430 Ottawa Street, Almonte ON

Transportation Impact Study

Prepared By:

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April 15, 2020

Novatech File: 119190
Ref: R-2020-052

NOVATECH
Engineers, Planners & Landscape Architects

April 15, 2020

Municipality of Mississippi Mills
Roads and Public Works
3131 Old Perth Road, PO Box 400
Almonte, ON K0A 1A0

Attention: **Mr. Guy Bourgon, P.Eng.**
Director, Roads and Public Works

Dear Mr. Bourgon:

Reference: **430 Ottawa Street**
Transportation Impact Study
Novatech File No. 119190

We are pleased to submit the following Transportation Impact Study in support of an Official Plan Amendment and Zoning Amendment to establish the principle of mixed-use development at 430 Ottawa Street.

If you have any questions or comments regarding this report, please feel free to contact the undersigned.

Yours truly,

NOVATECH

Patrick Hatton, P.Eng.
Project Manager | Transportation/Traffic

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EXECUTIVE SUMMARY

This Transportation Impact Study (TIS) report has been prepared in support of an Official Plan amendment and Zoning Amendment to establish the principle of mixed-use development at 430 Ottawa Street.

The redeveloped site is planned to consist of:

- 26,350 square feet of retail
- 124 apartment units

Completion of the redevelopment is planned for 2022 with phasing unknown at this time.

The subject site is currently zoned C4-4 in the Mississippi Mills zoning Schedule C and is currently occupied by about 60,000 ft^2 of retail. The proposed retail portion along the south of the site is permitted in this zone but the redevelopment will require an Official Plan Amendment and Zoning By-law Amendment to permit the residential use in the north fronting the adjacent multi-family residential.

Access to the site is planned via two full movement driveways onto Ottawa Street. The site includes 68 parking spaces for the retail portion and 174 parking spaces for the residential portion.

Weekday traffic counts collected at the Ottawa Street at Sadler Drive / Industrial Drive intersection on November 7, 2019 were provided by the Municipality of Mississippi Mills. Volumes at the existing site and adjacent driveways have been estimated using trip generation rates from *Trip Generation, 10th Edition* (Institute of Transportation Engineers, Washington, 2017) with consideration of both Pass-by Trips and Primary Trips.

A 2% background growth rate has been applied to traffic at the Ottawa Street / Sadler Drive / Industrial Drive intersection and through traffic along Ottawa Street at the nearby driveways. This growth rate has been established based on historical population growth in the Municipality's Official Plan. The background growth rate is intended to account for growth in regional traffic and is expected to be high enough to account for approved and ongoing developments within the study area.

Traffic generated by site redevelopment was estimated using *Trip Generation Manual*, *10th Edition* (Institute of Transportation Engineers, Washington 2017). The redevelopment of the site with residential and retail uses is estimated to generate 11 new primary two-way vehicle trips (-8 entering and +19 exiting) during the AM peak hour and a reduction of 39 new primary two-way vehicle trips (-11 entering and -28 exiting) during the PM peak hour.

Site traffic was distributed to Ottawa Street in this area and added to the projected background traffic to determine future traffic volumes.

The main conclusions and recommendations of this TIS are:

Development Design and Parking

- Pedestrian facilities will be provided between the main buildings and the parking lots. New pedestrian walkways will be constructed, providing connectivity to the existing pedestrian facility along Ottawa Street.
- The number of onsite parking, bicycle parking, barrier free, and vehicle loading spaces will be reviewed with site plan submission.

Access Design

- The proposed redevelopment will be served by two all movement accesses to Ottawa Street. The accesses are expected to be 8-9m wide and will be reviewed with site plan submission.
- The site's west driveway is opposite the west driveway to the development at 401 Ottawa Street to better enable cross connections between the two sites and consolidate the conflicts to a single point.
- The proposed east driveway is west of the midblock pedestrian signal to reduce conflicts between traffic turning right from the site (to Almonte) and pedestrians at the crossing.
- A left turn lane warrant indicates that an eastbound left turn lane is not expected to be warranted at the new (east) site access.
- Traffic signals are not required at either site access.

Traffic Analysis

- The site redevelopment is not expected to have any major impact on the overall operations of the study intersections.
- The signalized intersection of Ottawa Street at Sadler Drive / Industrial Drive is expected to continue to operate well with site redevelopment.
- The reduction in the site generated volumes during the PM peak hour may bring a reduction in traffic, leading to an improvement in the operations at some nearby driveways.
- The site's approaches to Ottawa Street are expected to operate with LOS 'C' or better and average delays of 16 seconds or less with site redevelopment.

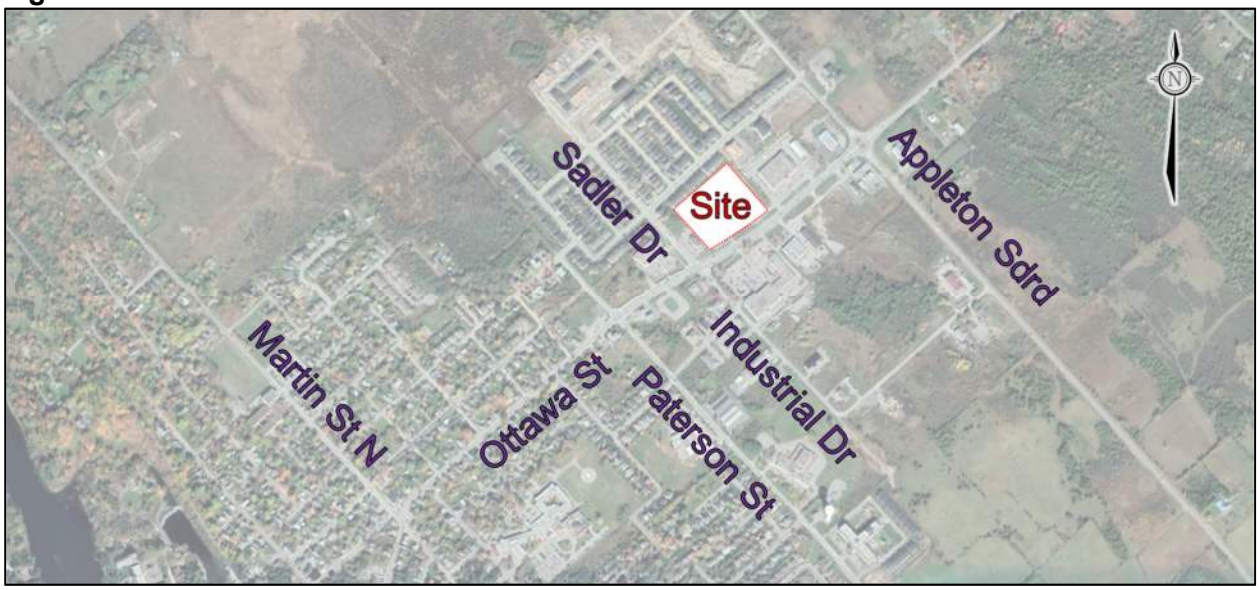
1.0 INTRODUCTION

This Transportation Impact Study (TIS) report has been prepared in support of an Official Plan amendment and Zoning Amendment to establish the principle of mixed-use development at 430 Ottawa Street. The subject site (See **Figure 1**) is occupied by about 60,000 ft^2 of retail and is surrounded by the following:

- Ottawa Street and commercial development in the south;
- Commercial development in the east;
- Commercial development and Sadler Drive in the west; and,
- Residential development in the north.

Existing access to the site is via one full access to Ottawa Street and shared connections to Sadler via the adjacent Tim Hortons and Ottawa Street via the adjacent Home Hardware.

Figure 1: Site Location



2.0 PROPOSED REDEVELOPMENT

The subject site is currently zoned C4-4 in the Mississippi Mills zoning Schedule C. The proposed retail portion along the south of the site is permitted in this zone but the redevelopment will require an Official Plan Amendment and Zoning By-law Amendment to permit the residential use in the north fronting the adjacent multi-family residential.

The redeveloped site is planned to consist of:

- 26,350 square feet of retail
- 124 apartment units

The concept includes 68 parking spaces for the retail portion and 174 parking spaces for the residential portion. For the purpose of this study, it is assumed that the development may be complete by 2022. Phasing is unknown at this time.

Access to the site is planned via two full movement driveways onto Ottawa Street. For a conservative analysis of the Ottawa Street driveways, the shared accesses to the adjacent properties have not been considered, however a qualitative assessment of the impacts to the shared access is provided. The concept plan is included in **Appendix A**.

3.0 EXISTING CONDITIONS

3.1 Roadways

Ottawa Street extends from Main Street E (southwest) to Appleton Sideroad (northeast) and has a four-lane cross section and a posted speed limit of 50 km/h within the study area.

Sadler Drive extends from Ottawa Street to Horton Street in the north and has a two-lane cross section and a 50km/h regulatory speed limit.

Industrial Drive extends from Ottawa Street to Appleton Sideroad in the south and has a two-lane cross section and a 50 km/h regulatory speed limit.

3.2 Intersections

Ottawa Street at Sadler Drive / Industrial Drive

- Signalized intersection
- Northbound: one shared left turn / through lane and right turn channelized taper.
- Southbound: one left turn lane, one through /right shared lane.
- Eastbound and Westbound: one left turn lane, one through lane and one through / right turn shared lane.
- Standard crosswalks are provided on all legs of the intersection.

3.2.1 Driveways

A review of adjacent driveways along Ottawa Street is provided as follows:

North side: one driveway for 430 Ottawa Street (site), two driveways for the Home Hardware at 476 Ottawa Street. The driveways are approximately 90m, 225m, and 325m east of the Sadler Drive / Industrial Drive signalized intersection.

South side: two driveways for the retail centre at 401 Ottawa Street, one driveway for retail plaza at 453 Ottawa Street. The driveways are approximately 90m, 145m, and 200m east of the Sadler Drive / Industrial Drive signalized intersection.

3.2.2 Pedestrian and Cycling Facilities

There are asphalt sidewalks along both sides of Ottawa Street east of Sadler / Industrial, concrete sidewalks on both sides of Sadler Drive and asphalt sidewalk on the west side of Industrial Drive in this area.

There is a midblock pedestrian signal (MPS) crosswalk crossing Ottawa Street about 185m east of the Sadler Drive intersection.

3.2.3 Transit

Classic Alliance Motorcoach operates its route #502/503 between Perth/Carleton Place/Almonte and Ottawa/Gatineau with peak period service to Ottawa in the morning and from Ottawa in the afternoon.

3.2.4 Existing Traffic Volumes

Weekday traffic counts collected at the Ottawa Street at Sadler Drive / Industrial Drive intersection on November 7, 2019 were provided by the Municipality of Mississippi Mills. Volumes at the existing site and adjacent driveways have been estimated using trip generation rates from *Trip Generation, 10th Edition* (Institute of Transportation Engineers, Washington, 2017), See **Table 1**.

Two types of trips are included in the trips that are generated by the nearby development sites - **Pass-by** and **Primary Trips**.

Pass-by trips are those which are made as ‘intervening opportunity’ stops to commercial and retail land uses by vehicle trips already passing by the site. Although these trips will be included in the driveway volumes to the site, they will not increase the overall traffic volumes on Study Area roads.

Primary trips for this Study include all external site generated trips that are not considered pass-by trips.

Table 1: Estimated Trip Generation of Existing Development Sites

Land Use[1]	Units[2]	Vehicle Trips Generated[3]					
		AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Existing Site							
Retail (ITE 820)	60.0	35	21	56	110	119	229
Pass-By Retail Trips[4]		0	0	0	39	39	78
Primary Vehicle Trips Existing Development		35	21	56	71	80	151
Existing YIG Site							
Retail (ITE 820)	23.9	14	9	23	44	47	91
Supermarket (ITE 850)	37.2	85	57	142	175	169	344
Total YIG Site Trips		99	66	165	219	216	435
Pass-By Trips[4,5]		0	0	0	77	77	154
Primary Vehicle Trips		99	66	165	142	139	281
Existing Civic 453							
Retail (ITE 820)	26.1	16	9	25	48	51	99
Pass-By Retail Trips[4]		0	0	0	17	17	34
Primary Vehicle Trips		16	9	25	31	34	65
Existing Home Hardware Site							
Building Materials and Lumber Store (ITE 812)	40.5	40	24	64	39	44	83
Pass-By Retail Trips[6]		0	0	0	11	11	22
Primary Vehicle Trips		40	24	64	28	33	61

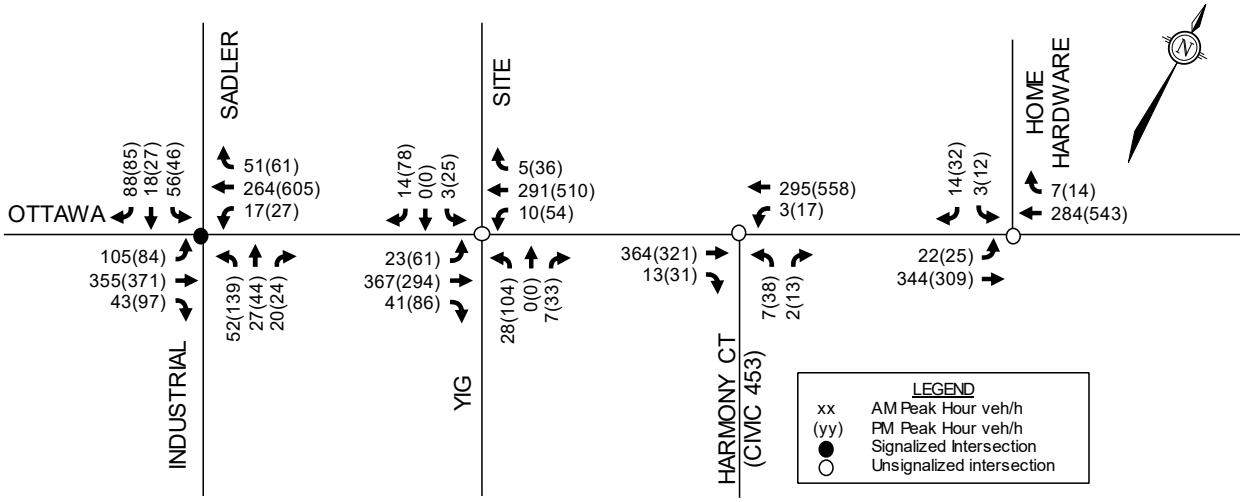
Notes:

1. Trip Generation for the associated Land Use from *Trip Generation 10th Edition* (Institute of Transportation Engineers, Washington, 2017).
2. Units are 1,000 ft^2 of GFA / GLA.
3. Vehicle trips per hour for peak hours.
4. *Trip Generation Handbook, 3rd Edition* (Institute of Transportation Engineers, 2017) indicates an average of 34% pass-by trips for a Shopping Centre (Table E.9, Pages 187-190) in the PM.
5. *Trip Generation Handbook, 3rd Edition (Institute of Transportation Engineers, 2017)* indicates an average of 36% pass-by trips for a Supermarket (Table E.13, Page 196) in the PM.
6. *Trip Generation Handbook, 3rd Edition* (Institute of Transportation Engineers, 2017) indicates an average of 26% pass-by trips for a Hardware/Paint Store (Table E.8, Page 186) in the PM.

Estimated traffic volumes generated by the subject site and adjacent sites have been distributed to the driveway intersections to obtain the existing AM and PM peak hour traffic volumes (See **Figure 2**). Peak hour summary sheets of the traffic count are included in **Appendix B**.

Of the trips generated by Your Independent Grocer, 20% have been distributed to that site's east driveway and 35% have been distributed to that site's driveway off Industrial Drive (driveways not shown). 20% of the trips generated by the existing site have been assigned to the shared driveway with Home Hardware and 10% of the existing site's trips to the north have been assigned to the connection at Sadler Drive (shared with Tim Hortons). 60% of the Home Hardware trips to/from the east and 40% of the Home Hardware trips to/from the west have been assigned to that site's east driveway.

Figure 2: Existing Traffic Volumes



Intersection analysis of existing traffic volumes is included in **Section 5.1**.

3.3 Planned Conditions

The Municipality of Mississippi Mills has developed its Active Transportation Plan (2015) and Transportation Master Plan (2016) which recommend infrastructure modifications (See **Table 2**) that will impact transportation within the study area. While these modifications may reduce vehicular traffic through this area, no reduction has been applied for this study.

