2275 16th Street East, Owen Sound Transportation Impact Study

Paradigm Transportation Solutions Limited

November 2022
220378

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Project Summary

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2275 16th Street East, Owen Sound Transportation Impact Study

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Executive Summary

Content

Paradigm Transportation Solutions Limited (Paradigm) has been retained to conduct this Transportation Impact Study (TIS) for a proposed mixed-use development located at 2275 16th Street East in the City of Owen Sound, Grey County.

This Transportation Impact Study (TIS) includes an analysis of existing traffic conditions, a description of the proposed development, traffic forecasts for a five-year horizon from the date of TIS submission (2027), and assessment of traffic impacts with recommendations to accommodate the proposed development as appropriate.

Development Concept

The subject site is located on the south side of 16th Street East immediately east of the existing commercial plaza and west of the Grey County CP Rail Trail. The proposed development includes two commercial buildings totalling 1,200 m^2 (12,917 ft^2) GFA, one 500 m^2 (5,382 ft^2) GFA commercial-office building, a 311 m^2 (3,348 ft^2) GFA restaurant with drive-through, a 300 m^2 (3,229 ft^2) GFA restaurant and three apartment buildings accommodating a total of 120 residential units.

Vehicular access is proposed via a new municipal street connection to 16th Street East which will be shared with the commercial plaza to the west. The new street will extend approximately 128 metres south of 16th Street East. Two driveways are proposed for the development on the new municipal street: a northerly driveway 61 metres from 16th Street East, and a southerly driveway at the end of the new municipal street, which will extend west into the commercial plaza.

TIS Scope

The scope of the Transportation Impact Study for the proposed development includes:

- **Study Area intersections:**
  - 16th Street East and 18th Avenue East (signalized);
  - 16th Street East and 20th Avenue East (signalized); and
  - New municipal street intersection on 16th Street East.
- **Analysis Periods:** Weekday AM and PM peak hours.

- **Background Developments:**
  - Telfer Creek Subdivision;
  - 1960 16th Street East; and
  - Heritage Grove Centre (2125 16th Street East).
- **Traffic Conditions:** Existing (2022) and five years from TIS submission (2027).

Conclusions

Based on the investigations carried out, it is concluded that:

- **Existing Traffic Conditions:** The study area intersections are operating with acceptable levels of service.
- **Development Trip Generation:** The development is forecast to generate 166 and 106 trips during the AM and PM peak hours, respectively.
- **2027 Background Traffic Conditions:** The study area intersections are forecast to operate with acceptable levels of service, except for the northbound left-turn movement at the intersection of 18th Avenue East and 16th Street East which is forecast to operate with 95th percentile queues exceeding the available storage of 40 metres by 2 metres during the PM peak hour.
- **2027 Total Traffic Conditions:** The study area intersections are forecast to operate with the same critical movement as under 2027 background traffic conditions. The northbound left-turn movement at the New Municipal Street intersection on 16th Street East is forecast to operate with LOS D during the PM peak hour; however, v/c ratios are low during both the AM and PM peak hours.
- **New Municipal Street on 16th Street East:**
  - The new municipal street connection to 16th Street East has been analyzed under stop control on the northbound approach.
  - Traffic signal control is not warranted under both 2027 background and total traffic conditions.
  - Under stop control, a westbound left-turn lane with 25 metres of storage is warranted under both 2027 background and total traffic conditions.
  - The northbound left-turn queues were assessed relative to the driveway locations on the New Municipal Street. The

closest northerly driveway is located 61 metres south of 16th Street East. The projected 95th percentile queue lengths under 2027 total traffic conditions, are 8 metres during the AM peak hour, and 20 metres during the PM peak hour. Therefore, the internal driveway will not be impacted by northbound left-turn queues at 16th Street East.

Recommendations

Based on the findings and conclusions of this study, it is recommended that the development be considered for approval as proposed.

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Figures

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1 Introduction

1.1 Overview

Paradigm Transportation Solutions Limited (Paradigm) has been retained to conduct this Transportation Impact Study (TIS) for a proposed mixed-use development located at 2275 16th Street East in the City of Owen Sound, Grey County. **Figure 1.1** illustrates the subject development location.

The subject site is located on the south side of 16th Street East immediately east of the existing commercial plaza and west of the Grey County CP Rail Trail. The proposed development includes two commercial buildings totalling 1,200 m^2 (12,917 ft^2) GFA, one 500 m^2 (5,382 ft^2) GFA commercial-office building, a 311 m^2 (3,348 ft^2) GFA restaurant with drive-through, a 300 m^2 (3,229 ft^2) GFA restaurant and three apartment buildings accommodating a total of 120 residential units.

Vehicular access is proposed via a new municipal street connection to 16th Street East which will be shared with the commercial plaza to the west. The new street will extend approximately 128 metres south of 16th Street East. Two driveways are proposed for the development on the new municipal street: a northerly driveway 61 metres from 16th Street East, and a southerly driveway at the end of the new municipal street, which will extend west into the commercial plaza.

1.2 Purpose and Scope

The purpose of this report is to identify and assess the potential traffic impact resulting from the proposed development. The scope of the study, developed in consultation with City of Owen Sound staff via e-mail in August 2022, includes:

- Assessment of the current traffic and site conditions within the study area;
- Estimates of background traffic growth for five years from the date of TIS submission (2027);
- Estimates of additional traffic generated by the subject site;
- Analyses of the impact of future traffic on the surrounding road network, including the following study area intersections:
  - 16th Street East and 18th Avenue East (signalized);
  - 16th Street East and 20th Avenue East (signalized); and
  - New municipal street intersection on 16th Street East.

- Recommendations necessary to mitigate the site generated traffic in a satisfactory manner.

Appendix A contains the pre-study consultation material and responses from the City of Owen Sound.

This study has been prepared in accordance with the requirements detailed by the City of Owen Sound Transportation Impact Study Guidelines[1].

[1] Site Development Engineering Standards, City of Owen Sound, January 2015.

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Location of Subject Site

2275 16th Street East, Owen Sound TIS
220378

Figure 1.1

2 Existing Conditions

2.1 Existing Roadways

The main roadways near the subject site considered in assessing the traffic impacts of the development include:

- **16th Street East** is an east-west major arterial road[2] with a four-lane cross section west of 18th Avenue East, three-lane cross section between 18th Avenue East and the existing Right-In Right-Out access to the adjacent property, and two-lane cross section to the east. The roadway has a posted speed limit of 80 km/h to the east of the new municipal street and 50 km/h to the west. Sidewalks are provided on both sides of the roadway west of 18th Avenue East and on the south side to the east.
- **20th Avenue East** is a north-south collector road with a two-lane cross section and an assumed speed limit of 50 km/h. Sidewalks are currently provided on the east side of the roadway. 20th Avenue East is to be extended south to 8th Street East and north to 17th Street East.
- **18th Avenue East** is a north-south collector road with a four-lane cross section and an assumed speed limit of 50 km/h. Sidewalks are provided on both sides of the roadway.

Figure 2.1 illustrates the existing lane configuration and traffic control at the study area intersections.

[2] City of Owen Sound Official Plan Schedule 'C', May 2021.

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Existing Lane Configuration and Traffic Control

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Figure 2.1

2.2 Transit Service

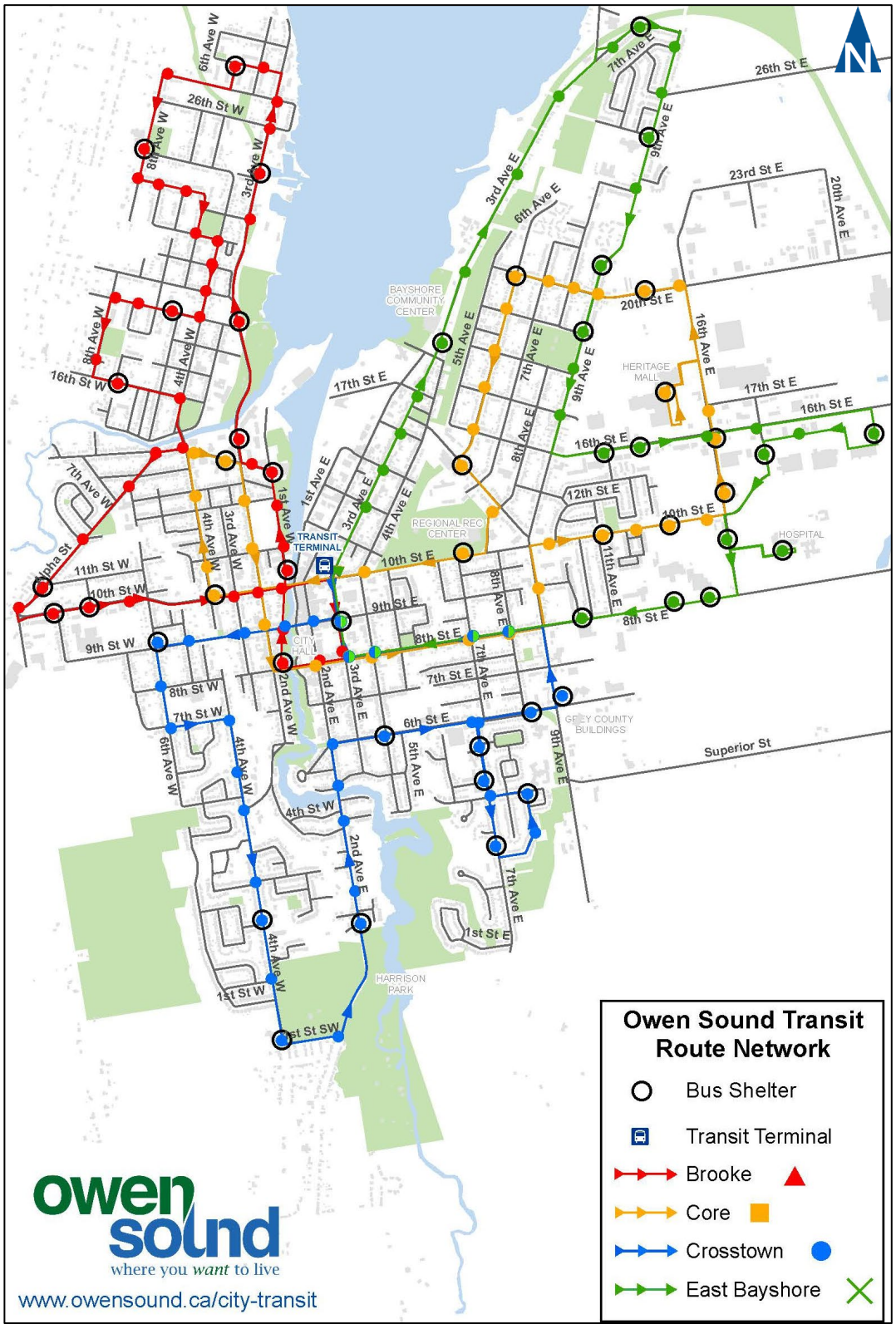
Owen Sound Transit East Bayshore route operates along 16th Street East and through the existing Heritage Grove Centre adjacent to the subject site. The route has major stops at the transit terminal and the Owen Sound Hospital, and operates Monday to Friday between 6:30 AM and 6:00 PM and Saturday between 9:00 AM and 4:00 PM. The closest stop is at the Heritage Grove Centre (approximately 150 metres from the subject site).

Figure 2.2 illustrates the existing transit service.

2.3 Traffic Volumes

Figure 2.3 illustrates the existing AM (9:00 – 10:00 AM) and PM (3:00 – 4:00 PM) weekday peak hour traffic volumes collected by Paradigm on 23 August 2022. Existing traffic volumes traveling eastbound and westbound along the frontage of the new municipal street were taken from traffic counts collected by Paradigm on 8 June 2022 at the intersection of 16th Street East and 28th Avenue East.

Appendix B contains the detailed traffic counts and signal timings for the study area intersections.



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Existing Transit Network

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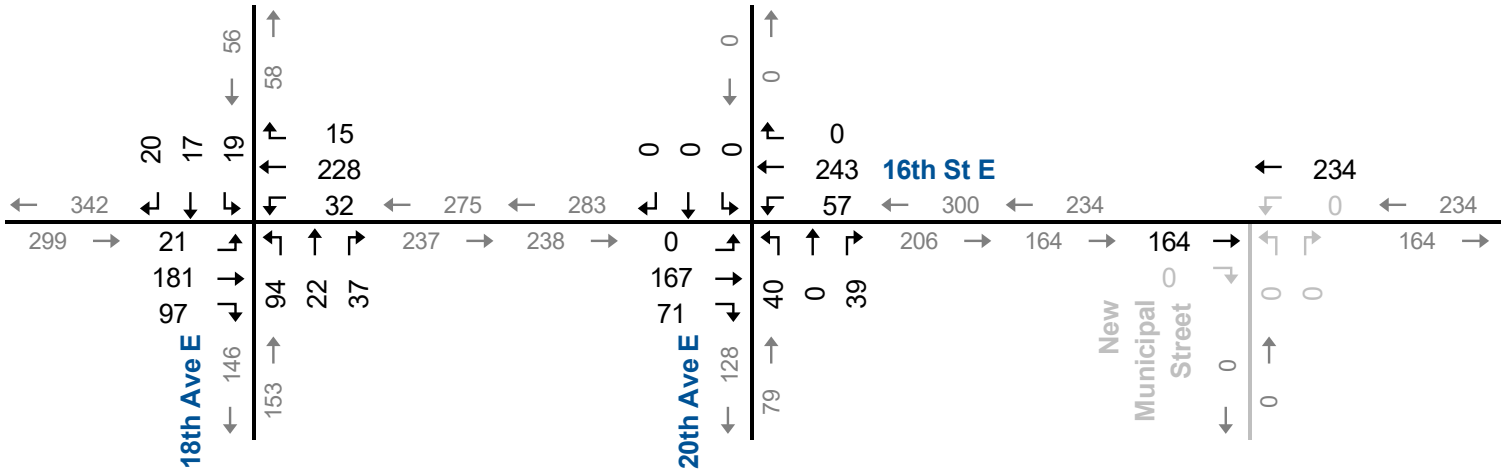
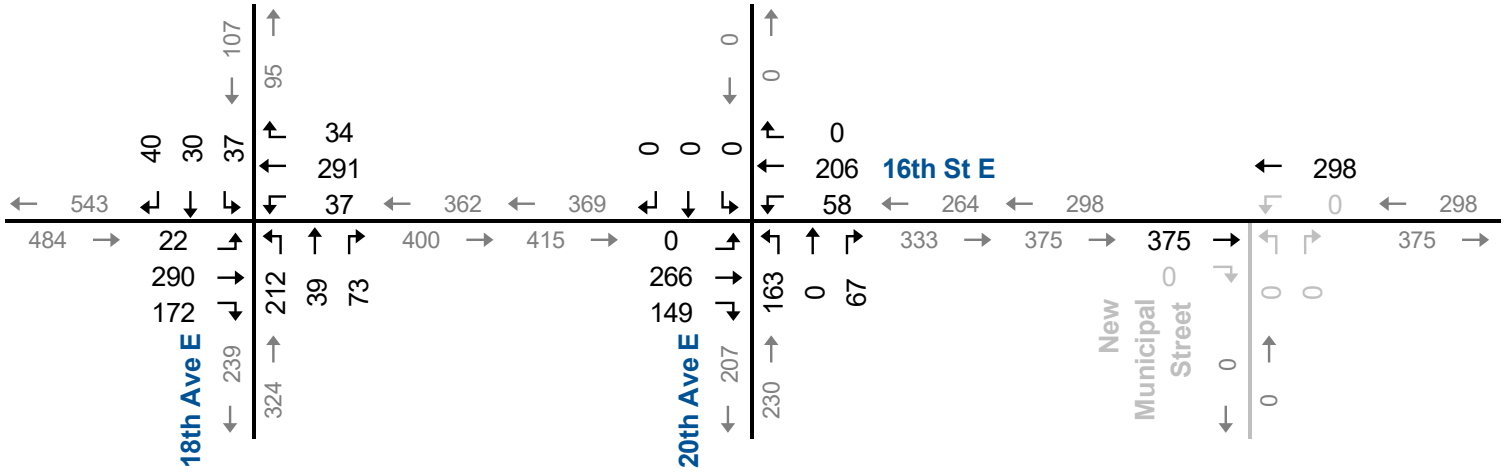
Figure 2.2

AM Peak Hour



PM Peak Hour



Existing Traffic Volumes

2275 16th Street East, Owen Sound TIS
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Figure 2.3

2.4 Traffic Operations

The level of service conditions at the study area intersections have been assessed using Synchro 11. Movements are considered critical under the following conditions:

- Volume/capacity (v/c) ratios for overall intersection operations, through movements or shared through/turning movements increased to 0.90 or above;
- v/c ratios for exclusive movements that will exceed 1.00;
- 95th percentile queue lengths for individual movements exceed the available lane storage.

Intersection level of service (LOS) is a recognized method of quantifying the average delay experienced by drivers at intersections. It is based on the delay experienced by individual vehicles executing various movements. The delay is related to the number of vehicles intending to make a particular movement, compared to the estimated capacity for that movement. The capacity is based on a number of criteria related to the opposing traffic flows and intersection geometry.

The highest possible rating is LOS A, under which the average total delay is equal to or less than 10.0 seconds per vehicle. When the average delay exceeds 80 seconds for signalized intersections, 50 seconds for unsignalized intersections or when the volume to capacity ratio is greater than 1.0, the movement is classed as LOS F and remedial measures are usually implemented, if they are feasible. LOS E is usually used as a guideline for the determination of road improvement needs on through lanes, while LOS F may be acceptable for left-turn movements at peak times, depending on delays.

Table 2.1 summarizes the results of the intersection operational analysis under existing conditions, including the AM and PM peak hour LOS, v/c ratios, and 95th percentile queues.

The results indicate that the study area intersections are operating with acceptable levels of service, and with no problem movements.

Appendix C contains the detailed Synchro 11 reports.

TABLE 2.1: EXISTING TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	18th Ave E & 16th St E	TCS	LOS	B	B	>	**B**	B	C	>	**C**	A	A	>	**A**	A	A	>	**A**	**B**
			Delay	17	20	>	**19**	18	27	>	**26**	7	6	>	**7**	7	10	>	**9**	**18**
			V/C	0.07	0.48	>		0.11	0.46	>		0.13	0.04	>		0.03	0.03	>		
			Q	7	25	>		9	29	>		14	5	>		4	4	>		
			Stor.	40	-	>		30	-	>		40	-	>		25	-	>		
			Avail.	33	-	>		21	-	>		26	-	>		21	-	>		
	20th Ave E & 16th St E	TCS	LOS		A	A	**A**	A	A		**A**	C		A	**B**					**A**
			Delay		4	2	**3**	4	4		**4**	24		10	**17**					**6**
			V/C		0.13	0.06		0.07	0.19			0.15		0.15						
			Q		15	4		6	22			12		7						
			Stor.		-	-		40	-			-		-						
			Avail.		-	-		34	-			-		-						
PM Peak Hour	18th Ave E & 16th St E	TCS	LOS	B	C	>	**C**	B	C	>	**C**	B	A	>	**A**	A	B	>	**B**	**B**
			Delay	18	26	>	**25**	19	26	>	**25**	10	7	>	**9**	10	12	>	**11**	**20**
			V/C	0.07	0.67	>		0.15	0.45	>		0.30	0.08	>		0.06	0.07	>		
			Q	8	47	>		11	40	>		34	8	>		8	7	>		
			Stor.	40	-	>		30	-	>		40	-	>		25	-	>		
			Avail.	32	-	>		19	-	>		6	-	>		17	-	>		
	20th Ave E & 16th St E	TCS	LOS		A	A	**A**	A	A		**A**	C		A	**C**					**B**
			Delay		8	2	**6**	7	7		**7**	28		7	**22**					**10**
			V/C		0.26	0.16		0.10	0.20			0.48		0.19						
			Q		32	7		9	25			38		9						
			Stor.		-	-		40	-			-		-						
			Avail.		-	-		31	-			-		-						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
Stor. - Existing Storage (m)
Avail. - Available Storage (m)
TCS - Traffic Control Signal
< / > - Shared with through movement

3 Development Concept

3.1 Development Description

The subject site is located on the south side of 16th Street East immediately east of the existing commercial plaza and west of the Grey County CP Rail Trail. The proposed development includes two commercial buildings totalling 1,200 m^2 (12,917 ft^2) GFA, one 500 m^2 (5,382 ft^2) GFA commercial-office building, a 311 m^2 (3,348 ft^2) GFA restaurant with drive-through, a 300 m^2 (3,229 ft^2) GFA restaurant and three apartment buildings accommodating a total of 120 residential units.

Vehicular access is proposed via a new municipal street connection to 16th Street East which will be shared with the commercial plaza to the west. The new municipal street will extend approximately 128 metres south of the property line at 16th Street East. Two driveways are proposed for the subject development on the municipal street.

The northerly driveway (located between Building A and Building B) is located 61 metres from the 16th Street property line and will form a tee intersection with the new municipal street.

The southerly driveway (south of Building A) will extend west into the existing commercial plaza forming a tee intersection at the southerly terminus of the new municipal street.

Figure 3.1 shows the development concept.

ZONING INFORMATION
CITY OF OWEN SOUND ZONING INFORMATION

	REGULATIONS	REQUIRED	PROPOSED
a	MINIMUM LOT FRONTAGE	30m	39.5m
b	MINIMUM LOT AREA	1500m²	1980.6m²
c	MAXIMUM LOT COVERAGE	N/A	XX
d	MINIMUM FRONT YARD SETBACK	10.0m	6.0m
e	MINIMUM REAR YARD SETBACK	2.0m	2.0m
f	MINIMUM INTERIOR SIDE YARD SETBACK	2.0m	2.0m
g	MINIMUM EXTERIOR SIDE YARD SETBACK	3.0m	3.0m
h	MAXIMUM BUILDING HEIGHT	18m	18m
i	MINIMUM GROSS FLOOR AREA	35m² PER DWELLING UNIT	N/A
j	FLOOR SPACE INDEX	N/A	N/A
k	MAXIMUM DENSITY	N/A	120 UNITS
l	MINIMUM LANDSCAPED OPEN SPACE	N/A	XX

PARKING CALCULATION

USE	BUILDING GROSS FLOOR AREA / NUMBER OF UNITS	NUMBER OF STALLS REQUIRED	NUMBER OF STALLS PROVIDED
COMMERCIAL (1 SPACE PER 28m² OF GROSS FLOOR AREA) RETAIL (1 SPACE PER 25m² OF GROSS FLOOR AREA) RESTAURANT (1 SPACE PER 9m² OF GROSS FLOOR AREA)			
BUILDING A- COMMERCIAL RETAIL	600 m²	22	24
BUILDING B- COMMERCIAL RETAIL	600 m²	22	23
BUILDING C- RESTAURANT	311 m²	35	36
BUILDING D- COMMERCIAL OFFICE	500 m²	18	23
BUILDING E	300 m²	34	34
TOTAL COMMERCIAL:		131	136
BF PARKING REQUIRED (O.S. BYLAW 5.19.1):	101-200 STALLS = 5BF	5	5
RESIDENTIAL: APARTMENT (1.25 SPACES PER DWELLING UNIT)			
BUILDING F-1	40 UNITS	50	50
BUILDING F-2	40 UNITS	50	50
BUILDING F-3	40 UNITS	50	54
TOTAL RESIDENTIAL:		150	154
BF PARKING REQUIRED (O.S. BYLAW 5.19.1):	101-150 STALLS = 5 BF	5	6
	TOTAL REQUIRED		281 CARS
	TOTAL PROVIDED		290 CARS

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Proposed Site Plan

2275 16th Street East, Owen Sound TIS
220378

Figure 3.1

3.2 Development Trip Generation

The Institute of Transportation Engineers (ITE) Trip Generation Manual[3] provides rates and equations used to estimate the peak hour traffic volumes generated by the Land Use Codes (LUC) of this development:

- LUC 221 (Multifamily Housing, Mid Rise);
- LUC 712 (Small Office Building);
- LUC 822 (Strip Retail Plaza);
- LUC 932 (High-Turnover (Sit-Down) Restaurant; and
- LUC 934 (Fast-Food Restaurant with Drive-Through Window).

The mixed-use nature of the proposed development will encourage shared trips by different land uses, and the potential internal capture has been estimated using the NCHRP 8-51 Internal Trip Capture Estimation Tool. **Appendix D** contains the NCHRP 8-51 Internal Trip Capture Estimation Tool data sheets.

The ITE provides information on average pass-by rates for land use codes. Pass-by rates for LUC 932 and LUC 934 were applied to the trips generated by the restaurant component of the proposed development. Pass-by trips were applied to the new municipal street connection to 16th Street East. Pass-by trips were assigned to this intersection based on existing eastbound and westbound volumes along 16th Street East. The pass-by rates were applied after internal capture reductions.

Table 3.1 summarizes the forecast number of net new trips generated by the proposed development.

[3] Institute of Transportation Engineers Trip Generation Manual 11th Edition, 2021.

TABLE 3.1: TRIP GENERATION

Land Use	Number of Units	GFA (1,000 ft²)	Trip Type	AM Peak Hour				PM Peak Hour			
				Rate	In	Out	Total	Rate	In	Out	Total
LUC 221 - Multifamily Housing (Mid-Rise)	120	-	Total	Eq	9	32	**41**	Eq	29	18	**47**
			Internal	15%	0	6	6	53%	16	9	25
LUC 712 - Small Office Building	-	5.38	Total	1.67	7	2	**9**	2.16	4	8	**12**
			Internal	22%	1	1	2	42%	3	2	5
LUC 822 - Strip Retail Plaza	-	12.92	Total	2.36	17	13	**30**	6.59	43	42	**85**
			Internal	10%	1	2	3	61%	28	24	52
LUC 932 - High-Turnover (Sit-Down) Restaurant	-	3.23	Total	9.57	17	14	**31**	9.05	18	11	**29**
			Internal	16%	4	1	5	69%	7	13	20
			Pass-by	0%	0	0	0	43%	2	2	4
LUC 934 - Fast-Food Restaurant with Drive-Through Window	-	3.35	Total	44.61	76	73	**149**	33.03	58	53	**111**
			Internal	4%	5	1	6	22%	9	15	24
			Pass-by	50%	36	36	72	55%	24	24	48
Total Trip Generation					**126**	**134**	**260**		**152**	**132**	**284**
Total Internal Capture				*8%*	*11*	*11*	*22*	*44%*	*63*	*63*	*126*
Total Pass-By					*36*	*36*	*72*		*26*	*26*	*52*
Net Trip Generation					**79**	**87**	**166**		**63**	**43**	**106**

LUC 221 - AM: T = 0.44(X) - 11.61 | PM: T = 0.39(X) + 0.34

3.3 Development Trip Distribution and Assignment

The trip distribution was determined based on existing travel patterns within the study area. **Table 3.2** displays the breakdown of trip distributions used in this study.

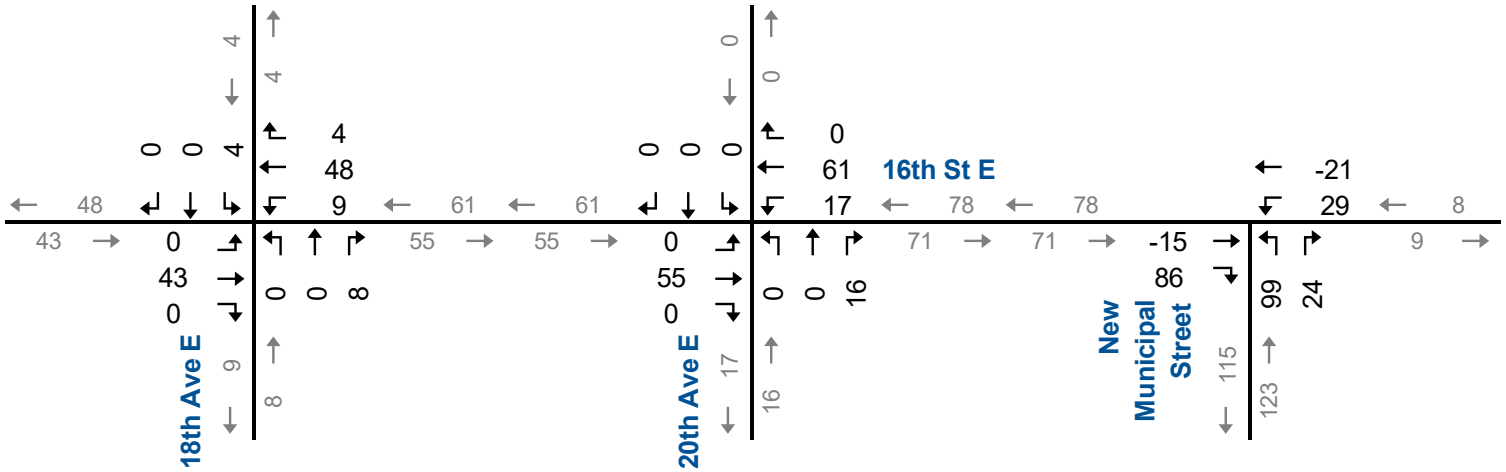
TABLE 3.2: ESTIMATED TRIP DISTRIBUTION

Origin/Destination	Percentage
North via 20th Ave E	0%
North via 18th Ave E	5%
South via 20th Ave E	20%
South via 18th Ave E	10%
East via 16th St E	10%
West via 16th St E	55%
Total	**100%**

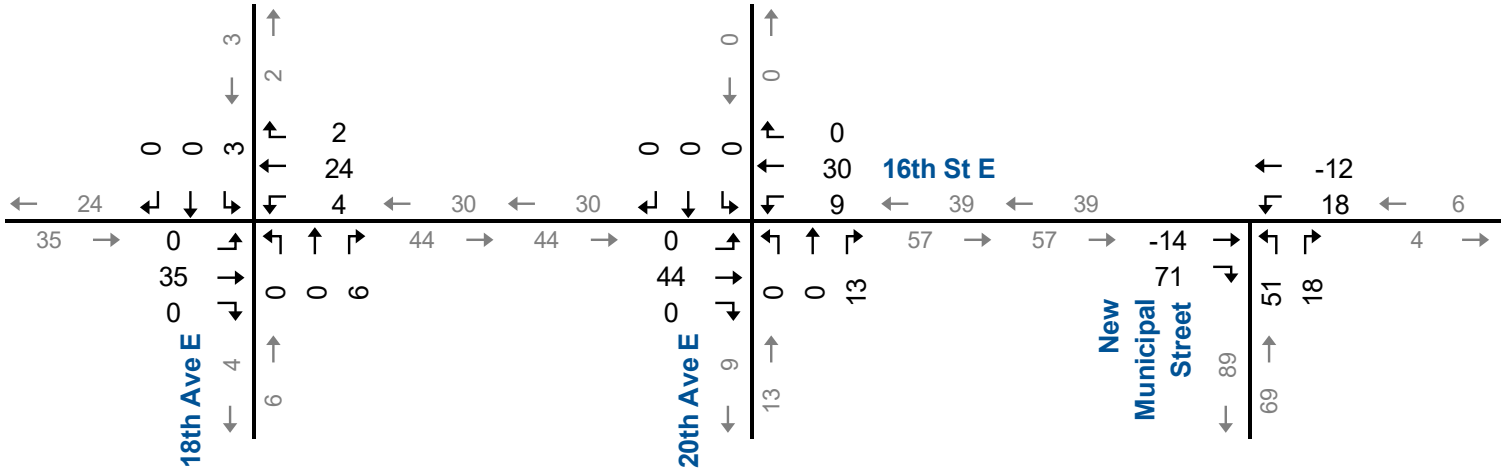
Figure 3.2 illustrates the site-generated traffic volumes for the AM and PM peak hours. **Appendix D** contains the net site-generated traffic volumes and pass-by trips.

It is noted that trips generated by the subject site have been assigned to the future 20th Avenue East Extension, which is not currently in place. Even if the subject development were to be completed, partially or in full, prior to the extension, the resulting development traffic can be accommodated by other study area intersections.

AM Peak Hour



PM Peak Hour



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Site Generated Traffic Volumes

2275 16th Street East, Owen Sound TIS
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Figure 3.2

4 Evaluation of Future Traffic Conditions

The assessment of future traffic conditions in this section includes estimates of future background and total traffic volumes, and the analyses for the 2027 horizon.

4.1 Background Traffic Forecasts

To derive the 2027 generalized background traffic volumes, a growth rate of 1% was applied to the existing roadway traffic volumes. This growth rate was confirmed with the City during the pre-study consultation.

