

TRAFFIC IMPACT STUDY

PROPOSED RESIDENTIAL SUBDIVISION

HILLSBURGH HEIGHTS INC.

5916 TRAFALGAR ROAD NORTH

HILLSBURGH URBAN AREA

TOWN OF ERIN

NOVEMBER 18TH 2021

TRAFFIC IMPACT STUDY

PROPOSED RESIDENTIAL SUBDIVISION

HILLSBURGH HEIGHTS INC.

5916 TRAFALGAR ROAD NORTH

HILLSBURGH URBAN AREA

TOWN OF ERIN

NOVEMBER 18TH 2021

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1. INTRODUCTION

CANDEVCON LIMITED was retained by Hillsburgh Heights Inc. to undertake a Traffic Impact Study in support of the Draft Plan of Subdivision and Zoning By-law Amendment Application for the proposed Residential Subdivision that is located immediately west of Trafalgar Road North and approximately two (2) kilometres north of Wellington Road 22, in the Town of Erin. **Figure 1** illustrates the location of the proposed Residential Subdivision.

As a requirement of the approval process, the Town of Erin and the County of Wellington require the preparation of a Traffic Impact Study to support the proposed Residential Subdivision and to examine the implications of the proposed Residential Subdivision on the adjacent transportation infrastructure.

It is anticipated that the proposed Residential Subdivision will be fully built-out and occupied by 2026. As a result, a full build-out 2026 horizon along with a five (5) year post build-out 2031 horizon were analyzed.

The Terms of Reference for the Study (copy included in **Appendix A**) were circulated to the County of Wellington and to the Town of Erin and the comments were received as included in **Appendix A**. The comments¹ provided on behalf of the Town requested that the TIS should also account for four other proposed developments in the Community of Hillsburgh. Since no information is available with respect to the development timing, it was assumed that they would also be fully built out by 2026. The comments provided on behalf of the Town also stipulated that 5 year and 10 year post full build out be analyzed. Since, there are too many variables associated with a 10 year build out in the context of other potential developments a 10 year build out was not analyzed.

The purpose of this Study is to determine the traffic impacts of the proposed Residential Subdivision as well as the other proposed developments on the surrounding road network.

¹ E-mail dated October 21st 2021.

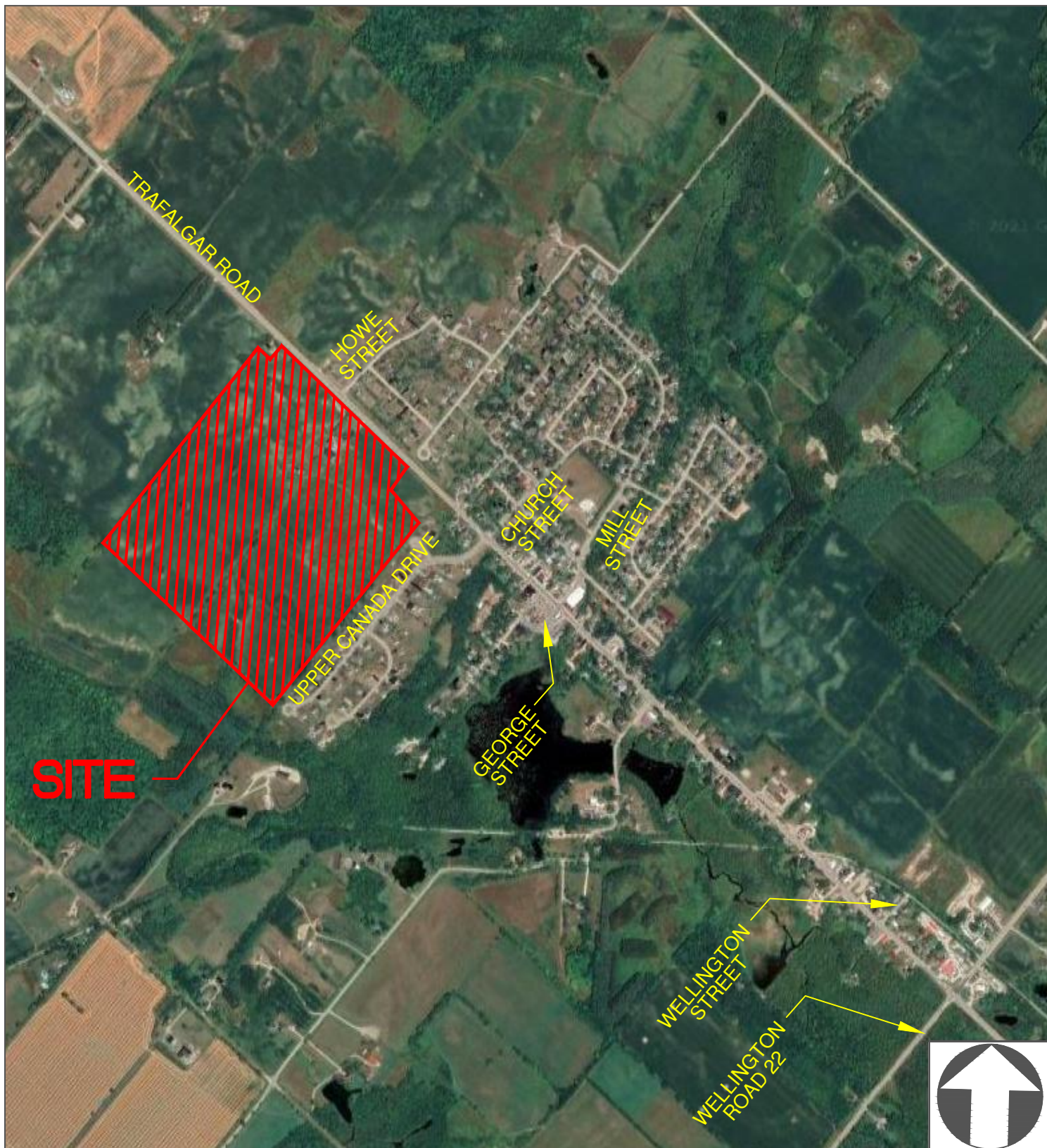
1. INTRODUCTION (CONT'D)

The Traffic Impact Study addresses the future operations at the following intersections as stipulated by the Town:

- Trafalgar Road North at Wellington Road 22,
- George Street/Mill Street at Trafalgar Road North,
- Upper Canada Drive/Church Street at Trafalgar Road North,
- Proposed Street 'A'/Howe Street at Trafalgar Road North,
- Proposed Street 'E' at Trafalgar Road North,
- Proposed Street 'A' at Proposed Street 'B'/Proposed Street 'G'.

The Trafalgar Road North at Wellington Road 22, George Street/Mill Street at Trafalgar Road North, Upper Canada Drive/Church Street at Trafalgar Road North and Howe Street at Trafalgar Road North intersections were studied under the Existing (2021), the Future (2026 & 2031) Total Background and the Future (2026 & 2031) Total Traffic scenarios. The proposed Streets 'E' and 'A' at Trafalgar Road North and proposed Street 'A' at proposed Street 'B'/proposed Street 'G' intersections were studied under the Future (2026 & 2031) Total Traffic scenarios.

The Traffic Impact Study addresses the traffic operations during the typical Weekday A.M. and Weekday P.M. Peak Hours.



TRAFFIC IMPACT STUDY
HILLSBURGH HEIGHTS INC.
PROPOSED RESIDENTIAL SUBDIVISION

5916 TRAFALGAR ROAD NORTH
PART 1 OF PLAN 61R-9590
PART OF LOT 26, CONCESSION 7
HILLSBURGH URBAN AREA
TOWN OF ERIN

LOCATION PLAN

CANDEVCON LIMITED
CONSULTING ENGINEERS AND PLANNERS
9358 GOREWAY DRIVE TEL. (905) 794-0600
BRAMPTON, ONTARIO L6P 0M7 FAX (905) 794-0611

DRAWN BY:

K.F.

PROJECT No.

W21081

CHECKED BY:

B.W.

FIGURE No.

SCALE:

N.T.S.

DATE:

OCT 22nd, 2021

1

2. SUBJECT DEVELOPMENT – STUDY AREA

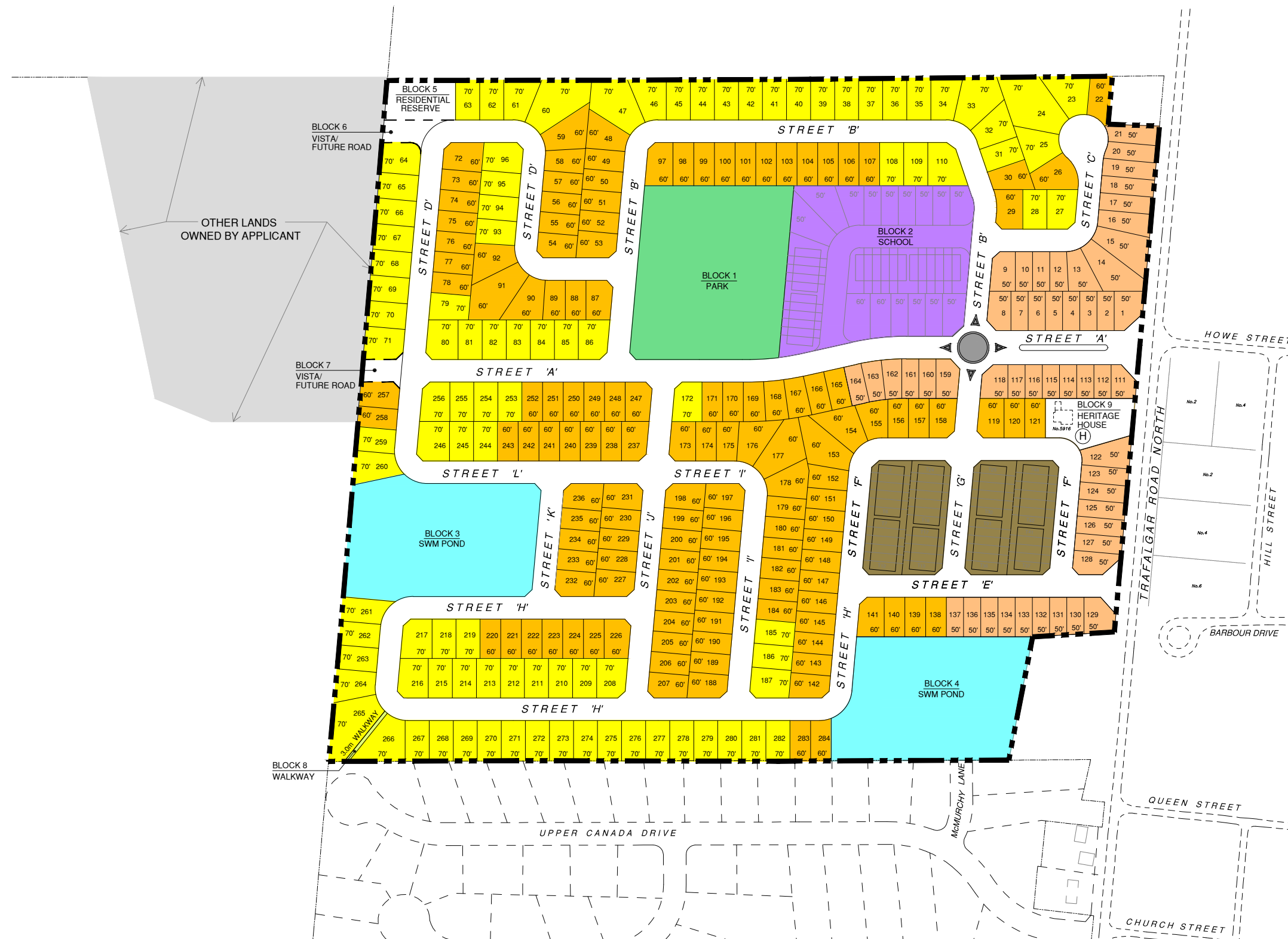
The subject property is located immediately west of Trafalgar Road North and approximately two (2) kilometres north of Wellington Road 22. The total area of the property is 99.83 acres.

The subject development is surrounded by the following land uses:

- To the north, existing agricultural with Side Road 27 beyond,
- To the east, Trafalgar Road North with existing residential beyond,
- To the south, Upper Canada Drive and existing residential,
- To the west, vacant lands owned by the applicant and vacant lands with woodlands beyond.

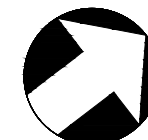
The proposed Residential Subdivision comprises 284 single detached homes, 48 townhouse units, a school block, a park and twelve (12) local roads. Vehicle access to the proposed Residential Subdivision is proposed via the proposed Streets ‘A’ and ‘E’, which connects with Trafalgar Road North. The proposed Street ‘A’ access will be a full-moves access that aligns with Howe Street to form a four-legged intersection. The proposed Street ‘E’ access will be a full-moves access that is located at the southeast corner of the Subject Property. In addition, west of the Howe Street/proposed Street ‘A’ at Trafalgar Road North intersection, proposed Streets ‘B’ and ‘G’ will align at proposed Street ‘A’; forming a four-legged roundabout intersection.

The Preliminary Development Plan is provided in **Figure 2**.



TRAFFIC IMPACT STUDY
HILLSBURGH HEIGHTS INC.
PROPOSED RESIDENTIAL SUBDIVISION
5916 TRAFALGAR ROAD NORTH
TOWN OF ERIN

PRELIMINARY DEVELOPMENT PLAN



CANDEVCON LIMITED
CONSULTING ENGINEERS AND PLANNERS
TEL. (905) 794-0600 FAX (905) 794-0611

DATE:	NOV, 10th 2021	JOB No. W21081
DESIGN:	K.F.	FIG. No.
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3. EXISTING AND FUTURE ROAD NETWORK

3.1 Existing Road Network

The road network within the Study Area is described below:

Trafalgar Road North

Trafalgar Road North is an existing Arterial Road that is under the jurisdiction of the County of Wellington. Within the Study Area, Trafalgar Road North is a two (2) lane roadway with a posted speed limit of 40 km/h. From Wellington Road 22 to approximately 200 metres south of Howe Street the roadway consists of an urban cross-section. From approximately 200 metres south of Howe Street to the north end of the Study Area (Howe Street), the roadway consists of a rural cross-section. Within the Study Area, where an urban cross-section is provided, a pedestrian sidewalk or a multi-use path is provided on at least one side of the roadway.

Wellington Road 22

Wellington Road 22 is an existing Arterial Road that is under the jurisdiction of the County of Wellington. Within the vicinity of the Study Area, Wellington Road 22 is a two (2) lane roadway with a rural cross-section. The roadway has a posted speed limit of 70 km/h east of Trafalgar Road North and a posted speed limit of 80 km/h west of Trafalgar Road North.

George Street

George Street is an existing local road that is under the jurisdiction of the Town of Erin. The local road comprises two (2) lanes with an assumed speed limit of 50 km/h and a rural cross section. George Street consists of two (2) components: an east-west roadway that connects with Trafalgar Road to the east and that terminates at a driveway of a dwelling unit to the west; and a roadway that travels in the west direction before travelling in the north direction with connections to Mill Street and Trafalgar Road North easterly and to its other component northerly.

3. EXISTING AND FUTURE ROAD NETWORK (CONT'D)

3.1 Existing Road Network (Cont'd)

Mill Street

Mill Street is an existing local road that is under the jurisdiction of the Town of Erin. The local road comprises two (2) lanes with an assumed speed limit of 50 km/h and a rural cross section. From its connection with George Street and Trafalgar Road North, the roadway travels in the east direction before travelling in the north direction to connect with Orangeville Street.

Upper Canada Drive

Upper Canada Drive is an existing east-west local road that is under the jurisdiction of the Town of Erin. The roadway connects with Trafalgar Road North and Church Street easterly and terminates in a cul-de-sac at the western end. The local road comprises two (2) lanes with an assumed speed limit of 50 km/h, an urban cross section and a pedestrian sidewalk on the south side.

Church Street

Church Street is an existing local road that is under the jurisdiction of the Town of Erin. The local road comprises two (2) lanes with an assumed speed limit of 50 km/h and a rural cross section. From its connection with Upper Canada Drive and Trafalgar Road North, the roadway travels in the east direction before travelling in the south direction to connect with Mill Street. From Trafalgar Road North to Barker Street, a pedestrian sidewalk is provided on at least one side of the roadway.

Howe Street

Howe Street is an existing local road that is under the jurisdiction of the Town of Erin. The roadway connects with Trafalgar Road North at the west end to form a T-intersection and connects with Wallace Street at the east end to form a road elbow. The local road comprises two (2) lanes with an assumed speed limit of 50 km/h and a rural cross section.

3. EXISTING AND FUTURE ROAD NETWORK (CONT'D)

3.2 Future Road Network

By the 2031 horizon year, it is not anticipated that Trafalgar Road North, Wellington Road 22, George Street, Mill Street, Upper Canada Drive, Church Street, and Howe Street will be widened. However, by the 2026 horizon year, it is anticipated that two (2) collector roads will be constructed within the vicinity of the Study Area². A collector road (proposed West Collector Road) will connect with Wellington Road 22 at approximately 500 metres west of Trafalgar Road North. From Wellington Road 22, the collector road will travel in the north direction before travelling in the north-east direction to connect with Station Street. The east end of Station Street that connects with Trafalgar Road North will be upgraded to a collector road to form part of the proposed roadway. The second collector road (proposed East Collector Road) that is anticipated will connect with Wellington Road 22 at approximately 350 metres east of Trafalgar Road North. From Wellington Road 22, the collector road will travel in the north direction before travelling in the west direction to connect with Trafalgar Road North. The connection with Trafalgar Road North will be immediately south of the existing Station Street at Trafalgar Road North intersection. The proposed collector roads are illustrated in **Figure 5**.

The proposed Hillsburgh Heights Residential Subdivision comprises twelve (12) local roads with a full-moves access (proposed Street “A”) that connects with Trafalgar Road North and Howe Street and a full-moves access (proposed Street “E”) that connects with Trafalgar Road North. In addition, west of the Howe Street/proposed Street ‘A’ at Trafalgar Road North intersection, proposed Streets ‘B’ and ‘G’ will align at proposed Street ‘A’; forming a four-legged roundabout intersection.

² Town of Erin’s Official Plan – Office Consolidation, Town of Erin, October 2021.

4. EXISTING TRAFFIC CONDITIONS

4.1 Existing Traffic

The Existing (2021) traffic volumes for the concerned intersections are based on the turning movement counts taken by Ontario Traffic Inc. (OTI) on Thursday October 28, 2021. (See **Appendix B**) To capture the Weekday A.M. and P.M. Peak Hours, counts were taken from 7:00 A.M. to 10:00 A.M. and from 3:00 P.M. to 6:00 P.M.

For the intersection of Trafalgar Road North at Wellington Road 22, the A.M. and P.M. Peak Hour traffic volumes occurred between 7:30 A.M. and 8:30 A.M. and between 4:15 P.M. and 5:15 P.M., respectively.

For the intersection of George Street/Mill Street at Trafalgar Road North, the A.M. and P.M. Peak Hour traffic volumes occurred between 7:15 A.M. and 8:15 A.M. and between 3:45 P.M. and 4:45 P.M., respectively.

For the intersection of Upper Canada Drive/Church Street at Trafalgar Road North, the A.M. and P.M. Peak Hour traffic volumes occurred between 7:15 A.M. and 8:15 A.M. and between 3:45 P.M. and 4:45 P.M., respectively.

For the intersection of Howe Street at Trafalgar Road North, the A.M. and P.M. Peak Hour traffic volumes occurred between 8:00 A.M. and 9:00 A.M. and between 3:45 P.M. and 4:45 P.M., respectively.

The turning movement counts were conducted during the Covid-19 pandemic. Although all of the services were open and most of the capacity restrictions were lifted when these counts were taken, some offices were still not operating at full capacity and the traffic volumes are anticipated to be less than typical. Based on this assumption, a pandemic projection factor of 20% was used conservatively to project the traffic volumes to typical conditions. To determine the Existing (2021) Traffic Volumes, the projection factor was applied to all of the turning movements.

The Existing (2021) Traffic Volumes are illustrated in **Figures 3 and 4**

Existing (2021) Traffic Volumes - A.M. Peak Hour

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Hillsburgh Heights Inc.

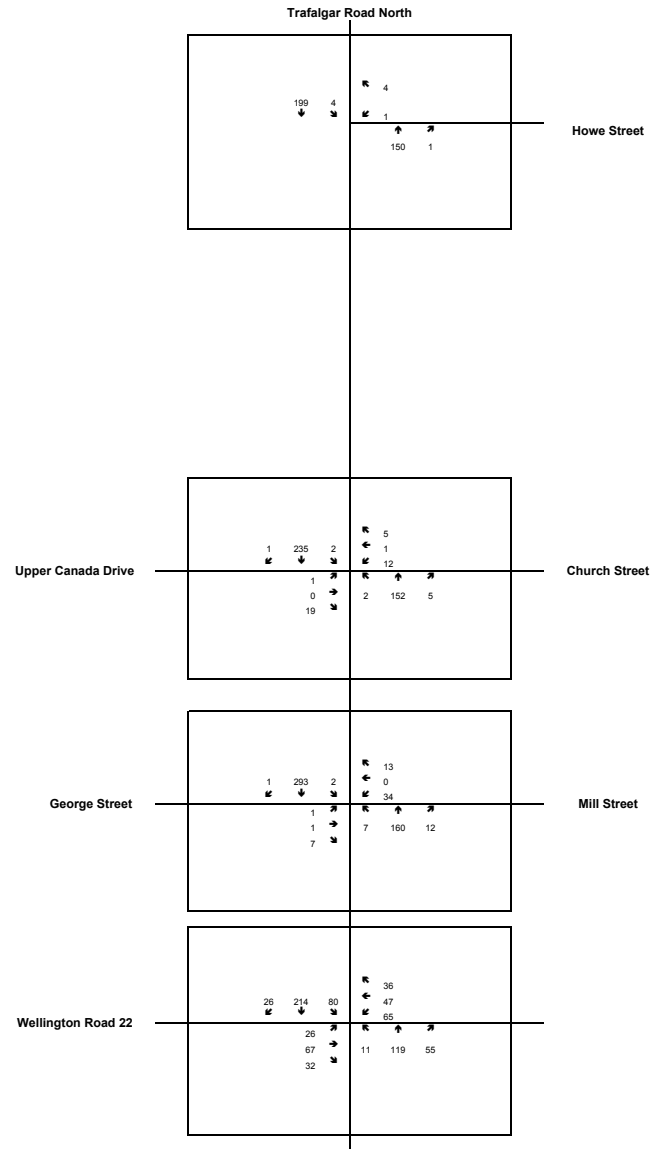


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Date:

November 9 2021

Prepared by:

B.W.



Existing (2021) Traffic Volumes - P.M. Peak Hour

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Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

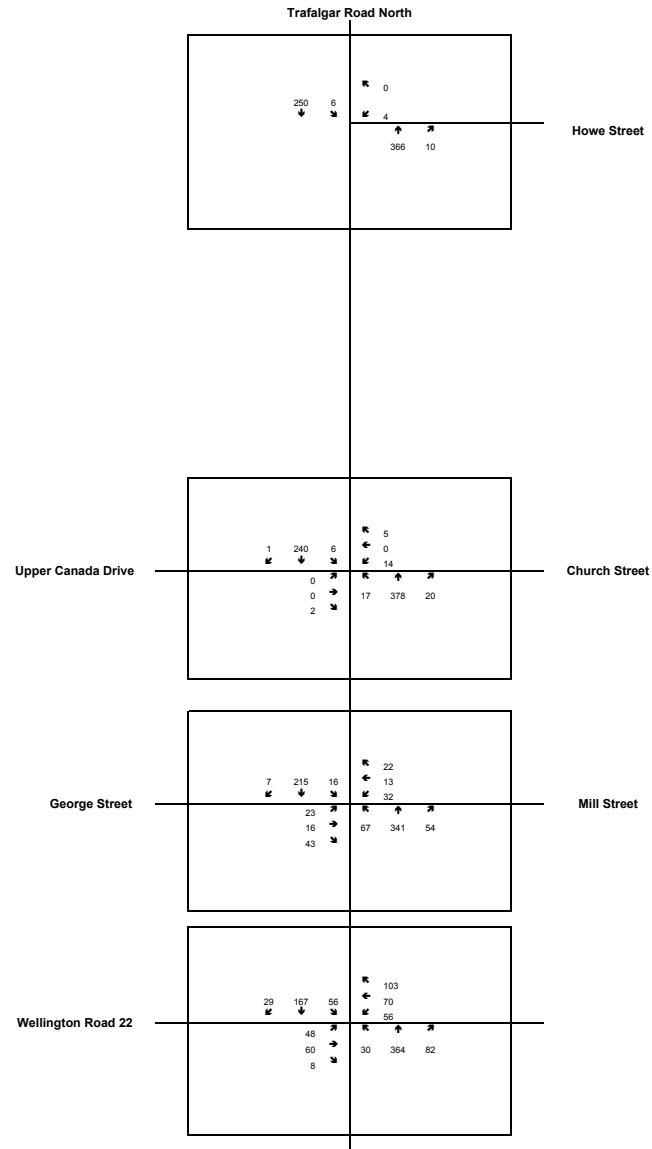


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Date: November 9 2021
Prepared by: B.W.



4. EXISTING TRAFFIC CONDITIONS (CONT'D)

4.2 Existing Traffic Analysis

The Existing (2021) peak hour traffic volumes are provided in **Figures 3 and 4** and the Level of Service (LOS) was analyzed using SYNCHRO 9.0 software³.

Trafalgar Road North at Wellington Road 22 was analyzed as a semi-actuated signalized intersection with Trafalgar Road North as the main street. The lane configuration used in the analysis comprises a left and a shared through-right turning lane at the northbound and southbound approaches; and a shared left-through-right turning lane at the eastbound and westbound approaches. The signal timing plans were received from the County of Wellington and are included in **Appendix C**.

George Street/Mill Street at Trafalgar Road North was analyzed as an un-signalized intersection with stop-controls at the eastbound and westbound approaches. The lane configuration used in the analysis comprises a shared left-through-right turning lane at all approaches.

Upper Canada Drive/Church Street at Trafalgar Road North was analyzed as an un-signalized intersection with stop-controls at the eastbound and westbound approaches. The lane configuration used in the analysis comprises a shared left-through-right turning lane at all approaches.

Howe Street at Trafalgar Road North was analyzed as an un-signalized intersection with a stop-control at the westbound approach. The lane configuration used in the analysis comprises a through and a right turning lane at the northbound approach; a shared left-right turning lane at the westbound approach; and a shared through-left turning lane at the southbound approach.

³ Synchro 9 Traffic Signal Optimization and Simulation Modeling Software, Version 9, Trafficware Corporation, 2014.

4. EXISTING TRAFFIC CONDITIONS (CONT'D)

4.2 Existing Traffic Analysis (Cont'd)

The results of the analysis are summarized in **Table 1**. The related calculations are provided in **Appendix E**. The LOS definitions for signalized and un-signalized intersections are included in **Appendix D** for reference.

4. EXISTING TRAFFIC CONDITIONS (CONT'D)

4.2 Existing Traffic Analysis (Cont'd)

Table 1: Existing (2021) Traffic – Level of Service

Intersection	Turning Movement	A.M. Peak Hour				P.M. Peak Hour			
		V/C	LOS	Delay ¹	95th Queue (m)	V/C	LOS	Delay ¹	95th Queue (m)
Trafalgar Road North at Wellington Road 22 (Signalized)	Overall	0.52	B	13.9	n/a	0.60	B	15.2	n/a
	EB Approach	0.37	B	20.0	25.5	0.37	C	23.2	26.9
	WB Approach	0.52	C	25.2	31.9	0.60	C	23.2	42.9
	NBL	0.02	A	8.5	3.3	0.06	A	9.1	6.8
	NBT	0.23	A	7.9	22.2	0.51	B	12.6	70.6
	NBR	0.23	A	7.9	22.2	0.51	B	12.6	70.6
	SBL	0.17	A	9.7	14.1	0.15	B	10.2	11.6
	SBT	0.30	A	9.9	34.5	0.22	A	9.1	27.8
	SBR	0.30	A	9.9	34.5	0.22	A	9.1	27.8
Trafalgar Road North at Howe Street (Un-signalized)	Overall	0.09	A	0.2	n/a	0.24	A	0.2	n/a
	WB Approach	0.01	A	9.8	0.2	0.01	B	13.8	0.2
	NB Approach	0.09	A	0.0	0.0	0.24	A	0.0	0.0
	SB Approach	0.00	A	0.2	0.1	0.01	A	0.3	0.1
Trafalgar Road North at George Street/Mill Street (Un-signalized)	Overall	0.10	A	1.5	n/a	0.23	A	4.3	n/a
	EB Approach	0.02	B	10.9	0.4	0.22	C	16.5	6.5
	WB Approach	0.10	B	12.8	2.6	0.23	C	20.3	7.1
	NB Approach	0.01	A	0.4	0.2	0.05	A	1.6	1.4
	SB Approach	0.00	A	0.1	0.0	0.01	A	0.7	0.4
Trafalgar Road North at Upper Canada Drive/Church Street (Un-signalized)	Overall	0.04	A	1.0	n/a	0.05	A	0.8	n/a
	EB Approach	0.03	B	10.1	0.8	0.00	A	9.6	0.1
	WB Approach	0.04	B	12.3	1.1	0.05	B	14.8	1.2
	NB Approach	0.00	A	0.1	0.0	0.01	A	0.5	0.3
	SB Approach	0.00	A	0.1	0.0	0.01	A	0.2	0.1

Note 1: Delays are measured in seconds per vehicle.

Note 2: Signalized intersections are based on existing signal timing plans.

4. EXISTING TRAFFIC CONDITIONS (CONT'D)

4.2 Existing Traffic Analysis (Cont'd)

Trafalgar Road North at Wellington Road 22

The analysis of the Existing (2021) Traffic Conditions indicates that the signalized intersection operates at a Level of Service “B” during the A.M. and P.M. Peak Hours.

During the A.M. and P.M. Peak Hours, all of the turning movements operate at a Level of Service “C” or better.

Trafalgar Road North at Howe Street

The analysis of the Existing (2021) Traffic Conditions indicates that the un-signalized intersection operates at a Level of Service “A” during the A.M. and P.M. Peak Hours.

All of the turning movements operate at a Level of Service “A” during the A.M. Peak Hour and at a Level of Service “B” or better during the P.M. Peak Hour.

Trafalgar Road North at George Street/Mill Street

The analysis of the Existing (2021) Traffic Conditions indicates that the un-signalized intersection operates at a Level of Service “A” during the A.M. and P.M. Peak Hours.

All of the turning movements operate at a Level of Service “B” or better during the A.M. Peak Hour and at a Level of Service “C” or better during the P.M. Peak Hour.

4. EXISTING TRAFFIC CONDITIONS (CONT'D)

4.2 Existing Traffic Analysis (Cont'd)

Trafalgar Road North at George Street/Mill Street

The analysis of the Existing (2021) Traffic Conditions indicates that the un-signalized intersection operates at a Level of Service “A” during the A.M. and P.M. Peak Hours.

All of the turning movements operate at a Level of Service “B” or better during the A.M. and P.M. Peak Hours.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS

5.1 Other Background Traffic

As noted in Section 1 the Study will consider the site-generated trips from four (4) anticipated developments within the vicinity of Subject Development that were confirmed with the Town of Erin.

An anticipated development owned by Carson Reid Homes Ltd is located immediately south of Station Street and approximately 300 metres west of Trafalgar Road North. The anticipated development will be serviced by the proposed West Collector Road and will comprise of 182 single detached homes.

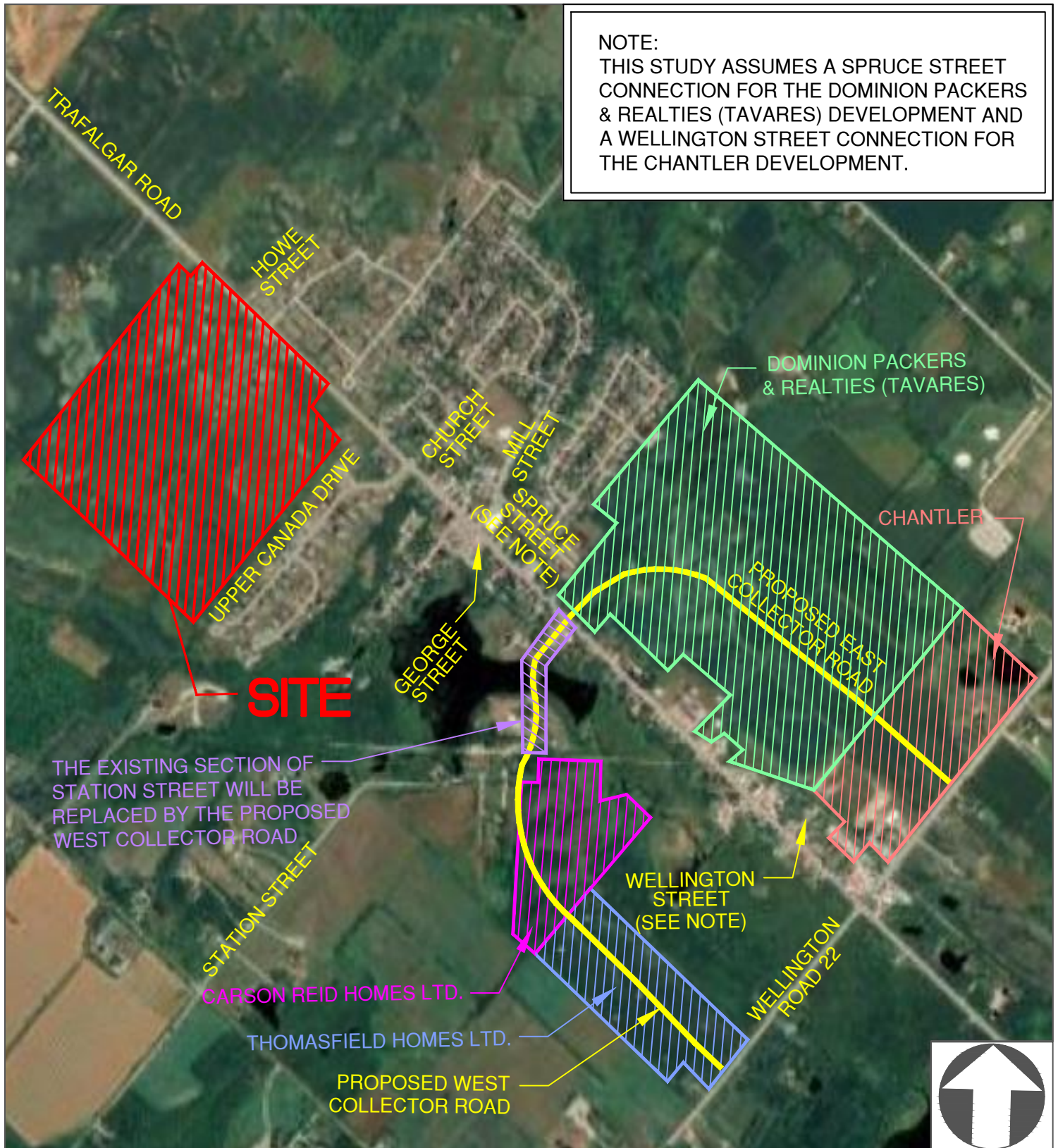
An anticipated development owned by Thomasfield Homes Ltd is located immediately north of Wellington Road 22 and approximately 450 metres west of Trafalgar Road North. The anticipated development will be serviced by the proposed West Collector Road and will comprise of 210 single detached homes.

An anticipated development owned by Dominion Packers & Realities (Tavares) that comprises 700 single detached homes is located immediately south of Douglas Crescent and east of Trafalgar Road North. It is assumed that the anticipated development will be serviced by the proposed East Collector Road and the Spruce Street roadway, which is connected to Mill Street.

An anticipated development owned by Chantler that comprises 213 single detached homes is located immediately north of Wellington Road 22 and approximately 350 metres east of Trafalgar Road North. It is assumed that the anticipated development will be serviced by the proposed East Collector Road and Wellington Street, which comprises a westerly connection with Trafalgar Road North.

The locations of the anticipated developments and the future road network are illustrated in **Figure 5**.

NOTE:
THIS STUDY ASSUMES A SPRUCE STREET
CONNECTION FOR THE DOMINION PACKERS
& REALTIES (TAVARES) DEVELOPMENT AND
A WELLINGTON STREET CONNECTION FOR
THE CHANTLER DEVELOPMENT.



TRAFFIC IMPACT STUDY

HILLSBURGH HEIGHTS INC.
PROPOSED RESIDENTIAL SUBDIVISION

5916 TRAFALGAR ROAD NORTH
PART 1 OF PLAN 61R-9590
PART OF LOT 26, CONCESSION 7
HILLSBURGH URBAN AREA
TOWN OF ERIN

THE FUTURE ROAD NETWORK AND THE LOCATION OF ANTICIPATED DEVELOPMENTS

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NOV 10th, 2021

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.1.1. Other Background Traffic - Carson Reid Homes Ltd

For the single detached homes (Land Use 210) within the anticipated development, the trip generation formulae from the ITE Trip Generation Manual were applied for the A.M. and P.M. Peak Hours⁴.

Table 2 summarizes the trip generation formulae along with the percentages of incoming and outgoing trips for the A.M. and P.M. Peak Hours.

**Table 2: Trip Generation Formulae with Inbound and Outbound Percentages
– Anticipated Developments**

ITE Land Use	A.M. Peak Hour			P.M. Peak Hour		
	Fitted Curve Equation	% In	% Out	Fitted Curve Equation	% In	% Out
Single-Family Detached Housing (LU 210)	$T = 0.71X + 4.80$ (Note 1)	25%	75%	$\ln(T) = 0.96 \ln(X) + 0.20$ (Note 1)	63%	37%

Note 1: T represents the total number of trips and X represents the number of dwelling units.

The resulting number of trips generated was determined by the trip generation formulae in **Table 2** and the number of dwelling units. The anticipated development comprises 182 single detached homes.

The resulting number of trips generated is provided in **Table 3** for the A.M. and P.M. Peak Hours of adjacent street traffic.

⁴ Trip Generation Manual, 10th Edition, Institute of Transportation Engineers, 2017.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.1.1. Other Background Traffic - Carson Reid Homes Ltd (Cont'd)

Table 3: Site-Generated Trips - Carson Reid Homes Ltd

ITE Land Use	No. of dwelling units	A.M. Peak Hour			P.M. Peak Hour		
		Trips In	Trips Out	Total	Trips In	Trips Out	Total
Single-Family Detached Housing (LU 210)	182	34	100	134	114	67	181

The anticipated development is expected to generate a total of 134 trips during the A.M. Peak Hour (34 inbound trips and 100 outbound trips) and 181 trips during the P.M. Peak Hour (114 inbound trips and 67 outbound trips).

For the site-generated trips from the anticipated development, the 2016 Transportation Tomorrow Survey and the future road network was utilized for the assumed trip distribution and trip assignment. The Transportation Tomorrow Survey database query that was used to determine the trip distribution is provided in **Appendix F**.

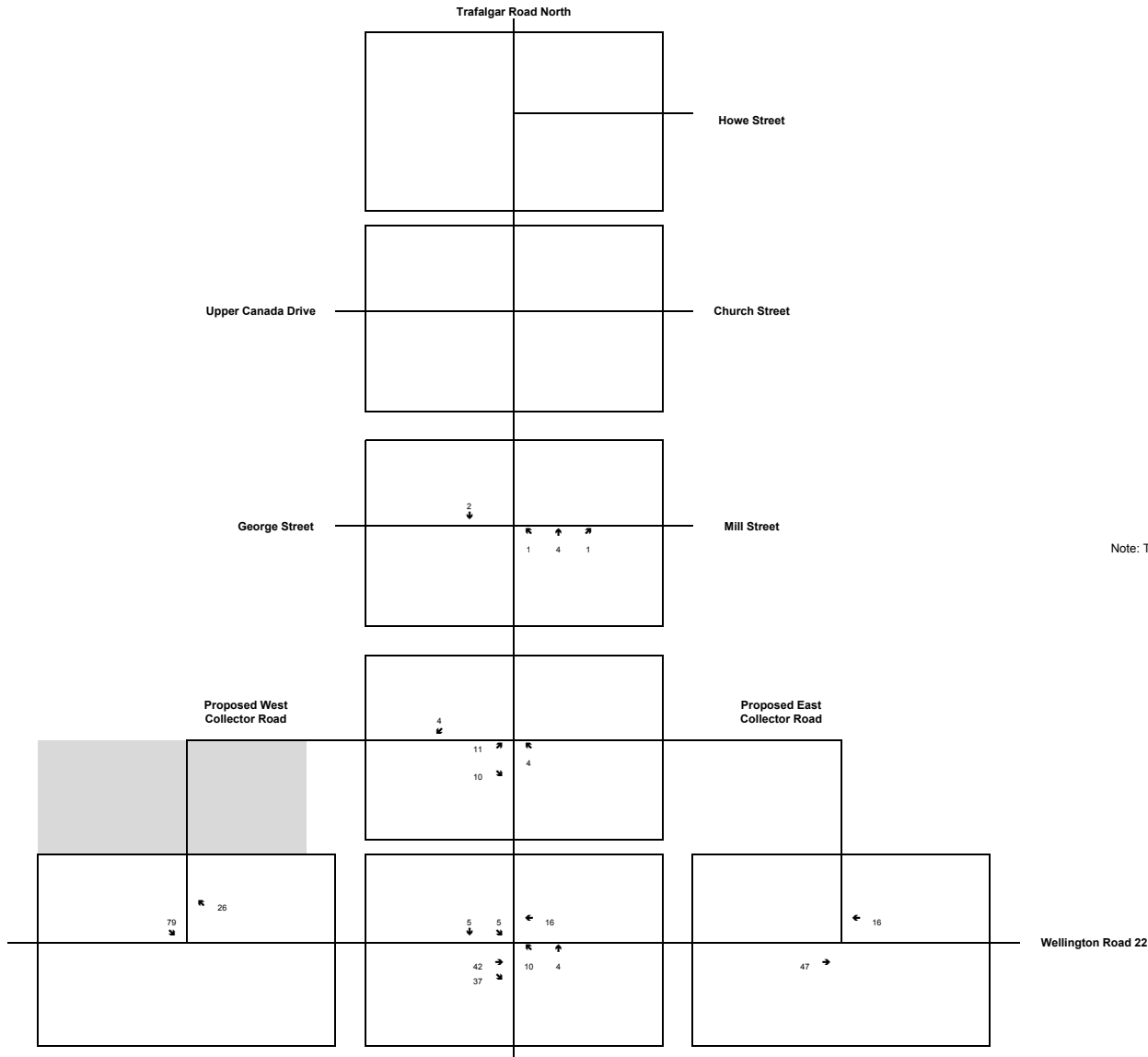
The assumed trip distribution and assignment will be as follows:

- 11% (11%) to/from the north and within the Study Area via Trafalgar Road North,
- 47% (47%) to/from the east via Wellington Road 22,
- 42% (42%) to/from the south via Trafalgar Road North.

