TRAFFIC IMPACT STUDY

PROPOSED RESIDENTIAL SUBDIVISION

HILLSBURGH HEIGHTS INC.

5916 TRAFALGAR ROAD NORTH

HILLSBURGH URBAN AREA

TOWN OF ERIN

TOWN FILE NOS. OP21-01 & Z21-09

UPDATED JULY 28TH 2022

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

PROJECT NO. W21081

TRAFFIC IMPACT STUDY

PROPOSED RESIDENTIAL SUBDIVISION

HILLSBURGH HEIGHTS INC.

5916 TRAFALGAR ROAD NORTH

HILLSBURGH URBAN AREA

TOWN OF ERIN

TOWN FILE NOS. OP21-01 & Z21-09

UPDATED JULY 28TH 2022

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

PROJECT NO. W21081

TABLE OF CONTENTS

TABLE OF CONTENTS (CONT'D)

LIST OF TABLES

LIST OF FIGURES

LIST OF FIGURES (CONT'D)

APPENDICES

APPENDIX A: **Terms of Reference**

APPENDIX B: **Turning Movement Counts**

APPENDIX C: **Signal Timing Plans**

APPENDIX D: **Level of Service Definitions**

APPENDIX E: **Synchro Analysis: Signalized and Un-signalized Intersection Capacity Analysis for Existing (2021), Future (2026 & 2031) Total Background and Future (2026 & 2031) Total Traffic Scenarios**

APPENDIX F: **Transportation Tomorrow Survey Database Query**

APPENDIX G: **Signal Warrant Analysis**

APPENDIX H: **Site Visit Pictures for Sight Distance Measurements**

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 comments[1] 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.

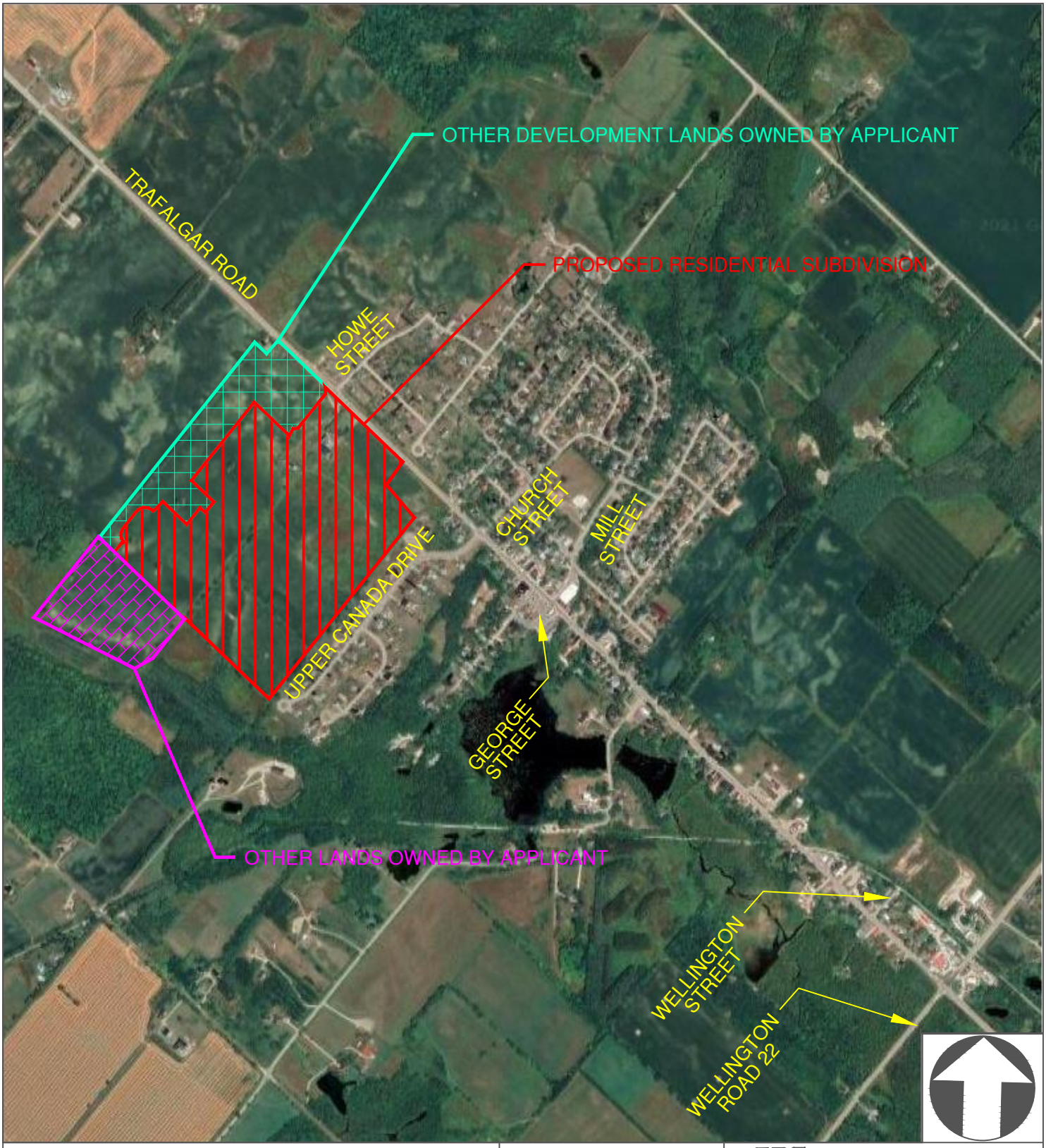
1. INTRODUCTION (CONT'D)

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 'G'/future Local Road.

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 Street 'E' at Trafalgar Road North and proposed Street 'A' at proposed Street 'G'/future Local Road 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, BRAMPTON, ONTARIO L6P 0M7
TEL. (905) 794-0600 FAX (905) 794-0611

DRAWN BY: K.F.	PROJECT No. W21081
CHECKED BY: B.W.	FIGURE No. 1
SCALE: N.T.S.	
DATE: JULY 15th 2022	

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 79.81 acres.

The Subject Development is surrounded by the following land uses:

- To the north, development lands owned by the applicant with future commercial and residential land uses,
- To the east, Trafalgar Road North with existing residential beyond,
- To the south, existing residential with Upper Canada Drive beyond,
- To the west, vacant lands owned by the applicant and other vacant lands with woodlands beyond.

The proposed Residential Subdivision comprises 196 single detached homes (includes the heritage house in Block 8), 174 townhouse units, a school block, a park and twelve (12) public roads. Vehicle access to the proposed Residential Subdivision is provided via 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 Street 'B' and a future Local Road will align at proposed Street 'A'; forming a four-legged roundabout intersection.

To minimize the proposed Residential Subdivision's impact to Trafalgar Road North, an internal connection to McMurchy Lane was considered so that site-generated trips can use Upper Canada Drive to access Trafalgar Road North rather than providing the Street 'E' at Trafalgar Road North intersection. However, it was determined that an internal connection to McMurchy Lane was not feasible due to grading constraints.

The proposed Draft Plan of Subdivision is provided in **Figure 2**.

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

PROPOSED DRAFT PLAN OF SUBDIVISION

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

DATE: JULY, 15th 2022	JOB No. W21081
DESIGN: K.F.	FIG. No. 2
SCALE: N.T.S.	

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 Area[2]. 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) public 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 Street 'G' and a future Local Road will align at proposed Street 'A'; forming a four-legged roundabout intersection.

Given the existing conditions on Trafalgar Road in relation to pedestrian connections, there are currently no sidewalk on Trafalgar Road or Howe Street. There are no future warrants for any sidewalk connections required on the eastside of Trafalgar Road.

[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

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

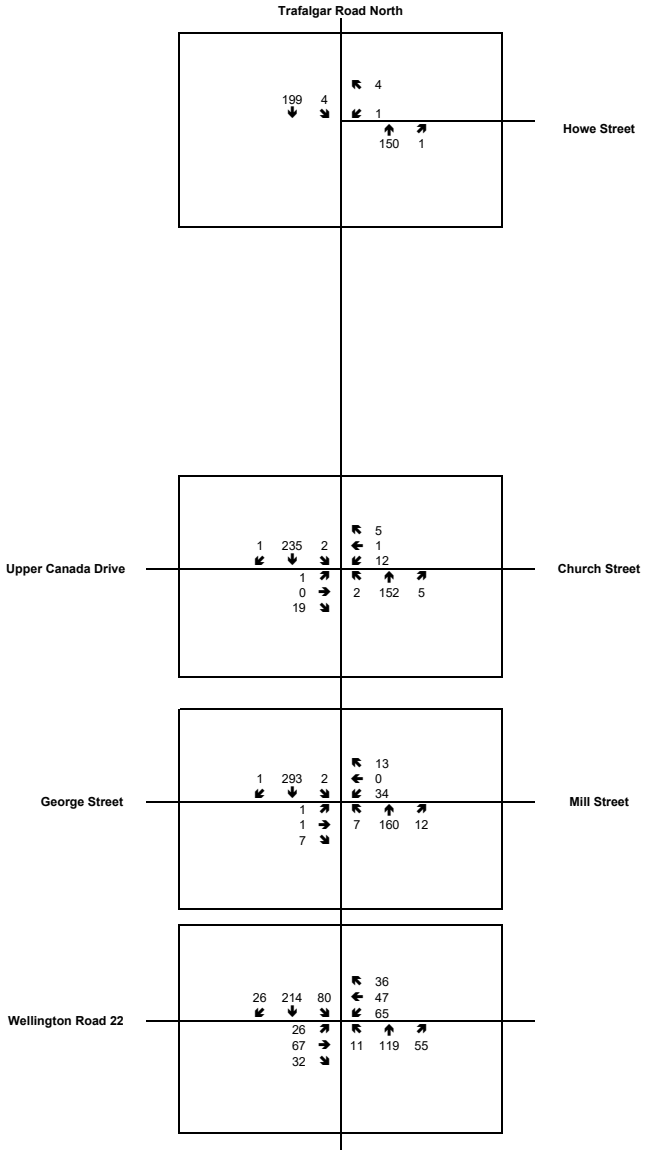


Figure No: 3

Date: November 9 2021

Prepared by: B.W.

N

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

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

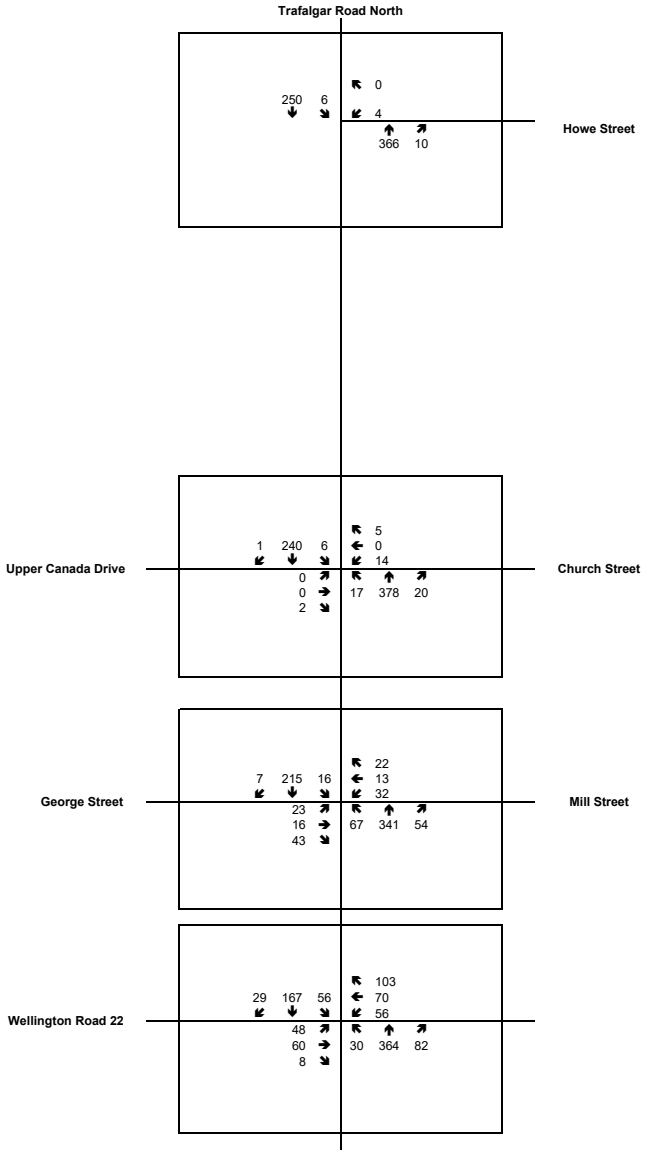


Figure No: 4

Date: November 9 2021

Prepared by: B.W.

N

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 software[3].

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 Lane /Approach	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
	NB TR	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
	SB TR	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

The Study will consider the site-generated trips from five (5) anticipated developments within the vicinity of Study Area.

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 & Realties (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.

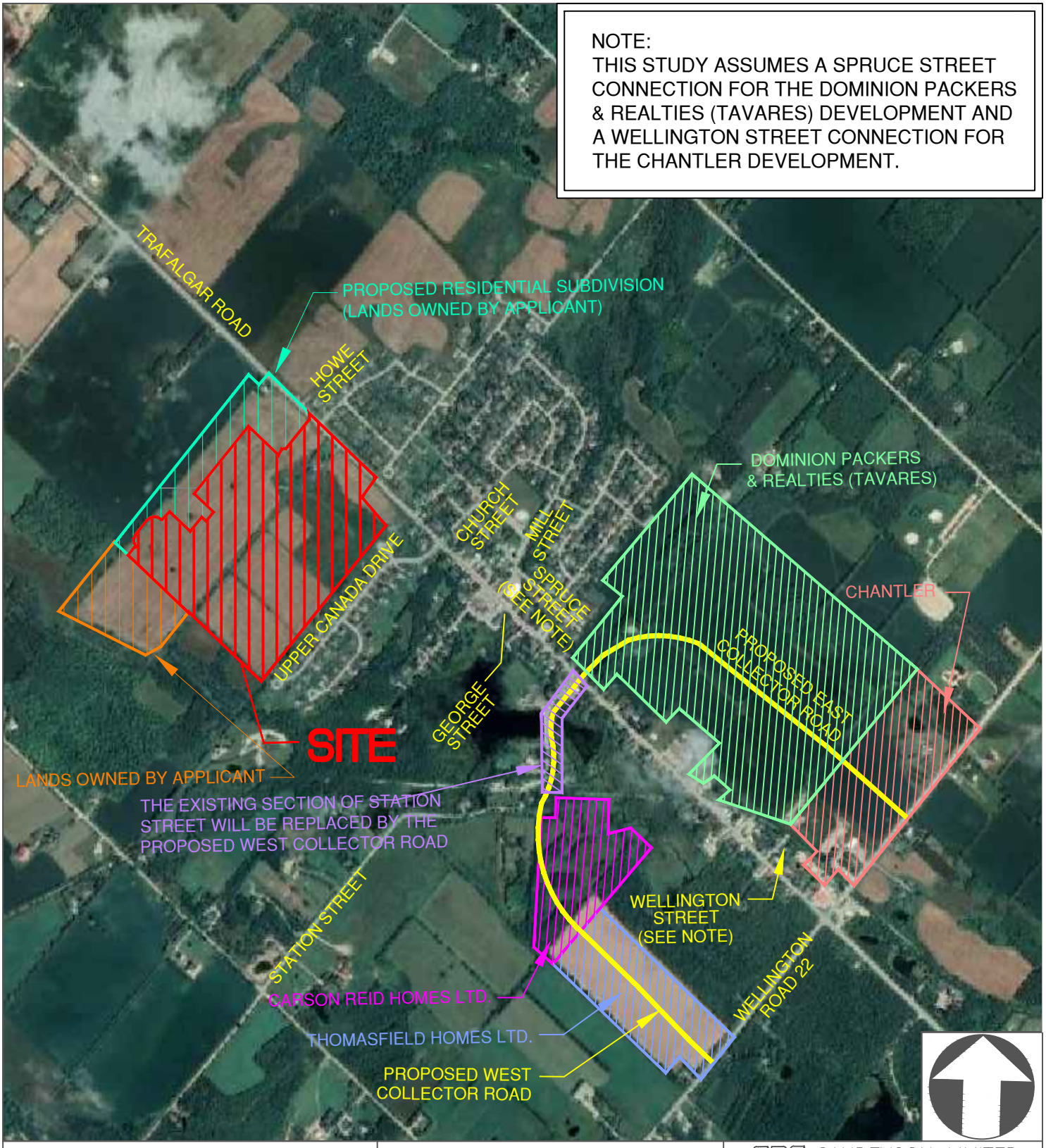
An anticipated development owned by Chantler that comprises 213 single detached homes is located immediately north of Wellington Road 22 and approximately 350 metres east of Trafalgar Road North. It is assumed that the anticipated development will be serviced by the proposed East Collector Road and Wellington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

5. FUTURE TOTAL BACKGROUND TRAFFIC CONDITIONS

5.1 Other Background Traffic

A proposed Residential Subdivision owned by the applicant is immediately north of the Subject Subdivision. At the time this report was prepared, details to the proposed Residential Subdivision are preliminary. However, the proposed Residential Subdivision comprises residential land uses at the north end and commercial land uses at the southeast corner of the property. For this Study, it is assumed that the proposed Residential Subdivision will comprise of 44 single detached homes, 23 townhouse units and 60,000 ft^2 of commercial land use. It is also assumed that access to the residential land uses within the proposed Residential Subdivision will be provided via connection with the elbow for Street 'B', single detached lots fronting the north end of Street ‘C’ and a future Local Road that aligns with Street ‘G’ at Street ‘A’ to form a four-legged roundabout intersection. For the commercial land uses at the southeast corner of the property, it is assumed that access is provided via a full-moves access at Trafalgar Road North, a right-in/right-out access at Street ‘A’ and a full-moves access at the future Local Road that aligns with Street ‘G’ at Street ‘A’ to form a four-legged roundabout intersection. Unlike the four (4) anticipated background developments mentioned above, it is anticipated that the proposed Residential Subdivision will be fully built and occupied between the 2026 and 2031 horizon years. Therefore, site-generated trips from the proposed Residential Subdivision will only be included in the 2031 horizon year. In addition, since access to the anticipated background development is dependent on the construction of the Subject Subdivision, the site-generated trips from the proposed Residential Subdivision will only be included in the Future (2031) Total Traffic scenario.

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



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

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

DRAWN BY: K.F.	PROJECT No. W21081
CHECKED BY: B.W.	FIGURE No. 5
SCALE: N.T.S.	
DATE: JULY 20th 2022	

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 Hours[4].

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**.

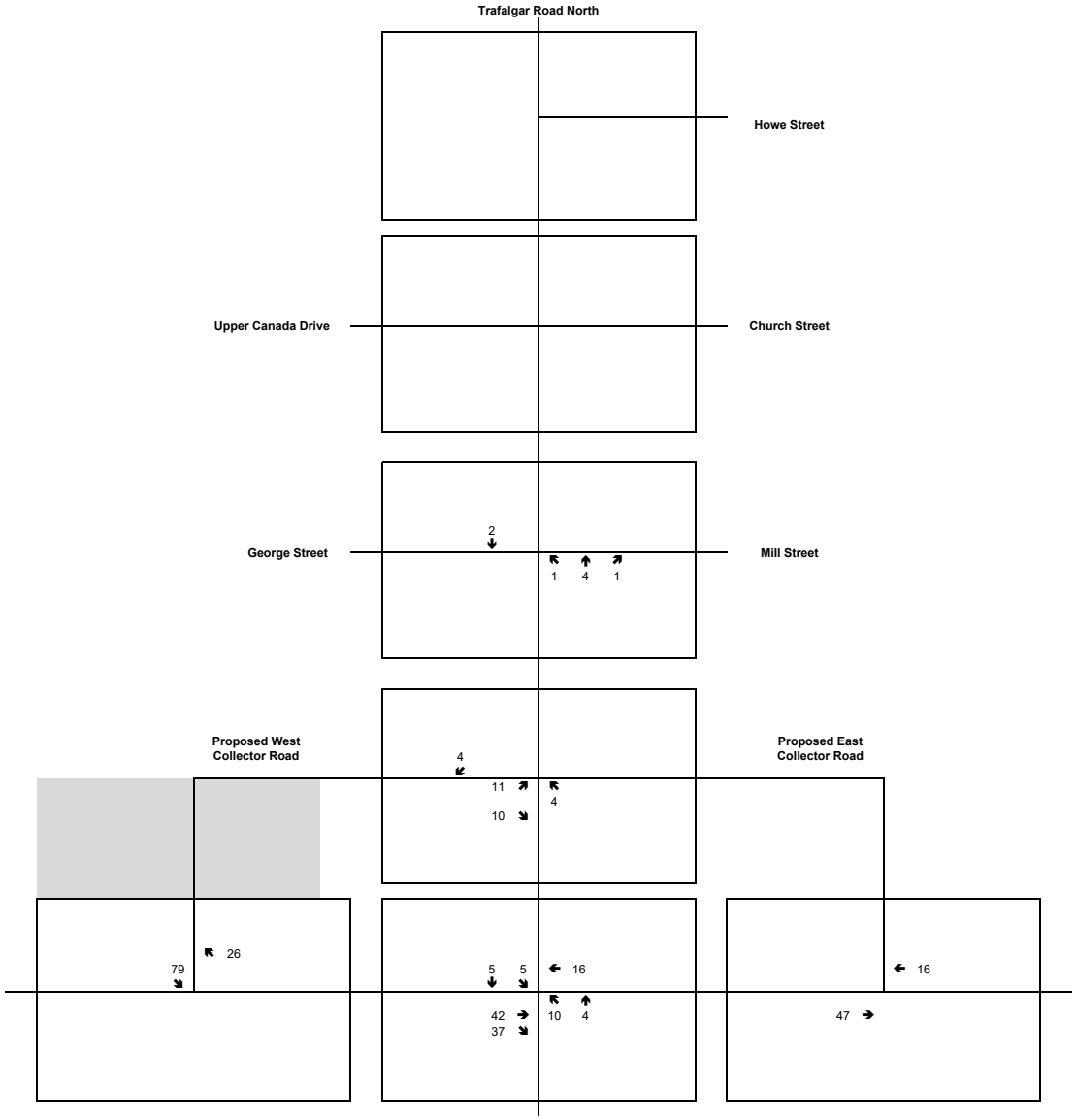
The assumed trip distribution and assignment will be as follows:

- 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

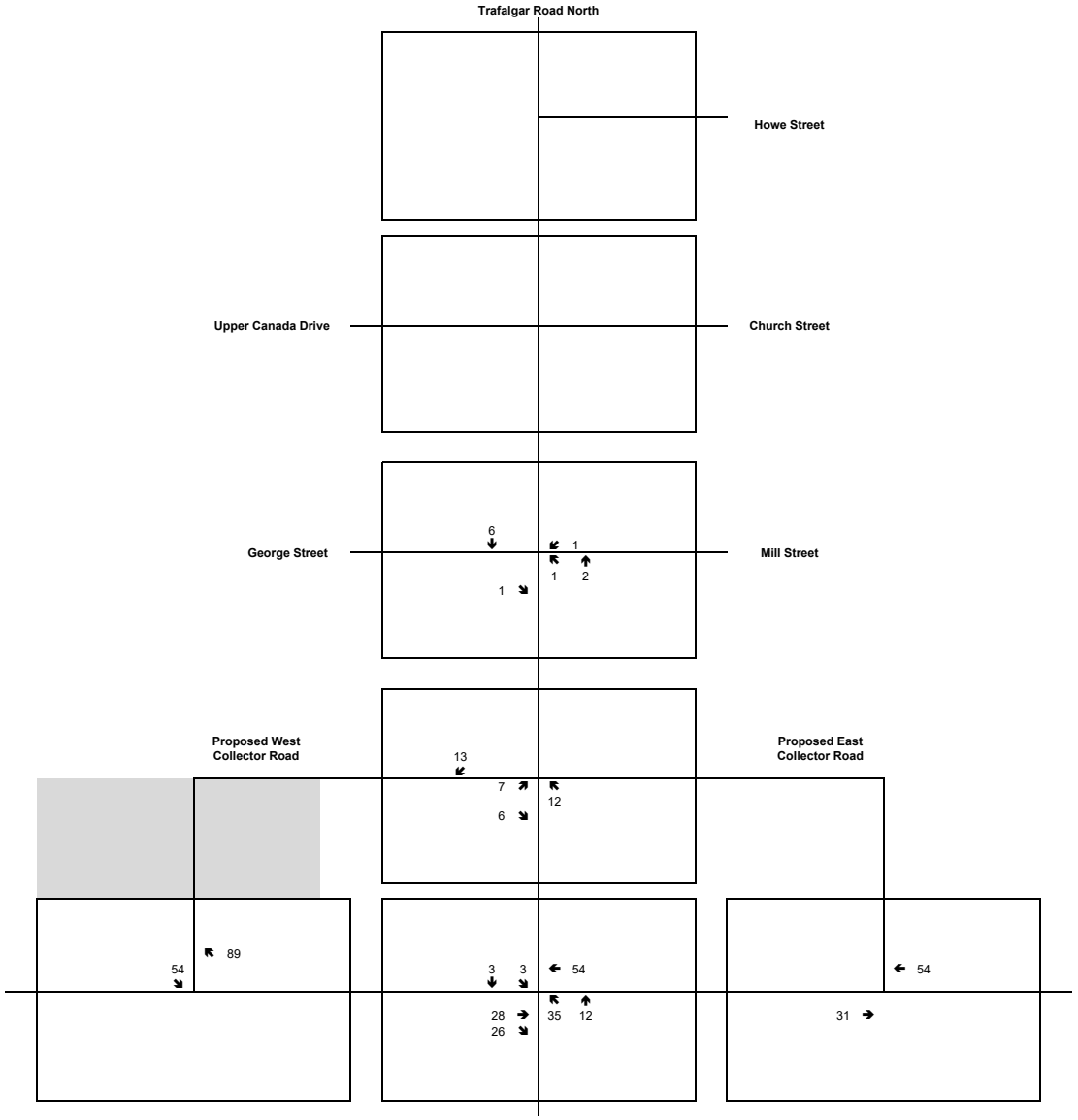
Date: November 17 2021

Prepared by: B.W.

