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50 Saunders Street

TRAFFIC IMPACT BRIEF

Lotco II Limited

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Issue	Date	Description
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1 Introduction

Tatham Engineering Limited has been retained by Lotco II Limited to prepare a Traffic Impact Brief in support of Draft Plan Approval for the proposed 50 Saunders Street residential development in the Town of Collingwood (as illustrated in Figure 1). The objective of the brief is to address the transportation requirements of the Town of Collingwood and Simcoe County, including site access, site traffic volumes, sight lines at the access points and potential impacts to the adjacent road system.



2 Existing Conditions

2.1 EXISTING SITE

The subject property consists of approximately 3.89 ha (9.61 acres) of undeveloped land on the west side of Saunders Street, north of Poplar Sideroad. The site is bound by Saunders Street to the east, Poplar Sideroad to the south, residential lands to the west and St. Mary's Elementary Catholic School to the north. The lands are legally described as Lots R1, R2, and part of R3, registered plan 446, geographic Township of Nottawasaga, now in the Town of Collingwood.

2.2 ROAD NETWORK

Poplar Sideroad (County Road 32) is a primary arterial road under the jurisdiction of the County of Simcoe. It is oriented east-west through the study area and has a two-lane (i.e. one travel lane per direction) urban cross-section with curb and gutter on both sides of the road and a 2.0 metre asphalt sidewalk on the north side of the road. The posted speed limit is 60 km/h and thus a design speed of 70 km/h has been considered (posted speed limit + 10 km/h for lower volume roads). As a primary arterial road, Poplar Sideroad has an assumed planning capacity of 900 vehicles per hour per lane.

Saunders Street is a local road under the jurisdiction of the Town of Collingwood. The road is oriented north-south through the study area, providing a two-lane urban cross-section with a 1.5 metre concrete sidewalk on the west side of the road. The posted speed limit is 50 km/h and thus a design speed of 60 km/h has been considered (posted speed limit + 10 km/h). As a local road, Saunders Street has an assumed planning capacity of 400 vphpl.

The study area road network is illustrated in Figure 2.

2.3 TRAFFIC VOLUMES

Existing traffic volumes on the study area road network were established based on traffic counts conducted at the intersection of Saunders Street with Poplar Sideroad on Tuesday October 29, 2019 from 7:00 to 10:00 and 16:00 to 19:00. The corresponding traffic count details are provided in Appendix A whereas the 2019 peak hour volumes are illustrated in Figure 3.

2.4 INTERSECTION OPERATIONS

The operations of the intersection of Saunders Street with Poplar Sideroad was analyzed based on the 2019 traffic volumes, the existing configuration and intersection control and procedures outlined in the *2000 Highway Capacity Manual*¹ (using Synchro v.10 software). For unsignalized

¹ *Highway Capacity Manual*. Transportation Research Board, Washington DC, 2000.



intersections, the review considers the average delay (measured in seconds), level of service (LOS) and volume to capacity (v/c) for the critical movements, namely the stop movement on the minor street (Saunders Street). A summary of the analyses is provided in Table 1. Level of service A corresponds to the best operating condition with minimal delays whereas level of service F corresponds to poor operations resulting from high intersection delays. A v/c ratio of less than 1.0 indicates the intersection movement/approach is operating at less than capacity while v/c of 1.0 indicates capacity has been reached. Detailed operations worksheets for the existing traffic conditions are included in Appendix B.

Table 1: Intersection Operations – 2019 Conditions

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			DELAY	LOS	V/C	DELAY	LOS	V/C
Saunders Street & Poplar Sideroad	SB	stop	16	C	0.23	14	B	0.08

Based on the existing volumes and intersection control, the subject intersection provides good levels of service (LOS C or better) with average delays during both peak hours. As such, no improvements are required to support the existing conditions.

2.5 ROAD SECTION OPERATIONS

As previously noted, a capacity of 900 vphpl has been assumed for Poplar Sideroad and 400 vphpl for Saunders Street. The existing road section operations are summarized in Table 2, reflective of the peak directional peak hour volumes. As indicated, the study area road network is operating at 59% of capacity or less (i.e. $v/c \leq 0.59$), thus indicating that the network is operating well below capacity. No improvements are recommended to address capacity under existing conditions.

Table 2: Road Section Operations – 2019 Conditions

ROADS & LANES PER DIRECTION		CAPACITY ¹		TRAFFIC VOLUMES		VOLUME TO CAPACITY	
		NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
Poplar Sideroad	1	900	900	528	491	0.59	0.55
Saunders Street	1	400	400	81	87	0.20	0.22

¹ Capacity is vehicles per hour per direction.



2.6 TURN LANE REQUIREMENTS

Despite the otherwise acceptable operations provided at the intersection of Poplar Sideroad with Saunders Street, the need for exclusive left and right turn lanes on Poplar Sideroad to serve turning traffic has been reviewed in consideration of MTO warrants for exclusive left and right turn lanes at unsignalized intersections on a two lane highway with a design speed of 70 km/h (posted speed + 10 km/h).

MTO guidelines suggest that exclusive right turn lanes be considered where right turn volumes exceed 60 vehicles per hour and impede the operations of through traffic. Based on the existing volume of right turning traffic accessing the site (in the order of 8 to 36 vehicles per hour) an exclusive right turn lane is not warranted.

With respect to a left turn lane to serve the intersection, the need for such is based on the volume of left turning traffic, the volume of advancing and opposing traffic and the design speed. Based on the MTO warrant criteria, using 15% left turns (AM peak hour) and 5% left turns (PM peak hour) in the advancing volume and a design speed of 70 km/h, an eastbound left turn lane with 15 metres of storage is warranted on Poplar Sideroad at Saunders Street under existing conditions. The completed warrants are provided in Appendix C.

It is noted that the peak hour left turn volumes are in the order of 17 to 45 vehicles, which translates to less than 1 vehicle per minute and are not otherwise considered significant. Furthermore, the traffic signals at the intersection of Hurontario Street with Poplar Sideroad will meter the traffic flow on Poplar Sideroad, providing additional gaps in the traffic flow to facilitate the left turn movement to Saunders Street. In consideration of the available capacity on Poplar Sideroad and the otherwise good operations at the intersection of Saunders Street with Poplar Sideroad, an exclusive left turn lane is not considered necessary.



3 Proposed Development

3.1 SITE LOCATION

As illustrated in Figure 1, the development site is located on the west side of Saunders Street, north of Poplar Sideroad. The site is bound by Saunders Street to the east, Poplar Sideroad to the south, residential lands to the west and St. Mary's Elementary Catholic School to the north.

3.2 PROPOSED LAND-USE

The proposed development will consist of 64 single detached lots with access provided via a new municipal road with a 20.0 metre right-of-way. Build-out of the site is anticipated by 2022.

A concept plan is provided in Figure 4.

3.3 SITE ACCESS

As illustrated in Figure 4, the development will be served by a new municipal road which will connect to Saunders Street at 2 locations. The north connection will be located opposite Mary Street (creating a 4-leg intersection), whereas the south connection will be located approximately 50 metres north of the intersection with Poplar Sideroad. Access to the individual lots will be provided via direct driveway access to the new municipal road, with the exception of those fronting Saunders Street which will have direct driveway access to Saunders Street.

3.4 ON-SITE CIRCULATION

The proposed municipal road serving the site will have a 20.0 metre right-of-way and maintain an 8.5-metre wide paved surface, satisfying the Town's design standards for an urban local residential roadway.

In considering the above, the internal site layout as proposed is sufficient with respect to the circulation of site generated traffic and the manoeuvring requirements of the design vehicles accessing the site (i.e. passenger cars, SUV's, vans, etc.). Furthermore, the 8.5-metre wide proposed roadway will accommodate the circulation of emergency vehicles, garbage trucks and snow removal vehicles.

Road elbows will be provided at both of the corners along the proposed municipal road, as per Town standards.

3.5 PARKING

As per the Town of Collingwood Zoning By-law 2010-040, a single detached dwelling must provide 2 spaces per unit. The proposed development will provide a minimum of 1 garage space and 1 driveway space per unit, thus satisfying the Town's parking requirements.



3.6 TRIP GENERATION

The number of vehicle trips to be generated by the proposed development has been determined based on type of use, development size, and trip generation rates as per the *ITE Trip Generation Manual*², 10th Edition. Based on the proposed residential use, the *single family detached* (ITE code 210) land-use has been applied to the development. Trip estimates have been established using the fitted curve equations derived from the ITE survey data for the respective land-use and peak hour, considering 64 residential units. The *ITE Trip Generation Handbook* recommends that the fitted curve equation, when provided, be applied instead of the average rates, particularly when the data indicates a high correlation between the independent variable (i.e. number of units) and dependent variable (i.e. trips). The fitted curve equation results in a more accurate representation of the anticipated site trip generation than the average rate. With respect to the subject development, the application of the fitted curve equation results in greater trip estimates when compared to application of the average rate. As such, application of the fitted curve equation is considered conservative.

The associated trip rates and trip estimates are provided in Table 3.

