total (%)		
6	Maryland	1992	18	61	6	33	39	2510	25
6	Maryland	1992	26	58	11	31	42	1020	25
8	Maryland	1992	47	62	23	15	38	2635	25
8	Kentucky	1993	83	52	8	40	48	4965	2
8	Kentucky	1993	60	53	20	27	47	1491	2
8	Kentucky	1993	—	72	7	21	28	2657	2
8	Maryland	1992	36	67	14	19	33	3095	25
8	Maryland	1992	46	46	11	43	54	3770	25
8	Maryland	1992	35	54	3	43	46	7080	25
10	Kentucky	1993	—	57	19	24	43	1812	2
10	Kentucky	1993	—	55	16	29	45	2657	2
12	Maryland	1992	52	38	10	52	62	3835	25
12	Pennsylvania	2009	—	66	—	—	34	—	19
12	Pennsylvania	2009	—	51	—	—	49	—	19
12	Pennsylvania	2009	—	40	—	—	60	—	19
12	Pennsylvania	2009	—	61	—	—	39	—	19
12	New Jersey	2009	—	73	—	—	27	—	19

Vehicle Pass-By Rates by Land Use

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

Land Use Code	944
Land Use	Gasoline/Service Station
Setting	General Urban/Suburban
Time Period	Saturday Midday
# Data Sites	5
Average Pass-By Rate	49%

Pass-By Characteristics for Individual Sites

Vehicle Fueling Positions	State or Province	Survey Year	# Interviews	Pass-By Trip (%)	Non-Pass-By Trips			Adj Street Peak Hour Volume	Source
					Primary (%)	Diverted (%)	Total (%)		
12	Pennsylvania	2009	—	60	—	—	40	—	19
12	Pennsylvania	2009	—	30	—	—	70	—	19
12	Pennsylvania	2009	—	55	—	—	45	—	19
12	Pennsylvania	2009	—	37	—	—	63	—	19
12	New Jersey	2009	—	65	—	—	35	—	19

Vehicle Pass-By Rates by Land Use

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

Land Use Code	945									
Land Use	Convenience Store/Gas Station									
Setting	General Urban/Suburban									
Time Period	Weekday AM Peak Period									
# Data Sites	16 Sites with between 2 and 8 VFP					28 Sites with between 9 and 20 VFP				
Average Pass-By Rate	60% for Sites with between 2 and 8 VFP					76% for Sites with between 9 and 20 VFP				
	Pass-By Characteristics for Individual Sites									
			Survey		Pass-By	Non-Pass-By Trips			Adj Street Peak	
GFA (000)	VFP	State or Province	Year	# Interviews	Trip (%)	Primary (%)	Diverted (%)	Total (%)	Hour Volume	Source
2	8	Maryland	1992	46	87	13	0	13	2235	25
2.1	6	Maryland	1992	26	58	23	19	42	2080	25
2.1	6	Maryland	1992	26	58	23	19	42	2080	25
2.2	8	Maryland	1992	31	47	34	19	53	1785	25
2.2	< 8	Indiana	1993	79	56	6	38	44	635	2
2.2	8	Maryland	1992	35	78	9	13	22	7080	25
2.3	6	Maryland	1992	37	32	41	27	68	2080	25
2.3	< 8	Kentucky	1993	58	64	5	31	36	1255	2
2.3	6	Maryland	1992	37	32	41	27	68	2080	25
2.4	< 8	Kentucky	1993	—	48	17	35	52	1210	2
2.6	< 8	Kentucky	1993	—	72	15	13	28	940	2
2.8	< 8	Kentucky	1993	—	54	11	35	46	1240	2
3	< 8	Indiana	1993	62	74	10	16	26	790	2
3.6	< 8	Kentucky	1993	49	67	4	29	33	1985	2
3.7	< 8	Kentucky	1993	49	66	16	18	34	990	2
4.694	12	Maryland	2000	—	72	—	—	28	2440	30
4.694	12	Maryland	2000	—	78	—	—	22	1561	30
4.694	12	Maryland	2000	—	79	—	—	21	2764	30
4.848	12	Virginia	2000	—	55	—	—	45	1398	30
5.06	12	Pennsylvania	2000	—	84	—	—	16	3219	30
5.242	12	Virginia	2000	—	74	—	—	26	1160	30
5.242	12	Virginia	2000	—	71	—	—	29	548	30
5.488	12	Delaware	2000	—	80	—	—	20	—	30
5.5	12	Pennsylvania	2000	—	85	—	—	15	2975	30
4.2	< 8	Kentucky	1993	47	62	19	19	38	1705	2
4.694	16	Maryland	2000	—	90	—	—	10	2278	30
4.694	16	Delaware	2000	—	74	—	—	26	2185	30
4.694	16	Delaware	2000	—	58	—	—	42	962	30
4.694	16	Delaware	2000	—	84	—	—	16	2956	30
4.694	16	New Jersey	2000	—	79	—	—	21	1859	30
4.694	20	Delaware	2000	—	84	—	—	16	3864	30
4.848	16	Virginia	2000	—	68	—	—	32	2106	30
4.848	16	Virginia	2000	—	85	—	—	15	2676	30
4.848	16	Virginia	2000	—	75	—	—	25	3244	30
4.848	16	Virginia	2000	—	71	—	—	29	1663	30
4.993	16	Pennsylvania	2000	—	75	—	—	25	1991	30
5.094	16	New Jersey	2000	—	86	—	—	14	1260	30
5.5	16	Pennsylvania	2000	—	82	—	—	18	1570	30
5.543	16	Pennsylvania	2000	—	84	—	—	16	1933	30
5.565	16	Pennsylvania	2000	—	77	—	—	23	2262	30
5.565	16	Pennsylvania	2000	—	68	—	—	32	2854	30
5.565	16	New Jersey	2000	—	58	—	—	42	1253	30
5.565	16	New Jersey	2000	—	79	—	—	21	1928	30
5.565	16	New Jersey	2000	---	84	---	---	16	1953	30

Vehicle Pass-By Rates by Land Use

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

Land Use Code	945									
Land Use	Convenience Store/Gas Station									
Setting	General Urban/Suburban									
Time Period	Weekday PM Peak Period									
# Data Sites	12 Sites with between 2 and 8 VFP					28 Sites with between 9 and 20 VFP				
Average Pass-By Rate	56% for Sites with between 2 and 8 VFP					75% for Sites with between 9 and 20 VFP				
	Pass-By Characteristics for Individual Sites									
			Survey		Pass-By	Non-Pass-By Trips			Adj Street Peak	
GFA (000)	VFP	State or Province	Year	# Interviews	Trip (%)	Primary (%)	Diverted (%)	Total (%)	Hour Volume	Source
2.1	8	Maryland	1992	31	52	13	35	48	1785	25
2.1	6	Maryland	1992	30	53	20	27	47	1060	25
2.2	< 8	Indiana	1993	115	48	16	36	52	820	2
2.3	< 8	Kentucky	1993	67	57	16	27	43	1954	2
2.3	6	Maryland	1992	55	40	11	49	60	2760	25
2.4	< 8	Kentucky	1993	—	58	13	29	42	2655	2
2.6	< 8	Kentucky	1993	68	67	15	18	33	950	2
2.8	< 8	Kentucky	1993	—	62	11	27	38	2875	2
3	< 8	Indiana	1993	80	65	15	20	35	1165	2
3.6	< 8	Kentucky	1993	60	56	17	27	44	2505	2
3.7	< 8	Kentucky	1993	70	61	16	23	39	2175	2
4.2	< 8	Kentucky	1993	61	58	26	16	42	2300	2
4.694	12	Maryland	2000	—	78	—	—	22	3549	30
4.694	12	Maryland	2000	—	67	—	—	33	2272	30
4.694	12	Maryland	2000	—	66	—	—	34	3514	30
4.848	12	Virginia	2000	—	71	—	—	29	2350	30
5.06	12	Pennsylvania	2000	—	91	—	—	9	4181	30
5.242	12	Virginia	2000	—	70	—	—	30	2445	30
5.242	12	Virginia	2000	—	56	—	—	44	950	30
5.488	12	Delaware	2000	—	73	—	—	27	—	30
5.5	12	Pennsylvania	2000	—	84	—	—	16	4025	30
4.694	16	Maryland	2000	—	89	—	—	11	2755	30
4.694	16	Delaware	2000	—	73	—	—	27	1858	30
4.694	16	Delaware	2000	—	59	—	—	41	1344	30
4.694	16	Delaware	2000	—	72	—	—	28	3434	30
4.694	16	New Jersey	2000	—	81	—	—	19	1734	30
4.694	20	Delaware	2000	—	76	—	—	24	1616	30
4.848	16	Virginia	2000	—	67	—	—	33	2.954	30
4.848	16	Virginia	2000	—	78	—	—	22	3086	30
4.848	16	Virginia	2000	—	83	—	—	17	4143	30
4.848	16	Virginia	2000	—	73	—	—	27	2534	30
4.993	16	Pennsylvania	2000	—	72	—	—	28	2917	30
5.094	16	New Jersey	2000	—	86	—	—	14	1730	30
5.5	16	Pennsylvania	2000	—	90	—	—	10	2616	30
5.543	16	Pennsylvania	2000	—	87	—	—	13	2363	30
5.565	16	Pennsylvania	2000	—	81	—	—	19	2770	30
5.565	16	Pennsylvania	2000	—	76	—	—	24	3362	30
5.565	16	New Jersey	2000	—	61	—	—	39	1713	30
5.565	16	New Jersey	2000	—	86	—	—	14	1721	30
5.565	16	New Jersey	2000	---	81	---	---	19	2227	30

Appendix J

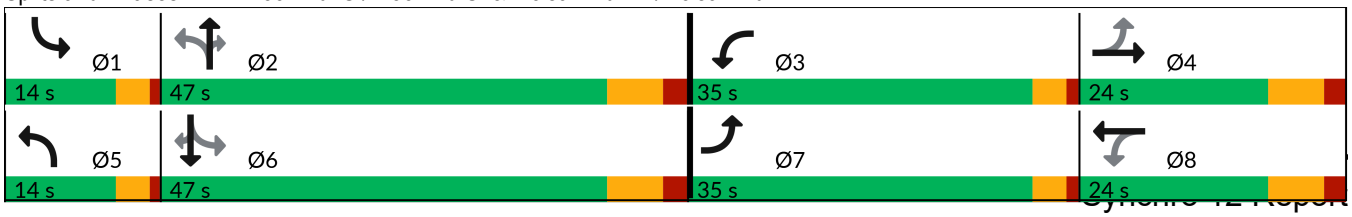
Future Total Synchro Reports

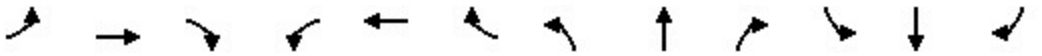
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	77	63	61	13	202	442	160	125	778	71
Future Volume (vph)	77	63	61	13	202	442	160	125	778	71
Lane Group Flow (vph)	88	241	69	60	230	502	182	142	884	81
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	15.0	5.0	15.0	8.0	40.0	40.0	8.0	40.0	40.0
Minimum Split (s)	9.0	22.0	9.0	22.0	12.0	47.0	47.0	12.0	47.0	47.0
Total Split (s)	35.0	24.0	35.0	24.0	14.0	47.0	47.0	14.0	47.0	47.0
Total Split (%)	29.2%	20.0%	29.2%	20.0%	11.7%	39.2%	39.2%	11.7%	39.2%	39.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
v/c Ratio	0.26	0.86	0.32	0.27	0.97	0.38	0.25	0.29	0.66	0.11
Control Delay (s/veh)	24.7	55.9	26.4	19.5	72.9	22.2	4.2	12.6	27.6	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	24.7	55.9	26.4	19.5	72.9	22.2	4.2	12.6	27.6	2.4
Queue Length 50th (m)	12.4	32.9	9.7	2.7	~24.5	37.9	0.0	13.1	77.5	0.0
Queue Length 95th (m)	23.5	#79.0	19.5	14.6	#75.9	54.3	13.0	24.5	103.4	5.2
Internal Link Dist (m)		106.5		215.4		432.3			100.5	
Turn Bay Length (m)	54.0		55.0		142.0		66.0	62.0		62.0
Base Capacity (vph)	451	281	372	224	236	1320	718	498	1340	724
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.86	0.19	0.27	0.97	0.38	0.25	0.29	0.66	0.11

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 98.5
Natural Cycle: 90
Control Type: Semi Act-Uncoord
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Brock Rd. S./Brock Rd.S. & Mclean Rd. W./Mclean Rd.W.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	63	149	61	13	40	202	442	160	125	778	71
Future Volume (vph)	77	63	149	61	13	40	202	442	160	125	778	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.89		1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1289	1228		1106	1077		1180	3167	1468	1626	3282	1615
Flt Permitted	0.71	1.00		0.41	1.00		0.21	1.00	1.00	0.44	1.00	1.00
Satd. Flow (perm)	957	1228		481	1077		258	3167	1468	759	3282	1615
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	88	72	169	69	15	45	230	502	182	142	884	81
RTOR Reduction (vph)	0	68	0	0	37	0	0	0	107	0	0	48
Lane Group Flow (vph)	88	173	0	69	23	0	230	502	75	142	884	33
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	40%	12%	47%	63%	100%	42%	53%	14%	10%	11%	10%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	27.3	17.1		26.7	16.8		51.2	41.1	41.1	49.4	40.2	40.2
Effective Green, g (s)	27.3	17.1		26.7	16.8		51.2	41.1	41.1	49.4	40.2	40.2
Actuated g/C Ratio	0.27	0.17		0.27	0.17		0.52	0.41	0.41	0.50	0.40	0.40
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	5.0	3.0		5.0	3.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	297	211		191	182		226	1310	607	457	1328	653
v/s Ratio Prot	0.03	c0.14		c0.04	0.02		c0.10	0.16		0.03	0.27	
v/s Ratio Perm	0.05			0.06			c0.42		0.05	0.13		0.02
v/c Ratio	0.30	0.82		0.36	0.12		1.02	0.38	0.12	0.31	0.67	0.05
Uniform Delay, d1	28.0	39.6		28.5	35.0		18.9	20.3	18.0	13.8	24.1	18.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	21.9		2.4	0.3		64.5	0.9	0.4	0.4	2.7	0.1
Delay (s)	29.2	61.5		30.9	35.3		83.4	21.1	18.4	14.2	26.7	18.1
Level of Service	C	E		C	D		F	C	B	B	C	B
Approach Delay (s/veh)		52.8			33.0			36.2			24.5	
Approach LOS		D			C			D			C	

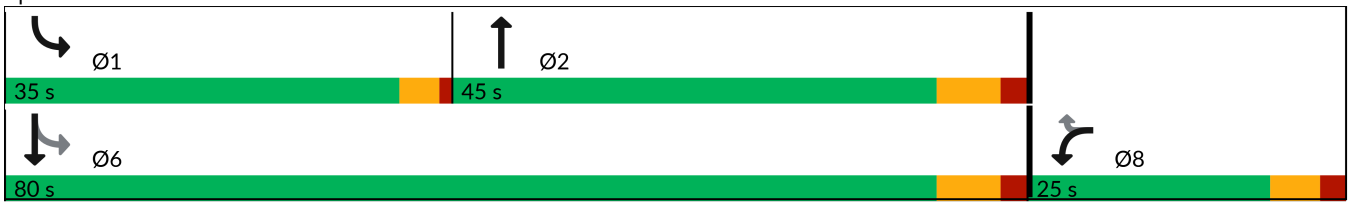
Intersection Summary			
HCM 2000 Control Delay (s/veh)	33.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	99.3	Sum of lost time (s)	22.0
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	123	130	670	169	806
Future Volume (vph)	123	130	670	169	806
Lane Group Flow (vph)	134	141	830	184	876
Turn Type	Prot	Perm	NA	pm+pt	NA
Protected Phases	8		2	1	6
Permitted Phases		8		6	
Detector Phase	8	8	2	1	6
Switch Phase					
Minimum Initial (s)	15.0	15.0	35.0	10.0	35.0
Minimum Split (s)	21.0	21.0	42.0	14.0	42.0
Total Split (s)	25.0	25.0	45.0	35.0	80.0
Total Split (%)	23.8%	23.8%	42.9%	33.3%	76.2%
Yellow Time (s)	4.0	4.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	4.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	Max	None	Max
v/c Ratio	0.56	0.42	0.51	0.37	0.41
Control Delay (s/veh)	49.0	10.4	15.2	6.3	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	49.0	10.4	15.2	6.3	6.9
Queue Length 50th (m)	26.2	0.0	50.4	9.3	33.5
Queue Length 95th (m)	46.2	16.9	75.5	17.5	48.5
Internal Link Dist (m)	497.7		346.3		432.3
Turn Bay Length (m)	56.0			21.0	
Base Capacity (vph)	273	365	1635	731	2154
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.49	0.39	0.51	0.25	0.41

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 102.8
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 2: Brock Rd. S. & Nicholas Beaver Rd.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	123	130	670	94	169	806
Future Volume (vph)	123	130	670	94	169	806
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		4.0	7.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1480	1357	2893		1702	3034
Flt Permitted	0.95	1.00	1.00		0.28	1.00
Satd. Flow (perm)	1480	1357	2893		496	3034
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	141	728	102	184	876
RTOR Reduction (vph)	0	118	7	0	0	0
Lane Group Flow (vph)	134	23	823	0	184	876
Confl. Peds. (#/hr)				3	3	
Heavy Vehicles (%)	22%	19%	22%	22%	6%	19%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	16.8	16.8	57.9		73.0	73.0
Effective Green, g (s)	16.8	16.8	57.9		73.0	73.0
Actuated g/C Ratio	0.16	0.16	0.56		0.71	0.71
Clearance Time (s)	6.0	6.0	7.0		4.0	7.0
Vehicle Extension (s)	5.0	5.0	0.2		5.0	0.2
Lane Grp Cap (vph)	241	221	1629		482	2154
v/s Ratio Prot	c0.09		c0.28		0.04	c0.29
v/s Ratio Perm		0.02			0.23	
v/c Ratio	0.56	0.10	0.51		0.38	0.41
Uniform Delay, d1	39.6	36.6	13.7		5.7	6.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.7	0.4	1.1		1.1	0.6
Delay (s)	44.2	37.0	14.8		6.8	6.6
Level of Service	D	D	B		A	A
Approach Delay (s/veh)	40.5		14.8			6.7
Approach LOS	D		B			A

Intersection Summary			
HCM 2000 Control Delay (s/veh)	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	102.8	Sum of lost time (s)	17.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBR	NBT	SBT
Lane Configurations			
Traffic Volume (vph)	107	557	866
Future Volume (vph)	107	557	866
Lane Group Flow (vph)	116	605	1056
Sign Control		Free	Free

Intersection Summary
Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	107	0	557	866	106
Future Volume (Veh/h)	0	107	0	557	866	106
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	116	0	605	941	115
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				124		
pX, platoon unblocked	0.90					
vC, conflicting volume	1301	528	1056			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1116	528	1056			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	77	100			
cM capacity (veh/h)	182	495	655			

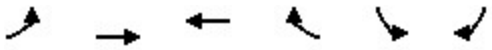
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	116	303	303	627	429
Volume Left	0	0	0	0	0
Volume Right	116	0	0	0	115
cSH	495	1700	1700	1700	1700
Volume to Capacity	0.23	0.18	0.18	0.37	0.25
Queue Length 95th (m)	7.2	0.0	0.0	0.0	0.0
Control Delay (s/veh)	14.5	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s/veh)	14.5	0.0		0.0	
Approach LOS	B				

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	40.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBT	WBT	SBL
Lane Configurations			
Traffic Volume (vph)	204	200	84
Future Volume (vph)	204	200	84
Lane Group Flow (vph)	232	309	99
Sign Control	Free	Free	Stop

Intersection Summary

Control Type: Unsignalized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	204	200	85	84	7
Future Volume (Veh/h)	9	204	200	85	84	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	222	217	92	91	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			130			
pX, platoon unblocked	0.92				0.92	0.92
vC, conflicting volume	309				505	263
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	199				413	149
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				83	99
cM capacity (veh/h)	1257				541	822

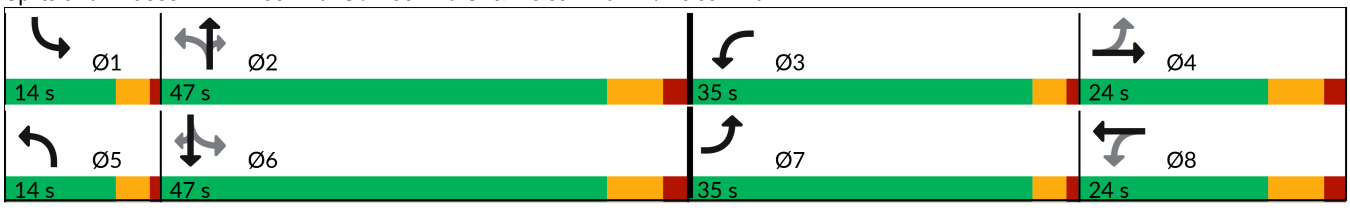
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	232	309	99
Volume Left	10	0	91
Volume Right	0	92	8
cSH	1257	1700	556
Volume to Capacity	0.01	0.18	0.18
Queue Length 95th (m)	0.2	0.0	5.1
Control Delay (s/veh)	0.4	0.0	12.9
Lane LOS	A		B
Approach Delay (s/veh)	0.4	0.0	12.9
Approach LOS			B

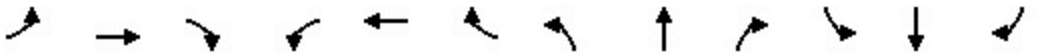
Intersection Summary			
Average Delay		2.1	
Intersection Capacity Utilization		29.8%	ICU Level of Service
Analysis Period (min)		15	

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	174	16	153	75	272	688	55	39	527	31
Future Volume (vph)	174	16	153	75	272	688	55	39	527	31
Lane Group Flow (vph)	183	173	161	213	286	724	58	41	555	33
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	15.0	5.0	15.0	8.0	40.0	40.0	8.0	40.0	40.0
Minimum Split (s)	9.0	22.0	9.0	22.0	12.0	47.0	47.0	12.0	47.0	47.0
Total Split (s)	35.0	24.0	35.0	24.0	14.0	47.0	47.0	14.0	47.0	47.0
Total Split (%)	29.2%	20.0%	29.2%	20.0%	11.7%	39.2%	39.2%	11.7%	39.2%	39.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
v/c Ratio	0.46	0.54	0.47	0.74	0.68	0.46	0.09	0.15	0.43	0.06
Control Delay (s/veh)	26.7	15.6	27.7	46.6	24.7	23.1	0.7	13.7	25.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	26.7	15.6	27.7	46.6	24.7	23.1	0.7	13.7	25.4	0.2
Queue Length 50th (m)	26.9	3.2	24.0	31.5	32.0	60.3	0.0	3.9	45.3	0.0
Queue Length 95th (m)	43.8	24.9	40.6	#67.1	#60.5	87.8	1.1	10.3	66.1	0.0
Internal Link Dist (m)		106.5		215.4		432.3			100.5	
Turn Bay Length (m)	54.0		55.0		142.0		66.0	62.0		62.0
Base Capacity (vph)	571	339	456	299	421	1560	632	295	1299	544
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.51	0.35	0.71	0.68	0.46	0.09	0.14	0.43	0.06

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 104
Natural Cycle: 90
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Brock Rd. S./Brock Rd.S. & Mclean Rd. W./Mclean Rd.W.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	16	148	153	75	127	272	688	55	39	527	31
Future Volume (vph)	174	16	148	153	75	127	272	688	55	39	527	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.86		1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1703	1279		1346	1512		1625	3471	1272	1203	3374	1241
Flt Permitted	0.47	1.00		0.51	1.00		0.35	1.00	1.00	0.34	1.00	1.00
Satd. Flow (perm)	835	1279		719	1512		604	3471	1272	433	3374	1241
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	183	17	156	161	79	134	286	724	58	41	555	33
RTOR Reduction (vph)	0	133	0	0	50	0	0	0	32	0	0	20
Lane Group Flow (vph)	183	40	0	161	163	0	286	724	26	41	555	13
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	6%	25%	27%	34%	5%	19%	11%	4%	27%	50%	7%	27%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	31.0	15.6		33.0	16.6		55.8	46.8	46.8	46.8	41.8	41.8
Effective Green, g (s)	31.0	15.6		33.0	16.6		55.8	46.8	46.8	46.8	41.8	41.8
Actuated g/C Ratio	0.29	0.15		0.31	0.16		0.53	0.44	0.44	0.44	0.40	0.40
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	5.0	3.0		5.0	3.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	371	188		321	237		415	1535	562	227	1333	490
v/s Ratio Prot	0.07	0.03		c0.08	c0.11		c0.07	0.21		0.01	0.16	
v/s Ratio Perm	0.07			0.08			c0.30		0.02	0.07		0.01
v/c Ratio	0.49	0.21		0.50	0.69		0.69	0.47	0.05	0.18	0.42	0.03
Uniform Delay, d1	29.7	39.7		28.5	42.2		15.5	20.8	16.8	17.1	23.2	19.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	0.6		2.6	8.1		4.7	1.0	0.2	0.4	1.0	0.1
Delay (s)	31.9	40.3		31.1	50.2		20.2	21.8	16.9	17.5	24.1	19.7
Level of Service	C	D		C	D		C	C	B	B	C	B
Approach Delay (s/veh)		35.9			42.0			21.1			23.5	
Approach LOS		D			D			C			C	

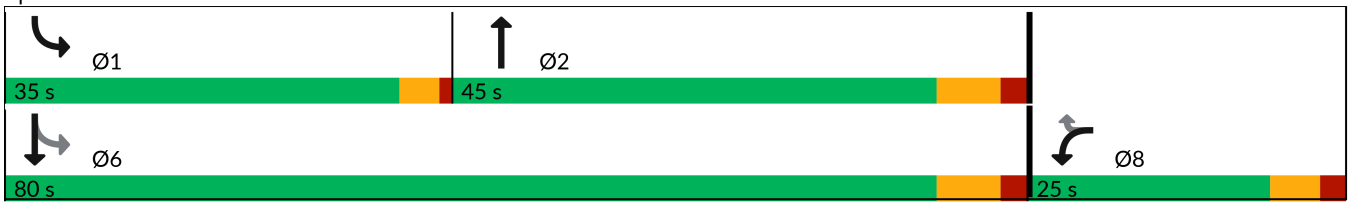
Intersection Summary			
HCM 2000 Control Delay (s/veh)	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	105.8	Sum of lost time (s)	22.0
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	140	168	862	52	787
Future Volume (vph)	140	168	862	52	787
Lane Group Flow (vph)	161	193	1021	60	905
Turn Type	Prot	Perm	NA	pm+pt	NA
Protected Phases	8		2	1	6
Permitted Phases		8		6	
Detector Phase	8	8	2	1	6
Switch Phase					
Minimum Initial (s)	15.0	15.0	35.0	10.0	35.0
Minimum Split (s)	21.0	21.0	42.0	14.0	42.0
Total Split (s)	25.0	25.0	45.0	35.0	80.0
Total Split (%)	23.8%	23.8%	42.9%	33.3%	76.2%
Yellow Time (s)	4.0	4.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	4.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	Max	None	Max
v/c Ratio	0.60	0.47	0.51	0.16	0.39
Control Delay (s/veh)	49.7	9.6	13.8	5.0	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	49.7	9.6	13.8	5.0	6.8
Queue Length 50th (m)	31.7	0.0	65.2	2.9	35.2
Queue Length 95th (m)	51.4	17.2	82.6	6.5	46.5
Internal Link Dist (m)	497.7		346.3		432.3
Turn Bay Length (m)	56.0			21.0	
Base Capacity (vph)	303	436	2010	601	2312
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.53	0.44	0.51	0.10	0.39

