TRANSPORTATION IMPACT STUDY

0 PIN OAK DRIVE

CITY OF NIAGARA FALLS
REGION OF NIAGARA

PREPARED FOR:

PENTA PROPERTIES INC.

PREPARED BY:

C.F. CROZIER & ASSOCIATES INC.
2800 HIGH POINT DRIVE, SUITE 100
MILTON, ON L9T 6P4

JULY 2023

CFCA FILE NO. 2284-6376

CROZIER
CONSULTING ENGINEERS

Revision Number	Date	Comments
Rev.0	June 27, 2022	Issued for Client Review
Rev.1	June 29, 2022	Issued for Submission
Rev.2	July 2023	Issued for 2nd Submission

Executive Summary

C.F. Crozier & Associates Inc. (Crozier) has been retained by Penta Properties Inc. (the Applicant) to prepare a Transportation Impact Study (TIS) in support of the Zoning By-Law Amendment (ZBA) and Draft Plan of Submission (DPS) for the site located at 0 Pin Oak Drive, City of Niagara Falls. Comments were provided on the 1st submission by the City of Niagara Falls on June 2, 2023, and are incorporated in this 2nd submission.

The subject lands cover an area of approximately 13.49 ha and currently consists of on open lot. The subject property is designated as Residential Medium Density and Environmental Protection Area under the City of Niagara Falls Garner South Secondary Plan. The site is bounded by Pin Oak Drive to the east, Kalar Road to the west, an electric utility company to the north and vacant lands to the south. The proposed development consists of 355 residential units in 29 blocks. There is a proposed street ('Street A') with accesses off Pin Oak Drive and Kalar Road.

Under 2022 existing conditions, all study intersections operate with a Level of Service of "C" or better with no movement's overcapacity or queuing concerns.

This study considered a ten-year horizon period to assess the impact of the trips generated by the development on surrounding intersections, per City of Niagara TIS Guidelines.

Under Future Background conditions in the ten-year horizon period, the intersections are expected to operate with a Level of Service of "D" or better. The intersection of Kalar Road and McLeod Road is expected to have volume-to-capacity ratios of over 0.85 due to the southbound left turn movement during the A.m. and p.m. peak hours. The intersection of Pin Oak Drive and McLeod Road is also expected to have volume-to-capacity ratios of over 0.85 due to the westbound left-turn movement.

The trips expected to generate are 134 two-way (32 inbound and 102 outbound) trips during the a.m. peak hour and 171 two-way (108 inbound and 63 outbound) trips during the p.m. peak hour.

There is minimal change in traffic operations between the Future Background and Future Total conditions. This indicates that the site generated traffic is expected to not materially impact the operations at the surrounding intersections.

To improve the intersections, we recommend optimizing the splits for the intersections of Kalar Road at McLeod Road and Pin Oak Drive at McLeod Road to reduce the volume-to-capacity and control delay.

Left turn lane warrants were conducted at Kalar Road Site Access A and Pin Oak Drive at Site Access A using the MTO Design Supplement Appendix 9A for Section 9.17.2.1 Volume Warrants for Left-Turn Lanes, Chapter 9. The results indicated that left turns are not warranted for any of the intersections. According to TAC Justification 7, signals are not warranted for the intersections of Kalar Road Site Access A and Pin Oak Drive at Site Access A.

The proposed site accesses meet the TAC GDGCR requirements for sight distance, corner clearance and access spacing. The site provides a variety of Transportation Demand Management measures such as pedestrian connectivity at the site access, proximity to public transit and bicycle provisions.

Based on the analysis contained within this report, the proposed residential development at 0 Pin Oak Drive, in the City of Niagara Falls can be supported from transportation operations, safety, and parking perspectives.

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1.0 Introduction

Penta Properties Inc. retained C.F. Crozier & Associates Inc. (Crozier) to prepare a Transportation Impact Study (TIS) to support the Planning Applications for the site located at 0 Pin Oak Drive, City of Niagara Falls, Niagara Region.

This study assesses the impacts of the proposed development on the boundary road network and recommends required mitigation measures, if warranted. The study analyzes the operations of the boundary road network. The future traffic operations of the site generated vehicular trips are also analyzed.

The study has been completed in accordance with the agreed upon Terms of Reference with the City of Niagara Falls staff, and with the associated analyses and findings outlined in this study. Comments were provided on the 1st submission by the City of Niagara Falls on June 2, 2023, and are incorporated in this 2nd submission.

Appendix A contains the Terms of Reference for the study, as well as the 1st submission comments and their respective responses.

2.0 Development Proposal

According to the Draft Plan (Metropolitan Consulting, March 2022), there are residential blocks proposed as well as a road network to connect all external developments. Three Streets are also proposed within the block of developments. There are an expected number of 31 blocks with 306 to 335 townhome units. The full buildout of the proposed development is estimated to occur within five years (2027).

There will be two streets constructed within the subject lands. Street 'A' will intersection with Pin Oak Drive and Kalar Road. Street 'B' will intersect with Street 'A' within the subject lands.

3.0 Existing Conditions

3.1 Development Lands

The subject lands cover an area of approximately 13.49 ha and currently consists of on open lot. The subject property is designated as Residential Medium Density and Environmental Protection Area under the City of Niagara Falls Garner South Secondary Plan. The site is bounded by Pin Oak Drive to the east, Kalar Road to the west, an electric utility company to the north and vacant lands to the south. The Queen Elizabeth Way is also approximately 530 meters east of the site.

There is the Canadian Drive Hub located approximately 330 m east of the site. The Canadian Drive Hub contains multiple transit routes as well as commercial buildings. These transit routes connect the area with the rest of the city.

Figure 1 displays the Draft Plan.

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3.2 Boundary Road Network

3.2.1 Study Roadways

McLeod Road is an arterial road according to the City of Niagara Falls Official Plan (2019), with a posted speed of 50 km/h. This roadway has 2 lanes in each direction between Pin Oak Drive and Kalar Road. There are left turn storage lanes, sidewalk facilities provided on each side until a portion on the south side of the road segment, from Pin Oak Drive to Kalar Road, and a lane dedicated for bicycle use. The roadway is in the East-West direction.

Pin Oak Drive is a collector road according to the City of Niagara Falls Official Plan (2019), with an assumed speed of 50 km/h. This roadway has 1 lane in each direction, with a continuous storage lane in the centre of the roadway, designated for left and right turns. There is a left turn storage lane when terminating at McLeod Road. There are sidewalk facilities provided on the west side alongside the existing developed lands, and a multi-use pathway on the east side, intended for pedestrian and bicycle use. Pin Oak Drive starts from McLeod Road and ends at Canadian Drive. The roadway is in the North-South direction.

Canadian Drive isa collector road according to the City of Niagara Falls Official Plan (2019), with an assumed speed of 50 km/h. This roadway has 1 lane in each direction with storage lanes, sidewalk facilities provided on the north side of the street, and a multi-use pathway on the south side, intended for pedestrian and bicycle use. Canadian Drive starts from Pin Oak Drive and ends at Montrose Road. The roadway is in the East-West direction.

Kalar Road is an arterial road according to the City of Niagara Falls Official Plan (2019), with a posted speed of 50 km/h. This roadway has 1 lane in each direction with storage lanes, sidewalk facilities provided on each side as well lanes dedicated for bicycle use. The roadway is in the north-south direction.

Brown Road is an arterial road according to the City of Niagara Falls Official Plan (2019 with a posted speed of 60 km/h. This roadway has 1 lane in each direction. The roadway is in the east-west direction.

Proposed Street A would be a minor residential collector road per the classification in the City of Niagara Falls Official Plan (2019), with an assumed speed of 50 km/hr. This roadway is expected to have 1 lane in each direction.

Proposed Street B would be a local road per the classification in the City of Niagara Falls Official Plan (2019), with an assumed speed of 50 km/hr. This roadway is expected to have 1 lane in each direction.

3.2.2 Study Intersections

Pin Oak Drive and McLeod Road is a signalized intersection. There are crosswalks located on all approaches. All approaches have left-turn storage lanes while the south approach has a right-turn channelized storage lane. There is an existing multi-use pathway on the south leg east side of Pin Oak Drive, all other legs have approaches on each side. All approaches have left-turn storage lanes and the south approach has a channelized right turn. There are lanes designated for bicycle use on each approach except the south approach.

Canadian Drive and Pin Oak Drive is a stop-controlled three-legged intersection, with just north and east approaches. There is a sidewalk on the north side of Canadian Drive which changes into a multi-use pathway on the east side of the Pin Oak roadway. There are lanes designated for bicycle use on each approach except the south approach.

Kalar Road and McLeod Road is a signalized intersection, with crosswalks across all approaches. Each approach has left-turn storage lanes. The east approach has a right-turn storage lane. The north approach has a lane designated for bicycle use.

Kalar Road and Brown Road is a 'T' intersection where Kalar Road is the minor, stop controlled approach and Brown Road is the major approach. There are left-turn storage lanes on east and south approaches.

Pin Oak Drive and Proposed Road A is intended to be a stop controlled 'T' intersection where the Proposed Road is the minor, stop controlled approach and Pin Oak Drive is the major approach.

Kalar Road and Proposed Road A is intended to be a stop-controlled intersection and align with Elderberry Drive. Elderberry Drive and the Proposed Road would run east-west, while Kalar Road will remain running in the north-south directions.

3.3 Public Transit

The site is served by the Niagara Falls Transit connecting transit riders to major locations, such as Canadian Drive Hub.

Table 1: Transit Routes

Route	Route No.	Nearest Bus Stop to Site	Approximate Service Times		Headway Time (min/Hrs)
			Weekdays	Weekends	
Fort Erie Municipal Center-Canadian Drive HUB	22	Canadian Drive	7:30 A.M. – 8:30 P.M.	7:30 A.M. – 8:30 P.M. (Saturday)	60 mins
Morrison-Dorchester Hub - Niagara College - Welland Campus	60	Canadian Drive	7:00 A.M. – 6:02 P.M.	None	30 mins
Niagara College - Welland Campus - Morrison-Dorchester Hub	65	Canadian Drive	6:55 A.M. - 9:55 P.M.	6:55 A.M. - 9:55 P.M. (Saturday)	60 mins
Main & Ferry Hub - Canadian Drive HUB	101	Pin Oak Drive & Cineplex	6:32 A.M. – 5:32 P.M.	6:32 A.M. – 5:32 P.M. (Saturday)	60 mins
Canadian Drive HUB-Mt. Carmel Plaza	105	McLeod Road and Pin Oak Drive McLeod Road and Kalar Road	6:15 A.M. – 5:15 P.M.	6:15 A.M. – 5:15 P.M. (Saturday)	60 mins
Canadian Drive HUB-Main & Ferry Hub	103	Pin Oak Drive & Cineplex	6:02 A.M. – 6:02 P.M.	6:02 A.M. – 6:02 P.M. (Saturdays)	60 mins
Canadian Drive HUB-Morrison-Dorchester Hub	111	Pin Oak Drive & Cineplex	6:15 A.M. – 6:15 P.M.	6:15 A.M. – 6:15 P.M. (Saturdays)	60 mins
Canadian Drive HUB-Willoughby Dr & Caronpost Road	112	Pin Oak Drive & Cineplex	5:10 P.M.	5:10 P.M. (Saturdays)	24 Hrs
Montrose Road & Thorold Stone Road- Canadian Drive HUB	113	McLeod Road and Pin Oak Drive	6:23 A.M. – 5:23 P.M.	6:23 A.M. – 5:23 P.M. (Saturday)	60 mins

Table 1: Transit Routes

Route	Route No.	Nearest Bus Stop to Site	Approximate Service Times	Headway Time (min/Hrs)	Route
Canadian Drive HUB-Mt. Carmel Plaza	205	McLeod Road and Pin Oak Drive McLeod Road and Kalar Road	6:15 A.M. – 10:15 P.M.	7:15 A.M. – 8:15 P.M. 6:15 A.M. – 10:15 P.M. (Saturday)	30 mins
Montrose Road & Thorold Stone Road- Canadian Drive HUB	213	McLeod Road and Pin Oak Drive McLeod Road and Kalar Road	6:30 A.M. – 10:30 P.M.	7:30 A.M. – 7:30 P.M. (Sunday) 6:30 A.M. – 10:30 (Saturday)	60 mins

Table 1 outlines the transit routes that are available in the study area. Appendix B contains the relevant transit maps as well as relevant excerpts.

3.4 Traffic Data

As approved by a Terms of Reference established with the City of Niagara Falls, new traffic count data was collected for the site from a specialty traffic counting firm, Spectrum Traffic Inc. Data was collected for the study intersections on Wednesday May 4, 2022.

The intersection of Kalar Road and Brown Road results indicated that the peak hour periods were 7:45 – 8:45 a.m. (a.m. peak) and 3:30 – 4:30 p.m. (p.m. peak).

The intersection of Kalar Road and McLeod Road results indicated that the peak hour periods were 7:45 – 8:45 a.m. (a.m. peak) and 4:30 – 5:30 p.m. (p.m. peak).

The intersection of Pin Oak Drive and Canadian Drive results indicated that the peak hour periods were 9:00 – 10:00 a.m. (a.m. peak) and 4:00 – 5:00 p.m. (p.m. peak).

The intersection of Pin Oak Drive and McLeod Road results indicated that the peak hour periods were 9:00 – 10:00 A.m. (a.m. peak) and 4:30 – 5:30 p.m. (p.m. peak).

The signal timing plan of the intersection of McLeod Road and Kalar Road utilized for this study is dated October 19, 2011. It is a fully actuated uncoordinated intersection.

The signal timing plan of the intersection of McLeod Road and Pin Oak Drive/Lowe's entrance utilized for this study is dated May 5, 2022. It is a fully actuated uncoordinated intersection.

Traffic Data is found in Appendix C.

3.5 Traffic Modelling

The assessment of intersections is based on the method outlined in the "Highway Capacity Manual, 2010" using Synchro 11 modeling software. Intersections are assessed using a Level of Service metric, with ranges of delay assigned a letter from "A" to "F". For example, if the Level of Service "A" means free flow conditions with unimpeded maneuverability, and Level of Service F means extremely low low-speed vehicle maneuverability, and high delay.

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 resulting in no or minor delays for vehicles travelling through these intersections. Levels of Service "C" through "F" are often measured in the commuter peak hours when greater vehicle volumes cause longer wait times resulting in longer travel times. The Level of Service (LOS) definitions for signalized and stop control intersections is included in Appendix D.

3.6 Intersection Operations

The 2022 existing conditions are illustrated in **Figure 2.** Levels of Service based on current operations are outlined in **Table 2.** Appendix D contains the Level of Service definitions and Appendix E contains the synchro analysis worksheets.

Table 2: Existing Conditions

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Maximum v/c ratio [2]	95th Percentile Queue Length > Storage Lane Length
Kalar Road and McLeod Road	Signalized	A.M.	B	18.5 s	0.69 (NBT)	None
		P.M.	B	18.8 s	0.66 (NBT)	None
Pin Oak Drive and McLeod Road	Signalized	A.M.	C	22.3 s	0.78 (EBT)	None
		P.M.	C	29.9 s	0.84 (EBT)	None
Kalar Road and Brown Road	Stop-Controlled	A.M.	A	10.1 s	0.07 (SBL)	None
		P.M.	A	10.2 s	0.06 (SBL)	None
Canadian Drive and Pin Oak Drive	Stop-Controlled	A.M.	A	9.1 s	0.18 (WBL)	None
		P.M.	A	9.4 s	0.23 (WBL)	None

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle. Existing Signal Timings provided by the City of Niagara were used.
Note 2: The critical v/c ratio is the maximum volume to capacity ratio (v/c ratio) for movements at the intersection. In addition, all v/c ratios greater than 0.85 are outlined and highlighted.

The signalized intersection of Kalar Road and McLeod Road operates with a Level of Service of "B" in the a.m. and p.m. peak hour. This intersection does not have any queue lengths greater than the storage lane lengths. The signalized intersection of Pin Oak Drive and McLeod Road operates with a Level of Service of "C" in both the a.m. and p.m. peak hours. It also experiences a volume-to-capacity ratios of 0.78 and 0.84 in the a.m. and p.m. hours respectively. This intersection does not have any queue lengths greater than the storage lane lengths.

The stop-controlled intersection of Kalar Road at Brown Road operates with a Level of Service of "A" in the a.m. and p.m. peak hours. The stop-controlled intersection of Canadian Drive and Pin Oak Drive operates with a Level of Service of "A" during the a.m. and p.m. peak hours.

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4.0 Future Background Conditions

Future Background conditions refer to traffic conditions incorporating expected growth, development and improvements within the surrounding intersections occurring within the study horizons, outside of the development proposal.

4.1 Study Horizon

As confirmed with the City of Niagara Falls, the horizon years selected to assess the impacts of the proposed development include:

- Existing Conditions: 2022
- Ten years from Existing Conditions: 2032

Future Background traffic volumes for horizon years consist of the following components:

- Background traffic growth from outside the study area.
- Traffic generated within the study area from other proposed developments.

4.2 Background Developments

Per discussion with the City of Niagara Falls, there are two background developments included in the analysis of the study. Communications with the City have been included in Appendix A. Relevant background studies have been included in Appendix F. **Table 3** outlines the trips generated by the background developments which were applied to the proposed developments.

Table 3: Background Developments

Address	Total A.M. Peak Hour Trips		Total P.M. Peak Hour Trips
7449 Montrose Road Residential Development	Phase 1	13	18
	Phase 2	15	24
Splendor Subdivision (Niagara Falls)	151		193

It is important to note that the estimated trips from the 7449 Montrose Road background development are for traffic expected to use the proposed Pin Oak Drive access. The other traffic expected to be generated by this development are using the other access points which put the traffic on roads outside of the study area for the subject lands.

4.3 Traffic Growth Rates

The City of Niagara Falls confirmed to use a background growth rate of 2% for all movements at the intersections being analyzed.

4.4 Intersection Operations

The Future Background conditions are illustrated in **Figure 3.** The results of the Future Background conditions are outlined in **Table 4**. Appendix D contains the Level of Service definitions and Appendix E contains the capacity analysis worksheets.

Table 4: 2032 Future Background Conditions

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Maximum v/c ratio [2]	95th Percentile Queue Length > Storage Lane Length
Kalar Road and McLeod Road	Signalized	A.M.	C	31.1 s	1.02 (SBL)	None
		P.M.	D	48.9 s	1.30 (SBL)	294.6 m > 222 m (SBL)
Pin Oak Drive and McLeod Road	Signalized	A.M.	C	32.8 s	0.89 (EBT)	None
		P.M.	D	42.8 s	0.97 (WBL)	92.1 m > 72 m (WBL)
Kalar Road and Brown Road	Stop-Controlled	A.M.	A	10.7 s	0.11 (SBL)	None
		P.M.	A	10.8 s	0.10 (SBL)	None
Canadian Drive and Pin Oak Drive	Stop-Controlled	A.M.	A	9.3 s	0.22 (WBL)	None
		P.M.	A	9.8 s	0.29 (WBL)	None

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle. Existing Signal Timings provided by the City of Niagara were used.
Note 2: The critical v/c ratio is the maximum volume to capacity ratio (v/c ratio) for movements at the intersection. In addition, all v/c ratios greater than 0.85 are outlined and highlighted.

The signalized intersection of Kalar Road and McLeod Road is expected to operate with a Level of Service of "C" in the a.m. peak hour and "D" in the p.m. peak hour. The intersection is expected to have a critical volume-to-capacity ratio of 1.02 in the a.m. peak hour and 1.30 in the p.m. hour for the southbound left turn. This volume-to-capacity ratio can be attributed to comparatively high left turning volume in northbound, southbound and westbound movements.

The signalized intersection of Pin Oak Drive and McLeod Road is expected to operate with a Level of Service of "C" in the a.m peak hour and "D" in the p.m. peak hour. It also is expected to experience critical volume-to-capacity ratios of 0.89 and 0.97 in the a.m. and p.m. hours, respectively in the eastbound through and westbound left turn movements, respectively. This can be due to the high volume of traffic turning westbound left coming off the QEW.

The stop-controlled intersection of Kalar Road and Brown Road is expected to operate with a Level of Service of "A" in the a.m. and p.m. peak hours. The stop-controlled intersection of Canadian Drive and Pin Oak Drive is expected to operate with a Level of Service of "A" during the a.m. and p.m. peak hours.

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5.0 Future Total Conditions

5.1 Study Horizons

The horizon years remain the same as the Future Background scenario. Future Total traffic volumes for horizon years consist of the following components:

- Background traffic growth from outside the study area.
- Traffic generated within the study area from other proposed developments.
- Site generated traffic

5.2 Site Generated Trips

The proposed development will result in additional vehicles on the boundary road network that would otherwise not exist. The development will also result in additional turning movements at the intersections. The following section outlines the transportation planning methodology and estimation of the trip generation, distribution, and assignment characteristics for the site-generated traffic.

5.2.1 ITE Trip Generation

Site-generated traffic of the proposed development was calculated using the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition, using Land Use Category (LUC) 220 for the proposed residential units.

The forecasted unadjusted two-way trips are tabulated in **Table 5**. The details for each LUC including the equation of fitted curved used are shown in Appendix G.

Table 5: ITE Trip Generation for the Proposed Development

	Parameter	AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
Multi-Family Housing (LUC 220) 335 Units	Gross Trips	32	102	134	108	63	171
	Equation	T = 0.31 (X) + 22.85			T = 0.43 (X) + 20.55		
	Net New Trips	32	102	134	108	171	95
Net New Trips		**32**	**102**	**134**	**108**	**63**	**171**

The trips expected to generate are 134 two-way (32 inbound and 102 outbound) trips during the a.m. peak hour and 171 two-way (108 inbound and 63 outbound) trips during the p.m. peak hour.

5.2.2 Trip Distribution and Assignment

Existing traffic data was used to estimate the peak hour trip distribution at the site, as confirmed with the City of Niagara Falls. **Table 6** outlines the trip distribution for the proposed development divided into time and direction of travel. Existing traffic patterns from traffic movement counts were used to distribute the site generated trips to the boundary road network.

Figure 4 shows the trip distribution and **Figure 5** shows the trip assignment for the vehicles at the proposed development.

Table 6: Trip Distribution for Passenger Vehicles

Distribution	A.M.		P.M.	
	Inbound	Outbound	Inbound	Outbound
North	10%	12%	22%	26%
South	0%	4%	3%	13%
East	90%	35%	30%	43%
West	0%	49%	45%	18%

Trip Distribution Data from Transportation Tomorrow Survey Results can be found in Appendix H.

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5.3 Intersection Operations

The Future Total conditions are illustrated in **Figure 6**. The results of the Future Total conditions are outlined in **Table 7**. Appendix D contains the Level of Service definitions and Appendix E contains the capacity analysis worksheets.

Table 7: 2032 Future Total Conditions

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Maximum v/c ratio [2]	95th Percentile Queue Length > Storage Lane Length
Kalar Road and McLeod Road	Signalized	A.M.	D	37.2 s	1.11 (SBL)	None
		P.M.	E	68.5 s	1.59 (SBL)	272 m > 222 m (SBL)
Pin Oak Drive and McLeod Road	Signalized	A.M.	C	33.7 s	0.90 (EBT)	None
		P.M.	D	48.0 s	1.09 (WBL)	97.1 m > 72 m (WBL)
Kalar Road and Brown Road	Stop-Controlled	A.M.	A	10.7 s	0.11 (SBL)	None
		P.M.	A	11.1 s	0.11 (SBL)	None
Canadian Drive and Pin Oak Drive	Stop-Controlled	A.M.	A	9.3 s	0.22 (WBL)	None
		P.M.	A	9.8 s	0.29 (WBL)	None
Kalar Road and Proposed Road A	Stop-Controlled	A.M.	A	9.4 s	0.34 (SBL)	None
		P.M.	B	11.4 s	0.49 (NBT)	None
Pin Oak Drive and Proposed Road A	Stop-Controlled	A.M.	A	8.5 s	0.30 (NBL)	None
		P.M.	A	9.5 s	0.39 (NBT)	None

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle. Existing Signal Timings provided by the City of Niagara were used.
Note 2: The critical v/c ratio is the maximum volume to capacity ratio (v/c ratio) for movements at the intersection. In addition, all v/c ratios greater than 0.85 are outlined and highlighted.

The signalized intersection of Kalar Road and McLeod Road is expected to operate with a Level of Service of "D" in the a.m. peak hour and "E" in the p.m. peak hour. The intersection is expected to have a critical volume-to-capacity ratio of 1.11 in the a.m. peak hour and 1.59 in the p.m. hour for the southbound left turn. The number of vehicles moving southbound left are expected to cause the critical volume-to-capacity. The high volume of traffic can be explained by vehicles heading to the off ramp and on ramp of the Queen Elizabeth Way located 1.15 km to the east of the intersection causing high volume of traffic turning southbound left.

The signalized intersection of Pin Oak Drive and McLeod Road is expected to operate with a Level of Service of "C" in the a.m. peak hour and "D" in the p.m. peak hour. It also is expected to experience critical volume-to-capacity ratios of 0.90 and 1.09 in the a.m. and p.m. hours, respectively in the eastbound through and westbound left turn movements, respectively. This is due to the high volume of traffic turning southbound left.

The stop-controlled intersection of Kalar Road and Brown Road is expected to operate with a Level of Service of "A" in the a.m. and p.m. peak hours.

The stop-controlled intersection of Canadian Drive and Pin Oak Drive is expected to operate with a Level of Service of "A" during the a.m. and p.m. peak hours. Per the City's comments, the 95th percentile queue length was examined and found to be less than the spacing between this intersection and the new Proposed Road A intersection.

The intersection of Kalar Road and Proposed Road A (site access) is expected to operate with a Level of Service of "A" in the a.m. peak hour and "B" in the p.m. peak hours.

The intersection of Pin Oak Drive and Proposed Road A (site access) is expected to operate with a Level of Service of "A" in the a.m. and p.m. peak hours. The Proposed Road A (site access) will provide shorter travel times for drivers in the existing Warren Woods subdivision to get to and from Niagara Square. This additional travel path may increase traffic along Proposed Road A, which has capacity at its intersections, and remove traffic from McLeod Road at the Kalar Road and Pin Oak Drive intersections, which have high v/c ratios.

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6.0 Comparisons and Recommendations

6.1 Future Background and Future Total Comparison

The results for the Future Total conditions in 2032 are not significantly different from the 2032 Future Background conditions in terms of the Level of Service. However, the control delays and volume-to-capacity ratios increase due to the addition of trips generated from the site. The **Table 8** outlines the comparison between the two conditions.

Table 8: 2032 Comparison of Future Background and Future Total Conditions

Intersection	Peak Hour	Future Background Conditions			Future Total Conditions		
		Level of Service	Control Delay	Maximum v/c ratio	Level of Service	Control Delay	Maximum v/c ratio [2]
Kalar Road and McLeod Road	A.M.	C	31.1 s	1.02 (SBL)	D	37.2 s	1.11 (SBL)
	P.M.	D	48.9 s	1.30 (SBL)	E	68.5 s	1.59 (SBL)
Pin Oak Drive and McLeod Road	A.M.	C	32.8 s	0.89 (EBT)	C	33.7 s	0.90 (EBT)
	P.M.	D	42.8 s	0.97 (WBL)	D	48.0 s	1.09 (WBL)
Kalar Road and Brown Road	A.M.	A	10.7 s	0.11 (SBL)	A	10.7 s	0.11 (SBL)
	P.M.	A	10.8 s	0.10 (SBL)	A	11.1 s	0.11 (SBL)
Canadian Drive and Pin Oak Drive	A.M.	A	9.3 s	0.22 (WBL)	A	9.3 s	0.22 (WBL)
	P.M.	A	9.8 s	0.29 (WBL)	A	9.8 s	0.29 (WBL)

6.2 Warrants

Per consultation with the City of Niagara Falls, left turn lane warrants were conducted at Kalar Road and Site Access and Pin Oak Drive at Site Access using the MTO Design Supplement Appendix 9A for Section 9.17.2.1 Volume Warrants for Left-Turn Lanes, Chapter 9. The results indicated that left turns are not warranted for any of the intersections.

According to TAC Justification 7, signals are not warranted for the intersections of Kalar Road Site Access and Pin Oak Drive at Site Access.

6.3 Recommendations

The analysis of this development indicates that there will be potential congestion as the volume-to-capacity ratios exceed 1.0 for the signalized intersections of Kalar Road at McLeod Road, and Pin Oak Drive at McLeod Drive.

To improve the intersections of Kalar Road at McLeod Road, and Pin Oak Drive at McLeod Road, one option would be to optimize the splits. The results of this improvement are outlined below in **Table 9**.

Table 9: Recommendations

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Maximum v/c ratio [2]	95th Percentile Queue Length > Storage Lane Length
Kalar Road and McLeod Road	Signalized	A.M.	C	31.1 s	0.96 (SBL)	None
		P.M.	D	52.8 s	1.33 (SBL)	116.8 m > 114 m (WBL)
Pin Oak Drive and McLeod Road	Signalized	A.M.	C	27.4 s	0.85 (EBT)	None
		P.M.	D	42.7 s	1.00 (NBL)	86.9 m > 72 m (WBL)

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle. Existing Signal Timings provided by the City of Niagara were used.
Note 2: The critical v/c ratio is the maximum volume to capacity ratio (v/c ratio) for movements at the intersection. In addition, all v/c ratios greater than 0.85 are outlined and highlighted.

By optimizing the signals, the volume-to-capacity ratio and control delay are expected to decrease for both intersections.

Optimizing the splits for the signalized intersection of Kalar Road and McLeod Road during the a.m peak hours increased the maximum split for the southbound left, eastbound through, and southbound through movements. All other applicable movements had a decrease in the maximum split. During the p.m. peak hour optimizing the split increased the maximum split for the southbound left turn movement to 19.0 s and decreased the maximum split for eastbound left movement to 9.0 s. The pedestrian walk time did not change.

Optimizing the splits for the signalized intersection of Pin Oak Drive and McLeod Road during the a.m. peak hours increased the maximum split for the northbound through, westbound left, eastbound through, southbound through and westbound through movements. All other applicable movements had a decrease in the maximum split. During the p.m. peak hour resulted in the northbound through, westbound left, eastbound through, and eastbound left movements decrease their maximum split. While the northbound left, southbound through, and westbound through increased their maximum split. The pedestrian walk time did not change.

It is noted that there is an upcoming McLeod Road Environmental Assessment planned to start in 2024 for the section of the road from Kalar Road to Thorold Townline Road. This should evaluate the improvements recommended as well as the higher v/c ratios seen in the study under Future Background conditions.

6.4 Sightline Review

A review of the available sight distance at the proposed site intersections were undertaken based on Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (June 2017). The three intersections, Kalar Road at proposed Street A, Pin Oak Drive at proposed street A and proposed Street A at proposed Street B are assumed to have a posted speed of 50 km/h with a design speed of 60 km/h. Utilizing the equation provided by the TAC guideline 9.9.1 and the table provided in 9.9.5, the required sight distance of a passenger vehicle making a left-turn and a right-turn from stop are 130 metres and 110 metres respectively.

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.
- 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 Geometric Design Guide for Canadian Roads (June2017):

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

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 10: Sight Distance Analysis

Feature	Kalar Road at Site Access (Street A)	Pin Oak Drive at Site Access (Street A)	Street A and Street B
Access Type	Full-Movement	Full-Movement	Full-Movement
Posted Speed Limit of Roadway	50 km/h	50 km/h	50 km/h
Assumed Design Speed	60 km/h	60 km/h	60 km/h
Base Time Gap	6.5 s (right) 7.5 s (left)	6.5 s (right) 7.5 s (left)	6.5 s (right) 7.5 s (left)
Grade of Roadway	Less than 3%	Less than 3%	Less than 3%
Horizontal Alignment of Roadway	Straight	Straight	Curved
Required Sight Distance (right turn)	110 m	110 m	110 m
Available Sight Distance (right turn)	>110 m	>110 m	>110 m
Required Sight Distance (left turn)	130 m	130 m	130 m
Available Sight Distance (left turn)	>130 m	85 m to the intersection of Canadian Drive at Pin Oak Drive	>130 m
Minimum Sight Distances Satisfied?	Yes	Yes	Yes

All the new intersections are expected to have adequate sight line distances. Appendix I has all relevant TAC excerpts.

This page is a placeholder for Figure #7.

This page is a placeholder for Figure #8.

This page is a placeholder for Figure #9.

6.5 Access Spacing

Access spacing is the distance between accesses, or between an access and a street corner along a roadway. The required and provided spacing per section 9.4.2.2 of the TAC GDGCR are summarized in **Table 11**. Appendix I contains all relevant TAC excerpts. The spacing between the Site Access and the intersection of Canadian Drive and Pin Oak Drive meet the TAC requirements.

Table 11: Minimum Intersection Spacing Requirement

Feature	Pin Oak Drive at Street A and Pin Oak Drive at Canadian Drive Intersection
Minimum Spacing Requirement	60 m
Minimum Spacing Distance Satisfied?	Yes

7.0 Transportation Demand Management (TDM)

Transportation Demand Management (TDM) measures are recommended to promote alternative modes of transportation, such as transit, cycling or walking, and reduce single-occupant vehicle (SOV) trips entering and exiting the proposed development. The measures presented in the following subsections.

7.1 Cyclist Facilities

Safe and secure bicycle parking spaces would help encourage cycling as another mode of transportation to reduce automobile trips.

The proposed development includes residential units. Since these residential units will have their own garages, which can be used for bicycle parking, no separate/designated bicycle parking spaces have been proposed for residents.

Currently, there are multi-use pathways along the intersections which would connect to the site and dedicated bicycle lanes for use. These provide connections to and from the development.

7.2 Pedestrian Facilities

Existing pedestrian connections on the surrounding road network should connect to the proposed site though the proposed access. These paths should be well-lit to be safe and appealing to residents and visitors. Furthermore, pedestrian refuges, such as benches or fixtures, may be provided for additional aesthetic value and refuge for walking residents.

There are sidewalks available at each roadway which connect to the proposed accesses.

7.3 Parking

Each residential unit must have designated parking, as it should reach the minimum number of required spaces for residents and visitors. Currently, it is assumed that each unit has dedicated parking spaces for use.

8.0 Conclusion

The subject lands cover an area of approximately 13.49 ha and currently consists of on open lot. The subject property is designated as Residential Medium Density and Environmental Protection Area under the City of Niagara Falls Garner South Secondary Plan. The site is bounded by Pin Oak Drive to the east, Kalar Road to the west, an electric utility company to the north and vacant lands to the south. The proposed development consists of 355 residential units in 29 blocks. There is a proposed street ('Street A') with accesses off Pin Oak Drive and Kalar Road.

- Under 2022 existing conditions, all study intersections operate with a Level of Service of "C" or better with no movement's overcapacity or queuing concerns.

- Under Future Background conditions during the ten-year horizon period, the intersections are expected to operate with a Level of Service of "E" or better. The intersection of Kalar Road and McLeod Road and Pin Oak Drive and McLeod Road have volume-to-capacity ratios of over 0.85 due to the southbound left turn movement during the a.m. and p.m. peak hours. The intersection of Pin Oak Drive and McLeod Road also are expected to have a volume-to-capacity ratios of over 0.85 due to the southbound left-turn movement caused by the QEW on and off ramps.

- The trips expected to generate are 134 two-way (32 inbound and 102 outbound) trips during the a.m. peak hour and 171 two-way (108 inbound and 63 outbound) trips during the p.m. peak hour.

- There is minimal change in traffic operations between the Future Background and Future Total conditions. This indicates that the site generated traffic does not materially impact the operations at the surrounding intersections.

- To improve the intersections, we recommend optimizing the splits of the intersections of Kalar Road at McLeod Road and Pin Oak Drive at McLeod Road. This would reduce control delay and improve the volume-to-capacity ratios.

- We also recommend converting one through lane into a southbound left turn at the intersection of Kalar Road at McLeod Road, which would result in two southbound left turn lanes, and one through and right lane.

- Left turn lane warrants were conducted at Kalar Road Site Access A and Pin Oak Drive at Site Access A using the MTO Design Supplement Appendix 9A for Section 9.17.2.1 Volume Warrants for Left-Turn Lanes, Chapter 9. The results indicated that left turns are not warranted for any of the intersections. According to TAC Justification 7, signals are not warranted for the intersections of Kalar Road Site Access and Pin Oak Drive at Site Access.

- The proposed site accesses meet the TAC GDGCR requirements for sight distance, corner clearance and access spacing.

- The site provides a variety of Transportation Demand Management measures such as pedestrian connectivity at the site access, proximity to public transit and bicycle provisions.

In conclusion, the proposed residential development at 0 Pin Oak Drive in the City of Niagara Falls can be supported from transportation operations, safety, and parking perspectives. We trust that this review satisfies any transportation concerns associated with the Draft Plan for this development.

Please feel free to contact the undersigned for any further information required.

Respectfully submitted,

C.F. CROZIER & ASSOCIATES INC.

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

C.F. CROZIER & ASSOCIATES INC.

R. Aaron Wignall, Associate
Senior Project Manager, Transportation

AW/IL/hn/la

J:\2200\2284- Penta Properties Inc\6376- 0 Pin Oak Dr\Reports\2023.07.21_TIS.docx

APPENDIX A

Correspondence

From: John Grubich <jgrubich@niagarafalls.ca>
Sent: April 29, 2022 10:43 AM
To: Ian Lindley <ilindley@cfcrozier.ca>
Cc: Aaron Wignall <awignall@cfcrozier.ca>; Mathew Bilodeau <mbilodeau@niagarafalls.ca>; Alexa Cooper <acooper@niagarafalls.ca>
Subject: RE: [EXTERNAL]-Terms of Reference: Pin Oak Residential Development

Ian;

Thank you for forwarding your terms of reference for the traffic study and updated plan for this proposed subdivision.

For the study area, please expand to include:

- Pin Oak Drive and McLeod Road
- Pin Oak Drive and Canadian Drive
- Pin Oak Drive and Proposed road
- Kalar Road and McLeod Road
- Kalar Road and Brown Road
- Kalar Road and Proposed road

I do not have any current TMC data since the Costco opened, as we did not collect traffic data in 2020 or 2021 due to Covid. You will need to have TMC data collected.