Table 3: Trip Generation

LAND-USE	TRIP BASIS	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		IN	OUT	TOTAL	IN	OUT	TOTAL
single family detached (ITE 210)	equation ¹	$(T) = 0.71(X) + 4.80$			$\ln(T) = 0.96\ln(X) + 0.20$		
	distribution	25%	75%	100%	58%	42%	100%
	estimate	13	38	51	42	24	66

¹ ITE fitted curve equations - where T = the number of trips, and X = the number of residential units

Overall, the proposed development is expected to generate 51 trips during the weekday AM peak hour and 66 trips during the weekday PM peak hour (total of inbound and outbound trips).

3.7 TRIP DISTRIBUTION & ASSIGNMENT

The distribution of the new trips generated by the site has been developed based on the location of the site in relation to surrounding development and population centres, and existing traffic patterns observed at the intersection of Saunders Street with Poplar Sideroad.

The following distribution has been assumed:

- 60% to/from the east (via Poplar Sideroad);

² *ITE Trip Generation Manual, 10th Edition*. Institute of Transportation Engineers, September 2017.



- 30% to/from the west (via Poplar Sideroad); and
- 10% to/from the north (via Saunders Street).

The assignment of the site trips generated by the development to the area road network is based on the trip distribution noted above with consideration given to the expected travel routes. The resulting site generated traffic volumes assigned to the road network is illustrated in Figure 5.



4 Future Conditions

4.1 BACKGROUND GROWTH

4.1.1 Population Growth

The 2016 Census Canada profile indicates that the population of the Town of Collingwood increased from 17,986 in 2011 to 20,102 in 2016, translating to an annual growth rate of 2.3%. As per the Town's *Official Plan*³ (which references the *Places to Growth Plan for the Greater Golden Horseshoe*), the Town has been allocated a population of 33,400 by the year 2031. In considering the 2016 census population, this translates to a growth rate of 3.4 % per annum for the period 2016 to 2031.

4.1.2 Traffic Growth

The traffic projections contained in the *Town of Collingwood Transportation Study*⁴ applied a background growth rate of 0.5% along with development traffic associated with several planned developments throughout the Town. The resulting annual growth for the road network ranged from 3 to 4% for the period 2010 to 2030.

4.1.3 Overall Background Growth

In consideration of the historic growth in the area and future growth projections for the Town, a background growth rate of 3.0% per annum has been applied to the traffic volumes on Poplar Sideroad. No growth was applied to the volumes on Saunders Street, recognizing that as a local road latent background growth is not anticipated.

4.2 DEVELOPMENT GROWTH

In addition to the 3.0% background growth rate, consideration has also been given to other developments planned for the study area. The background developments are discussed in detail below.

4.2.1 Mountaincroft Subdivision

The Mountaincroft subdivision is located on the northeast corner of the High Street and Poplar Sideroad intersection, to the west of the subject site. Upon completion, it will consist of approximately 375 single family units.

³ *Town of Collingwood Official Plan*. Town of Collingwood Land Use Planning Services, October 2017

⁴ *Town of Collingwood Transportation Study*. C.C. Tatham & Associates Ltd., July 9, 2012



Phases 1 through 5 are currently built with Phase 6, the final phase, partially built and slated for completion in 2020. Phase 6 is located at the northwest corner of the property. Upon completion, the final phase is anticipated to generate in the order of 53 to 70 new peak hour trips (as per ITE trip generation rates for the *single family detached* land use) with the majority of trips expected to enter/exit the site via Findlay Drive (with the extension of Findlay Drive to High Street, Findlay Drive now provides access to the site from High Street and Hurontario Street). After distributing the generated trips to the surrounding road network, the trips assigned through the study area intersection (Poplar Sideroad with Saunders Street) will be minimal. As such, in considering the location of the final phase and expected travel routes of residents, traffic associated with Phase 6 is not anticipated to have any appreciable impact on the study area road network and therefore has not been considered in the background traffic volumes.

4.2.2 Summit View Development

The Summit View development is located on the northwest corner of the High Street and Poplar Sideroad intersection. The development is to consist of 406 residential units built over two phases. As per the *Charleston Homes Residential Development Traffic Impact Study*⁵, 50% build-out was initially anticipated by 2020 with full build-out by 2025; however, with construction of the Summit View development commencing in 2019, full build-out is not anticipated until 2030. For the purpose of this study, 25% build-out has been assumed by 2022. The site generated traffic volumes for the Summit View development, as provided in the *Charleston Homes Residential Development TIS*, have been applied to the study area intersection - adjusted to reflect 25% build-out by 2022. It is noted that the respective TIS considered an ultimate unit count of 367, whereas the current Summit View development plan considers 406 units. The trip generation has been revised to consider the additional 39 residential units. The Summit View development traffic is illustrated in Figure 6.

4.3 TRAFFIC VOLUMES

Future traffic volumes expected for the 2022 horizon year have been determined based on the 2019 traffic volumes, adjusted to reflect an annual background growth rate of 3.0%, traffic associated with the Summit View development and the additional traffic to be generated by the proposed residential development. Volumes for Mary Street have been estimated based on the level of development which it serves along with consideration for its connection to the wider road network via Newbourne Street.

The resulting total traffic volumes are presented in Figure 7.

⁵ *Charleston Homes Residential Development Traffic Impact Study*. C.C. Tatham & Associates Ltd. December 2015.



4.4 INTERSECTION OPERATIONS

The operations of the study area intersection were again investigated considering the total traffic volumes for the 2022 horizon year. A summary of the analyses is provided in Table 5, whereas detailed operations worksheets for the total traffic conditions are included in Appendix D.

As indicated, the subject intersection will continue to provide good levels of service (LOS C) with average delays during both peak hours. As such, no improvements are required to support the future conditions.

Table 4: Intersection Operations – 2022 Conditions

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			DELAY	LOS	V/C	DELAY	LOS	V/C
Saunders Street & Poplar Sideroad	SB	stop	22	C	0.39	19	C	0.19

4.5 ROAD SECTION OPERATIONS

The road section operations were reviewed again with consideration of the projected total traffic volumes for the 2022 horizon period. The results are provided in Table 5.

The study area road network is expected to operate at 66% of capacity or less through the 2022 horizon period (i.e. $v/c \leq 0.66$) under total conditions. As such, no improvements are recommended to accommodate the projected total volumes with respect to road capacity.

Table 5: Road Section Operations – 2022 Conditions

ROADS & LANES PER DIRECTION		CAPACITY ¹		TRAFFIC VOLUMES		VOLUME TO CAPACITY	
		NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
Poplar Sideroad	1	900	900	598	553	0.66	0.61
Saunders Street	1	400	400	93	121	0.23	0.30

¹ Capacity is vehicles per hour per direction.

4.6 ACCESS OPERATIONS

In consideration of the relatively low volume of trips to be generated by the development and the excess reserve capacity on Saunders Street, the site access points are expected to provide excellent operations with minimal delays.



4.7 SIGHT LINE ASSESSMENT

As per the TAC *Geometric Design Guide for Canadian Roads*⁶, the minimum stopping sight distance for a design speed of 60 km/h (posted 50 km/h + 10 km/h) is 85 metres. This provides sufficient distance for an approaching motorist to observe a stationary hazard in the road (i.e. a vehicle slowing or stopped to turn into the subject site) and bring their vehicle to a complete stop prior to the hazard.

The available sight lines to/from the north and south along Saunders Street at the north access are in the order of 240 meters, thus exceeding the minimum stopping sight distance requirement.

The sight lines to/from the north along Saunders Street at the south access are in excess of 300 metres; whereas the sight lines to/from the south are approximately 50 metres, limited by the termination of Saunders Street at its intersection with Poplar Sideroad. Although the minimum stopping sight distance is not satisfied, such is not considered problematic given that vehicles approaching from the south will do so at a reduced speed, having completed a turning movement from Poplar Sideroad.

In consideration of the above, no improvements are required to address the sight lines at the proposed site access points.

4.8 TURN LANE REQUIREMENTS

The need for exclusive right and left turn lanes were again investigated on Poplar Sideroad at Saunders Street.

As previously noted, MTO guidelines suggest that an exclusive right turn lane be considered where right turn volumes exceed 60 vehicles per hour and impede the operations of through traffic. Based on the estimated volume of right turning traffic from Poplar Sideroad to Saunders Street (in the order of 33 to 44 vehicles per hour), an exclusive right turn lane is not warranted.

In consideration of MTO left turn lane warrants and the future total traffic volumes (including site generated traffic), an eastbound left turn lane with 25 metres of storage is warranted on Poplar Sideroad at Saunders Street. The completed warrants are provided in Appendix E.