4.1.1 Other Area Developments

The following other area developments have been included in the background traffic volumes:

- **1960 16th Street East** is a commercial development located in the northwest corner of 16th Street East and the 20th Avenue East extension. The proposed development includes 14,894 ft^2 of commercial uses and 6,903 ft^2 of fast-food restaurant with drive-through. A TIS completed in October 2021[4] indicates that the development is estimated to generate 196 AM peak hour trips and 292 PM peak hour trips.
- **Heritage Grove Centre**, located at 2125 16th Street East**,** is a commercial development located immediately west of the subject site and will share the new municipal street connection to 16th Street East. A TIS was completed in April 2019[5], however, the development has since progressed with a few buildings yet to be developed. A total of 90,850 ft^2 GFA remains including a 35,000 ft^2 grocery store and two retail buildings totalling 55,850 ft^2. The remaining development is estimated to generate 197 AM peak hour trips and 411 PM peak hour trips. The trip distribution used in the April 2019 TIS was based on an earlier development plan including a hotel and gas station. The trip distribution has been updated to reflect the proposed uses and location within the development. **Appendix E** contains the trip generation estimates and updated development plan.
- **Telfer Creek Subdivision** is a mixed-use development located between 8th Street East and 16th Street East, immediately east

[4] 1960 16th Street East Traffic Impact Study. Prepared by Tatham Engineering, October 2021.
[5] 2125 16th Street East (Heritage Grove) Commercial Development. Prepared by C.F. Crozier & Associates Inc., April 2019.

of the hospital lands. The development includes 330 residential units and 15,000 ft^2 of commercial uses. A TIS completed in July 2019[6] indicates that the development is estimated to generate 185 AM peak hour trips and 345 PM peak hour trips.

Figure 4.1 illustrates the location of the other area developments.

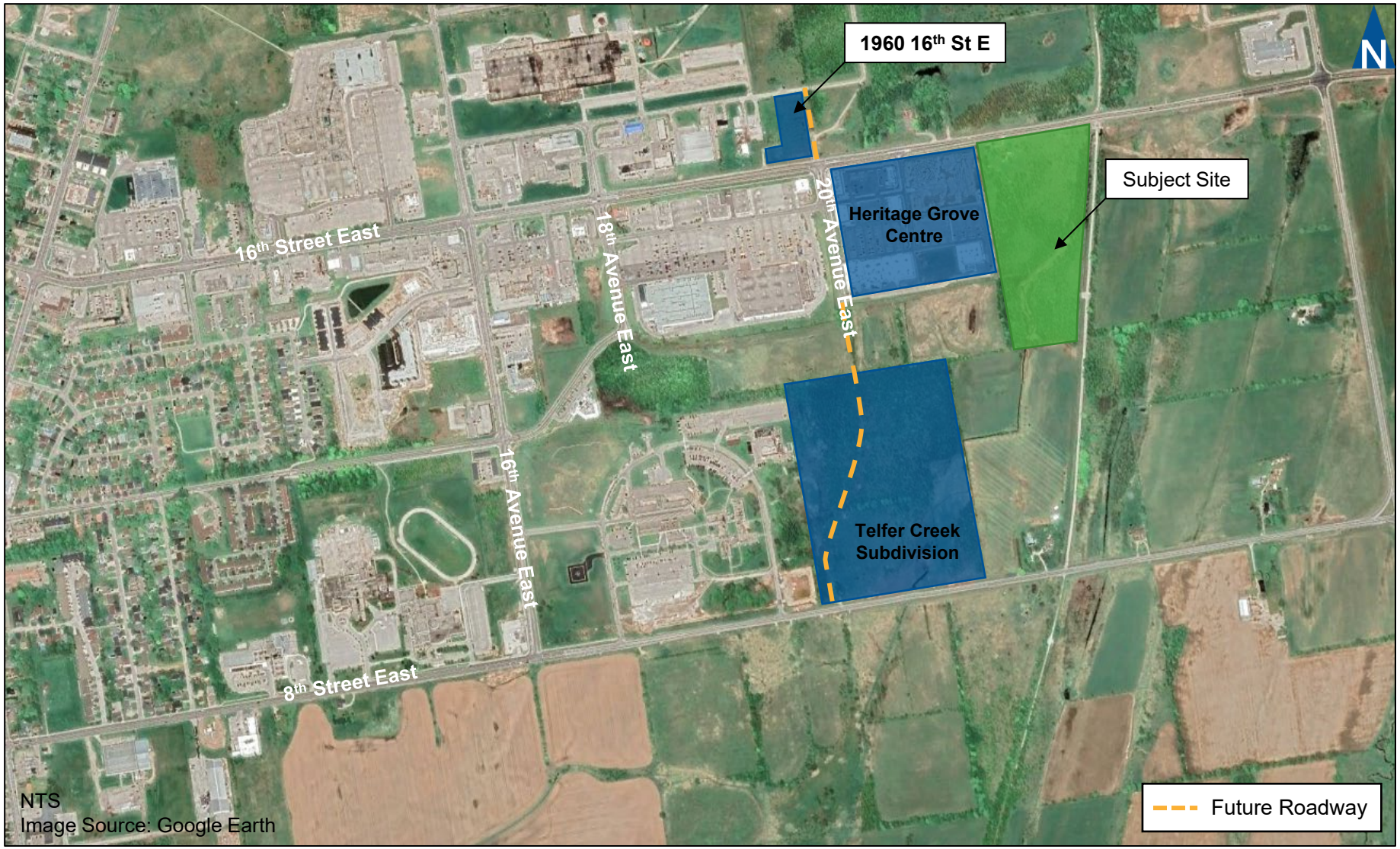
Appendix E contains the other area development traffic volumes.

The City also provided reports for the Redhawk Subdivision and the development at 1300 16th Avenue East. These developments have not been included in the background traffic volumes as there would be minimal impacts due to these developments at the study area intersections.

4.1.2 Network Improvements

During pre-study consultation, the City indicated that 20th Avenue East would be extended north to 17th Street East and south to 8th Street East.

[6] Telfer Creek Subdivision Traffic Update Memo. Prepared by C.F. Crozier & Associates Inc., July 2019.



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Other Area Development Locations

2275 16th Street East, Owen Sound TIS
220378

Figure 4.1

4.2 2027 Background Traffic Operations

Figure 4.2 illustrates the 2027 background traffic volumes, including road traffic growth and other area development traffic.

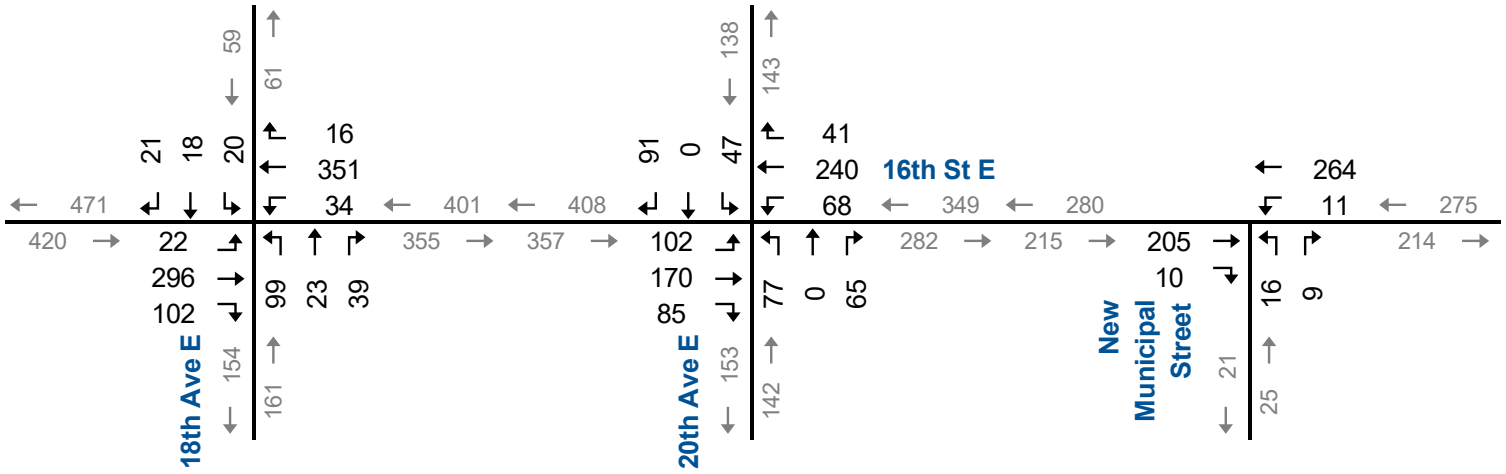
The new municipal street connection to 16th Street East has been analyzed under background traffic conditions as the adjacent property to the west will share access to this street. The intersection has been analyzed under stop sign control with an auxiliary westbound left-turn lane.

The 2027 background traffic volumes have been analyzed using the same methodology as under existing traffic conditions. Signal timings have not been optimized.

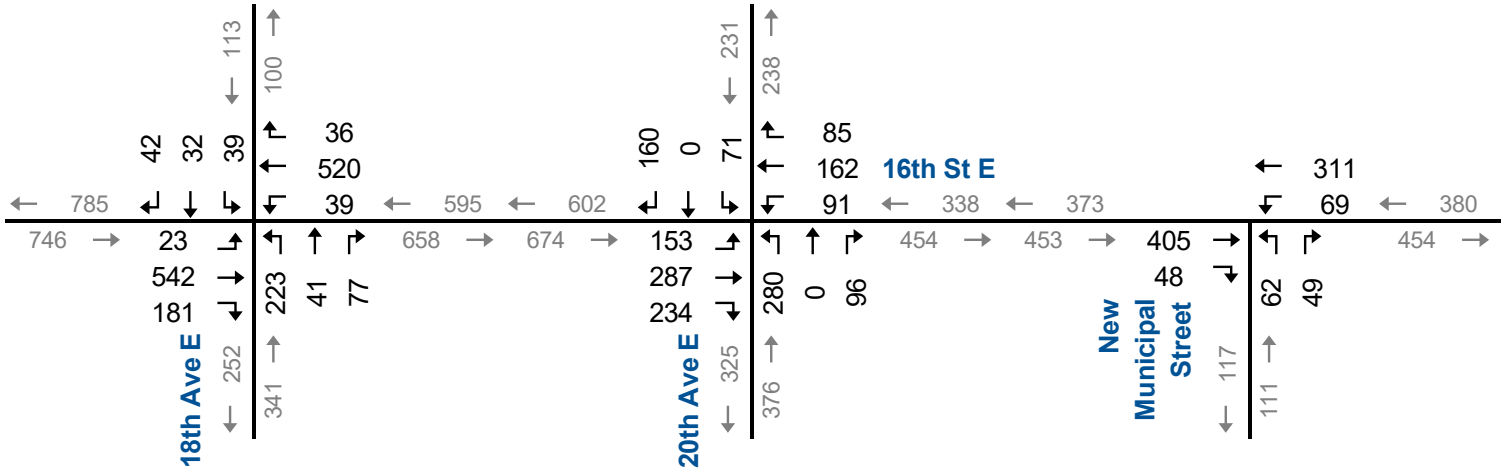
Table 4.1 summarizes the results of the 2027 background traffic operations. The results indicate that the study area intersections are forecast to operate with acceptable levels of service during the AM and PM peak hours, except for the northbound left-turn movement at the intersection of 18th Avenue East and 16th Street East which is forecast to operate with 95th percentile queues exceeding the available storage of 40 metres by 2 metres during the PM peak hour.

Appendix F contains the supporting detailed Synchro 11 reports.

AM Peak Hour



PM Peak Hour



paradigm TRANSPORTATION SOLUTIONS LIMITED

2027 Background Traffic Volumes

2275 16th Street East, Owen Sound TIS
220378

Figure 4.2

TABLE 4.1: 2027 BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	18th Ave E & 16th St E	TCS	LOS	B	C	>	C	B	C	>	C	A	A	>	A	A	B	>	B	C
			Delay	16	27	>	26	17	26	>	25	9	8	>	9	9	11	>	11	22
			V/C	0.07	0.62	>		0.12	0.51	>		0.15	0.04	>		0.04	0.03	>		
			Q	7	43	>		10	43	>		16	5	>		5	5	>		
			Stor.	40	-	>		30	-	>		40	-	>		25	-	>		
			Avail.	33	-	>		20	-	>		24	-	>		20	-	>		
	20th Ave E & 16th St E	TCS	LOS	A	A	>	A	A	A	>	A	C	A	>	B	C	A	>	A	A
			Delay	6	4	>	5	6	6	>	6	28	0	>	15	24	0	>	9	7
			V/C	0.15	0.12	>		0.10	0.25	>		0.37	0.09	>		0.20	0.14	>		
			Q	13	10	>		9	30	>		21	0	>		14	0	>		
			Stor.	40	-	>		40	-	>		-	-	>		-	-	>		
			Avail.	27	-	>		31	-	>		-	-	>		-	-	>		
	New Municipal Street & 16th St E	TWSC	LOS		A	>	A	A	A		A	B		A	B					
			Delay		0	>	0	8	0		0	12		10	11					
			V/C		0.00	>		0.01	0.00			0.04		0.01						
			Q		0	>		0	0			1		0						
			Stor.		-	>		25	-			-		-						
			Avail.		-	>		25	-			-		-						
PM Peak Hour	18th Ave E & 16th St E	TCS	LOS	B	C	>	C	B	C	>	C	B	A	>	B	B	B	>	B	C
			Delay	17	34	>	33	19	27	>	27	14	9	>	12	13	14	>	14	26
			V/C	0.09	0.80	>		0.19	0.57	>		0.35	0.09	>		0.07	0.08	>		
			Q	8	93	>		12	71	>		42	9	>		10	9	>		
			Stor.	40	-	>		30	-	>		40	-	>		25	-	>		
			Avail.	32	-	>		18	-	>		-2	-	>		15	-	>		
	20th Ave E & 16th St E	TCS	LOS	B	A	>	A	B	B	>	B	D	A	>	C	B	A	>	A	B
			Delay	15	7	>	9	15	12	>	13	38	0	>	28	19	0	>	6	14
			V/C	0.29	0.31	>		0.24	0.29	>		0.77	0.14	>		0.18	0.18	>		
			Q	34	28	>		22	42	>		72	0	>		18	0	>		
			Stor.	40	-	>		40	-	>		-	-	>		-	-	>		
			Avail.	6	-	>		18	-	>		-	-	>		-	-	>		
	New Municipal Street & 16th St E	TWSC	LOS		A	>	A	A	A		A	C		B	C					
			Delay		0	>	0	9	0		2	23		12	18					
			V/C		0.00	>		0.07	0.00			0.25		0.09						
			Q		0	>		2	0			8		2						
			Stor.		-	>		25	-			-		-						
			Avail.		-	>		23	-			-		-						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
Stor. - Existing Storage (m)
Avail. - Available Storage (m)
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
< / > - Shared with through movement

4.3 2027 Total Traffic Operations

Figure 4.3 illustrates the 2027 total traffic volumes, including trips generated by the proposed development.

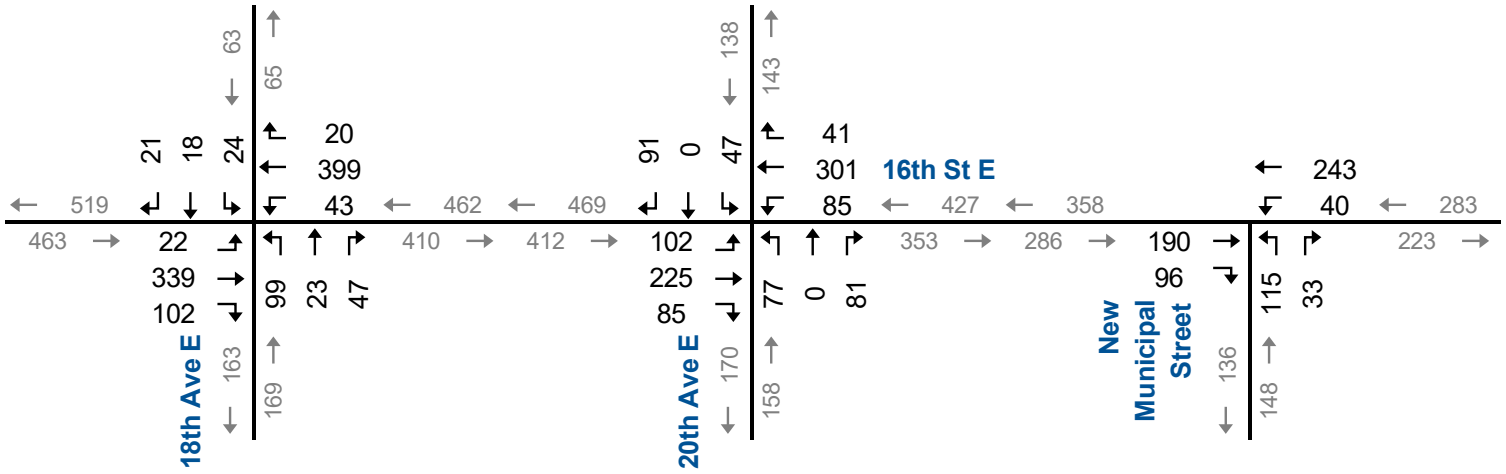
The 2027 total traffic volumes have been analyzed using the same methodology as under existing and background traffic conditions. Signal timings have not been optimized.

Table 4.2 summarizes the results of the 2027 total traffic operations. The results indicate that the study area intersections are forecast to operate with the same critical movement as under 2027 background traffic conditions. The northbound left-turn movement at the New Municipal Street intersection on 16th Street East is forecast to operate with LOS D during the PM peak hour; however, v/c ratios are low during both the AM and PM peak hours.

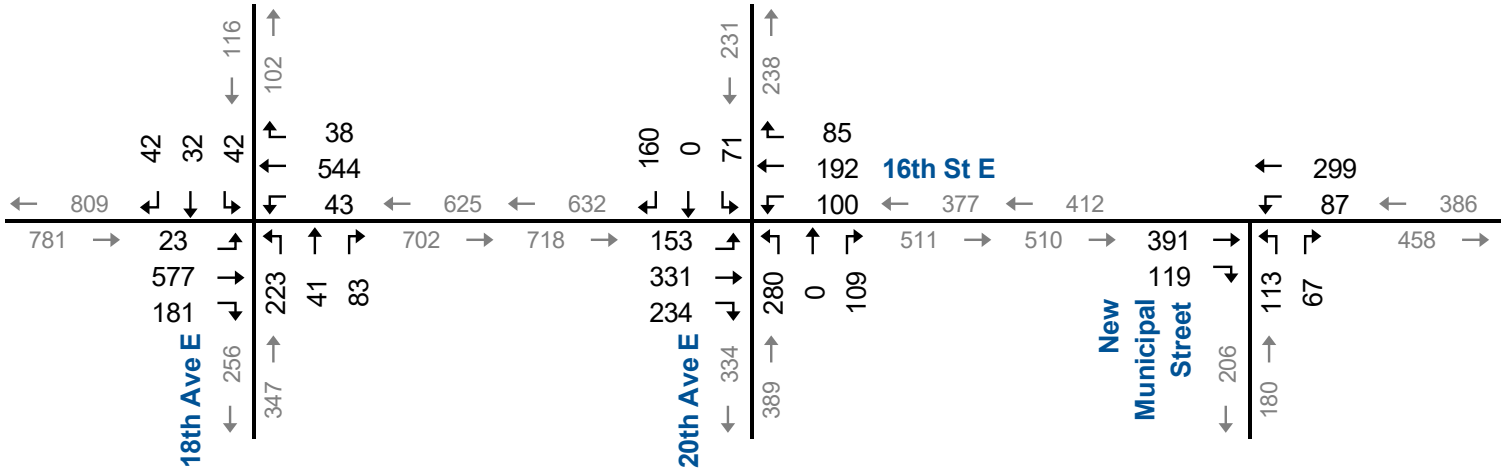
The northerly internal driveway located between Building A and Building B is 61 metres from 16th Street East. The northbound left-turn movement at the New Municipal Street is forecast to operate with 95th percentile queues of 8 metres during the AM peak hour and 20 metres during the PM peak hour. Therefore, northbound queues are not expected to block the internal driveway.

Appendix G contains the supporting detailed Synchro 11 reports.

AM Peak Hour



PM Peak Hour



paradigm TRANSPORTATION SOLUTIONS LIMITED

2027 Total Traffic Volumes

2275 16th Street East, Owen Sound TIS
220378

Figure 4.3

TABLE 4.2: 2027 TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	18th Ave E & 16th St E	TCS	LOS	B	C	>	C	B	C	>	C	A	A	>	A	A	B	>	B	C
			Delay	16	28	>	27	17	26	>	25	10	8	>	9	10	12	>	11	23
			V/C	0.07	0.65	>		0.15	0.56	>		0.15	0.05	>		0.04	0.03	>		
			Q	7	49	>		11	49	>		17	6	>		6	5	>		
			Stor.	40	-	>		30	-	>		40	-	>		25	-	>		
			Avail.	33	-	>		19	-	>		23	-	>		19	-	>		
	20th Ave E & 16th St E	TCS	LOS	A	A	>	A	A	A	>	A	C	A	>	B	C	A	>	A	A
			Delay	7	4	>	5	6	7	>	7	28	0	>	14	24	0	>	9	7
			V/C	0.16	0.15	>		0.13	0.30	>		0.37	0.12	>		0.21	0.15	>		
			Q	14	13	>		11	38	>		21	0	>		14	0	>		
			Stor.	40	-	>		40	-	>		-	-	>		-	-	>		
			Avail.	26	-	>		29	-	>		-	-	>		-	-	>		
	New Municipal Street & 16th St E	TWSC	LOS		A	>	A	A	A		A	C		A	B					
			Delay		0	>	0	8	0		1	16		10	15					
			V/C		0.00	>		0.04	0.00			0.28		0.05						
			Q		0	>		1	0			8		1						
			Stor.		-	>		25	-			-		-						
			Avail.		-	>		24	-			-		-						
PM Peak Hour	18th Ave E & 16th St E	TCS	LOS	B	C	>	C	B	C	>	C	B	A	>	B	B	B	>	B	C
			Delay	17	35	>	34	19	27	>	27	14	8	>	12	13	14	>	14	26
			V/C	0.09	0.82	>		0.22	0.58	>		0.35	0.10	>		0.08	0.08	>		
			Q	8	99	>		12	75	>		42	9	>		10	9	>		
			Stor.	40	-	>		30	-	>		40	-	>		25	-	>		
			Avail.	32	-	>		18	-	>		-2	-	>		15	-	>		
	20th Ave E & 16th St E	TCS	LOS	B	A	>	A	B	B	>	B	D	A	>	C	B	A	>	A	B
			Delay	15	8	>	9	16	13	>	14	38	0	>	27	19	0	>	6	14
			V/C	0.30	0.34	>		0.29	0.32	>		0.77	0.17	>		0.18	0.19	>		
			Q	34	32	>		25	49	>		72	0	>		18	0	>		
			Stor.	40	-	>		40	-	>		-	-	>		-	-	>		
			Avail.	6	-	>		15	-	>		-	-	>		-	-	>		
	New Municipal Street & 16th St E	TWSC	LOS		A	>	A	A	A		A	D		B	D					
			Delay		0	>	0	9	0		2	34		12	26					
			V/C		0.00	>		0.09	0.00			0.51		0.13						
			Q		0	>		2	0			20		3						
			Stor.		-	>		25	-			-		-						
			Avail.		-	>		23	-			-		-						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
Stor. - Existing Storage (m)
Avail. - Available Storage (m)
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
< / > - Shared with through movement

4.4 New Municipal Street Intersection at 16th Street East

As noted previously, the new municipal street connection to 16th Street East has been reviewed under 2027 background and total traffic conditions. Stop control was assumed for the new intersection with a westbound left-turn lane and separated left/right-turn lanes on the northbound approach.

4.4.1 Signal Warrants

The new intersection was assessed using the Ontario Traffic Manual (OTM) signal warrant guidelines[7] to determine if traffic signal control is warranted. Based on the warrant analysis, traffic signal control is not warranted under both forecast 2027 background and total traffic conditions. **Appendix H** contains the warrant worksheets.

4.4.2 Westbound Left-Turn Lane

Under stop-control, the need for a westbound left-turn lane has been assessed using the Ministry of Transportation Design Supplement for the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads[8].

The warrant was calculated using the nomographs for left-turn lanes on a two-lane undivided highway at an unsignalized intersection with a design speed of 100 km/h (20 km/h over the posted speed limit). Based on this criterion, a westbound left-turn lane with 25 metres of storage is warranted under 2027 background and total traffic conditions.

Appendix H contains the left-turn lane warrant nomographs.

4.4.3 Eastbound Right-Turn Lane

The TAC Geometric Design Guide for Canadian Roads[9] indicates that a right-turn lane may be considered at an unsignalized intersection when the volume of turning vehicles compared to the through traffic volume causes undue hazard. However, no potential traffic hazards are anticipated for the eastbound through and right-turn movements based on the results of the intersection operational analysis under 2027 total traffic conditions (**Table 4.2**). The results indicate that the

[7] Ontario Traffic Manual Book 12 – Traffic Signals
[8] *MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads*, June 2017.
[9] *TAC Geometric Design Guide for Canadian Roads*, June 2017.

combined eastbound through and right-turn movements register LOS A with no delays for the AM and PM peak hours.

5 Conclusions and Recommendations

5.1 Conclusions

Based on the investigations carried out, it is concluded that:

- **Existing Traffic Conditions:** The study area intersections are operating with acceptable levels of service.
- **Development Trip Generation:** The development is forecast to generate 166 and 106 trips during the AM and PM peak hours, respectively.
- **2027 Background Traffic Conditions:** The study area intersections are forecast to operate with acceptable levels of service, except for the northbound left-turn movement at the intersection of 18th Avenue East and 16th Street East which is forecast to operate with 95th percentile queues exceeding the available storage of 40 metres by 2 metres during the PM peak hour.
- **2027 Total Traffic Conditions:** The study area intersections are forecast to operate with the same critical movement as under 2027 background traffic conditions. The northbound left-turn movement at the New Municipal Street intersection on 16th Street East is forecast to operate with LOS D during the PM peak hour; however, v/c ratios are low during both the AM and PM peak hours.
- **New Municipal Street on 16th Street East:**
  - The new municipal street connection to 16th Street East has been analyzed under stop control on the northbound approach.
  - Traffic signal control is not warranted under both 2027 background and total traffic conditions.
  - Under stop control, a westbound left-turn lane with 25 metres of storage is warranted under both 2027 background and total traffic conditions.
  - The northbound left-turn queues were assessed relative to the driveway locations on the New Municipal Street. The closest northerly driveway is located 61 metres south of 16th Street East. The projected 95th percentile queue lengths under 2027 total traffic conditions, are 8 metres during the AM peak hour, and 20 metres during the PM peak hour. Therefore, the internal driveway will not be impacted by northbound left-turn queues at 16th Street East.

5.2 Recommendations

Based on the findings and conclusions of this study, it is recommended that the development be considered for approval as proposed.

Appendix A

Pre-Study Consultation

Maddison Murch

From: Dana Goetz <dgoetz@owensound.ca>
Sent: August 9, 2022 10:41 AM
To: Maddison Murch
Cc: Rajan Philips; Peter Paquette
Subject: RE: (220378) 2275 16th Street East, Owen Sound TIA Pre-Study Consultation

Yes, summer counts are acceptable.

Dana M. Goetz, C.E.T.
Engineering Technologist III
ENGINEERING SERVICES DIVISION
PUBLIC WORKS & ENGINEERING DEPARTMENT
CITY OF OWEN SOUND
808 2nd Avenue East, Owen Sound, ON N4K 2H4
Telephone: [519] 376-4440 ext. 3308 | Fax: [519] 372-1209

Please visit the City's website (www.owensound.ca) for information on how to access City services.

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From: Maddison Murch <mmurch@ptsl.com>
Sent: August 9, 2022 10:30 AM
To: Dana Goetz <dgoetz@owensound.ca>
Cc: Rajan Philips <rphilips@ptsl.com>
Subject: RE: (220378) 2275 16th Street East, Owen Sound TIA Pre-Study Consultation

Thanks Dana. Is the City accepting summer counts?

Regards,

Maddison Murch, EIT
Transportation Consultant

Paradigm Transportation Solutions Limited
p: 519.896.3163 x205
e: mmurch@ptsl.com

**** Paradigm is now operating on a 4-day workweek. Our offices are closed Fridays. ****

From: Dana Goetz <dgoetz@owensound.ca>
Sent: August 8, 2022 4:11 PM
To: Maddison Murch <mmurch@ptsl.com>
Cc: Peter Paquette <ppaquette@owensound.ca>
Subject: FW: (220378) 2275 16th Street East, Owen Sound TIA Pre-Study Consultation

We don't have anything from those intersections. However, I have included the recent counts from the 16th St E/16th Ave E intersection.

Please contact Peter Paquette if you need anything else in this regard

Dana M. Goetz, C.E.T.
Engineering Technologist III
ENGINEERING SERVICES DIVISION
PUBLIC WORKS & ENGINEERING DEPARTMENT
CITY OF OWEN SOUND
808 2nd Avenue East, Owen Sound, ON N4K 2H4
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Please visit the City's website (www.owensound.ca) for information on how to access City services.

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From: Maddison Murch <mmurch@ptsl.com>
Sent: August 8, 2022 12:46 PM
To: Dana Goetz <dgoetz@owensound.ca>
Cc: Rajan Philips <rphilips@ptsl.com>
Subject: RE: (220378) 2275 16th Street East, Owen Sound TIA Pre-Study Consultation

Hi Dana,

Does the City happen to have recent counts at the intersections of 18th Ave E/16th St E and 20th Ave E/16th St E?

Thanks,

Maddison Murch, EIT
Transportation Consultant

Paradigm Transportation Solutions Limited
p: 519.896.3163 x205

e: mmurch@ptsl.com

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From: Dana Goetz <dgoetz@owensound.ca>
Sent: August 8, 2022 9:14 AM
To: Maddison Murch <mmurch@ptsl.com>
Cc: Rajan Philips <rphilips@ptsl.com>; mdewan@exquisitedevelopers.ca; Matt.Marck@grey.ca
Subject: RE: (220378) 2275 16th Street East, Owen Sound TIA Pre-Study Consultation

Hi Maddison;

I will attached the relevant TIS in separate subsequent e-mails

The scope is acceptable with the revisions noted in red below.

Thank you for your patience

Dana M. Goetz, C.E.T.
Engineering Technologist III
ENGINEERING SERVICES DIVISION
PUBLIC WORKS & ENGINEERING DEPARTMENT
CITY OF OWEN SOUND
808 2nd Avenue East, Owen Sound, ON N4K 2H4
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Please visit the City's website (www.owensound.ca) for information on how to access City services.

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From: Maddison Murch <mmurch@ptsl.com>
Sent: July 21, 2022 8:35 AM
To: Chris Webb <cwebb@owensound.ca>
Cc: Rajan Philips <rphilips@ptsl.com>; mdewan@exquisitedevelopers.ca; Matt.Marck@grey.ca; Dana Goetz <dgoetz@owensound.ca>
Subject: RE: (220378) 2275 16th Street East, Owen Sound TIA Pre-Study Consultation

Hi Chris,

We have been retained to complete a TIA for the proposed mixed-use development located at 2275 16th Street East in the City of Owen Sound. We sent the below scope of work to Dana at the City and Matt at the County. We have been advised to send this to you as well. Please review and let us know if you have any comments or questions on the proposed scope of work.

Regards,

Maddison Murch, EIT
Transportation Consultant

Paradigm Transportation Solutions Limited
p: 519.896.3163 x205
e: mmurch@ptsl.com

**** Paradigm is now operating on a 4-day workweek. Our offices are closed Fridays. ****

From: Maddison Murch
Sent: July 11, 2022 12:13 PM
To: Dana Goetz <dgoetz@owensound.ca>; Matt Marck <Matt.Marck@grey.ca>
Cc: Rajan Philips <rphilips@ptsl.com>; mdewan@exquisitedevelopers.ca
Subject: RE: (220378) 2275 16th Street East, Owen Sound TIA Pre-Study Consultation

Hi Dana and Matt,

I am following up on the scope of work email sent on June 29 (see below). Please let us know if you have any comments or questions.

Regards,

Maddison Murch, EIT
Transportation Consultant

Paradigm Transportation Solutions Limited
p: 519.896.3163 x205
e: mmurch@ptsl.com

**** Paradigm is now operating on a 4-day workweek. Our offices are closed Fridays. ****

From: Maddison Murch
Sent: June 29, 2022 11:48 AM
To: Dana Goetz <dgoetz@owensound.ca>; Matt Marck <Matt.Marck@grey.ca>
Cc: Rajan Philips <rphilips@ptsl.com>; mdewan@exquisitedevelopers.ca
Subject: (220378) 2275 16th Street East, Owen Sound TIA Pre-Study Consultation

Hi Dana and Matt,

Paradigm has been retained to complete a Transportation Impact Assessment (TIA) for the proposed mixed-use development located at 2275 16th Street East in the City of Owen Sound. The proposed development consists of three commercial buildings accommodating 2,445 m^2 GFA and three apartment buildings accommodating 114 units (38 units in each building). Vehicular access is proposed via a new municipal road connection to 16th Street East, located immediately east of the existing commercial development.

A preliminary site plan is attached.

We have prepared the following scope of work for the TIA, for review/approval:

- Weekday AM and PM peak hours of adjacent roads for analysis.
- Study area to include the future intersection of the new municipal road connection onto 16th Street East. **Traffic counts at the intersection of 16th Street East and 28th Avenue East collected by Paradigm in June 2022 will be used.**
- Horizon Year: Five years from TIS submission (2027).
- Background Growth Rate: 1% per annum as per the Grey County Official Plan. **Please confirm.**
- Background Developments: **Please confirm and provide corresponding TIS reports or site statistics.**
- Background roadway improvements: **Please confirm.**
- Trip Generation: ITE Trip Generation Manual 11th Edition.
- Trip Distribution: Existing traffic patterns.
- TIA Guidelines: City of Owen Sound Municipal Engineering Design Standards.