N

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.

N

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.

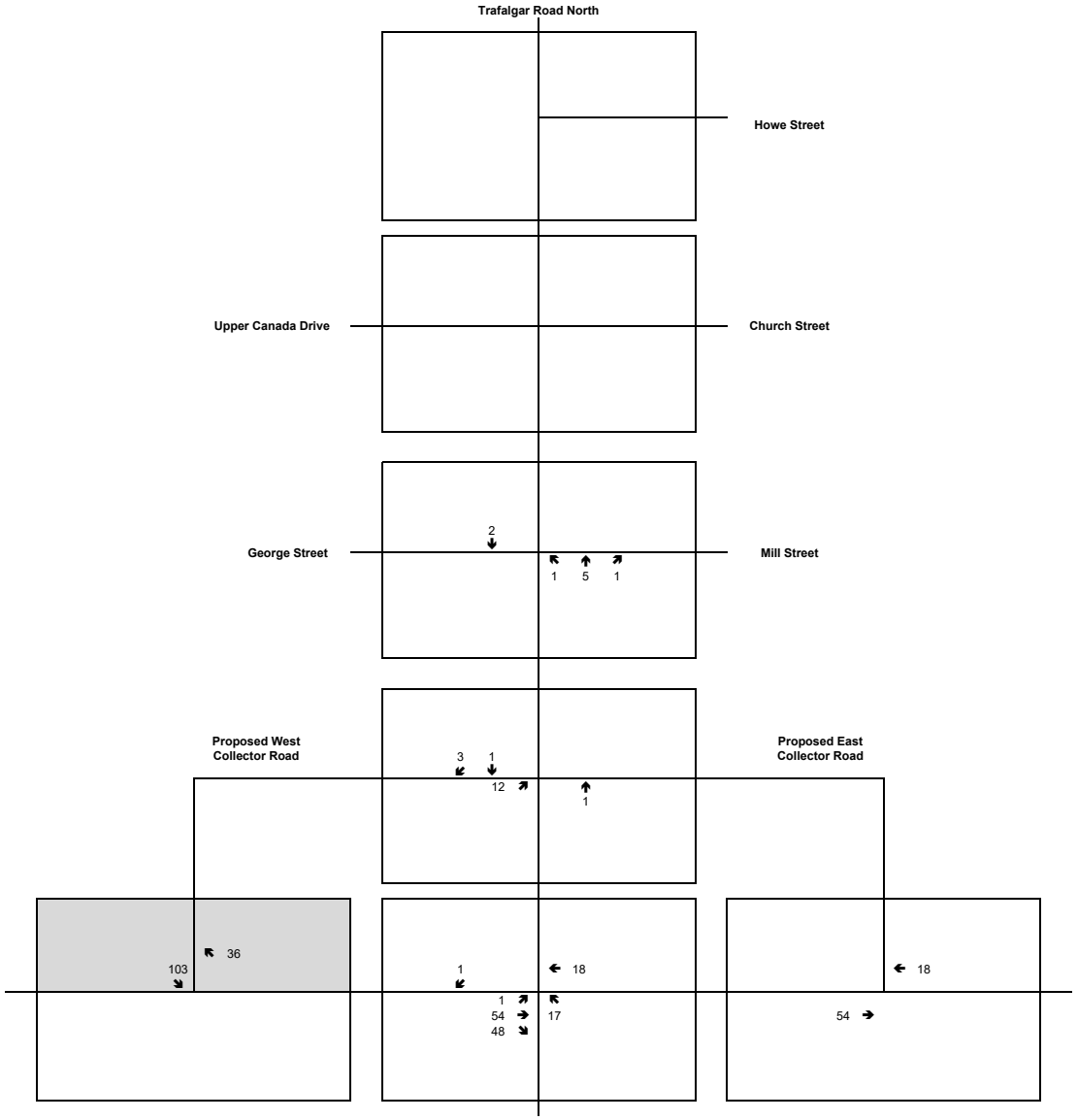
The assumed trip distribution and assignment will be as follows:

- 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

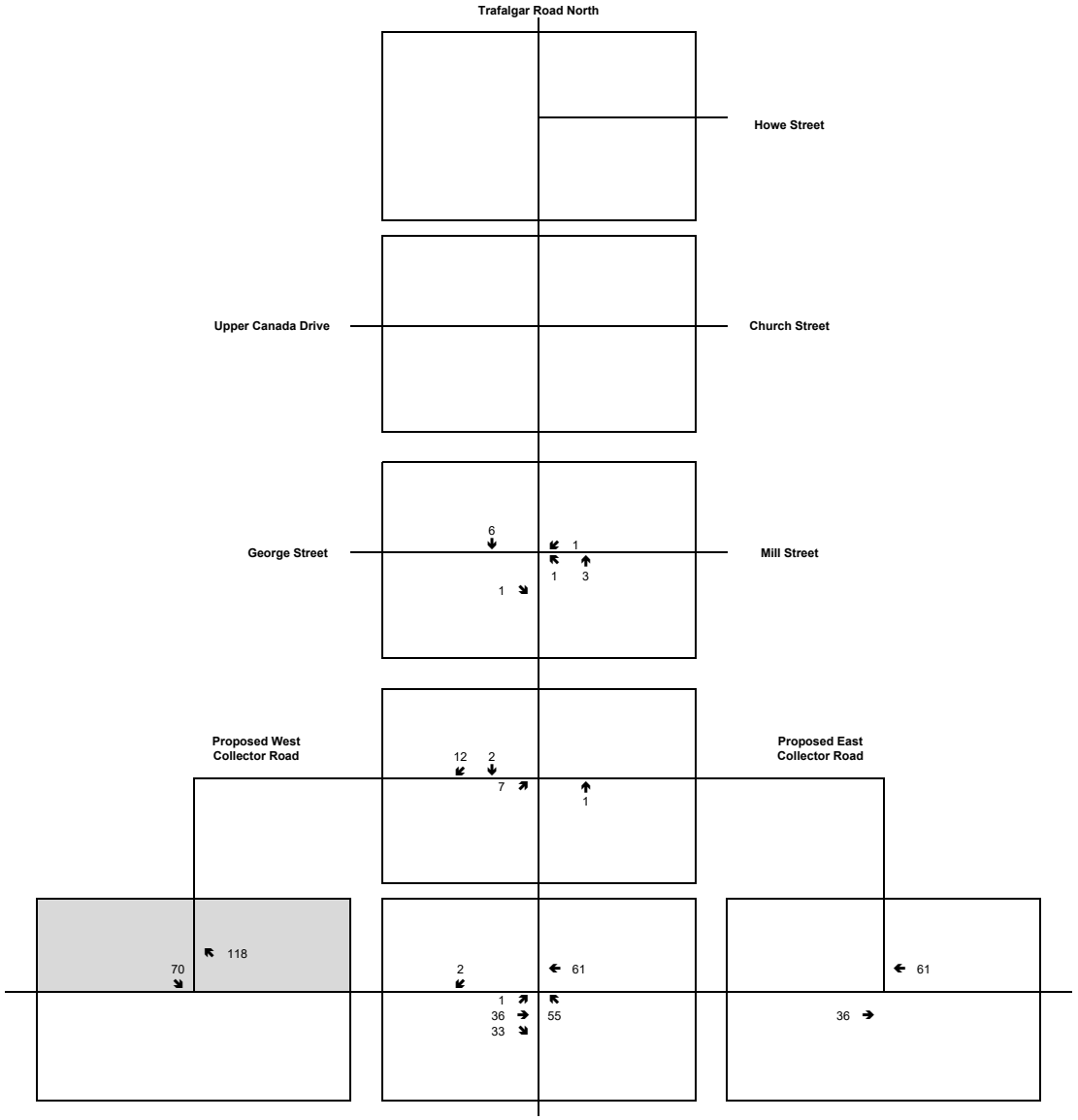
Date: November 17 2021

Prepared by: B.W.

N

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.

N

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

5.1.3. Other Background Traffic - Dominion Packers & Realties (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 & Realties (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.

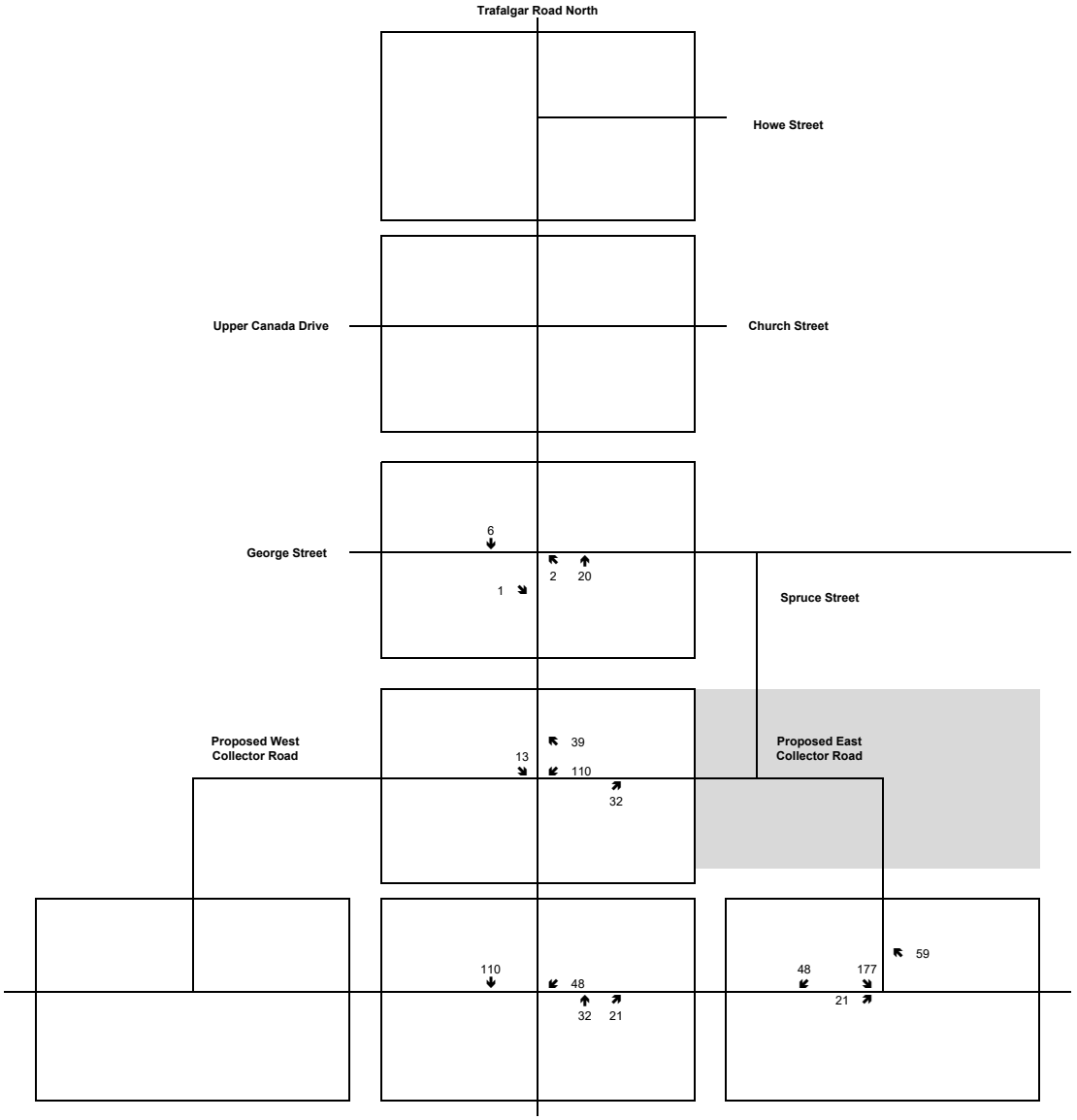
The assumed trip distribution and assignment will be as follows:

- 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 & Realties (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**

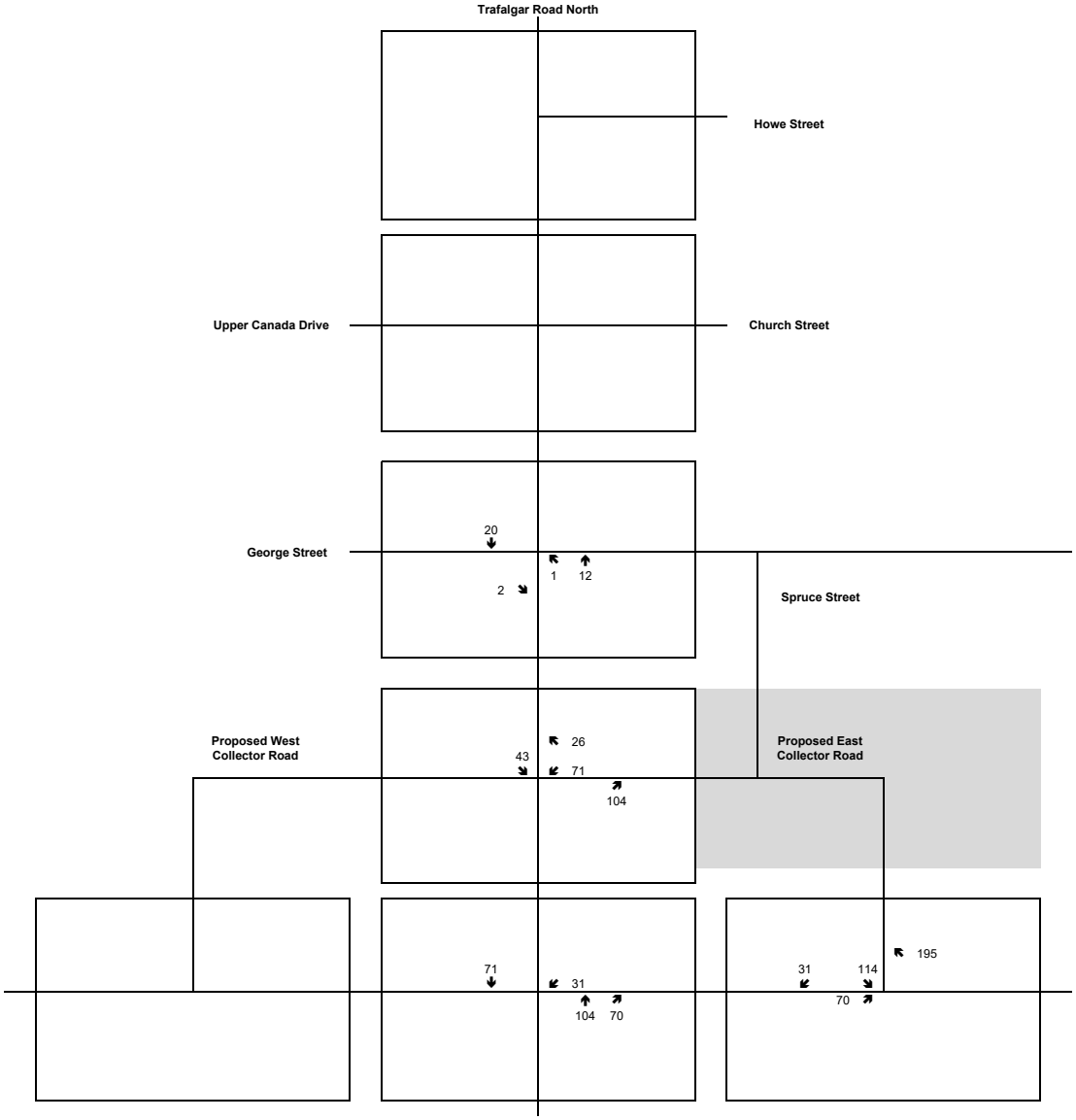
Date: **November 17 2021**

Prepared by: **B.W.**

N

Trip Assignment of Anticipated Development
(Dominion Packers & Realties (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.**

N

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.

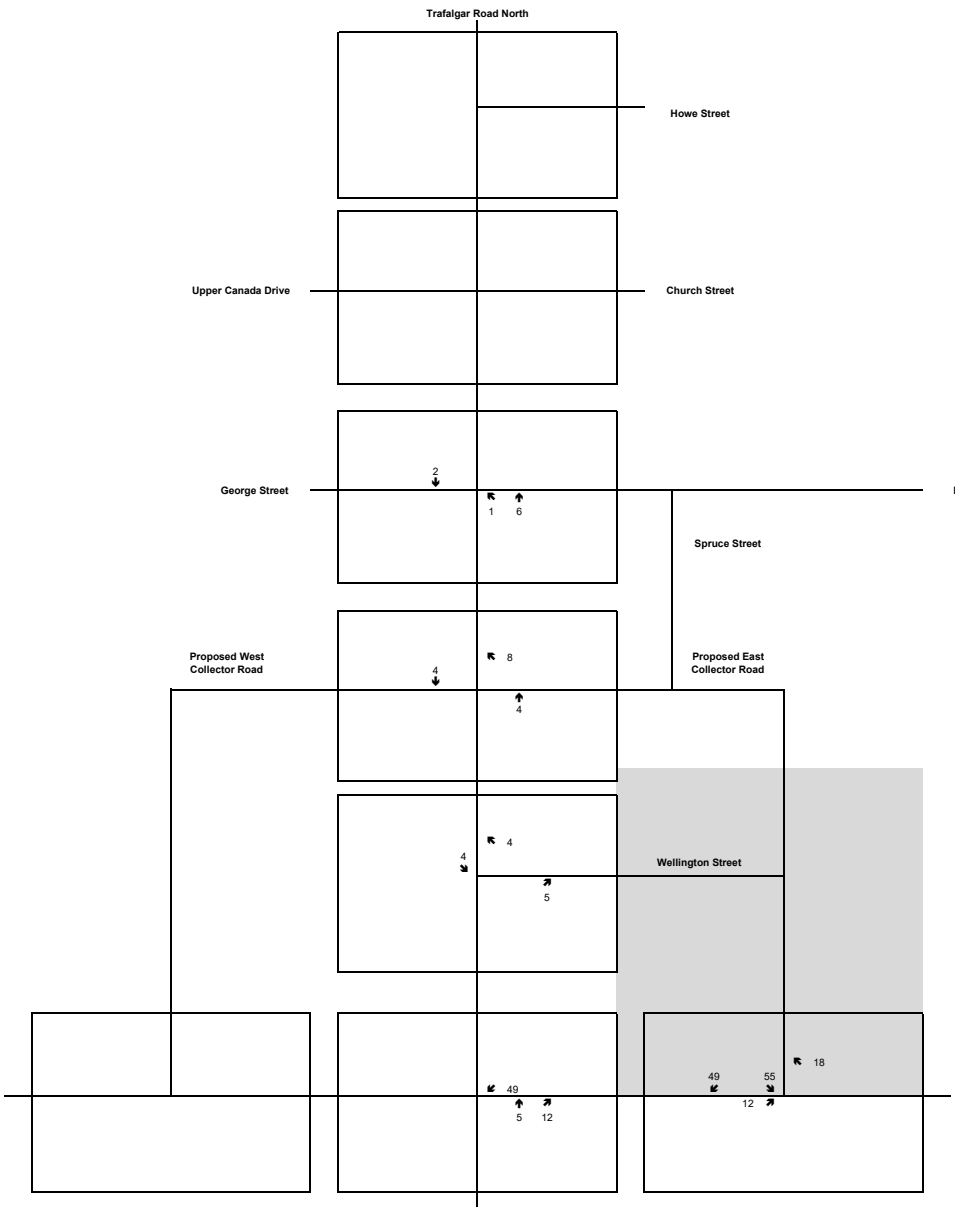
The assumed trip distribution and assignment will be as follows:

- 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

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.



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

Figure No: 12

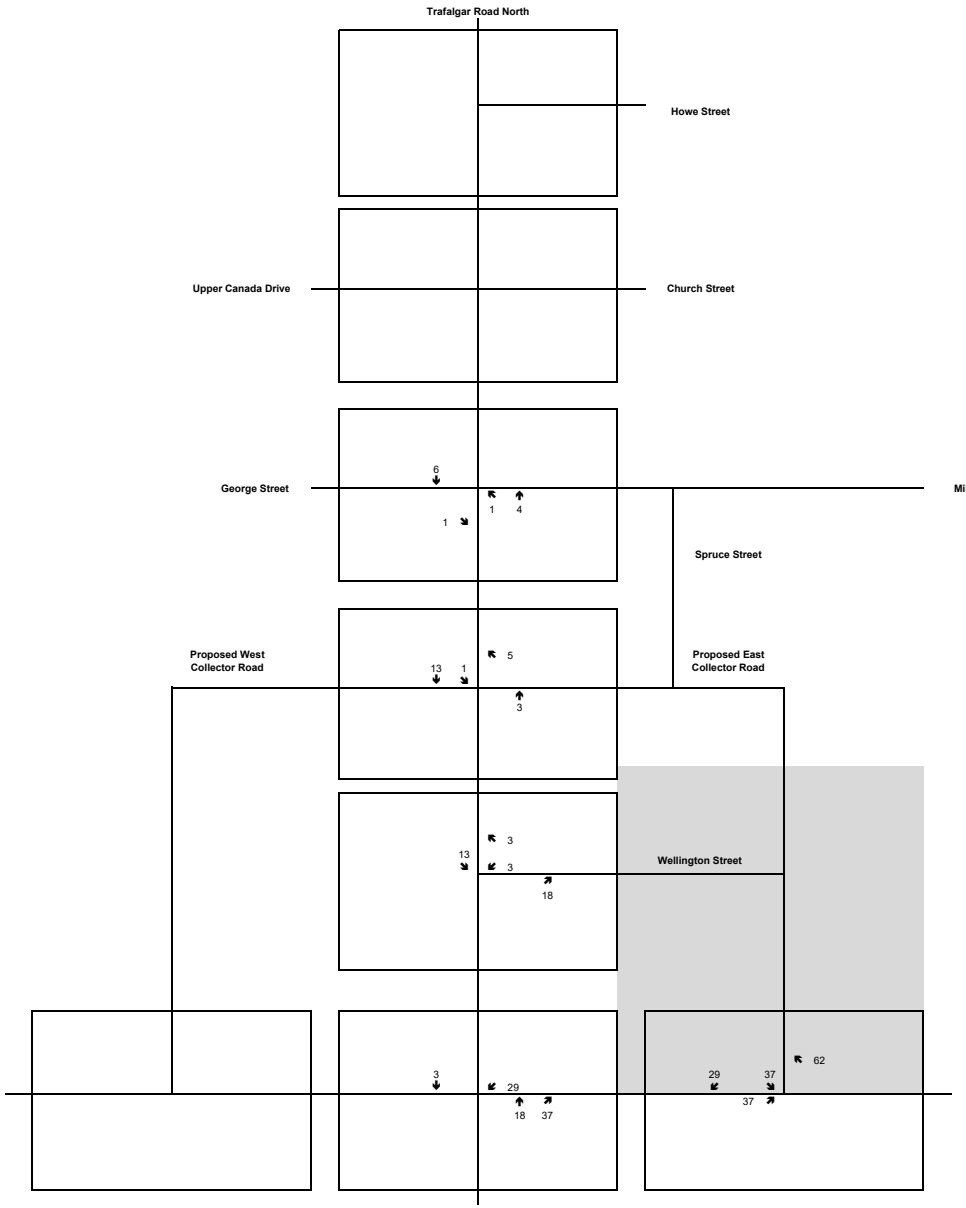
Date: November 17 2021

Prepared by: B.W.