The site-generated trip volumes and trip assignment used in the analysis for the anticipated development are illustrated in **Figures 6 and 7**.

Trip Assignment of Anticipated Development (Carson Reid Homes Ltd)
A.M. Peak Hour

W21081
 Proposed Residential Subdivision
 Town of Erin
 Hillsburgh Heights Inc.



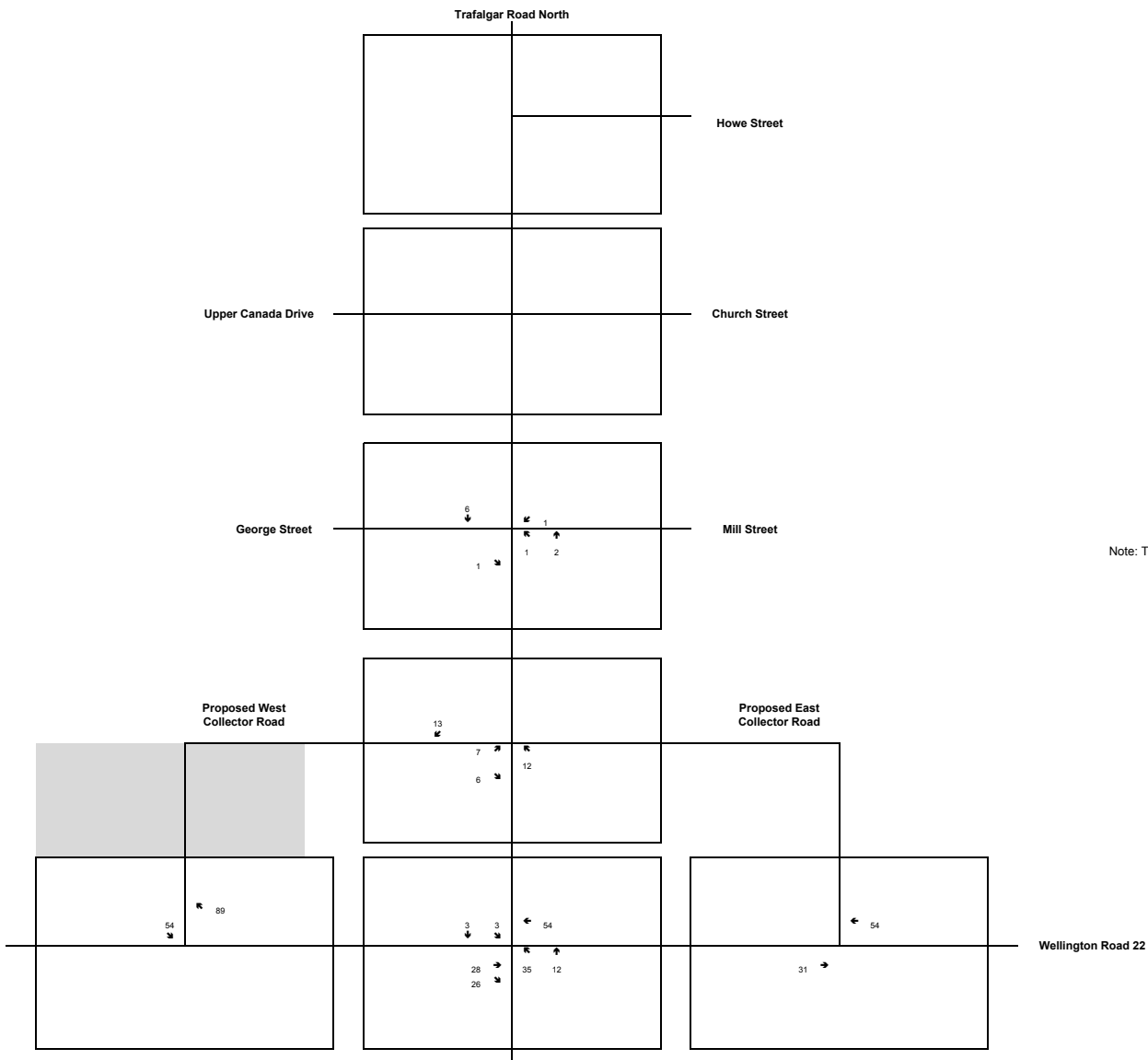
Note: The Location of the Anticipated Background Development is Shaded in Grey.

Figure No: 6
 Date: November 17 2021
 Prepared by: B.W.



Trip Assignment of Anticipated Development (Carson Reid Homes Ltd)
P.M. Peak Hour

W21081
 Proposed Residential Subdivision
 Town of Erin
 Hillsburgh Heights Inc.



Note: The Location of the Anticipated Background Development is Shaded in Grey.

Figure No: 7
 Date: November 17 2021
 Prepared by: B.W.



5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.1.2. Other Background Traffic - Thomasfield Homes Ltd

The resulting number of trips generated was determined by the trip generation formulae in **Table 2** and the number of dwelling units. The anticipated development comprises 210 single detached homes.

The resulting number of trips generated is provided in **Table 4** for the A.M. and P.M. Peak Hours of adjacent street traffic.

Table 4: Site-Generated Trips - Thomasfield Homes Ltd

ITE Land Use	No. of dwelling units	A.M. Peak Hour			P.M. Peak Hour		
		Trips In	Trips Out	Total	Trips In	Trips Out	Total
Single-Family Detached Housing (LU 210)	210	39	115	154	130	77	207

The anticipated development is expected to generate a total of 154 trips during the A.M. Peak Hour (39 inbound trips and 115 outbound trips) and 207 trips during the P.M. Peak Hour (130 inbound trips and 77 outbound trips).

For the site-generated trips from the anticipated development, the 2016 Transportation Tomorrow Survey and the future road network was utilized for the assumed trip distribution and trip assignment.

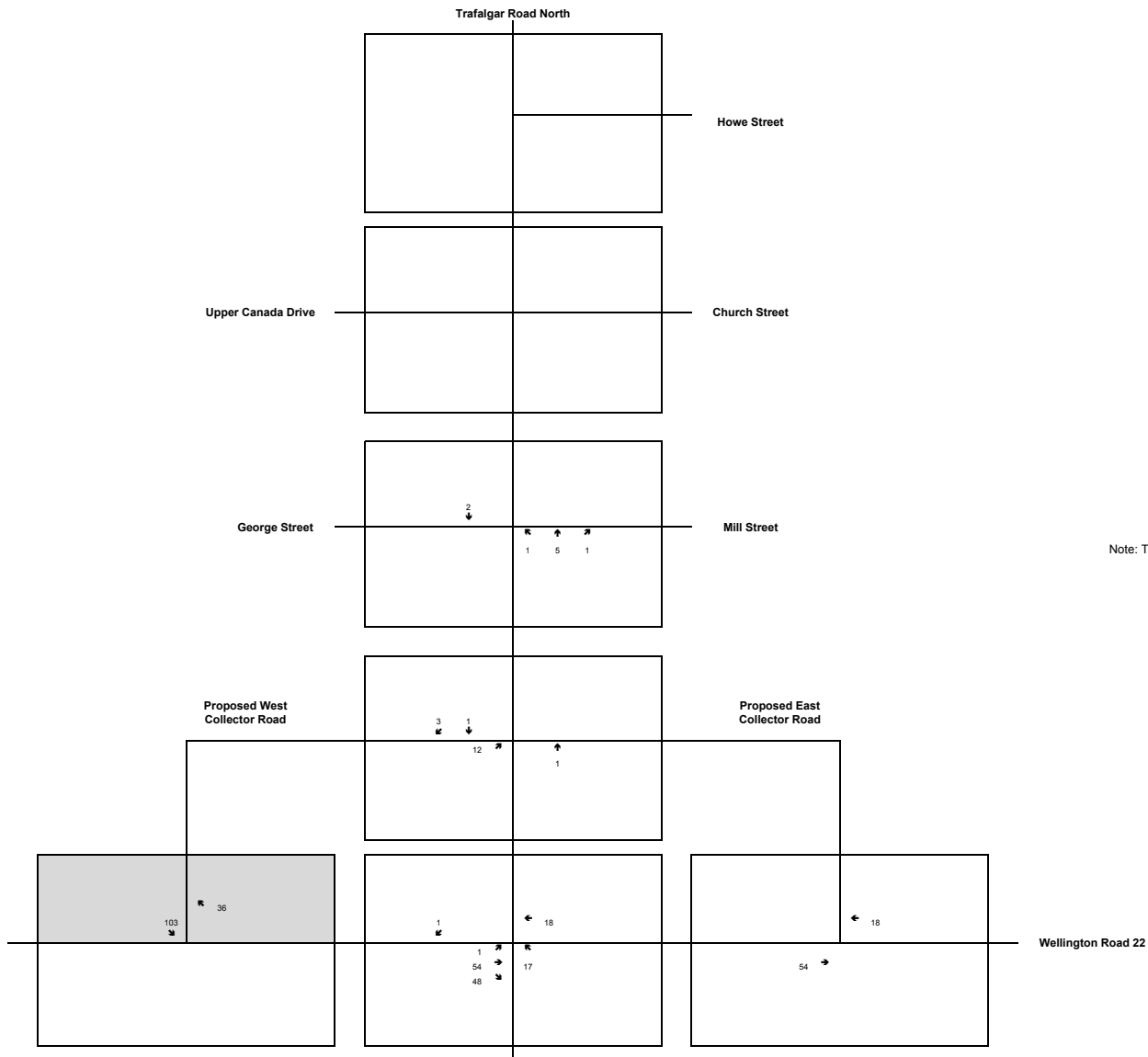
The assumed trip distribution and assignment will be as follows:

- 11% (11%) to/from the north and within the Study Area via Trafalgar Road North,
- 47% (47%) to/from the east via Wellington Road 22,
- 42% (42%) to/from the south via Trafalgar Road North.

The site-generated trip volumes and trip assignment used in the analysis for the anticipated development are illustrated in **Figures 8 and 9**.

Trip Assignment of Anticipated Development (Thomasfield Homes Ltd)
A.M. Peak Hour

W21081
 Proposed Residential Subdivision
 Town of Erin
 Hillsburgh Heights Inc.



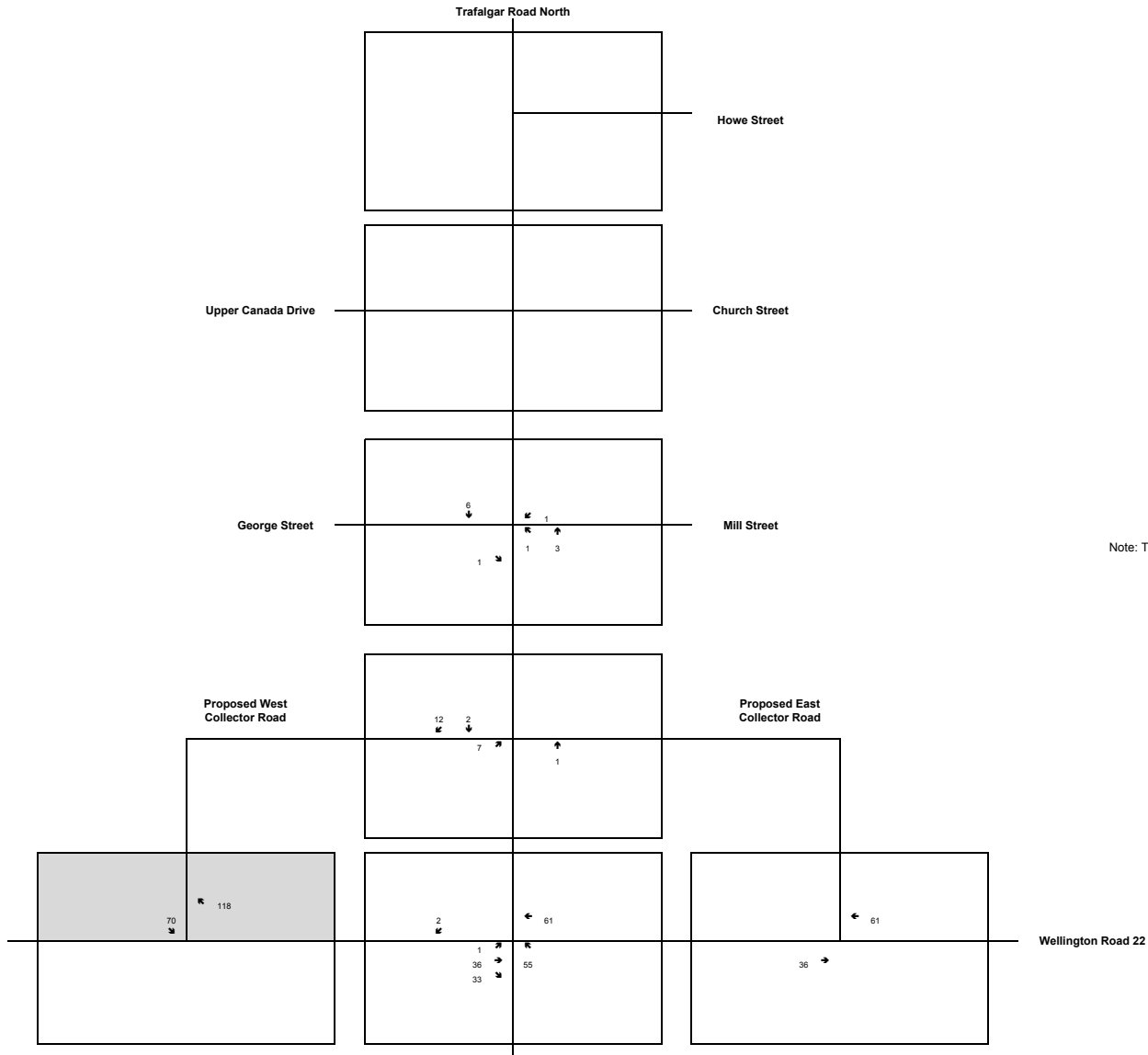
Note: The Location of the Anticipated Background Development is Shaded in Grey.

Figure No: 8
 Date: November 17 2021
 Prepared by: B.W.



**Trip Assignment of Anticipated Development (Thomasfield Homes Ltd)
P.M. Peak Hour**

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.



Note: The Location of the Anticipated Background Development is Shaded in Grey.

Figure No: 9
Date: November 17 2021
Prepared by: B.W.



5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.1.3. Other Background Traffic - Dominion Packers & Realities (Tavares)

The resulting number of trips generated was determined by the trip generation formulae in **Table 2** and the number of dwelling units. The anticipated development comprises 700 single detached homes.

The resulting number of trips generated is provided in **Table 5** for the A.M. and P.M. Peak Hours of adjacent street traffic.

Table 5: Site-Generated Trips - Dominion Packers & Realities (Tavares)

ITE Land Use	No. of dwelling units	A.M. Peak Hour			P.M. Peak Hour		
		Trips In	Trips Out	Total	Trips In	Trips Out	Total
Single-Family Detached Housing (LU 210)	700	126	376	502	415	243	658

The anticipated development is expected to generate a total of 502 trips during the A.M. Peak Hour (126 inbound trips and 376 outbound trips) and 658 trips during the P.M. Peak Hour (415 inbound trips and 243 outbound trips).

For the site-generated trips from the anticipated development, the 2016 Transportation Tomorrow Survey and the future road network was utilized for the assumed trip distribution and trip assignment.

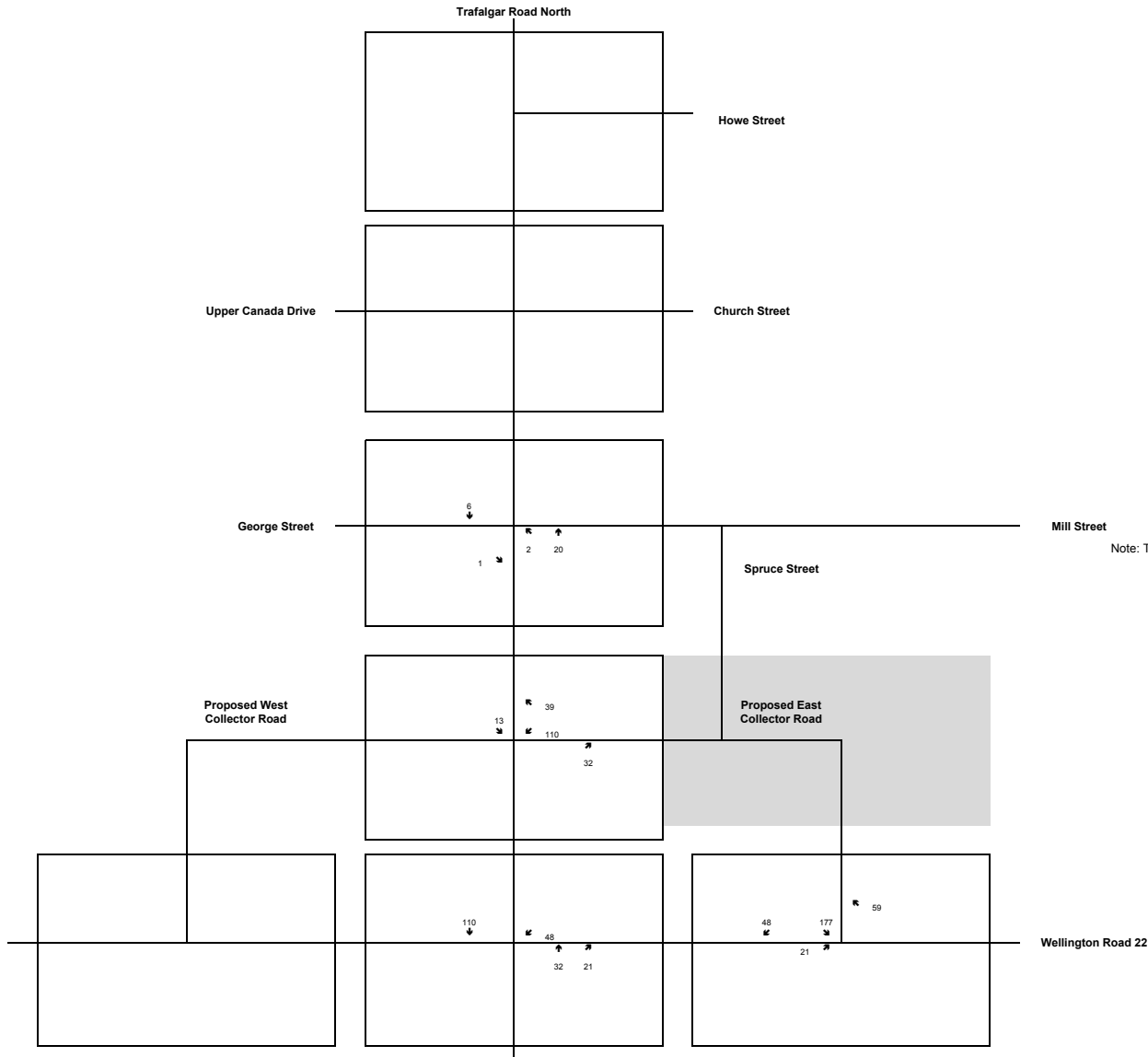
The assumed trip distribution and assignment will be as follows:

- 11% (11%) to/from the north and within the Study Area via Trafalgar Road North,
- 47% (47%) to/from the east via Wellington Road 22,
- 42% (42%) to/from the south via Trafalgar Road North.

The site-generated trip volumes and trip assignment used in the analysis for the anticipated development are illustrated in **Figures 10 and 11**.

**Trip Assignment of Anticipated Development
(Dominion Packers & Realities (Tavares))
A.M. Peak Hour**

**W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.**



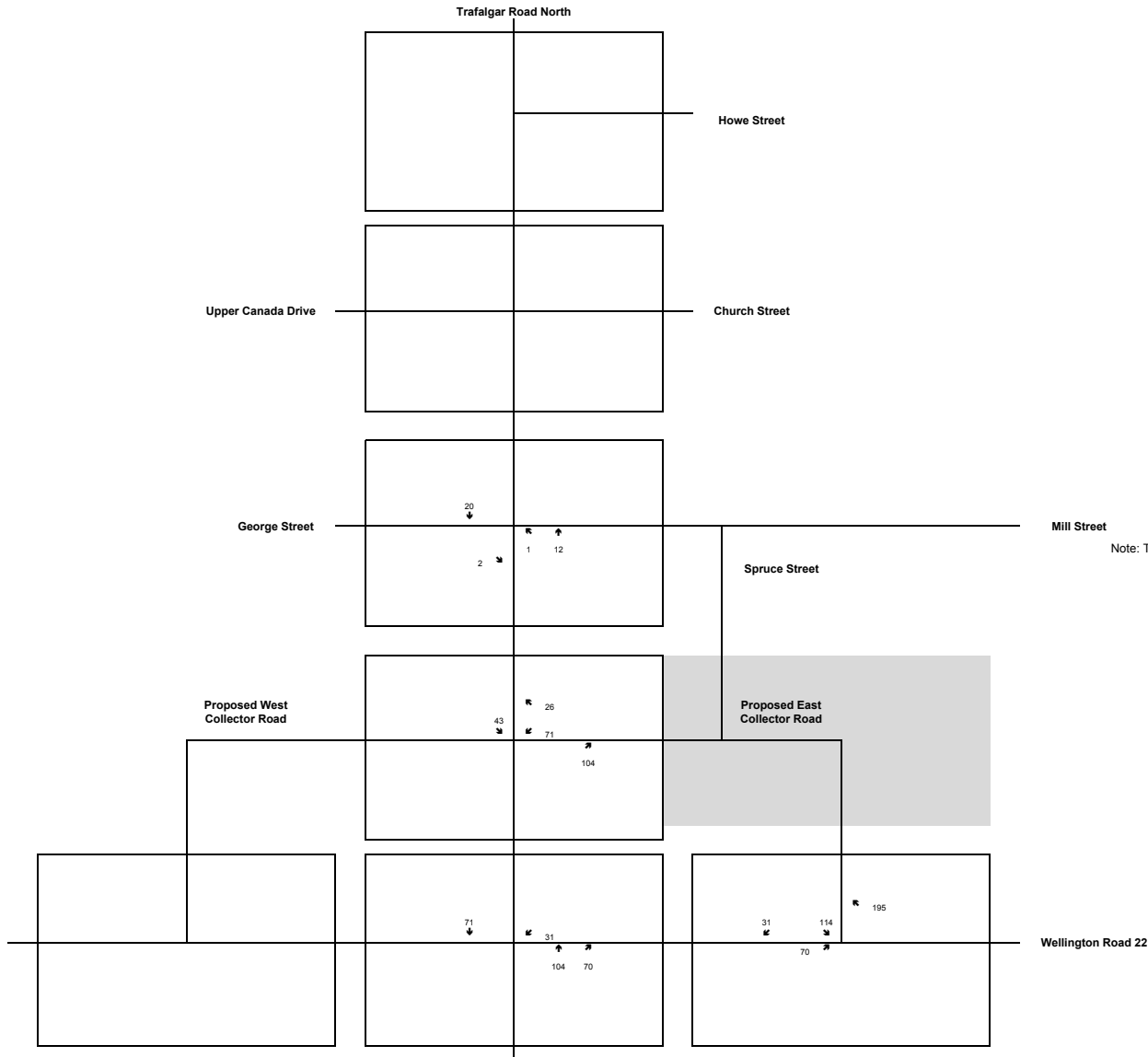
Note: The Location of the Anticipated Background Development is Shaded in Grey.

Figure No: 10
Date: November 17 2021
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**Trip Assignment of Anticipated Development
(Dominion Packers & Realities (Tavares))
P.M. Peak Hour**

**W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.**



Note: The Location of the Anticipated Background Development is Shaded in Grey.

Figure No: 11
Date: November 17 2021
Prepared by: B.W.



5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.1.4. Other Background Traffic - Chantler

The resulting number of trips generated was determined by the trip generation formulae in **Table 2** and the number of dwelling units. The anticipated development comprises 213 single detached homes.

The resulting number of trips generated is provided in **Table 6** for the A.M. and P.M. Peak Hours of adjacent street traffic.

Table 6: Site-Generated Trips - Chantler

ITE Land Use	No. of dwelling units	A.M. Peak Hour			P.M. Peak Hour		
		Trips In	Trips Out	Total	Trips In	Trips Out	Total
Single-Family Detached Housing (LU 210)	213	39	117	156	132	78	210

The anticipated development is expected to generate a total of 156 trips during the A.M. Peak Hour (39 inbound trips and 117 outbound trips) and 210 trips during the P.M. Peak Hour (132 inbound trips and 78 outbound trips).

For the site-generated trips from the anticipated development, the 2016 Transportation Tomorrow Survey and the future road network was utilized for the assumed trip distribution and trip assignment.

The assumed trip distribution and assignment will be as follows:

- 11% (11%) to/from the north and within the Study Area via Trafalgar Road North,
- 47% (47%) to/from the east via Wellington Road 22,
- 42% (42%) to/from the south via Trafalgar Road North.

The site-generated trip volumes and trip assignment used in the analysis for the anticipated development are illustrated in **Figures 12 and 13**.

Trip Assignment of Anticipated Development (Chantler)
A.M. Peak Hour

W21061
 Proposed Residential Subdivision
 Town of Erin
 Hillsburgh Heights Inc.

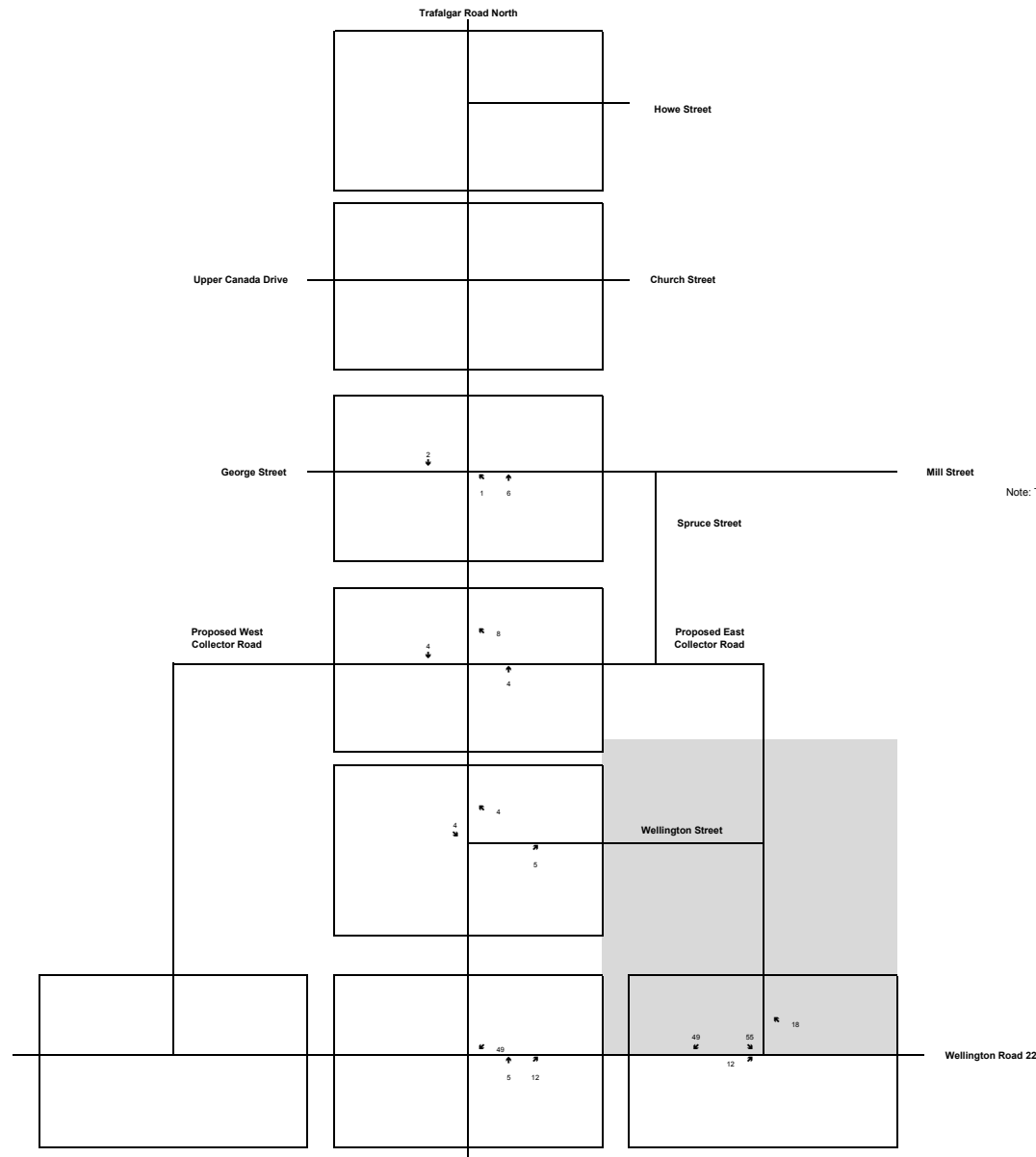


Figure No: 12

Date: November 17 2021

Prepared by: B.W.



Trip Assignment of Anticipated Development (Chantler)
P.M. Peak Hour

W21081
 Proposed Residential Subdivision
 Town of Erin
 Hillsburgh Heights Inc.

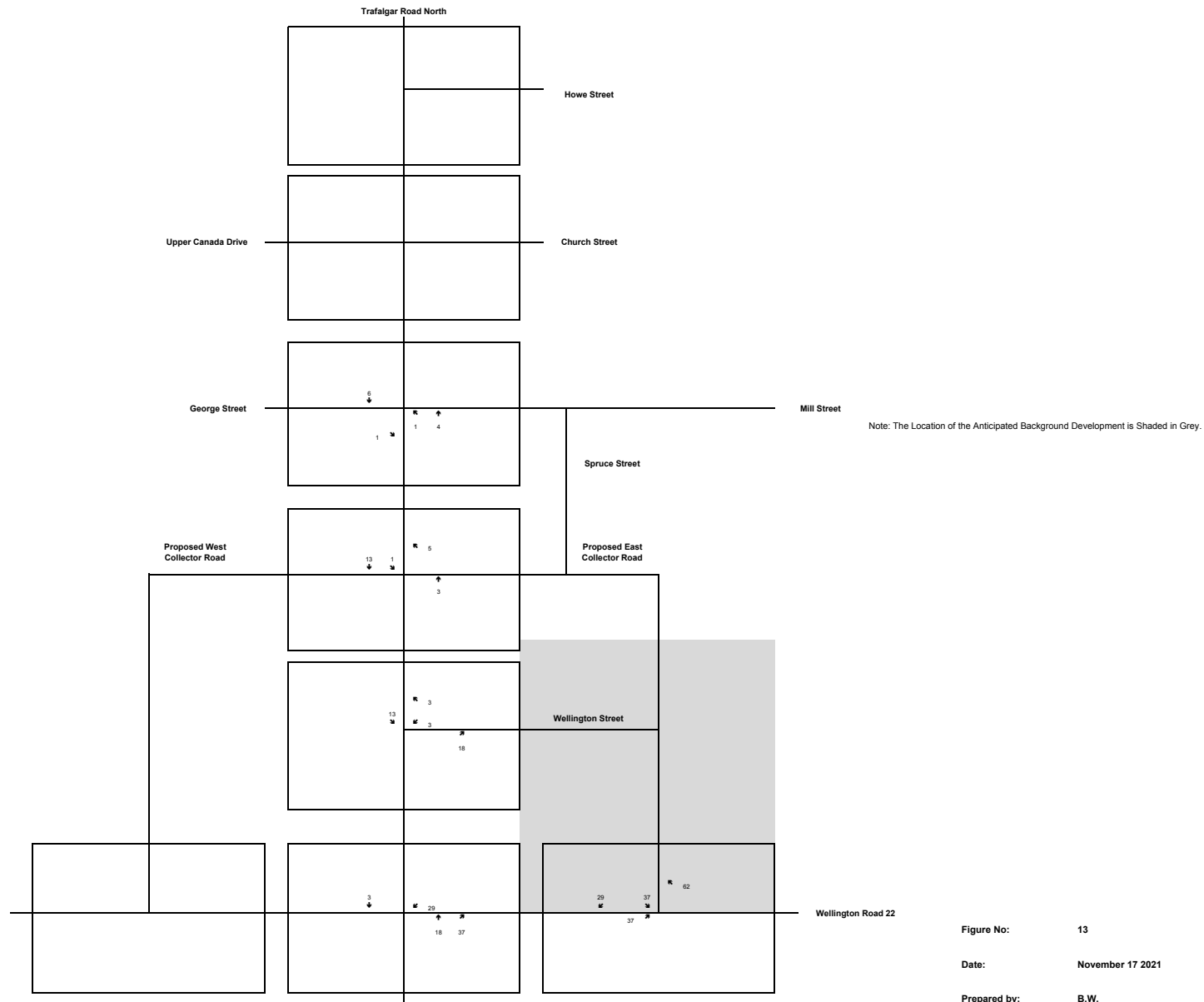


Figure No: 13
 Date: November 17 2021
 Prepared by: B.W.



5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.2 Traffic Growth Rate

The traffic growth rates for Trafalgar Road North and Wellington Road 22 were obtained from the County of Wellington. An annual growth rate of 2% was considered for these roadways from 2021 to 2031.

For the George Street/Mill Street at Trafalgar Road North, Upper Canada Drive/Church Street at Trafalgar Road North and Howe Street at Trafalgar Road North intersections, traffic growth was applied to the through movements on Trafalgar Road North. For the intersection of Trafalgar Road North at Wellington Road 22, an annual growth rate of 2% was applied to all of the turning movements.

5.3 Future (2026) Total Background Traffic

The Future (2026) Total Background Traffic is based on the Existing (2021) Traffic volumes projected with traffic growth for five (5) years for Trafalgar Road North and Wellington Road 22 plus the site-generated trips from the anticipated developments. The site-generated trip volumes used in the analysis for the anticipated developments are illustrated in **Figures 14 and 15**.

The Future (2026) Total Background Traffic Volumes are illustrated in **Figures 16 and 17** for the A.M. and P.M. Peak Hours.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.4 Future (2026) Total Background Traffic Analysis

For the Future (2026) Total Background Traffic Volumes, the LOS was analyzed using SYNCHRO 9.0 software.

The signal timing plans and the lane configurations used in the Existing (2021) Traffic Analysis are used in the Future (2026) Total Background Traffic Analysis.

The results of the analysis are summarized in **Table 7**. The related calculations are provided in **Appendix E**.

**Trip Assignment of Anticipated Developments
A.M. Peak Hour**

W21061
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

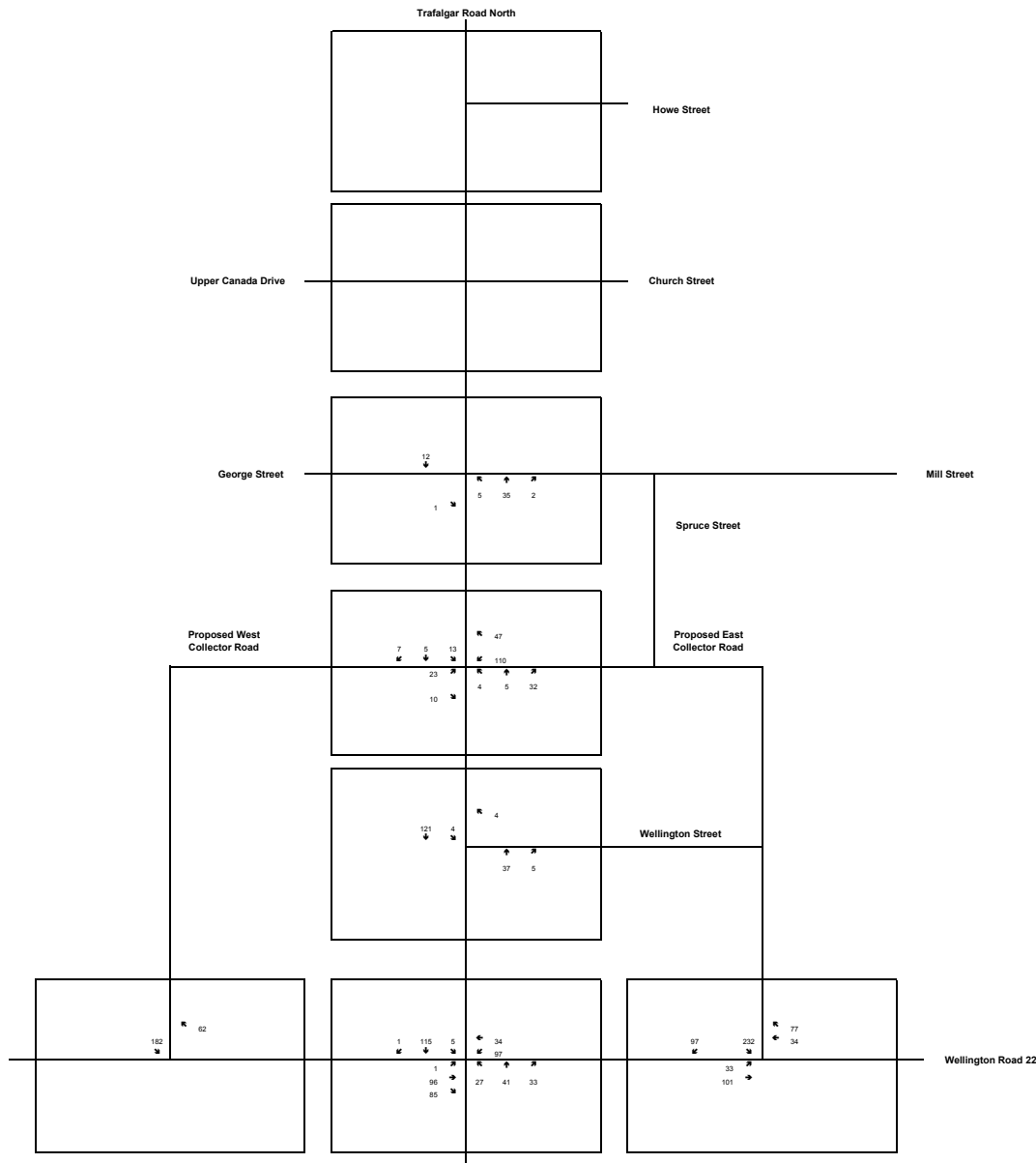


Figure No: 14

Date: November 17 2021

Prepared by: B.W.



**Trip Assignment of Anticipated Developments
P.M. Peak Hour**

W21061
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

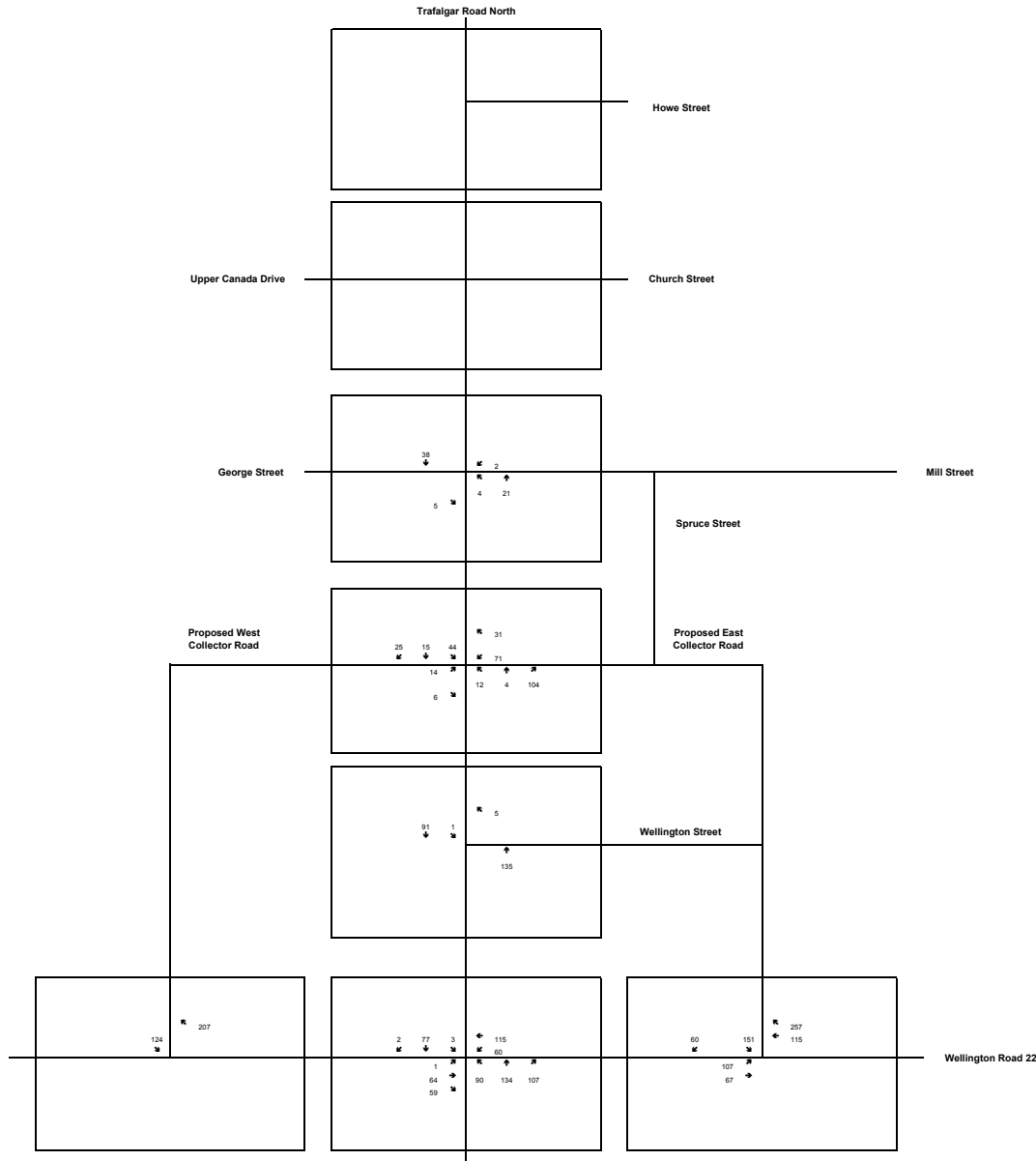


Figure No: 15

Date: November 17 2021

Prepared by: B.W.