Consistent with the existing conditions, the left turn volumes from Poplar Sideroad to Saunders Street remain low (in the order of 30 to 49 vehicles, or less than 1 vehicle per minute). In consideration of the available capacity on Poplar Sideroad, the metered traffic flow associated with the downstream traffic signals at Hurontario Street and Poplar Sideroad and the otherwise good operations at the intersection of Saunders Street with Poplar Sideroad, an exclusive left turn lane is not considered necessary. Regardless, it is noted that the left turn lane warrants are

⁶ *Geometric Design Guide for Canadian Roads*, Transportation Association of Canada. June 2017



satisfied under existing conditions and not otherwise triggered by additional traffic volumes associated with the subject development (the site only contributes an additional 4 to 13 vehicles to the eastbound left turn movement).



5 Summary

5.1 PROPOSED DEVELOPMENT

The proposed residential development, to be located at Saunders Street in the Town of Collingwood will consist of 64 single family lots. Upon build-out, the development is expected to generate 51 new trips during the AM peak hour and 66 new trips during the PM peak hour.

5.2 TRAFFIC OPERATIONS

In consideration of the available capacity on the road network and the otherwise good operations at the study area intersection and site access points, no improvements to the road network are required to accommodate the proposed development

5.3 TURN LANE REQUIREMENTS

The need for exclusive right and left turn lanes along Poplar Sideroad at Saunders Street was assessed in consideration of MTO warrant criteria. Based on the existing and future traffic volumes, an exclusive eastbound left turn lane is warranted on Poplar Sideroad at Saunders Street. However, in consideration of the available capacity on Poplar Sideroad, the metered traffic flow associated with the downstream traffic signals at Hurontario Street and Poplar Sideroad (which will create gaps in the westbound traffic flow, thus providing increased crossing opportunities for the eastbound left turn movement) and the otherwise good operations at the intersection of Saunders Street with Poplar Sideroad, an exclusive left turn lane is not considered necessary. Regardless, it is noted that the left turn lane warrants are satisfied under existing conditions and not otherwise triggered by additional traffic volumes associated with the subject development (the site only contributes an additional 4 to 13 vehicles to the eastbound left turn movement).

5.4 SIGHT LINE ASSESSMENT

The available sight lines along Saunders Street at the proposed site access points were reviewed and are considered acceptable in consideration of the TAC design standards and minimum sight distance requirements. While the sight lines to/from the south at the south access do not satisfy the minimum sight distance requirement, such is not considered problematic given that the sight lines extend to the terminus of Saunders Street at Poplar Sideroad, where traffic will be approaching the site at a reduced speed after completing a full stop and turning movement from Poplar Sideroad.





50 SAUNDERS STREET

Figure 1: Site Location





50 SAUNDERS STREET

Figure 2A: Area Road Network





Looking east along Poplar Sideroad from Saunders Street



Looking west along Poplar Sideroad from Saunders Street

50 SAUNDERS STREET

Figure 2B: Area Road Network





Looking north along Saunders Street from proposed south access point



Looking south along Saunders Street from proposed south access point

50 SAUNDERS STREET

Figure 2C: Area Road Network





source: Google Streetview

Looking north along Saunders Street from proposed north access point / Mary Street



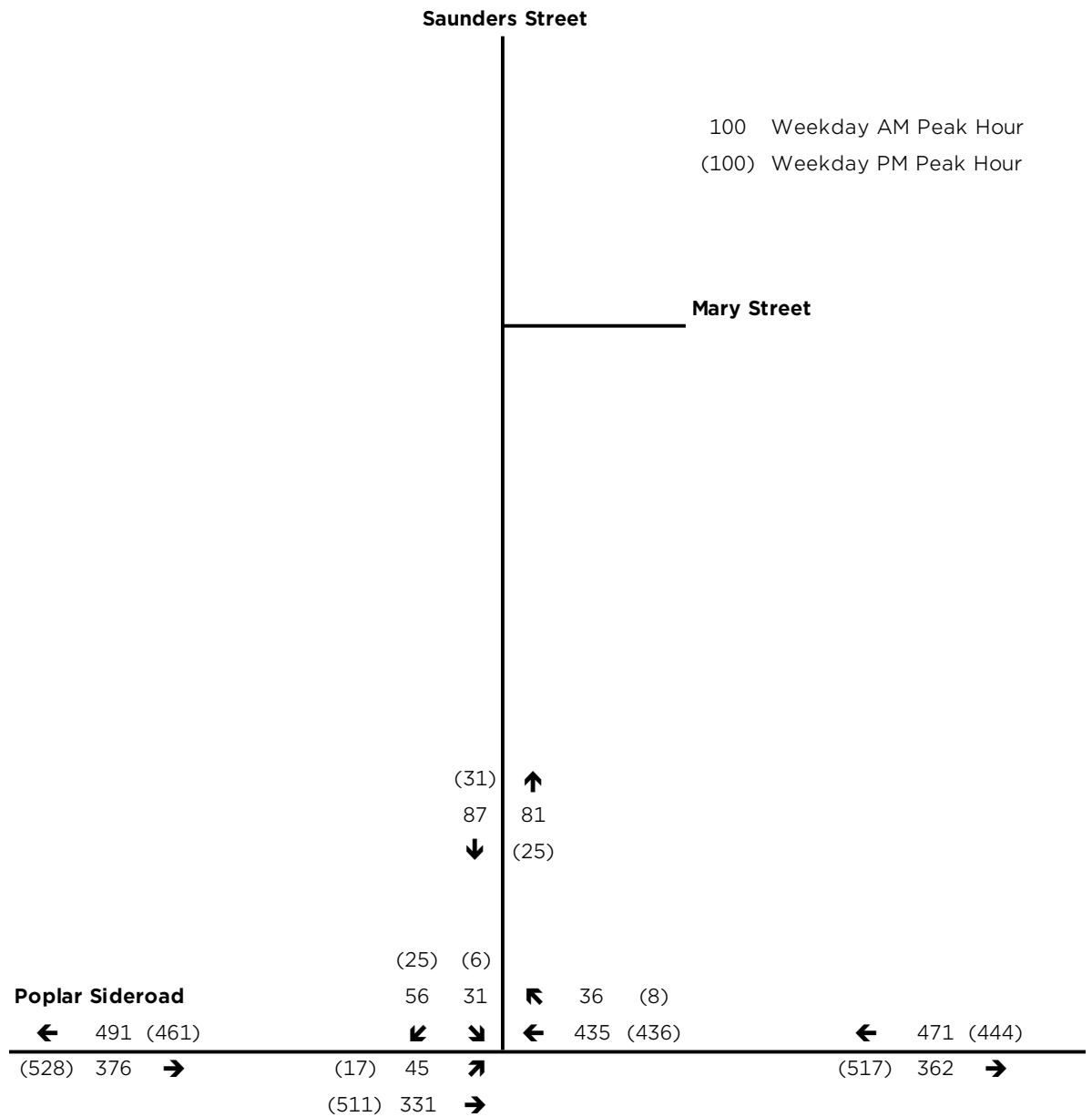
source: Google Streetview

Looking south along Saunders Street from Mary Street / proposed north access point