The Niagara Region maintains our signal timing data. You can make a request for the data via https://www.niagararegion.ca/living/roads/permits/traffic-data-requests.aspx

For background traffic, please include the traffic from the Splendour subdivision (SW of McLeod / Kalar); AM & PM trip diagrams attached. There is an active development application for two apartment buildings at the NE corner of McLeod / Kalar with traffic affecting the two McLeod Road intersections. Trip estimates from this development are noted below:

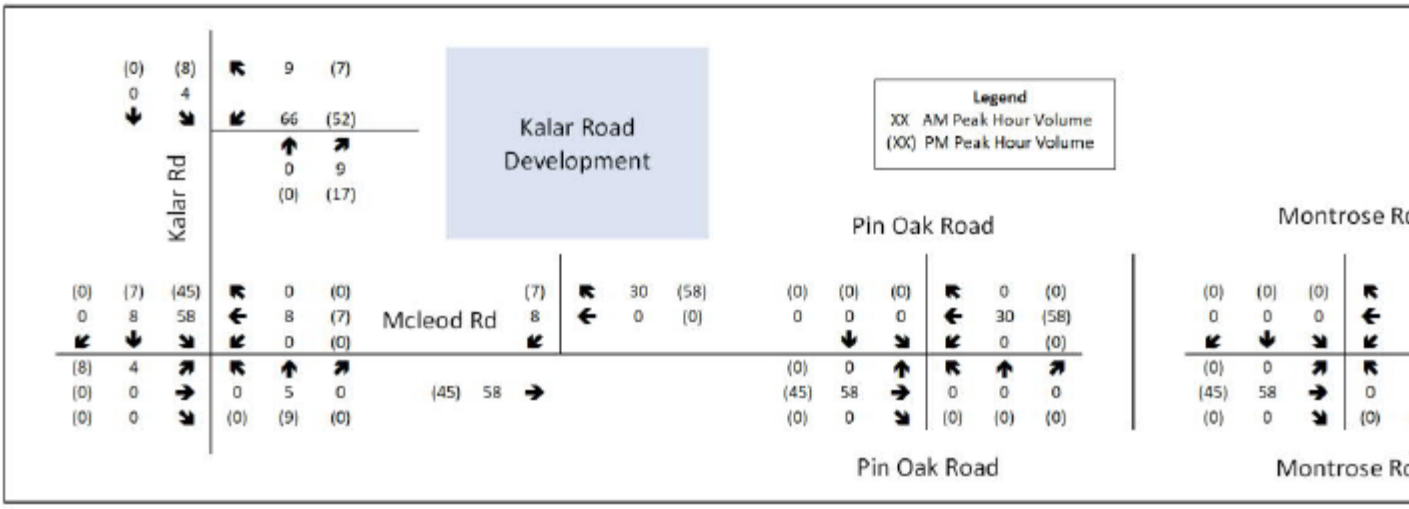


Figure 4-2 – Proposed Residential Development – Site Trips

Please use a 2% growth rate. There are several smaller developments planned or in-stream in this part of the City.

There are no planned road / transit improvements to the area. Kalar Road and Pin Oak Drive were both reconstructed in the past 5 years and McLeod Road east of Kalar Road was widened about 7-8 years ago. A new transit hub was constructed along Canadian Drive in 2019/20. The City plans on carrying out an EA for McLeod Road west of Kalar Road, probably commencing in 2023.

Please address the following in your report:

- Kalar Road & proposed access – are traffic signals or a SBLT lane warranted?
- Pin Oak Drive & proposed road - are traffic signals or a NBLT lane warranted? Address the setback of the proposed road on Pin Oak Drive in relation to Canadian Drive, and if queues from the all-way stop would extend to/beyond this new intersection. Similarly, what setback would be provided from the nearest Costco driveway and if any conflict may result.
- Sight lines due to the curvature of the proposed road.
- If and how much traffic is reassigned to the proposed road as it provides a shorter travel distance between the existing neighourhood to the west and the commercial area.

The remainder of your work plan is acceptable. I trust this information is helpful to start your work. Please feel free to contact me if you wish to discuss any aspect further.

John Grubich, C.E.T. | Traffic Planning Supervisor | Municipal Works - Transportation Services | City of Niagara Falls
8208 Heartland Forest Road | Niagara Falls, ON L2H 0L7 | (905) 356-7521 ext 5214 | Fax 905-356-5576 | jgrubich@niagarafalls.ca

From: Ian Lindley <ilindley@cfcrozier.ca>
Sent: Thursday, April 28, 2022 4:10 PM
To: John Grubich <jgrubich@niagarafalls.ca>
Cc: Aaron Wignall <awignall@cfcrozier.ca>
Subject: [EXTERNAL]-Terms of Reference: Pin Oak Residential Development

Good Afternoon,

C.F. Crozier & Associates Inc. (Crozier) has been retained to prepare a Transportation Impact Study (TIS) for a new residential development in the City of Niagara Falls. The site is located between Pin Oak Drive and Kalar Drive. The Conceptual Site Plan for the proposed development is attached in this email for your review.

We are kindly requesting that you review the following Terms of Reference (ToR) and provide feedback regarding our scope of work and request for data. Furthermore, should you not be the appropriate person for correspondence, it would be appreciated to be directed to the appropriate contact.

Study Methodology for the Transportation Impact Study
The following intersections will be analyzed as part of the scope of study:

- Pin Oak Drive and McLeod Road
- Kalar Road and McLeod Road
- Proposed Site Accesses at Pin Oak Drive and Kalar Road

We kindly request that the most recent traffic counts available to the City at the above noted intersections be provided for this study. Additionally, please confirm the above noted intersections are sufficient for the study.

Alternatively, we may consult specialty traffic counting firms we typically work with, in the event recent counts are not available.

Analysis Periods and Scenarios
The weekday A.M. and P.M. peak hours for the 2022 existing conditions will be assessed. 10 years from the date of the study (2032) will be considered for future background and total traffic conditions.

Background Developments
Please provide any background developments in the vicinity of the proposed development that should be included as part of the study, as well as the associated transportation impact studies that should be included in our analysis, as available.

Future Background Growth Rate
Per the City of Niagara Falls TIS Guidelines, an industry standard growth rate of 2% will be applied to all movements. Please advise whether the assumed growth rate is sufficient, or alternatively please provide an appropriate growth rate(s) to reflect expected growth in the area.

Trip Generation and Distribution

Trip Generation for the proposed development will be based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition. Based on the attached concept plan, Single-Family Attached Housing (Land Use Code 215) would apply to the planned development.

The site generated trips will be distributed to the boundary road network using traffic patterns from traffic movement counts or using Transportation Tomorrow Survey (TTS) data.

Roadway and Transit Improvements
Please confirm if there are planned roadway and transit improvements that should be taken into consideration as part of the study

Analysis Procedures
Traffic analysis will be conducted per the City of Niagara Falls TIS guidelines.
Weekday A.M. and P.M. peak hours will be analyzed using Synchro 11.0 analysis software, using Highway Capacity Manual (HCM) procedures.
A peak hour factor of 0.92 will be used for the analysis if no peak hour factor is provided as part of the traffic data.
Additional transportation elements, such as corner clearance and sight distance will be analysed.

Transportation Demand Management (TDM) Opportunities
Per Region of Waterloo TIS guidelines, analysis of existing and future Transportation Demand Management (TDM) opportunities will be conducted to reduce single-occupant vehicle (SOV) trips and promote alternative modes of transportation including transit and active transportation as applicable.

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 the most recent traffic counts available for the intersections of study.
- Please provide relevant growth rate(s) applicable to the roadways of study.
- Please provide any relevant background developments and the associated traffic impact studies that are to be included our analysis.
- Please provide details of any planned roadway or transit improvements in the surrounding study area within the horizon years.

I hope the contents outlined in this email are acceptable. Should you have any questions or require any further information, please feel free to contact myself or Aaron Wignall.

Regards,
Ian

Ian Lindley | Engineering Intern
2800 High Point Drive, Suite 100 | Milton, ON L9T 6P4
T: 905.875.0026

Crozier Connections:

Read our latest news and announcements here.

APPENDIX B

Existing Transit Information

22 Fort Erie Municipal Center - Canadian Drive HUB

View In Website Mode

The 22 bus line (Fort Erie Municipal Center - Canadian Drive HUB) has 2 routes. For regular weekdays, their operation hours are:
(1) Fort Erie: 7:30 AM - 8:30 PM (2) Niagara Falls: 6:55 AM - 8:55 PM
Use the Moovit App to find the closest 22 bus station near you and find out when is the next 22 bus arriving.

Direction: Fort Erie

3 stops
VIEW LINE SCHEDULE

Canadian Drive
Hub7812 Canadian Drive, Niagara Falls

Concentrix

Fort Erie Municipal Center

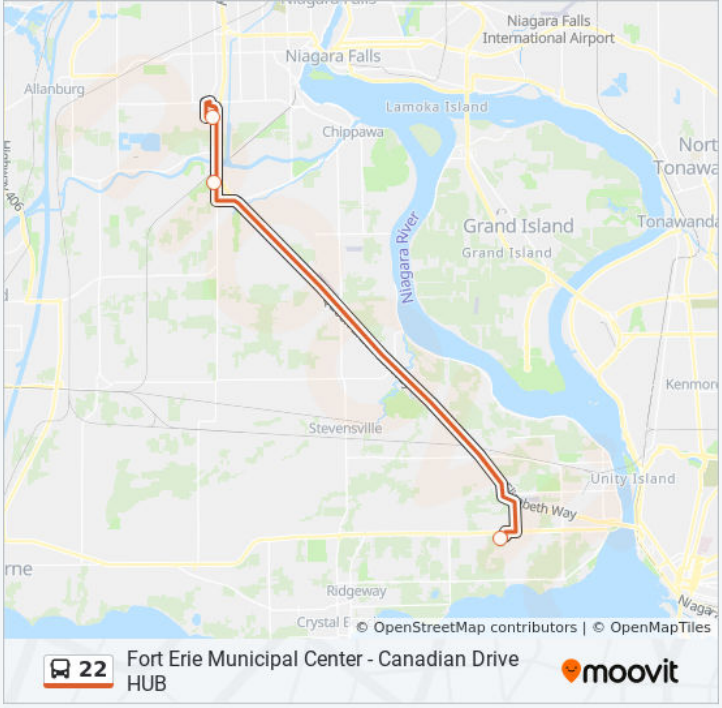
22 bus Time Schedule

Fort Erie Route Timetable:

Sunday	Not Operational
Monday	7:30 AM - 8:30 PM
Tuesday	7:30 AM - 8:30 PM
Wednesday	7:30 AM - 8:30 PM
Thursday	7:30 AM - 8:30 PM
Friday	7:30 AM - 8:30 PM
Saturday	7:30 AM - 8:30 PM

22 bus Info

Direction: Fort Erie
Stops: 3
Trip Duration: 24 min
Line Summary:


Niagara Falls International Airport
Niagara Falls
Allanburg
Lamoka Island
Chippawa
Grand Island
Grand Island
Niagara River
Stevensville
Unity Island
Ridgeway
© OpenStreetMap contributors | © OpenMapTiles
22
Fort Erie Municipal Center - Canadian Drive HUB
moovit

Direction: Niagara Falls

3 stops

VIEW LINE SCHEDULE

Fort Erie Municipal Center

Concentrix

Canadian Drive
Hub7812 Canadian Drive, Niagara Falls

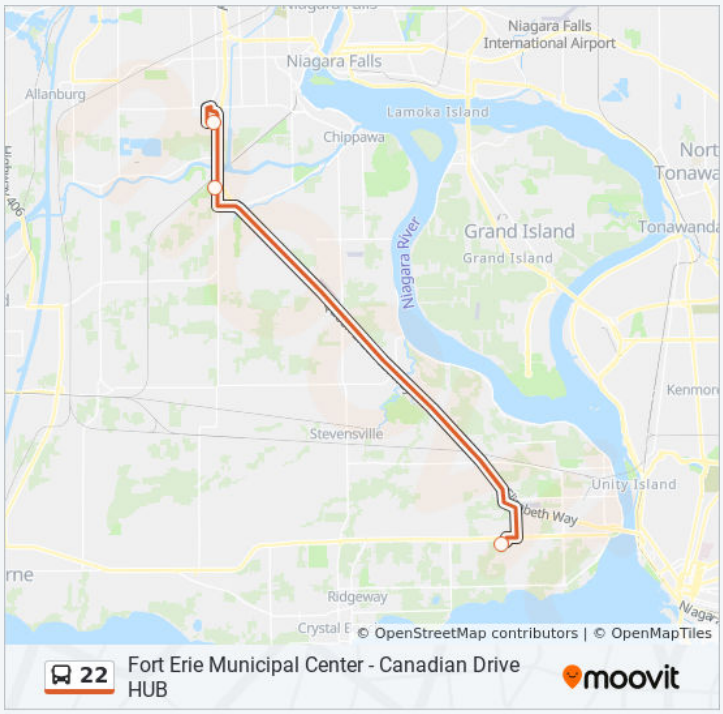
22 bus Time Schedule

Niagara Falls Route Timetable:

Sunday	Not Operational
Monday	6:55 AM - 8:55 PM
Tuesday	6:55 AM - 8:55 PM
Wednesday	6:55 AM - 8:55 PM
Thursday	6:55 AM - 8:55 PM
Friday	6:55 AM - 8:55 PM
Saturday	6:55 AM - 8:55 PM

22 bus Info

Direction: Niagara Falls
Stops: 3
Trip Duration: 25 min
Line Summary:



22 bus time schedules and route maps are available in an offline PDF at moovitapp.com. Use the Moovit App to see live bus times, train schedule or subway schedule, and step-by-step directions for all public transit in Toronto.

Check Live Arrival Times

60 Morrison-Dorchester Hub - Niagara College - Welland Campus

View In Website Mode

The 60 bus line (Morrison-Dorchester Hub - Niagara College - Welland Campus) has 2 routes. For regular weekdays, their operation hours are:
(1) Express To Welland Bus Terminal: 7:00 AM - 5:00 PM (2) Welland: 7:00 AM - 10:00 PM
Use the Moovit App to find the closest 60 bus station near you and find out when is the next 60 bus arriving.

Direction: Express To Welland Bus Terminal

2 stops

VIEW LINE SCHEDULE

Morrison-Dorchester Hub7190 Morrison Street, Niagara Falls

Welland Bus Terminal24 Dorothy Street, Welland

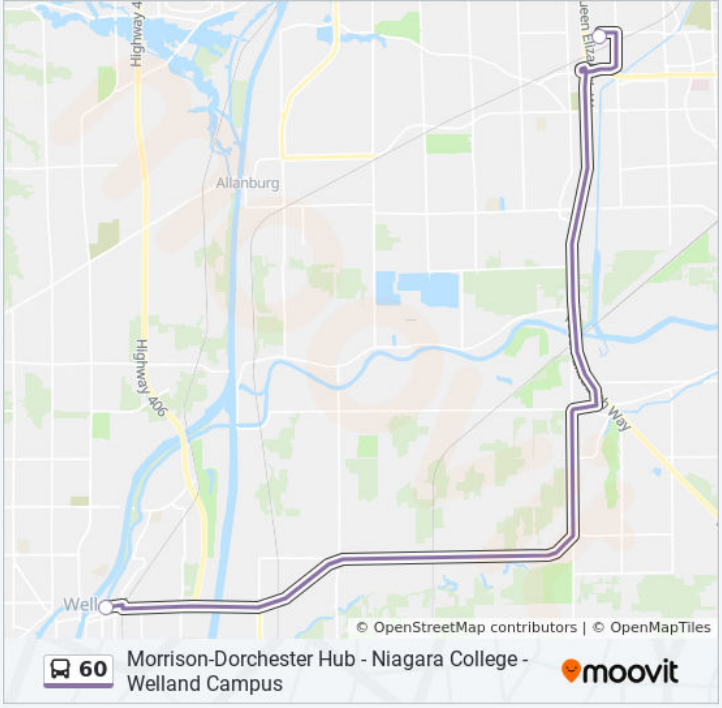
60 bus Time Schedule

Express To Welland Bus Terminal Route Timetable:

Sunday	Not Operational
Monday	7:00 AM - 5:00 PM
Tuesday	7:00 AM - 5:00 PM
Wednesday	7:00 AM - 5:00 PM
Thursday	7:00 AM - 5:00 PM
Friday	7:00 AM - 5:00 PM
Saturday	Not Operational

60 bus Info

Direction: Express To Welland Bus Terminal
Stops: 2
Trip Duration: 25 min
Line Summary:


Allanburg
Highway 406
Welland
© OpenStreetMap contributors | © OpenMapTiles
60
Morrison-Dorchester Hub - Niagara College - Welland Campus
moovit

Direction: Welland

9 stops

VIEW LINE SCHEDULE

Morrison-Dorchester
Hub7190 Morrison Street, Niagara Falls

Thldstone Rd@Dorch NW
CorThorold Stone Road, Niagara Falls

Montrose Rd & Lundy's
Ln7572 Lundy's Ln, Niagara Falls

Canadian Drive
Hub7812 Canadian Drive, Niagara Falls

Concentrix

Schisler Rd + Montrose Rd

East Main St + Wellington
St718 East Main Street, Welland

Welland Bus Terminal24 Dorothy Street, Welland

Niagara College - Welland
CampusNiagara College Boulevard, Welland

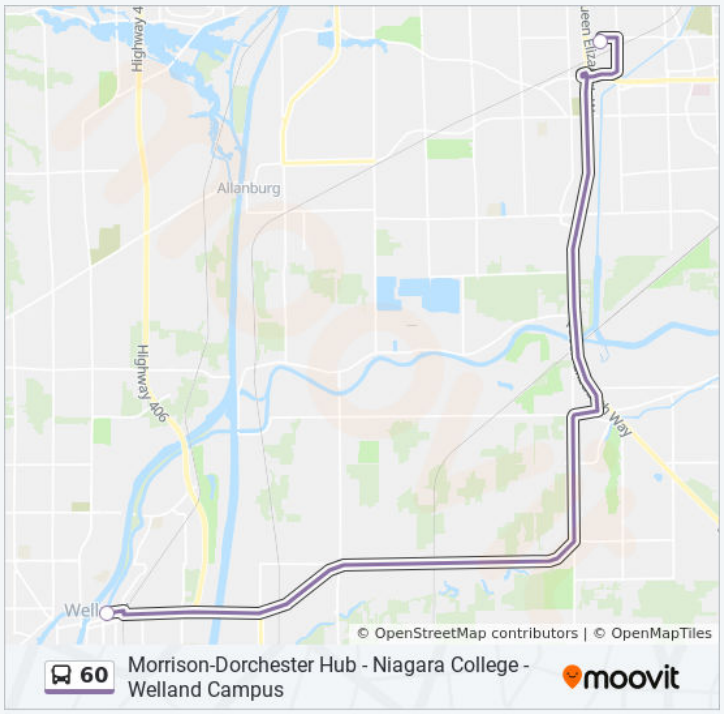
60 bus Time Schedule

Welland Route Timetable:

Sunday	Not Operational
Monday	7:00 AM - 10:00 PM
Tuesday	7:00 AM - 10:00 PM
Wednesday	7:00 AM - 10:00 PM
Thursday	7:00 AM - 10:00 PM
Friday	7:00 AM - 10:00 PM
Saturday	7:00 AM - 10:00 PM

60 bus Info

Direction: Welland
Stops: 9
Trip Duration: 50 min
Line Summary:



60 bus time schedules and route maps are available in an offline PDF at moovitapp.com. Use the Moovit App to see live bus times, train schedule or subway schedule, and step-by-step directions for all public transit in Toronto.

Check Live Arrival Times

101 bus time schedule & line map

101 Main & Ferry Hub - Canadian Drive HUB

View In Website Mode

The 101 bus line (Main & Ferry Hub - Canadian Drive HUB) has 2 routes. For regular weekdays, their operation hours are: (1) Dunn St. - Canadian Drive Hub: 7:00 AM - 6:00 PM (2) Dunn St. - Main & Ferry: 6:32 AM - 5:32 PM
Use the Moovit App to find the closest 101 bus station near you and find out when is the next 101 bus arriving.

Direction: Dunn St. - Canadian Drive Hub

27 stops

VIEW LINE SCHEDULE

Main & Ferry Hub5924 Main Street, Niagara Falls

Main St & Culp St6121 Main Street, Niagara Falls

Main St & Symmes
St6209 Main Street, Niagara Falls

Main St. & Murray St.6289 Main St, Niagara Falls

Murray
Sw@Stanley5556 Murray Street, Niagara Falls

Stanley Av & Dixon
St5527 Dixon Street, Niagara Falls

Dunn&Stanley NW5582 Dunn Street, Niagara Falls

Dunn St & Level
Avenue5770 Dunn St, Niagara Falls

Dunn St & Orchard
Av5891 Dunn Street, Niagara Falls

Dunn St & Locus Av6095 Dunn St, Niagara Falls

Dunn & Drummond
NE6203 Dunn Street, Niagara Falls

Dunn St & Kiwanis
Cres6381 Dunn Street, Niagara Falls

Dunn St & Caledonia
St6443 Dunn Street, Niagara Falls

Dunn St & 6679 Dunn
St6681 Dunn St, Niagara Falls

Dunn St & Hagar
Av6683 Dunn Street, Niagara Falls

Dorchester Rd & Dunn
St6725 Dorchester Road, Niagara Falls

101 bus Time Schedule

Dunn St. - Canadian Drive Hub Route Timetable:

Sunday	Not Operational
Monday	7:00 AM - 6:00 PM
Tuesday	7:00 AM - 6:00 PM
Wednesday	7:00 AM - 6:00 PM
Thursday	7:00 AM - 6:00 PM
Friday	7:00 AM - 6:00 PM
Saturday	7:00 AM - 6:00 PM

101 bus Info

Direction: Dunn St. - Canadian Drive Hub
Stops: 27
Trip Duration: 28 min
Line Summary:

Dorchester Rd & Margaret
St6821 Dorchester Road, Niagara Falls

Dorchester Rd & Winston
St6961 Dorchester Road, Niagara Falls

Dorchester Rd & Douglas
St7083 Dorchester Road, Niagara Falls

Dorchester Rd & Mcleod
Rd7227 Dorchester Road, Niagara Falls

Mcleod Rd & Sharon
Av7222 Sharon Avenue, Niagara Falls

Oakwood Dr
SW8951 Oakwood Drive, Niagara Falls

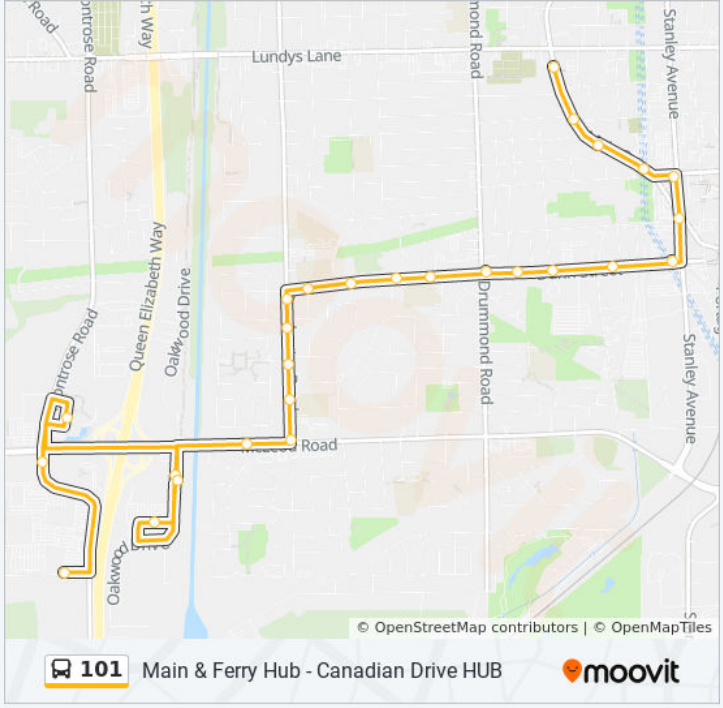
Walmart & Oakwood Dr

Oakwood Dr
SE8952 Oakwood Drive, Niagara Falls

Mcbain Centre

Montrose & S Of
Mcleod7267 Montrose Road, Niagara Falls

Canadian Drive
Hub7812 Canadian Drive, Niagara Falls



Direction: Dunn St. - Main & Ferry

25 stops

VIEW LINE SCHEDULE

Canadian Drive
Hub7812 Canadian Drive, Niagara Falls

Pin Oak Dr & Cineplex

Mcbain Centre

Oakwood Dr
SW8951 Oakwood Drive, Niagara Falls

Walmart & Oakwood Dr

Oakwood Dr
SE8952 Oakwood Drive, Niagara Falls

Mcleod Rd & Jubilee
Dr7068 McLeod Road, Niagara Falls

Dorchester Rd & Mcleod
NE7168 Dorchester Road, Niagara Falls

Dorchester Rd & Caledonia
St6934 Dorchester Road, Niagara Falls

Dorchester Rd & Winston
St6954 Dorchester Road, Niagara Falls

Dorchester Rd & Margaret
St6724 Dorchester Road, Niagara Falls

Dorchester Rd & Dunn
St6654 Dorchester Road, Niagara Falls

Dunn St & Carlton
Avenue6549 Dunn Street, Niagara Falls

Dunn St & Caledonia
St6536 Dunn Street, Niagara Falls

Dunn St & Kiwanis
Cr6406 Dunn Street, Niagara Falls

Dunn & Drummond
SW6240 Dunn Street, Niagara Falls

Dunn St & Locus Av6095 Dunn St, Niagara Falls

Dunn St & Orchard
Av5974 Dunn Street, Niagara Falls

Dunn St & Aithanthus
Av5840 Dunn Street, Niagara Falls

Dunn& Stanley SW5582 Dunn St, Niagara Falls

Stanley Av & Dixon

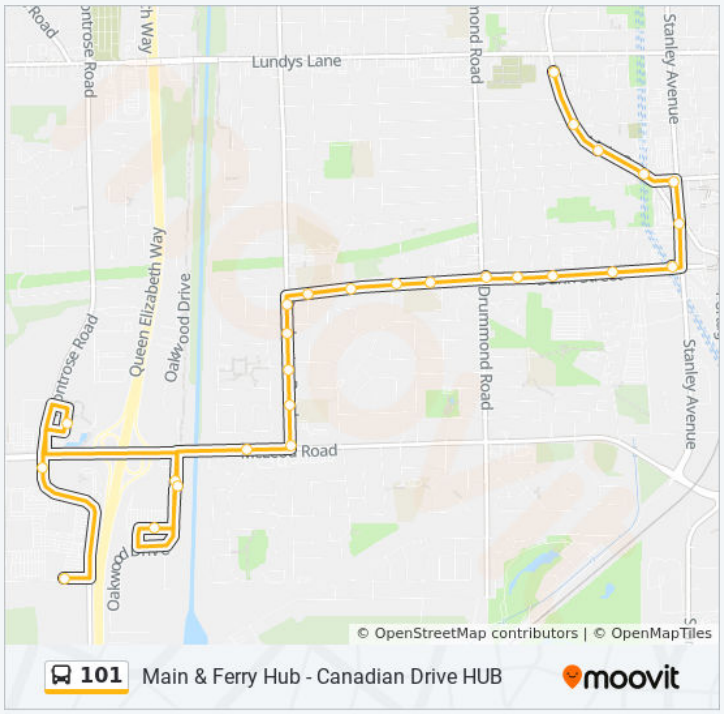
101 bus Time Schedule

Dunn St. - Main & Ferry Route Timetable:

Sunday	Not Operational
Monday	6:32 AM - 5:32 PM
Tuesday	6:32 AM - 5:32 PM
Wednesday	6:32 AM - 5:32 PM
Thursday	6:32 AM - 5:32 PM
Friday	6:32 AM - 5:32 PM
Saturday	6:32 AM - 5:32 PM

101 bus Info

Direction: Dunn St. - Main & Ferry
Stops: 25
Trip Duration: 26 min
Line Summary:



St6410 Stanley Avenue, Niagara Falls

Murray St & Stanley
AvMurray Street, Niagara Falls

Main St & Murray
St6278 Main Street, Niagara Falls

Main St & Robinson
St6174 Main Street, Niagara Falls

Main & Ferry Hub5924 Main Street, Niagara Falls

101 bus time schedules and route maps are available in an offline PDF at moovitapp.com. Use the Moovit App to see live bus times, train schedule or subway schedule, and step-by-step directions for all public transit in Toronto.

Check Live Arrival Times

103 bus time schedule & line map

103 Canadian Drive HUB - Main & Ferry Hub

View In Website Mode

The 103 bus line (Canadian Drive HUB - Main & Ferry Hub) has 2 routes. For regular weekdays, their operation hours are: (1) Drummond Rd - Canadian Drive Hub: 6:30 AM - 6:30 PM (2) Drummond Rd- Main & Ferry: 6:02 AM - 6:02 PM
Use the Moovit App to find the closest 103 bus station near you and find out when is the next 103 bus arriving.

Direction: Drummond Rd - Canadian Drive Hub

32 stops

VIEW LINE SCHEDULE

Main & Ferry Hub5924 Main Street, Niagara Falls

Culp St & Main St5925 Culp Street, Niagara Falls

Culp St & Orchard
Av6009 Culp Street, Niagara Falls

Culp St & 6155 Culp
St6140 Culp Street, Niagara Falls

Culp St & Drummond
Rd6197 Culp Street, Niagara Falls

Drummond Rd & Taylor
St6205 Drummond Road, Niagara Falls

Drummond Rd & Murray
St6373 Drummond Road, Niagara Falls

Dixon St6521 Drummond Road, Niagara Falls

Drummond Rd & Dunn St
SE6635 Drummond Road, Niagara Falls

Drummond Rd & Margaret
St6767 Drummond Road, Niagara Falls

Drummond Rd & Skinner
St6963 Drummond Road, Niagara Falls

Drummond&Mcl
NW7223 Drummond Road, Niagara Falls

Mcleod Rd & Heximer
Av6341 McLeod Road, Niagara Falls

Mcleod Rd & Dell
Ave6441 McLeod Road, Niagara Falls

Mcleod Rd & Merritt
Av6577 McLeod Road, Niagara Falls

103 bus Time Schedule

Drummond Rd - Canadian Drive Hub Route Timetable:

Sunday	Not Operational
Monday	6:30 AM - 6:30 PM
Tuesday	6:30 AM - 6:30 PM
Wednesday	6:30 AM - 6:30 PM
Thursday	6:30 AM - 6:30 PM
Friday	6:30 AM - 6:30 PM
Saturday	6:30 AM - 6:30 PM

103 bus Info

Direction: Drummond Rd - Canadian Drive Hub
Stops: 32
Trip Duration: 28 min
Line Summary:

Mcleod Rd & Adams
Av6705 McLeod Road, Niagara Falls

Dorchester + Mcleod
Rd7343 Dorchester Road, Niagara Falls

Jill Dr & Valliant
St6954 Valiant Street, Niagara Falls

Jill Dr & Jubilee Dr7096 Jill Dr, Niagara Falls

Jubilee Dr & Red Haven
Cr7637 Jubilee Drive, Niagara Falls

Jubilee Dr & Ronnie
Cr7679 Jubilee Drive, Niagara Falls

Jubilee Dr & 7748
Jubilee7775 Jubilee Drive, Niagara Falls

Jubilee &
Dorchester7775 Jubilee Drive, Niagara Falls

Dorchester Rd & Fern
Av7568 Dorchester Road, Niagara Falls

Dorchester Rd & Jill
Dr7502 Dorchester Road, Niagara Falls

Dorchester &
Mcleod7042 Dorchester Road, Niagara Falls

Mcleod Rd & Sharon
Av7222 Sharon Avenue, Niagara Falls

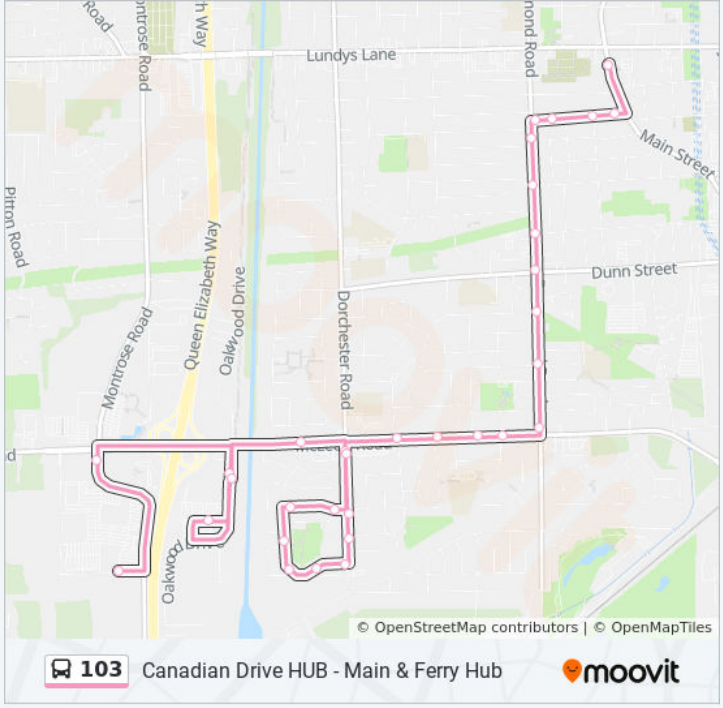
Oakwood Dr
SW8951 Oakwood Drive, Niagara Falls

Walmart & Oakwood Dr

Oakwood Dr
SE8952 Oakwood Drive, Niagara Falls

Montrose & S Of
Mcleod7267 Montrose Road, Niagara Falls

Canadian Drive
Hub7812 Canadian Drive, Niagara Falls



Direction: Drummond Rd- Main & Ferry

33 stops

VIEW LINE SCHEDULE

Canadian Drive
Hub7812 Canadian Drive, Niagara Falls

Pin Oak Dr & Cineplex

Oakwood Dr
SW8951 Oakwood Drive, Niagara Falls

Walmart & Oakwood Dr

Oakwood Dr
SE8952 Oakwood Drive, Niagara Falls

Mcleod Rd & Jubilee
Dr7068 McLeod Road, Niagara Falls

Dorchester + Mcleod
Rd7343 Dorchester Road, Niagara Falls

Jill Dr & Valliant
St6954 Valiant Street, Niagara Falls

Jill Dr & Jubilee Dr7096 Jill Dr, Niagara Falls

Jubilee Dr & Red Haven
Cr7637 Jubilee Drive, Niagara Falls

Jubilee Dr & Ronnie
Cr7679 Jubilee Drive, Niagara Falls

Jubilee Dr & 7748
Jubilee7775 Jubilee Drive, Niagara Falls

Jubilee &
Dorchester7775 Jubilee Drive, Niagara Falls

Dorchester Rd & Fern
Av7568 Dorchester Road, Niagara Falls

Dorchester Rd & Jill
Dr7502 Dorchester Road, Niagara Falls

Dorchester &
Mcleod7042 Dorchester Road, Niagara Falls

Mcleod Rd & Fern
Av6730 McLeod Road, Niagara Falls

Mcleod Rd & Merritt
Av6560 McLeod Road, Niagara Falls

Mcleod Rd & Dell
Av6442 McLeod Road, Niagara Falls

Mcleod Rd & Heximer
Av6322 Mcleod Rd, Niagara Falls

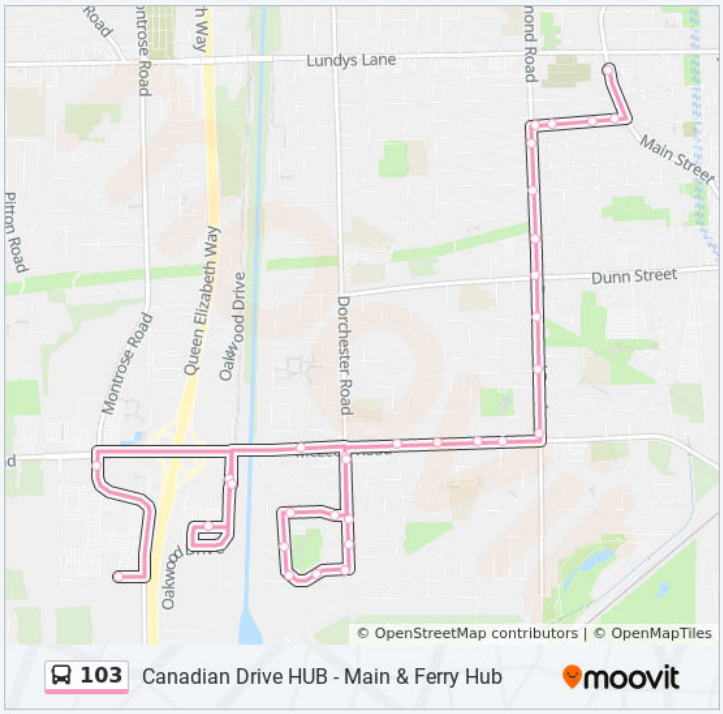
103 bus Time Schedule

Drummond Rd- Main & Ferry Route Timetable:

Sunday	Not Operational
Monday	6:02 AM - 6:02 PM
Tuesday	6:02 AM - 6:02 PM
Wednesday	6:02 AM - 6:02 PM
Thursday	6:02 AM - 6:02 PM
Friday	6:02 AM - 6:02 PM
Saturday	6:02 AM - 6:02 PM

103 bus Info

Direction: Drummond Rd- Main & Ferry
Stops: 33
Trip Duration: 26 min
Line Summary:



Drummond &
Mcleod7182 Drummond Rd, Niagara Falls

Drummond Rd & Arad
St7036 Drummond Road, Niagara Falls

Drummond Rd & Churchill
St6894 Drummond Road, Niagara Falls

Drummond Rd & Atlee
St6848 Drummond Road, Niagara Falls

Drummond Rd & Margaret
St6798 Drummond Road, Niagara Falls

Drummond Rd & Dunn
St6680 Drummond Road, Niagara Falls

Drummond Rd & Dixon
St6538 Drummond Road, Niagara Falls

Drummond Rd & Murray
St6370 Drummond Road, Niagara Falls

Drummond Rd & Delaware
St6246 Drummond Road, Niagara Falls

Drummond Rd & Culp
St6126 Drummond Road, Niagara Falls

Drummond Rd & Barker
St6060 Drummond Road, Niagara Falls

Drummond Rd & Ll
SE5964 Drummond Road, Niagara Falls

Main & Ferry Hub5924 Main Street, Niagara Falls

103 bus time schedules and route maps are available in an offline PDF at moovitapp.com. Use the Moovit App to see live bus times, train schedule or subway schedule, and step-by-step directions for all public transit in Toronto.

Check Live Arrival Times

105 bus time schedule & line map

105 Canadian Drive HUB - Mt. Carmel Plaza

View In Website Mode

The 105 bus line (Canadian Drive HUB - Mt. Carmel Plaza) has 2 routes. For regular weekdays, their operation hours are: (1) Kalar Rd - Canadian Drive Hub: 6:15 AM - 5:15 PM (2) Kalar Rd - Mt Carmel Plaza: 5:45 AM - 5:45 PM
Use the Moovit App to find the closest 105 bus station near you and find out when is the next 105 bus arriving.