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 103.8
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 2: Brock Rd. S. & Nicholas Beaver Rd.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	140	168	862	26	52	787
Future Volume (vph)	140	168	862	26	52	787
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		4.0	7.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1656	1524	3332		1504	3252
Flt Permitted	0.95	1.00	1.00		0.22	1.00
Satd. Flow (perm)	1656	1524	3332		345	3252
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	161	193	991	30	60	905
RTOR Reduction (vph)	0	162	1	0	0	0
Lane Group Flow (vph)	161	31	1020	0	60	905
Confl. Peds. (#/hr)				1	1	
Heavy Vehicles (%)	9%	6%	6%	67%	20%	11%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	17.0	17.0	62.6		74.6	74.6
Effective Green, g (s)	17.0	17.0	62.6		74.6	74.6
Actuated g/C Ratio	0.16	0.16	0.60		0.71	0.71
Clearance Time (s)	6.0	6.0	7.0		4.0	7.0
Vehicle Extension (s)	5.0	5.0	0.2		5.0	0.2
Lane Grp Cap (vph)	269	247	1994		334	2319
v/s Ratio Prot	c0.10		c0.31		0.01	c0.28
v/s Ratio Perm		0.02			0.11	
v/c Ratio	0.60	0.13	0.51		0.18	0.39
Uniform Delay, d1	40.6	37.5	12.2		5.7	6.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	5.3	0.5	0.9		0.5	0.5
Delay (s)	46.0	37.9	13.1		6.2	6.5
Level of Service	D	D	B		A	A
Approach Delay (s/veh)	41.6		13.1			6.4
Approach LOS	D		B			A

Intersection Summary			
HCM 2000 Control Delay (s/veh)	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	104.6	Sum of lost time (s)	17.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBR	NBT	SBT
Lane Configurations			
Traffic Volume (vph)	68	988	527
Future Volume (vph)	68	988	527
Lane Group Flow (vph)	74	1074	645
Sign Control		Free	Free

Intersection Summary
Control Type: Unsignalized

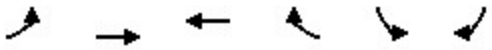
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	68	0	988	527	66
Future Volume (Veh/h)	0	68	0	988	527	66
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	74	0	1074	573	72
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				124		
pX, platoon unblocked	0.85					
vC, conflicting volume	1146	323	645			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	831	323	645			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	89	100			
cM capacity (veh/h)	263	673	936			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	74	537	537	382	263
Volume Left	0	0	0	0	0
Volume Right	74	0	0	0	72
cSH	673	1700	1700	1700	1700
Volume to Capacity	0.11	0.32	0.32	0.22	0.15
Queue Length 95th (m)	2.9	0.0	0.0	0.0	0.0
Control Delay (s/veh)	11.0	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s/veh)	11.0	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	30.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBT	SBL
Lane Configurations			
Traffic Volume (vph)	225	255	111
Future Volume (vph)	225	255	111
Lane Group Flow (vph)	253	409	132
Sign Control	Free	Free	Stop

Intersection Summary
Control Type: Unsignalized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	225	255	121	111	10
Future Volume (Veh/h)	7	225	255	121	111	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	245	277	132	121	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			130			
pX, platoon unblocked	0.89				0.89	0.89
vC, conflicting volume	409				604	343
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	274				493	199
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				74	99
cM capacity (veh/h)	1147				473	749

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	253	409	132
Volume Left	8	0	121
Volume Right	0	132	11
cSH	1147	1700	488
Volume to Capacity	0.01	0.24	0.27
Queue Length 95th (m)	0.2	0.0	8.7
Control Delay (s/veh)	0.3	0.0	15.1
Lane LOS	A		C
Approach Delay (s/veh)	0.3	0.0	15.1
Approach LOS			C

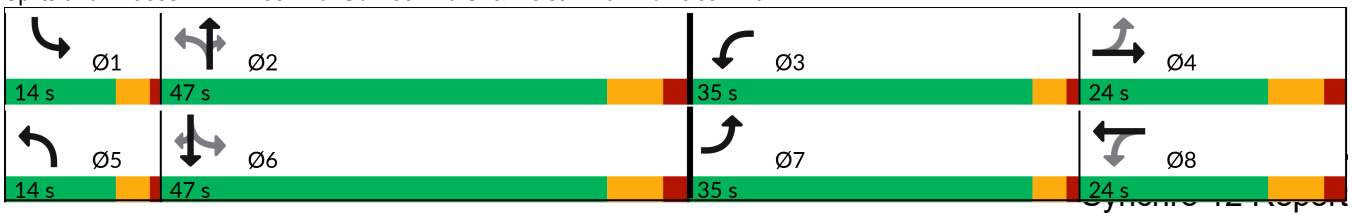
Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		

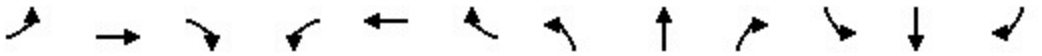
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	77	65	64	13	212	490	165	129	854	74
Future Volume (vph)	77	65	64	13	212	490	165	129	854	74
Lane Group Flow (vph)	88	257	73	62	241	557	188	147	970	84
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	15.0	5.0	15.0	8.0	40.0	40.0	8.0	40.0	40.0
Minimum Split (s)	9.0	22.0	9.0	22.0	12.0	47.0	47.0	12.0	47.0	47.0
Total Split (s)	35.0	24.0	35.0	24.0	14.0	47.0	47.0	14.0	47.0	47.0
Total Split (%)	29.2%	20.0%	29.2%	20.0%	11.7%	39.2%	39.2%	11.7%	39.2%	39.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
v/c Ratio	0.26	0.91	0.34	0.28	1.13	0.42	0.26	0.32	0.73	0.12
Control Delay (s/veh)	24.6	64.1	27.1	19.2	120.1	23.0	4.2	13.1	29.6	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	24.6	64.1	27.1	19.2	120.1	23.0	4.2	13.1	29.6	2.7
Queue Length 50th (m)	12.4	36.1	10.3	2.7	~39.1	43.3	0.0	13.6	88.5	0.0
Queue Length 95th (m)	23.5	#86.4	20.4	14.6	#90.8	61.1	13.2	25.4	117.6	5.7
Internal Link Dist (m)		106.5		215.4		432.3			100.5	
Turn Bay Length (m)	54.0		55.0		142.0		66.0	62.0		62.0
Base Capacity (vph)	453	282	369	225	214	1316	720	468	1337	722
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.91	0.20	0.28	1.13	0.42	0.26	0.31	0.73	0.12

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 98.7
Natural Cycle: 90
Control Type: Semi Act-Uncoord
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Brock Rd. S./Brock Rd.S. & Mclean Rd. W./Mclean Rd.W.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	65	161	64	13	41	212	490	165	129	854	74
Future Volume (vph)	77	65	161	64	13	41	212	490	165	129	854	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.89		1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1289	1222		1106	1079		1180	3167	1468	1626	3282	1615
Flt Permitted	0.71	1.00		0.37	1.00		0.17	1.00	1.00	0.40	1.00	1.00
Satd. Flow (perm)	967	1222		426	1079		212	3167	1468	691	3282	1615
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	88	74	183	73	15	47	241	557	188	147	970	84
RTOR Reduction (vph)	0	71	0	0	39	0	0	0	111	0	0	50
Lane Group Flow (vph)	88	186	0	73	23	0	241	557	77	147	970	34
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	40%	12%	47%	63%	100%	42%	53%	14%	10%	11%	10%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	27.3	17.1		27.1	17.0		51.1	41.0	41.0	49.5	40.2	40.2
Effective Green, g (s)	27.3	17.1		27.1	17.0		51.1	41.0	41.0	49.5	40.2	40.2
Actuated g/C Ratio	0.27	0.17		0.27	0.17		0.51	0.41	0.41	0.50	0.40	0.40
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	5.0	3.0		5.0	3.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	298	210		185	184		207	1304	604	431	1325	652
v/s Ratio Prot	0.03	c0.15		c0.04	0.02		c0.12	0.18		0.03	0.30	
v/s Ratio Perm	0.05			0.07			c0.48		0.05	0.14		0.02
v/c Ratio	0.30	0.88		0.39	0.13		1.16	0.43	0.13	0.34	0.73	0.05
Uniform Delay, d1	28.1	40.2		28.4	34.9		18.1	20.9	18.2	13.9	25.1	18.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	32.6		2.9	0.3		113.9	1.0	0.4	0.5	3.6	0.2
Delay (s)	29.3	72.9		31.3	35.3		132.0	21.9	18.6	14.4	28.7	18.2
Level of Service	C	E		C	D		F	C	B	B	C	B
Approach Delay (s/veh)		61.7			33.1			48.2			26.2	
Approach LOS		E			C			D			C	

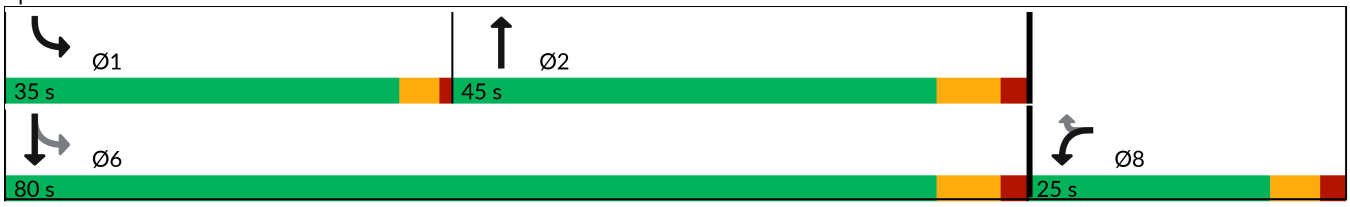
Intersection Summary			
HCM 2000 Control Delay (s/veh)	39.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	99.5	Sum of lost time (s)	22.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	136	140	723	185	881
Future Volume (vph)	136	140	723	185	881
Lane Group Flow (vph)	148	152	899	201	958
Turn Type	Prot	Perm	NA	pm+pt	NA
Protected Phases	8		2	1	6
Permitted Phases		8		6	
Detector Phase	8	8	2	1	6
Switch Phase					
Minimum Initial (s)	15.0	15.0	35.0	10.0	35.0
Minimum Split (s)	21.0	21.0	42.0	14.0	42.0
Total Split (s)	25.0	25.0	45.0	35.0	80.0
Total Split (%)	23.8%	23.8%	42.9%	33.3%	76.2%
Yellow Time (s)	4.0	4.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	4.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	Max	None	Max
v/c Ratio	0.61	0.43	0.56	0.43	0.45
Control Delay (s/veh)	51.2	10.4	16.5	7.1	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	51.2	10.4	16.5	7.1	7.3
Queue Length 50th (m)	29.2	0.0	58.8	10.8	39.8
Queue Length 95th (m)	50.7	17.6	87.3	19.0	54.7
Internal Link Dist (m)	497.7		346.3		432.3
Turn Bay Length (m)	56.0			21.0	
Base Capacity (vph)	272	374	1617	706	2149
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.54	0.41	0.56	0.28	0.45

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 103.1
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 2: Brock Rd. S. & Nicholas Beaver Rd.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	136	140	723	104	185	881
Future Volume (vph)	136	140	723	104	185	881
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		4.0	7.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1480	1357	2891		1703	3034
Flt Permitted	0.95	1.00	1.00		0.25	1.00
Satd. Flow (perm)	1480	1357	2891		445	3034
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	148	152	786	113	201	958
RTOR Reduction (vph)	0	127	8	0	0	0
Lane Group Flow (vph)	148	25	891	0	201	958
Confl. Peds. (#/hr)				3	3	
Heavy Vehicles (%)	22%	19%	22%	22%	6%	19%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	17.0	17.0	57.4		73.0	73.0
Effective Green, g (s)	17.0	17.0	57.4		73.0	73.0
Actuated g/C Ratio	0.17	0.17	0.56		0.71	0.71
Clearance Time (s)	6.0	6.0	7.0		4.0	7.0
Vehicle Extension (s)	5.0	5.0	0.2		5.0	0.2
Lane Grp Cap (vph)	244	223	1611		457	2150
v/s Ratio Prot	c0.10		c0.31		0.05	c0.32
v/s Ratio Perm		0.02			0.26	
v/c Ratio	0.61	0.11	0.55		0.44	0.45
Uniform Delay, d1	39.9	36.6	14.6		6.3	6.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	6.2	0.5	1.4		1.4	0.7
Delay (s)	46.1	37.1	16.0		7.7	7.1
Level of Service	D	D	B		A	A
Approach Delay (s/veh)	41.5		16.0			7.2
Approach LOS	D		B			A

Intersection Summary			
HCM 2000 Control Delay (s/veh)	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBR	NBT	SBT
Lane Configurations			
Traffic Volume (vph)	107	607	950
Future Volume (vph)	107	607	950
Lane Group Flow (vph)	116	660	1148
Sign Control		Free	Free

Intersection Summary
Control Type: Unsignalized

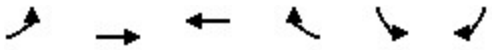
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	107	0	607	950	106
Future Volume (Veh/h)	0	107	0	607	950	106
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	116	0	660	1033	115
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				124		
pX, platoon unblocked	0.89					
vC, conflicting volume	1421	574	1148			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1218	574	1148			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	75	100			
cM capacity (veh/h)	153	462	604			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	116	330	330	689	459
Volume Left	0	0	0	0	0
Volume Right	116	0	0	0	115
cSH	462	1700	1700	1700	1700
Volume to Capacity	0.25	0.19	0.19	0.41	0.27
Queue Length 95th (m)	7.9	0.0	0.0	0.0	0.0
Control Delay (s/veh)	15.4	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s/veh)	15.4	0.0		0.0	
Approach LOS	C				

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	42.9%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBT	WBT	SBL
Lane Configurations			
Traffic Volume (vph)	219	213	84
Future Volume (vph)	219	213	84
Lane Group Flow (vph)	248	324	99
Sign Control	Free	Free	Stop

Intersection Summary
Control Type: Unsignalized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	219	213	85	84	7
Future Volume (Veh/h)	9	219	213	85	84	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	238	232	92	91	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			130			
pX, platoon unblocked	0.90				0.90	0.90
vC, conflicting volume	324				536	278
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	200				435	150
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				82	99
cM capacity (veh/h)	1241				519	812

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	248	324	99
Volume Left	10	0	91
Volume Right	0	92	8
cSH	1241	1700	535
Volume to Capacity	0.01	0.19	0.19
Queue Length 95th (m)	0.2	0.0	5.4
Control Delay (s/veh)	0.4	0.0	13.3
Lane LOS	A		B
Approach Delay (s/veh)	0.4	0.0	13.3
Approach LOS			B

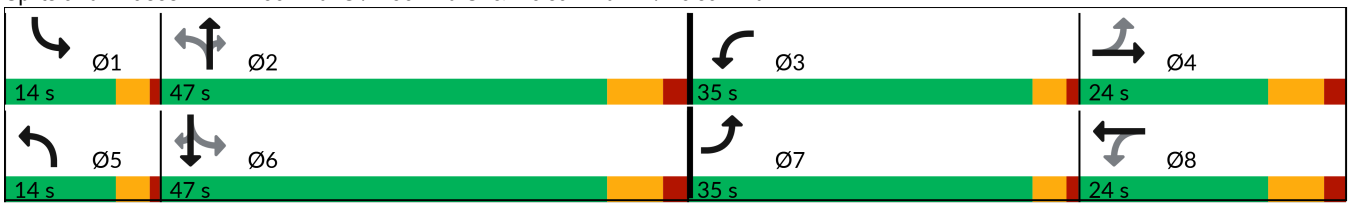
Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	30.6%	ICU Level of Service	A
Analysis Period (min)	15		

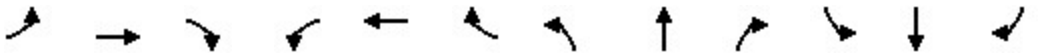
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	178	16	159	77	287	765	57	40	577	33
Future Volume (vph)	178	16	159	77	287	765	57	40	577	33
Lane Group Flow (vph)	187	183	167	219	302	805	60	42	607	35
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	15.0	5.0	15.0	8.0	40.0	40.0	8.0	40.0	40.0
Minimum Split (s)	9.0	22.0	9.0	22.0	12.0	47.0	47.0	12.0	47.0	47.0
Total Split (s)	35.0	24.0	35.0	24.0	14.0	47.0	47.0	14.0	47.0	47.0
Total Split (%)	29.2%	20.0%	29.2%	20.0%	11.7%	39.2%	39.2%	11.7%	39.2%	39.2%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max	Max
v/c Ratio	0.47	0.55	0.49	0.75	0.76	0.52	0.10	0.17	0.47	0.06
Control Delay (s/veh)	27.0	15.6	28.2	47.7	30.7	24.3	0.9	14.2	26.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	27.0	15.6	28.2	47.7	30.7	24.3	0.9	14.2	26.3	0.2
Queue Length 50th (m)	27.6	3.2	25.0	32.8	34.3	69.4	0.0	4.0	50.7	0.0
Queue Length 95th (m)	44.7	25.8	42.1	#68.9	#78.1	101.5	1.6	10.8	74.0	0.0
Internal Link Dist (m)		106.5		215.4		432.3			100.5	
Turn Bay Length (m)	54.0		55.0		142.0		66.0	62.0		62.0
Base Capacity (vph)	570	347	453	301	396	1553	629	269	1295	543
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.53	0.37	0.73	0.76	0.52	0.10	0.16	0.47	0.06

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 104.4
Natural Cycle: 90
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Brock Rd. S./Brock Rd.S. & Mclean Rd. W./Mclean Rd.W.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	178	16	158	159	77	131	287	765	57	40	577	33
Future Volume (vph)	178	16	158	159	77	131	287	765	57	40	577	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.86		1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1703	1277		1346	1511		1626	3471	1272	1203	3374	1241
Flt Permitted	0.45	1.00		0.48	1.00		0.32	1.00	1.00	0.30	1.00	1.00
Satd. Flow (perm)	809	1277		674	1511		551	3471	1272	374	3374	1241
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	187	17	166	167	81	138	302	805	60	42	607	35
RTOR Reduction (vph)	0	142	0	0	51	0	0	0	34	0	0	21
Lane Group Flow (vph)	187	41	0	167	168	0	302	805	26	42	607	14
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	6%	25%	27%	34%	5%	19%	11%	4%	27%	50%	7%	27%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	31.2	15.6		33.4	16.7		55.7	46.7	46.7	46.7	41.7	41.7
Effective Green, g (s)	31.2	15.6		33.4	16.7		55.7	46.7	46.7	46.7	41.7	41.7
Actuated g/C Ratio	0.29	0.15		0.32	0.16		0.53	0.44	0.44	0.44	0.39	0.39
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	5.0	3.0		5.0	3.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	369	187		318	238		390	1529	560	203	1327	488
v/s Ratio Prot	0.07	0.03		c0.08	c0.11		c0.07	0.23		0.01	0.18	
v/s Ratio Perm	0.07			0.08			c0.33		0.02	0.08		0.01
v/c Ratio	0.51	0.22		0.53	0.71		0.77	0.53	0.05	0.21	0.46	0.03
Uniform Delay, d1	29.8	39.8		28.5	42.3		16.9	21.6	16.9	17.4	23.8	19.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	0.6		3.0	9.2		9.3	1.3	0.2	0.5	1.1	0.1
Delay (s)	32.0	40.4		31.5	51.6		26.1	22.9	17.1	17.9	24.9	19.8
Level of Service	C	D		C	D		C	C	B	B	C	B
Approach Delay (s/veh)		36.2			42.9			23.4			24.2	
Approach LOS		D			D			C			C	

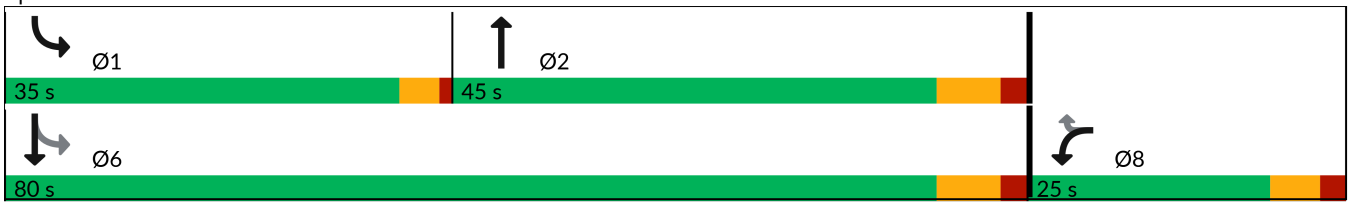
Intersection Summary			
HCM 2000 Control Delay (s/veh)	28.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	155	183	942	57	849
Future Volume (vph)	155	183	942	57	849
Lane Group Flow (vph)	178	210	1116	66	976
Turn Type	Prot	Perm	NA	pm+pt	NA
Protected Phases	8		2	1	6
Permitted Phases		8		6	
Detector Phase	8	8	2	1	6
Switch Phase					
Minimum Initial (s)	15.0	15.0	35.0	10.0	35.0
Minimum Split (s)	21.0	21.0	42.0	14.0	42.0
Total Split (s)	25.0	25.0	45.0	35.0	80.0
Total Split (%)	23.8%	23.8%	42.9%	33.3%	76.2%
Yellow Time (s)	4.0	4.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	4.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	Max	None	Max
v/c Ratio	0.65	0.49	0.56	0.20	0.42
Control Delay (s/veh)	51.9	9.5	14.8	5.4	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	51.9	9.5	14.8	5.4	7.2
Queue Length 50th (m)	35.5	0.0	76.5	3.4	41.0
Queue Length 95th (m)	56.6	18.0	93.6	7.0	51.4
Internal Link Dist (m)	497.7		346.3		432.3
Turn Bay Length (m)	56.0			21.0	
Base Capacity (vph)	303	450	2000	580	2302
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.59	0.47	0.56	0.11	0.42

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 103.7
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 2: Brock Rd. S. & Nicholas Beaver Rd.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	155	183	942	29	57	849
Future Volume (vph)	155	183	942	29	57	849
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		4.0	7.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1656	1524	3331		1504	3252
Flt Permitted	0.95	1.00	1.00		0.19	1.00
Satd. Flow (perm)	1656	1524	3331		297	3252
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	178	210	1083	33	66	976
RTOR Reduction (vph)	0	175	1	0	0	0
Lane Group Flow (vph)	178	35	1115	0	66	976
Confl. Peds. (#/hr)				1	1	
Heavy Vehicles (%)	9%	6%	6%	67%	20%	11%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	17.3	17.3	62.2		74.2	74.2
Effective Green, g (s)	17.3	17.3	62.2		74.2	74.2
Actuated g/C Ratio	0.17	0.17	0.60		0.71	0.71
Clearance Time (s)	6.0	6.0	7.0		4.0	7.0
Vehicle Extension (s)	5.0	5.0	0.2		5.0	0.2
Lane Grp Cap (vph)	274	252	1982		303	2309
v/s Ratio Prot	c0.11		c0.33		0.02	c0.30
v/s Ratio Perm		0.02			0.14	
v/c Ratio	0.65	0.14	0.56		0.22	0.42
Uniform Delay, d1	40.8	37.2	12.9		6.3	6.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	7.1	0.5	1.2		0.8	0.6
Delay (s)	47.9	37.8	14.0		7.1	6.8
Level of Service	D	D	B		A	A
Approach Delay (s/veh)	42.4		14.0			6.9
Approach LOS	D		B			A

Intersection Summary			
HCM 2000 Control Delay (s/veh)	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	104.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBR	NBT	SBT
Lane Configurations			
Traffic Volume (vph)	68	1073	580
Future Volume (vph)	68	1073	580
Lane Group Flow (vph)	74	1166	702
Sign Control		Free	Free

Intersection Summary

Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	68	0	1073	580	66
Future Volume (Veh/h)	0	68	0	1073	580	66
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	74	0	1166	630	72
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				124		
pX, platoon unblocked	0.83					
vC, conflicting volume	1249	351	702			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	896	351	702			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	89	100			
cM capacity (veh/h)	233	645	891			

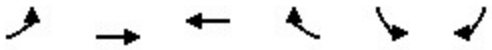
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	74	583	583	420	282
Volume Left	0	0	0	0	0
Volume Right	74	0	0	0	72
cSH	645	1700	1700	1700	1700
Volume to Capacity	0.11	0.34	0.34	0.25	0.17
Queue Length 95th (m)	3.1	0.0	0.0	0.0	0.0
Control Delay (s/veh)	11.3	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s/veh)	11.3	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	33.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBT	SBL
Lane Configurations			
Traffic Volume (vph)	239	273	111
Future Volume (vph)	239	273	111
Lane Group Flow (vph)	268	429	132
Sign Control	Free	Free	Stop

Intersection Summary

Control Type: Unsignalized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	239	273	121	111	10
Future Volume (Veh/h)	7	239	273	121	111	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	260	297	132	121	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			130			
pX, platoon unblocked	0.88				0.88	0.88
vC, conflicting volume	429				639	363
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	284				522	209
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				73	98
cM capacity (veh/h)	1126				450	732

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	268	429	132
Volume Left	8	0	121
Volume Right	0	132	11
cSH	1126	1700	465
Volume to Capacity	0.01	0.25	0.28
Queue Length 95th (m)	0.2	0.0	9.3
Control Delay (s/veh)	0.3	0.0	15.8
Lane LOS	A		C
Approach Delay (s/veh)	0.3	0.0	15.8
Approach LOS			C

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	35.2%	ICU Level of Service	A
Analysis Period (min)	15		

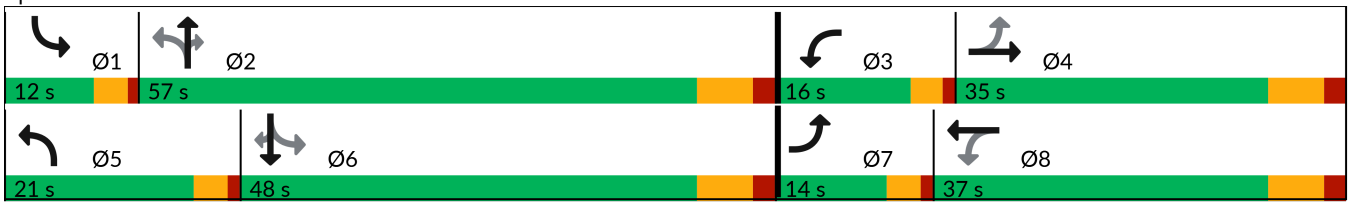
Appendix K

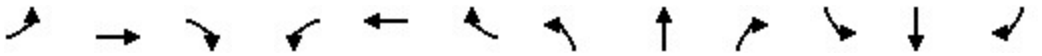
Optimized Existing, Future Background, and Future Total Synchro Reports