50 SAUNDERS STREET

Figure 2D: Area Road Network





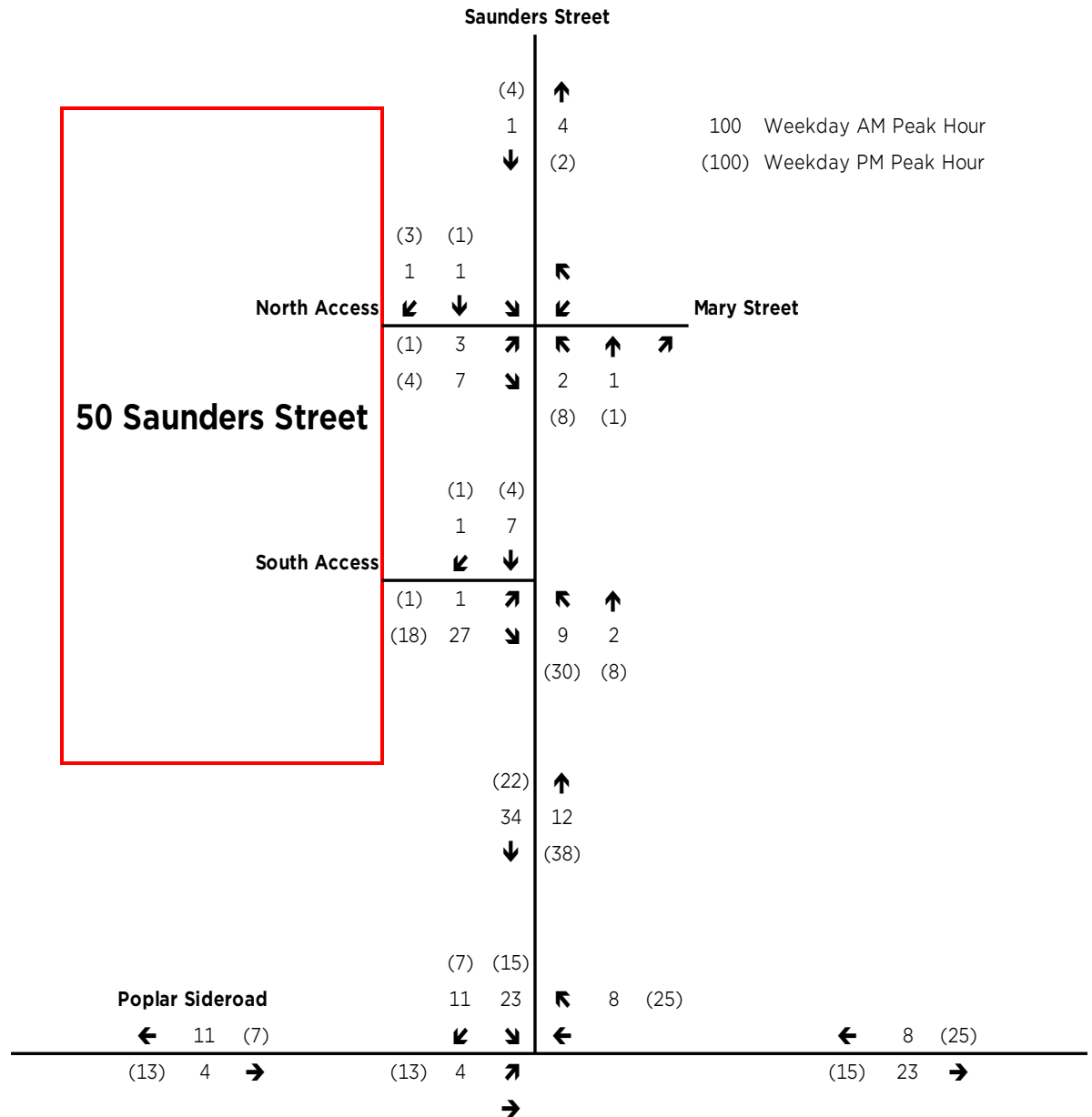
50 SAUNDERS STREET

Figure 3: 2019 Traffic Volumes





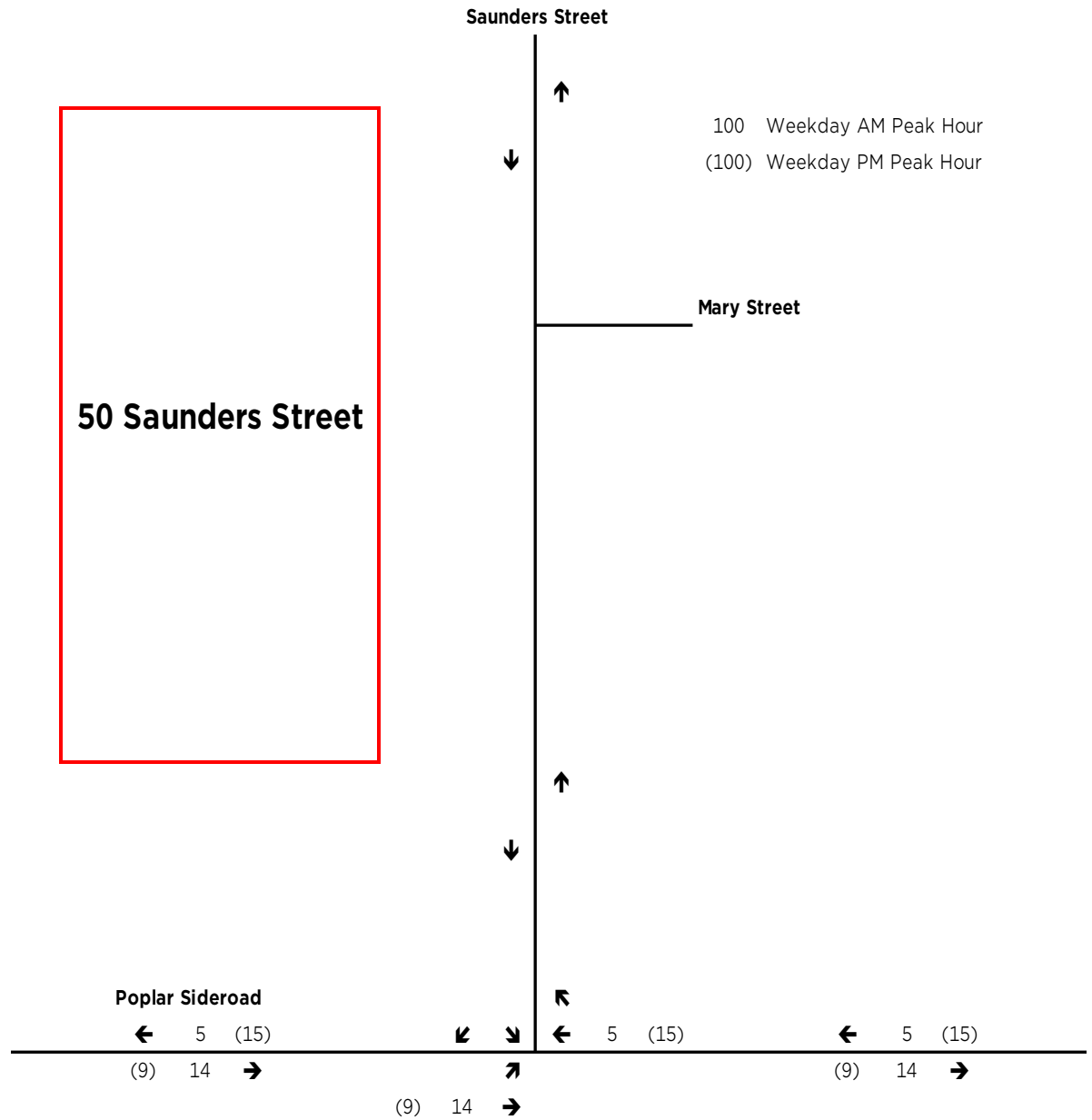
Figure 4: Concept Plan



50 SAUNDERS STREET

Figure 5: Site Generated Traffic Volumes

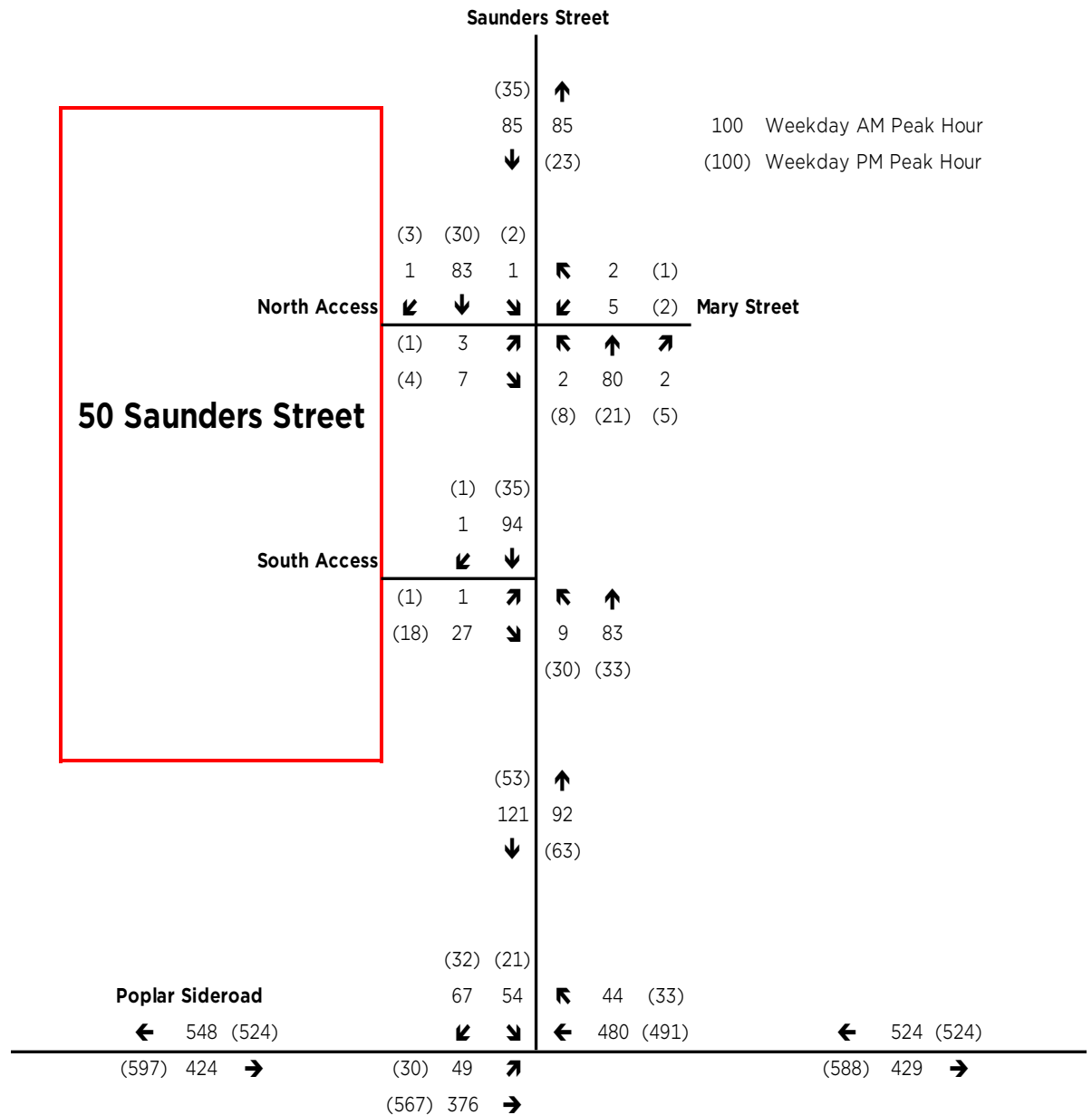




50 SAUNDERS STREET

Figure 6: Background Development Volumes – Summit View





50 SAUNDERS STREET
Figure 7: 2022 Total Traffic Volumes



Appendix A: Traffic Counts

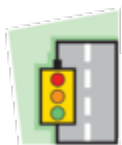


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Project #19350 - Tatham Engineering Ltd