N

Trip Assignment of Anticipated Development (Chantler)
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: 13

Date: November 17 2021

Prepared by: B.W.

N

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

5.1.5. Other Background Traffic – Anticipated Background Development Owned by the Applicant

For the single detached homes (Land Use 210), the townhouse units (Land Use 220) and the commercial land uses (Land Use 820) within the anticipated development, the trip generation formulae from the ITE Trip Generation Manual were applied for the A.M. and P.M. Peak Hours.

Table 7 summarizes the trip generation formulae along with the percentages of incoming and outgoing trips for the A.M. and P.M. Peak Hours.

Table 7: Trip Generation Formulae with Inbound and Outbound Percentages - Anticipated Background Development Owned by the Applicant

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%
Shopping Centre (LU 820)	T= 0.50X + 151.78 (Note 2)	62%	38%	Ln(T) = 0.74Ln(X) + 2.89 (Note 2)	48%	52%

Note 1: T represents the total number of trips and X represents the number of dwelling units.
Note 2: T represents the total number of trips and X represents every 1,000 square feet of G.L.A.

The resulting number of trips generated was determined by the trip generation formulae in **Table 7** and the land uses that were assumed. It is assumed that the anticipated development comprises 44 single detached homes, 23 townhouse units and 60,000 ft^2 of commercial land use. For the commercial land uses, this Study applied a pass-by percentage of 34% for the P.M. Peak Hour. The pass-by trip percentage was based on the data provided in the ITE Trip GenerationHandbook 3rd Edition[5].

[5] Trip Generation Handbook (3rd Edition), Institute of Transportation Engineers, September 2017.

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

5.1.5. Other Background Traffic – Anticipated Background Development Owned by the Applicant (Cont'd)

The resulting number of trips generated is provided in **Table 8** for the A.M. and P.M. Peak Hours of adjacent street traffic.

Table 8: Site-Generated Trips - Anticipated Background Development Owned by the Applicant

ITE Land Use	Quantity	Trips	A.M. Peak Hour			P.M. Peak Hour		
			Trips In	Trips Out	Total	Trips In	Trips Out	Total
Single-Family Detached Housing (LU 210)	44 Dwelling units	Gross Trips	9	27	36	29	17	46
Multifamily Housing (Low-Rise) (LU 220)	23 Dwelling Units	Gross Trips	3	9	12	10	6	16
Shopping Centre (LU 820)	60,000 ft^2 G.L.A.	Gross Trips Passby Net Trips	113 0 113	69 0 69	182 0 182	179 61 118	193 61 132	372 122 250
TOTAL	-	Gross Trips Passby Net Trips	125 0 125	105 0 105	**230** **0** **230**	218 61 157	216 61 155	**434** **122** **312**

The anticipated development is expected to generate a total of 230 trips during the A.M. Peak Hour (125 inbound trips and 105 outbound trips) and 434 trips during the P.M. Peak Hour (218 inbound trips and 216 outbound trips).

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

5.1.5. Other Background Traffic – Anticipated Background Development Owned by the Applicant (Cont'd)

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 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 the commercial land uses, based on the nature of the land uses, the trip distribution and assignment is based on the residential land use within the vicinity of the proposed Residential Subdivision.

The assumed trip distribution and assignment will be as follows:

- 80% (80%) to/from the residential land uses within the Subject Subdivision and the anticipated background development owned by the applicant,
- 12% (12%) to/from the east via Howe Street,
- 5% (5%) to/from the south via Upper Canada Drive and Trafalgar Road North,
- 3% (3%) to/from the south via Church Street.

The site-generated trip volumes and trip assignment used in the analysis for the anticipated development are illustrated in **Figures 14 and 15**.

Trip Assignment of Proposed Residential Subdivision (Lands Owned by Applicant)
A.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

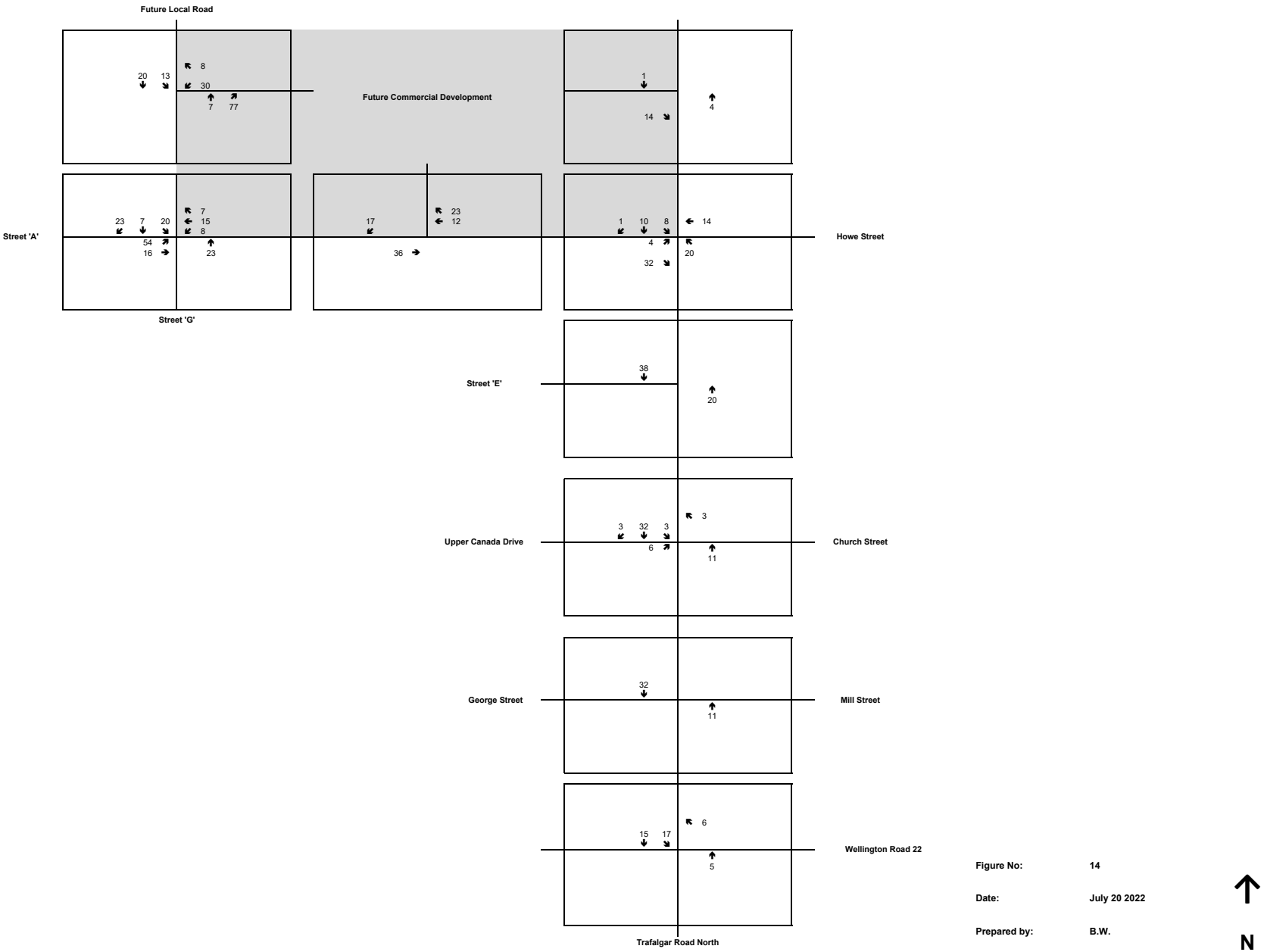


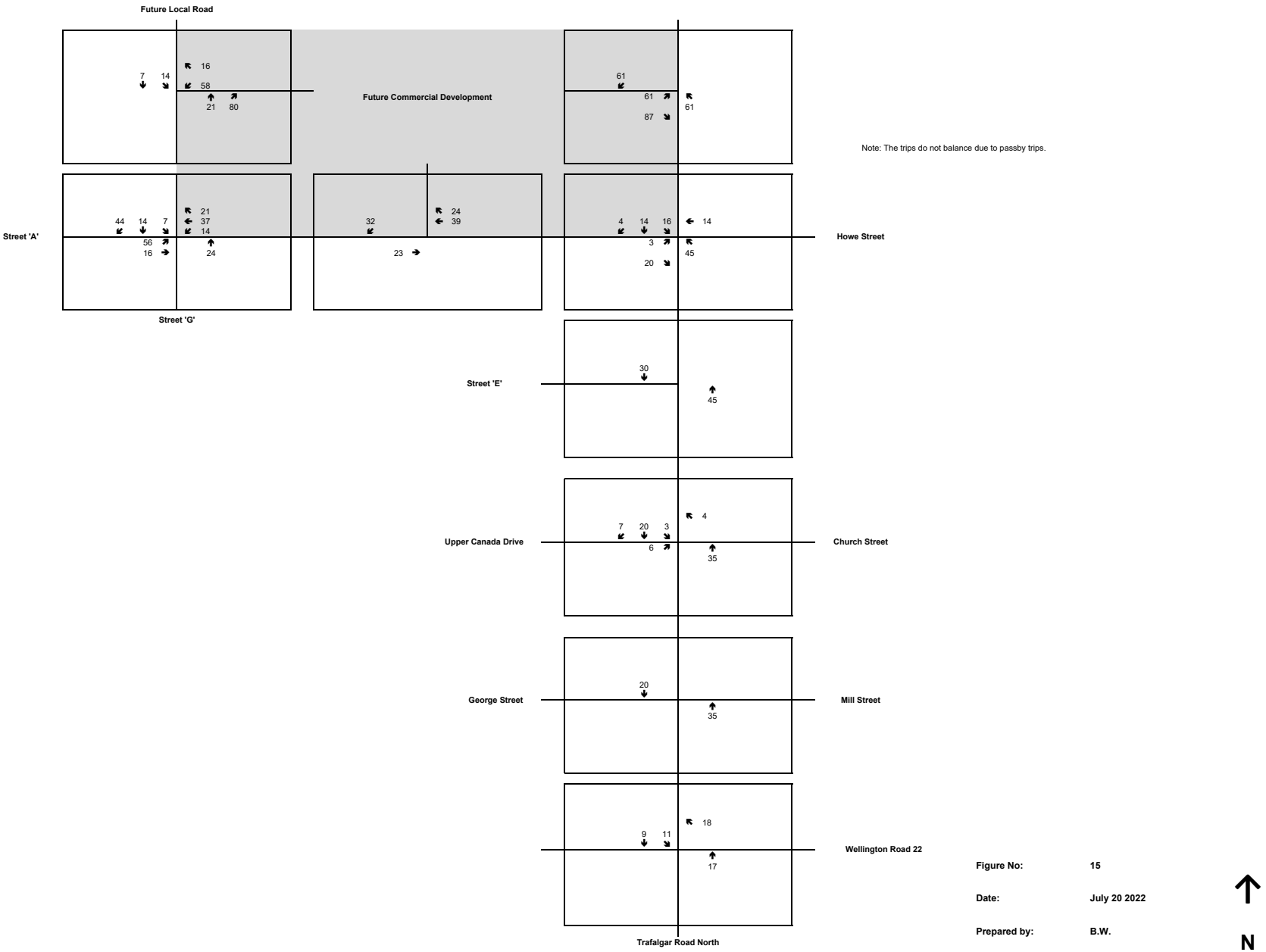
Figure No: 14

Date: July 20 2022

Prepared by: B.W.

Trip Assignment of Proposed Residential Subdivision (Lands Owned by Applicant)
P.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.



Note: The trips do not balance due to passby trips.

Figure No: 15

Date: July 20 2022

Prepared by: B.W.

N

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 owned by Carson Reid Homes Ltd, Thomasfield Homes Ltd, Dominion Packers & Realties (Tavares) and Chantler. The site-generated trip volumes used in the analysis for the anticipated developments are illustrated in **Figures 16 and 17**.

The Future (2026) Total Background Traffic Volumes are illustrated in **Figures 18 and 19** for the A.M. and P.M. Peak Hours.

Trip Assignment of Anticipated Developments (2026 Horizon Year)
A.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

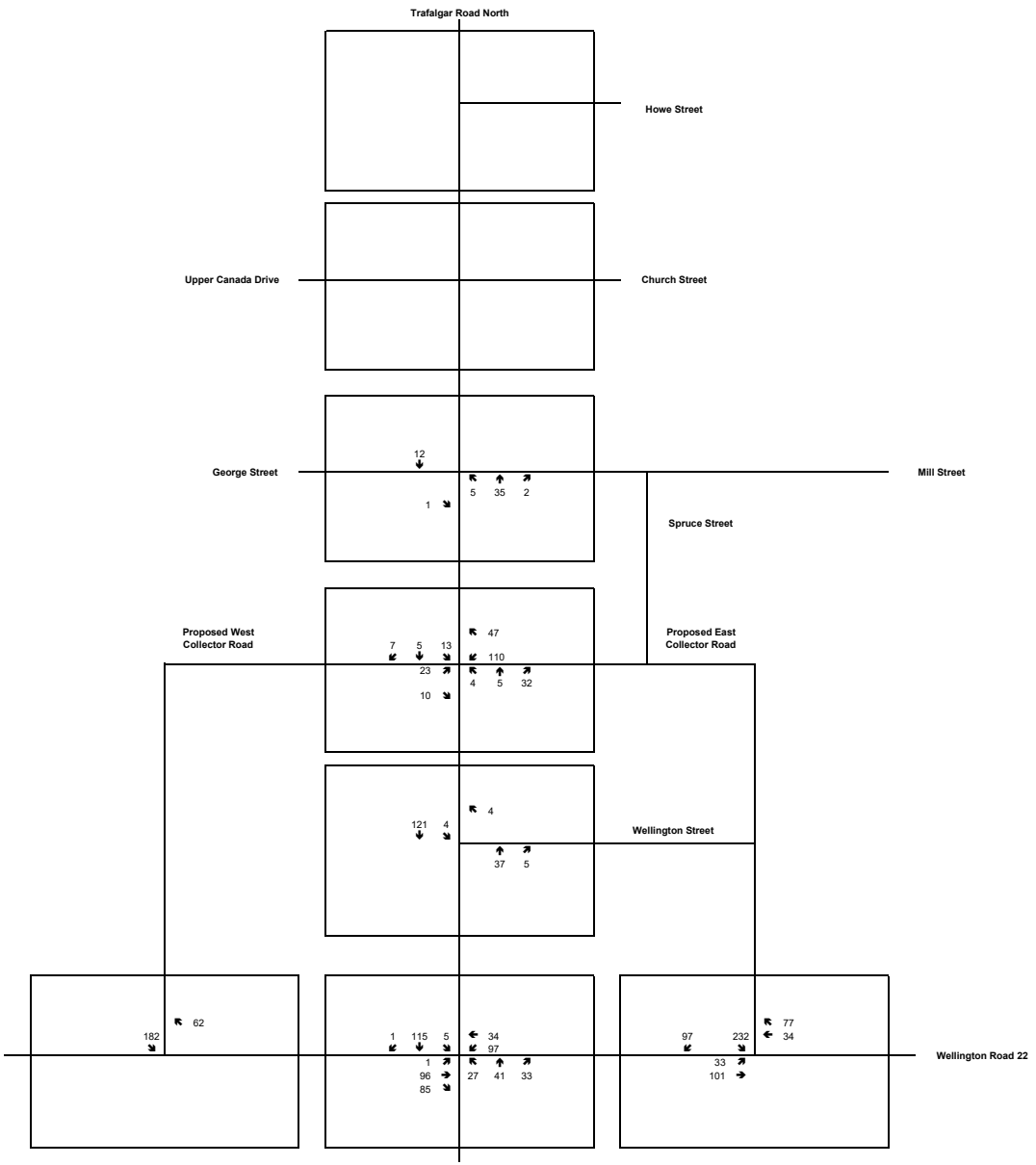


Figure No: 16

Date: July 20 2022

Prepared by: B.W.

N

Trip Assignment of Anticipated Developments (2026 Horizon Year)
P.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

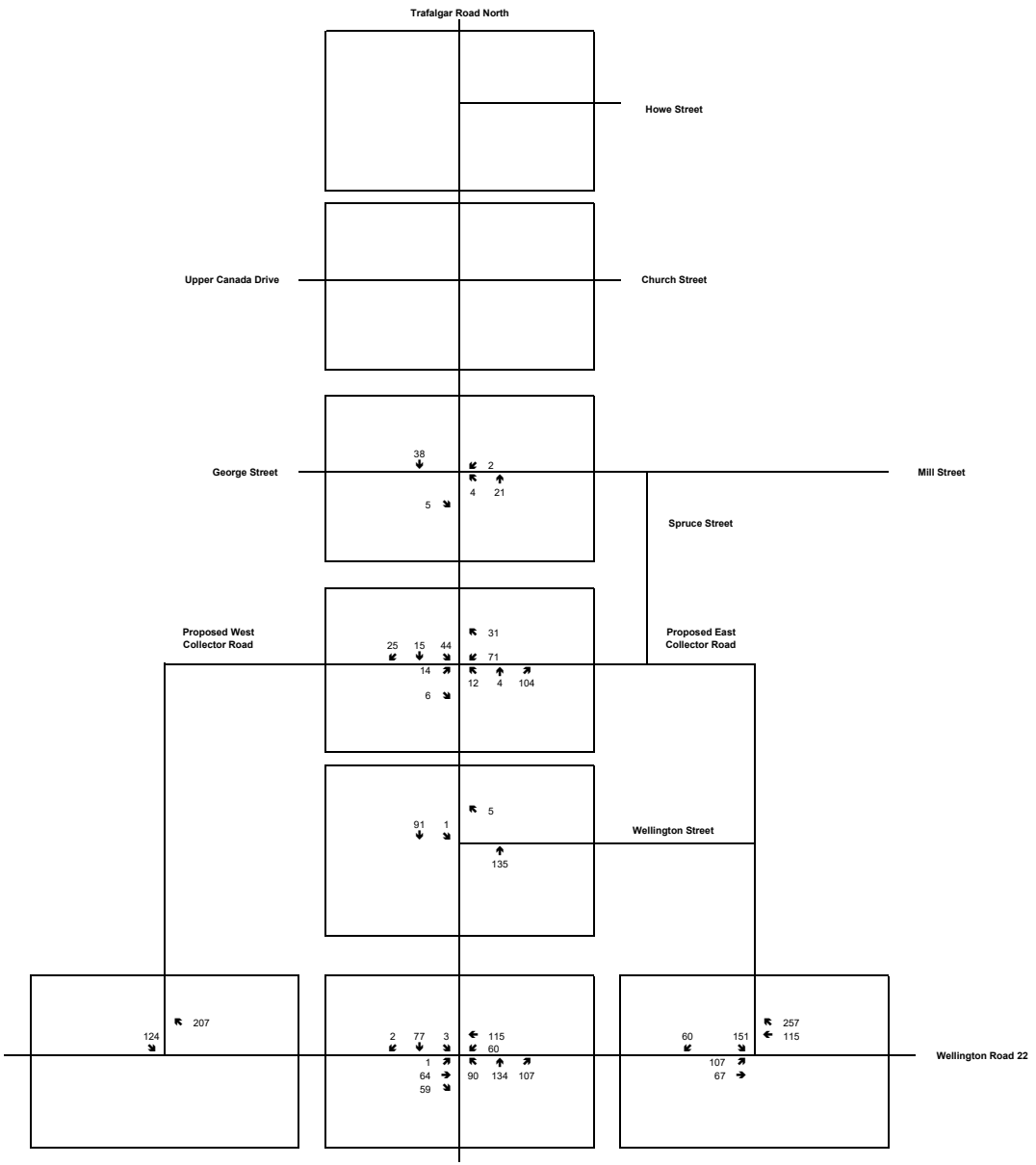


Figure No: 17

Date: July 20 2022

Prepared by: B.W.

N

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

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

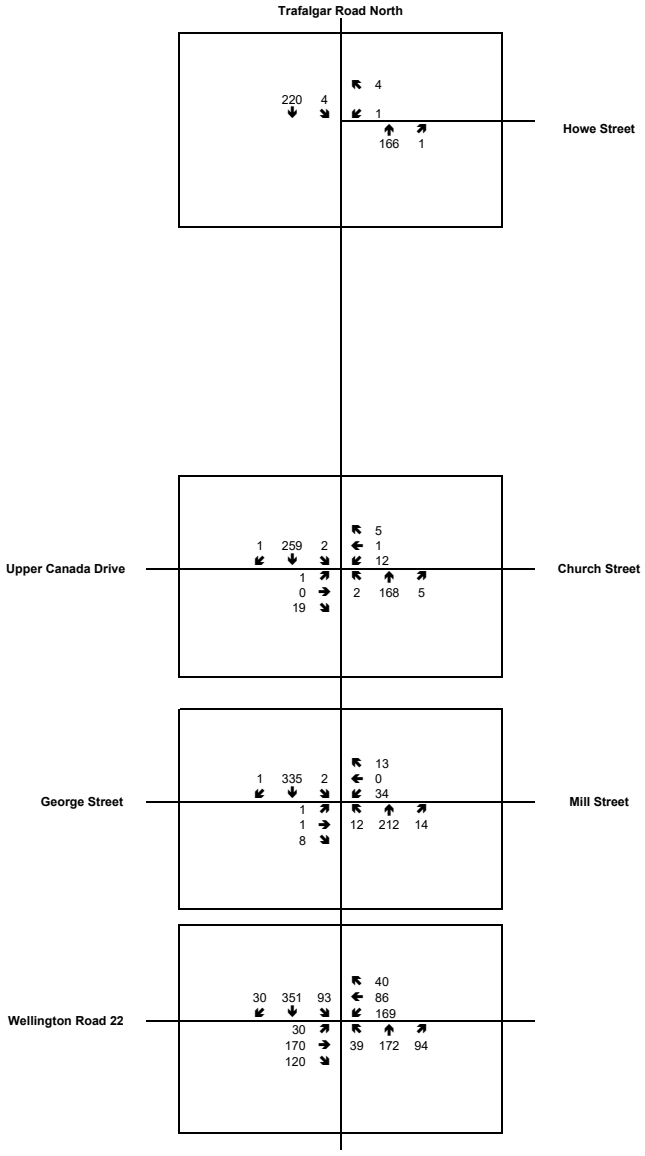


Figure No: 18

Date: July 20 2022

Prepared by: B.W.