Future (2026) Total Background Traffic Volumes - A.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

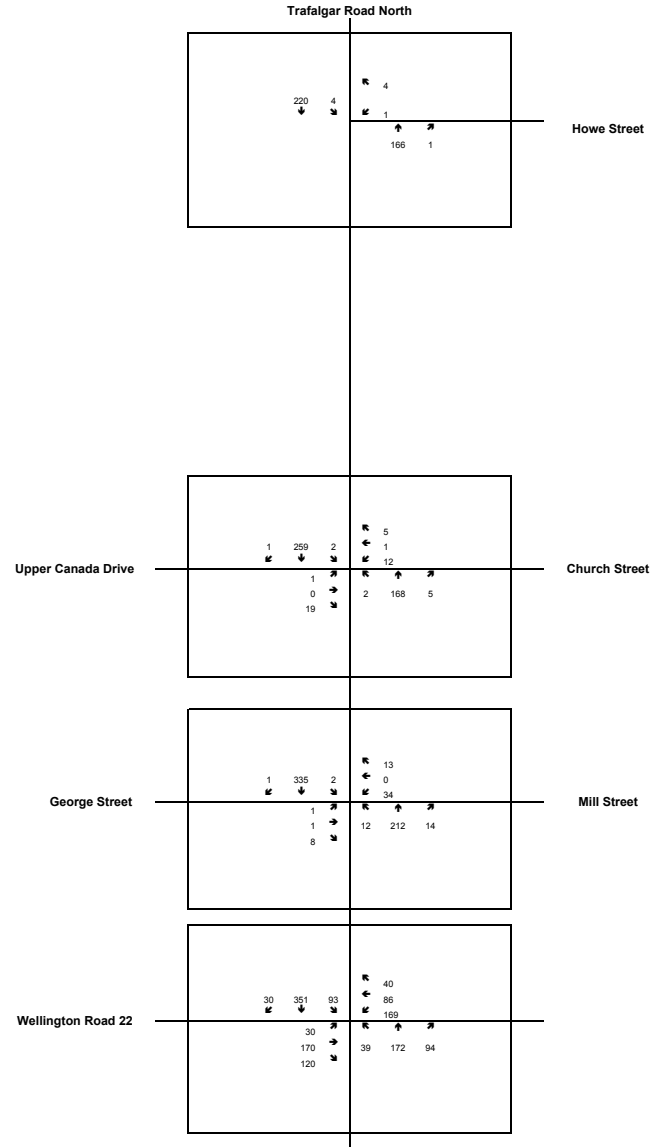


Figure No:

16

Date:

November 10 2021

Prepared by:

B.W.



Future (2026) Total Background Traffic Volumes - P.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

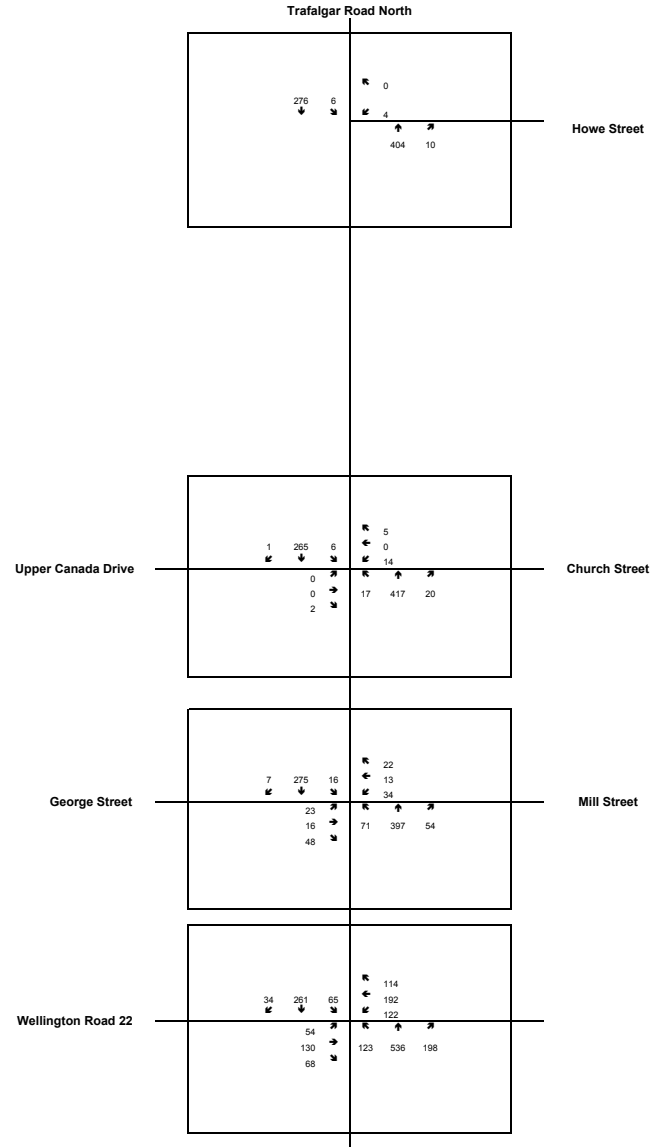


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17

Date:

November 10 2021

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5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.4 Future (2026) Total Background Traffic Analysis (Cont'd)

Table 7: Future (2026) Total Background Traffic – Level of Service

Intersection	Turning Movement	A.M. Peak Hour				P.M. Peak Hour			
		V/C	LOS	Delay ¹	95th Queue (m)	V/C	LOS	Delay ¹	95th Queue (m)
Trafalgar Road North at Wellington Road 22 (Signalized)	Overall	1.02	C	31.9	n/a	0.96	D	37.7	n/a
	EB Approach	0.61	C	23.3	64.7	0.57	C	23.5	54.3
	WB Approach	1.02	F	81.8	100.1	0.93	D	50.6	122.7
	NBL	0.12	B	13.3	9.6	0.34	B	16.7	26.5
	NBT	0.42	B	13.9	42.7	0.96	D	45.0	193.5
	NBR	0.42	B	13.9	42.7	0.96	D	45.0	193.5
	SBL	0.27	B	15.4	20.0	0.76	E	69.8	33.3
	SBT	0.57	B	18.9	71.0	0.38	B	14.9	49.8
	SBR	0.57	B	18.9	71.0	0.38	B	14.9	49.8
Trafalgar Road North at Howe Street (Un-signalized)	Overall	0.10	A	0.2	n/a	0.26	A	0.2	n/a
	WB Approach	0.01	A	9.9	0.2	0.01	B	14.7	0.3
	NB Approach	0.10	A	0.0	0.0	0.26	A	0.0	0.0
	SB Approach	0.00	A	0.2	0.1	0.01	A	0.2	0.2
Trafalgar Road North at George Street/Mill Street (Un-signalized)	Overall	0.12	A	1.5	n/a	0.30	A	4.6	n/a
	EB Approach	0.02	B	11.4	0.5	0.26	C	19.1	8.4
	WB Approach	0.12	B	14.4	3.2	0.30	D	25.8	9.6
	NB Approach	0.01	A	0.5	0.3	0.06	A	1.7	1.5
	SB Approach	0.00	A	0.1	0.0	0.02	A	0.6	0.4
Trafalgar Road North at Upper Canada Drive/Church Street (Un-signalized)	Overall	0.05	A	1.0	n/a	0.05	A	0.8	n/a
	EB Approach	0.03	B	10.3	0.8	0.00	A	9.7	0.1
	WB Approach	0.05	B	12.8	1.1	0.05	C	15.9	1.4
	NB Approach	0.00	A	0.1	0.0	0.01	A	0.4	0.3
	SB Approach	0.00	A	0.1	0.0	0.01	A	0.2	0.1

Note 1: Delays are measured in seconds per vehicle.

Note 2: Signalized intersections are based on existing signal timing plans.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.4 Future (2026) Total Background Traffic Analysis (Cont'd)

Trafalgar Road North at Wellington Road 22

The analysis of the Future (2026) Total Background Traffic Conditions indicates that the signalized intersection will begin to operate at a Level of Service "C" during the A.M. Peak Hour and a Level of Service "D" during the P.M. Peak Hour. With the growth in background traffic, impacts to the intersection moderate during the A.M. and P.M. Peak Hours.

During the A.M. Peak Hour, the westbound approach will begin to operate at a Level of Service "F" with a volume over capacity ratio that is greater than 1.0. All of the other turning movements will continue to operate at a Level of Service "C" or better during the A.M. Peak Hour and will begin to operate at a Level of Service "E" or better during the P.M. Peak Hour.

Trafalgar Road North at Howe Street

The analysis of the Future (2026) Total Background Traffic Conditions indicates that the un-signalized intersection will continue to operate at a Level of Service "A" during the A.M. and P.M. Peak Hours. With the growth in background traffic, impacts to the intersection minor during the A.M. and P.M. Peak Hours.

All of the turning movements will continue to operate at a Level of Service "A" during the A.M. Peak Hour and at a Level of Service "B" or better during the P.M. Peak Hour.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.4 Future (2026) Total Background Traffic Analysis (Cont'd)

Trafalgar Road North at George Street/Mill Street

The analysis of the Future (2026) Total Background Traffic Conditions indicates that the un-signalized intersection will continue to operate at a Level of Service “A” during the A.M. and P.M. Peak Hours. With the growth in background traffic, impacts to the intersection minor during the A.M. Peak Hour and low during the P.M. Peak Hour.

All of the turning movements will continue to operate at a Level of Service “B” or better during the A.M. Peak Hour and will begin to operate at a Level of Service “D” or better during the P.M. Peak Hour.

Trafalgar Road North at Upper Canada Drive/Church Street

The analysis of the Future (2026) Total Background Traffic Conditions indicates that the un-signalized intersection will continue to operate at a Level of Service “A” during the A.M. and P.M. Peak Hours. With the growth in background traffic, impacts to the intersection minor during the A.M. and P.M. Peak Hours.

All of the turning movements will continue to operate at a Level of Service “B” or better during the A.M. Peak Hour and will begin to operate at a Level of Service “C” or better during the P.M. Peak Hour.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.5 Future (2031) Total Background Traffic

The Future (2031) Total Background Traffic is based on the Existing (2021) Traffic volumes projected with traffic growth for ten (10) years for Trafalgar Road North and Wellington Road 22 plus the site-generated trips from the anticipated developments.

The Future (2031) Total Background Traffic Volumes are illustrated in **Figures 18 and 19** for the A.M. and P.M. Peak Hours.

5.6 Future (2031) Total Background Traffic Analysis

For the Future (2031) Total Background Traffic Volumes, the LOS was analyzed using SYNCHRO 9.0 software.

The signal timing plans and the lane configurations used in the Future (2026) Total Background Traffic Analysis are used in the Future (2031) Total Background Traffic Analysis.

The results of the analysis are summarized in **Table 8**. The related calculations are provided in **Appendix E**.

Future (2031) Total Background Traffic Volumes - A.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

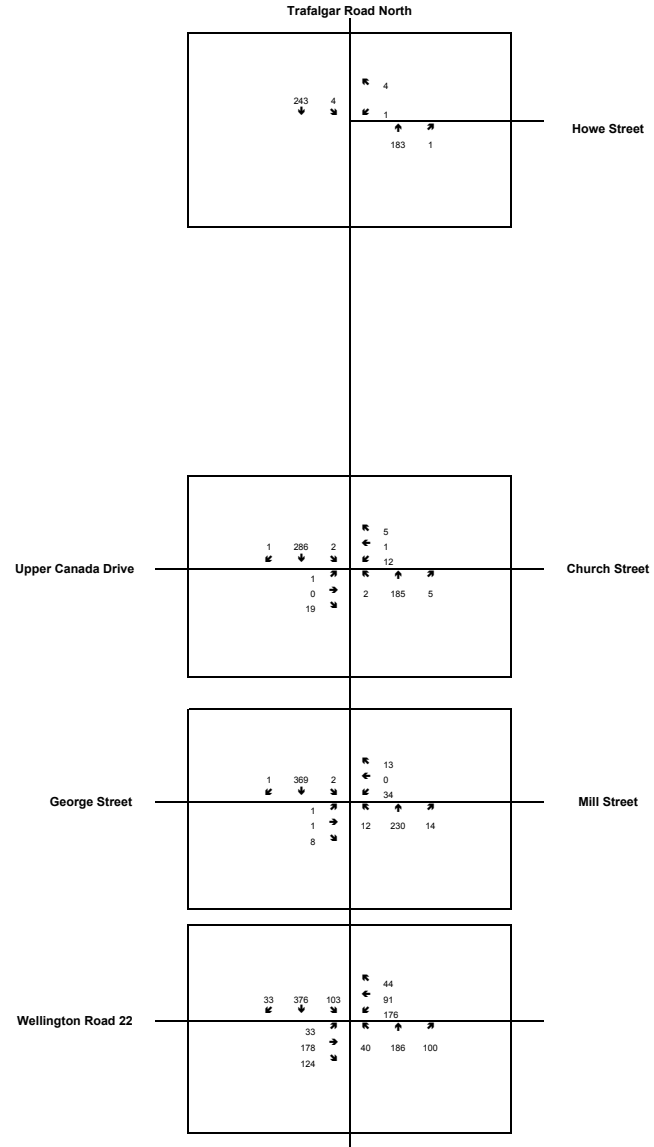


Figure No: 18
Date: November 10 2021
Prepared by: B.W.



Future (2031) Total Background Traffic Volumes - P.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

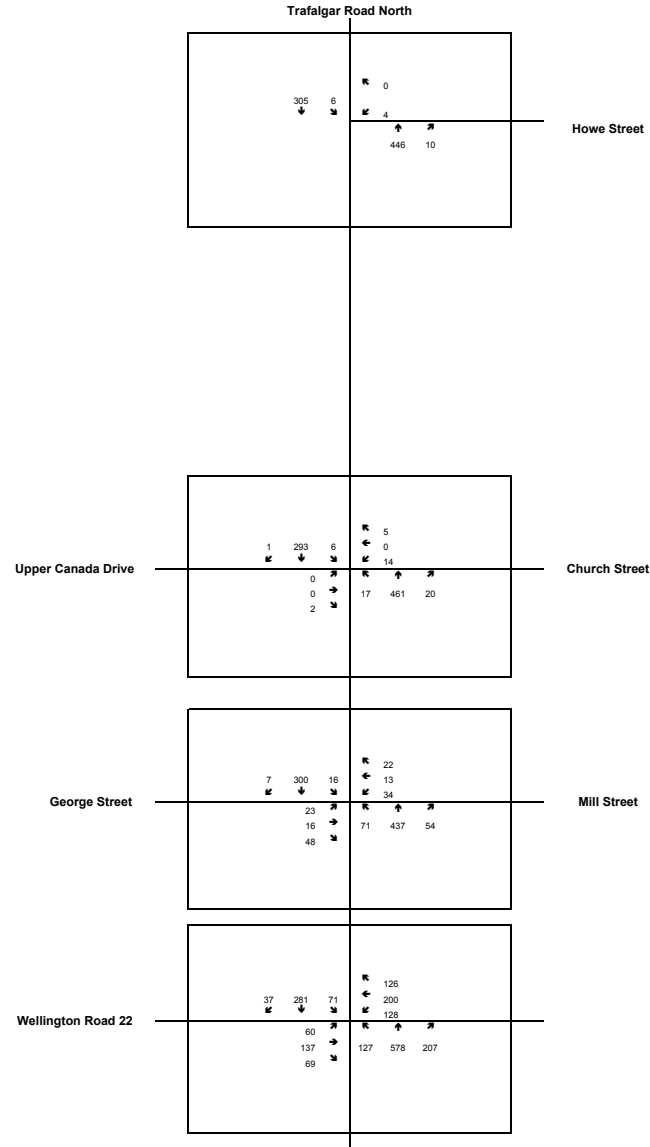


Figure No: 19
Date: November 10 2021
Prepared by: B.W.



5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.6 Future (2031) Total Background Traffic Analysis (Cont'd)

Table 8: Future (2031) Total Background Traffic – Level of Service

Intersection	Turning Movement	A.M. Peak Hour				P.M. Peak Hour			
		V/C	LOS	Delay ¹	95th Queue (m)	V/C	LOS	Delay ¹	95th Queue (m)
Trafalgar Road North at Wellington Road 22 (Signalized)	Overall	1.10	D	37.6	n/a	1.04	D	48.5	n/a
	EB Approach	0.64	C	24.5	69.5	0.60	C	25.0	59.3
	WB Approach	1.10	F	106.0	108.5	0.97	E	59.1	133.9
	NBL	0.14	B	13.6	9.9	0.38	B	17.8	28.3
	NBT	0.45	B	14.6	46.8	1.04	E	65.2	213.2
	NBR	0.45	B	14.6	46.8	1.04	E	65.2	213.2
	SBL	0.31	B	16.2	22.3	0.85	F	86.5	36.6
	SBT	0.62	B	20.0	78.0	0.42	B	15.6	54.4
	SBR	0.62	B	20.0	78.0	0.42	B	15.6	54.4
Trafalgar Road North at Howe Street (Un-signalized)	Overall	0.11	A	0.2	n/a	0.29	A	0.2	n/a
	WB Approach	0.01	B	10.1	0.2	0.01	C	15.8	0.3
	NB Approach	0.11	A	0.0	0.0	0.29	A	0.0	0.0
	SB Approach	0.00	A	0.1	0.1	0.01	A	0.2	0.2
Trafalgar Road North at George Street/Mill Street (Un-signalized)	Overall	0.13	A	1.4	n/a	0.33	A	4.8	n/a
	EB Approach	0.02	B	11.8	0.5	0.29	C	20.9	9.4
	WB Approach	0.13	C	15.3	3.5	0.33	D	29.2	11.1
	NB Approach	0.01	A	0.5	0.3	0.06	A	1.7	1.6
	SB Approach	0.00	A	0.1	0.0	0.02	A	0.6	0.4
Trafalgar Road North at Upper Canada Drive/Church Street (Un-signalized)	Overall	0.05	A	0.9	n/a	0.06	A	0.8	n/a
	EB Approach	0.04	B	10.6	0.9	0.00	A	9.9	0.1
	WB Approach	0.05	B	13.5	1.2	0.06	C	17.2	1.5
	NB Approach	0.00	A	0.1	0.0	0.01	A	0.4	0.3
	SB Approach	0.00	A	0.1	0.0	0.01	A	0.2	0.1

Note 1: Delays are measured in seconds per vehicle.

Note 2: Signalized intersections are based on existing signal timing plans.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.6 Future (2031) Total Background Traffic Analysis (Cont'd)

Trafalgar Road North at Wellington Road 22

The analysis of the Future (2031) Total Background Traffic Conditions indicates that the signalized intersection will begin to operate at a Level of Service “D” during the A.M. Peak Hour and will continue to operate at a Level of Service “D” during the P.M. Peak Hour. With the growth in background traffic, impacts to the intersection low during the A.M. and P.M. Peak Hours.

During the A.M. Peak Hour, the westbound approach will continue to operate at a Level of Service “F” with a volume over capacity ratio that is greater than 1.0.

In addition, during the P.M. Peak Hour, the shared through-right turning lane at the northbound approach will begin to operate with a volume over capacity ratio that is greater than 1.0 and the southbound left turning movement will begin to operate at a Level of Service “F”.

Trafalgar Road North at Howe Street

The analysis of the Future (2031) Total Background Traffic Conditions indicates that the un-signalized intersection will continue to operate at a Level of Service “A” during the A.M. and P.M. Peak Hours. With the growth in background traffic, impacts to the intersection minor during the A.M. and P.M. Peak Hours.

All of the turning movements will begin to operate at a Level of Service “B” or better during the A.M. Peak Hour and at a Level of Service “C” or better during the P.M. Peak Hour.

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS (CONT'D)

5.6 Future (2031) Total Background Traffic Analysis (Cont'd)

Trafalgar Road North at George Street/Mill Street

The analysis of the Future (2031) Total Background Traffic Conditions indicates that the un-signalized intersection will continue to operate at a Level of Service “A” during the A.M. and P.M. Peak Hours. With the growth in background traffic, impacts to the intersection minor during the A.M. Peak Hour and low during the P.M. Peak Hour.

All of the turning movements will begin to operate at a Level of Service “C” or better during the A.M. Peak Hour and will continue to operate at a Level of Service “D” or better during the P.M. Peak Hour.

Trafalgar Road North at Upper Canada Drive/Church Street

The analysis of the Future (2031) Total Background Traffic Conditions indicates that the un-signalized intersection will continue to operate at a Level of Service “A” during the A.M. and P.M. Peak Hours. With the growth in background traffic, impacts to the intersection minor during the A.M. and P.M. Peak Hours.

All of the turning movements will continue to operate at a Level of Service “B” or better during the A.M. Peak Hour and at a Level of Service “C” or better during the P.M. Peak Hour.

6. TRIP GENERATION AND DISTRIBUTION

6.1. Trip Generation

For the single detached homes (Land Use 210), townhouse units (Land Use 220) and School Block (Land Use 520), the trip generation rates and formulae from the ITE Trip Generation Manual were applied for the A.M. and P.M. Peak Hours.

Based on the pre-consultation comments provided by the Upper Grand District School Board, it is assumed that the proposed School Block within the Subject Subdivision will be an elementary school with a capacity for 450 students.⁵

Table 9 summarizes the trip generation rates and formulae along with the percentages of incoming and outgoing trips for the A.M. and P.M. Peak Hours.

Table 9: Trip Generation Rates and Formulae with Inbound and Outbound Percentages

ITE Land Use	A.M. Peak Hour			P.M. Peak Hour		
	Fitted Curve Equation	% In	% Out	Fitted Curve Equation	% In	% Out
Single-Family Detached Housing (LU 210)	$T = 0.71X + 4.80$ (Note 1)	25%	75%	$\ln(T) = 0.96 \ln(X) + 0.20$ (Note 1)	63%	37%
Multifamily Housing (Low-Rise) (LU 220)	$\ln(T) = 0.95 \ln(X) - 0.51$ (Note 1)	23%	77%	$\ln(T) = 0.89 \ln(X) - 0.02$ (Note 1)	63%	37%
Elementary School (LU 520)	0.67 (Note 2)	54%	46%	0.17 (Note 2)	48%	52%

Note 1: T represents the total number of trips and X represents the number of dwelling units.

Note 2: Trip rate is per student.

⁵ Re: Development Pre-Consultation Meeting D'Angelo Property, 5916 Trafalgar Road North, Erin (Hillsburgh), Adam Laranjeiro, July 13, 2021.

6. TRIP GENERATION AND DISTRIBUTION (CONT'D)

6.2 Total Site-Generated Trips

The resulting number of trips generated was determined by the trip generation rates and formulae in **Table 9** and the proposed land uses. It is anticipated that the Subject Property will comprise of 284 single detached homes, 48 townhouse units and an Elementary School with a capacity for 450 students.

The resulting number of trips generated is provided in **Table 10** for the A.M. and P.M. Peak Hours of adjacent street traffic.

Table 10: Site-Generated Trips

ITE Land Use	Quantity	A.M. Peak Hour			P.M. Peak Hour		
		Trips In	Trips Out	Total	Trips In	Trips Out	Total
Single-Family Detached Housing (LU 210)	284 dwelling units	52	154	206	175	102	277
Multifamily Housing (Low-Rise) (LU 220)	48 dwelling units	6	18	24	20	11	31
Elementary School (LU 520)	450 students	163	139	302	37	40	77
TOTAL	--	221	311	532	232	153	385

The proposed Residential Subdivision is expected to generate a total of 532 trips during the A.M. Peak Hour (221 inbound trips and 311 outbound trips) and 385 trips during the P.M. Peak Hour (232 inbound trips and 153 outbound trips).

6. TRIP GENERATION AND DISTRIBUTION (CONT'D)

6.3 Trip Distribution and Assignment

For the single detached homes and the townhouse units, the 2016 Transportation Tomorrow Survey and the future road network was utilized for the assumed trip distribution and trip assignment. The Transportation Tomorrow Survey database query that was used to determine the trip distribution is provided in **Appendix F**.

The assumed trip distribution and assignment will be as follows:

- 47% (47%) to/from the east via Wellington Road 22,
- 11% (11%) to/from the north via Trafalgar Road North and within the Study Area,
- 42% (42%) to/from the south via Trafalgar Road North.

For site-generated trips entering the elementary school during the A.M. Peak Hour and site-generate trips leaving the elementary school during the P.M. Peak Hour, the assumed trip distribution and assignment is based on the future residential land use in relation to the location of the existing Ross R. MacKay Public Elementary School, which currently services the catchment area bounded by Erin-Garafraxa Townline to the north, Winston Churchill Boulevard to the east, Sideroad 17 to the south and Fourth Line to the west. For site-generated trips leaving the elementary school during the A.M. Peak Hour and site-generate trips entering the elementary school during the P.M. Peak Hour, the assumed trip distribution and assignment is based on the 2016 Transportation Tomorrow Survey and the future road network. The Transportation Tomorrow Survey database query that was used to determine the trip distribution is provided in **Appendix F**. In addition, at the time this Study was prepared, the access locations for the elementary school were not determined. Therefore, this Study assumes that the elementary school will be serviced by a full-moves access along the proposed Street 'A' frontage.

6. TRIP GENERATION AND DISTRIBUTION (CONT'D)

6.3 Trip Distribution and Assignment (Cont'd)

The assumed trip distribution and assignment will be as follows:

A.M. Peak Hour

- 44% from within the Subject Subdivision,
- 3% from the east and outside the vicinity of the Study Area via Orangeville Street and Howe Street,
- 43% from the east via Howe Street, Church Street or Mill Street,
- 8% from the south via Upper Canada Drive or George Street,
- 2% from the west and outside the vicinity of the Study Area via Station Street/proposed West Collector Road or Side Road 27,
- 4% to the north via Trafalgar Road North,
- 46% to the east via Wellington Road 22,
- 43% to the south via Trafalgar Road North,
- 7% to the south and within the Study Area via Trafalgar Road North.

P.M. Peak Hour

- 4% from the north via Trafalgar Road North,
- 46% from the east via Wellington Road 22,
- 43% from the south via Trafalgar Road North,
- 7% from the south and within the Study Area via Trafalgar Road North,
- 44% to within the Subject Subdivision,
- 3% to the east and outside the vicinity of the Study Area via Church Street and Howe Street,
- 43% to the east via Howe Street, Church Street or Mill Street,
- 8% to the south via Upper Canada Drive or George Street,
- 2% to the west and outside the vicinity of the Study Area via Station Street/proposed West Collector Road or Side Road 27.

The site-generated trip volumes and trip assignment used in the analysis for the Subject Property are illustrated in **Figures 20 and 21**.

**Trip Assignment of Subject Subdivision
A.M. Peak Hour**

W21081
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Town of Erin
Hillsburgh Heights Inc.

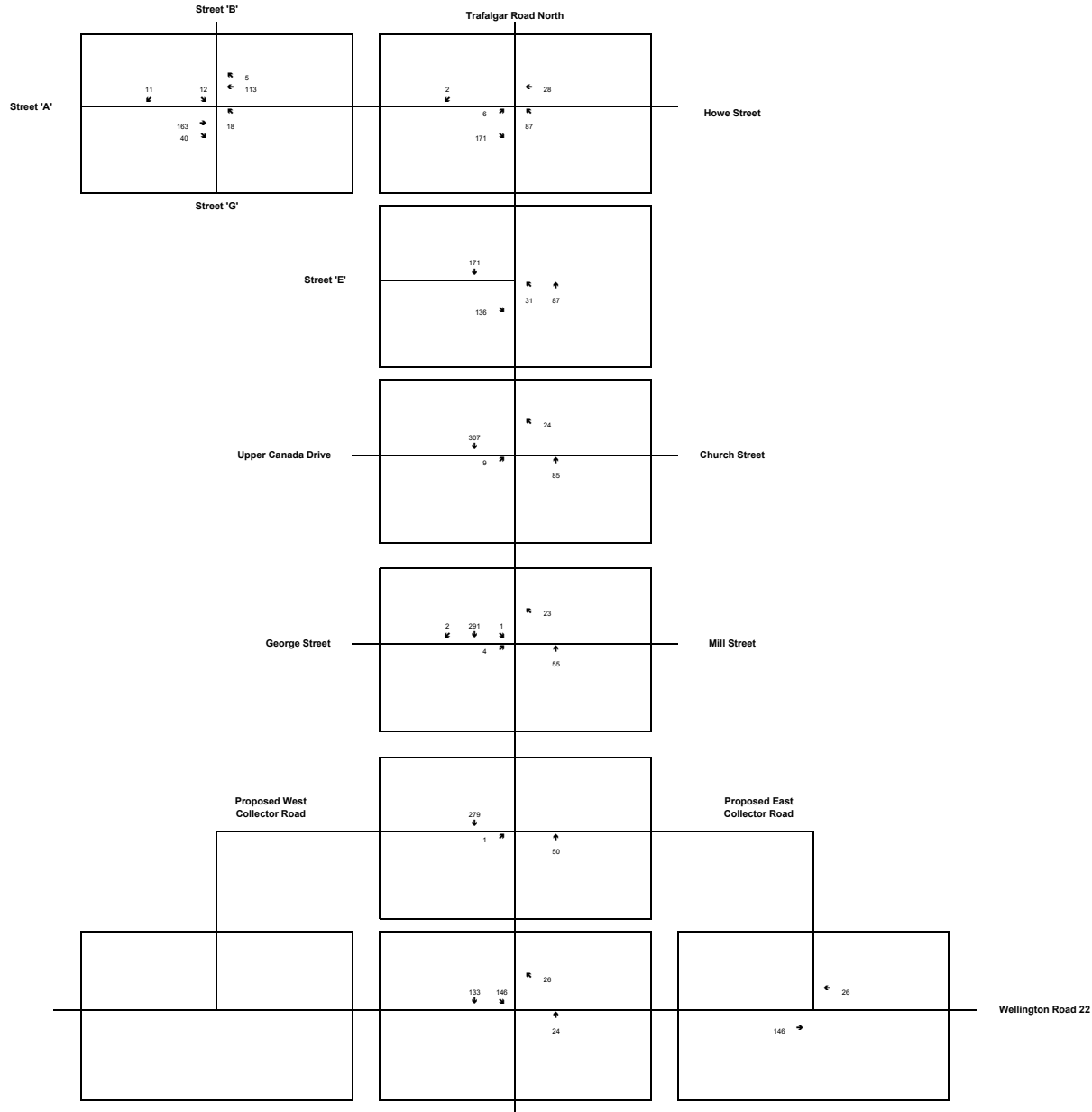


Figure No: 20

Date: November 11 2021

Prepared by: B.W.



**Trip Assignment of Subject Subdivision
P.M. Peak Hour**

W21681
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

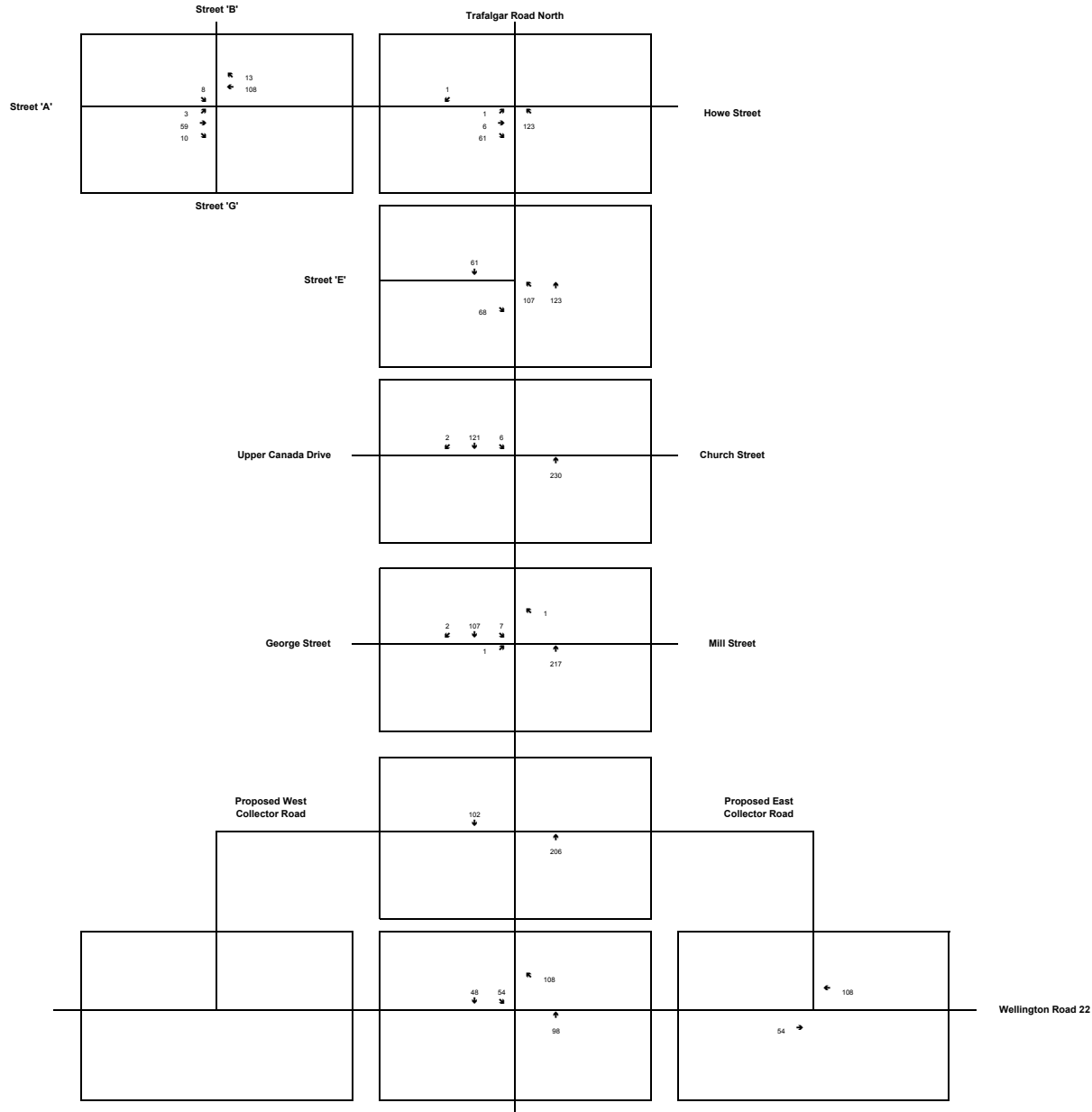


Figure No: 21
Date: November 11 2021
Prepared by: B.W.



7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.1 Future (2026) Total Traffic

The Future (2026) Total Traffic is based on the Future (2026) Total Background Traffic Volumes plus the Site-Generated Traffic Volumes for the Subject Property. The Future (2026) Total Traffic Volumes are provided in **Figures 22 and 23**.

7.2 Future (2026) Total Traffic Analysis

For the Future (2026) Total Traffic Volumes, the LOS was analyzed using SYNCHRO 9.0 software.

For the Trafalgar Road North at Wellington Road 22, George Street/Mill Street at Trafalgar Road North and Upper Canada Drive/Church Street at Trafalgar Road North intersections, the signal timing plans and the lane configurations used in the Future (2026) Total Background Traffic Analysis are used in the Future (2026) Total Traffic Analysis.

Proposed Street 'A'/Howe Street at Trafalgar Road North was analyzed as an un-signalized intersection with stop-controls at the eastbound and westbound approaches. The lane configuration used in the analysis comprises a shared left-through-right turning lane at all approaches.

Proposed Street 'E' at Trafalgar Road North was analyzed as an un-signalized intersection with a stop-control at the eastbound approach. The lane configuration used in the analysis comprises a shared through-left turning lane at the northbound approach; a shared left-right turning lane at the eastbound approach; and a shared through-right turning lane at the southbound approach.

Proposed Street 'A' at proposed Street 'B'/proposed Street 'G' was analyzed as a single lane roundabout. The lane configuration used in the analysis comprises a shared left-through-right turning lane at all approaches.

The results of the analysis are summarized in **Table 11**. The related calculations are provided in **Appendix E**.

Future (2026) Total Traffic Volumes - A.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

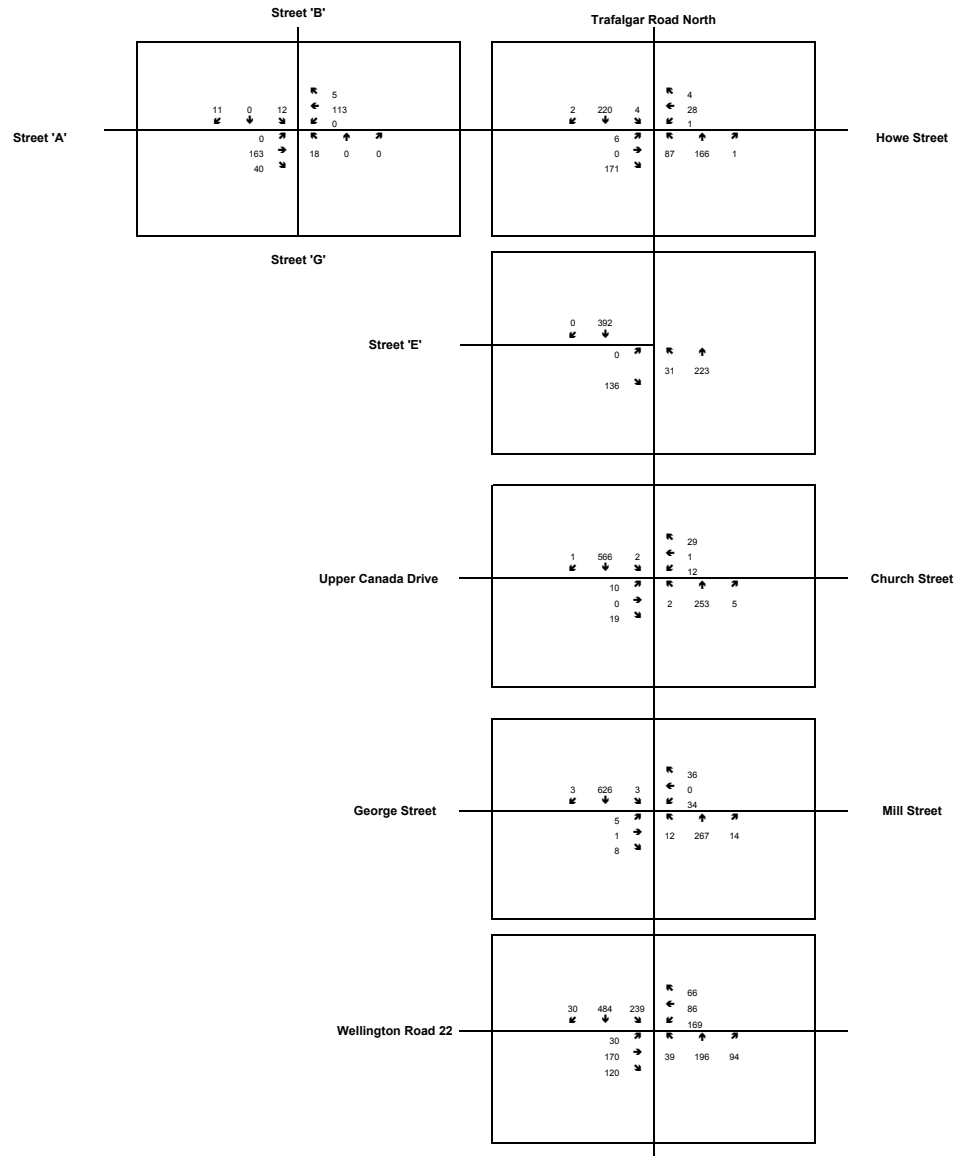


Figure No: 22
Date: November 11 2021
Prepared by: B.W.



Future (2026) Total Traffic Volumes - P.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

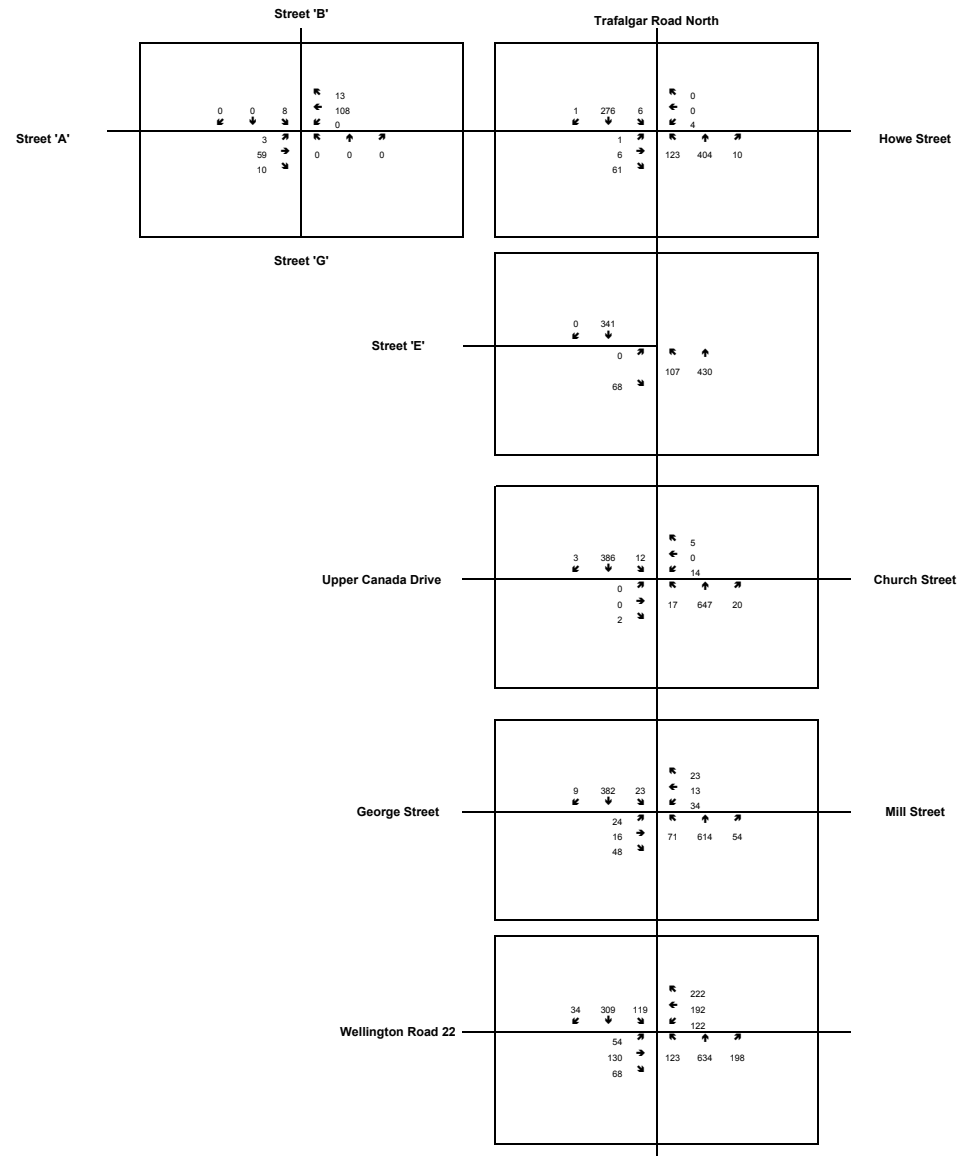


Figure No: 23
Date: November 11 2021
Prepared by: B.W.