Please let us know if you have any comments or questions.

Regards,

Maddison Murch, EIT
Transportation Consultant

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road, Cambridge ON N1R 8J8
p: 519.896.3163 x205
e: mmurch@ptsl.com
w: www.ptsl.com

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Maddison Murch

From: Dana Goetz <dgoetz@owensound.ca>
Sent: August 8, 2022 9:22 AM
To: Maddison Murch
Subject: TIS

Sorry about that. Here they are:

We have prepared the following scope of work for the TIA, for review/approval:

- *Weekday AM and PM peak hours of adjacent roads for analysis including the 18th Ave E/16th St E and 20th Ave E/16th St E. intersections*
- *Study area to include the future intersection of the new municipal road connection onto 16th Street East.* ***Traffic counts at the intersection of 16th Street East and 28th Avenue East collected by Paradigm in June 2022 will be used.***
- *Horizon Year: Five years from TIS submission (2027).*
- *Background Growth Rate: 1% per annum as per the Grey County Official Plan.* ***Please confirm.***
- *Background Developments:* ***Please confirm and provide corresponding TIS reports or site statistics.***
- *Background roadway improvements:* ***Extension of 20th Avenue East south to 8th Street East and north to 17th Street East***
- *Trip Generation: ITE Trip Generation Manual 11th Edition.*
- *Trip Distribution: Existing traffic patterns.*
- *TIA Guidelines: City of Owen Sound Municipal Engineering Design Standards.*

Dana M. Goetz, C.E.T.
Engineering Technologist III
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Appendix B

Existing Traffic Data

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: 18th Avenue E & 16th Street E
Site Code: 220378
Start Date: 08/23/2022

Turning Movement Data

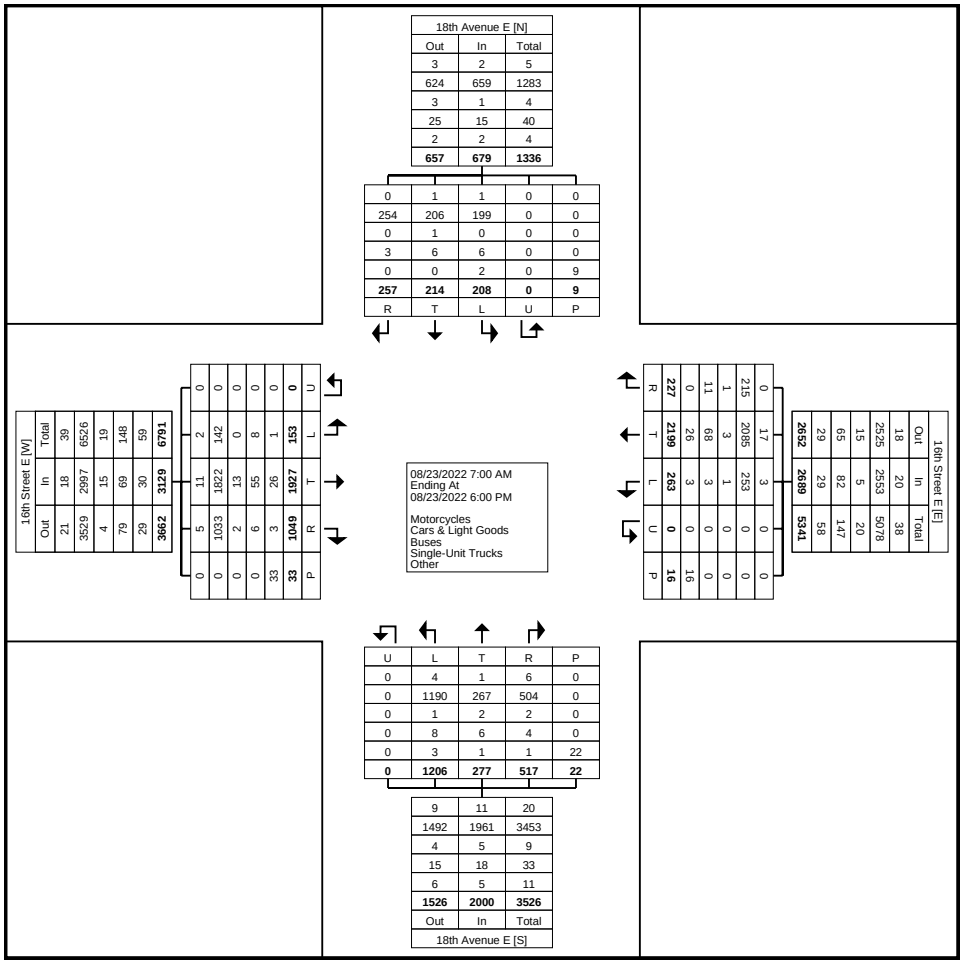
Start Time	16th Street E Eastbound						16th Street E Westbound						18th Avenue E Northbound						18th Avenue E Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	3	33	6	0	0	42	1	32	2	0	0	35	5	5	9	0	0	19	0	2	1	0	0	3	99
7:15 AM	1	37	1	0	1	39	3	39	2	0	0	44	4	1	9	0	0	14	1	2	1	0	0	4	101
7:30 AM	1	30	7	0	1	38	3	54	3	0	0	60	6	3	14	0	1	23	1	6	1	0	0	8	129
7:45 AM	5	29	11	0	0	45	2	42	4	0	0	48	14	10	15	0	0	39	0	2	2	0	0	4	136
Hourly Total	10	129	25	0	2	164	9	167	11	0	0	187	29	19	47	0	1	95	2	12	5	0	0	19	465
8:00 AM	3	33	14	0	2	50	4	50	3	0	0	57	10	5	11	0	0	26	2	0	1	0	0	3	136
8:15 AM	7	43	17	0	0	67	4	43	7	0	0	54	12	6	16	0	0	34	3	2	5	0	0	10	165
8:30 AM	1	38	17	0	0	56	6	48	10	0	0	64	14	4	8	0	0	26	0	1	5	0	0	6	152
8:45 AM	4	37	22	0	0	63	8	65	8	0	1	81	15	4	14	0	0	33	6	6	3	0	0	15	192
Hourly Total	15	151	70	0	2	236	22	206	28	0	1	256	51	19	49	0	0	119	11	9	14	0	0	34	645
9:00 AM	3	43	20	0	1	66	5	50	4	0	0	59	26	4	10	0	0	40	2	5	4	0	0	11	176
9:15 AM	5	53	17	0	0	75	8	48	2	0	0	58	18	4	8	0	1	30	8	4	6	0	0	18	181
9:30 AM	5	44	17	0	3	66	9	74	3	0	0	86	28	7	9	0	0	44	4	3	5	0	0	12	208
9:45 AM	8	41	43	0	0	92	10	56	6	0	1	72	22	7	10	0	0	39	5	5	5	0	0	15	218
Hourly Total	21	181	97	0	4	299	32	228	15	0	1	275	94	22	37	0	1	153	19	17	20	0	0	56	783
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	9	75	51	0	1	135	6	77	10	0	0	93	48	15	19	0	2	82	13	13	12	0	0	38	348
11:45 AM	8	79	33	0	2	120	16	79	13	0	2	108	47	14	17	0	0	78	8	10	18	0	0	36	342
Hourly Total	17	154	84	0	3	255	22	156	23	0	2	201	95	29	36	0	2	160	21	23	30	0	0	74	690
12:00 PM	9	68	53	0	1	130	12	95	14	0	0	121	56	17	24	0	0	97	15	11	13	0	0	39	387
12:15 PM	11	69	44	0	1	124	7	79	7	0	0	93	61	18	22	0	0	101	8	7	7	0	0	22	340
12:30 PM	5	92	72	0	1	169	16	116	15	0	0	147	69	12	16	0	1	97	13	10	15	0	0	38	451
12:45 PM	7	91	48	0	1	146	12	94	18	0	1	124	71	15	25	0	1	111	5	10	9	0	1	24	405
Hourly Total	32	320	217	0	4	569	47	384	54	0	1	485	257	62	87	0	2	406	41	38	44	0	1	123	1583
1:00 PM	6	63	30	0	6	99	17	78	12	0	0	107	66	10	27	0	0	103	9	8	15	0	2	32	341
1:15 PM	5	100	40	0	0	145	10	98	12	0	2	120	55	10	18	0	1	83	12	7	10	0	1	29	377
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	11	163	70	0	6	244	27	176	24	0	2	227	121	20	45	0	1	186	21	15	25	0	3	61	718
3:00 PM	6	68	47	0	1	121	8	65	17	0	1	90	56	9	20	0	0	85	8	8	11	0	0	27	323
3:15 PM	3	77	38	0	2	118	7	75	4	0	4	86	58	9	14	0	2	81	10	7	10	0	2	27	312
3:30 PM	4	75	49	0	0	128	11	74	9	0	0	94	48	10	22	0	1	80	11	9	9	0	0	29	331
3:45 PM	9	70	38	0	0	117	11	77	4	0	1	92	50	11	17	0	2	78	8	6	10	0	1	24	311
Hourly Total	22	290	172	0	3	484	37	291	34	0	6	362	212	39	73	0	5	324	37	30	40	0	3	107	1277
4:00 PM	9	70	43	0	3	122	6	74	8	0	2	88	43	6	22	0	2	71	10	11	15	0	2	36	317
4:15 PM	5	56	46	0	1	107	5	79	3	0	0	87	36	3	23	0	2	62	9	8	15	0	0	32	288

4:30 PM	2	72	38	0	1	112	10	86	4	0	0	100	44	18	15	0	1	77	10	10	10	0	0	30	319
4:45 PM	1	75	41	0	2	117	8	74	5	0	1	87	53	10	18	0	2	81	7	8	10	0	0	25	310
Hourly Total	17	273	168	0	7	458	29	313	20	0	3	362	176	37	78	0	7	291	36	37	50	0	2	123	1234
5:00 PM	5	70	44	0	1	119	7	84	6	0	0	97	48	8	20	0	1	76	7	17	12	0	0	36	328
5:15 PM	1	67	48	0	0	116	13	69	3	0	0	85	48	9	19	0	1	76	9	6	7	0	0	22	299
5:30 PM	2	66	26	0	0	94	10	63	4	0	0	77	45	10	13	0	0	68	3	6	5	0	0	14	253
5:45 PM	0	63	28	0	1	91	8	62	5	0	0	75	30	3	13	0	1	46	1	4	5	0	0	10	222
Hourly Total	8	266	146	0	2	420	38	278	18	0	0	334	171	30	65	0	3	266	20	33	29	0	0	82	1102
Grand Total	153	1927	1049	0	33	3129	263	2199	227	0	16	2689	1206	277	517	0	22	2000	208	214	257	0	9	679	8497
Approach %	4.9	61.6	33.5	0.0	-	-	9.8	81.8	8.4	0.0	-	-	60.3	13.9	25.9	0.0	-	-	30.6	31.5	37.8	0.0	-	-	-
Total %	1.8	22.7	12.3	0.0	-	36.8	3.1	25.9	2.7	0.0	-	31.6	14.2	3.3	6.1	0.0	-	23.5	2.4	2.5	3.0	0.0	-	8.0	-
Motorcycles	2	11	5	0	-	18	3	17	0	0	-	20	4	1	6	0	-	11	1	1	0	0	-	2	51
% Motorcycles	1.3	0.6	0.5	-	-	0.6	1.1	0.8	0.0	-	-	0.7	0.3	0.4	1.2	-	-	0.6	0.5	0.5	0.0	-	-	0.3	0.6
Cars & Light Goods	142	1822	1033	0	-	2997	253	2085	215	0	-	2553	1190	267	504	0	-	1961	199	206	254	0	-	659	8170
% Cars & Light Goods	92.8	94.6	98.5	-	-	95.8	96.2	94.8	94.7	-	-	94.9	98.7	96.4	97.5	-	-	98.1	95.7	96.3	98.8	-	-	97.1	96.2
Buses	0	13	2	0	-	15	1	3	1	0	-	5	1	2	2	0	-	5	0	1	0	0	-	1	26
% Buses	0.0	0.7	0.2	-	-	0.5	0.4	0.1	0.4	-	-	0.2	0.1	0.7	0.4	-	-	0.3	0.0	0.5	0.0	-	-	0.1	0.3
Single-Unit Trucks	8	55	6	0	-	69	3	68	11	0	-	82	8	6	4	0	-	18	6	6	3	0	-	15	184
% Single-Unit Trucks	5.2	2.9	0.6	-	-	2.2	1.1	3.1	4.8	-	-	3.0	0.7	2.2	0.8	-	-	0.9	2.9	2.8	1.2	-	-	2.2	2.2
Articulated Trucks	1	26	2	0	-	29	1	25	0	0	-	26	3	1	0	0	-	4	1	0	0	0	-	1	60
% Articulated Trucks	0.7	1.3	0.2	-	-	0.9	0.4	1.1	0.0	-	-	1.0	0.2	0.4	0.0	-	-	0.2	0.5	0.0	0.0	-	-	0.1	0.7
Bicycles on Road	0	0	1	0	-	1	2	1	0	0	-	3	0	0	1	0	-	1	1	0	0	0	-	1	6
% Bicycles on Road	0.0	0.0	0.1	-	-	0.0	0.8	0.0	0.0	-	-	0.1	0.0	0.0	0.2	-	-	0.1	0.5	0.0	0.0	-	-	0.1	0.1
Bicycles on Crosswalk	-	-	-	-	8	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	2	-	-
% Bicycles on Crosswalk	-	-	-	-	24.2	-	-	-	-	-	6.3	-	-	-	-	-	4.5	-	-	-	-	-	22.2	-	-
Pedestrians	-	-	-	-	25	-	-	-	-	-	15	-	-	-	-	-	21	-	-	-	-	-	7	-	-
% Pedestrians	-	-	-	-	75.8	-	-	-	-	-	93.8	-	-	-	-	-	95.5	-	-	-	-	-	77.8	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: 18th Avenue E & 16th Street E
Site Code: 220378
Start Date: 08/23/2022



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: 18th Avenue E & 16th Street E
Site Code: 220378
Start Date: 08/23/2022

Turning Movement Peak Hour Data (9:00 AM)

Start Time	16th Street E Eastbound						16th Street E Westbound						18th Avenue E Northbound						18th Avenue E Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
9:00 AM	3	43	20	0	1	66	5	50	4	0	0	59	26	4	10	0	0	40	2	5	4	0	0	11	176
9:15 AM	5	53	17	0	0	75	8	48	2	0	0	58	18	4	8	0	1	30	8	4	6	0	0	18	181
9:30 AM	5	44	17	0	3	66	9	74	3	0	0	86	28	7	9	0	0	44	4	3	5	0	0	12	208
9:45 AM	8	41	43	0	0	92	10	56	6	0	1	72	22	7	10	0	0	39	5	5	5	0	0	15	218
Total	21	181	97	0	4	299	32	228	15	0	1	275	94	22	37	0	1	153	19	17	20	0	0	56	783
Approach %	7.0	60.5	32.4	0.0	-	-	11.6	82.9	5.5	0.0	-	-	61.4	14.4	24.2	0.0	-	-	33.9	30.4	35.7	0.0	-	-	-
Total %	2.7	23.1	12.4	0.0	-	38.2	4.1	29.1	1.9	0.0	-	35.1	12.0	2.8	4.7	0.0	-	19.5	2.4	2.2	2.6	0.0	-	7.2	-
PHF	0.656	0.854	0.564	0.000	-	0.813	0.800	0.770	0.625	0.000	-	0.799	0.839	0.786	0.925	0.000	-	0.869	0.594	0.850	0.833	0.000	-	0.778	0.898
Motorcycles	0	0	1	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Motorcycles	0.0	0.0	1.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Cars & Light Goods	21	169	96	0	-	286	32	213	14	0	-	259	91	21	37	0	-	149	16	16	20	0	-	52	746
% Cars & Light Goods	100.0	93.4	99.0	-	-	95.7	100.0	93.4	93.3	-	-	94.2	96.8	95.5	100.0	-	-	97.4	84.2	94.1	100.0	-	-	92.9	95.3
Buses	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	0	-	1	0	0	0	0	-	0	1
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	1.1	0.0	0.0	-	-	0.7	0.0	0.0	0.0	-	-	0.0	0.1
Single-Unit Trucks	0	8	0	0	-	8	0	10	1	0	-	11	2	1	0	0	-	3	3	1	0	0	-	4	26
% Single-Unit Trucks	0.0	4.4	0.0	-	-	2.7	0.0	4.4	6.7	-	-	4.0	2.1	4.5	0.0	-	-	2.0	15.8	5.9	0.0	-	-	7.1	3.3
Articulated Trucks	0	4	0	0	-	4	0	4	0	0	-	4	0	0	0	0	-	0	0	0	0	0	-	0	8
% Articulated Trucks	0.0	2.2	0.0	-	-	1.3	0.0	1.8	0.0	-	-	1.5	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	1.0
Bicycles on Road	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.4	0.0	-	-	0.4	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	25.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	75.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

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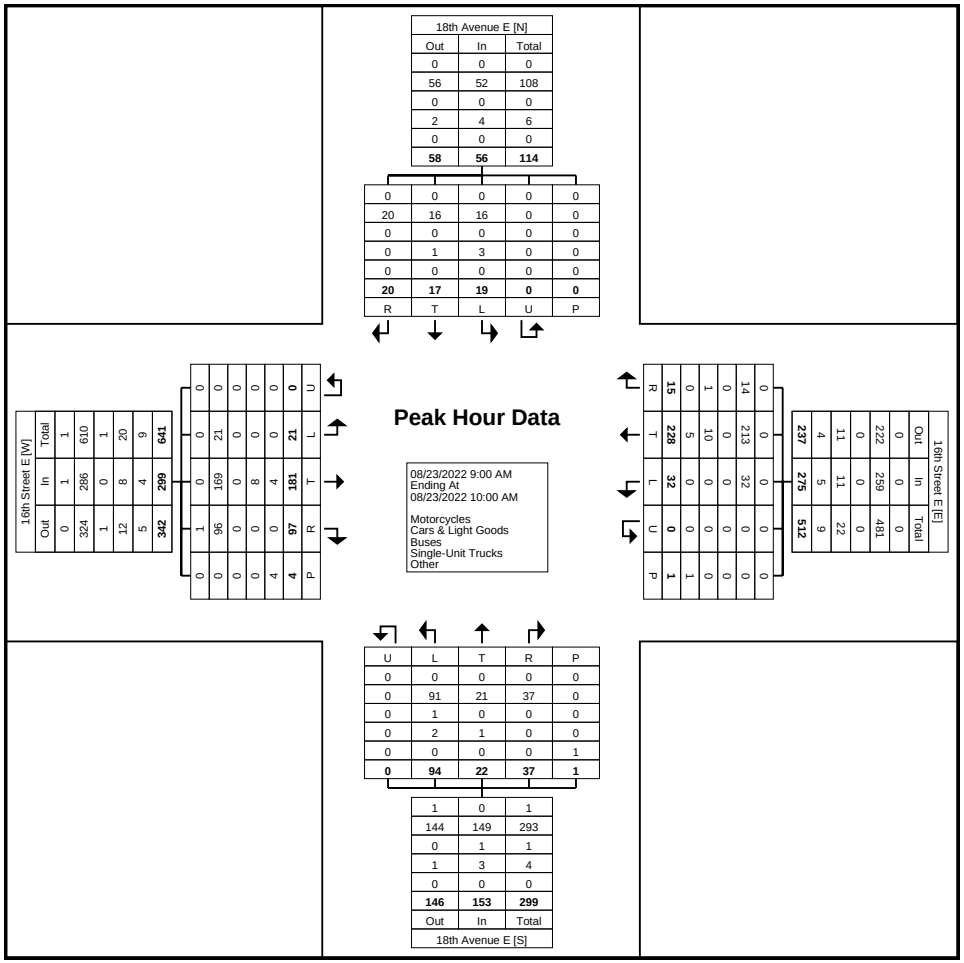

Turning Movement Peak Hour Data Plot (9:00 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: 18th Avenue E & 16th Street E
Site Code: 220378
Start Date: 08/23/2022

Turning Movement Peak Hour Data (12:00 PM)

Start Time	16th Street E Eastbound						16th Street E Westbound						18th Avenue E Northbound						18th Avenue E Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:00 PM	9	68	53	0	1	130	12	95	14	0	0	121	56	17	24	0	0	97	15	11	13	0	0	39	387
12:15 PM	11	69	44	0	1	124	7	79	7	0	0	93	61	18	22	0	0	101	8	7	7	0	0	22	340
12:30 PM	5	92	72	0	1	169	16	116	15	0	0	147	69	12	16	0	1	97	13	10	15	0	0	38	451
12:45 PM	7	91	48	0	1	146	12	94	18	0	1	124	71	15	25	0	1	111	5	10	9	0	1	24	405
Total	32	320	217	0	4	569	47	384	54	0	1	485	257	62	87	0	2	406	41	38	44	0	1	123	1583
Approach %	5.6	56.2	38.1	0.0	-	-	9.7	79.2	11.1	0.0	-	-	63.3	15.3	21.4	0.0	-	-	33.3	30.9	35.8	0.0	-	-	-
Total %	2.0	20.2	13.7	0.0	-	35.9	3.0	24.3	3.4	0.0	-	30.6	16.2	3.9	5.5	0.0	-	25.6	2.6	2.4	2.8	0.0	-	7.8	-
PHF	0.727	0.870	0.753	0.000	-	0.842	0.734	0.828	0.750	0.000	-	0.825	0.905	0.861	0.870	0.000	-	0.914	0.683	0.864	0.733	0.000	-	0.788	0.877
Motorcycles	1	1	1	0	-	3	0	3	0	0	-	3	1	0	1	0	-	2	0	0	0	0	-	0	8
% Motorcycles	3.1	0.3	0.5	-	-	0.5	0.0	0.8	0.0	-	-	0.6	0.4	0.0	1.1	-	-	0.5	0.0	0.0	0.0	-	-	0.0	0.5
Cars & Light Goods	28	310	214	0	-	552	43	361	53	0	-	457	255	60	86	0	-	401	41	37	43	0	-	121	1531
% Cars & Light Goods	87.5	96.9	98.6	-	-	97.0	91.5	94.0	98.1	-	-	94.2	99.2	96.8	98.9	-	-	98.8	100.0	97.4	97.7	-	-	98.4	96.7
Buses	0	1	0	0	-	1	1	1	1	0	-	3	0	1	0	0	-	1	0	1	0	0	-	1	6
% Buses	0.0	0.3	0.0	-	-	0.2	2.1	0.3	1.9	-	-	0.6	0.0	1.6	0.0	-	-	0.2	0.0	2.6	0.0	-	-	0.8	0.4
Single-Unit Trucks	3	5	2	0	-	10	1	10	0	0	-	11	0	1	0	0	-	1	0	0	1	0	-	1	23
% Single-Unit Trucks	9.4	1.6	0.9	-	-	1.8	2.1	2.6	0.0	-	-	2.3	0.0	1.6	0.0	-	-	0.2	0.0	0.0	2.3	-	-	0.8	1.5
Articulated Trucks	0	3	0	0	-	3	0	9	0	0	-	9	1	0	0	0	-	1	0	0	0	0	-	0	13
% Articulated Trucks	0.0	0.9	0.0	-	-	0.5	0.0	2.3	0.0	-	-	1.9	0.4	0.0	0.0	-	-	0.2	0.0	0.0	0.0	-	-	0.0	0.8
Bicycles on Road	0	0	0	0	-	0	2	0	0	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	2
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	4.3	0.0	0.0	-	-	0.4	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	4	-	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

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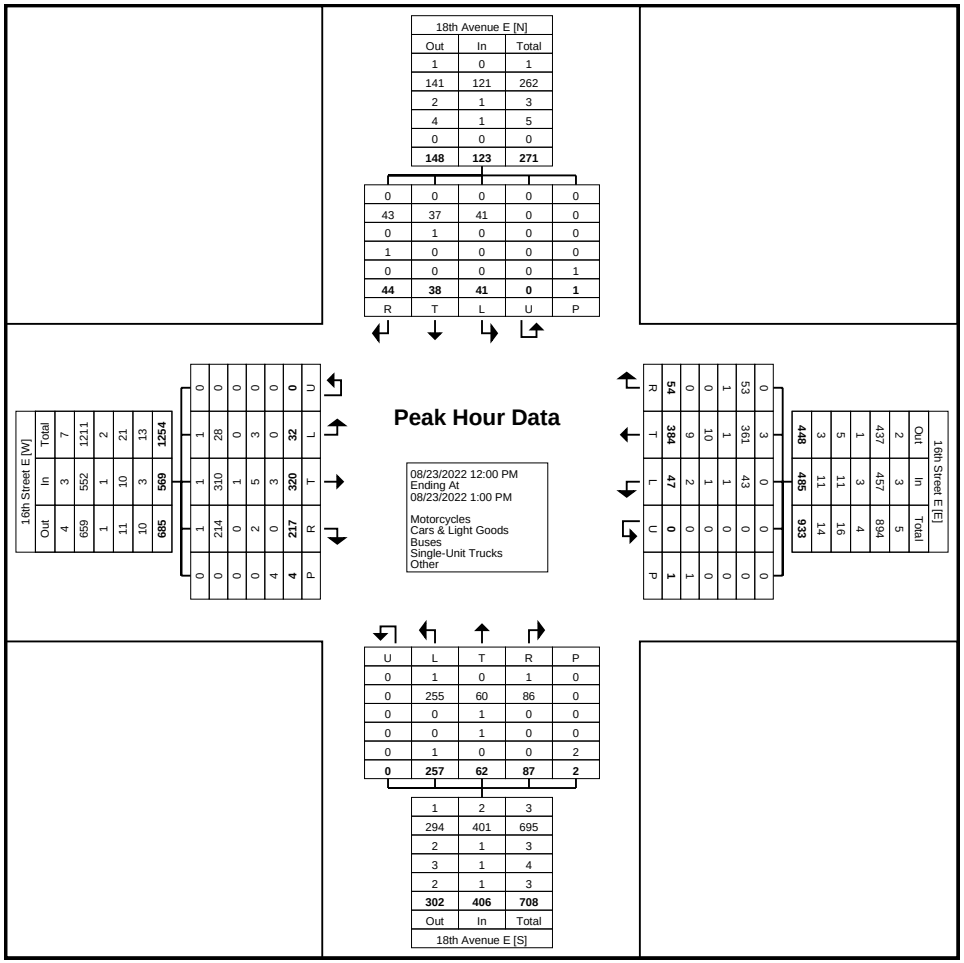
Start Date: 08/23/2022



Turning Movement Peak Hour Data Plot (12:00 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: 18th Avenue E & 16th Street E
Site Code: 220378
Start Date: 08/23/2022

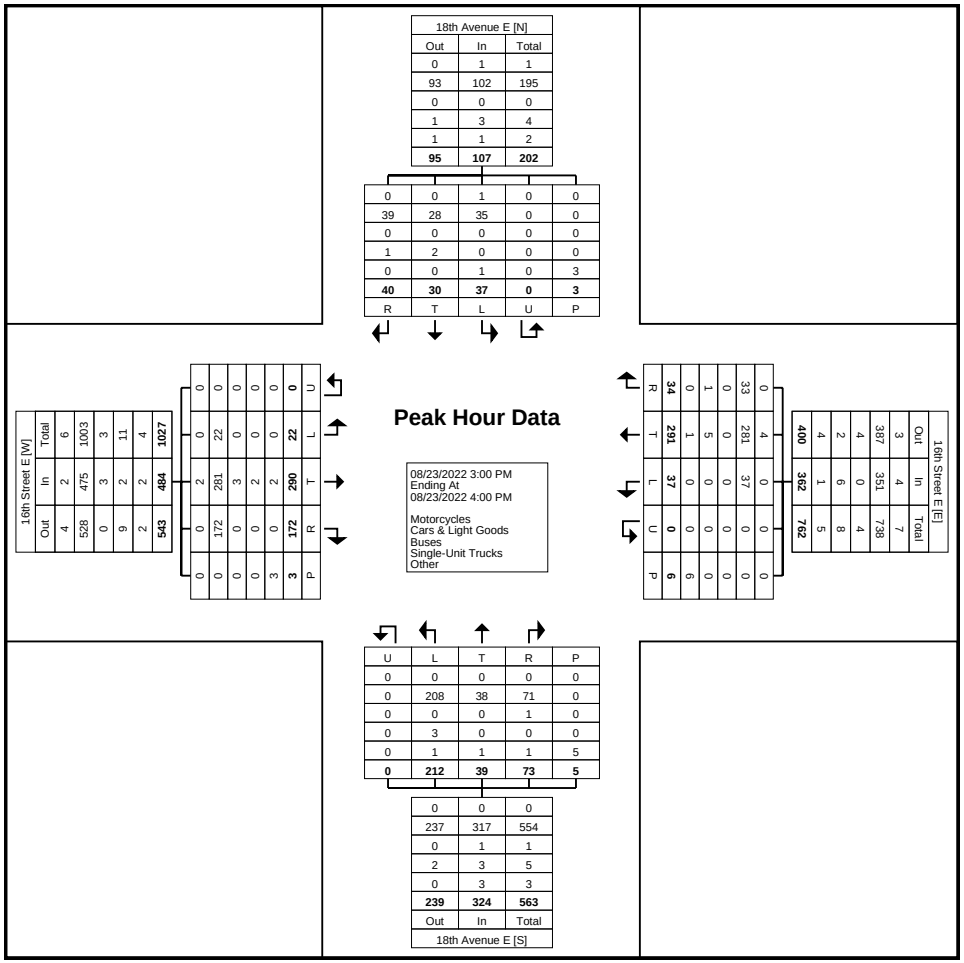
Turning Movement Peak Hour Data (3:00 PM)

Start Time	16th Street E Eastbound						16th Street E Westbound						18th Avenue E Northbound						18th Avenue E Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
3:00 PM	6	68	47	0	1	121	8	65	17	0	1	90	56	9	20	0	0	85	8	8	11	0	0	27	323
3:15 PM	3	77	38	0	2	118	7	75	4	0	4	86	58	9	14	0	2	81	10	7	10	0	2	27	312
3:30 PM	4	75	49	0	0	128	11	74	9	0	0	94	48	10	22	0	1	80	11	9	9	0	0	29	331
3:45 PM	9	70	38	0	0	117	11	77	4	0	1	92	50	11	17	0	2	78	8	6	10	0	1	24	311
Total	22	290	172	0	3	484	37	291	34	0	6	362	212	39	73	0	5	324	37	30	40	0	3	107	1277
Approach %	4.5	59.9	35.5	0.0	-	-	10.2	80.4	9.4	0.0	-	-	65.4	12.0	22.5	0.0	-	-	34.6	28.0	37.4	0.0	-	-	-
Total %	1.7	22.7	13.5	0.0	-	37.9	2.9	22.8	2.7	0.0	-	28.3	16.6	3.1	5.7	0.0	-	25.4	2.9	2.3	3.1	0.0	-	8.4	-
PHF	0.611	0.942	0.878	0.000	-	0.945	0.841	0.945	0.500	0.000	-	0.963	0.914	0.886	0.830	0.000	-	0.953	0.841	0.833	0.909	0.000	-	0.922	0.965
Motorcycles	0	2	0	0	-	2	0	4	0	0	-	4	0	0	0	0	-	0	1	0	0	0	-	1	7
% Motorcycles	0.0	0.7	0.0	-	-	0.4	0.0	1.4	0.0	-	-	1.1	0.0	0.0	0.0	-	-	0.0	2.7	0.0	0.0	-	-	0.9	0.5
Cars & Light Goods	22	281	172	0	-	475	37	281	33	0	-	351	208	38	71	0	-	317	35	28	39	0	-	102	1245
% Cars & Light Goods	100.0	96.9	100.0	-	-	98.1	100.0	96.6	97.1	-	-	97.0	98.1	97.4	97.3	-	-	97.8	94.6	93.3	97.5	-	-	95.3	97.5
Buses	0	3	0	0	-	3	0	0	0	0	-	0	0	0	1	0	-	1	0	0	0	0	-	0	4
% Buses	0.0	1.0	0.0	-	-	0.6	0.0	0.0	0.0	-	-	0.0	0.0	0.0	1.4	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.3
Single-Unit Trucks	0	2	0	0	-	2	0	5	1	0	-	6	3	0	0	0	-	3	0	2	1	0	-	3	14
% Single-Unit Trucks	0.0	0.7	0.0	-	-	0.4	0.0	1.7	2.9	-	-	1.7	1.4	0.0	0.0	-	-	0.9	0.0	6.7	2.5	-	-	2.8	1.1
Articulated Trucks	0	2	0	0	-	2	0	1	0	0	-	1	1	1	0	0	-	2	0	0	0	0	-	0	5
% Articulated Trucks	0.0	0.7	0.0	-	-	0.4	0.0	0.3	0.0	-	-	0.3	0.5	2.6	0.0	-	-	0.6	0.0	0.0	0.0	-	-	0.0	0.4
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	1	0	-	1	1	0	0	0	-	1	2
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	1.4	-	-	0.3	2.7	0.0	0.0	-	-	0.9	0.2
Bicycles on Crosswalk	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	2	-	-
% Bicycles on Crosswalk	-	-	-	-	66.7	-	-	-	-	-	16.7	-	-	-	-	-	0.0	-	-	-	-	-	66.7	-	-
Pedestrians	-	-	-	-	1	-	-	-	-	-	5	-	-	-	-	-	5	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	33.3	-	-	-	-	-	83.3	-	-	-	-	-	100.0	-	-	-	-	-	33.3	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: 18th Avenue E & 16th Street E
Site Code: 220378
Start Date: 08/23/2022