N

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

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

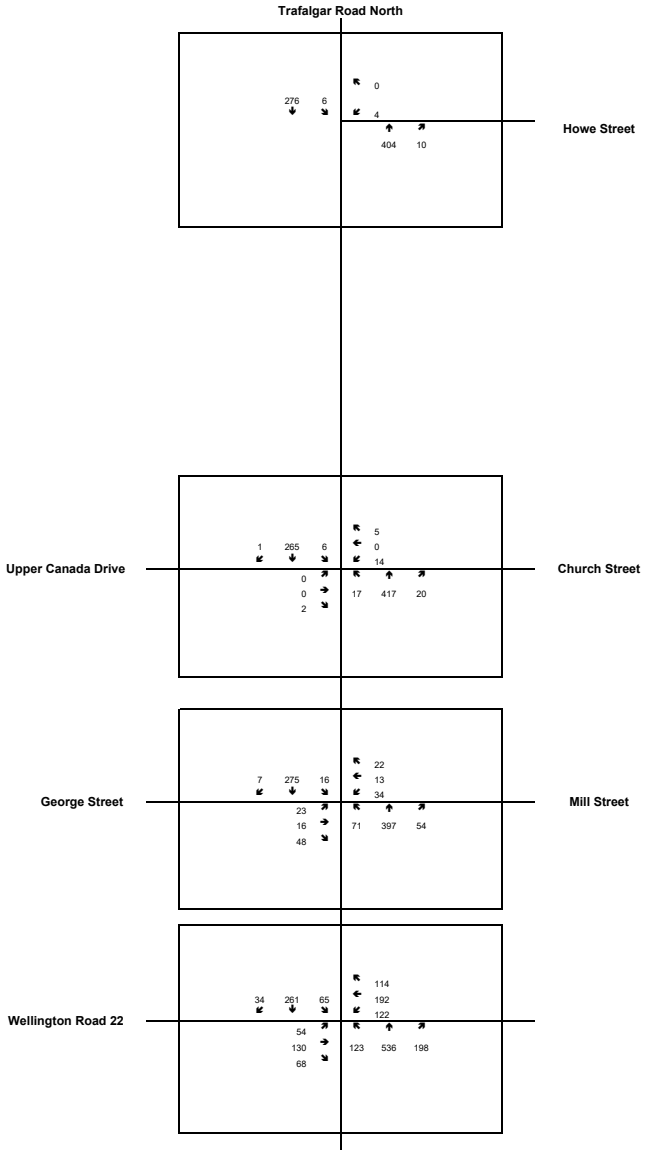


Figure No: 19

Date: July 20 2022

Prepared by: B.W.

N

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 9.** The related calculations are provided in **Appendix E**.

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

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

Table 9: Future (2026) Total Background Traffic – Level of Service

Intersection	Turning Lane /Approach	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
	NB TR	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
	SB TR	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 due to the growth in background traffic. 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 owned by Carson Reid Homes Ltd, Thomasfield Homes Ltd, Dominion Packers & Realties (Tavares) and Chantler.

The Future (2031) Total Background Traffic Volumes are illustrated in **Figures 20 and 21** 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 10.** 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.

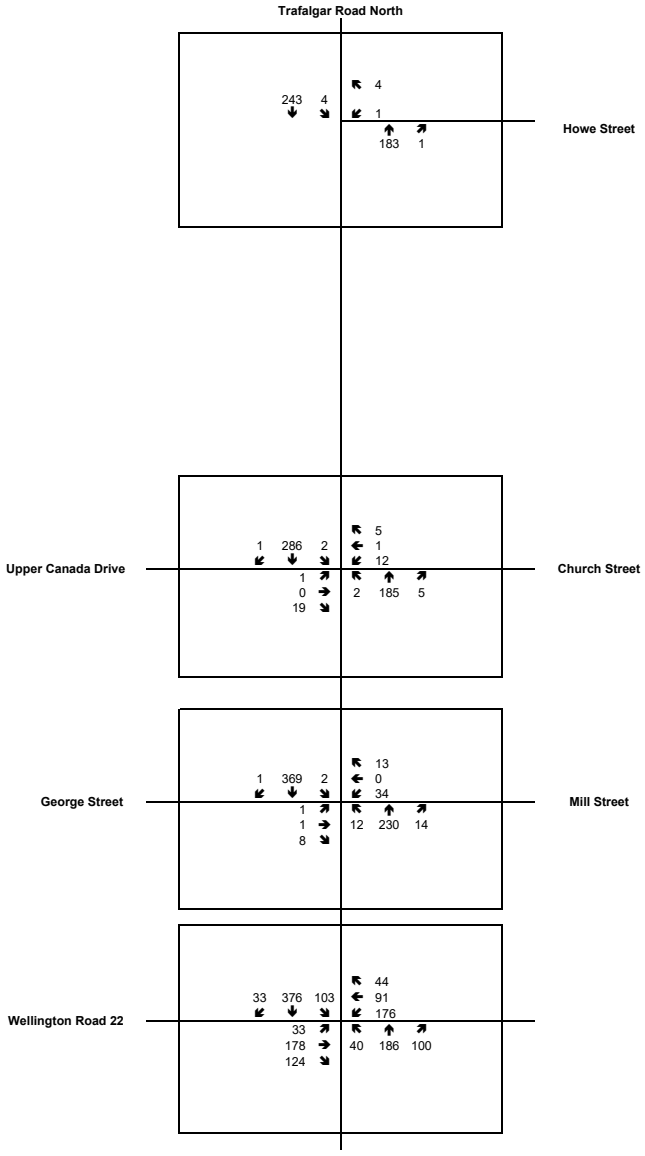


Figure No: 20

Date: July 20 2022

Prepared by: B.W.

N

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

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

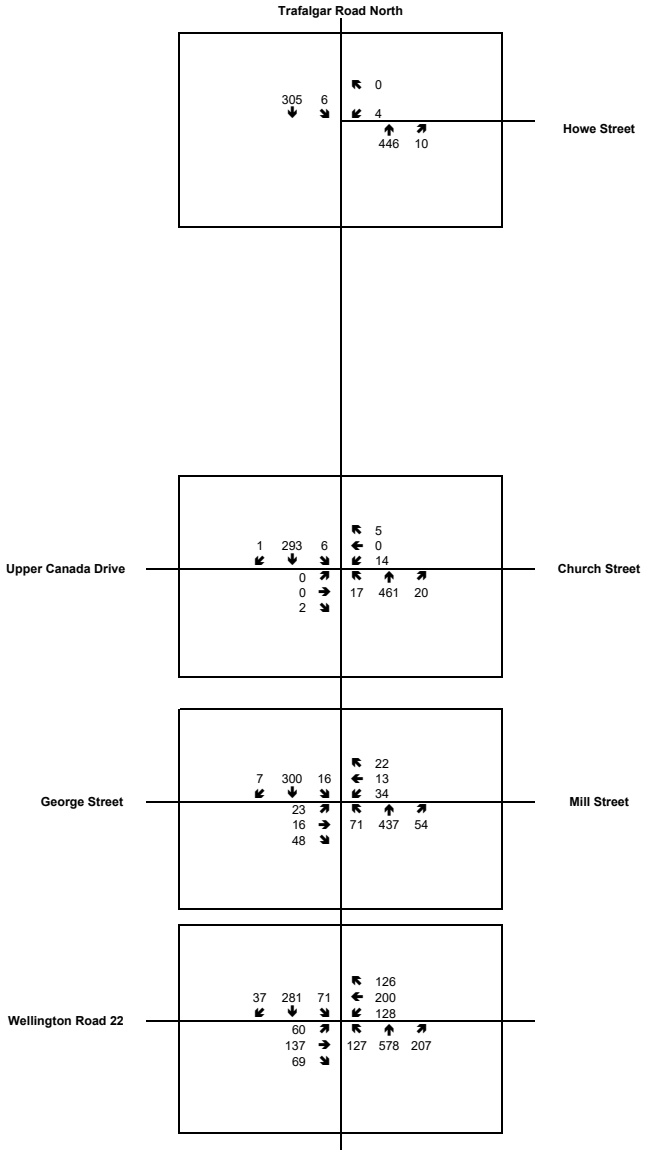


Figure No: 21

Date: July 20 2022

Prepared by: B.W.

N

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

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

Table 10: Future (2031) Total Background Traffic – Level of Service

Intersection	Turning Lane /Approach	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
	NB TR	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
	SB TR	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 are 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 due to the growth in background traffic.

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" due to the growth in background traffic.

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.[6]

Table 11 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 11: 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.

[6] 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 11** and the proposed land uses. It is anticipated that the Subject Property will comprise of 196 single detached homes, 174 townhouse units and an Elementary School with a capacity for 450 students.

The resulting number of trips generated is provided in **Table 12** for the A.M. and P.M. Peak Hours of adjacent street traffic.

Table 12: 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)	196 dwelling units	36	108	144	122	72	194
Multifamily Housing (Low-Rise) (LU 220)	174 dwelling units	19	62	81	61	36	97
Elementary School (LU 520)	450 students	163	139	302	37	40	77
TOTAL	--	218	309	**527**	220	148	**368**

The proposed Residential Subdivision is expected to generate a total of 527 trips during the A.M. Peak Hour (218 inbound trips and 309 outbound trips) and 368 trips during the P.M. Peak Hour (220 inbound trips and 148 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.

The site-generated trip volumes and trip assignment used in the analysis for the single detached homes and the townhouse units are illustrated in **Figures 22 and 23**.

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 trip distribution and assignment is based on the future residential land use within an assumed attendance area for the elementary school. The attendance area was determined by using the attendance area for the existing Ross R. MacKay Public Elementary School, which is 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. Based on the location of the proposed Elementary School and the existing Ross R. MacKay Public Elementary School, it was assumed that the Attendance Area will be separated evenly and at the mid-point of the two locations.

Trip Assignment of Residential Land Uses within the Subject Subdivision
A.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

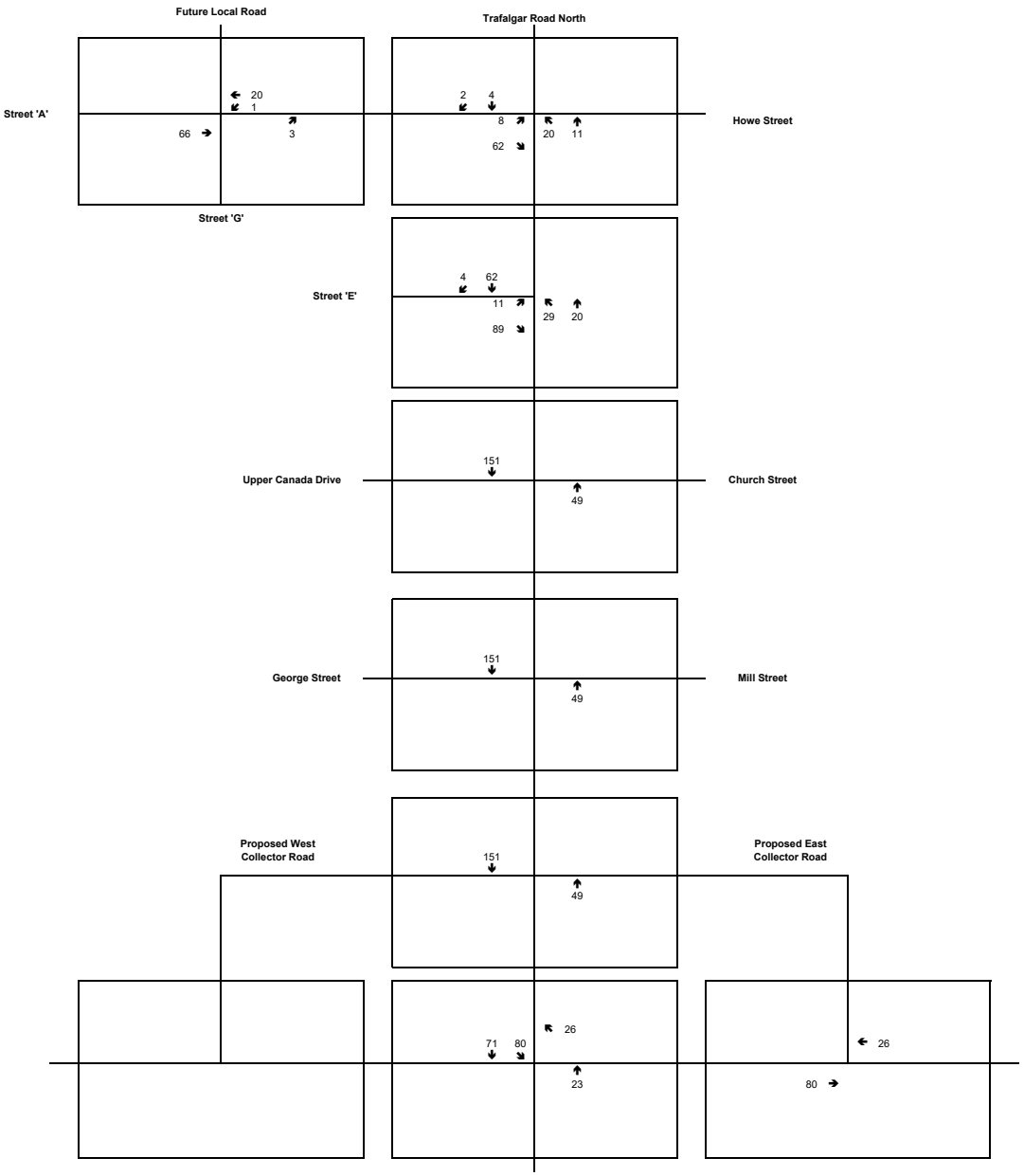


Figure No: 22

Date: July 20 2022

Prepared by: B.W.

N

Trip Assignment of Residential Land Uses within the Subject Subdivision
P.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

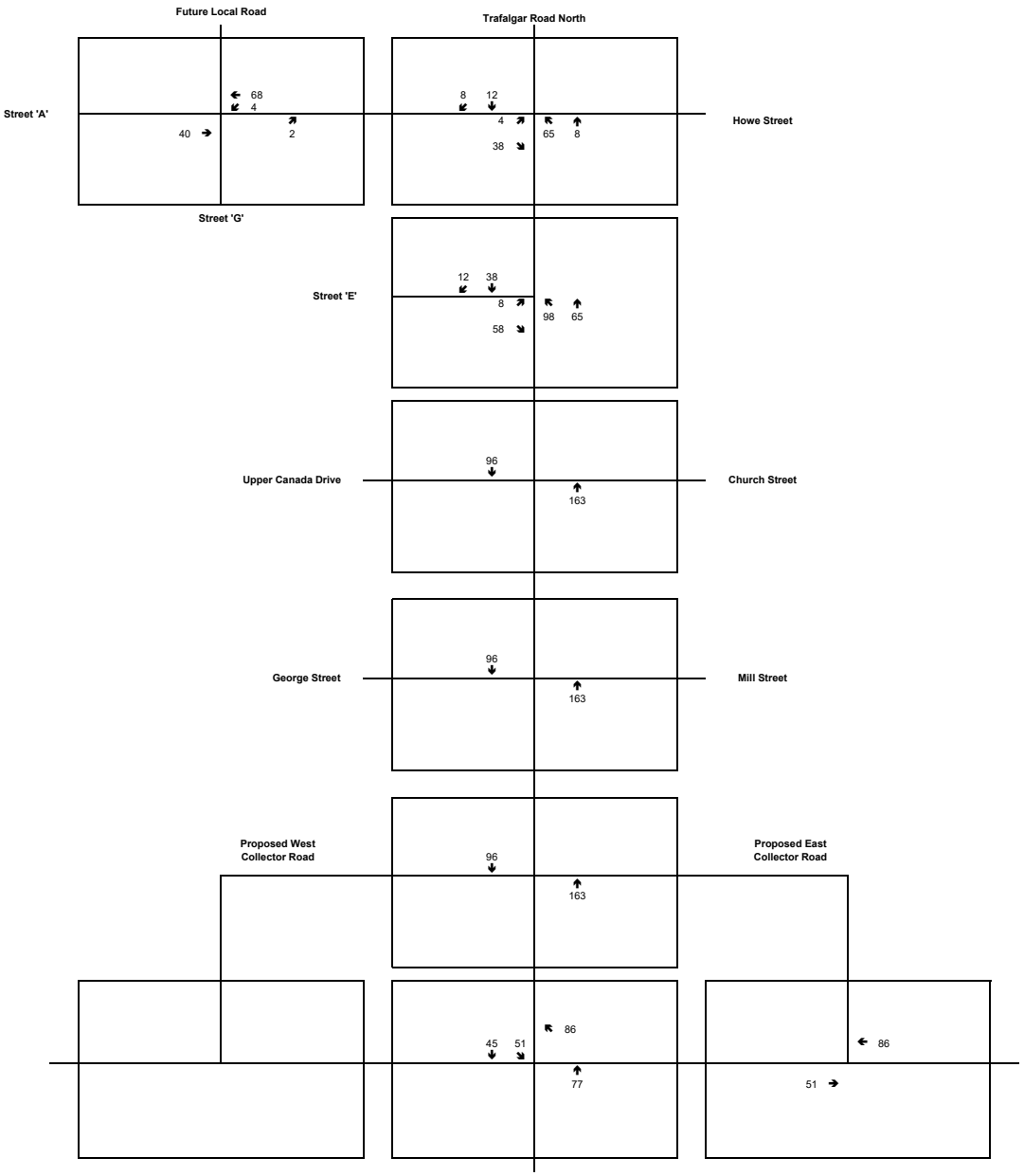


Figure No: 23

Date: July 20 2022

Prepared by: B.W.

N

Subject Res. Total PM

6. TRIP GENERATION AND DISTRIBUTION (CONT'D)

6.3 Trip Distribution and Assignment (Cont'd)

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 results of the 2016 Transportation Tomorrow Survey as per residential land use within the attendance area 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.

For the 2026 horizon year, the assumed trip distribution and assignment will be as follows:

A.M. Peak Hour

- 47% from within the Subject Subdivision,
- 3% from the east and outside the vicinity of the Study Area via Orangeville Street and Howe Street,
- 41% from the east via Howe Street, Church Street or Mill Street,
- 8% from the south via Upper Canada Drive or George Street,
- 1% from the west and outside the vicinity of the Study Area via Station Street/proposed West Collector Road or Side Road 27.

Total 100% inbound

- 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.

Total 100% outbound

6. TRIP GENERATION AND DISTRIBUTION (CONT'D)

6.3 Trip Distribution and Assignment (Cont'd)

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.

Total 100% inbound

- 47% to within the Subject Subdivision,
- 3% to the east and outside the vicinity of the Study Area via Church Street and Howe Street,
- 41% to the east via Howe Street, Church Street or Mill Street,
- 8% to the south via Upper Canada Drive or George Street,
- 1% to the west and outside the vicinity of the Study Area via Station Street/proposed West Collector Road or Side Road 27.

Total 100% outbound

The site-generated trip volumes and trip assignment used in the analysis for the Elementary School during the 2026 horizon year are illustrated in **Figures 24 and 25**.

Trip Assignment of Proposed Elementary School within the Subject Subdivision (2026 Horizon Year) A.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

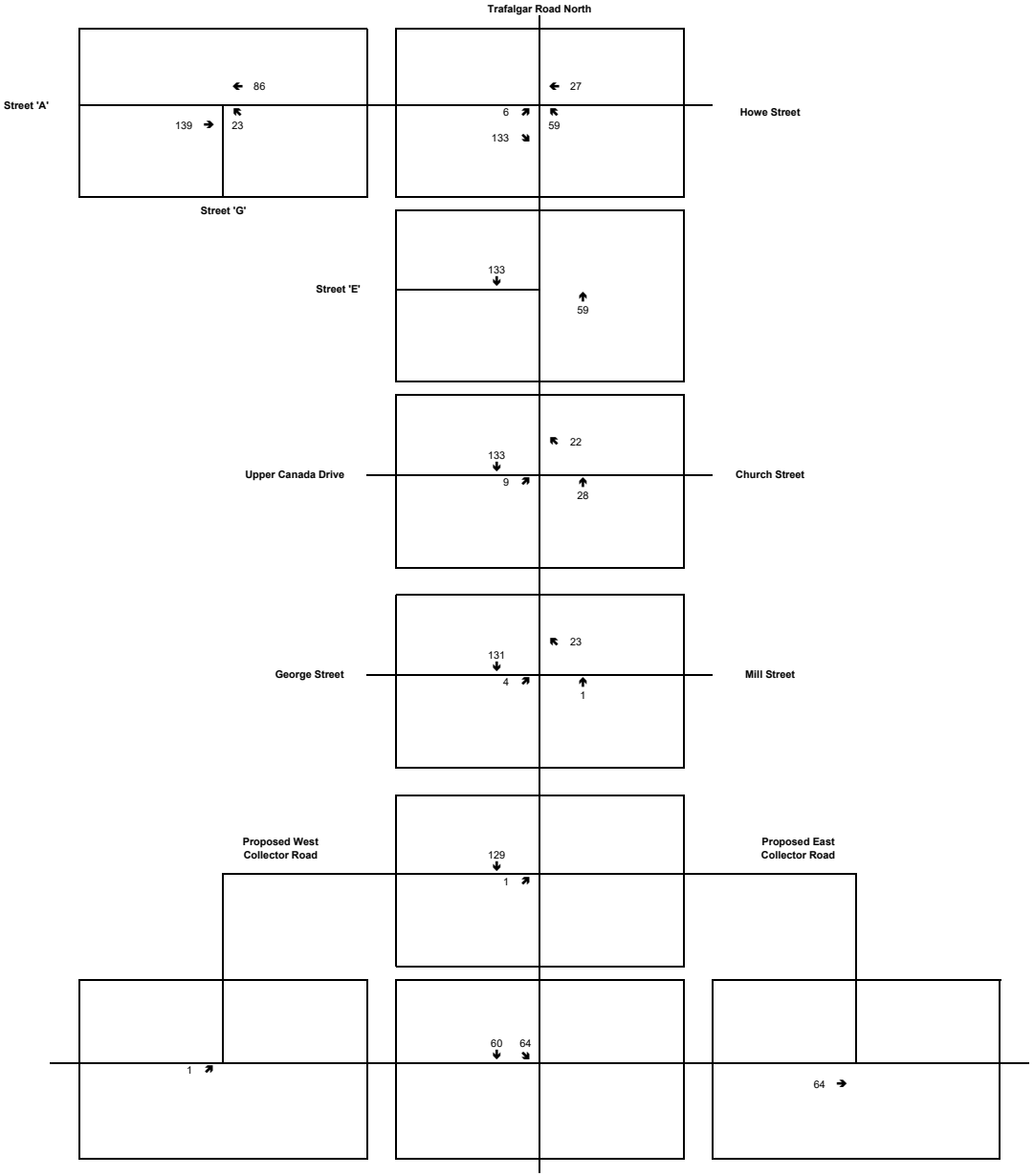


Figure No: 24

Date: July 20 2022

Prepared by: B.W.