Intersection Count Report

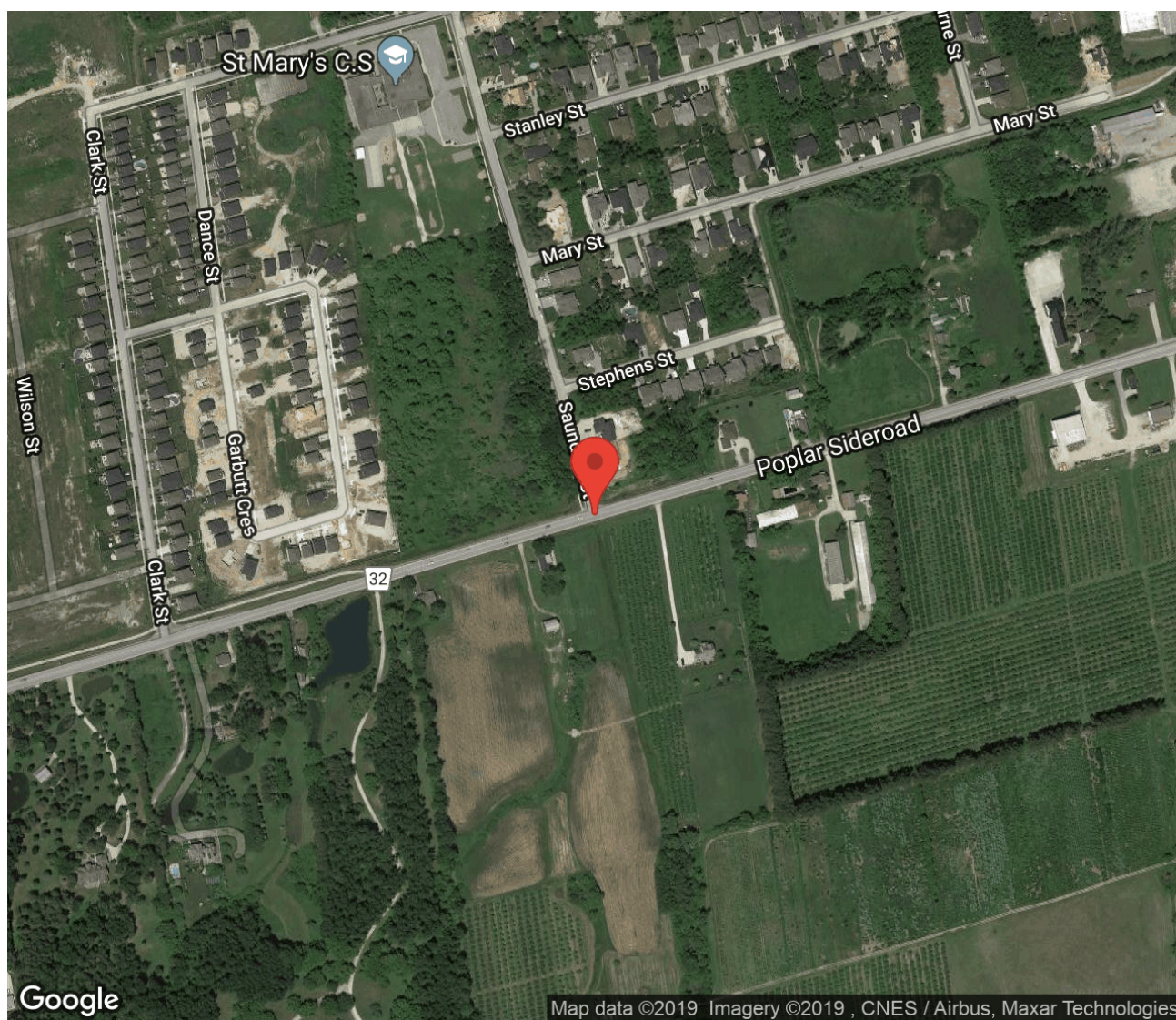
Intersection:	Poplar Sideroad & Saunders St
Municipality:	Collingwood
Count Date:	Oct 29, 2019
Site Code:	1935000001
Count Categories:	Cars, Trucks, Pedestrians
Count Period:	07:00-10:00, 15:00-18:00
Weather:	Clear

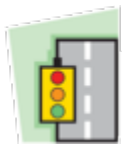


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TRAFFIC MONITORING SERVICES & PRODUCTS

Traffic Count Map

Intersection: Poplar Sideroad & Saunders St
Municipality: Collingwood
Count Date: Oct 29, 2019





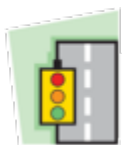
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Traffic Count Summary

Intersection: Poplar Sideroad & Saunders St
Municipality: Collingwood
Count Date: Oct 29, 2019

Saunders St - Traffic Summary

Hour	North Approach Totals						South Approach Totals					
	Includes Cars, Trucks						Includes Cars, Trucks					
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds
07:00 - 08:00	7	0	10	0	17	2	0	0	0	0	0	0
08:00 - 09:00	31	0	56	0	87	2	0	0	0	0	0	0
09:00 - 10:00	2	0	17	0	19	1	0	0	0	0	0	0
BREAK												
15:00 - 16:00	27	0	46	0	73	15	0	0	0	0	0	0
16:00 - 17:00	5	0	26	0	31	4	0	0	0	0	0	0
17:00 - 18:00	7	0	23	0	30	3	0	0	0	0	0	0
GRAND TOTAL	79	0	178	0	257	27	0	0	0	0	0	0



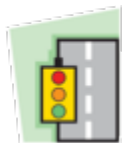
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Traffic Count Summary

Intersection: Poplar Sideroad & Saunders St
Municipality: Collingwood
Count Date: Oct 29, 2019

Poplar Sideroad - Traffic Summary

Hour	East Approach Totals						West Approach Totals					
	Includes Cars, Trucks						Includes Cars, Trucks					
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds
07:00 - 08:00	0	306	9	0	315	0	10	274	0	0	284	2
08:00 - 09:00	0	435	36	0	471	0	45	331	0	0	376	0
09:00 - 10:00	0	321	10	0	331	0	13	300	0	0	313	0
BREAK												
15:00 - 16:00	0	370	17	0	387	0	23	407	0	0	430	0
16:00 - 17:00	0	430	8	0	438	0	23	506	0	0	529	0
17:00 - 18:00	0	402	9	0	411	0	31	468	0	0	499	0
GRAND TOTAL	0	2264	89	0	2353	0	145	2286	0	0	2431	2



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Traffic Count Data

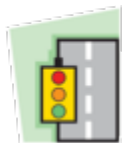
Intersection: Poplar Sideroad & Saunders St

Municipality: Collingwood

Count Date: Oct 29, 2019

North Approach - Saunders St

Start Time	Cars					Trucks					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	
07:00	0	0	0	0	0	0	0	0	0	0	0
07:15	1	0	1	0	2	0	0	0	0	0	0
07:30	4	0	3	0	7	0	0	1	0	1	2
07:45	2	0	5	0	7	0	0	0	0	0	0
08:00	2	0	6	0	8	0	0	0	0	0	0
08:15	6	0	9	0	15	0	0	0	0	0	0
08:30	11	0	19	0	30	2	0	0	0	2	0
08:45	10	0	22	0	32	0	0	0	0	0	2
09:00	0	0	5	0	5	1	0	0	0	1	0
09:15	1	0	5	0	6	0	0	0	0	0	1
09:30	0	0	3	0	3	0	0	0	0	0	0
09:45	0	0	4	0	4	0	0	0	0	0	0
SUBTOTAL	37	0	82	0	119	3	0	1	0	4	5



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TRAFFIC MONITORING SERVICES & PRODUCTS

Traffic Count Data

Intersection: Poplar Sideroad & Saunders St
Municipality: Collingwood
Count Date: Oct 29, 2019