Table 2: Identified Infrastructure Modifications

Facility Type	Roadway	From	To	Priority
New Concrete Sidewalk	**Ottawa Street**	Existing Sidewalk	Appleton Sideroad	High
	Industrial Drive	Houston Street	Appleton Sideroad	Low
	Sadler Drive	Honeybourne Street	Existing Sidewalk	Medium
Urban Bicycle Spine Network	**Ottawa Street**	Patterson Street	Industrial Drive	High
		453 Ottawa Street	Appleton Sideroad	High
New Collectors North and South of Ottawa Street		Martin Street	Appleton Sideroad	5-10 years (Construction)

4.0 DEMAND FORECASTING

4.1 Background Traffic

A 2% background growth rate has been applied to traffic at the Ottawa Street / Sadler Drive / Industrial Drive intersection and through traffic along Ottawa Street at the nearby driveways. This growth rate has been established based on a review of the historical population growth for the area identified in the Municipality's Official Plan. The background growth rate is intended to account for growth in regional traffic and is expected to be high enough to account for approved and ongoing developments within the study area. Projected 2022 and 2027 background traffic volumes are shown in **Figures 3** and **4**, respectively.

Figure 3: 2022 Background Traffic Volumes

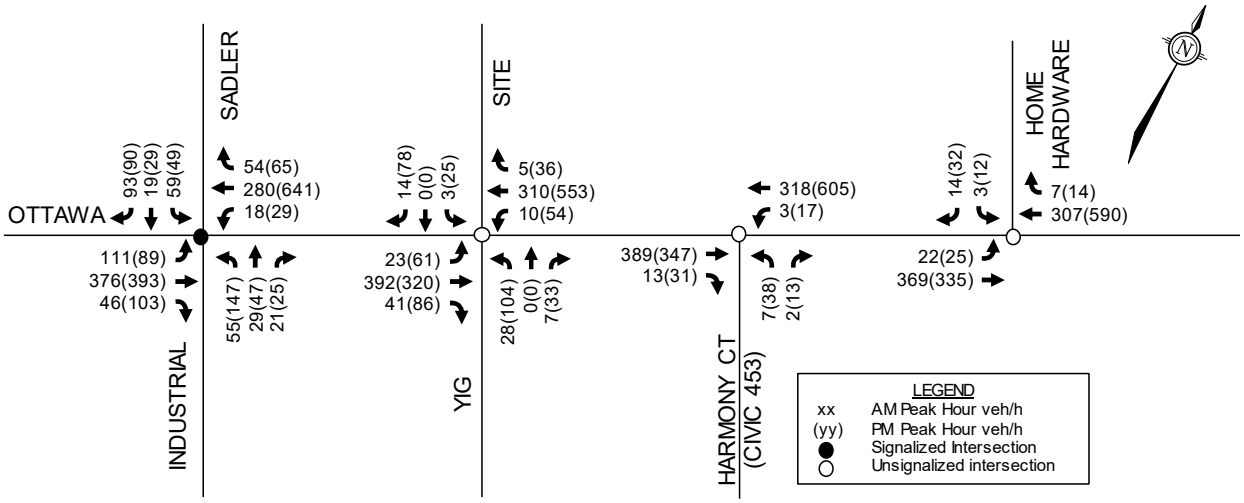
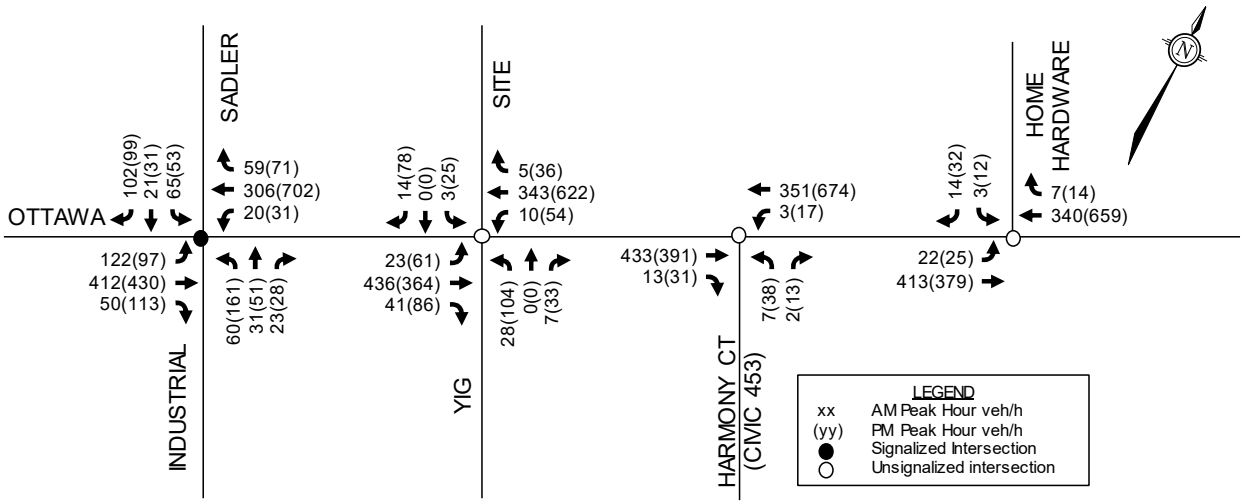


Figure 4: 2027 Background Traffic Volumes



4.2 Development-Generated Traffic

4.2.1 Trip Generation

The site is currently occupied by a 60,000 square foot retail plaza. The proposed redevelopment includes:

- About 26,350 square feet of retail; and,
- 124 apartment units.

There are anticipated to be synergies between the retail and residential portions of the development (i.e. stopping off on the way home). The ITE internal trip methodology (See **Appendix B**) indicates that in the PM peak hour there could be up to 5 internal trips from the residential to the retail and up to 14 internal trips from the retail to the residential. A reduction of 5 trips in and 5 trips out has been applied to the site trips.

Two types of trips are included in the external trips that will be generated by the proposed redevelopment - **Pass-by** and **Primary Trips**.

Pass-by trips are those which are made as 'intervening opportunity' stops to commercial and retail land uses by vehicle trips already passing by the site. Although these trips will be included in the driveway volumes to the site, they will not increase the overall traffic volumes on Study Area roads. *Trip Generation Handbook, 3rd Edition* (Institute of Transportation Engineers, Washington 2017) indicates an average PM peak rate of 34% for pass-by trips for a Shopping Centre (Table E.9, Pages 187-190). Since many of the peak hour trips generated by this site can be expected to come from traffic passing the site on Ottawa Street, a 34% pass-by rate has been used for the retail trips in the PM peak hour.

Primary trips for this Study include all external site generated trips that are not considered pass-by trips.

Trips generated by the existing site and proposed redevelopment were estimated (See **Table 3**) using *Trip Generation*, *10th Edition* (Institute of Transportation Engineers, Washington, 2017).

Table 3: Estimated Trip Generation

Land Use[1]	Units[2]	Vehicle Trips Generated[3]					
		AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
New Development							
Retail (ITE 820)	26.4	16	9	25	48	52	100
Multifamily Housing (Mid-Rise) (ITE 221)	124	11	31	42	33	21	54
Total Site Trips		27	40	67	81	73	154
Internal Trip Capture[4]		0	0	0	5	5	10
Pass-By Retail Trips[5]		0	0	0	16	16	32
Total Primary Vehicle Trips		27	40	67	60	52	112
Existing Development							
Retail (ITE 820)	60.0	35	21	56	110	119	229
Pass-By Retail Trips[5]		0	0	0	39	39	78
Primary Vehicle Trips Existing Development		35	21	56	71	80	151
Net Trips							
Net New Vehicle Trips		-8	19	11	-11	-28	-39

Notes:
1. Trip Generation for the associated Land Use from *Trip Generation 10th Edition* (Institute of Transportation Engineers, Washington, 2017).
2. Units are Dwelling Units for Residential, 1,000 ft^2 of GLA for retail.
3. Vehicle trips per hour for peak hours.
4. These are the trips estimated between the proposed onsite residential and retail uses using methodology from Chapter 6 of *Trip Generation Handbook, 3rd Edition* (Institute of Transportation Engineers, 2017).
5. *Trip Generation Handbook, 3rd Edition* (Institute of Transportation Engineers, 2017) indicates an average of 34% pass-by trips for a Shopping Centre (Table E.9, Pages 187-190).

The proposed redevelopment is estimated to generate 11 new primary two-way vehicle trips (-8 entering and +19 exiting) during the AM peak hour and a reduction of 39 new primary two-way vehicle trips (-11 entering and -28 exiting) during the PM peak hour.

4.2.2 Trip Distribution / Assignment

Trips generated by the redevelopment have been distributed based on existing travel patterns and knowledge of planned area development. It is estimated that the primary trips will have the following distribution:

Direction	Retail	Residential
To / from the east (Ottawa / Appleton roundabout)	20%	40%
To / from the west (Almonte)	65%	55%
To / from the north (Sadler Drive)	10%	0%
To / from the south (Industrial Drive)	5%	5%

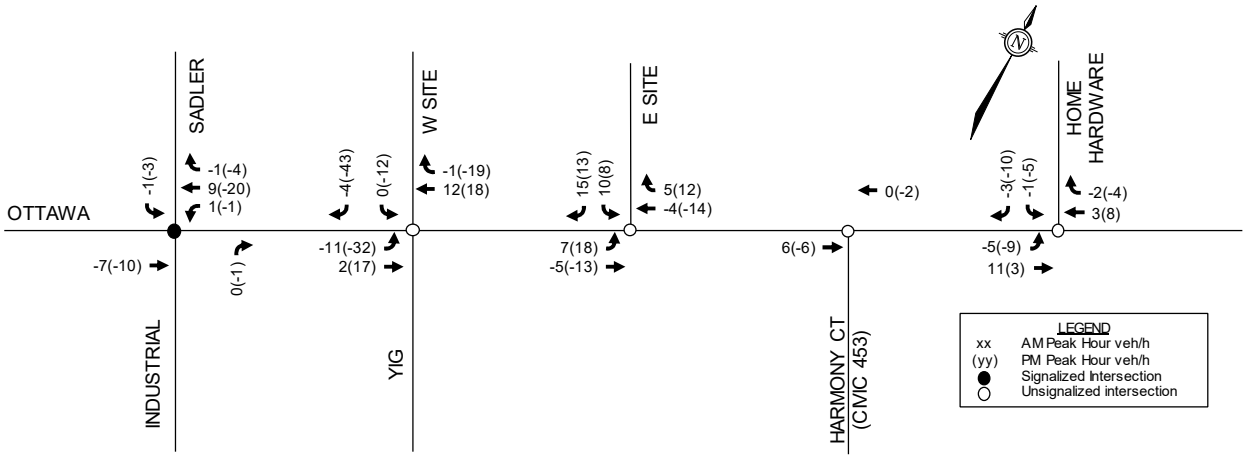
PM pass-by site generated trips were assigned to the roadway network based on directional distribution of counted volumes on Ottawa Street passing the site during the PM peak hour (65% westbound, 35% eastbound).

It is expected based on the lot layout and driveway configurations that the majority (about 80%) of retail trips will use the west driveway while the majority (about 80%) of residential trips will use the east driveway.

Traffic volumes generated by site redevelopment have been assigned to the study area intersections and are shown in **Figure 5**.

Since there is projected to be a net reduction in site trips during the PM peak hour, as well as different directional distributions for the proposed site's retail and residential development, there is expected to be a reduction in traffic volume for several movements with site redevelopment.

Figure 5: Site Generated Traffic Volumes



4.3 Total Traffic Volumes with Site Generated Trips

Site generated traffic volumes (**Figure 5**) have been added to the 2022 and 2027 Future Background Traffic Volumes (**Figures 3 and 4**, respectively) to obtain the 2022 and 2027 Total Traffic Volumes **(Figures 6 and 7**, respectively).

Intersection analysis of future background and total traffic volumes is included in **Section 5.1**.

Figure 6: 2022 Total Traffic Volumes with Site Generated Trips

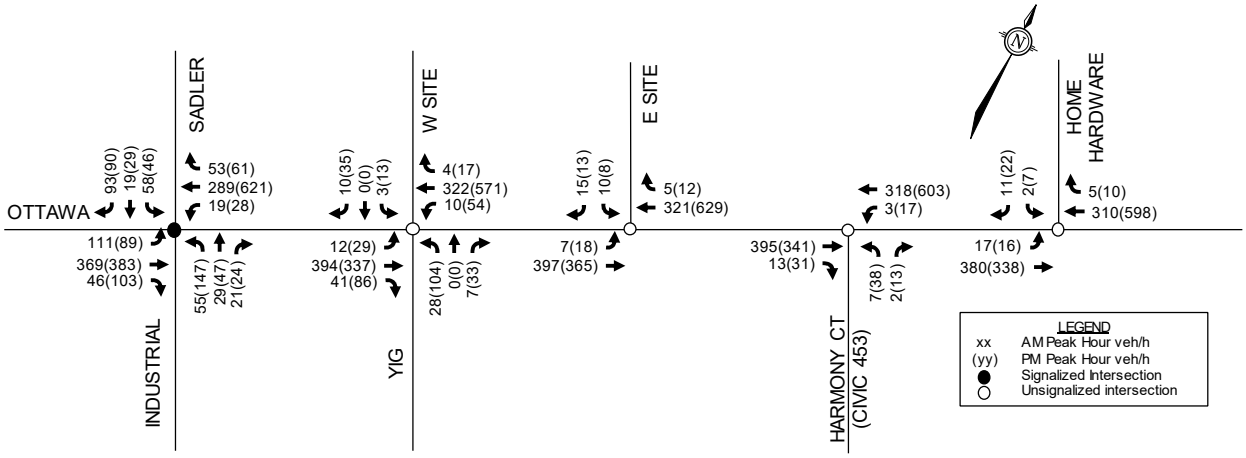
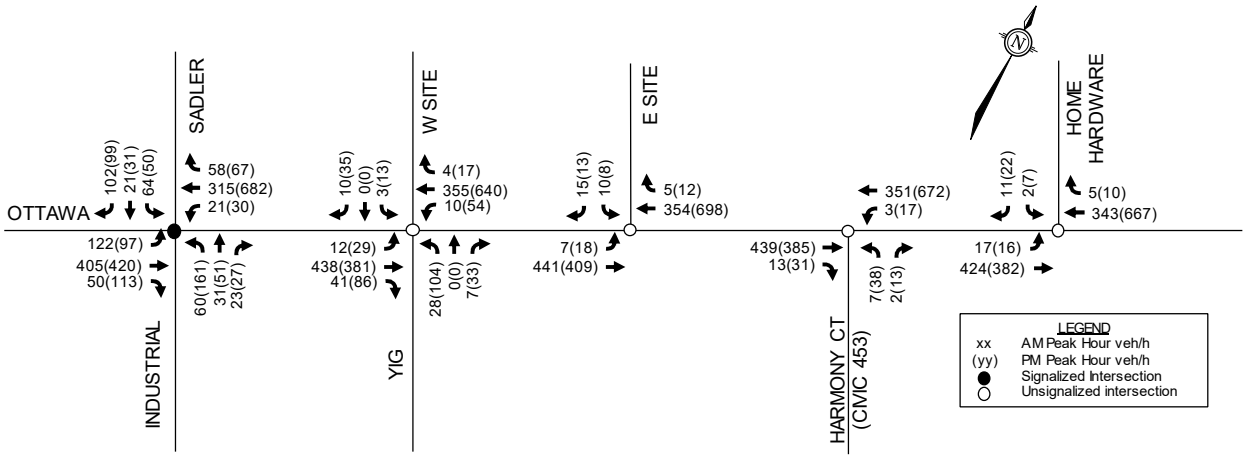


Figure 7: 2027 Total Traffic Volumes with Site Generated Trips



5.0 IMPACT ANALYSIS

5.1 Intersection Analysis

The City of Ottawa Guidelines for LOS has been used to assess the signalized intersection of Ottawa Street at Sadler Drive / Industrial Drive. This is consistent with the recent Ottawa Street Traffic Safety Review completed for the Municipality of Mississippi Mills and relate the intersection's critical movement volume to capacity ratio (v/c) to the LOS.