N

Trip Assignment of Proposed Elementary School within the Subject Subdivision (2026 Horizon Year)
P.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

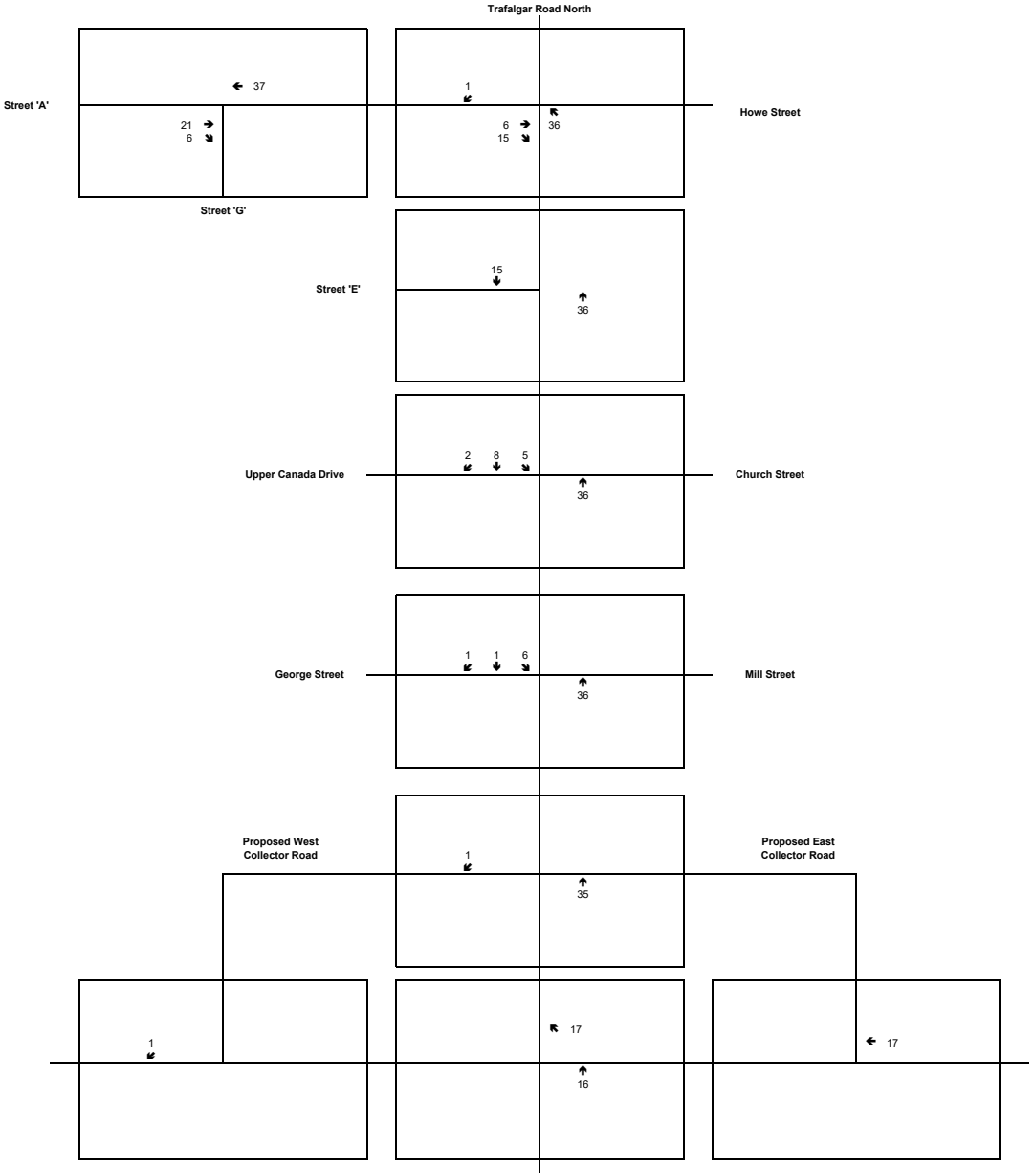


Figure No: 25

Date: July 20 2022

Prepared by: B.W.

N

Subject School 2026 PM

6. TRIP GENERATION AND DISTRIBUTION (CONT'D)

6.3 Trip Distribution and Assignment (Cont'd)

For the 2031 horizon year, with the occupancy of the anticipated development immediately north of the Subject Subdivision that is owned by the applicant, the assumed trip distribution and assignment will be as follows:

A.M. Peak Hour

- 51% from within the Subject Subdivision and the anticipated development owned by the applicant,
- 3% from the east and outside the vicinity of the Study Area via Orangeville Street and Howe Street,
- 38% from the east via Howe Street, Church Street or Mill Street,
- 7% from the south via Upper Canada Drive or George Street,
- 1% from the west and outside the vicinity of the Study Area via Station Street/proposed West Collector Road or Side Road 27.

Total 100% inbound

- 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.

Total 100% outbound

6. TRIP GENERATION AND DISTRIBUTION (CONT'D)

6.3 Trip Distribution and Assignment (Cont'd)

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.

Total 100% inbound

- 51% to within the Subject Subdivision and the anticipated development owned by the applicant,
- 3% to the east and outside the vicinity of the Study Area via Church Street and Howe Street,
- 38% to the east via Howe Street, Church Street or Mill Street,
- 7% to the south via Upper Canada Drive or George Street,
- 1% to the west and outside the vicinity of the Study Area via Station Street/proposed West Collector Road or Side Road 27.

Total 100% outbound

The site-generated trip volumes and trip assignment used in the analysis for the Elementary School during the 2031 horizon year are illustrated in **Figures 26 and 27**.

For the 2026 horizon year, the site-generated trip volumes and trip assignment used in the analysis for the proposed Residential Subdivision are illustrated in **Figures 28 and 29**.

For the 2031 horizon year, the site-generated trip volumes and trip assignment used in the analysis for the proposed Residential Subdivision are illustrated in **Figures 30 and 31**.

Trip Assignment of Proposed Elementary School within the Subject Subdivision (2031 Horizon Year) A.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

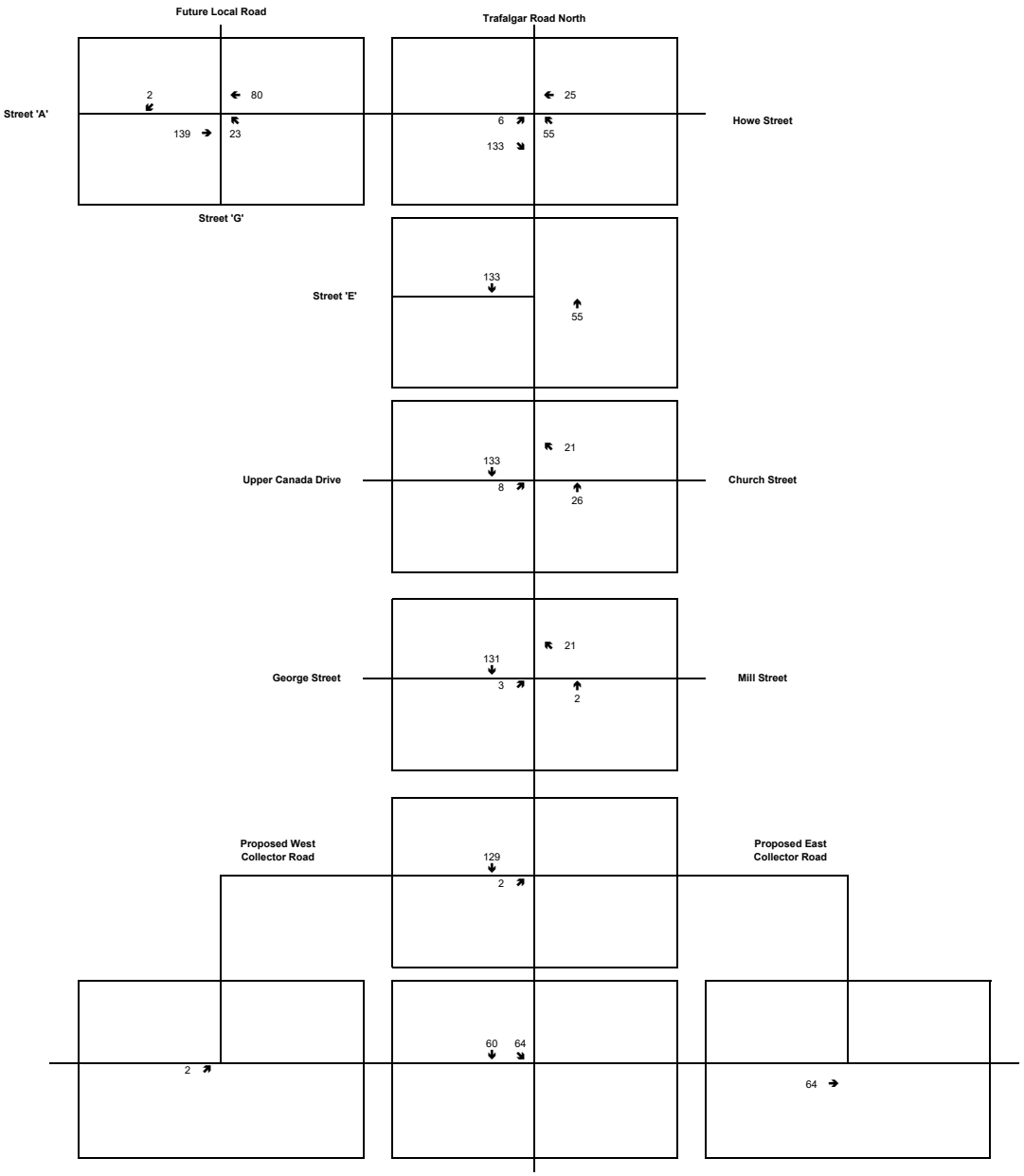


Figure No: 26

Date: July 20 2022

Prepared by: B.W.

N

Trip Assignment of Proposed Elementary School within the Subject Subdivision (2031 Horizon Year) P.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

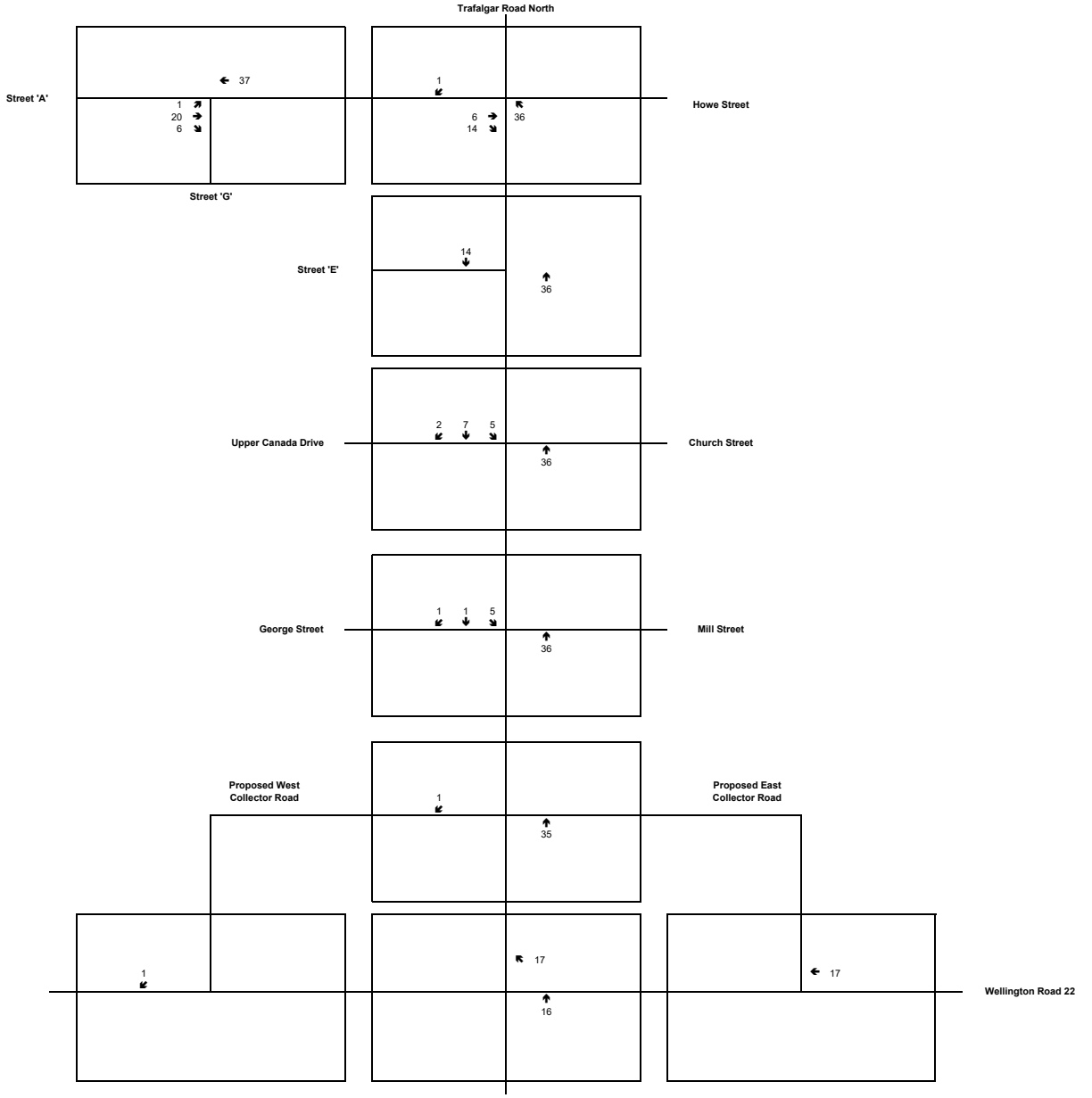


Figure No: 27

Date: July 20 2022

Prepared by: B.W.

N

Subject School 2031 PM

Trip Assignment of Subject Subdivision (2026 Horizon Year)
A.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

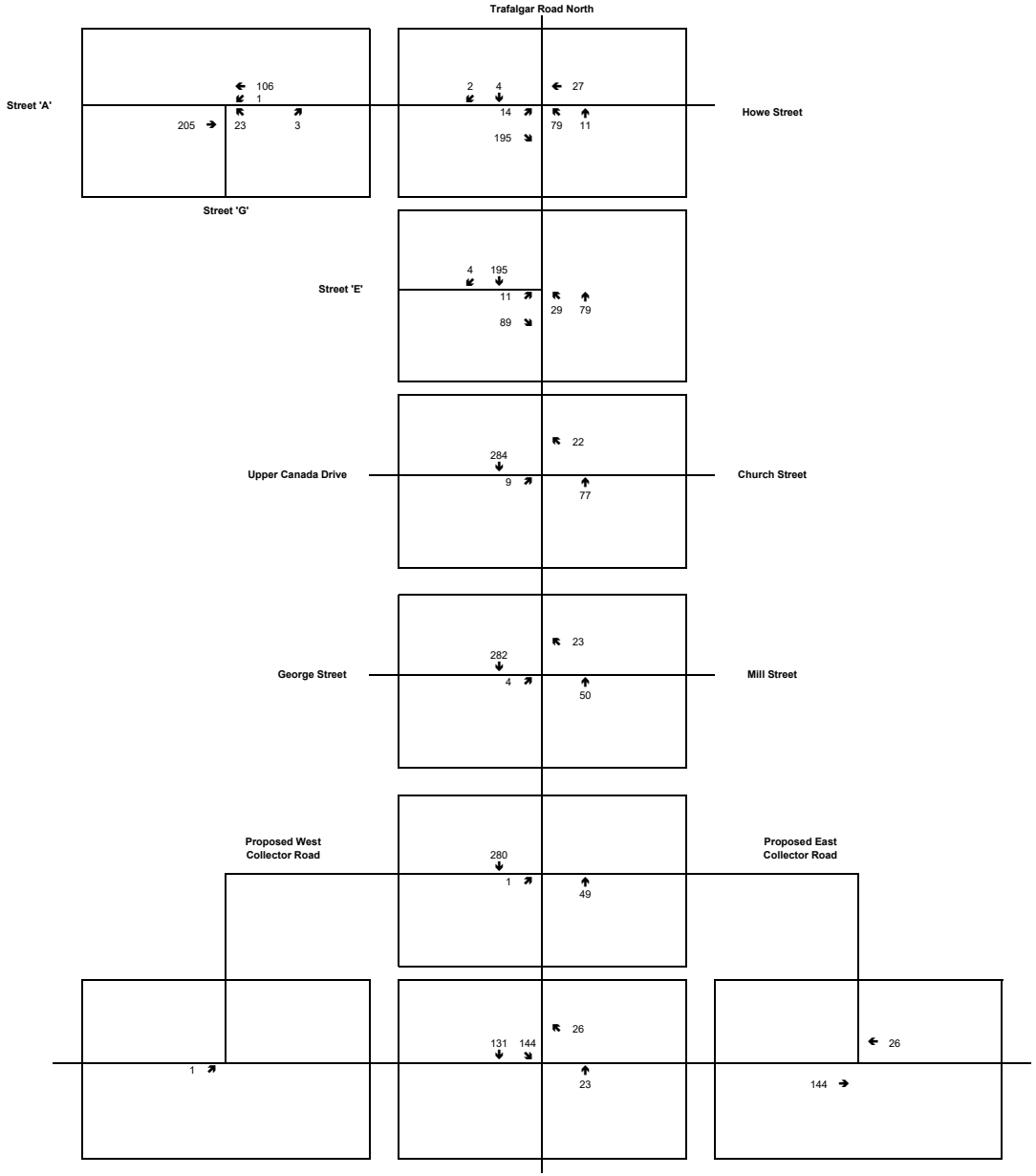


Figure No:	28
Date:	July 20 2022
Prepared by:	B.W.

N

Subject Total AM 2026

Trip Assignment of Subject Subdivision (2026 Horizon Year)
P.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

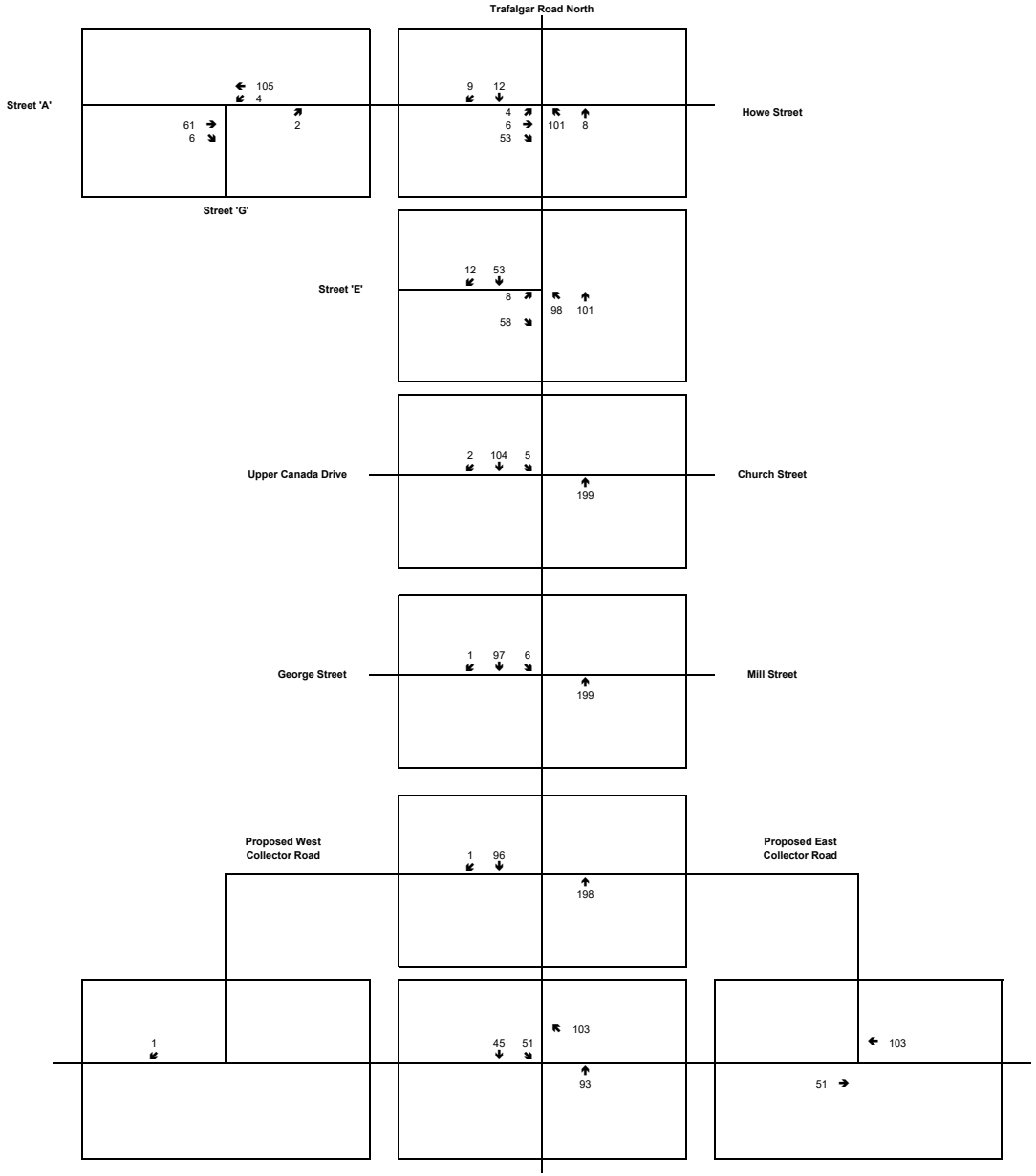


Figure No:	29
Date:	July 20 2022
Prepared by:	B.W.

N

Subject Total PM 2026

Trip Assignment of Subject Subdivision (2031 Horizon Year)
A.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

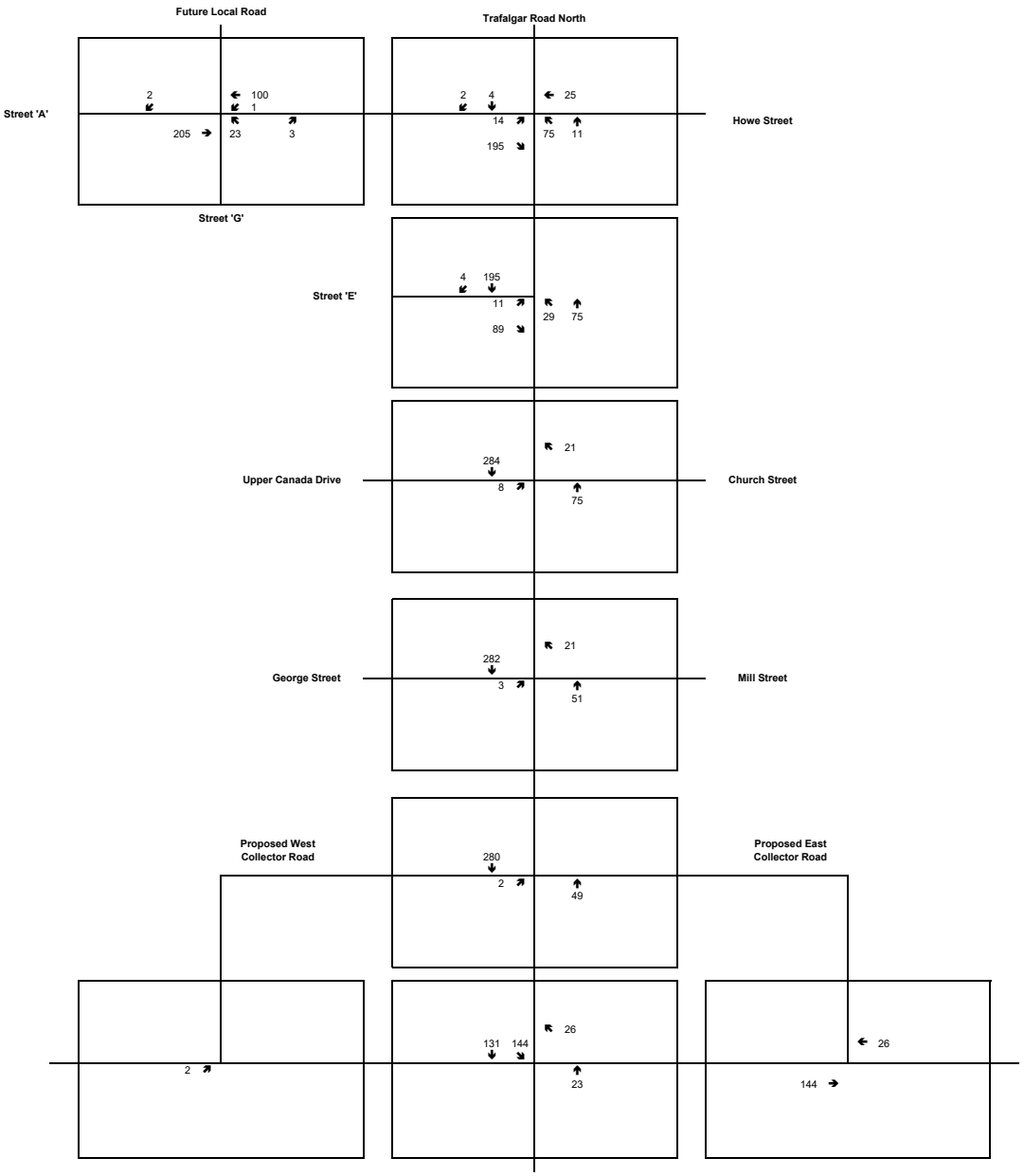


Figure No: 30

Date: July 20 2022

Prepared by: B.W.