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	12	64	64	10	130	532	165	125	817	74
Future Volume (vph)	12	64	64	10	130	532	165	125	817	74
Lane Group Flow (vph)	14	238	73	58	148	605	188	142	928	84
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	15.0	5.0	15.0	8.0	40.0	40.0	8.0	40.0	40.0
Minimum Split (s)	9.0	22.0	9.0	22.0	12.0	47.0	47.0	12.0	47.0	47.0
Total Split (s)	14.0	35.0	16.0	37.0	21.0	57.0	57.0	12.0	48.0	48.0
Total Split (%)	11.7%	29.2%	13.3%	30.8%	17.5%	47.5%	47.5%	10.0%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Max	Max	Max	None	Min	Min
v/c Ratio	0.05	0.79	0.36	0.19	0.55	0.41	0.24	0.34	0.75	0.12
Control Delay (s/veh)	23.8	46.5	30.3	14.5	22.6	22.2	3.9	15.2	35.5	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	23.8	46.5	30.3	14.5	22.6	22.2	3.9	15.2	35.5	0.5
Queue Length 50th (m)	2.1	34.1	11.6	1.7	15.3	48.7	0.0	14.1	97.9	0.0
Queue Length 95th (m)	6.5	62.3	22.3	12.9	35.8	70.7	13.2	27.6	133.3	0.3
Internal Link Dist (m)		106.5		215.4		432.3			100.5	
Turn Bay Length (m)	54.0		55.0		142.0		66.0	62.0		62.0
Base Capacity (vph)	306	384	210	347	269	1465	780	415	1245	703
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.62	0.35	0.17	0.55	0.41	0.24	0.34	0.75	0.12

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 109.1
Natural Cycle: 90
Control Type: Semi Act-Uncoord

Splits and Phases: 1: Brock Rd. S./Brock Rd.S. & Mclean Rd. W./Mclean Rd.W.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	64	145	64	10	41	130	532	165	125	817	74
Future Volume (vph)	12	64	145	64	10	41	130	532	165	125	817	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.90		1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1289	1232		1106	1091		1180	3167	1468	1626	3282	1615
Flt Permitted	0.72	1.00		0.36	1.00		0.15	1.00	1.00	0.42	1.00	1.00
Satd. Flow (perm)	976	1232		417	1091		188	3167	1468	724	3282	1615
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	14	73	165	73	11	47	148	605	188	142	928	84
RTOR Reduction (vph)	0	71	0	0	35	0	0	0	103	0	0	53
Lane Group Flow (vph)	14	167	0	73	23	0	148	605	85	142	928	31
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	40%	12%	47%	63%	100%	42%	53%	14%	10%	11%	10%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	25.2	21.8		34.8	27.4		62.6	50.5	50.5	49.5	41.4	41.4
Effective Green, g (s)	25.2	21.8		34.8	27.4		62.6	50.5	50.5	49.5	41.4	41.4
Actuated g/C Ratio	0.23	0.20		0.31	0.25		0.56	0.45	0.45	0.44	0.37	0.37
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	5.0	3.0		5.0	3.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	230	241		185	268		258	1435	665	387	1219	600
v/s Ratio Prot	0.00	c0.14		c0.03	0.02		c0.09	0.19		0.03	c0.28	
v/s Ratio Perm	0.01			0.09			0.23		0.06	0.14		0.02
v/c Ratio	0.06	0.69		0.39	0.08		0.57	0.42	0.13	0.37	0.76	0.05
Uniform Delay, d1	33.7	41.7		28.8	32.3		16.1	20.6	17.7	18.8	30.7	22.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	8.4		2.9	0.1		9.0	0.9	0.4	0.6	3.4	0.1
Delay (s)	33.9	50.1		31.7	32.5		25.1	21.5	18.1	19.4	34.0	22.5
Level of Service	C	D		C	C		C	C	B	B	C	C
Approach Delay (s/veh)		49.2			32.0			21.4			31.4	
Approach LOS		D			C			C			C	

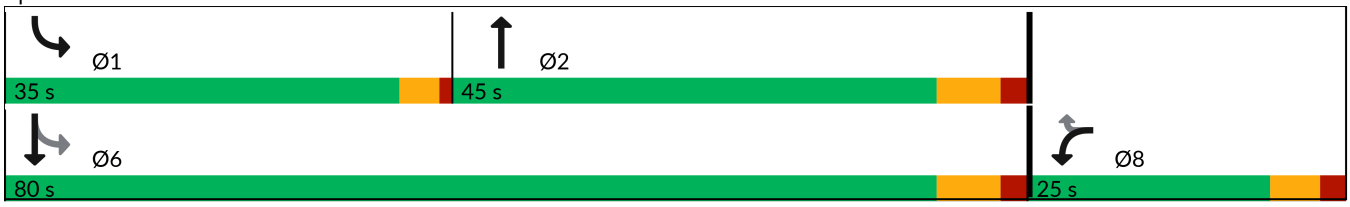
Intersection Summary			
HCM 2000 Control Delay (s/veh)	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	111.4	Sum of lost time (s)	22.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	136	130	694	173	841
Future Volume (vph)	136	130	694	173	841
Lane Group Flow (vph)	148	141	867	188	914
Turn Type	Prot	Perm	NA	pm+pt	NA
Protected Phases	8		2	1	6
Permitted Phases		8		6	
Detector Phase	8	8	2	1	6
Switch Phase					
Minimum Initial (s)	15.0	15.0	35.0	10.0	35.0
Minimum Split (s)	21.0	21.0	42.0	14.0	42.0
Total Split (s)	25.0	25.0	45.0	35.0	80.0
Total Split (%)	23.8%	23.8%	42.9%	33.3%	76.2%
Yellow Time (s)	4.0	4.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	4.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	Max	None	Max
v/c Ratio	0.61	0.41	0.53	0.39	0.43
Control Delay (s/veh)	51.2	10.4	15.8	6.6	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	51.2	10.4	15.8	6.6	7.1
Queue Length 50th (m)	29.2	0.0	55.2	10.0	37.1
Queue Length 95th (m)	50.7	16.9	80.4	17.8	51.4
Internal Link Dist (m)	497.7		346.3		432.3
Turn Bay Length (m)	56.0			21.0	
Base Capacity (vph)	272	365	1626	717	2149
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.54	0.39	0.53	0.26	0.43

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 103.1
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 2: Brock Rd. S. & Nicholas Beaver Rd.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	136	130	694	104	173	841
Future Volume (vph)	136	130	694	104	173	841
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		4.0	7.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1480	1357	2889		1703	3034
Flt Permitted	0.95	1.00	1.00		0.26	1.00
Satd. Flow (perm)	1480	1357	2889		469	3034
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	148	141	754	113	188	914
RTOR Reduction (vph)	0	118	8	0	0	0
Lane Group Flow (vph)	148	23	859	0	188	914
Confl. Peds. (#/hr)				3	3	
Heavy Vehicles (%)	22%	19%	22%	22%	6%	19%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	17.0	17.0	57.8		73.0	73.0
Effective Green, g (s)	17.0	17.0	57.8		73.0	73.0
Actuated g/C Ratio	0.17	0.17	0.56		0.71	0.71
Clearance Time (s)	6.0	6.0	7.0		4.0	7.0
Vehicle Extension (s)	5.0	5.0	0.2		5.0	0.2
Lane Grp Cap (vph)	244	223	1621		466	2150
v/s Ratio Prot	c0.10		c0.30		0.04	c0.30
v/s Ratio Perm		0.02			0.24	
v/c Ratio	0.61	0.10	0.53		0.40	0.43
Uniform Delay, d1	39.9	36.5	14.1		6.0	6.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	6.2	0.4	1.2		1.2	0.6
Delay (s)	46.1	37.0	15.4		7.2	6.9
Level of Service	D	D	B		A	A
Approach Delay (s/veh)	41.6		15.4			6.9
Approach LOS	D		B			A

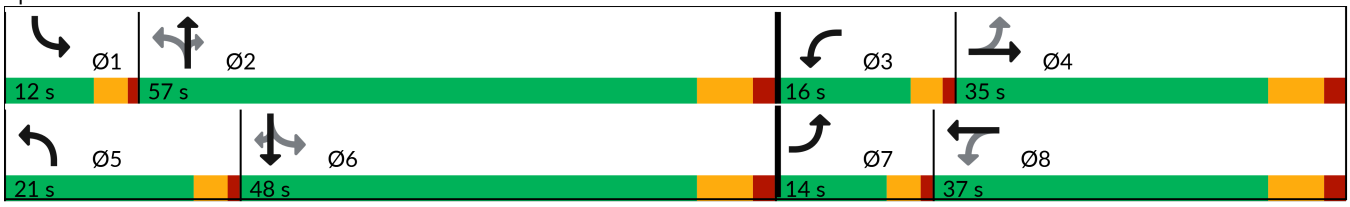
Intersection Summary			
HCM 2000 Control Delay (s/veh)	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

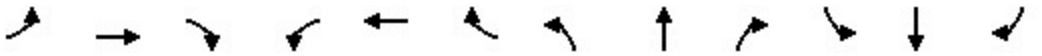
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	78	15	159	71	172	829	57	38	552	33
Future Volume (vph)	78	15	159	71	172	829	57	38	552	33
Lane Group Flow (vph)	82	171	167	213	181	873	60	40	581	35
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	15.0	5.0	15.0	8.0	40.0	40.0	8.0	40.0	40.0
Minimum Split (s)	9.0	22.0	9.0	22.0	12.0	47.0	47.0	12.0	47.0	47.0
Total Split (s)	14.0	35.0	16.0	37.0	21.0	57.0	57.0	12.0	48.0	48.0
Total Split (%)	11.7%	29.2%	13.3%	30.8%	17.5%	47.5%	47.5%	10.0%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Max	Max	Max	None	Min	Min
v/c Ratio	0.24	0.52	0.60	0.59	0.36	0.50	0.09	0.16	0.46	0.06
Control Delay (s/veh)	27.5	14.5	38.3	34.1	12.5	20.5	0.7	12.2	27.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	27.5	14.5	38.3	34.1	12.5	20.5	0.7	12.2	27.4	0.2
Queue Length 50th (m)	12.8	3.1	28.4	29.1	16.3	69.5	0.0	3.3	49.3	0.0
Queue Length 95th (m)	24.3	23.4	47.3	55.1	31.8	99.8	1.3	9.1	72.4	0.0
Internal Link Dist (m)		106.5		215.4		432.3			100.5	
Turn Bay Length (m)	54.0		55.0		142.0		66.0	62.0		62.0
Base Capacity (vph)	351	445	277	472	503	1746	694	254	1277	559
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.38	0.60	0.45	0.36	0.50	0.09	0.16	0.45	0.06

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 108.4
Natural Cycle: 90
Control Type: Semi Act-Uncoord

Splits and Phases: 1: Brock Rd. S./Brock Rd.S. & Mclean Rd. W./Mclean Rd.W.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	15	147	159	71	131	172	829	57	38	552	33
Future Volume (vph)	78	15	147	159	71	131	172	829	57	38	552	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.86		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1703	1277		1346	1504		1626	3471	1272	1203	3374	1240
Flt Permitted	0.59	1.00		0.44	1.00		0.33	1.00	1.00	0.33	1.00	1.00
Satd. Flow (perm)	1065	1277		630	1504		564	3471	1272	412	3374	1240
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	82	16	155	167	75	138	181	873	60	40	581	35
RTOR Reduction (vph)	0	130	0	0	60	0	0	0	30	0	0	22
Lane Group Flow (vph)	82	41	0	167	153	0	181	873	30	40	581	13
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	6%	25%	27%	34%	5%	19%	11%	4%	27%	50%	7%	27%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	25.4	17.5		33.5	21.6		63.2	54.5	54.5	46.9	42.2	42.2
Effective Green, g (s)	25.4	17.5		33.5	21.6		63.2	54.5	54.5	46.9	42.2	42.2
Actuated g/C Ratio	0.23	0.16		0.30	0.20		0.57	0.49	0.49	0.42	0.38	0.38
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	5.0	3.0		5.0	3.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	289	201		268	293		485	1708	626	208	1286	472
v/s Ratio Prot	0.02	0.03		c0.07	0.10		c0.06	c0.25		0.01	0.17	
v/s Ratio Perm	0.04			c0.12			0.16		0.02	0.07		0.01
v/c Ratio	0.28	0.20		0.62	0.52		0.37	0.51	0.05	0.19	0.45	0.03
Uniform Delay, d1	34.5	40.5		31.0	39.9		12.2	19.1	14.6	19.0	25.6	21.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	0.5		6.3	1.7		2.2	1.1	0.1	0.5	0.5	0.1
Delay (s)	35.7	41.0		37.2	41.6		14.4	20.2	14.7	19.5	26.1	21.5
Level of Service	D	D		D	D		B	C	B	B	C	C
Approach Delay (s/veh)		39.3			39.7			18.9			25.5	
Approach LOS		D			D			B			C	

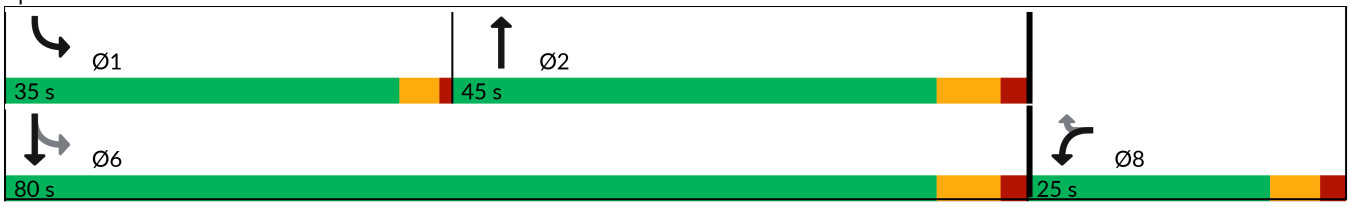
Intersection Summary			
HCM 2000 Control Delay (s/veh)	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	110.7	Sum of lost time (s)	22.0
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	155	170	905	53	816
Future Volume (vph)	155	170	905	53	816
Lane Group Flow (vph)	178	195	1073	61	938
Turn Type	Prot	Perm	NA	pm+pt	NA
Protected Phases	8		2	1	6
Permitted Phases		8		6	
Detector Phase	8	8	2	1	6
Switch Phase					
Minimum Initial (s)	15.0	15.0	35.0	10.0	35.0
Minimum Split (s)	21.0	21.0	42.0	14.0	42.0
Total Split (s)	25.0	25.0	45.0	35.0	80.0
Total Split (%)	23.8%	23.8%	42.9%	33.3%	76.2%
Yellow Time (s)	4.0	4.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	4.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	Max	None	Max
v/c Ratio	0.65	0.47	0.54	0.18	0.41
Control Delay (s/veh)	52.0	9.5	14.4	5.2	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	52.0	9.5	14.4	5.2	7.0
Queue Length 50th (m)	35.5	0.0	72.3	3.1	38.7
Queue Length 95th (m)	56.6	17.4	88.5	6.5	48.7
Internal Link Dist (m)	497.7		346.3		432.3
Turn Bay Length (m)	56.0			21.0	
Base Capacity (vph)	302	438	1999	588	2303
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.59	0.45	0.54	0.10	0.41

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 103.9
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 2: Brock Rd. S. & Nicholas Beaver Rd.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	155	170	905	29	53	816
Future Volume (vph)	155	170	905	29	53	816
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		4.0	7.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1656	1524	3329		1504	3252
Flt Permitted	0.95	1.00	1.00		0.20	1.00
Satd. Flow (perm)	1656	1524	3329		318	3252
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	178	195	1040	33	61	938
RTOR Reduction (vph)	0	163	1	0	0	0
Lane Group Flow (vph)	178	32	1072	0	61	938
Confl. Peds. (#/hr)				1	1	
Heavy Vehicles (%)	9%	6%	6%	67%	20%	11%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	17.3	17.3	62.4		74.4	74.4
Effective Green, g (s)	17.3	17.3	62.4		74.4	74.4
Actuated g/C Ratio	0.17	0.17	0.60		0.71	0.71
Clearance Time (s)	6.0	6.0	7.0		4.0	7.0
Vehicle Extension (s)	5.0	5.0	0.2		5.0	0.2
Lane Grp Cap (vph)	273	251	1984		316	2310
v/s Ratio Prot	c0.11		c0.32		0.01	c0.29
v/s Ratio Perm		0.02			0.12	
v/c Ratio	0.65	0.13	0.54		0.19	0.41
Uniform Delay, d1	40.9	37.3	12.6		6.1	6.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	7.3	0.5	1.1		0.6	0.5
Delay (s)	48.2	37.8	13.7		6.7	6.7
Level of Service	D	D	B		A	A
Approach Delay (s/veh)	42.7		13.7			6.7
Approach LOS	D		B			A

Intersection Summary			
HCM 2000 Control Delay (s/veh)	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	104.7	Sum of lost time (s)	17.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

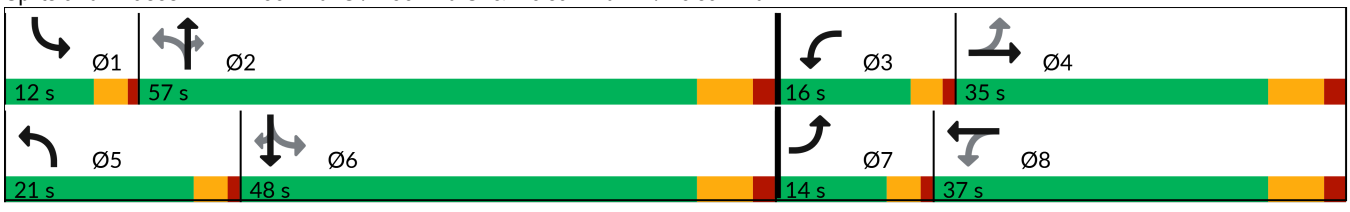
c Critical Lane Group

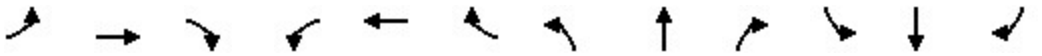
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	77	65	64	13	212	490	165	129	854	74
Future Volume (vph)	77	65	64	13	212	490	165	129	854	74
Lane Group Flow (vph)	88	257	73	62	241	557	188	147	970	84
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	15.0	5.0	15.0	8.0	40.0	40.0	8.0	40.0	40.0
Minimum Split (s)	9.0	22.0	9.0	22.0	12.0	47.0	47.0	12.0	47.0	47.0
Total Split (s)	14.0	35.0	16.0	37.0	21.0	57.0	57.0	12.0	48.0	48.0
Total Split (%)	11.7%	29.2%	13.3%	30.8%	17.5%	47.5%	47.5%	10.0%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Max	Max	Max	None	Min	Min
v/c Ratio	0.28	0.82	0.37	0.24	0.93	0.38	0.24	0.35	0.79	0.12
Control Delay (s/veh)	27.7	47.8	30.4	16.8	67.6	22.3	3.9	15.7	37.8	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	27.7	47.8	30.4	16.8	67.6	22.3	3.9	15.7	37.8	0.5
Queue Length 50th (m)	14.1	37.1	11.6	2.8	38.3	45.4	0.0	15.3	107.1	0.0
Queue Length 95th (m)	25.7	67.1	22.3	14.0	#95.1	64.5	13.2	28.5	141.4	0.3
Internal Link Dist (m)		106.5		215.4		432.3			100.5	
Turn Bay Length (m)	54.0		55.0		142.0		66.0	62.0		62.0
Base Capacity (vph)	311	385	207	331	258	1452	775	425	1234	698
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.67	0.35	0.19	0.93	0.38	0.24	0.35	0.79	0.12

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 110.1
Natural Cycle: 90
Control Type: Semi Act-Uncoord
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Brock Rd. S./Brock Rd.S. & Mclean Rd. W./Mclean Rd.W.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	65	161	64	13	41	212	490	165	129	854	74
Future Volume (vph)	77	65	161	64	13	41	212	490	165	129	854	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.89		1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1289	1222		1106	1079		1180	3167	1468	1626	3282	1615
Flt Permitted	0.72	1.00		0.36	1.00		0.14	1.00	1.00	0.44	1.00	1.00
Satd. Flow (perm)	973	1222		414	1079		169	3167	1468	759	3282	1615
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	88	74	183	73	15	47	241	557	188	147	970	84
RTOR Reduction (vph)	0	78	0	0	37	0	0	0	102	0	0	53
Lane Group Flow (vph)	88	179	0	73	25	0	241	557	86	147	970	31
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	40%	12%	47%	63%	100%	42%	53%	14%	10%	11%	10%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	29.0	21.3		31.6	22.6		62.6	50.5	50.5	49.5	41.4	41.4
Effective Green, g (s)	29.0	21.3		31.6	22.6		62.6	50.5	50.5	49.5	41.4	41.4
Actuated g/C Ratio	0.26	0.19		0.28	0.20		0.56	0.46	0.46	0.45	0.37	0.37
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	5.0	3.0		5.0	3.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	276	234		174	219		252	1442	668	402	1225	602
v/s Ratio Prot	0.02	c0.15		c0.03	0.02		c0.15	0.18		0.03	0.30	
v/s Ratio Perm	0.06			0.09			c0.39		0.06	0.14		0.02
v/c Ratio	0.32	0.76		0.42	0.11		0.96	0.39	0.13	0.37	0.79	0.05
Uniform Delay, d1	32.5	42.4		30.8	36.0		27.2	20.0	17.5	18.7	30.9	22.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	13.7		3.4	0.2		46.5	0.8	0.4	0.6	4.1	0.1
Delay (s)	33.9	56.1		34.2	36.2		73.7	20.7	17.9	19.3	35.0	22.3
Level of Service	C	E		C	D		E	C	B	B	D	C
Approach Delay (s/veh)		50.4			35.1			33.1			32.2	
Approach LOS		D			D			C			C	

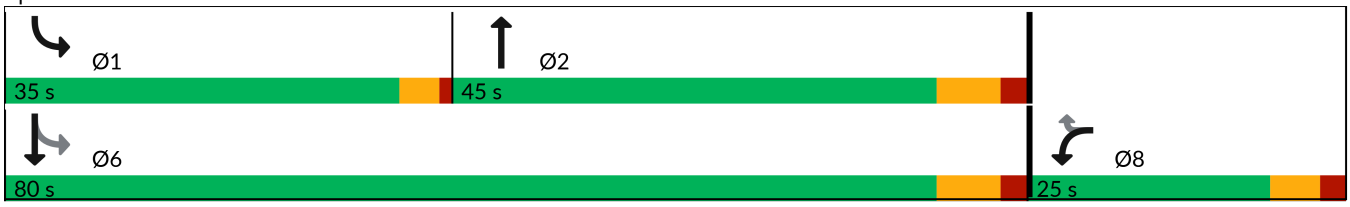
Intersection Summary			
HCM 2000 Control Delay (s/veh)	35.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	110.9	Sum of lost time (s)	22.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	136	140	723	185	881
Future Volume (vph)	136	140	723	185	881
Lane Group Flow (vph)	148	152	899	201	958
Turn Type	Prot	Perm	NA	pm+pt	NA
Protected Phases	8		2	1	6
Permitted Phases		8		6	
Detector Phase	8	8	2	1	6
Switch Phase					
Minimum Initial (s)	15.0	15.0	35.0	10.0	35.0
Minimum Split (s)	21.0	21.0	42.0	14.0	42.0
Total Split (s)	25.0	25.0	45.0	35.0	80.0
Total Split (%)	23.8%	23.8%	42.9%	33.3%	76.2%
Yellow Time (s)	4.0	4.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	4.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	Max	None	Max
v/c Ratio	0.61	0.43	0.56	0.43	0.45
Control Delay (s/veh)	51.2	10.4	16.5	7.1	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	51.2	10.4	16.5	7.1	7.3
Queue Length 50th (m)	29.2	0.0	58.8	10.8	39.8
Queue Length 95th (m)	50.7	17.6	87.3	19.0	54.7
Internal Link Dist (m)	497.7		346.3		432.3
Turn Bay Length (m)	56.0			21.0	
Base Capacity (vph)	272	374	1617	706	2149
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.54	0.41	0.56	0.28	0.45

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 103.1
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 2: Brock Rd. S. & Nicholas Beaver Rd.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	136	140	723	104	185	881
Future Volume (vph)	136	140	723	104	185	881
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		4.0	7.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1480	1357	2891		1703	3034
Flt Permitted	0.95	1.00	1.00		0.25	1.00
Satd. Flow (perm)	1480	1357	2891		445	3034
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	148	152	786	113	201	958
RTOR Reduction (vph)	0	127	8	0	0	0
Lane Group Flow (vph)	148	25	891	0	201	958
Confl. Peds. (#/hr)				3	3	
Heavy Vehicles (%)	22%	19%	22%	22%	6%	19%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	17.0	17.0	57.4		73.0	73.0
Effective Green, g (s)	17.0	17.0	57.4		73.0	73.0
Actuated g/C Ratio	0.17	0.17	0.56		0.71	0.71
Clearance Time (s)	6.0	6.0	7.0		4.0	7.0
Vehicle Extension (s)	5.0	5.0	0.2		5.0	0.2
Lane Grp Cap (vph)	244	223	1611		457	2150
v/s Ratio Prot	c0.10		c0.31		0.05	c0.32
v/s Ratio Perm		0.02			0.26	
v/c Ratio	0.61	0.11	0.55		0.44	0.45
Uniform Delay, d1	39.9	36.6	14.6		6.3	6.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	6.2	0.5	1.4		1.4	0.7
Delay (s)	46.1	37.1	16.0		7.7	7.1
Level of Service	D	D	B		A	A
Approach Delay (s/veh)	41.5		16.0			7.2
Approach LOS	D		B			A

Intersection Summary			
HCM 2000 Control Delay (s/veh)	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBR	NBT	SBT
Lane Configurations			
Traffic Volume (vph)	107	607	950
Future Volume (vph)	107	607	950
Lane Group Flow (vph)	116	660	1148
Sign Control		Free	Free

Intersection Summary
Control Type: Unsignalized

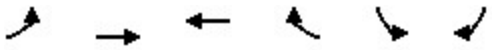
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	107	0	607	950	106
Future Volume (Veh/h)	0	107	0	607	950	106
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	116	0	660	1033	115
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				124		
pX, platoon unblocked	0.89					
vC, conflicting volume	1421	574	1148			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1234	574	1148			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	75	100			
cM capacity (veh/h)	151	462	604			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	116	330	330	689	459
Volume Left	0	0	0	0	0
Volume Right	116	0	0	0	115
cSH	462	1700	1700	1700	1700
Volume to Capacity	0.25	0.19	0.19	0.41	0.27
Queue Length 95th (m)	7.9	0.0	0.0	0.0	0.0
Control Delay (s/veh)	15.4	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s/veh)	15.4	0.0		0.0	
Approach LOS	C				

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	42.9%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBT	WBT	SBL
Lane Configurations			
Traffic Volume (vph)	219	213	84
Future Volume (vph)	219	213	84
Lane Group Flow (vph)	248	324	99
Sign Control	Free	Free	Stop

Intersection Summary
Control Type: Unsignalized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	219	213	85	84	7
Future Volume (Veh/h)	9	219	213	85	84	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	238	232	92	91	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			130			
pX, platoon unblocked	0.91				0.91	0.91
vC, conflicting volume	324				536	278
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	208				441	157
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				82	99
cM capacity (veh/h)	1241				518	808

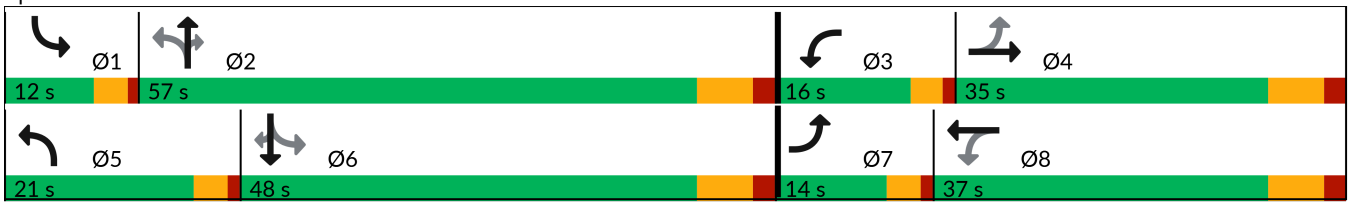
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	248	324	99
Volume Left	10	0	91
Volume Right	0	92	8
cSH	1241	1700	534
Volume to Capacity	0.01	0.19	0.19
Queue Length 95th (m)	0.2	0.0	5.4
Control Delay (s/veh)	0.4	0.0	13.3
Lane LOS	A		B
Approach Delay (s/veh)	0.4	0.0	13.3
Approach LOS			B

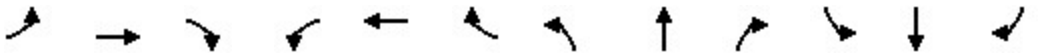
Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	30.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	178	16	159	77	287	765	57	40	577	33
Future Volume (vph)	178	16	159	77	287	765	57	40	577	33
Lane Group Flow (vph)	187	183	167	219	302	805	60	42	607	35
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	15.0	5.0	15.0	8.0	40.0	40.0	8.0	40.0	40.0
Minimum Split (s)	9.0	22.0	9.0	22.0	12.0	47.0	47.0	12.0	47.0	47.0
Total Split (s)	14.0	35.0	16.0	37.0	21.0	57.0	57.0	12.0	48.0	48.0
Total Split (%)	11.7%	29.2%	13.3%	30.8%	17.5%	47.5%	47.5%	10.0%	40.0%	40.0%
Yellow Time (s)	3.0	5.0	3.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	4.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Max	Max	Max	None	Min	Min
v/c Ratio	0.59	0.54	0.60	0.68	0.62	0.46	0.09	0.16	0.48	0.06
Control Delay (s/veh)	36.4	14.4	37.9	40.1	17.4	20.1	0.6	12.4	28.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	36.4	14.4	37.9	40.1	17.4	20.1	0.6	12.4	28.0	0.2
Queue Length 50th (m)	31.3	3.3	28.4	31.9	29.7	62.5	0.0	3.5	51.9	0.0
Queue Length 95th (m)	50.3	24.1	47.3	58.6	55.1	91.8	1.2	9.8	77.0	0.0
Internal Link Dist (m)		106.5		215.4		432.3			100.5	
Turn Bay Length (m)	54.0		55.0		142.0		66.0	62.0		62.0
Base Capacity (vph)	319	452	279	466	491	1741	692	265	1272	558
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.40	0.60	0.47	0.62	0.46	0.09	0.16	0.48	0.06

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 108.8
Natural Cycle: 90
Control Type: Semi Act-Uncoord

Splits and Phases: 1: Brock Rd. S./Brock Rd.S. & Mclean Rd. W./Mclean Rd.W.