Turning Movement Peak Hour Data Plot (3:00 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: 20th Avenue E & 16th Street E
Site Code: 220378
Start Date: 08/23/2022

Turning Movement Data

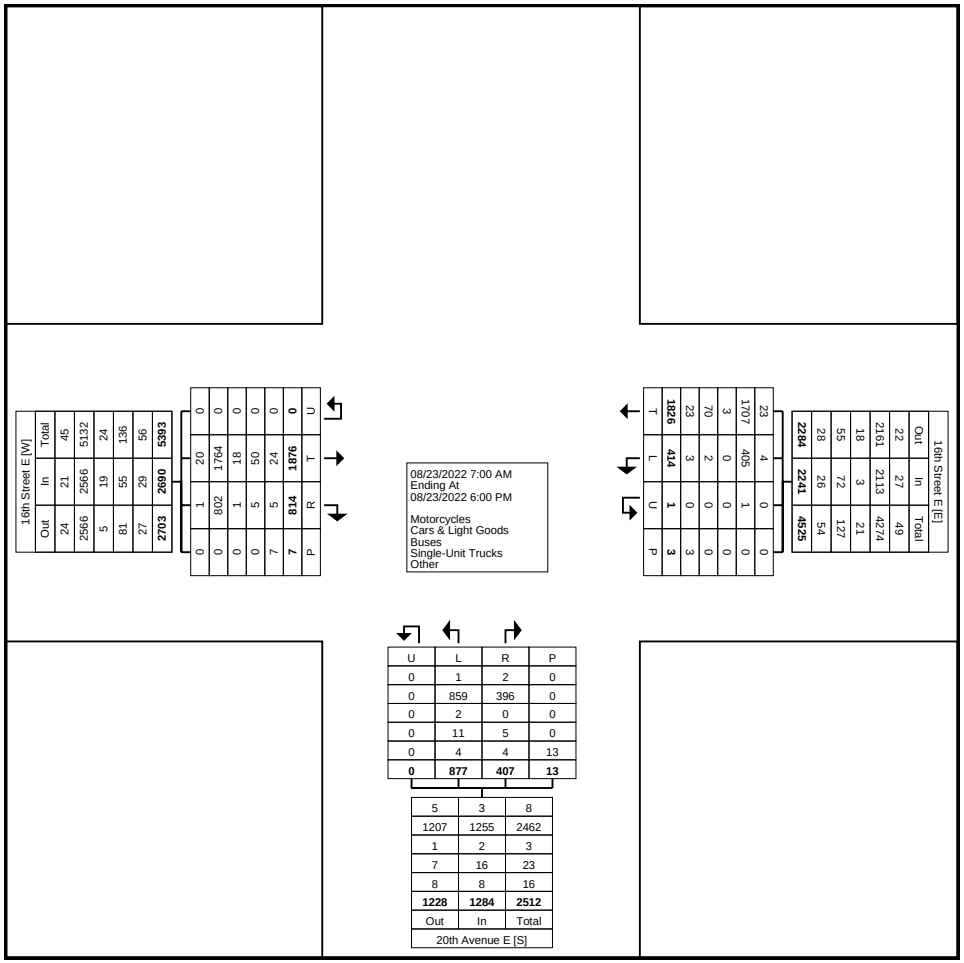
Start Time	16th Street E Eastbound					16th Street E Westbound					20th Avenue E Northbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:00 AM	45	1	0	0	46	5	36	0	0	41	2	3	0	0	5	92
7:15 AM	47	1	0	0	48	3	41	0	0	44	0	1	0	0	1	93
7:30 AM	36	4	0	0	40	3	61	0	0	64	5	1	0	1	6	110
7:45 AM	44	4	0	0	48	7	45	0	0	52	0	5	0	0	5	105
Hourly Total	172	10	0	0	182	18	183	0	0	201	7	10	0	1	17	400
8:00 AM	44	5	0	0	49	6	50	0	0	56	5	7	0	0	12	117
8:15 AM	56	3	0	0	59	4	53	0	0	57	3	6	0	0	9	125
8:30 AM	42	7	0	0	49	10	63	0	0	73	2	6	0	0	8	130
8:45 AM	53	4	0	0	57	13	81	0	0	94	2	8	0	0	10	161
Hourly Total	195	19	0	0	214	33	247	0	0	280	12	27	0	0	39	533
9:00 AM	42	11	0	0	53	8	50	0	0	58	10	9	0	0	19	130
9:15 AM	51	21	0	0	72	18	53	0	0	71	5	8	0	0	13	156
9:30 AM	37	17	0	4	54	14	71	0	0	85	15	5	0	0	20	159
9:45 AM	37	22	0	0	59	17	69	0	0	86	10	17	0	0	27	172
Hourly Total	167	71	0	4	238	57	243	0	0	300	40	39	0	0	79	617
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	60	43	0	0	103	32	49	0	0	81	44	24	0	1	68	252
11:45 AM	62	47	0	0	109	21	64	0	0	85	57	12	0	0	69	263
Hourly Total	122	90	0	0	212	53	113	0	0	166	101	36	0	1	137	515
12:00 PM	67	42	0	0	109	14	53	0	0	67	58	11	0	2	69	245
12:15 PM	59	45	0	0	104	9	53	0	0	62	45	18	0	1	63	229
12:30 PM	71	44	0	0	115	22	81	0	1	103	67	14	0	0	81	299
12:45 PM	74	46	0	0	120	17	70	0	1	87	50	19	0	0	69	276
Hourly Total	271	177	0	0	448	62	257	0	2	319	220	62	0	3	282	1049
1:00 PM	61	45	0	0	106	11	53	0	0	64	53	17	0	0	70	240
1:15 PM	86	44	0	2	130	21	73	0	0	94	46	13	0	0	59	283
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	147	89	0	2	236	32	126	0	0	158	99	30	0	0	129	523
3:00 PM	66	37	0	0	103	10	57	0	0	67	33	20	0	0	53	223
3:15 PM	64	38	0	0	102	11	38	0	0	49	50	10	0	2	60	211
3:30 PM	67	43	0	1	110	19	52	0	1	71	45	21	0	1	66	247
3:45 PM	69	31	0	0	100	18	59	0	0	77	35	16	0	0	51	228
Hourly Total	266	149	0	1	415	58	206	0	1	264	163	67	0	3	230	909
4:00 PM	71	26	0	0	97	11	54	0	0	65	26	19	0	0	45	207
4:15 PM	61	29	0	0	90	8	57	0	0	65	25	8	0	1	33	188
4:30 PM	68	29	0	0	97	8	64	0	0	72	41	17	0	0	58	227

4:45 PM	73	29	0	0	102	13	52	1	0	66	29	21	0	0	50	218
Hourly Total	273	113	0	0	386	40	227	1	0	268	121	65	0	1	186	840
5:00 PM	64	30	0	0	94	24	67	0	0	91	31	13	0	1	44	229
5:15 PM	77	23	0	0	100	15	52	0	0	67	39	26	0	3	65	232
5:30 PM	65	20	0	0	85	14	57	0	0	71	20	19	0	0	39	195
5:45 PM	57	23	0	0	80	8	48	0	0	56	24	13	0	0	37	173
Hourly Total	263	96	0	0	359	61	224	0	0	285	114	71	0	4	185	829
Grand Total	1876	814	0	7	2690	414	1826	1	3	2241	877	407	0	13	1284	6215
Approach %	69.7	30.3	0.0	-	-	18.5	81.5	0.0	-	-	68.3	31.7	0.0	-	-	-
Total %	30.2	13.1	0.0	-	43.3	6.7	29.4	0.0	-	36.1	14.1	6.5	0.0	-	20.7	-
Motorcycles	20	1	0	-	21	4	23	0	-	27	1	2	0	-	3	51
% Motorcycles	1.1	0.1	-	-	0.8	1.0	1.3	0.0	-	1.2	0.1	0.5	-	-	0.2	0.8
Cars & Light Goods	1764	802	0	-	2566	405	1707	1	-	2113	859	396	0	-	1255	5934
% Cars & Light Goods	94.0	98.5	-	-	95.4	97.8	93.5	100.0	-	94.3	97.9	97.3	-	-	97.7	95.5
Buses	18	1	0	-	19	0	3	0	-	3	2	0	0	-	2	24
% Buses	1.0	0.1	-	-	0.7	0.0	0.2	0.0	-	0.1	0.2	0.0	-	-	0.2	0.4
Single-Unit Trucks	50	5	0	-	55	2	70	0	-	72	11	5	0	-	16	143
% Single-Unit Trucks	2.7	0.6	-	-	2.0	0.5	3.8	0.0	-	3.2	1.3	1.2	-	-	1.2	2.3
Articulated Trucks	24	4	0	-	28	3	23	0	-	26	4	3	0	-	7	61
% Articulated Trucks	1.3	0.5	-	-	1.0	0.7	1.3	0.0	-	1.2	0.5	0.7	-	-	0.5	1.0
Bicycles on Road	0	1	0	-	1	0	0	0	-	0	0	1	0	-	1	2
% Bicycles on Road	0.0	0.1	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.2	-	-	0.1	0.0
Bicycles on Crosswalk	-	-	-	2	-	-	-	-	0	-	-	-	-	4	-	-
% Bicycles on Crosswalk	-	-	-	28.6	-	-	-	-	0.0	-	-	-	-	30.8	-	-
Pedestrians	-	-	-	5	-	-	-	-	3	-	-	-	-	9	-	-
% Pedestrians	-	-	-	71.4	-	-	-	-	100.0	-	-	-	-	69.2	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: 20th Avenue E & 16th Street E
Site Code: 220378
Start Date: 08/23/2022



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: 20th Avenue E & 16th Street E
Site Code: 220378
Start Date: 08/23/2022

Turning Movement Peak Hour Data (9:00 AM)

Start Time	16th Street E Eastbound					16th Street E Westbound					20th Avenue E Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
9:00 AM	42	11	0	0	53	8	50	0	0	58	10	9	0	0	19	130
9:15 AM	51	21	0	0	72	18	53	0	0	71	5	8	0	0	13	156
9:30 AM	37	17	0	4	54	14	71	0	0	85	15	5	0	0	20	159
9:45 AM	37	22	0	0	59	17	69	0	0	86	10	17	0	0	27	172
Total	167	71	0	4	238	57	243	0	0	300	40	39	0	0	79	617
Approach %	70.2	29.8	0.0	-	-	19.0	81.0	0.0	-	-	50.6	49.4	0.0	-	-	-
Total %	27.1	11.5	0.0	-	38.6	9.2	39.4	0.0	-	48.6	6.5	6.3	0.0	-	12.8	-
PHF	0.819	0.807	0.000	-	0.826	0.792	0.856	0.000	-	0.872	0.667	0.574	0.000	-	0.731	0.897
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	155	67	0	-	222	56	230	0	-	286	38	38	0	-	76	584
% Cars & Light Goods	92.8	94.4	-	-	93.3	98.2	94.7	-	-	95.3	95.0	97.4	-	-	96.2	94.7
Buses	2	0	0	-	2	0	0	0	-	0	0	0	0	-	0	2
% Buses	1.2	0.0	-	-	0.8	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.3
Single-Unit Trucks	8	2	0	-	10	1	10	0	-	11	1	1	0	-	2	23
% Single-Unit Trucks	4.8	2.8	-	-	4.2	1.8	4.1	-	-	3.7	2.5	2.6	-	-	2.5	3.7
Articulated Trucks	2	2	0	-	4	0	3	0	-	3	1	0	0	-	1	8
% Articulated Trucks	1.2	2.8	-	-	1.7	0.0	1.2	-	-	1.0	2.5	0.0	-	-	1.3	1.3
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	25.0	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	3	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	75.0	-	-	-	-	-	-	-	-	-	-	-	-

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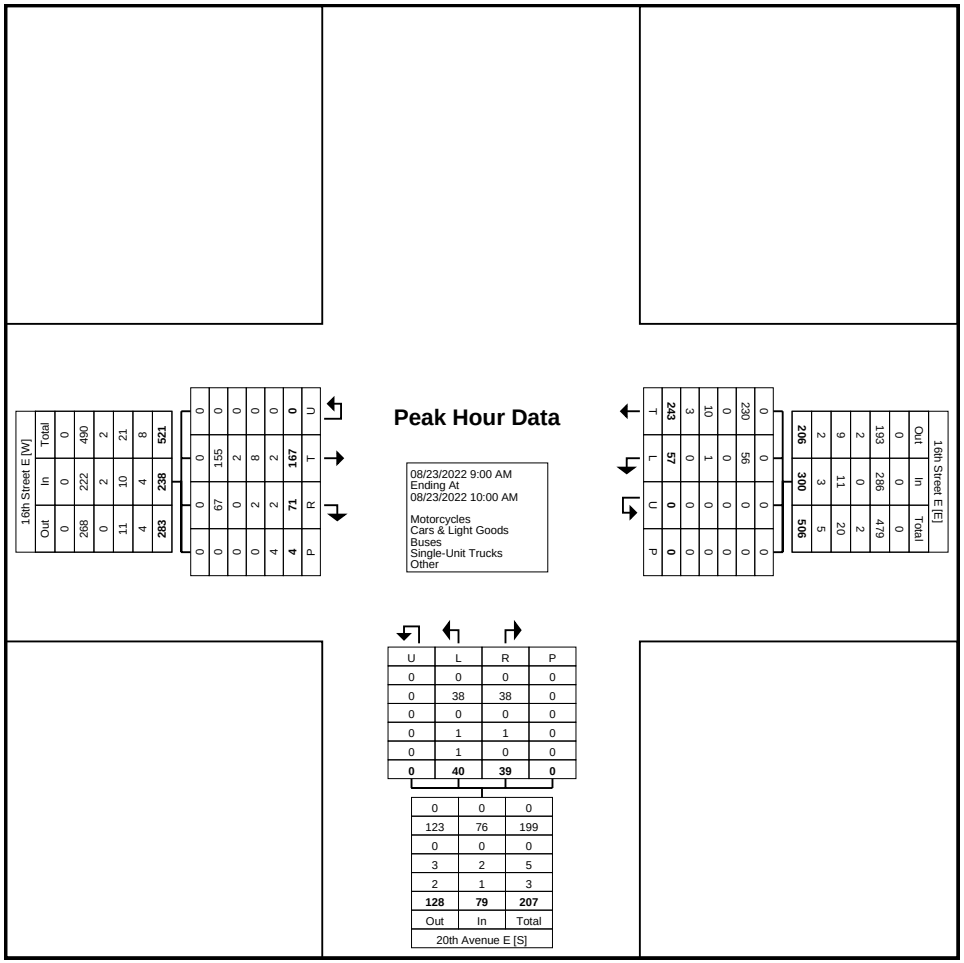
Count Name: 20th Avenue E & 16th Street E
Site Code: 220378
Start Date: 08/23/2022



Turning Movement Peak Hour Data Plot (9:00 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: 20th Avenue E & 16th Street E
Site Code: 220378
Start Date: 08/23/2022

Turning Movement Peak Hour Data (12:30 PM)

Start Time	16th Street E Eastbound					16th Street E Westbound					20th Avenue E Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
12:30 PM	71	44	0	0	115	22	81	0	1	103	67	14	0	0	81	299
12:45 PM	74	46	0	0	120	17	70	0	1	87	50	19	0	0	69	276
1:00 PM	61	45	0	0	106	11	53	0	0	64	53	17	0	0	70	240
1:15 PM	86	44	0	2	130	21	73	0	0	94	46	13	0	0	59	283
Total	292	179	0	2	471	71	277	0	2	348	216	63	0	0	279	1098
Approach %	62.0	38.0	0.0	-	-	20.4	79.6	0.0	-	-	77.4	22.6	0.0	-	-	-
Total %	26.6	16.3	0.0	-	42.9	6.5	25.2	0.0	-	31.7	19.7	5.7	0.0	-	25.4	-
PHF	0.849	0.973	0.000	-	0.906	0.807	0.855	0.000	-	0.845	0.806	0.829	0.000	-	0.861	0.918
Motorcycles	3	0	0	-	3	1	2	0	-	3	0	0	0	-	0	6
% Motorcycles	1.0	0.0	-	-	0.6	1.4	0.7	-	-	0.9	0.0	0.0	-	-	0.0	0.5
Cars & Light Goods	272	177	0	-	449	70	260	0	-	330	213	61	0	-	274	1053
% Cars & Light Goods	93.2	98.9	-	-	95.3	98.6	93.9	-	-	94.8	98.6	96.8	-	-	98.2	95.9
Buses	1	1	0	-	2	0	1	0	-	1	0	0	0	-	0	3
% Buses	0.3	0.6	-	-	0.4	0.0	0.4	-	-	0.3	0.0	0.0	-	-	0.0	0.3
Single-Unit Trucks	7	0	0	-	7	0	10	0	-	10	2	1	0	-	3	20
% Single-Unit Trucks	2.4	0.0	-	-	1.5	0.0	3.6	-	-	2.9	0.9	1.6	-	-	1.1	1.8
Articulated Trucks	9	1	0	-	10	0	4	0	-	4	1	1	0	-	2	16
% Articulated Trucks	3.1	0.6	-	-	2.1	0.0	1.4	-	-	1.1	0.5	1.6	-	-	0.7	1.5
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	-	-	-
Pedestrians	-	-	-	2	-	-	-	-	2	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	-	-

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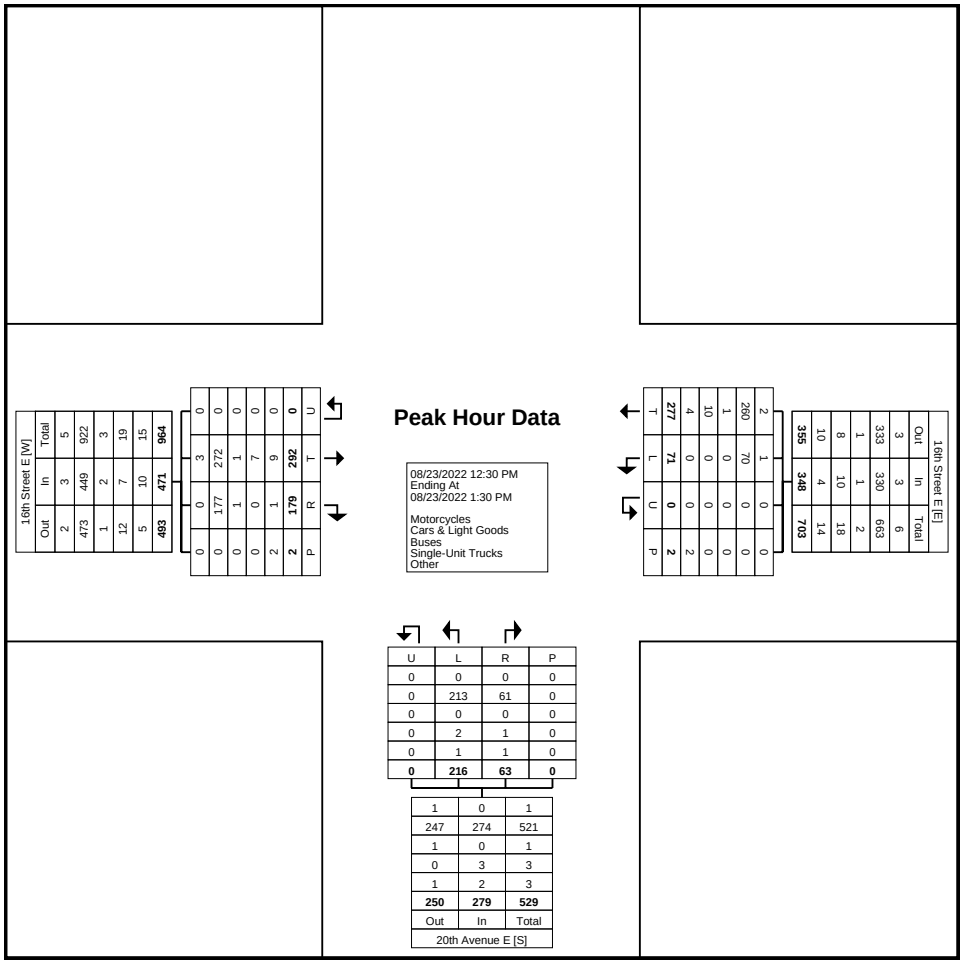
Site Code: 220378
Start Date: 08/23/2022



Turning Movement Peak Hour Data Plot (12:30 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: 20th Avenue E & 16th Street E
Site Code: 220378
Start Date: 08/23/2022

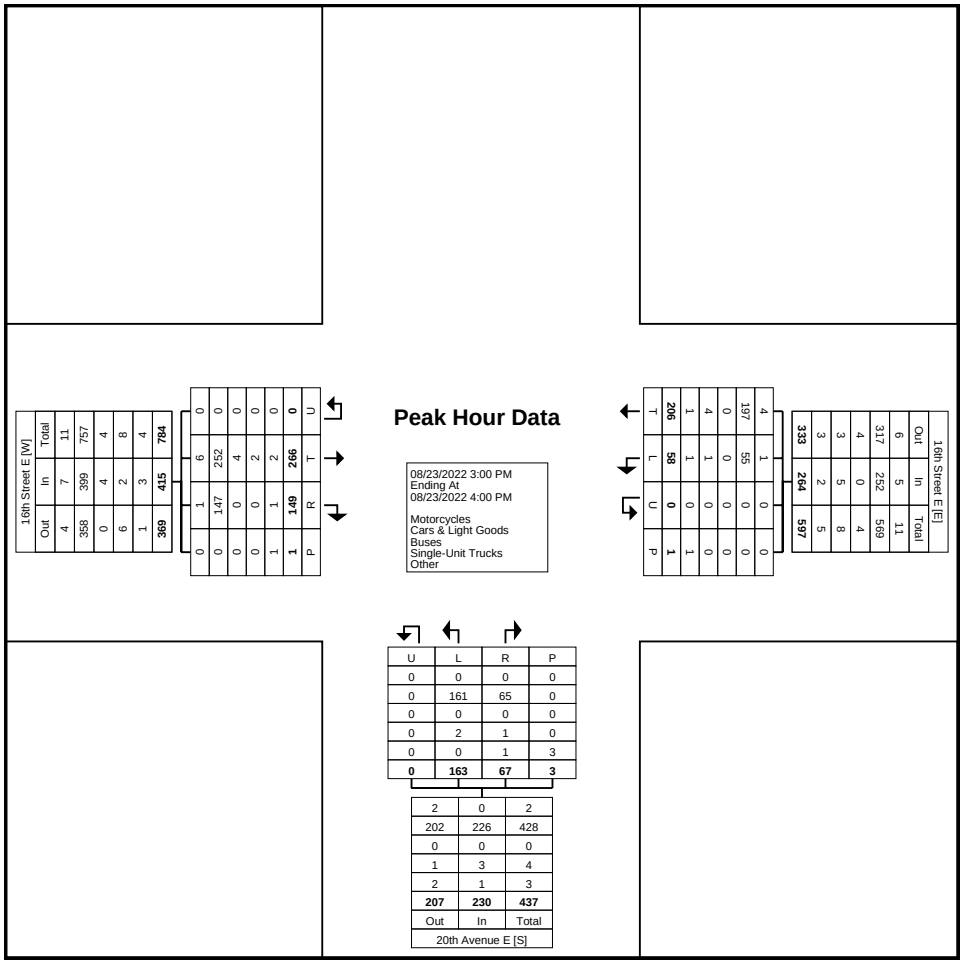
Turning Movement Peak Hour Data (3:00 PM)

Start Time	16th Street E Eastbound					16th Street E Westbound					20th Avenue E Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
3:00 PM	66	37	0	0	103	10	57	0	0	67	33	20	0	0	53	223
3:15 PM	64	38	0	0	102	11	38	0	0	49	50	10	0	2	60	211
3:30 PM	67	43	0	1	110	19	52	0	1	71	45	21	0	1	66	247
3:45 PM	69	31	0	0	100	18	59	0	0	77	35	16	0	0	51	228
Total	266	149	0	1	415	58	206	0	1	264	163	67	0	3	230	909
Approach %	64.1	35.9	0.0	-	-	22.0	78.0	0.0	-	-	70.9	29.1	0.0	-	-	-
Total %	29.3	16.4	0.0	-	45.7	6.4	22.7	0.0	-	29.0	17.9	7.4	0.0	-	25.3	-
PHF	0.964	0.866	0.000	-	0.943	0.763	0.873	0.000	-	0.857	0.815	0.798	0.000	-	0.871	0.920
Motorcycles	6	1	0	-	7	1	4	0	-	5	0	0	0	-	0	12
% Motorcycles	2.3	0.7	-	-	1.7	1.7	1.9	-	-	1.9	0.0	0.0	-	-	0.0	1.3
Cars & Light Goods	252	147	0	-	399	55	197	0	-	252	161	65	0	-	226	877
% Cars & Light Goods	94.7	98.7	-	-	96.1	94.8	95.6	-	-	95.5	98.8	97.0	-	-	98.3	96.5
Buses	4	0	0	-	4	0	0	0	-	0	0	0	0	-	0	4
% Buses	1.5	0.0	-	-	1.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.4
Single-Unit Trucks	2	0	0	-	2	1	4	0	-	5	2	1	0	-	3	10
% Single-Unit Trucks	0.8	0.0	-	-	0.5	1.7	1.9	-	-	1.9	1.2	1.5	-	-	1.3	1.1
Articulated Trucks	2	0	0	-	2	1	1	0	-	2	0	1	0	-	1	5
% Articulated Trucks	0.8	0.0	-	-	0.5	1.7	0.5	-	-	0.8	0.0	1.5	-	-	0.4	0.6
Bicycles on Road	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.7	-	-	0.2	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	1	-	-	-	-	0	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	100.0	-	-	-	-	0.0	-	-	-	-	33.3	-	-
Pedestrians	-	-	-	0	-	-	-	-	1	-	-	-	-	2	-	-
% Pedestrians	-	-	-	0.0	-	-	-	-	100.0	-	-	-	-	66.7	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: 20th Avenue E & 16th Street E
Site Code: 220378
Start Date: 08/23/2022



Turning Movement Peak Hour Data Plot (3:00 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 mmurch@ptsl.com

Count Name: 16th Street East & 28th Avenue East Owen Sound
Site Code: 220358
Start Date: 06/08/2022

Turning Movement Data

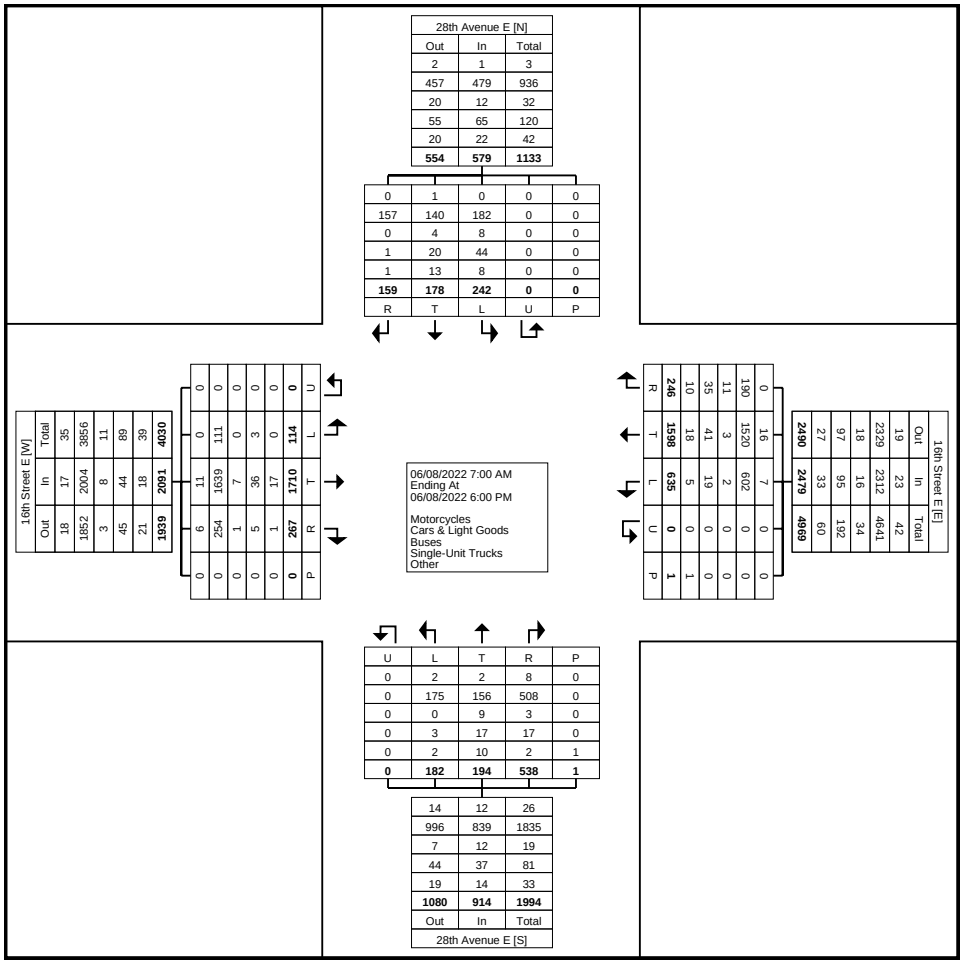
Start Time	16th Street E Eastbound						16th Street E Westbound						28th Avenue E Northbound						28th Avenue E Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	3	40	0	0	0	43	9	27	9	0	0	45	2	7	22	0	0	31	8	10	1	0	0	19	138
7:15 AM	1	31	0	0	0	32	21	38	7	0	0	66	2	6	15	0	0	23	4	2	2	0	0	8	129
7:30 AM	4	46	2	0	0	52	32	45	11	0	0	88	2	5	13	0	0	20	9	4	4	0	0	17	177
7:45 AM	3	33	0	0	0	36	39	44	13	0	0	96	4	15	15	0	0	34	12	1	0	0	0	13	179
Hourly Total	11	150	2	0	0	163	101	154	40	0	0	295	10	33	65	0	0	108	33	17	7	0	0	57	623
8:00 AM	4	30	5	0	0	39	33	48	8	0	0	89	6	7	19	0	0	32	4	2	2	0	0	8	168
8:15 AM	3	35	3	0	0	41	40	63	13	0	0	116	3	3	10	0	0	16	14	4	0	0	0	18	191
8:30 AM	2	41	5	0	0	48	29	57	9	0	0	95	3	9	11	0	0	23	10	1	4	0	0	15	181
8:45 AM	3	46	5	0	0	54	20	46	5	0	0	71	9	10	13	0	0	32	8	3	4	0	0	15	172
Hourly Total	12	152	18	0	0	182	122	214	35	0	0	371	21	29	53	0	0	103	36	10	10	0	0	56	712
9:00 AM	1	37	3	0	0	41	10	51	10	0	0	71	1	7	16	0	0	24	15	4	4	0	0	23	159
9:15 AM	5	49	9	0	0	63	16	55	3	0	0	74	4	4	12	0	0	20	5	11	4	0	0	20	177
9:30 AM	2	31	4	0	0	37	10	40	4	0	0	54	5	9	19	0	0	33	10	10	2	0	0	22	146
9:45 AM	3	28	5	0	0	36	13	52	7	0	0	72	4	4	13	0	1	21	7	4	9	0	0	20	149
Hourly Total	11	145	21	0	0	177	49	198	24	0	0	271	14	24	60	0	1	98	37	29	19	0	0	85	631
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	1	64	15	0	0	80	18	60	3	0	0	81	7	2	12	0	0	21	3	4	3	0	0	10	192
11:45 AM	4	52	12	0	0	68	18	48	5	0	0	71	8	6	16	0	0	30	6	4	7	0	0	17	186
Hourly Total	5	116	27	0	0	148	36	108	8	0	0	152	15	8	28	0	0	51	9	8	10	0	0	27	378
12:00 PM	5	67	11	0	0	83	16	51	4	0	0	71	14	6	12	0	0	32	4	7	10	0	0	21	207
12:15 PM	6	62	9	0	0	77	19	39	7	0	0	65	10	6	15	0	0	31	6	4	5	0	0	15	188
12:30 PM	7	58	11	0	0	76	15	46	10	0	0	71	10	4	5	0	0	19	9	1	7	0	0	17	183
12:45 PM	5	55	8	0	0	68	17	53	4	0	1	74	11	3	16	0	0	30	10	10	6	0	0	26	198
Hourly Total	23	242	39	0	0	304	67	189	25	0	1	281	45	19	48	0	0	112	29	22	28	0	0	79	776
1:00 PM	5	40	15	0	0	60	16	50	7	0	0	73	8	3	11	0	0	22	6	7	8	0	0	21	176
1:15 PM	5	56	11	0	0	72	17	46	9	0	0	72	3	3	14	0	0	20	3	2	4	0	0	9	173
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	10	96	26	0	0	132	33	96	16	0	0	145	11	6	25	0	0	42	9	9	12	0	0	30	349
3:00 PM	4	54	12	0	0	70	13	37	6	0	0	56	9	10	14	0	0	33	7	3	3	0	0	13	172
3:15 PM	1	70	10	0	0	81	12	55	11	0	0	78	4	9	19	0	0	32	5	7	5	0	0	17	208
3:30 PM	2	58	16	0	0	76	14	42	2	0	0	58	4	5	21	0	0	30	9	8	6	0	0	23	187
3:45 PM	3	66	14	0	0	83	13	47	11	0	0	71	2	4	23	0	0	29	4	11	2	0	0	17	200
Hourly Total	10	248	52	0	0	310	52	181	30	0	0	263	19	28	77	0	0	124	25	29	16	0	0	70	767
4:00 PM	3	63	9	0	0	75	22	56	12	0	0	90	6	7	36	0	0	49	10	5	10	0	0	25	239
4:15 PM	8	77	12	0	0	97	37	53	10	0	0	100	6	6	24	0	0	36	7	7	4	0	0	18	251