7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.2 Future (2026) Total Traffic Analysis (Cont'd)

Table 11: Future (2026) Total Traffic – Level of Service

Intersection	Turning Movement	A.M. Peak Hour				P.M. Peak Hour			
		V/C	LOS	Delay ¹	95th Queue (m)	V/C	LOS	Delay ¹	95th Queue (m)
Trafalgar Road North at Wellington Road 22 (Signalized)	Overall	1.07	D	37.1	n/a	1.42	E	74.7	n/a
	EB Approach	0.61	C	23.3	64.7	0.59	C	24.5	56.1
	WB Approach	1.07	F	95.1	108.6	1.08	F	86.8	159.6
	NBL	0.19	B	15.1	10.4	0.39	B	18.2	27.9
	NBT	0.46	B	15.0	48.0	1.11	F	87.0	232.5
	NBR	0.46	B	15.0	48.0	1.11	F	87.0	232.5
	SBL	0.73	C	31.3	69.4	1.42	F	267.7	48.1
	SBT	0.71	C	26.1	108.1	0.45	B	16.2	59.6
	SBR	0.71	C	26.1	108.1	0.45	B	16.2	59.6
Trafalgar Road North at Howe Street/ Proposed Street 'A' (Un-signalized)	Overall	0.23	A	4.7	n/a	0.13	A	2.8	n/a
	EB Approach	0.23	B	11.0	7.2	0.13	B	12.2	3.5
	WB Approach	0.08	B	14.8	2.2	0.03	D	28.7	0.6
	NB Approach	0.07	A	3.1	1.7	0.11	A	2.8	2.8
	SB Approach	0.00	A	0.2	0.1	0.01	A	0.2	0.2
Trafalgar Road North at George Street/Mill Street (Un-signalized)	Overall	0.24	A	1.8	n/a	0.53	A	6.6	n/a
	EB Approach	0.05	C	18.0	1.3	0.44	E	35.0	16.7
	WB Approach	0.24	C	19.7	7.2	0.53	F	56.8	20.6
	NB Approach	0.01	A	0.5	0.3	0.07	A	1.7	1.7
	SB Approach	0.00	A	0.1	0.1	0.03	A	0.8	0.7
Trafalgar Road North at Upper Canada Drive/Church Street (Un-signalized)	Overall	0.13	A	1.4	n/a	0.09	A	0.8	n/a
	EB Approach	0.11	C	18.3	3.1	0.00	B	10.6	0.1
	WB Approach	0.13	C	15.6	3.6	0.09	C	24.9	2.5
	NB Approach	0.00	A	0.1	0.1	0.02	A	0.4	0.4
	SB Approach	0.00	A	0.0	0.0	0.01	A	0.4	0.3

Note 1: Delays are measured in seconds per vehicle.

Note 2: Signalized intersections are based on existing signal timing plans.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.2 Future (2026) Total Traffic Analysis (Cont'd)

Table 11: Future (2026) Total Traffic – Level of Service

Intersection	Turning Movement	A.M. Peak Hour				P.M. Peak Hour			
		V/C	LOS	Delay ¹	95th Queue (m)	V/C	LOS	Delay ¹	95th Queue (m)
Trafalgar Road North at Proposed Street 'E' (Un-signalized)	Overall	0.25	A	2.6	n/a	0.22	A	2.2	n/a
	EB Approach	0.24	B	12.5	7.3	0.11	B	11.0	2.9
	NB Approach	0.03	A	1.3	0.7	0.10	A	2.6	2.6
	SB Approach	0.25	A	0.0	0.0	0.22	A	0.0	0.0
Street 'A' at Proposed Street 'B'/ Proposed Street 'G' (Roundabout)	Overall	0.20	A	4.7	n/a	0.12	A	4.1	n/a
	EB Approach	0.20	A	5.1	7.0	0.07	A	3.9	0.0
	WB Approach	0.12	A	4.3	0.0	0.12	A	4.3	0.0
	NB Approach	0.02	A	4.1	0.0	0.00	A	3.4	0.0
	SB Approach	0.03	A	3.9	0.0	0.01	A	3.7	0.0

Note 1: Delays are measured in seconds per vehicle.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.2 Future (2026) Total Traffic Analysis (Cont'd)

Trafalgar Road North at Wellington Road 22

The analysis of the Future (2026) Total Traffic Conditions indicates that the signalized intersection will begin to operate at a Level of Service “D” during the A.M. Peak Hour and at a Level of Service “E” during the P.M. Peak Hour. With the inclusion of site-generated trips, impacts to the intersection are low during the A.M. Peak Hour and high during P.M. Peak Hour.

The westbound approach will continue to operate at a Level of Service “F” with a volume over capacity ratio that is greater than 1.0 during the A.M. Peak Hour and will begin to operate at a Level of Service “F” with a volume over capacity ratio that is greater than 1.0 during the P.M. Peak Hour.

During the P.M. Peak Hour, the shared through-right turning lane at the northbound approach and the left turning lane at the southbound approach will begin to operate at a Level of Service “F” with a volume over capacity ratio that is greater than 1.0. In addition, during the A.M. and P.M. Peak Hours, the queue lengths at the southbound left turning lane may begin to result in a spillback of vehicles into the adjacent lane.

Trafalgar Road North at Howe Street/proposed Street ‘A’

The analysis of the Future (2026) Total Traffic Conditions indicates that the un-signalized intersection will continue to operate at a Level of Service “A” during the A.M. and P.M. Peak Hours. With the inclusion of site-generated trips, impacts to the intersection are moderate during the A.M. and P.M. Peak Hours.

All of the turning movements will begin to operate at a Level of Service “B” or better during the A.M. Peak Hour and at a Level of Service “D” or better during the P.M. Peak Hour.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.2 Future (2026) Total Traffic Analysis (Cont'd)

Trafalgar Road North at George Street/Mill Street

The analysis of the Future (2026) Total Traffic Conditions indicates that the un-signalized intersection will continue to operate at a Level of Service “A” during the A.M. and P.M. Peak Hours. With the inclusion of site-generated trips, impacts to the intersection are low during the A.M. Peak Hour and moderate during P.M. Peak Hour.

During the P.M. Peak Hour, the westbound approach will operate at a Level of Service “F” with an average delay of 56.8 seconds per vehicle. All of the other turning movements will begin to operate at a Level of Service “C” or better during the A.M. Peak Hour and a Level of Service “E” or better during the P.M. Peak Hour.

Trafalgar Road North at Upper Canada Drive/Church Street

The analysis of the Future (2026) Total Traffic Conditions indicates that the un-signalized intersection will continue to operate at a Level of Service “A” during the A.M. and P.M. Peak Hours. With the inclusion of site-generated trips, impacts to the intersection are low during the A.M. and P.M. Peak Hours.

All of the turning movements will begin to operate at a Level of Service “C” or better during the A.M. Peak Hour and continue to operate at a Level of Service “C” or better during the P.M. Peak Hour.

Trafalgar Road North at proposed Street ‘E’

The analysis of the Future (2026) Total Traffic Conditions indicates that the un-signalized intersection will operate at a Level of Service “A” during the A.M. and P.M. Peak Hours.

During the A.M. and P.M. Peak Hours, all of the turning movements will operate at a Level of Service “B” or better.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.2 Future (2026) Total Traffic Analysis (Cont'd)

Proposed Street 'A' at proposed Street 'B'/proposed Street 'G'

The analysis of the Future (2026) Total Traffic Conditions indicates that all of the approaches at the roundabout will operate at a Level of Service "A" during the A.M. and P.M. Peak Hours.

7.2.1 Future (2026) Total Traffic Analysis – Recommended Improvements

For the Trafalgar Road North at Wellington Road 22 intersection, there are critical turning movements during the A.M. and P.M. Peak Hours.

In order to address the critical turning movements, the following improvements are recommended.

- Modify the signal timing plans for the Weekday A.M. and P.M. Peak Period,
- Include a left turning lane at the eastbound approach with 25 metres of storage,
- Include a left turning lane at the westbound approach with 55 metres of storage,
- Extend the storage of the southbound left turning lane to 60 metres.

With the recommended improvements, all of the turning movements will operate at a Level of Service "D" or better during the A.M. Peak Hour and at a Level of Service "E" or better during the P.M. Peak Hour.

The traffic conditions with the recommended improvements are summarized in **Table 12**. The related calculations are provided in **Appendix E**.

For the Trafalgar Road North at George Street/Mill Street intersection, the westbound approach operates at a Level of Service "F" during the P.M. Peak Hour. However, with an average delay of 56.8 seconds per vehicle, it is considered acceptable for Peak Period conditions.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.2.1 Future (2026) Total Traffic Analysis – Recommended Improvements

Table 12: Future (2026) Total Traffic – Level of Service – with Improvements

Intersection	Turning Movement	A.M. Peak Hour				P.M. Peak Hour			
		V/C	LOS	Delay ¹	95th Queue (m)	V/C	LOS	Delay ¹	95th Queue (m)
Trafalgar Road North at Wellington Road 22 (Signalized)	Overall	0.90	C	29.0	n/a	1.03	E	55.3	n/a
	EBL	0.16	C	24.1	10.3	0.44	D	39.4	21.2
	EBT	0.90	D	51.6	76.0	0.41	C	34.7	65.6
	EBR	0.90	D	51.6	76.0	0.41	C	34.7	65.6
	WBL	0.75	D	37.1	38.8	0.47	D	47.5	52.7
	WBT	0.32	B	12.9	23.3	0.98	E	80.0	185.3
	WBR	0.32	B	12.9	23.3	0.98	E	80.0	185.3
	NBL	0.18	B	19.4	11.2	0.32	C	22.8	38.1
	NBT	0.68	C	26.2	56.3	1.03	E	69.3	345.6
	NBR	0.68	C	26.2	56.3	1.03	E	69.3	345.6
	SBL	0.63	B	17.1	32.0	0.86	E	66.8	56.7
	SBT	0.80	C	26.7	109.9	0.36	B	16.1	74.6
	SBR	0.80	C	26.7	109.9	0.36	B	16.1	74.6

Note 1: Delays are measured in seconds per vehicle.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.3 Future (2031) Total Traffic

The Future (2031) Total Traffic is based on the Future (2031) Total Background Traffic Volumes plus the Site-Generated Traffic Volumes for the Subject Property. The Future (2031) Total Traffic Volumes are provided in **Figures 24 and 25**.

7.4 Future (2031) Total Traffic Analysis

For the Future (2031) Total Traffic Volumes, the LOS was analyzed using SYNCHRO 9.0 software.

The signal timing plans and the lane configurations used in the Future (2026) Total Traffic Analysis are used in the Future (2031) Total Traffic Analysis.

The results of the analysis are summarized in **Table 13**. The related calculations are provided in **Appendix E**.

Future (2031) Total Traffic Volumes - A.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

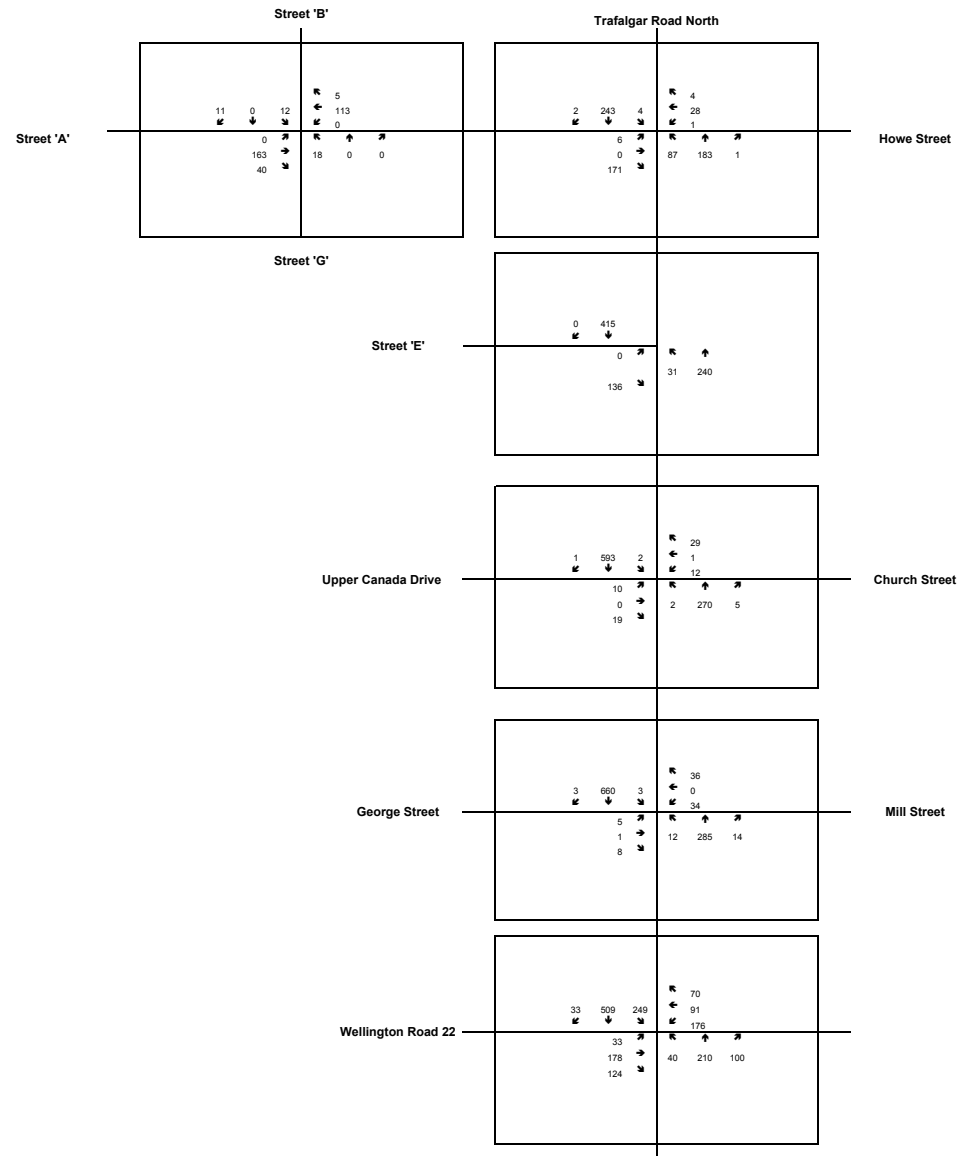


Figure No: 24

Date: November 11 2021

Prepared by: B.W.



Future (2031) Total Traffic Volumes - P.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
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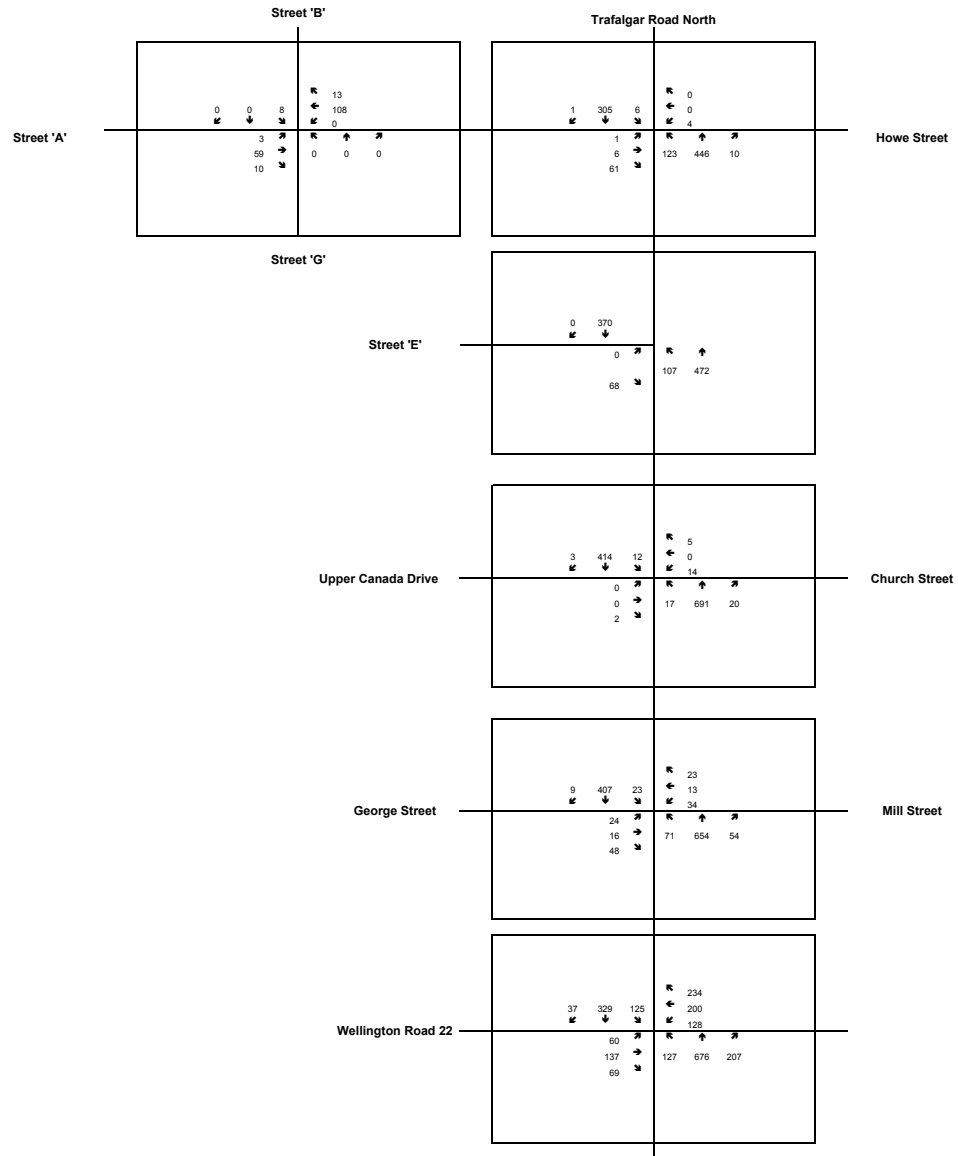


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Date: November 11 2021
Prepared by: B.W.



7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.4 Future (2031) Total Traffic Analysis (Cont'd)

Table 13: Future (2031) Total Traffic – Level of Service

Intersection	Turning Movement	A.M. Peak Hour				P.M. Peak Hour			
		V/C	LOS	Delay ¹	95th Queue (m)	V/C	LOS	Delay ¹	95th Queue (m)
Trafalgar Road North at Wellington Road 22 (Signalized)	Overall	1.15	D	44.0	n/a	1.49	F	91.8	n/a
	EB Approach	0.65	C	24.6	69.6	0.65	C	27.4	62.0
	WB Approach	1.15	F	122.0	116.6	1.14	F	110.2	171.2
	NBL	0.21	B	16.0	10.9	0.43	B	19.3	29.9
	NBT	0.49	B	15.6	52.2	1.17	F	112.8	251.9
	NBR	0.49	B	15.6	52.2	1.17	F	112.8	251.9
	SBL	0.80	D	37.4	76.1	1.49	F	293.5	50.8
	SBT	0.81	C	29.7	130.6	0.48	B	16.7	64.3
	SBR	0.81	C	29.7	130.6	0.48	B	16.7	64.3
Trafalgar Road North at Howe Street/ Proposed Street 'A' (Un-signalized)	Overall	0.24	A	4.6	n/a	0.14	A	2.8	n/a
	EB Approach	0.24	B	11.3	7.5	0.14	B	12.7	3.8
	WB Approach	0.09	C	15.4	2.3	0.03	D	32.1	0.7
	NB Approach	0.07	A	3.0	1.8	0.11	A	2.8	2.9
	SB Approach	0.00	A	0.1	0.1	0.01	A	0.2	0.2
Trafalgar Road North at George Street/Mill Street (Un-signalized)	Overall	0.26	A	1.8	n/a	0.59	A	7.4	n/a
	EB Approach	0.06	C	19.0	1.4	0.49	E	40.8	19.2
	WB Approach	0.26	C	21.2	8.0	0.59	F	69.3	23.9
	NB Approach	0.01	A	0.5	0.4	0.07	A	1.7	1.7
	SB Approach	0.00	A	0.1	0.1	0.03	A	0.8	0.7
Trafalgar Road North at Upper Canada Drive/Church Street (Un-signalized)	Overall	0.14	A	1.4	n/a	0.11	A	0.9	n/a
	EB Approach	0.12	C	19.4	3.3	0.00	B	10.8	0.1
	WB Approach	0.14	C	16.4	3.9	0.11	D	27.5	2.8
	NB Approach	0.00	A	0.1	0.1	0.02	A	0.4	0.4
	SB Approach	0.08	A	0.0	0.0	0.01	A	0.4	0.3

Note 1: Delays are measured in seconds per vehicle.

Note 2: Signalized intersections are based on existing signal timing plans.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.4 Future (2031) Total Traffic Analysis (Cont'd)

Table 13: Future (2031) Total Traffic – Level of Service

Intersection	Turning Movement	A.M. Peak Hour				P.M. Peak Hour			
		V/C	LOS	Delay ¹	95th Queue (m)	V/C	LOS	Delay ¹	95th Queue (m)
Trafalgar Road North at Proposed Street 'E' (Un-signalized)	Overall	0.27	A	2.5	n/a	0.24	A	2.2	n/a
	EB Approach	0.24	B	12.8	7.6	0.11	B	11.3	3.1
	NB Approach	0.03	A	1.2	0.8	0.10	A	2.6	2.7
	SB Approach	0.27	A	0.0	0.0	0.24	A	0.0	0.0
Proposed Street 'A' at Proposed Street 'B'/ Proposed Street 'G' (Roundabout)	Overall	0.20	A	4.7	n/a	0.12	A	4.1	n/a
	EB Approach	0.20	A	5.1	7.0	0.07	A	3.9	0.0
	WB Approach	0.12	A	4.3	0.0	0.12	A	4.3	0.0
	NB Approach	0.02	A	4.1	0.0	0.00	A	3.4	0.0
	SB Approach	0.03	A	3.9	0.0	0.01	A	3.7	0.0

Note 1: Delays are measured in seconds per vehicle.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.4 Future (2031) Total Traffic Analysis (Cont'd)

Trafalgar Road North at Wellington Road 22

The analysis of the Future (2031) Total Traffic Conditions indicates that the signalized intersection will continue to operate at a Level of Service “D” during the A.M. Peak Hour and will begin to operate at a Level of Service “F” during the P.M. Peak Hour. With the growth in background traffic, impacts to the intersection are low during the A.M. Peak Hour and moderate during P.M. Peak Hour.

The westbound approach will continue to operate at a Level of Service “F” with a volume over capacity ratio that is greater than 1.0 during the A.M. and P.M. Peak Hours.

During the P.M. Peak Hour, the shared through-right turning lane at the northbound approach and the left turning lane at the southbound approach will continue to operate at a Level of Service “F” with a volume over capacity ratio that is greater than 1.0. In addition, during the A.M. and P.M. Peak Hours, the queue lengths at the southbound left turning lane may continue to result in a spillback of vehicles into the adjacent lane.

Trafalgar Road North at Howe Street/proposed Street ‘A’

The analysis of the Future (2031) Total Traffic Conditions indicates that the un-signalized intersection will continue to operate at a Level of Service “A” during the A.M. and P.M. Peak Hours. With the growth in background traffic, impacts to the intersection are minor during the A.M. and P.M. Peak Hours.

All of the turning movements will begin to operate at a Level of Service “C” or better during the A.M. Peak Hour and will continue to operate at a Level of Service “D” or better during the P.M. Peak Hour.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.4 Future (2031) Total Traffic Analysis (Cont'd)

Trafalgar Road North at George Street/Mill Street

The analysis of the Future (2031) Total Traffic Conditions indicates that the un-signalized intersection will continue to operate at a Level of Service “A” during the A.M. and P.M. Peak Hours. With the growth in background traffic, impacts to the intersection are minor during the A.M. Peak Hour and low during P.M. Peak Hour.

During the P.M. Peak Hour, the westbound approach will operate at a Level of Service “F” with an average delay of 69.3 seconds per vehicle. All of the other turning movements will continue to operate at a Level of Service “C” or better during the A.M. Peak Hour and a Level of Service “E” or better during the P.M. Peak Hour.

Trafalgar Road North at Upper Canada Drive/Church Street

The analysis of the Future (2031) Total Traffic Conditions indicates that the un-signalized intersection will continue to operate at a Level of Service “A” during the A.M. and P.M. Peak Hours. With the growth in background traffic, impacts to the intersection are minor during the A.M. and P.M. Peak Hours.

All of the turning movements will continue to operate at a Level of Service “C” or better during the A.M. Peak Hour and begin to operate at a Level of Service “D” or better during the P.M. Peak Hour.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.4 Future (2031) Total Traffic Analysis (Cont'd)

Trafalgar Road North at proposed Street 'E'

The analysis of the Future (2031) Total Traffic Conditions indicates that the un-signalized intersection will continue to operate at a Level of Service "A" during the A.M. and P.M. Peak Hours. With the growth in background traffic, impacts to the intersection are minor during the A.M. and P.M. Peak Hours.

During the A.M. and P.M. Peak Hours, all of the turning movements will continue to operate at a Level of Service "B" or better.

Proposed Street 'A' at proposed Street 'B'/proposed Street 'G'

The analysis of the Future (2031) Total Traffic Conditions indicates that all of the approaches at the roundabout will continue to operate at a Level of Service "A" during the A.M. and P.M. Peak Hours. Since background traffic growth is not anticipated at proposed Streets 'A', 'B' and 'G', the traffic conditions have not changed.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.4.1 Future (2031) Total Traffic Analysis - Recommended Improvements

For the Trafalgar Road North at Wellington Road 22 intersection, there are critical turning movements as a result of background traffic growth from the 2026 horizon year.

In order to address the critical turning movements, the following improvements are recommended beyond the recommendations made for the 2026 horizon:

- Modify the signal timing plans for the Weekday A.M. and P.M. Peak Period,
- Include a right turning lane at the northbound approach with 25 metres of storage,
- Include a right turning lane at the westbound approach with 30 metres of storage.

With the recommended improvements, all of the turning movements will operate at a Level of Service “D” or better during the A.M. and P.M. Peak Hours.

The traffic conditions with the recommended improvements are summarized in **Table 14**. The related calculations are provided in **Appendix E**.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.4.1 Future (2031) Total Traffic Analysis - Recommended Improvements (Cont'd)

Table 14: Future (2031) Total Traffic – Level of Service – with Improvements

Intersection	Turning Movement	A.M. Peak Hour				P.M. Peak Hour			
		V/C	LOS	Delay ¹	95th Queue (m)	V/C	LOS	Delay ¹	95th Queue (m)
Trafalgar Road North at Wellington Road 22 (Signalized)	Overall	0.87	C	28.9	n/a	0.96	C	29.1	n/a
	EBL	0.15	C	27.1	12.5	0.18	B	19.8	15.9
	EBT	0.87	D	50.5	88.6	0.72	D	41.1	60.1
	EBR	0.87	D	50.5	88.6	0.72	D	41.1	60.1
	WBL	0.84	D	51.3	51.5	0.43	C	24.7	29.9
	WBT	0.18	C	20.1	22.4	0.61	D	38.5	60.3
	WBR	0.15	A	2.3	3.8	0.50	A	7.9	19.4
	NBL	0.19	C	22.7	13.3	0.40	C	20.8	31.3
	NBT	0.48	C	25.9	50.2	0.96	D	49.3	188.3
	NBR	0.20	A	3.4	6.8	0.30	A	7.3	22.1
	SBL	0.54	B	14.9	39.3	0.65	C	24.4	21.6
	SBT	0.79	C	27.3	119.6	0.42	B	13.3	58.1
	SBR	0.79	C	27.3	119.6	0.42	B	13.3	58.1

Note 1: Delays are measured in seconds per vehicle.

For the Trafalgar Road North at George Street/Mill Street intersection, the westbound approach operates at a Level of Service “F” during the P.M. Peak Hour. However, with an average delay of 69.3 seconds per vehicle, it is considered acceptable for Peak Period conditions.

8. REVIEW OF ROUNDABOUT – SWEPT PATH ANALYSIS

Using the preliminary design of the roundabout intersection at proposed Street ‘A’ at proposed Street ‘B’/proposed Street ‘G’, the geometry of the roundabout was analyzed for fire emergency vehicles. Vehicle swept paths have been analyzed in AutoTURN software and are provided in **Figure RA-1**. The vehicle swept paths demonstrate that the proposed geometry and right of way is acceptable.

9. SUMMARY

The proposed Residential Subdivision is expected to generate a total of 532 trips during the A.M. Peak Hour (221 inbound trips and 311 outbound trips) and 385 trips during the P.M. Peak Hour (232 inbound trips and 153 outbound trips). During the A.M. and P.M. Peak Hours, traffic impacts from the trips generated by the proposed Residential Subdivision are moderate.

Vehicle access to the proposed Residential Subdivision from Trafalgar Road North is provided via the proposed Street 'E' that is located at the southeast corner of the Subject Property and the proposed Street 'A' that aligns with Howe Street to form a four legged intersection.

The following recommendations should be considered for the full build-out 2026 horizon year:

Trafalgar Road North at Wellington Road 22

- Modify the signal timing plans for the Weekday A.M. and P.M. Peak Period,
- Include a left turning lane at the eastbound approach with 25 metres of storage,
- Include a left turning lane at the westbound approach with 55 metres of storage,
- Extend the storage of the southbound left turning lane to 60 metres.

Proposed Street 'A'/Howe Street at Trafalgar Road North

- An un-signalized intersection with stop-controls at the eastbound and westbound approaches,
- A shared left-through-right turning lane at all approaches.

Proposed Street 'E' at Trafalgar Road North

- An un-signalized intersection with a stop-control at the eastbound approach,
- A shared through-left turning lane at the northbound approach,
- A shared left-right turning lane at the eastbound approach,
- A shared through-right turning lane at the southbound approach.

9. SUMMARY (CONT'D)

Proposed Street 'A' at proposed Street 'B'/ proposed Street 'G'

- A single lane roundabout intersection,
- A shared left-through-right turning lane at all approaches.

With the exception of the Trafalgar Road North at George Street/Mill Street intersection, all of intersections will have turning movements that operate at a Level of Service "E" or better.

For the Trafalgar Road North at George Street/Mill Street intersection, the westbound approach operates at a Level of Service "F" during the P.M. Peak Hour. However, with an average delay of 56.8 seconds per vehicle, it is considered acceptable for Peak Period conditions.

To address the growth in background traffic, the following recommendations should be considered for the five (5) year post build-out 2031 horizon year (beyond the improvements as recommended for the 2026 horizon):

Trafalgar Road North at Wellington Road 22

- Modify the signal timing plans for the Weekday A.M. and P.M. Peak Period,
- Include a right turning lane at the northbound approach with 25 metres of storage,
- Include a right turning lane at the westbound approach with 30 metres of storage.

With the exception of the Trafalgar Road North at George Street/Mill Street intersection, all of intersections will have turning movements that operate at a Level of Service "E" or better.

For the Trafalgar Road North at George Street/Mill Street intersection, during the P.M. Peak Hour, the westbound approach is anticipated to have an average delay of 69.3 seconds per vehicle. However, it is considered acceptable for Peak Period conditions.

In addition, the preliminary design of the roundabout at proposed Street 'A' at proposed Street 'B'/proposed Street 'G' demonstrates that adequate circulation will be provided for fire emergency vehicles.

9. SUMMARY (CONT'D)

Based on the analysis outlined in the Study, and with the implementation of the recommendations as outlined, all the key intersections will operate at acceptable levels of service during the Weekday A.M. and P.M. Peak Hours under the 2026 and 2031 horizon years.

This Report was prepared by:

CANDEVCON LIMITED



Brian Wong, P. Eng.
Intermediate Transportation Engineer



David Lee, P. Eng.
Project Manager

APPENDIX A

TERMS OF REFERENCE

Traffic Impact Study – Terms of Reference

- a) Assemble, review and confirm background data (i.e. traffic volume/flow on the adjacent road network during weekday peak hours) available from official sources, existing road geometry and access locations.
- b) Gather/conduct turning movement counts (if necessary) for the Howe Street at Trafalgar Road North intersection during the Weekday AM and Weekday PM Peak Hours. (We may need to use historical traffic counts given the current covid-19 situation.)
- c) Establish existing traffic patterns and historic travel growth rates for the study area.
- d) Consult with the County of Wellington and the Town of Erin to confirm data as required (i.e. growth trends, other proposed development timing etc.), issues/developments to be addressed and any anticipated future road improvements.
- e) Confirm with the County of Wellington and the Town of Erin for any future planned road improvements in the area.
- f) Assess total future trips generated by the proposed Residential Subdivision during the Weekday AM and Weekday PM Peak Hours.
- g) Develop the trip distribution and traffic assignment for the proposed Residential Subdivision during the Weekday AM and Weekday PM Peak Hours.
- h) Establish the five (5) year time horizon post full build-out of the proposed Residential Subdivision to forecast future peak periods of street traffic.
- i) Analyze peak period traffic operations at the following key site access points. (To be confirmed with the County of Wellington and the Town of Erin)
 - Street 'A'/Howe Street at Trafalgar Road North,
 - Street 'F' at Trafalgar Road North.
- j) Complete traffic operations and volume-capacity analyses using the Synchro 9.0 software.
- k) Assess existing and future total background and total traffic operations (five (5) year horizon post development) at the proposed key access points mentioned above.
- l) Prepare a report to summarize the findings of the traffic impact analysis, as well as to recommend any improvements required to mitigate the traffic impacts (if any). Submit the final report to the County of Wellington and the Town of Erin for review/comments.

Traffic Impact Study – Terms of Reference (Cont'd)

- m) Provide and circulate copies of the final report to all applicable approval authorities (first submission only).

David Lee

From: Kooistra, Tim <tkooistra@dillon.ca>
Sent: October-12-21 1:22 PM
To: Brian Wong
Cc: David Lee; Diarmuid Horgan; Pasquale Costanzo
Subject: Re: FW: W21081 - 5916 Trafalgar Road North - Terms of Reference (County of Wellington)

Hi Brian,

As promised, I am following up with regard to the proposed residential subdivision located at 5916 Trafalgar Road North (Wellington Road 24) within the Town of Erin and located immediately north of the community of Hillsburgh. As I noted during our phone call, Dillon Consulting Limited has been retained by the County of Wellington to review the proposed scope of work for traffic impact studies that may impact the County road network and associated intersections. As a result, this response is being provided on behalf of the County of Wellington for your consideration.

The required transportation impact study will need to consider the following:

- The Existing and/or Future Operational analysis at the intersections of:
 - Wellington Road 24 (Trafalgar Road) and Howe Street / future Street 'A' - currently unsignalized
 - Wellington Road 24 and Upper Canada Drive / Church Street - currently unsignalized
 - Wellington Road 22 and Wellington Road 24 - signalized (*signal timing is attached*)
- Turning movement data will need to be collected at each of these three study area intersections.
- Future Operational analysis at:
 - the proposed internal Street 'A' & Street 'B' intersection - future roundabout.
 - The proposed Wellington Road 24 (Trafalgar Road) and future Street 'E'
- Use a 2.0% per annum growth rate to forecast the traffic volumes to various horizon years including:
 - 2021 (Existing)
 - 2030 (Buildout)
 - 2035 (5 years following build-out)
- The report should include a discussion as to whether or not a local road connection to McMurchy Lane and Upper Canada Drive could be introduced rather than connecting Street 'E' to Wellington Road 24.
- The trip generation and future traffic volumes will need to explicitly consider that a school will be constructed on the school block as discussed.
- Due to the vertical profile of Wellington Road 24, a safety assessment will need to be completed at both locations. As you can see across the corridor from where Street 'E' was constructed, Barbour Drive features a cul-de-sac and no direct connection.
- Due to the vertical profile along Wellington Road 24 fronting the proposed residential development, sightline analysis needs to be completed at the locations of the two intersections are being proposed to connect to Wellington Road 24 (future Street 'A' & future Street 'E'). Based on available speeds found along this portion of the corridor, a 70 km/h design speed (posted + 30 km/h) should be used.
- The need for both a northbound left-turn lane and a southbound right-turn lane at the Howe Street / future Street 'A' intersection and the future Street 'E' intersection need to be explicitly assessed utilizing a 70 km/h design speed.

Lastly, any background developments that may impact future traffic volumes in the study area (along Wellington Road 24) will need to be identified by Town of Erin staff.

As always, please let me know if you have any questions or comments on this matter.

Thanks,

Tim

Tim Kooistra, C.E.T.
Dillon Consulting Limited
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T - 519.438.1288 ext. 1330
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M - 519.851.5403
TKooistra@dillon.ca
www.dillon.ca



On Thu, Oct 7, 2021 at 9:02 AM Pasquale Costanzo <pasqualec@wellington.ca> wrote:

Hi Tim,

Could you review the attached terms of reference for a proposed subdivision at the north end of Hillsburgh and provide any comments.

Thank you

David Lee

From: Joe Mullan <mullan@ainleygroup.com>
Sent: October-21-21 1:42 PM
To: Brian Wong
Cc: Nick Colucci; Angela Sciberras; Tanjot Bal; Pasquale Costanzo; David Lee; Diarmuid Horgan
Subject: W21081 - 5916 Trafalgar Road North - Terms of Reference (Town of Erin)
Attachments: Erin Development Ownership Map.pdf

Hi Brian:

We have review your proposed Terms of Reference for the Hillsburgh Heights (Briarwood) development and we provide the following comments:

1. Given the size of the development, we concur with the minimum of two access street from the Development onto Trafalgar Road. These access streets should be designed in accordance with the TAC Manual in relation to intersection spacing and corner clearance requirements etc.
2. Please utilize the Institute of Transportation Engineers Trip Generation Manual 10th Edition for site trip estimate and using traffic count data and Transportation Tomorrow Survey data for trip distribution.
3. Given the size of the development, future horizons should include build out year of any phases if applicable, plus the full build out year of the development, along with five and ten years post full build out.
4. It is unlikely that there is any traffic data/turning movements for Trafalgar Road and the existing intersections through Hillsburgh, therefore, we require that Traffic Counts/turning movement data be obtained for the 3 hrs Weekday AM period (7am to 10am) and 3 hrs Weekday PM from 3pm to 6pm). This will account for any possible changes that have occurred to people's work schedules because of the pandemic, whereby the peak hour may occur later in the morning or earlier in the afternoon.
5. With respect to future growth within Hillsburgh, there are four other major developments that are proposing to develop within the next number of years. Given that Trafalgar Road is the main spine of Hillsburgh, all new developments will impact the amount of traffic utilizing Trafalgar Road; therefore, these new Developments need to be accounted for in the TIS for your clients development.

The details we have associated with these future developments in Hillsburgh are noted below and the locations of each are shown on the attached map

#	Development Name	Number of Proposed SDE's
2	Carson Reid Homes Ltd	182
3	Thomasfield Homes Ltd	210
4	Dominion Packers & Realties (Tavares)	700
16	Chantler	213

6. Given the potential impact of these developments collectively (1,625 SDE's) on Trafalgar Road, please include the following intersections in the traffic counts and associated analysis within the TIS for your clients development.

- Trafalgar Road / Upper Canada Drive / Church Street
- Trafalgar Road / Mill Street/George Street
- Trafalgar Road / County 22

Should you have any questions regarding this information please do not hesitate to contact me

Regards,

J. A. Mullan, P.Eng.
President & CEO



Tel: (705) 445-3451 Ext. 126
Cell: (705) 718-7230

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From: Brian Wong <brian@candevcon.com>
Sent: Wednesday, October 6, 2021 10:12 AM
To: Nick Colucci <nick.colucci@erin.ca>
Cc: Joe Mullan <mullan@ainleygroup.com>; David Lee <david@candevcon.com>; Diarmuid Horgan <dhorgan@candevcon.com>
Subject: W21081 - 5916 Trafalgar Road North - Terms of Reference (Town of Erin)

Good Morning Nick,

We are preparing a Traffic Impact Study for a proposed Residential Subdivision that is immediately west of Trafalgar Road North and north of Upper Canada Drive. Please find the Terms of Reference and the latest Preliminary Development Plan attached for your review and comment. In the meantime, can you please provide the Traffic Impact Study and/or the Site Plan for any anticipated background developments within the vicinity of the proposed Residential Subdivision.

If you require any further information, please do not hesitate to contact me.

Brian Wong, P.Eng.