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	178	16	158	159	77	131	287	765	57	40	577	33
Future Volume (vph)	178	16	158	159	77	131	287	765	57	40	577	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.86		1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1703	1277		1346	1511		1626	3471	1272	1203	3374	1240
Flt Permitted	0.49	1.00		0.46	1.00		0.32	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)	876	1277		645	1511		540	3471	1272	440	3374	1240
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	187	17	166	167	81	138	302	805	60	42	607	35
RTOR Reduction (vph)	0	140	0	0	56	0	0	0	30	0	0	22
Lane Group Flow (vph)	187	43	0	167	163	0	302	805	30	42	607	13
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	6%	25%	27%	34%	5%	19%	11%	4%	27%	50%	7%	27%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	27.1	17.1		31.1	19.1		63.3	54.6	54.6	47.0	42.3	42.3
Effective Green, g (s)	27.1	17.1		31.1	19.1		63.3	54.6	54.6	47.0	42.3	42.3
Actuated g/C Ratio	0.25	0.15		0.28	0.17		0.57	0.49	0.49	0.43	0.38	0.38
Clearance Time (s)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	5.0	3.0		5.0	3.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	289	197		257	261		476	1716	629	219	1292	475
v/s Ratio Prot	0.06	0.03		c0.07	0.11		c0.10	0.23		0.01	0.18	
v/s Ratio Perm	0.10			c0.11			c0.27		0.02	0.07		0.01
v/c Ratio	0.65	0.22		0.65	0.62		0.63	0.47	0.05	0.19	0.47	0.03
Uniform Delay, d1	35.5	40.8		32.7	42.3		13.4	18.4	14.4	18.9	25.6	21.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.7	0.6		7.5	4.6		6.3	0.9	0.1	0.4	0.6	0.1
Delay (s)	42.1	41.3		40.2	46.9		19.7	19.3	14.6	19.3	26.2	21.3
Level of Service	D	D		D	D		B	B	B	B	C	C
Approach Delay (s/veh)		41.7			44.0			19.2			25.5	
Approach LOS		D			D			B			C	

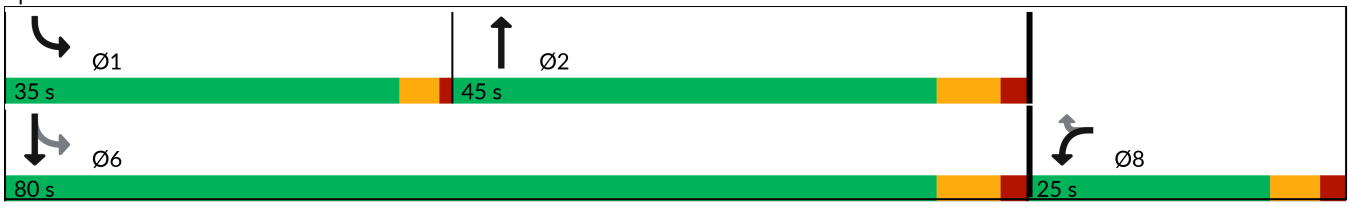
Intersection Summary			
HCM 2000 Control Delay (s/veh)	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	110.4	Sum of lost time (s)	22.0
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	155	183	942	57	849
Future Volume (vph)	155	183	942	57	849
Lane Group Flow (vph)	178	210	1116	66	976
Turn Type	Prot	Perm	NA	pm+pt	NA
Protected Phases	8		2	1	6
Permitted Phases		8		6	
Detector Phase	8	8	2	1	6
Switch Phase					
Minimum Initial (s)	15.0	15.0	35.0	10.0	35.0
Minimum Split (s)	21.0	21.0	42.0	14.0	42.0
Total Split (s)	25.0	25.0	45.0	35.0	80.0
Total Split (%)	23.8%	23.8%	42.9%	33.3%	76.2%
Yellow Time (s)	4.0	4.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	4.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	None	None	Max	None	Max
v/c Ratio	0.65	0.49	0.56	0.20	0.42
Control Delay (s/veh)	51.9	9.5	14.8	5.4	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	51.9	9.5	14.8	5.4	7.2
Queue Length 50th (m)	35.5	0.0	76.5	3.4	41.0
Queue Length 95th (m)	56.6	18.0	93.6	7.0	51.4
Internal Link Dist (m)	497.7		346.3		432.3
Turn Bay Length (m)	56.0			21.0	
Base Capacity (vph)	303	450	2000	580	2302
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.59	0.47	0.56	0.11	0.42

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 103.7
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 2: Brock Rd. S. & Nicholas Beaver Rd.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	155	183	942	29	57	849
Future Volume (vph)	155	183	942	29	57	849
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0		4.0	7.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1656	1524	3331		1504	3252
Flt Permitted	0.95	1.00	1.00		0.19	1.00
Satd. Flow (perm)	1656	1524	3331		297	3252
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	178	210	1083	33	66	976
RTOR Reduction (vph)	0	175	1	0	0	0
Lane Group Flow (vph)	178	35	1115	0	66	976
Confl. Peds. (#/hr)				1	1	
Heavy Vehicles (%)	9%	6%	6%	67%	20%	11%
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	17.3	17.3	62.2		74.2	74.2
Effective Green, g (s)	17.3	17.3	62.2		74.2	74.2
Actuated g/C Ratio	0.17	0.17	0.60		0.71	0.71
Clearance Time (s)	6.0	6.0	7.0		4.0	7.0
Vehicle Extension (s)	5.0	5.0	0.2		5.0	0.2
Lane Grp Cap (vph)	274	252	1982		303	2309
v/s Ratio Prot	c0.11		c0.33		0.02	c0.30
v/s Ratio Perm		0.02			0.14	
v/c Ratio	0.65	0.14	0.56		0.22	0.42
Uniform Delay, d1	40.8	37.2	12.9		6.3	6.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	7.1	0.5	1.2		0.8	0.6
Delay (s)	47.9	37.8	14.0		7.1	6.8
Level of Service	D	D	B		A	A
Approach Delay (s/veh)	42.4		14.0			6.9
Approach LOS	D		B			A

Intersection Summary			
HCM 2000 Control Delay (s/veh)	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	104.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBR	NBT	SBT
Lane Configurations			
Traffic Volume (vph)	68	1073	580
Future Volume (vph)	68	1073	580
Lane Group Flow (vph)	74	1166	702
Sign Control		Free	Free

Intersection Summary

Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	68	0	1073	580	66
Future Volume (Veh/h)	0	68	0	1073	580	66
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	74	0	1166	630	72
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				124		
pX, platoon unblocked	0.85					
vC, conflicting volume	1249	351	702			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	936	351	702			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	89	100			
cM capacity (veh/h)	224	645	891			

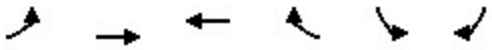
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	74	583	583	420	282
Volume Left	0	0	0	0	0
Volume Right	74	0	0	0	72
cSH	645	1700	1700	1700	1700
Volume to Capacity	0.11	0.34	0.34	0.25	0.17
Queue Length 95th (m)	3.1	0.0	0.0	0.0	0.0
Control Delay (s/veh)	11.3	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s/veh)	11.3	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	33.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBT	SBL
Lane Configurations			
Traffic Volume (vph)	239	273	111
Future Volume (vph)	239	273	111
Lane Group Flow (vph)	268	429	132
Sign Control	Free	Free	Stop

Intersection Summary

Control Type: Unsignalized



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	239	273	121	111	10
Future Volume (Veh/h)	7	239	273	121	111	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	260	297	132	121	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			130			
pX, platoon unblocked	0.89				0.89	0.89
vC, conflicting volume	429				639	363
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	300				535	226
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				73	98
cM capacity (veh/h)	1126				448	726

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	268	429	132
Volume Left	8	0	121
Volume Right	0	132	11
cSH	1126	1700	463
Volume to Capacity	0.01	0.25	0.29
Queue Length 95th (m)	0.2	0.0	9.3
Control Delay (s/veh)	0.3	0.0	15.8
Lane LOS	A		C
Approach Delay (s/veh)	0.3	0.0	15.8
Approach LOS			C

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	35.2%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix L

Township of Puslinch's Comprehensive Zoning By-Law No. 023-18 Relevant Excerpts

TOWNSHIP OF PUSLINCH

COMPREHENSIVE ZONING BY-LAW No. 023-18

COUNCIL ADOPTED: APRIL 2018
LPAT ORDER: JANUARY 23, 2020 – PL180505

CONSOLIDATED MAY 2021

5.0 PARKING AND LOADING REGULATIONS

5.1 LOADING AND UNLOADING SPACE REGULATIONS

5.1.1 Loading Spaces Required

a. The **owner** of any **lot**, **building** or **structure** used or **erected** for any purpose involving the receiving, shipping, loading or unloading of goods, wares, merchandise, or raw materials, other than an **agricultural use**, shall provide and maintain, on the same **lot**, facilities comprising one or more **loading spaces** in accordance with the provisions of this Section.

5.1.2 Loading Space Requirements

a. The number of **loading spaces** required on a **lot** shall be based on the total **net floor area** of all the uses on the said **lot** for which **loading spaces** are required by Subsection 5.1.1, in accordance with Table 5.1 below.

Table 5.1 Number of **Loading Spaces** Required

NET FLOOR AREA OF BUILDING OR STRUCTURE	MINIMUM NUMBER OF LOADING SPACES REQUIRED
Less than 250 m²	0
Between 250 m² and 2,500 m²	1
Greater than 2,500 m² and less than 5,000 m²	2
Greater than 5,000 m²	3 + 1 additional space for each 10,000 m² in excess of 5,000 m²

5.1.3 Dimensions of Loading Spaces

a. The minimum dimensions of a **loading space** shall be 3.5 metres in width and 10 metres in length, with a minimum vertical clearance of four (4) metres.

5.1.4 Location of Loading Spaces

a. Required **loading spaces** shall:

i. be provided on the same **lot** occupied by the **building** or **structure** for which the said **loading spaces** are required;

ii. abut the **building** for which the **loading space** is provided; and

iii. shall not form a part of any **street** or **lane**.

5.1.5 Yards Where Permitted

a. **Loading spaces** shall not be permitted:

i. closer than three (3) metres to any **lot line**;

ii. in any **front yard**;

iii. in any minimum **required yard**;

iv. between the exterior closest to the **exterior lot line** and the **exterior lot line**; and

v. closer than 7.5 metres to any Residential **Zone** boundary, except if it is located entirely within a **building** or **structure** or located in a Residential **Zone**.

5.1.6 Access to Loading Spaces

a. Access to **loading spaces** shall be by means of a **driveway** at least six (6) metres wide contained within the **lot** on which the **loading spaces** are located.

5.1.7 Addition to Existing Use

a. When a **building** or **structure** has insufficient **loading spaces** on the date of passing of this By- Law to comply with the requirements herein, this By-Law shall not be interpreted to require that the deficiency be made up prior to the construction of any addition, provided that any additional **loading spaces** required by this By-Law for such addition are provided in accordance with all provisions hereof respecting **loading spaces**.

5.1.8 Exemption for C1 and CMU Zone

a. Notwithstanding any other provision hereof to the contrary, no **loading spaces** shall be required for any **building**, **structure**, or use located within a C1 or CMU **Zone**.

5.2 PARKING REGULATIONS

5.2.1 General Parking Provisions

a. No person shall use any **premises** in any **zone** for any purpose permitted by this By-law, unless the minimum number of **parking spaces** required are provided as specified by this By-law.

b. Where the minimum number of **parking spaces** is calculated on the basis of a rate or ratio,

the required number of **parking spaces** shall be rounded up to the next whole number.

c. The parking requirements for more than one use on a **lot** or for a **building** containing more than one use, shall be the sum total of the parking requirements for each of the component uses, unless otherwise specified in this By-law.

d. All required **parking spaces** shall be unobstructed and available for general parking purposes and used for that purpose at all times, unless otherwise specified in this By-law.

5.2.2 Parking Spaces Required

a. Except as otherwise provided herein, the **owner** of any **lot**, **building**, or **structure** used or **erected** for any of the purposes set forth in Tables 5.2 and 5.3 of this Subsection, shall provide and maintain for the sole use of the **owner** or other persons entering upon or making use of the said **lot**, **building** or **structure** from time to time, one or more **parking spaces** in accordance with the provisions of this Subsection.

Table 5.2 Residential **Parking Space** Requirements

USE	MINIMUM PARKING SPACE REQUIREMENT
Accessory apartment	1 per **dwelling unit**, in addition to the requirement for the **principal dwelling unit**
Bed and breakfast	1 per guest room, in addition to the requirement for the **principal dwelling unit**
Boarding, lodging, or rooming house	1 per guest room, in addition to the requirement for the **principal dwelling unit**
Dwelling, duplex	2 per **dwelling unit**
Dwelling, multiple	1.5 per **dwelling unit** and 0.25 per unit for visitor **parking spaces**
Dwelling, semi-detached	2 per **dwelling unit**
Dwelling, Single detached	2 per **dwelling unit**
Dwelling, townhouse	2 per **dwelling unit**
Dwelling unit in **mixed-use building**	1 per **dwelling unit**
Garden suite	1 per **dwelling unit**
Group home	2 per **dwelling unit**
Home business	1 for any employee that is not a resident in the **dwelling unit** in addition to the required parking for the **dwelling unit**

Home industry	1 for any employee that is not a resident in the **dwelling unit** in addition to the required parking for the **dwelling unit**
Private home day care	The minimum parking space requirement for the **principal dwelling unit**
Retirement home	0.5 spaces per unit.

Table 5.3 Non-residential Parking Space Requirements

USE	MINIMUM PARKING SPACE REQUIREMENT (BASED ON NET FLOOR AREA UNLESS OTHERWISE NOTED)
Agricultural use	No requirement
Agriculture-related use	1 per 100 m²
Agricultural service and supply establishments	1 per 40 m²
Agricultural animal clinic	1 per 50 m²
Animal clinic	1 per 20 m²
Art gallery	1 per 30 m²
Artisan studio	1 per 30 m²
Asphalt plant	1 per 30 m² for office component
Assembly hall	1 per 5 persons seating capacity or 1 per 10 m2 GFA where there are no seats
Auction sales establishment	1 per 15 m²
Motor vehicle body shop	3 per service bay
Motor vehicle sales and rental establishment	1 per 30 m² for office component
Motor vehicle service establishment	3 per service bay or 1 per 100 m² or whichever is greater
Motor vehicle washing establishment	1 plus 6 waiting spaces per wash bay
Building supply store	1 per 100 m²
Business or professional office	1 per 40 m²
Caterer's establishment	1 per 40 m²
Commercial mall	1 per 20 m²
Commercial school or studio	1 per 30 m²
Commercial self-storage facility	1 per 100 m²
Community garden	1 per 100 m² of area used for **community garden** purposes
Contractor's yard	1 per 50 m²
Day care centre	1 per 40 m²
Dry cleaning plant	1 per 40 m²
Dry cleaning depot	1 per employee and 2 additional spaces for pickup / loading
Factory outlet	1 per 20 m²
Farm related business	1 per 40 m²
Farm greenhouse	No requirement
Financial institution	1 per 20 m² or 1 per 30 m² if the **financial institution** has a **drive-through service facility**

USE	MINIMUM PARKING SPACE REQUIREMENT (BASED ON NET FLOOR AREA UNLESS OTHERWISE NOTED)
Funeral establishment	1 per 20 m²
Gas bar	1 per **gas bar** pump
Garden centre	1 per 35 m²
Golf course	5 per hole
Golf driving range	1.5 per tee
Hospital	4 per bed
Hotel or **motel**	1 per guest room plus 1 per 20 m² of **floor area** of each refreshment room or dining room
Industrial use	1/100 m² for the first 10,000 m² of **floor area** and 1/200 m² for any **floor area** after the first 10,000 m²
Kennel	1 per 30 m² for office component
Laundromat	1 per 30 m²
Long term care facility	1 per 4 beds and 1 per 2 employees
Marina	0.5 per boat slip and 1/20 m2 of total retail floor area
Medical office	1 per 25 m²
Miniature golf course	1.5 per tee
Museum	1 per 30 m²
Personal service establishment	1 per 20 m²
Place of entertainment	1 per 20 m²
Place of worship	1 per 4 persons seating capacity or 1 per 10 m², whichever is greater
Postal or courier outlet	1 per 30 m²
Private club	1 per 4 persons seating capacity or 1 per 10 m², whichever is greater
Private school	1.5 per classroom for elementary schools 5.0 per classroom for secondary schools
Public **buildings**	1 per 30 m²
Public school	1.5 per classroom for elementary schools 5.0 per classroom for secondary schools
Recreational vehicle sales or rental establishment	1 per 30 m² for office component
Equipment rental establishment	1 per 50 m²
Restaurant	1 per 10 m² including **outdoor patio** area
Retail store	1 per 20 m²
Salvage yard	1 per 20 m²
Service or repair establishment	1 per 50 m²
Short term accommodation	0.5 **parking spaces** per occupant or 1.0 **parking space** per guest room used for sleeping, whichever is the greater
Trade service establishment	1 per 50 m²
Transport terminal	1 per 100 m²
Warehouse	1 per 200 m²
Any **outdoor storage area** involving the	1 per 100 m² of net **floor area** and **outdoor**

USE	MINIMUM PARKING SPACE REQUIREMENT (BASED ON NET FLOOR AREA UNLESS OTHERWISE NOTED)
display and sale of goods and materials, including **vehicles**	**storage area**
Any other use permitted by this by-law other than those listed above	1 per 20 m² of **net floor area**
Any other place of assembly permitted by this by-law other than those listed above	1 per permitted Fire Code Capacity

5.2.3 Dimensions of Parking Spaces

a. A **parking space** required hereby shall have minimum rectangular dimensions of three (3) by six (6) metres, except that:

   i. the minimum width of a **parking space** accessory to a **single detached**, **semi-detached** or **townhouse dwelling** shall be 2.5 metres; and,

   ii. where the **principal** access to a **parking space** is provided on the longest dimension of such **parking space**, the minimum dimensions of the said **parking space** shall be three (3) by 6.7 metres.

5.2.4 Shared Parking Spaces

a. Where more than one of the uses listed in Table 5.3 are located on the same **lot**, **parking spaces** may be shared between the uses, and the cumulative total of **parking spaces** required for all the uses on the **lot** may be reduced from that required in Table 5.4.

b. To calculate the required parking using Table 5.4:

   A. Determine the parking requirement for each use;

   B. Calculate the parking requirement for each use;

   C. Multiply the required parking by the percentage of peak period for each time period;

   D. Calculate the total required parking for all uses in each time period, for both weekdays and Saturdays (excluding Sundays); and

   E. The time period with the highest total parking requirement is the required parking for the **lot**.

Table 5.4 Percentage of Required Parking Permitted to be shared

USE	PERCENTAGE OF PEAK PERIOD							
	WEEKDAY				SATURDAY			
	Morning	Noon	Afternoon	Evening	Morning	Noon	Afternoon	Evening
Business or professional office	100	80	100	10	10	10	10	5
Financial institution	100	100	100	15	20	20	20	5
Hotel or **motel**	70	70	70	100	70	70	70	100
Place of entertainment or **theatre**	10	10	25	80	40	70	80	100
Restaurant	20	90	30	100	30	90	50	100
Retail store	75	80	90	90	80	100	100	50

5.2.5 Location of Parking Spaces

a. All required **parking spaces** shall be provided on the same **lot** occupied by the **building**, **structure**, or use for which such **parking spaces** are required, and shall not form a part of any **street** or **lane**.

b. **Parking spaces** shall not extend into any part of a **lot** that is required to be used for **planting strips** as specified by this By-law.

5.2.6 Parking in Residential Zones

a. The maximum width of a **driveway** leading to a **private garage** or carport in the **front** or **exterior side yards** shall be:

   i. Six (6) metres for a **lot** having a **lot frontage** of 12 metres or less;

   ii. Equal to 50 percent of the **lot frontage** on a **lot** having greater than 12 metres and less than 18 metres of **lot frontage**; or

   iii. Nine (9) metres for a **lot** having a **lot frontage** equal to or greater than 18 metres.

b. The width of the **lot** specified in subsection (a) above is the horizontal distance between the **interior side** and/or **exterior side lot lines**, with such distance being measured perpendicularly to the line joining the mid-point of the **front lot line** with the mid-point of the **rear lot line** at a point on that line six (6) metres from the **front lot line**.

c. The width of the **private garage** specified in subsection (a) above is the width of interior wall(s). In the case of a carport, the width is measured from the wall of the **principal building** to the outside of the post supporting the roof of the carport.

d. Where a **private garage** is detached from the **principal building** and is accessed by a **driveway** crossing the **front lot line**, the **driveway** shall be located no closer to the **interior side lot line** than the minimum setback required for **accessory buildings or structures**.

e. Where a **private garage** is detached from the **principal building** and is accessed by a **driveway** crossing the **exterior side lot line**, the **driveway** shall be located no closer to the **rear lot line** than the minimum setback required for **accessory buildings or structures**.

f. Notwithstanding subsections (b) and (c) above, the setback for the **driveway** may be less to match the setback of a **private garage** that existed on the effective date of this By-law.

5.2.7 Yards Where Permitted

a. Except as otherwise provided herein, uncovered surface **parking areas** shall be permitted in any part of any **yard**, provided that any part of a **parking area** located within a **required yard** shall be separated from any **lot line**s adjacent to such **required yard** by a **planting strip** no less than one (1) metre in width. This provision does not apply to a **parking area** accessory to a **single detached dwelling**.

5.2.8 Parking Structures

a. Parking **structures** shall comply with the provisions for the **principal building** in accordance with this By-law.

b. No setbacks or **yards** shall be required for any portion of a parking **structure** that is entirely below **grade**. This exemption also applies to external ventilation shafts, stairwells, landings, and other similar facilities.

5.2.9 Access to Parking Areas and Structures

a. Access to **parking areas** shall be provided from a **street** by means of one or more un-obstructed **driveways**, provided that no **lot** shall have more than two **driveways** for the first 30 metres of **street** line thereof plus one **driveway** for each additional 30 metres of **street** line.

b. **Driveways** that are accessory to a single **dwelling unit** shall not exceed six (6) metres in width, and any other **driveway** shall not exceed 10 metres in width, measured parallel to the said **street**, at any point on the **lot** closer to the said **street** than the **street** setback required therefrom.

c. **Driveways** and **parking aisles** shall have a minimum unobstructed width of six (6) metres where two-way traffic is permitted and three (3) metres **driveway** where only one-way direction of traffic flow is permitted and is clearly indicated by signs, pavement markings or both, except that the minimum width required for any **driveway** accessory to a **single detached, semi-detached** or **townhouse dwelling** shall be 2.5 metres.

5.2.10 Surfacing of Parking Areas, Driveways and Loading Spaces

a. All **parking areas**, **driveways**, and **loading spaces** in any **zone** other than a Parks and Open Space **Zone**, an Industrial **Zone**, or an Agricultural **Zone** shall be provided and maintained with a stable treated surface so as to prevent the raising of dust or loose particles, such surface to be constructed of: asphalt, concrete, brick, interlocking brick, permeable paving, cement, or other similar hardscape surface, sufficient to provide stability, prevent erosion, be usable in all seasons, and provide adequate drainage facilities.

5.2.11 Addition to Existing Use

a. Where an **existing** use has insufficient **parking spaces** on the date of passing of this By-Law to conform to the requirements herein, this By-Law shall not be interpreted to require that the deficiency be made up prior to the construction of any addition or a change of use, provided that any additional **parking spaces** required by this By-Law for such addition or change of use are provided in accordance with all provisions hereof respecting **parking spaces** and **parking areas**.