North Approach - Saunders St

Start Time	Cars					Trucks					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	11	0	16	0	27	0	0	0	0	0	2
15:15	4	0	11	0	15	0	0	0	0	0	9
15:30	7	0	8	0	15	0	0	1	0	1	4
15:45	5	0	10	0	15	0	0	0	0	0	0
16:00	1	0	8	0	9	0	0	0	0	0	2
16:15	1	0	8	0	9	0	0	0	0	0	0
16:30	1	0	6	0	7	0	0	0	0	0	2
16:45	2	0	4	0	6	0	0	0	0	0	0
17:00	2	0	7	0	9	0	0	0	0	0	0
17:15	1	0	6	0	7	0	0	0	0	0	1
17:30	1	0	7	0	8	0	0	0	0	0	0
17:45	3	0	3	0	6	0	0	0	0	0	2
SUBTOTAL	39	0	94	0	133	0	0	1	0	1	22
GRAND TOTAL	76	0	176	0	252	3	0	2	0	5	27

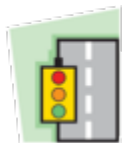


Traffic Count Data

Intersection: Poplar Sideroad & Saunders St
 Municipality: Collingwood
 Count Date: Oct 29, 2019

East Approach - Poplar Sideroad

Start Time	Cars					Trucks					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	0	42	1	0	43	0	5	1	0	6	0
07:15	0	79	1	0	80	0	6	2	0	8	0
07:30	0	83	3	0	86	0	5	0	0	5	0
07:45	0	79	1	0	80	0	7	0	0	7	0
08:00	0	78	5	0	83	0	16	0	0	16	0
08:15	0	109	7	0	116	0	7	0	0	7	0
08:30	0	90	18	0	108	0	9	1	0	10	0
08:45	0	112	5	0	117	0	14	0	0	14	0
09:00	0	73	4	0	77	0	11	0	0	11	0
09:15	0	76	4	0	80	0	5	0	0	5	0
09:30	0	61	1	0	62	0	11	0	0	11	0
09:45	0	78	1	0	79	0	6	0	0	6	0
SUBTOTAL	0	960	51	0	1011	0	102	4	0	106	0



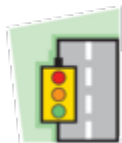
Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

Traffic Count Data

Intersection: Poplar Sideroad & Saunders St
Municipality: Collingwood
Count Date: Oct 29, 2019

East Approach - Poplar Sideroad

Start Time	Cars					Trucks					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	
15:00	0	85	8	0	93	0	8	0	0	8	0
15:15	0	98	2	0	100	0	1	0	0	1	0
15:30	0	77	4	0	81	0	8	1	0	9	0
15:45	0	84	2	0	86	0	9	0	0	9	0
16:00	0	93	3	0	96	0	7	0	0	7	0
16:15	0	114	2	0	116	0	5	0	0	5	0
16:30	0	108	1	0	109	0	5	0	0	5	0
16:45	0	90	2	0	92	0	8	0	0	8	0
17:00	0	104	3	0	107	0	2	0	0	2	0
17:15	0	95	1	0	96	0	5	0	0	5	0
17:30	0	98	3	0	101	0	2	0	0	2	0
17:45	0	94	2	0	96	0	2	0	0	2	0
SUBTOTAL	0	1140	33	0	1173	0	62	1	0	63	0
GRAND TOTAL	0	2100	84	0	2184	0	164	5	0	169	0



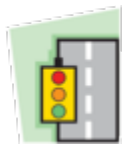
Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

Traffic Count Data

Intersection: Poplar Sideroad & Saunders St
Municipality: Collingwood
Count Date: Oct 29, 2019

West Approach - Poplar Sideroad

Start Time	Cars					Trucks					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	3	60	0	0	63	0	2	0	0	2	0
07:15	1	49	0	0	50	0	2	0	0	2	2
07:30	3	79	0	0	82	0	5	0	0	5	0
07:45	2	72	0	0	74	1	5	0	0	6	0
08:00	11	65	0	0	76	0	7	0	0	7	0
08:15	8	76	0	0	84	0	4	0	0	4	0
08:30	17	79	0	0	96	0	3	0	0	3	0
08:45	9	88	0	0	97	0	9	0	0	9	0
09:00	7	57	0	0	64	1	10	0	0	11	0
09:15	0	45	0	0	45	0	4	0	0	4	0
09:30	1	83	0	0	84	0	9	0	0	9	0
09:45	4	86	0	0	90	0	6	0	0	6	0
SUBTOTAL	66	839	0	0	905	2	66	0	0	68	2



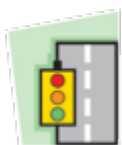
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TRAFFIC MONITORING + SERVICES & PRODUCTS

Traffic Count Data

Intersection: Poplar Sideroad & Saunders St
Municipality: Collingwood
Count Date: Oct 29, 2019

West Approach - Poplar Sideroad

Start Time	Cars					Trucks					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	
15:00	10	92	0	0	102	1	6	0	0	7	0
15:15	6	91	0	0	97	0	7	0	0	7	0
15:30	3	85	0	0	88	0	7	0	0	7	0
15:45	3	110	0	0	113	0	9	0	0	9	0
16:00	13	114	0	0	127	0	3	0	0	3	0
16:15	3	120	0	0	123	0	9	0	0	9	0
16:30	2	122	0	0	124	0	6	0	0	6	0
16:45	5	124	0	0	129	0	8	0	0	8	0
17:00	7	114	0	0	121	0	8	0	0	8	0
17:15	10	113	0	0	123	0	7	0	0	7	0
17:30	5	94	0	0	99	0	5	0	0	5	0
17:45	9	124	0	0	133	0	3	0	0	3	0
SUBTOTAL	76	1303	0	0	1379	1	78	0	0	79	0
GRAND TOTAL	142	2142	0	0	2284	3	144	0	0	147	2



Ontario Traffic Inc.

TRAFFIC MONITORING SERVICES & PRODUCTS

Peak Hour Diagram

Specified Period

From: 07:00:00
To: 10:00:00

One Hour Peak

From: 08:00:00
To: 09:00:00

Intersection: Poplar Sideroad & Saunders St
Site ID: 1935000001
Count Date: Oct 29, 2019

Weather conditions:

**** Unsignalized Intersection ****

Major Road: Poplar Sideroad runs E/W

North Approach

	Out	In	Total
	85	80	165
	2	1	3
Totals	87	81	168

Saunders St

	0	2	0
	56	29	0
Totals	56	31	0

East Approach

	Out	In	Total
	424	337	761
	47	25	72
Totals	471	362	833

Poplar Sideroad

	Totals	
	0	
	45	
Totals	45	

Peds: 2

Peds: 0



Peds: 0

Peds: 0

Poplar Sideroad

Totals		
0	0	0
36	35	1
435	389	46

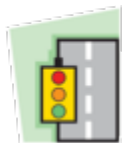
West Approach

	Out	In	Total
	353	445	798
	23	46	69
Totals	376	491	867

- Cars

- Trucks

Comments



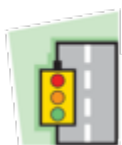
Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

Peak Hour Summary

Intersection: Poplar Sideroad & Saunders St
Count Date: Oct 29, 2019
Period: 07:00 - 10:00

Peak Hour Data (08:00 - 09:00)

	North Approach Saunders St						South Approach						East Approach Poplar Sideroad						West Approach Poplar Sideroad						Total Vehic es	
Start Time	←	↑	→	↺	Peds	Total	←	↑	→	↺	Peds	Total	←	↑	→	↺	Peds	Total	←	↑	→	↺	Peds	Total		
08:00	2		6	0	0	8					0				94	5	0	0	99	11	72		0	0	83	190
08:15	6		9	0	0	15					0				116	7	0	0	123	8	80		0	0	88	226
08:30	13		19	0	0	32					0				99	19	0	0	118	17	82		0	0	99	249
08:45	10		22	0	2	32					0				126	5	0	0	131	9	97		0	0	106	269
Grand Total	31		56	0	2	87					0	0		435	36	0	0	471	45	331		0	0	376	934	
Approach %	35.6		64.4	0	-	-					-	-		92.4	7.6	0	-	-	12	88		0	-	-		
Totals %	3.3		6	0		9.3					0			46.6	3.9	0		50.4	4.8	35.4		0		40.3		
PHF	0.6		0.64	0		0.68					0			0.86	0.47	0		0.9	0.66	0.85		0		0.89	0.87	
Cars	29		56	0		85					0			389	35	0		424	45	308		0		353	862	
% Cars	93.5		100	0		97.7					0			89.4	97.2	0		90	100	93.1		0		93.9	92.3	
Trucks	2		0	0		2					0			46	1	0		47	0	23		0		23	72	
% Trucks	6.5		0	0		2.3					0			10.6	2.8	0		10	0	6.9		0		6.1	7.7	
Peds					2	-					0	-						0	-				0	-	2	
% Peds					100	-					0	-						0	-				0	-	-	



Ontario Traffic Inc.