4:30 PM	3	80	8	0	0	91	28	61	11	0	0	100	6	7	25	0	0	38	10	13	6	0	0	29	258
4:45 PM	7	72	10	0	0	89	19	59	2	0	0	80	11	7	17	0	0	35	9	11	10	0	0	30	234
Hourly Total	21	292	39	0	0	352	106	229	35	0	0	370	29	27	102	0	0	158	36	36	30	0	0	102	982
5:00 PM	5	81	12	0	0	98	16	65	6	0	0	87	6	6	25	0	0	37	10	8	11	0	0	29	251
5:15 PM	4	80	11	0	0	95	25	59	11	0	0	95	4	3	24	0	0	31	9	5	5	0	0	19	240
5:30 PM	2	59	10	0	0	71	15	57	7	0	0	79	2	3	20	0	0	25	6	2	1	0	0	9	184
5:45 PM	0	49	10	0	0	59	13	48	9	0	0	70	6	8	11	0	0	25	3	3	10	0	0	16	170
Hourly Total	11	269	43	0	0	323	69	229	33	0	0	331	18	20	80	0	0	118	28	18	27	0	0	73	845
Grand Total	114	1710	267	0	0	2091	635	1598	246	0	1	2479	182	194	538	0	1	914	242	178	159	0	0	579	6063
Approach %	5.5	81.8	12.8	0.0	-	-	25.6	64.5	9.9	0.0	-	-	19.9	21.2	58.9	0.0	-	-	41.8	30.7	27.5	0.0	-	-	-
Total %	1.9	28.2	4.4	0.0	-	34.5	10.5	26.4	4.1	0.0	-	40.9	3.0	3.2	8.9	0.0	-	15.1	4.0	2.9	2.6	0.0	-	9.5	-
Motorcycles	0	11	6	0	-	17	7	16	0	0	-	23	2	2	8	0	-	12	0	1	0	0	-	1	53
% Motorcycles	0.0	0.6	2.2	-	-	0.8	1.1	1.0	0.0	-	-	0.9	1.1	1.0	1.5	-	-	1.3	0.0	0.6	0.0	-	-	0.2	0.9
Cars & Light Goods	111	1639	254	0	-	2004	602	1520	190	0	-	2312	175	156	508	0	-	839	182	140	157	0	-	479	5634
% Cars & Light Goods	97.4	95.8	95.1	-	-	95.8	94.8	95.1	77.2	-	-	93.3	96.2	80.4	94.4	-	-	91.8	75.2	78.7	98.7	-	-	82.7	92.9
Buses	0	7	1	0	-	8	2	3	11	0	-	16	0	9	3	0	-	12	8	4	0	0	-	12	48
% Buses	0.0	0.4	0.4	-	-	0.4	0.3	0.2	4.5	-	-	0.6	0.0	4.6	0.6	-	-	1.3	3.3	2.2	0.0	-	-	2.1	0.8
Single-Unit Trucks	3	36	5	0	-	44	19	41	35	0	-	95	3	17	17	0	-	37	44	20	1	0	-	65	241
% Single-Unit Trucks	2.6	2.1	1.9	-	-	2.1	3.0	2.6	14.2	-	-	3.8	1.6	8.8	3.2	-	-	4.0	18.2	11.2	0.6	-	-	11.2	4.0
Articulated Trucks	0	16	1	0	-	17	5	18	9	0	-	32	2	10	1	0	-	13	8	12	1	0	-	21	83
% Articulated Trucks	0.0	0.9	0.4	-	-	0.8	0.8	1.1	3.7	-	-	1.3	1.1	5.2	0.2	-	-	1.4	3.3	6.7	0.6	-	-	3.6	1.4
Bicycles on Road	0	1	0	0	-	1	0	0	1	0	-	1	0	0	1	0	-	1	0	1	0	0	-	1	4
% Bicycles on Road	0.0	0.1	0.0	-	-	0.0	0.0	0.0	0.4	-	-	0.0	0.0	0.0	0.2	-	-	0.1	0.0	0.6	0.0	-	-	0.2	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 mmurch@ptsl.com

Count Name: 16th Street East & 28th Avenue
East Owen Sound
Site Code: 220358
Start Date: 06/08/2022



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 mmurch@ptsl.com

Count Name: 16th Street East & 28th Avenue East Owen Sound
Site Code: 220358
Start Date: 06/08/2022

Turning Movement Peak Hour Data (7:45 AM)

Start Time	16th Street E Eastbound						16th Street E Westbound						28th Avenue E Northbound						28th Avenue E Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:45 AM	3	33	0	0	0	36	39	44	13	0	0	96	4	15	15	0	0	34	12	1	0	0	0	13	179
8:00 AM	4	30	5	0	0	39	33	48	8	0	0	89	6	7	19	0	0	32	4	2	2	0	0	8	168
8:15 AM	3	35	3	0	0	41	40	63	13	0	0	116	3	3	10	0	0	16	14	4	0	0	0	18	191
8:30 AM	2	41	5	0	0	48	29	57	9	0	0	95	3	9	11	0	0	23	10	1	4	0	0	15	181
Total	12	139	13	0	0	164	141	212	43	0	0	396	16	34	55	0	0	105	40	8	6	0	0	54	719
Approach %	7.3	84.8	7.9	0.0	-	-	35.6	53.5	10.9	0.0	-	-	15.2	32.4	52.4	0.0	-	-	74.1	14.8	11.1	0.0	-	-	-
Total %	1.7	19.3	1.8	0.0	-	22.8	19.6	29.5	6.0	0.0	-	55.1	2.2	4.7	7.6	0.0	-	14.6	5.6	1.1	0.8	0.0	-	7.5	-
PHF	0.750	0.848	0.650	0.000	-	0.854	0.881	0.841	0.827	0.000	-	0.853	0.667	0.567	0.724	0.000	-	0.772	0.714	0.500	0.375	0.000	-	0.750	0.941
Motorcycles	0	0	0	0	-	0	1	1	0	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	2
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.7	0.5	0.0	-	-	0.5	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.3
Cars & Light Goods	12	132	13	0	-	157	135	208	33	0	-	376	16	29	53	0	-	98	30	5	5	0	-	40	671
% Cars & Light Goods	100.0	95.0	100.0	-	-	95.7	95.7	98.1	76.7	-	-	94.9	100.0	85.3	96.4	-	-	93.3	75.0	62.5	83.3	-	-	74.1	93.3
Buses	0	0	0	0	-	0	2	0	2	0	-	4	0	2	0	0	-	2	1	1	0	0	-	2	8
% Buses	0.0	0.0	0.0	-	-	0.0	1.4	0.0	4.7	-	-	1.0	0.0	5.9	0.0	-	-	1.9	2.5	12.5	0.0	-	-	3.7	1.1
Single-Unit Trucks	0	6	0	0	-	6	3	2	4	0	-	9	0	2	2	0	-	4	8	1	1	0	-	10	29
% Single-Unit Trucks	0.0	4.3	0.0	-	-	3.7	2.1	0.9	9.3	-	-	2.3	0.0	5.9	3.6	-	-	3.8	20.0	12.5	16.7	-	-	18.5	4.0
Articulated Trucks	0	1	0	0	-	1	0	1	3	0	-	4	0	1	0	0	-	1	1	1	0	0	-	2	8
% Articulated Trucks	0.0	0.7	0.0	-	-	0.6	0.0	0.5	7.0	-	-	1.0	0.0	2.9	0.0	-	-	1.0	2.5	12.5	0.0	-	-	3.7	1.1
Bicycles on Road	0	0	0	0	-	0	0	0	1	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	2.3	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Site Code: 220358
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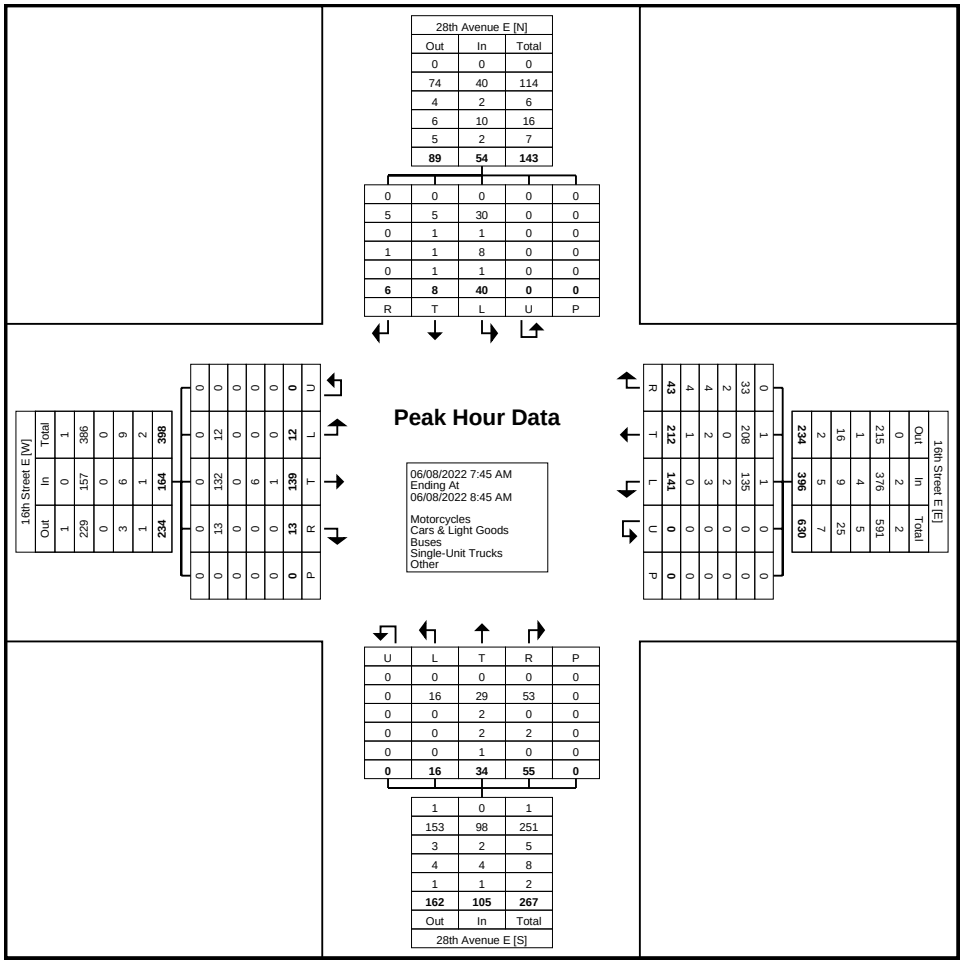


Turning Movement Peak Hour Data Plot (7:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 mmurch@ptsl.com

Count Name: 16th Street East & 28th Avenue East Owen Sound
Site Code: 220358
Start Date: 06/08/2022

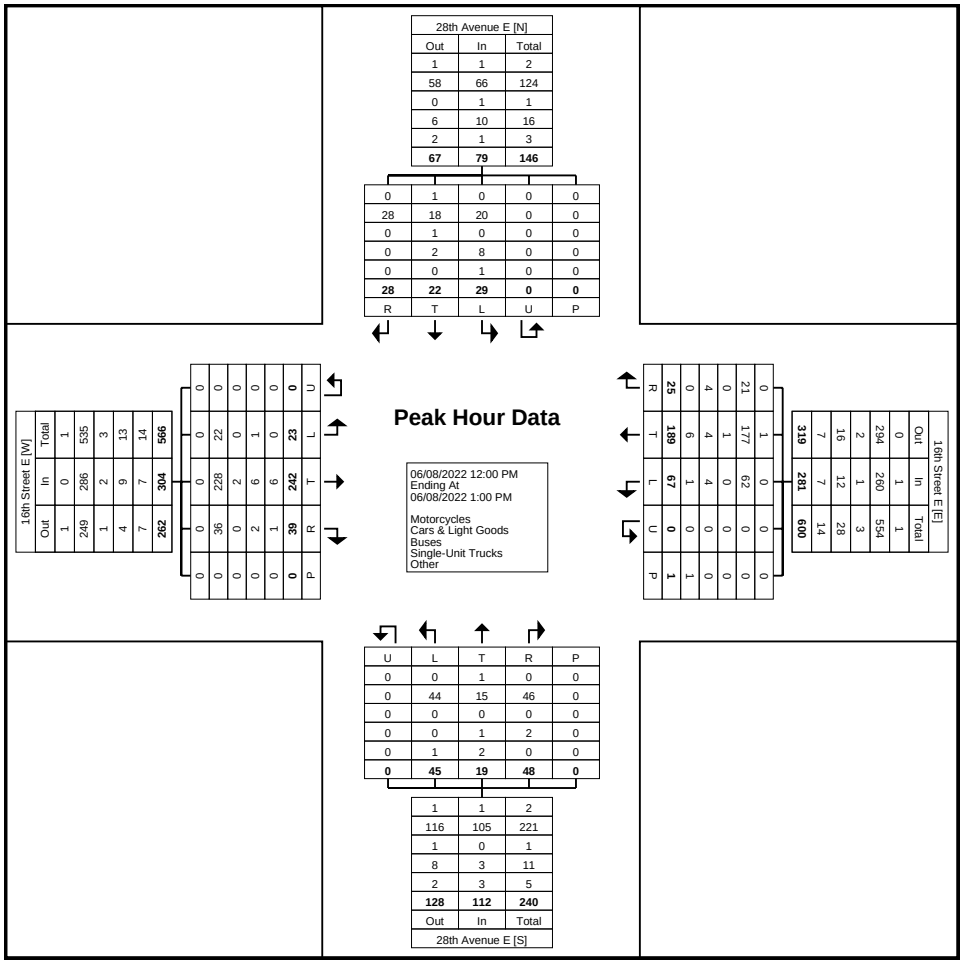
Turning Movement Peak Hour Data (12:00 PM)

Start Time	16th Street E Eastbound						16th Street E Westbound						28th Avenue E Northbound						28th Avenue E Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
12:00 PM	5	67	11	0	0	83	16	51	4	0	0	71	14	6	12	0	0	32	4	7	10	0	0	21	207
12:15 PM	6	62	9	0	0	77	19	39	7	0	0	65	10	6	15	0	0	31	6	4	5	0	0	15	188
12:30 PM	7	58	11	0	0	76	15	46	10	0	0	71	10	4	5	0	0	19	9	1	7	0	0	17	183
12:45 PM	5	55	8	0	0	68	17	53	4	0	1	74	11	3	16	0	0	30	10	10	6	0	0	26	198
Total	23	242	39	0	0	304	67	189	25	0	1	281	45	19	48	0	0	112	29	22	28	0	0	79	776
Approach %	7.6	79.6	12.8	0.0	-	-	23.8	67.3	8.9	0.0	-	-	40.2	17.0	42.9	0.0	-	-	36.7	27.8	35.4	0.0	-	-	-
Total %	3.0	31.2	5.0	0.0	-	39.2	8.6	24.4	3.2	0.0	-	36.2	5.8	2.4	6.2	0.0	-	14.4	3.7	2.8	3.6	0.0	-	10.2	-
PHF	0.821	0.903	0.886	0.000	-	0.916	0.882	0.892	0.625	0.000	-	0.949	0.804	0.792	0.750	0.000	-	0.875	0.725	0.550	0.700	0.000	-	0.760	0.937
Motorcycles	0	0	0	0	-	0	0	1	0	0	-	1	0	1	0	0	-	1	0	1	0	0	-	1	3
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.5	0.0	-	-	0.4	0.0	5.3	0.0	-	-	0.9	0.0	4.5	0.0	-	-	1.3	0.4
Cars & Light Goods	22	228	36	0	-	286	62	177	21	0	-	260	44	15	46	0	-	105	20	18	28	0	-	66	717
% Cars & Light Goods	95.7	94.2	92.3	-	-	94.1	92.5	93.7	84.0	-	-	92.5	97.8	78.9	95.8	-	-	93.8	69.0	81.8	100.0	-	-	83.5	92.4
Buses	0	2	0	0	-	2	0	1	0	0	-	1	0	0	0	0	-	0	0	1	0	0	-	1	4
% Buses	0.0	0.8	0.0	-	-	0.7	0.0	0.5	0.0	-	-	0.4	0.0	0.0	0.0	-	-	0.0	0.0	4.5	0.0	-	-	1.3	0.5
Single-Unit Trucks	1	6	2	0	-	9	4	4	4	0	-	12	0	1	2	0	-	3	8	2	0	0	-	10	34
% Single-Unit Trucks	4.3	2.5	5.1	-	-	3.0	6.0	2.1	16.0	-	-	4.3	0.0	5.3	4.2	-	-	2.7	27.6	9.1	0.0	-	-	12.7	4.4
Articulated Trucks	0	5	1	0	-	6	1	6	0	0	-	7	1	2	0	0	-	3	1	0	0	0	-	1	17
% Articulated Trucks	0.0	2.1	2.6	-	-	2.0	1.5	3.2	0.0	-	-	2.5	2.2	10.5	0.0	-	-	2.7	3.4	0.0	0.0	-	-	1.3	2.2
Bicycles on Road	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.4	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 mmurch@ptsl.com

Count Name: 16th Street East & 28th Avenue
East Owen Sound
Site Code: 220358
Start Date: 06/08/2022



Turning Movement Peak Hour Data Plot (12:00 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: 16th Street East & 28th Avenue East Owen Sound
Site Code: 220358
Start Date: 06/08/2022

Turning Movement Peak Hour Data (4:15 PM)

Start Time	16th Street E Eastbound						16th Street E Westbound						28th Avenue E Northbound						28th Avenue E Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:15 PM	8	77	12	0	0	97	37	53	10	0	0	100	6	6	24	0	0	36	7	7	4	0	0	18	251
4:30 PM	3	80	8	0	0	91	28	61	11	0	0	100	6	7	25	0	0	38	10	13	6	0	0	29	258
4:45 PM	7	72	10	0	0	89	19	59	2	0	0	80	11	7	17	0	0	35	9	11	10	0	0	30	234
5:00 PM	5	81	12	0	0	98	16	65	6	0	0	87	6	6	25	0	0	37	10	8	11	0	0	29	251
Total	23	310	42	0	0	375	100	238	29	0	0	367	29	26	91	0	0	146	36	39	31	0	0	106	994
Approach %	6.1	82.7	11.2	0.0	-	-	27.2	64.9	7.9	0.0	-	-	19.9	17.8	62.3	0.0	-	-	34.0	36.8	29.2	0.0	-	-	-
Total %	2.3	31.2	4.2	0.0	-	37.7	10.1	23.9	2.9	0.0	-	36.9	2.9	2.6	9.2	0.0	-	14.7	3.6	3.9	3.1	0.0	-	10.7	-
PHF	0.719	0.957	0.875	0.000	-	0.957	0.676	0.915	0.659	0.000	-	0.918	0.659	0.929	0.910	0.000	-	0.961	0.900	0.750	0.705	0.000	-	0.883	0.963
Motorcycles	0	3	0	0	-	3	2	5	0	0	-	7	0	0	1	0	-	1	0	0	0	0	-	0	11
% Motorcycles	0.0	1.0	0.0	-	-	0.8	2.0	2.1	0.0	-	-	1.9	0.0	0.0	1.1	-	-	0.7	0.0	0.0	0.0	-	-	0.0	1.1
Cars & Light Goods	23	302	42	0	-	367	96	218	19	0	-	333	29	23	88	0	-	140	35	37	31	0	-	103	943
% Cars & Light Goods	100.0	97.4	100.0	-	-	97.9	96.0	91.6	65.5	-	-	90.7	100.0	88.5	96.7	-	-	95.9	97.2	94.9	100.0	-	-	97.2	94.9
Buses	0	1	0	0	-	1	0	1	4	0	-	5	0	1	0	0	-	1	0	0	0	0	-	0	7
% Buses	0.0	0.3	0.0	-	-	0.3	0.0	0.4	13.8	-	-	1.4	0.0	3.8	0.0	-	-	0.7	0.0	0.0	0.0	-	-	0.0	0.7
Single-Unit Trucks	0	3	0	0	-	3	2	13	5	0	-	20	0	1	2	0	-	3	1	1	0	0	-	2	28
% Single-Unit Trucks	0.0	1.0	0.0	-	-	0.8	2.0	5.5	17.2	-	-	5.4	0.0	3.8	2.2	-	-	2.1	2.8	2.6	0.0	-	-	1.9	2.8
Articulated Trucks	0	1	0	0	-	1	0	1	1	0	-	2	0	1	0	0	-	1	0	1	0	0	-	1	5
% Articulated Trucks	0.0	0.3	0.0	-	-	0.3	0.0	0.4	3.4	-	-	0.5	0.0	3.8	0.0	-	-	0.7	0.0	2.6	0.0	-	-	0.9	0.5
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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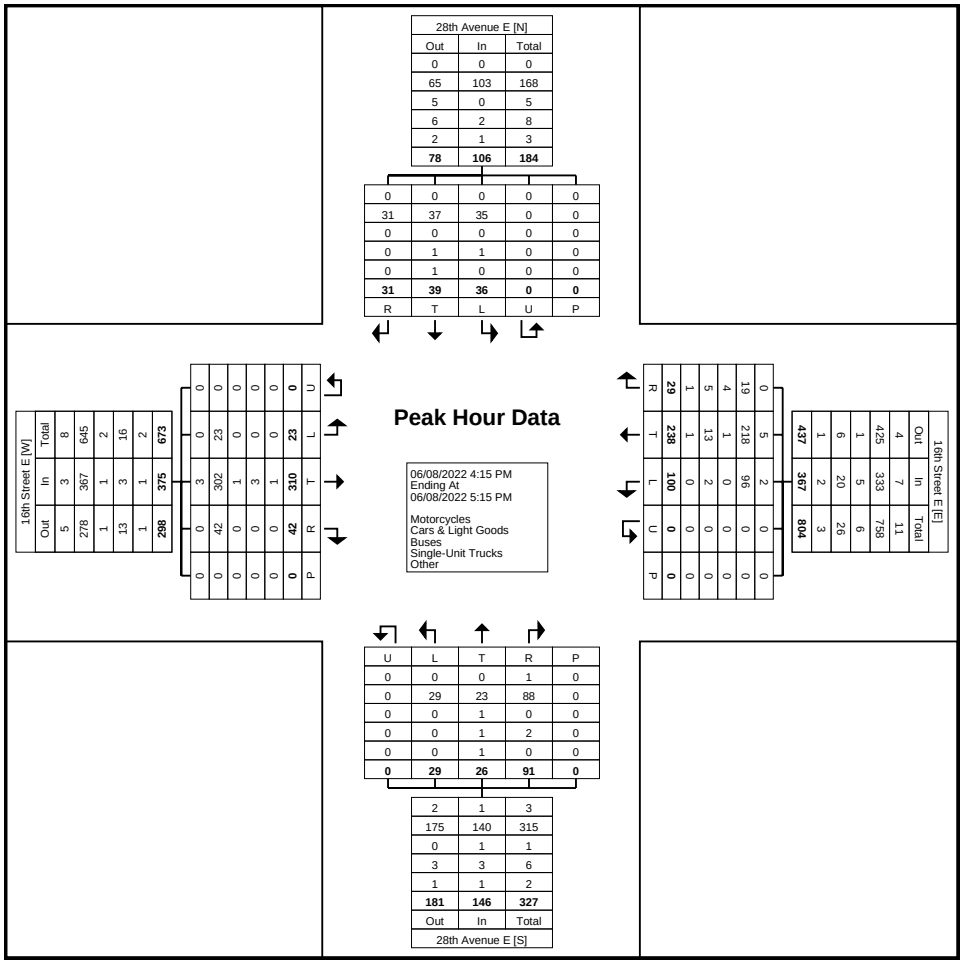


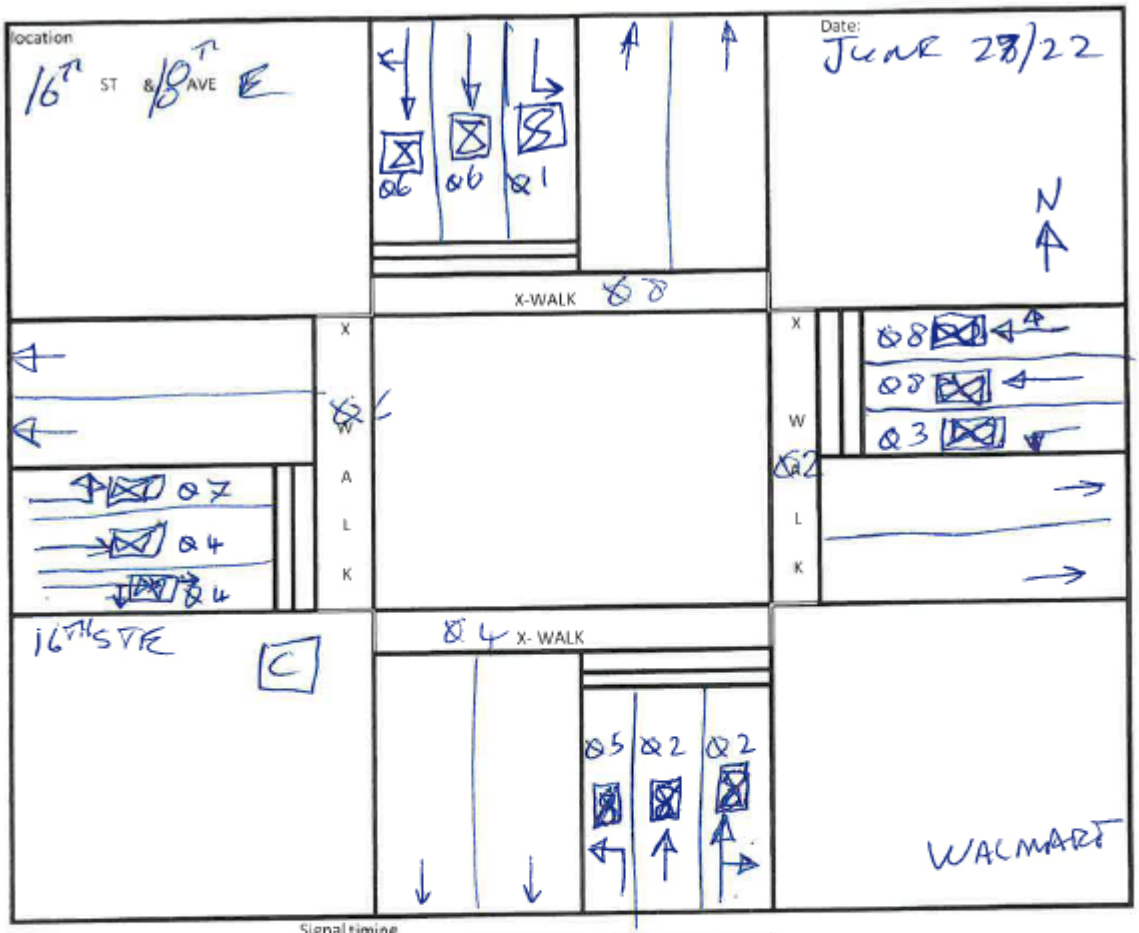
Turning Movement Peak Hour Data Plot (4:15 PM)

Maddison Murch

From: Peter Paquette <ppaquette@owensound.ca>
Sent: August 25, 2022 1:23 PM
To: Maddison Murch
Subject: RE: (220378) 2275 16th Street East, Owen Sound TIA Pre-Study Consultation

Maddison
Here are the time plans for the intersections you requested.
Peter

#19



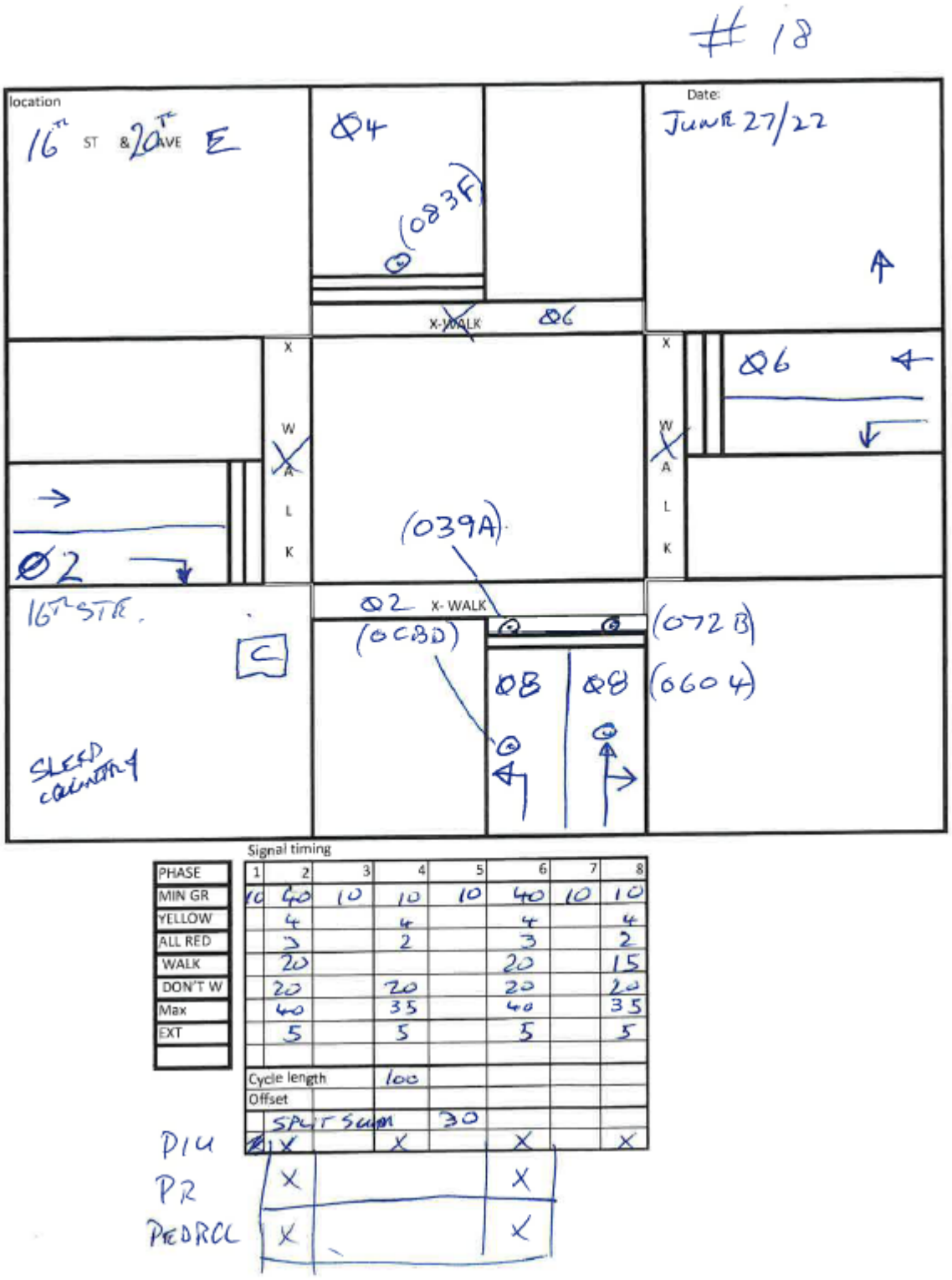
Signal timing

PHASE	1	2	3	4	5	6	7	8
MIN GR		10		25		10		25
YELLOW		4		4		4		4
ALL RED		2		2		2		2
WALK		15		15		15		15
DON'T W		10		10		10		10
Max								
EXT		5		5		5		5
SPLIT	35	21	10	34	35	21	10	34
Cycle length				100				
Offset								
	X	X	X	X	X	X	X	X

PIC

BULL DOG BUTTONS

12 LOOPS



From: Maddison Murch <mmurch@ptsl.com>
Sent: Thursday, August 25, 2022 9:00 AM
To: Peter Paquette <ppaquette@owensound.ca>
Subject: RE: (220378) 2275 16th Street East, Owen Sound TIA Pre-Study Consultation

Hi Peter,

Are you able to provide us with the signal timing plans for 16th St E/18th Ave E and 16th St E/20th Ave E?