5.2.12 Parking of Commercial Motor vehicles in Residential Zones

a. The following provisions apply to the parking of **commercial motor vehicles** in Residential **Zones**:
   i. Only one (1) **commercial motor vehicle** may be parked on a **lot**;
   ii. Only a permanent resident of the dwelling unit may park a **commercial motor vehicle** on the **lot**;
   iii. The **commercial motor vehicle** shall be parked in a **private garage** or on a **driveway**;
   iv. A **commercial motor vehicle** shall not be permitted on any **lot** unless the principal dwelling has been constructed on that same **lot**;
   v. The **commercial motor vehicle** shall be no more than 7.5 metres in length (exclusive of hitch/tongue); and
   vi. The **commercial motor vehicle** shall be no more than 3.2 metres in **height**, measured from the ground to the highest point of the **commercial motor vehicle**.

5.2.13 Parking of Recreational Vehicles and Boats

a. The following provisions apply to the outdoor parking or storage of any **recreational vehicle** or boat in a Residential **Zone**:

i. The **recreational vehicle** or boat shall not be used for human habitation purposes while parked on the **lot**;

ii. A total of one **recreational vehicle** and one boat shall be permitted on a **lot**;

iii. The **recreational vehicle** or boat shall be parked in the **interior** or **rear yards**, or in a **yard** between a **building** and a lake or watercourse deemed to be a **front yard**, and/or on a **driveway** extending from a **private garage** or carport;

iv. A **recreational vehicle** and a boat shall not be parked on the same **driveway**.

v. A **recreational vehicle** or boat shall not occupy required **parking spaces**.

vi. A **recreational vehicle** or boat, if located on the **driveway**, shall be located no closer than 0.5 metres from the edge of the **lot** line.

5.2.14 Barrier-Free Parking

a. Where the parking requirement for any use is 4 or more spaces, **barrier-free parking spaces** shall be provided in accordance with the following:

i. Each **barrier-free parking space** shall have a minimum width of 3.6 metres and minimum depth of 6.0 metres;

ii. Each **barrier-free parking space** shall be hard-surfaced and level;

iii. Each **barrier-free parking space** shall be located near and accessible to an entrance; and,

iv. Each **barrier-free parking space** shall be appropriately identified for its intended use by persons with limited mobility or other disabilities

b. The number of **barrier-free parking spaces** shall be determined in accordance with Table 5.5 below.

Table 5.5 **Barrier-Free Parking Space** Requirements

TOTAL NUMBER OF PARKING SPACES REQUIRED ON THE LOT	MINIMUM NUMBER OF REQUIRED PARKING SPACES DEDICATED AS BARRIER-FREE
3-25	1
26-100	1 + 3% of total number of **parking spaces** on **lot**

TOTAL NUMBER OF PARKING SPACES REQUIRED ON THE LOT	MINIMUM NUMBER OF REQUIRED PARKING SPACES DEDICATED AS BARRIER-FREE
101-200	4 + 2% of total number of **parking spaces** on **lot**
201 or greater	8 + 2% of total number of **parking spaces** on **lot**

5.2.15 Bicycle Parking

a. Bicycle parking spaces shall be required for the uses listed in Table 5.6 below in addition to any required **parking spaces**.

b. Each bicycle parking space shall be a minimum of 60 centimetres wide and 1.8 metres long.

Table 5.6 Bicycle Parking Space Requirements

USE	REQUIRED PARKING STANDARDS (PER NET FLOOR AREA)
Retail, personal, institutional	The greater of 2 spaces or 1 space /1000 m²
Industrial	2 /1,000 m²
Long term care facility, retirement home	The lesser of 5 or 0.25 per bed or **dwelling unit**
Public and **private school**	1 /10 students of design capacity & 1 space/35 employees
Dwelling units or **mixed-use buildings** with more than 6 **dwelling units**	2 spaces for the first 6 **dwelling units** plus 2 spaces for each additional 6 **dwelling units** or fraction thereof

Tree Inventory and Preservation Plan
7456 McLean Road West
Puslinch, Ontario

prepared for

DAAZ Inc.
8290 17th Sideroad East
Acton, Ontario L7J 2M1

prepared by

KUNTZ FORESTRY CONSULTING INC.

25 July 2025; revised 26 September 2025, 18 December 2025, 11 February 2026, and 18 March 2026

KUNTZ FORESTRY CONSULTING INC. Project P4711

Introduction

Kuntz Forestry Consulting Inc. was retained by DAAZ Inc. to complete a Tree Inventory and Preservation Plan as part of a development application for the subject property located at 7456 McLean Road in Puslinch, Ontario. The subject property is located on the west corner of the intersection between McLean Road West and Brock Road South, within an industrial / commercial / rural area.

The work plan for this tree preservation study included the following:

- Prepare an inventory of the tree resources measuring 10cm diameter at breast height (DBH) and greater on and within six metres of the subject property and trees of all sizes within the road right-of-way;
- Evaluate potential tree saving opportunities based on the proposed development plans;
- Determine whether the treed feature within the subject property qualifies as "woodlands" per the definition set forth in the County of Wellington's Forest Conservation By-law (By-law No. 5115-09), and;
- Document the findings in a Tree Inventory and Preservation Plan.

The results of the evaluation are provided below.

Methodology

Tree Inventory

The tree inventory was conducted on 14 July 2025 and 18 July 2025. Trees measuring 10cm DBH and greater on and within six meters of the subject property and trees of all sizes within the road right-of-way were included in the inventory. Trees were located using a topographic survey provided for the subject property, aerial imagery, and estimations made from known points in the field. Trees included in the inventory were identified as Trees 589 – 812. Where appropriate, trees were tagged with their identification number. Trees that were not tagged were denoted with the letters "NT" preceding their identification number on Table 1 and on Figure 1.

The dripline distance was primarily used in the preservation planning analysis to determine the preservation potential of trees. Where development is proposed within a tree's dripline, there is the potential to damage tree roots and tree removal may be required. The dripline distance was estimated for the trees included in the inventory and rounded to the nearest metre.

Tree resources were visually assessed for condition utilizing the following parameters:

Tree # – Number assigned to trees that corresponds to Figure 1.
Species – Common and botanical names provided in the inventory table.
DBH – Diameter (cm) at breast height, measured at 1.4m above the ground.
Condition – Condition of tree considering trunk integrity (TI), crown structure (CS) and crown vigor (CV). Condition ratings include poor (P), fair (F), and good (G).
Crown Dieback – Percentage of dead branches within the crown.
Dripline – Crown radius (m).
Comments – Any other relevant tree condition information.

Where trees occurred in groups, they were inventoried as polygons using a 100% stand tally analysis by species, size class, and quality. Five polygons were included in the inventory and were identified as Polygons P-1 – P-5.

Trees within polygons were assessed utilizing the following parameters:

Species – Common and botanical names provided in the inventory table.
Size Class (DBH) – 0cm – 9.5cm (only for polygons located within the road right-of-way), 10cm – 29.5cm, 30cm – 40.5cm, and 41cm and above.
Quality Class: Acceptable Growing Stock (AGS), Unacceptable Growing Stock (UGS).

Trees classified as AGS are trees with no major defects in the bole and a relatively good crown structure and vigour. Trees classified as UGS are trees with a major defect in the bole and / or those exhibiting a relatively poor crown structure or vigour.

Refer to Table 1 and Table 2 for the detailed tree inventory and Figure 1 for the locations of the trees and polygons.

Woodland Designation Assessment

The definition of “woodlands”, as identified in the County of Wellington’s Forest Conservation By-law (By-law No. 5115-09) is as follows:

> *“Woodlands” means land, one hectare (2.47 acres) or more in area measured to the drip line, and includes any unforested corridors within the area that are equal to or less than 30 metres (98.4 feet) in width, with at least:*
>
> *(i) 1,000 trees, of any size, per hectare (405 trees, of any size, per acre);*
>
> *(ii) 750 trees, measuring over 5 centimetres in diameter, per hectare (304 trees, measuring over 2 inches in diameter, per acre);*
>
> *(iii) 500 trees, measuring over 12 centimetres in diameter, per hectare (202 trees, measuring over 4.7 inches in diameter, per acre), or;*
>
> *(iv) 250 trees, measuring over 20 centimetres in diameter, per hectare (101 trees, measuring over 7.9 inches in diameter, per acre).*
>
> *but does not include a cultivated fruit orchard, nut orchard or a plantation established for the purpose of producing Christmas trees. For the purpose of the definition of woodlands, all measurements of the trees are to be taken at 1.37 metres (4.5 feet) from the ground.*

The field assessments for the woodland designation assessment occurred on 18 July 2025 whereby the dripline limits of the treed feature, identified as Unit 1, were delineated in the field using a backpack GPS unit (Trimble R2® GNSS receiver) accurate to ± one metre.

Unit 1 was subject to a density plot sampling technique involving the placement of five 3.99m-radius plots at random throughout the unit. Within these plots, trees of all sizes were tallied using a 100% plot tally analysis implementing the following parameters:

Species – Common and botanical names provided in the table.
Size Class (DBH) – 0cm – 5cm, 5.5cm – 12cm, 12.5cm – 20cm, and 20.5cm and above.

The tree counts tallied within each size class of the five density plots were averaged and these averages were extrapolated to determine the number of stems per hectare for each size class. These values were compared to the minimum requirements of "woodlands", as defined in the County of Wellington's Forest Conservation By-law.

Refer to Figure 2 for the delineation of Unit 1 and the locations of the density plots. Refer to Table 3 for the 100% plot tally analyses of the density plots.

Existing Site Conditions

The subject property is currently occupied by the remnants of a homestead and vacant land. Tree resources exist in the form of landscape trees and natural regeneration.

Refer to Figure 1 for the existing site conditions.

Individual Tree Resources

The inventory documented a total of 223 trees and five polygons on and within six metres of the subject property and within the road right-of-way. Tree resources are comprised of Apple species (*Malus sp.*), Austrian Pine (*Pinus nigra*), Balsam Fir (*Abies balsamea*), Basswood (*Tilia americana*), Black Cherry (*Prunus serotina*), Black Walnut (*Juglans nigra*), Blue Spruce (*Picea pungens*), Bur Oak (*Quercus macrocarpa*), Eastern White Cedar (*Thuja occidentalis*), Hawthorn species (*Crataegus sp.*), Little-leaf Linden (*Tilia cordata*), Manitoba Maple (*Acer negundo*), Mountain Ash species (*Sorbus sp.*), Norway Maple (*Acer platanoides*), Norway Spruce (*Picea abies*), Poplar species (*Populus sp.*), Scots Pine (*Pinus sylvestris*), Siberian Elm (*Ulmus pumila*), Silver Maple (*Acer saccharinum*), Sugar Maple (*Acer saccharum*), Tamarack (*Larix laricina*), White Birch (*Betula papyrifera*), White Mulberry (*Morus alba*), White Pine (*Pinus strobus*), White Spruce (*Picea glauca*), and Willow species (*Salix sp.*).

Refer to Table 1 and Table 2 for the full tree inventory information and Figure 1 for the locations of trees and polygons reported in the inventory.

Proposed Development

The proposed development involves the demolition of all remaining structures associated with the homestead and the construction of a commercial building, a restaurant building, a transport truck gas bar, a small vehicle gas bar, and surface parking areas. Vehicular access is proposed from McLean Road West and Brock Road South. It is anticipated that grading works will be required throughout the subject property and within the adjacent McLean Road West and Brock Road South right-of-way to support the proposed development.

Refer to Figure 1 for the proposed development plan.

Discussion

The following sections provide a discussion and analysis of tree impacts and tree preservation relative to the proposed development and existing conditions.

Development Impacts / Tree Removal

The removal of 221 trees and five polygons, including Trees 591 – 812 and Polygons P-1 – P-5, will be required to accommodate the proposed development. These trees either conflict directly with the proposed development or the level of encroachment into their driplines resulting from works associated with the proposed development would be at an intolerable level such that the trees would not be expected to overcome the injury.

Trees 689, 711, 726, 742 – 745, and 765, and Polygon P-2 – P-5 are located fully or partially within the Township-owned right-of-way and as such, permission from the Township of Puslinch will be required prior to the removal of these trees and polygons. All other trees identified for removal are located fully within the boundaries of the subject property.

Tree resources within the subject property have the potential to be suitable habitat for a variety of wildlife, including potential habitat for species at risk birds and bats. Tree removals should occur outside of the breeding bird window, which occurs from April 1st to August 31st, to avoid impacts to birds in the area and to ensure compliance with the Migratory Birds Convention Act. The bat roosting season in Southern Ontario occurs from April 1st to November 30th. As such, in order to satisfy the tree removal timing restrictions respecting birds and bats, tree removals should occur between December 1st and March 31st.

Refer to Figure 1 for the locations of the trees and polygons identified for removal.

Tree Preservation

The preservation of the remaining two trees, identified as Trees 589 and 590, will be possible. The dripline of Tree 589 does not intersect the subject property boundary or the right-of-way area immediately adjacent to the subject property and Tree 590 is a dead tree. Tree preservation fencing has not been prescribed for Trees 589 and 590 as it is assumed that these trees will not be subjected to construction-related disturbance associated with the proposed development. Should disturbance within the Brock Road South right-of-way be expected beyond the area immediately adjacent to the subject property, tree preservation fencing may be required to sufficiently protect these trees.

Refer to Figure 1 for the locations of the trees identified for preservation, the general Tree Protection Plan Notes, and the tree preservation fence detail.

Woodland Designation Assessment

The total area of Unit 1, based on the feature's delineated dripline, is approximately 1.12ha. As such, the feature satisfies the minimum size criteria for "woodlands", in accordance with the County of Wellington's Forest Conservation By-law (By-law No. 5115-09).

The tree counts tallied within each size class of the five density plots were averaged and these averages were extrapolated to determine the number of stems per hectare for each size class, as shown in the table below:

Tree Size Class →	0cm - 5cm	5.5cm - 12cm	12.5cm – 20cm	20.5cm +	Total All Sizes
Average Number of Trees	4.4	2.8	0.2	1.4	8.8
Number of Stems Per Hectare	**880**	**560**	**40**	**280**	**1760**

Unit 1 contains over 1000 trees of any size per hectare, more than 750 trees measuring over 5cm DBH per hectare, and over 250 trees measuring over 20cm DBH per hectare. As such, Unit 1 qualifies as “woodlands” per the definition set forth in the County of Wellington’s Forest Conservation By-law.

Refer to Figure 2 for the delineation of Unit 1 and the locations of the density plots. Refer to Table 3 for the 100% plot tally analyses of the density plots.

Although Unit 1 meets the minimum size requirements to be considered a “woodland” under the Forest Conservation By-law, it is understood that a clearing permit will not be required if the removal of trees from within Unit 1 occurs as a condition of site plan approval. An undertaking has been provided by DAAZ Inc. indicating that tree removals will not occur until site plan approval has been granted. Refer to Appendix A for the undertaking.

Summary and Recommendations

Kuntz Forestry Consulting Inc. was retained by DAAZ Inc. to complete a Tree Inventory and Preservation Plan as part of a development application for the subject property located at 7456 McLean Road in Puslinch, Ontario. A tree inventory was conducted and reviewed in the context of the proposed development.

The findings of the study indicate a total of 223 trees and five polygons on and within six metres of the subject property and within the road right-of-way. The removal of 221 trees and five polygons will be required to accommodate the proposed development. The preservation of the remaining two trees will be possible.

The following recommendations are suggested to minimize impacts to trees identified for preservation. Refer to Figure 1 for the general Tree Protection Plan Notes and the tree preservation fence detail.

- Tree protection barriers and fencing should be erected at locations prescribed on Figure 1. All tree protection measures should follow the guidelines as set out in the tree preservation plan notes and the tree preservation fencing detail.

- No construction activity including surface treatments, excavations of any kind, storage of materials or vehicles, unless specifically outlined above, is permitted within the area identified on Figure 1 as a tree protection zone (TPZ) at any time during or after construction.

- Branches and roots that extend beyond prescribed tree protection zones that require pruning must be pruned by a qualified Arborist or other tree professional. All pruning of tree roots and branches must be in accordance with Good Arboricultural Standards.

- Site visits pre, during, and post construction are recommended by either a certified consulting arborist (I.S.A.) or registered professional forester (R.P.F.) to ensure proper

utilization of tree protection barriers. Trees should also be inspected for damage incurred during construction to ensure appropriate pruning or other measures are

Respectfully Submitted,

Kuntz Forestry Consulting Inc.

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Resources

The Corporation of the County of Wellington, 2009. Forest Conservation By-law (By-law No. 5115-09). https://www.wellington.ca/media/file/conservation-and-sustainable-use-woodlands-law-5115-09.

Limitations of Assessment

Only the tree(s) identified in this report were included in the inventory. The assessment of the trees presented in this report has been made using accepted arboricultural techniques. These may include a visual examination taken from the ground of all the above-ground parts of the tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of attack by insects, discoloured foliage, the condition of any visible root structures, the degree of lean (if any), the general condition of the trees and the identification of potentially hazardous trees or recommendations for removal (if applicable). Where trees could not be directly accessed (i.e. due to obstructions, and/or on neighbouring properties), trees were assessed as accurately as possible from nearby vantage points.

Locations of trees provided in the report are determined as accurately as possible based on the best information available. If official survey information is not provided, tree locations in the report may not be exact. Where KFCI's in-house GPS unit is used (if applicable), tree locations are accurate only to the extent that the technology allows, which can be variable based on satellite available, RTK network / cell coverage, canopy coverage, and/or projection transformation limitations. In this case, if trees occur on or near property boundaries, an official site survey may be required to determine ownership utilizing specialized survey protocol to gain precise location.

Furthermore, recommendations made in this report are based on the development plans that have been provided at the time of reporting. These recommendations may no longer be applicable should changes be made to the development plan and/or grading, servicing, or landscaping plans following report submission.

Notwithstanding the recommendations and conclusions made in this report, it must be recognized that trees are living organisms, and their health and vigor constantly change over time. They are not immune to changes in site conditions or seasonal variations in the weather conditions. Any tree will fail if the forces applied to the tree exceed the strength of the tree or its parts.

Although every effort has been made to ensure that this assessment is reasonably accurate, the trees should be re-assessed periodically. The assessment presented in this report is valid at the time of inspection.

Table 1. Tree Inventory

Location: 7456 McLean Road West, Puslinch Date: 14 July 2025 and 18 July 2025 Surveyors: KNH

Tree #	Common Name	Scientific Name	DBH	TI	CS	CV	CDB	DL	Comments	Owner	Action
NT589	Hawthorn species	*Crataegus sp.*	~12, ~12	FG	F	F	30	3	Union at base, epicormic branching (M), lean (L)	Township (Right-of-Way)	Preserve
NT590	White Elm	*Ulmus americana*	~26	D	D	D	100	-	Dead	Township (Right-of-Way)	Preserve
NT591	Manitoba Maple	*Acer negundo*	~80, ~58	P	P	P	90	7	V-union at 1m with included bark, lean (M), moribund	Subject	Remove
NT592	Manitoba Maple	*Acer negundo*	~59	F	PF	PF	20	8	Lean (M), poor branch unions, epicormic branching (H), poor form (M)	Subject	Remove
NT593	Manitoba Maple	*Acer negundo*	~30	PF	PF	PF	20	6	Bow (H), epicormic branching (H)	Subject	Remove
NT594	Manitoba Maple	*Acer negundo*	~90	PF	P	PF	60	10	V-union at 1.5m with included bark, poor form (H), poor branch unions, broken branches (H), epicormic branching (H)	Subject	Remove
NT595	Manitoba Maple	*Acer negundo*	~66	P	P	P	80	9	Broken branches (H), stem wounds (H) from torn out branch, lean (L), epicormic branching (H), poor form (H)	Subject	Remove
NT596	Manitoba Maple	*Acer negundo*	~44, ~30	P	P	P	80	6	Failed at base, broken branches (H), epicormic branching (H), poor form (H)	Subject	Remove
NT597	Manitoba Maple	*Acer negundo*	~60	P	P	P	80	10	Failed at base, broken branches (H), epicormic branching (H), poor form (H)	Subject	Remove
NT598	White Spruce	*Picea glauca*	~28	G	F	F	30	3		Subject	Remove
NT599	White Spruce	*Picea glauca*	~40	FG	F	F	30	4	Lean (L)	Subject	Remove
601	Willow species	*Salix sp.*	104.5	F	F	PF	20	12	V-union at 1.5m and 2m with included bark, pruning wounds (L), coppice growth, epicormic branching (L)	Subject	Remove
602	Norway Maple	*Acer platanoides*	33	FG	FG	FG		7	Lean (L), crowded by Tree 601	Subject	Remove
603	Sugar Maple	*Acer saccharum*	37.5	F	F	F		5	V-union at 3m with included bark, epicormic branching (L)	Subject	Remove
604	Black Walnut	*Juglans nigra*	38.5	F	F	F		6	Burls (M), asymmetrical crown (L)	Subject	Remove
605	Scots Pine	*Pinus sylvestris*	16	D	D	D	100	-	Dead	Subject	Remove
606	Norway Maple	*Acer platanoides*	11	F	G	FG		4	Lean (L), seam (L)	Subject	Remove
607	Scots Pine	*Pinus sylvestris*	20	G	F	F		3	Vine competition (H), asymmetrical crown (M)	Subject	Remove
608	Willow species	*Salix sp.*	59, 41	P	P	P	90	5	Cavities (H), v-union at 1m and 2m with included bark, broken branches (M)	Subject	Remove
609	Norway Maple	*Acer platanoides*	17, 10	F	F	FG		4	Union at base, lean (L), crowded by Tree 608, multiple branch attachments	Subject	Remove
610	Norway Maple	*Acer platanoides*	21.5	FG	F	F		5	Lean (L), asymmetrical crown (M)	Subject	Remove
611	Norway Maple	*Acer platanoides*	18, 14.5	FG	G	G		4	Lean (L), union at base	Subject	Remove
612	Willow species	*Salix sp.*	27	FG	PF	F	30	5	Broken branches (M), bow (L)	Subject	Remove
613	Eastern White Cedar	*Thuja occidentalis*	13.5	F	PF	PF	40	2	Crook (M), decay (L) in trunk	Subject	Remove
614	Eastern White Cedar	*Thuja occidentalis*	18.5	PF	PF	PF	40	2	Lean (L), decay (M) in trunk, cavities (M)	Subject	Remove
615	Eastern White Cedar	*Thuja occidentalis*	20.5, 20.5, 14	P	PF	P	40	3	V-union at base with included bark, cavities (H), decay (H) in trunk, lean (L)	Subject	Remove
616	Eastern White Cedar	*Thuja occidentalis*	19.5	P	PF	P	40	2	Lean (M), cavities (H), decay (H) in trunk	Subject	Remove
617	Eastern White Cedar	*Thuja occidentalis*	41, 25	P	PF	P	40	3	Union at base, v-union at 2m with included bark, crook (M), vine competition (M), multiple branch attachments, cavities (H), decay (M) in trunk	Subject	Remove
618	Black Walnut	*Juglans nigra*	28	F	F	FG		6	Canker (L)	Subject	Remove
619	Manitoba Maple	*Acer negundo*	27, 21.5	P	P	P	80	4	Epicormic branching (M), vine competition (H), v-union at 1m with included bark, decay (H) in trunk, broken branches (H)	Subject	Remove
620	Sugar Maple	*Acer saccharum*	32	G	F	F		5	Asymmetrical crown (M), epicormic branching (L)	Subject	Remove
621	Sugar Maple	*Acer saccharum*	24	G	PF	PF	10	4	Asymmetrical crown (M), epicormic branching (H)	Subject	Remove
622	Sugar Maple	*Acer saccharum*	26	G	F	F	10	4	Epicormic branching (M)	Subject	Remove
623	Black Walnut	*Juglans nigra*	44	PF	F	PF	10	7	Canker (M), cavities (M)	Subject	Remove
624	Sugar Maple	*Acer saccharum*	34	PF	F	PF	20	5	V-union at 2m with included bark, decay (M) in trunk, epicormic branching (L)	Subject	Remove
625	Sugar Maple	*Acer saccharum*	11	G	PF	PF	40	2	Crowded by Trees 624 and 626, epicormic branching (M), asymmetrical crown (M)	Subject	Remove
626	Sugar Maple	*Acer saccharum*	25	G	F	F	20	4	Asymmetrical crown (M)	Subject	Remove
627	Black Walnut	*Juglans nigra*	30	F	FG	F	10	6	Lean (L), crook (M)	Subject	Remove
628	Eastern White Cedar	*Thuja occidentalis*	11.5	FG	F	F	20	3	Asymmetrical crown (M), lean (L)	Subject	Remove
629	Apple species	*Malus sp.*	39.5	F	F	F	30	4	Lean (M), union at 1.5m, epicormic branching (M)	Subject	Remove
630	White Pine	*Pinus strobus*	35	G	F	F	20	5	Vine competition (M)	Subject	Remove