Intermediate Transportation Engineer

CANDEVCON LIMITED
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APPENDIX B

TURNING MOVEMENT COUNTS

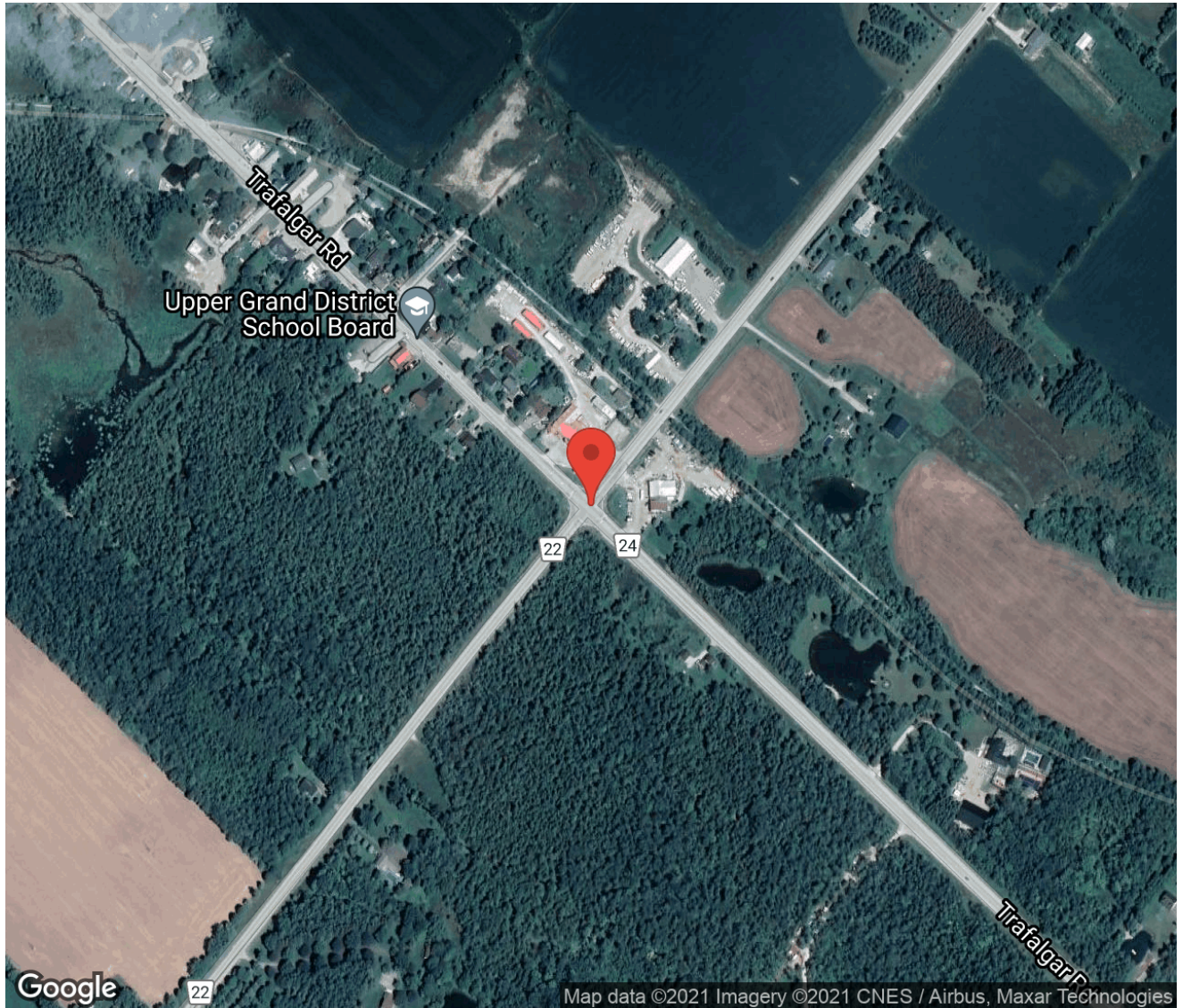
Project #21-219 - Candevcon Limited

Intersection Count Report

Intersection:	Trafalgar Rd N & Wellington Rd 22
Municipality:	Erin
Count Date:	Oct 28, 2021
Site Code:	2121900003
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	07:00-10:00, 15:00-18:00
Weather:	Clear

Traffic Count Map

Intersection:	Trafalgar Rd N & Wellington Rd 22
Site Code:	2121900003
Municipality:	Erin
Count Date:	Oct 28, 2021



Traffic Count Summary

Intersection: Trafalgar Rd N & Wellington Rd 22
 Site Code: 2121900003
 Municipality: Erin
 Count Date: Oct 28, 2021

Trafalgar Rd N - Traffic Summary

Hour	North Approach Totals						South Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	53	176	24	0	253	0	3	85	27	0	115	0	368
08:00 - 09:00	59	148	19	0	226	0	12	110	41	0	163	0	389
09:00 - 10:00	33	117	21	0	171	0	5	124	25	0	154	0	325
BREAK													
15:00 - 16:00	60	137	25	0	222	0	23	257	46	0	326	0	548
16:00 - 17:00	50	138	22	0	210	0	22	283	68	0	373	0	583
17:00 - 18:00	21	136	22	0	179	0	20	296	59	0	375	0	554
GRAND TOTAL	276	852	133	0	1261	0	85	1155	266	0	1506	0	2767

Traffic Count Summary

Intersection: Trafalgar Rd N & Wellington Rd 22
 Site Code: 2121900003
 Municipality: Erin
 Count Date: Oct 28, 2021

Wellington Rd 22 - Traffic Summary

East Approach Totals							West Approach Totals						
Hour	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						Total
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	34	34	19	0	87	0	15	36	23	0	74	0	161
08:00 - 09:00	43	41	27	0	111	0	26	55	26	0	107	0	218
09:00 - 10:00	26	32	42	0	100	0	13	33	7	0	53	0	153
BREAK													
15:00 - 16:00	38	55	94	0	187	0	24	28	15	0	67	0	254
16:00 - 17:00	43	62	81	0	186	0	44	54	11	0	109	0	295
17:00 - 18:00	32	56	70	0	158	0	43	33	4	0	80	0	238
GRAND TOTAL	216	280	333	0	829	0	165	239	86	0	490	0	1319

Traffic Count Data

Intersection: Trafalgar Rd N & Wellington Rd 22
Site Code: 2121900003
Municipality: Erin
Count Date: Oct 28, 2021

North Approach - Trafalgar Rd N

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	5	40	0	0	45	0	0	0	0	0	0	0	0	0	0	0
07:15	8	39	9	0	56	1	0	1	0	2	0	0	0	0	0	0
07:30	15	33	9	0	57	1	6	2	0	9	0	0	0	0	0	0
07:45	18	51	3	0	72	5	7	0	0	12	0	0	0	0	0	0
08:00	9	34	2	0	45	4	3	1	0	8	0	0	0	0	0	0
08:15	11	38	4	0	53	4	6	1	0	11	0	0	0	0	0	0
08:30	13	21	7	0	41	1	3	1	0	5	0	0	0	0	0	0
08:45	12	40	3	0	55	5	3	0	0	8	0	0	0	0	0	0
09:00	10	20	3	0	33	1	1	0	0	2	0	0	0	0	0	0
09:15	10	31	5	0	46	0	6	0	0	6	0	0	0	0	0	0
09:30	7	29	5	0	41	0	2	1	0	3	0	0	0	0	0	0
09:45	4	25	7	0	36	1	3	0	0	4	0	0	0	0	0	0
SUBTOTAL	122	401	57	0	580	23	40	7	0	70	0	0	0	0	0	0

Traffic Count Data

Intersection: Trafalgar Rd N & Wellington Rd 22
Site Code: 2121900003
Municipality: Erin
Count Date: Oct 28, 2021

North Approach - Trafalgar Rd N

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	14	31	1	0	46	6	6	0	0	12	0	0	0	0	0	0
15:15	14	29	11	0	54	4	0	0	0	4	0	0	0	0	0	0
15:30	8	21	3	0	32	5	4	2	0	11	0	0	0	0	0	0
15:45	6	34	7	0	47	3	12	1	0	16	0	0	0	0	0	0
16:00	9	33	5	0	47	1	2	0	0	3	0	0	0	0	0	0
16:15	15	33	4	0	52	3	2	0	0	5	0	0	0	0	0	0
16:30	9	26	9	0	44	0	1	0	0	1	0	0	0	0	0	0
16:45	13	40	4	0	57	0	1	0	0	1	0	0	0	0	0	0
17:00	7	36	7	0	50	0	0	0	0	0	0	0	0	0	0	0
17:15	6	36	6	0	48	1	2	0	0	3	0	0	0	0	0	0
17:30	2	22	5	0	29	2	3	0	0	5	0	0	0	0	0	0
17:45	2	37	4	0	43	1	0	0	0	1	0	0	0	0	0	0
SUBTOTAL	105	378	66	0	549	26	33	3	0	62	0	0	0	0	0	0
GRAND TOTAL	227	779	123	0	1129	49	73	10	0	132	0	0	0	0	0	0

Traffic Count Data

Intersection: Trafalgar Rd N & Wellington Rd 22
 Site Code: 2121900003
 Municipality: Erin
 Count Date: Oct 28, 2021

South Approach - Trafalgar Rd N

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0
07:15	0	19	3	0	22	0	6	2	0	8	0	0	0	0	0	0
07:30	1	26	6	0	33	0	4	2	0	6	0	0	0	0	0	0
07:45	2	21	13	0	36	0	4	1	0	5	0	0	0	0	0	0
08:00	2	18	12	0	32	0	6	0	0	6	0	0	0	0	0	0
08:15	4	15	11	0	30	0	5	1	0	6	0	0	0	0	0	0
08:30	2	25	6	0	33	1	3	2	0	6	0	0	0	0	0	0
08:45	3	34	7	0	44	0	4	2	0	6	0	0	0	0	0	0
09:00	1	21	6	0	28	0	2	0	0	2	0	0	0	0	0	0
09:15	2	25	5	0	32	0	9	1	0	10	0	0	0	0	0	0
09:30	0	24	4	0	28	0	7	1	0	8	0	0	0	0	0	0
09:45	2	29	6	0	37	0	7	2	0	9	0	0	0	0	0	0
SUBTOTAL	19	262	79	0	360	1	57	14	0	72	0	0	0	0	0	0

Traffic Count Data

Intersection: Trafalgar Rd N & Wellington Rd 22
Site Code: 2121900003
Municipality: Erin
Count Date: Oct 28, 2021

South Approach - Trafalgar Rd N

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
15:00	4	43	11	0	58	1	6	1	0	8	0	0	0	0	0	0
15:15	6	74	7	0	87	1	4	0	0	5	0	0	0	0	0	0
15:30	7	53	12	0	72	2	3	2	0	7	0	0	0	0	0	0
15:45	2	67	12	0	81	0	7	1	0	8	0	0	0	0	0	0
16:00	5	59	10	0	74	0	5	3	0	8	0	0	0	0	0	0
16:15	6	74	18	0	98	3	2	0	0	5	0	0	0	0	0	0
16:30	4	69	14	0	87	1	3	0	0	4	0	0	0	0	0	0
16:45	3	70	23	0	96	0	1	0	0	1	0	0	0	0	0	0
17:00	7	81	13	0	101	1	3	0	0	4	0	0	0	0	0	0
17:15	5	79	13	0	97	1	3	1	0	5	0	0	0	0	0	0
17:30	3	55	16	0	74	0	4	0	0	4	0	0	0	0	0	0
17:45	3	69	16	0	88	0	2	0	0	2	0	0	0	0	0	0
SUBTOTAL	55	793	165	0	1013	10	43	8	0	61	0	0	0	0	0	0
GRAND TOTAL	74	1055	244	0	1373	11	100	22	0	133	0	0	0	0	0	0

Traffic Count Data

Intersection: Trafalgar Rd N & Wellington Rd 22
 Site Code: 2121900003
 Municipality: Erin
 Count Date: Oct 28, 2021

East Approach - Wellington Rd 22

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0
07:15	10	8	4	0	22	0	0	3	0	3	0	0	0	0	0	0
07:30	9	8	5	0	22	2	1	1	0	4	0	0	0	0	0	0
07:45	11	11	6	0	28	2	0	0	0	2	0	0	0	0	0	0
08:00	14	7	6	0	27	5	0	4	0	9	0	0	0	0	0	0
08:15	9	11	7	0	27	2	1	1	0	4	0	0	0	0	0	0
08:30	5	10	5	0	20	1	1	1	0	3	0	0	0	0	0	0
08:45	4	10	2	0	16	3	1	1	0	5	0	0	0	0	0	0
09:00	6	7	10	0	23	2	1	1	0	4	0	0	0	0	0	0
09:15	7	5	8	0	20	0	1	1	0	2	0	0	0	0	0	0
09:30	3	7	7	0	17	0	1	1	0	2	0	0	0	0	0	0
09:45	5	6	11	0	22	3	4	3	0	10	0	0	0	0	0	0
SUBTOTAL	83	96	71	0	250	20	11	17	0	48	0	0	0	0	0	0

Traffic Count Data

Intersection: Trafalgar Rd N & Wellington Rd 22
Site Code: 2121900003
Municipality: Erin
Count Date: Oct 28, 2021

East Approach - Wellington Rd 22

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	5	8	24	0	37	0	0	1	0	1	0	0	0	0	0	0
15:15	10	19	25	0	54	0	0	3	0	3	0	0	0	0	0	0
15:30	9	12	16	0	37	0	0	5	0	5	0	0	0	0	0	0
15:45	14	15	19	0	48	0	1	1	0	2	0	0	0	0	0	0
16:00	8	19	16	0	43	0	0	2	0	2	0	0	0	0	0	0
16:15	11	17	19	0	47	1	0	0	0	1	0	0	0	0	0	0
16:30	8	10	16	0	34	0	0	2	0	2	0	0	0	0	0	0
16:45	14	16	26	0	56	1	0	0	0	1	0	0	0	0	0	0
17:00	12	14	23	0	49	0	1	0	0	1	0	0	0	0	0	0
17:15	9	14	19	0	42	0	0	1	0	1	0	0	0	0	0	0
17:30	6	17	18	0	41	0	0	0	0	0	0	0	0	0	0	0
17:45	5	10	9	0	24	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	111	171	230	0	512	2	2	15	0	19	0	0	0	0	0	0
GRAND TOTAL	194	267	301	0	762	22	13	32	0	67	0	0	0	0	0	0

Traffic Count Data

Intersection: Trafalgar Rd N & Wellington Rd 22
 Site Code: 2121900003
 Municipality: Erin
 Count Date: Oct 28, 2021

West Approach - Wellington Rd 22

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
07:15	1	8	8	0	17	2	0	0	0	2	0	0	0	0	0	0
07:30	1	14	5	0	20	1	0	1	0	2	0	0	0	0	0	0
07:45	10	14	7	0	31	0	0	0	0	0	0	0	0	0	0	0
08:00	3	19	9	0	31	0	1	0	0	1	0	0	0	0	0	0
08:15	6	8	5	0	19	1	0	0	0	1	0	0	0	0	0	0
08:30	4	10	6	0	20	0	1	0	0	1	0	0	0	0	0	0
08:45	9	16	6	0	31	3	0	0	0	3	0	0	0	0	0	0
09:00	1	7	3	0	11	2	0	1	0	3	0	0	0	0	0	0
09:15	5	9	2	0	16	0	1	0	0	1	0	0	0	0	0	0
09:30	2	4	0	0	6	0	0	0	0	0	0	0	0	0	0	0
09:45	3	12	1	0	16	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	45	121	54	0	220	9	3	2	0	14	0	0	0	0	0	0

Traffic Count Data

Intersection: Trafalgar Rd N & Wellington Rd 22
Site Code: 2121900003
Municipality: Erin
Count Date: Oct 28, 2021

West Approach - Wellington Rd 22

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	4	5	3	0	12	0	0	2	0	2	0	0	0	0	0	0
15:15	7	7	1	0	15	1	0	0	0	1	0	0	0	0	0	0
15:30	5	8	4	0	17	0	0	0	0	0	0	0	0	0	0	0
15:45	6	7	3	0	16	1	1	2	0	4	0	0	0	0	0	0
16:00	12	12	3	0	27	1	0	1	0	2	0	0	0	0	0	0
16:15	11	12	1	0	24	0	0	0	0	0	0	0	0	0	0	0
16:30	6	14	3	0	23	0	0	0	0	0	0	0	0	0	0	0
16:45	14	15	2	0	31	0	1	1	0	2	0	0	0	0	0	0
17:00	9	8	0	0	17	0	0	0	0	0	0	0	0	0	0	0
17:15	9	8	2	0	19	0	0	0	0	0	0	0	0	0	0	0
17:30	12	4	0	0	16	0	1	1	0	2	0	0	0	0	0	0
17:45	13	12	0	0	25	0	0	1	0	1	0	0	0	0	0	0
SUBTOTAL	108	112	22	0	242	3	3	8	0	14	0	0	0	0	0	0
GRAND TOTAL	153	233	76	0	462	12	6	10	0	28	0	0	0	0	0	0

Peak Hour Diagram

Specified Period

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

One Hour Peak

From: 07:30:00
To: 08:30:00

Intersection: Trafalgar Rd N & Wellington Rd 22
Site Code: 2121900003
Count Date: Oct 28, 2021

Weather conditions: Clear

**** Signalized Intersection ****

Major Road: Trafalgar Rd N runs N/S

North Approach

	Out	In	Total
	227	124	351
	40	27	67
	0	0	0
Totals	267	151	418

Trafalgar Rd N

	0	0	0	0
	4	22	14	0
	18	156	53	0
Totals	22	178	67	0






East Approach

	Out	In	Total
	104	150	254
	19	19	38
	0	0	0
Totals	123	169	292

Wellington Rd 22

				Totals
	0	0	0	0
	0	2	20	22
	0	1	55	56
	0	1	26	27






Peds: 0

Peds: 0



Peds: 0

Peds: 0

Wellington Rd 22

Totals			
0	0	0	0
30	24	6	0
39	37	2	0
54	43	11	0






West Approach

	Out	In	Total
	101	64	165
	4	6	10
	0	0	0
Totals	105	70	175

Totals				
9	99	46	0	0
	9	80	42	0
	0	19	4	0
	0	0	0	0

Trafalgar Rd N

South Approach

	Out	In	Total
	131	225	356
	23	34	57
	0	0	0
Totals	154	259	413

 - Cars

 - Trucks

 - Bicycles

Comments

Peak Hour Summary

Intersection: Trafalgar Rd N & Wellington Rd 22
Site Code: 2121900003
Count Date: Oct 28, 2021
Period: 07:00 - 10:00

Peak Hour Data (07:30 - 08:30)

Start Time	North Approach Trafalgar Rd N						South Approach Trafalgar Rd N						East Approach Wellington Rd 22						West Approach Wellington Rd 22						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
07:30	16	39	11	0	0	66	1	30	8	0	0	39	11	9	6	0	0	26	2	14	6	0	0	22	153
07:45	23	58	3	0	0	84	2	25	14	0	0	41	13	11	6	0	0	30	10	14	7	0	0	31	186
08:00	13	37	3	0	0	53	2	24	12	0	0	38	19	7	10	0	0	36	3	20	9	0	0	32	159
08:15	15	44	5	0	0	64	4	20	12	0	0	36	11	12	8	0	0	31	7	8	5	0	0	20	151
Grand Total	67	178	22	0	0	267	9	99	46	0	0	154	54	39	30	0	0	123	22	56	27	0	0	105	649
Approach %	25.1	66.7	8.2	0	-	-	5.8	64.3	29.9	0	-	-	43.9	31.7	24.4	0	-	-	21	53.3	25.7	0	-	-	-
Totals %	10.3	27.4	3.4	0	-	41.1	1.4	15.3	7.1	0	-	23.7	8.3	6	4.6	0	-	19	3.4	8.6	4.2	0	-	16.2	-
PHF	0.73	0.77	0.5	0	-	0.79	0.56	0.83	0.82	0	-	0.94	0.71	0.81	0.75	0	-	0.85	0.55	0.7	0.75	0	-	0.82	0.87
Cars	53	156	18	0	-	227	9	80	42	0	-	131	43	37	24	0	-	104	20	55	26	0	-	101	563
% Cars	79.1	87.6	81.8	0	-	85	100	80.8	91.3	0	-	85.1	79.6	94.9	80	0	-	84.6	90.9	98.2	96.3	0	-	96.2	86.7
Trucks	14	22	4	0	-	40	0	19	4	0	-	23	11	2	6	0	-	19	2	1	1	0	-	4	86
% Trucks	20.9	12.4	18.2	0	-	15	0	19.2	8.7	0	-	14.9	20.4	5.1	20	0	-	15.4	9.1	1.8	3.7	0	-	3.8	13.3
Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
Peds	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	0
% Peds	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-

Peak Hour Diagram

Specified Period

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

One Hour Peak

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

Intersection: Trafalgar Rd N & Wellington Rd 22
Site Code: 2121900003
Count Date: Oct 28, 2021

Weather conditions: Clear

**** Signalized Intersection ****

Major Road: Trafalgar Rd N runs N/S

North Approach

	Out	In	Total
	203	418	621
	7	11	18
	0	0	0
Totals	210	429	639

Trafalgar Rd N

	0	0	0	0
	0	4	3	0
	24	135	44	0
Totals	24	139	47	0






East Approach

	Out	In	Total
	186	161	347
	5	4	9
	0	0	0
Totals	191	165	356

Wellington Rd 22

				Totals
	0	0	0	0
	0	0	40	40
	0	1	49	50
	0	1	6	7






Peds: 0

Peds: 0



Peds: 0

Peds: 0

Wellington Rd 22

Totals			
0	0	0	0
86	84	2	0
58	57	1	0
47	45	2	0






West Approach

	Out	In	Total
	95	101	196
	2	6	8
	0	0	0
Totals	97	107	204

Totals				
	20	294	68	0
	5	9	0	0
	0	0	0	0

Trafalgar Rd N

South Approach

	Out	In	Total
	382	186	568
	14	7	21
	0	0	0
Totals	396	193	589

 - Cars

 - Trucks

 - Bicycles

Comments

Peak Hour Summary

Intersection: Trafalgar Rd N & Wellington Rd 22
Site Code: 2121900003
Count Date: Oct 28, 2021
Period: 15:00 - 18:00

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

Start Time	North Approach Trafalgar Rd N						South Approach Trafalgar Rd N						East Approach Wellington Rd 22						West Approach Wellington Rd 22						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
16:15	18	35	4	0	0	57	9	76	18	0	0	103	12	17	19	0	0	48	11	12	1	0	0	24	232
16:30	9	27	9	0	0	45	5	72	14	0	0	91	8	10	18	0	0	36	6	14	3	0	0	23	195
16:45	13	41	4	0	0	58	3	71	23	0	0	97	15	16	26	0	0	57	14	16	3	0	0	33	245
17:00	7	36	7	0	0	50	8	84	13	0	0	105	12	15	23	0	0	50	9	8	0	0	0	17	222
Grand Total	47	139	24	0	0	210	25	303	68	0	0	396	47	58	86	0	0	191	40	50	7	0	0	97	894
Approach %	22.4	66.2	11.4	0	-	-	6.3	76.5	17.2	0	-	-	24.6	30.4	45	0	-	-	41.2	51.5	7.2	0	-	-	-
Totals %	5.3	15.5	2.7	0	-	23.5	2.8	33.9	7.6	0	-	44.3	5.3	6.5	9.6	0	-	21.4	4.5	5.6	0.8	0	-	10.9	-
PHF	0.65	0.85	0.67	0	-	0.91	0.69	0.9	0.74	0	-	0.94	0.78	0.85	0.83	0	-	0.84	0.71	0.78	0.58	0	-	0.73	0.91
Cars	44	135	24	0	-	203	20	294	68	0	-	382	45	57	84	0	-	186	40	49	6	0	-	95	866
% Cars	93.6	97.1	100	0	-	96.7	80	97	100	0	-	96.5	95.7	98.3	97.7	0	-	97.4	100	98	85.7	0	-	97.9	96.9
Trucks	3	4	0	0	-	7	5	9	0	0	-	14	2	1	2	0	-	5	0	1	1	0	-	2	28
% Trucks	6.4	2.9	0	0	-	3.3	20	3	0	0	-	3.5	4.3	1.7	2.3	0	-	2.6	0	2	14.3	0	-	2.1	3.1
Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
Peds	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	0
% Peds	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-

Project #21-219 - Candevcon Limited

Intersection Count Report

Intersection:	Trafalgar Rd N & Mill St-George St
Municipality:	Erin
Count Date:	Oct 28, 2021
Site Code:	2121900004
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	07:00-10:00, 15:00-18:00
Weather:	Clear

Traffic Count Map

Intersection:	Trafalgar Rd N & Mill St-George St
Site Code:	2121900004
Municipality:	Erin
Count Date:	Oct 28, 2021



Traffic Count Summary

Intersection: Trafalgar Rd N & Mill St-George St
 Site Code: 2121900004
 Municipality: Erin
 Count Date: Oct 28, 2021

Trafalgar Rd N - Traffic Summary

Hour	North Approach Totals						South Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	2	219	3	0	224	0	4	119	4	0	127	1	351
08:00 - 09:00	8	176	0	0	184	0	14	120	10	0	144	1	328
09:00 - 10:00	5	127	3	0	135	0	18	134	15	0	167	0	302
BREAK													
15:00 - 16:00	15	167	5	0	187	1	61	224	40	0	325	0	512
16:00 - 17:00	11	156	4	0	171	0	51	286	38	0	375	0	546
17:00 - 18:00	14	124	2	0	140	0	50	284	41	0	375	2	515
GRAND TOTAL	55	969	17	0	1041	1	198	1167	148	0	1513	4	2554

Traffic Count Summary

Intersection: Trafalgar Rd N & Mill St-George St
 Site Code: 2121900004
 Municipality: Erin
 Count Date: Oct 28, 2021

Mill St - Traffic Summary

East Approach Totals							West Approach Totals						
Hour	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						Total
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	17	0	7	0	24	0	2	2	8	0	12	0	36
08:00 - 09:00	29	3	7	0	39	3	7	1	8	0	16	0	55
09:00 - 10:00	19	5	5	0	29	0	2	2	23	0	27	0	56
BREAK													
15:00 - 16:00	24	10	13	0	47	0	20	9	44	0	73	0	120
16:00 - 17:00	25	13	13	0	51	3	20	8	30	0	58	5	109
17:00 - 18:00	14	6	8	0	28	0	14	16	29	0	59	2	87
GRAND TOTAL	128	37	53	0	218	6	65	38	142	0	245	7	463

Traffic Count Data

Intersection: Trafalgar Rd N & Mill St-George St
Site Code: 2121900004
Municipality: Erin
Count Date: Oct 28, 2021

North Approach - Trafalgar Rd N

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	1	25	2	0	28	0	0	0	0	0	0	0	0	0	0	0
07:15	0	57	0	0	57	0	8	0	0	8	0	0	0	0	0	0
07:30	1	52	0	0	53	0	6	0	0	6	0	0	0	0	0	0
07:45	0	59	1	0	60	0	12	0	0	12	0	0	0	0	0	0
08:00	1	43	0	0	44	0	7	0	0	7	0	0	0	0	0	0
08:15	2	32	0	0	34	0	7	0	0	7	0	0	0	0	0	0
08:30	2	35	0	0	37	0	10	0	0	10	0	0	0	0	0	0
08:45	3	36	0	0	39	0	6	0	0	6	0	0	0	0	0	0
09:00	0	24	1	0	25	0	6	0	0	6	0	0	0	0	0	0
09:15	2	27	1	0	30	1	3	0	0	4	0	0	0	0	0	0
09:30	2	30	1	0	33	0	7	0	0	7	0	0	0	0	0	0
09:45	0	27	0	0	27	0	3	0	0	3	0	0	0	0	0	0
SUBTOTAL	14	447	6	0	467	1	75	0	0	76	0	0	0	0	0	0

Traffic Count Data

Intersection: Trafalgar Rd N & Mill St-George St
Site Code: 2121900004
Municipality: Erin
Count Date: Oct 28, 2021

North Approach - Trafalgar Rd N

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	3	38	2	0	43	0	9	0	0	9	0	0	0	0	0	0
15:15	3	35	0	0	38	0	5	0	0	5	0	0	0	0	0	0
15:30	5	22	0	0	27	0	6	0	0	6	0	0	0	0	0	1
15:45	4	40	3	0	47	0	12	0	0	12	0	0	0	0	0	0
16:00	6	44	3	0	53	0	4	0	0	4	0	0	0	0	0	0
16:15	0	45	0	0	45	0	2	0	0	2	0	0	0	0	0	0
16:30	3	31	0	0	34	0	1	0	0	1	0	0	0	0	0	0
16:45	2	28	1	0	31	0	1	0	0	1	0	0	0	0	0	0
17:00	4	35	0	0	39	0	1	0	0	1	0	0	0	0	0	0
17:15	7	35	0	0	42	0	1	0	0	1	0	0	0	0	0	0
17:30	3	27	1	0	31	0	1	0	0	1	0	0	0	0	0	0
17:45	0	23	1	0	24	0	1	0	0	1	0	0	0	0	0	0
SUBTOTAL	40	403	11	0	454	0	44	0	0	44	0	0	0	0	0	1
GRAND TOTAL	54	850	17	0	921	1	119	0	0	120	0	0	0	0	0	1

Traffic Count Data

Intersection: Trafalgar Rd N & Mill St-George St
Site Code: 2121900004
Municipality: Erin
Count Date: Oct 28, 2021

South Approach - Trafalgar Rd N

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	0	17	0	0	17	0	0	0	0	0	0	0	0	0	0	0
07:15	0	28	2	0	30	0	6	0	0	6	0	0	0	0	0	1
07:30	0	27	0	0	27	0	6	0	0	6	0	0	0	0	0	0
07:45	4	28	1	0	33	0	7	1	0	8	0	0	0	0	0	0
08:00	2	21	6	0	29	0	10	0	0	10	0	0	0	0	0	0
08:15	3	19	0	0	22	0	8	0	0	8	0	0	0	0	0	0
08:30	4	26	1	0	31	0	5	0	0	5	0	0	0	0	0	1
08:45	5	25	3	0	33	0	6	0	0	6	0	0	0	0	0	0
09:00	7	22	4	0	33	0	7	0	0	7	0	0	0	0	0	0
09:15	5	23	2	0	30	1	8	2	0	11	0	0	0	0	0	0
09:30	2	28	0	0	30	0	5	0	0	5	0	0	0	0	0	0
09:45	3	30	6	0	39	0	11	1	0	12	0	0	0	0	0	0
SUBTOTAL	35	294	25	0	354	1	79	4	0	84	0	0	0	0	0	2

Traffic Count Data

Intersection: Trafalgar Rd N & Mill St-George St
Site Code: 2121900004
Municipality: Erin
Count Date: Oct 28, 2021

South Approach - Trafalgar Rd N

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	12	46	10	0	68	0	8	0	0	8	0	0	0	0	0	0
15:15	19	49	7	0	75	0	6	0	0	6	0	0	0	0	0	0
15:30	14	50	8	0	72	1	5	2	0	8	0	0	0	0	0	0
15:45	15	56	12	0	83	0	4	1	0	5	0	0	0	0	0	0
16:00	11	61	15	0	87	0	9	0	0	9	0	0	0	0	0	0
16:15	13	75	14	0	102	2	1	0	0	3	0	0	0	0	0	0
16:30	15	73	3	0	91	0	5	0	0	5	0	0	0	0	0	0
16:45	10	61	6	0	77	0	1	0	0	1	0	0	0	0	0	0
17:00	15	74	17	0	106	0	2	0	0	2	0	0	0	0	0	0
17:15	11	80	9	0	100	0	5	0	0	5	0	0	0	0	0	0
17:30	11	56	7	0	74	0	3	0	0	3	0	0	0	0	0	2
17:45	13	61	8	0	82	0	3	0	0	3	0	0	0	0	0	0
SUBTOTAL	159	742	116	0	1017	3	52	3	0	58	0	0	0	0	0	2
GRAND TOTAL	194	1036	141	0	1371	4	131	7	0	142	0	0	0	0	0	4

Traffic Count Data

Intersection: Trafalgar Rd N & Mill St-George St
Site Code: 2121900004
Municipality: Erin
Count Date: Oct 28, 2021

East Approach - Mill St

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
07:15	5	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0
07:30	8	0	3	0	11	0	0	0	0	0	0	0	0	0	0	0
07:45	3	0	4	0	7	0	0	0	0	0	0	0	0	0	0	0
08:00	10	0	3	0	13	2	0	1	0	3	0	0	0	0	0	0
08:15	3	0	1	0	4	1	0	0	0	1	0	0	0	0	0	0
08:30	7	2	0	0	9	1	0	0	0	1	0	0	0	0	0	3
08:45	5	1	1	0	7	0	0	1	0	1	0	0	0	0	0	0
09:00	6	0	2	0	8	0	0	0	0	0	0	0	0	0	0	0
09:15	5	2	1	0	8	0	0	0	0	0	0	0	0	0	0	0
09:30	3	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0
09:45	4	2	2	0	8	1	0	0	0	1	0	0	0	0	0	0
SUBTOTAL	60	8	17	0	85	5	0	2	0	7	0	0	0	0	0	3

Traffic Count Data

Intersection: Trafalgar Rd N & Mill St-George St
Site Code: 2121900004
Municipality: Erin
Count Date: Oct 28, 2021

East Approach - Mill St

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	6	1	3	0	10	1	0	0	0	1	0	0	0	0	0	0
15:15	8	5	2	0	15	0	0	0	0	0	0	0	0	0	0	0
15:30	1	2	3	0	6	1	0	0	0	1	0	0	0	0	0	0
15:45	4	2	5	0	11	3	0	0	0	3	0	0	0	0	0	0
16:00	6	3	6	0	15	0	0	0	0	0	0	0	0	0	0	0
16:15	6	5	2	0	13	1	0	0	0	1	0	0	0	0	0	3
16:30	7	1	5	0	13	0	0	0	0	0	0	0	0	0	0	0
16:45	5	4	0	0	9	0	0	0	0	0	0	0	0	0	0	0
17:00	4	1	3	0	8	0	0	0	0	0	0	0	0	0	0	0
17:15	3	3	3	0	9	0	0	0	0	0	0	0	0	0	0	0
17:30	1	1	2	0	4	0	0	0	0	0	0	0	0	0	0	0
17:45	6	1	0	0	7	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	57	29	34	0	120	6	0	0	0	6	0	0	0	0	0	3
GRAND TOTAL	117	37	51	0	205	11	0	2	0	13	0	0	0	0	0	6

Traffic Count Data

Intersection: Trafalgar Rd N & Mill St-George St
 Site Code: 2121900004
 Municipality: Erin
 Count Date: Oct 28, 2021

West Approach - George St

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	1	1	3	0	5	0	0	0	0	0	0	0	0	0	0	0
07:15	1	1	3	0	5	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
08:30	3	1	4	0	8	0	0	0	0	0	0	0	0	0	0	0
08:45	4	0	2	0	6	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	9	0	9	0	0	0	0	0	0	0	0	0	0	0
09:15	0	1	5	0	6	1	0	2	0	3	0	0	0	0	0	0
09:30	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0
09:45	1	1	4	0	6	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	10	5	36	0	51	1	0	3	0	4	0	0	0	0	0	0

Traffic Count Data

Intersection: Trafalgar Rd N & Mill St-George St
Site Code: 2121900004
Municipality: Erin
Count Date: Oct 28, 2021

West Approach - George St

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	9	1	14	0	24	0	0	1	0	1	0	0	0	0	0	0
15:15	5	1	9	0	15	0	0	0	0	0	0	0	0	0	0	0
15:30	1	2	10	0	13	0	0	0	0	0	2	0	0	0	2	0
15:45	2	5	10	0	17	1	0	0	0	1	0	0	0	0	0	0
16:00	4	2	11	0	17	0	0	0	0	0	2	0	0	0	2	0
16:15	4	6	8	0	18	0	0	0	0	0	0	0	0	0	0	3
16:30	4	0	7	0	11	2	0	0	0	2	0	0	0	0	0	2
16:45	4	0	4	0	8	0	0	0	0	0	0	0	0	0	0	0
17:00	2	10	11	0	23	0	0	0	0	0	0	0	0	0	0	0
17:15	9	2	10	0	21	0	0	0	0	0	0	0	0	0	0	0
17:30	1	2	3	0	6	0	0	0	0	0	0	0	0	0	0	2
17:45	2	2	5	0	9	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	47	33	102	0	182	3	0	1	0	4	4	0	0	0	4	7
GRAND TOTAL	57	38	138	0	233	4	0	4	0	8	4	0	0	0	4	7

Peak Hour Diagram

Specified Period

From: 07:00:00

To: 10:00:00

One Hour Peak

From: 07:15:00

To: 08:15:00

Intersection: Trafalgar Rd N & Mill St-George St

Site Code: 2121900004

Count Date: Oct 28, 2021

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Trafalgar Rd N runs N/S

North Approach

	Out	In	Total
	214	115	329
	33	30	63
	0	0	0
Totals	247	145	392

Trafalgar Rd N

	0	0	0	0
	0	33	0	0
	1	211	2	0
Totals	1	244	2	0

East Approach

	Out	In	Total
	36	12	48
	3	1	4
	0	0	0
Totals	39	13	52

George St

				Totals
	0	0	0	0
	0	0	1	1
	0	0	1	1
	0	1	5	6

Peds: 0

Peds: 0



Peds: 0

Peds: 1

Mill St

Totals			
0	0	0	0
11	10	1	0
0	0	0	0
28	26	2	0

West Approach

	Out	In	Total
	7	7	14
	1	0	1
	0	0	0
Totals	8	7	15

Totals				
	6	104	9	0
	0	29	1	0
	0	0	0	0

Trafalgar Rd N

South Approach

	Out	In	Total
	119	242	361
	30	36	66
	0	0	0
Totals	149	278	427

- Cars

- Trucks

- Bicycles

Comments

Peak Hour Summary

Intersection: Trafalgar Rd N & Mill St-George St
Site Code: 2121900004
Count Date: Oct 28, 2021
Period: 07:00 - 10:00

Peak Hour Data (07:15 - 08:15)

Start Time	North Approach Trafalgar Rd N						South Approach Trafalgar Rd N						East Approach Mill St						West Approach George St						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
07:15	0	65	0	0	0	65	0	34	2	0	1	36	5	0	0	0	0	5	1	1	3	0	0	5	111
07:30	1	58	0	0	0	59	0	33	0	0	0	33	8	0	3	0	0	11	0	0	2	0	0	2	105
07:45	0	71	1	0	0	72	4	35	2	0	0	41	3	0	4	0	0	7	0	0	0	0	0	0	120
08:00	1	50	0	0	0	51	2	31	6	0	0	39	12	0	4	0	0	16	0	0	1	0	0	1	107
Grand Total	2	244	1	0	0	247	6	133	10	0	1	149	28	0	11	0	0	39	1	1	6	0	0	8	443
Approach %	0.8	98.8	0.4	0	-	-	4	89.3	6.7	0	-	-	71.8	0	28.2	0	-	-	12.5	12.5	75	0	-	-	-
Totals %	0.5	55.1	0.2	0	-	55.8	1.4	30	2.3	0	-	33.6	6.3	0	2.5	0	-	8.8	0.2	0.2	1.4	0	-	1.8	-
PHF	0.5	0.86	0.25	0	-	0.86	0.38	0.95	0.42	0	-	0.91	0.58	0	0.69	0	-	0.61	0.25	0.25	0.5	0	-	0.4	0.92
Cars	2	211	1	0	-	214	6	104	9	0	-	119	26	0	10	0	-	36	1	1	5	0	-	7	376
% Cars	100	86.5	100	0	-	86.6	100	78.2	90	0	-	79.9	92.9	0	90.9	0	-	92.3	100	100	83.3	0	-	87.5	84.9
Trucks	0	33	0	0	-	33	0	29	1	0	-	30	2	0	1	0	-	3	0	0	1	0	-	1	67
% Trucks	0	13.5	0	0	-	13.4	0	21.8	10	0	-	20.1	7.1	0	9.1	0	-	7.7	0	0	16.7	0	-	12.5	15.1
Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
Peds	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	1
% Peds	-	-	-	-	0	-	-	-	-	-	100	-	-	-	-	-	0	-	-	-	-	-	0	-	-

Peak Hour Diagram

Specified Period

From: 15:00:00

To: 18:00:00

One Hour Peak

From: 15:45:00

To: 16:45:00

Intersection: Trafalgar Rd N & Mill St-George St

Site Code: 2121900004

Count Date: Oct 28, 2021

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Trafalgar Rd N runs N/S

North Approach

	Out	In	Total
	179	297	476
	19	22	41
	0	2	2
Totals	198	321	519

Trafalgar Rd N

	0	0	0	0
	0	19	0	0
	6	160	13	0
Totals	6	179	13	0

East Approach

	Out	In	Total
	52	70	122
	4	1	5
	0	0	0
Totals	56	71	127

George St

				Totals
	0	0	0	0
	2	3	14	19
	0	0	13	13
	0	0	36	36

Peds: 0



Peds: 5

Peds: 3

Peds: 0

Mill St

Totals			
0	0	0	0
18	18	0	0
11	11	0	0
27	23	4	0

West Approach

	Out	In	Total
	63	71	134
	3	2	5
	2	0	2
Totals	68	73	141

				
Totals	56	284	45	0
	54	265	44	0
	2	19	1	0
	0	0	0	0

Trafalgar Rd N

South Approach

	Out	In	Total
	363	219	582
	22	23	45
	0	0	0
Totals	385	242	627

- Cars

- Trucks

- Bicycles

Comments

Peak Hour Summary

Intersection: Trafalgar Rd N & Mill St-George St
Site Code: 2121900004
Count Date: Oct 28, 2021
Period: 15:00 - 18:00

Peak Hour Data (15:45 - 16:45)

Start Time	North Approach Trafalgar Rd N						South Approach Trafalgar Rd N						East Approach Mill St						West Approach George St						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
15:45	4	52	3	0	0	59	15	60	13	0	0	88	7	2	5	0	0	14	3	5	10	0	0	18	179
16:00	6	48	3	0	0	57	11	70	15	0	0	96	6	3	6	0	0	15	6	2	11	0	0	19	187
16:15	0	47	0	0	0	47	15	76	14	0	0	105	7	5	2	0	3	14	4	6	8	0	3	18	184
16:30	3	32	0	0	0	35	15	78	3	0	0	96	7	1	5	0	0	13	6	0	7	0	2	13	157
Grand Total	13	179	6	0	0	198	56	284	45	0	0	385	27	11	18	0	3	56	19	13	36	0	5	68	707
Approach %	6.6	90.4	3	0		-	14.5	73.8	11.7	0		-	48.2	19.6	32.1	0		-	27.9	19.1	52.9	0		-	
Totals %	1.8	25.3	0.8	0		28	7.9	40.2	6.4	0		54.5	3.8	1.6	2.5	0		7.9	2.7	1.8	5.1	0		9.6	
PHF	0.54	0.86	0.5	0		0.84	0.93	0.91	0.75	0		0.92	0.96	0.55	0.75	0		0.93	0.79	0.54	0.82	0		0.89	0.95
Cars	13	160	6	0		179	54	265	44	0		363	23	11	18	0		52	14	13	36	0		63	657
% Cars	100	89.4	100	0		90.4	96.4	93.3	97.8	0		94.3	85.2	100	100	0		92.9	73.7	100	100	0		92.6	92.9
Trucks	0	19	0	0		19	2	19	1	0		22	4	0	0	0		4	3	0	0	0		3	48
% Trucks	0	10.6	0	0		9.6	3.6	6.7	2.2	0		5.7	14.8	0	0	0		7.1	15.8	0	0	0		4.4	6.8
Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	2	0	0	0		2	2
% Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	10.5	0	0	0		2.9	0.3
Peds					0	-					0	-					3	-					5	-	8
% Peds					0	-					0	-					37.5	-					62.5	-	