Direction: Kalar Rd - Canadian Drive Hub

39 stops

VIEW LINE SCHEDULE

Mt. Carmel Plaza

Montrose Rd & Thorowest
Plaza7610 Cameron Court, Niagara Falls

Montrose Rd & Thorold Stone Rd
N3993 Montrose Road, Niagara Falls

Thorold Stone Rd & Montrose
Rd7703 Thorold Stone Road, Niagara Falls

Thorold Stone Rd & Cardinal
Dr7980 Thorold Stone Road, Niagara Falls

Thld Stone
@Glenoaks8169 Thorold Stone Road, Niagara Falls

Kalar&Thorold Stone
SW4007 Kalar Road, Niagara Falls

Kalar Rd & 4167 Kalar
Rd4150 Kalar Road, Niagara Falls

Kalar Rd & Constabile
Dr4473 Kalar Road, Niagara Falls

Kalar Rd & Marcon
St4574 Kalar Road, Niagara Falls

Woodbine St & Kalar
Rd8190 Woodbine St, Niagara Falls

Woodbine & Paddock
SW7992 Woodbine Street, Niagara Falls

Paddock Trail Drive
79537973 Paddock Trail, Niagara Falls

Paddock Trail Dr & Preakness
St8071 Paddock Trail, Niagara Falls

Paddock Trail Dr & Epsom

105 bus Time Schedule

Kalar Rd - Canadian Drive Hub Route Timetable:

Sunday	Not Operational
Monday	6:15 AM - 5:15 PM
Tuesday	6:15 AM - 5:15 PM
Wednesday	6:15 AM - 5:15 PM
Thursday	6:15 AM - 5:15 PM
Friday	6:15 AM - 5:15 PM
Saturday	6:15 AM - 5:15 PM

105 bus Info

Direction: Kalar Rd - Canadian Drive Hub
Stops: 39
Trip Duration: 28 min
Line Summary:

Ct8109 Paddock Trail, Niagara Falls

Paddock Trail Dr & Kalar Rd
82615080 Kalar Road, Niagara Falls

Kalar Rd & Beaverdams
Rd5407 Kalar Road, Niagara Falls

Kalar Rd & Racey
Av5577 Kalar Road, Niagara Falls

Kalar Rd & Feren
Dr5703 Kalar Road, Niagara Falls

Kalar Rd & Lundy's Lane
NW5817 Kalar Road, Niagara Falls

Kalar Rd & Catalina
St5947 Kalar Road, Niagara Falls

Kalar Rd & Rideau
St6180 Kalar Road, Niagara Falls

Kalar Rd & Forestview
Blvd6334 Desanka Avenue, Niagara Falls

Armelina Crescent
65346507 Kalar Road, Niagara Falls

Kalar Rd & 6623 Kalar
RdKalar Road, Niagara Falls

Kalar Rd & Coventry
Rd6877 Kalar Road, Niagara Falls

Kalar Rd & Mcgarry
Dr6971 Kalar Road, Niagara Falls

Kalar Rd & Mcleod Rd
70597067 Kalar Road, Niagara Falls

Mcleod Rd & Kalar
Rd7100 Kelly Drive, Niagara Falls

Mcleod Rd & Parkside
Rd7228 Kelly Drive, Niagara Falls

Mcleod Rd & St. Michael's
Schoo8731 McLeod Road, Niagara Falls

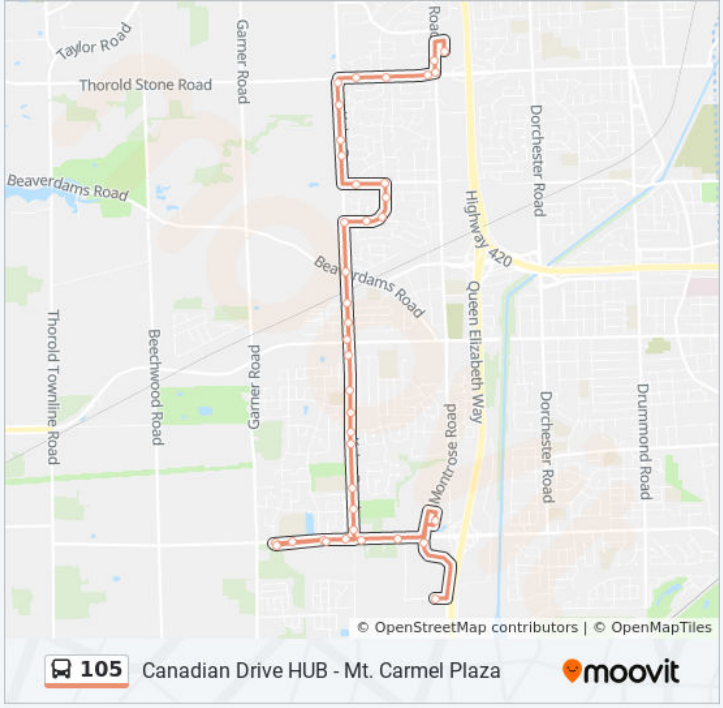
Mcleod Rd & St. Michael's
Av8927 McLeod Road, Niagara Falls

Boys & Girls
Club8928 McLeod Road, Niagara Falls

Mcleod Rd (S) & Parkside
Rd7210 Kelly Dr, Niagara Falls

Mcleod Rd & Kalar
Rd8184 McLeod Road, Niagara Falls

Mcleod Rd & Pin Oak
Dr8055 McLeod Road, Niagara Falls



Mcbain Centre

Montrose & S Of
Mcleod7267 Montrose Road, Niagara Falls

Canadian Drive
Hub7812 Canadian Drive, Niagara Falls

Direction: Kalar Rd - Mt Carmel Plaza

40 stops

VIEW LINE SCHEDULE

Canadian Drive
Hub7812 Canadian Drive, Niagara Falls

Pin Oak Dr & Cineplex

Mcbain Centre

Mcleod Rd & 8065
Mcleod8065 McLeod Road, Niagara Falls

Mcleod Rd & Kalar
Rd8183 McLeod Road, Niagara Falls

Mcleod Rd & Kalar
Rd7100 Kelly Drive, Niagara Falls

Mcleod Rd & Parkside
Rd7228 Kelly Drive, Niagara Falls

Mcleod Rd & St. Michael's
Schoo8731 McLeod Road, Niagara Falls

Mcleod Rd & St. Michael's
Av8927 McLeod Road, Niagara Falls

Boys & Girls
Club8928 McLeod Road, Niagara Falls

Mcleod Rd (S) & Parkside
Rd7210 Kelly Dr, Niagara Falls

Kalar Rd & Mcleod
Rd7067 Kalar Road, Niagara Falls

Kalar Rd & Mcgarry
Dr7058 Kalar Road, Niagara Falls

Kalar Rd & Coventry
Rd6856 Kalar Road, Niagara Falls

Kalar Rd & 3730 Kalar
Rd6742 Kalar Road, Niagara Falls

Kalar Rd & 6600 Kalar
RdKalar Road, Niagara Falls

Kalar Rd & Westwood
St6506 Kalar Road, Niagara Falls

Kalar Rd & North Of Rideau
St6230 Kalar Road, Niagara Falls

Kalar Rd & 6066 Kalar
Rd6066 Kalar Road, Niagara Falls

Kalar Rd. & Lundy's

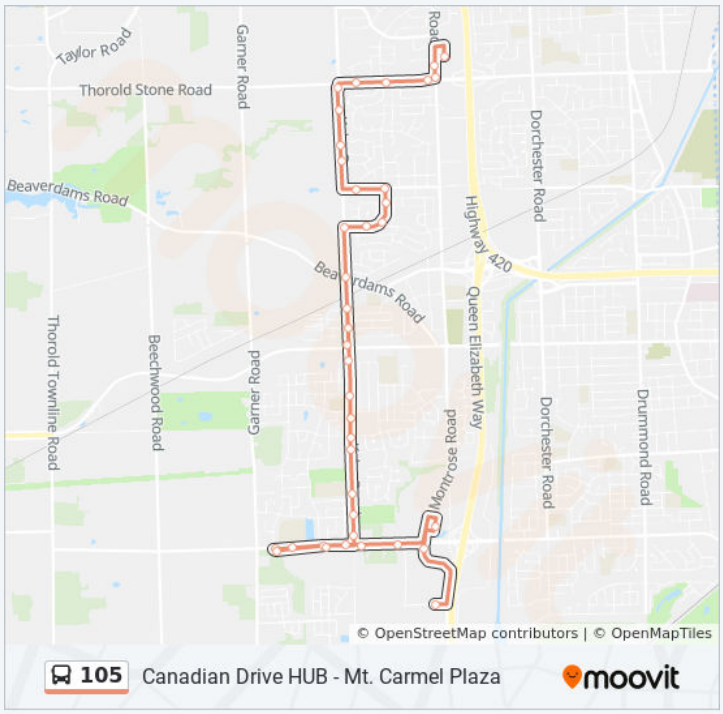
105 bus Time Schedule

Kalar Rd - Mt Carmel Plaza Route Timetable:

Sunday	Not Operational
Monday	5:45 AM - 5:45 PM
Tuesday	5:45 AM - 5:45 PM
Wednesday	5:45 AM - 5:45 PM
Thursday	5:45 AM - 5:45 PM
Friday	5:45 AM - 5:45 PM
Saturday	5:45 AM - 5:45 PM

105 bus Info

Direction: Kalar Rd - Mt Carmel Plaza
Stops: 40
Trip Duration: 28 min
Line Summary:



Lane5854 Kalar Road, Niagara Falls

Kalar Rd & Lundy's Lane
N/E5816 Kalar Road, Niagara Falls

Kalar Rd & Harvest
Cr5705 Kalar Road, Niagara Falls

Kalar Rd & Racey
Av8291 Racey Avenue, Niagara Falls

Kalar Rd & Beaverdams
Rd5409 Kalar Road, Niagara Falls

Paddock Trail Dr & Post
Rd5049 Post Road, Niagara Falls

Paddock Trail Dr & Epson
Ct8107 Paddock Trail, Niagara Falls

Paddock Trail Dr & Preakness
808068 Paddock Trail, Niagara Falls

Paddock Trail Drive
79537973 Paddock Trail, Niagara Falls

Paddock Trail & Woodbine
SE7920 Paddock Trail, Niagara Falls

Woodbine St & 8103 Woodbine
St8115 Woodbine Street, Niagara Falls

Woodbine St & Kalar
Rd8249 Woodbine Street, Niagara Falls

Kalar Rd & Marcon
St4574 Kalar Road, Niagara Falls

Kalar Rd & Constabile
Dr4471 Kalar Road, Niagara Falls

Kalar Rd & 4240 Kalar
Rd4267 Kalar Road, Niagara Falls

Kalar Rd & Niven
St4151 Kalar Road, Niagara Falls

Kalar&Thosto SE4006 Kalar Road, Niagara Falls

Thorold Stone Rd & Shiners
Creek7916 Thorold Stone Road, Niagara Falls

Thorold Stone Rd & Collard
Av7794 Thorold Stone Road, Niagara Falls

Montrose Rd & Thorold Stone
Rd7610 Cameron Court, Niagara Falls

Mt. Carmel Plaza

105 bus time schedules and route maps are available in an offline PDF at moovitapp.com. Use the Moovit App to see live bus times, train schedule or subway schedule, and step-by-step directions for all public transit in Toronto.

Check Live Arrival Times

111 Morrison-Dorchester Hub - Canadian Drive HUB

View In Website Mode

The 111 bus line (Morrison-Dorchester Hub - Canadian Drive HUB) has 2 routes. For regular weekdays, their operation hours are:
(1) Dorchester Rd - Canadian Drive Hub: 6:00 AM - 6:30 PM (2) Dorchester Rd - Morrison/Dorchester: 6:15 AM - 6:15 PM
Use the Moovit App to find the closest 111 bus station near you and find out when is the next 111 bus arriving.

Direction: Dorchester Rd - Canadian Drive Hub

20 stops

VIEW LINE SCHEDULE

Morrison-Dorchester
Hub7190 Morrison Street, Niagara Falls

Zehrs Parking Lot & Morrison St

Dorchester Rd & Dawson
St5039 Dorchester Road, Niagara Falls

Dorchester Rd & Garden
St5581 Dorchester Road, Niagara Falls

Dorchester Rd & High
St6900 High Street, Niagara Falls

Dorchester@ Ll NW
Corner5837 Dorchester Road, Niagara Falls

Dorchester + Lundy's Lane
SW5959 Dorchester Road, Niagara Falls

Dorchester Rd & Barker
St6019 Dorchester Road, Niagara Falls

Dorchester Rd & Stokes
St6240 Dorchester Road, Niagara Falls

Dorchester Rd & Coach
Dr6364 Dorchester Road, Niagara Falls

Dorchester Rd & Mcmillan
Dr6511 Dorchester Road, Niagara Falls

Dorchester Rd & Dunn
St6725 Dorchester Road, Niagara Falls

Dorchester Rd & Margaret
St6821 Dorchester Road, Niagara Falls

Dorchester Rd & Winston
St6961 Dorchester Road, Niagara Falls

111 bus Time Schedule

Dorchester Rd - Canadian Drive Hub Route Timetable:

Sunday	Not Operational
Monday	6:00 AM - 6:30 PM
Tuesday	6:00 AM - 6:30 PM
Wednesday	6:00 AM - 6:30 PM
Thursday	6:00 AM - 6:30 PM
Friday	6:00 AM - 6:30 PM
Saturday	6:00 AM - 6:30 PM

111 bus Info

Direction: Dorchester Rd - Canadian Drive Hub
Stops: 20
Trip Duration: 13 min
Line Summary:

Dorchester Rd & Douglas
St7083 Dorchester Road, Niagara Falls

Dorchester Rd & Mcleod
Rd7227 Dorchester Road, Niagara Falls

Mcleod Rd & Sharon
Av7222 Sharon Avenue, Niagara Falls

Mcleod Rd @ Oakwood
Dr7070 Oakwood Drive, Niagara Falls

Montrose & S Of
Mcleod7267 Montrose Road, Niagara Falls

Canadian Drive
Hub7812 Canadian Drive, Niagara Falls

Direction: Dorchester Rd - Morrison/Dorchester

18 stops

VIEW LINE SCHEDULE

Canadian Drive
Hub7812 Canadian Drive, Niagara Falls

Pin Oak Dr & Cineplex

Mcleod Rd & Jubilee
Dr7068 McLeod Road, Niagara Falls

Dorchester Rd & Mcleod
NE7168 Dorchester Road, Niagara Falls

Dorchester Rd & Caledonia
St6934 Dorchester Road, Niagara Falls

Dorchester Rd & Winston
St6954 Dorchester Road, Niagara Falls

Dorchester Rd & Margaret
St6724 Dorchester Road, Niagara Falls

Dorchester Rd & Dunn
St6654 Dorchester Road, Niagara Falls

Dorchester Rd &
Mcmillan6478 Dorchester Road, Niagara Falls

Dorchester Rd & Coach
Dr6372 Dorchester Road, Niagara Falls

Dorchester Rd & Stokes
St6278 Dorchester Road, Niagara Falls

Dorchester Rd & Barker
St6052 Dorchester Road, Niagara Falls

Dorchester & Lundy's
Lane5910 Dorchester Road, Niagara Falls

Dorchester Rd & High
St5758 Dorchester Road, Niagara Falls

Dorchester Rd & Frederica
St5556 Dorchester Road, Niagara Falls

Dorchester Rd & Dawson
St5200 Dorchester Road, Niagara Falls

Dorchester Rd & Keiffer
St5002 Dorchester Road, Niagara Falls

Morrison-Dorchester
Hub7190 Morrison Street, Niagara Falls

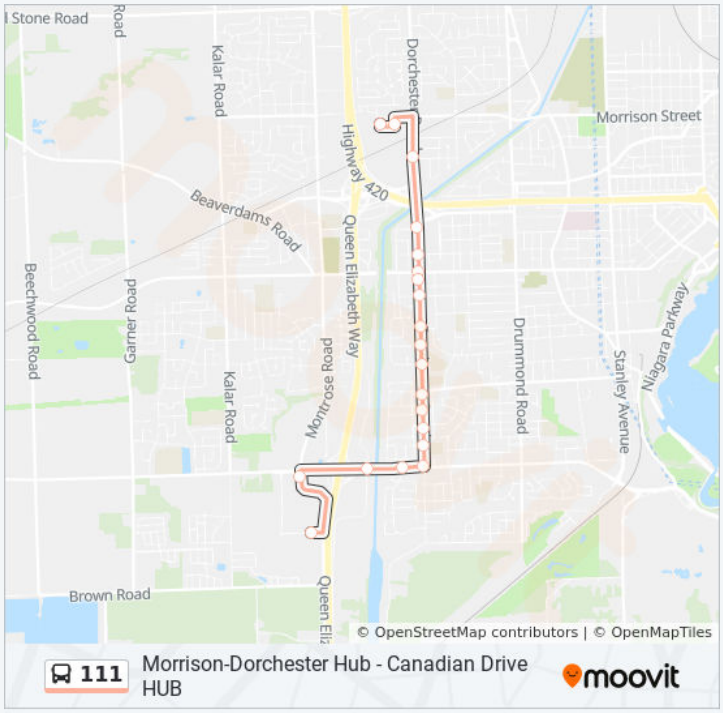
111 bus Time Schedule

Dorchester Rd - Morrison/Dorchester Route Timetable:

Sunday	Not Operational
Monday	6:15 AM - 6:15 PM
Tuesday	6:15 AM - 6:15 PM
Wednesday	6:15 AM - 6:15 PM
Thursday	6:15 AM - 6:15 PM
Friday	6:15 AM - 6:15 PM
Saturday	6:15 AM - 6:15 PM

111 bus Info

Direction: Dorchester Rd - Morrison/Dorchester
Stops: 18
Trip Duration: 13 min
Line Summary:



111 bus time schedules and route maps are available in an offline PDF at moovitapp.com. Use the Moovit App to see live bus times, train schedule or subway schedule, and step-by-step directions for all public transit in Toronto.

Check Live Arrival Times

112 Willoughby Dr & Caronpost Rd - Canadian Drive HUB

View In Website Mode

The 112 bus line (Willoughby Dr & Caronpost Rd - Canadian Drive HUB) has 3 routes. For regular weekdays, their operation hours are:
(1) Mcleod Rd - Chippawa: 5:10 PM (2) Mcleod Rd - Chippawa: 7:45 AM - 4:45 PM (3) Mcleod Rd- Canadian Drive Hub: 7:10 AM - 4:10 PM
Use the Moovit App to find the closest 112 bus station near you and find out when is the next 112 bus arriving.

Direction: Mcleod Rd - Chippawa

13 stops
VIEW LINE SCHEDULE

Willoughby Dr & Caronpost
Rd8659 Willoughby Drive, Niagara Falls

Opp. Bella Retirement
Home8769 Willoughby Drive, Niagara Falls

Weinbrenner &
Willloughby8833 Willoughby Dr, Niagara Falls

Weinbrenner Before
Campbell3741 Weinbrenner Rd, Niagara Falls

Weinbrenner Rd & Campbell
Av3964 Weinbrenner Road, Niagara Falls

Weinbrenner Rd & Montcalm
Cr4052 Montcalm Crescent, Niagara Falls

Weinbrenner Rd & Sodom
Rd4108 Weinbrenner Road, Niagara Falls

Welland St & Drake
St4140 Welland Street, Niagara Falls

Welland St & Banting
St4078 Welland Street, Niagara Falls

Welland St & Oliver
St4048 Welland Street, Niagara Falls

Oliver St & Gunning
St8609 Oliver Street, Niagara Falls

Gunning Dr & Mears
Ct3663 Gunning Drive, Niagara Falls

Gunning &
Willloughby8485 Willoughby Drive, Niagara Falls

112 bus Time Schedule

Mcleod Rd - Chippawa Route Timetable:

Sunday	Not Operational
Monday	5:10 PM
Tuesday	5:10 PM
Wednesday	5:10 PM
Thursday	5:10 PM
Friday	5:10 PM
Saturday	5:10 PM

112 bus Info

Direction: Mcleod Rd - Chippawa
Stops: 13
Trip Duration: 5 min
Line Summary:


Two Rivers B&B
RBC
Niagara Street
Welland River
Bridgewater Street
Welland Street
Front Street
Cattell Drive
Parliament Avenue
Roosevelt Avenue
Banting Avenue
Betty's Restaurant
Mann Street
Legends Way
© OpenStreetMap contributors | © OpenMapTiles
112
Willoughby Dr & Caronpost Rd - Canadian Drive HUB
moovit

Direction: Mcleod Rd - Chippawa

31 stops

VIEW LINE SCHEDULE

Canadian Drive
Hub7812 Canadian Drive, Niagara Falls

Pin Oak Dr & Cineplex

Oakwood Dr
SW8951 Oakwood Drive, Niagara Falls

Walmart & Oakwood Dr

Oakwood Dr
SE8952 Oakwood Drive, Niagara Falls

Mcleod Rd & Jubilee
Dr7068 McLeod Road, Niagara Falls

Mcleod Rd & Dorchester
Rd6984 McLeod Road, Niagara Falls

Mcleod Rd & Fern
Av6730 McLeod Road, Niagara Falls

Mcleod Rd & Merritt
Av6560 McLeod Road, Niagara Falls

Mcleod Rd & Dell
Av6442 McLeod Road, Niagara Falls

Mcleod Rd & Heximer
Av6322 Mcleod Rd, Niagara Falls

Mcleod Rd & Drummond
Rd7261 Drummond Road, Niagara Falls

Mcleod Rd. Opp. Duncan
Ave6091 Mcleod Rd, Niagara Falls

Mcleod Rd & Alex Av
S/W5944 McLeod Road, Niagara Falls

Ailanthus Av & Frontenac
St7416 Ailanthus Avenue, Niagara Falls

Ailanthus Av6989 Ailanthus Avenue, Niagara Falls

Ailanthus Before
Sunnylea5842 Sunnylea Cr, Niagara Falls

Ailanthus Av & Dunn
St6674 Ailanthus Avenue, Niagara Falls

Dunn& Stanley SW5582 Dunn St, Niagara Falls

Stanley Av & Dunn
St7057 Stanley Avenue, Niagara Falls

112 bus Time Schedule

Mcleod Rd - Chippawa Route Timetable:

Sunday	Not Operational
Monday	7:45 AM - 4:45 PM
Tuesday	7:45 AM - 4:45 PM
Wednesday	7:45 AM - 4:45 PM
Thursday	7:45 AM - 4:45 PM
Friday	7:45 AM - 4:45 PM
Saturday	7:45 AM - 4:45 PM

112 bus Info

Direction: Mcleod Rd - Chippawa
Stops: 31
Trip Duration: 25 min
Line Summary:

Stanley Av & Livingstone
St7103 Stanley Avenue, Niagara Falls

Stanley Ave Opp. Mt.
Carmel7141 Stanley Avenue, Niagara Falls

Stanley Ave & Marineland
ParkwayStanley Avenue, Niagara Falls

Portage Rd Opp. Oak
Hall7500 Portage Road, Niagara Falls

Marineland- Outbound To Chippawa

Portage Rd & Legion
St3847 Legion Street, Niagara Falls

Portage Rd & Front
St8090 Portage Road, Niagara Falls

Willoughby Dr & Welland
St8267 Willoughby Drive, Niagara Falls

Willoughby Dr & Aberdeen
St3642 Aberdeen Street, Niagara Falls

Willoughby Dr & Gunning
Dr8485 Willoughby Drive, Niagara Falls

Willoughby Dr & Caronpost
Rd8659 Willoughby Drive, Niagara Falls

Direction: Mcleod Rd- Canadian Drive Hub

46 stops

VIEW LINE SCHEDULE

Willoughby Dr & Caronpost
Rd8659 Willoughby Drive, Niagara Falls

Opp. Bella Retirement
Home8769 Willoughby Drive, Niagara Falls

Weinbrenner &
Willloughby8833 Willoughby Dr, Niagara Falls

Weinbrenner Before
Campbell3741 Weinbrenner Rd, Niagara Falls

Weinbrenner Rd & Campbell
Av3964 Weinbrenner Road, Niagara Falls

Weinbrenner Rd & Montcalm
Cr4052 Montcalm Crescent, Niagara Falls

Weinbrenner Rd & Sodom
Rd4108 Weinbrenner Road, Niagara Falls

Welland St & Drake
St4140 Welland Street, Niagara Falls

Welland St & Banting
St4078 Welland Street, Niagara Falls

Welland St & Oliver
St4048 Welland Street, Niagara Falls

Oliver St & Gunning
St8609 Oliver Street, Niagara Falls

Gunning Dr & Mears
Ct3663 Gunning Drive, Niagara Falls

Gunning &
Willloughby8485 Willoughby Drive, Niagara Falls

Aberdeen St8317 Willoughby Drive, Niagara Falls

Willoughby Dr & Main
St3732 Main Street, Niagara Falls

8076 Portage
Rd8033 Portage Road, Niagara Falls

Portage Rd & Legion
St7918 Portage Road, Niagara Falls

Marineland- Inbound To M&F

Oakes Hall7500 Portage Road, Niagara Falls

Marineland Pk & Stanley
AvMarineland Parkway, Niagara Falls

112 bus Time Schedule

Mcleod Rd- Canadian Drive Hub Route Timetable:

Sunday	Not Operational
Monday	7:10 AM - 4:10 PM
Tuesday	7:10 AM - 4:10 PM
Wednesday	7:10 AM - 4:10 PM
Thursday	7:10 AM - 4:10 PM
Friday	7:10 AM - 4:10 PM
Saturday	7:10 AM - 4:10 PM

112 bus Info

Direction: Mcleod Rd- Canadian Drive Hub
Stops: 46
Trip Duration: 33 min
Line Summary:

Stanley Av & Mcleod
Rd7178 Stanley Avenue, Niagara Falls

7021 Stanley
Av7140 Stanley Avenue, Niagara Falls

Stanley Av & Livingstone
St6880 Stanley Avenue, Niagara Falls

Stanley Av & Dunn
St6708 Stanley Avenue, Niagara Falls

Dunn&Stanley NW5582 Dunn Street, Niagara Falls

Dunn St & Level
Avenue5770 Dunn St, Niagara Falls

Ailanthus Av & Dunn
St6675 Ailanthus Avenue, Niagara Falls

Cb Wright
Park6923 Ailanthus Avenue, Niagara Falls

Stamford Kiwanis
Manor6991 Ailanthus Avenue, Niagara Falls

Ailanthus Av & Frontenac
St5775 Frontenac Street, Niagara Falls

Mcleod Rd & Ailanthus
Av7726 Ailanthus Avenue, Niagara Falls

Mcleod Rd & Alex
Av5933 McLeod Road, Niagara Falls

Mcleod Rd. After Duncan
Ave6131 McLeod Road, Niagara Falls

Mcleod Rd & Drummond
Rd6239 McLeod Road, Niagara Falls

Mcleod Rd & Heximer
Av6341 McLeod Road, Niagara Falls

Mcleod Rd & Dell
Ave6441 McLeod Road, Niagara Falls

Mcleod Rd & Merritt
Av6577 McLeod Road, Niagara Falls

Mcleod Rd & Adams
Av6705 McLeod Road, Niagara Falls

Mcleod Rd & Bruce
Av7205 Bruce Avenue, Niagara Falls

Mcleod Rd & Dorchester
Rd6873 McLeod Road, Niagara Falls

Mcleod Rd & Sharon
Av7222 Sharon Avenue, Niagara Falls

Oakwood Dr
SW8951 Oakwood Drive, Niagara Falls

Walmart & Oakwood Dr

Oakwood Dr
SE8952 Oakwood Drive, Niagara Falls

Montrose & S Of
Mcleod7267 Montrose Road, Niagara Falls

Canadian Drive
Hub7812 Canadian Drive, Niagara Falls

112 bus time schedules and route maps are available in an offline PDF at moovitapp.com. Use the Moovit App to see live bus times, train schedule or subway schedule, and step-by-step directions for all public transit in Toronto.

Check Live Arrival Times

113 Montrose Rd & Thorold Stone Rd - Candian Drive HUB

View In Website Mode

The 113 bus line (Montrose Rd & Thorold Stone Rd - Candian Drive HUB) has 3 routes. For regular weekdays, their operation hours are:
(1) Brown Road Loop: 6:01 AM - 6:01 PM (2) Montrose Rd - Mt Carmel Plaza: 6:23 AM - 5:23 PM (3) Montrose Rd - Canadian Drive Hub: 6:37 AM - 5:37 PM
Use the Moovit App to find the closest 113 bus station near you and find out when is the next 113 bus arriving.

Direction: Brown Road Loop

9 stops
VIEW LINE SCHEDULE

Candian Drive
Hub7770 Canadian Drive, Niagara Falls

Montrose & S Of
Mcleod7267 Montrose Road, Niagara Falls

Brown Rd. @ Shadbush

Kalar Rd North Of Buckeye
Cres7646 Buckeye Cr, Niagara Falls

Kalar Rd SE Opp.
Elderberry7728 Kalar Road, Niagara Falls

Mcleod Rd & Kalar
Rd8184 McLeod Road, Niagara Falls

Mcleod Rd & Pin Oak
Dr8055 McLeod Road, Niagara Falls

Montrose & S Of
Mcleod7267 Montrose Road, Niagara Falls

Canadian Drive
Hub7812 Canadian Drive, Niagara Falls

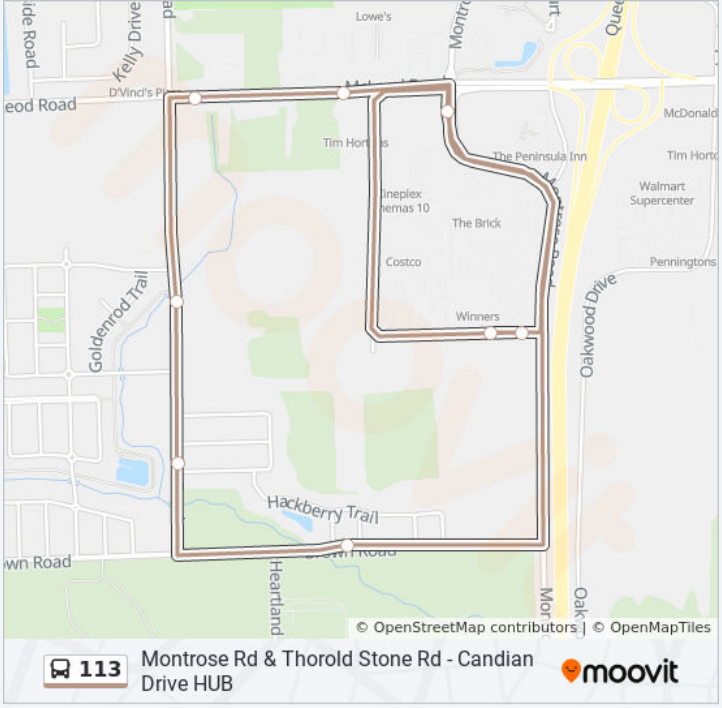
113 bus Time Schedule

Brown Road Loop Route Timetable:

Sunday	Not Operational
Monday	6:01 AM - 6:01 PM
Tuesday	6:01 AM - 6:01 PM
Wednesday	6:01 AM - 6:01 PM
Thursday	6:01 AM - 6:01 PM
Friday	6:01 AM - 6:01 PM
Saturday	6:01 AM - 6:01 PM

113 bus Info

Direction: Brown Road Loop
Stops: 9
Trip Duration: 8 min
Line Summary:


Lowe's
D'Vinci's Pi
McDonald
Tim Horton
The Peninsula Inn
Walmart Supercenter
The Brick
Costco
Penningtons
Winners
Goldenrod Trail
Oakwood Drive
Hackberry Trail
Heartland
© OpenStreetMap contributors | © OpenMapTiles
113
Montrose Rd & Thorold Stone Rd - Candian Drive HUB
moovit

Direction: Montrose Rd - Mt Carmel Plaza

18 stops

VIEW LINE SCHEDULE

Canadian Drive
Hub7812 Canadian Drive, Niagara Falls

Pin Oak Dr & Cineplex

Mcbain Centre

Montrose + Marpin
Crt6580 Montrose Road, Niagara Falls

Montrose&Delta
S6317 Montrose Road, Niagara Falls

Montrose Rd After Delta Dr.
South6410 Montrose Road, Niagara Falls

Montrose&Delta
N6263 Montrose Road, Niagara Falls

Opp. St. George'S
Church6146 Montrose Road, Niagara Falls

Montrose Rd & Lundy's
Ln5998 Montrose Road, Niagara Falls

Montrose Rd East Side & Wayne
St5976 Montrose Road, Niagara Falls

Montrose Rd S.E. & Greendale
St7542 Greendale Street, Niagara Falls

Montrose Rd After Wanless
St5260 Montrose Road, Niagara Falls

Montrose Rd S.E. & Preakness
St5052 Montrose Road, Niagara Falls

Montrose Rd Before Morrison
StMontrose Road, Niagara Falls

Montrose Rd Before Mulhern
St4715 Montrose Road, Niagara Falls

Montrose Rd & Border
City4392 Montrose Road, Niagara Falls

Montrose Rd S.E. & Chorozy
St4184 Montrose Road, Niagara Falls

Montrose Rd & Thorold Stone
Rd7610 Cameron Court, Niagara Falls

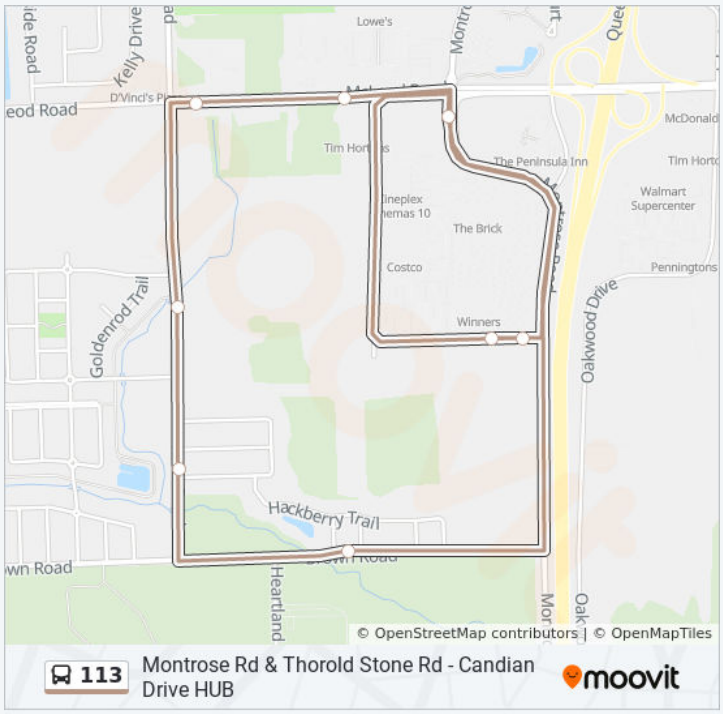
113 bus Time Schedule

Montrose Rd - Mt Carmel Plaza Route Timetable:

Sunday	Not Operational
Monday	6:23 AM - 5:23 PM
Tuesday	6:23 AM - 5:23 PM
Wednesday	6:23 AM - 5:23 PM
Thursday	6:23 AM - 5:23 PM
Friday	6:23 AM - 5:23 PM
Saturday	6:23 AM - 5:23 PM

113 bus Info

Direction: Montrose Rd - Mt Carmel Plaza
Stops: 18
Trip Duration: 14 min
Line Summary:



Direction: Montrose Rd - Canadian Drive Hub

31 stops

VIEW LINE SCHEDULE

Montrose Rd & Thorold Stone
Rd7610 Cameron Court, Niagara Falls

Mt. Carmel Plaza

Montrose Rd & Opp
Southwood7616 Mount Carmel Bv, Niagara Falls

Montrose Rd & Cardinal
Dr3400 Cardinal Drive, Niagara Falls

Cardinal Dr & Canterbury
Cr3368 Cardinal Drive, Niagara Falls

Monastary Dr & Trinity
Cr7464 Monastery Drive, Niagara Falls

Monastery &
Montrose3704 Montrose Road, Niagara Falls

Montrose Rd & Mount Carmel
Blvd3754 Montrose Road, Niagara Falls

Montrose Rd & Thorowest
Plaza7610 Cameron Court, Niagara Falls

Montrose Rd & Thorold Stone Rd
N3993 Montrose Road, Niagara Falls

Montrose Rd & Thorold Stone
Rd4085 Montrose Road, Niagara Falls

Montrose Rd & Chorozy
St4181 Montrose Road, Niagara Falls

Montrose Rd & Alpine
Dr4445 Montrose Road, Niagara Falls

4603 Montrose
Rd4589 Montrose Road, Niagara Falls

Montrose Rd & Mulhern
St4663 Montrose Road, Niagara Falls

Montrose & Woodbine
SW4791 Montrose Road, Niagara Falls

Montrose Rd & Preakness
St5049 Montrose Road, Niagara Falls

Montrose Rd & Watson
St5331 Montrose Road, Niagara Falls

Montrose Rd Opp. Greendale
SchoolMontrose Road, Niagara Falls

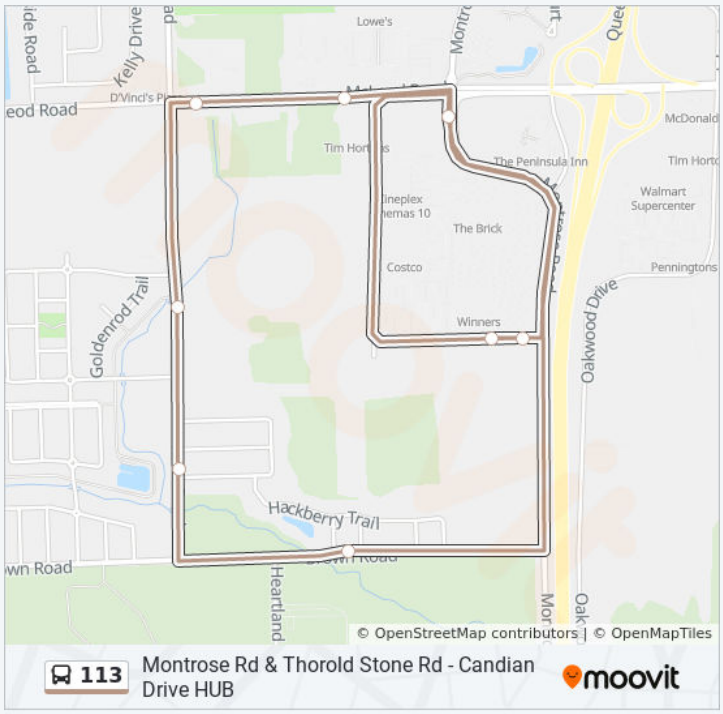
113 bus Time Schedule

Montrose Rd - Canadian Drive Hub Route Timetable:

Sunday	Not Operational
Monday	6:37 AM - 5:37 PM
Tuesday	6:37 AM - 5:37 PM
Wednesday	6:37 AM - 5:37 PM
Thursday	6:37 AM - 5:37 PM
Friday	6:37 AM - 5:37 PM
Saturday	6:37 AM - 5:37 PM

113 bus Info

Direction: Montrose Rd - Canadian Drive Hub
Stops: 31
Trip Duration: 24 min
Line Summary:



Montrose Rd & Rysdale
St5479 Montrose Road, Niagara Falls

Montrose Rd & Wayne
St5723 Montrose Rd, Niagara Falls

Montrose Rd & Lundy's
Ln7572 Lundy's Ln, Niagara Falls

St. George'S
Church6145 Montrose Road, Niagara Falls

Montrose Rd & Charnwood
Av6241 Montrose Road, Niagara Falls

Montrose Rd Before Badger
Rd6409 Montrose Rd, Niagara Falls

Montrose Rd & Badger
Rd6313 Montrose Road, Niagara Falls

Montrose Rd & Charnwood
Av6537 Montrose Road, Niagara Falls

Montrose Rd & Kinsmen
Ct6663 Montrose Road, Niagara Falls

Mcbain Centre

Montrose & S Of
Mcleod7267 Montrose Road, Niagara Falls

Candian Drive
Hub7770 Canadian Drive, Niagara Falls

113 bus time schedules and route maps are available in an offline PDF at moovitapp.com. Use the Moovit App to see live bus times, train schedule or subway schedule, and step-by-step directions for all public transit in Toronto.