631	Willow species	*Salix sp.*	72	PF	F	PF	10	9	Decay (M) in trunk, burls (L), lean (L), epicormic branching (M), broken branches (L)	Subject	Remove
632	Willow species	*Salix sp.*	15.5	PF	F	F		5	Crook (H), asymmetrical crown (M), crowded by Tree 631	Subject	Remove
633	Manitoba Maple	*Acer negundo*	20	PF	PF	PF	40	5	Lean (M), crook (M), cavities (L), epicormic branching (M)	Subject	Remove
634	Silver Maple	*Acer saccharinum*	13, 12.5, 12	F	F	F	10	5	Union at base, v-union at 1m with included bark, lean (L), bow (L), epicormic branching (L), asymmetrical crown (L)	Subject	Remove
635	Silver Maple	*Acer saccharinum*	30, 30, 19	PF	PF	F		6	V-union at 0.5m with included bark, epicormic branching (H), crook (M), poor form (M)	Subject	Remove
636	Willow species	*Salix sp.*	94	D	D	D	100	-	Dead	Subject	Remove
637	Poplar species	*Populus sp.*	41	F	F	F	20	5	Crook (M)	Subject	Remove
638	Silver Maple	*Acer saccharinum*	30, 21	PF	F	F	20	8	V-union at 0.5m with included bark, epicormic branching (M), crook (M), lean (L)	Subject	Remove
639	Silver Maple	*Acer saccharinum*	28, 21, 11	F	F	F	20	6	V-union at 0.5m with included bark, epicormic branching (L)	Subject	Remove
640	Willow species	*Salix sp.*	45	F	F	F		6	Lean (M), crook (M), seam (L), epicormic branching (M), broken branches (L)	Subject	Remove
641	Black Walnut	*Juglans nigra*	15.5	F	G	F		4	Lean (L), canker (L)	Subject	Remove
642	Black Walnut	*Juglans nigra*	44	FG	F	F	10	8	Lean (L), broken branches (L)	Subject	Remove
643	Eastern White Cedar	*Thuja occidentalis*	~28, ~12	P	F	PF	20	3	Union at 0.5m, cavities (H)	Subject	Remove
644	White Spruce	*Picea glauca*	29	G	F	F	20	4		Subject	Remove
645	Silver Maple	*Acer saccharinum*	59, 13, 12.5, 12	F	F	F	30	7	V-union at base and 3m with included bark, epicormic branching (L)	Subject	Remove
646	Manitoba Maple	*Acer negundo*	20	PF	F	PF	30	4	Lean (M), decay (L) in trunk, epicormic branching (M)	Subject	Remove
647	White Spruce	*Picea glauca*	12	FG	G	G		2	Lean (L)	Subject	Remove
648	Manitoba Maple	*Acer negundo*	20	PF	F	PF	30	2	Lean (M), epicormic branching (M), cavities (L)	Subject	Remove
649	White Spruce	*Picea glauca*	20	FG	FG	F	10	2	Lean (L)	Subject	Remove
650	Manitoba Maple	*Acer negundo*	22	FG	F	F	30	5	Lean (L), epicormic branching (M)	Subject	Remove
651	White Spruce	*Picea glauca*	19	G	FG	F	10	2		Subject	Remove
652	Manitoba Maple	*Acer negundo*	30	F	PF	PF	30	4	V-union at 3m with included bark, poor form (L), epicormic branching (M)	Subject	Remove
653	Poplar species	*Populus sp.*	54	D	D	D	100	-	Dead	Subject	Remove
654	White Spruce	*Picea glauca*	15	FG	P	F		2	Top lost at 2m, lean (L)	Subject	Remove
655	Manitoba Maple	*Acer negundo*	27	FG	F	F	20	4	Lean (L), epicormic branching (M)	Subject	Remove
656	Eastern White Cedar	*Thuja occidentalis*	14, 10, 10, 9	F	F	FG		3	V-union at base and 1m with included bark, asymmetrical crown (M)	Subject	Remove
657	White Spruce	*Picea glauca*	19.5	G	FG	F	10	3		Subject	Remove
658	White Spruce	*Picea glauca*	20	G	FG	F	10	3		Subject	Remove
659	White Spruce	*Picea glauca*	20	FG	FG	F	10	3	Crook (L)	Subject	Remove
660	White Spruce	*Picea glauca*	50.5	G	F	F	20	5	Broken branches (L)	Subject	Remove
661	Manitoba Maple	*Acer negundo*	40, 21, 20, 17	PF	F	F	20	6	V-union at base and 1m with included bark, cavities (L), lean (L-M), epicormic branching (M)	Subject	Remove
662	Sugar Maple	*Acer saccharum*	49	P	P	P	80	4	Vertical crack in trunk, broken branches (H), cavities (H), decay (H) in trunk, asymmetrical crown (H), epicormic branching (H)	Subject	Remove
663	Norway Maple	*Acer platanoides*	57	G	FG	F	10	9		Subject	Remove
664	Black Walnut	*Juglans nigra*	22	FG	FG	F	10	5	Included fence (L)	Subject	Remove
665	Bur Oak	*Quercus macrocarpa*	21	G	PF	PF	20	4	Epicormic branching (H)	Subject	Remove
666	Willow species	*Salix sp.*	12, 11	P	P	P	70	3	V-union at base with included bark and cavities (H), decay (H) in trunk, lean (M), epicormic branching (M), poor branch unions	Subject	Remove
667	White Elm	*Ulmus americana*	39	D	D	D	100	-	Dead	Subject	Remove
668	Apple species	*Malus sp.*	15, 10	PF	P	PF	40	2	Epicormic branching (H), union at 1m, asymmetrical crown (M), decay (M) in trunk, cavities (M), broken branches (M)	Subject	Remove
669	Little-leaf Linden	*Tilia cordata*	50, 19	F	F	F		6	Union at base, poor branch unions, burls (L), bow (L)	Subject	Remove
670	Eastern White Cedar	*Thuja occidentalis*	10	F	F	FG		2	Asymmetrical crown (M), crook (M)	Subject	Remove
671	Norway Spruce	*Picea abies*	47.5	G	F	F	10	4	Epicormic branching (L)	Subject	Remove
672	Manitoba Maple	*Acer negundo*	24, 13, 11.5	PF	F	PF	30	5	V-union at base and 0.5m with included bark, cavities (L), epicormic branching (M), lean (L-M), poor branch unions	Subject	Remove
673	Silver Maple	*Acer saccharinum*	50	F	PF	PF	40	5	Multiple branch attachments, v-union at 3m with included bark, canker (L), epicormic branching (L)	Subject	Remove
674	Norway Spruce	*Picea abies*	36	G	F	F	20	4	Epicormic branching (M)	Subject	Remove
675	Blue Spruce	*Picea pungens*	26	G	F	F	20	3	Epicormic branching (M)	Subject	Remove
676	Blue Spruce	*Picea pungens*	26.5	G	F	F	20	3	Epicormic branching (M)	Subject	Remove

677	Black Walnut	*Juglans nigra*	13	G	F	G		4	Asymmetrical crown (M)	Subject	Remove
678	Willow species	*Salix sp.*	39	G	PF	PF	40	5	Asymmetrical crown (L), epicormic branching (M)	Subject	Remove
679	Black Walnut	*Juglans nigra*	22.5	F	F	F	20	3	Crook (M)	Subject	Remove
680	Black Walnut	*Juglans nigra*	35	G	F	F	20	7	Epicormic branching (L)	Subject	Remove
681	Willow species	*Salix sp.*	~160	P	P	PF	30	14	Failed at base, epicormic branching (M), union at base with cavities (H)	Subject	Remove
682	Black Walnut	*Juglans nigra*	29.5	G	G	FG		7		Subject	Remove
683	Poplar species	*Populus sp.*	19	F	FG	F	10	4	Crook (M)	Subject	Remove
684	Poplar species	*Populus sp.*	11.5	FG	FG	F	10	3	Crook (L)	Subject	Remove
685	Silver Maple	*Acer saccharinum*	76	PF	PF	F	20	9	V-union at 1.5m with included bark, multiple branch attachments, poor branch unions, epicormic branching (M)	Subject	Remove
686	Poplar species	*Populus sp.*	13	FG	F	F	30	4	Lean (L), asymmetrical crown (L)	Subject	Remove
687	Poplar species	*Populus sp.*	16	F	PF	PF	30	4	Lean (L), crook (L), asymmetrical crown (H), epicormic branching (M)	Subject	Remove
688	Silver Maple	*Acer saccharinum*	~12, ~12, ~12	PF	PF	PF		5	Epicormic branching from stump, decay (H) in stump, asymmetrical crown (M), bow (M)	Subject	Remove
689	Silver Maple	*Acer saccharinum*	49.5	F	F	F	10	6	V-union at 2m with included bark, asymmetrical crown (L), epicormic branching (M)	Subject / Township (Right-of-Way)	Remove
690	Poplar species	*Populus sp.*	22.5	PF	P	P	90	3	Moribund, crook (L), decay (M) in trunk, top dead	Subject	Remove
691	Poplar species	*Populus sp.*	19, 15	F	F	F	20	4	Union at base, crook (L), decay (L) in trunk	Subject	Remove
692	Poplar species	*Populus sp.*	21	FG	F	F	20	4	Crook (L)	Subject	Remove
693	Black Walnut	*Juglans nigra*	33	G	FG	F	10	5		Subject	Remove
694	Poplar species	*Populus sp.*	30	PF	P	P	90	4	Decay (M) in trunk, moribund	Subject	Remove
695	Poplar species	*Populus sp.*	16	G	FG	FG	10	4		Subject	Remove
696	Poplar species	*Populus sp.*	18	G	FG	FG	10	4		Subject	Remove
697	Poplar species	*Populus sp.*	22.5	G	F	F	20	4		Subject	Remove
698	Poplar species	*Populus sp.*	22.5	G	FG	FG	10	4		Subject	Remove
699	Poplar species	*Populus sp.*	27.5	G	F	F	20	4		Subject	Remove
700	Poplar species	*Populus sp.*	20	F	PF	PF	40	4	Crook (M), asymmetrical crown (M)	Subject	Remove
701	Poplar species	*Populus sp.*	21	G	F	F	20	4		Subject	Remove
702	Poplar species	*Populus sp.*	13	F	F	F	20	3	Crook (M)	Subject	Remove
703	Mountain Ash species	*Sorbus sp.*	16	P	P	P	80	2	Top lost at 3m, epicormic branching (M), decay (M) in trunk, lean (L)	Subject	Remove
704	Poplar species	*Populus sp.*	11	F	P	P	70	3	Lean (L), crook (L)	Subject	Remove
705	Poplar species	*Populus sp.*	13	D	D	D	100	-	Dead	Subject	Remove
706	Poplar species	*Populus sp.*	11.5	D	D	D	100	-	Dead	Subject	Remove
707	Poplar species	*Populus sp.*	20	FG	FG	F	10	4	Crook (L)	Subject	Remove
708	Poplar species	*Populus sp.*	28	PF	PF	P	60	4	Top dead, epicormic branching (M), decay (M) in trunk	Subject	Remove
709	Poplar species	*Populus sp.*	10	G	FG	FG	10	3		Subject	Remove
710	Poplar species	*Populus sp.*	17	G	FG	FG	10	4		Subject	Remove
711	White Elm	*Ulmus americana*	41	G	F	F	30	5	Pruning wounds (L), epicormic branching (M)	Township (Right-of-Way)	Remove
712	Siberian Elm	*Ulmus pumila*	15	G	F	F	30	3	Epicormic branching (M)	Subject	Remove
713	Poplar species	*Populus sp.*	14	FG	F	F	10	3	Crook (L), epicormic branching (L)	Subject	Remove
714	Siberian Elm	*Ulmus pumila*	13	G	F	F	20	3	Epicormic branching (L)	Subject	Remove
715	Siberian Elm	*Ulmus pumila*	11	G	PF	PF	40	3		Subject	Remove
716	Poplar species	*Populus sp.*	24.5	PF	F	PF	30	4	Vine competition (M), decay (M) in trunk, crook (L), epicormic branching (M)	Subject	Remove
717	Poplar species	*Populus sp.*	23	F	F	F	10	5	Lean (L), crook (M), epicormic branching (L)	Subject	Remove
718	Poplar species	*Populus sp.*	14	G	F	FG	10	3	Asymmetrical crown (L)	Subject	Remove
719	Eastern White Cedar	*Thuja occidentalis*	~10	FG	F	FG		2	Lean (L), asymmetrical crown (M)	Subject	Remove
720	Silver Maple	*Acer saccharinum*	~56, 34.5, 23	PF	PF	PF	30	6	Union at 1m, cavities (M), broken branches (M), decay (M) in trunk, epicormic branching (M)	Subject	Remove
721	Poplar species	*Populus sp.*	25.5	F	F	F	10	4	Lean (L), multiple branch attachments, poor branch unions, vine competition (L)	Subject	Remove
722	Silver Maple	*Acer saccharinum*	35	FG	PF	PF	30	6	Poor branch unions, poor form (L), asymmetrical crown (L), epicormic branching (M)	Subject	Remove
723	Silver Maple	*Acer saccharinum*	~78	F	PF	PF	30	6	V-union at 2m with included bark, poor branch unions, poor form (L), asymmetrical crown (L), epicormic branching (M)	Subject	Remove

724	Balsam Fir	*Abies balsamea*	20	F	F	F	20	3	Stem wounds (M), rope girdling trunk (L)	Subject	Remove
725	Manitoba Maple	*Acer negundo*	24, 18, 13	PF	PF	PF	30	4	V-union at 1m with included bark, broken branches (M), epicormic branching (M), decay (L) in trunk, cavities (L)	Subject	Remove
726	White Birch	*Betula papyrifera*	~24, ~14, 11	F	F	F		4	V-union at base with included bark, lean (L), epicormic branching (M)	Township (Right-of-Way)	Remove
727	Austrian Pine	*Pinus nigra*	37	FG	PF	PF	40	4	Lean (L)	Subject	Remove
728	Black Walnut	*Juglans nigra*	33	FG	FG	FG		5	Lean (L), asymmetrical crown (L)	Subject	Remove
729	Sugar Maple	*Acer saccharum*	21	PF	F	PF		4	Cavities (M), epicormic branching (M), asymmetrical crown (M), lean (L)	Subject	Remove
730	Austrian Pine	*Pinus nigra*	24.5	D	D	D	100	-	Dead	Subject	Remove
731	Norway Maple	*Acer platanoides*	27.5	G	F	F	20	5		Subject	Remove
732	Sugar Maple	*Acer saccharum*	37	G	F	F	20	5		Subject	Remove
733	Black Walnut	*Juglans nigra*	18	G	FG	FG	10	5		Subject	Remove
734	Apple species	*Malus sp.*	15.5	D	D	D	100	-	Dead	Subject	Remove
735	Austrian Pine	*Pinus nigra*	47	F	F	F	20	6	V-union at 5m with included bark	Subject	Remove
736	Tamarack	*Larix laricina*	34.5	FG	F	F	20	5	Lean (L), epicormic branching (L)	Subject	Remove
737	Norway Spruce	*Picea abies*	20	FG	F	F	10	3	Lean (L), asymmetrical crown (L)	Subject	Remove
738	Sugar Maple	*Acer saccharum*	16	G	F	FG		4	Asymmetrical crown (M)	Subject	Remove
739	White Spruce	*Picea glauca*	20, 19	F	FG	FG		3	V-union at 0.5m with included bark	Subject	Remove
740	Scots Pine	*Pinus sylvestris*	32.5	FG	F	F	10	4	Lean (L), asymmetrical crown (L)	Subject	Remove
741	White Birch	*Betula papyrifera*	30, 25	F	F	F	10	5	V-union at 0.5m with included bark, lean (L)	Subject	Remove
742	Sugar Maple	*Acer saccharum*	~86	P	P	P	80	5	Cavities (H), decay (H) in trunk, asymmetrical crown (H), broken branches (H)	Subject / Township (Right-of-Way)	Remove
743	Sugar Maple	*Acer saccharum*	~54	F	F	F	30	5	Asymmetrical crown (L), broken branches (M), decay (L) in trunk	Subject / Township (Right-of-Way)	Remove
744	Austrian Pine	*Pinus nigra*	32	F	F	F	30	4	Included chain (H)	Subject / Township (Right-of-Way)	Remove
745	Austrian Pine	*Pinus nigra*	40.5	F	F	F	30	4	Lean (L)	Township (Right-of-Way)	Remove
746	Blue Spruce	*Picea pungens*	37	F	PF	PF	30	4	Asymmetrical crown (L), top dead	Subject	Remove
747	Austrian Pine	*Pinus nigra*	38	G	PF	F	30	5	Asymmetrical crown (M)	Subject	Remove
748	Austrian Pine	*Pinus nigra*	35	G	PF	F	30	5	Asymmetrical crown (M)	Subject	Remove
749	Norway Maple	*Acer platanoides*	52	F	F	F	10	6	Multiple branch attachments, poor branch unions, epicormic branching (L)	Subject	Remove
750	Hawthorn species	*Crataegus sp.*	16, 16	PF	PF	PF	40	3	V-union at 1m with included bark and cavities (M)	Subject	Remove
751	Norway Maple	*Acer platanoides*	24	FG	G	FG		4	Lean (L)	Subject	Remove
752	Eastern White Cedar	*Thuja occidentalis*	10, 10	G	F	F		2	Union at 1m, asymmetrical crown (M)	Subject	Remove
753	Scots Pine	*Pinus sylvestris*	14	FG	F	F	20	2	Lean (L)	Subject	Remove
754	Poplar species	*Populus sp.*	15.5	F	F	F	30	3	Top dead	Subject	Remove
755	Scots Pine	*Pinus sylvestris*	18.5	FG	FG	FG	10	3	Lean (L)	Subject	Remove
756	Poplar species	*Populus sp.*	15	G	G	G		3		Subject	Remove
757	Poplar species	*Populus sp.*	11	G	G	G		2		Subject	Remove
758	Poplar species	*Populus sp.*	11	G	G	G		2		Subject	Remove
759	Scots Pine	*Pinus sylvestris*	17	F	F	F	20	3	Lean (L), crook (L)	Subject	Remove
760	Poplar species	*Populus sp.*	13	F	F	F	10	3	Sweep (L), seam (L), crook (L)	Subject	Remove
761	Scots Pine	*Pinus sylvestris*	14.5	FG	F	F	20	2	Lean (L), asymmetrical crown (L)	Subject	Remove
762	Scots Pine	*Pinus sylvestris*	19.5	G	FG	FG	10	3		Subject	Remove
763	Scots Pine	*Pinus sylvestris*	11	G	G	G		2		Subject	Remove
764	Apple species	*Malus sp.*	17.5, 17	F	F	F	20	4	Union at base, bow (L), epicormic branching (M), lean (L)	Subject	Remove
765	Norway Maple	*Acer platanoides*	20	FG	FG	G		4	Sweep (L), asymmetrical crown (L)	Township (Right-of-Way)	Remove
766	Apple species	*Malus sp.*	10.5, 10	F	F	F	30	3	Bow (M), v-union at 1m with included bark, epicormic branching (M)	Subject	Remove
767	Sugar Maple	*Acer saccharum*	14.5	PF	F	F	20	3	Bow (M), crook (M), poor form (M)	Subject	Remove
768	Apple species	*Malus sp.*	23, 17, 15	P	F	PF	30	4	V-union at 0.5m with included bark, union at 1m, cavities (H), epicormic branching (M), crook (L)	Subject	Remove

769	Apple species	*Malus sp.*	35, 24	P	P	P	60	4	Union at 1m, cavities (H), decay (M) in trunk, epicormic branching (M)	Subject	Remove
770	Black Walnut	*Juglans nigra*	37	G	FG	F	10	7		Subject	Remove
771	Black Cherry	*Prunus serotina*	42	P	P	P	90	5	Cavities (H), decay (H) in trunk, asymmetrical crown (H), broken branches (H), moribund	Subject	Remove
772	Austrian Pine	*Pinus nigra*	19	D	D	D	100	-	Dead	Subject	Remove
773	Austrian Pine	*Pinus nigra*	14.5	G	PF	PF	40	3		Subject	Remove
774	Scots Pine	*Pinus sylvestris*	16.5	FG	FG	FG	10	3	Lean (L)	Subject	Remove
775	Scots Pine	*Pinus sylvestris*	27	FG	FG	FG	10	4	Lean (L)	Subject	Remove
776	Norway Spruce	*Picea abies*	35	G	FG	F	10	5		Subject	Remove
777	Austrian Pine	*Pinus nigra*	41	F	F	F	10	5	V-union at 4m with included bark	Subject	Remove
778	Sugar Maple	*Acer saccharum*	42	PF	PF	PF	40	5	V-union at 2m with included bark, multiple branch attachments, poor branch unions, root flare below ground, broken branches (H)	Subject	Remove
779	Basswood	*Tilia americana*	56.5	F	F	F	10	6	V-union at 2m and 3m with included bark, asymmetrical crown (M), bow (L)	Subject	Remove
780	Willow species	*Salix sp.*	15.5, 14, 13	PF	F	F	30	4	V-union at base with included bark, bow (M), epicormic branching (M)	Subject	Remove
781	White Pine	*Pinus strobus*	28	G	FG	FG	10	5		Subject	Remove
782	White Spruce	*Picea glauca*	11	G	FG	G		2	Asymmetrical crown (L)	Subject	Remove
783	White Spruce	*Picea glauca*	14	G	G	G		3		Subject	Remove
784	White Spruce	*Picea glauca*	11	G	F	F	20	2	Asymmetrical crown (M)	Subject	Remove
785	White Spruce	*Picea glauca*	14	G	F	F	20	3	Asymmetrical crown (L)	Subject	Remove
786	Silver Maple	*Acer saccharinum*	21, 15, 14, 10	PF	F	F	20	6	V-union at base and 1m with included bark, canker (L), lean (L), epicormic branching (L)	Subject	Remove
787	Silver Maple	*Acer saccharinum*	14	FG	F	F		4	Bow (L), epicormic branching (M)	Subject	Remove
788	Silver Maple	*Acer saccharinum*	12	F	PF	F	20	4	Asymmetrical crown (H), canker (L)	Subject	Remove
789	Silver Maple	*Acer saccharinum*	22, 17	PF	F	F	20	6	V-union at 1m with included bark, bow (L), canker (L), asymmetrical crown (L)	Subject	Remove
790	Silver Maple	*Acer saccharinum*	18	FG	F	F	10	5	Epicormic branching (M), crook (L)	Subject	Remove
791	White Spruce	*Picea glauca*	15	G	G	G		3		Subject	Remove
792	Silver Maple	*Acer saccharinum*	29	FG	F	F	10	7	Lean (L), asymmetrical crown (L)	Subject	Remove
793	White Spruce	*Picea glauca*	~14	G	G	G		3		Subject	Remove
794	Silver Maple	*Acer saccharinum*	40, 37	PF	F	PF	20	7	Cavities (H), union at 1m with cavities (H), multiple branch attachments, bow (M), epicormic branching (M)	Subject	Remove
795	White Elm	*Ulmus americana*	~72, ~48	P	PF	PF	30	12	V-union at 1m with included bark and wetwood and stems fused to 2m and seam (H) below, broken branches (M), epicormic branching (M)	Subject	Remove
796	White Elm	*Ulmus americana*	~82	G	PF	F	30	10	Epicormic branching (M), broken branches (M)	Subject	Remove
797	Manitoba Maple	*Acer negundo*	36	F	F	F	30	7	Growth deficit (L), asymmetrical crown (L), lean (L), epicormic branching (M)	Subject	Remove
798	Manitoba Maple	*Acer negundo*	34.5, 18	PF	F	F	30	8	V-union at 1m with included bark, epicormic branching (M), bow (M), asymmetrical crown (L)	Subject	Remove
799	Manitoba Maple	*Acer negundo*	38	F	PF	F	30	7	Asymmetrical crown (M), lean (L), crook (L), epicormic branching (M)	Subject	Remove
800	Manitoba Maple	*Acer negundo*	28	PF	PF	PF	30	6	Sweep (M), bow (M), broken branches (H), asymmetrical crown (H), epicormic branching (M)	Subject	Remove
801	Manitoba Maple	*Acer negundo*	18, 17, 16, 14, 14, 11	PF	F	F	20	5	V-union at base and 0.5m with included bark, lean (L-M), epicormic branching (M)	Subject	Remove
802	Manitoba Maple	*Acer negundo*	17, 17	F	PF	F	30	5	Union at base, lean (M), broken branches (H), epicormic branching (M), asymmetrical crown (M)	Subject	Remove
803	Manitoba Maple	*Acer negundo*	~34	PF	PF	PF	30	6	Lean (H), epicormic branching (H), asymmetrical crown (M)	Subject	Remove
804	Manitoba Maple	*Acer negundo*	~40	P	P	P	80	8	Failed at base, broken branches (H), epicormic branching (H), poor form (H)	Subject	Remove
805	Manitoba Maple	*Acer negundo*	35, 27.5, 24	PF	PF	PF	30	8	V-union at 1m with included bark, lean (H), asymmetrical crown (M), epicormic branching (H)	Subject	Remove
806	Manitoba Maple	*Acer negundo*	55.5	PF	PF	PF	30	9	Multiple branch attachments, poor branch unions, epicormic branching (H), broken branches (M), fruiting bodies	Subject	Remove
807	Black Walnut	*Juglans nigra*	20, 18.5	F	F	F	10	5	V-union at 1m with included bark	Subject	Remove
808	Manitoba Maple	*Acer negundo*	~42, ~36	F	F	F	20	7	V-union at base with included bark, bow (L), asymmetrical crown (L), epicormic branching (H)	Subject	Remove
809	Poplar species	*Populus sp.*	22.5, 10.5	PF	FG	F		4	V-union at 0.5m with included bark, decay (H) in trunk, epicormic branching (L)	Subject	Remove
810	Poplar species	*Populus sp.*	18	F	G	G		4	Sweep (M), lean (L), vine competition (L)	Subject	Remove
811	Poplar species	*Populus sp.*	15	G	G	G		3	Vine competition (L)	Subject	Remove
812	Black Walnut	*Juglans nigra*	25, 22	F	F	F		5	Previously tagged: #724, v-union at 0.5m with included bark, epicormic branching (L)	Subject	Remove

P-1	See Table 2	Subject	Remove
P-2	See Table 2	Township (Right-of-Way)	Remove
P-3	See Table 2	Township (Right-of-Way)	Remove
P-4	See Table 2	Township (Right-of-Way)	Remove
P-5	See Table 2	Township (Right-of-Way)	Remove

Codes		
DBH	Diameter at Breast Height	*(cm)*
TI	Trunk Integrity	*(G, F, P, D)*
CS	Crown Structure	*(G, F, P, D)*
CV	Crown Vigor	*(G, F, P, D)*
CDB	Crown Dieback	*(%)*
DL	Dripline (Radius)	*(m)*
Owner	Subject, Neighbour, Township	
~ = estimate (L) = light; (M) = moderate; (H) = heavy G = good; F = fair; P = poor; D = dead		

Table 2. 100% Stand Tally Analyses of Polygons

Polygon P-1

Tree Size Class →	10cm - 29.5cm		30cm - 40.5cm		41cm +		Total All Sizes	
Species	**AGS**	**UGS**	**AGS**	**UGS**	**AGS**	**UGS**	**AGS**	**UGS**
Eastern White Cedar (*Thuja occidentalis*)	1	9	0	0	0	0	1	9
Total Number of Trees	**1**	**9**	**0**	**0**	**0**	**0**	**1**	**9**

Polygon P-2

Tree Size Class →	0cm - 9.5cm		10cm - 29.5cm		30cm - 40.5cm		41cm +		Total All Sizes	
Species	**AGS**	**UGS**	**AGS**	**UGS**	**AGS**	**UGS**	**AGS**	**UGS**	**AGS**	**UGS**
Norway Maple (*Acer platanoides*)	4	0	0	0	0	0	0	0	4	0
White Mulberry (*Morus alba*)	1	0	0	0	0	0	0	0	1	0
Total Number of Trees	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**

Polygon P-3

Tree Size Class →	0cm - 9.5cm		10cm - 29.5cm		30cm - 40.5cm		41cm +		Total All Sizes	
Species	**AGS**	**UGS**	**AGS**	**UGS**	**AGS**	**UGS**	**AGS**	**UGS**	**AGS**	**UGS**
Willow species (*Salix sp.*)	3	0	0	0	0	0	0	0	3	0
Manitoba Maple (*Acer negundo*)	7	0	0	0	0	0	0	0	7	0
Poplar species (*Populus sp.*)	1	0	0	0	0	0	0	0	1	0
Total Number of Trees	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**0**

Polygon P-4

Tree Size Class →	0cm - 9.5cm		10cm - 29.5cm		30cm - 40.5cm		41cm +		Total All Sizes	
Species	**AGS**	**UGS**	**AGS**	**UGS**	**AGS**	**UGS**	**AGS**	**UGS**	**AGS**	**UGS**
Poplar species (*Populus sp.*)	7	0	0	0	0	0	0	0	7	0
Total Number of Trees	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**0**

Polygon P-5

Tree Size Class →	0cm - 9.5cm		10cm - 29.5cm		30cm - 40.5cm		41cm +		Total All Sizes	
Species	**AGS**	**UGS**	**AGS**	**UGS**	**AGS**	**UGS**	**AGS**	**UGS**	**AGS**	**UGS**
Austrian Pine (*Pinus nigra*)	2	0	0	0	0	0	0	0	2	0
Poplar species (*Populus sp.*)	1	0	0	0	0	0	0	0	1	0
Total Number of Trees	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**

Table 3. 100% Plot Tally Analyses of Density Plots

Plot 1

Tree Size Class →	0cm - 5cm	5.5cm - 12cm	12.5cm - 20cm	20.5cm +	Total All Sizes
Species					
Manitoba Maple (*Acer negundo*)	0	0	0	3	3
Total Number of Trees	**0**	**0**	**0**	**3**	**3**

Plot 2

Tree Size Class →	0cm - 5cm	5.5cm - 12cm	12.5cm - 20cm	20.5cm +	Total All Sizes
Species					
Sugar Maple (*Acer saccharum*)	0	1	0	2	3
Black Walnut (*Juglans nigra*)	2	0	0	2	4
Total Number of Trees	**2**	**1**	**0**	**4**	**7**

Plot 3

Tree Size Class →	0cm - 5cm	5.5cm - 12cm	12.5cm - 20cm	20.5cm +	Total All Sizes
Species					
Poplar species (*Populus sp.*)	11	6	1	0	18
Total Number of Trees	**11**	**6**	**1**	**0**	**18**

Plot 4

Tree Size Class →	0cm - 5cm	5.5cm - 12cm	12.5cm - 20cm	20.5cm +	Total All Sizes
Species					
Scots Pine (*Pinus sylvestris*)	1	3	3	0	7
Poplar species (*Populus sp.*)	2	2	2	0	6
Willow species (*Salix sp.*)	0	1	0	0	1
Total Number of Trees	**3**	**6**	**0**	**0**	**9**

Plot 5

Tree Size Class →	0cm - 5cm	5.5cm - 12cm	12.5cm - 20cm	20.5cm +	Total All Sizes
Species					
Poplar species (*Populus sp.*)	6	0	0	0	6
Scots Pine (*Pinus sylvestris*)	0	1	0	0	1
Total Number of Trees	**6**	**1**	**0**	**0**	**7**

Appendix A. Undertaking

UNDERTAKING

TO: The Corporation of the Township of Puslinch

RE: Lands municipally known as 7456 Mclean Road West and N/A Brock Road South, being PIN 71196-0037 (LT) and PIN 71196-0039 (LT) (the "Lands")

I, Ishwinderpreet Singh Wadhwa, President of Daaz Inc., hereby undertake and agree as follows:

1. That Daaz Inc. shall not remove, injure, or destroy any trees located on the Lands unless and until site plan approval has been granted by the Township of Puslinch.