Appendix C

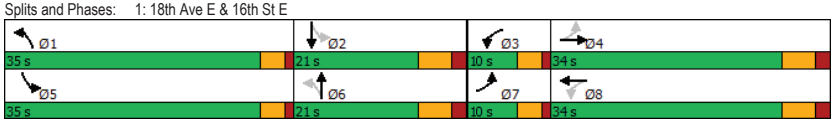
Existing Traffic Operations Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	181	97	32	228	15	94	22	37	19	17	20
Future Volume (vph)	21	181	97	32	228	15	94	22	37	19	17	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	30.0		20.0	40.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	15.0			100.0			30.0			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00		1.00			1.00	0.99		1.00	0.99	
Frt		0.948			0.991			0.906			0.917	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3258	0	1805	3373	0	1752	3184	0	1556	3194	0
Flt Permitted	0.589			0.568			0.639			0.713		
Satd. Flow (perm)	1119	3258	0	1078	3373	0	1173	3184	0	1167	3194	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		97			7			40			22	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		172.0			431.3			151.6			112.5	
Travel Time (s)		12.4			31.1			10.9			8.1	
Confl. Peds. (#/hr)			1	1			4		1	1		4
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
Heavy Vehicles (%)	0%	7%	0%	0%	6%	7%	3%	5%	0%	16%	6%	0%
Adj. Flow (vph)	23	197	105	35	248	16	102	24	40	21	18	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	302	0	35	264	0	102	64	0	21	40	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		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	
Detector 1 Position(m)	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	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4			8			6			2		
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	32.0		9.5	32.0		9.5	32.0		9.5	32.0	
Total Split (s)	10.0	34.0		10.0	34.0		35.0	21.0		35.0	21.0	
Total Split (%)	10.0%	34.0%		10.0%	34.0%		35.0%	21.0%		35.0%	21.0%	
Maximum Green (s)	6.0	28.0		6.0	28.0		31.0	15.0		31.0	15.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Max		None	Max	
Walk Time (s)		15.0			15.0			15.0			15.0	
Flash Dont Walk (s)		10.0			10.0			10.0			10.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	14.2	10.1		14.2	10.1		36.6	33.0		32.6	25.9	
Actuated g/C Ratio	0.23	0.17		0.23	0.17		0.60	0.54		0.54	0.43	
v/c Ratio	0.07	0.48		0.11	0.46		0.13	0.04		0.03	0.03	
Control Delay	17.2	19.5		17.8	26.8		7.0	6.1		7.3	9.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	17.2	19.5		17.8	26.8		7.0	6.1		7.3	9.6	
LOS	B	B		B	C		A	A		A	A	
Approach Delay		19.3			25.7			6.7			8.8	
Approach LOS		B			C			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 60.7			
Natural Cycle: 85			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.48			
Intersection Signal Delay: 18.4		Intersection LOS: B	
Intersection Capacity Utilization 46.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: 18th Ave E & 16th St E



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	23	302	35	264	102	64	21	40
v/c Ratio	0.07	0.48	0.11	0.46	0.13	0.04	0.03	0.03
Control Delay	17.2	19.5	17.8	26.8	7.0	6.1	7.3	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.2	19.5	17.8	26.8	7.0	6.1	7.3	9.6
Queue Length 50th (m)	2.1	10.8	3.2	13.7	3.3	0.4	0.7	0.5
Queue Length 95th (m)	6.9	25.4	9.3	28.7	13.6	4.8	4.3	4.1
Internal Link Dist (m)		148.0		407.3		127.6		88.5
Turn Bay Length (m)	40.0		30.0		40.0		25.0	
Base Capacity (vph)	332	1606	327	1615	1039	1749	935	1374
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.19	0.11	0.16	0.10	0.04	0.02	0.03

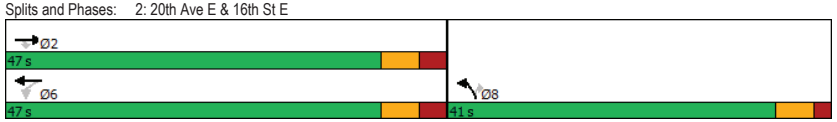
Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	167	71	57	243	40	39
Future Volume (vph)	167	71	57	243	40	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	40.0		0.0	0.0
Storage Lanes		1	1		1	1
Taper Length (m)			100.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.99	
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1776	1524	1770	1810	1719	1568
Flt Permitted			0.643		0.950	
Satd. Flow (perm)	1776	1524	1198	1810	1710	1568
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		77				42
Link Speed (k/h)	50			50	50	
Link Distance (m)	431.3			163.2	176.8	
Travel Time (s)	31.1			11.8	12.7	
Confl. Peds. (#/hr)					4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	6%	2%	5%	5%	3%
Adj. Flow (vph)	182	77	62	264	43	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	182	77	62	264	43	42
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	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	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
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	40.0	40.0	40.0	40.0	10.0	10.0
Minimum Split (s)	47.0	47.0	47.0	47.0	41.0	41.0
Total Split (s)	47.0	47.0	47.0	47.0	41.0	41.0
Total Split (%)	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%
Maximum Green (s)	40.0	40.0	40.0	40.0	35.0	35.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0
Recall Mode	Max	Max	None	None	None	None
Walk Time (s)	20.0	20.0	20.0	20.0	15.0	15.0
Flash Dont Walk (s)	20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	48.9	48.9	48.9	48.9	10.2	10.2
Actuated g/C Ratio	0.78	0.78	0.78	0.78	0.16	0.16
v/c Ratio	0.13	0.06	0.07	0.19	0.15	0.15
Control Delay	4.2	1.5	4.4	4.4	24.4	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.2	1.5	4.4	4.4	24.4	9.8
LOS	A	A	A	A	C	A
Approach Delay	3.4			4.4	17.2	
Approach LOS	A			A	B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 88			
Actuated Cycle Length: 62.8			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.19			
Intersection Signal Delay: 5.6		Intersection LOS: A	
Intersection Capacity Utilization 78.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 2: 20th Ave E & 16th St E



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	182	77	62	264	43	42
v/c Ratio	0.13	0.06	0.07	0.19	0.15	0.15
Control Delay	4.2	1.5	4.4	4.4	24.4	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.2	1.5	4.4	4.4	24.4	9.8
Queue Length 50th (m)	7.7	0.0	2.5	11.7	4.6	0.0
Queue Length 95th (m)	15.1	3.8	6.4	21.6	12.5	7.4
Internal Link Dist (m)	407.3			139.2	152.8	
Turn Bay Length (m)			40.0			
Base Capacity (vph)	1384	1204	933	1410	959	893
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.06	0.07	0.19	0.04	0.05

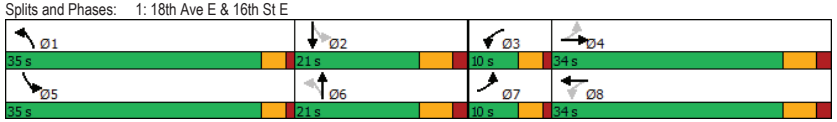
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	290	172	37	291	34	212	39	73	37	30	40
Future Volume (vph)	22	290	172	37	291	34	212	39	73	37	30	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	30.0		20.0	40.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	15.0			100.0			30.0			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	0.99		1.00	1.00		1.00	0.99		0.99	0.99	
Frt		0.944			0.984			0.902			0.915	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3343	0	1805	3473	0	1770	3162	0	1805	3126	0
Flt Permitted	0.540			0.303			0.616			0.675		
Satd. Flow (perm)	1024	3343	0	574	3473	0	1144	3162	0	1275	3126	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		121			12			79			43	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		172.0			431.3			151.6			112.5	
Travel Time (s)		12.4			31.1			10.9			8.1	
Confl. Peds. (#/hr)	3		5	5		3	3		6	6		3
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
Heavy Vehicles (%)	0%	2%	0%	0%	2%	3%	2%	3%	1%	0%	7%	3%
Adj. Flow (vph)	24	315	187	40	316	37	230	42	79	40	33	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	502	0	40	353	0	230	121	0	40	76	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		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	
Detector 1 Position(m)	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	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4			8			6			2		
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	32.0		9.5	32.0		9.5	32.0		9.5	32.0	
Total Split (s)	10.0	34.0		10.0	34.0		35.0	21.0		35.0	21.0	
Total Split (%)	10.0%	34.0%		10.0%	34.0%		35.0%	21.0%		35.0%	21.0%	
Maximum Green (s)	6.0	28.0		6.0	28.0		31.0	15.0		31.0	15.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Max		None	Max	
Walk Time (s)		15.0			15.0			15.0			15.0	
Flash Dont Walk (s)		10.0			10.0			10.0			10.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	19.4	14.2		20.2	16.1		42.4	34.5		34.2	25.7	
Actuated g/C Ratio	0.27	0.20		0.28	0.22		0.59	0.48		0.47	0.36	
v/c Ratio	0.07	0.67		0.15	0.45		0.30	0.08		0.06	0.07	
Control Delay	17.7	25.5		18.8	26.2		10.1	7.4		9.7	11.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	17.7	25.5		18.8	26.2		10.1	7.4		9.7	11.5	
LOS	B	C		B	C		B	A		A	B	
Approach Delay		25.2			25.4			9.1			10.9	
Approach LOS		C			C			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 72.2			
Natural Cycle: 85			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 20.0		Intersection LOS: B	
Intersection Capacity Utilization 53.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: 18th Ave E & 16th St E



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	24	502	40	353	230	121	40	76
v/c Ratio	0.07	0.67	0.15	0.45	0.30	0.08	0.06	0.07
Control Delay	17.7	25.5	18.8	26.2	10.1	7.4	9.7	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.7	25.5	18.8	26.2	10.1	7.4	9.7	11.5
Queue Length 50th (m)	2.4	28.2	4.0	20.2	16.6	2.0	2.6	1.7
Queue Length 95th (m)	7.7	47.0	11.0	40.0	34.1	8.0	7.9	7.4
Internal Link Dist (m)		148.0		407.3		127.6		88.5
Turn Bay Length (m)	40.0		30.0		40.0		25.0	
Base Capacity (vph)	342	1404	265	1391	948	1552	982	1139
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.36	0.15	0.25	0.24	0.08	0.04	0.07

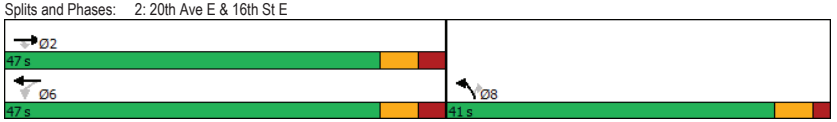
Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	266	149	58	206	163	67
Future Volume (vph)	266	149	58	206	163	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	40.0		0.0	0.0
Storage Lanes		1	1		1	1
Taper Length (m)			100.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99	1.00		1.00	0.99
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1845	1615	1752	1863	1787	1568
Flt Permitted			0.583		0.950	
Satd. Flow (perm)	1845	1592	1074	1863	1785	1548
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		162				73
Link Speed (k/h)	50			50	50	
Link Distance (m)	431.3			163.2	176.8	
Travel Time (s)	31.1			11.8	12.7	
Confl. Peds. (#/hr)		3	3		1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	3%	2%	1%	3%
Adj. Flow (vph)	289	162	63	224	177	73
Shared Lane Traffic (%)						
Lane Group Flow (vph)	289	162	63	224	177	73
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	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0
Trailing Detector (m)	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
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)	9.4			9.4		
Detector 2 Size(m)	0.6			0.6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	2			6	8	
Permitted Phases		2	6			8
Detector Phase	2	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	40.0	40.0	40.0	40.0	10.0	10.0
Minimum Split (s)	47.0	47.0	47.0	47.0	41.0	41.0
Total Split (s)	47.0	47.0	47.0	47.0	41.0	41.0
Total Split (%)	53.4%	53.4%	53.4%	53.4%	46.6%	46.6%
Maximum Green (s)	40.0	40.0	40.0	40.0	35.0	35.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0
Recall Mode	Max	Max	None	None	None	None
Walk Time (s)	20.0	20.0	20.0	20.0	15.0	15.0
Flash Dont Walk (s)	20.0	20.0	20.0	20.0	20.0	20.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	40.1	40.1	40.1	40.1	13.7	13.7
Actuated g/C Ratio	0.60	0.60	0.60	0.60	0.21	0.21
v/c Ratio	0.26	0.16	0.10	0.20	0.48	0.19
Control Delay	7.6	1.8	7.0	7.2	28.0	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.6	1.8	7.0	7.2	28.0	7.4
LOS	A	A	A	A	C	A
Approach Delay	5.5			7.1	22.0	
Approach LOS	A			A	C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 88			
Actuated Cycle Length: 66.8			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.48			
Intersection Signal Delay: 10.2		Intersection LOS: B	
Intersection Capacity Utilization 78.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 2: 20th Ave E & 16th St E



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	289	162	63	224	177	73
v/c Ratio	0.26	0.16	0.10	0.20	0.48	0.19
Control Delay	7.6	1.8	7.0	7.2	28.0	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.6	1.8	7.0	7.2	28.0	7.4
Queue Length 50th (m)	15.7	0.0	3.1	11.7	20.6	0.0
Queue Length 95th (m)	32.1	7.1	9.0	24.7	37.6	9.2
Internal Link Dist (m)	407.3			139.2	152.8	
Turn Bay Length (m)			40.0			
Base Capacity (vph)	1107	1020	644	1118	938	847
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.16	0.10	0.20	0.19	0.09

Intersection Summary

Appendix D

Internal Capture Worksheet & Net/Pass-by Trips

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	2275 16th St E	**Organization:**	PTSL
Project Location:	Owen Sound	**Performed By:**	
Scenario Description:		**Date:**	
Analysis Year:		**Checked By:**	
Analysis Period:	**AM Street Peak Hour**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office	712	5,382		9	7	2
Retail	822	12,917		30	17	13
Restaurant	932/934	6,577		180	93	87
Cinema/Entertainment				0		
Residential	221		120	41	9	32
Hotel				0		
All Other Land Uses[2]				0		
Total				260	126	134

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	1	0	0	0
Retail	0		2	0	0	0
Restaurant	1	1		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	6	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	260	126	134
Internal Capture Percentage	8%	9%	8%
External Vehicle-Trips[3]	238	115	123
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	14%	50%
Retail	6%	15%
Restaurant	10%	2%
Cinema/Entertainment	N/A	N/A
Residential	0%	19%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	2275 16th St E
Analysis Period:	**AM Street Peak Hour**

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	7	7	1.00	2	2
Retail	1.00	17	17	1.00	13	13
Restaurant	1.00	93	93	1.00	87	87
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	9	9	1.00	32	32
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		1	1	0	0	0
Retail	4		2	0	2	0
Restaurant	27	12		0	3	3
Cinema/Entertainment	0	0	0		0	0
Residential	1	0	6	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		5	21	0	0	0
Retail	0		47	0	0	0
Restaurant	1	1		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	3	19	0		0
Hotel	0	1	6	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	1	6	7	6	0	0
Retail	1	16	17	16	0	0
Restaurant	9	84	93	84	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	9	9	9	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	1	1	2	1	0	0
Retail	2	11	13	11	0	0
Restaurant	2	85	87	85	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	6	26	32	26	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	2275 16th St E	**Organization:**	PTSL
Project Location:	Owen Sound	**Performed By:**	
Scenario Description:		**Date:**	
Analysis Year:		**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office	712	5,382		12	4	8
Retail	822	12,917		85	43	42
Restaurant	932/934	6,577		140	76	64
Cinema/Entertainment				0		
Residential	221		120	47	29	18
Hotel				0		
All Other Land Uses[2]				0		
Total				284	152	132

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail					0	
Restaurant						
Cinema/Entertainment						
Residential		0				
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		2	0	0	0	0
Retail	1		12	0	11	0
Restaurant	1	22		0	5	0
Cinema/Entertainment	0	0	0		0	0
Residential	1	4	4	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	284	152	132
Internal Capture Percentage	44%	41%	48%
External Vehicle-Trips[3]	158	89	69
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	75%	25%
Retail	65%	57%
Restaurant	21%	44%
Cinema/Entertainment	N/A	N/A
Residential	55%	50%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	2275 16th St E
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	4	4	1.00	8	8
Retail	1.00	43	43	1.00	42	42
Restaurant	1.00	76	76	1.00	64	64
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	29	29	1.00	18	18
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		2	0	0	0	0
Retail	1		12	2	11	2
Restaurant	2	26		5	12	4
Cinema/Entertainment	0	0	0		0	0
Residential	1	8	4	0		1
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		3	2	0	1	0
Retail	1		22	0	13	0
Restaurant	1	22		0	5	0
Cinema/Entertainment	0	2	2		1	0
Residential	2	4	11	0		0
Hotel	0	1	4	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	3	1	4	1	0	0
Retail	28	15	43	15	0	0
Restaurant	16	60	76	60	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	16	13	29	13	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	2	6	8	6	0	0
Retail	24	18	42	18	0	0
Restaurant	28	36	64	36	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	9	9	18	9	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

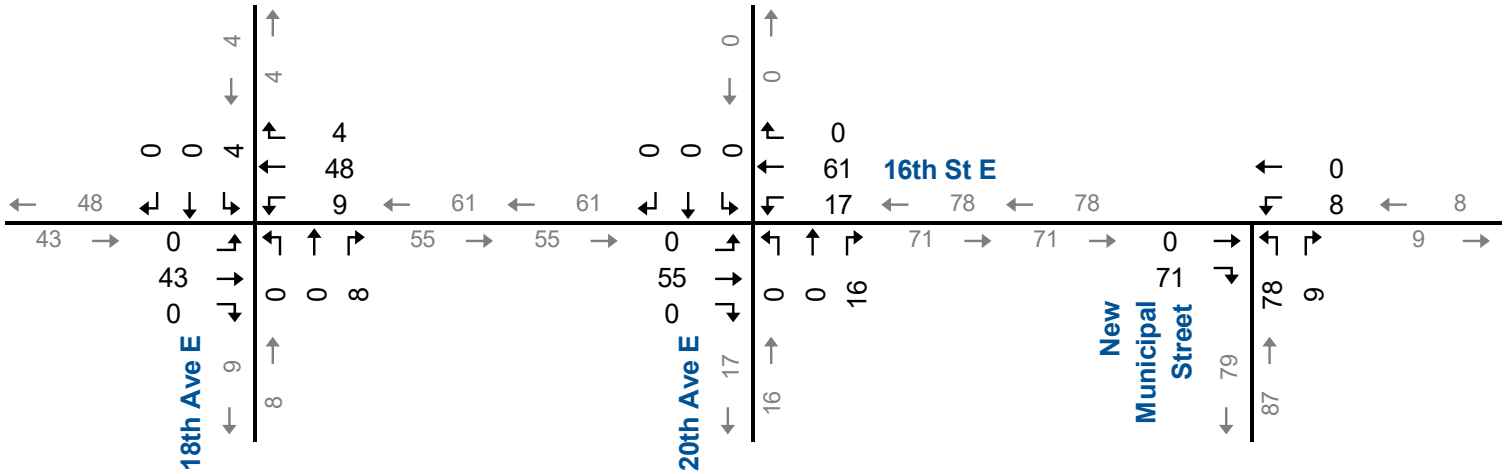
[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

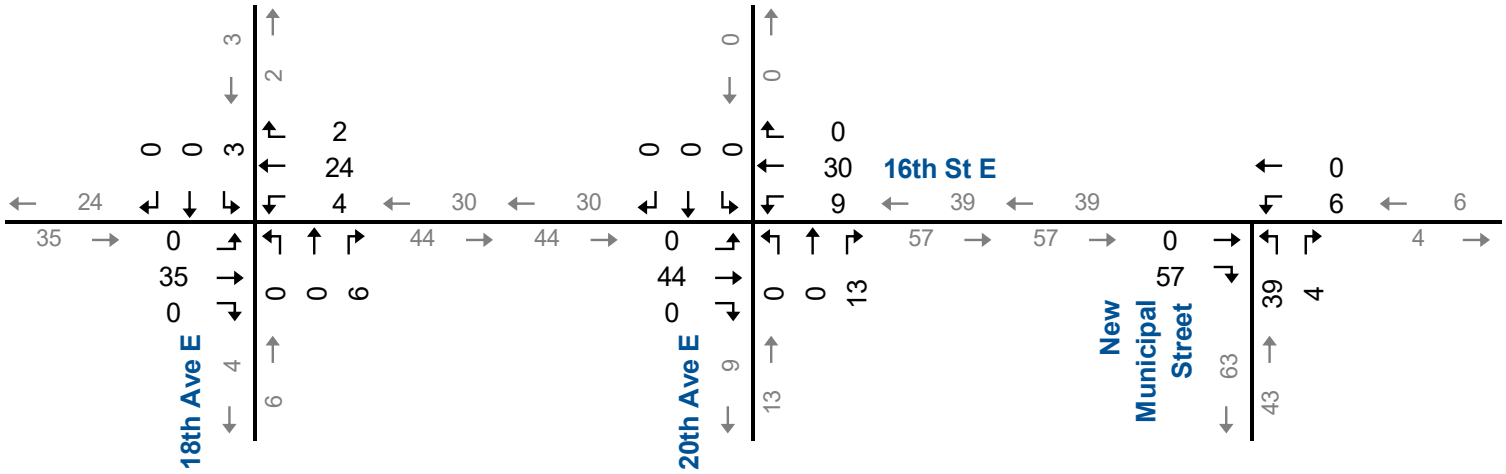
[3]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