Check Live Arrival Times

205 bus time schedule & line map

205 Mt. Carmel Plaza - Canadian Drive HUB

View In Website Mode

The 205 bus line (Mt. Carmel Plaza - Canadian Drive HUB) has 2 routes. For regular weekdays, their operation hours are:
(1) Kalar Rd - Canadian Drive Hub: 6:15 PM - 10:15 PM (2) Kalar Rd - Mt Carmel Plaza: 7:00 PM - 10:00 PM
Use the Moovit App to find the closest 205 bus station near you and find out when is the next 205 bus arriving.

Direction: Kalar Rd - Canadian Drive Hub

28 stops

VIEW LINE SCHEDULE

Mt. Carmel Plaza

Montrose Rd & Thorowest
Plaza7610 Cameron Court, Niagara Falls

Montrose Rd & Thorold Stone Rd
N3993 Montrose Road, Niagara Falls

Thorold Stone Rd & Montrose
Rd7703 Thorold Stone Road, Niagara Falls

Thorold Stone Rd & Cardinal
Dr7980 Thorold Stone Road, Niagara Falls

Thld Stone
@Glenoaks8169 Thorold Stone Road, Niagara Falls

Kalar&Thorold Stone
SW4007 Kalar Road, Niagara Falls

Kalar Rd & 4167 Kalar
Rd4150 Kalar Road, Niagara Falls

Kalar Rd & Constabile
Dr4473 Kalar Road, Niagara Falls

Kalar@Across From
Marcon4575 Kalar Road, Niagara Falls

Kalar Rd & Woodbine St
South4773 Kalar Road, Niagara Falls

Kalar Rd & Paddock Trail Dr
South5079 Kalar Road, Niagara Falls

Kalar Rd & Beaverdams
Rd5407 Kalar Road, Niagara Falls

Kalar Rd & Racey
Av5577 Kalar Road, Niagara Falls

Kalar Rd & Feren

205 bus Time Schedule

Kalar Rd - Canadian Drive Hub Route Timetable:

Sunday	7:15 AM - 8:15 PM
Monday	6:15 PM - 10:15 PM
Tuesday	6:15 PM - 10:15 PM
Wednesday	6:15 PM - 10:15 PM
Thursday	6:15 PM - 10:15 PM
Friday	6:15 PM - 10:15 PM
Saturday	6:15 PM - 10:15 PM

205 bus Info

Direction: Kalar Rd - Canadian Drive Hub
Stops: 28
Trip Duration: 14 min
Line Summary:

Dr5703 Kalar Road, Niagara Falls

Kalar Rd & Lundy's Lane
NW5817 Kalar Road, Niagara Falls

Kalar Rd & Catalina
St5947 Kalar Road, Niagara Falls

Kalar Rd & Rideau
St6180 Kalar Road, Niagara Falls

Kalar Rd & Forestview
Blvd6334 Desanka Avenue, Niagara Falls

Armelina Crescent
65346507 Kalar Road, Niagara Falls

Kalar Rd & 6623 Kalar
RdKalar Road, Niagara Falls

6733 Kalar Rd6743 Kalar Road, Niagara Falls

Kalar Rd & Coventry
Rd6877 Kalar Road, Niagara Falls

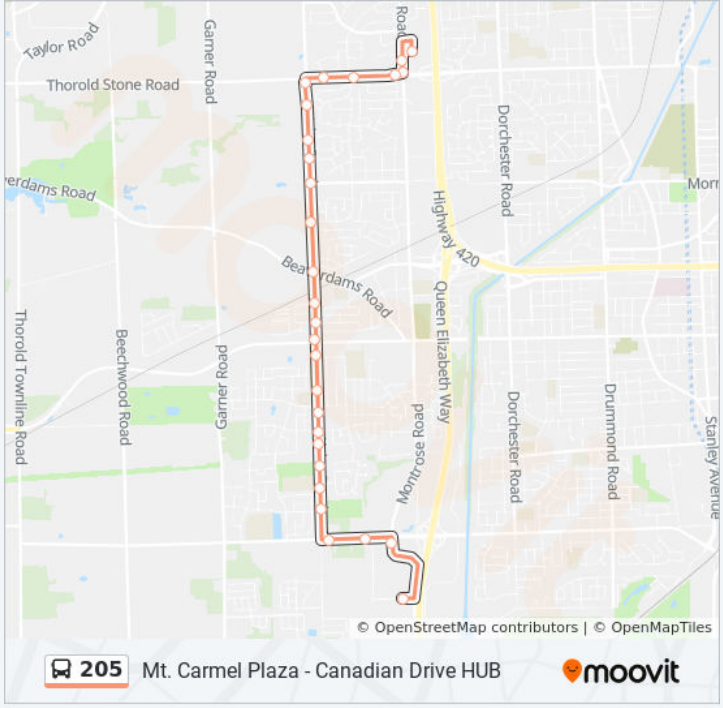
Kalar Rd & Mcgarry
Dr6971 Kalar Road, Niagara Falls

Mcleod Rd & Kalar
Rd8184 McLeod Road, Niagara Falls

Mcleod Rd & Pin Oak
Dr8055 McLeod Road, Niagara Falls

Montrose & S Of
Mcleod7267 Montrose Road, Niagara Falls

Canadian Drive
Hub7812 Canadian Drive, Niagara Falls



Direction: Kalar Rd - Mt Carmel Plaza

28 stops

VIEW LINE SCHEDULE

Canadian Drive
Hub7812 Canadian Drive, Niagara Falls

Pin Oak Dr & Cineplex

Mcleod Rd & 8065
Mcleod8065 McLeod Road, Niagara Falls

Mcleod Rd & Kalar
Rd8183 McLeod Road, Niagara Falls

Kalar Rd & Mcleod
Rd7067 Kalar Road, Niagara Falls

Kalar Rd & Mcgarry
Dr7058 Kalar Road, Niagara Falls

Kalar Rd & Coventry
Rd6856 Kalar Road, Niagara Falls

Kalar Rd & 3730 Kalar
Rd6742 Kalar Road, Niagara Falls

Kalar Rd & 6600 Kalar
RdKalar Road, Niagara Falls

Kalar Rd & Westwood
St6506 Kalar Road, Niagara Falls

Kalar Rd & North Of Rideau
St6230 Kalar Road, Niagara Falls

Kalar Rd & 6066 Kalar
Rd6066 Kalar Road, Niagara Falls

Kalar Rd. & Lundy's
Lane5854 Kalar Road, Niagara Falls

Kalar Rd & Lundy's Lane
N/E5816 Kalar Road, Niagara Falls

Kalar Rd & Harvest
Cr5705 Kalar Road, Niagara Falls

Kalar Rd & Racey
Av8291 Racey Avenue, Niagara Falls

Kalar Rd & Beaverdams
Rd5409 Kalar Road, Niagara Falls

Kalar Rd & Paddock Trail Dr
North5081 Kalar Road, Niagara Falls

Kalar Rd & Woodbine St
North4784 Kalar Road, Niagara Falls

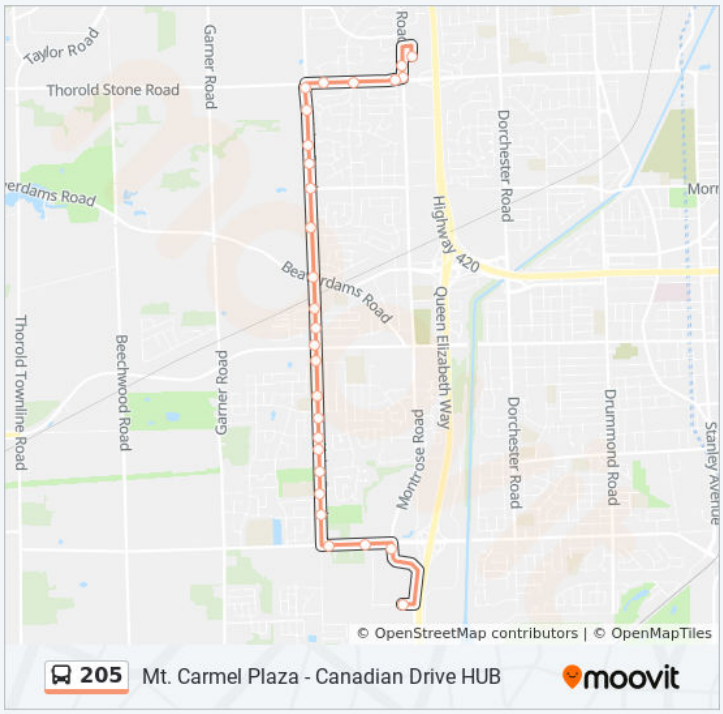
205 bus Time Schedule

Kalar Rd - Mt Carmel Plaza Route Timetable:

Sunday	7:00 AM - 8:00 PM
Monday	7:00 PM - 10:00 PM
Tuesday	7:00 PM - 10:00 PM
Wednesday	7:00 PM - 10:00 PM
Thursday	7:00 PM - 10:00 PM
Friday	7:00 PM - 10:00 PM
Saturday	7:00 PM - 10:00 PM

205 bus Info

Direction: Kalar Rd - Mt Carmel Plaza
Stops: 28
Trip Duration: 14 min
Line Summary:



Kalar Rd & Marcon
St4574 Kalar Road, Niagara Falls

Kalar Rd & Constabile
Dr4471 Kalar Road, Niagara Falls

Kalar Rd & 4240 Kalar
Rd4267 Kalar Road, Niagara Falls

Kalar Rd & Niven
St4151 Kalar Road, Niagara Falls

Kalar&Thosto SE4006 Kalar Road, Niagara Falls

Thorold Stone Rd & Shiners
Creek7916 Thorold Stone Road, Niagara Falls

Thorold Stone Rd & Collard
Av7794 Thorold Stone Road, Niagara Falls

Montrose Rd & Thorold Stone
Rd7610 Cameron Court, Niagara Falls

Mt. Carmel Plaza

205 bus time schedules and route maps are available in an offline PDF at moovitapp.com. Use the Moovit App to see live bus times, train schedule or subway schedule, and step-by-step directions for all public transit in Toronto.

Check Live Arrival Times

moovit 213 bus time schedule & line map

213 Montrose Rd & Thorold Stone Rd - Canadian Drive HUB

View In Website Mode

The 213 bus line (Montrose Rd & Thorold Stone Rd - Canadian Drive HUB) has 2 routes. For regular weekdays, their operation hours are:
(1) Montrose Rd - Canadian Drive Hub: 6:44 PM - 10:44 PM (2) Montrose Rd - Mt Carmel Plaza: 6:30 PM - 10:30 PM
Use the Moovit App to find the closest 213 bus station near you and find out when is the next 213 bus arriving.

Direction: Montrose Rd - Canadian Drive Hub

25 stops

VIEW LINE SCHEDULE

Montrose Rd & Thorold Stone
Rd7610 Cameron Court, Niagara Falls

Mt. Carmel Plaza

Montrose Rd & Thorowest
Plaza7610 Cameron Court, Niagara Falls

Montrose Rd & Thorold Stone Rd
N3993 Montrose Road, Niagara Falls

Montrose Rd & Thorold Stone
Rd4085 Montrose Road, Niagara Falls

Montrose Rd & Chorozy
St4181 Montrose Road, Niagara Falls

Montrose Rd & Alpine
Dr4445 Montrose Road, Niagara Falls

4603 Montrose
Rd4589 Montrose Road, Niagara Falls

Montrose Rd & Mulhern
St4663 Montrose Road, Niagara Falls

Montrose & Woodbine
SW4791 Montrose Road, Niagara Falls

Montrose Rd & Preakness
St5049 Montrose Road, Niagara Falls

Montrose Rd & Watson
St5331 Montrose Road, Niagara Falls

Montrose Rd Opp. Greendale
SchoolMontrose Road, Niagara Falls

Montrose Rd & Rysdale
St5479 Montrose Road, Niagara Falls

213 bus Time Schedule

Montrose Rd - Canadian Drive Hub Route Timetable:

Sunday	7:44 AM - 7:44 PM
Monday	6:44 PM - 10:44 PM
Tuesday	6:44 PM - 10:44 PM
Wednesday	6:44 PM - 10:44 PM
Thursday	6:44 PM - 10:44 PM
Friday	6:44 PM - 10:44 PM
Saturday	6:44 PM - 10:44 PM

213 bus Info

Direction: Montrose Rd - Canadian Drive Hub
Stops: 25
Trip Duration: 13 min
Line Summary:

Montrose Rd & Wayne
St5723 Montrose Rd, Niagara Falls

Montrose Rd & Lundy's
Ln7572 Lundy's Ln, Niagara Falls

St. George'S
Church6145 Montrose Road, Niagara Falls

Montrose Rd & Charnwood
Av6241 Montrose Road, Niagara Falls

Montrose Rd Before Badger
Rd6409 Montrose Rd, Niagara Falls

Montrose Rd & Badger
Rd6313 Montrose Road, Niagara Falls

Montrose Rd & Charnwood
Av6537 Montrose Road, Niagara Falls

Montrose Rd & Kinsmen
Ct6663 Montrose Road, Niagara Falls

Mcbain Centre

Montrose & S Of
Mcleod7267 Montrose Road, Niagara Falls

Canadian Drive
Hub7812 Canadian Drive, Niagara Falls

Direction: Montrose Rd - Mt Carmel Plaza

18 stops

VIEW LINE SCHEDULE

Canadian Drive
Hub7812 Canadian Drive, Niagara Falls

Pin Oak Dr & Cineplex

Mcbain Centre

Montrose + Marpin
Crt6580 Montrose Road, Niagara Falls

Montrose&Delta
S6317 Montrose Road, Niagara Falls

Montrose Rd After Delta Dr.
South6410 Montrose Road, Niagara Falls

Montrose&Delta
N6263 Montrose Road, Niagara Falls

Opp. St. George'S
Church6146 Montrose Road, Niagara Falls

Montrose Rd & Lundy's
Ln5998 Montrose Road, Niagara Falls

Montrose Rd East Side & Wayne
St5976 Montrose Road, Niagara Falls

Montrose Rd S.E. & Greendale
St7542 Greendale Street, Niagara Falls

Montrose Rd After Wanless
St5260 Montrose Road, Niagara Falls

Montrose Rd S.E. & Preakness
St5052 Montrose Road, Niagara Falls

Montrose Rd Before Morrison
StMontrose Road, Niagara Falls

Montrose Rd Before Mulhern
St4715 Montrose Road, Niagara Falls

Montrose Rd & Border
City4392 Montrose Road, Niagara Falls

Montrose Rd S.E. & Chorozy
St4184 Montrose Road, Niagara Falls

Montrose Rd & Thorold Stone
Rd7610 Cameron Court, Niagara Falls

213 bus Time Schedule

Montrose Rd - Mt Carmel Plaza Route Timetable:

Sunday	7:30 AM - 7:30 PM
Monday	6:30 PM - 10:30 PM
Tuesday	6:30 PM - 10:30 PM
Wednesday	6:30 PM - 10:30 PM
Thursday	6:30 PM - 10:30 PM
Friday	6:30 PM - 10:30 PM
Saturday	6:30 PM - 10:30 PM

213 bus Info

Direction: Montrose Rd - Mt Carmel Plaza
Stops: 18
Trip Duration: 14 min
Line Summary:

213 bus time schedules and route maps are available in an offline PDF at moovitapp.com. Use the Moovit App to see live bus times, train schedule or subway schedule, and step-by-step directions for all public transit in Toronto.

Check Live Arrival Times

APPENDIX C

Traffic Data

TRAFFIC SIGNAL WARRANTS - JUSTIFICATION 7 (PROJECTED VOLUMES)

GENERAL INFORMATION **FUTURE WEEKDAY PEAK HOUR**

Analyst	Placeholder	**Jurisdiction**	City of Niagara	
Agency or Company	Crozier	**Date**	June 9, 2022	
Analysis Period	2032 Total	**East-West Street**	Site Access	
		North-South Street	Kalar Road	
Flow Conditions	Free flow (rural)	**Major Street**	North-South	
'T' Intersection	Yes	**Approach lanes per direction**	1	Major Street
Existing Intersection	Yes	**Approach lanes per direction**	1	Minor Street
Additional Comments				

Justification 1: Minimum Vehicle Volumes **JUSTIFIED** **No**

Justification	Guidance Approach Lanes				Compliance			120%
	1 Lanes		2 or More Lanes		Sectional		Entire %	Satisfied
Flow Conditions	**Free Flow**	**Restricted Flow**	**Free Flow**	**Restricted Flow**	**Average Hourly Volumes**	**%**		
A. Vehicle volume, all approaches	480				**273**	38%	38%	No
B. Vehicle volume, along minor streets	120				**29**	16%	16%	No

Justification 2: Delay To Cross Traffic **JUSTIFIED** **No**

Justification	Guidance Approach Lanes				Compliance			120%
	1 Lanes		2 or More Lanes [1]		Sectional		Entire %	Satisfied
Flow Conditions	**Free Flow**	**Restricted Flow**	**Free Flow**	**Restricted Flow**	**Average Hourly Volumes**	**%**		
A. Vehicle volume, major street	480				**244**	34%	34%	No
B. Combined vehicle and pedestrian volume crossing artery from minor streets	50				**4**	5%	5%	No

CONCLUSION

The results of the calculations show that justifications are not met.
Therefore traffic control signal is not justified at this intersection for the horizon year 2032 Total

Note: 1. The minimum volumes were corrected from 120 vehicles and 170 vehicles in OTM, March 2012 to 50 vehicles and 70 vehicles to match Justification 2B.

TRAFFIC SIGNAL WARRANTS - JUSTIFICATION 7 (PROJECTED VOLUMES)

GENERAL INFORMATION **FUTURE WEEKDAY PEAK HOUR**

Analyst	Placeholder	**Jurisdiction**	City of Niagara
Agency or Company	Crozier	**Date**	June 9, 2022
Analysis Period	2032 Total	**East-West Street**	Site Access
		North-South Street	Kalar Road
Flow Conditions	Free flow (rural)	**Major Street**	North-South
'T' Intersection	Yes	**Approach lanes per direction**	1 Major Street
Existing Intersection	Yes	**Approach lanes per direction**	1 Minor Street

Additional Comments

TRAFFIC & PEDESTRIAN VOLUMES

Hour Ending	Main Road Approaches							Minor Road Approaches							Pedestrian Crossing Major Road	Pedestrian Crossing Minor Road
	Northbound			Southbound			Total	Eastbound			Westbound			Total		
	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT			
AM Peak Hour	0	127	0	21	249	0	**397**	0	0	0	14	0	57	**71**		
PM Peak Hour	57	325	0	14	184	0	**580**	0	0	0	2	0	42	**44**		
Total	**57**	**452**	**0**	**35**	**433**	**0**	**977**	**0**	**0**	**0**	**16**	**0**	**99**	**115**	**0**	**0**

Parameter	AM	PM	Average Hourly Volume (AHV)
Vehicle volume, all approaches	468	624	273
Vehicle volume, along minor street	71	44	29
Vehicle volume, along major street	397	580	244
Combined vehicle and pedestrian volume crossing from minor streets	14	2	4

NOTES

1. The traffic control signal justification was done as per criteria defined in Ontario Traffic Manual, Book: 12 (March 2012) Justification 7 - Projected Volumes.

	AM	PM
2. Traffic crossing MAJOR street defined as:		
a. Left turns from both minor street approaches	14	2
b. The heaviest through volume from the minor street	0	0
c. 50% of the heavier left turn movement from the major street when both of the following are met:	0	0
1. the left turn volume > 120	No	No
2. the left turn volume + opposing volume > 720	No	No
d. Pedestrians crossing the major street	0	0

3. Justifications 1 and 2 are required to be met to 120% in the case of an existing intersection and 150% in the case of a new intersection
4. For 'T' intersection, the threshold values to be increased by 50%

Signal Code: KLRMCL

Intersection: MCLEOD RD. & KALAR RD.

Municipality: niagarafalls

Owner: city

Last Modified: 2011-10-19 11:42:12 AM

Timing Parameters	EBD ADV. MCLEOD RD.	EBD/WBD THRU MCLEOD RD.	SBD ADV. KALAR RD.	NBD/SBD THRU KALAR RD.	n/a	n/a
Min Green	6	10	6	8	0	0
Walk	0	14	0	14	0	0
Ped Clearance	0	25	0	24	0	0
Vehicle Ext.	2.5	2.5	2.5	2.5	0	0
Max Green	11	30.7	12	34.7	0	0
Yellow	3	3.3	3	3.3	0	0
All Red	0	3.1	0	3	0	0

		Offset
Minimum Cycle	30.7	0
Pedestrian Cycle	89.7	
Maximum Cycle	107.1	0
Operation	FA	

Installed On:	2008-11-18
Count Date:	--/--/----

FA = Fully Actuated SA = Semi Actuated FT = Fixed Time

Signal Code: MCLPNK

Intersection: McLEOD RD. & PIN OAK DR./LOWES ENTRANCE

Municipality: niagarafalls

Owner: city

Last Modified: 2022-05-12 4:01:19 PM

Timing Parameters	EBD & WBD ADVANCE McLEOD RD.	EBD & WBD THRU McLEOD RD.	NBD & SBD THRU	NBD ADVANCE PIN OAK DR.	n/a	n/a
Min Green	6	10	8	6	0	0
Walk	0	10	11	0	0	0
Ped Clearance	0	16	18	0	0	0
Vehicle Ext.	2.6	2.2	2.8	2.6	0	0
Max Green	20	45	25	20	0	0
Yellow	3	4	4	3	0	0
All Red	0	3	3	0	0	0

		Offset
Minimum Cycle	32	0
Pedestrian Cycle	69	
Maximum Cycle	130	93
Operation	FA	

Installed On:	2020-09-24
Count Date:	--/--/----

FA = Fully Actuated SA = Semi Actuated FT = Fixed Time

PUBLIC WORKS DEPARTMENT
The Regional Municipality of Niagara
1815 Sir Isaac Brock Way
P.O. Box 1042
Thorold, Ontario
L2V 4T7

Telephone: 905.980.6000
Fax: 905.687.8056

Niagara Region
PUBLIC WORKS

Traffic Information Request

To: C.F. Crozier & Associates
Address: 2800 High Point Drive, Suite 100
Milton, ON
L9T 6P4
Attention: Ian Lindley

Phone: 905-875-0026
Date: May 13, 2022
Pages: 2
Prepared By: Manny Rataul

Location and/or Study Name: Pin Oak Drive @ McLeod Road
Kalar Road @ McLeod Road

	Description	Qty.		Price	Total
☐	Eight Hour Intersection Traffic Count per Location (TMC)		X	$ 265.00	$ -
☐	24hr Automatic Traffic Recorder (ATR) Info per Location		X	$ 85.00	$ -
☐	Average Annual Daily Traffic Map - (Colour)		X	$ 220.00	$ -
☐	AADT Volume Book		X	$ 220.00	$ -
☐	Spot Speed Study - radar gun location		X	$ 110.00	$ -
☐	24hr Speed Study per location		X	$ 265.00	$ -
☐	24hr Classification Count per location		X	$ 265.00	$ -
☐	Motor Vehicle Collision General Inquiry Report per location		X	$ 157.00	$ -
☐	Intersection Capacity Analysis per location		X	$ 275.00	$ -
☒	Traffic Signal Timing Summary per location	2	X	$ 110.00	$ 220.00
				Subtotal	$ 194.69
				HST	$ 25.31
				TOTAL (HST Included)	$ 220.00

THIS IS NOT AN INVOICE. For information purposes only. All prices include HST
You will be invoiced for this data from our Finance Department.

APPENDIX D

Level of Service Definitions

Level of Service Definitions

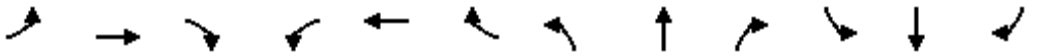
Two-Way Stop Controlled Intersections

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 E

Capacity Analysis

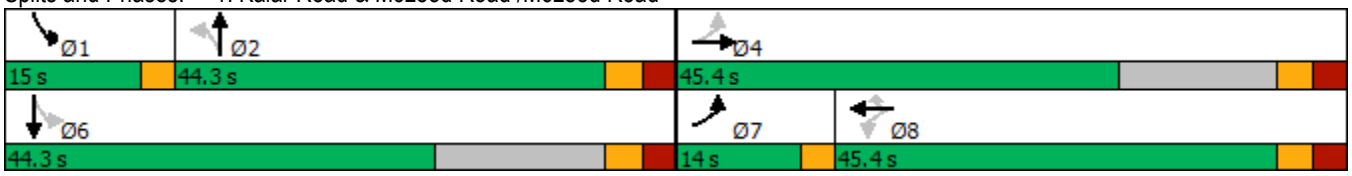


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	336	47	51	259	189	61	130	130	297	95	128
Future Volume (vph)	69	336	47	51	259	189	61	130	130	297	95	128
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	123.0		0.0	114.0		68.0	100.0		0.0	222.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.982				0.850		0.925			0.914	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3201	0	1630	3260	1458	1630	1587	0	1630	2979	0
Flt Permitted	0.463			0.508			0.601			0.401		
Satd. Flow (perm)	794	3201	0	872	3260	1458	1031	1587	0	688	2979	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17				205		45			139	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		373.4			545.0			239.8			262.2	
Travel Time (s)		26.9			39.2			17.3			18.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	75	365	51	55	282	205	66	141	141	323	103	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	416	0	55	282	205	66	282	0	323	242	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8	8	2	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0	10.0	8.0	8.0		6.0	8.0	
Minimum Split (s)	9.0	45.4		45.4	45.4	45.4	44.3	44.3		9.0	44.3	
Total Split (s)	14.0	45.4		45.4	45.4	45.4	44.3	44.3		15.0	44.3	
Total Split (%)	11.8%	38.2%		38.2%	38.2%	38.2%	37.3%	37.3%		12.6%	37.3%	
Maximum Green (s)	11.0	39.0		39.0	39.0	39.0	38.0	38.0		12.0	38.0	
Yellow Time (s)	3.0	3.3		3.3	3.3	3.3	3.3	3.3		3.0	3.3	
All-Red Time (s)	0.0	3.1		3.1	3.1	3.1	3.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	6.4		6.4	6.4	6.4	6.3	6.3		3.0	6.3	
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	
Recall Mode	None	Min		Min	Min	Min	None	None		None	None	
Walk Time (s)		14.0		14.0	14.0	14.0	14.0	14.0			14.0	
Flash Dont Walk (s)		25.0		25.0	25.0	25.0	24.0	24.0			24.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0			0	
Act Effct Green (s)	24.0	20.5		12.0	12.0	12.0	14.8	14.8		32.7	29.2	
Actuated g/C Ratio	0.38	0.33		0.19	0.19	0.19	0.23	0.23		0.52	0.46	
v/c Ratio	0.18	0.40		0.33	0.45	0.46	0.27	0.69		0.62	0.17	
Control Delay	14.7	17.3		32.0	27.7	8.4	24.7	29.4		16.2	5.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	14.7	17.3		32.0	27.7	8.4	24.7	29.4		16.2	5.4	
LOS	B	B		C	C	A	C	C		B	A	
Approach Delay		16.9			20.9			28.5			11.6	
Approach LOS		B			C			C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 118.7			
Actuated Cycle Length: 63			
Natural Cycle: 110			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 18.5		Intersection LOS: B	
Intersection Capacity Utilization 73.2%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Kalar Road & McLeod Road /McLeod Road



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	75	416	55	282	205	66	282	323	242
v/c Ratio	0.18	0.40	0.33	0.45	0.46	0.27	0.69	0.62	0.17
Control Delay	14.7	17.3	32.0	27.7	8.4	24.7	29.4	16.2	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	17.3	32.0	27.7	8.4	24.7	29.4	16.2	5.4
Queue Length 50th (m)	5.8	19.3	6.1	16.9	0.0	6.8	26.8	22.1	3.4
Queue Length 95th (m)	15.6	35.6	18.5	33.0	17.3	18.7	57.9	49.1	10.9
Internal Link Dist (m)		349.4		521.0			215.8		238.2
Turn Bay Length (m)	123.0		114.0		68.0	100.0		222.0	
Base Capacity (vph)	455	2663	565	2113	1017	651	1019	544	2499
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.16	0.10	0.13	0.20	0.10	0.28	0.59	0.10

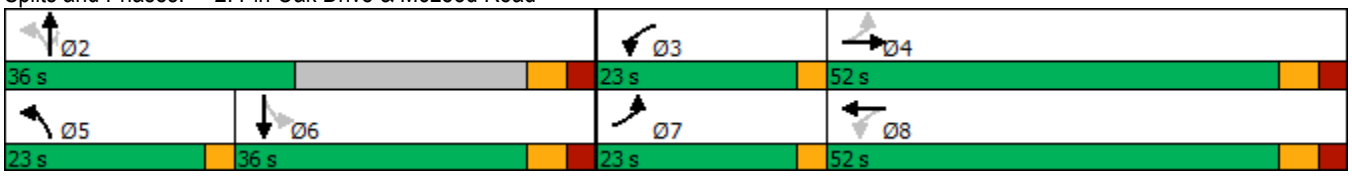
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	429	197	233	321	100	121	34	250	80	39	37
Future Volume (vph)	48	429	197	233	321	100	121	34	250	80	39	37
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	82.0		0.0	72.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.953			0.964				0.850		0.927	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3107	0	1630	3142	0	1630	1716	1458	1630	1590	0
Flt Permitted	0.488			0.240			0.561			0.733		
Satd. Flow (perm)	837	3107	0	412	3142	0	962	1716	1458	1258	1590	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		60			33				272		33	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		545.0			503.9			546.2			81.3	
Travel Time (s)		39.2			36.3			39.3			5.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	466	214	253	349	109	132	37	272	87	42	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	52	680	0	253	458	0	132	37	272	87	82	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	9.0	33.0		9.0	33.0		9.0	36.0	36.0	36.0	36.0	
Total Split (s)	23.0	52.0		23.0	52.0		23.0	36.0	36.0	36.0	36.0	
Total Split (%)	17.2%	38.8%		17.2%	38.8%		17.2%	26.9%	26.9%	26.9%	26.9%	
Maximum Green (s)	20.0	45.0		20.0	45.0		20.0	29.0	29.0	29.0	29.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	3.0		0.0	3.0		0.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0	7.0	7.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	2.6	2.2		2.6	2.2		2.6	2.8	2.8	2.8	2.8	
Recall Mode	None	Min		None	Min		None	None	None	Min	Min	
Walk Time (s)		10.0			10.0			11.0	11.0	11.0	11.0	
Flash Dont Walk (s)		16.0			16.0			18.0	18.0	18.0	18.0	
Pedestrian Calls (#/hr)		0			0			0	0	0	0	
Act Effct Green (s)	32.0	20.7		40.3	30.5		30.9	26.7	26.7	11.6	11.6	
Actuated g/C Ratio	0.41	0.27		0.52	0.39		0.40	0.34	0.34	0.15	0.15	
v/c Ratio	0.12	0.78		0.62	0.36		0.27	0.06	0.40	0.46	0.31	
Control Delay	11.8	31.9		18.7	18.1		18.9	19.8	4.8	43.2	26.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	11.8	31.9		18.7	18.1		18.9	19.8	4.8	43.2	26.0	
LOS	B	C		B	B		B	B	A	D	C	
Approach Delay		30.5			18.3			10.3			34.8	
Approach LOS		C			B			B			C	

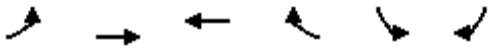
Intersection Summary	
Area Type:	Other
Cycle Length: 134	
Actuated Cycle Length: 77.5	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 22.3	Intersection LOS: C
Intersection Capacity Utilization 62.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: Pin Oak Drive & McLeod Road



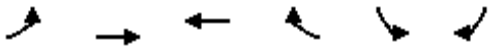
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	52	680	253	458	132	37	272	87	82
v/c Ratio	0.12	0.78	0.62	0.36	0.27	0.06	0.40	0.46	0.31
Control Delay	11.8	31.9	18.7	18.1	18.9	19.8	4.8	43.2	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	31.9	18.7	18.1	18.9	19.8	4.8	43.2	26.0
Queue Length 50th (m)	3.5	43.8	19.5	24.7	12.3	3.6	0.0	11.8	6.4
Queue Length 95th (m)	11.4	86.5	46.1	48.2	32.6	12.6	17.0	34.0	24.1
Internal Link Dist (m)		521.0		479.9		522.2			57.3
Turn Bay Length (m)	82.0		72.0						
Base Capacity (vph)	647	1927	545	1938	565	1215	1111	496	647
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.35	0.46	0.24	0.23	0.03	0.24	0.18	0.13

Intersection Summary



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	59	38	22	39	46	41
Future Volume (vph)	59	38	22	39	46	41
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	281.0			0.0	67.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1467	1544	1544	1312	1467	1312
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1467	1544	1544	1312	1467	1312
Link Speed (k/h)		50	50		50	
Link Distance (m)		711.8	905.7		761.8	
Travel Time (s)		51.2	65.2		54.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	41	24	42	50	45
Shared Lane Traffic (%)						
Lane Group Flow (vph)	64	41	24	42	50	45
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.27	1.27	1.27	1.27	1.27	1.27
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

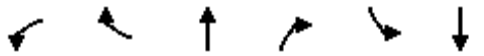
Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 20.6%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	59	38	22	39	46	41
Future Volume (Veh/h)	59	38	22	39	46	41
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)	64	41	24	42	50	45
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	66				193	24
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	66				193	24
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				93	96
cM capacity (veh/h)	1536				763	1052

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	64	41	24	42	50	45
Volume Left	64	0	0	0	50	0
Volume Right	0	0	0	42	0	45
cSH	1536	1700	1700	1700	763	1052
Volume to Capacity	0.04	0.02	0.01	0.02	0.07	0.04
Queue Length 95th (m)	1.0	0.0	0.0	0.0	1.7	1.1
Control Delay (s)	7.4	0.0	0.0	0.0	10.1	8.6
Lane LOS	A				B	A
Approach Delay (s)	4.5		0.0		9.4	
Approach LOS					A	

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	20.6%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	3	172	1	1	60	8
Future Volume (vph)	3	172	1	1	60	8
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.867		0.932			
Flt Protected	0.999					0.958
Satd. Flow (prot)	1486	0	1599	0	0	1644
Flt Permitted	0.999					0.958
Satd. Flow (perm)	1486	0	1599	0	0	1644
Link Speed (k/h)	50		50			50
Link Distance (m)	429.9		52.0			95.9
Travel Time (s)	31.0		3.7			6.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	187	1	1	65	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	190	0	2	0	0	74
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 29.1%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	172	1	1	60	8
Future Volume (Veh/h)	3	172	1	1	60	8
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)	3	187	1	1	65	9
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	140	2			2	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	140	2			2	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	83			96	
cM capacity (veh/h)	818	1083			1620	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	190	2	74
Volume Left	3	0	65
Volume Right	187	1	0
cSH	1077	1700	1620
Volume to Capacity	0.18	0.00	0.04
Queue Length 95th (m)	5.1	0.0	1.0
Control Delay (s)	9.1	0.0	6.5
Lane LOS	A		A
Approach Delay (s)	9.1	0.0	6.5
Approach LOS	A		

Intersection Summary			
Average Delay	8.3		
Intersection Capacity Utilization	29.1%	ICU Level of Service	A
Analysis Period (min)	15		

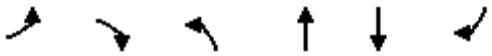
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	39	0	0	193
Future Volume (vph)	0	0	39	0	0	193
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1716	0	1716	0	0	1716
Flt Permitted						
Satd. Flow (perm)	1716	0	1716	0	0	1716
Link Speed (k/h)	50		50			50
Link Distance (m)	163.5		761.8			220.5
Travel Time (s)	11.8		54.8			15.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	42	0	0	210
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	42	0	0	210
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100		100	100	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 14.4%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	39	0	0	193
Future Volume (Veh/h)	0	0	39	0	0	193
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	0	42	0	0	210
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	252	42			42	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	252	42			42	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	737	1029			1567	

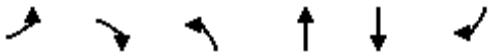
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	42	210
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1567
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	14.4%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	172	58	0
Future Volume (vph)	0	0	0	172	58	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	30.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1716	0	1716	1716	1716	0
Flt Permitted						
Satd. Flow (perm)	1716	0	1716	1716	1716	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	217.3			95.9	546.2	
Travel Time (s)	15.6			6.9	39.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	187	63	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	187	63	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100	100			100
Sign Control	Stop			Free	Free	

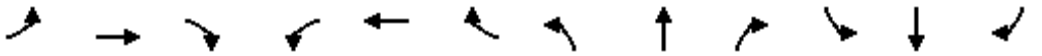
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	13.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	172	58	0
Future Volume (Veh/h)	0	0	0	172	58	0
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	0	0	187	63	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	250	63	63			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	250	63	63			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	739	1002	1540			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	0	0	187	63
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.11	0.04
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.0	0.0		0.0
Approach LOS	A			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	13.2%	ICU Level of Service	A
Analysis Period (min)	15		