2. This Undertaking is provided in connection with the ongoing review of the proposed development of the Lands and is intended to address comments received from the Township's ecologist.

3. This Undertaking shall remain in full force and effect until site plan approval has been granted by the Township of Puslinch, unless otherwise agreed to in writing by the Township.

DATED at MILTON ON, this 17 day of MARCH, 2026.

DAAZ INC.

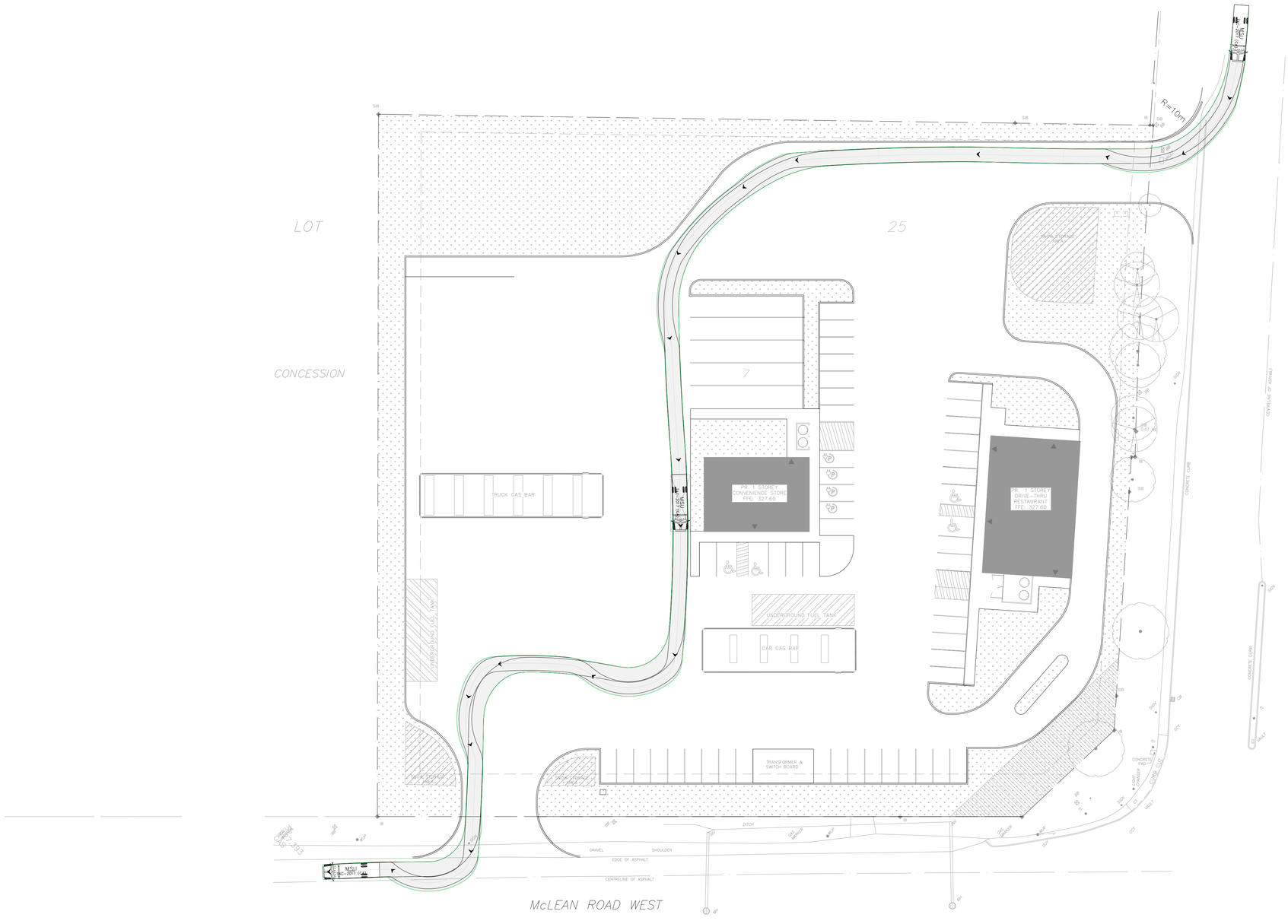
[redacted]

Per:

Name: Ishwinderpreet Singh Wadhwa

Title: President

I have authority to bind the corporation.



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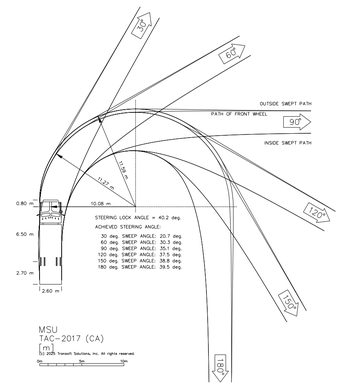
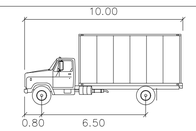
FOR REVIEW

NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



VEHICLE PROFILE



MSU

meters

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Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.2

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR REVIEW	08/31/2023
2	ISSUED FOR SUBMISSION	10/19/2023
3	ISSUED FOR SUBMISSION	08/01/2025
4	ISSUED FOR COORDINATION	12/01/2025
5	ISSUED FOR SUBMISSION	01/26/2026
6	ISSUED FOR SUBMISSION	03/17/2026

Project

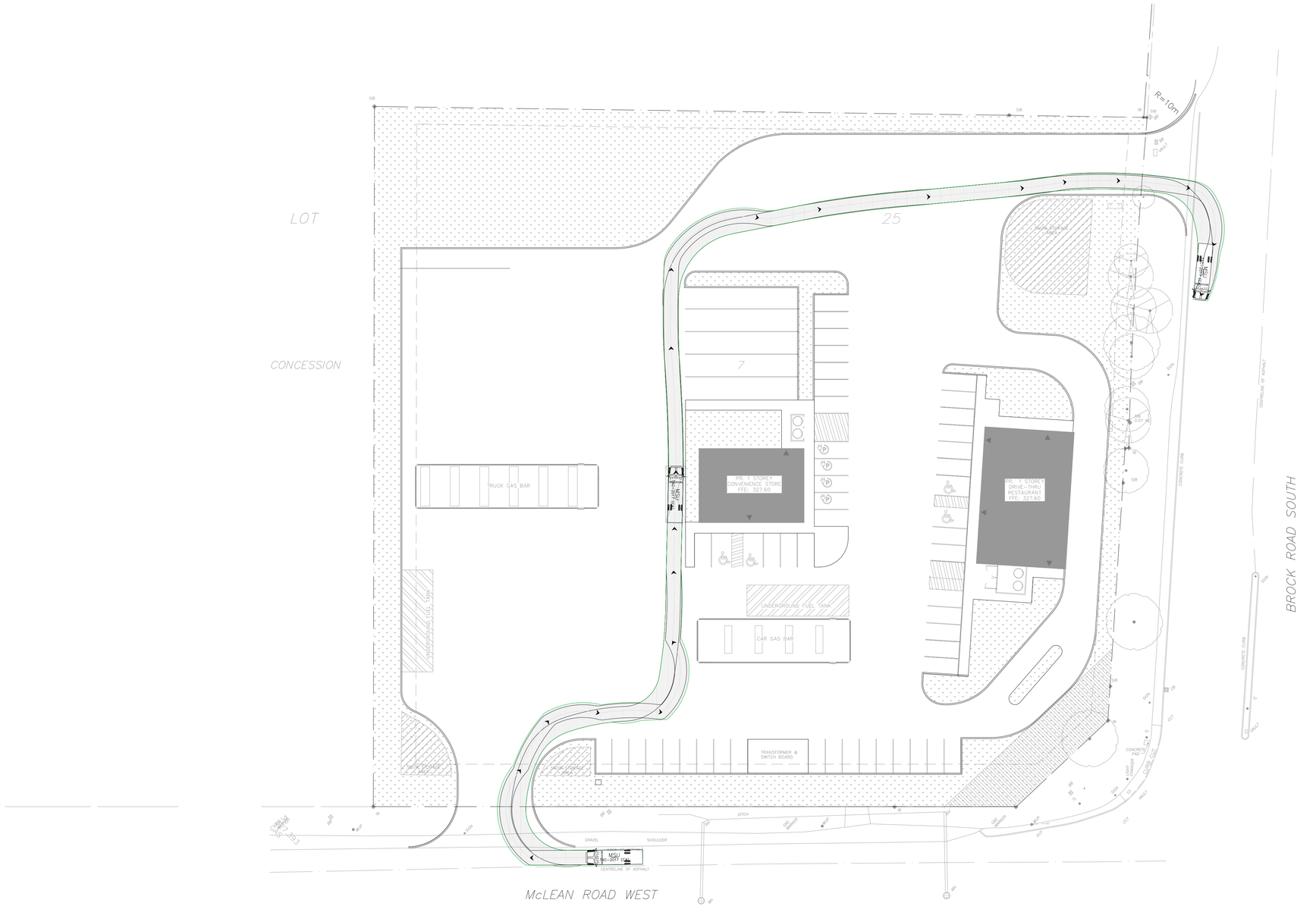
7456 McLEAN ROAD WEST AND
197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH

Drawing

VEHICLE MANEUVERING ANALYSIS
MEDIUM SINGLE UNIT (MSU) TRUCK

CROZIER
CONSULTING ENGINEERS

Drawn	I.A./M.P./I.M.	Design	M.P./I.M.	Project No.	2792-7289
Check	R.K./I.L.	Check	R.K./I.L.	Scale	1:400
				Dwg.	FIG12



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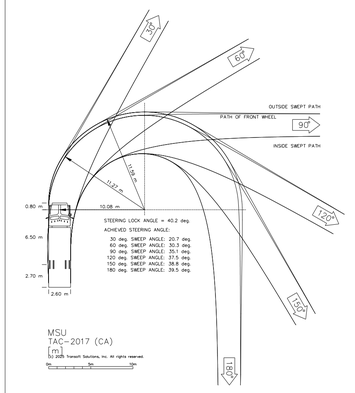
FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



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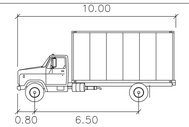

MSU

	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.2

No.	ISSUE	DATE: MM/DD/YYYY
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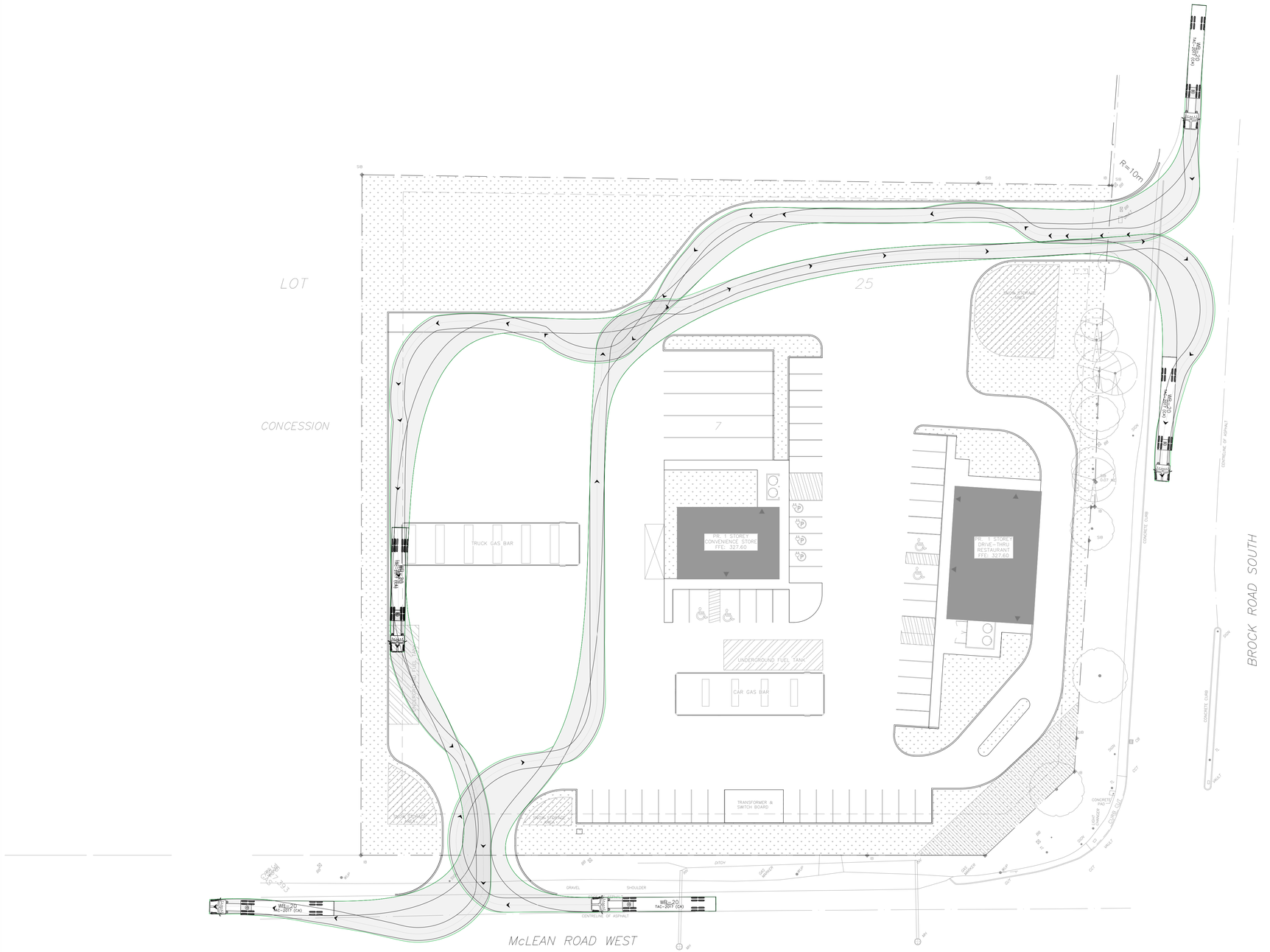
6	ISSUED FOR SUBMISSION	03/17/2026

Project
7456 McLEAN ROAD WEST AND
197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH

Drawing
VEHICLE MANEUVERING ANALYSIS
MEDIUM SINGLE UNIT (MSU) TRUCK

CROZIER
CONSULTING ENGINEERS

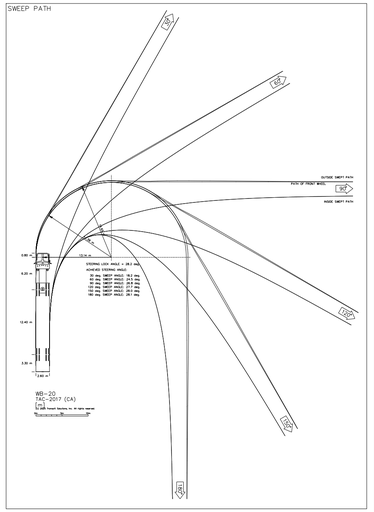
Drawn: I.A./M.P./I.M.	Design: M.P./I.M.	Project No.	2792-7289
Check: R.K./I.L.	Check: R.K./I.L.	Scale: 1:400	Dwg. FIG13



FOR REVIEW

NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



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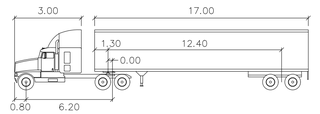

WB–20

meters

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Trailer Width	: 2.60	Steering Angle	: 28.2
Tractor Track	: 2.60	Articulating Angle	: 70.0
Trailer Track	: 2.60		

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6	ISSUED FOR SUBMISSION	03/17/2026

Project

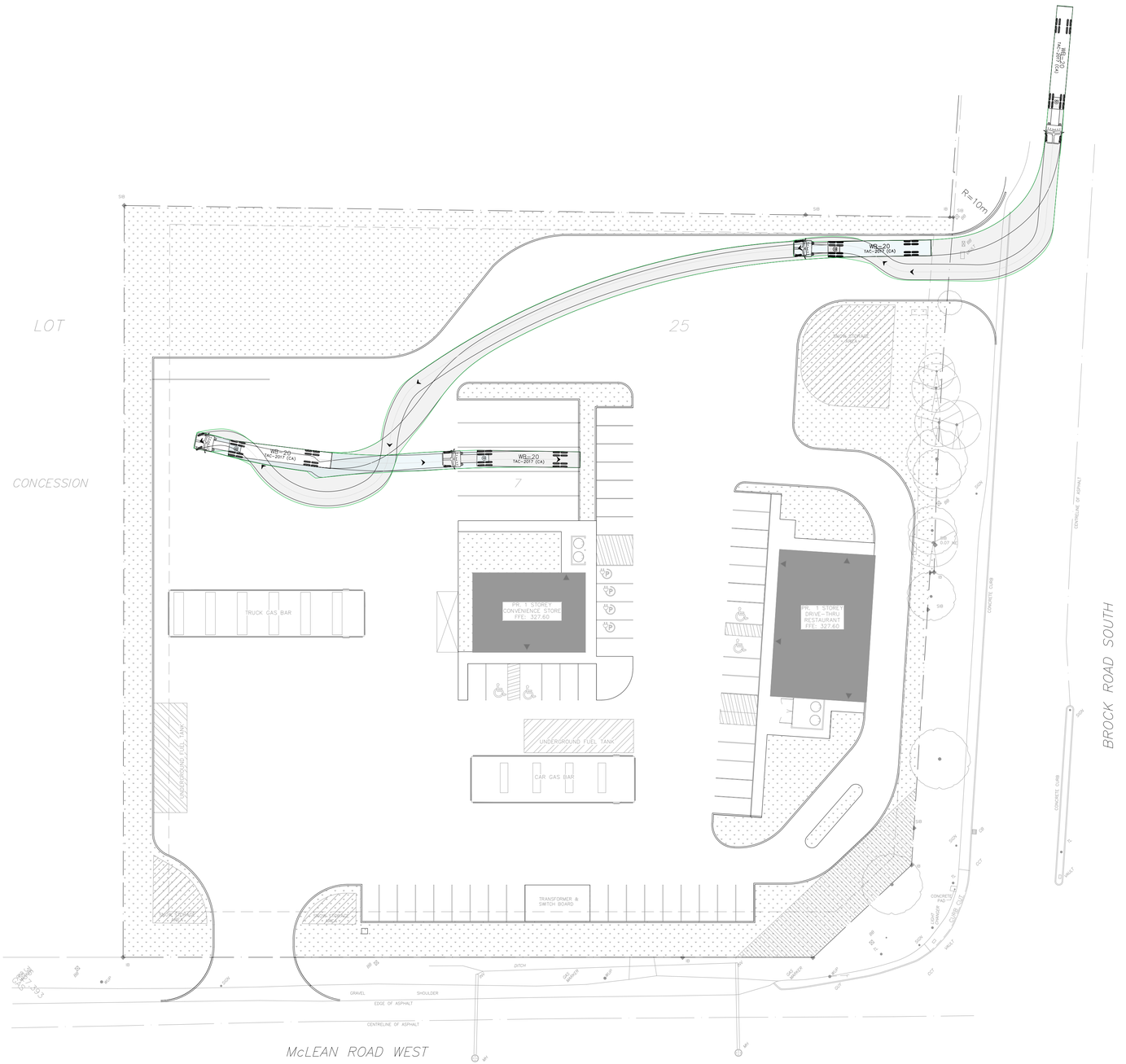
7456 McLEAN ROAD WEST AND
197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH

Drawing

VEHICLE MANEUVERING ANALYSIS
WB–20 TRUCK

CROZIER
CONSULTING ENGINEERS

Drawn	I.A./M.P./I.M.	Design	M.P./I.M.	Project No.	2792–7289
Check	R.K./I.L.	Check	R.K./I.L.	Scale	1:400
				Dwg.	FIG14



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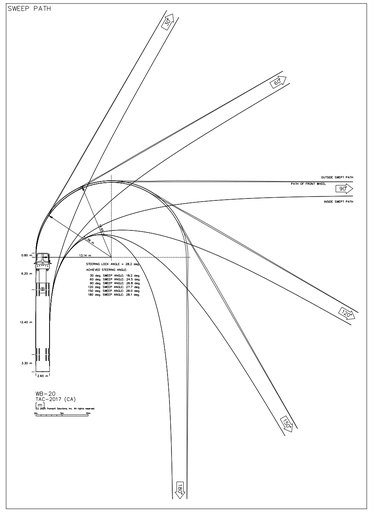
FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



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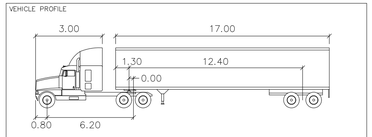

WB-20

meters

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Tractor Track	: 2.60	Articulating Angle	: 70.0
Trailer Track	: 2.60		

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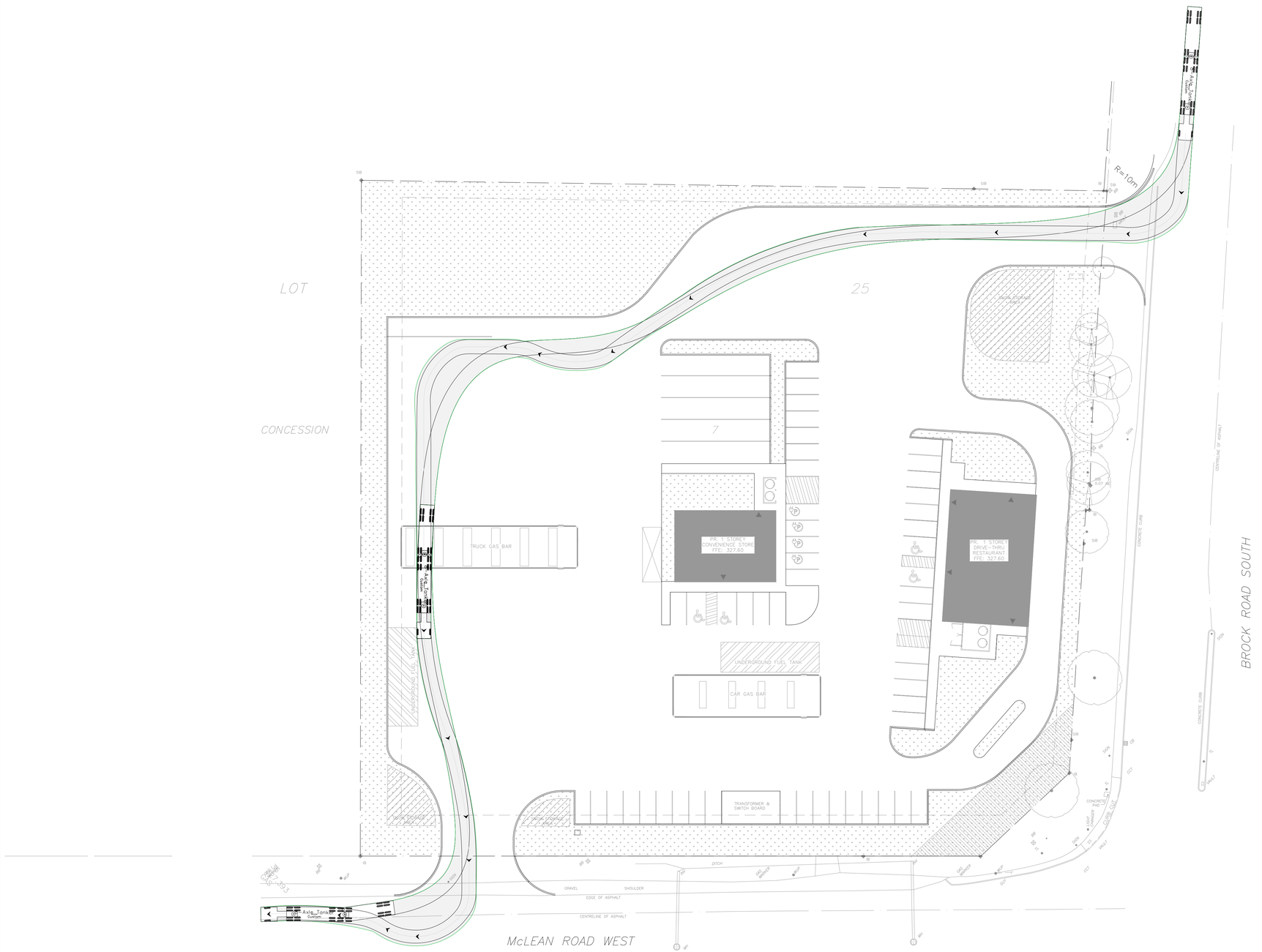
Project
7456 McLEAN ROAD WEST AND
197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH

Drawing
VEHICLE MANEUVERING ANALYSIS
WB-20 TRUCK

CROZIER
CONSULTING ENGINEERS

Drawn I.A./M.P./I.M.	Design M.P./I.M.	Project No.	2792-7289
Check R.K./I.L.	Check R.K./I.L.	Scale 1:400	Dwg. FIG15