AM Peak Hour

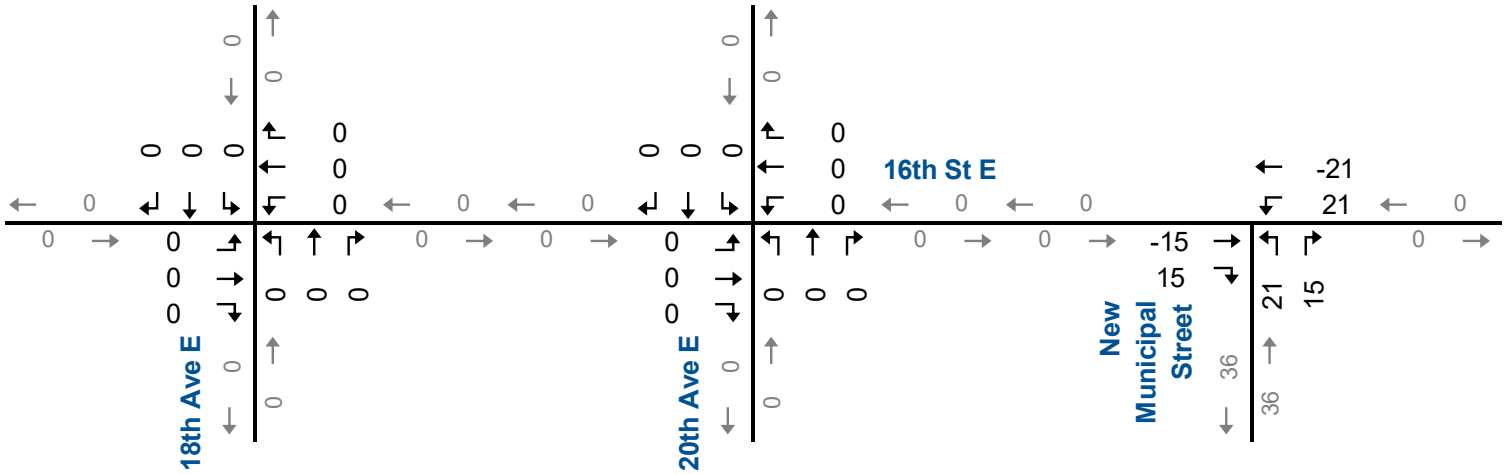


PM Peak Hour

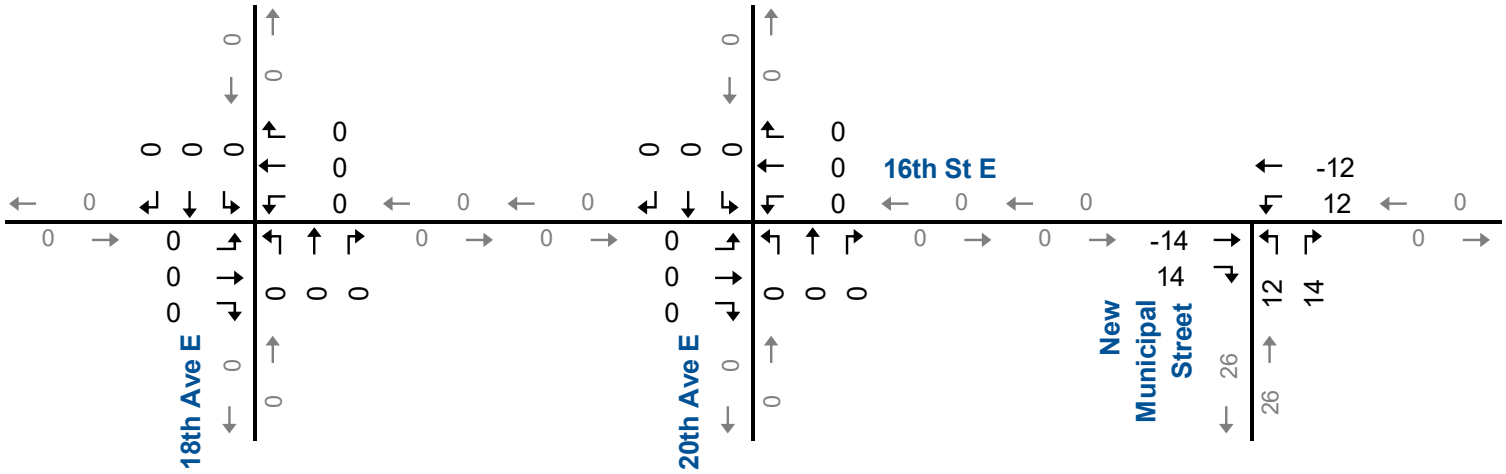


Site Generated Traffic Volumes - Net

AM Peak Hour



PM Peak Hour

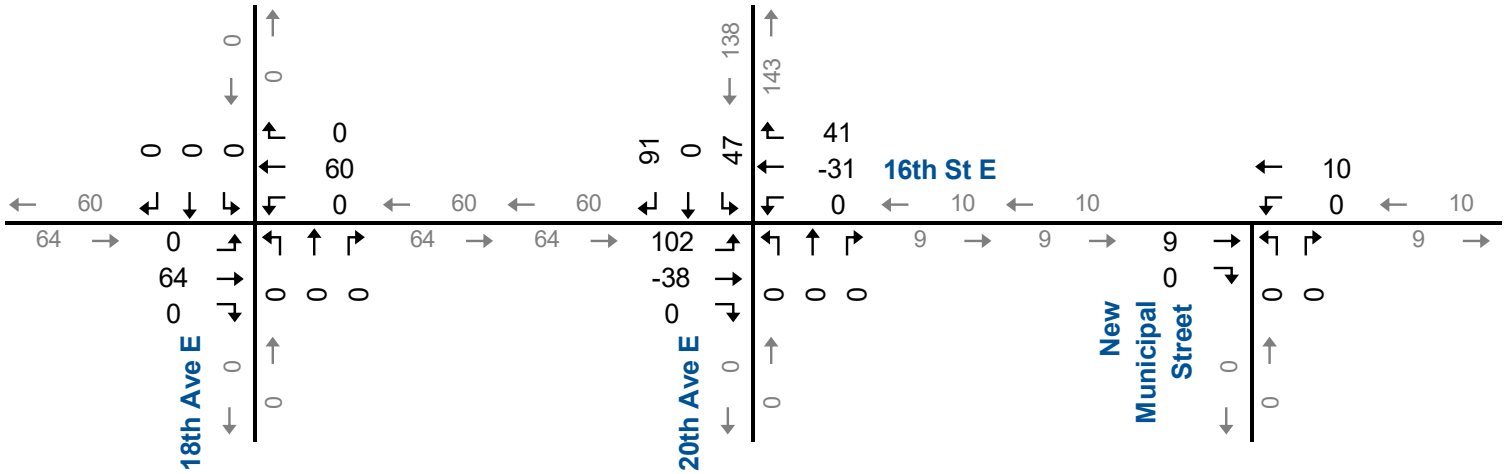


Site Generated Traffic Volumes - Pass-by

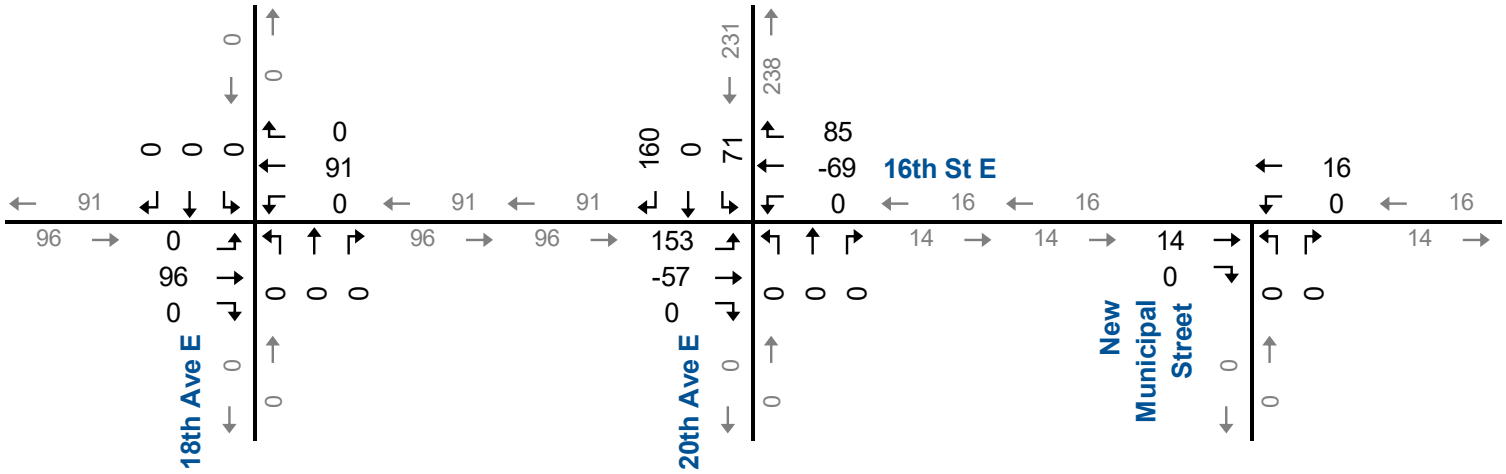
Appendix E

Other Area Development Traffic Volumes

AM Peak Hour

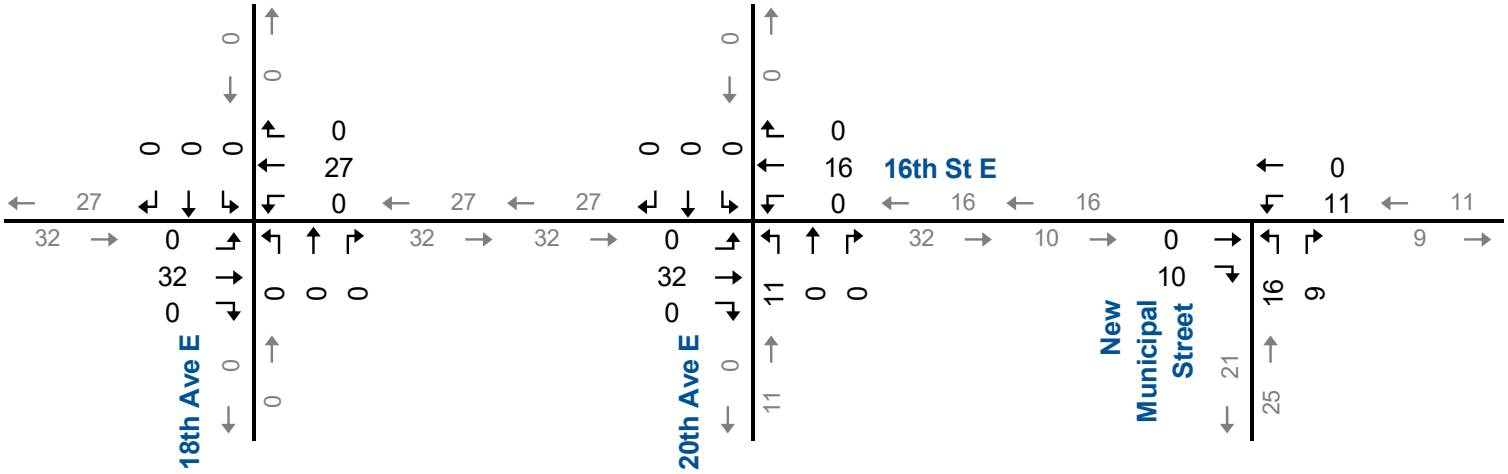


PM Peak Hour

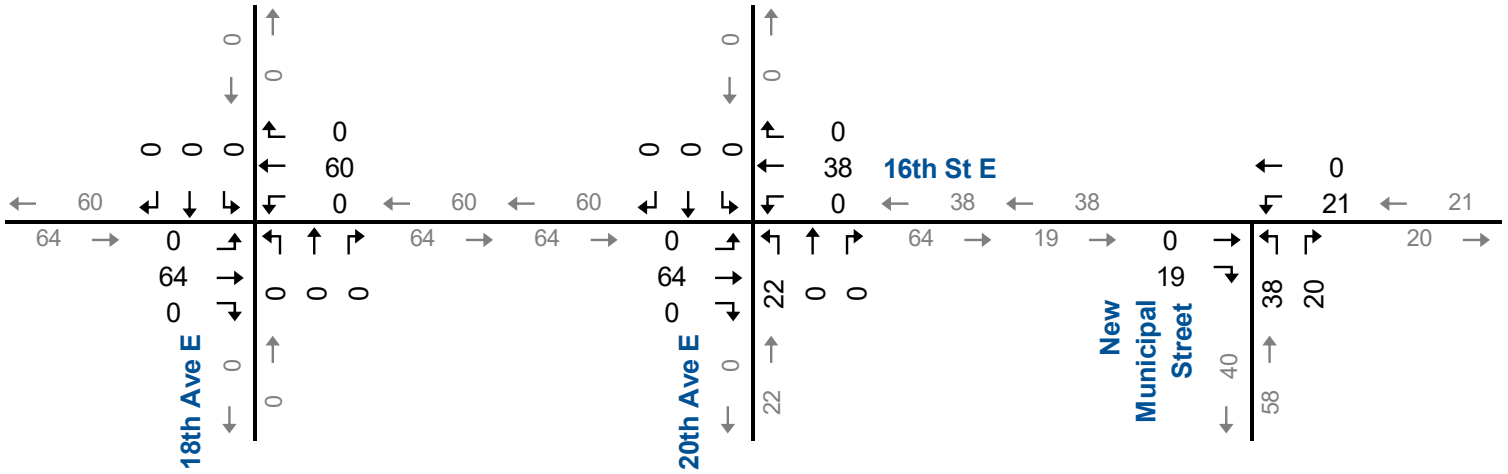


Other Area Development Traffic Volumes
1960 16th Street East

AM Peak Hour

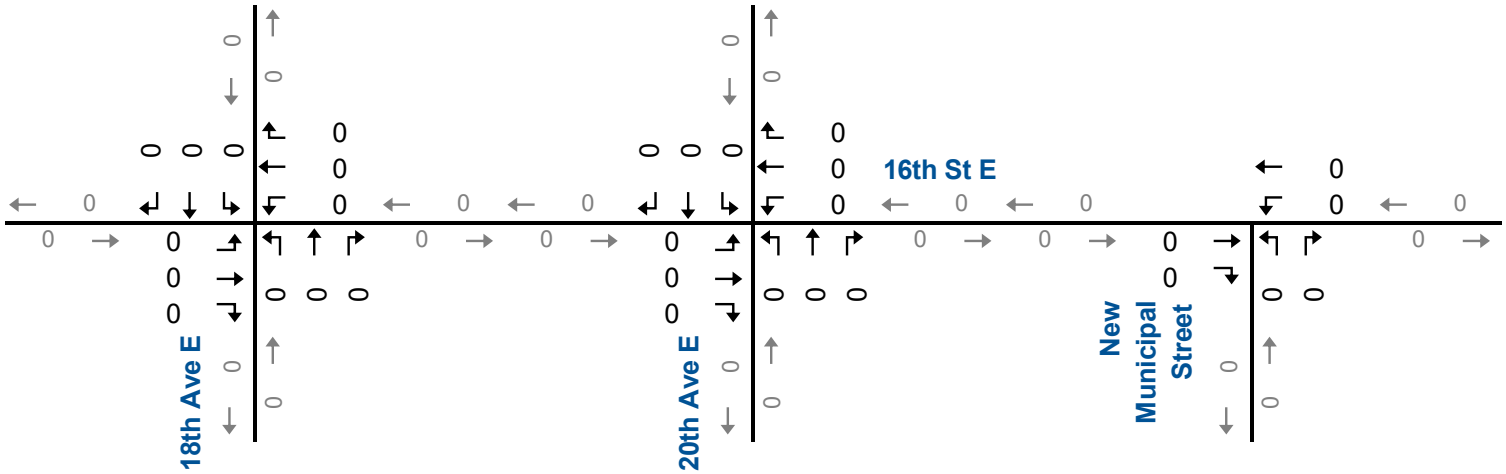


PM Peak Hour

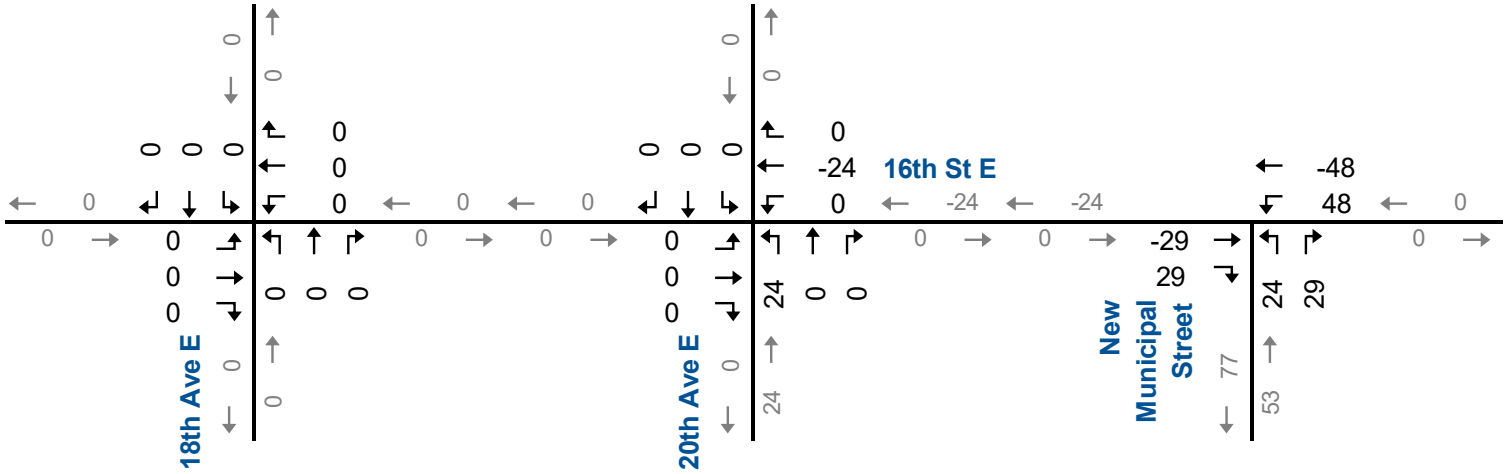


Other Area Development Traffic Volumes
Heritage Grove Centre - Net

AM Peak Hour

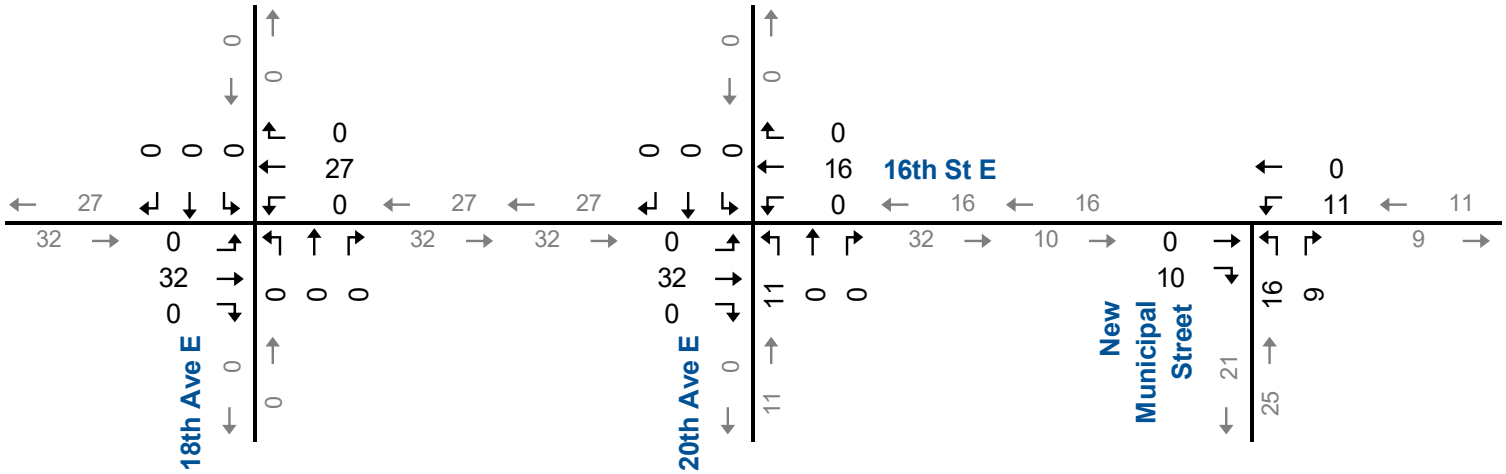


PM Peak Hour

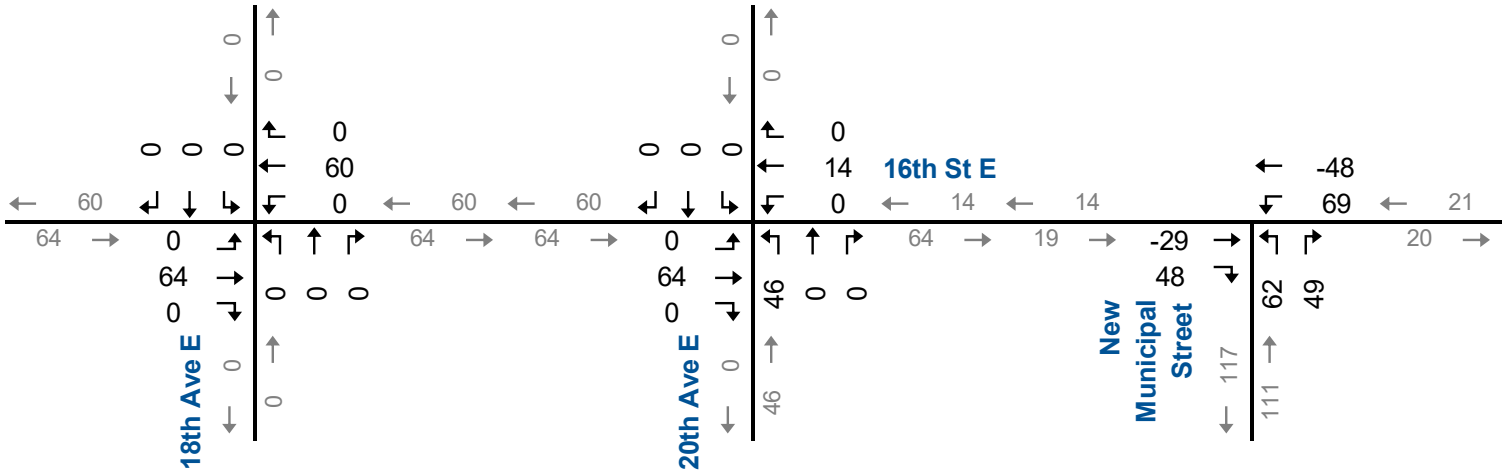


Other Area Development Traffic Volumes
Heritage Grove Centre – Pass-by

AM Peak Hour

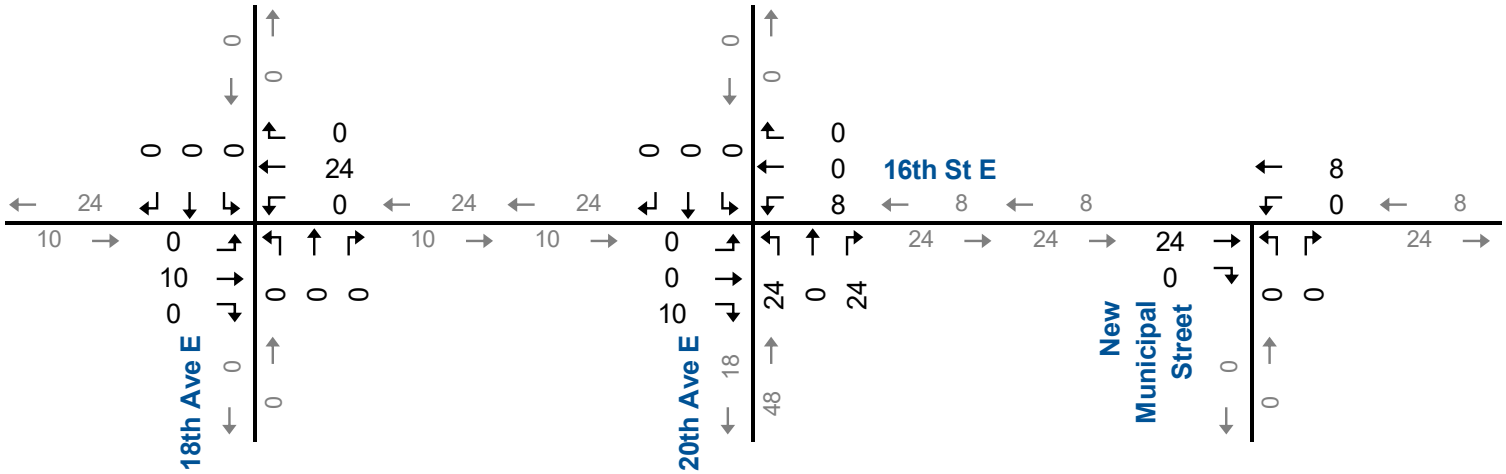


PM Peak Hour

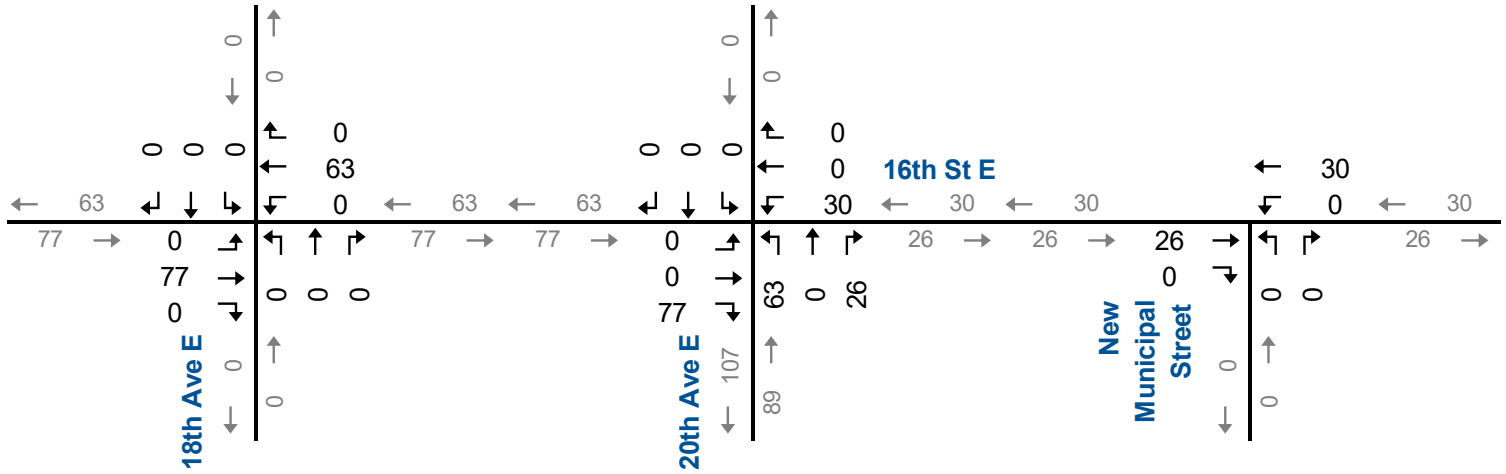


Other Area Development Traffic Volumes
Heritage Grove Centre – Total

AM Peak Hour



PM Peak Hour



Other Area Development Traffic Volumes
Telfer Creek Subdivision

Appendix F

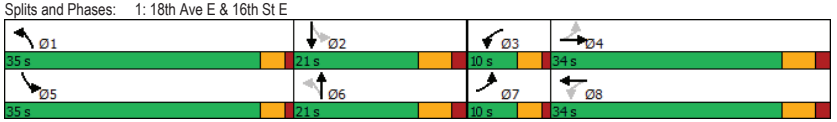
2027 Background Traffic Operations Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	296	102	34	351	16	99	23	39	20	18	21
Future Volume (vph)	22	296	102	34	351	16	99	23	39	20	18	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	30.0		20.0	40.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	15.0			100.0			30.0			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00		1.00			1.00	0.99		1.00	0.99	
Frt		0.962			0.994			0.906			0.920	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3290	0	1805	3384	0	1752	3184	0	1556	3202	0
Flt Permitted	0.506			0.389			0.640			0.711		
Satd. Flow (perm)	961	3290	0	739	3384	0	1175	3184	0	1163	3202	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		47			4			42			23	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		172.0			431.3			151.6			112.5	
Travel Time (s)		12.4			31.1			10.9			8.1	
Confl. Peds. (#/hr)			1	1			4		1	1		4
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
Heavy Vehicles (%)	0%	7%	0%	0%	6%	7%	3%	5%	0%	16%	6%	0%
Adj. Flow (vph)	24	322	111	37	382	17	108	25	42	22	20	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	433	0	37	399	0	108	67	0	22	43	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		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	
Detector 1 Position(m)	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	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4			8			6			2		
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	32.0		9.5	32.0		9.5	32.0		9.5	32.0	
Total Split (s)	10.0	34.0		10.0	34.0		35.0	21.0		35.0	21.0	
Total Split (%)	10.0%	34.0%		10.0%	34.0%		35.0%	21.0%		35.0%	21.0%	
Maximum Green (s)	6.0	28.0		6.0	28.0		31.0	15.0		31.0	15.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Max		None	Max	
Walk Time (s)		15.0			15.0			15.0			15.0	
Flash Dont Walk (s)		10.0			10.0			10.0			10.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	18.6	13.3		19.3	15.2		36.9	31.6		32.9	26.1	
Actuated g/C Ratio	0.28	0.20		0.29	0.23		0.56	0.48		0.50	0.39	
v/c Ratio	0.07	0.62		0.12	0.51		0.15	0.04		0.04	0.03	
Control Delay	16.1	27.0		16.7	26.0		9.3	8.2		9.3	11.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	16.1	27.0		16.7	26.0		9.3	8.2		9.3	11.3	
LOS	B	C		B	C		A	A		A	B	
Approach Delay		26.4			25.2			8.9			10.6	
Approach LOS		C			C			A			B	

Intersection Summary		
Area Type:	Other	
Cycle Length: 100		
Actuated Cycle Length: 66.4		
Natural Cycle: 85		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 0.62		
Intersection Signal Delay: 22.3		Intersection LOS: C
Intersection Capacity Utilization 50.1%		ICU Level of Service A
Analysis Period (min) 15		

Splits and Phases: 1: 18th Ave E & 16th St E



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	24	433	37	399	108	67	22	43
v/c Ratio	0.07	0.62	0.12	0.51	0.15	0.04	0.04	0.03
Control Delay	16.1	27.0	16.7	26.0	9.3	8.2	9.3	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	27.0	16.7	26.0	9.3	8.2	9.3	11.3
Queue Length 50th (m)	2.2	27.1	3.4	22.3	7.1	0.8	1.4	1.0
Queue Length 95th (m)	7.0	43.1	9.6	42.8	16.4	5.4	5.1	4.7
Internal Link Dist (m)		148.0		407.3		127.6		88.5
Turn Bay Length (m)	40.0		30.0		40.0		25.0	
Base Capacity (vph)	348	1475	315	1492	962	1536	866	1272
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.29	0.12	0.27	0.11	0.04	0.03	0.03

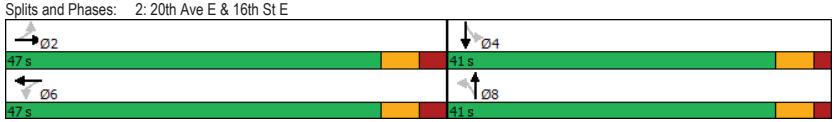
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	170	85	68	240	41	77	0	65	47	0	91
Future Volume (vph)	102	170	85	68	240	41	77	0	65	47	0	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	40.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	80.0			100.0			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							1.00				0.98	
Frt		0.950			0.978			0.850			0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3215	0	1770	1782	0	1719	1568	0	1805	1575	0
Flt Permitted	0.574			0.581			0.693			0.711		
Satd. Flow (perm)	1091	3215	0	1082	1782	0	1249	1568	0	1351	1575	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		92			13			648			522	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		431.3			163.2			176.8			151.9	
Travel Time (s)		31.1			11.8			12.7			10.9	
Confl. Peds. (#/hr)							4					4
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
Heavy Vehicles (%)	0%	7%	6%	2%	5%	0%	5%	0%	3%	0%	0%	0%
Adj. Flow (vph)	111	185	92	74	261	45	84	0	71	51	0	99
Shared Lane Traffic (%)												
Lane Group Flow (vph)	111	277	0	74	306	0	84	71	0	51	99	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	100		15	25		100	25		15	100		100
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		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	
Detector 1 Position(m)	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	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	40.0	40.0		40.0	40.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	47.0	47.0		47.0	47.0		41.0	41.0		41.0	41.0	
Total Split (s)	47.0	47.0		47.0	47.0		41.0	41.0		41.0	41.0	
Total Split (%)	53.4%	53.4%		53.4%	53.4%		46.6%	46.6%		46.6%	46.6%	
Maximum Green (s)	40.0	40.0		40.0	40.0		35.0	35.0		35.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		5.0	5.0		3.0	3.0	
Recall Mode	Max	Max		None	None		None	None		None	None	
Walk Time (s)	20.0	20.0		20.0	20.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	44.6	44.6		44.6	44.6		12.0	12.0		12.0	12.0	
Actuated g/C Ratio	0.69	0.69		0.69	0.69		0.19	0.19		0.19	0.19	
v/c Ratio	0.15	0.12		0.10	0.25		0.37	0.09		0.20	0.14	
Control Delay	6.5	3.8		6.2	6.2		27.9	0.2		24.4	0.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	6.5	3.8		6.2	6.2		27.9	0.2		24.4	0.4	
LOS	A	A		A	A		C	A		C	A	
Approach Delay		4.6			6.2			15.2			8.6	
Approach LOS		A			A			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 88			
Actuated Cycle Length: 64.8			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.37			
Intersection Signal Delay: 7.2		Intersection LOS: A	
Intersection Capacity Utilization 95.1%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 2: 20th Ave E & 16th St E



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	111	277	74	306	84	71	51	99
v/c Ratio	0.15	0.12	0.10	0.25	0.37	0.09	0.20	0.14
Control Delay	6.5	3.8	6.2	6.2	27.9	0.2	24.4	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	3.8	6.2	6.2	27.9	0.2	24.4	0.4
Queue Length 50th (m)	5.1	4.2	3.3	14.4	9.4	0.0	5.5	0.0
Queue Length 95th (m)	13.3	9.8	9.4	30.3	21.1	0.0	14.0	0.0
Internal Link Dist (m)		407.3		139.2		152.8		127.9
Turn Bay Length (m)	40.0		40.0					
Base Capacity (vph)	751	2243	745	1231	675	1145	730	1091
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.12	0.10	0.25	0.12	0.06	0.07	0.09

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	205	10	11	264	16	9
Future Volume (vph)	205	10	11	264	16	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	25.0		0.0	0.0
Storage Lanes		0	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	0.994					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1818	0	1770	1863	1770	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	1818	0	1770	1863	1770	1583
Link Speed (k/h)	50			80	50	
Link Distance (m)	152.4			140.0	189.7	
Travel Time (s)	11.0			6.3	13.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	2%	2%	2%	2%	2%
Adj. Flow (vph)	223	11	12	287	17	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	234	0	12	287	17	10
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	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		100	100		100	100
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	23.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	205	10	11	264	16	9
Future Vol, veh/h	205	10	11	264	16	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	2	2	2	2	2
Mvmt Flow	223	11	12	287	17	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	234	0	540	229
Stage 1	-	-	-	-	229	-
Stage 2	-	-	-	-	311	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1333	-	503	810
Stage 1	-	-	-	-	809	-
Stage 2	-	-	-	-	743	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1333	-	498	810
Mov Cap-2 Maneuver	-	-	-	-	498	-
Stage 1	-	-	-	-	809	-
Stage 2	-	-	-	-	736	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	11.4
HCM LOS			B

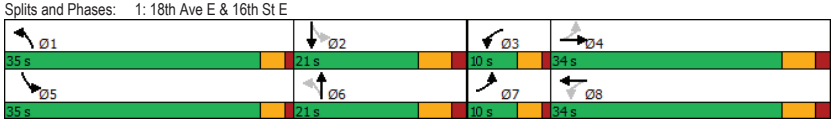
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	498	810	-	-	1333	-
HCM Lane V/C Ratio	0.035	0.012	-	-	0.009	-
HCM Control Delay (s)	12.5	9.5	-	-	7.7	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	542	181	39	520	36	223	41	77	39	32	42
Future Volume (vph)	23	542	181	39	520	36	223	41	77	39	32	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	30.0		20.0	40.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	15.0			100.0			30.0			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00	1.00		1.00	0.99		0.99	0.99	
Frt		0.962			0.990			0.902			0.915	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3406	0	1805	3498	0	1770	3162	0	1805	3126	0
Flt Permitted	0.312			0.161			0.613			0.670		
Satd. Flow (perm)	592	3406	0	305	3498	0	1138	3162	0	1265	3126	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		45			7			84			46	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		172.0			431.3			151.6			112.5	
Travel Time (s)		12.4			31.1			10.9			8.1	
Confl. Peds. (#/hr)	3		5	5		3	3		6	6		3
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
Heavy Vehicles (%)	0%	2%	0%	0%	2%	3%	2%	3%	1%	0%	7%	3%
Adj. Flow (vph)	25	589	197	42	565	39	242	45	84	42	35	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	786	0	42	604	0	242	129	0	42	81	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		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	
Detector 1 Position(m)	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	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4			8			6			2		
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	32.0		9.5	32.0		9.5	32.0		9.5	32.0	
Total Split (s)	10.0	34.0		10.0	34.0		35.0	21.0		35.0	21.0	
Total Split (%)	10.0%	34.0%		10.0%	34.0%		35.0%	21.0%		35.0%	21.0%	
Maximum Green (s)	6.0	28.0		6.0	28.0		31.0	15.0		31.0	15.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Max		None	Max	
Walk Time (s)		15.0			15.0			15.0			15.0	
Flash Dont Walk (s)		10.0			10.0			10.0			10.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	28.3	23.1		29.1	24.9		44.2	36.2		34.4	25.7	
Actuated g/C Ratio	0.34	0.28		0.35	0.30		0.53	0.44		0.41	0.31	
v/c Ratio	0.09	0.80		0.19	0.57		0.35	0.09		0.07	0.08	
Control Delay	17.1	34.0		18.7	27.3		13.9	8.7		13.0	14.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	17.1	34.0		18.7	27.3		13.9	8.7		13.0	14.0	
LOS	B	C		B	C		B	A		B	B	
Approach Delay		33.4			26.7			12.1			13.7	
Approach LOS		C			C			B			B	

Intersection Summary		
Area Type:	Other	
Cycle Length: 100		
Actuated Cycle Length: 82.9		
Natural Cycle: 85		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 0.80		
Intersection Signal Delay: 25.9		Intersection LOS: C
Intersection Capacity Utilization 59.2%		ICU Level of Service B
Analysis Period (min) 15		

Splits and Phases: 1: 18th Ave E & 16th St E



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	25	786	42	604	242	129	42	81
v/c Ratio	0.09	0.80	0.19	0.57	0.35	0.09	0.07	0.08
Control Delay	17.1	34.0	18.7	27.3	13.9	8.7	13.0	14.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.1	34.0	18.7	27.3	13.9	8.7	13.0	14.0
Queue Length 50th (m)	2.6	65.0	4.4	40.5	24.6	2.7	3.8	2.4
Queue Length 95th (m)	8.0	93.2	11.5	71.3	41.9	9.2	9.5	8.6
Internal Link Dist (m)		148.0		407.3		127.6		88.5
Turn Bay Length (m)	40.0		30.0		40.0		25.0	
Base Capacity (vph)	292	1211	218	1276	849	1426	882	1001
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.65	0.19	0.47	0.29	0.09	0.05	0.08

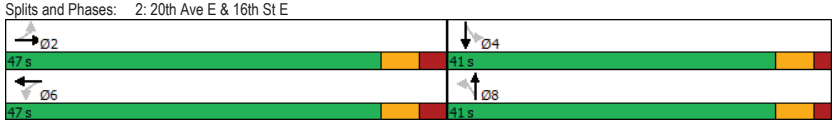
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	287	234	91	162	85	280	0	96	71	0	160
Future Volume (vph)	153	287	234	91	162	85	280	0	96	71	0	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	40.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	80.0			100.0			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		1.00			1.00	0.99		1.00	0.98	
Frt		0.933			0.949			0.850			0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3293	0	1752	1780	0	1787	1393	0	1805	1581	0
Flt Permitted	0.594			0.432			0.647			0.690		
Satd. Flow (perm)	1129	3293	0	796	1780	0	1216	1393	0	1310	1581	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		254			39			442			665	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		431.3			163.2			176.8			151.9	
Travel Time (s)		31.1			11.8			12.7			10.9	
Confl. Peds. (#/hr)			3	3			1		1	1		1
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
Heavy Vehicles (%)	0%	3%	0%	3%	2%	0%	1%	0%	3%	0%	0%	0%
Parking (#/hr)								0				
Adj. Flow (vph)	166	312	254	99	176	92	304	0	104	77	0	174
Shared Lane Traffic (%)												
Lane Group Flow (vph)	166	566	0	99	268	0	304	104	0	77	174	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.14	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		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	
Detector 1 Position(m)	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	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
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												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	40.0	40.0		40.0	40.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	47.0	47.0		47.0	47.0		41.0	41.0		41.0	41.0	
Total Split (s)	47.0	47.0		47.0	47.0		41.0	41.0		41.0	41.0	
Total Split (%)	53.4%	53.4%		53.4%	53.4%		46.6%	46.6%		46.6%	46.6%	
Maximum Green (s)	40.0	40.0		40.0	40.0		35.0	35.0		35.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		5.0	5.0		3.0	3.0	
Recall Mode	Max	Max		None	None		None	None		None	None	
Walk Time (s)	20.0	20.0		20.0	20.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	40.3	40.3		40.3	40.3		25.7	25.7		25.7	25.7	
Actuated g/C Ratio	0.51	0.51		0.51	0.51		0.32	0.32		0.32	0.32	
v/c Ratio	0.29	0.31		0.24	0.29		0.77	0.14		0.18	0.18	
Control Delay	14.8	7.3		15.2	11.9		37.6	0.4		19.3	0.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	14.8	7.3		15.2	11.9		37.6	0.4		19.3	0.4	
LOS	B	A		B	B		D	A		B	A	
Approach Delay		9.0			12.8			28.1			6.2	
Approach LOS		A			B			C			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 88			
Actuated Cycle Length: 79.1			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 13.8		Intersection LOS: B	
Intersection Capacity Utilization 114.5%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 2: 20th Ave E & 16th St E



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	166	566	99	268	304	104	77	174
v/c Ratio	0.29	0.31	0.24	0.29	0.77	0.14	0.18	0.18
Control Delay	14.8	7.3	15.2	11.9	37.6	0.4	19.3	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.8	7.3	15.2	11.9	37.6	0.4	19.3	0.4
Queue Length 50th (m)	14.3	13.3	8.3	19.3	42.3	0.0	8.6	0.0
Queue Length 95th (m)	33.5	28.1	22.4	42.2	71.6	0.0	18.0	0.0
Internal Link Dist (m)		407.3		139.2		152.8		127.9
Turn Bay Length (m)	40.0		40.0					
Base Capacity (vph)	575	1802	405	926	542	866	584	1073
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.31	0.24	0.29	0.56	0.12	0.13	0.16

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	405	48	69	311	62	49
Future Volume (vph)	405	48	69	311	62	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	25.0		0.0	0.0
Storage Lanes		0	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	0.986					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1837	0	1770	1810	1770	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	1837	0	1770	1810	1770	1583
Link Speed (k/h)	50			80	50	
Link Distance (m)	152.4			140.0	189.7	
Travel Time (s)	11.0			6.3	13.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	5%	2%	2%
Adj. Flow (vph)	440	52	75	338	67	53
Shared Lane Traffic (%)						
Lane Group Flow (vph)	492	0	75	338	67	53
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	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	41.5%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	405	48	69	311	62	49
Future Vol, veh/h	405	48	69	311	62	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	5	2	2
Mvmt Flow	440	52	75	338	67	53

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	492	0	954	466
Stage 1	-	-	-	-	466	-
Stage 2	-	-	-	-	488	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1071	-	287	597
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	617	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1071	-	267	597
Mov Cap-2 Maneuver	-	-	-	-	267	-
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	574	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	18
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	267	597	-	-	1071	-
HCM Lane V/C Ratio	0.252	0.089	-	-	0.07	-
HCM Control Delay (s)	23	11.6	-	-	8.6	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	1	0.3	-	-	0.2	-

Appendix G

2027 Total Traffic Operations Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	339	102	43	399	20	99	23	47	24	18	21
Future Volume (vph)	22	339	102	43	399	20	99	23	47	24	18	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	30.0		20.0	40.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	15.0			100.0			30.0			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00		1.00			1.00	0.99		1.00	0.99	
Frt		0.965			0.993			0.899			0.920	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3296	0	1805	3380	0	1752	3165	0	1556	3202	0
Flt Permitted	0.440			0.350			0.638			0.705		
Satd. Flow (perm)	836	3296	0	665	3380	0	1172	3165	0	1153	3202	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		39			5			51			23	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		172.0			431.3			151.6			112.5	
Travel Time (s)		12.4			31.1			10.9			8.1	
Confl. Peds. (#/hr)			1	1			4		1	1		4
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
Heavy Vehicles (%)	0%	7%	0%	0%	6%	7%	3%	5%	0%	16%	6%	0%
Adj. Flow (vph)	24	368	111	47	434	22	108	25	51	26	20	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	479	0	47	456	0	108	76	0	26	43	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		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	
Detector 1 Position(m)	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	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
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	