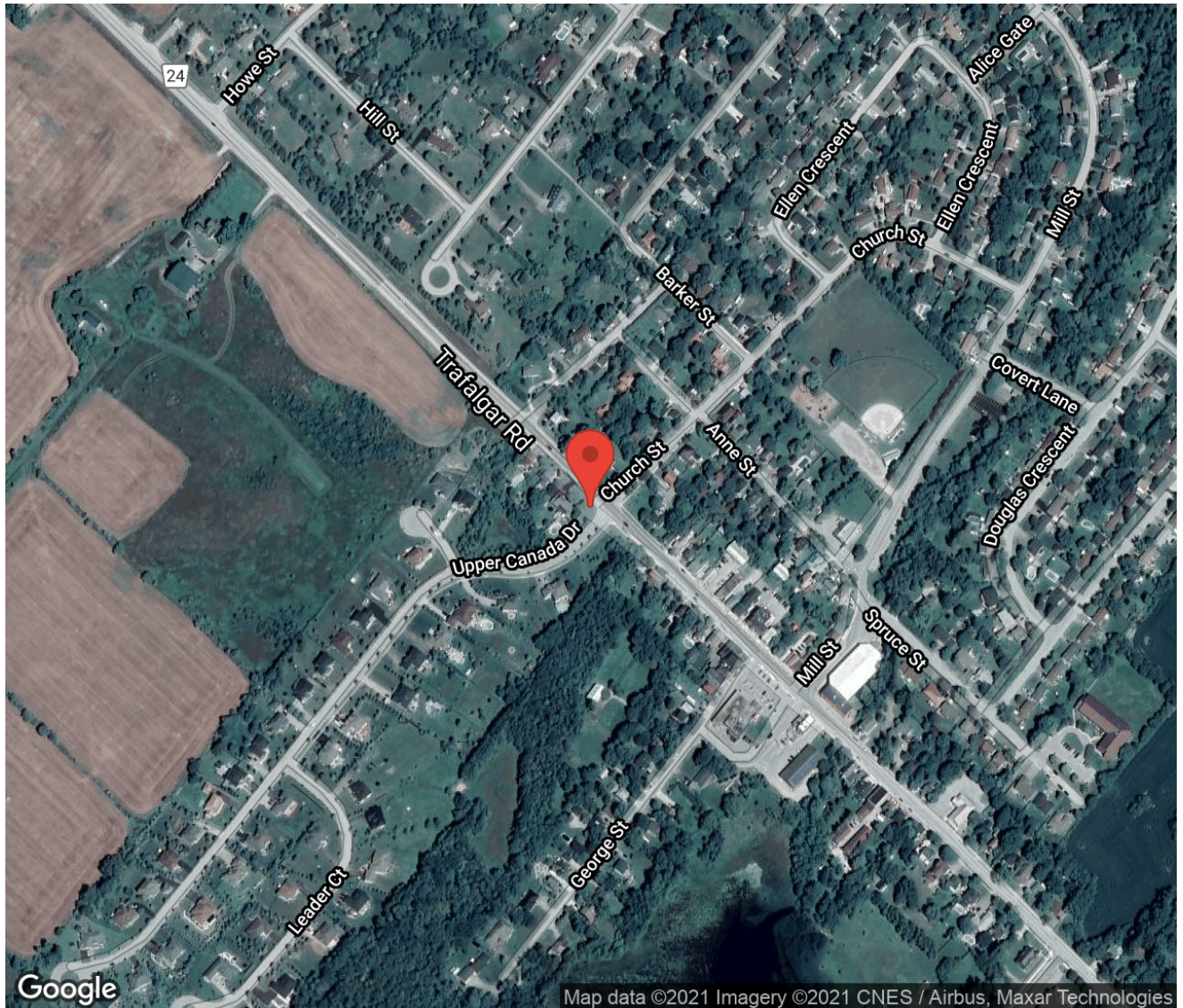
Project #21-219 - Candevcon Limited

Intersection Count Report

Intersection:	Trafalgar Rd N & Upper Canada Dr-Church St
Municipality:	Erin
Count Date:	Oct 28, 2021
Site Code:	2121900002
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	07:00-10:00, 15:00-18:00
Weather:	Clear

Traffic Count Map

Intersection:	Trafalgar Rd N & Upper Canada Dr-Church St
Site Code:	2121900002
Municipality:	Erin
Count Date:	Oct 28, 2021



Traffic Count Summary

Intersection: Trafalgar Rd N & Upper Canada Dr-Church St
Site Code: 2121900002
Municipality: Erin
Count Date: Oct 28, 2021

Trafalgar Rd N - Traffic Summary

Hour	North Approach Totals						South Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	2	200	1	0	203	0	1	120	4	0	125	4	328
08:00 - 09:00	1	142	1	0	144	2	7	107	5	0	119	0	263
09:00 - 10:00	4	103	1	0	108	0	1	118	6	0	125	2	233
BREAK													
15:00 - 16:00	4	179	3	0	186	0	8	245	15	0	268	1	454
16:00 - 17:00	6	190	2	0	198	1	16	325	10	0	351	5	549
17:00 - 18:00	7	139	2	0	148	0	13	300	9	0	322	1	470
GRAND TOTAL	24	953	10	0	987	3	46	1215	49	0	1310	13	2297

Traffic Count Summary

Intersection: Trafalgar Rd N & Upper Canada Dr-Church St
 Site Code: 2121900002
 Municipality: Erin
 Count Date: Oct 28, 2021

Church St - Traffic Summary

Hour	East Approach Totals						West Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	8	0	2	0	10	0	4	0	13	0	17	0	27
08:00 - 09:00	7	1	5	0	13	0	3	0	10	0	13	5	26
09:00 - 10:00	8	0	4	0	12	1	2	0	8	0	10	1	22
BREAK													
15:00 - 16:00	10	7	5	0	22	0	3	3	6	0	12	0	34
16:00 - 17:00	6	1	3	0	10	1	1	1	2	0	4	0	14
17:00 - 18:00	8	1	4	0	13	0	6	0	6	0	12	0	25
GRAND TOTAL	47	10	23	0	80	2	19	4	45	0	68	6	148

Traffic Count Data

Intersection: Trafalgar Rd N & Upper Canada Dr-Church St
Site Code: 2121900002
Municipality: Erin
Count Date: Oct 28, 2021

North Approach - Trafalgar Rd N

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	0	40	0	0	40	0	4	0	0	4	0	0	0	0	0	0
07:15	2	42	0	0	44	0	4	0	0	4	0	0	0	0	0	0
07:30	0	41	0	0	41	0	5	0	0	5	0	0	0	0	0	0
07:45	0	51	1	0	52	0	13	0	0	13	0	0	0	0	0	0
08:00	0	33	0	0	33	0	7	0	0	7	0	0	0	0	0	0
08:15	0	28	1	0	29	0	6	0	0	6	0	0	0	0	0	0
08:30	0	27	0	0	27	1	7	0	0	8	0	0	0	0	0	1
08:45	0	28	0	0	28	0	6	0	0	6	0	0	0	0	0	1
09:00	0	14	0	0	14	0	4	0	0	4	0	0	0	0	0	0
09:15	1	23	0	0	24	0	6	0	0	6	0	0	0	0	0	0
09:30	1	25	1	0	27	0	6	0	0	6	0	0	0	0	0	0
09:45	2	22	0	0	24	0	3	0	0	3	0	0	0	0	0	0
SUBTOTAL	6	374	3	0	383	1	71	0	0	72	0	0	0	0	0	2

Traffic Count Data

Intersection: Trafalgar Rd N & Upper Canada Dr-Church St
Site Code: 2121900002
Municipality: Erin
Count Date: Oct 28, 2021

North Approach - Trafalgar Rd N

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
15:00	4	31	1	0	36	0	6	0	0	6	0	0	0	0	0	0
15:15	0	37	0	0	37	0	5	0	0	5	0	0	0	0	0	0
15:30	0	32	1	0	33	0	7	0	0	7	0	0	0	0	0	0
15:45	0	50	1	0	51	0	11	0	0	11	0	0	0	0	0	0
16:00	0	48	0	0	48	0	4	0	0	4	0	0	0	0	0	0
16:15	4	50	0	0	54	0	2	0	0	2	0	0	0	0	0	0
16:30	1	34	0	0	35	0	1	0	0	1	0	0	0	0	0	0
16:45	1	50	2	0	53	0	1	0	0	1	0	0	0	0	0	1
17:00	4	32	0	0	36	0	1	0	0	1	0	0	0	0	0	0
17:15	1	38	1	0	40	0	0	0	0	0	0	0	0	0	0	0
17:30	2	37	0	0	39	0	4	0	0	4	0	0	0	0	0	0
17:45	0	27	1	0	28	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	17	466	7	0	490	0	42	0	0	42	0	0	0	0	0	1
GRAND TOTAL	23	840	10	0	873	1	113	0	0	114	0	0	0	0	0	3

Traffic Count Data

Intersection: Trafalgar Rd N & Upper Canada Dr-Church St
Site Code: 2121900002
Municipality: Erin
Count Date: Oct 28, 2021

South Approach - Trafalgar Rd N

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	1	18	0	0	19	0	3	0	0	3	0	0	0	0	0	0
07:15	0	19	2	0	21	0	9	0	0	9	0	0	0	0	0	2
07:30	0	29	1	0	30	0	6	0	0	6	0	0	0	0	0	2
07:45	0	30	1	0	31	0	6	0	0	6	0	0	0	0	0	0
08:00	2	19	0	0	21	0	9	0	0	9	0	0	0	0	0	0
08:15	1	18	0	0	19	0	7	1	0	8	0	0	0	0	0	0
08:30	2	21	1	0	24	0	4	0	0	4	0	0	0	0	0	0
08:45	2	25	1	0	28	0	4	2	0	6	0	0	0	0	0	0
09:00	0	14	0	0	14	0	7	0	0	7	0	0	0	0	0	0
09:15	0	19	0	0	19	0	9	2	0	11	0	0	0	0	0	0
09:30	1	28	2	0	31	0	5	1	0	6	0	0	0	0	0	1
09:45	0	25	1	0	26	0	11	0	0	11	0	0	0	0	0	1
SUBTOTAL	9	265	9	0	283	0	80	6	0	86	0	0	0	0	0	6

Traffic Count Data

Intersection: Trafalgar Rd N & Upper Canada Dr-Church St
Site Code: 2121900002
Municipality: Erin
Count Date: Oct 28, 2021

South Approach - Trafalgar Rd N

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	1	52	0	0	53	0	8	0	0	8	0	0	0	0	0	0
15:15	5	54	2	0	61	0	6	0	0	6	0	0	0	0	0	0
15:30	0	55	4	0	59	1	4	1	0	6	0	0	0	0	0	1
15:45	1	62	8	0	71	0	4	0	0	4	0	0	0	0	0	0
16:00	2	73	1	0	76	0	9	1	0	10	0	0	0	0	0	5
16:15	6	81	2	0	89	0	1	0	0	1	0	0	0	0	0	0
16:30	5	78	5	0	88	0	7	0	0	7	0	0	0	0	0	0
16:45	3	75	1	0	79	0	1	0	0	1	0	0	0	0	0	0
17:00	3	85	3	0	91	0	2	0	0	2	0	0	0	0	0	1
17:15	2	86	0	0	88	0	4	0	0	4	0	0	0	0	0	0
17:30	5	63	1	0	69	1	2	0	0	3	0	0	0	0	0	0
17:45	2	56	5	0	63	0	2	0	0	2	0	0	0	0	0	0
SUBTOTAL	35	820	32	0	887	2	50	2	0	54	0	0	0	0	0	7
GRAND TOTAL	44	1085	41	0	1170	2	130	8	0	140	0	0	0	0	0	13

Traffic Count Data

Intersection: Trafalgar Rd N & Upper Canada Dr-Church St
 Site Code: 2121900002
 Municipality: Erin
 Count Date: Oct 28, 2021

East Approach - Church St

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
07:30	3	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0
07:45	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
08:00	2	0	2	0	4	0	1	0	0	1	0	0	0	0	0	0
08:15	3	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0
08:30	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
09:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
09:15	3	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0
09:30	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
09:45	4	0	1	0	5	0	0	0	0	0	0	0	0	0	0	1
SUBTOTAL	23	0	11	0	34	0	1	0	0	1	0	0	0	0	0	1

Traffic Count Data

Intersection: Trafalgar Rd N & Upper Canada Dr-Church St
 Site Code: 2121900002
 Municipality: Erin
 Count Date: Oct 28, 2021

East Approach - Church St

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	2	7	1	0	10	0	0	0	0	0	0	0	0	0	0	0
15:15	1	0	2	0	3	1	0	0	0	1	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	5	0	2	0	7	1	0	0	0	1	0	0	0	0	0	0
16:00	4	0	2	0	6	0	0	0	0	0	0	0	0	0	0	1
16:15	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
16:30	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
16:45	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0
17:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
17:15	3	1	2	0	6	0	0	0	0	0	0	0	0	0	0	0
17:30	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
17:45	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	22	9	12	0	43	2	0	0	0	2	0	0	0	0	0	1
GRAND TOTAL	45	9	23	0	77	2	1	0	0	3	0	0	0	0	0	2

Traffic Count Data

Intersection: Trafalgar Rd N & Upper Canada Dr-Church St
 Site Code: 2121900002
 Municipality: Erin
 Count Date: Oct 28, 2021

West Approach - Upper Canada Dr

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
07:30	1	0	3	0	4	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	8	0	8	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0
08:15	1	0	3	0	4	0	0	1	0	1	0	0	0	0	0	0
08:30	1	0	3	0	4	0	0	0	0	0	0	0	0	0	0	5
08:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30	1	0	4	0	5	0	0	0	0	0	0	0	0	0	0	1
09:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	9	0	30	0	39	0	0	1	0	1	0	0	0	0	0	6

Traffic Count Data

Intersection: Trafalgar Rd N & Upper Canada Dr-Church St
Site Code: 2121900002
Municipality: Erin
Count Date: Oct 28, 2021

West Approach - Upper Canada Dr

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	1	3	0	0	4	1	0	0	0	1	0	0	0	0	0	0
15:15	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
15:45	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	1	1	1	0	3	0	0	0	0	0	0	0	0	0	0	0
17:00	1	0	3	0	4	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
17:30	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
17:45	3	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	8	4	14	0	26	2	0	0	0	2	0	0	0	0	0	0
GRAND TOTAL	17	4	44	0	65	2	0	1	0	3	0	0	0	0	0	6

Peak Hour Diagram

Specified Period

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

One Hour Peak

From: 07:15:00
To: 08:15:00

Intersection: Trafalgar Rd N & Upper Canada Dr-Church St
Site Code: 2121900002
Count Date: Oct 28, 2021

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Trafalgar Rd N runs N/S

North Approach

	Out	In	Total
	170	102	272
	29	30	59
	0	0	0
Totals	199	132	331

Trafalgar Rd N

	0	0	0	0
	0	29	0	0
	1	167	2	0
Totals	1	196	2	0






East Approach

	Out	In	Total
	14	6	20
	1	0	1
	0	0	0
Totals	15	6	21

Upper Canada Dr

				Totals
	0	0	0	0
	0	0	1	1
	0	0	0	0
	0	0	16	16

Peds: 0

Peds: 0



Peds: 0

Peds: 4

Church St

Totals			
0	0	0	0
4	4	0	0
1	0	1	0
10	10	0	0

West Approach

	Out	In	Total
	17	3	20
	0	1	1
	0	0	0
Totals	17	4	21

Totals	2	127	4	0
	2	97	4	0
	0	30	0	0
	0	0	0	0

Trafalgar Rd N

South Approach

	Out	In	Total
	103	193	296
	30	29	59
	0	0	0
Totals	133	222	355

 - Cars

 - Trucks

 - Bicycles

Comments

Peak Hour Summary

Intersection: Trafalgar Rd N & Upper Canada Dr-Church St
 Site Code: 2121900002
 Count Date: Oct 28, 2021
 Period: 07:00 - 10:00

Peak Hour Data (07:15 - 08:15)

Start Time	North Approach Trafalgar Rd N						South Approach Trafalgar Rd N						East Approach Church St						West Approach Upper Canada Dr						Total Vehicles
	←	↑	→	↺	Peds	Total	←	↑	→	↺	Peds	Total	←	↑	→	↺	Peds	Total	←	↑	→	↺	Peds	Total	
07:15	2	46	0	0	0	48	0	28	2	0	2	30	2	0	1	0	0	3	0	0	2	0	0	2	83
07:30	0	46	0	0	0	46	0	35	1	0	2	36	3	0	1	0	0	4	1	0	3	0	0	4	90
07:45	0	64	1	0	0	65	0	36	1	0	0	37	3	0	0	0	0	3	0	0	8	0	0	8	113
08:00	0	40	0	0	0	40	2	28	0	0	0	30	2	1	2	0	0	5	0	0	3	0	0	3	78
Grand Total	2	196	1	0	0	199	2	127	4	0	4	133	10	1	4	0	0	15	1	0	16	0	0	17	364
Approach %	1	98.5	0.5	0	-	-	1.5	95.5	3	0	-	-	66.7	6.7	26.7	0	-	-	5.9	0	94.1	0	-	-	-
Totals %	0.5	53.8	0.3	0	-	54.7	0.5	34.9	1.1	0	-	36.5	2.7	0.3	1.1	0	-	4.1	0.3	0	4.4	0	-	4.7	-
PHF	0.25	0.77	0.25	0	-	0.77	0.25	0.88	0.5	0	-	0.9	0.83	0.25	0.5	0	-	0.75	0.25	0	0.5	0	-	0.53	0.81
Cars	2	167	1	0	-	170	2	97	4	0	-	103	10	0	4	0	-	14	1	0	16	0	-	17	304
% Cars	100	85.2	100	0	-	85.4	100	76.4	100	0	-	77.4	100	0	100	0	-	93.3	100	0	100	0	-	100	83.5
Trucks	0	29	0	0	-	29	0	30	0	0	-	30	0	1	0	0	-	1	0	0	0	0	-	0	60
% Trucks	0	14.8	0	0	-	14.6	0	23.6	0	0	-	22.6	0	100	0	0	-	6.7	0	0	0	0	-	0	16.5
Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
Peds	-	-	-	-	0	-	-	-	-	-	4	-	-	-	-	-	0	-	-	-	-	-	0	-	4
% Peds	-	-	-	-	0	-	-	-	-	-	100	-	-	-	-	-	0	-	-	-	-	-	0	-	-

Peak Hour Diagram

Specified Period

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

One Hour Peak

From: 15:45:00
To: 16:45:00

Intersection: Trafalgar Rd N & Upper Canada Dr-Church St
Site Code: 2121900002
Count Date: Oct 28, 2021

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Trafalgar Rd N runs N/S

North Approach

	Out	In	Total
	188	298	486
	18	21	39
	0	0	0
Totals	206	319	525

Trafalgar Rd N

	0	0	0	0
	0	18	0	0
	1	182	5	0
Totals	1	200	5	0






East Approach

	Out	In	Total
	15	21	36
	1	1	2
	0	0	0
Totals	16	22	38

Upper Canada Dr

				Totals
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	2	2

Peds: 0

Peds: 0



Peds: 1

Peds: 5

Church St

Totals			
0	0	0	0
4	4	0	0
0	0	0	0
12	11	1	0

West Approach

	Out	In	Total
	2	15	17
	0	0	0
	0	0	0
Totals	2	15	17

Totals	14	315	17	0
	14	294	16	0
	0	21	1	0
	0	0	0	0

Trafalgar Rd N

South Approach

	Out	In	Total
	324	195	519
	22	19	41
	0	0	0
Totals	346	214	560

 - Cars

 - Trucks

 - Bicycles

Comments

Peak Hour Summary

Intersection: Trafalgar Rd N & Upper Canada Dr-Church St
Site Code: 2121900002
Count Date: Oct 28, 2021
Period: 15:00 - 18:00

Peak Hour Data (15:45 - 16:45)

Start Time	North Approach Trafalgar Rd N						South Approach Trafalgar Rd N						East Approach Church St						West Approach Upper Canada Dr						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
15:45	0	61	1	0	0	62	1	66	8	0	0	75	6	0	2	0	0	8	0	0	1	0	0	1	146
16:00	0	52	0	0	0	52	2	82	2	0	5	86	4	0	2	0	1	6	0	0	1	0	0	1	145
16:15	4	52	0	0	0	56	6	82	2	0	0	90	1	0	0	0	0	1	0	0	0	0	0	0	147
16:30	1	35	0	0	0	36	5	85	5	0	0	95	1	0	0	0	0	1	0	0	0	0	0	0	132
Grand Total	5	200	1	0	0	206	14	315	17	0	5	346	12	0	4	0	1	16	0	0	2	0	0	2	570
Approach %	2.4	97.1	0.5	0	-	-	4	91	4.9	0	-	-	75	0	25	0	-	-	0	0	100	0	-	-	-
Totals %	0.9	35.1	0.2	0	-	36.1	2.5	55.3	3	0	-	60.7	2.1	0	0.7	0	-	2.8	0	0	0.4	0	-	0.4	-
PHF	0.31	0.82	0.25	0	-	0.83	0.58	0.93	0.53	0	-	0.91	0.5	0	0.5	0	-	0.5	0	0	0.5	0	-	0.5	0.97
Cars	5	182	1	0	-	188	14	294	16	0	-	324	11	0	4	0	-	15	0	0	2	0	-	2	529
% Cars	100	91	100	0	-	91.3	100	93.3	94.1	0	-	93.6	91.7	0	100	0	-	93.8	0	0	100	0	-	100	92.8
Trucks	0	18	0	0	-	18	0	21	1	0	-	22	1	0	0	0	-	1	0	0	0	0	-	0	41
% Trucks	0	9	0	0	-	8.7	0	6.7	5.9	0	-	6.4	8.3	0	0	0	-	6.3	0	0	0	0	-	0	7.2
Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
Peds	-	-	-	-	0	-	-	-	-	-	5	-	-	-	-	-	1	-	-	-	-	-	0	-	6
% Peds	-	-	-	-	0	-	-	-	-	-	83.3	-	-	-	-	-	16.7	-	-	-	-	-	0	-	-

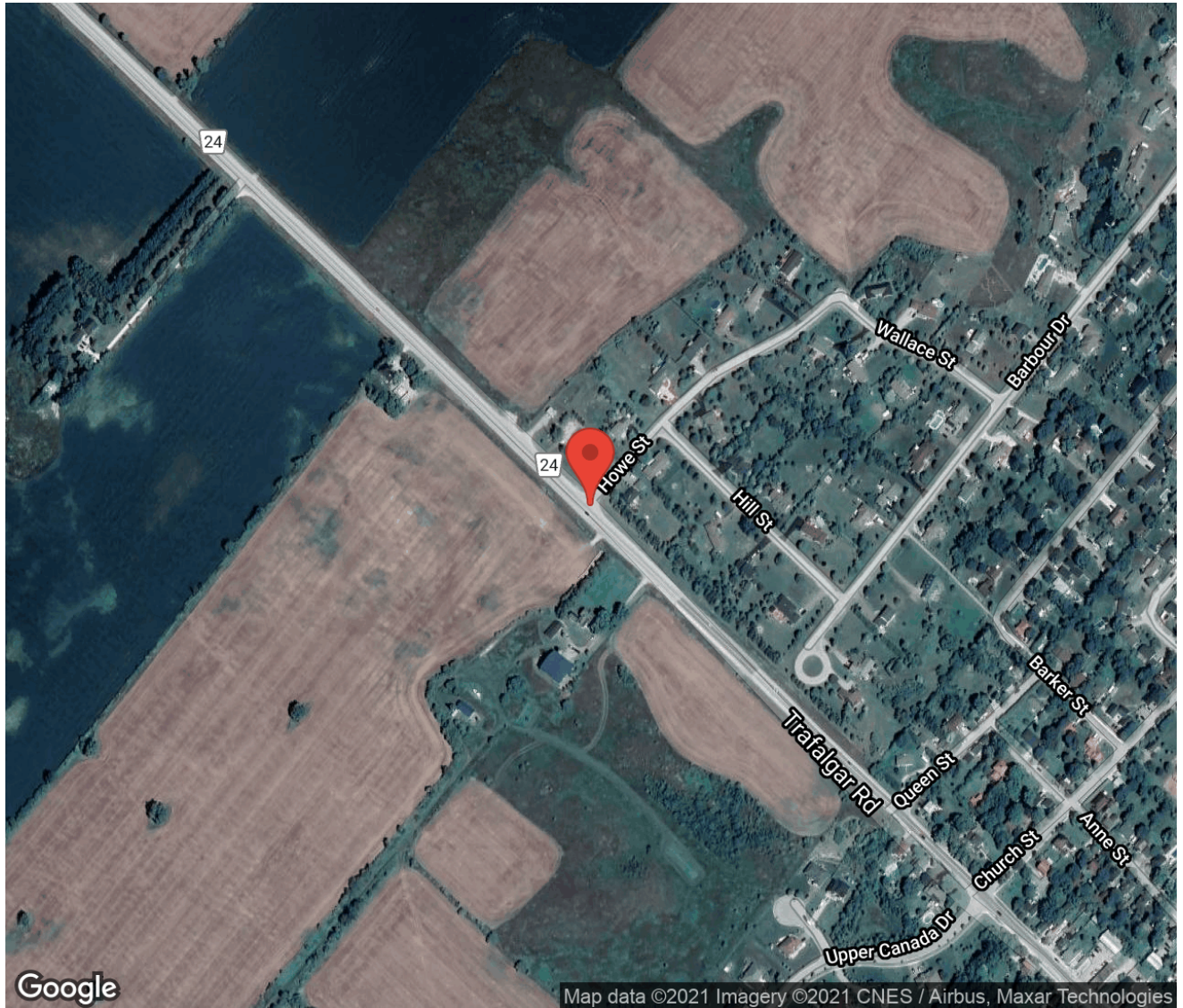
Project #21-219 - Candevcon Limited

Intersection Count Report

Intersection:	Trafalgar Rd N & Howe St
Municipality:	Erin
Count Date:	Oct 28, 2021
Site Code:	2121900001
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	07:00-10:00, 15:00-18:00
Weather:	Clear

Traffic Count Map

Intersection:	Trafalgar Rd N & Howe St
Site Code:	2121900001
Municipality:	Erin
Count Date:	Oct 28, 2021



Traffic Count Summary

Intersection: Trafalgar Rd N & Howe St
Site Code: 2121900001
Municipality: Erin
Count Date: Oct 28, 2021

Trafalgar Rd N - Traffic Summary

Hour	North Approach Totals						South Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	0	155	0	0	155	0	0	119	1	0	120	0	275
08:00 - 09:00	3	166	0	0	169	0	0	125	1	0	126	0	295
09:00 - 10:00	0	112	0	0	112	0	0	132	4	0	136	0	248
BREAK													
15:00 - 16:00	7	194	0	0	201	0	0	250	5	0	255	0	456
16:00 - 17:00	5	183	0	0	188	0	0	325	5	0	330	0	518
17:00 - 18:00	3	163	0	0	166	0	0	308	8	0	316	0	482
GRAND TOTAL	18	973	0	0	991	0	0	1259	24	0	1283	0	2274

Traffic Count Summary

Intersection: Trafalgar Rd N & Howe St
Site Code: 2121900001
Municipality: Erin
Count Date: Oct 28, 2021

Howe St - Traffic Summary

East Approach Totals							West Approach Totals						
Hour	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						Total
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	4	0	2	0	6	0	0	0	0	0	0	0	6
08:00 - 09:00	1	0	3	0	4	0	0	0	0	0	0	0	4
09:00 - 10:00	3	0	1	0	4	0	0	0	0	0	0	0	4
BREAK													
15:00 - 16:00	7	0	4	0	11	0	0	0	0	0	0	0	11
16:00 - 17:00	2	0	2	0	4	0	0	0	0	0	0	0	4
17:00 - 18:00	3	0	2	0	5	0	0	0	0	0	0	0	5
GRAND TOTAL	20	0	14	0	34	0	0	0	0	0	0	0	34

Traffic Count Data

Intersection: Trafalgar Rd N & Howe St
Site Code: 2121900001
Municipality: Erin
Count Date: Oct 28, 2021

North Approach - Trafalgar Rd N

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
07:00	0	35	0	0	35	0	4	0	0	4	0	0	0	0	0	0
07:15	0	40	0	0	40	0	6	0	0	6	0	0	0	0	0	0
07:30	0	34	0	0	34	0	5	0	0	5	0	0	0	0	0	0
07:45	0	25	0	0	25	0	6	0	0	6	0	0	0	0	0	0
08:00	2	33	0	0	35	0	5	0	0	5	0	0	0	0	0	0
08:15	0	33	0	0	33	0	7	0	0	7	0	0	0	0	0	0
08:30	0	36	0	0	36	0	8	0	0	8	0	0	0	0	0	0
08:45	1	38	0	0	39	0	6	0	0	6	0	0	0	0	0	0
09:00	0	20	0	0	20	0	7	0	0	7	0	0	0	0	0	0
09:15	0	20	0	0	20	0	4	0	0	4	0	0	0	0	0	0
09:30	0	28	0	0	28	0	6	0	0	6	0	0	0	0	0	0
09:45	0	23	0	0	23	0	4	0	0	4	0	0	0	0	0	0
SUBTOTAL	3	365	0	0	368	0	68	0	0	68	0	0	0	0	0	0

Traffic Count Data

Intersection: Trafalgar Rd N & Howe St
Site Code: 2121900001
Municipality: Erin
Count Date: Oct 28, 2021

North Approach - Trafalgar Rd N

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
15:00	3	41	0	0	44	0	7	0	0	7	0	0	0	0	0	0
15:15	3	42	0	0	45	0	4	0	0	4	0	0	0	0	0	0
15:30	1	25	0	0	26	0	6	0	0	6	0	0	0	0	0	0
15:45	0	58	0	0	58	0	11	0	0	11	0	0	0	0	0	0
16:00	1	42	0	0	43	0	4	0	0	4	0	0	0	0	0	0
16:15	2	56	0	0	58	0	2	0	0	2	0	0	0	0	0	0
16:30	2	34	0	0	36	0	1	0	0	1	0	0	0	0	0	0
16:45	0	44	0	0	44	0	0	0	0	0	0	0	0	0	0	0
17:00	1	39	0	0	40	0	1	0	0	1	0	0	0	0	0	0
17:15	2	44	0	0	46	0	1	0	0	1	0	0	0	0	0	0
17:30	0	40	0	0	40	0	3	0	0	3	0	0	0	0	0	0
17:45	0	34	0	0	34	0	1	0	0	1	0	0	0	0	0	0
SUBTOTAL	15	499	0	0	514	0	41	0	0	41	0	0	0	0	0	0
GRAND TOTAL	18	864	0	0	882	0	109	0	0	109	0	0	0	0	0	0

Traffic Count Data

Intersection: Trafalgar Rd N & Howe St
Site Code: 2121900001
Municipality: Erin
Count Date: Oct 28, 2021

South Approach - Trafalgar Rd N

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	0	20	0	0	20	0	3	0	0	3	0	0	0	0	0	0
07:15	0	22	0	0	22	0	9	0	0	9	0	0	0	0	0	0
07:30	0	32	1	0	33	0	6	0	0	6	0	0	0	0	0	0
07:45	0	23	0	0	23	0	4	0	0	4	0	0	0	0	0	0
08:00	0	26	1	0	27	0	9	0	0	9	0	0	0	0	0	0
08:15	0	23	0	0	23	0	7	0	0	7	0	0	0	0	0	0
08:30	0	27	0	0	27	0	3	0	0	3	0	0	0	0	0	0
08:45	0	26	0	0	26	0	4	0	0	4	0	0	0	0	0	0
09:00	0	24	0	0	24	0	9	0	0	9	0	0	0	0	0	0
09:15	0	23	0	0	23	0	6	1	0	7	0	0	0	0	0	0
09:30	0	32	0	0	32	0	5	0	0	5	0	0	0	0	0	0
09:45	0	23	3	0	26	0	10	0	0	10	0	0	0	0	0	0
SUBTOTAL	0	301	5	0	306	0	75	1	0	76	0	0	0	0	0	0

Traffic Count Data

Intersection: Trafalgar Rd N & Howe St
Site Code: 2121900001
Municipality: Erin
Count Date: Oct 28, 2021

South Approach - Trafalgar Rd N

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	0	58	0	0	58	0	10	0	0	10	0	0	0	0	0	0
15:15	0	55	0	0	55	0	6	0	0	6	0	0	0	0	0	0
15:30	0	53	1	0	54	0	7	1	0	8	0	0	0	0	0	0
15:45	0	57	2	0	59	0	4	1	0	5	0	0	0	0	0	0
16:00	0	77	1	0	78	0	7	0	0	7	0	0	0	0	0	0
16:15	0	78	3	0	81	0	1	0	0	1	0	0	0	0	0	0
16:30	0	74	1	0	75	0	7	0	0	7	0	0	0	0	0	0
16:45	0	80	0	0	80	0	1	0	0	1	0	0	0	0	0	0
17:00	0	76	4	0	80	0	1	0	0	1	0	0	0	0	0	0
17:15	0	89	2	0	91	0	5	0	0	5	0	0	0	0	0	0
17:30	0	66	1	0	67	0	2	0	0	2	0	0	0	0	0	0
17:45	0	66	1	0	67	0	3	0	0	3	0	0	0	0	0	0
SUBTOTAL	0	829	16	0	845	0	54	2	0	56	0	0	0	0	0	0
GRAND TOTAL	0	1130	21	0	1151	0	129	3	0	132	0	0	0	0	0	0

Traffic Count Data

Intersection: Trafalgar Rd N & Howe St
Site Code: 2121900001
Municipality: Erin
Count Date: Oct 28, 2021

East Approach - Howe St

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
07:00	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
07:30	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
08:30	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	6	0	6	0	12	2	0	0	0	2	0	0	0	0	0	0

Traffic Count Data

Intersection: Trafalgar Rd N & Howe St
Site Code: 2121900001
Municipality: Erin
Count Date: Oct 28, 2021

East Approach - Howe St

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
15:00	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0
15:15	3	0	2	0	5	0	0	0	0	0	0	0	0	0	0	0
15:30	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
15:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
16:30	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
17:15	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
17:30	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	12	0	8	0	20	0	0	0	0	0	0	0	0	0	0	0
GRAND TOTAL	18	0	14	0	32	2	0	0	0	2	0	0	0	0	0	0

Peak Hour Diagram

Specified Period

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

One Hour Peak

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

Intersection: Trafalgar Rd N & Howe St
Site Code: 2121900001
Count Date: Oct 28, 2021

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Trafalgar Rd N runs N/S

North Approach

	Out	In	Total
	143	105	248
	26	23	49
	0	0	0
Totals	169	128	297

Trafalgar Rd N

	0	0	0
	26	0	0
	140	3	0
Totals	166	3	0

↓ ↘ ↻

Peds: 0



Peds: 0

Totals	125	1	0
	102	1	0
	23	0	0
	0	0	0

↑ ↘ ↻

Trafalgar Rd N

East Approach

	Out	In	Total
	3	4	7
	1	0	1
	0	0	0
Totals	4	4	8

Howe St

Totals			
0	0	0	0
3	3	0	0
1	0	1	0

↻ ↑ ↓

South Approach

	Out	In	Total
	103	140	243
	23	27	50
	0	0	0
Totals	126	167	293

 - Cars

 - Trucks

 - Bicycles

Comments

Peak Hour Summary

Intersection: Trafalgar Rd N & Howe St
Site Code: 2121900001
Count Date: Oct 28, 2021
Period: 07:00 - 10:00

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

	North Approach Trafalgar Rd N						South Approach Trafalgar Rd N						East Approach Howe St						West Approach						Total Vehicl es
Start Time	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
08:00	2	38		0	0	40		35	1	0	0	36	0		1	0	0	1					0		77
08:15	0	40		0	0	40		30	0	0	0	30	1		0	0	0	1					0		71
08:30	0	44		0	0	44		30	0	0	0	30	0		2	0	0	2					0		76
08:45	1	44		0	0	45		30	0	0	0	30	0		0	0	0	0					0		75
Grand Total	3	166		0	0	169		125	1	0	0	126	1		3	0	0	4					0	0	299
Approach %	1.8	98.2		0		-		99.2	0.8	0		-	25		75	0		-						-	
Totals %	1	55.5		0		56.5		41.8	0.3	0		42.1	0.3		1	0		1.3					0		
PHF	0.38	0.94		0		0.94		0.89	0.25	0		0.88	0.25		0.38	0		0.5					0		0.97
Cars	3	140		0		143		102	1	0		103	0		3	0		3					0		249
% Cars	100	84.3		0		84.6		81.6	100	0		81.7	0		100	0		75					0		83.3
Trucks	0	26		0		26		23	0	0		23	1		0	0		1					0		50
% Trucks	0	15.7		0		15.4		18.4	0	0		18.3	100		0	0		25					0		16.7
Bicycles	0	0		0		0		0	0	0		0	0		0	0		0					0		0
% Bicycles	0	0		0		0		0	0	0		0	0		0	0		0					0		0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Peak Hour Diagram

Specified Period

From: 15:00:00

To: 18:00:00

One Hour Peak

From: 15:45:00

To: 16:45:00

Intersection: Trafalgar Rd N & Howe St

Site Code: 2121900001

Count Date: Oct 28, 2021

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Trafalgar Rd N runs N/S

North Approach

	Out	In	Total
	195	286	481
	18	19	37
	0	0	0
Totals	213	305	518

Trafalgar Rd N

	0	0	0
	18	0	0
	190	5	0
Totals	208	5	0

Peds: 0



Peds: 0

	286	7	0
	19	1	0
	0	0	0
Totals	305	8	0

Trafalgar Rd N

East Approach

	Out	In	Total
	3	12	15
	0	1	1
	0	0	0
Totals	3	13	16

Howe St

Totals			
	0	0	0
	0	0	0
	3	3	0

South Approach

	Out	In	Total
	293	193	486
	20	18	38
	0	0	0
Totals	313	211	524

 - Cars

 - Trucks

 - Bicycles

Comments

Peak Hour Summary

Intersection: Trafalgar Rd N & Howe St
Site Code: 2121900001
Count Date: Oct 28, 2021
Period: 15:00 - 18:00

Peak Hour Data (15:45 - 16:45)

	North Approach Trafalgar Rd N						South Approach Trafalgar Rd N						East Approach Howe St						West Approach						Total Vehicl es	
Start Time	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total		
15:45	0	69		0	0	69		61	3	0	0	64	1		0	0	0	0	1				0		134	
16:00	1	46		0	0	47		84	1	0	0	85	0		0	0	0	0	0				0		0	132
16:15	2	58		0	0	60		79	3	0	0	82	1		0	0	0	0	1				0		143	
16:30	2	35		0	0	37		81	1	0	0	82	1		0	0	0	0	1				0		120	
Grand Total	5	208		0	0	213		305	8	0	0	313	3		0	0	0	3					0	0	529	
Approach %	2.3	97.7		0		-		97.4	2.6	0		-	100		0	0		-					-			
Totals %	0.9	39.3		0		40.3		57.7	1.5	0		59.2	0.6		0	0		0.6					0			
PHF	0.63	0.75		0		0.77		0.91	0.67	0		0.92	0.75		0	0		0.75					0		0.92	
Cars	5	190		0		195		286	7	0		293	3		0	0		3					0		491	
% Cars	100	91.3		0		91.5		93.8	87.5	0		93.6	100		0	0		100					0		92.8	
Trucks	0	18		0		18		19	1	0		20	0		0	0		0					0		38	
% Trucks	0	8.7		0		8.5		6.2	12.5	0		6.4	0		0	0		0					0		7.2	
Bicycles	0	0		0		0		0	0	0		0	0		0	0		0					0		0	
% Bicycles	0	0		0		0		0	0	0		0	0		0	0		0					0		0	
Peds					0	-					0	-					0	-					0	-	0	
% Peds					0	-					0	-					0	-					0	-		

APPENDIX C

SIGNAL TIMING PLANS

Configuration

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

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

	Overlap			
	A	B	C	D
Direction . . .				

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

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

Configuration Continued

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

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

MMU Compatibility Program (Info Only)

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

Version Info:

Software Assy.	Part No.	Version
Boot	27831	2.83
Program	45561	7.9
Application		. 3
Help	27891	6.33
Configuration	27918	C000

[illegible]

Ped Carryover

Ped Start Phase	Carry Over Phase
-----------------	------------------

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

Power Start, Remote Flash

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

Initialization Interval:

Power Start Yellow
 External Start. Yellow

Power Start All Red Time. . 0
 Power Start Flash Time. . . 0

Remote Flash Options:

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

Option Data

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

Enable Programmable Options

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

Five Section Left Turn Control

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

Left Turn Head.

Dimming:

[illegible]

Detector Type/Timers

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

Detector Names

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

Detector Type/Timers

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

Detector Names

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

Ped/SD Local Assign,Log Interval

```

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

```

```

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

```

Detector Log Interval . . 0

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

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

Diagnostic Plans/Fail Action

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

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

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

Diagnostic Plans/Fail Action

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

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

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

Detector Diagnostic Intervals

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

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

Speed Detectors

```

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

```

```

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

```

Units. Inches

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

Coordinator Manual Command and Options

Manual Enable Pattern 0

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

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

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

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

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

Coordination Patterns

Preemptors

Preemptor 1

```

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

```

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

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

Out of Flash Color for Exit Phases Green

Preemptor 2

```

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

```

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

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

Out of Flash Color for Exit Phases Green

Linked Preemptor 0

Preemptors

Preemptor 3

```

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

```

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

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

Out of Flash Color for Exit Phases Green

Linked Preemptor 0

Preemptor 4

```

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

```

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

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

Out of Flash Color for Exit Phases Green

Linked Preemptor 0

Preemptors

Preemptor 5

```

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

```

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

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

Out of Flash Color for Exit Phases Green

Linked Preemptor 0

Preemptor 6

```

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

```

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

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

Out of Flash Color for Exit Phases Green

Linked Preemptor 0

Bus Preemptors

[illegible]

NIC/TOD Clock/Calendar

Manual NIC Program Step 0

Manual TOD Program Step 0

NIC Resync Time 0000

Sync Reference is Reference Time

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

Disable Daylight Savings Time NO

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

TOD Weekly/Yearly

Holiday Programs

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

NIC Program Steps

Step	Program	Step Begins	Pattern	Override

TOD Program Steps

Step 1 Program 1 Step Begins 2300

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

Phase Number

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

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

Step 2 Program 1 Step Begins 0500

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

Phase Number

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

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

APPENDIX D

LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE DEFINITIONS

Level of Service Criteria for Signalized Intersections

Level of Service	Control Delay per Vehicle (seconds)	Interpretation
A	≤ 10	Excellent. Progression is extremely favourable and most of the vehicles arrive during the green phase. Most vehicles do not stop at all
B	$>10 \text{ \& } \leq 20$	Very Good. Good progressing, short cycle lengths or both. More vehicles stop than with LOS "A", causing higher levels of average delay.
C	$>20 \text{ \& } \leq 35$	Good. Fair progressing, longer cycle lengths or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
D	$>35 \text{ \& } \leq 55$	Fair. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavourable progression, long cycle lengths, or high V/C ratio. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	$>55 \text{ \& } \leq 80$	Poor. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.
F	>80	Unsatisfactory. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occurs at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such delays. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.