Intersection capacity analysis has been completed for the existing as well as the projected 2022 and 2027 traffic volumes without and with site generated trips. The results of the intersection analysis are summarized in **Table 4** (Existing) **Table 5** (2022) and **Table 6** (2027). Detailed *Synchro 10* reports are included in **Appendix C**.

Table 4: Existing Intersection Operations

Intersection		AM Peak			PM Peak		
		Max v/c or Delay	LOS	Mvmt	Max v/c or Delay	LOS	Mvmt
Ottawa Street @	Sadler / Industrial[1]	0.27	A	NB	0.66	B	WBT
	West Site Driveway / YIG	14 sec	B	NB	37 sec	E	NB
	Civic 453	12 sec	B	NB	14 sec	B	NB
	Home Hardware	10 sec	A	SB	13 sec	B	SB

1. Signalized Intersection

Table 5: 2022 Intersection Operations Without and With Site Redevelopment

Intersection		AM Peak			PM Peak		
		Max v/c or Delay	LOS	Mvmt	Max v/c or Delay	LOS	Mvmt
2022 Future Background - Without Site Development							
Ottawa Street @	Sadler / Industrial[1]	0.29	A	NB	0.69	B	WBT
	West Site Driveway / YIG	15 sec	B	NB	41 sec	F	NB
	Civic 453	13 sec	B	NB	15 sec	C	NB
	Home Hardware	10 sec	A	SB	13 sec	B	SB
2022 Total Traffic - With Site Development							
Ottawa Street @	Sadler / Industrial[1]	0.29	A	NB	0.68	B	WBT
	West Site Driveway / YIG	14 sec	B	NB	28 sec	D	NB
	East Site Driveway	11 sec	B	SB	14 sec	B	SB
	Civic 453	13 sec	B	NB	15 sec	C	NB
	Home Hardware	10 sec	A	SB	12 sec	B	SB

1. Signalized Intersection

Table 6: 2027 Intersection Operations Without and With Site Redevelopment

Intersection		AM Peak			PM Peak		
		Max v/c or Delay	LOS	Mvmt	Max v/c or Delay	LOS	Mvmt
2027 Future Background - Without Site Development							
Ottawa Street @	Sadler / Industrial[1]	0.31	A	NB	0.75	C	WBT
	West Site Driveway / YIG	15 sec	C	NB	51 sec	F	NB
	Civic 453	13 sec	B	NB	17 sec	C	NB
	Home Hardware	10 sec	B	SB	14 sec	B	SB
2027 Total Traffic - With Site Development							
Ottawa Street @	Sadler / Industrial[1]	0.31	A	NB	0.74	C	WBT
	West Site Driveway / YIG	15 sec	C	NB	33 sec	D	NB
	East Site Driveway	11 sec	B	SB	15 sec	B	SB
	Civic 453	13 sec	B	NB	16 sec	C	NB
	Home Hardware	10 sec	B	SB	13 sec	B	SB

1. Signalized Intersection

By the 2027 horizon year, the site redevelopment is not expected to have any major impact on the overall operations of the study intersections. The signalized intersection of Ottawa Street at Sadler Drive / Industrial Drive is expected to continue to operate well. A reduction in the site generated volumes during the PM peak hour relative to the existing site (See **Table 3**) is projected.

The site's approaches to Ottawa Street (SB at West and East Site Driveways) are expected to operate with LOS 'C' or better and average delays of 16 seconds or less with site redevelopment.

Delay on the northbound YIG approach improves to 33 seconds delay (LOS D) from 51 seconds (LOS F) with decreased site traffic and the new access. The northbound (YIG) 95th percentile queue in 2027 is expected to be reduced to 20m from 30m with site redevelopment.

An eastbound left turn lane warrant has been reviewed for the new (east) access (See **Appendix B**) and the left turn lane is not expected to be warranted with site redevelopment and projected 2027 traffic volumes. Traffic signals are not required at the west access / YIG access at Ottawa Street or the east site access.

5.2 Development Design

5.2.1 Circulation and Access

The proposed redevelopment will be served by two two-way driveways to Ottawa Street. It is acknowledged that the Town has asked for consideration of a realigned shared access with Home Hardware to Ottawa Street opposite Civic #453. It is our understanding that the adjacent property owner has no interest in a realigned access. Use of the existing shared access is expected to be minimal with the addition of the new east driveway. The Town has also asked for removal of the access connection to the Tim's and consideration of a new access to Sadler at the northwest corner of the site. The site has no frontage to Sadler and it is our understanding that Tim Hortons has no interest in a new shared access at the northwest corner of the subject site. Regarding the existing shared connection, the redevelopment is expected to result in a net decrease in site traffic compared to existing conditions. The 2027 analysis shows SB queues of 15m or less at Sadler/Ottawa/Industrial in the AM /PM peaks. Based on an access spacing of 50m, these queues are not expected to block the existing Tim's access to Sadler.

The driveways are expected to be between 8-9 metres in width. Fire Routes are shown on the Concept Plan (Appendix A) and will be reviewed as part of a subsequent site plan application. Garbage collection and delivery movements will be reviewed at the site plan stage.

5.2.2 Parking

Minimum vehicular and bicycle parking rates and loading space for the proposed uses are identified in the Town's Zoning By-Law (ZBL)**.** Minimum barrier-free parking is established in the Province of Ontario's Accessibility for Ontarians with Disabilities Act (AODA).

The number of onsite parking, bicycle parking, barrier free, and vehicle loading spaces will be reviewed with site plan submission.

5.3 Access Intersections

The proposed redevelopment will be served by two driveways to Ottawa Street. Each driveway is intended to be STOP controlled with free flow traffic on Ottawa Street. The applicable Town's ZBL requirements and appropriate design guidelines are summarized below:

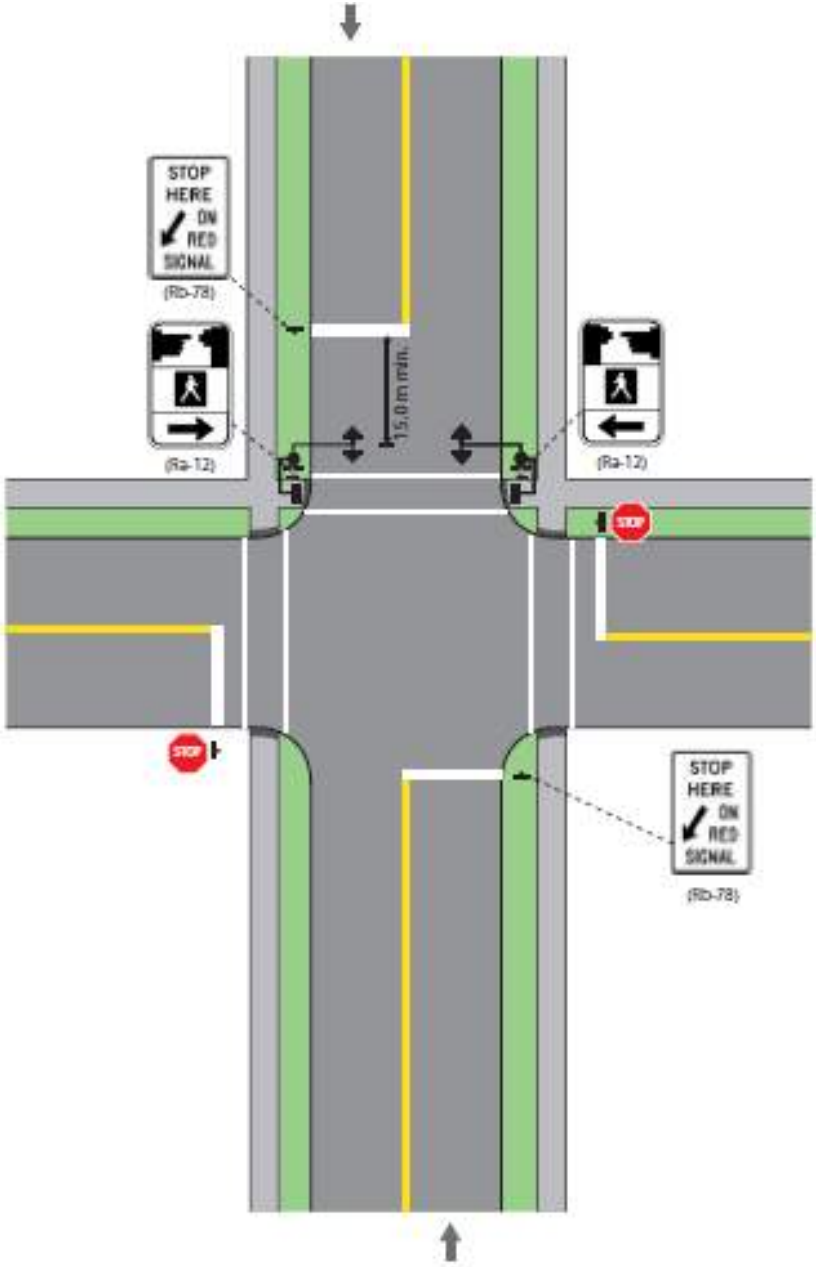
- The Town's ZBL's Section 9.3.9 indicates:
  - Driveways are to have a maximum width of 9m.
  - A maximum of three driveways are permitted based on about 170m of frontage.
- TAC corner clearance– 70m in advance of a signal along an arterial road.
- The Transportation Association of Canada (TAC) outlines minimum clear throat lengths for driveways based on the land use, development size, and type of roadway.
  - 15m clear throat for retail developments under 25,000m^2 onto an arterial; and,
  - 25m clear throat for apartments with 100-200 units onto an arterial.

The concept satisfies the Town's Zoning By-law and the TAC corner clearance. While the clear throat is not achieved by the concept plan, this will be refined at site plan.

The site's west driveway onto Ottawa Street is opposite the west driveway for the development at 401 Ottawa Street (Independent Grocer). This better enables cross connections between the two sites and consolidates the conflicts to a single point.

The proposed east driveway is west of the midblock pedestrian signal to reduce conflicts between traffic turning right from the site (to Almonte) and pedestrians at the crossing. This pedestrian crossing would function more like an Intersection Pedestrian Signal (IPS) (See **Figure 8**). Four lanes on Ottawa Street would remain.

Figure 8: Sketch of an Intersection Pedestrian Signal Treatment on a Two-lane Roadway (Extracted from Figure 15, OTM Book 15)



Traffic analysis of the driveway intersections is included in **Section 5.1**. All movements to / from the site are expected to operate at LOS 'C' or better under both the 2022 and 2027 total traffic conditions, with an average delay of 16 seconds or less.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Development Design and Parking

- Pedestrian facilities will be provided between the main buildings and the parking lots. New pedestrian walkways will be constructed, providing connectivity to the existing pedestrian facility along Ottawa Street.
- The number of onsite parking, bicycle parking, barrier free, and vehicle loading spaces will be reviewed with site plan submission.

Access Design

- The proposed redevelopment will be served by two all movement accesses to Ottawa Street. The accesses are expected to be 8-9m wide and will be reviewed with site plan submission.
- The site's west driveway is opposite the west driveway to the development at 401 Ottawa Street to better enable cross connections between the two sites and consolidate the conflicts to a single point.
- The proposed east driveway is west of the midblock pedestrian signal to reduce conflicts between traffic turning right from the site (to Almonte) and pedestrians at the crossing.
- A left turn lane warrant indicates that an eastbound left turn lane is not expected to be warranted at the new (east) site access.
- Traffic signals are not required at either site access.

Traffic Analysis

- The site redevelopment is not expected to have any major impact on the overall operations of the study intersections.
- The signalized intersection of Ottawa Street at Sadler Drive / Industrial Drive is expected to continue to operate well with site redevelopment.
- The reduction in the site generated volumes during the PM peak hour may bring a reduction in traffic, leading to an improvement in the operations at some nearby driveways.
- The site's approaches to Ottawa Street are expected to operate with LOS 'C' or better and average delays of 16 seconds or less with site redevelopment.

NOVATECH

Prepared by:

Patrick Hatton, P.Eng.
Project Manager | Transportation/Traffic

Reviewed by:

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Senior Project Manager | Transportation/Traffic

APPENDIX A

Concept Plan

BUILDING AREAS:

RESIDENTIAL: 124 UNITS
COMMERCIAL: 1105m^2 + 1344m^2 = 2449m^2 (26351ft^2)

PARKING REQUIRED:
RESIDENTIAL: 124 @ 1.4 SPACES/UNIT:
124 X 1.4 = 174 SPACES
COMMERCIAL: 2449m^2 @ 2.5 SPACES/100m^2:
2449 x 2.5/100 = 62 SPACES

PARKING SHOWN:
RESIDENTIAL: 174 SPACES (ALL NORTH OF RETAIL)
COMMERCIAL: 68 SPACES

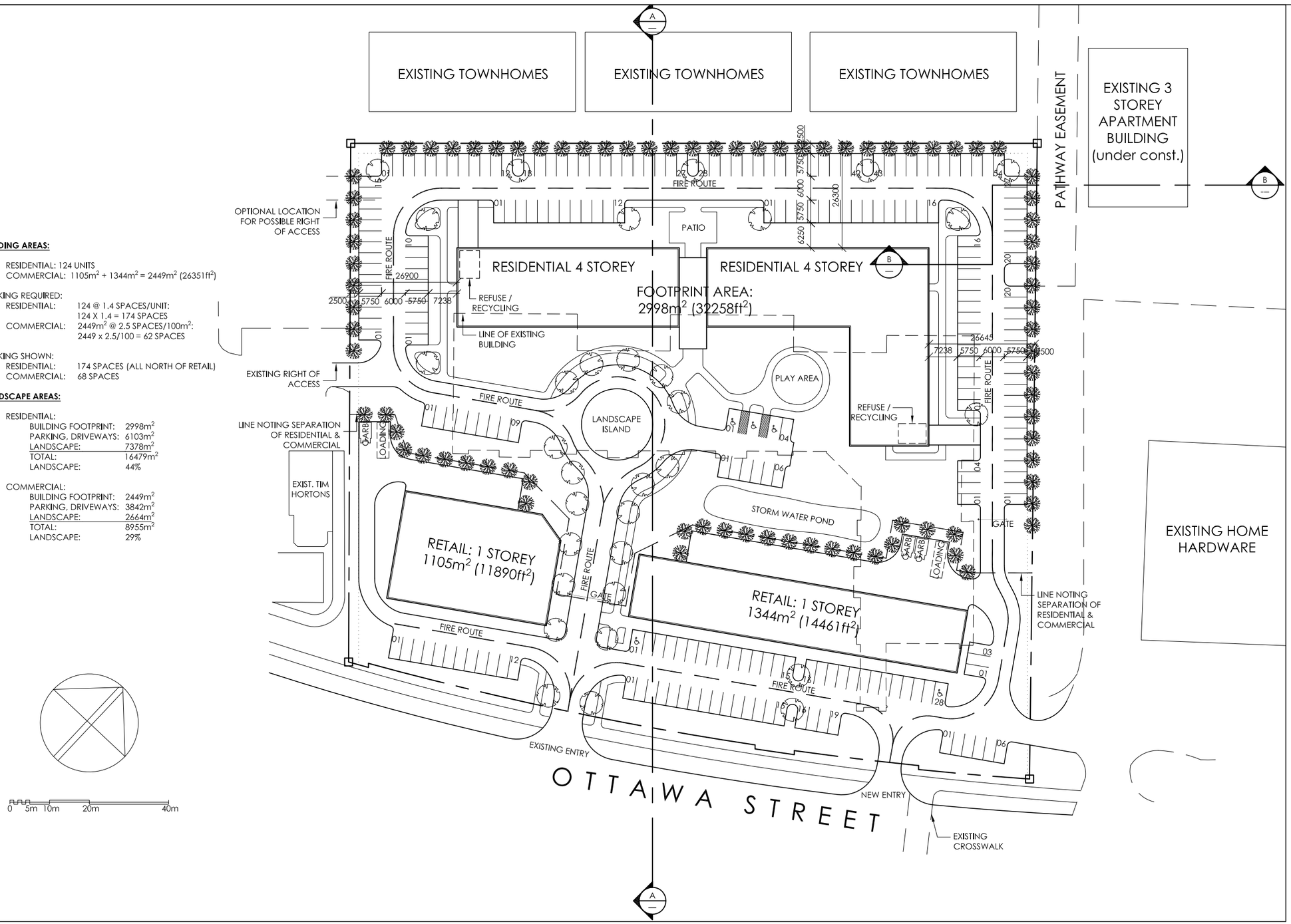
LANDSCAPE AREAS:

RESIDENTIAL:

BUILDING FOOTPRINT:	2998m^2
PARKING, DRIVEWAYS:	6103m^2
LANDSCAPE:	7378m^2
TOTAL:	16479m^2
LANDSCAPE:	44%

COMMERCIAL:

BUILDING FOOTPRINT:	2449m^2
PARKING, DRIVEWAYS:	3842m^2
LANDSCAPE:	2664m^2
TOTAL:	8955m^2
LANDSCAPE:	29%



0 5m 10m 20m 40m

ALMONTE MIXED USE

SITE PLAN
APRIL 2, 2020

SCALE: 1:1000 (WHEN PRINTED ON 11x17)

Vandenberg & Wildeboer
A·R·C·H·I·T·E·C·T·S

APPENDIX B

Traffic Count Data, Internal Trip Capture Worksheet, and Left Turn Warrant

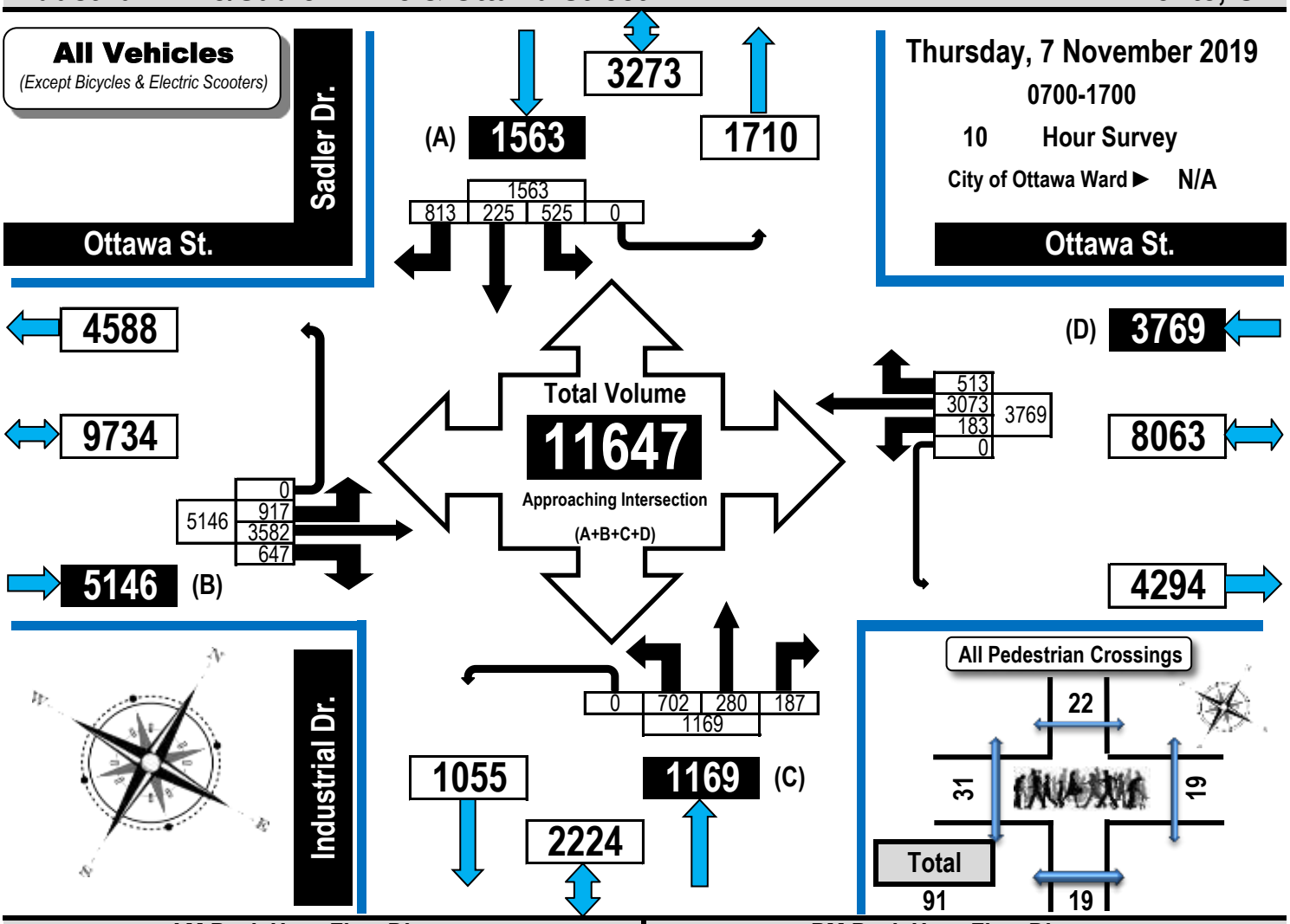
Turning Movement Count
Summary, AM and PM Peak Hour Flow Diagrams

Automobiles, Taxis, Light Trucks, Vans, SUV's, Motorcycles, Heavy Trucks, Buses, and School Buses

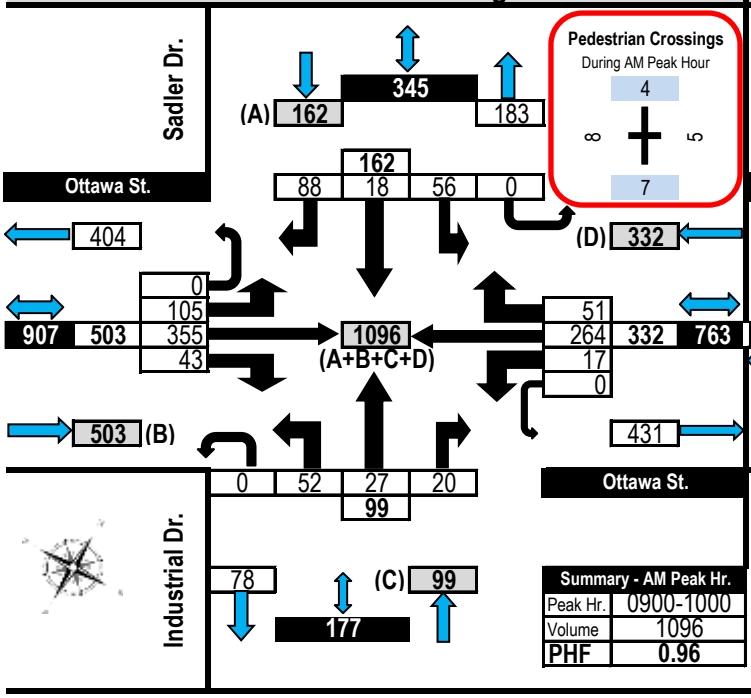
Industrial Drive/Sadler Drive & Ottawa Street — Almonte, ON

All Vehicles
(Except Bicycles & Electric Scooters)

Thursday, 7 November 2019
0700-1700
10 Hour Survey
City of Ottawa Ward ► N/A

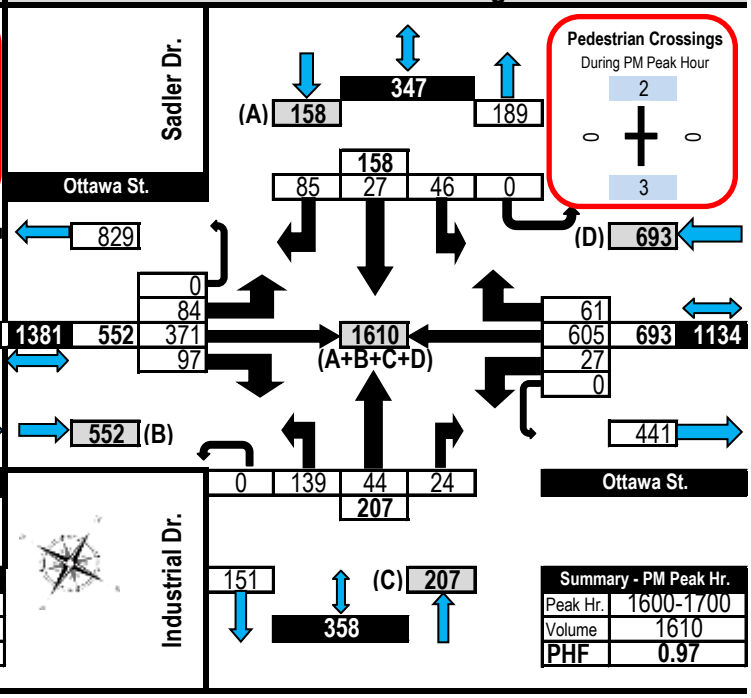


AM Peak Hour Flow Diagram



Summary - AM Peak Hr.	
Peak Hr.	0900-1000
Volume	1096
PHF	0.96

PM Peak Hour Flow Diagram



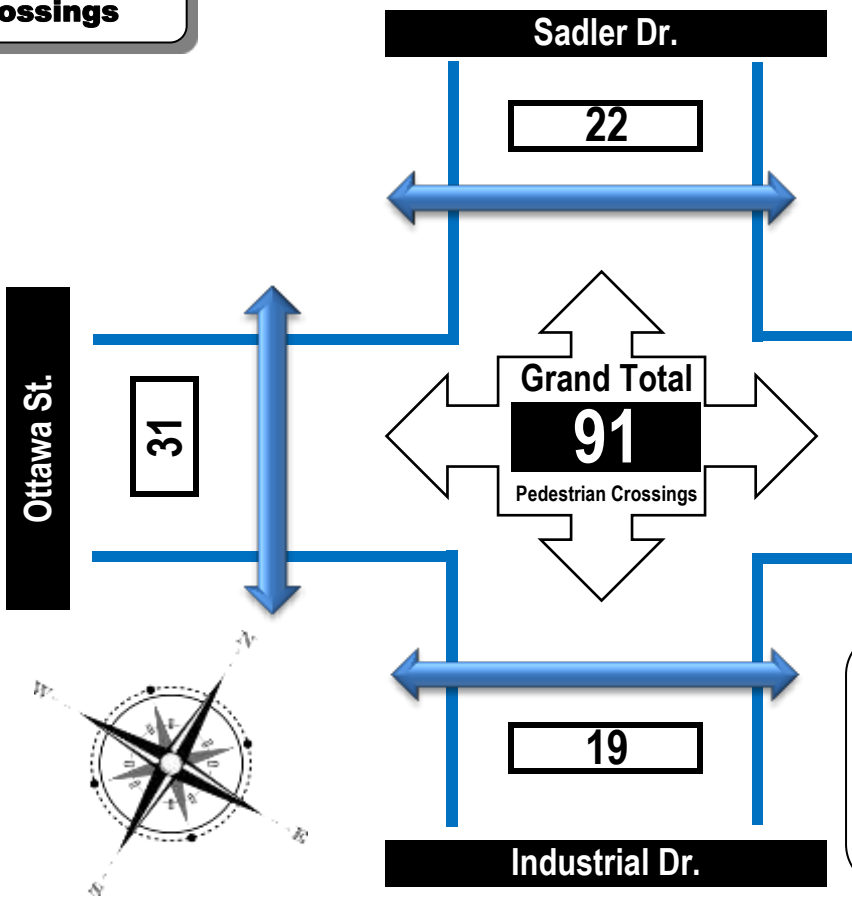
Summary - PM Peak Hr.	
Peak Hr.	1600-1700
Volume	1610
PHF	0.97

Turning Movement Count
Pedestrian Crossings Summary and Flow Diagram

Industrial Drive/Sadler Drive & Ottawa Street — Almonte, ON

Pedestrian Crossings

Thursday, 7 November 2019
0700-1700
10 Hour Survey
City of Ottawa Ward ► N/A



Note

*The values in the summary table below and the flow diagram represent the number of pedestrian crossing**s** **NOT** the number of individual pedestrian**s** crossing. For example, some pedestrians will cross one approach, then another to reach their destination. Accordingly, one pedestrian crossing two approaches will be recorded as two crossings.*

Time Period	West Side Crossing Ottawa St.	East Side Crossing Ottawa St.	Street Total	South Side Crossing Industrial Dr.	North Side Crossing Sadler Dr.	Street Total	Grand Total
0700-0800	0	1	1	0	0	0	1
0800-0900	2	0	2	2	3	5	7
0900-1000	8	5	13	7	4	11	24
1000-1100	4	2	6	0	2	2	8
1100-1200	0	1	1	1	5	6	7
1200-1300	1	1	2	0	2	2	4
1300-1400	3	3	6	3	0	3	9
1400-1500	2	0	2	0	2	2	4
1500-1600	11	6	17	3	2	5	22
1600-1700	0	0	0	3	2	5	5
Totals	31	19	50	19	22	41	91

Comments:
There were no issues involving pedestrian crossings.

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	430 Ottawa Street	**Organization:**	Novatech
Project Location:	Almonte	**Performed By:**	Patrick Hatton
Scenario Description:	Full Site Development	**Date:**	2/5/2020
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[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				100	48	52
Restaurant				0		
Cinema/Entertainment				0		
Residential				54	33	21
Hotel				0		
All Other Land Uses[2]				0		
				154	81	73

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% 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					185	
Restaurant						
Cinema/Entertainment						
Residential		185				
Hotel						

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

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	14	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	5	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	154	81	73
Internal Capture Percentage	25%	23%	26%
External Vehicle-Trips[5]	116	62	54
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

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

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	10%	27%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	42%	24%
Hotel	N/A	N/A

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

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

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be

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

[6]Person-Trips

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

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Project Name:	430 Ottawa Street
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	0	0	1.00	0	0
Retail	1.00	48	48	1.00	52	52
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	33	33	1.00	21	21
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		0	0	0	0	0
Retail	1		15	2	14	3
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	1	9	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		4	0	0	1	0
Retail	0		0	0	15	0
Restaurant	0	24		0	5	0
Cinema/Entertainment	0	2	0		1	0
Residential	0	5	0	0		0
Hotel	0	1	0	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	0	0	0	0	0	0
Retail	5	43	48	43	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	14	19	33	19	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)

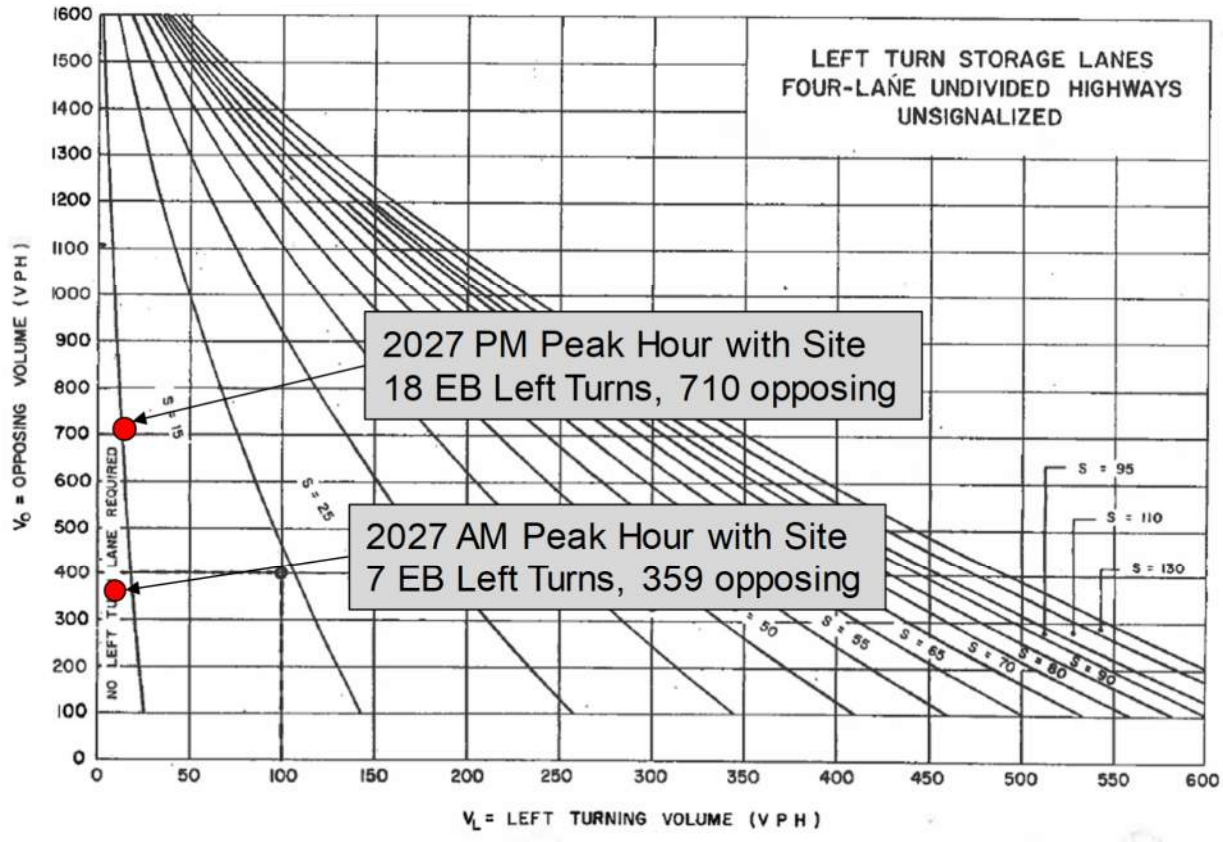
Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	14	38	52	38	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	5	16	21	16	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	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 is not subject to internal trip capture computations in this estimator