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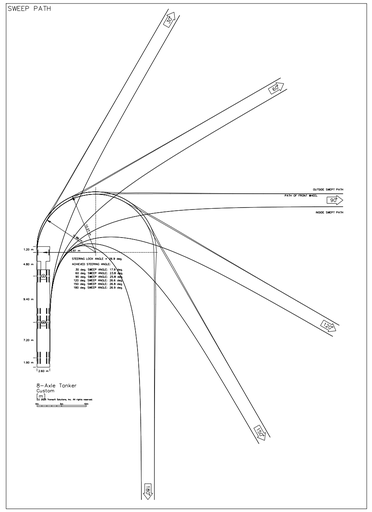
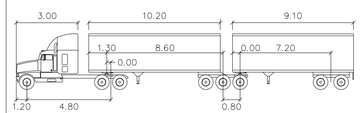
FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



VEHICLE PROFILE



8-Axle Tanker

	meters		
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Trailer Width	: 2.60	Steering Angle	: 26.9
Tractor Track	: 2.60	Articulating Angle	: 70.0
Trailer Track	: 2.60		

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR REVIEW	08/31/2023
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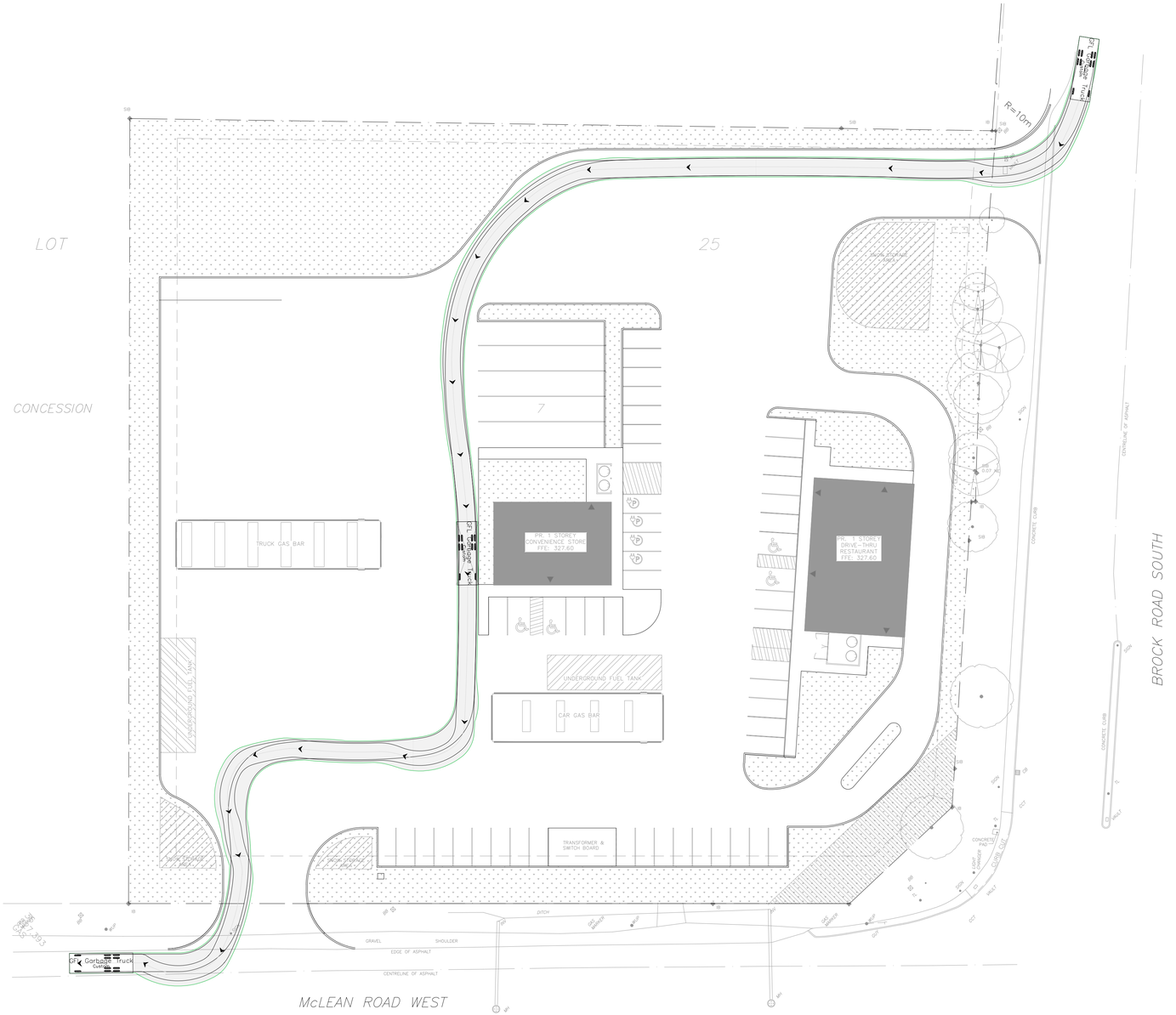
5	ISSUED FOR SUBMISSION	01/26/2026
6	ISSUED FOR SUBMISSION	03/17/2026

Project
7456 McLEAN ROAD WEST AND
197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH

Drawing
VEHICLE MANEUVERING ANALYSIS
8-AXLE FUEL TANKER

CROZIER
CONSULTING ENGINEERS

Drawn I.A./M.P./I.M.	Design M.P./I.M.	Project No.	2792-7289
Check R.K./I.L.	Check R.K./I.L.	Scale 1:400	Dwg. FIG16



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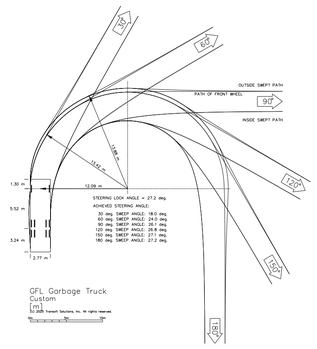
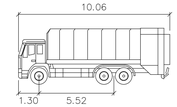
SCALE: 1:400

FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



VEHICLE PROFILE



GFL Garbage Truck

	meters
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Lock to Lock Time	: 6.0
Steering Angle	: 27.2

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR REVIEW	08/31/2023
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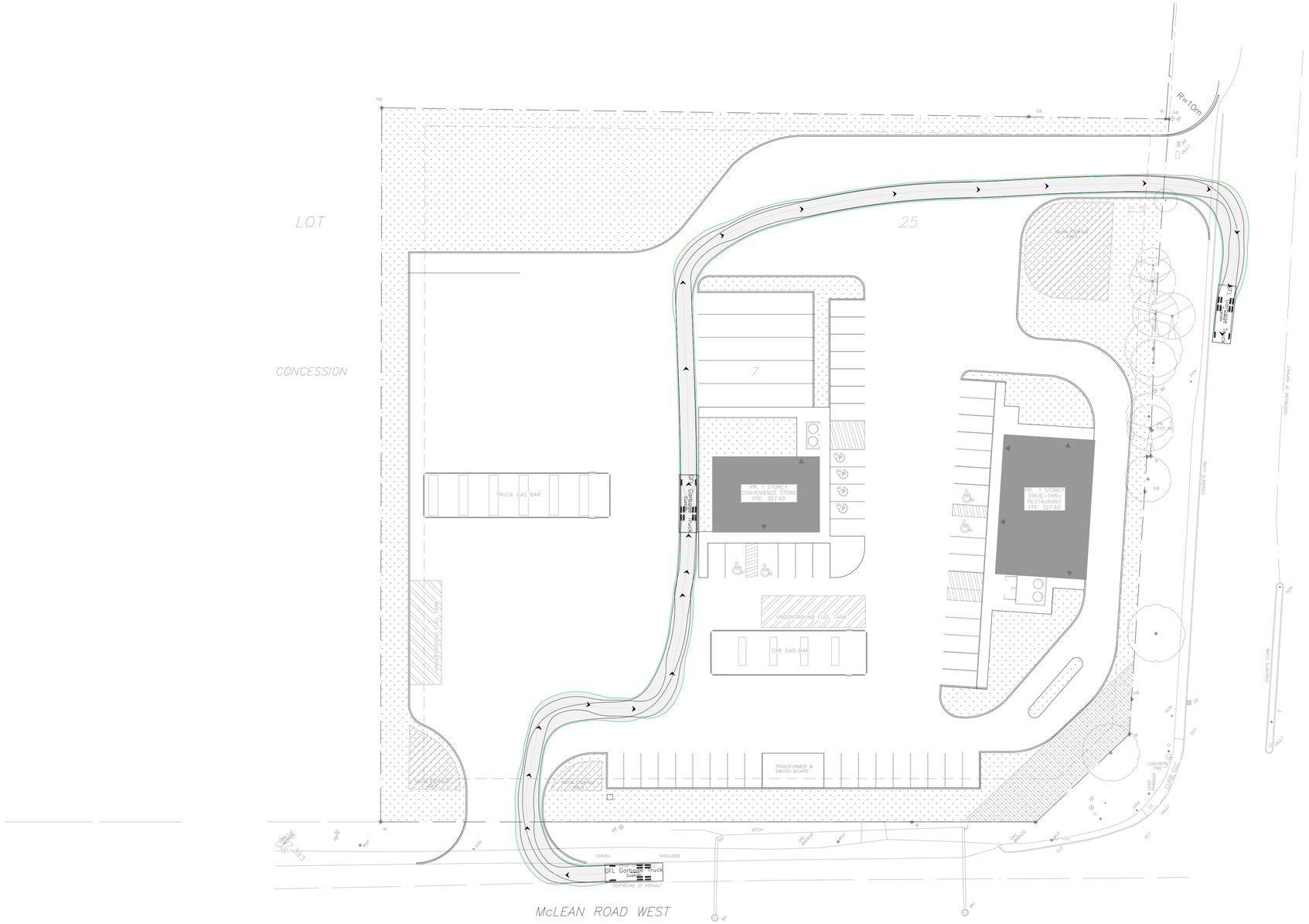
5	ISSUED FOR SUBMISSION	01/26/2026
6	ISSUED FOR SUBMISSION	03/17/2026

Project
7456 McLEAN ROAD WEST AND
197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH

Drawing
VEHICLE MANEUVERING ANALYSIS
WASTE COLLECTION

CROZIER
CONSULTING ENGINEERS

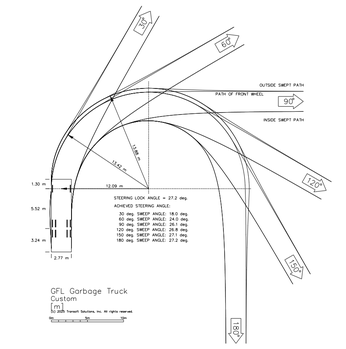
Drawn I.A./M.P./I.M.	Design M.P./I.M.	Project No.	2792-7289
Check R.K./I.L.	Check R.K./I.L.	Scale 1:400	Dwg. FIG17



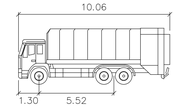
FOR REVIEW

NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



VEHICLE PROFILE



GFL Garbage Truck

	meters
Width	: 2.77
Track	: 2.77
Lock to Lock Time	: 6.0
Steering Angle	: 27.2

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR REVIEW	08/31/2023
2	ISSUED FOR SUBMISSION	10/19/2023
3	ISSUED FOR SUBMISSION	08/01/2025
4	ISSUED FOR COORDINATION	12/01/2025
5	ISSUED FOR SUBMISSION	01/26/2026
6	ISSUED FOR SUBMISSION	03/17/2026

Project

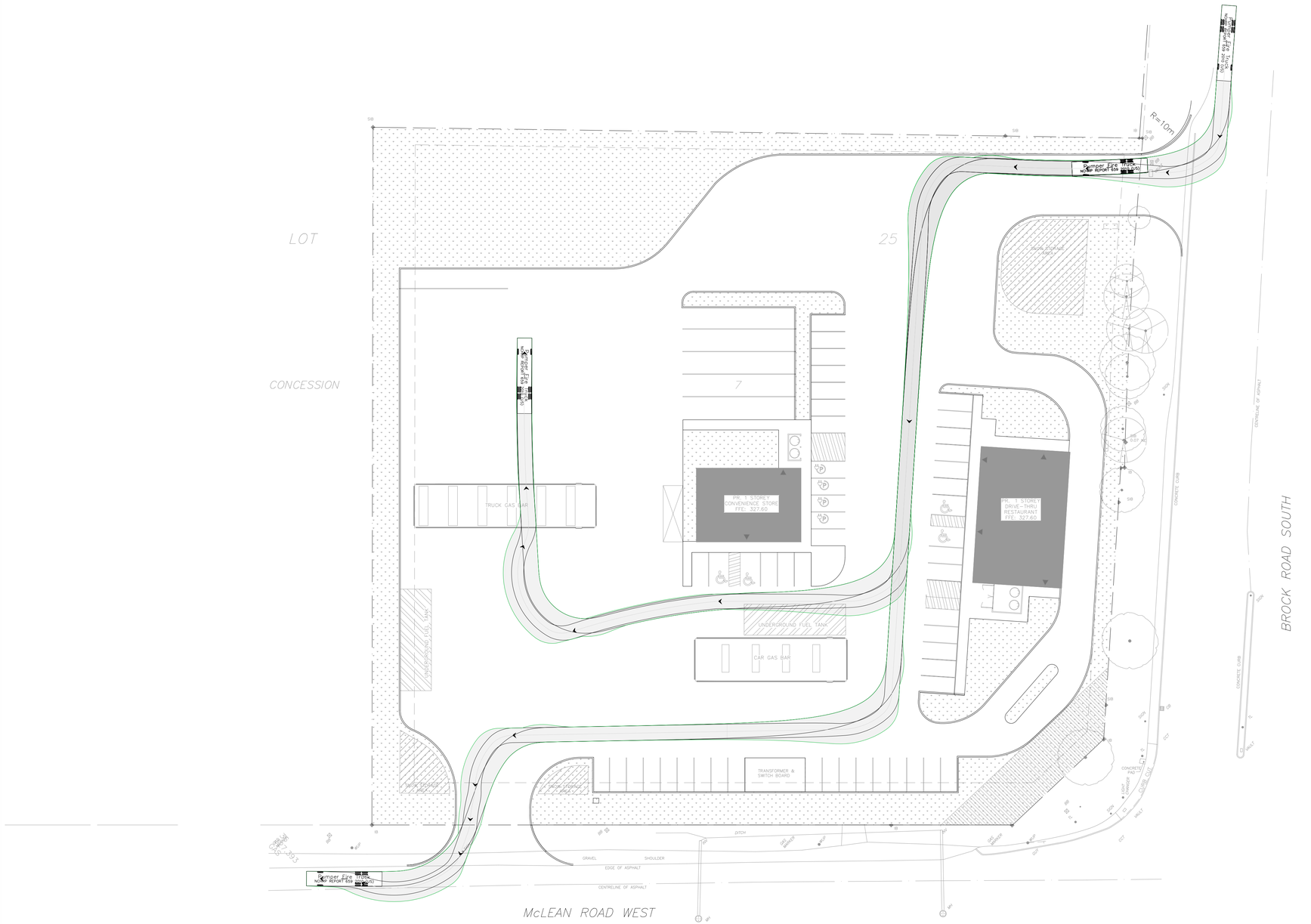
7456 McLEAN ROAD WEST AND
197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH

Drawing

VEHICLE MANEUVERING ANALYSIS
WASTE COLLECTION

CROZIER
CONSULTING ENGINEERS

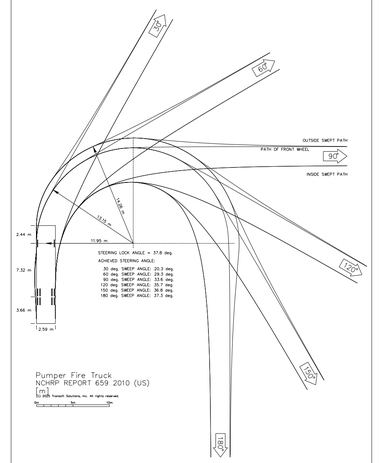
Drawn: I.A./M.P./I.M.	Design: M.P./I.M.	Project No.: 2792-7289	
Check: R.K./I.L.	Check: R.K./I.L.	Scale: 1:400	Dwg.: FIG18



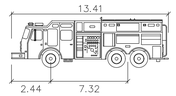
FOR REVIEW

NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



VEHICLE PROFILE



Pumper Fire Truck

	meters
Width	: 2.59
Track	: 2.59
Lock to Lock Time	: 6.0
Steering Angle	: 37.8

No.	ISSUE	DATE: MM/DD/YYYY
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Project

7456 McLEAN ROAD WEST AND
197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH

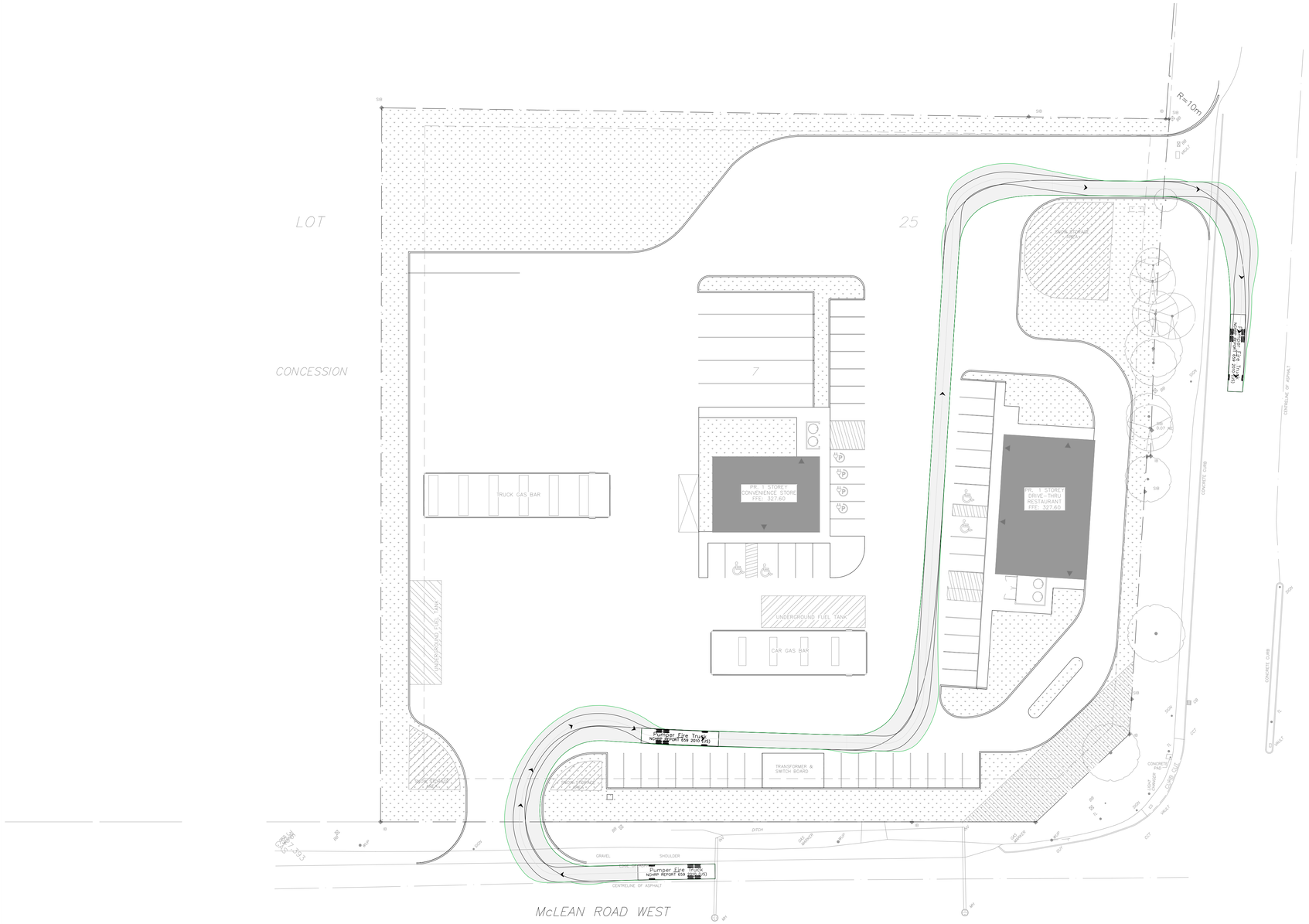
Drawing

VEHICLE MANEUVERING ANALYSIS
FIRE TRUCK

CROZIER
CONSULTING ENGINEERS

Drawn: I.A./M.P./I.M.	Design: M.P./I.M.	Project No.	2792-7289
Check: R.K./I.L.	Check: R.K./I.L.	Scale: 1:400	Dwg. FIG19

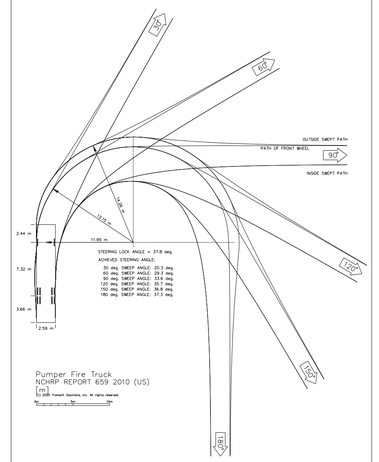
10 0m 10 20 30
SCALE: 1:400



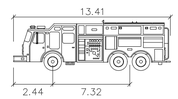
10 0m 10 20 30
SCALE: 1:400

FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



VEHICLE PROFILE



Pumper Fire Truck

	meters
Width	: 2.59
Track	: 2.59
Lock to Lock Time	: 6.0
Steering Angle	: 37.8

No.	ISSUE	DATE: MM/DD/YYYY
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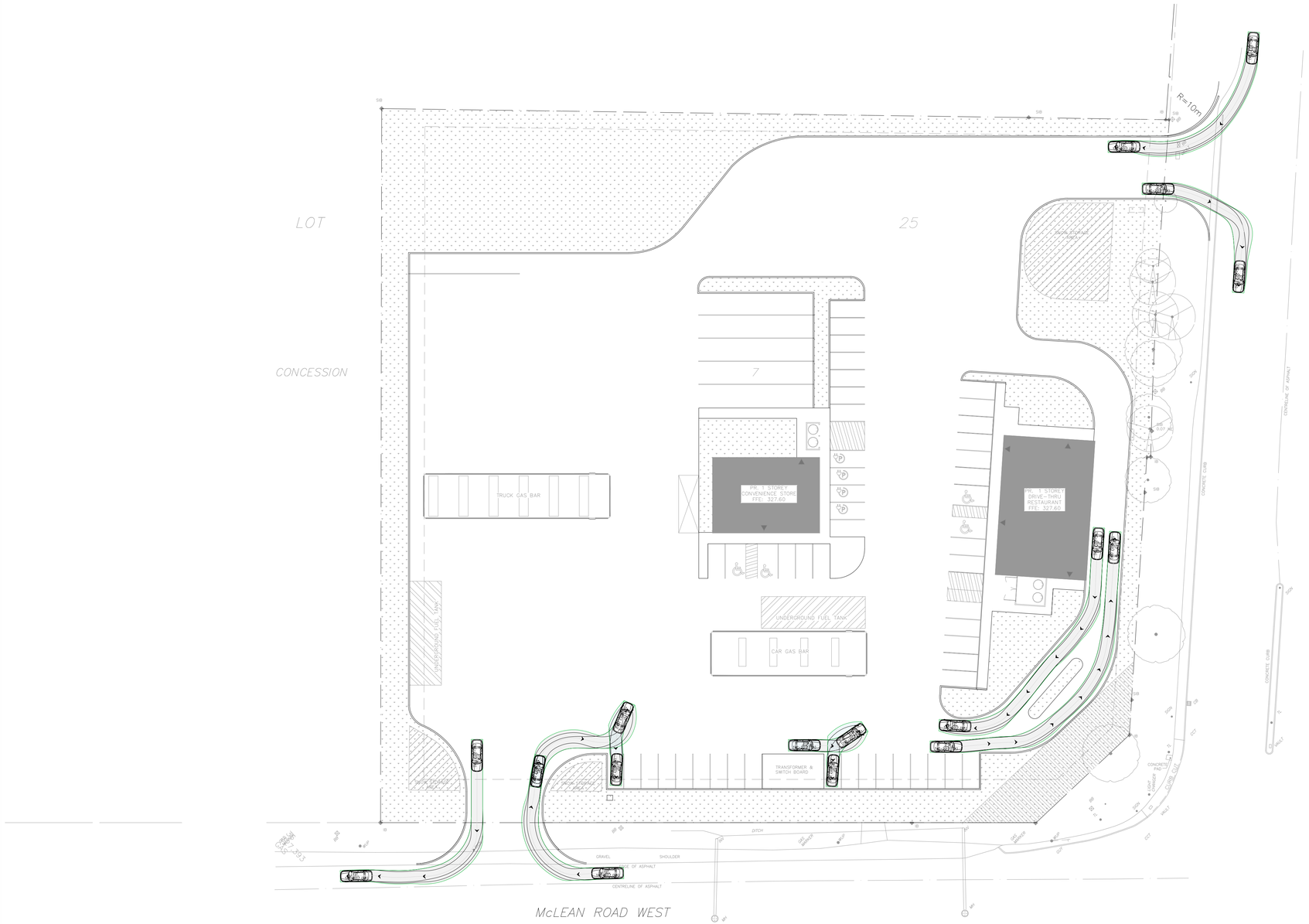
Project
7456 McLEAN ROAD WEST AND
197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH

Drawing
VEHICLE MANEUVERING ANALYSIS
FIRE TRUCK

CROZIER
CONSULTING ENGINEERS

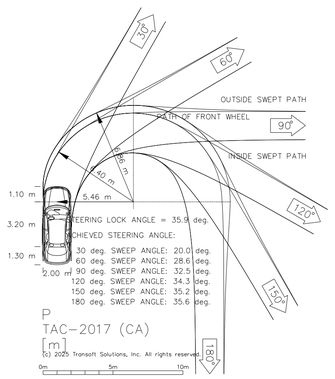
Drawn I.A./M.P./I.M.	Design M.P./I.M.	Project No.	2792-7289
Check R.K./I.L.	Check R.K./I.L.	Scale 1:400	Dwg. FIG20



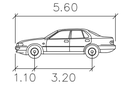
10 0m 10 20 30
SCALE: 1:400

FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

SWEEP PATH



VEHICLE PROFILE



P

	meters
Width	: 2.00
Track	: 2.00
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR REVIEW	08/31/2023
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6	ISSUED FOR SUBMISSION	03/17/2026

Project
7456 McLEAN ROAD WEST AND
197 BROCK ROAD SOUTH
TOWNSHIP OF PUSLINCH

Drawing
VEHICLE MANEUVERING ANALYSIS
PASSENGER CAR

CROZIER
CONSULTING ENGINEERS

Drawn: I.A./M.P./I.M.	Design: M.P./I.M.	Project No.: 2792-7289	
Check: R.K./I.L.	Check: R.K./I.L.	Scale: 1:400	Dwg.: FIG21