N

Subject Total AM 2031

Trip Assignment of Subject Subdivision (2031 Horizon Year)
P.M. Peak Hour

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

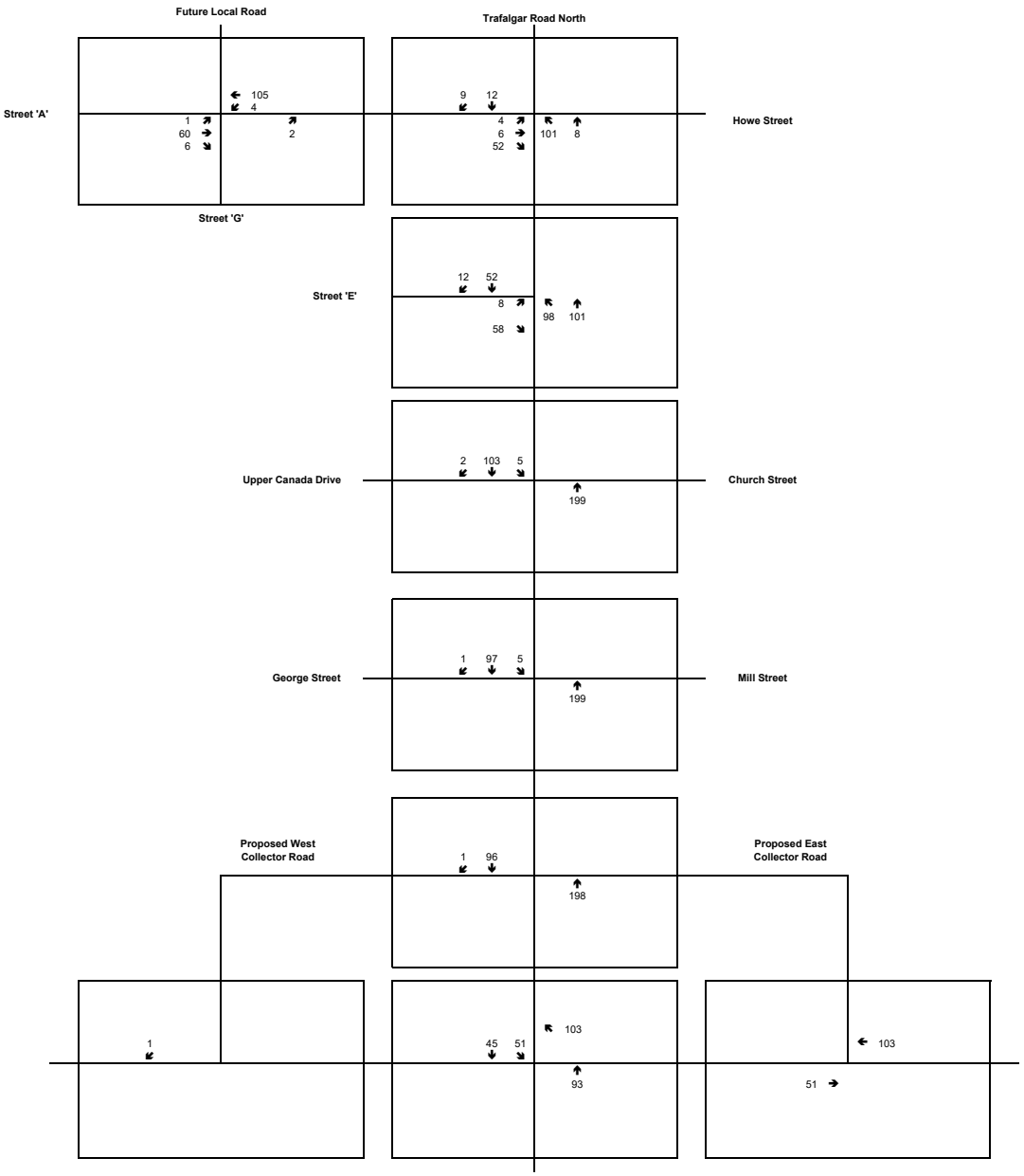


Figure No: 31

Date: July 20 2022

Prepared by: B.W.

N

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 32 and 33**.

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 'G' was analyzed as a single lane roundabout that is yield-controlled at all approaches. The lane configuration used in the analysis comprises a shared left-right turning lane at the northbound approach; a shared through-right turning lane at the eastbound approach; and a shared through-left turning lane at the westbound approach.

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

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

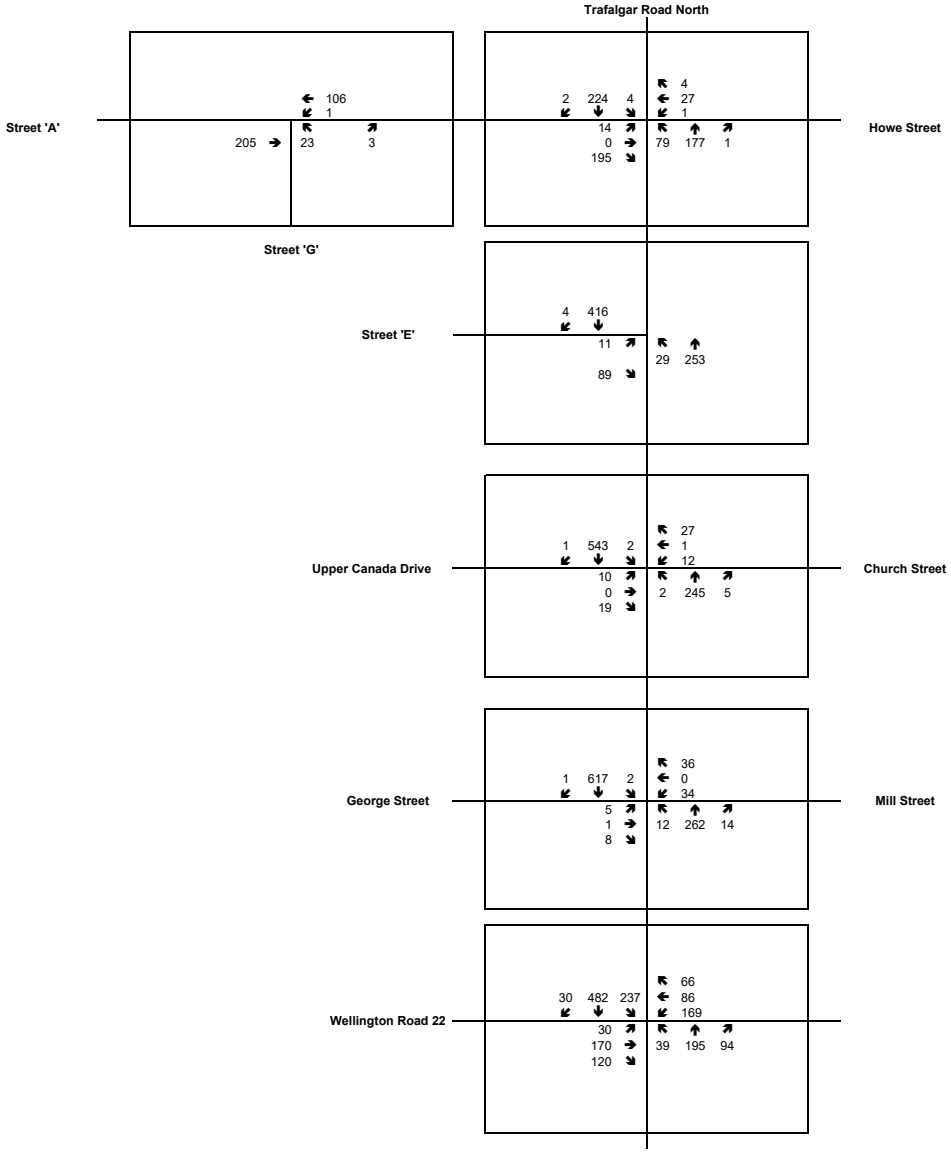


Figure No: 32

Date: July 20 2022

Prepared by: B.W.

N

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

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

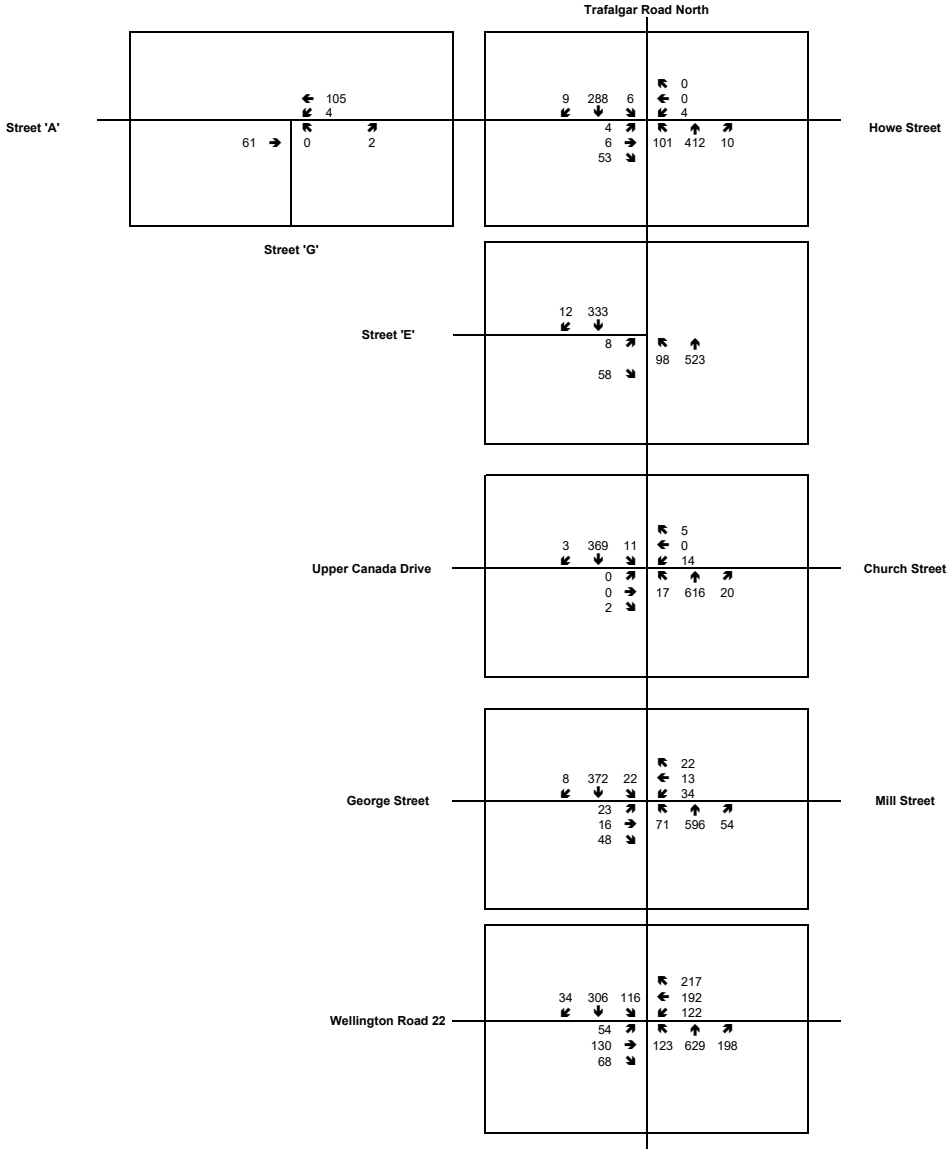


Figure No: 33

Date: July 20 2022

Prepared by: B.W.

N

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

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

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

Table 13: Future (2026) Total Traffic – Level of Service

Intersection	Turning Lane /Approach	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**	**37.0**	**n/a**	**1.38**	**E**	**72.0**	**n/a**
	EB Approach	0.61	C	23.3	64.7	0.59	C	24.5	56.0
	WB Approach	1.07	F	95.1	108.6	1.07	F	84.6	158.0
	NBL	0.19	B	15.1	10.4	0.39	B	18.0	27.8
	NB TR	0.45	B	15.0	47.9	1.10	F	84.3	230.1
	SBL	0.72	C	30.8	68.1	1.38	F	250.8	48.4
	SB TR	0.77	C	26.0	107.6	0.45	B	16.2	58.8
Trafalgar Road North at Howe Street/ Proposed Street 'A' (Un-signalized)	**Overall**	**0.29**	**A**	**5.0**	**n/a**	**0.13**	**A**	**2.5**	**n/a**
	EB Approach	0.29	B	11.7	9.5	0.13	B	12.9	3.6
	WB Approach	0.08	B	14.7	2.1	0.02	D	27.0	0.6
	NB Approach	0.06	A	2.8	1.5	0.09	A	2.4	2.3
	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**	**0.23**	**A**	**1.8**	**n/a**	**0.50**	**A**	**6.2**	**n/a**
	EB Approach	0.05	C	17.7	1.3	0.41	D	32.0	15.1
	WB Approach	0.23	C	19.2	7.0	0.50	F	52.3	19.1
	NB Approach	0.01	A	0.5	0.3	0.07	A	1.7	1.7
	SB Approach	0.00	A	0.0	0.0	0.03	A	0.8	0.6
Trafalgar Road North at Upper Canada Drive/ Church Street (Un-signalized)	**Overall**	**0.12**	**A**	**1.3**	**n/a**	**0.09**	**A**	**0.8**	**n/a**
	EB Approach	0.11	C	17.5	2.9	0.00	B	10.4	0.1
	WB Approach	0.12	C	15.3	3.3	0.09	C	23.2	2.3
	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 13: Future (2026) Total Traffic – Level of Service

Intersection	Approach	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**	**2.0**	**n/a**	**0.22**	**A**	**2.2**	**n/a**
	EB Approach	0.19	B	13.0	5.7	0.14	B	13.0	3.8
	NB Approach	0.03	A	1.1	0.7	0.09	A	2.3	2.4
	SB Approach	0.27	A	0.0	0.0	0.22	A	0.0	0.0
Street 'A' at Proposed Street 'G' (Roundabout)	**Overall**	**0.20**	**A**	**4.8**	**n/a**	**0.11**	**A**	**4.0**	**n/a**
	EB Approach	0.20	A	5.1	7.0	0.06	A	3.8	0.0
	WB Approach	0.11	A	4.3	0.0	0.11	A	4.2	0.0
	NB Approach	0.03	A	4.4	0.0	0.00	A	3.4	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 begin to operate at a Level of Service "F" with an average delay of 52.3 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 "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 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 – Right-Turn Lane Warrant Analysis

For the southbound right turning movements at the Trafalgar Road North at Howe Street/proposed Street 'A' and Trafalgar Road North at proposed Street 'E' intersections, a right-turn lane warrant analysis was conducted using the principles provided in the Ministry of Transportation Ontario's Geometric Design Standards for Ontario Highways[7]. Based on the procedure to the right-turn lane warrant analysis, a right-turning lane should be considered when traffic volumes are 60 vehicles per hour or higher. With the southbound right turning movements at the concerned intersections operating with 12 vehicles per vehicle or less, right turning lanes are not warranted.

7.2.2 Future (2026) Total Traffic Analysis – Left-Turn Lane Warrant Analysis

For the northbound left turning movement at the Trafalgar Road North at Howe Street/proposed Street 'A' and Trafalgar Road North at proposed Street 'E' intersections, a left-turn lane warrant analysis was undertaken. The analysis followed the procedure specified in the Ministry of Transportation Ontario's Geometric Design Standards for Ontario Highways.

At approximately 200 metres north of the proposed Residential Subdivision, travelling in the southbound direction, the posted speed limit on Trafalgar Road North changes from 60 km/h to 40 km/h. Therefore, a design speed of 70 km/h was assumed.

[7] Geometric Design Standards for Ontario Highways, Ministry of Transportation Ontario.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.2.2 Future (2026) Total Traffic Analysis – Left-Turn Lane Warrant Analysis

For the Trafalgar Road North at Howe Street/proposed Street 'A' and Trafalgar Road North at proposed Street 'E' intersections, the analysis determined that a left-turning lane at the northbound approach is warranted during the P.M. Peak Hour.

For the Trafalgar Road North at Howe Street/proposed Street 'A' intersection, in order to match the construction of a northbound left-turning lane, a southbound left-turning lane will be recommended to create a balanced intersection.

The results of the analysis are provided in **Figures 34 and 35**.

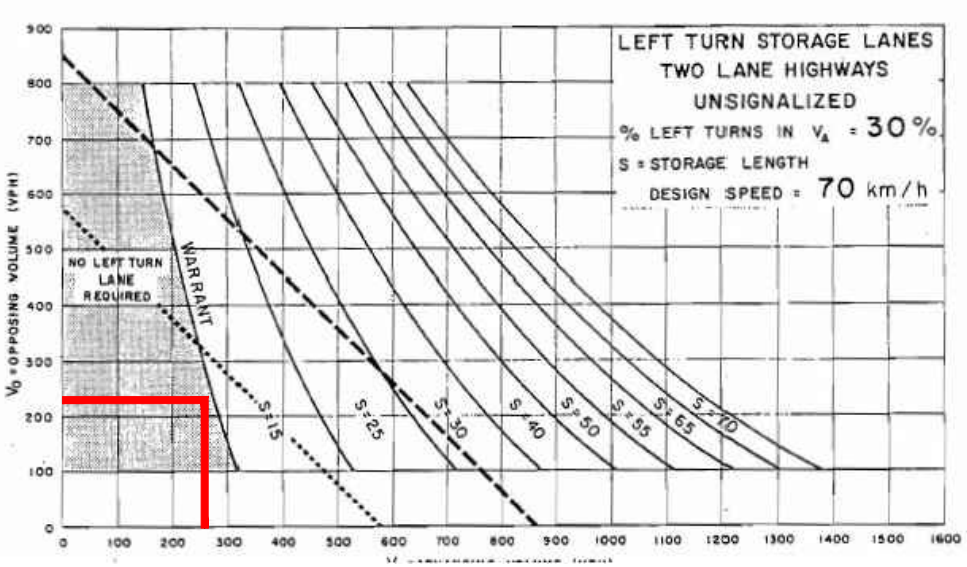
7.2.3 Future (2026) Total Traffic Analysis – Signal Warrant Analysis

The Future (2026) Total Traffic Analysis indicates that the westbound approach for the Trafalgar Road North at George Street/Mill Street intersection will operate at a Level of Service "F" with an average delay of 52.3 seconds per vehicle during the P.M. Peak Hour.

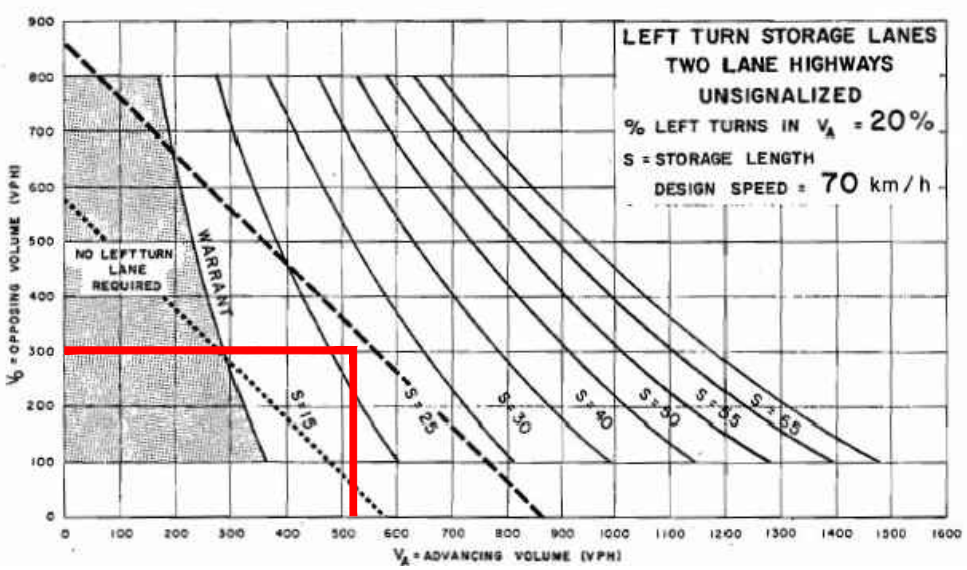
Therefore, a signal warrant analysis was undertaken since the intersection is currently un-signalized. The analysis followed the procedures specified in Book 12 Justification 7 in the Ontario Traffic Manual and is provided in **Appendix G**[8].

The signal warrant analysis indicates that the Trafalgar Road North at George Street/Mill Street intersection does not warrant traffic signals. Although the westbound approach operates at a Level of Service "F" during the P.M. Peak Hour, an average delay of 52.3 seconds per vehicle is acceptable during the Weekday Peak Periods.

[8] Ontario Traffic Manual Book 12 – Traffic Signals, Ministry of Transportation Ontario, March 2012.

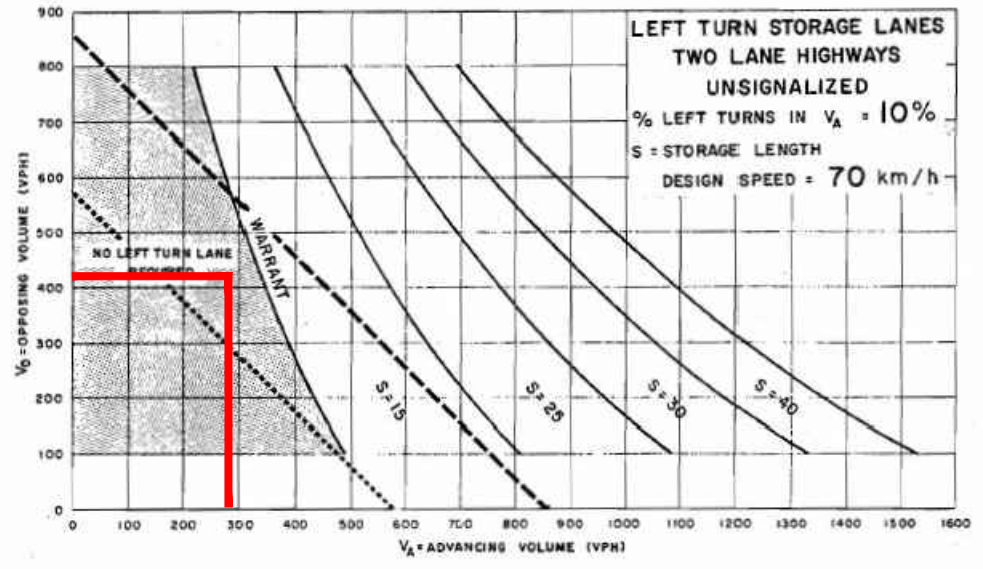


A.M. PEAK HOUR

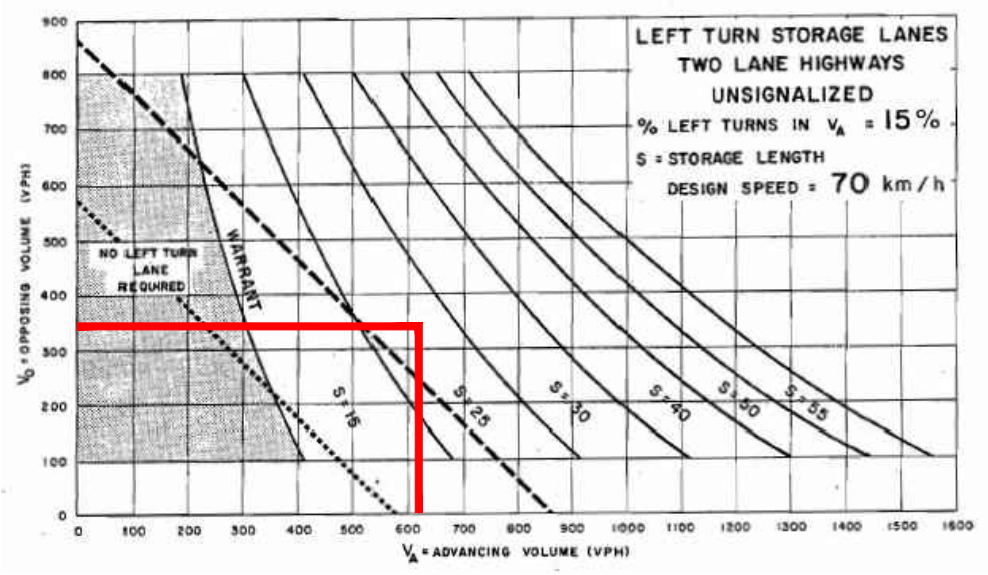


P.M. PEAK HOUR

TRAFFIC IMPACT STUDY PROPOSED RESIDENTIAL SUBDIVISION HILLSBURGH HEIGHTS INC. TOWN OF ERIN	CANDEVCON LIMITED CONSULTING ENGINEERS AND PLANNERS TEL. (905) 794-0600 FAX (905) 794-0611	
	DATE JULY 21, 2022	JOB NO. W21081
LEFT-TURN LANE WARRANT ANALYSIS FUTURE (2026) TOTAL TRAFFIC TRAFALGAR ROAD NORTH AT HOWE STREET/STREET 'A' - NB APPROACH	DRAWN BY B.W.	FIG. No 34



A.M. PEAK HOUR



P.M. PEAK HOUR

TRAFFIC IMPACT STUDY PROPOSED RESIDENTIAL SUBDIVISION HILLSBURGH HEIGHTS INC. TOWN OF ERIN	CANDEVCON LIMITED CONSULTING ENGINEERS AND PLANNERS TEL. (905) 794-0600 FAX (905) 794-0611	
	DATE JULY 21, 2022	JOB NO. W21081
LEFT-TURN LANE WARRANT ANALYSIS FUTURE (2026) TOTAL TRAFFIC TRAFALGAR ROAD NORTH AT STREET 'E' - NB APPROACH	DRAWN BY B.W.	FIG. No 35

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.2.4 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 35 metres of storage,
- Include a left turning lane at the westbound approach with 45 metres of storage,
- Extend the storage of the southbound left turning lane to 65 metres.