Source: *From Highway Capacity Manual Special Report 209-Table 9-1, Page 9-7*

LEVEL OF SERVICE DEFINITIONS

Level of Service Criteria for Two Way Stop Control (TWSC) Intersections

Level of Service	Control Delay per Vehicle (seconds)	Interpretation
A	≤ 10	Excellent. Large & frequent gaps in traffic on the main roadway. Queuing on the minor street is rare
B	$>10 \text{ \& } \leq 15$	Very Good. Fewer gaps exist in the traffic on the main roadway. Queuing on the minor street is minimal.
C	$>15 \text{ \& } \leq 25$	Good. Fewer gaps exist in traffic on the main roadway. Delay on the minor approach becomes more noticeable.
D	$>25 \text{ \& } \leq 35$	Fair. Infrequent & shorter gaps in traffic on the main roadway. Queuing lengths develop on the minor street.
E	$>35 \text{ \& } \leq 50$	Poor. Very infrequent gaps in traffic on the main roadway. Queuing lengths become noticeable.
F	>50	Unsatisfactory. Very few gaps in traffic on the main roadway. Excessive delays with significant queue lengths on the minor street

Source: From Highway Capacity Manual Special Report 209-Table 10-7, Page No.10-25

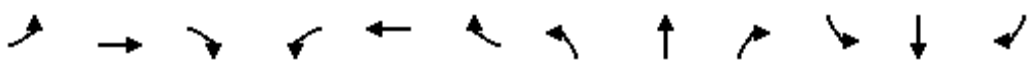
APPENDIX E

SIGNALIZED AND UN-SIGNALIZED INTERSECTION CAPACITY ANALYSIS FOR EXISTING (2021), FUTURE (2026 & 2031) TOTAL BACKGROUND AND FUTURE (2026 & 2031) TOTAL TRAFFIC SENARIOS

HCM Signalized Intersection Capacity Analysis

11: Trafalgar Road North & Wellington Road 22

Existing - AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	26	67	32	65	47	36	11	119	55	80	214	26
Future Volume (vph)	26	67	32	65	47	36	11	119	55	80	214	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		0.0	45.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1746	0	0	1559	0	1805	1563	0	1492	1660	0
Flt Permitted		0.896			0.812		0.590			0.632		
Satd. Flow (perm)	0	1580	0	0	1295	0	1121	1563	0	992	1660	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			23			39			10	
Link Speed (k/h)		70			70			40			40	
Link Distance (m)		304.3			341.1			247.9			1456.2	
Travel Time (s)		15.6			17.5			22.3			131.1	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	9%	2%	4%	20%	5%	20%	0%	19%	9%	21%	12%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	144	0	0	170	0	13	200	0	92	276	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		37.5	37.5		37.5	37.5	
Total Split (s)	34.5	34.5		34.5	34.5		42.5	42.5		42.5	42.5	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		55.2%	55.2%		55.2%	55.2%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		16.3			16.3		37.5	37.5		37.5	37.5	
Actuated g/C Ratio		0.24			0.24		0.54	0.54		0.54	0.54	
v/c Ratio		0.37			0.52		0.02	0.23		0.17	0.30	
Control Delay		20.0			25.2		8.5	7.9		9.7	9.9	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		20.0			25.2		8.5	7.9		9.7	9.9	
LOS		B			C		A	A		A	A	
Approach Delay		20.0			25.2			7.9			9.8	
Approach LOS		B			C			A			A	
Queue Length 50th (m)		12.6			16.2		0.7	9.6		5.4	16.9	
Queue Length 95th (m)		25.5			31.9		3.3	22.2		14.1	34.5	
Internal Link Dist (m)		280.3			317.1			223.9			1432.2	
Turn Bay Length (m)							40.0			45.0		
Base Capacity (vph)		637			523		609	867		539	907	

HCM Signalized Intersection Capacity Analysis 11: Trafalgar Road North & Wellington Road 22

Existing - AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.23			0.33		0.02	0.23		0.17	0.30	

Intersection Summary

Area Type: Other

Cycle Length: 77

Actuated Cycle Length: 68.9

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 13.9

Intersection LOS: B

Intersection Capacity Utilization 83.7%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 11: Trafalgar Road North & Wellington Road 22

 Ø2	 Ø4
42.5 s	34.5 s
 Ø6	 Ø8
42.5 s	34.5 s

HCM Un-signalized Intersection Capacity Analysis 8: Trafalgar Road North & George Street/Mill Street

Existing - AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	7	34	0	13	7	160	12	2	293	1
Future Volume (Veh/h)	1	1	7	34	0	13	7	160	12	2	293	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	8	37	0	14	8	174	13	2	318	1
Pedestrians								1				
Lane Width (m)								3.6				
Walking Speed (m/s)								1.2				
Percent Blockage								0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	533	526	320	528	520	180	319			187		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	533	526	320	528	520	180	319			187		
tC, single (s)	7.1	6.5	6.4	7.2	6.5	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.6	4.0	3.4	2.2			2.2		
p0 queue free %	100	100	99	92	100	98	99			100		
cM capacity (veh/h)	450	456	687	444	460	844	1252			1399		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	10	51	195	321								
Volume Left	1	37	8	2								
Volume Right	8	14	13	1								
cSH	623	510	1252	1399								
Volume to Capacity	0.02	0.10	0.01	0.00								
Queue Length 95th (m)	0.4	2.6	0.2	0.0								
Control Delay (s)	10.9	12.8	0.4	0.1								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.9	12.8	0.4	0.1								
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			32.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis 5: Trafalgar Road North & Upper Canada Drive/Church Street

Existing - AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	19	12	1	5	2	152	5	2	235	1
Future Volume (Veh/h)	1	0	19	12	1	5	2	152	5	2	235	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	1	0	23	15	1	6	2	188	6	2	290	1
Pedestrians								4				
Lane Width (m)								3.6				
Walking Speed (m/s)								1.2				
Percent Blockage								0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	496	492	294	516	490	191	291			194		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	496	492	294	516	490	191	291			194		
tC, single (s)	7.1	6.5	6.2	7.1	7.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.9	3.3	2.2			2.2		
p0 queue free %	100	100	97	97	100	99	100			100		
cM capacity (veh/h)	482	479	747	455	362	856	1282			1391		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	24	22	196	293								
Volume Left	1	15	2	2								
Volume Right	23	6	6	1								
cSH	730	515	1282	1391								
Volume to Capacity	0.03	0.04	0.00	0.00								
Queue Length 95th (m)	0.8	1.1	0.0	0.0								
Control Delay (s)	10.1	12.3	0.1	0.1								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.1	12.3	0.1	0.1								
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			26.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis

3: Trafalgar Road North & Howe Street

Existing - AM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	4	150	1	4	199
Future Volume (Veh/h)	1	4	150	1	4	199
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	1	4	155	1	4	205
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	368	156			156	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	368	156			156	
tC, single (s)	7.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	4.4	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	475	896			1436	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	5	156	209			
Volume Left	1	0	4			
Volume Right	4	1	0			
cSH	761	1700	1436			
Volume to Capacity	0.01	0.09	0.00			
Queue Length 95th (m)	0.2	0.0	0.1			
Control Delay (s)	9.8	0.0	0.2			
Lane LOS	A		A			
Approach Delay (s)	9.8	0.0	0.2			
Approach LOS	A					
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			23.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

11: Trafalgar Road North & Wellington Road 22

Existing - PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	48	60	8	56	70	103	30	364	82	56	167	29
Future Volume (vph)	48	60	8	56	70	103	30	364	82	56	167	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		0.0	45.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1809	0	0	1720	0	1504	1803	0	1703	1812	0
Flt Permitted		0.747			0.876		0.623			0.426		
Satd. Flow (perm)	0	1379	0	0	1525	0	986	1803	0	764	1812	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			59			19			15	
Link Speed (k/h)		70			70			40			40	
Link Distance (m)		304.3			341.1			247.9			1456.2	
Travel Time (s)		15.6			17.5			22.3			131.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	2%	14%	4%	2%	2%	20%	3%	0%	6%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	128	0	0	252	0	33	490	0	62	216	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		37.5	37.5		37.5	37.5	
Total Split (s)	34.5	34.5		34.5	34.5		42.5	42.5		42.5	42.5	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		55.2%	55.2%		55.2%	55.2%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		16.7			16.7		35.9	35.9		35.9	35.9	
Actuated g/C Ratio		0.25			0.25		0.53	0.53		0.53	0.53	
v/c Ratio		0.37			0.60		0.06	0.51		0.15	0.22	
Control Delay		23.2			23.2		9.1	12.6		10.2	9.1	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		23.2			23.2		9.1	12.6		10.2	9.1	
LOS		C			C		A	B		B	A	
Approach Delay		23.2			23.2			12.4			9.4	
Approach LOS		C			C			B			A	
Queue Length 50th (m)		13.2			21.6		1.8	34.2		3.6	12.0	
Queue Length 95th (m)		26.9			42.9		6.8	70.6		11.6	27.8	
Internal Link Dist (m)		280.3			317.1			223.9			1432.2	
Turn Bay Length (m)							40.0			45.0		
Base Capacity (vph)		554			644		523	966		405	969	

HCM Signalized Intersection Capacity Analysis

11: Trafalgar Road North & Wellington Road 22

Existing - PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.23			0.39		0.06	0.51		0.15	0.22	

Intersection Summary

Area Type: Other

Cycle Length: 77

Actuated Cycle Length: 67.6

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 15.2

Intersection LOS: B

Intersection Capacity Utilization 73.7%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 11: Trafalgar Road North & Wellington Road 22

 Ø2	 Ø4
42.5 s	34.5 s
 Ø6	 Ø8
42.5 s	34.5 s

HCM Un-signalized Intersection Capacity Analysis 8: Trafalgar Road North & George Street/Mill Street

Existing - PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	16	43	32	13	22	67	341	54	16	215	7
Future Volume (Veh/h)	23	16	43	32	13	22	67	341	54	16	215	7
Sign Control		Stop			Stop			Free			Free	
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	17	45	34	14	23	71	359	57	17	226	7
Pedestrians		5			3							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	828	830	234	850	804	390	238			419		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	828	830	234	850	804	390	238			419		
tC, single (s)	7.3	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	90	94	94	85	95	97	95			99		
cM capacity (veh/h)	240	285	806	226	295	661	1312			1148		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	86	71	487	250								
Volume Left	24	34	71	17								
Volume Right	45	23	57	7								
cSH	399	305	1312	1148								
Volume to Capacity	0.22	0.23	0.05	0.01								
Queue Length 95th (m)	6.5	7.1	1.4	0.4								
Control Delay (s)	16.5	20.3	1.6	0.7								
Lane LOS	C	C	A	A								
Approach Delay (s)	16.5	20.3	1.6	0.7								
Approach LOS	C	C										
Intersection Summary												
Average Delay			4.3									
Intersection Capacity Utilization			54.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis 5: Trafalgar Road North & Upper Canada Drive/Church Street

Existing - PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	2	14	0	5	17	378	20	6	240	1
Future Volume (Veh/h)	0	0	2	14	0	5	17	378	20	6	240	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	0	2	14	0	5	18	390	21	6	247	1
Pedestrians					1			5				
Lane Width (m)					3.6			3.6				
Walking Speed (m/s)					1.2			1.2				
Percent Blockage					0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	701	708	252	704	698	402	248			412		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	701	708	252	704	698	402	248			412		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	96	100	99	99			99		
cM capacity (veh/h)	348	355	788	336	360	653	1330			1157		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	2	19	429	254								
Volume Left	0	14	18	6								
Volume Right	2	5	21	1								
cSH	788	385	1330	1157								
Volume to Capacity	0.00	0.05	0.01	0.01								
Queue Length 95th (m)	0.1	1.2	0.3	0.1								
Control Delay (s)	9.6	14.8	0.5	0.2								
Lane LOS	A	B	A	A								
Approach Delay (s)	9.6	14.8	0.5	0.2								
Approach LOS	A	B										
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			43.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis

3: Trafalgar Road North & Howe Street

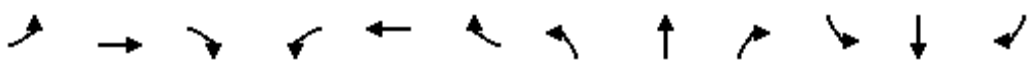
Existing - PM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	0	366	10	6	250
Future Volume (Veh/h)	4	0	366	10	6	250
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	0	398	11	7	272
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	690	404			409	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	690	404			409	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			99	
cM capacity (veh/h)	412	651			1161	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	4	409	279			
Volume Left	4	0	7			
Volume Right	0	11	0			
cSH	412	1700	1161			
Volume to Capacity	0.01	0.24	0.01			
Queue Length 95th (m)	0.2	0.0	0.1			
Control Delay (s)	13.8	0.0	0.3			
Lane LOS	B		A			
Approach Delay (s)	13.8	0.0	0.3			
Approach LOS	B					
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			29.9%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

11: Trafalgar Road North & Wellington Road 22

2026 Future Total Background - AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	30	170	120	169	86	40	39	172	94	93	351	30
Future Volume (vph)	30	170	120	169	86	40	39	172	94	93	351	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		0.0	45.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1735	0	0	1569	0	1805	1558	0	1492	1669	0
Flt Permitted		0.940			0.577		0.422			0.556		
Satd. Flow (perm)	0	1639	0	0	931	0	802	1558	0	873	1669	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		43			11			47			7	
Link Speed (k/h)		70			70			40			40	
Link Distance (m)		304.3			341.1			247.9			1456.2	
Travel Time (s)		15.6			17.5			22.3			131.1	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	9%	2%	4%	20%	5%	20%	0%	19%	9%	21%	12%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	367	0	0	339	0	45	306	0	107	437	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		37.5	37.5		37.5	37.5	
Total Split (s)	34.5	34.5		34.5	34.5		42.5	42.5		42.5	42.5	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		55.2%	55.2%		55.2%	55.2%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		27.0			27.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio		0.35			0.35		0.45	0.45		0.45	0.45	
v/c Ratio		0.61			1.02		0.12	0.42		0.27	0.57	
Control Delay		23.3			81.8		13.3	13.9		15.4	18.9	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		23.3			81.8		13.3	13.9		15.4	18.9	
LOS		C			F		B	B		B	B	
Approach Delay		23.3			81.8			13.8			18.2	
Approach LOS		C			F			B			B	
Queue Length 50th (m)		40.1			~51.7		3.8	25.0		9.8	46.5	
Queue Length 95th (m)		64.7			#100.1		9.6	42.7		20.0	71.0	
Internal Link Dist (m)		280.3			317.1			223.9			1432.2	
Turn Bay Length (m)							40.0			45.0		
Base Capacity (vph)		602			333		364	733		396	762	

HCM Signalized Intersection Capacity Analysis

11: Trafalgar Road North & Wellington Road 22

2026 Future Total Background - AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.61			1.02		0.12	0.42		0.27	0.57	

Intersection Summary

Area Type: Other

Cycle Length: 77

Actuated Cycle Length: 77

Natural Cycle: 75

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.02

Intersection Signal Delay: 31.9

Intersection LOS: C

Intersection Capacity Utilization 109.2%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 11: Trafalgar Road North & Wellington Road 22

 Ø2	 Ø4
42.5 s	34.5 s
 Ø6	 Ø8
42.5 s	34.5 s

HCM Un-signalized Intersection Capacity Analysis 8: Trafalgar Road North & George Street/Mill Street

2026 Future Total Background - AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	8	34	0	13	12	212	14	2	335	1
Future Volume (Veh/h)	1	1	8	34	0	13	12	212	14	2	335	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	9	37	0	14	13	230	15	2	364	1
Pedestrians								1				
Lane Width (m)								3.6				
Walking Speed (m/s)								1.2				
Percent Blockage								0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	646	640	366	642	632	238	365			245		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	646	640	366	642	632	238	365			245		
tC, single (s)	7.1	6.5	6.4	7.2	6.5	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.6	4.0	3.4	2.2			2.2		
p0 queue free %	100	100	99	90	100	98	99			100		
cM capacity (veh/h)	377	391	647	370	395	784	1205			1333		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	11	51	258	367								
Volume Left	1	37	13	2								
Volume Right	9	14	15	1								
cSH	575	433	1205	1333								
Volume to Capacity	0.02	0.12	0.01	0.00								
Queue Length 95th (m)	0.5	3.2	0.3	0.0								
Control Delay (s)	11.4	14.4	0.5	0.1								
Lane LOS	B	B	A	A								
Approach Delay (s)	11.4	14.4	0.5	0.1								
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			36.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis

2026 Future Total Background - AM

5: Trafalgar Road North & Upper Canada Drive/Church Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	1	0	19	12	1	5	2	168	5	2	259	1
Future Volume (Veh/h)	1	0	19	12	1	5	2	168	5	2	259	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	1	0	23	15	1	6	2	207	6	2	320	1
Pedestrians								4				
Lane Width (m)								3.6				
Walking Speed (m/s)								1.2				
Percent Blockage								0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	545	542	324	566	539	210	321			213		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	545	542	324	566	539	210	321			213		
tC, single (s)	7.1	6.5	6.2	7.1	7.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.9	3.3	2.2			2.2		
p0 queue free %	100	100	97	96	100	99	100			100		
cM capacity (veh/h)	447	449	719	422	336	835	1250			1369		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	24	22	215	323								
Volume Left	1	15	2	2								
Volume Right	23	6	6	1								
cSH	701	481	1250	1369								
Volume to Capacity	0.03	0.05	0.00	0.00								
Queue Length 95th (m)	0.8	1.1	0.0	0.0								
Control Delay (s)	10.3	12.8	0.1	0.1								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.3	12.8	0.1	0.1								
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			27.7%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis

3: Trafalgar Road North & Howe Street

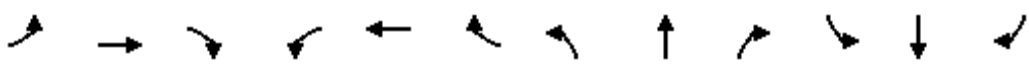
2026 Future Total Background - AM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	4	166	1	4	220
Future Volume (Veh/h)	1	4	166	1	4	220
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	1	4	171	1	4	227
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	406	172			172	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	406	172			172	
tC, single (s)	7.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	4.4	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	449	877			1417	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	5	172	231			
Volume Left	1	0	4			
Volume Right	4	1	0			
cSH	737	1700	1417			
Volume to Capacity	0.01	0.10	0.00			
Queue Length 95th (m)	0.2	0.0	0.1			
Control Delay (s)	9.9	0.0	0.2			
Lane LOS	A		A			
Approach Delay (s)	9.9	0.0	0.2			
Approach LOS	A					
Intersection Summary						
Average Delay		0.2				
Intersection Capacity Utilization		24.8%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

11: Trafalgar Road North & Wellington Road 22

2026 Future Total Background - PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	54	130	68	122	192	114	123	536	198	65	261	34
Future Volume (vph)	54	130	68	122	192	114	123	536	198	65	261	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		0.0	45.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1726	0	0	1761	0	1504	1783	0	1703	1819	0
Flt Permitted		0.792			0.802		0.540			0.114		
Satd. Flow (perm)	0	1382	0	0	1432	0	855	1783	0	204	1819	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			26			32			11	
Link Speed (k/h)		70			70			40			40	
Link Distance (m)		304.3			341.1			247.9			1456.2	
Travel Time (s)		15.6			17.5			22.3			131.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	2%	14%	4%	2%	2%	20%	3%	0%	6%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	277	0	0	470	0	135	807	0	71	324	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		37.5	37.5		37.5	37.5	
Total Split (s)	34.5	34.5		34.5	34.5		42.5	42.5		42.5	42.5	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		55.2%	55.2%		55.2%	55.2%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		26.0			26.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio		0.34			0.34		0.46	0.46		0.46	0.46	
v/c Ratio		0.57			0.93		0.34	0.96		0.76	0.38	
Control Delay		23.5			50.6		16.7	45.0		69.8	14.9	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		23.5			50.6		16.7	45.0		69.8	14.9	
LOS		C			D		B	D		E	B	
Approach Delay		23.5			50.6			41.0			24.8	
Approach LOS		C			D			D			C	
Queue Length 50th (m)		30.2			64.1		12.8	112.6		8.7	30.3	
Queue Length 95th (m)		54.3			#122.7		26.5	#193.5		#33.3	49.8	
Internal Link Dist (m)		280.3			317.1			223.9			1432.2	
Turn Bay Length (m)							40.0			45.0		
Base Capacity (vph)		508			526		393	838		93	843	

HCM Signalized Intersection Capacity Analysis 11: Trafalgar Road North & Wellington Road 22

2026 Future Total Background - PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.55			0.89		0.34	0.96		0.76	0.38	

Intersection Summary

Area Type: Other

Cycle Length: 77

Actuated Cycle Length: 76

Natural Cycle: 90

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 37.7

Intersection LOS: D

Intersection Capacity Utilization 119.6%

ICU Level of Service H

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 11: Trafalgar Road North & Wellington Road 22

 Ø2	 Ø4
42.5 s	34.5 s
 Ø6	 Ø8
42.5 s	34.5 s

HCM Un-signalized Intersection Capacity Analysis 8: Trafalgar Road North & George Street/Mill Street

2026 Future Total Background - PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	16	48	34	13	22	71	397	54	16	275	7
Future Volume (Veh/h)	23	16	48	34	13	22	71	397	54	16	275	7
Sign Control		Stop			Stop			Free			Free	
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	17	51	36	14	23	75	418	57	17	289	7
Pedestrians		5			3							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	958	960	298	986	934	450	301			478		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	958	960	298	986	934	450	301			478		
tC, single (s)	7.3	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	88	93	93	80	94	96	94			98		
cM capacity (veh/h)	192	238	744	177	246	612	1244			1092		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	92	73	550	313								
Volume Left	24	36	75	17								
Volume Right	51	23	57	7								
cSH	347	245	1244	1092								
Volume to Capacity	0.26	0.30	0.06	0.02								
Queue Length 95th (m)	8.4	9.6	1.5	0.4								
Control Delay (s)	19.1	25.8	1.7	0.6								
Lane LOS	C	D	A	A								
Approach Delay (s)	19.1	25.8	1.7	0.6								
Approach LOS	C	D										
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization			60.9%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis

2026 Future Total Background - PM

5: Trafalgar Road North & Upper Canada Drive/Church Street

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	2	14	0	5	17	417	20	6	265	1
Future Volume (Veh/h)	0	0	2	14	0	5	17	417	20	6	265	1
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	0	2	14	0	5	18	430	21	6	273	1
Pedestrians					1				5			
Lane Width (m)					3.6				3.6			
Walking Speed (m/s)					1.2				1.2			
Percent Blockage					0				0			
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	767	774	278	770	764	442	274				452	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	767	774	278	770	764	442	274				452	
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	100	95	100	99	99				99	
cM capacity (veh/h)	314	325	762	303	330	620	1301				1118	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	2	19	469	280								
Volume Left	0	14	18	6								
Volume Right	2	5	21	1								
cSH	762	350	1301	1118								
Volume to Capacity	0.00	0.05	0.01	0.01								
Queue Length 95th (m)	0.1	1.4	0.3	0.1								
Control Delay (s)	9.7	15.9	0.4	0.2								
Lane LOS	A	C	A	A								
Approach Delay (s)	9.7	15.9	0.4	0.2								
Approach LOS	A	C										
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			46.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis

3: Trafalgar Road North & Howe Street

2026 Future Total Background - PM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	0	404	10	6	276
Future Volume (Veh/h)	4	0	404	10	6	276
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	0	439	11	7	300
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	758	444			450	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	758	444			450	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			99	
cM capacity (veh/h)	375	618			1121	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	4	450	307			
Volume Left	4	0	7			
Volume Right	0	11	0			
cSH	375	1700	1121			
Volume to Capacity	0.01	0.26	0.01			
Queue Length 95th (m)	0.3	0.0	0.2			
Control Delay (s)	14.7	0.0	0.2			
Lane LOS	B		A			
Approach Delay (s)	14.7	0.0	0.2			
Approach LOS	B					
Intersection Summary						
Average Delay		0.2				
Intersection Capacity Utilization		31.9%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis 11: Trafalgar Road North & Wellington Road 22

2031 Future Total Background - AM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	33	178	124	176	91	44	40	186	100	103	376	33
Future Volume (vph)	33	178	124	176	91	44	40	186	100	103	376	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		0.0	45.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1736	0	0	1569	0	1805	1559	0	1492	1669	0
Flt Permitted		0.935			0.564		0.390			0.532		
Satd. Flow (perm)	0	1632	0	0	909	0	741	1559	0	835	1669	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42			12			46			8	
Link Speed (k/h)		70			70			40			40	
Link Distance (m)		304.3			341.1			247.9			1456.2	
Travel Time (s)		15.6			17.5			22.3			131.1	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	9%	2%	4%	20%	5%	20%	0%	19%	9%	21%	12%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	386	0	0	358	0	46	329	0	118	470	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		37.5	37.5		37.5	37.5	
Total Split (s)	34.5	34.5		34.5	34.5		42.5	42.5		42.5	42.5	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		55.2%	55.2%		55.2%	55.2%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		27.0			27.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio		0.35			0.35		0.45	0.45		0.45	0.45	
v/c Ratio		0.64			1.10		0.14	0.45		0.31	0.62	
Control Delay		24.5			106.0		13.6	14.6		16.2	20.0	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		24.5			106.0		13.6	14.6		16.2	20.0	
LOS		C			F		B	B		B	B	
Approach Delay		24.5			106.0			14.5			19.2	
Approach LOS		C			F			B			B	
Queue Length 50th (m)		43.4			~62.2		3.9	27.9		11.0	51.3	
Queue Length 95th (m)		69.5			#108.5		9.9	46.8		22.3	78.0	
Internal Link Dist (m)		280.3			317.1			223.9			1432.2	
Turn Bay Length (m)							40.0			45.0		
Base Capacity (vph)		599			326		336	733		379	763	

HCM Signalized Intersection Capacity Analysis 11: Trafalgar Road North & Wellington Road 22

2031 Future Total Background - AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.64			1.10		0.14	0.45		0.31	0.62	

Intersection Summary

Area Type: Other

Cycle Length: 77

Actuated Cycle Length: 77

Natural Cycle: 80

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.10

Intersection Signal Delay: 37.6

Intersection LOS: D

Intersection Capacity Utilization 111.0%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 11: Trafalgar Road North & Wellington Road 22

 Ø2	 Ø4
42.5 s	34.5 s
 Ø6	 Ø8
42.5 s	34.5 s

HCM Un-signalized Intersection Capacity Analysis 8: Trafalgar Road North & George Street/Mill Street

2031 Future Total Background - AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	8	34	0	13	12	230	14	2	369	1
Future Volume (Veh/h)	1	1	8	34	0	13	12	230	14	2	369	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	9	37	0	14	13	250	15	2	401	1
Pedestrians								1				
Lane Width (m)								3.6				
Walking Speed (m/s)								1.2				
Percent Blockage								0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	703	696	402	700	690	258	402			265		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	703	696	402	700	690	258	402			265		
tC, single (s)	7.1	6.5	6.4	7.2	6.5	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.6	4.0	3.4	2.2			2.2		
p0 queue free %	100	100	99	89	100	98	99			100		
cM capacity (veh/h)	345	363	616	338	366	764	1168			1311		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	11	51	278	404								
Volume Left	1	37	13	2								
Volume Right	9	14	15	1								
cSH	543	399	1168	1311								
Volume to Capacity	0.02	0.13	0.01	0.00								
Queue Length 95th (m)	0.5	3.5	0.3	0.0								
Control Delay (s)	11.8	15.3	0.5	0.1								
Lane LOS	B	C	A	A								
Approach Delay (s)	11.8	15.3	0.5	0.1								
Approach LOS	B	C										
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			37.5%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis

2031 Future Total Background - AM

5: Trafalgar Road North & Upper Canada Drive/Church Street

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	19	12	1	5	2	185	5	2	286	1
Future Volume (Veh/h)	1	0	19	12	1	5	2	185	5	2	286	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	1	0	23	15	1	6	2	228	6	2	353	1
Pedestrians								4				
Lane Width (m)								3.6				
Walking Speed (m/s)								1.2				
Percent Blockage								0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	599	596	358	620	593	231	354			234		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	599	596	358	620	593	231	354			234		
tC, single (s)	7.1	6.5	6.2	7.1	7.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.9	3.3	2.2			2.2		
p0 queue free %	100	100	97	96	100	99	100			100		
cM capacity (veh/h)	411	419	689	388	310	813	1216			1345		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	24	22	236	356								
Volume Left	1	15	2	2								
Volume Right	23	6	6	1								
cSH	670	446	1216	1345								
Volume to Capacity	0.04	0.05	0.00	0.00								
Queue Length 95th (m)	0.9	1.2	0.0	0.0								
Control Delay (s)	10.6	13.5	0.1	0.1								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.6	13.5	0.1	0.1								
Approach LOS	B	B										
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			29.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis

3: Trafalgar Road North & Howe Street

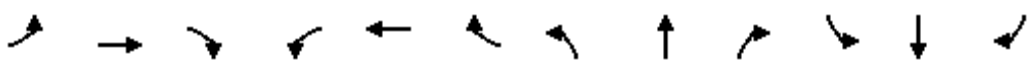
2031 Future Total Background - AM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	4	183	1	4	243
Future Volume (Veh/h)	1	4	183	1	4	243
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	1	4	189	1	4	251
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	448	190			190	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	448	190			190	
tC, single (s)	7.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	4.4	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	422	857			1396	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	5	190	255			
Volume Left	1	0	4			
Volume Right	4	1	0			
cSH	711	1700	1396			
Volume to Capacity	0.01	0.11	0.00			
Queue Length 95th (m)	0.2	0.0	0.1			
Control Delay (s)	10.1	0.0	0.1			
Lane LOS	B		A			
Approach Delay (s)	10.1	0.0	0.1			
Approach LOS	B					
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			26.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

11: Trafalgar Road North & Wellington Road 22

2031 Future Total Background - PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↘		↗	↘	
Traffic Volume (vph)	60	137	69	128	200	126	127	578	207	71	281	37
Future Volume (vph)	60	137	69	128	200	126	127	578	207	71	281	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		0.0	45.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1733	0	0	1759	0	1504	1785	0	1703	1818	0
Flt Permitted		0.765			0.794		0.510			0.114		
Satd. Flow (perm)	0	1340	0	0	1416	0	808	1785	0	204	1818	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			28			31			11	
Link Speed (k/h)		70			70			40			40	
Link Distance (m)		304.3			341.1			247.9			1456.2	
Travel Time (s)		15.6			17.5			22.3			131.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	2%	14%	4%	2%	2%	20%	3%	0%	6%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	293	0	0	499	0	140	862	0	78	350	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		37.5	37.5		37.5	37.5	
Total Split (s)	34.5	34.5		34.5	34.5		42.5	42.5		42.5	42.5	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		55.2%	55.2%		55.2%	55.2%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		27.0			27.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio		0.35			0.35		0.45	0.45		0.45	0.45	
v/c Ratio		0.60			0.97		0.38	1.04		0.85	0.42	
Control Delay		25.0			59.1		17.8	65.2		86.5	15.6	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		25.0			59.1		17.8	65.2		86.5	15.6	
LOS		C			E		B	E		F	B	
Approach Delay		25.0			59.1			58.6			28.5	
Approach LOS		C			E			E			C	
Queue Length 50th (m)		33.1			70.6		13.6	~142.8		10.1	33.4	
Queue Length 95th (m)		59.3			#133.9		28.3	#213.2		#36.6	54.4	
Internal Link Dist (m)		280.3			317.1			223.9			1432.2	
Turn Bay Length (m)							40.0			45.0		
Base Capacity (vph)		486			514		367	828		92	832	

HCM Signalized Intersection Capacity Analysis

11: Trafalgar Road North & Wellington Road 22

2031 Future Total Background - PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.60			0.97		0.38	1.04		0.85	0.42	

Intersection Summary

Area Type: Other

Cycle Length: 77

Actuated Cycle Length: 77

Natural Cycle: 90

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 48.5

Intersection LOS: D

Intersection Capacity Utilization 123.6%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 11: Trafalgar Road North & Wellington Road 22

 Ø2	 Ø4
42.5 s	34.5 s
 Ø6	 Ø8
42.5 s	34.5 s

HCM Un-signalized Intersection Capacity Analysis 8: Trafalgar Road North & George Street/Mill Street

2031 Future Total Background - PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	16	48	34	13	22	71	437	54	16	300	7
Future Volume (Veh/h)	23	16	48	34	13	22	71	437	54	16	300	7
Sign Control		Stop			Stop			Free			Free	
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	17	51	36	14	23	75	460	57	17	316	7
Pedestrians		5			3							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1027	1028	324	1054	1004	492	328			520		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1027	1028	324	1054	1004	492	328			520		
tC, single (s)	7.3	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	86	92	93	77	94	96	94			98		
cM capacity (veh/h)	171	216	718	157	224	580	1215			1054		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	92	73	592	340								
Volume Left	24	36	75	17								
Volume Right	51	23	57	7								
cSH	317	220	1215	1054								
Volume to Capacity	0.29	0.33	0.06	0.02								
Queue Length 95th (m)	9.4	11.1	1.6	0.4								
Control Delay (s)	20.9	29.2	1.7	0.6								
Lane LOS	C	D	A	A								
Approach Delay (s)	20.9	29.2	1.7	0.6								
Approach LOS	C	D										
Intersection Summary												
Average Delay			4.8									
Intersection Capacity Utilization			64.4%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis

2031 Future Total Background - PM

5: Trafalgar Road North & Upper Canada Drive/Church Street

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	2	14	0	5	17	461	20	6	293	1
Future Volume (Veh/h)	0	0	2	14	0	5	17	461	20	6	293	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	0	2	14	0	5	18	475	21	6	302	1
Pedestrians					1			5				
Lane Width (m)					3.6			3.6				
Walking Speed (m/s)					1.2			1.2				
Percent Blockage					0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	841	848	308	844	838	486	303			497		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	841	848	308	844	838	486	303			497		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	95	100	99	99			99		
cM capacity (veh/h)	280	295	734	270	299	585	1269			1076		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	2	19	514	309								
Volume Left	0	14	18	6								
Volume Right	2	5	21	1								
cSH	734	315	1269	1076								
Volume to Capacity	0.00	0.06	0.01	0.01								
Queue Length 95th (m)	0.1	1.5	0.3	0.1								
Control Delay (s)	9.9	17.2	0.4	0.2								
Lane LOS	A	C	A	A								
Approach Delay (s)	9.9	17.2	0.4	0.2								
Approach LOS	A	C										
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			48.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis 3: Trafalgar Road North & Howe Street

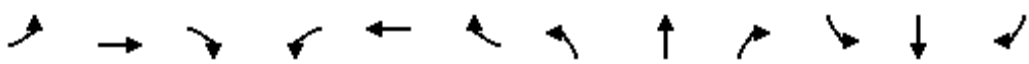
2031 Future Total Background - PM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	0	446	10	6	305
Future Volume (Veh/h)	4	0	446	10	6	305
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	0	485	11	7	332
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	836	490			496	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	836	490			496	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			99	
cM capacity (veh/h)	337	582			1078	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	4	496	339			
Volume Left	4	0	7			
Volume Right	0	11	0			
cSH	337	1700	1078			
Volume to Capacity	0.01	0.29	0.01			
Queue Length 95th (m)	0.3	0.0	0.2			
Control Delay (s)	15.8	0.0	0.2			
Lane LOS	C		A			
Approach Delay (s)	15.8	0.0	0.2			
Approach LOS	C					
Intersection Summary						
Average Delay		0.2				
Intersection Capacity Utilization		34.1%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

11: Trafalgar Road North & Wellington Road 22

2026 Future Total Traffic - AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	30	170	120	169	86	66	39	196	94	239	484	30
Future Volume (vph)	30	170	120	169	86	66	39	196	94	239	484	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		0.0	45.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1735	0	0	1551	0	1805	1561	0	1492	1676	0
Flt Permitted		0.939			0.596		0.278			0.527		
Satd. Flow (perm)	0	1637	0	0	949	0	528	1561	0	828	1676	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		43			19			41			5	
Link Speed (k/h)		70			70			40			40	
Link Distance (m)		304.3			341.1			247.9			1456.2	
Travel Time (s)		15.6			17.5			22.3			131.1	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	9%	2%	4%	20%	5%	20%	0%	19%	9%	21%	12%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	367	0	0	369	0	45	333	0	275	590	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		37.5	37.5		37.5	37.5	
Total Split (s)	34.5	34.5		34.5	34.5		42.5	42.5		42.5	42.5	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		55.2%	55.2%		55.2%	55.2%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		27.0			27.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio		0.35			0.35		0.45	0.45		0.45	0.45	
v/c Ratio		0.61			1.07		0.19	0.46		0.73	0.77	
Control Delay		23.3			95.1		15.1	15.0		31.3	26.1	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		23.3			95.1		15.1	15.0		31.3	26.1	
LOS		C			F		B	B		C	C	
Approach Delay		23.3			95.1			15.0			27.8	
Approach LOS		C			F			B			C	
Queue Length 50th (m)		40.1			~61.9		3.9	29.0		32.9	72.3	
Queue Length 95th (m)		64.7			#108.6		10.4	48.0		#69.4	108.1	
Internal Link Dist (m)		280.3			317.1			223.9			1432.2	
Turn Bay Length (m)							40.0			45.0		
Base Capacity (vph)		601			345		240	731		376	764	

HCM Signalized Intersection Capacity Analysis

11: Trafalgar Road North & Wellington Road 22

2026 Future Total Traffic - AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.61			1.07		0.19	0.46		0.73	0.77	

Intersection Summary

Area Type: Other

Cycle Length: 77

Actuated Cycle Length: 77

Natural Cycle: 75

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 37.1

Intersection LOS: D

Intersection Capacity Utilization 113.1%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

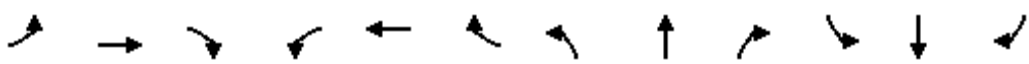
Queue shown is maximum after two cycles.