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


LEFT TURN STORAGE LANES
FOUR-LANE UNDIVIDED HIGHWAYS
UNSIGNALIZED
2027 PM Peak Hour with Site
18 EB Left Turns, 710 opposing
2027 AM Peak Hour with Site
7 EB Left Turns, 359 opposing
NO LEFT TURN LANE REQUIRED
S = 15
S = 25
S = 50
S = 55
S = 65
S = 70
S = 80
S = 90
S = 95
S = 110
S = 130
V_O = OPPOSING VOLUME (VPH)
V_L = LEFT TURNING VOLUME (VPH)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
0
50
100
150
200
250
300
350
400
450
500
550
600

APPENDIX C

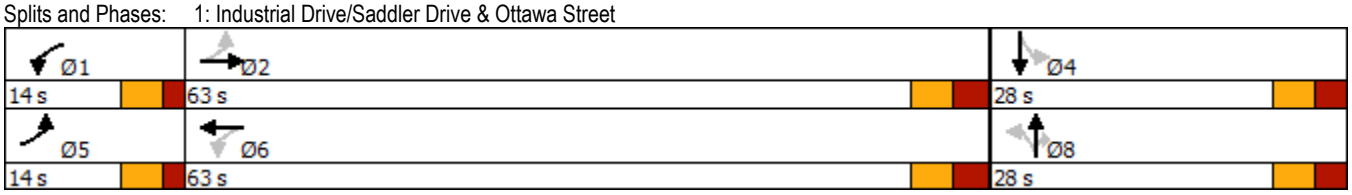
Synchro Reports

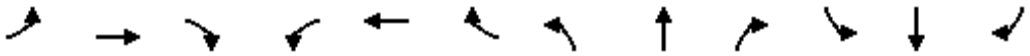
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	355	43	17	264	51	52	27	20	56	18	88
Future Volume (vph)	105	355	43	17	264	51	52	27	20	56	18	88
Satd. Flow (prot)	1658	3250	0	1658	3222	0	0	1689	1483	1658	1498	0
Flt Permitted	0.431			0.507				0.733		0.703		
Satd. Flow (perm)	749	3250	0	877	3222	0	0	1271	1455	1219	1498	0
Satd. Flow (RTOR)		19			33				85		93	
Lane Group Flow (vph)	111	419	0	18	332	0	0	83	21	59	112	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Total Split (s)	14.0	63.0		14.0	63.0		28.0	28.0	28.0	28.0	28.0	
Total Lost Time (s)	5.0	6.2		5.0	6.2			6.0	6.0	6.0	6.0	
Act Effct Green (s)	25.8	24.7		20.7	16.8			10.4	10.4	10.4	10.4	
Actuated g/C Ratio	0.59	0.57		0.48	0.39			0.24	0.24	0.24	0.24	
v/c Ratio	0.18	0.23		0.03	0.26			0.27	0.05	0.20	0.26	
Control Delay	6.0	8.3		5.7	13.8			18.5	0.2	17.5	7.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	6.0	8.3		5.7	13.8			18.5	0.2	17.5	7.8	
LOS	A	A		A	B			B	A	B	A	
Approach Delay		7.8			13.4			14.8			11.1	
Approach LOS		A			B			B			B	
Queue Length 50th (m)	3.5	7.5		0.5	9.8			5.1	0.0	3.5	1.1	
Queue Length 95th (m)	8.4	22.2		2.3	18.6			14.2	0.0	10.9	10.0	
Internal Link Dist (m)		164.7			77.9			256.4			162.3	
Turn Bay Length (m)	45.0			30.0					25.0	40.0		
Base Capacity (vph)	637	3250		630	3222			660	797	633	823	
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	0.17	0.13		0.03	0.10			0.13	0.03	0.09	0.14	

Intersection Summary

Cycle Length: 105
Actuated Cycle Length: 43.5
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.27
Intersection Signal Delay: 10.6 — Intersection LOS: B
Intersection Capacity Utilization 49.3% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: Industrial Drive/Saddler Drive & Ottawa Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	367	41	10	291	5	28	0	7	3	0	14
Future Volume (Veh/h)	23	367	41	10	291	5	28	0	7	3	0	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	24	386	43	11	306	5	29	0	7	3	0	15
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		102										
pX, platoon unblocked				0.97			0.97	0.97	0.97	0.97	0.97	
vC, conflicting volume	311			429			646	788	214	578	808	156
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	311			347			570	718	126	501	738	156
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			92	100	99	99	100	98
cM capacity (veh/h)	1246			1171			376	333	873	426	324	862

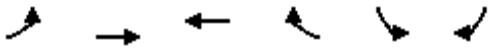
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	217	236	164	158	36	18
Volume Left	24	0	11	0	29	3
Volume Right	0	43	0	5	7	15
cSH	1246	1700	1171	1700	423	737
Volume to Capacity	0.02	0.14	0.01	0.09	0.09	0.02
Queue Length 95th (m)	0.4	0.0	0.2	0.0	1.9	0.5
Control Delay (s)	1.0	0.0	0.6	0.0	14.3	10.0
Lane LOS	A		A		B	B
Approach Delay (s)	0.5		0.3		14.3	10.0
Approach LOS					B	B

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	38.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	364	13	3	295	7	2
Future Volume (Veh/h)	364	13	3	295	7	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	383	14	3	311	7	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	218					
pX, platoon unblocked						
vC, conflicting volume			397		552	198
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			397		552	198
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			1158		463	809

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	255	142	107	207	9
Volume Left	0	0	3	0	7
Volume Right	0	14	0	0	2
cSH	1700	1700	1158	1700	511
Volume to Capacity	0.15	0.08	0.00	0.12	0.02
Queue Length 95th (m)	0.0	0.0	0.1	0.0	0.4
Control Delay (s)	0.0	0.0	0.3	0.0	12.2
Lane LOS			A		B
Approach Delay (s)	0.0		0.1		12.2
Approach LOS					B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	21.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	22	344	284	7	3	14
Future Volume (Veh/h)	22	344	284	7	3	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	362	299	7	3	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		239				
pX, platoon unblocked						
vC, conflicting volume	306				530	153
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	306				530	153
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	98
cM capacity (veh/h)	1252				470	866

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	144	241	199	107	18
Volume Left	23	0	0	0	3
Volume Right	0	0	0	7	15
cSH	1252	1700	1700	1700	759
Volume to Capacity	0.02	0.14	0.12	0.06	0.02
Queue Length 95th (m)	0.4	0.0	0.0	0.0	0.5
Control Delay (s)	1.4	0.0	0.0	0.0	9.9
Lane LOS	A				A
Approach Delay (s)	0.5		0.0		9.9
Approach LOS					A

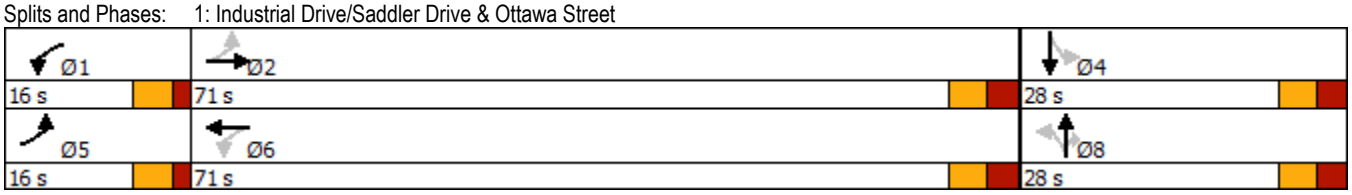
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	32.6%	ICU Level of Service	A
Analysis Period (min)	15		

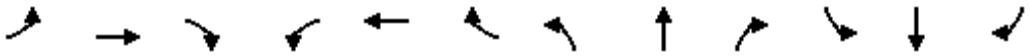
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	371	97	27	605	61	139	44	24	46	27	85
Future Volume (vph)	84	371	97	27	605	61	139	44	24	46	27	85
Satd. Flow (prot)	1658	3195	0	1658	3262	0	0	1681	1483	1658	1546	0
Flt Permitted	0.260			0.472				0.702		0.637		
Satd. Flow (perm)	453	3195	0	821	3262	0	0	1225	1483	1112	1546	0
Satd. Flow (RTOR)		47			15				78		89	
Lane Group Flow (vph)	88	493	0	28	701	0	0	192	25	48	117	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Total Split (s)	16.0	71.0		16.0	71.0		28.0	28.0	28.0	28.0	28.0	
Total Lost Time (s)	5.0	6.2		5.0	6.2			6.0	6.0	6.0	6.0	
Act Effct Green (s)	29.3	24.9		24.6	18.8			16.6	16.6	16.6	16.6	
Actuated g/C Ratio	0.50	0.43		0.42	0.32			0.28	0.28	0.28	0.28	
v/c Ratio	0.22	0.36		0.06	0.66			0.55	0.05	0.15	0.23	
Control Delay	8.7	12.4		7.9	21.5			27.3	0.2	19.7	8.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	8.7	12.4		7.9	21.5			27.3	0.2	19.7	8.6	
LOS	A	B		A	C			C	A	B	A	
Approach Delay		11.8			20.9			24.2			11.8	
Approach LOS		B			C			C			B	
Queue Length 50th (m)	4.0	12.3		1.2	32.6			17.4	0.0	3.8	2.2	
Queue Length 95th (m)	10.4	32.0		4.4	54.2			38.3	0.0	11.4	12.6	
Internal Link Dist (m)		164.7			77.9			256.4			162.3	
Turn Bay Length (m)	45.0			30.0					25.0	40.0		
Base Capacity (vph)	475	3095		565	3158			496	647	450	679	
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	0.19	0.16		0.05	0.22			0.39	0.04	0.11	0.17	

Intersection Summary

Cycle Length: 115
Actuated Cycle Length: 58.5
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 17.3 — Intersection LOS: B
Intersection Capacity Utilization 56.5% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: Industrial Drive/Saddler Drive & Ottawa Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	294	86	54	510	36	104	0	33	25	0	78
Future Volume (Veh/h)	61	294	86	54	510	36	104	0	33	25	0	78
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	64	309	91	57	537	38	109	0	35	26	0	82
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		102										
pX, platoon unblocked				0.94			0.94	0.94	0.94	0.94	0.94	
vC, conflicting volume	575			400			947	1172	200	988	1198	288
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	575			246			826	1064	35	869	1092	288
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			95			46	100	96	87	100	88
cM capacity (veh/h)	994			1243			203	187	973	206	180	709

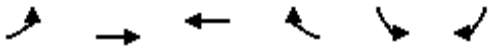
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	218	246	326	306	144	108
Volume Left	64	0	57	0	109	26
Volume Right	0	91	0	38	35	82
cSH	994	1700	1243	1700	251	446
Volume to Capacity	0.06	0.14	0.05	0.18	0.57	0.24
Queue Length 95th (m)	1.4	0.0	1.0	0.0	22.8	6.6
Control Delay (s)	3.0	0.0	1.8	0.0	37.0	15.6
Lane LOS	A		A		E	C
Approach Delay (s)	1.4		0.9		37.0	15.6
Approach LOS					E	C

Intersection Summary				
Average Delay	6.1			
Intersection Capacity Utilization	56.0%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	321	31	17	558	38	13
Future Volume (Veh/h)	321	31	17	558	38	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	338	33	18	587	40	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	218					
pX, platoon unblocked						
vC, conflicting volume			371		684	186
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			371		684	186
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		89	98
cM capacity (veh/h)			1184		377	825

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	225	146	214	391	54
Volume Left	0	0	18	0	40
Volume Right	0	33	0	0	14
cSH	1700	1700	1184	1700	438
Volume to Capacity	0.13	0.09	0.02	0.23	0.12
Queue Length 95th (m)	0.0	0.0	0.3	0.0	2.9
Control Delay (s)	0.0	0.0	0.8	0.0	14.4
Lane LOS			A		B
Approach Delay (s)	0.0		0.3		14.4
Approach LOS					B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	39.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	309	543	14	12	32
Future Volume (Veh/h)	25	309	543	14	12	32
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	26	325	572	15	13	34
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		239				
pX, platoon unblocked						
vC, conflicting volume	587				794	294
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	587				794	294
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				96	95
cM capacity (veh/h)	984				317	703

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	134	217	381	206	47
Volume Left	26	0	0	0	13
Volume Right	0	0	0	15	34
cSH	984	1700	1700	1700	526
Volume to Capacity	0.03	0.13	0.22	0.12	0.09
Queue Length 95th (m)	0.6	0.0	0.0	0.0	2.1
Control Delay (s)	1.9	0.0	0.0	0.0	12.5
Lane LOS	A				B
Approach Delay (s)	0.7		0.0		12.5
Approach LOS					B

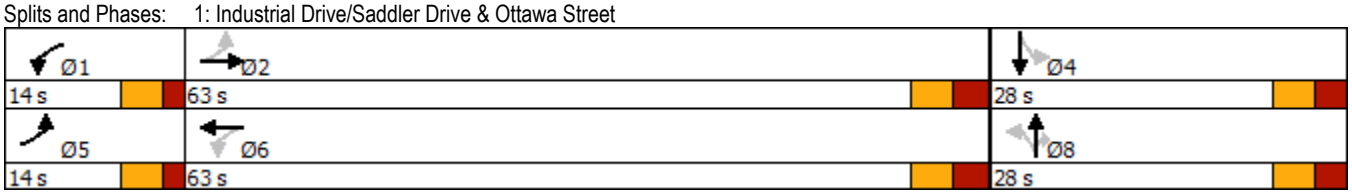
Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	39.2%	ICU Level of Service	A
Analysis Period (min)	15		

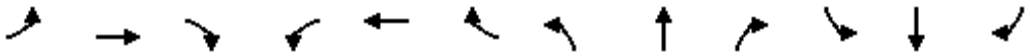
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	376	46	18	280	54	55	29	21	59	19	93
Future Volume (vph)	111	376	46	18	280	54	55	29	21	59	19	93
Satd. Flow (prot)	1658	3250	0	1658	3222	0	0	1689	1483	1658	1498	0
Flt Permitted	0.424			0.495				0.733		0.699		
Satd. Flow (perm)	737	3250	0	857	3222	0	0	1271	1455	1212	1498	0
Satd. Flow (RTOR)		19			33				85		98	
Lane Group Flow (vph)	117	444	0	19	352	0	0	89	22	62	118	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Total Split (s)	14.0	63.0		14.0	63.0		28.0	28.0	28.0	28.0	28.0	
Total Lost Time (s)	5.0	6.2		5.0	6.2			6.0	6.0	6.0	6.0	
Act Effct Green (s)	26.1	25.1		20.9	17.0			10.6	10.6	10.6	10.6	
Actuated g/C Ratio	0.59	0.57		0.48	0.39			0.24	0.24	0.24	0.24	
v/c Ratio	0.19	0.24		0.04	0.28			0.29	0.05	0.21	0.27	
Control Delay	6.2	8.4		5.8	14.0			18.9	0.2	17.8	7.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	6.2	8.4		5.8	14.0			18.9	0.2	17.8	7.8	
LOS	A	A		A	B			B	A	B	A	
Approach Delay		7.9			13.6			15.2			11.3	
Approach LOS		A			B			B			B	
Queue Length 50th (m)	3.7	8.1		0.6	10.6			5.5	0.0	3.8	1.2	
Queue Length 95th (m)	8.9	23.9		2.4	20.0			15.2	0.0	11.5	10.3	
Internal Link Dist (m)		164.7			77.9			256.4			162.3	
Turn Bay Length (m)	45.0			30.0					25.0	40.0		
Base Capacity (vph)	632	3250		623	3222			656	792	625	820	
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	0.19	0.14		0.03	0.11			0.14	0.03	0.10	0.14	