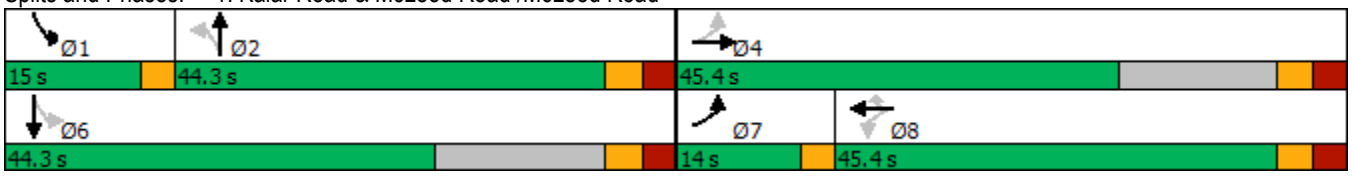


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	365	26	136	398	370	29	94	153	315	97	41
Future Volume (vph)	31	365	26	136	398	370	29	94	153	315	97	41
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	123.0		0.0	114.0		68.0	100.0		0.0	222.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.990				0.850		0.907			0.955	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3227	0	1630	3260	1458	1630	1556	0	1630	3113	0
Flt Permitted	0.416			0.504			0.657			0.406		
Satd. Flow (perm)	714	3227	0	865	3260	1458	1127	1556	0	697	3113	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8				402		73			45	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		373.4			545.0			239.8			262.2	
Travel Time (s)		26.9			39.2			17.3			18.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	397	28	148	433	402	32	102	166	342	105	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	425	0	148	433	402	32	268	0	342	150	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8	8	2	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0	10.0	8.0	8.0		6.0	8.0	
Minimum Split (s)	9.0	45.4		45.4	45.4	45.4	44.3	44.3		9.0	44.3	
Total Split (s)	14.0	45.4		45.4	45.4	45.4	44.3	44.3		15.0	44.3	
Total Split (%)	11.8%	38.2%		38.2%	38.2%	38.2%	37.3%	37.3%		12.6%	37.3%	
Maximum Green (s)	11.0	39.0		39.0	39.0	39.0	38.0	38.0		12.0	38.0	
Yellow Time (s)	3.0	3.3		3.3	3.3	3.3	3.3	3.3		3.0	3.3	
All-Red Time (s)	0.0	3.1		3.1	3.1	3.1	3.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	6.4		6.4	6.4	6.4	6.3	6.3		3.0	6.3	
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	
Recall Mode	None	Min		Min	Min	Min	None	None		None	None	
Walk Time (s)		14.0		14.0	14.0	14.0	14.0	14.0			14.0	
Flash Dont Walk (s)		25.0		25.0	25.0	25.0	24.0	24.0			24.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0			0	
Act Effct Green (s)	25.7	21.9		18.6	18.6	18.6	14.9	14.9		33.9	30.3	
Actuated g/C Ratio	0.39	0.33		0.28	0.28	0.28	0.23	0.23		0.51	0.46	
v/c Ratio	0.09	0.39		0.61	0.47	0.58	0.13	0.66		0.65	0.10	
Control Delay	13.2	17.1		34.9	22.6	6.3	25.8	27.3		21.2	10.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	13.2	17.1		34.9	22.6	6.3	25.8	27.3		21.2	10.1	
LOS	B	B		C	C	A	C	C		C	B	
Approach Delay		16.8			17.8			27.2			17.8	
Approach LOS		B			B			C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 118.7			
Actuated Cycle Length: 66.1			
Natural Cycle: 110			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 18.8		Intersection LOS: B	
Intersection Capacity Utilization 73.9%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Kalar Road & McLeod Road /McLeod Road



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	34	425	148	433	402	32	268	342	150
v/c Ratio	0.09	0.39	0.61	0.47	0.58	0.13	0.66	0.65	0.10
Control Delay	13.2	17.1	34.9	22.6	6.3	25.8	27.3	21.2	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	17.1	34.9	22.6	6.3	25.8	27.3	21.2	10.1
Queue Length 50th (m)	2.5	20.2	14.3	21.1	0.0	2.9	19.5	20.3	3.1
Queue Length 95th (m)	8.6	37.6	44.5	48.7	20.8	12.6	60.9	#84.7	12.9
Internal Link Dist (m)		349.4		521.0			215.8		238.2
Turn Bay Length (m)	123.0		114.0		68.0	100.0		222.0	
Base Capacity (vph)	444	2641	559	2106	1084	709	1006	542	2555
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.16	0.26	0.21	0.37	0.05	0.27	0.63	0.06

Intersection Summary

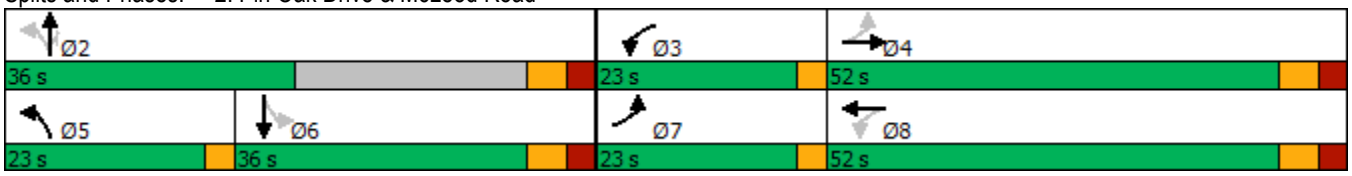
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	581	188	220	620	88	227	48	390	104	55	81
Future Volume (vph)	71	581	188	220	620	88	227	48	390	104	55	81
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	82.0		0.0	72.0		0.0	0.0		0.0	57.0		0.0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.963			0.981				0.850		0.911	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3139	0	1630	3198	0	1630	1716	1458	1630	1563	0
Flt Permitted	0.294			0.160			0.543			0.723		
Satd. Flow (perm)	504	3139	0	275	3198	0	932	1716	1458	1240	1563	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		35			13				398		50	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		545.0			503.9			546.2			81.3	
Travel Time (s)		39.2			36.3			39.3			5.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	77	632	204	239	674	96	247	52	424	113	60	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	77	836	0	239	770	0	247	52	424	113	148	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	9.0	33.0		9.0	33.0		9.0	36.0	36.0	36.0	36.0	
Total Split (s)	23.0	52.0		23.0	52.0		23.0	36.0	36.0	36.0	36.0	
Total Split (%)	17.2%	38.8%		17.2%	38.8%		17.2%	26.9%	26.9%	26.9%	26.9%	
Maximum Green (s)	20.0	45.0		20.0	45.0		20.0	29.0	29.0	29.0	29.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	3.0		0.0	3.0		0.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0	7.0	7.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	2.6	2.2		2.6	2.2		2.6	2.8	2.8	2.8	2.8	
Recall Mode	Min	Min		Min	Min		Min	Min	Min	Min	Min	
Walk Time (s)		10.0			10.0			11.0	11.0	11.0	11.0	
Flash Dont Walk (s)		16.0			16.0			18.0	18.0	18.0	18.0	
Pedestrian Calls (#/hr)		0			0			0	0	0	0	
Act Effct Green (s)	42.3	30.0		50.4	35.2		39.9	35.6	35.6	14.8	14.8	
Actuated g/C Ratio	0.44	0.31		0.52	0.36		0.41	0.37	0.37	0.15	0.15	
v/c Ratio	0.25	0.84		0.73	0.66		0.48	0.08	0.54	0.60	0.53	
Control Delay	15.1	39.3		29.7	28.4		25.6	23.6	6.4	56.3	35.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	15.1	39.3		29.7	28.4		25.6	23.6	6.4	56.3	35.4	
LOS	B	D		C	C		C	C	A	E	D	
Approach Delay		37.3			28.7			14.2			44.5	
Approach LOS		D			C			B			D	

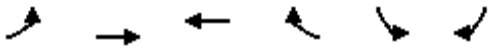
Intersection Summary			
Area Type:	Other		
Cycle Length: 134			
Actuated Cycle Length: 96.9			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 29.2		Intersection LOS: C	
Intersection Capacity Utilization 77.7%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 2: Pin Oak Drive & McLeod Road



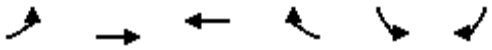
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	77	836	239	770	247	52	424	113	148
v/c Ratio	0.25	0.84	0.73	0.66	0.48	0.08	0.54	0.60	0.53
Control Delay	15.1	39.3	29.7	28.4	25.6	23.6	6.4	56.3	35.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.1	39.3	29.7	28.4	25.6	23.6	6.4	56.3	35.4
Queue Length 50th (m)	7.5	78.4	25.8	65.5	32.3	6.4	3.2	21.3	17.9
Queue Length 95th (m)	17.1	124.6	56.9	99.8	70.3	18.7	30.6	47.9	45.4
Internal Link Dist (m)		521.0		479.9		522.2			57.3
Turn Bay Length (m)	82.0		72.0					57.0	
Base Capacity (vph)	507	1561	440	1627	536	975	1000	392	529
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.54	0.54	0.47	0.46	0.05	0.42	0.29	0.28

Intersection Summary



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	55	24	59	78	43	39
Future Volume (vph)	55	24	59	78	43	39
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	281.0			0.0	67.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1467	1544	1544	1312	1467	1312
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1467	1544	1544	1312	1467	1312
Link Speed (k/h)		50	50		50	
Link Distance (m)		711.8	905.7		761.8	
Travel Time (s)		51.2	65.2		54.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	26	64	85	47	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	60	26	64	85	47	42
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.27	1.27	1.27	1.27	1.27	1.27
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 20.3%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	55	24	59	78	43	39
Future Volume (Veh/h)	55	24	59	78	43	39
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)	60	26	64	85	47	42
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	149				210	64
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	149				210	64
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				94	96
cM capacity (veh/h)	1432				746	1000

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	60	26	64	85	47	42
Volume Left	60	0	0	0	47	0
Volume Right	0	0	0	85	0	42
cSH	1432	1700	1700	1700	746	1000
Volume to Capacity	0.04	0.02	0.04	0.05	0.06	0.04
Queue Length 95th (m)	1.0	0.0	0.0	0.0	1.6	1.1
Control Delay (s)	7.6	0.0	0.0	0.0	10.2	8.8
Lane LOS	A				B	A
Approach Delay (s)	5.3		0.0		9.5	
Approach LOS					A	

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	20.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	3	224	12	7	89	1
Future Volume (vph)	3	224	12	7	89	1
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.867		0.949			
Flt Protected	0.999					0.953
Satd. Flow (prot)	1486	0	1628	0	0	1635
Flt Permitted	0.999					0.953
Satd. Flow (perm)	1486	0	1628	0	0	1635
Link Speed (k/h)	50		50			50
Link Distance (m)	429.9		52.0			95.9
Travel Time (s)	31.0		3.7			6.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	243	13	8	97	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	246	0	21	0	0	98
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 34.0%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	224	12	7	89	1
Future Volume (Veh/h)	3	224	12	7	89	1
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)	3	243	13	8	97	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	212	17			21	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	212	17			21	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	77			94	
cM capacity (veh/h)	729	1062			1595	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	246	21	98
Volume Left	3	0	97
Volume Right	243	8	0
cSH	1056	1700	1595
Volume to Capacity	0.23	0.01	0.06
Queue Length 95th (m)	7.2	0.0	1.6
Control Delay (s)	9.4	0.0	7.3
Lane LOS	A		A
Approach Delay (s)	9.4	0.0	7.3
Approach LOS	A		

Intersection Summary			
Average Delay	8.3		
Intersection Capacity Utilization	34.0%	ICU Level of Service	A
Analysis Period (min)	15		

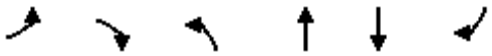
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	78	0	0	259
Future Volume (vph)	0	0	78	0	0	259
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1716	0	1716	0	0	1716
Flt Permitted						
Satd. Flow (perm)	1716	0	1716	0	0	1716
Link Speed (k/h)	50		50			50
Link Distance (m)	163.5		761.8			220.5
Travel Time (s)	11.8		54.8			15.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	85	0	0	282
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	85	0	0	282
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100		100	100	
Sign Control	Stop		Stop			Stop

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 18.1%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	0	0	78	0	0	259
Future Volume (vph)	0	0	78	0	0	259
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	85	0	0	282

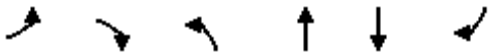
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	0	85	282
Volume Left (vph)	0	0	0
Volume Right (vph)	0	0	0
Hadj (s)	0.00	0.03	0.03
Departure Headway (s)	4.7	4.2	4.0
Degree Utilization, x	0.00	0.10	0.31
Capacity (veh/h)	715	838	890
Control Delay (s)	7.7	7.7	8.8
Approach Delay (s)	0.0	7.7	8.8
Approach LOS	A	A	A

Intersection Summary			
Delay	8.6		
Level of Service	A		
Intersection Capacity Utilization	18.1%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	224	88	0
Future Volume (vph)	0	0	0	224	88	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	30.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1716	0	1716	1716	1716	0
Flt Permitted						
Satd. Flow (perm)	1716	0	1716	1716	1716	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	217.3			95.9	546.2	
Travel Time (s)	15.6			6.9	39.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	243	96	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	243	96	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100	100			100
Sign Control	Stop			Stop	Stop	

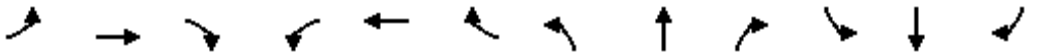
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 16.1%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	0	0	0	224	88	0
Future Volume (vph)	0	0	0	224	88	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	243	96	0

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	0	0	243	96
Volume Left (vph)	0	0	0	0
Volume Right (vph)	0	0	0	0
Hadj (s)	0.00	0.00	0.03	0.03
Departure Headway (s)	4.7	4.6	4.6	4.3
Degree Utilization, x	0.00	0.00	0.31	0.11
Capacity (veh/h)	716	795	774	831
Control Delay (s)	7.7	6.4	8.4	7.8
Approach Delay (s)	0.0	8.4		7.8
Approach LOS	A	A		A

Intersection Summary			
Delay	8.3		
Level of Service	A		
Intersection Capacity Utilization	16.1%	ICU Level of Service	A
Analysis Period (min)	15		

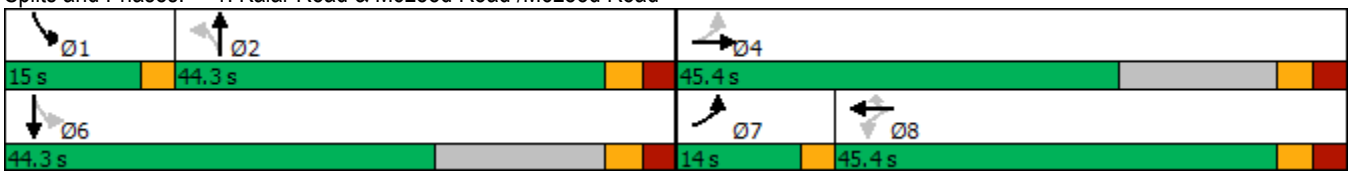


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	456	63	72	337	231	76	175	189	421	129	164
Future Volume (vph)	104	456	63	72	337	231	76	175	189	421	129	164
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	123.0		0.0	114.0		68.0	100.0		0.0	222.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.982				0.850		0.922			0.916	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3201	0	1630	3260	1458	1630	1582	0	1630	2986	0
Flt Permitted	0.421			0.440			0.559			0.281		
Satd. Flow (perm)	722	3201	0	755	3260	1458	959	1582	0	482	2986	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16				251		48			178	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		373.4			545.0			239.8			262.2	
Travel Time (s)		26.9			39.2			17.3			18.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	113	496	68	78	366	251	83	190	205	458	140	178
Shared Lane Traffic (%)												
Lane Group Flow (vph)	113	564	0	78	366	251	83	395	0	458	318	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8	8	2	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0	10.0	8.0	8.0		6.0	8.0	
Minimum Split (s)	9.0	45.4		45.4	45.4	45.4	44.3	44.3		9.0	44.3	
Total Split (s)	14.0	45.4		45.4	45.4	45.4	44.3	44.3		15.0	44.3	
Total Split (%)	11.8%	38.2%		38.2%	38.2%	38.2%	37.3%	37.3%		12.6%	37.3%	
Maximum Green (s)	11.0	39.0		39.0	39.0	39.0	38.0	38.0		12.0	38.0	
Yellow Time (s)	3.0	3.3		3.3	3.3	3.3	3.3	3.3		3.0	3.3	
All-Red Time (s)	0.0	3.1		3.1	3.1	3.1	3.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	6.4		6.4	6.4	6.4	6.3	6.3		3.0	6.3	
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	
Recall Mode	None	Min		Min	Min	Min	None	None		None	None	
Walk Time (s)		14.0		14.0	14.0	14.0	14.0	14.0			14.0	
Flash Dont Walk (s)		25.0		25.0	25.0	25.0	24.0	24.0			24.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0			0	
Act Effct Green (s)	29.2	25.6		15.9	15.9	15.9	22.6	22.6		42.0	38.5	
Actuated g/C Ratio	0.38	0.33		0.21	0.21	0.21	0.29	0.29		0.54	0.50	
v/c Ratio	0.30	0.53		0.50	0.55	0.50	0.30	0.80		1.02	0.20	
Control Delay	19.3	22.5		43.6	32.9	8.2	25.9	35.9		68.0	5.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	19.3	22.5		43.6	32.9	8.2	25.9	35.9		68.0	5.9	
LOS	B	C		D	C	A	C	D		E	A	
Approach Delay		22.0			25.1			34.1			42.5	
Approach LOS		C			C			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 118.7			
Actuated Cycle Length: 77.5			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 31.1		Intersection LOS: C	
Intersection Capacity Utilization 91.3%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Kalar Road & McLeod Road /McLeod Road



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	113	564	78	366	251	83	395	458	318
v/c Ratio	0.30	0.53	0.50	0.55	0.50	0.30	0.80	1.02	0.20
Control Delay	19.3	22.5	43.6	32.9	8.2	25.9	35.9	68.0	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	22.5	43.6	32.9	8.2	25.9	35.9	68.0	5.9
Queue Length 50th (m)	10.8	33.6	10.9	27.0	0.0	9.8	48.9	~47.2	5.7
Queue Length 95th (m)	27.1	61.7	29.7	49.8	20.1	24.7	96.1	#155.0	15.3
Internal Link Dist (m)		349.4		521.0			215.8		238.2
Turn Bay Length (m)	123.0		114.0		68.0	100.0		222.0	
Base Capacity (vph)	407	2303	401	1732	892	496	842	448	2195
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.24	0.19	0.21	0.28	0.17	0.47	1.02	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

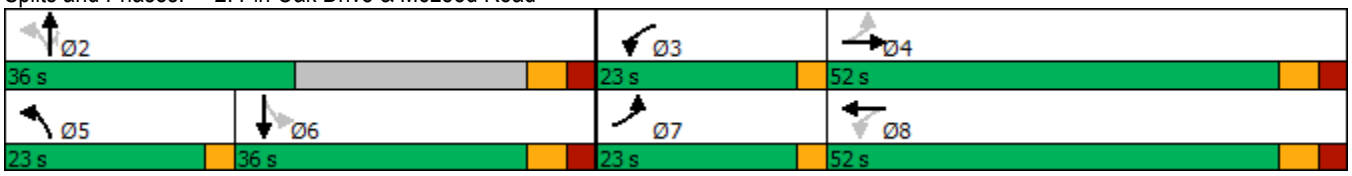
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	657	241	292	422	122	161	42	308	98	48	46
Future Volume (vph)	59	657	241	292	422	122	161	42	308	98	48	46
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	82.0		0.0	72.0		0.0	0.0		0.0	57.0		0.0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.960			0.966				0.850		0.926	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3129	0	1630	3149	0	1630	1716	1458	1630	1589	0
Flt Permitted	0.428			0.115			0.574			0.727		
Satd. Flow (perm)	734	3129	0	197	3149	0	985	1716	1458	1247	1589	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42			30				335		33	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		545.0			503.9			546.2			81.3	
Travel Time (s)		39.2			36.3			39.3			5.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	714	262	317	459	133	175	46	335	107	52	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	976	0	317	592	0	175	46	335	107	102	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	9.0	33.0		10.5	33.0		9.0	36.0	36.0	36.0	36.0	
Total Split (s)	23.0	52.0		23.0	52.0		23.0	36.0	36.0	36.0	36.0	
Total Split (%)	17.2%	38.8%		17.2%	38.8%		17.2%	26.9%	26.9%	26.9%	26.9%	
Maximum Green (s)	20.0	45.0		20.0	45.0		20.0	29.0	29.0	29.0	29.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	3.0		0.0	3.0		0.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0	7.0	7.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	2.6	2.2		2.6	2.2		2.6	2.8	2.8	2.8	2.8	
Recall Mode	Min	Min		Min	Min		Min	Min	Min	Min	Min	
Walk Time (s)		10.0			10.0			11.0	11.0	11.0	11.0	
Flash Dont Walk (s)		16.0			16.0			18.0	18.0	18.0	18.0	
Pedestrian Calls (#/hr)		0			0			0	0	0	0	
Act Effct Green (s)	48.4	37.0		64.7	50.2		37.8	33.6	33.6	14.7	14.7	
Actuated g/C Ratio	0.45	0.34		0.60	0.46		0.35	0.31	0.31	0.14	0.14	
v/c Ratio	0.17	0.89		0.82	0.40		0.40	0.09	0.49	0.64	0.42	
Control Delay	13.2	44.3		44.1	20.2		29.4	27.8	5.7	64.4	37.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	13.2	44.3		44.1	20.2		29.4	27.8	5.7	64.4	37.3	
LOS	B	D		D	C		C	C	A	E	D	
Approach Delay		42.4			28.5			15.0			51.2	
Approach LOS		D			C			B			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 134			
Actuated Cycle Length: 108.6			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 32.8		Intersection LOS: C	
Intersection Capacity Utilization 77.0%		ICU Level of Service D	
Analysis Period (min) 15			

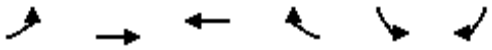
Splits and Phases: 2: Pin Oak Drive & McLeod Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	64	976	317	592	175	46	335	107	102
v/c Ratio	0.17	0.89	0.82	0.40	0.40	0.09	0.49	0.64	0.42
Control Delay	13.2	44.3	44.1	20.2	29.4	27.8	5.7	64.4	37.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	44.3	44.1	20.2	29.4	27.8	5.7	64.4	37.3
Queue Length 50th (m)	5.8	104.7	49.5	42.8	28.7	7.3	0.0	23.5	14.5
Queue Length 95th (m)	14.5	151.5	#119.9	69.5	49.8	17.0	20.6	45.4	33.6
Internal Link Dist (m)		521.0		479.9		522.2			57.3
Turn Bay Length (m)	82.0		72.0					57.0	
Base Capacity (vph)	585	1353	387	1518	464	842	886	341	459
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.72	0.82	0.39	0.38	0.05	0.38	0.31	0.22

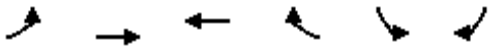
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	73	47	27	55	71	52
Future Volume (vph)	73	47	27	55	71	52
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	281.0			0.0	67.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1467	1544	1544	1312	1467	1312
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1467	1544	1544	1312	1467	1312
Link Speed (k/h)		50	50		50	
Link Distance (m)		711.8	905.7		761.8	
Travel Time (s)		51.2	65.2		54.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	51	29	60	77	57
Shared Lane Traffic (%)						
Lane Group Flow (vph)	79	51	29	60	77	57
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.27	1.27	1.27	1.27	1.27	1.27
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 23.0%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	73	47	27	55	71	52
Future Volume (Veh/h)	73	47	27	55	71	52
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)	79	51	29	60	77	57
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	89				238	29
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	89				238	29
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				89	95
cM capacity (veh/h)	1506				711	1046

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	79	51	29	60	77	57
Volume Left	79	0	0	0	77	0
Volume Right	0	0	0	60	0	57
cSH	1506	1700	1700	1700	711	1046
Volume to Capacity	0.05	0.03	0.02	0.04	0.11	0.05
Queue Length 95th (m)	1.3	0.0	0.0	0.0	2.9	1.4
Control Delay (s)	7.5	0.0	0.0	0.0	10.7	8.6
Lane LOS	A				B	A
Approach Delay (s)	4.6		0.0		9.8	
Approach LOS					A	

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	23.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	4	210	2	2	74	10
Future Volume (vph)	4	210	2	2	74	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.867		0.932			
Flt Protected	0.999					0.958
Satd. Flow (prot)	1486	0	1599	0	0	1644
Flt Permitted	0.999					0.958
Satd. Flow (perm)	1486	0	1599	0	0	1644
Link Speed (k/h)	50		50			50
Link Distance (m)	429.9		52.0			95.9
Travel Time (s)	31.0		3.7			6.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	228	2	2	80	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	232	0	4	0	0	91
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 32.7%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	210	2	2	74	10
Future Volume (Veh/h)	4	210	2	2	74	10
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)	4	228	2	2	80	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)						
pX, platoon unblocked						
vC, conflicting volume	174	3			4	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174	3			4	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	79			95	
cM capacity (veh/h)	776	1081			1618	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	232	4	91
Volume Left	4	0	80
Volume Right	228	2	0
cSH	1074	1700	1618
Volume to Capacity	0.22	0.00	0.05
Queue Length 95th (m)	6.6	0.0	1.2
Control Delay (s)	9.3	0.0	6.5
Lane LOS	A		A
Approach Delay (s)	9.3	0.0	6.5
Approach LOS	A		

Intersection Summary			
Average Delay	8.4		
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		

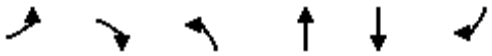
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	127	0	0	249
Future Volume (vph)	0	0	127	0	0	249
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1716	0	1716	0	0	1716
Flt Permitted						
Satd. Flow (perm)	1716	0	1716	0	0	1716
Link Speed (k/h)	50		50			50
Link Distance (m)	163.5		761.8			220.5
Travel Time (s)	11.8		54.8			15.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	138	0	0	271
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	138	0	0	271
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Stop			Stop

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 17.6%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	0	0	127	0	0	249
Future Volume (vph)	0	0	127	0	0	249
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	138	0	0	271

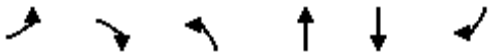
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	0	138	271
Volume Left (vph)	0	0	0
Volume Right (vph)	0	0	0
Hadj (s)	0.00	0.03	0.03
Departure Headway (s)	4.8	4.2	4.1
Degree Utilization, x	0.00	0.16	0.31
Capacity (veh/h)	697	842	878
Control Delay (s)	7.8	8.0	8.8
Approach Delay (s)	0.0	8.0	8.8
Approach LOS	A	A	A

Intersection Summary			
Delay	8.6		
Level of Service	A		
Intersection Capacity Utilization	17.6%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	210	71	0
Future Volume (vph)	0	0	0	210	71	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	30.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1716	0	1716	1716	1716	0
Flt Permitted						
Satd. Flow (perm)	1716	0	1716	1716	1716	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	217.3			95.9	546.2	
Travel Time (s)	15.6			6.9	39.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	228	77	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	228	77	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Stop	Stop	

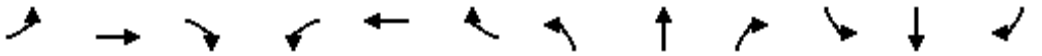
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	15.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	0	0	0	210	71	0
Future Volume (vph)	0	0	0	210	71	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	228	77	0

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	0	0	228	77
Volume Left (vph)	0	0	0	0
Volume Right (vph)	0	0	0	0
Hadj (s)	0.00	0.00	0.03	0.03
Departure Headway (s)	4.6	4.5	4.6	4.3
Degree Utilization, x	0.00	0.00	0.29	0.09
Capacity (veh/h)	742	797	776	834
Control Delay (s)	7.6	6.3	8.2	7.7
Approach Delay (s)	0.0	8.2		7.7
Approach LOS	A	A		A

Intersection Summary			
Delay	8.1		
Level of Service	A		
Intersection Capacity Utilization	15.3%	ICU Level of Service	A
Analysis Period (min)	15		

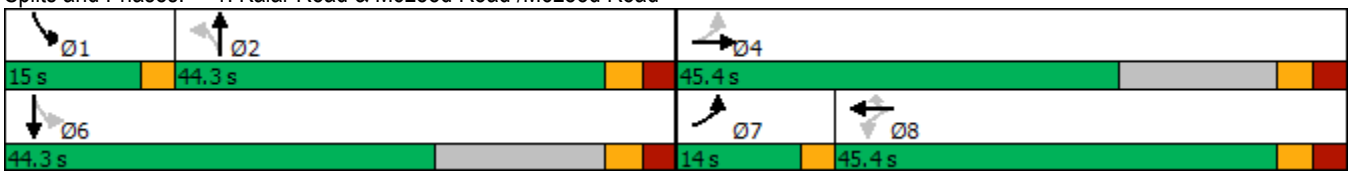


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	471	34	194	536	452	41	139	205	429	141	72
Future Volume (vph)	59	471	34	194	536	452	41	139	205	429	141	72
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	123.0		0.0	114.0		68.0	100.0		0.0	222.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.990				0.850		0.911			0.949	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3227	0	1630	3260	1458	1630	1563	0	1630	3094	0
Flt Permitted	0.315			0.447			0.608			0.244		
Satd. Flow (perm)	540	3227	0	767	3260	1458	1043	1563	0	419	3094	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8				491		66			78	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		373.4			545.0			239.8			262.2	
Travel Time (s)		26.9			39.2			17.3			18.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	512	37	211	583	491	45	151	223	466	153	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	549	0	211	583	491	45	374	0	466	231	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8	8	2	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0	10.0	8.0	8.0		6.0	8.0	
Minimum Split (s)	9.0	45.4		45.4	45.4	45.4	44.3	44.3		9.0	44.3	
Total Split (s)	14.0	45.4		45.4	45.4	45.4	44.3	44.3		15.0	44.3	
Total Split (%)	11.8%	38.2%		38.2%	38.2%	38.2%	37.3%	37.3%		12.6%	37.3%	
Maximum Green (s)	11.0	39.0		39.0	39.0	39.0	38.0	38.0		12.0	38.0	
Yellow Time (s)	3.0	3.3		3.3	3.3	3.3	3.3	3.3		3.0	3.3	
All-Red Time (s)	0.0	3.1		3.1	3.1	3.1	3.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	6.4		6.4	6.4	6.4	6.3	6.3		3.0	6.3	
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	
Recall Mode	None	Min		Min	Min	Min	None	None		None	None	
Walk Time (s)		14.0		14.0	14.0	14.0	14.0	14.0			14.0	
Flash Dont Walk (s)		25.0		25.0	25.0	25.0	24.0	24.0			24.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0			0	
Act Effct Green (s)	44.2	40.5		31.8	31.8	31.8	24.4	24.4		44.0	40.5	
Actuated g/C Ratio	0.47	0.43		0.34	0.34	0.34	0.26	0.26		0.47	0.43	
v/c Ratio	0.18	0.40		0.82	0.53	0.60	0.17	0.83		1.30	0.17	
Control Delay	16.2	19.2		57.8	28.8	6.1	31.1	44.7		177.5	12.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	16.2	19.2		57.8	28.8	6.1	31.1	44.7		177.5	12.7	
LOS	B	B		E	C	A	C	D		F	B	
Approach Delay		18.9			24.9			43.2			122.9	
Approach LOS		B			C			D			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 118.7			
Actuated Cycle Length: 94.6			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.30			
Intersection Signal Delay: 48.9		Intersection LOS: D	
Intersection Capacity Utilization 93.6%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Kalar Road & McLeod Road /McLeod Road

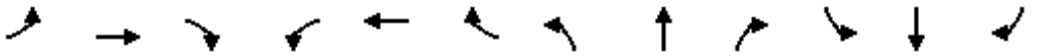


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	64	549	211	583	491	45	374	466	231
v/c Ratio	0.18	0.40	0.82	0.53	0.60	0.17	0.83	1.30	0.17
Control Delay	16.2	19.2	57.8	28.8	6.1	31.1	44.7	177.5	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.2	19.2	57.8	28.8	6.1	31.1	44.7	177.5	12.7
Queue Length 50th (m)	6.5	35.9	38.0	48.6	0.0	7.3	61.7	~103.0	10.3
Queue Length 95th (m)	16.5	59.8	#93.3	79.9	26.4	17.3	102.6	#222.1	19.3
Internal Link Dist (m)		349.4		521.0			215.8		238.2
Turn Bay Length (m)	123.0		114.0		68.0	100.0		222.0	
Base Capacity (vph)	387	1940	338	1440	918	448	710	359	1888
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.28	0.62	0.40	0.53	0.10	0.53	1.30	0.12

Intersection Summary

~ 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.

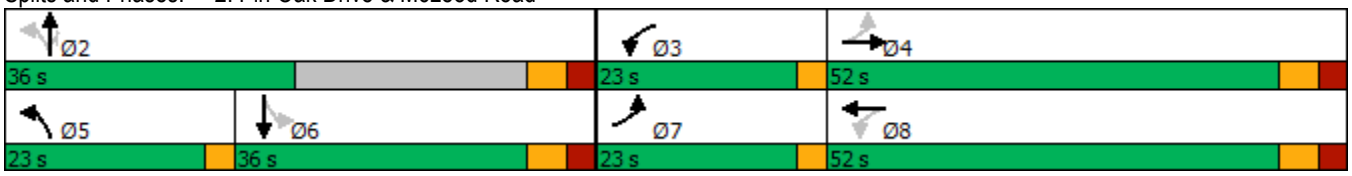


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	789	230	288	814	108	285	59	478	127	68	99
Future Volume (vph)	87	789	230	288	814	108	285	59	478	127	68	99
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	82.0		0.0	72.0		0.0	0.0		0.0	57.0		0.0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.966			0.982				0.850		0.911	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3149	0	1630	3201	0	1630	1716	1458	1630	1563	0
Flt Permitted	0.226			0.083			0.413			0.715		
Satd. Flow (perm)	388	3149	0	142	3201	0	709	1716	1458	1227	1563	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30			12				360		50	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		545.0			503.9			546.2			81.3	
Travel Time (s)		39.2			36.3			39.3			5.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	95	858	250	313	885	117	310	64	520	138	74	108
Shared Lane Traffic (%)												
Lane Group Flow (vph)	95	1108	0	313	1002	0	310	64	520	138	182	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	9.0	33.0		10.5	33.0		9.0	36.0	36.0	36.0	36.0	
Total Split (s)	23.0	52.0		23.0	52.0		23.0	36.0	36.0	36.0	36.0	
Total Split (%)	17.2%	38.8%		17.2%	38.8%		17.2%	26.9%	26.9%	26.9%	26.9%	
Maximum Green (s)	20.0	45.0		20.0	45.0		20.0	29.0	29.0	29.0	29.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	3.0		0.0	3.0		0.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0	7.0	7.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	2.6	2.2		2.6	2.2		2.6	2.8	2.8	2.8	2.8	
Recall Mode	None	Min		None	Min		None	None	None	None	None	
Walk Time (s)		10.0			10.0			11.0	11.0	11.0	11.0	
Flash Dont Walk (s)		16.0			16.0			18.0	18.0	18.0	18.0	
Pedestrian Calls (#/hr)		0			0			0	0	0	0	
Act Effct Green (s)	57.9	45.1		72.2	56.5		45.6	41.5	41.5	18.8	18.8	
Actuated g/C Ratio	0.47	0.36		0.58	0.46		0.37	0.34	0.34	0.15	0.15	
v/c Ratio	0.35	0.95		0.97	0.68		0.76	0.11	0.71	0.74	0.65	
Control Delay	17.5	54.8		78.0	30.7		43.7	28.1	16.1	73.2	46.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	17.5	54.8		78.0	30.7		43.7	28.1	16.1	73.2	46.3	
LOS	B	D		E	C		D	C	B	E	D	
Approach Delay		51.8			42.0			26.5			57.9	
Approach LOS		D			D			C			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 134			
Actuated Cycle Length: 123.8			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 42.8		Intersection LOS: D	
Intersection Capacity Utilization 94.9%		ICU Level of Service F	
Analysis Period (min) 15			

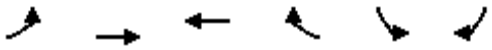
Splits and Phases: 2: Pin Oak Drive & McLeod Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	95	1108	313	1002	310	64	520	138	182
v/c Ratio	0.35	0.95	0.97	0.68	0.76	0.11	0.71	0.74	0.65
Control Delay	17.5	54.8	78.0	30.7	43.7	28.1	16.1	73.2	46.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.5	54.8	78.0	30.7	43.7	28.1	16.1	73.2	46.3
Queue Length 50th (m)	10.3	141.5	64.0	103.0	61.3	11.2	34.5	34.3	32.1
Queue Length 95th (m)	21.8	#213.0	#138.5	155.3	89.2	21.6	77.5	57.0	56.8
Internal Link Dist (m)		521.0		479.9		522.2			57.3
Turn Bay Length (m)	82.0		72.0					57.0	
Base Capacity (vph)	418	1167	324	1467	410	723	822	288	405
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.95	0.97	0.68	0.76	0.09	0.63	0.48	0.45

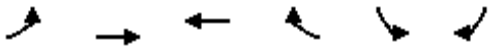
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	70	30	72	119	63	49
Future Volume (vph)	70	30	72	119	63	49
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	281.0			0.0	67.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1467	1544	1544	1312	1467	1312
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1467	1544	1544	1312	1467	1312
Link Speed (k/h)		50	50		50	
Link Distance (m)		711.8	905.7		761.8	
Travel Time (s)		51.2	65.2		54.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	33	78	129	68	53
Shared Lane Traffic (%)						
Lane Group Flow (vph)	76	33	78	129	68	53
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.27	1.27	1.27	1.27	1.27	1.27
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 22.2%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	70	30	72	119	63	49
Future Volume (Veh/h)	70	30	72	119	63	49
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)	76	33	78	129	68	53
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	207				263	78
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	207				263	78
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				90	95
cM capacity (veh/h)	1364				686	983

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	76	33	78	129	68	53
Volume Left	76	0	0	0	68	0
Volume Right	0	0	0	129	0	53
cSH	1364	1700	1700	1700	686	983
Volume to Capacity	0.06	0.02	0.05	0.08	0.10	0.05
Queue Length 95th (m)	1.4	0.0	0.0	0.0	2.6	1.4
Control Delay (s)	7.8	0.0	0.0	0.0	10.8	8.9
Lane LOS	A				B	A
Approach Delay (s)	5.4		0.0		10.0	
Approach LOS					A	