For the Trafalgar Road North at Howe Street/proposed Street 'A' and Trafalgar Road North at proposed Street 'E' intersections, improvements were made based on the results of the left-turn lane warrant analysis. The left-turn lane warrant analysis indicates that a northbound left turning lane is warranted during the P.M. Peak Hour. For the Trafalgar Road North at Howe Street/proposed Street 'A' intersection, to avoid issues with safety due to the construction of a northbound left-turning lane, a southbound left-turning lane will be constructed.

The following improvements are recommended for the concerned intersections.

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

- Include a left turning lane at the northbound and southbound approaches with 15 metres of storage.

Proposed Street 'E' at Trafalgar Road North

- Include a left turning lane at the northbound approach with 15 metres of storage.

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 52.3 seconds per vehicle, it is considered acceptable for Peak Period conditions.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.2.4 Future (2026) Total Traffic Analysis – Recommended Improvements (Cont'd)

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

Table 14: Future (2026) Total Traffic – Level of Service – with Improvements

Intersection	Turning Lane /Approach	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**	**0.89**	**C**	**28.1**	**n/a**	**1.00**	**D**	**44.3**	**n/a**
	EBL	0.14	C	23.1	10.0	0.70	E	75.4	31.7
	EB TR	0.89	D	50.1	80.0	0.51	C	30.7	52.7
	WBL	0.72	C	34.1	36.2	0.54	D	39.4	40.8
	WB TR	0.42	B	15.5	28.5	0.99	E	71.3	135.7
	NBL	0.19	B	14.0	9.5	0.31	B	15.8	27.1
	NB TR	0.47	B	13.8	42.4	1.00	D	52.8	245.9
	SBL	0.73	C	29.8	60.9	0.70	C	32.0	21.7
	SB TR	0.80	C	26.7	109.7	0.35	B	10.2	48.1
Trafalgar Road North at Howe Street/ Proposed Street 'A' (Un-signalized)	**Overall**	**0.29**	**A**	**4.9**	**n/a**	**0.27**	**A**	**2.0**	**n/a**
	EB Approach	0.29	B	11.7	9.5	0.13	B	12.9	3.6
	WB Approach	0.08	B	14.7	2.1	0.02	D	26.8	0.6
	NBL	0.06	A	7.9	1.5	0.09	A	8.2	2.3
	NB TR	0.11	A	0.0	0.0	0.27	A	0.0	0.0
	SBL	0.00	A	7.6	0.1	0.01	A	8.3	0.2
	SB TR	0.14	A	0.0	0.0	0.19	A	0.0	0.0
Trafalgar Road North at Proposed Street 'E' (Un-signalized)	**Overall**	**0.27**	**A**	**1.9**	**n/a**	**0.33**	**A**	**1.6**	**n/a**
	EB Approach	0.19	B	13.0	5.7	0.14	B	13.0	3.8
	NBL	0.03	A	8.4	0.7	0.09	A	8.3	2.4
	NBT	0.16	A	0.0	0.0	0.33	A	0.0	0.0
	SB Approach	0.27	A	0.0	0.0	0.22	A	0.0	0.0

Note 1: Delays are measured in seconds per vehicle.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.2.4 Future (2026) Total Traffic Analysis – Recommended Improvements (Cont'd)

With the recommended improvements, the intersection of Trafalgar Road North at Wellington Road 22 will 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. All of the turning movements will operate at a Level of Service "D" or better during the A.M. Peak Hour and a Level of Service "E" or better during the P.M. Peak Hour.

The Trafalgar Road North at Howe Street/proposed Street 'A' intersection operates at a Level of Service "A" during the A.M. and P.M. Peak Hours. All of the turning movements will operate at a Level of Service "B" or better during the A.M. Peak Hour and a Level of Service "D" or better during the P.M. Peak Hour.

The Trafalgar Road North at proposed Street 'E' intersection operates at a Level of Service "A" during the A.M. and P.M. Peak Hours. All of the turning movements will operate at a Level of Service "B" or better during the A.M. and P.M. Peak Hours.

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 from the Subject Property and the Site-Generated Traffic Volumes from the anticipated development that is immediately north of the Subject Property and that is owned by the applicant. (**Figures 14 and 15**) The Future (2031) Total Traffic Volumes are provided in **Figures 36 and 37**.

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

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

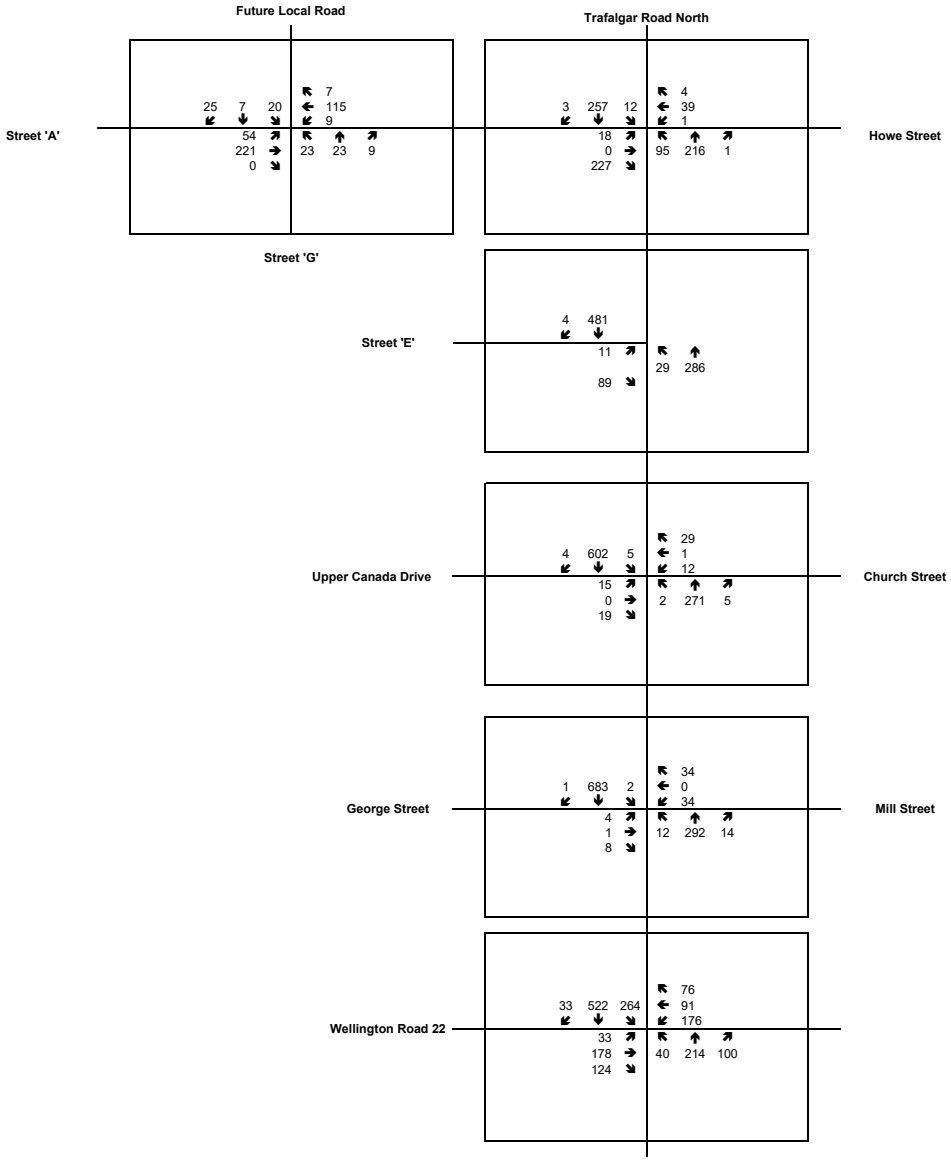


Figure No: 36

Date: July 21 2022

Prepared by: B.W.

N

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

W21081
Proposed Residential Subdivision
Town of Erin
Hillsburgh Heights Inc.

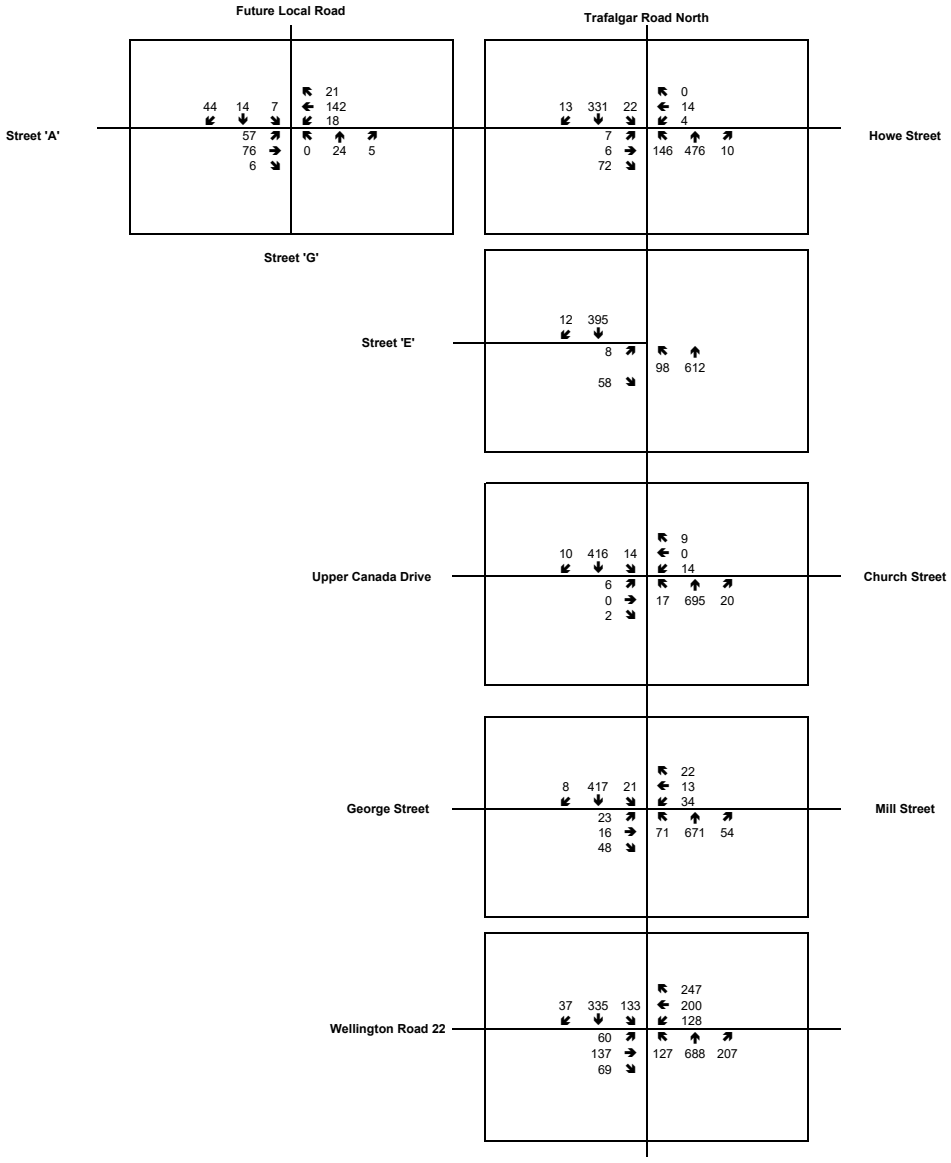


Figure No: 37

Date: July 21 2022

Prepared by: B.W.

N

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.4 Future (2031) Total Traffic Analysis

For the Future (2031) 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, Upper Canada Drive/Church Street at Trafalgar Road North, Howe Street/proposed Street 'A' at Trafalgar Road North and proposed Street 'E' at Trafalgar Road North intersections, 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 proposed Street 'A' at proposed Street 'G'/future Local Road intersection was analyzed as a single lane roundabout that is yield-controlled at all approaches. 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 15.** The related calculations are provided in **Appendix E**.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

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

Table 15: Future (2031) Total Traffic – Level of Service

Intersection	Turning Lane /Approach	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**	**1.16**	**D**	**46.4**	**n/a**	**1.59**	**F**	**99.0**	**n/a**
	EB Approach	0.65	C	24.6	69.6	0.66	C	27.7	62.2
	WB Approach	1.16	F	126.8	118.8	1.16	F	117.3	175.8
	NBL	0.23	B	16.5	11.1	0.43	B	19.5	30.0
	NB TR	0.49	B	15.8	53.3	1.19	F	119.2	256.6
	SBL	0.85	D	44.1	83.2	1.59	F	333.1	54.8
	SB TR	0.84	C	30.3	136.2	0.49	B	16.9	65.4
Trafalgar Road North at Howe Street/ Proposed Street 'A' (Un-signalized)	**Overall**	**0.37**	**A**	**5.8**	**n/a**	**0.23**	**A**	**4.0**	**n/a**
	EB Approach	0.37	B	13.3	13.7	0.23	C	16.6	7.0
	WB Approach	0.14	C	17.6	3.7	0.14	E	37.0	3.9
	NB Approach	0.08	A	2.9	2.0	0.13	A	3.2	3.7
	SB Approach	0.01	A	0.4	0.2	0.02	A	0.7	0.6
Trafalgar Road North at George Street/ Mill Street (Un-signalized)	**Overall**	**0.26**	**A**	**1.8**	**n/a**	**0.62**	**A**	**7.6**	**n/a**
	EB Approach	0.05	C	18.9	1.3	0.49	E	41.9	19.4
	WB Approach	0.26	C	22.3	8.2	0.62	F	75.0	24.9
	NB Approach	0.01	A	0.5	0.4	0.07	A	1.7	1.8
	SB Approach	0.00	A	0.0	0.0	0.03	A	0.7	0.6
Trafalgar Road North at Upper Canada Drive/ Church Street (Un-signalized)	**Overall**	**0.17**	**A**	**1.6**	**n/a**	**0.12**	**A**	**1.1**	**n/a**
	EB Approach	0.17	C	22.2	4.7	0.04	D	25.6	1.1
	WB Approach	0.15	C	16.7	4.0	0.12	D	25.9	3.2
	NB Approach	0.00	A	0.1	0.1	0.02	A	0.4	0.4
	SB Approach	0.00	A	0.1	0.1	0.02	A	0.5	0.4

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 15: Future (2031) Total Traffic – Level of Service

Intersection	Approach	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**	**0.31**	**A**	**1.9**	**n/a**	**0.26**	**A**	**2.2**	**n/a**
	EB Approach	0.22	B	14.1	6.5	0.16	B	14.4	4.5
	NB Approach	0.03	A	1.1	0.8	0.10	A	2.3	2.5
	SB Approach	0.31	A	0.0	0.0	0.26	A	0.0	0.0
Proposed Street 'A' at Proposed Street 'G'/ future Local Road (Roundabout)	**Overall**	**0.28**	**A**	**5.5**	**n/a**	**0.19**	**A**	**4.9**	**n/a**
	EB Approach	0.28	A	6.1	7.0	0.14	A	4.7	0.0
	WB Approach	0.14	A	4.9	7.0	0.19	A	5.4	7.0
	NB Approach	0.08	A	5.3	0.0	0.03	A	4.1	0.0
	SB Approach	0.06	A	4.4	0.0	0.08	A	4.6	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 inclusion of site-generated traffic, 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 will continue to operate with a volume over capacity ratio that is greater than 1.0 and will begin to operate at a Level of Service "F".

The left turning lane at the southbound approach will continue to operate at a Level of Service "F" and will begin to operate with a volume over capacity ratio that is greater than 1.0. The queue lengths at the southbound left turning lane may begin to result in a spill back of vehicles into the adjacent lane during the A.M. and P.M. Peak Hours.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

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

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 inclusion of site-generated traffic, impacts to the intersection are high 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 a Level of Service "E" or better during the P.M. Peak Hour.

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 inclusion of site-generated traffic, 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 begin to operate at a Level of Service "F" with an average delay of 75.0 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 will begin to operate at a Level of Service "E" 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 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 inclusion of site-generated traffic, 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 a Level of Service "D" or better during the P.M. Peak Hour.

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 minimal 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 'G'/future Local Road

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. With the growth in background traffic, impacts to the intersection are low during the A.M. and P.M. Peak Hours.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.4.1 Future (2031) Total Traffic Analysis – Right-Turn Lane Warrant Analysis

For the southbound right turning movements at the Trafalgar Road North at Howe Street/proposed Street 'A' and Trafalgar Road North at proposed Street 'E' intersections, a right-turn lane warrant analysis was conducted using the principles provided in the Ministry of Transportation Ontario's Geometric Design Standards for Ontario Highways. Based on the procedure to the right-turn lane warrant analysis, a right-turning lane should be considered when traffic volumes are 60 vehicles per hour or higher. With the southbound right turning movements at the concerned intersections operating with 13 vehicles per vehicle or less, right turning lanes are not warranted.

7.4.2 Future (2031) Total Traffic Analysis – Signal Warrant Analysis

The Future (2031) Total Traffic Analysis indicates that the westbound approach for the Trafalgar Road North at George Street/Mill Street intersection will operate at a Level of Service "F" with an average delay of 75.0 seconds per vehicle during the P.M. Peak Hour.

Therefore, a signal warrant analysis was undertaken since the intersection is currently un-signalized. The analysis followed the procedures specified in Book 12 Justification 7 in the Ontario Traffic Manual and is provided in **Appendix G**.

The signal warrant analysis indicates that the Trafalgar Road North at George Street/Mill Street intersection does not warrant traffic signals. Although the westbound approach operates at a Level of Service "F" during the P.M. Peak Hour, an average delay of 75.0 seconds per vehicle is acceptable during the Weekday Peak Periods.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

7.4.3 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 20 metres of storage,
- Extend the storage for the left turning lane at the southbound approach to 70 metres,
- Include a right turning lane at the westbound approach with 35 metres of storage.

The traffic conditions with the recommended improvements are summarized in **Table 16.** The related calculations are provided in **Appendix E**.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

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

Table 16: Future (2031) Total Traffic – Level of Service – with Improvements

Intersection	Turning Lane /Approach	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**	**0.86**	**C**	**28.3**	**n/a**	**0.82**	**B**	**19.7**	**n/a**
	EBL	0.15	C	23.9	11.4	0.24	C	20.9	15.3
	EB TR	0.86	D	45.6	79.2	0.54	C	21.3	36.9
	WBL	0.79	D	40.6	43.5	0.54	C	28.5	29.9
	WBT	0.18	B	17.6	20.0	0.51	C	24.3	39.9
	WBR	0.17	A	5.4	8.1	0.57	B	15.0	32.3
	NBL	0.22	B	15.7	10.6	0.35	B	12.4	21.3
	NBT	0.35	B	14.6	36.1	0.82	C	22.8	135.6
	NBR	0.16	A	3.1	7.1	0.26	A	5.1	16.5
	SBL	0.72	C	28.0	68.1	0.78	D	47.3	44.6
	SB TR	0.85	C	31.0	130.0	0.45	B	11.4	47.8
Trafalgar Road North at Howe Street/ Proposed Street 'A' (Un-signalized)	**Overall**	**0.37**	**A**	**5.6**	**n/a**	**0.31**	**A**	**3.2**	**n/a**
	EB Approach	0.37	B	13.3	13.7	0.23	C	16.6	7.0
	WB Approach	0.14	C	17.6	3.7	0.14	E	36.9	3.9
	NBL	0.08	A	8.0	2.0	0.13	A	8.5	3.7
	NB TR	0.13	A	0.0	0.0	0.31	A	0.0	0.0
	SBL	0.01	A	7.7	0.2	0.02	A	8.5	0.6
	SB TR	0.16	A	0.0	0.0	0.22	A	0.0	0.0
Trafalgar Road North at Proposed Street 'E' (Un-signalized)	**Overall**	**0.31**	**A**	**1.8**	**n/a**	**0.39**	**A**	**1.5**	**n/a**
	EB Approach	0.22	B	14.1	6.5	0.16	B	14.4	4.5
	NBL	0.03	A	8.6	0.8	0.10	A	8.6	2.5
	NBT	0.18	A	0.0	0.0	0.39	A	0.0	0.0
	SB Approach	0.31	A	0.0	0.0	0.26	A	0.0	0.0

Note 1: Delays are measured in seconds per vehicle.

7. FUTURE TOTAL TRAFFIC CONDITIONS (CONT'D)

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

For Trafalgar Road North at Wellington Road 22, the intersection will operate at a Level of Service "C" during the A.M. Peak Hour and a Level of Service "B" during the P.M. Peak Hour. All of the turning movements will operate at a Level of Service "D" or better during the A.M. and P.M. Peak Hours.

For the Trafalgar Road North at Howe Street/proposed Street 'A' and Trafalgar Road North at proposed Street 'E' intersections, with the improvements recommended for the 2026 horizon year, all of the turning movements will continue to operate at an acceptable Levels of Service during the A.M. and P.M. Peak Hours.

For the Trafalgar Road North at George Street/Mill Street intersection, although the westbound approach operates at a Level of Service "F" during the P.M. Peak Hour, with an average delay of 75.0 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 ‘G’/future Local Road, 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.