Intersection Summary

Cycle Length: 105
Actuated Cycle Length: 43.9
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.29
Intersection Signal Delay: 10.8 — Intersection LOS: B
Intersection Capacity Utilization 49.8% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: Industrial Drive/Saddler Drive & Ottawa Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	392	41	10	310	5	28	0	7	3	0	14
Future Volume (Veh/h)	23	392	41	10	310	5	28	0	7	3	0	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	24	413	43	11	326	5	29	0	7	3	0	15
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		102										
pX, platoon unblocked				0.96			0.96	0.96	0.96	0.96	0.96	
vC, conflicting volume	331			456			682	836	228	612	854	166
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	331			356			591	750	119	518	770	166
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			92	100	99	99	100	98
cM capacity (veh/h)	1225			1154			361	316	876	411	308	850

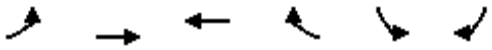
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	230	250	174	168	36	18
Volume Left	24	0	11	0	29	3
Volume Right	0	43	0	5	7	15
cSH	1225	1700	1154	1700	407	722
Volume to Capacity	0.02	0.15	0.01	0.10	0.09	0.02
Queue Length 95th (m)	0.4	0.0	0.2	0.0	2.0	0.5
Control Delay (s)	1.0	0.0	0.6	0.0	14.7	10.1
Lane LOS	A		A		B	B
Approach Delay (s)	0.5		0.3		14.7	10.1
Approach LOS					B	B

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	40.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	389	13	3	318	7	2
Future Volume (Veh/h)	389	13	3	318	7	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	409	14	3	335	7	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	218					
pX, platoon unblocked						
vC, conflicting volume			423		590	212
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			423		590	212
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			1133		438	794

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	273	150	115	223	9
Volume Left	0	0	3	0	7
Volume Right	0	14	0	0	2
cSH	1700	1700	1133	1700	486
Volume to Capacity	0.16	0.09	0.00	0.13	0.02
Queue Length 95th (m)	0.0	0.0	0.1	0.0	0.4
Control Delay (s)	0.0	0.0	0.2	0.0	12.5
Lane LOS			A		B
Approach Delay (s)	0.0		0.1		12.5
Approach LOS					B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	21.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	22	369	307	7	3	14
Future Volume (Veh/h)	22	369	307	7	3	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	388	323	7	3	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		239				
pX, platoon unblocked						
vC, conflicting volume	330				566	165
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	330				566	165
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	98
cM capacity (veh/h)	1226				445	850

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	152	259	215	115	18
Volume Left	23	0	0	0	3
Volume Right	0	0	0	7	15
cSH	1226	1700	1700	1700	739
Volume to Capacity	0.02	0.15	0.13	0.07	0.02
Queue Length 95th (m)	0.4	0.0	0.0	0.0	0.5
Control Delay (s)	1.3	0.0	0.0	0.0	10.0
Lane LOS	A				A
Approach Delay (s)	0.5		0.0		10.0
Approach LOS					A

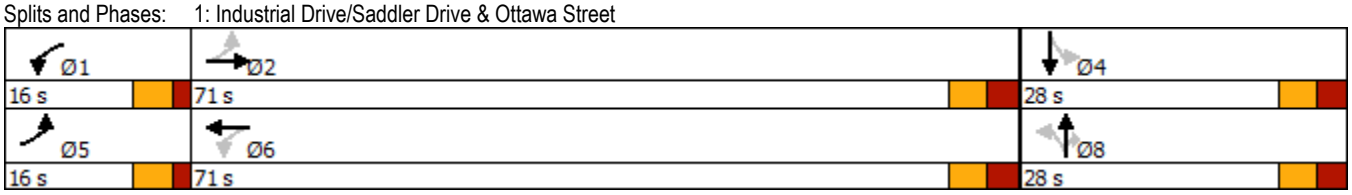
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	34.0%	ICU Level of Service	A
Analysis Period (min)	15		

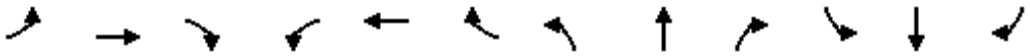
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	393	103	29	641	65	147	47	25	49	29	90
Future Volume (vph)	89	393	103	29	641	65	147	47	25	49	29	90
Satd. Flow (prot)	1658	3195	0	1658	3262	0	0	1681	1483	1658	1548	0
Flt Permitted	0.231			0.459				0.697		0.630		
Satd. Flow (perm)	403	3195	0	798	3262	0	0	1216	1483	1099	1548	0
Satd. Flow (RTOR)		46			15				78		95	
Lane Group Flow (vph)	94	522	0	31	743	0	0	204	26	52	126	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Total Split (s)	16.0	71.0		16.0	71.0		28.0	28.0	28.0	28.0	28.0	
Total Lost Time (s)	5.0	6.2		5.0	6.2			6.0	6.0	6.0	6.0	
Act Effct Green (s)	31.4	26.9		26.5	20.6			19.7	19.7	19.7	19.7	
Actuated g/C Ratio	0.50	0.42		0.42	0.33			0.31	0.31	0.31	0.31	
v/c Ratio	0.26	0.38		0.07	0.69			0.54	0.05	0.15	0.23	
Control Delay	9.6	13.2		8.3	23.2			27.3	0.2	20.3	8.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	9.6	13.2		8.3	23.2			27.3	0.2	20.3	8.7	
LOS	A	B		A	C			C	A	C	A	
Approach Delay		12.7			22.6			24.2			12.1	
Approach LOS		B			C			C			B	
Queue Length 50th (m)	4.9	15.1		1.6	38.6			19.3	0.0	4.3	2.5	
Queue Length 95th (m)	10.8	34.0		4.7	58.2			43.1	0.0	12.9	13.9	
Internal Link Dist (m)		164.7			77.9			256.4			162.3	
Turn Bay Length (m)	45.0			30.0					25.0	40.0		
Base Capacity (vph)	431	3075		535	3138			443	590	401	625	
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	0.22	0.17		0.06	0.24			0.46	0.04	0.13	0.20	

Intersection Summary

Cycle Length: 115
Actuated Cycle Length: 63.3
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 18.4 — Intersection LOS: B
Intersection Capacity Utilization 58.6% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: Industrial Drive/Saddler Drive & Ottawa Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	320	86	54	553	36	104	0	33	25	0	78
Future Volume (Veh/h)	61	320	86	54	553	36	104	0	33	25	0	78
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	64	337	91	57	582	38	109	0	35	26	0	82
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		102										
pX, platoon unblocked				0.93			0.93	0.93	0.93	0.93	0.93	
vC, conflicting volume	620			428			998	1244	214	1046	1271	310
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	620			238			849	1115	8	902	1143	310
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			95			43	100	96	86	100	88
cM capacity (veh/h)	956			1235			191	171	998	191	165	686

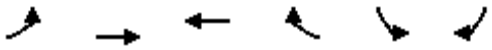
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	232	260	348	329	144	108
Volume Left	64	0	57	0	109	26
Volume Right	0	91	0	38	35	82
cSH	956	1700	1235	1700	237	423
Volume to Capacity	0.07	0.15	0.05	0.19	0.61	0.26
Queue Length 95th (m)	1.5	0.0	1.0	0.0	24.8	7.0
Control Delay (s)	3.0	0.0	1.7	0.0	41.1	16.4
Lane LOS	A		A		E	C
Approach Delay (s)	1.4		0.9		41.1	16.4
Approach LOS					E	C

Intersection Summary				
Average Delay	6.3			
Intersection Capacity Utilization	58.0%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	347	31	17	605	38	13
Future Volume (Veh/h)	347	31	17	605	38	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	365	33	18	637	40	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	218					
pX, platoon unblocked						
vC, conflicting volume			398		736	199
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			398		736	199
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		89	98
cM capacity (veh/h)			1157		349	809

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	243	155	230	425	54
Volume Left	0	0	18	0	40
Volume Right	0	33	0	0	14
cSH	1700	1700	1157	1700	409
Volume to Capacity	0.14	0.09	0.02	0.25	0.13
Queue Length 95th (m)	0.0	0.0	0.3	0.0	3.2
Control Delay (s)	0.0	0.0	0.8	0.0	15.1
Lane LOS			A		C
Approach Delay (s)	0.0		0.3		15.1
Approach LOS					C

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	40.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	335	590	14	12	32
Future Volume (Veh/h)	25	335	590	14	12	32
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	26	353	621	15	13	34
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		239				
pX, platoon unblocked						
vC, conflicting volume	636				857	318
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	636				857	318
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				95	95
cM capacity (veh/h)	943				288	678

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	144	235	414	222	47
Volume Left	26	0	0	0	13
Volume Right	0	0	0	15	34
cSH	943	1700	1700	1700	493
Volume to Capacity	0.03	0.14	0.24	0.13	0.10
Queue Length 95th (m)	0.6	0.0	0.0	0.0	2.2
Control Delay (s)	1.8	0.0	0.0	0.0	13.1
Lane LOS	A				B
Approach Delay (s)	0.7		0.0		13.1
Approach LOS					B

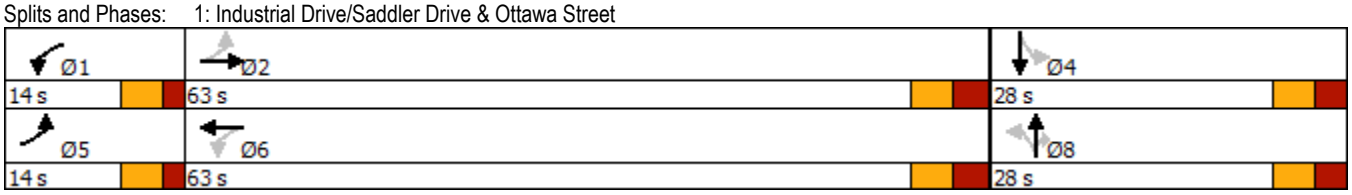
Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	39.8%	ICU Level of Service	A
Analysis Period (min)	15		

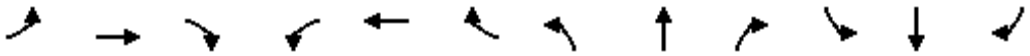
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	122	412	50	20	306	59	60	31	23	65	21	102
Future Volume (vph)	122	412	50	20	306	59	60	31	23	65	21	102
Satd. Flow (prot)	1658	3250	0	1658	3222	0	0	1689	1483	1658	1499	0
Flt Permitted	0.411			0.475				0.725		0.695		
Satd. Flow (perm)	714	3250	0	823	3222	0	0	1257	1455	1205	1499	0
Satd. Flow (RTOR)		20			33				85		107	
Lane Group Flow (vph)	128	487	0	21	384	0	0	96	24	68	129	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Total Split (s)	14.0	63.0		14.0	63.0		28.0	28.0	28.0	28.0	28.0	
Total Lost Time (s)	5.0	6.2		5.0	6.2			6.0	6.0	6.0	6.0	
Act Effct Green (s)	26.1	25.3		20.9	17.3			11.0	11.0	11.0	11.0	
Actuated g/C Ratio	0.59	0.58		0.48	0.39			0.25	0.25	0.25	0.25	
v/c Ratio	0.21	0.26		0.04	0.30			0.31	0.06	0.23	0.28	
Control Delay	6.4	8.5		5.8	14.2			19.5	0.3	18.3	7.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	6.4	8.5		5.8	14.2			19.5	0.3	18.3	7.8	
LOS	A	A		A	B			B	A	B	A	
Approach Delay		8.1			13.8			15.6			11.4	
Approach LOS		A			B			B			B	
Queue Length 50th (m)	4.1	9.0		0.6	12.0			6.2	0.0	4.3	1.3	
Queue Length 95th (m)	10.1	26.8		2.7	22.2			16.5	0.0	12.6	11.0	
Internal Link Dist (m)		164.7			77.9			256.4			162.3	
Turn Bay Length (m)	45.0			30.0					25.0	40.0		
Base Capacity (vph)	627	3250		614	3222			664	809	637	843	
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	0.20	0.15		0.03	0.12			0.14	0.03	0.11	0.15	

Intersection Summary

Cycle Length: 105
Actuated Cycle Length: 43.9
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.31
Intersection Signal Delay: 11.0 — Intersection LOS: B
Intersection Capacity Utilization 59.9% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: Industrial Drive/Saddler Drive & Ottawa Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	436	41	10	343	5	28	0	7	3	0	14
Future Volume (Veh/h)	23	436	41	10	343	5	28	0	7	3	0	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	24	459	43	11	361	5	29	0	7	3	0	15
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		102										
pX, platoon unblocked				0.95			0.95	0.95	0.95	0.95	0.95	
vC, conflicting volume	366			502			746	916	251	670	936	183
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	366			370			627	807	106	547	827	183
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			91	100	99	99	100	98
cM capacity (veh/h)	1189			1125			335	289	881	387	282	828

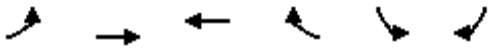
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	254	272	192	186	36	18
Volume Left	24	0	11	0	29	3
Volume Right	0	43	0	5	7	15
cSH	1189	1700	1125	1700	381	696
Volume to Capacity	0.02	0.16	0.01	0.11	0.09	0.03
Queue Length 95th (m)	0.4	0.0	0.2	0.0	2.2	0.6
Control Delay (s)	0.9	0.0	0.6	0.0	15.4	10.3
Lane LOS	A		A		C	B
Approach Delay (s)	0.5		0.3		15.4	10.3
Approach LOS					C	B

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	42.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	433	13	3	351	7	2
Future Volume (Veh/h)	433	13	3	351	7	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	456	14	3	369	7	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	218					
pX, platoon unblocked						
vC, conflicting volume			470		654	235
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			470		654	235
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			1088		399	767

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	304	166	126	246	9
Volume Left	0	0	3	0	7
Volume Right	0	14	0	0	2
cSH	1700	1700	1088	1700	446
Volume to Capacity	0.18	0.10	0.00	0.14	0.02
Queue Length 95th (m)	0.0	0.0	0.1	0.0	0.4
Control Delay (s)	0.0	0.0	0.2	0.0	13.2
Lane LOS			A		B
Approach Delay (s)	0.0		0.1		13.2
Approach LOS					B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	23.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	22	413	340	7	3	14
Future Volume (Veh/h)	22	413	340	7	3	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	435	358	7	3	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		239				
pX, platoon unblocked						
vC, conflicting volume	365				625	182
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	365				625	182
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	98
cM capacity (veh/h)	1190				409	829

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	168	290	239	126	18
Volume Left	23	0	0	0	3
Volume Right	0	0	0	7	15
cSH	1190	1700	1700	1700	708
Volume to Capacity	0.02	0.17	0.14	0.07	0.03
Queue Length 95th (m)	0.4	0.0	0.0	0.0	0.5
Control Delay (s)	1.3	0.0	0.0	0.0	10.2
Lane LOS	A				B
Approach Delay (s)	0.5		0.0		10.2
Approach LOS					B

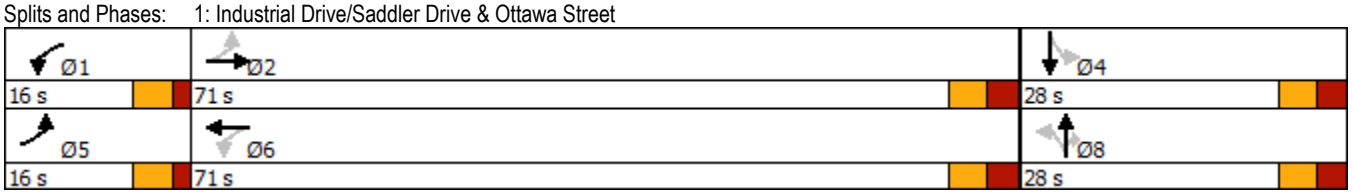
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		