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	22.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	4	274	15	9	109	2
Future Volume (vph)	4	274	15	9	109	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.867		0.948			
Flt Protected	0.999					0.953
Satd. Flow (prot)	1486	0	1626	0	0	1635
Flt Permitted	0.999					0.953
Satd. Flow (perm)	1486	0	1626	0	0	1635
Link Speed (k/h)	50		50			50
Link Distance (m)	429.9		52.0			95.9
Travel Time (s)	31.0		3.7			6.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	298	16	10	118	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	302	0	26	0	0	120
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.7%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	274	15	9	109	2
Future Volume (Veh/h)	4	274	15	9	109	2
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)	4	298	16	10	118	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	259	21			26	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	259	21			26	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	72			93	
cM capacity (veh/h)	676	1056			1588	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	302	26	120
Volume Left	4	0	118
Volume Right	298	10	0
cSH	1049	1700	1588
Volume to Capacity	0.29	0.02	0.07
Queue Length 95th (m)	9.6	0.0	1.9
Control Delay (s)	9.8	0.0	7.3
Lane LOS	A		A
Approach Delay (s)	9.8	0.0	7.3
Approach LOS	A		

Intersection Summary			
Average Delay	8.6		
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		

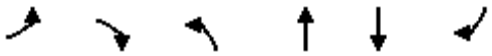
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	184	0	0	325
Future Volume (vph)	0	0	184	0	0	325
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1716	0	1716	0	0	1716
Flt Permitted						
Satd. Flow (perm)	1716	0	1716	0	0	1716
Link Speed (k/h)	50		50			50
Link Distance (m)	163.5		761.8			220.5
Travel Time (s)	11.8		54.8			15.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	200	0	0	353
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	200	0	0	353
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100		100	100	
Sign Control	Stop		Stop			Stop

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 21.9%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	0	0	184	0	0	325
Future Volume (vph)	0	0	184	0	0	325
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	200	0	0	353

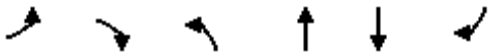
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	0	200	353
Volume Left (vph)	0	0	0
Volume Right (vph)	0	0	0
Hadj (s)	0.00	0.03	0.03
Departure Headway (s)	5.1	4.3	4.1
Degree Utilization, x	0.00	0.24	0.40
Capacity (veh/h)	642	825	855
Control Delay (s)	8.1	8.6	9.9
Approach Delay (s)	0.0	8.6	9.9
Approach LOS	A	A	A

Intersection Summary			
Delay	9.4		
Level of Service	A		
Intersection Capacity Utilization	21.9%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	274	108	0
Future Volume (vph)	0	0	0	274	108	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	30.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1716	0	1716	1716	1716	0
Flt Permitted						
Satd. Flow (perm)	1716	0	1716	1716	1716	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	217.3			95.9	546.2	
Travel Time (s)	15.6			6.9	39.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	298	117	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	298	117	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100	100			100
Sign Control	Stop			Stop	Stop	

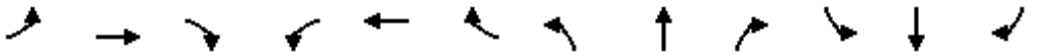
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	19.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	0	0	0	274	108	0
Future Volume (vph)	0	0	0	274	108	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	298	117	0

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	0	0	298	117
Volume Left (vph)	0	0	0	0
Volume Right (vph)	0	0	0	0
Hadj (s)	0.00	0.00	0.03	0.03
Departure Headway (s)	4.9	4.6	4.6	4.3
Degree Utilization, x	0.00	0.00	0.38	0.14
Capacity (veh/h)	682	793	772	819
Control Delay (s)	7.9	6.4	9.2	8.1
Approach Delay (s)	0.0	9.2		8.1
Approach LOS	A	A		A

Intersection Summary			
Delay	8.9		
Level of Service	A		
Intersection Capacity Utilization	19.0%	ICU Level of Service	A
Analysis Period (min)	15		

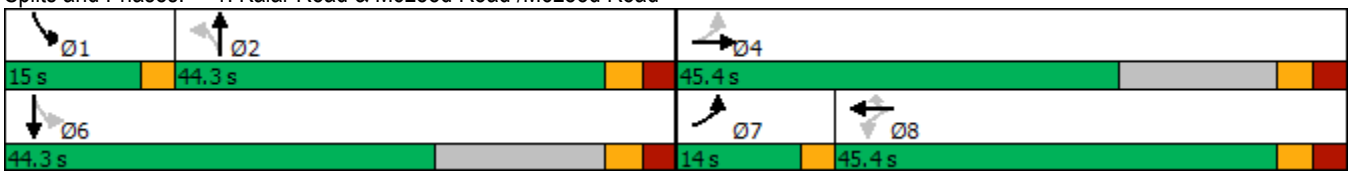


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	456	63	87	337	231	83	185	225	421	131	164
Future Volume (vph)	104	456	63	87	337	231	83	185	225	421	131	164
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	123.0		0.0	114.0		68.0	100.0		0.0	222.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.982				0.850		0.918			0.917	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3201	0	1630	3260	1458	1630	1575	0	1630	2989	0
Flt Permitted	0.419			0.440			0.558			0.245		
Satd. Flow (perm)	719	3201	0	755	3260	1458	957	1575	0	420	2989	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16				251		54			178	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		373.4			545.0			239.8			262.2	
Travel Time (s)		26.9			39.2			17.3			18.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	113	496	68	95	366	251	90	201	245	458	142	178
Shared Lane Traffic (%)												
Lane Group Flow (vph)	113	564	0	95	366	251	90	446	0	458	320	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8	8	2	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0	10.0	8.0	8.0		6.0	8.0	
Minimum Split (s)	9.0	45.4		45.4	45.4	45.4	44.3	44.3		9.0	44.3	
Total Split (s)	14.0	45.4		45.4	45.4	45.4	44.3	44.3		15.0	44.3	
Total Split (%)	11.8%	38.2%		38.2%	38.2%	38.2%	37.3%	37.3%		12.6%	37.3%	
Maximum Green (s)	11.0	39.0		39.0	39.0	39.0	38.0	38.0		12.0	38.0	
Yellow Time (s)	3.0	3.3		3.3	3.3	3.3	3.3	3.3		3.0	3.3	
All-Red Time (s)	0.0	3.1		3.1	3.1	3.1	3.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	6.4		6.4	6.4	6.4	6.3	6.3		3.0	6.3	
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	
Recall Mode	None	Min		Min	Min	Min	None	None		None	None	
Walk Time (s)		14.0		14.0	14.0	14.0	14.0	14.0			14.0	
Flash Dont Walk (s)		25.0		25.0	25.0	25.0	24.0	24.0			24.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0			0	
Act Effct Green (s)	31.3	27.7		17.9	17.9	17.9	26.9	26.9		46.2	42.7	
Actuated g/C Ratio	0.37	0.33		0.21	0.21	0.21	0.32	0.32		0.55	0.51	
v/c Ratio	0.31	0.53		0.59	0.53	0.49	0.29	0.82		1.11	0.20	
Control Delay	20.6	23.9		49.2	33.8	7.8	26.4	38.1		96.6	6.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	20.6	23.9		49.2	33.8	7.8	26.4	38.1		96.6	6.2	
LOS	C	C		D	C	A	C	D		F	A	
Approach Delay		23.3			26.7			36.2			59.4	
Approach LOS		C			C			D			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 118.7			
Actuated Cycle Length: 83.8			
Natural Cycle: 120			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.11			
Intersection Signal Delay: 37.2		Intersection LOS: D	
Intersection Capacity Utilization 94.3%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Kalar Road & McLeod Road /McLeod Road



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	113	564	95	366	251	90	446	458	320
v/c Ratio	0.31	0.53	0.59	0.53	0.49	0.29	0.82	1.11	0.20
Control Delay	20.6	23.9	49.2	33.8	7.8	26.4	38.1	96.6	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	23.9	49.2	33.8	7.8	26.4	38.1	96.6	6.2
Queue Length 50th (m)	12.3	37.7	14.9	29.8	0.0	11.3	61.2	~61.6	6.3
Queue Length 95th (m)	27.4	62.1	35.4	49.9	19.5	28.0	118.5	#178.2	16.7
Internal Link Dist (m)		349.4		521.0			215.8		238.2
Turn Bay Length (m)	123.0		114.0		68.0	100.0		222.0	
Base Capacity (vph)	394	2144	371	1602	844	458	782	414	2056
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.26	0.26	0.23	0.30	0.20	0.57	1.11	0.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

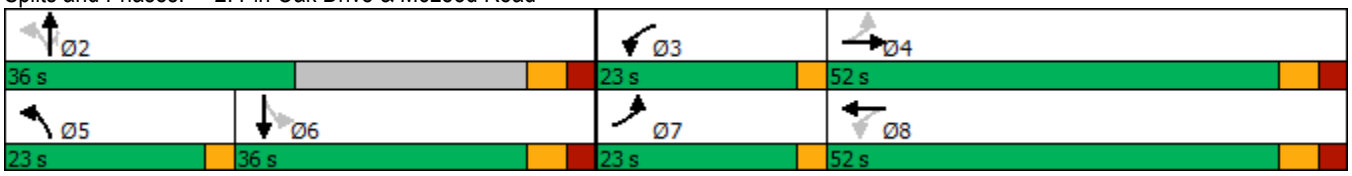
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	693	241	307	437	122	161	42	344	98	48	46
Future Volume (vph)	59	693	241	307	437	122	161	42	344	98	48	46
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	82.0		0.0	72.0		0.0	0.0		0.0	57.0		0.0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.961			0.967				0.850		0.926	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3133	0	1630	3152	0	1630	1716	1458	1630	1589	0
Flt Permitted	0.422			0.111			0.575			0.727		
Satd. Flow (perm)	724	3133	0	190	3152	0	987	1716	1458	1247	1589	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		39			29				373		33	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		545.0			503.9			546.2			81.3	
Travel Time (s)		39.2			36.3			39.3			5.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	753	262	334	475	133	175	46	374	107	52	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	1015	0	334	608	0	175	46	374	107	102	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	9.0	33.0		9.0	33.0		9.0	36.0	36.0	36.0	36.0	
Total Split (s)	23.0	52.0		23.0	52.0		23.0	36.0	36.0	36.0	36.0	
Total Split (%)	17.2%	38.8%		17.2%	38.8%		17.2%	26.9%	26.9%	26.9%	26.9%	
Maximum Green (s)	20.0	45.0		20.0	45.0		20.0	29.0	29.0	29.0	29.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	3.0		0.0	3.0		0.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0	7.0	7.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	2.6	2.2		2.6	2.2		2.6	2.8	2.8	2.8	2.8	
Recall Mode	None	Min		None	Min		None	None	None	None	None	
Walk Time (s)		10.0			10.0			11.0	11.0	11.0	11.0	
Flash Dont Walk (s)		16.0			16.0			18.0	18.0	18.0	18.0	
Pedestrian Calls (#/hr)		0			0			0	0	0	0	
Act Effct Green (s)	50.5	39.2		66.7	54.7		37.9	33.8	33.8	14.7	14.7	
Actuated g/C Ratio	0.46	0.35		0.60	0.49		0.34	0.31	0.31	0.13	0.13	
v/c Ratio	0.16	0.90		0.88	0.39		0.41	0.09	0.53	0.65	0.42	
Control Delay	13.1	44.6		52.6	19.5		30.2	28.3	5.9	66.0	37.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	13.1	44.6		52.6	19.5		30.2	28.3	5.9	66.0	37.7	
LOS	B	D		D	B		C	C	A	E	D	
Approach Delay		42.7			31.2			14.8			52.2	
Approach LOS		D			C			B			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 134			
Actuated Cycle Length: 110.8			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 33.7		Intersection LOS: C	
Intersection Capacity Utilization 79.0%		ICU Level of Service D	
Analysis Period (min) 15			

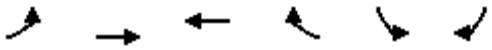
Splits and Phases: 2: Pin Oak Drive & McLeod Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	64	1015	334	608	175	46	374	107	102
v/c Ratio	0.16	0.90	0.88	0.39	0.41	0.09	0.53	0.65	0.42
Control Delay	13.1	44.6	52.6	19.5	30.2	28.3	5.9	66.0	37.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.1	44.6	52.6	19.5	30.2	28.3	5.9	66.0	37.7
Queue Length 50th (m)	5.8	111.4	56.6	44.3	30.3	7.7	0.2	24.4	15.1
Queue Length 95th (m)	14.5	#170.4	#132.1	71.9	49.8	17.0	22.1	45.4	33.6
Internal Link Dist (m)		521.0		479.9		522.2			57.3
Turn Bay Length (m)	82.0		72.0					57.0	
Base Capacity (vph)	583	1322	380	1569	456	822	893	333	449
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.77	0.88	0.39	0.38	0.06	0.42	0.32	0.23

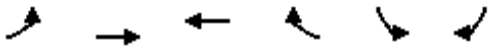
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	73	47	27	55	73	64
Future Volume (vph)	73	47	27	55	73	64
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	281.0			0.0	67.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1467	1544	1544	1312	1467	1312
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1467	1544	1544	1312	1467	1312
Link Speed (k/h)		50	50		50	
Link Distance (m)		711.8	905.7		761.8	
Travel Time (s)		51.2	65.2		54.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	51	29	60	79	70
Shared Lane Traffic (%)						
Lane Group Flow (vph)	79	51	29	60	79	70
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.27	1.27	1.27	1.27	1.27	1.27
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 23.1%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	73	47	27	55	73	64
Future Volume (Veh/h)	73	47	27	55	73	64
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)	79	51	29	60	79	70
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	89				238	29
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	89				238	29
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				89	93
cM capacity (veh/h)	1506				711	1046

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	79	51	29	60	79	70
Volume Left	79	0	0	0	79	0
Volume Right	0	0	0	60	0	70
cSH	1506	1700	1700	1700	711	1046
Volume to Capacity	0.05	0.03	0.02	0.04	0.11	0.07
Queue Length 95th (m)	1.3	0.0	0.0	0.0	3.0	1.7
Control Delay (s)	7.5	0.0	0.0	0.0	10.7	8.7
Lane LOS	A				B	A
Approach Delay (s)	4.6		0.0		9.8	
Approach LOS					A	

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	4	213	2	2	78	10
Future Volume (vph)	4	213	2	2	78	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.867		0.932			
Flt Protected	0.999					0.958
Satd. Flow (prot)	1486	0	1599	0	0	1644
Flt Permitted	0.999					0.958
Satd. Flow (perm)	1486	0	1599	0	0	1644
Link Speed (k/h)	50		50			50
Link Distance (m)	429.9		52.0			95.9
Travel Time (s)	31.0		3.7			6.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	232	2	2	85	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	236	0	4	0	0	96
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.1%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	213	2	2	78	10
Future Volume (Veh/h)	4	213	2	2	78	10
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)	4	232	2	2	85	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)						
pX, platoon unblocked						
vC, conflicting volume	184	3			4	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	184	3			4	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	79			95	
cM capacity (veh/h)	763	1081			1618	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	236	4	96
Volume Left	4	0	85
Volume Right	232	2	0
cSH	1073	1700	1618
Volume to Capacity	0.22	0.00	0.05
Queue Length 95th (m)	6.7	0.0	1.3
Control Delay (s)	9.3	0.0	6.6
Lane LOS	A		A
Approach Delay (s)	9.3	0.0	6.6
Approach LOS	A		

Intersection Summary			
Average Delay	8.4		
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
Analysis Period (min)	15		

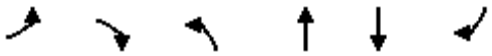
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	13	51	127	0	16	249
Future Volume (vph)	13	51	127	0	16	249
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.892					
Flt Protected	0.990					0.997
Satd. Flow (prot)	1515	0	1716	0	0	1711
Flt Permitted	0.990					0.997
Satd. Flow (perm)	1515	0	1716	0	0	1711
Link Speed (k/h)	50		50			50
Link Distance (m)	163.5		761.8			220.5
Travel Time (s)	11.8		54.8			15.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	55	138	0	17	271
Shared Lane Traffic (%)						
Lane Group Flow (vph)	69	0	138	0	0	288
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100		100	100	
Sign Control	Stop		Stop			Stop

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 36.6%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	13	51	127	0	16	249
Future Volume (vph)	13	51	127	0	16	249
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	55	138	0	17	271

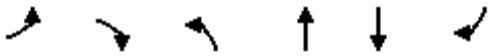
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	69	138	288
Volume Left (vph)	14	0	17
Volume Right (vph)	55	0	0
Hadj (s)	-0.40	0.03	0.05
Departure Headway (s)	4.4	4.4	4.3
Degree Utilization, x	0.08	0.17	0.34
Capacity (veh/h)	737	792	821
Control Delay (s)	7.8	8.3	9.4
Approach Delay (s)	7.8	8.3	9.4
Approach LOS	A	A	A

Intersection Summary			
Delay	8.9		
Level of Service	A		
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	36	4	3	210	71	15
Future Volume (vph)	36	4	3	210	71	15
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	30.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.987				0.977	
Flt Protected	0.957		0.950			
Satd. Flow (prot)	1621	0	1630	1716	1676	0
Flt Permitted	0.957		0.950			
Satd. Flow (perm)	1621	0	1630	1716	1676	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	217.3			95.9	546.2	
Travel Time (s)	15.6			6.9	39.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	4	3	228	77	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	0	3	228	93	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100	100			100
Sign Control	Stop			Stop	Stop	

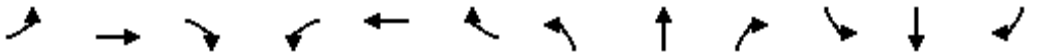
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	22.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	36	4	3	210	71	15
Future Volume (vph)	36	4	3	210	71	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	4	3	228	77	16

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	43	3	228	93
Volume Left (vph)	39	3	0	0
Volume Right (vph)	4	0	0	16
Hadj (s)	0.16	0.53	0.03	-0.07
Departure Headway (s)	4.8	5.2	4.7	4.3
Degree Utilization, x	0.06	0.00	0.30	0.11
Capacity (veh/h)	692	676	750	823
Control Delay (s)	8.1	7.0	8.5	7.8
Approach Delay (s)	8.1	8.5		7.8
Approach LOS	A	A		A

Intersection Summary			
Delay	8.3		
Level of Service	A		
Intersection Capacity Utilization	22.0%	ICU Level of Service	A
Analysis Period (min)	15		

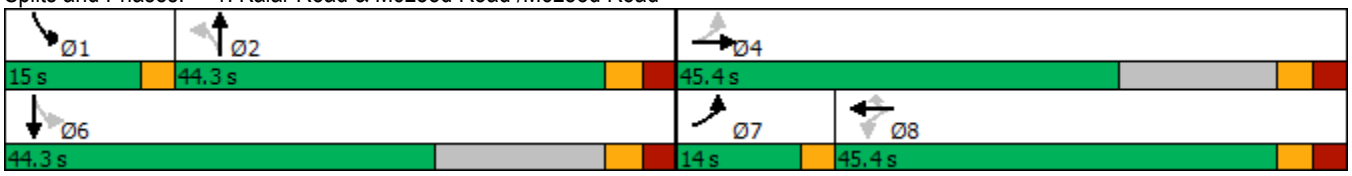


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	471	41	232	536	452	47	145	230	429	151	72
Future Volume (vph)	59	471	41	232	536	452	47	145	230	429	151	72
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	123.0		0.0	114.0		68.0	100.0		0.0	222.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.988				0.850		0.908			0.952	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3221	0	1630	3260	1458	1630	1558	0	1630	3103	0
Flt Permitted	0.331			0.443			0.601			0.188		
Satd. Flow (perm)	568	3221	0	760	3260	1458	1031	1558	0	323	3103	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				491		71			78	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		373.4			545.0			239.8			262.2	
Travel Time (s)		26.9			39.2			17.3			18.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	512	45	252	583	491	51	158	250	466	164	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	557	0	252	583	491	51	408	0	466	242	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8	8	2	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0	10.0	8.0	8.0		6.0	8.0	
Minimum Split (s)	9.0	45.4		45.4	45.4	45.4	44.3	44.3		9.0	44.3	
Total Split (s)	14.0	45.4		45.4	45.4	45.4	44.3	44.3		15.0	44.3	
Total Split (%)	11.8%	38.2%		38.2%	38.2%	38.2%	37.3%	37.3%		12.6%	37.3%	
Maximum Green (s)	11.0	39.0		39.0	39.0	39.0	38.0	38.0		12.0	38.0	
Yellow Time (s)	3.0	3.3		3.3	3.3	3.3	3.3	3.3		3.0	3.3	
All-Red Time (s)	0.0	3.1		3.1	3.1	3.1	3.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	6.4		6.4	6.4	6.4	6.3	6.3		3.0	6.3	
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	
Recall Mode	None	Min		Min	Min	Min	None	None		None	None	
Walk Time (s)		14.0		14.0	14.0	14.0	14.0	14.0			14.0	
Flash Dont Walk (s)		25.0		25.0	25.0	25.0	24.0	24.0			24.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0			0	
Act Effct Green (s)	52.3	48.8		39.6	39.6	39.6	27.2	27.2		45.8	42.5	
Actuated g/C Ratio	0.50	0.47		0.38	0.38	0.38	0.26	0.26		0.44	0.41	
v/c Ratio	0.17	0.37		0.87	0.47	0.57	0.19	0.89		1.59	0.18	
Control Delay	16.5	19.2		63.8	28.2	5.5	31.8	52.7		300.2	13.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	16.5	19.2		63.8	28.2	5.5	31.8	52.7		300.2	13.5	
LOS	B	B		E	C	A	C	D		F	B	
Approach Delay		18.9			26.6			50.4			202.2	
Approach LOS		B			C			D			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 118.7			
Actuated Cycle Length: 104.2			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.59			
Intersection Signal Delay: 68.5		Intersection LOS: E	
Intersection Capacity Utilization 98.2%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Kalar Road & McLeod Road /McLeod Road

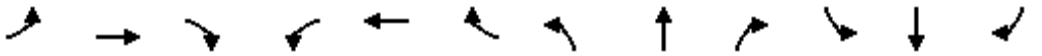


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	64	557	252	583	491	51	408	466	242
v/c Ratio	0.17	0.37	0.87	0.47	0.57	0.19	0.89	1.59	0.18
Control Delay	16.5	19.2	63.8	28.2	5.5	31.8	52.7	300.2	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.5	19.2	63.8	28.2	5.5	31.8	52.7	300.2	13.5
Queue Length 50th (m)	6.9	38.5	51.4	51.0	0.0	8.6	71.9	~123.1	11.5
Queue Length 95th (m)	16.5	60.7	#117.9	79.9	26.4	19.2	114.8	#202.1	20.4
Internal Link Dist (m)		349.4		521.0			215.8		238.2
Turn Bay Length (m)	123.0		114.0		68.0	100.0		222.0	
Base Capacity (vph)	398	1670	289	1240	859	382	622	294	1642
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.33	0.87	0.47	0.57	0.13	0.66	1.59	0.15

Intersection Summary

~ 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.

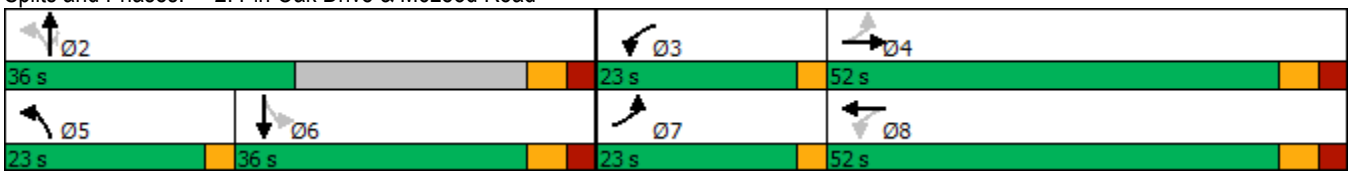


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	814	230	326	852	108	285	59	503	127	68	99
Future Volume (vph)	87	814	230	326	852	108	285	59	503	127	68	99
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	82.0		0.0	72.0		0.0	0.0		0.0	57.0		0.0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967			0.983				0.850		0.911	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3152	0	1630	3204	0	1630	1716	1458	1630	1563	0
Flt Permitted	0.206			0.083			0.413			0.715		
Satd. Flow (perm)	353	3152	0	142	3204	0	709	1716	1458	1227	1563	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29			11				357		50	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		545.0			503.9			546.2			81.3	
Travel Time (s)		39.2			36.3			39.3			5.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	95	885	250	354	926	117	310	64	547	138	74	108
Shared Lane Traffic (%)												
Lane Group Flow (vph)	95	1135	0	354	1043	0	310	64	547	138	182	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	10.5	33.0		9.0	33.0		9.0	36.0	36.0	36.0	36.0	
Total Split (s)	23.0	52.0		23.0	52.0		23.0	36.0	36.0	36.0	36.0	
Total Split (%)	17.2%	38.8%		17.2%	38.8%		17.2%	26.9%	26.9%	26.9%	26.9%	
Maximum Green (s)	20.0	45.0		20.0	45.0		20.0	29.0	29.0	29.0	29.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	3.0		0.0	3.0		0.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0	7.0	7.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	2.6	2.2		2.6	2.2		2.6	2.8	2.8	2.8	2.8	
Recall Mode	None	Min		None	Min		None	None	None	None	None	
Walk Time (s)		10.0			10.0			11.0	11.0	11.0	11.0	
Flash Dont Walk (s)		16.0			16.0			18.0	18.0	18.0	18.0	
Pedestrian Calls (#/hr)		0			0			0	0	0	0	
Act Effct Green (s)	58.0	45.1		72.2	56.4		45.6	41.5	41.5	18.8	18.8	
Actuated g/C Ratio	0.47	0.36		0.58	0.46		0.37	0.34	0.34	0.15	0.15	
v/c Ratio	0.37	0.97		1.09	0.71		0.76	0.11	0.75	0.74	0.65	
Control Delay	18.0	58.9		112.4	31.8		43.7	28.1	19.0	73.2	46.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	18.0	58.9		112.4	31.8		43.7	28.1	19.0	73.2	46.3	
LOS	B	E		F	C		D	C	B	E	D	
Approach Delay		55.7			52.2			27.9			57.9	
Approach LOS		E			D			C			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 134			
Actuated Cycle Length: 123.8			
Natural Cycle: 110			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.09			
Intersection Signal Delay: 48.0		Intersection LOS: D	
Intersection Capacity Utilization 98.0%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 2: Pin Oak Drive & McLeod Road

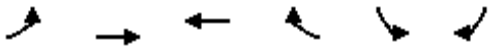


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	95	1135	354	1043	310	64	547	138	182
v/c Ratio	0.37	0.97	1.09	0.71	0.76	0.11	0.75	0.74	0.65
Control Delay	18.0	58.9	112.4	31.8	43.7	28.1	19.0	73.2	46.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	58.9	112.4	31.8	43.7	28.1	19.0	73.2	46.3
Queue Length 50th (m)	10.3	147.0	~86.6	109.3	61.3	11.2	43.8	34.3	32.1
Queue Length 95th (m)	21.8	#221.3	#165.4	164.9	89.2	21.6	89.9	57.0	56.8
Internal Link Dist (m)		521.0		479.9		522.2			57.3
Turn Bay Length (m)	82.0		72.0					57.0	
Base Capacity (vph)	404	1167	324	1465	410	723	821	288	405
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.97	1.09	0.71	0.76	0.09	0.67	0.48	0.45

Intersection Summary

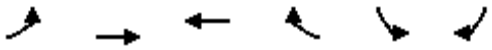
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	82	30	72	121	64	50
Future Volume (vph)	82	30	72	121	64	50
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	281.0			0.0	67.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1467	1544	1544	1312	1467	1312
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1467	1544	1544	1312	1467	1312
Link Speed (k/h)		50	50		50	
Link Distance (m)		711.8	905.7		761.8	
Travel Time (s)		51.2	65.2		54.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	89	33	78	132	70	54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	89	33	78	132	70	54
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.27	1.27	1.27	1.27	1.27	1.27
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 23.1%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	82	30	72	121	64	50
Future Volume (Veh/h)	82	30	72	121	64	50
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)	89	33	78	132	70	54
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	210				289	78
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	210				289	78
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				89	95
cM capacity (veh/h)	1361				656	983

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	89	33	78	132	70	54
Volume Left	89	0	0	0	70	0
Volume Right	0	0	0	132	0	54
cSH	1361	1700	1700	1700	656	983
Volume to Capacity	0.07	0.02	0.05	0.08	0.11	0.05
Queue Length 95th (m)	1.7	0.0	0.0	0.0	2.9	1.4
Control Delay (s)	7.8	0.0	0.0	0.0	11.1	8.9
Lane LOS	A				B	A
Approach Delay (s)	5.7		0.0		10.2	
Approach LOS					B	

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	4	278	15	9	111	2
Future Volume (vph)	4	278	15	9	111	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.867		0.948			
Flt Protected	0.999					0.953
Satd. Flow (prot)	1486	0	1626	0	0	1635
Flt Permitted	0.999					0.953
Satd. Flow (perm)	1486	0	1626	0	0	1635
Link Speed (k/h)	50		50			50
Link Distance (m)	429.9		52.0			95.9
Travel Time (s)	31.0		3.7			6.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	302	16	10	121	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	306	0	26	0	0	123
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.0%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	278	15	9	111	2
Future Volume (Veh/h)	4	278	15	9	111	2
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)	4	302	16	10	121	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	265	21			26	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	265	21			26	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	71			92	
cM capacity (veh/h)	669	1056			1588	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	306	26	123
Volume Left	4	0	121
Volume Right	302	10	0
cSH	1049	1700	1588
Volume to Capacity	0.29	0.02	0.08
Queue Length 95th (m)	9.8	0.0	2.0
Control Delay (s)	9.8	0.0	7.3
Lane LOS	A		A
Approach Delay (s)	9.8	0.0	7.3
Approach LOS	A		

Intersection Summary			
Average Delay	8.6		
Intersection Capacity Utilization	39.0%	ICU Level of Service	A
Analysis Period (min)	15		

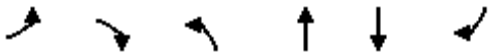
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	2	36	184	13	54	325
Future Volume (vph)	2	36	184	13	54	325
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.872		0.991			
Flt Protected	0.998					0.993
Satd. Flow (prot)	1493	0	1700	0	0	1704
Flt Permitted	0.998					0.993
Satd. Flow (perm)	1493	0	1700	0	0	1704
Link Speed (k/h)	50		50			50
Link Distance (m)	163.5		761.8			220.5
Travel Time (s)	11.8		54.8			15.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	39	200	14	59	353
Shared Lane Traffic (%)						
Lane Group Flow (vph)	41	0	214	0	0	412
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100		100	100	
Sign Control	Stop		Stop			Stop

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.5%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	2	36	184	13	54	325
Future Volume (vph)	2	36	184	13	54	325
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	39	200	14	59	353

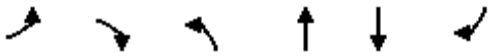
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	41	214	412
Volume Left (vph)	2	0	59
Volume Right (vph)	39	14	0
Hadj (s)	-0.53	-0.01	0.06
Departure Headway (s)	4.7	4.4	4.3
Degree Utilization, x	0.05	0.26	0.49
Capacity (veh/h)	669	791	821
Control Delay (s)	8.0	9.0	11.4
Approach Delay (s)	8.0	9.0	11.4
Approach LOS	A	A	B

Intersection Summary			
Delay	10.4		
Level of Service	B		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	25	2	4	274	108	38
Future Volume (vph)	25	2	4	274	108	38
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	30.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.991				0.965	
Flt Protected	0.956		0.950			
Satd. Flow (prot)	1625	0	1630	1716	1656	0
Flt Permitted	0.956		0.950			
Satd. Flow (perm)	1625	0	1630	1716	1656	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	217.3			95.9	546.2	
Travel Time (s)	15.6			6.9	39.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	2	4	298	117	41
Shared Lane Traffic (%)						
Lane Group Flow (vph)	29	0	4	298	158	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100	100			100
Sign Control	Stop			Stop	Stop	

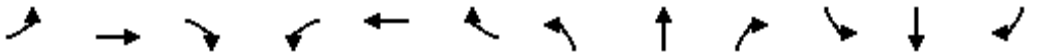
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 25.7%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	25	2	4	274	108	38
Future Volume (vph)	25	2	4	274	108	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	2	4	298	117	41

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	29	4	298	158
Volume Left (vph)	27	4	0	0
Volume Right (vph)	2	0	0	41
Hadj (s)	0.18	0.53	0.03	-0.12
Departure Headway (s)	5.1	5.2	4.7	4.3
Degree Utilization, x	0.04	0.01	0.39	0.19
Capacity (veh/h)	638	675	751	818
Control Delay (s)	8.3	7.1	9.5	8.3
Approach Delay (s)	8.3	9.5		8.3
Approach LOS	A	A		A

Intersection Summary			
Delay	9.0		
Level of Service	A		
Intersection Capacity Utilization	25.7%	ICU Level of Service	A
Analysis Period (min)	15		

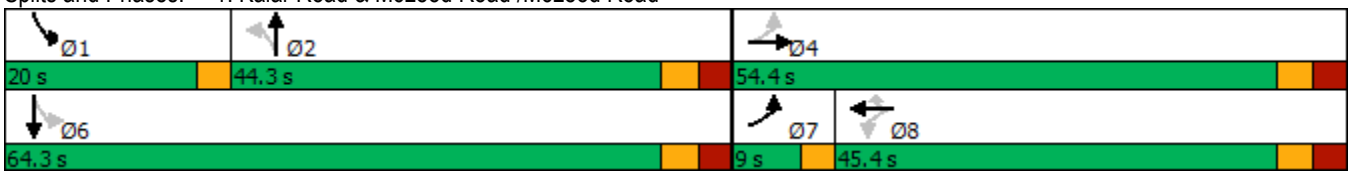


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	456	63	87	337	231	83	185	225	421	131	164
Future Volume (vph)	104	456	63	87	337	231	83	185	225	421	131	164
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	123.0		0.0	114.0		68.0	100.0		0.0	222.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.982				0.850		0.918			0.917	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3201	0	1630	3260	1458	1630	1575	0	1630	2989	0
Flt Permitted	0.404			0.440			0.558			0.232		
Satd. Flow (perm)	693	3201	0	755	3260	1458	957	1575	0	398	2989	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15				251		54			178	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		373.4			545.0			239.8			262.2	
Travel Time (s)		26.9			39.2			17.3			18.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	113	496	68	95	366	251	90	201	245	458	142	178
Shared Lane Traffic (%)												
Lane Group Flow (vph)	113	564	0	95	366	251	90	446	0	458	320	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8	8	2	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0	10.0	8.0	8.0		6.0	8.0	
Minimum Split (s)	9.0	45.4		45.4	45.4	45.4	44.3	44.3		9.0	44.3	
Total Split (s)	9.0	54.4		45.4	45.4	45.4	44.3	44.3		20.0	64.3	
Total Split (%)	7.6%	45.8%		38.2%	38.2%	38.2%	37.3%	37.3%		16.8%	54.2%	
Maximum Green (s)	6.0	48.0		39.0	39.0	39.0	38.0	38.0		17.0	58.0	
Yellow Time (s)	3.0	3.3		3.3	3.3	3.3	3.3	3.3		3.0	3.3	
All-Red Time (s)	0.0	3.1		3.1	3.1	3.1	3.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	6.4		6.4	6.4	6.4	6.3	6.3		3.0	6.3	
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	
Recall Mode	None	Min		Min	Min	Min	None	None		None	None	
Walk Time (s)		14.0		14.0	14.0	14.0	14.0	14.0			14.0	
Flash Dont Walk (s)		25.0		25.0	25.0	25.0	24.0	24.0			24.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0			0	
Act Effct Green (s)	30.1	26.6		17.3	17.3	17.3	27.3	27.3		51.2	47.9	
Actuated g/C Ratio	0.34	0.30		0.20	0.20	0.20	0.31	0.31		0.59	0.55	
v/c Ratio	0.37	0.57		0.64	0.57	0.51	0.30	0.84		0.96	0.19	
Control Delay	25.4	28.0		53.5	35.7	8.2	26.8	40.7		50.1	5.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	25.4	28.0		53.5	35.7	8.2	26.8	40.7		50.1	5.1	
LOS	C	C		D	D	A	C	D		D	A	
Approach Delay		27.6			28.4			38.4			31.6	
Approach LOS		C			C			D			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 118.7			
Actuated Cycle Length: 87.5			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 31.1		Intersection LOS: C	
Intersection Capacity Utilization 94.3%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Kalar Road & McLeod Road /McLeod Road



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	113	564	95	366	251	90	446	458	320
v/c Ratio	0.37	0.57	0.64	0.57	0.51	0.30	0.84	0.96	0.19
Control Delay	25.4	28.0	53.5	35.7	8.2	26.8	40.7	50.1	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.4	28.0	53.5	35.7	8.2	26.8	40.7	50.1	5.1
Queue Length 50th (m)	13.8	42.2	15.3	30.5	0.0	11.5	62.4	47.1	5.6
Queue Length 95th (m)	29.8	67.4	35.4	49.9	19.5	28.0	118.5	#141.8	15.0
Internal Link Dist (m)		349.4		521.0			215.8		238.2
Turn Bay Length (m)	123.0		114.0		68.0	100.0		222.0	
Base Capacity (vph)	304	1810	345	1492	803	426	732	478	2091
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.31	0.28	0.25	0.31	0.21	0.61	0.96	0.15