TRAFFIC MONITORING SERVICES & PRODUCTS

Peak Hour Diagram

Specified Period

From: 15:00:00
To: 18:00:00

One Hour Peak

From: 16:15:00
To: 17:15:00

Intersection: Poplar Sideroad & Saunders St
Site ID: 1935000001
Count Date: Oct 29, 2019

Weather conditions:

**** Unsignalized Intersection ****

Major Road: Poplar Sideroad runs E/W

North Approach

	Out	In	Total
	31	25	56
	0	0	0
Totals	31	25	56

Saunders St

	0	0	0
	25	6	0
Totals	25	6	0

East Approach

	Out	In	Total
	424	486	910
	20	31	51
Totals	444	517	961

Poplar Sideroad

	Out	In	Total
	0	0	0
	0	17	17
	31	480	511

Peds: 2

Peds: 0



Peds: 0

Peds: 0

Poplar Sideroad

	Out	In	Total
	0	0	0
	8	8	16
	436	416	852

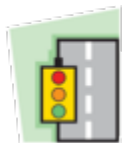
West Approach

	Out	In	Total
	497	441	938
	31	20	51
Totals	528	461	989

- Cars

- Trucks

Comments



Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

Peak Hour Summary

Intersection: Poplar Sideroad & Saunders St
Count Date: Oct 29, 2019
Period: 15:00 - 18:00

Peak Hour Data (16:15 - 17:15)

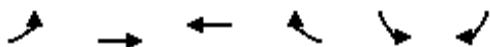
Start Time	North Approach Saunders St						South Approach						East Approach Poplar Sideroad						West Approach Poplar Sideroad						Total Vehicles
	←	↑	→	↺	Peds	Total	←	↑	→	↺	Peds	Total	←	↑	→	↺	Peds	Total	←	↑	→	↺	Peds	Total	
16:15	1		8	0	0	9					0			119	2	0	0	121	3	129		0	0	132	262
16:30	1		6	0	2	7					0			113	1	0	0	114	2	128		0	0	130	251
16:45	2		4	0	0	6					0			98	2	0	0	100	5	132		0	0	137	243
17:00	2		7	0	0	9					0			106	3	0	0	109	7	122		0	0	129	247
Grand Total	6		25	0	2	31					0	0		436	8	0	0	444	17	511		0	0	528	1003
Approach %	19.4		80.6	0	-	-					-	-		98.2	1.8	0	-	-	3.2	96.8		0	-	-	-
Totals %	0.6		2.5	0	3.1	-					0	-		43.5	0.8	0	-	44.3	1.7	50.9		0	-	52.6	-
PHF	0.75		0.78	0	0.86	-					0	-		0.92	0.67	0	-	0.92	0.61	0.97		0	-	0.96	0.96
Cars	6		25	0	31	-					0	-		416	8	0	-	424	17	480		0	-	497	952
% Cars	100		100	0	100	-					0	-		95.4	100	0	-	95.5	100	93.9		0	-	94.1	94.9
Trucks	0		0	0	0	-					0	-		20	0	0	-	20	0	31		0	-	31	51
% Trucks	0		0	0	0	-					0	-		4.6	0	0	-	4.5	0	6.1		0	-	5.9	5.1
Peds					2	-					0	-					0	-					0	-	2
% Peds					100	-					0	-					0	-					0	-	-

Appendix B: Existing Traffic Operations

HCM Unsignalized Intersection Capacity Analysis

1: Poplar Sideroad & Saunders Street

10/31/2019



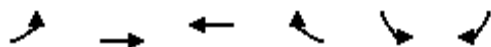
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	45	331	435	36	31	56
Future Volume (Veh/h)	45	331	435	36	31	56
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	360	473	39	34	61
Pedestrians						
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	512				950	492
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	512				950	492
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				88	89
cM capacity (veh/h)	1053				275	576
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	409	512	95			
Volume Left	49	0	34			
Volume Right	0	39	61			
cSH	1053	1700	414			
Volume to Capacity	0.05	0.30	0.23			
Queue Length 95th (m)	1.1	0.0	6.6			
Control Delay (s)	1.5	0.0	16.3			
Lane LOS	A		C			
Approach Delay (s)	1.5	0.0	16.3			
Approach LOS			C			
Intersection Summary						
Average Delay			2.1			
Intersection Capacity Utilization			60.1%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