Splits and Phases: 11: Trafalgar Road North & Wellington Road 22

 Ø2	 Ø4
42.5 s	34.5 s
 Ø6	 Ø8
42.5 s	34.5 s

HCM Un-signalized Intersection Capacity Analysis 8: Trafalgar Road North & George Street/Mill Street

2026 Future Total Traffic - AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	5	1	8	34	0	36	12	267	14	3	626	3
Future Volume (Veh/h)	5	1	8	34	0	36	12	267	14	3	626	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	1	9	37	0	39	13	290	15	3	680	3
Pedestrians								1				
Lane Width (m)								3.6				
Walking Speed (m/s)								1.2				
Percent Blockage								0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1050	1018	682	1022	1012	298	683			305		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1050	1018	682	1022	1012	298	683			305		
tC, single (s)	7.1	6.5	6.4	7.2	6.5	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.6	4.0	3.4	2.2			2.2		
p0 queue free %	97	100	98	82	100	95	99			100		
cM capacity (veh/h)	193	235	424	202	237	726	919			1267		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	15	76	318	686								
Volume Left	5	37	13	3								
Volume Right	9	39	15	3								
cSH	292	321	919	1267								
Volume to Capacity	0.05	0.24	0.01	0.00								
Queue Length 95th (m)	1.3	7.2	0.3	0.1								
Control Delay (s)	18.0	19.7	0.5	0.1								
Lane LOS	C	C	A	A								
Approach Delay (s)	18.0	19.7	0.5	0.1								
Approach LOS	C	C										
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			47.0%			ICU Level of Service				A		
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis 5: Trafalgar Road North & Upper Canada Drive/Church Street

2026 Future Total Traffic - AM

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	10	0	19	12	1	29	2	253	5	2	566	1	
Future Volume (Veh/h)	10	0	19	12	1	29	2	253	5	2	566	1	
Sign Control	Stop				Stop				Free				
Grade	0%				0%				0%				
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	
Hourly flow rate (vph)	12	0	23	15	1	36	2	312	6	2	699	1	
Pedestrians								4					
Lane Width (m)								3.6					
Walking Speed (m/s)								1.2					
Percent Blockage								0					
Right turn flare (veh)													
Median type								None	None				
Median storage veh													
Upstream signal (m)													
pX, platoon unblocked													
vC, conflicting volume	1059	1026	704	1050	1023	315	700	318					
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	1059	1026	704	1050	1023	315	700	318					
tC, single (s)	7.1	6.5	6.2	7.1	7.5	6.2	4.1	4.1					
tC, 2 stage (s)													
tF (s)	3.5	4.0	3.3	3.5	4.9	3.3	2.2	2.2					
p0 queue free %	94	100	95	92	99	95	100	100					
cM capacity (veh/h)	193	236	439	195	161	730	906	1253					
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	35	52	320	702									
Volume Left	12	15	2	2									
Volume Right	23	36	6	1									
cSH	305	393	906	1253									
Volume to Capacity	0.11	0.13	0.00	0.00									
Queue Length 95th (m)	3.1	3.6	0.1	0.0									
Control Delay (s)	18.3	15.6	0.1	0.0									
Lane LOS	C	C	A	A									
Approach Delay (s)	18.3	15.6	0.1	0.0									
Approach LOS	C	C											
Intersection Summary													
Average Delay			1.4										
Intersection Capacity Utilization			42.4%	ICU Level of Service					A				
Analysis Period (min)			15										

HCM Un-signalized Intersection Capacity Analysis 3: Trafalgar Road North & Street 'A'/Howe Street

2026 Future Total Traffic - AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	171	1	28	4	87	166	1	4	220	2
Future Volume (Veh/h)	6	0	171	1	28	4	87	166	1	4	220	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	6	0	176	1	29	4	90	171	1	4	227	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	606	588	228	764	588	172	229			172		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	606	588	228	764	588	172	229			172		
tC, single (s)	7.1	6.5	6.2	8.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	4.4	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	78	99	93	100	93			100		
cM capacity (veh/h)	364	392	811	167	392	877	1339			1417		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	182	34	262	233								
Volume Left	6	1	90	4								
Volume Right	176	4	1	2								
cSH	780	402	1339	1417								
Volume to Capacity	0.23	0.08	0.07	0.00								
Queue Length 95th (m)	7.2	2.2	1.7	0.1								
Control Delay (s)	11.0	14.8	3.1	0.2								
Lane LOS	B	B	A	A								
Approach Delay (s)	11.0	14.8	3.1	0.2								
Approach LOS	B	B										
Intersection Summary												
Average Delay			4.7									
Intersection Capacity Utilization			49.1%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis 14: Trafalgar Road North & Street 'E'

2026 Future Total Traffic - AM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	136	31	223	392	0
Future Volume (Veh/h)	0	136	31	223	392	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	148	34	242	426	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	736	426	426			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	736	426	426			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	76	97			
cM capacity (veh/h)	375	628	1133			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	148	276	426			
Volume Left	0	34	0			
Volume Right	148	0	0			
cSH	628	1133	1700			
Volume to Capacity	0.24	0.03	0.25			
Queue Length 95th (m)	7.3	0.7	0.0			
Control Delay (s)	12.5	1.3	0.0			
Lane LOS	B	A				
Approach Delay (s)	12.5	1.3	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		2.6				
Intersection Capacity Utilization		52.5%		ICU Level of Service		A
Analysis Period (min)		15				

Intersection				
Intersection Delay, s/veh	4.7			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	220	128	20	25
Demand Flow Rate, veh/h	225	130	20	25
Vehicles Circulating, veh/h	13	20	194	145
Vehicles Exiting, veh/h	157	194	44	5
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.1	4.3	4.1	3.9
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	225	130	20	25
Cap Entry Lane, veh/h	1115	1108	931	977
Entry HV Adj Factor	0.980	0.981	1.000	1.000
Flow Entry, veh/h	220	128	20	25
Cap Entry, veh/h	1093	1087	931	977
V/C Ratio	0.202	0.117	0.021	0.026
Control Delay, s/veh	5.1	4.3	4.1	3.9
LOS	A	A	A	A
95th %tile Queue, veh	1	0	0	0

HCM Signalized Intersection Capacity Analysis

11: Trafalgar Road North & Wellington Road 22

2026 Future Total Traffic - PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	54	130	68	122	192	222	123	634	198	119	309	34
Future Volume (vph)	54	130	68	122	192	222	123	634	198	119	309	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		0.0	45.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1726	0	0	1731	0	1504	1791	0	1703	1822	0
Flt Permitted		0.738			0.836		0.482			0.114		
Satd. Flow (perm)	0	1288	0	0	1464	0	763	1791	0	204	1822	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			51			27			9	
Link Speed (k/h)		70			70			40			40	
Link Distance (m)		304.3			341.1			247.9			1456.2	
Travel Time (s)		15.6			17.5			22.3			131.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	2%	14%	4%	2%	2%	20%	3%	0%	6%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	277	0	0	589	0	135	915	0	131	377	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		37.5	37.5		37.5	37.5	
Total Split (s)	34.5	34.5		34.5	34.5		42.5	42.5		42.5	42.5	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		55.2%	55.2%		55.2%	55.2%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		27.0			27.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio		0.35			0.35		0.45	0.45		0.45	0.45	
v/c Ratio		0.59			1.08		0.39	1.11		1.42	0.45	
Control Delay		24.5			86.8		18.2	87.0		267.7	16.2	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		24.5			86.8		18.2	87.0		267.7	16.2	
LOS		C			F		B	F		F	B	
Approach Delay		24.5			86.8			78.1			81.1	
Approach LOS		C			F			E			F	
Queue Length 50th (m)		30.7			~97.2		13.1	~160.8		~27.5	37.0	
Queue Length 95th (m)		56.1			#159.6		27.9	#232.5		#48.1	59.6	
Internal Link Dist (m)		280.3			317.1			223.9			1432.2	
Turn Bay Length (m)							40.0			45.0		
Base Capacity (vph)		469			546		346	828		92	833	

HCM Signalized Intersection Capacity Analysis

11: Trafalgar Road North & Wellington Road 22

2026 Future Total Traffic - PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.59			1.08		0.39	1.11		1.42	0.45	

Intersection Summary

Area Type: Other

Cycle Length: 77

Actuated Cycle Length: 77

Natural Cycle: 150

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.42

Intersection Signal Delay: 74.7

Intersection LOS: E

Intersection Capacity Utilization 130.7%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 11: Trafalgar Road North & Wellington Road 22

 Ø2	 Ø4
42.5 s	34.5 s
 Ø6	 Ø8
42.5 s	34.5 s

HCM Un-signalized Intersection Capacity Analysis 8: Trafalgar Road North & George Street/Mill Street

2026 Future Total Traffic - PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	16	48	34	13	23	71	614	54	23	382	9
Future Volume (Veh/h)	24	16	48	34	13	23	71	614	54	23	382	9
Sign Control		Stop			Stop			Free			Free	
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)	25	17	51	36	14	24	75	646	57	24	402	9
Pedestrians		5			3							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1315	1316	412	1342	1292	678	416			706		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1315	1316	412	1342	1292	678	416			706		
tC, single (s)	7.3	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	76	88	92	62	91	95	93			97		
cM capacity (veh/h)	102	144	642	94	149	455	1128			899		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	93	74	778	435								
Volume Left	25	36	75	24								
Volume Right	51	24	57	9								
cSH	210	140	1128	899								
Volume to Capacity	0.44	0.53	0.07	0.03								
Queue Length 95th (m)	16.7	20.6	1.7	0.7								
Control Delay (s)	35.0	56.8	1.7	0.8								
Lane LOS	E	F	A	A								
Approach Delay (s)	35.0	56.8	1.7	0.8								
Approach LOS	E	F										
Intersection Summary												
Average Delay			6.6									
Intersection Capacity Utilization			73.0%		ICU Level of Service					D		
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis 5: Trafalgar Road North & Upper Canada Drive/Church Street

2026 Future Total Traffic - PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	2	14	0	5	17	647	20	12	386	3
Future Volume (Veh/h)	0	0	2	14	0	5	17	647	20	12	386	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	0	2	14	0	5	18	667	21	12	398	3
Pedestrians					1			5				
Lane Width (m)					3.6			3.6				
Walking Speed (m/s)					1.2			1.2				
Percent Blockage					0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1142	1148	404	1145	1140	678	401			689		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1142	1148	404	1145	1140	678	401			689		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	92	100	99	98			99		
cM capacity (veh/h)	173	194	648	167	197	455	1169			914		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	2	19	706	413								
Volume Left	0	14	18	12								
Volume Right	2	5	21	3								
cSH	648	200	1169	914								
Volume to Capacity	0.00	0.09	0.02	0.01								
Queue Length 95th (m)	0.1	2.5	0.4	0.3								
Control Delay (s)	10.6	24.9	0.4	0.4								
Lane LOS	B	C	A	A								
Approach Delay (s)	10.6	24.9	0.4	0.4								
Approach LOS	B	C										
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			57.0%	ICU Level of Service	B							
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis 3: Trafalgar Road North & Street 'A'/Howe Street

2026 Future Total Traffic - PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	6	61	4	0	0	123	404	10	6	276	1
Future Volume (Veh/h)	1	6	61	4	0	0	123	404	10	6	276	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	7	66	4	0	0	134	439	11	7	300	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1027	1032	300	1096	1028	444	301	450				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1027	1032	300	1096	1028	444	301	450				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	99	97	91	97	100	100	89	99				
cM capacity (veh/h)	194	207	739	156	208	618	1260	1121				
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	74	4	584	308								
Volume Left	1	4	134	7								
Volume Right	66	0	11	1								
cSH	577	156	1260	1121								
Volume to Capacity	0.13	0.03	0.11	0.01								
Queue Length 95th (m)	3.5	0.6	2.8	0.2								
Control Delay (s)	12.2	28.7	2.8	0.2								
Lane LOS	B	D	A	A								
Approach Delay (s)	12.2	28.7	2.8	0.2								
Approach LOS	B	D										
Intersection Summary												
Average Delay			2.8									
Intersection Capacity Utilization			57.7%	ICU Level of Service					B			
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis 14: Trafalgar Road North & Street 'E'

2026 Future Total Traffic - PM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	68	107	430	341	0
Future Volume (Veh/h)	0	68	107	430	341	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	74	116	467	371	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1070	371	371			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1070	371	371			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	89	90			
cM capacity (veh/h)	221	675	1188			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	74	583	371			
Volume Left	0	116	0			
Volume Right	74	0	0			
cSH	675	1188	1700			
Volume to Capacity	0.11	0.10	0.22			
Queue Length 95th (m)	2.9	2.6	0.0			
Control Delay (s)	11.0	2.6	0.0			
Lane LOS	B	A				
Approach Delay (s)	11.0	2.6	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		2.2				
Intersection Capacity Utilization		60.7%		ICU Level of Service		B
Analysis Period (min)		15				

HCM Roundabout Analysis
17: Street 'G'/Street 'B' & Street 'A'

2026 Future Total Traffic - PM

Intersection				
Intersection Delay, s/veh	4.1			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	78	131	0	9
Demand Flow Rate, veh/h	79	133	0	9
Vehicles Circulating, veh/h	9	3	77	119
Vehicles Exiting, veh/h	119	74	11	17
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.9	4.3	0.0	3.7
Approach LOS	A	A	-	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	79	133	0	9
Cap Entry Lane, veh/h	1120	1127	1046	1003
Entry HV Adj Factor	0.984	0.982	1.000	1.000
Flow Entry, veh/h	78	131	0	9
Cap Entry, veh/h	1102	1107	1046	1003
V/C Ratio	0.071	0.118	0.000	0.009
Control Delay, s/veh	3.9	4.3	3.4	3.7
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	0

HCM Signalized Intersection Capacity Analysis
11: Trafalgar Road North & Wellington Road 22

2026 Future Total Traffic - AM - with Improvements

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	170	120	169	86	66	39	196	94	239	484	30
Future Volume (vph)	30	170	120	169	86	66	39	196	94	239	484	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		0.0	55.0		0.0	40.0		0.0	60.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1656	1733	0	1504	1593	0	1805	1561	0	1492	1676	0
Flt Permitted	0.647			0.292			0.437			0.443		
Satd. Flow (perm)	1128	1733	0	462	1593	0	830	1561	0	696	1676	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		49			62			38			6	
Link Speed (k/h)		70			70			40			40	
Link Distance (m)		304.3			341.1			247.9			1456.2	
Travel Time (s)		15.6			17.5			22.3			131.1	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	9%	2%	4%	20%	5%	20%	0%	19%	9%	21%	12%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	333	0	194	175	0	45	333	0	275	590	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		8.0	8.0		5.0	8.0	
Minimum Split (s)	19.5	19.5		8.0	19.5		20.7	20.7		8.0	20.7	
Total Split (s)	20.0	20.0		8.0	28.0		28.0	28.0		9.0	37.0	
Total Split (%)	30.8%	30.8%		12.3%	43.1%		43.1%	43.1%		13.8%	56.9%	
Yellow Time (s)	5.5	5.5		3.0	5.5		5.5	5.5		3.0	5.5	
All-Red Time (s)	2.0	2.0		0.0	2.0		3.2	3.2		0.0	3.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.5	7.5		3.0	7.5		8.7	8.7		3.0	8.7	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Recall Mode	None	None		None	None		Max	Max		None	Max	
Act Effct Green (s)	12.5	12.5		25.0	20.5		19.3	19.3		34.0	28.3	
Actuated g/C Ratio	0.19	0.19		0.38	0.32		0.30	0.30		0.52	0.44	
v/c Ratio	0.16	0.90		0.75	0.32		0.18	0.68		0.63	0.80	
Control Delay	24.1	51.6		37.1	12.9		19.4	26.2		17.1	26.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	24.1	51.6		37.1	12.9		19.4	26.2		17.1	26.7	
LOS	C	D		D	B		B	C		B	C	
Approach Delay		49.1			25.6			25.4			23.6	
Approach LOS		D			C			C			C	
Queue Length 50th (m)	3.6	35.6		16.9	10.4		4.2	32.4		18.8	61.5	
Queue Length 95th (m)	10.3	#76.0		#39.9	23.3		11.2	56.3		32.0	#109.9	
Internal Link Dist (m)		280.3			317.1			223.9			1432.2	
Turn Bay Length (m)	25.0			55.0			40.0			60.0		
Base Capacity (vph)	216	372		257	544		246	490		437	733	

HCM Signalized Intersection Capacity Analysis 11: Trafalgar Road North & Wellington Road 22

2026 Future Total Traffic - AM - with Improvements

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.16	0.90		0.75	0.32		0.18	0.68		0.63	0.80	

Intersection Summary

Area Type: Other

Cycle Length: 65

Actuated Cycle Length: 65

Natural Cycle: 65

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 29.0

Intersection LOS: C

Intersection Capacity Utilization 83.7%

ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 11: Trafalgar Road North & Wellington Road 22

 Ø1	 Ø2	 Ø3	 Ø4
9 s	28 s	8 s	20 s
 Ø6		 Ø8	
37 s		28 s	

HCM Signalized Intersection Capacity Analysis
11: Trafalgar Road North & Wellington Road 22

2026 Future Total Traffic - PM - with Improvements

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	130	68	122	192	222	123	634	198	119	309	34
Future Volume (vph)	54	130	68	122	192	222	123	634	198	119	309	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		0.0	55.0		0.0	40.0		0.0	60.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1805	1697	0	1736	1714	0	1504	1791	0	1703	1822	0
Flt Permitted	0.113			0.622			0.538			0.060		
Satd. Flow (perm)	215	1697	0	1136	1714	0	852	1791	0	108	1822	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			43			17			7	
Link Speed (k/h)		70			70			40			40	
Link Distance (m)		304.3			341.1			247.9			1456.2	
Travel Time (s)		15.6			17.5			22.3			131.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	2%	14%	4%	2%	2%	20%	3%	0%	6%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	218	0	134	455	0	135	915	0	131	377	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	12.0		12.0	12.0		8.0	8.0		5.0	8.0	
Minimum Split (s)	8.0	19.5		19.5	19.5		20.7	20.7		8.0	20.7	
Total Split (s)	8.0	48.0		40.0	40.0		72.0	72.0		10.0	82.0	
Total Split (%)	6.2%	36.9%		30.8%	30.8%		55.4%	55.4%		7.7%	63.1%	
Yellow Time (s)	3.0	5.5		5.5	5.5		5.5	5.5		3.0	5.5	
All-Red Time (s)	0.0	2.0		2.0	2.0		3.2	3.2		0.0	3.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.0	7.5		7.5	7.5		8.7	8.7		3.0	8.7	
Lead/Lag	Lead			Lag	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes		
Recall Mode	None	None		None	None		Max	Max		None	Max	
Act Effct Green (s)	43.3	38.8		32.5	32.5		63.3	63.3		79.1	73.3	
Actuated g/C Ratio	0.34	0.30		0.25	0.25		0.49	0.49		0.62	0.57	
v/c Ratio	0.44	0.41		0.47	0.98		0.32	1.03		0.86	0.36	
Control Delay	39.4	34.7		47.5	80.0		22.8	69.3		66.8	16.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	39.4	34.7		47.5	80.0		22.8	69.3		66.8	16.1	
LOS	D	C		D	E		C	E		E	B	
Approach Delay		35.7			72.6			63.4			29.2	
Approach LOS		D			E			E			C	
Queue Length 50th (m)	10.7	41.6		30.9	113.3		21.6	~263.7		18.2	52.5	
Queue Length 95th (m)	21.2	65.6		52.7	#185.3		38.1	#345.6		#56.7	74.6	
Internal Link Dist (m)		280.3			317.1			223.9			1432.2	
Turn Bay Length (m)	25.0			55.0			40.0			60.0		
Base Capacity (vph)	134	550		288	466		420	891		153	1043	

HCM Signalized Intersection Capacity Analysis 11: Trafalgar Road North & Wellington Road 22

2026 Future Total Traffic - PM - with Improvements

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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	0.44	0.40		0.47	0.98		0.32	1.03		0.86	0.36	

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 128.4

Natural Cycle: 130

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.03

Intersection Signal Delay: 55.3

Intersection LOS: E

Intersection Capacity Utilization 100.0%

ICU Level of Service G

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 11: Trafalgar Road North & Wellington Road 22

 Ø1	 Ø2	 Ø4
10 s	72 s	48 s
 Ø6		 Ø7
82 s		8 s
		 Ø8
		40 s

HCM Signalized Intersection Capacity Analysis 11: Trafalgar Road North & Wellington Road 22

2031 Future Total Traffic - AM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	33	178	124	176	91	70	40	210	100	249	509	33
Future Volume (vph)	33	178	124	176	91	70	40	210	100	249	509	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		0.0	45.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1736	0	0	1553	0	1805	1562	0	1492	1676	0
Flt Permitted		0.931			0.582		0.248			0.503		
Satd. Flow (perm)	0	1625	0	0	927	0	471	1562	0	790	1676	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42			19			41			6	
Link Speed (k/h)		70			70			40			40	
Link Distance (m)		304.3			341.1			247.9			1456.2	
Travel Time (s)		15.6			17.5			22.3			131.1	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	9%	2%	4%	20%	5%	20%	0%	19%	9%	21%	12%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	386	0	0	387	0	46	356	0	286	623	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		37.5	37.5		37.5	37.5	
Total Split (s)	34.5	34.5		34.5	34.5		42.5	42.5		42.5	42.5	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		55.2%	55.2%		55.2%	55.2%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		27.0			27.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio		0.35			0.35		0.45	0.45		0.45	0.45	
v/c Ratio		0.65			1.15		0.21	0.49		0.80	0.81	
Control Delay		24.6			122.0		16.0	15.6		37.4	28.7	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		24.6			122.0		16.0	15.6		37.4	28.7	
LOS		C			F		B	B		D	C	
Approach Delay		24.6			122.0			15.7			31.5	
Approach LOS		C			F			B			C	
Queue Length 50th (m)		43.4			~69.2		4.1	31.9		35.9	78.6	
Queue Length 95th (m)		69.6			#116.6		10.9	52.2		#76.1	#130.6	
Internal Link Dist (m)		280.3			317.1			223.9			1432.2	
Turn Bay Length (m)							40.0			45.0		
Base Capacity (vph)		597			337		214	732		359	765	

HCM Signalized Intersection Capacity Analysis

11: Trafalgar Road North & Wellington Road 22

2031 Future Total Traffic - AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.65			1.15		0.21	0.49		0.80	0.81	

Intersection Summary

Area Type: Other

Cycle Length: 77

Actuated Cycle Length: 77

Natural Cycle: 80

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.15

Intersection Signal Delay: 44.0

Intersection LOS: D

Intersection Capacity Utilization 116.3%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 11: Trafalgar Road North & Wellington Road 22

 Ø2	 Ø4
42.5 s	34.5 s
 Ø6	 Ø8
42.5 s	34.5 s

HCM Un-signalized Intersection Capacity Analysis 8: Trafalgar Road North & George Street/Mill Street

2031 Future Total Traffic - AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1	8	34	0	36	12	285	14	3	660	3
Future Volume (Veh/h)	5	1	8	34	0	36	12	285	14	3	660	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	1	9	37	0	39	13	310	15	3	717	3
Pedestrians								1				
Lane Width (m)								3.6				
Walking Speed (m/s)								1.2				
Percent Blockage								0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1107	1076	720	1078	1070	318	720			325		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1107	1076	720	1078	1070	318	720			325		
tC, single (s)	7.1	6.5	6.4	7.2	6.5	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.6	4.0	3.4	2.2			2.2		
p0 queue free %	97	100	98	80	100	94	99			100		
cM capacity (veh/h)	176	217	404	184	219	707	891			1246		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	15	76	338	723								
Volume Left	5	37	13	3								
Volume Right	9	39	15	3								
cSH	272	297	891	1246								
Volume to Capacity	0.06	0.26	0.01	0.00								
Queue Length 95th (m)	1.4	8.0	0.4	0.1								
Control Delay (s)	19.0	21.2	0.5	0.1								
Lane LOS	C	C	A	A								
Approach Delay (s)	19.0	21.2	0.5	0.1								
Approach LOS	C	C										
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			48.8%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis 5: Trafalgar Road North & Upper Canada Drive/Church Street

2031 Future Total Traffic - AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	19	12	1	29	2	270	5	2	593	1
Future Volume (Veh/h)	10	0	19	12	1	29	2	270	5	2	593	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	12	0	23	15	1	36	2	333	6	2	732	1
Pedestrians								4				
Lane Width (m)								3.6				
Walking Speed (m/s)								1.2				
Percent Blockage								0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1113	1080	736	1104	1077	336	733			339		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1113	1080	736	1104	1077	336	733			339		
tC, single (s)	7.1	6.5	6.2	7.1	7.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.9	3.3	2.2			2.2		
p0 queue free %	93	100	95	92	99	95	100			100		
cM capacity (veh/h)	177	219	421	179	148	711	881			1231		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	35	52	341	735								
Volume Left	12	15	2	2								
Volume Right	23	36	6	1								
cSH	285	368	881	1231								
Volume to Capacity	0.12	0.14	0.00	0.00								
Queue Length 95th (m)	3.3	3.9	0.1	0.0								
Control Delay (s)	19.4	16.4	0.1	0.0								
Lane LOS	C	C	A	A								
Approach Delay (s)	19.4	16.4	0.1	0.0								
Approach LOS	C	C										
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			43.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis 3: Trafalgar Road North & Street 'A'/Howe Street

2031 Future Total Traffic - AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	171	1	28	4	87	183	1	4	243	2
Future Volume (Veh/h)	6	0	171	1	28	4	87	183	1	4	243	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	6	0	176	1	29	4	90	189	1	4	251	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	648	630	252	806	630	190	253			190		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	648	630	252	806	630	190	253			190		
tC, single (s)	7.1	6.5	6.2	8.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	4.4	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	78	99	92	100	93			100		
cM capacity (veh/h)	339	370	787	154	370	857	1312			1396		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	182	34	280	257								
Volume Left	6	1	90	4								
Volume Right	176	4	1	2								
cSH	754	380	1312	1396								
Volume to Capacity	0.24	0.09	0.07	0.00								
Queue Length 95th (m)	7.5	2.3	1.8	0.1								
Control Delay (s)	11.3	15.4	3.0	0.1								
Lane LOS	B	C	A	A								
Approach Delay (s)	11.3	15.4	3.0	0.1								
Approach LOS	B	C										
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization			51.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis 14: Trafalgar Road North & Street 'E'

2031 Future Total Traffic - AM

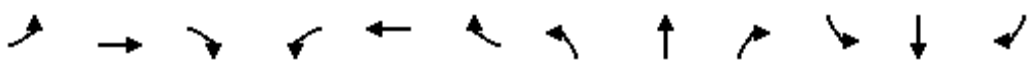
						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	136	31	240	415	0
Future Volume (Veh/h)	0	136	31	240	415	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	148	34	261	451	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	780	451	451			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	780	451	451			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	76	97			
cM capacity (veh/h)	353	608	1109			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	148	295	451			
Volume Left	0	34	0			
Volume Right	148	0	0			
cSH	608	1109	1700			
Volume to Capacity	0.24	0.03	0.27			
Queue Length 95th (m)	7.6	0.8	0.0			
Control Delay (s)	12.8	1.2	0.0			
Lane LOS	B	A				
Approach Delay (s)	12.8	1.2	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		2.5				
Intersection Capacity Utilization		53.7%		ICU Level of Service		A
Analysis Period (min)		15				

Intersection				
Intersection Delay, s/veh	4.7			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	220	128	20	25
Demand Flow Rate, veh/h	225	130	20	25
Vehicles Circulating, veh/h	13	20	194	145
Vehicles Exiting, veh/h	157	194	44	5
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.1	4.3	4.1	3.9
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	225	130	20	25
Cap Entry Lane, veh/h	1115	1108	931	977
Entry HV Adj Factor	0.980	0.981	1.000	1.000
Flow Entry, veh/h	220	128	20	25
Cap Entry, veh/h	1093	1087	931	977
V/C Ratio	0.202	0.117	0.021	0.026
Control Delay, s/veh	5.1	4.3	4.1	3.9
LOS	A	A	A	A
95th %tile Queue, veh	1	0	0	0

HCM Signalized Intersection Capacity Analysis

11: Trafalgar Road North & Wellington Road 22

2031 Future Total Traffic - PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	137	69	128	200	234	127	676	207	125	329	37
Future Volume (vph)	60	137	69	128	200	234	127	676	207	125	329	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		0.0	45.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	0	1733	0	0	1731	0	1504	1792	0	1703	1822	0
Flt Permitted		0.704			0.827		0.456			0.114		
Satd. Flow (perm)	0	1233	0	0	1448	0	722	1792	0	204	1822	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			51			26			10	
Link Speed (k/h)		70			70			40			40	
Link Distance (m)		304.3			341.1			247.9			1456.2	
Travel Time (s)		15.6			17.5			22.3			131.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	2%	14%	4%	2%	2%	20%	3%	0%	6%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	293	0	0	618	0	140	970	0	137	403	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		30.0	30.0		30.0	30.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		37.5	37.5		37.5	37.5	
Total Split (s)	34.5	34.5		34.5	34.5		42.5	42.5		42.5	42.5	
Total Split (%)	44.8%	44.8%		44.8%	44.8%		55.2%	55.2%		55.2%	55.2%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.5	5.5		5.5	5.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.5			7.5		7.5	7.5		7.5	7.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		27.0			27.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio		0.35			0.35		0.45	0.45		0.45	0.45	
v/c Ratio		0.65			1.14		0.43	1.17		1.49	0.48	
Control Delay		27.4			110.2		19.3	112.8		293.5	16.7	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		27.4			110.2		19.3	112.8		293.5	16.7	
LOS		C			F		B	F		F	B	
Approach Delay		27.4			110.2			101.0			87.0	
Approach LOS		C			F			F			F	
Queue Length 50th (m)		34.0			~107.9		13.9	~179.2		~29.4	40.2	
Queue Length 95th (m)		62.0			#171.2		29.9	#251.9		#50.8	64.3	
Internal Link Dist (m)		280.3			317.1			223.9			1432.2	
Turn Bay Length (m)							40.0			45.0		
Base Capacity (vph)		448			540		328	828		92	833	

HCM Signalized Intersection Capacity Analysis

11: Trafalgar Road North & Wellington Road 22

2031 Future Total Traffic - PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.65			1.14		0.43	1.17		1.49	0.48	

Intersection Summary

Area Type: Other

Cycle Length: 77

Actuated Cycle Length: 77

Natural Cycle: 130

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.49

Intersection Signal Delay: 91.8

Intersection LOS: F

Intersection Capacity Utilization 134.7%

ICU Level of Service H

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 11: Trafalgar Road North & Wellington Road 22

 Ø2	 Ø4
42.5 s	34.5 s
 Ø6	 Ø8
42.5 s	34.5 s

HCM Un-signalized Intersection Capacity Analysis 8: Trafalgar Road North & George Street/Mill Street

2031 Future Total Traffic - PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	16	48	34	13	23	71	654	54	23	407	9
Future Volume (Veh/h)	24	16	48	34	13	23	71	654	54	23	407	9
Sign Control		Stop			Stop			Free			Free	
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)	25	17	51	36	14	24	75	688	57	24	428	9
Pedestrians		5			3							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		0			0							
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1383	1384	438	1410	1360	720	442			748		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1383	1384	438	1410	1360	720	442			748		
tC, single (s)	7.3	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	72	87	92	57	90	94	93			97		
cM capacity (veh/h)	90	130	621	83	135	430	1103			868		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	93	74	820	461								
Volume Left	25	36	75	24								
Volume Right	51	24	57	9								
cSH	190	125	1103	868								
Volume to Capacity	0.49	0.59	0.07	0.03								
Queue Length 95th (m)	19.2	23.9	1.7	0.7								
Control Delay (s)	40.8	69.3	1.7	0.8								
Lane LOS	E	F	A	A								
Approach Delay (s)	40.8	69.3	1.7	0.8								
Approach LOS	E	F										
Intersection Summary												
Average Delay			7.4									
Intersection Capacity Utilization			75.8%		ICU Level of Service					D		
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis 5: Trafalgar Road North & Upper Canada Drive/Church Street

2031 Future Total Traffic - PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	2	14	0	5	17	691	20	12	414	3
Future Volume (Veh/h)	0	0	2	14	0	5	17	691	20	12	414	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	0	2	14	0	5	18	712	21	12	427	3
Pedestrians					1			5				
Lane Width (m)					3.6			3.6				
Walking Speed (m/s)					1.2			1.2				
Percent Blockage					0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1216	1222	434	1219	1214	724	430			734		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1216	1222	434	1219	1214	724	430			734		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	91	100	99	98			99		
cM capacity (veh/h)	154	176	624	148	178	429	1140			880		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	2	19	751	442								
Volume Left	0	14	18	12								
Volume Right	2	5	21	3								
cSH	624	179	1140	880								
Volume to Capacity	0.00	0.11	0.02	0.01								
Queue Length 95th (m)	0.1	2.8	0.4	0.3								
Control Delay (s)	10.8	27.5	0.4	0.4								
Lane LOS	B	D	A	A								
Approach Delay (s)	10.8	27.5	0.4	0.4								
Approach LOS	B	D										
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			59.5%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis 3: Trafalgar Road North & Street 'A'/Howe Street

2031 Future Total Traffic - PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	6	61	4	0	0	123	446	10	6	305	1
Future Volume (Veh/h)	1	6	61	4	0	0	123	446	10	6	305	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	7	66	4	0	0	134	485	11	7	332	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1105	1110	332	1174	1106	490	333			496		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1105	1110	332	1174	1106	490	333			496		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	96	91	97	100	100	89			99		
cM capacity (veh/h)	172	185	709	137	186	582	1226			1078		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	74	4	630	340								
Volume Left	1	4	134	7								
Volume Right	66	0	11	1								
cSH	541	137	1226	1078								
Volume to Capacity	0.14	0.03	0.11	0.01								
Queue Length 95th (m)	3.8	0.7	2.9	0.2								
Control Delay (s)	12.7	32.1	2.8	0.2								
Lane LOS	B	D	A	A								
Approach Delay (s)	12.7	32.1	2.8	0.2								
Approach LOS	B	D										
Intersection Summary												
Average Delay			2.8									
Intersection Capacity Utilization			61.4%	ICU Level of Service					B			
Analysis Period (min)			15									

HCM Un-signalized Intersection Capacity Analysis 14: Trafalgar Road North & Street 'E'

2031 Future Total Traffic - PM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	68	107	472	370	0
Future Volume (Veh/h)	0	68	107	472	370	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	74	116	513	402	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1147	402	402			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1147	402	402			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	89	90			
cM capacity (veh/h)	198	648	1157			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	74	629	402			
Volume Left	0	116	0			
Volume Right	74	0	0			
cSH	648	1157	1700			
Volume to Capacity	0.11	0.10	0.24			
Queue Length 95th (m)	3.1	2.7	0.0			
Control Delay (s)	11.3	2.6	0.0			
Lane LOS	B	A				
Approach Delay (s)	11.3	2.6	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		2.2				
Intersection Capacity Utilization		64.4%		ICU Level of Service		C
Analysis Period (min)		15				

HCM Roundabout Analysis
17: Street 'G'/Street 'B' & Street 'A'

2031 Future Total Traffic - PM

Intersection				
Intersection Delay, s/veh	4.1			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	78	131	0	9
Demand Flow Rate, veh/h	79	133	0	9
Vehicles Circulating, veh/h	9	3	77	119
Vehicles Exiting, veh/h	119	74	11	17
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.9	4.3	0.0	3.7
Approach LOS	A	A	-	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	79	133	0	9
Cap Entry Lane, veh/h	1120	1127	1046	1003
Entry HV Adj Factor	0.984	0.982	1.000	1.000
Flow Entry, veh/h	78	131	0	9
Cap Entry, veh/h	1102	1107	1046	1003
V/C Ratio	0.071	0.118	0.000	0.009
Control Delay, s/veh	3.9	4.3	3.4	3.7
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	0

HCM Signalized Intersection Capacity Analysis
11: Trafalgar Road North & Wellington Road 22

2031 Future Total Traffic - AM - with Improvements

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	178	124	176	91	70	40	210	100	249	509	33
Future Volume (vph)	33	178	124	176	91	70	40	210	100	249	509	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		0.0	55.0		30.0	40.0		25.0	60.0		0.0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1656	1733	0	1504	1810	1346	1805	1597	1482	1492	1676	0
Flt Permitted	0.689			0.261			0.403			0.544		
Satd. Flow (perm)	1201	1733	0	413	1810	1346	766	1597	1482	854	1676	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40				121			143			5
Link Speed (k/h)		70			70			40				40
Link Distance (m)		304.3			341.1			247.9			1456.2	
Travel Time (s)		15.6			17.5			22.3			131.1	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	9%	2%	4%	20%	5%	20%	0%	19%	9%	21%	12%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	38	348	0	202	105	80	46	241	115	286	623	0
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	4	4		3	8	8	2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0	12.0	8.0	8.0	8.0	5.0	8.0	
Minimum Split (s)	21.9	21.9		8.0	21.9	21.9	23.3	23.3	23.3	8.0	23.3	
Total Split (s)	25.0	25.0		9.0	34.0	34.0	34.0	34.0	34.0	12.0	46.0	
Total Split (%)	31.3%	31.3%		11.3%	42.5%	42.5%	42.5%	42.5%	42.5%	15.0%	57.5%	
Yellow Time (s)	5.5	5.5		3.0	5.5	5.5	5.5	5.5	5.5	3.0	5.5	
All-Red Time (s)	2.0	2.0		0.0	2.0	2.0	3.4	3.4	3.4	0.0	3.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	7.5	7.5		3.0	7.5	7.5	8.9	8.9	8.9	3.0	8.9	
Lead/Lag	Lag	Lag		Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes		
Recall Mode	None	None		None	None	None	Max	Max	Max	None	Max	
Act Effct Green (s)	16.9	16.9		30.4	25.9	25.9	25.1	25.1	25.1	43.0	37.1	
Actuated g/C Ratio	0.21	0.21		0.38	0.33	0.33	0.32	0.32	0.32	0.54	0.47	
v/c Ratio	0.15	0.87		0.84	0.18	0.15	0.19	0.48	0.20	0.54	0.79	
Control Delay	27.1	50.5		51.3	20.1	2.3	22.7	25.9	3.4	14.9	27.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	27.1	50.5		51.3	20.1	2.3	22.7	25.9	3.4	14.9	27.3	
LOS	C	D		D	C	A	C	C	A	B	C	
Approach Delay		48.2			32.7			19.1			23.4	
Approach LOS		D			C			B			C	
Queue Length 50th (m)	4.9	47.7		22.3	11.8	0.0	5.3	30.9	0.0	24.4	80.6	
Queue Length 95th (m)	12.5	#88.6		#51.5	22.4	3.8	13.3	50.2	6.8	39.3	#119.6	
Internal Link Dist (m)		280.3			317.1			223.9			1432.2	
Turn Bay Length (m)	25.0			55.0		30.0	40.0		25.0	60.0		
Base Capacity (vph)	264	413		240	604	529	242	505	566	534	785	

HCM Signalized Intersection Capacity Analysis 11: Trafalgar Road North & Wellington Road 22

2031 Future Total Traffic - AM - with Improvements

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.84		0.84	0.17	0.15	0.19	0.48	0.20	0.54	0.79	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 79.4

Natural Cycle: 80

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 28.9

Intersection LOS: C

Intersection Capacity Utilization 86.6%

ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 11: Trafalgar Road North & Wellington Road 22

 Ø1	 Ø2	 Ø3	 Ø4
12 s	34 s	9 s	25 s
 Ø6		 Ø8	
46 s		34 s	

HCM Signalized Intersection Capacity Analysis
11: Trafalgar Road North & Wellington Road 22

2031 Future Total Traffic - PM - with Improvements

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	137	69	128	200	234	127	676	207	125	329	37
Future Volume (vph)	60	137	69	128	200	234	127	676	207	125	329	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		0.0	55.0		30.0	40.0		25.0	60.0		0.0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Satd. Flow (prot)	1805	1703	0	1736	1863	1583	1504	1845	1615	1703	1822	0
Flt Permitted	0.599			0.497			0.525			0.110		
Satd. Flow (perm)	1138	1703	0	908	1863	1583	831	1845	1615	197	1822	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28				257			143		11	
Link Speed (k/h)		70			70			40			40	
Link Distance (m)		304.3			341.1			247.9			1456.2	
Travel Time (s)		15.6			17.5			22.3			131.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	2%	14%	4%	2%	2%	20%	3%	0%	6%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	227	0	141	220	257	140	743	227	137	403	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	7	4		3	8	8	2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	12.0		5.0	12.0	12.0	8.0	8.0	8.0	5.0	8.0	
Minimum Split (s)	8.0	21.9		8.0	21.9	21.9	23.3	23.3	23.3	8.0	23.3	
Total Split (s)	8.0	21.9		8.0	21.9	21.9	42.1	42.1	42.1	8.0	50.1	
Total Split (%)	10.0%	27.4%		10.0%	27.4%	27.4%	52.6%	52.6%	52.6%	10.0%	62.6%	
Yellow Time (s)	3.0	5.5		3.0	5.5	5.5	5.5	5.5	5.5	3.0	5.5	
All-Red Time (s)	0.0	2.0		0.0	2.0	2.0	3.4	3.4	3.4	0.0	3.4	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	7.5		3.0	7.5	7.5	8.9	8.9	8.9	3.0	8.9	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None		None	None	None	Max	Max	Max	None	Max	
Act Effct Green (s)	23.2	13.7		23.8	15.3	15.3	33.2	33.2	33.2	47.1	41.2	
Actuated g/C Ratio	0.29	0.17		0.30	0.19	0.19	0.42	0.42	0.42	0.59	0.52	
v/c Ratio	0.18	0.72		0.43	0.61	0.50	0.40	0.96	0.30	0.65	0.42	
Control Delay	19.8	41.1		24.7	38.5	7.9	20.8	49.3	7.3	24.4	13.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	19.8	41.1		24.7	38.5	7.9	20.8	49.3	7.3	24.4	13.3	
LOS	B	D		C	D	A	C	D	A	C	B	
Approach Delay		36.3			22.7			37.1			16.1	
Approach LOS		D			C			D			B	
Queue Length 50th (m)	7.2	30.0		16.1	33.0	0.0	15.3	112.9	8.1	8.9	36.5	
Queue Length 95th (m)	15.9	#60.1		29.9	#60.3	19.4	31.3	#188.3	22.1	#21.6	58.1	
Internal Link Dist (m)		280.3			317.1			223.9			1432.2	
Turn Bay Length (m)	25.0			55.0		30.0	40.0		25.0	60.0		
Base Capacity (vph)	375	332		325	365	516	347	772	758	212	951	

HCM Signalized Intersection Capacity Analysis 11: Trafalgar Road North & Wellington Road 22

2031 Future Total Traffic - PM - with Improvements

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.68		0.43	0.60	0.50	0.40	0.96	0.30	0.65	0.42	

Intersection Summary

Area Type: Other

Cycle Length: 80

Actuated Cycle Length: 79.3

Natural Cycle: 80

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 29.1

Intersection LOS: C

Intersection Capacity Utilization 81.3%

ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 11: Trafalgar Road North & Wellington Road 22

 Ø1	 Ø2	 Ø3	 Ø4
8 s	42.1 s	8 s	21.9 s
 Ø6		 Ø7	 Ø8
50.1 s		8 s	21.9 s

APPENDIX F

TRANSPORTATION TOMORROW SURVEY DATABASE QUERY

Tue Nov 09 2021 13:34:54 GMT-0500 (Eastern Standard Time) - Run Time: 2485ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig

Column: 2006 GTA zone of destination - gta06_dest

Filters:

(2006 GTA zone of origin - gta06_orig In 8370

and

Start time of trip - start_time In 700-859

and

Primary travel mode of trip - mode_prime In D

and

Trip purpose of origin - purp_orig In H

Trip 2016

Table:

Location	Toronto	Brampton	Brampton	Brampton	Halton	Internal	Erin Village	
	299	3332	3375	3462	4183	8370	8380	Total
8370	11	22	8	82	57	41	28	249
Percentage	4%	9%	3%	33%	23%	16%	11%	

Wed Nov 10 2021 13:45:46 GMT-0500 (Eastern Standard Time) - Run Time: 2788ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig

Column: 2006 GTA zone of destination - gta06_dest

Filters:

(2006 GTA zone of origin - gta06_orig In 8370, 8371, 8373

and

Start time of trip - start_time In 700-859

and

Primary travel mode of trip - mode_prime In D

and

Trip purpose of origin - purp_orig In H)

Trip 2016

Table:

	Toronto	Toronto	Markham	Brampton	Brampton	Brampton	Brampton	Brampton	Halton	Halton	Guelph	Wellington	Internal	Erin Village	Dufferin	External	
	299	309	2393	3332	3343	3375	3462	3721	4160	4183	8024	8365	8370	8380	8417	9057	
8370	11	0	0	22	0	8	82	0	0	57	0	0	41	28	0	0	
8371	0	12	0	0	0	0	0	12	0	0	0	0	0	0	0	0	
8373	0	0	8	0	46	0	0	0	8	0	30	17	0	0	17	17	
	11	12	8	22	46	8	82	12	8	57	30	17	41	28	17	17	399
	3%	3%	2%	6%	12%	2%	21%	3%	2%	14%	8%	4%	10%	7%	4%	4%	
Trip Assignment	1	1	1	1	1	1	1	1	1	1	1	1	2	1	3		

1 50% south via Trafalgar 50% east via Wellington Road 22

2 30% east via Wellington Road 22 and 70% south and within the Hillsburgh BA

3 north via Trafalgar