Intersection Summary

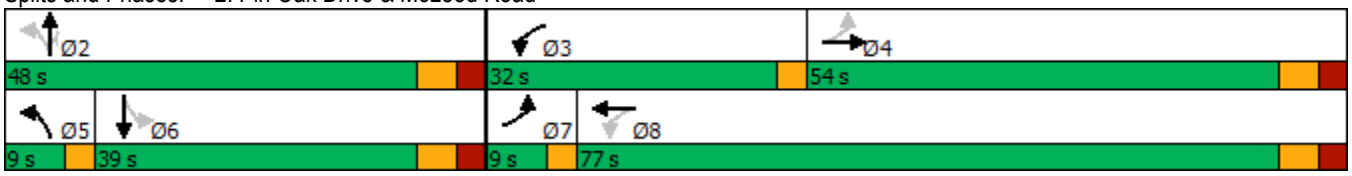
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	693	241	307	437	122	161	42	344	98	48	46
Future Volume (vph)	59	693	241	307	437	122	161	42	344	98	48	46
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	82.0		0.0	72.0		0.0	0.0		0.0	57.0		0.0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.961			0.967				0.850		0.926	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3133	0	1630	3152	0	1630	1716	1458	1630	1589	0
Flt Permitted	0.422			0.130			0.573			0.727		
Satd. Flow (perm)	724	3133	0	223	3152	0	983	1716	1458	1247	1589	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40			40				374		34	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		545.0			503.9			546.2			81.3	
Travel Time (s)		39.2			36.3			39.3			5.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	753	262	334	475	133	175	46	374	107	52	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	1015	0	334	608	0	175	46	374	107	102	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	9.0	33.0		9.0	33.0		9.0	36.0	36.0	36.0	36.0	
Total Split (s)	9.0	54.0		32.0	77.0		9.0	48.0	48.0	39.0	39.0	
Total Split (%)	6.7%	40.3%		23.9%	57.5%		6.7%	35.8%	35.8%	29.1%	29.1%	
Maximum Green (s)	6.0	47.0		29.0	70.0		6.0	41.0	41.0	32.0	32.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	3.0		0.0	3.0		0.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0	7.0	7.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	2.6	2.2		2.6	2.2		2.6	2.8	2.8	2.8	2.8	
Recall Mode	None	Min		None	Min		None	None	None	None	None	
Walk Time (s)		10.0			10.0			11.0	11.0	11.0	11.0	
Flash Dont Walk (s)		16.0			16.0			18.0	18.0	18.0	18.0	
Pedestrian Calls (#/hr)		0			0			0	0	0	0	
Act Effct Green (s)	47.4	36.9		65.1	54.1		28.1	23.9	23.9	14.5	14.5	
Actuated g/C Ratio	0.48	0.37		0.65	0.54		0.28	0.24	0.24	0.15	0.15	
v/c Ratio	0.16	0.85		0.76	0.35		0.55	0.11	0.59	0.59	0.39	
Control Delay	9.9	36.7		31.6	12.8		40.3	34.8	8.0	57.6	34.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	9.9	36.7		31.6	12.8		40.3	34.8	8.0	57.6	34.5	
LOS	A	D		C	B		D	C	A	E	C	
Approach Delay		35.1			19.5			19.6			46.3	
Approach LOS		D			B			B			D	

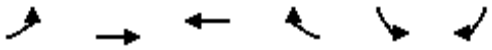
Intersection Summary			
Area Type:	Other		
Cycle Length: 134			
Actuated Cycle Length: 99.5			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 27.4		Intersection LOS: C	
Intersection Capacity Utilization 79.0%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 2: Pin Oak Drive & McLeod Road



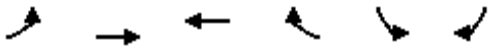
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	64	1015	334	608	175	46	374	107	102
v/c Ratio	0.16	0.85	0.76	0.35	0.55	0.11	0.59	0.59	0.39
Control Delay	9.9	36.7	31.6	12.8	40.3	34.8	8.0	57.6	34.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.9	36.7	31.6	12.8	40.3	34.8	8.0	57.6	34.5
Queue Length 50th (m)	4.1	94.9	39.9	33.1	29.4	7.5	0.0	20.9	12.7
Queue Length 95th (m)	10.4	149.5	85.2	51.7	57.9	19.5	26.6	44.6	32.5
Internal Link Dist (m)		521.0		479.9		522.2			57.3
Turn Bay Length (m)	82.0		72.0					57.0	
Base Capacity (vph)	402	1573	576	2320	318	742	842	420	559
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.65	0.58	0.26	0.55	0.06	0.44	0.25	0.18

Intersection Summary



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	73	47	27	55	73	64
Future Volume (vph)	73	47	27	55	73	64
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	281.0			0.0	67.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1467	1544	1544	1312	1467	1312
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1467	1544	1544	1312	1467	1312
Link Speed (k/h)		50	50		50	
Link Distance (m)		711.8	905.7		761.8	
Travel Time (s)		51.2	65.2		54.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	51	29	60	79	70
Shared Lane Traffic (%)						
Lane Group Flow (vph)	79	51	29	60	79	70
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.27	1.27	1.27	1.27	1.27	1.27
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 23.1%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	73	47	27	55	73	64
Future Volume (Veh/h)	73	47	27	55	73	64
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)	79	51	29	60	79	70
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	89				238	29
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	89				238	29
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				89	93
cM capacity (veh/h)	1506				711	1046

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	79	51	29	60	79	70
Volume Left	79	0	0	0	79	0
Volume Right	0	0	0	60	0	70
cSH	1506	1700	1700	1700	711	1046
Volume to Capacity	0.05	0.03	0.02	0.04	0.11	0.07
Queue Length 95th (m)	1.3	0.0	0.0	0.0	3.0	1.7
Control Delay (s)	7.5	0.0	0.0	0.0	10.7	8.7
Lane LOS	A				B	A
Approach Delay (s)	4.6		0.0		9.8	
Approach LOS					A	

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	4	213	2	2	78	10
Future Volume (vph)	4	213	2	2	78	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.867		0.932			
Flt Protected	0.999					0.958
Satd. Flow (prot)	1486	0	1599	0	0	1644
Flt Permitted	0.999					0.958
Satd. Flow (perm)	1486	0	1599	0	0	1644
Link Speed (k/h)	50		50			50
Link Distance (m)	429.9		52.0			95.9
Travel Time (s)	31.0		3.7			6.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	232	2	2	85	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	236	0	4	0	0	96
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.1%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	213	2	2	78	10
Future Volume (Veh/h)	4	213	2	2	78	10
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)	4	232	2	2	85	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)						
pX, platoon unblocked						
vC, conflicting volume	184	3			4	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	184	3			4	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	79			95	
cM capacity (veh/h)	763	1081			1618	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	236	4	96
Volume Left	4	0	85
Volume Right	232	2	0
cSH	1073	1700	1618
Volume to Capacity	0.22	0.00	0.05
Queue Length 95th (m)	6.7	0.0	1.3
Control Delay (s)	9.3	0.0	6.6
Lane LOS	A		A
Approach Delay (s)	9.3	0.0	6.6
Approach LOS	A		

Intersection Summary			
Average Delay	8.4		
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
Analysis Period (min)	15		

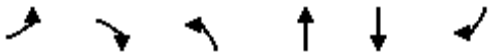
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	13	51	127	0	16	249
Future Volume (vph)	13	51	127	0	16	249
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.892					
Flt Protected	0.990					0.997
Satd. Flow (prot)	1515	0	1716	0	0	1711
Flt Permitted	0.990					0.997
Satd. Flow (perm)	1515	0	1716	0	0	1711
Link Speed (k/h)	50		50			50
Link Distance (m)	163.5		761.8			220.5
Travel Time (s)	11.8		54.8			15.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	55	138	0	17	271
Shared Lane Traffic (%)						
Lane Group Flow (vph)	69	0	138	0	0	288
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100		100	100	
Sign Control	Stop		Stop			Stop

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 36.6%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	13	51	127	0	16	249
Future Volume (vph)	13	51	127	0	16	249
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	55	138	0	17	271

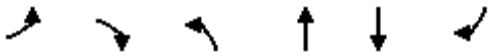
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	69	138	288
Volume Left (vph)	14	0	17
Volume Right (vph)	55	0	0
Hadj (s)	-0.40	0.03	0.05
Departure Headway (s)	4.4	4.4	4.3
Degree Utilization, x	0.08	0.17	0.34
Capacity (veh/h)	737	792	821
Control Delay (s)	7.8	8.3	9.4
Approach Delay (s)	7.8	8.3	9.4
Approach LOS	A	A	A

Intersection Summary			
Delay	8.9		
Level of Service	A		
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	36	4	3	210	71	15
Future Volume (vph)	36	4	3	210	71	15
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	30.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.987				0.977	
Flt Protected	0.957		0.950			
Satd. Flow (prot)	1621	0	1630	1716	1676	0
Flt Permitted	0.957		0.950			
Satd. Flow (perm)	1621	0	1630	1716	1676	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	217.3			95.9	546.2	
Travel Time (s)	15.6			6.9	39.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	4	3	228	77	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	0	3	228	93	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100	100			100
Sign Control	Stop			Stop	Stop	

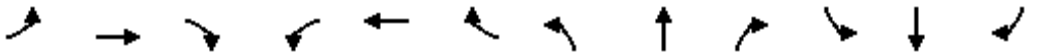
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	22.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	36	4	3	210	71	15
Future Volume (vph)	36	4	3	210	71	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	4	3	228	77	16

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	43	3	228	93
Volume Left (vph)	39	3	0	0
Volume Right (vph)	4	0	0	16
Hadj (s)	0.16	0.53	0.03	-0.07
Departure Headway (s)	4.8	5.2	4.7	4.3
Degree Utilization, x	0.06	0.00	0.30	0.11
Capacity (veh/h)	692	676	750	823
Control Delay (s)	8.1	7.0	8.5	7.8
Approach Delay (s)	8.1	8.5		7.8
Approach LOS	A	A		A

Intersection Summary			
Delay	8.3		
Level of Service	A		
Intersection Capacity Utilization	22.0%	ICU Level of Service	A
Analysis Period (min)	15		

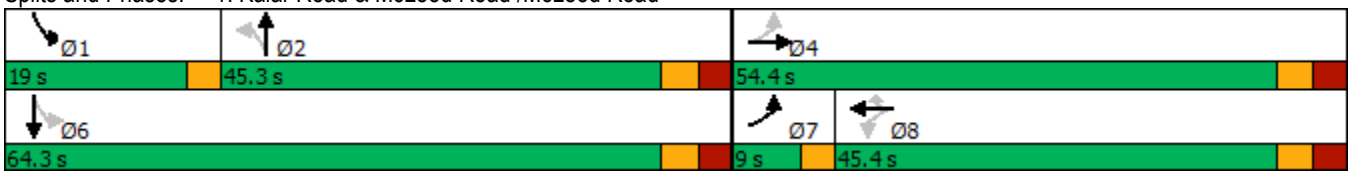


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	471	41	232	536	452	47	145	230	429	151	72
Future Volume (vph)	59	471	41	232	536	452	47	145	230	429	151	72
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	123.0		0.0	114.0		68.0	100.0		0.0	222.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.988				0.850		0.908			0.952	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3221	0	1630	3260	1458	1630	1558	0	1630	3103	0
Flt Permitted	0.326			0.443			0.601			0.188		
Satd. Flow (perm)	559	3221	0	760	3260	1458	1031	1558	0	323	3103	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9				491		71			78	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		373.4			545.0			239.8			262.2	
Travel Time (s)		26.9			39.2			17.3			18.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	512	45	252	583	491	51	158	250	466	164	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	557	0	252	583	491	51	408	0	466	242	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		8	8	8	2	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		10.0	10.0	10.0	8.0	8.0		6.0	8.0	
Minimum Split (s)	9.0	45.4		45.4	45.4	45.4	44.3	44.3		9.0	44.3	
Total Split (s)	9.0	54.4		45.4	45.4	45.4	45.3	45.3		19.0	64.3	
Total Split (%)	7.6%	45.8%		38.2%	38.2%	38.2%	38.2%	38.2%		16.0%	54.2%	
Maximum Green (s)	6.0	48.0		39.0	39.0	39.0	39.0	39.0		16.0	58.0	
Yellow Time (s)	3.0	3.3		3.3	3.3	3.3	3.3	3.3		3.0	3.3	
All-Red Time (s)	0.0	3.1		3.1	3.1	3.1	3.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	6.4		6.4	6.4	6.4	6.3	6.3		3.0	6.3	
Lead/Lag	Lead			Lag	Lag	Lag	Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.5	2.5		2.5	2.5	
Recall Mode	None	Min		Min	Min	Min	None	None		None	None	
Walk Time (s)		14.0		14.0	14.0	14.0	14.0	14.0			14.0	
Flash Dont Walk (s)		25.0		25.0	25.0	25.0	24.0	24.0			24.0	
Pedestrian Calls (#/hr)		0		0	0	0	0	0			0	
Act Effct Green (s)	49.8	46.4		39.5	39.5	39.5	27.9	27.9		50.5	47.2	
Actuated g/C Ratio	0.47	0.44		0.37	0.37	0.37	0.26	0.26		0.47	0.44	
v/c Ratio	0.20	0.40		0.89	0.48	0.58	0.19	0.89		1.33	0.17	
Control Delay	19.4	22.2		68.5	29.2	5.6	31.7	52.3		188.7	12.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	19.4	22.2		68.5	29.2	5.6	31.7	52.3		188.7	12.0	
LOS	B	C		E	C	A	C	D		F	B	
Approach Delay		21.9			27.9			50.0			128.3	
Approach LOS		C			C			D			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 118.7			
Actuated Cycle Length: 106.4			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.33			
Intersection Signal Delay: 52.8		Intersection LOS: D	
Intersection Capacity Utilization 98.2%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Kalar Road & McLeod Road /McLeod Road



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	64	557	252	583	491	51	408	466	242
v/c Ratio	0.20	0.40	0.89	0.48	0.58	0.19	0.89	1.33	0.17
Control Delay	19.4	22.2	68.5	29.2	5.6	31.7	52.3	188.7	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.4	22.2	68.5	29.2	5.6	31.7	52.3	188.7	12.0
Queue Length 50th (m)	7.6	42.3	53.4	52.8	0.0	8.8	73.5	~112.4	11.1
Queue Length 95th (m)	18.0	66.0	#117.9	79.9	26.4	18.9	113.3	#186.2	18.6
Internal Link Dist (m)		349.4		521.0			215.8		238.2
Turn Bay Length (m)	123.0		114.0		68.0	100.0		222.0	
Base Capacity (vph)	322	1475	282	1209	849	382	622	351	1747
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.38	0.89	0.48	0.58	0.13	0.66	1.33	0.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

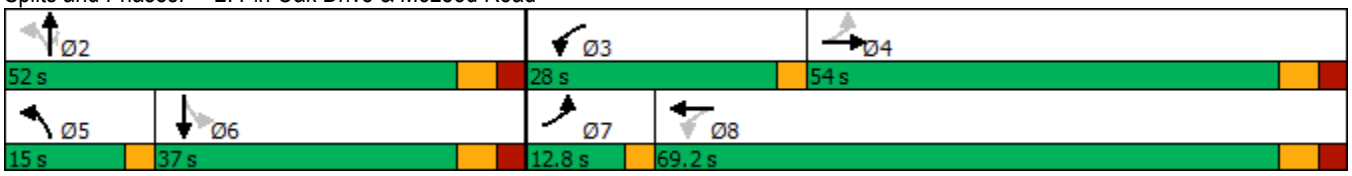
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	814	230	326	852	108	285	59	503	127	68	99
Future Volume (vph)	87	814	230	326	852	108	285	59	503	127	68	99
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	82.0		0.0	72.0		0.0	0.0		0.0	57.0		0.0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967			0.983				0.850		0.911	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3152	0	1630	3204	0	1630	1716	1458	1630	1563	0
Flt Permitted	0.265			0.081			0.419			0.715		
Satd. Flow (perm)	455	3152	0	139	3204	0	719	1716	1458	1227	1563	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30			14				373		51	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		545.0			503.9			546.2			81.3	
Travel Time (s)		39.2			36.3			39.3			5.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	95	885	250	354	926	117	310	64	547	138	74	108
Shared Lane Traffic (%)												
Lane Group Flow (vph)	95	1135	0	354	1043	0	310	64	547	138	182	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	10.5	33.0		9.0	33.0		9.0	36.0	36.0	36.0	36.0	
Total Split (s)	12.8	54.0		28.0	69.2		15.0	52.0	52.0	37.0	37.0	
Total Split (%)	9.6%	40.3%		20.9%	51.6%		11.2%	38.8%	38.8%	27.6%	27.6%	
Maximum Green (s)	9.8	47.0		25.0	62.2		12.0	45.0	45.0	30.0	30.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	3.0		0.0	3.0		0.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0	7.0	7.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	2.6	2.2		2.6	2.2		2.6	2.8	2.8	2.8	2.8	
Recall Mode	None	Min		None	Min		None	None	None	None	None	
Walk Time (s)		10.0			10.0			11.0	11.0	11.0	11.0	
Flash Dont Walk (s)		16.0			16.0			18.0	18.0	18.0	18.0	
Pedestrian Calls (#/hr)		0			0			0	0	0	0	
Act Effct Green (s)	58.9	47.1		79.1	64.3		38.2	34.2	34.2	19.1	19.1	
Actuated g/C Ratio	0.48	0.38		0.64	0.52		0.31	0.28	0.28	0.15	0.15	
v/c Ratio	0.33	0.93		0.91	0.62		1.00	0.13	0.81	0.73	0.64	
Control Delay	14.7	49.9		61.9	23.9		89.7	33.4	23.0	70.9	44.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	14.7	49.9		61.9	23.9		89.7	33.4	23.0	70.9	44.8	
LOS	B	D		E	C		F	C	C	E	D	
Approach Delay		47.2			33.5			46.2			56.1	
Approach LOS		D			C			D			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 134			
Actuated Cycle Length: 123.3			
Natural Cycle: 110			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.00			
Intersection Signal Delay: 42.7		Intersection LOS: D	
Intersection Capacity Utilization 98.0%		ICU Level of Service F	
Analysis Period (min) 15			

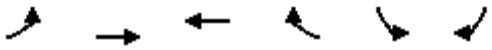
Splits and Phases: 2: Pin Oak Drive & McLeod Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	95	1135	354	1043	310	64	547	138	182
v/c Ratio	0.33	0.93	0.91	0.62	1.00	0.13	0.81	0.73	0.64
Control Delay	14.7	49.9	61.9	23.9	89.7	33.4	23.0	70.9	44.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	49.9	61.9	23.9	89.7	33.4	23.0	70.9	44.8
Queue Length 50th (m)	8.5	140.3	70.9	93.5	67.2	12.3	43.4	33.9	31.5
Queue Length 95th (m)	19.3	#215.9	#147.8	143.0	#123.3	23.6	92.7	56.4	56.0
Internal Link Dist (m)		521.0		479.9		522.2			57.3
Turn Bay Length (m)	82.0		72.0					57.0	
Base Capacity (vph)	318	1222	392	1677	311	627	770	299	419
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.93	0.90	0.62	1.00	0.10	0.71	0.46	0.43

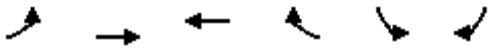
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	82	30	72	121	64	50
Future Volume (vph)	82	30	72	121	64	50
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	281.0			0.0	67.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1467	1544	1544	1312	1467	1312
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1467	1544	1544	1312	1467	1312
Link Speed (k/h)		50	50		50	
Link Distance (m)		711.8	905.7		761.8	
Travel Time (s)		51.2	65.2		54.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	89	33	78	132	70	54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	89	33	78	132	70	54
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.27	1.27	1.27	1.27	1.27	1.27
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 23.1%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	82	30	72	121	64	50
Future Volume (Veh/h)	82	30	72	121	64	50
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)	89	33	78	132	70	54
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	210				289	78
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	210				289	78
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				89	95
cM capacity (veh/h)	1361				656	983

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	89	33	78	132	70	54
Volume Left	89	0	0	0	70	0
Volume Right	0	0	0	132	0	54
cSH	1361	1700	1700	1700	656	983
Volume to Capacity	0.07	0.02	0.05	0.08	0.11	0.05
Queue Length 95th (m)	1.7	0.0	0.0	0.0	2.9	1.4
Control Delay (s)	7.8	0.0	0.0	0.0	11.1	8.9
Lane LOS	A				B	A
Approach Delay (s)	5.7		0.0		10.2	
Approach LOS					B	

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	4	278	15	9	111	2
Future Volume (vph)	4	278	15	9	111	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.867		0.948			
Flt Protected	0.999					0.953
Satd. Flow (prot)	1486	0	1626	0	0	1635
Flt Permitted	0.999					0.953
Satd. Flow (perm)	1486	0	1626	0	0	1635
Link Speed (k/h)	50		50			50
Link Distance (m)	429.9		52.0			95.9
Travel Time (s)	31.0		3.7			6.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	302	16	10	121	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	306	0	26	0	0	123
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.0%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	278	15	9	111	2
Future Volume (Veh/h)	4	278	15	9	111	2
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)	4	302	16	10	121	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	265	21			26	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	265	21			26	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	71			92	
cM capacity (veh/h)	669	1056			1588	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	306	26	123
Volume Left	4	0	121
Volume Right	302	10	0
cSH	1049	1700	1588
Volume to Capacity	0.29	0.02	0.08
Queue Length 95th (m)	9.8	0.0	2.0
Control Delay (s)	9.8	0.0	7.3
Lane LOS	A		A
Approach Delay (s)	9.8	0.0	7.3
Approach LOS	A		

Intersection Summary			
Average Delay	8.6		
Intersection Capacity Utilization	39.0%	ICU Level of Service	A
Analysis Period (min)	15		

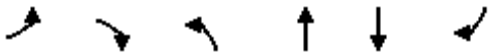
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	2	36	184	13	54	325
Future Volume (vph)	2	36	184	13	54	325
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.872		0.991			
Flt Protected	0.998					0.993
Satd. Flow (prot)	1493	0	1700	0	0	1704
Flt Permitted	0.998					0.993
Satd. Flow (perm)	1493	0	1700	0	0	1704
Link Speed (k/h)	50		50			50
Link Distance (m)	163.5		761.8			220.5
Travel Time (s)	11.8		54.8			15.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	39	200	14	59	353
Shared Lane Traffic (%)						
Lane Group Flow (vph)	41	0	214	0	0	412
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100		100	100	
Sign Control	Stop		Stop			Stop

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.5%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	2	36	184	13	54	325
Future Volume (vph)	2	36	184	13	54	325
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	39	200	14	59	353

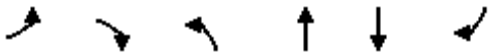
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	41	214	412
Volume Left (vph)	2	0	59
Volume Right (vph)	39	14	0
Hadj (s)	-0.53	-0.01	0.06
Departure Headway (s)	4.7	4.4	4.3
Degree Utilization, x	0.05	0.26	0.49
Capacity (veh/h)	669	791	821
Control Delay (s)	8.0	9.0	11.4
Approach Delay (s)	8.0	9.0	11.4
Approach LOS	A	A	B

Intersection Summary			
Delay	10.4		
Level of Service	B		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	25	2	4	274	108	38
Future Volume (vph)	25	2	4	274	108	38
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	30.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.991				0.965	
Flt Protected	0.956		0.950			
Satd. Flow (prot)	1625	0	1630	1716	1656	0
Flt Permitted	0.956		0.950			
Satd. Flow (perm)	1625	0	1630	1716	1656	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	217.3			95.9	546.2	
Travel Time (s)	15.6			6.9	39.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	2	4	298	117	41
Shared Lane Traffic (%)						
Lane Group Flow (vph)	29	0	4	298	158	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100	100			100
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 25.7%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	25	2	4	274	108	38
Future Volume (vph)	25	2	4	274	108	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	2	4	298	117	41

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	29	4	298	158
Volume Left (vph)	27	4	0	0
Volume Right (vph)	2	0	0	41
Hadj (s)	0.18	0.53	0.03	-0.12
Departure Headway (s)	5.1	5.2	4.7	4.3
Degree Utilization, x	0.04	0.01	0.39	0.19
Capacity (veh/h)	638	675	751	818
Control Delay (s)	8.3	7.1	9.5	8.3
Approach Delay (s)	8.3	9.5		8.3
Approach LOS	A	A		A

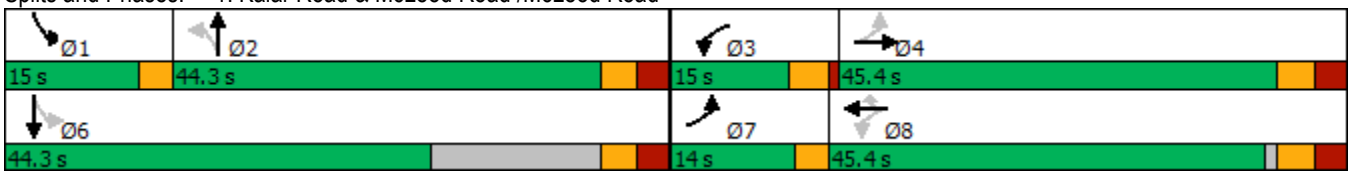
Intersection Summary			
Delay	9.0		
Level of Service	A		
Intersection Capacity Utilization	25.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	471	41	232	536	452	47	145	230	429	151	72
Future Volume (vph)	59	471	41	232	536	452	47	145	230	429	151	72
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	123.0		0.0	114.0		68.0	100.0		0.0	222.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt		0.988				0.850		0.908			0.952	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3221	0	1630	3260	1458	1630	1558	0	1630	3103	0
Flt Permitted	0.427			0.250			0.601			0.231		
Satd. Flow (perm)	733	3221	0	429	3260	1458	1031	1558	0	396	3103	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8				491		70			78	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		373.4			545.0			239.8			262.2	
Travel Time (s)		26.9			39.2			17.3			18.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	512	45	252	583	491	51	158	250	466	164	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	557	0	252	583	491	51	408	0	466	242	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8	8	2	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		4.5	10.0	10.0	8.0	8.0		6.0	8.0	
Minimum Split (s)	9.0	45.4		9.0	45.4	45.4	44.3	44.3		9.0	44.3	
Total Split (s)	14.0	45.4		15.0	45.4	45.4	44.3	44.3		15.0	44.3	
Total Split (%)	11.7%	37.9%		12.5%	37.9%	37.9%	37.0%	37.0%		12.5%	37.0%	
Maximum Green (s)	11.0	39.0		10.5	39.0	39.0	38.0	38.0		12.0	38.0	
Yellow Time (s)	3.0	3.3		3.5	3.3	3.3	3.3	3.3		3.0	3.3	
All-Red Time (s)	0.0	3.1		1.0	3.1	3.1	3.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	6.4		4.5	6.4	6.4	6.3	6.3		3.0	6.3	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag		Lead		
Lead-Lag Optimize?		Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	2.5	2.5		3.0	2.5	2.5	2.5	2.5		2.5	2.5	
Recall Mode	None	Min		None	Min	Min	None	None		None	None	
Walk Time (s)		8.0			8.0	8.0	8.0	8.0			8.0	
Flash Dont Walk (s)		25.0			25.0	25.0	24.0	24.0			24.0	
Pedestrian Calls (#/hr)		0			0	0	0	0			0	
Act Effct Green (s)	31.8	20.8		37.3	27.6	27.6	24.9	24.9		43.7	40.3	
Actuated g/C Ratio	0.36	0.23		0.42	0.31	0.31	0.28	0.28		0.49	0.45	
v/c Ratio	0.19	0.74		0.79	0.58	0.62	0.18	0.84		1.28	0.17	
Control Delay	18.0	38.4		39.6	30.8	6.7	26.5	41.6		167.6	10.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	18.0	38.4		39.6	30.8	6.7	26.5	41.6		167.6	10.3	
LOS	B	D		D	C	A	C	D		F	B	
Approach Delay		36.3			23.6			39.9			113.8	
Approach LOS		D			C			D			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 119.7			
Actuated Cycle Length: 89.3			
Natural Cycle: 110			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.28			
Intersection Signal Delay: 49.0		Intersection LOS: D	
Intersection Capacity Utilization 96.6%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Kalar Road & McLeod Road /McLeod Road

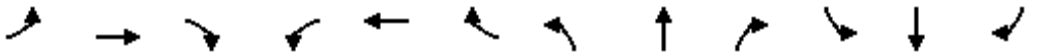


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	64	557	252	583	491	51	408	466	242
v/c Ratio	0.19	0.74	0.79	0.58	0.62	0.18	0.84	1.28	0.17
Control Delay	18.0	38.4	39.6	30.8	6.7	26.5	41.6	167.6	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	38.4	39.6	30.8	6.7	26.5	41.6	167.6	10.3
Queue Length 50th (m)	6.4	47.7	29.6	47.1	0.0	6.8	56.9	~79.8	8.5
Queue Length 95th (m)	16.9	77.2	#71.0	79.8	27.6	17.6	104.9	#206.7	18.1
Internal Link Dist (m)		349.4		521.0			215.8		238.2
Turn Bay Length (m)	123.0		114.0		68.0	100.0		222.0	
Base Capacity (vph)	404	1447	324	1497	935	450	719	363	1920
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.38	0.78	0.39	0.53	0.11	0.57	1.28	0.13

Intersection Summary

~ 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.

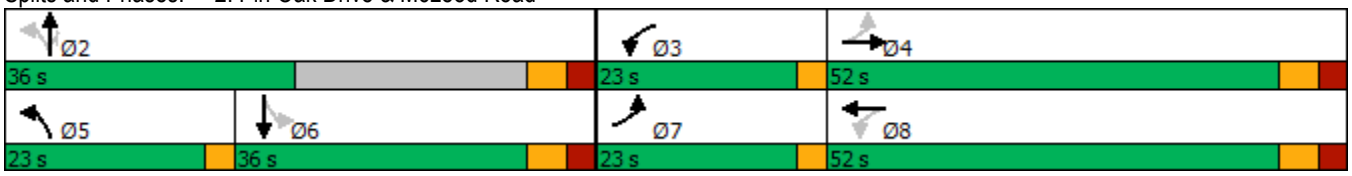


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	814	230	326	852	108	285	59	503	127	68	99
Future Volume (vph)	87	814	230	326	852	108	285	59	503	127	68	99
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (m)	82.0		0.0	72.0		0.0	0.0		0.0	57.0		0.0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967			0.983				0.850		0.911	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3152	0	1630	3204	0	1630	1716	1458	1630	1563	0
Flt Permitted	0.206			0.083			0.413			0.715		
Satd. Flow (perm)	353	3152	0	142	3204	0	709	1716	1458	1227	1563	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29			11				357		50	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		545.0			503.9			546.2			81.3	
Travel Time (s)		39.2			36.3			39.3			5.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	95	885	250	354	926	117	310	64	547	138	74	108
Shared Lane Traffic (%)												
Lane Group Flow (vph)	95	1135	0	354	1043	0	310	64	547	138	182	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2	2	6	6	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	10.5	33.0		9.0	33.0		9.0	36.0	36.0	36.0	36.0	
Total Split (s)	23.0	52.0		23.0	52.0		23.0	36.0	36.0	36.0	36.0	
Total Split (%)	17.2%	38.8%		17.2%	38.8%		17.2%	26.9%	26.9%	26.9%	26.9%	
Maximum Green (s)	20.0	45.0		20.0	45.0		20.0	29.0	29.0	29.0	29.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	0.0	3.0		0.0	3.0		0.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0	7.0	7.0	7.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	2.6	2.2		2.6	2.2		2.6	2.8	2.8	2.8	2.8	
Recall Mode	None	Min		None	Min		None	None	None	None	None	
Walk Time (s)		10.0			10.0			11.0	11.0	11.0	11.0	
Flash Dont Walk (s)		16.0			16.0			18.0	18.0	18.0	18.0	
Pedestrian Calls (#/hr)		0			0			0	0	0	0	
Act Effct Green (s)	58.0	45.1		72.2	56.4		45.6	41.5	41.5	18.8	18.8	
Actuated g/C Ratio	0.47	0.36		0.58	0.46		0.37	0.34	0.34	0.15	0.15	
v/c Ratio	0.37	0.97		1.09	0.71		0.76	0.11	0.75	0.74	0.65	
Control Delay	18.0	58.9		112.4	31.8		43.7	28.1	19.0	73.2	46.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	18.0	58.9		112.4	31.8		43.7	28.1	19.0	73.2	46.3	
LOS	B	E		F	C		D	C	B	E	D	
Approach Delay		55.7			52.2			27.9			57.9	
Approach LOS		E			D			C			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 134			
Actuated Cycle Length: 123.8			
Natural Cycle: 110			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.09			
Intersection Signal Delay: 48.0		Intersection LOS: D	
Intersection Capacity Utilization 98.0%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 2: Pin Oak Drive & McLeod Road

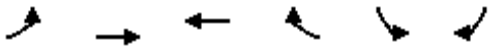


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	95	1135	354	1043	310	64	547	138	182
v/c Ratio	0.37	0.97	1.09	0.71	0.76	0.11	0.75	0.74	0.65
Control Delay	18.0	58.9	112.4	31.8	43.7	28.1	19.0	73.2	46.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	58.9	112.4	31.8	43.7	28.1	19.0	73.2	46.3
Queue Length 50th (m)	10.3	147.0	~86.6	109.3	61.3	11.2	43.8	34.3	32.1
Queue Length 95th (m)	21.8	#221.3	#165.4	164.9	89.2	21.6	89.9	57.0	56.8
Internal Link Dist (m)		521.0		479.9		522.2			57.3
Turn Bay Length (m)	82.0		72.0					57.0	
Base Capacity (vph)	404	1167	324	1465	410	723	821	288	405
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.97	1.09	0.71	0.76	0.09	0.67	0.48	0.45

Intersection Summary

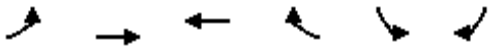
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	82	30	72	121	64	50
Future Volume (vph)	82	30	72	121	64	50
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	281.0			0.0	67.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1467	1544	1544	1312	1467	1312
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1467	1544	1544	1312	1467	1312
Link Speed (k/h)		50	50		50	
Link Distance (m)		711.8	905.7		761.8	
Travel Time (s)		51.2	65.2		54.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	89	33	78	132	70	54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	89	33	78	132	70	54
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.27	1.27	1.27	1.27	1.27	1.27
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 23.1%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	82	30	72	121	64	50
Future Volume (Veh/h)	82	30	72	121	64	50
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)	89	33	78	132	70	54
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	210				289	78
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	210				289	78
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				89	95
cM capacity (veh/h)	1361				656	983

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	89	33	78	132	70	54
Volume Left	89	0	0	0	70	0
Volume Right	0	0	0	132	0	54
cSH	1361	1700	1700	1700	656	983
Volume to Capacity	0.07	0.02	0.05	0.08	0.11	0.05
Queue Length 95th (m)	1.7	0.0	0.0	0.0	2.9	1.4
Control Delay (s)	7.8	0.0	0.0	0.0	11.1	8.9
Lane LOS	A				B	A
Approach Delay (s)	5.7		0.0		10.2	
Approach LOS					B	

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	4	278	15	9	111	2
Future Volume (vph)	4	278	15	9	111	2
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.867		0.948			
Flt Protected	0.999					0.953
Satd. Flow (prot)	1486	0	1626	0	0	1635
Flt Permitted	0.999					0.953
Satd. Flow (perm)	1486	0	1626	0	0	1635
Link Speed (k/h)	50		50			50
Link Distance (m)	429.9		52.0			95.9
Travel Time (s)	31.0		3.7			6.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	302	16	10	121	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	306	0	26	0	0	123
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.0%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	278	15	9	111	2
Future Volume (Veh/h)	4	278	15	9	111	2
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)	4	302	16	10	121	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	265	21			26	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	265	21			26	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	71			92	
cM capacity (veh/h)	669	1056			1588	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	306	26	123
Volume Left	4	0	121
Volume Right	302	10	0
cSH	1049	1700	1588
Volume to Capacity	0.29	0.02	0.08
Queue Length 95th (m)	9.8	0.0	2.0
Control Delay (s)	9.8	0.0	7.3
Lane LOS	A		A
Approach Delay (s)	9.8	0.0	7.3
Approach LOS	A		

Intersection Summary			
Average Delay	8.6		
Intersection Capacity Utilization	39.0%	ICU Level of Service	A
Analysis Period (min)	15		

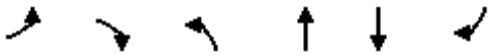
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	2	36	184	13	54	325
Future Volume (vph)	2	36	184	13	54	325
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.872		0.991			
Flt Protected	0.998					0.993
Satd. Flow (prot)	1493	0	1700	0	0	1704
Flt Permitted	0.998					0.993
Satd. Flow (perm)	1493	0	1700	0	0	1704
Link Speed (k/h)	50		50			50
Link Distance (m)	163.5		761.8			220.5
Travel Time (s)	11.8		54.8			15.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	39	200	14	59	353
Shared Lane Traffic (%)						
Lane Group Flow (vph)	41	0	214	0	0	412
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100		100	100	
Sign Control	Stop		Stop			Stop

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.5%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	2	36	184	13	54	325
Future Volume (vph)	2	36	184	13	54	325
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	39	200	14	59	353

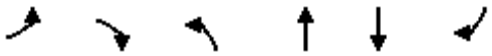
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	41	214	412
Volume Left (vph)	2	0	59
Volume Right (vph)	39	14	0
Hadj (s)	-0.53	-0.01	0.06
Departure Headway (s)	4.7	4.4	4.3
Degree Utilization, x	0.05	0.26	0.49
Capacity (veh/h)	669	791	821
Control Delay (s)	8.0	9.0	11.4
Approach Delay (s)	8.0	9.0	11.4
Approach LOS	A	A	B

Intersection Summary			
Delay	10.4		
Level of Service	B		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	25	2	4	274	108	38
Future Volume (vph)	25	2	4	274	108	38
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Storage Length (m)	0.0	0.0	30.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.991				0.965	
Flt Protected	0.956		0.950			
Satd. Flow (prot)	1625	0	1630	1716	1656	0
Flt Permitted	0.956		0.950			
Satd. Flow (perm)	1625	0	1630	1716	1656	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	217.3			95.9	546.2	
Travel Time (s)	15.6			6.9	39.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	2	4	298	117	41
Shared Lane Traffic (%)						
Lane Group Flow (vph)	29	0	4	298	158	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (k/h)	100	100	100			100
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 25.7%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	25	2	4	274	108	38
Future Volume (vph)	25	2	4	274	108	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	2	4	298	117	41

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total (vph)	29	4	298	158
Volume Left (vph)	27	4	0	0
Volume Right (vph)	2	0	0	41
Hadj (s)	0.18	0.53	0.03	-0.12
Departure Headway (s)	5.1	5.2	4.7	4.3
Degree Utilization, x	0.04	0.01	0.39	0.19
Capacity (veh/h)	638	675	751	818
Control Delay (s)	8.3	7.1	9.5	8.3
Approach Delay (s)	8.3	9.5		8.3
Approach LOS	A	A		A

Intersection Summary			
Delay	9.0		
Level of Service	A		
Intersection Capacity Utilization	25.7%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Kalar Road & McLeod Road /McLeod Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	T	TR
Maximum Queue (m)	35.1	58.5	67.0	42.1	53.1	54.9	37.5	40.7	111.1	150.5	31.8	25.3
Average Queue (m)	15.3	33.9	35.9	16.3	23.9	24.3	16.5	14.1	51.0	80.1	13.6	10.3
95th Queue (m)	29.8	54.9	57.7	30.8	39.8	41.9	28.1	30.7	93.8	132.2	26.5	19.4
Link Distance (m)		359.6	359.6		524.3	524.3			217.4		244.6	244.6
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	123.0			114.0			68.0	100.0		222.0		
Storage Blk Time (%)									1			
Queuing Penalty (veh)									0			