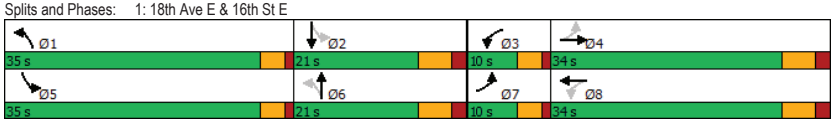
Lanes, Volumes, Timings
1: 18th Ave E & 16th St E

Total AM
2275 16th Street East, Owen Sound TIS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4			8			6			2		
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	32.0		9.5	32.0		9.5	32.0		9.5	32.0	
Total Split (s)	10.0	34.0		10.0	34.0		35.0	21.0		35.0	21.0	
Total Split (%)	10.0%	34.0%		10.0%	34.0%		35.0%	21.0%		35.0%	21.0%	
Maximum Green (s)	6.0	28.0		6.0	28.0		31.0	15.0		31.0	15.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Max		None	Max	
Walk Time (s)		15.0			15.0			15.0			15.0	
Flash Dont Walk (s)		10.0			10.0			10.0			10.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	19.8	14.5		20.5	16.4		37.1	31.7		33.0	26.1	
Actuated g/C Ratio	0.29	0.21		0.30	0.24		0.55	0.47		0.49	0.39	
v/c Ratio	0.07	0.65		0.15	0.56		0.15	0.05		0.04	0.03	
Control Delay	16.0	27.9		17.0	26.3		9.9	8.0		9.9	11.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	16.0	27.9		17.0	26.3		9.9	8.0		9.9	11.8	
LOS	B	C		B	C		A	A		A	B	
Approach Delay		27.4			25.4			9.1			11.1	
Approach LOS		C			C			A			B	

Intersection Summary		
Area Type:	Other	
Cycle Length: 100		
Actuated Cycle Length: 67.7		
Natural Cycle: 85		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 0.65		
Intersection Signal Delay: 23.0		Intersection LOS: C
Intersection Capacity Utilization 51.3%		ICU Level of Service A
Analysis Period (min) 15		

Splits and Phases: 1: 18th Ave E & 16th St E



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	24	479	47	456	108	76	26	43
v/c Ratio	0.07	0.65	0.15	0.56	0.15	0.05	0.04	0.03
Control Delay	16.0	27.9	17.0	26.3	9.9	8.0	9.9	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.0	27.9	17.0	26.3	9.9	8.0	9.9	11.8
Queue Length 50th (m)	2.2	31.5	4.4	26.1	7.5	0.9	1.7	1.0
Queue Length 95th (m)	7.0	48.7	11.4	49.0	17.1	5.9	5.9	4.9
Internal Link Dist (m)		148.0		407.3		127.6		88.5
Turn Bay Length (m)	40.0		30.0		40.0		25.0	
Base Capacity (vph)	333	1446	306	1463	946	1507	851	1249
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.33	0.15	0.31	0.11	0.05	0.03	0.03

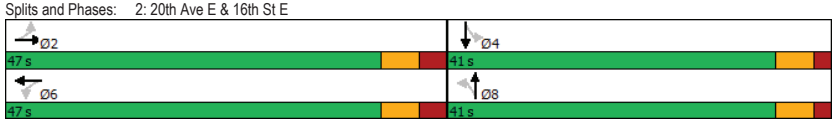
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	225	85	85	301	41	77	0	81	47	0	91
Future Volume (vph)	102	225	85	85	301	41	77	0	81	47	0	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	40.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	80.0			100.0			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							1.00				0.98	
Frt		0.959			0.982			0.850			0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3244	0	1770	1787	0	1719	1568	0	1805	1575	0
Flt Permitted	0.540			0.549			0.693			0.700		
Satd. Flow (perm)	1026	3244	0	1023	1787	0	1249	1568	0	1330	1575	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		81			10			546			431	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		431.3			163.2			176.8			151.9	
Travel Time (s)		31.1			11.8			12.7			10.9	
Confl. Peds. (#/hr)							4					4
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
Heavy Vehicles (%)	0%	7%	6%	2%	5%	0%	5%	0%	3%	0%	0%	0%
Adj. Flow (vph)	111	245	92	92	327	45	84	0	88	51	0	99
Shared Lane Traffic (%)												
Lane Group Flow (vph)	111	337	0	92	372	0	84	88	0	51	99	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	100		15	25		100	25		15	100		100
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		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	
Detector 1 Position(m)	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	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	40.0	40.0		40.0	40.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	47.0	47.0		47.0	47.0		41.0	41.0		41.0	41.0	
Total Split (s)	47.0	47.0		47.0	47.0		41.0	41.0		41.0	41.0	
Total Split (%)	53.4%	53.4%		53.4%	53.4%		46.6%	46.6%		46.6%	46.6%	
Maximum Green (s)	40.0	40.0		40.0	40.0		35.0	35.0		35.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		5.0	5.0		3.0	3.0	
Recall Mode	Max	Max		None	None		None	None		None	None	
Walk Time (s)	20.0	20.0		20.0	20.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	44.6	44.6		44.6	44.6		12.0	12.0		12.0	12.0	
Actuated g/C Ratio	0.69	0.69		0.69	0.69		0.19	0.19		0.19	0.19	
v/c Ratio	0.16	0.15		0.13	0.30		0.37	0.12		0.21	0.15	
Control Delay	6.6	4.3		6.5	6.6		27.9	0.3		24.5	0.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	6.6	4.3		6.5	6.6		27.9	0.3		24.5	0.5	
LOS	A	A		A	A		C	A		C	A	
Approach Delay		4.8			6.6			13.8			8.7	
Approach LOS		A			A			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 88			
Actuated Cycle Length: 64.8			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.37			
Intersection Signal Delay: 7.2		Intersection LOS: A	
Intersection Capacity Utilization 95.1%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 2: 20th Ave E & 16th St E



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	111	337	92	372	84	88	51	99
v/c Ratio	0.16	0.15	0.13	0.30	0.37	0.12	0.21	0.15
Control Delay	6.6	4.3	6.5	6.6	27.9	0.3	24.5	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.6	4.3	6.5	6.6	27.9	0.3	24.5	0.5
Queue Length 50th (m)	5.1	6.0	4.2	18.7	9.4	0.0	5.6	0.0
Queue Length 95th (m)	13.5	12.6	11.3	38.0	21.1	0.0	14.0	0.0
Internal Link Dist (m)		407.3		139.2		152.8		127.9
Turn Bay Length (m)	40.0		40.0					
Base Capacity (vph)	706	2260	704	1234	675	1098	718	1049
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.15	0.13	0.30	0.12	0.08	0.07	0.09

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	190	96	40	243	115	33
Future Volume (vph)	190	96	40	243	115	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	25.0		0.0	0.0
Storage Lanes		0	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	0.955					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1756	0	1770	1863	1770	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	1756	0	1770	1863	1770	1583
Link Speed (k/h)	50			80	50	
Link Distance (m)	152.4			140.0	189.7	
Travel Time (s)	11.0			6.3	13.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	2%	2%	2%	2%	2%
Adj. Flow (vph)	207	104	43	264	125	36
Shared Lane Traffic (%)						
Lane Group Flow (vph)	311	0	43	264	125	36
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	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		100	100		100	100
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 35.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	3.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	190	96	40	243	115	33
Future Vol, veh/h	190	96	40	243	115	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	2	2	2	2	2
Mvmt Flow	207	104	43	264	125	36

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	311	0	609	259
Stage 1	-	-	-	-	259	-
Stage 2	-	-	-	-	350	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1249	-	458	780
Stage 1	-	-	-	-	784	-
Stage 2	-	-	-	-	713	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1249	-	442	780
Mov Cap-2 Maneuver	-	-	-	-	442	-
Stage 1	-	-	-	-	784	-
Stage 2	-	-	-	-	689	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	14.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	442	780	-	-	1249	-
HCM Lane V/C Ratio	0.283	0.046	-	-	0.035	-
HCM Control Delay (s)	16.3	9.8	-	-	8	-
HCM Lane LOS	C	A	-	-	A	-
HCM 95th %tile Q(veh)	1.1	0.1	-	-	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	577	181	43	544	38	223	41	83	42	32	42
Future Volume (vph)	23	577	181	43	544	38	223	41	83	42	32	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	30.0		20.0	40.0		0.0	25.0		0.0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (m)	15.0			100.0			30.0			40.0		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00	1.00		1.00	1.00		1.00	0.99		0.99	0.99	
Frt		0.964			0.990			0.900			0.915	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3413	0	1805	3498	0	1770	3155	0	1805	3126	0
Flt Permitted	0.295			0.155			0.613			0.666		
Satd. Flow (perm)	560	3413	0	294	3498	0	1138	3155	0	1258	3126	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42			7			90			46	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		172.0			431.3			151.6			112.5	
Travel Time (s)		12.4			31.1			10.9			8.1	
Confl. Peds. (#/hr)	3		5	5		3	3		6	6		3
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
Heavy Vehicles (%)	0%	2%	0%	0%	2%	3%	2%	3%	1%	0%	7%	3%
Adj. Flow (vph)	25	627	197	47	591	41	242	45	90	46	35	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	824	0	47	632	0	242	135	0	46	81	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		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	
Detector 1 Position(m)	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	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
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	

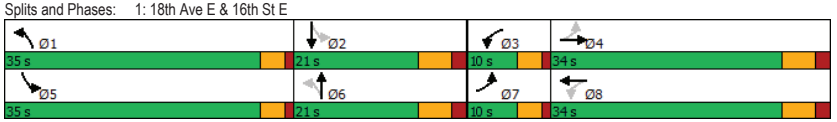
Lanes, Volumes, Timings
1: 18th Ave E & 16th St E

Total PM
2275 16th Street East, Owen Sound TIS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4			8			6			2		
Detector Phase	7	4		3	8		1	6		5	2	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	32.0		9.5	32.0		9.5	32.0		9.5	32.0	
Total Split (s)	10.0	34.0		10.0	34.0		35.0	21.0		35.0	21.0	
Total Split (%)	10.0%	34.0%		10.0%	34.0%		35.0%	21.0%		35.0%	21.0%	
Maximum Green (s)	6.0	28.0		6.0	28.0		31.0	15.0		31.0	15.0	
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		1.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Max		None	Max	
Walk Time (s)		15.0			15.0			15.0			15.0	
Flash Dont Walk (s)		10.0			10.0			10.0			10.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	29.3	24.0		30.0	25.8		44.2	36.1		34.4	25.6	
Actuated g/C Ratio	0.35	0.29		0.36	0.31		0.53	0.43		0.41	0.31	
v/c Ratio	0.09	0.82		0.22	0.58		0.35	0.10		0.08	0.08	
Control Delay	17.1	34.9		19.1	27.4		14.2	8.5		13.2	14.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	17.1	34.9		19.1	27.4		14.2	8.5		13.2	14.1	
LOS	B	C		B	C		B	A		B	B	
Approach Delay		34.4			26.9			12.2			13.7	
Approach LOS		C			C			B			B	

Intersection Summary		
Area Type:	Other	
Cycle Length: 100		
Actuated Cycle Length: 83.8		
Natural Cycle: 85		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 0.82		
Intersection Signal Delay: 26.5		Intersection LOS: C
Intersection Capacity Utilization 74.3%		ICU Level of Service D
Analysis Period (min) 15		

Splits and Phases: 1: 18th Ave E & 16th St E



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	25	824	47	632	242	135	46	81
v/c Ratio	0.09	0.82	0.22	0.58	0.35	0.10	0.08	0.08
Control Delay	17.1	34.9	19.1	27.4	14.2	8.5	13.2	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.1	34.9	19.1	27.4	14.2	8.5	13.2	14.1
Queue Length 50th (m)	2.6	69.6	5.0	42.8	25.6	2.8	4.3	2.4
Queue Length 95th (m)	8.0	99.2	12.4	75.0	41.9	9.4	10.2	8.6
Internal Link Dist (m)		148.0		407.3		127.6		88.5
Turn Bay Length (m)	40.0		30.0		40.0		25.0	
Base Capacity (vph)	286	1196	216	1272	839	1408	870	987
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.69	0.22	0.50	0.29	0.10	0.05	0.08

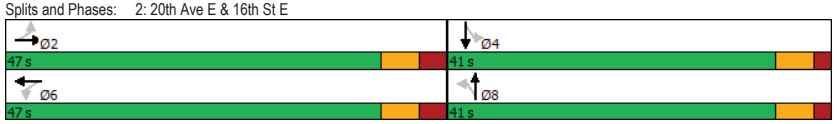
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	331	234	100	192	85	280	0	109	71	0	160
Future Volume (vph)	153	331	234	100	192	85	280	0	109	71	0	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	40.0		0.0	40.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	80.0			100.0			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		1.00			1.00	0.99		1.00	0.98	
Frt		0.938			0.954			0.850			0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3308	0	1752	1788	0	1787	1393	0	1805	1581	0
Flt Permitted	0.565			0.404			0.647			0.681		
Satd. Flow (perm)	1074	3308	0	745	1788	0	1216	1393	0	1293	1581	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		254			33			385			605	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		431.3			163.2			176.8			151.9	
Travel Time (s)		31.1			11.8			12.7			10.9	
Confl. Peds. (#/hr)			3	3			1		1	1		1
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
Heavy Vehicles (%)	0%	3%	0%	3%	2%	0%	1%	0%	3%	0%	0%	0%
Parking (#/hr)								0				
Adj. Flow (vph)	166	360	254	109	209	92	304	0	118	77	0	174
Shared Lane Traffic (%)												
Lane Group Flow (vph)	166	614	0	109	301	0	304	118	0	77	174	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.14	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		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	
Detector 1 Position(m)	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	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
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												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	40.0	40.0		40.0	40.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	47.0	47.0		47.0	47.0		41.0	41.0		41.0	41.0	
Total Split (s)	47.0	47.0		47.0	47.0		41.0	41.0		41.0	41.0	
Total Split (%)	53.4%	53.4%		53.4%	53.4%		46.6%	46.6%		46.6%	46.6%	
Maximum Green (s)	40.0	40.0		40.0	40.0		35.0	35.0		35.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		5.0	5.0		3.0	3.0	
Recall Mode	Max	Max		None	None		None	None		None	None	
Walk Time (s)	20.0	20.0		20.0	20.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	40.3	40.3		40.3	40.3		25.7	25.7		25.7	25.7	
Actuated g/C Ratio	0.51	0.51		0.51	0.51		0.32	0.32		0.32	0.32	
v/c Ratio	0.30	0.34		0.29	0.32		0.77	0.17		0.18	0.19	
Control Delay	15.1	7.9		16.1	12.7		37.6	0.5		19.3	0.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.1	7.9		16.1	12.7		37.6	0.5		19.3	0.5	
LOS	B	A		B	B		D	A		B	A	
Approach Delay		9.4			13.6			27.2			6.2	
Approach LOS		A			B			C			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 88			
Actuated Cycle Length: 79.1			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 13.9		Intersection LOS: B	
Intersection Capacity Utilization 114.5%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 2: 20th Ave E & 16th St E



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	166	614	109	301	304	118	77	174
v/c Ratio	0.30	0.34	0.29	0.32	0.77	0.17	0.18	0.19
Control Delay	15.1	7.9	16.1	12.7	37.6	0.5	19.3	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.1	7.9	16.1	12.7	37.6	0.5	19.3	0.5
Queue Length 50th (m)	14.4	15.5	9.4	23.2	42.3	0.0	8.6	0.0
Queue Length 95th (m)	34.0	32.1	25.0	49.2	71.6	0.0	18.0	0.0
Internal Link Dist (m)		407.3		139.2		152.8		127.9
Turn Bay Length (m)	40.0		40.0					
Base Capacity (vph)	547	1810	379	927	542	834	576	1040
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.34	0.29	0.32	0.56	0.14	0.13	0.17

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	391	119	87	299	113	67
Future Volume (vph)	391	119	87	299	113	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	25.0		0.0	0.0
Storage Lanes		0	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	0.969					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1805	0	1770	1810	1770	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	1805	0	1770	1810	1770	1583
Link Speed (k/h)	50			80	50	
Link Distance (m)	152.4			140.0	189.7	
Travel Time (s)	11.0			6.3	13.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	5%	2%	2%
Adj. Flow (vph)	425	129	95	325	123	73
Shared Lane Traffic (%)						
Lane Group Flow (vph)	554	0	95	325	123	73
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	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	391	119	87	299	113	67
Future Vol, veh/h	391	119	87	299	113	67
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	5	2	2
Mvmt Flow	425	129	95	325	123	73

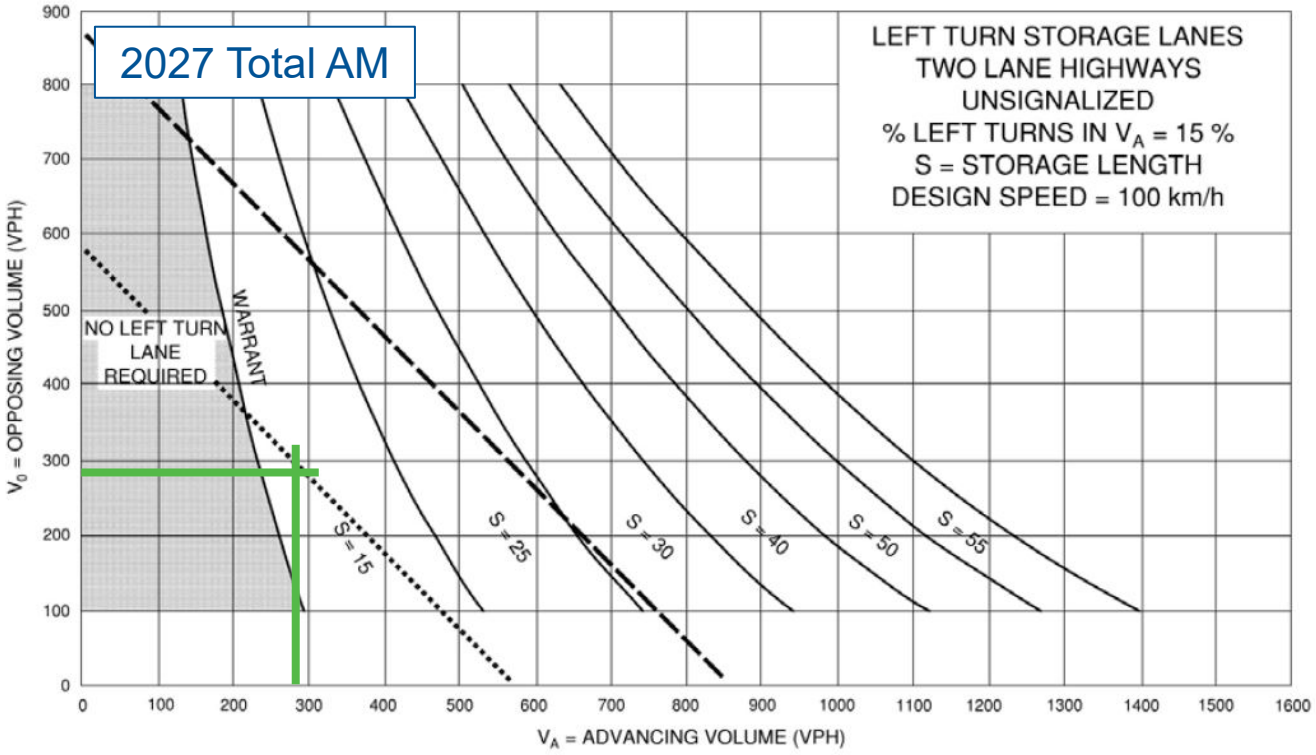
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	554	0	1005	490
Stage 1	-	-	-	-	490	-
Stage 2	-	-	-	-	515	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1016	-	268	578
Stage 1	-	-	-	-	616	-
Stage 2	-	-	-	-	600	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1016	-	243	578
Mov Cap-2 Maneuver	-	-	-	-	243	-
Stage 1	-	-	-	-	616	-
Stage 2	-	-	-	-	544	-

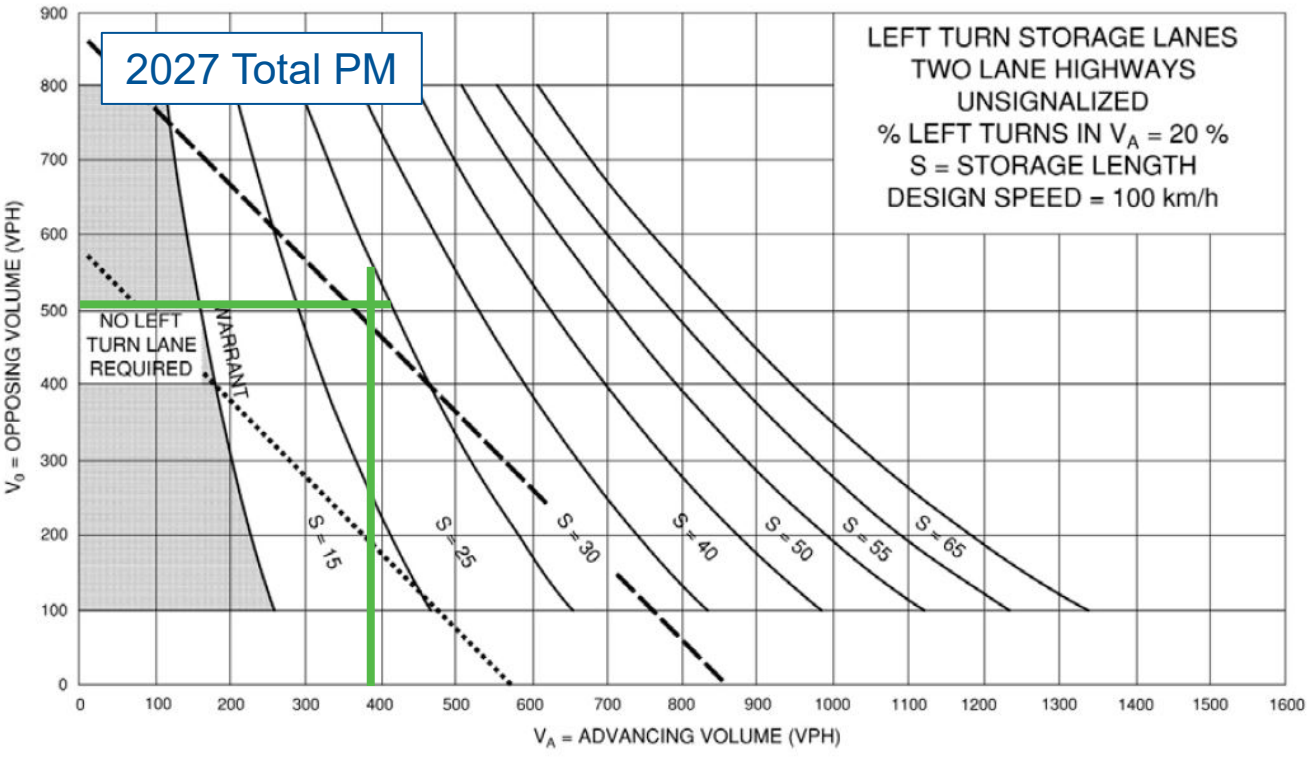
Approach	EB	WB	NB
HCM Control Delay, s	0	2	25.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	243	578	-	-	1016	-
HCM Lane V/C Ratio	0.505	0.126	-	-	0.093	-
HCM Control Delay (s)	34	12.1	-	-	8.9	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	2.6	0.4	-	-	0.3	-

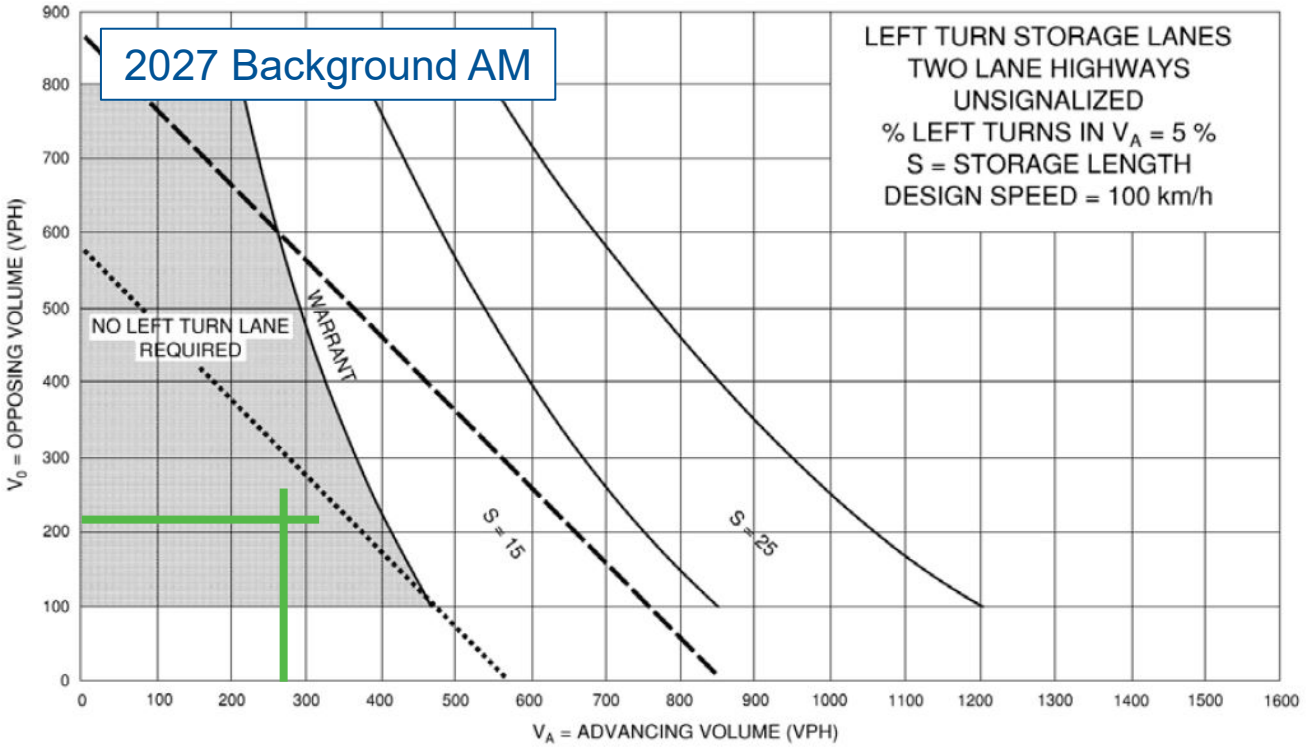
Appendix H

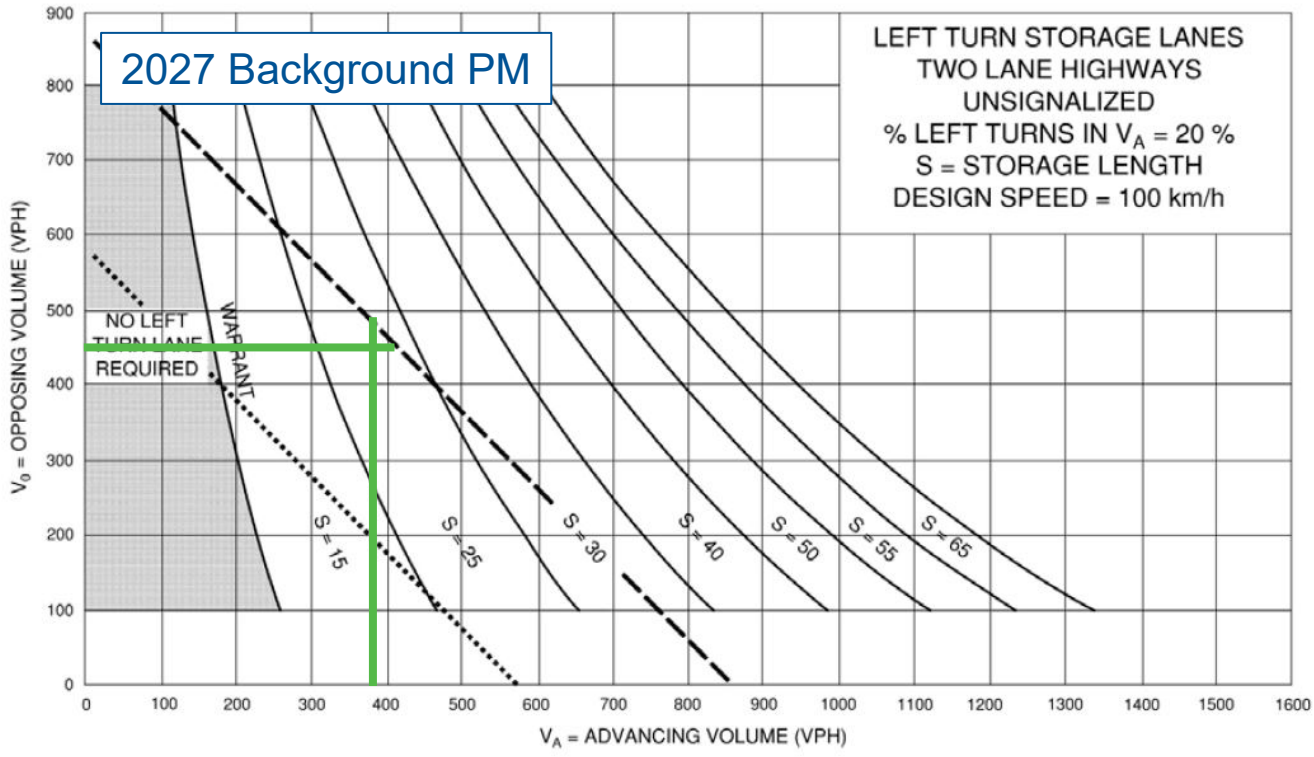
Signal and Left-Turn Lane Warrants





Westbound Left-Turn Lane Warrants
16th St E & New Municipal Street





Westbound Left-Turn Lane Warrants
16th St E & New Municipal Street

Signal Justification Calculation for Forecast Volumes
(OTM Book 12 - Justification 7)

Horizon Year: 2027 Total
Region/City/Township: City of Owen Sound

Major Street: 16th Street East
Minor Street: New Municipal Street
North/South?: N

Number of Approach Lanes: 1
Tee Intersection? Y
Flow Conditions: Restricted

PM Forecast Only? N

Warrant Results		
150% Satisfied	No	Justification for new intersections with forecast traffic
120% Satisfied	No	Justification for existing intersections with forecast traffic

	Major Street						Minor Street						
	16th Street East						New Municipal Street						
	Eastbound			Westbound			Northbound			Southbound			Peds
Time Period	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	Crossing
AM Peak Hour		190	96	40	243		115		33				
PM Peak Hour		391	119	87	299		113		67				
verage Hourly Volum	0	145	54	32	136	0	57	0	25	0	0	0	0

Warrant	AHV
1A - All	448
1B - Minor	82
2A - Major	366
2B - Cross	57

Warrant 1 - Minimum Vehicular Volume

	Approach Lanes	1		2 or more		Average Hourly Volume
1A	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	All Approaches	480	720	600	900	448
					% Fulfilled	62.3%

	Approach Lanes	1		2 or more		Average Hourly Volume
1B	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Minor Street Approaches	180	255	180	255	82
					% Fulfilled	32.2%

Warrant 2 - Delay To Cross Traffic

	Approach Lanes	1		2 or more		Average Hourly Volume
2A	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Major Street Approaches	480	720	600	900	366
					% Fulfilled	50.9%

	Approach Lanes	1		2 or more		Average Hourly Volume
2B	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Traffic Crossing Major Street	50	75	50	75	57
					% Fulfilled	76.0%

Signal Justification Calculation for Forecast Volumes
(OTM Book 12 - Justification 7)

Horizon Year: 2027 Background
Region/City/Township: City of Owen Sound

Major Street: 16th Street East
Minor Street: New Municipal Street
North/South?: N

Number of Approach Lanes: 1
Tee Intersection? Y
Flow Conditions: Restricted

PM Forecast Only? N

Warrant Results		
150% Satisfied	No	Justification for new intersections with forecast traffic
120% Satisfied	No	Justification for existing intersections with forecast traffic

	Major Street						Minor Street						
	16th Street East						New Municipal Street						
	Eastbound			Westbound			Northbound			Southbound			Peds
Time Period	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	Crossing
AM Peak Hour		205	10	11	264		16		9				
PM Peak Hour		405	48	69	311		62		49				
verage Hourly Volum	0	153	15	20	144	0	20	0	15	0	0	0	0

Warrant	AHV
1A - All	365
1B - Minor	34
2A - Major	331
2B - Cross	20

Warrant 1 - Minimum Vehicular Volume

	Approach Lanes	1		2 or more		Average Hourly Volume
1A	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	All Approaches	480	720	600	900	365
					% Fulfilled	50.7%

	Approach Lanes	1		2 or more		Average Hourly Volume
1B	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Minor Street Approaches	180	255	180	255	34
					% Fulfilled	13.3%

Warrant 2 - Delay To Cross Traffic

	Approach Lanes	1		2 or more		Average Hourly Volume
2A	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Major Street Approaches	480	720	600	900	331
					% Fulfilled	45.9%

	Approach Lanes	1		2 or more		Average Hourly Volume
2B	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Traffic Crossing Major Street	50	75	50	75	20
					% Fulfilled	26.0%