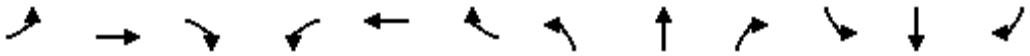
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	97	430	113	31	702	71	161	51	28	53	31	99
Future Volume (vph)	97	430	113	31	702	71	161	51	28	53	31	99
Satd. Flow (prot)	1658	3195	0	1658	3262	0	0	1681	1483	1658	1546	0
Flt Permitted	0.192			0.437				0.691		0.594		
Satd. Flow (perm)	335	3195	0	760	3262	0	0	1206	1483	1037	1546	0
Satd. Flow (RTOR)		47			15				78		104	
Lane Group Flow (vph)	102	572	0	33	814	0	0	223	29	56	137	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Total Split (s)	16.0	71.0		16.0	71.0		28.0	28.0	28.0	28.0	28.0	
Total Lost Time (s)	5.0	6.2		5.0	6.2			6.0	6.0	6.0	6.0	
Act Effct Green (s)	34.0	29.2		28.7	22.7			22.6	22.6	22.6	22.6	
Actuated g/C Ratio	0.50	0.43		0.42	0.33			0.33	0.33	0.33	0.33	
v/c Ratio	0.31	0.41		0.08	0.75			0.56	0.05	0.16	0.24	
Control Delay	10.4	13.9		8.4	25.2			29.2	0.2	21.7	8.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	10.4	13.9		8.4	25.2			29.2	0.2	21.7	8.8	
LOS	B	B		A	C			C	A	C	A	
Approach Delay		13.3			24.6			25.9			12.5	
Approach LOS		B			C			C			B	
Queue Length 50th (m)	5.7	18.1		1.8	45.8			22.8	0.0	4.9	2.8	
Queue Length 95th (m)	11.4	37.6		4.8	65.2			#54.3	0.1	14.3	15.1	
Internal Link Dist (m)		164.7			77.9			256.4			162.3	
Turn Bay Length (m)	45.0			30.0					25.0	40.0		
Base Capacity (vph)	386	2922		505	2980			397	540	341	579	
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	0.26	0.20		0.07	0.27			0.56	0.05	0.16	0.24	

Intersection Summary

Cycle Length: 115
Actuated Cycle Length: 68.5
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 19.7 Intersection LOS: B
Intersection Capacity Utilization 68.6% ICU Level of Service C
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Industrial Drive/Saddler Drive & Ottawa Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	364	86	54	622	36	104	0	33	25	0	78
Future Volume (Veh/h)	61	364	86	54	622	36	104	0	33	25	0	78
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	64	383	91	57	655	38	109	0	35	26	0	82
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		102										
pX, platoon unblocked				0.91			0.91	0.91	0.91	0.91	0.91	
vC, conflicting volume	693			474			1080	1364	237	1142	1390	346
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	693			236			899	1209	0	967	1238	346
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			95			36	100	96	84	100	87
cM capacity (veh/h)	898			1214			170	147	991	168	141	650

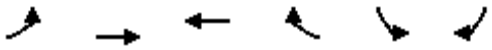
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	256	282	384	366	144	108
Volume Left	64	0	57	0	109	26
Volume Right	0	91	0	38	35	82
cSH	898	1700	1214	1700	213	384
Volume to Capacity	0.07	0.17	0.05	0.21	0.68	0.28
Queue Length 95th (m)	1.6	0.0	1.0	0.0	29.4	8.0
Control Delay (s)	2.9	0.0	1.6	0.0	51.1	18.0
Lane LOS	A		A		F	C
Approach Delay (s)	1.4		0.8		51.1	18.0
Approach LOS					F	C

Intersection Summary				
Average Delay	6.9			
Intersection Capacity Utilization	61.3%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	391	31	17	674	38	13
Future Volume (Veh/h)	391	31	17	674	38	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	412	33	18	709	40	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	218					
pX, platoon unblocked						
vC, conflicting volume			445		819	222
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			445		819	222
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		87	98
cM capacity (veh/h)			1112		308	781

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	275	170	254	473	54
Volume Left	0	0	18	0	40
Volume Right	0	33	0	0	14
cSH	1700	1700	1112	1700	366
Volume to Capacity	0.16	0.10	0.02	0.28	0.15
Queue Length 95th (m)	0.0	0.0	0.3	0.0	3.6
Control Delay (s)	0.0	0.0	0.7	0.0	16.5
Lane LOS			A		C
Approach Delay (s)	0.0		0.3		16.5
Approach LOS					C

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	379	659	14	12	32
Future Volume (Veh/h)	25	379	659	14	12	32
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	26	399	694	15	13	34
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		239				
pX, platoon unblocked						
vC, conflicting volume	709				953	354
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	709				953	354
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				95	95
cM capacity (veh/h)	886				250	642

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	159	266	463	246	47
Volume Left	26	0	0	0	13
Volume Right	0	0	0	15	34
cSH	886	1700	1700	1700	447
Volume to Capacity	0.03	0.16	0.27	0.14	0.11
Queue Length 95th (m)	0.6	0.0	0.0	0.0	2.4
Control Delay (s)	1.7	0.0	0.0	0.0	14.0
Lane LOS	A				B
Approach Delay (s)	0.7		0.0		14.0
Approach LOS					B

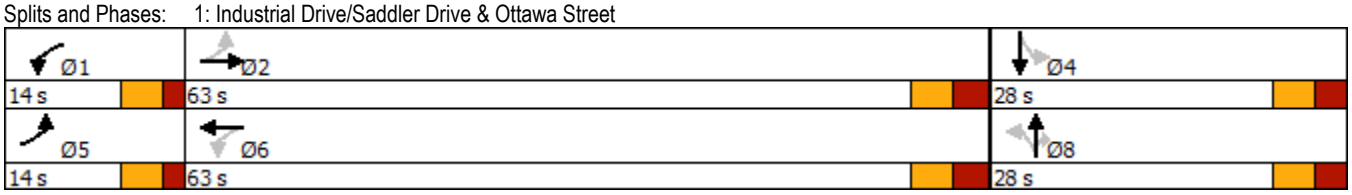
Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

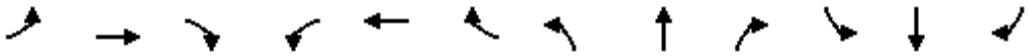
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	369	46	19	289	53	55	29	21	58	19	93
Future Volume (vph)	111	369	46	19	289	53	55	29	21	58	19	93
Satd. Flow (prot)	1658	3247	0	1658	3226	0	0	1689	1483	1658	1498	0
Flt Permitted	0.422			0.499				0.733		0.699		
Satd. Flow (perm)	733	3247	0	864	3226	0	0	1271	1455	1212	1498	0
Satd. Flow (RTOR)		20			31				85		98	
Lane Group Flow (vph)	117	436	0	20	360	0	0	89	22	61	118	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Total Split (s)	14.0	63.0		14.0	63.0		28.0	28.0	28.0	28.0	28.0	
Total Lost Time (s)	5.0	6.2		5.0	6.2			6.0	6.0	6.0	6.0	
Act Effct Green (s)	26.2	25.2		21.0	17.1			10.6	10.6	10.6	10.6	
Actuated g/C Ratio	0.60	0.57		0.48	0.39			0.24	0.24	0.24	0.24	
v/c Ratio	0.19	0.23		0.04	0.28			0.29	0.05	0.21	0.27	
Control Delay	6.2	8.4		5.8	14.1			19.0	0.2	17.8	7.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	6.2	8.4		5.8	14.1			19.0	0.2	17.8	7.8	
LOS	A	A		A	B			B	A	B	A	
Approach Delay		7.9			13.7			15.3			11.2	
Approach LOS		A			B			B			B	
Queue Length 50th (m)	3.7	7.8		0.6	11.0			5.5	0.0	3.7	1.2	
Queue Length 95th (m)	9.0	23.4		2.5	20.5			15.3	0.0	11.4	10.4	
Internal Link Dist (m)		164.7			77.9			256.4			162.3	
Turn Bay Length (m)	45.0			30.0					25.0	40.0		
Base Capacity (vph)	631	3247		625	3226			654	790	624	819	
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	0.19	0.13		0.03	0.11			0.14	0.03	0.10	0.14	

Intersection Summary

Cycle Length: 105
Actuated Cycle Length: 44
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.29
Intersection Signal Delay: 10.8 — Intersection LOS: B
Intersection Capacity Utilization 49.7% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: Industrial Drive/Saddler Drive & Ottawa Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	394	41	10	322	4	28	0	7	3	0	10
Future Volume (Veh/h)	12	394	41	10	322	4	28	0	7	3	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	13	415	43	11	339	4	29	0	7	3	0	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		102										
pX, platoon unblocked				0.96			0.96	0.96	0.96	0.96	0.96	
vC, conflicting volume	343			458			665	828	229	604	847	172
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	343			364			579	747	127	515	768	172
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			92	100	99	99	100	99
cM capacity (veh/h)	1213			1149			373	321	868	417	312	842

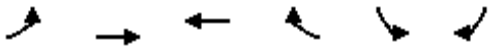
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	220	250	180	174	36	14
Volume Left	13	0	11	0	29	3
Volume Right	0	43	0	4	7	11
cSH	1213	1700	1149	1700	420	691
Volume to Capacity	0.01	0.15	0.01	0.10	0.09	0.02
Queue Length 95th (m)	0.2	0.0	0.2	0.0	2.0	0.4
Control Delay (s)	0.6	0.0	0.6	0.0	14.4	10.3
Lane LOS	A		A		B	B
Approach Delay (s)	0.3		0.3		14.4	10.3
Approach LOS					B	B

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	34.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	395	13	3	318	7	2
Future Volume (Veh/h)	395	13	3	318	7	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	416	14	3	335	7	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	218					
pX, platoon unblocked						
vC, conflicting volume			430		596	215
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			430		596	215
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			1126		433	790

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	277	153	115	223	9
Volume Left	0	0	3	0	7
Volume Right	0	14	0	0	2
cSH	1700	1700	1126	1700	482
Volume to Capacity	0.16	0.09	0.00	0.13	0.02
Queue Length 95th (m)	0.0	0.0	0.1	0.0	0.4
Control Delay (s)	0.0	0.0	0.2	0.0	12.6
Lane LOS			A		B
Approach Delay (s)	0.0		0.1		12.6
Approach LOS					B

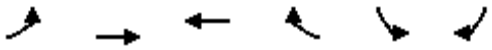
Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	22.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	380	310	5	2	11
Future Volume (Veh/h)	17	380	310	5	2	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	18	400	326	5	2	12
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		239				
pX, platoon unblocked						
vC, conflicting volume	331				564	166
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	331				564	166
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	99
cM capacity (veh/h)	1225				449	850

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	151	267	217	114	14
Volume Left	18	0	0	0	2
Volume Right	0	0	0	5	12
cSH	1225	1700	1700	1700	754
Volume to Capacity	0.01	0.16	0.13	0.07	0.02
Queue Length 95th (m)	0.3	0.0	0.0	0.0	0.4
Control Delay (s)	1.1	0.0	0.0	0.0	9.9
Lane LOS	A				A
Approach Delay (s)	0.4		0.0		9.9
Approach LOS					A

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	397	321	5	10	15
Future Volume (Veh/h)	7	397	321	5	10	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	7	418	338	5	11	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		185				
pX, platoon unblocked						
vC, conflicting volume	343				564	172
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	343				564	172
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				98	98
cM capacity (veh/h)	1213				453	842

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	146	279	225	118	27
Volume Left	7	0	0	0	11
Volume Right	0	0	0	5	16
cSH	1213	1700	1700	1700	624
Volume to Capacity	0.01	0.16	0.13	0.07	0.04
Queue Length 95th (m)	0.1	0.0	0.0	0.0	0.9
Control Delay (s)	0.4	0.0	0.0	0.0	11.0
Lane LOS	A				B
Approach Delay (s)	0.1		0.0		11.0
Approach LOS					B

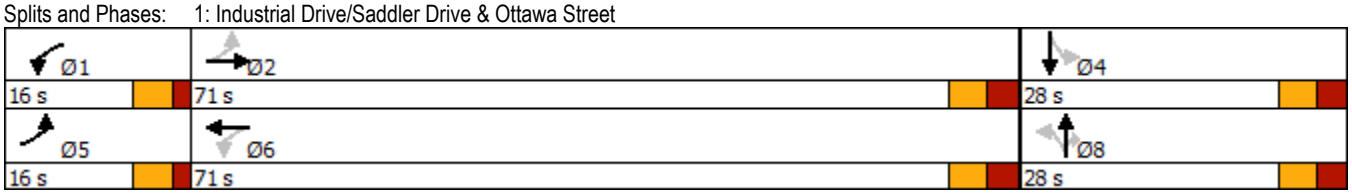
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	26.8%	ICU Level of Service	A
Analysis Period (min)	15		

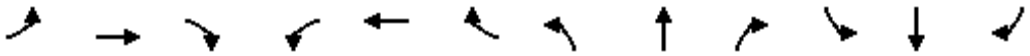
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	383	103	28	621	61	147	47	24	46	29	90
Future Volume (vph)	89	383	103	28	621	61	147	47	24	46	29	90
Satd. Flow (prot)	1658	3191	0	1658	3266	0	0	1681	1483	1658	1548	0
Flt Permitted	0.241			0.464				0.697		0.630		
Satd. Flow (perm)	420	3191	0	807	3266	0	0	1216	1483	1099	1548	0
Satd. Flow (RTOR)		48			15				78		95	
Lane Group Flow (vph)	94	511	0	29	718	0	0	204	25	48	126	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Total Split (s)	16.0	71.0		16.0	71.0		28.0	28.0	28.0	28.0	28.0	
Total Lost Time (s)	5.0	6.2		5.0	6.2			6.0	6.0	6.0	6.0	
Act Effct Green (s)	30.5	26.0		25.7	19.8			19.5	19.5	19.5	19.5	
Actuated g/C Ratio	0.49	0.42		0.41	0.32			0.31	0.31	0.31	0.31	
v/c Ratio	0.25	0.38		0.07	0.68			0.54	0.05	0.14	0.23	
Control Delay	9.7	13.3		8.4	23.1			26.5	0.2	19.5	8.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	9.7	13.3		8.4	23.1			26.5	0.2	19.5	8.4	
LOS	A	B		A	C			C	A	B	A	
Approach Delay		12.7			22.6			23.6			11.5	
Approach LOS		B			C			C			B	
Queue Length 50th (m)	4.9	14.5		1.4	36.6			19.0	0.0	3.9	2.5	
Queue Length 95th (m)	10.9	33.3		4.5	55.9			41.5	0.0	11.7	13.4	
Internal Link Dist (m)		164.7			77.9			256.4			162.3	
Turn Bay Length (m)	45.0			30.0					25.0	40.0		
Base Capacity (vph)	438	3047		536	3117			450	598	406	633	
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	0.21	0.17		0.05	0.23			0.45	0.04	0.12	0.20	

Intersection Summary

Cycle Length: 115
Actuated Cycle Length: 62.3
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 18.2 — Intersection LOS: B
Intersection Capacity Utilization 57.9% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: Industrial Drive/Saddler Drive & Ottawa Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	337	86	54	571	17	104	0	33	13	0	35
Future Volume (Veh/h)	29	337	86	54	571	17	104	0	33	13	0	35
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	31	355	91	57	601	18	109	0	35	14	0	37
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		102										
pX, platoon unblocked				0.93			0.93	0.93	0.93	0.93	0.93	
vC, conflicting volume	619			446			914	1196	223	998	1232	310
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	619			268			768	1070	29	859	1109	310
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			95			55	100	96	93	100	95
cM capacity (veh/h)	957			1209			242	189	971	212	180	686

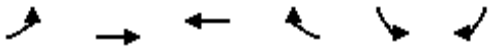
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	208	268	358	318	144	51
Volume Left	31	0	57	0	109	14
Volume Right	0	91	0	18	35	37
cSH	957	1700	1209	1700	296	425
Volume to Capacity	0.03	0.16	0.05	0.19	0.49	0.12
Queue Length 95th (m)	0.7	0.0	1.0	0.0	17.6	2.8
Control Delay (s)	1.6	0.0	1.7	0.0	28.2	14.6
Lane LOS	A		A		D	B
Approach Delay (s)	0.7		0.9		28.2	14.6
Approach LOS					D	B

Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	57.4%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	341	31	17	603	38	13
Future Volume (Veh/h)	341	31	17	603	38	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	359	33	18	635	40	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	218					
pX, platoon unblocked						
vC, conflicting volume			392		729	196
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			392		729	196
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		89	98
cM capacity (veh/h)			1163		352	812

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	239	153	230	423	54
Volume Left	0	0	18	0	40
Volume Right	0	33	0	0	14
cSH	1700	1700	1163	1700	413
Volume to Capacity	0.14	0.09	0.02	0.25	0.13
Queue Length 95th (m)	0.0	0.0	0.3	0.0	3.1
Control Delay (s)	0.0	0.0	0.8	0.0	15.0
Lane LOS			A		C
Approach Delay (s)	0.0		0.3		15.0
Approach LOS					C

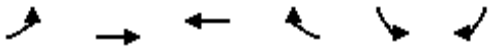
Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	338	598	10	7	22
Future Volume (Veh/h)	16	338	598	10	7	22
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	17	356	629	11	7	23
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		239				
pX, platoon unblocked						
vC, conflicting volume	640				846	320
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	640				846	320
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				98	97
cM capacity (veh/h)	940				296	676

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	136	237	419	221	30
Volume Left	17	0	0	0	7
Volume Right	0	0	0	11	23
cSH	940	1700	1700	1700	520
Volume to Capacity	0.02	0.14	0.25	0.13	0.06
Queue Length 95th (m)	0.4	0.0	0.0	0.0	1.3
Control Delay (s)	1.3	0.0	0.0	0.0	12.3
Lane LOS	A				B
Approach Delay (s)	0.5		0.0		12.3
Approach LOS					B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	32.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	365	629	12	8	13
Future Volume (Veh/h)	18	365	629	12	8	13
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	19	384	662	13	8	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		184				
pX, platoon unblocked						
vC, conflicting volume	675				898	338
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	675				898	338
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				97	98
cM capacity (veh/h)	912				273	658

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	147	256	441	234	22
Volume Left	19	0	0	0	8
Volume Right	0	0	0	13	14
cSH	912	1700	1700	1700	435
Volume to Capacity	0.02	0.15	0.26	0.14	0.05
Queue Length 95th (m)	0.4	0.0	0.0	0.0	1.1
Control Delay (s)	1.3	0.0	0.0	0.0	13.7
Lane LOS	A				B
Approach Delay (s)	0.5		0.0		13.7
Approach LOS					B

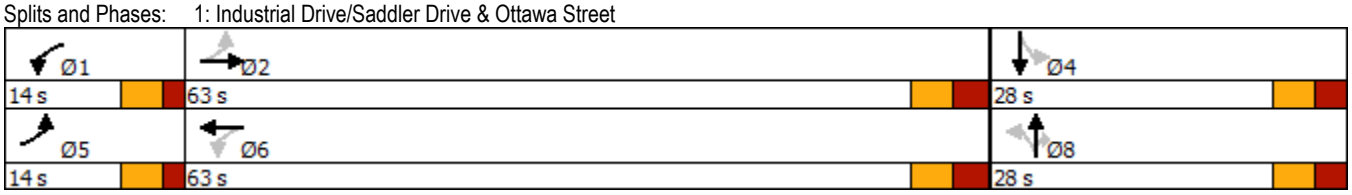
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

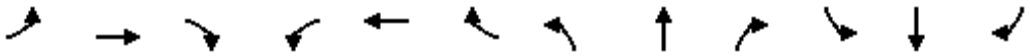
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	122	405	50	21	315	58	60	31	23	64	21	102
Future Volume (vph)	122	405	50	21	315	58	60	31	23	64	21	102
Satd. Flow (prot)	1658	3247	0	1658	3226	0	0	1689	1483	1658	1499	0
Flt Permitted	0.408			0.478				0.725		0.695		
Satd. Flow (perm)	709	3247	0	828	3226	0	0	1257	1455	1205	1499	0
Satd. Flow (RTOR)		20			31				85		107	
Lane Group Flow (vph)	128	479	0	22	393	0	0	96	24	67	129	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Total Split (s)	14.0	63.0		14.0	63.0		28.0	28.0	28.0	28.0	28.0	
Total Lost Time (s)	5.0	6.2		5.0	6.2			6.0	6.0	6.0	6.0	
Act Effct Green (s)	26.2	25.4		21.0	17.4			11.0	11.0	11.0	11.0	
Actuated g/C Ratio	0.60	0.58		0.48	0.40			0.25	0.25	0.25	0.25	
v/c Ratio	0.21	0.25		0.04	0.30			0.31	0.06	0.22	0.28	
Control Delay	6.3	8.5		5.9	14.3			19.6	0.3	18.4	7.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	6.3	8.5		5.9	14.3			19.6	0.3	18.4	7.8	
LOS	A	A		A	B			B	A	B	A	
Approach Delay		8.0			13.9			15.7			11.4	
Approach LOS		A			B			B			B	
Queue Length 50th (m)	4.1	8.8		0.7	12.4			6.2	0.0	4.2	1.3	
Queue Length 95th (m)	10.1	26.3		2.7	22.8			16.6	0.0	12.5	11.1	
Internal Link Dist (m)		164.7			77.9			256.4			162.3	
Turn Bay Length (m)	45.0			30.0					25.0	40.0		
Base Capacity (vph)	626	3247		616	3226			663	808	636	842	
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	0.20	0.15		0.04	0.12			0.14	0.03	0.11	0.15	

Intersection Summary

Cycle Length: 105
Actuated Cycle Length: 44
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.31
Intersection Signal Delay: 11.0 — Intersection LOS: B
Intersection Capacity Utilization 60.1% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: Industrial Drive/Saddler Drive & Ottawa Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	438	41	10	355	4	28	0	7	3	0	10
Future Volume (Veh/h)	12	438	41	10	355	4	28	0	7	3	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	13	461	43	11	374	4	29	0	7	3	0	11
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		102										
pX, platoon unblocked				0.95			0.95	0.95	0.95	0.95	0.95	
vC, conflicting volume	378			504			728	908	252	662	928	189
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	378			381			616	805	116	546	826	189
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			92	100	99	99	100	99
cM capacity (veh/h)	1177			1119			346	293	871	391	285	821

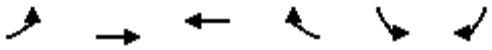
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	244	274	198	191	36	14
Volume Left	13	0	11	0	29	3
Volume Right	0	43	0	4	7	11
cSH	1177	1700	1119	1700	392	664
Volume to Capacity	0.01	0.16	0.01	0.11	0.09	0.02
Queue Length 95th (m)	0.2	0.0	0.2	0.0	2.1	0.5
Control Delay (s)	0.5	0.0	0.5	0.0	15.1	10.5
Lane LOS	A		A		C	B
Approach Delay (s)	0.2		0.3		15.1	10.5
Approach LOS					C	B

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	35.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	439	13	3	351	7	2
Future Volume (Veh/h)	439	13	3	351	7	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	462	14	3	369	7	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	218					
pX, platoon unblocked						
vC, conflicting volume			476		660	238
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			476		660	238
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			1082		395	763

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	308	168	126	246	9
Volume Left	0	0	3	0	7
Volume Right	0	14	0	0	2
cSH	1700	1700	1082	1700	443
Volume to Capacity	0.18	0.10	0.00	0.14	0.02
Queue Length 95th (m)	0.0	0.0	0.1	0.0	0.4
Control Delay (s)	0.0	0.0	0.2	0.0	13.3
Lane LOS			A		B
Approach Delay (s)	0.0		0.1		13.3
Approach LOS					B

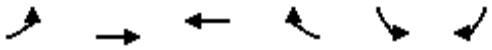
Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	23.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	424	343	5	2	11
Future Volume (Veh/h)	17	424	343	5	2	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	18	446	361	5	2	12
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		239				
pX, platoon unblocked						
vC, conflicting volume	366				622	183
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	366				622	183
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				100	99
cM capacity (veh/h)	1189				412	828

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	167	297	241	125	14
Volume Left	18	0	0	0	2
Volume Right	0	0	0	5	12
cSH	1189	1700	1700	1700	724
Volume to Capacity	0.02	0.17	0.14	0.07	0.02
Queue Length 95th (m)	0.3	0.0	0.0	0.0	0.4
Control Delay (s)	1.0	0.0	0.0	0.0	10.1
Lane LOS	A				B
Approach Delay (s)	0.4		0.0		10.1
Approach LOS					B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	35.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	441	354	5	10	15
Future Volume (Veh/h)	7	441	354	5	10	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	7	464	373	5	11	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		185				
pX, platoon unblocked						
vC, conflicting volume	378				622	189
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	378				622	189
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	98
cM capacity (veh/h)	1177				417	821

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	162	309	249	129	27
Volume Left	7	0	0	0	11
Volume Right	0	0	0	5	16
cSH	1177	1700	1700	1700	588
Volume to Capacity	0.01	0.18	0.15	0.08	0.05
Queue Length 95th (m)	0.1	0.0	0.0	0.0	1.0
Control Delay (s)	0.4	0.0	0.0	0.0	11.4
Lane LOS	A				B
Approach Delay (s)	0.1		0.0		11.4
Approach LOS					B

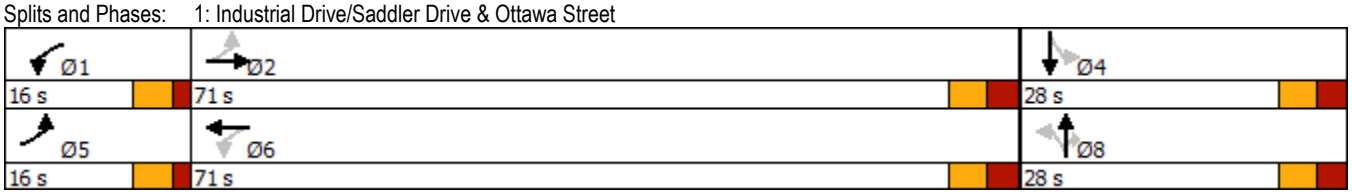
Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	28.1%	ICU Level of Service	A
Analysis Period (min)	15		

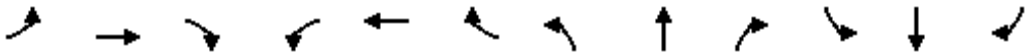
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	97	420	113	30	682	67	161	51	27	50	31	99
Future Volume (vph)	97	420	113	30	682	67	161	51	27	50	31	99
Satd. Flow (prot)	1658	3191	0	1658	3266	0	0	1681	1483	1658	1546	0
Flt Permitted	0.201			0.442				0.691		0.597		
Satd. Flow (perm)	350	3191	0	769	3266	0	0	1206	1483	1042	1546	0
Satd. Flow (RTOR)		48			15				78		104	
Lane Group Flow (vph)	102	561	0	32	789	0	0	223	28	53	137	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Total Split (s)	16.0	71.0		16.0	71.0		28.0	28.0	28.0	28.0	28.0	
Total Lost Time (s)	5.0	6.2		5.0	6.2			6.0	6.0	6.0	6.0	
Act Effct Green (s)	33.3	28.5		28.0	22.0			22.5	22.5	22.5	22.5	
Actuated g/C Ratio	0.49	0.42		0.41	0.32			0.33	0.33	0.33	0.33	
v/c Ratio	0.30	0.41		0.08	0.74			0.56	0.05	0.15	0.23	
Control Delay	10.4	13.9		8.4	25.1			28.6	0.2	21.1	8.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	10.4	13.9		8.4	25.1			28.6	0.2	21.1	8.6	
LOS	B	B		A	C			C	A	C	A	
Approach Delay		13.4			24.5			25.4			12.1	
Approach LOS		B			C			C			B	
Queue Length 50th (m)	5.7	17.6		1.7	43.9			22.5	0.0	4.6	2.8	
Queue Length 95th (m)	11.5	36.7		4.8	62.8			#53.5	0.0	13.7	14.9	
Internal Link Dist (m)		164.7			77.9			256.4			162.3	
Turn Bay Length (m)	45.0			30.0					25.0	40.0		
Base Capacity (vph)	391	2942		505	3008			401	545	347	584	
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	0.26	0.19		0.06	0.26			0.56	0.05	0.15	0.23	

Intersection Summary

Cycle Length: 115
Actuated Cycle Length: 67.7
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 19.6 Intersection LOS: B
Intersection Capacity Utilization 67.9% ICU Level of Service C
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Industrial Drive/Saddler Drive & Ottawa Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	381	86	54	640	17	104	0	33	13	0	35
Future Volume (Veh/h)	29	381	86	54	640	17	104	0	33	13	0	35
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	31	401	91	57	674	18	109	0	35	14	0	37
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		102										
pX, platoon unblocked				0.92			0.92	0.92	0.92	0.92	0.92	
vC, conflicting volume	692			492			996	1314	246	1094	1351	346
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	692			265			815	1162	0	922	1202	346
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			95			50	100	96	93	100	94
cM capacity (veh/h)	899			1188			218	163	994	187	155	650

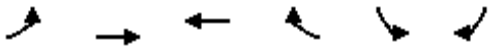
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	232	292	394	355	144	51
Volume Left	31	0	57	0	109	14
Volume Right	0	91	0	18	35	37
cSH	899	1700	1188	1700	269	387
Volume to Capacity	0.03	0.17	0.05	0.21	0.53	0.13
Queue Length 95th (m)	0.7	0.0	1.1	0.0	20.3	3.2
Control Delay (s)	1.5	0.0	1.6	0.0	32.7	15.7
Lane LOS	A		A		D	C
Approach Delay (s)	0.7		0.8		32.7	15.7
Approach LOS					D	C

Intersection Summary				
Average Delay	4.4			
Intersection Capacity Utilization	60.7%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	385	31	17	672	38	13
Future Volume (Veh/h)	385	31	17	672	38	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	405	33	18	707	40	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	218					
pX, platoon unblocked						
vC, conflicting volume			438		811	219
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			438		811	219
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		87	98
cM capacity (veh/h)			1118		312	785

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	270	168	254	471	54
Volume Left	0	0	18	0	40
Volume Right	0	33	0	0	14
cSH	1700	1700	1118	1700	370
Volume to Capacity	0.16	0.10	0.02	0.28	0.15
Queue Length 95th (m)	0.0	0.0	0.3	0.0	3.5
Control Delay (s)	0.0	0.0	0.7	0.0	16.4
Lane LOS			A		C
Approach Delay (s)	0.0		0.3		16.4
Approach LOS					C

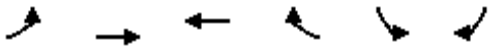
Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	382	667	10	7	22
Future Volume (Veh/h)	16	382	667	10	7	22
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	17	402	702	11	7	23
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		239				
pX, platoon unblocked						
vC, conflicting volume	713				942	356
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	713				942	356
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				97	96
cM capacity (veh/h)	883				256	640

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	151	268	468	245	30
Volume Left	17	0	0	0	7
Volume Right	0	0	0	11	23
cSH	883	1700	1700	1700	474
Volume to Capacity	0.02	0.16	0.28	0.14	0.06
Queue Length 95th (m)	0.4	0.0	0.0	0.0	1.4
Control Delay (s)	1.2	0.0	0.0	0.0	13.1
Lane LOS	A				B
Approach Delay (s)	0.4		0.0		13.1
Approach LOS					B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	33.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	409	698	12	8	13
Future Volume (Veh/h)	18	409	698	12	8	13
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	19	431	735	13	8	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		184				
pX, platoon unblocked						
vC, conflicting volume	748				995	374
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	748				995	374
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				97	98
cM capacity (veh/h)	856				236	623

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	163	287	490	258	22
Volume Left	19	0	0	0	8
Volume Right	0	0	0	13	14
cSH	856	1700	1700	1700	391
Volume to Capacity	0.02	0.17	0.29	0.15	0.06
Queue Length 95th (m)	0.5	0.0	0.0	0.0	1.2
Control Delay (s)	1.3	0.0	0.0	0.0	14.8
Lane LOS	A				B
Approach Delay (s)	0.5		0.0		14.8
Approach LOS					B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		