Intersection: 2: Pin Oak Drive & McLeod Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	R	L	TR
Maximum Queue (m)	89.0	98.5	97.5	71.0	41.5	54.2	60.3	20.7	41.6	34.9	40.5
Average Queue (m)	13.6	50.3	61.7	40.9	20.3	31.3	26.0	6.4	10.4	21.0	18.3
95th Queue (m)	48.0	82.4	89.8	68.0	36.9	48.5	43.7	16.8	30.0	34.0	31.9
Link Distance (m)		524.3	524.3		493.2	493.2	522.2	522.2	522.2		67.2
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (m)	82.0			72.0						57.0	
Storage Blk Time (%)	0	1		1							
Queuing Penalty (veh)	0	0		1							

Intersection: 3: Brown Road & Kalar Road

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (m)	9.3	14.6	13.0
Average Queue (m)	1.8	7.6	4.9
95th Queue (m)	7.8	10.6	10.2
Link Distance (m)			737.4
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	281.0	67.0	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Canadian Drive & Pin Oak Drive

Movement	WB
Directions Served	LR
Maximum Queue (m)	31.2
Average Queue (m)	13.3
95th Queue (m)	22.1
Link Distance (m)	419.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Kalar Road & Site Access A Kalar Drive

Movement	NB	SB
Directions Served	T	LT
Maximum Queue (m)	23.6	28.6
Average Queue (m)	12.2	15.9
95th Queue (m)	19.8	24.1
Link Distance (m)	737.4	205.6
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Pin Oak Drive & Site Access A Canadian Drive

Movement	NB	SB
Directions Served	T	T
Maximum Queue (m)	23.7	16.5
Average Queue (m)	10.7	8.3
95th Queue (m)	16.8	15.4
Link Distance (m)	82.4	522.2
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 2

Intersection: 1: Kalar Road & McLeod Road /McLeod Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	T	TR
Maximum Queue (m)	22.2	64.0	60.7	79.3	56.6	66.2	71.2	15.7	86.2	229.5	260.5	249.2
Average Queue (m)	12.0	29.3	28.5	36.7	30.8	34.6	34.3	7.9	50.5	199.7	201.5	58.7
95th Queue (m)	20.7	51.6	51.8	67.1	49.5	55.0	63.5	17.2	81.3	294.6	353.4	193.9
Link Distance (m)		359.6	359.6		524.3	524.3			217.4		244.6	244.6
Upstream Blk Time (%)											70	0
Queuing Penalty (veh)											0	0
Storage Bay Dist (m)	123.0			114.0			68.0	100.0		222.0		
Storage Blk Time (%)						0	0			73	7	
Queuing Penalty (veh)						0	1			51	31	

Intersection: 2: Pin Oak Drive & McLeod Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	
Directions Served	L	T	TR	L	T	TR	L	T	R	L	TR	
Maximum Queue (m)	89.4	142.2	154.1	79.4	161.6	156.7	94.5	27.4	66.6	64.2	76.9	
Average Queue (m)	20.1	84.2	95.5	72.0	94.1	86.7	55.3	11.5	28.3	33.7	34.2	
95th Queue (m)	58.8	128.3	138.0	92.1	163.7	147.8	83.5	25.1	55.8	54.9	66.8	
Link Distance (m)		524.3	524.3		493.2	493.2	522.2	522.2	522.2		67.2	
Upstream Blk Time (%)										0	2	
Queuing Penalty (veh)										0	0	
Storage Bay Dist (m)	82.0			72.0						57.0		
Storage Blk Time (%)	0	10		38	1					0	4	
Queuing Penalty (veh)	0	9		156	4					0	5	

Intersection: 3: Brown Road & Kalar Road

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (m)	15.7	14.5	12.7
Average Queue (m)	2.9	6.7	4.6
95th Queue (m)	10.5	11.8	9.2
Link Distance (m)			737.4
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	281.0	67.0	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Canadian Drive & Pin Oak Drive

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	27.5	9.2
Average Queue (m)	14.6	1.2
95th Queue (m)	23.5	6.3
Link Distance (m)	419.6	82.4
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Kalar Road & Site Access A Kalar Drive

Movement	NB	SB
Directions Served	T	LT
Maximum Queue (m)	16.8	30.6
Average Queue (m)	13.5	18.1
95th Queue (m)	20.2	26.4
Link Distance (m)	737.4	205.6
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Pin Oak Drive & Site Access A Canadian Drive

Movement	NB	SB
Directions Served	T	T
Maximum Queue (m)	23.9	16.3
Average Queue (m)	12.6	10.4
95th Queue (m)	20.5	14.5
Link Distance (m)	82.4	522.2
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 256

Intersection: 1: Kalar Road & McLeod Road /McLeod Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	T	TR
Maximum Queue (m)	40.9	48.7	51.8	40.7	48.2	60.0	46.7	107.5	142.8	169.0	26.4	42.9
Average Queue (m)	20.3	29.8	32.7	19.5	25.6	28.7	22.3	21.2	61.6	97.1	11.7	12.1
95th Queue (m)	38.1	47.3	48.8	34.5	40.5	46.8	38.5	70.1	112.1	158.1	24.6	26.3
Link Distance (m)		359.6	359.6		524.3	524.3			217.4		244.6	244.6
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	123.0			114.0			68.0	100.0		222.0		
Storage Blk Time (%)									4			
Queuing Penalty (veh)									4			

Intersection: 2: Pin Oak Drive & McLeod Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	
Directions Served	L	T	TR	L	T	TR	L	T	R	L	TR	
Maximum Queue (m)	27.8	92.7	113.1	78.6	56.1	54.5	58.7	21.4	71.6	46.1	52.6	
Average Queue (m)	11.7	55.5	65.3	45.6	20.9	26.8	27.9	5.5	15.1	21.9	19.0	
95th Queue (m)	23.0	85.4	97.2	72.0	40.6	44.9	43.9	16.1	48.9	39.3	37.8	
Link Distance (m)		524.3	524.3		493.2	493.2	522.2	522.2	522.2		67.2	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	82.0			72.0						57.0		
Storage Blk Time (%)		1		1							0	
Queuing Penalty (veh)		1		2							0	

Intersection: 3: Brown Road & Kalar Road

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (m)	14.9	19.6	12.5
Average Queue (m)	2.0	7.6	5.6
95th Queue (m)	8.9	13.9	8.4
Link Distance (m)			737.4
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	281.0	67.0	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Canadian Drive & Pin Oak Drive

Movement	WB
Directions Served	LR
Maximum Queue (m)	34.9
Average Queue (m)	12.9
95th Queue (m)	21.6
Link Distance (m)	419.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Kalar Road & Site Access A Kalar Drive

Movement	WB	NB	SB
Directions Served	LR	T	LT
Maximum Queue (m)	16.1	16.7	31.1
Average Queue (m)	8.6	11.9	17.0
95th Queue (m)	14.0	17.5	24.8
Link Distance (m)	153.3	737.4	205.6
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Pin Oak Drive & Site Access A Canadian Drive

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (m)	9.3	9.1	20.6	16.7
Average Queue (m)	6.4	1.5	10.6	8.8
95th Queue (m)	13.3	7.0	15.6	13.3
Link Distance (m)	207.0		82.4	522.2
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)		30.0		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 7

Intersection: 1: Kalar Road & McLeod Road /McLeod Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	T	TR
Maximum Queue (m)	40.9	66.2	67.3	84.5	53.8	54.5	65.4	107.2	129.1	229.5	260.5	249.2
Average Queue (m)	12.8	35.2	34.7	52.9	32.9	36.2	33.1	17.1	70.0	201.1	161.6	65.0
95th Queue (m)	26.0	53.9	56.4	82.9	52.0	53.1	53.1	57.6	111.0	272.0	350.4	221.9
Link Distance (m)		359.6	359.6		524.3	524.3			217.4		244.6	244.6
Upstream Blk Time (%)											53	0
Queuing Penalty (veh)											0	0
Storage Bay Dist (m)	123.0			114.0			68.0	100.0		222.0		
Storage Blk Time (%)							0	0	5	57	8	
Queuing Penalty (veh)							0	0	2	43	36	

Intersection: 2: Pin Oak Drive & McLeod Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	
Directions Served	L	T	TR	L	T	TR	L	T	R	L	TR	
Maximum Queue (m)	89.4	132.0	131.0	79.4	198.4	183.2	126.0	29.2	73.7	64.3	71.8	
Average Queue (m)	25.8	83.0	93.5	72.4	120.7	101.3	68.0	10.8	37.2	32.9	33.7	
95th Queue (m)	73.7	116.7	128.2	97.1	188.0	172.1	106.3	24.0	74.1	53.9	62.1	
Link Distance (m)		524.3	524.3		493.2	493.2	522.2	522.2	522.2		67.2	
Upstream Blk Time (%)										0	0	
Queuing Penalty (veh)										0	0	
Storage Bay Dist (m)	82.0			72.0						57.0		
Storage Blk Time (%)		8		50	2					1	0	
Queuing Penalty (veh)		7		212	6					2	0	

Intersection: 3: Brown Road & Kalar Road

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (m)	30.4	6.7	7.4	11.8
Average Queue (m)	4.8	0.2	6.7	4.9
95th Queue (m)	17.3	2.2	9.7	9.6
Link Distance (m)		895.3		737.4
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	281.0		67.0	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Canadian Drive & Pin Oak Drive

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	32.5	9.2
Average Queue (m)	14.8	0.3
95th Queue (m)	24.8	3.0
Link Distance (m)	419.6	82.4
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Kalar Road & Site Access A Kalar Drive

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (m)	20.3	36.8	31.0
Average Queue (m)	8.1	14.4	20.1
95th Queue (m)	15.2	24.5	27.1
Link Distance (m)	153.3	737.4	205.6
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Pin Oak Drive & Site Access A Canadian Drive

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (m)	16.4	9.2	20.6	27.9
Average Queue (m)	5.3	0.8	10.1	12.5
95th Queue (m)	13.3	4.8	14.4	20.6
Link Distance (m)	207.0		82.4	522.2
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)		30.0		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 309

Intersection: 1: Kalar Road & McLeod Road /McLeod Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	T	TR
Maximum Queue (m)	47.4	59.9	67.2	40.8	42.4	47.3	72.6	107.4	113.3	132.4	33.5	24.3
Average Queue (m)	19.1	32.7	32.9	19.2	24.5	26.1	24.9	24.2	62.9	69.0	12.1	9.2
95th Queue (m)	37.1	50.4	50.6	31.1	39.4	42.6	46.1	67.1	107.3	122.5	25.5	16.3
Link Distance (m)		359.6	359.6		524.3	524.3			217.4		244.6	244.6
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	123.0			114.0			68.0	100.0		222.0		
Storage Blk Time (%)							0		1			
Queuing Penalty (veh)							1		1			

Intersection: 2: Pin Oak Drive & McLeod Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	R	L	TR
Maximum Queue (m)	23.0	88.0	104.1	79.4	91.0	46.4	62.2	15.7	35.4	46.8	47.0
Average Queue (m)	8.1	52.9	58.4	41.1	19.9	24.6	34.6	6.8	11.7	20.3	15.1
95th Queue (m)	20.1	79.6	87.2	66.8	47.0	41.1	58.7	16.2	33.9	38.4	31.6
Link Distance (m)		524.3	524.3		493.2	493.2	522.2	522.2	522.2		67.2
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (m)	82.0			72.0						57.0	
Storage Blk Time (%)		0		1							
Queuing Penalty (veh)		0		3							

Intersection: 3: Brown Road & Kalar Road

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (m)	16.8	5.9	14.0	16.2
Average Queue (m)	2.0	0.2	7.4	6.0
95th Queue (m)	9.9	2.0	10.8	11.3
Link Distance (m)		895.3		737.4
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	281.0		67.0	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Canadian Drive & Pin Oak Drive

Movement	WB
Directions Served	LR
Maximum Queue (m)	21.9
Average Queue (m)	13.1
95th Queue (m)	19.2
Link Distance (m)	419.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Kalar Road & Site Access A Kalar Drive

Movement	WB	NB	SB
Directions Served	LR	T	LT
Maximum Queue (m)	15.9	24.2	23.4
Average Queue (m)	9.6	12.6	16.2
95th Queue (m)	13.9	21.5	22.2
Link Distance (m)	153.3	737.4	205.6
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Pin Oak Drive & Site Access A Canadian Drive

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (m)	16.4	9.1	16.6	16.7
Average Queue (m)	6.6	0.3	11.1	9.6
95th Queue (m)	14.9	3.0	15.9	15.4
Link Distance (m)	207.0		82.4	522.2
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)		30.0		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 5

Intersection: 1: Kalar Road & McLeod Road /McLeod Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	T	TR
Maximum Queue (m)	27.8	64.4	60.4	121.3	161.7	159.8	74.6	107.4	166.4	176.8	32.7	18.9
Average Queue (m)	12.3	38.2	36.1	64.7	49.2	49.3	32.4	32.4	90.7	91.7	16.1	6.6
95th Queue (m)	23.7	58.5	56.0	116.8	123.3	111.6	61.1	95.3	156.9	149.5	29.8	15.1
Link Distance (m)		359.6	359.6		524.3	524.3			217.4		244.6	244.6
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	123.0			114.0			68.0	100.0		222.0		
Storage Blk Time (%)				12		1	1		18			
Queuing Penalty (veh)				31		3	3		9			

Intersection: 2: Pin Oak Drive & McLeod Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	R	L	TR
Maximum Queue (m)	89.3	162.7	169.5	79.5	142.0	136.4	116.4	29.0	99.0	57.4	47.9
Average Queue (m)	20.7	90.8	97.2	68.5	66.2	63.8	65.6	11.0	45.4	28.9	31.2
95th Queue (m)	59.2	143.7	151.8	86.9	121.2	108.0	98.3	23.8	85.4	49.2	49.2
Link Distance (m)		524.3	524.3		493.2	493.2	522.2	522.2	522.2		67.2
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (m)	82.0			72.0						57.0	
Storage Blk Time (%)	0	14		15	2					1	
Queuing Penalty (veh)	0	12		63	7					1	

Intersection: 3: Brown Road & Kalar Road

Movement	EB	SB	SB
Directions Served	L	L	R
Maximum Queue (m)	22.6	14.6	13.3
Average Queue (m)	5.8	7.5	5.6
95th Queue (m)	15.3	13.3	10.6
Link Distance (m)			737.4
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	281.0	67.0	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Canadian Drive & Pin Oak Drive

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	30.9	9.3
Average Queue (m)	14.2	0.3
95th Queue (m)	21.9	3.1
Link Distance (m)	419.6	82.4
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Kalar Road & Site Access A Kalar Drive

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (m)	16.4	22.3	55.4
Average Queue (m)	7.5	15.3	20.7
95th Queue (m)	14.0	20.2	33.7
Link Distance (m)	153.3	737.4	205.6
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Pin Oak Drive & Site Access A Canadian Drive

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (m)	15.9	9.1	16.4	16.9
Average Queue (m)	7.2	1.2	10.7	11.9
95th Queue (m)	14.1	6.2	15.3	17.9
Link Distance (m)	207.0		82.4	522.2
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)		30.0		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 129

APPENDIX F

Background Developments

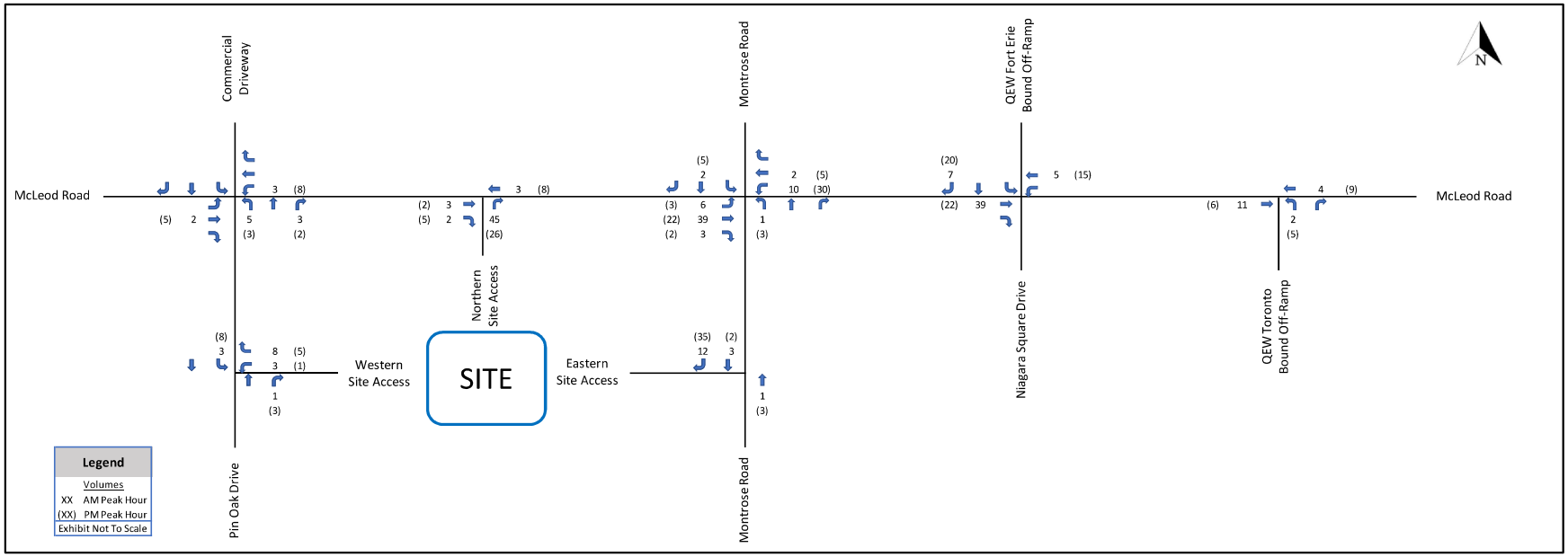


Figure 9: Estimated Site Generated Traffic (Phase 1)

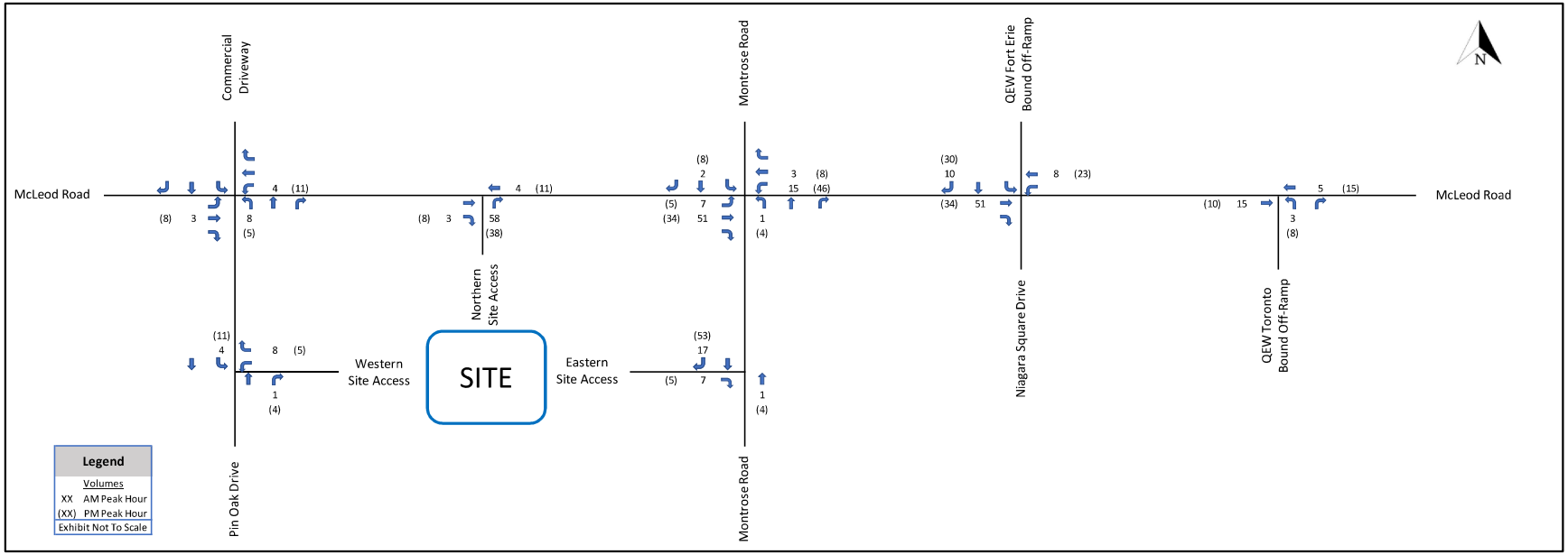


Figure 10: Estimated Site Generated Traffic (Phase 2)

APPENDIX G

Trip Data from ITE Trip Generation

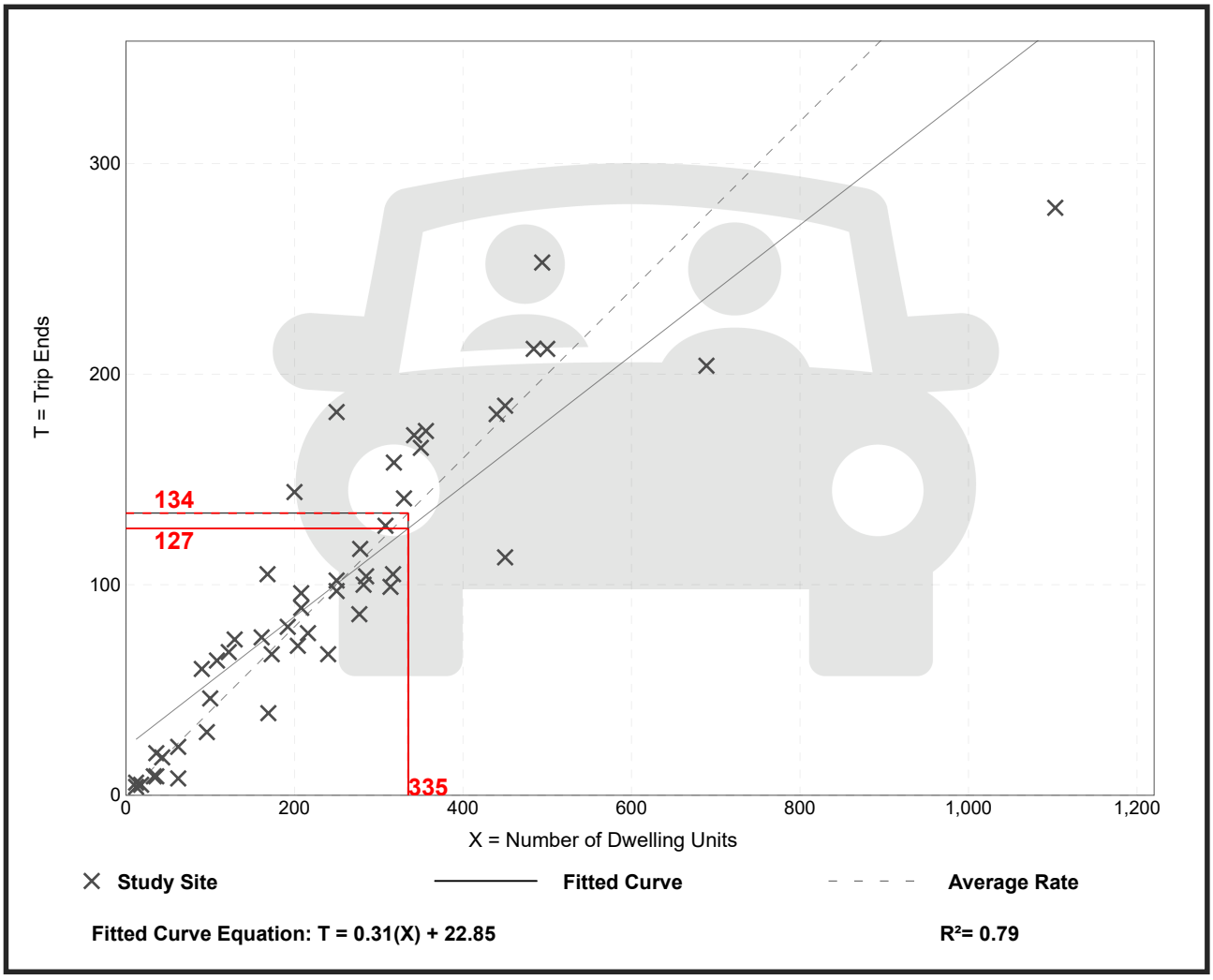
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

Vehicle Trip Ends vs: **Dwelling Units**
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: 49
Avg. Num. of Dwelling Units: 249
Directional Distribution: 24% entering, 76% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.40	0.13 - 0.73	0.12

Data Plot and Equation



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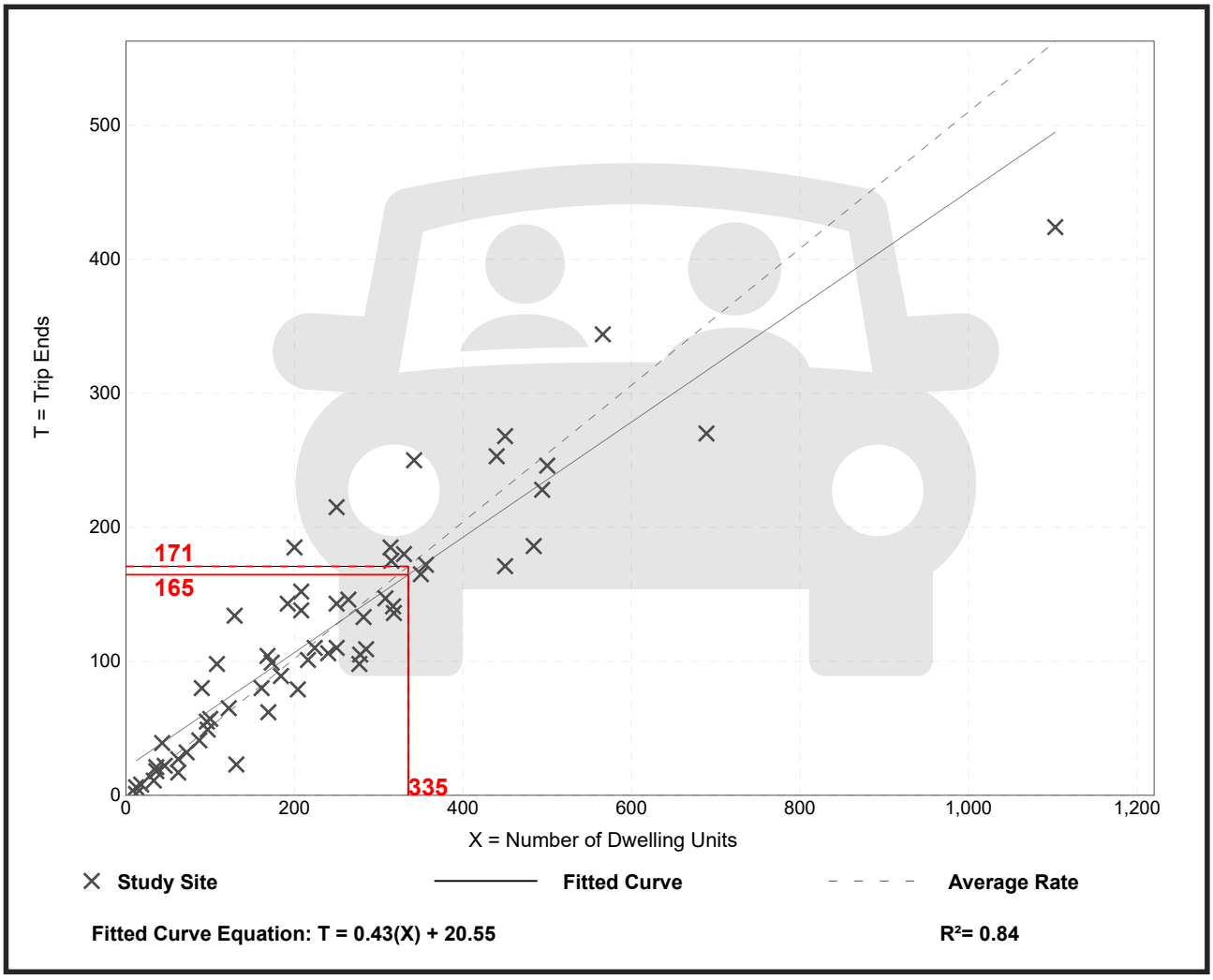
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

Vehicle Trip Ends vs: **Dwelling Units**
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: 59
Avg. Num. of Dwelling Units: 241
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.51	0.08 - 1.04	0.15

Data Plot and Equation



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APPENDIX H

Trip Distribution Data from Transportation Tomorrow Survey Results

TTS

Wed Jun 29 2022 09:54:58 GMT-0400 (Eastern Daylight Time) - Run Time: 2881ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig

Column: 2006 GTA zone of destination - gta06_dest

Filters:

(2006 GTA zone of destination - gta06_dest In 6225, 6226

and

Start time of trip - start_time In 630-930

and

Trip purpose of destination - purp_dest In H,)

Trip 2016

Table:

,6225,6226

6051,0,14

6199,0,137

6216,0,14

6225,0,83

6226,13,57

6228,0,21

6234,0,11

6235,0,21

9998,17,0

Wed Jun 29 2022 09:56:35 GMT-0400 (Eastern Daylight Time) - Run Time: 2294ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06_dest

Column: 2006 GTA zone of origin - gta06_orig

Filters:

(2006 GTA zone of origin - gta06_orig In 6225, 6226

and

Start time of trip - start_time In 630-930

and

Trip purpose of destination - purp_dest In H,)

Trip 2016

Table:

,6225,6226
6193,16,22
6216,43,0
6222,0,11
6225,0,13
6226,83,57
6236,0,51

Wed Jun 29 2022 09:55:32 GMT-0400 (Eastern Daylight Time) - Run Time: 2634ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig
Column: 2006 GTA zone of destination - gta06_dest

Filters:
(2006 GTA zone of destination - gta06_dest In 6225, 6226
and
Start time of trip - start_time In 1530-1830
and
Trip purpose of destination - purp_dest In H,)

Trip 2016
Table:

,6225,6226
37,0,5
52,0,5
246,10,0
4002,60,0
6002,0,14
6003,11,0
6043,13,0
6046,0,58
6047,6,0
6049,0,130
6050,0,26
6052,24,21
6057,0,11
6059,12,0
6062,27,0
6069,0,8
6074,180,0
6075,0,30

6082,0,17
6086,9,0
6087,0,5
6093,14,0
6094,15,0
6111,15,0
6126,21,0
6130,4,0
6131,18,0
6132,0,22
6144,30,0
6148,0,6
6156,10,0
6163,27,60
6169,11,0
6172,0,42
6173,0,26
6175,4,0
6191,0,78
6194,44,0
6195,31,0
6196,83,0
6198,13,98
6199,70,11
6202,61,0
6203,18,23
6210,21,34
6212,54,36
6216,19,0
6219,0,11
6220,10,0
6224,45,60
6,225,135,169
6226,0,13
6228,0,48
6232,23,43
6233,72,21
6235,0,53
6236,0,45
6237,0,15
6240,12,31
6241,0,5
6242,0,9
6244,19,0
6246,32,0
6249,0,16
6250,0,11

6257,11,0

6258,4,14

6259,0,11

6269,23,0

6274,0,202

6282,19,0

6283,0,11

6345,8,0

6349,30,0

6362,0,5

6365,21,0

9068,42,0

Wed Jun 29 2022 09:57:09 GMT-0400 (Eastern Daylight Time) - Run Time: 3084ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06_dest

Column: 2006 GTA zone of origin - gta06_orig

Filters:

(2006 GTA zone of origin - gta06_orig In 6225, 6226

and

Start time of trip - start_time In 1530-1830

and

Trip purpose of destination - purp_dest In H,)

Trip 2016

Table:

,6225,6226

4066,0,15

6032,0,38

6045,0,18

6050,0,12

6065,17,0

6097,0,40

6106,0,17

6123,24,0

6150,0,81

6154,0,10

6180,65,0

6194,0,18

6195,0,10

6196,77,0

6198,0,19

6199,0,107
6201,20,0
6206,5,0
6207,25,11
6213,0,16
6217,0,25
6218,0,153
6219,43,13
6222,25,0
6223,15,90
6225,135,0
6226,169,13
6228,21,44
6233,21,0
6236,0,39
6244,19,0
6249,0,62
6252,4,0
6256,112,0
6257,0,43
6273,21,0
6303,0,30
6308,0,21
6340,0,27
6342,76,0
6348,0,27
6349,0,8

APPENDIX I

TAC Excerpts

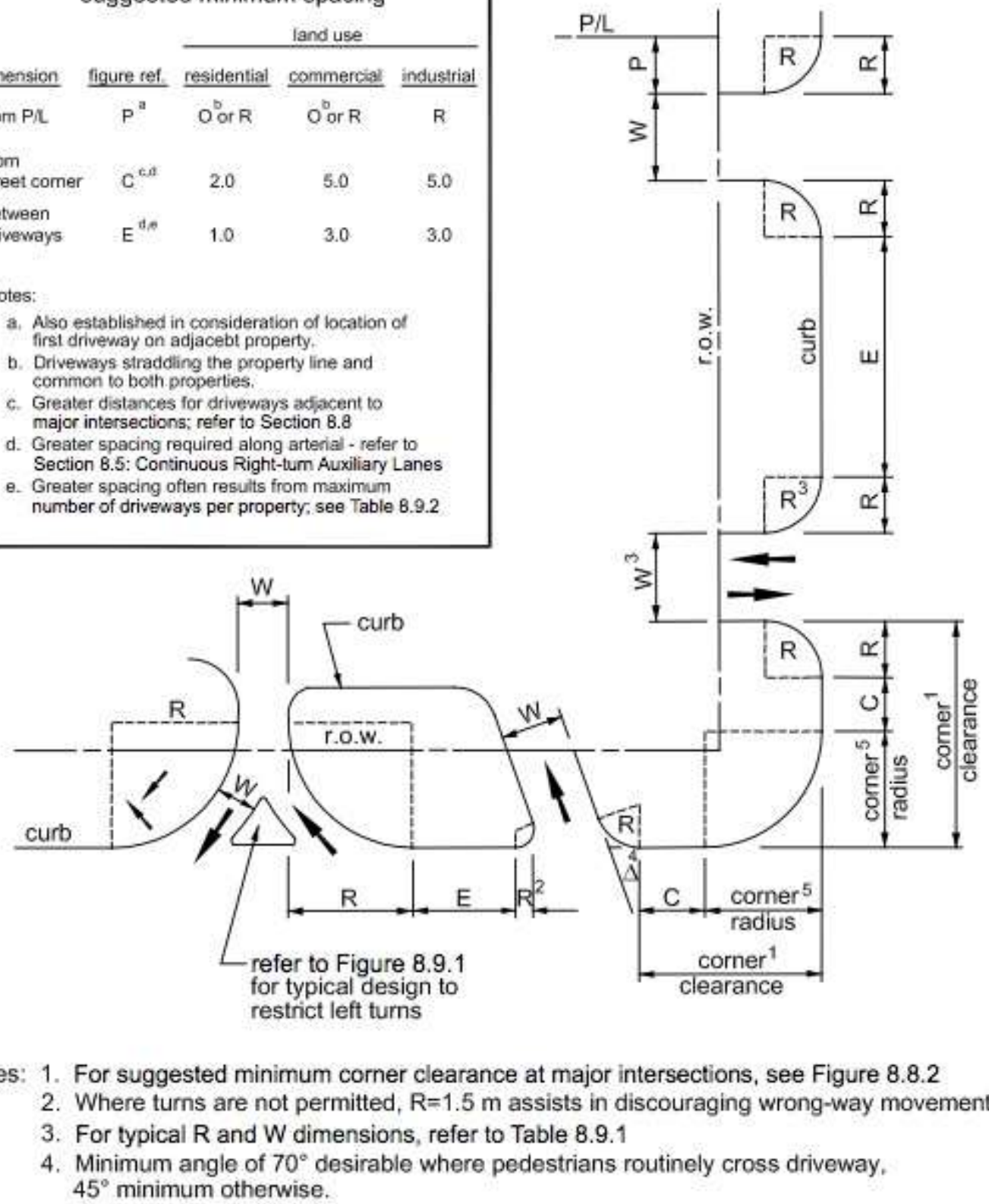
collector roadways, while a 3.0 m minimum is the suggested dimension for both commercial and industrial land uses. If there is a need to provide parallel parking between driveways along the roadway, a spacing of 6.0 to 7.5 m is suitable. If the spacing provided is in the range of 3.0 to 5.0 m, the space may appear inviting to a driver wishing to park, but if used, severely hampers the operation of the driveways by reducing sight lines and interfering with the turning paths of the vehicles.

suggested minimum spacing

dimension	figure ref.	land use: residential	commercial	industrial
from P/L	P [a]	O [b] or R	O [b] or R	R
from street corner	C [c,d]	2.0	5.0	5.0
between driveways	E [d,e]	1.0	3.0	3.0

Notes:

a. Also established in consideration of location of first driveway on adjacebt property.
b. Driveways straddling the property line and common to both properties.
c. Greater distances for driveways adjacent to major intersections; refer to Section 8.8
d. Greater spacing required along arterial - refer to Section 8.5: Continuous Right-turn Auxiliary Lanes
e. Greater spacing often results from maximum number of driveways per property; see Table 8.9.2



Notes:
1. For suggested minimum corner clearance at major intersections, see Figure 8.8.2
2. Where turns are not permitted, R=1.5 m assists in discouraging wrong-way movements.
3. For typical R and W dimensions, refer to Table 8.9.1
4. Minimum angle of 70° desirable where pedestrians routinely cross driveway, 45° minimum otherwise.

Figure 8.9.2: Driveway Spacing Guidelines – Locals and Collectors

Table 9.9.4: Design Intersection Sight Distance – Case B1, Left Turn From Stop

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	41.7	45
30	35	62.6	65
40	50	83.4	85
50	65	104.3	105
60	85	125.1	130
70	105	146.0	150
80	130	166.8	170
90	160	187.7	190
100	185	208.5	210
110	220	229.4	230
120	250	250.2	255
130	285	271.1	275

Note: Intersection sight distance shown is for a stopped passenger car to turn left onto a two-lane highway with no median and grades 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

Sight distance design for left turns at divided-highway intersections should consider multiple design vehicles and median width. If the design vehicle used to determine sight distance for a divided-highway intersection is larger than a passenger car, then sight distance for left turns will need to be checked for that selected design vehicle and for smaller design vehicles as well. If the divided-highway median is wide enough to store the design vehicle with a clearance to the through lanes of approximately 1 m at both ends of the vehicle, no separate analysis for the departure sight triangle for left turns is needed on the minor-road approach for the near roadway to the left. In most cases, the departure sight triangle for right turns (case B2) will provide sufficient sight distance for a passenger car to cross the near roadway to reach the median. Possible exceptions are addressed in the discussion of case B3.