1: Poplar Sideroad & Saunders Street

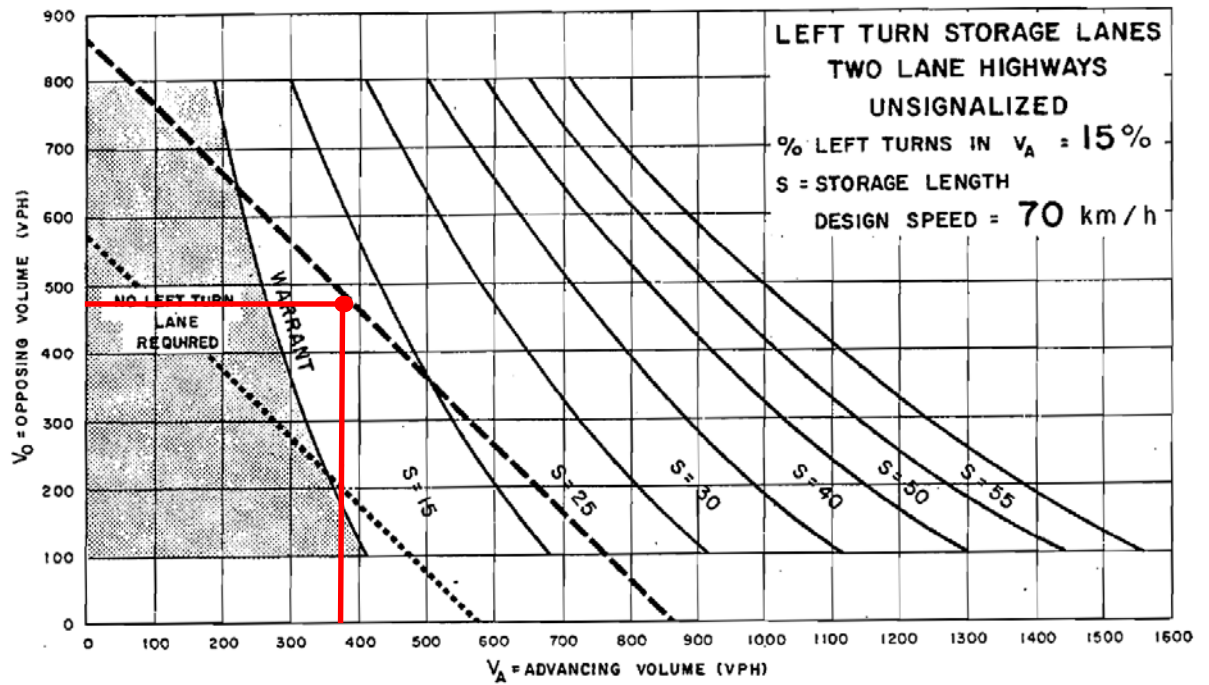
Existing 2019 - PM

50 Saunders Street

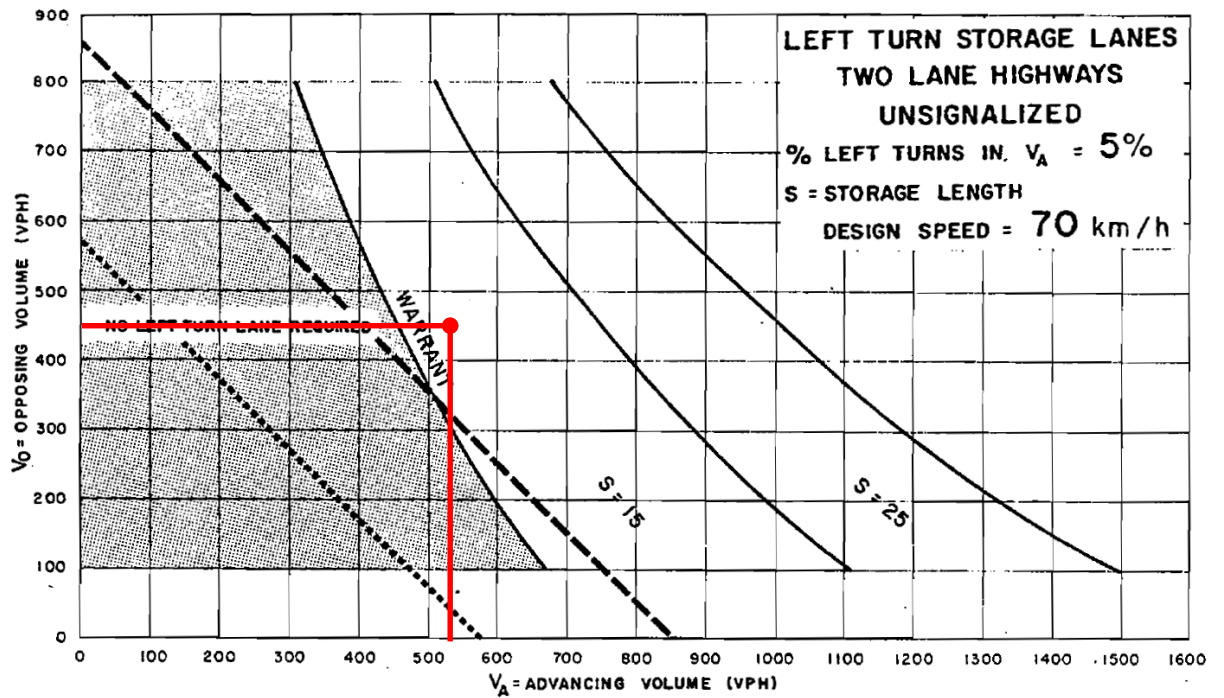


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↩	↩		↩	
Traffic Volume (veh/h)	17	511	436	8	6	25
Future Volume (Veh/h)	17	511	436	8	6	25
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	555	474	9	7	27
Pedestrians						
Lane 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	483				1070	478
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	483				1070	478
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				97	95
cM capacity (veh/h)	1080				241	587
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	573	483	34			
Volume Left	18	0	7			
Volume Right	0	9	27			
cSH	1080	1700	453			
Volume to Capacity	0.02	0.28	0.08			
Queue Length 95th (m)	0.4	0.0	1.8			
Control Delay (s)	0.5	0.0	13.6			
Lane LOS	A		B			
Approach Delay (s)	0.5	0.0	13.6			
Approach LOS			B			
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			50.6%	ICU Level of Service		A
Analysis Period (min)			15			

Appendix C: Existing Turn Lane Warrants



2019 Existing Traffic - AM



2019 Existing Traffic - PM

50 SAUNDERS STREET

Figure C1: Left Turn Warrants



Appendix D: Future Traffic Operations

HCM Unsignalized Intersection Capacity Analysis

1: Poplar Sideroad & Saunders Street

Total 2022 - AM

50 Saunders Street

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	49	376	480	44	54	67
Future Volume (Veh/h)	49	376	480	44	54	67
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)	53	409	522	48	59	73
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	570				1061	546
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	570				1061	546
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				75	86
cM capacity (veh/h)	1002				235	538
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	462	570	132			
Volume Left	53	0	59			
Volume Right	0	48	73			
cSH	1002	1700	341			
Volume to Capacity	0.05	0.34	0.39			
Queue Length 95th (m)	1.3	0.0	13.5			
Control Delay (s)	1.6	0.0	22.1			
Lane LOS	A		C			
Approach Delay (s)	1.6	0.0	22.1			
Approach LOS			C			
Intersection Summary						
Average Delay			3.1			
Intersection Capacity Utilization			67.5%	ICU Level of Service		C
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

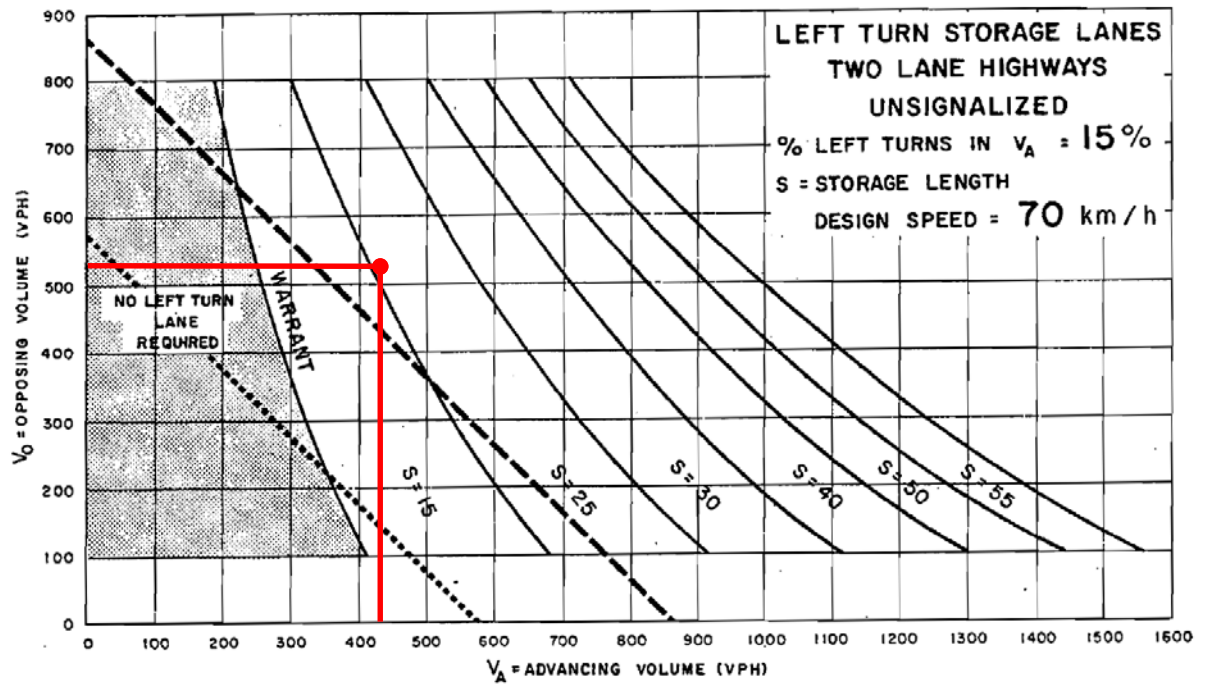
1: Poplar Sideroad & Saunders Street

Total 2022 - PM

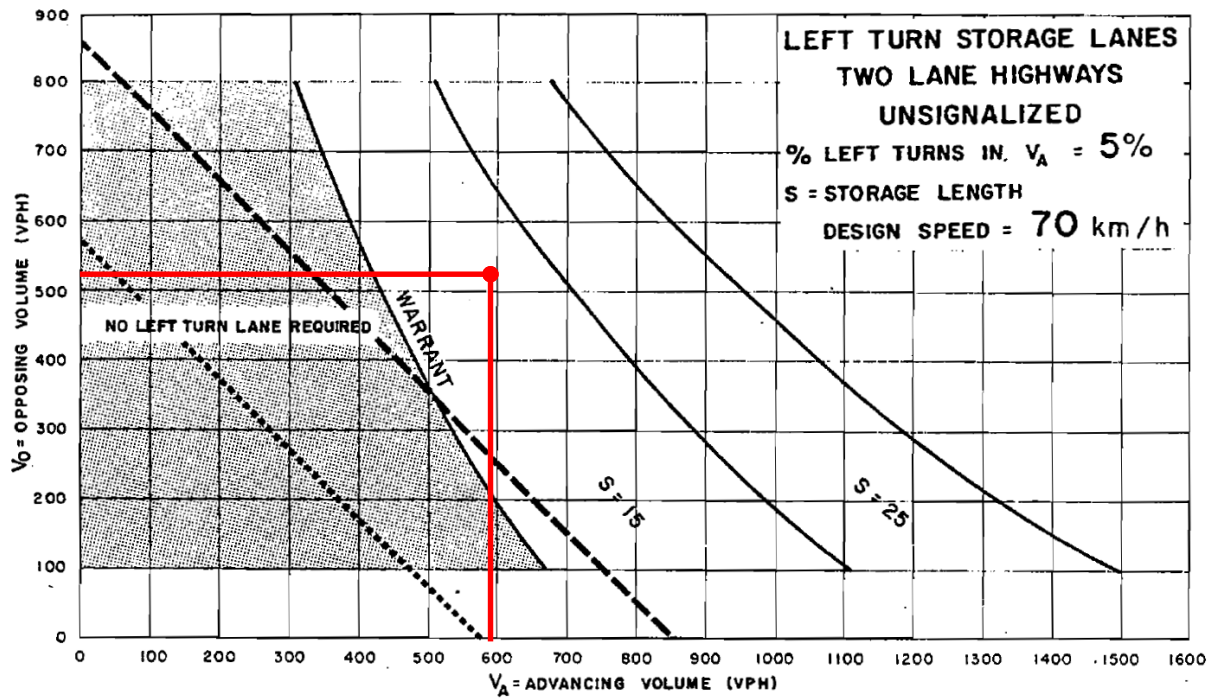
50 Saunders Street

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	30	567	491	33	21	32
Future Volume (Veh/h)	30	567	491	33	21	32
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)	33	616	534	36	23	35
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	570				1234	552
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	570				1234	552
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				88	93
cM capacity (veh/h)	1002				189	533
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	649	570	58			
Volume Left	33	0	23			
Volume Right	0	36	35			
cSH	1002	1700	309			
Volume to Capacity	0.03	0.34	0.19			
Queue Length 95th (m)	0.8	0.0	5.2			
Control Delay (s)	0.9	0.0	19.3			
Lane LOS	A		C			
Approach Delay (s)	0.9	0.0	19.3			
Approach LOS			C			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization		64.3%		ICU Level of Service		C
Analysis Period (min)		15				

Appendix E: Future Turn Lane Warrants



2022 Total Traffic - AM



2022 Total Traffic - PM

50 SAUNDERS STREET

Figure E1: Left Turn Warrants