BLOCK 2
SCHOOL

BLOCK 5A
FUTURE DEVELOPMENT
(COMMERCIAL)

STREET 'A'

STREET 'G'

78 77 76 75 74 73

8 7 6 5 4

20.0m
6.0 4.0 4.0 6.0

9.0m
R=26.0m
R=20.0m
R=15.0m
R=7.0m
R=10.0m
R=15.0m
5.0m
6.0m
23.0m
6.0 5.5 5.5 6.0
6.0 6.5 5.0 6.5 6.0
30.0m

Aerial Fire Truck
Access Report 636 (US)

HILLSBURGH HEIGHTS INC. (BRIARWOOD DEVELOPMENTS GROUP)	5916 TRAFALGAR ROAD NORTH (PLAN 61R-9590) PART OF LOT 26, CONCESSION 7 TOWN OF ERIN COUNTY OF WELLINGTON	*FIRE EMERGENCY SWEPT PATH PLAN*	CANDEVCON LIMITED CONSULTING ENGINEERS AND PLANNERS TEL. (905) 794-0600 FAX (905) 794-0611

DATE	JULY 22nd 2022	JOB No	W21081
DRAWN	S.G.K.	PLAN No.	RA-1
SCALE	1:500		

9. SIGHT DISTANCE ANALYSIS

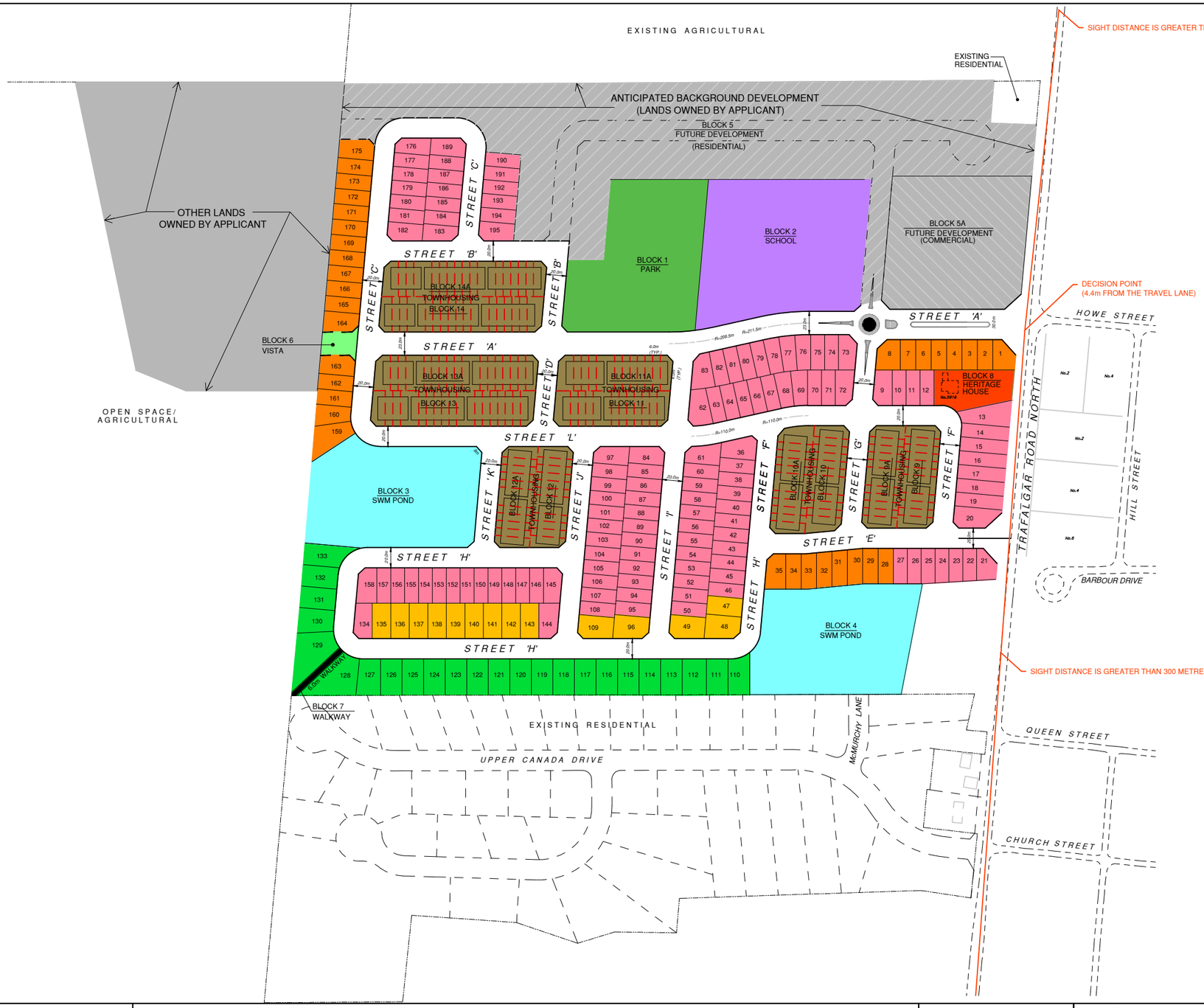
For the Trafalgar Road North at Howe Street/proposed Street 'A' and Trafalgar Road North at proposed Street 'E' intersections, the sight distances for vehicles exiting from the Subject Subdivision were reviewed. To evaluate the sight distances for the proposed accesses, the principles were taken from the Transportation Association of Canada's Geometric Design Guide for Canadian Roads[9].

To determine the sight distances from the vertical plane, CANDEVCON LIMITED conducted a site visit on April 26, 2022. Pictures taken during the site visit that illustrate the site distances from the proposed accesses are provided in **Appendix H**. For the sight distances from the horizontal plane, issues are minimal since the alignment of Trafalgar Road North is relatively straight. To demonstrate that the sight distances provided from the horizontal plane will exceed the sight distances required, the sight distances for vehicles exiting Street 'A' are provided in **Figure 38**.

At approximately 200 metres north of the proposed Residential Subdivision, travelling in the southbound direction, the posted speed limit on Trafalgar Road North changes from 60 km/h to 40 km/h. Therefore, for vehicles leaving the Subject Subdivision by making a right-turn, the design speed for vehicles on Trafalgar Road North is 70 km/h, conservatively. For vehicles leaving the Subject Subdivision by making a left-turn or a through movement, the design speed for vehicles on Trafalgar Road North is 60 km/h.

Based on the results of the analysis, the sight distances provided exceed the sight distances required. The findings of the sight distance analysis are provided in **Table 17**.

[9] Geometric Design Guide for Canadian Roads, Transportation Association of Canada, June 2017.



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

HORIZONTAL SIGHT DISTANCE MEASUREMENTS

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

DATE: JULY 22nd 2022	JOB No. W21081
DESIGN: B.W.	FIG. No. 38
SCALE: N.T.S.	

9. SIGHT DISTANCE ANALYSIS (CONT'D)

Table 17: The Required and Provided Sight Distances

Departing From	Turning Movement	Sight Distance Required	Sight Distance Provided	
			Vertical	Horizontal
Street 'A'	EBL	133m (Note 1)	220m	>300m
	EBT	117m (Note 1)	220m	>300m
	EBR	126m (Note 2)	240m	>300m
Street 'E'	EBL	133m (Note 1)	>300m	>300m
	EBR	126m (Note 2)	220m	>300m

Note 1: The design speed for Trafalgar Road North is 60 km/h.
Note 2: The design speed for Trafalgar Road North is 70 km/h.

10. SUMMARY

The proposed Residential Subdivision is expected to generate a total of 527 trips during the A.M. Peak Hour (218 inbound trips and 309 outbound trips) and 368 trips during the P.M. Peak Hour (220 inbound trips and 148 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. Between the 2026 and 2031 horizon years, it is anticipated that the future Residential Subdivision owned by the applicant that is immediately north of the Subject Subdivision will be fully built-out and occupied. At the time this report was prepared, details to the future Residential Subdivision are preliminary. However, for the roundabout within the Subject Subdivision that is immediately west of the proposed Street 'A'/Howe Street at Trafalgar Road North intersection, the anticipated development will provide a local road that aligns with Street 'G' at Street 'A' to form the north leg.

The lands that are immediately west of the Subject Subdivision that are owned by the applicant lie outside of the Hillsburgh Urban Boundary and are designated under Agricultural and Greenland. The future development potential for these lands, since they lie outside the Urban Boundary, will only be recognized once the lands are brought into the Urban Boundary, which could take up to 30 years. Therefore, the potential development will be built-out and occupied after the 2031 horizon year.

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 35 metres of storage,
- Include a left turning lane at the westbound approach with 45 metres of storage,
- Extend the storage of the southbound left turning lane to 65 metres.

10. SUMMARY (CONT'D)

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

- An un-signalized intersection with stop-controls at the eastbound and westbound approaches,
- A left turning lane with 15 metres of storage and a shared through-right turning lane at the northbound and southbound approaches,
- A shared left-through-right turning lane at the eastbound and westbound approaches.

Proposed Street 'E' at Trafalgar Road North

- An un-signalized intersection with a stop-control at the eastbound approach,
- A left turning lane with 15 metres of storage and a through 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.

Proposed Street 'A' at proposed Street 'G'

- A single lane roundabout intersection that is yield-controlled 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 52.3 seconds per vehicle, it is considered acceptable for Peak Period conditions.

10. SUMMARY (CONT'D)

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 20 metres of storage,
- Extend the storage for the left turning lane at the southbound approach to 70 metres,
- Include a right turning lane at the westbound approach with 35 metres of storage.

Proposed Street 'A' at proposed Street 'G'/future Local Road

- A north leg to the intersection that is a part of the anticipated development (lands owned by applicant) that is immediately north will be constructed.

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 75.0 seconds per vehicle, it is considered acceptable for Peak Period conditions.

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

10. SUMMARY (CONT'D)

Based on the analysis outlined in the Study, 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.

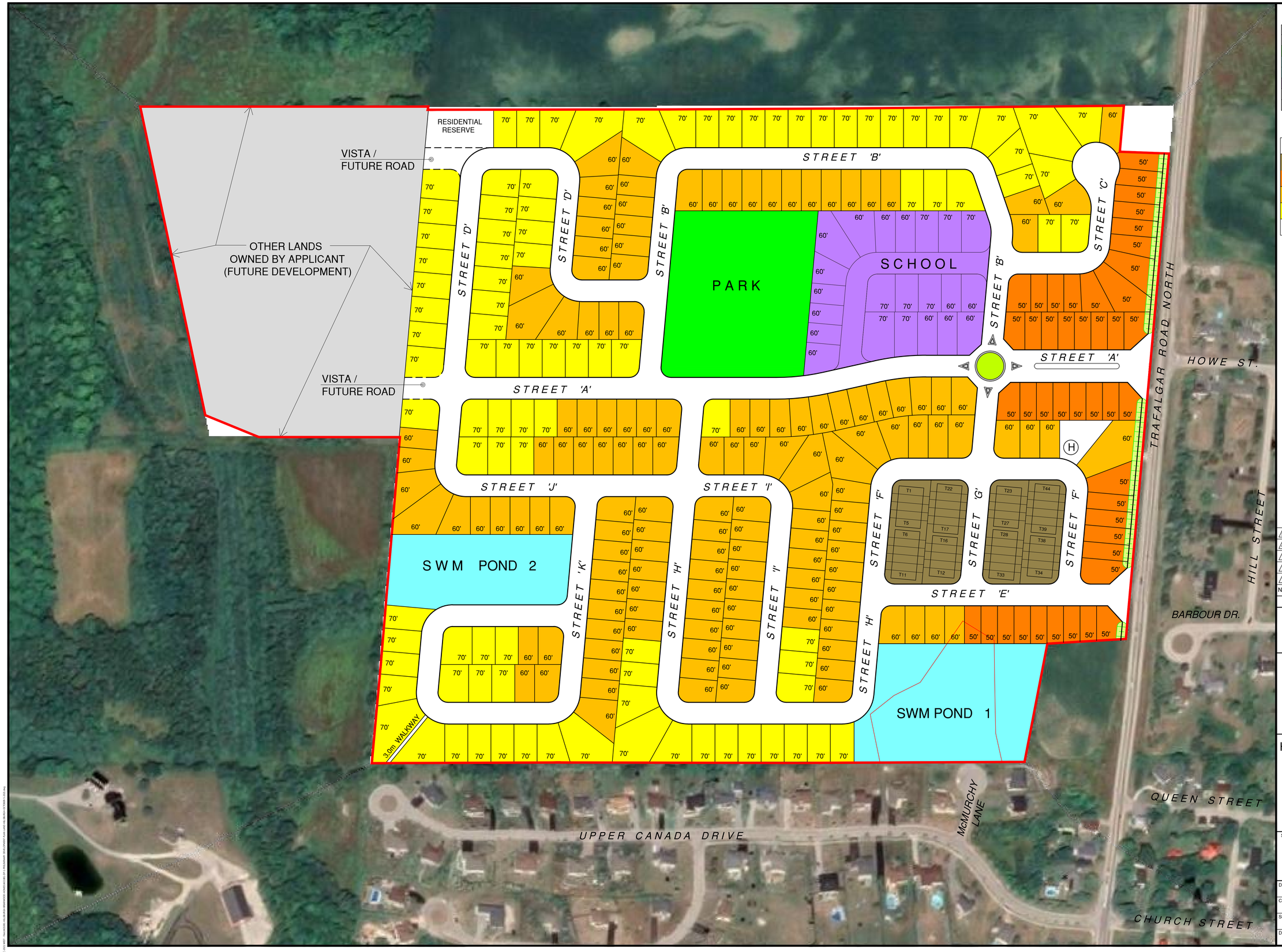
j) Complete traffic operations and volume-capacity analyses using the Synchro 9.0 software.

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).



LAND USE	AREA		PERCENTAGE
RESIDENTIAL	23.31 ha.	57.60 Ac.	57.8%
PARK 1	2.03 ha.	5.01 Ac.	5.0%
SWM POND 1	1.71 ha.	4.23 Ac.	6.9%
SWM POND 2	1.09 ha.	2.69 Ac.	
SCHOOL	2.23 ha.	5.51 Ac.	5.5%
ROADS / MISC.	10.03 ha.	24.79 Ac.	24.8%
TOTAL	40.40 ha.	99.83 Ac.	100%

LOT TYPE	FRONTAGE/ DEPTH	AREA	NUMBER OF LOTS	NUMBER OF UNITS
T	7.5mx35.0m	1.34 ha 3.31 Ac	-	44
50'	15.2mx35.0m	2.62 ha 6.47 Ac	44	44
60'	18.3mx35.0m	10.74 ha 26.54 Ac	147	147
70'	21.3mx35.0m	8.61 ha 21.28 Ac	97	97
TOTAL		23.31 ha 57.60 Ac	288	332

NO.	DESCRIPTION	DATE	BY
5			
4			
3			
2			
1			

REVISIONS

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

HILLSBURGH HEIGHTS INC.

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

SHEET TITLE:

PRELIMINARY DEVELOPMENT PLAN

DRAWN BY: S.G.K.	PROJECT No. W21081
CHECKED BY: D.K.H.	DRAWING No. DP-1
SCALE: 1:1500	
DATE: OCT., 5th 2021	

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

WWW.AINLEYGROUP.COM

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
CONSULTING ENGINEERS & PLANNERS
GTA WEST OFFICE (CORPORATE)
9358 Goreway Drive

Brampton, Ontario, L6P 0M7
(905)794-0600 OFFICE
(905)794-0611 FAX
E-mail: brian@candevcon.com

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.

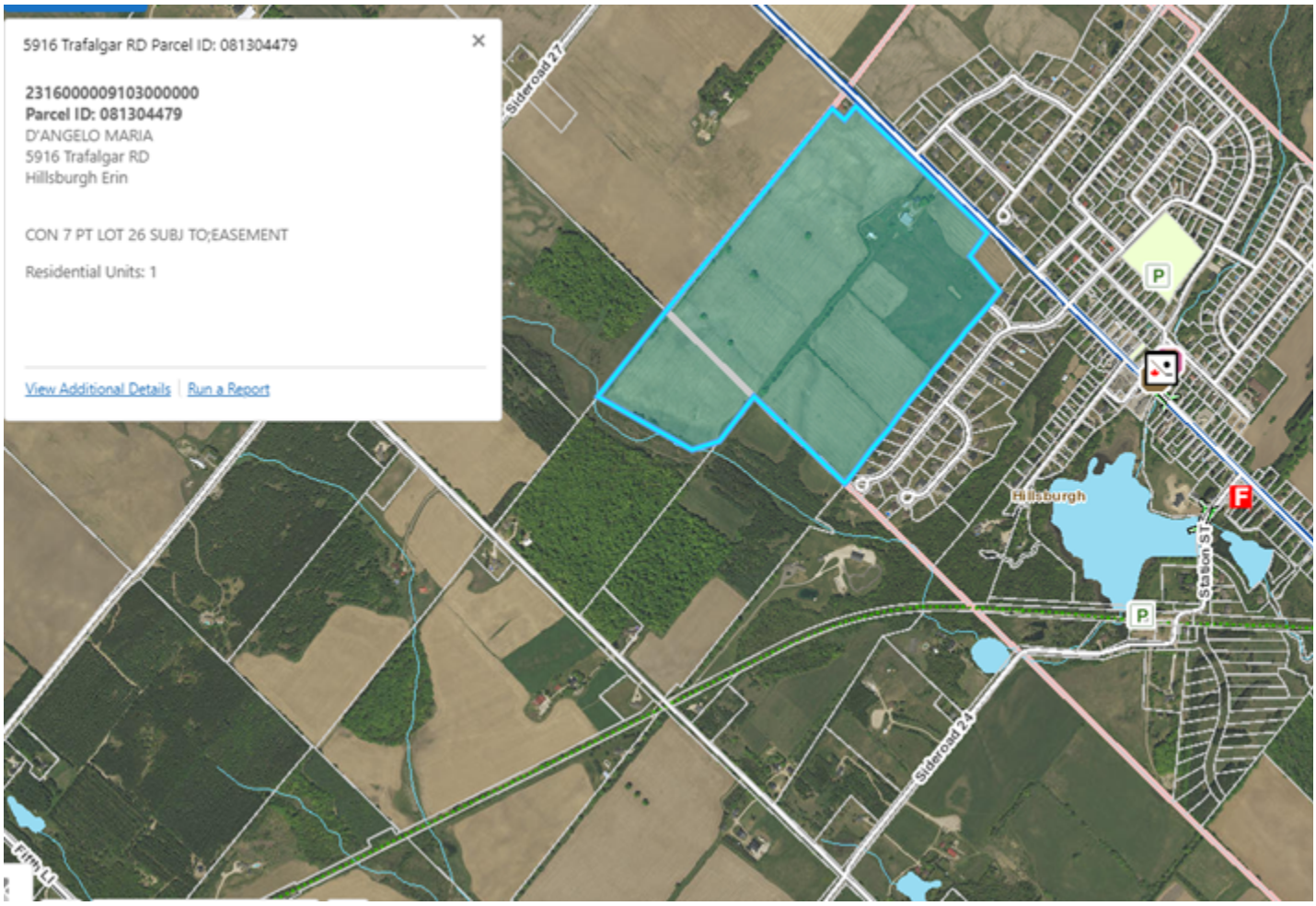
Thanks,

Tim

Tim Kooistra, C.E.T.
Dillon Consulting Limited
130 Dufferin Avenue Suite 1400
London, Ontario, N6A 5R2
T - 519.438.1288 ext. 1330
F - 519.672.8209
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



Pasquale Costanzo, C.E.T., CMMII Infrastructure Specialist

Technical Services Supervisor

County of Wellington, Roads Division

T 519.837.2601 x 2250

E pasqualec@wellington.ca

From: Brian Wong <brian@candevcon.com>
Sent: Wednesday, October 6, 2021 10:20 AM
To: Pasquale Costanzo <pasqualec@wellington.ca>
Cc: David Lee <david@candevcon.com>; Diarmuid Horgan <dhorgan@candevcon.com>
Subject: W21081 - 5916 Trafalgar Road North - Terms of Reference (County of Wellington)

Good Morning Pasquale,

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 let me know whether the County has any recent turning movement counts for the intersection of Trafalgar Road North at Howe Street and can you please provide me with growth projections for Trafalgar Road North. The horizon year is anticipated for 2030.

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

Brian Wong, P.Eng.

Intermediate Transportation Engineer

CANDEVCON LIMITED

CONSULTING ENGINEERS & PLANNERS

GTA WEST OFFICE (CORPORATE)

9358 Goreway Drive

Brampton, Ontario, L6P 0M7

(905)794-0600 OFFICE

(905)794-0611 FAX

E-mail: brian@candevcon.com

APPENDIX B

TURNING MOVEMENT COUNTS

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Project #21-219 - Candevcon Limited

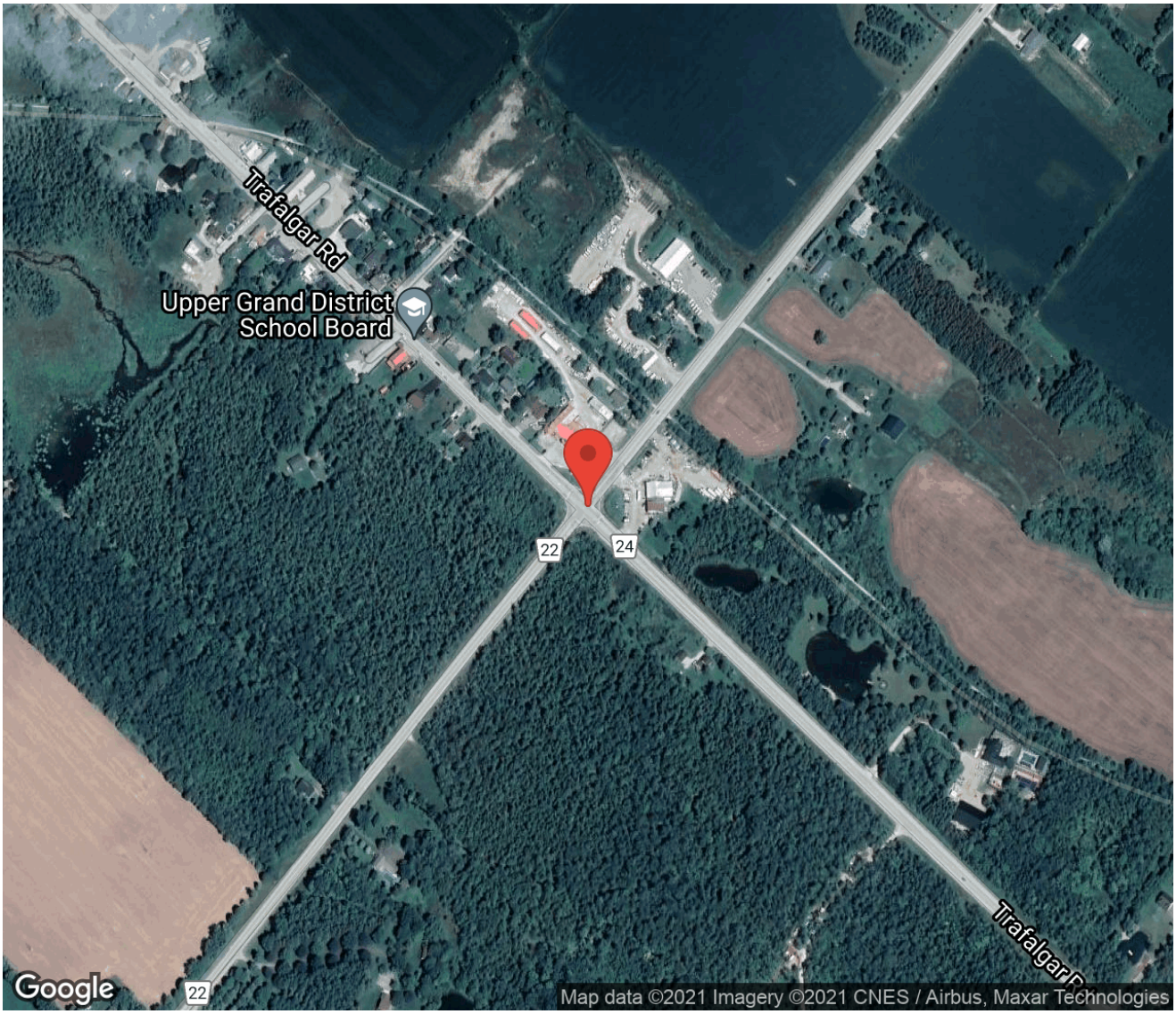
Intersection Count Report

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Map

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



Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

	North Approach Totals						South Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
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**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
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**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	07:00:00	From:	07:30:00
To:	10:00:00	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
Cars	227	124	351
Trucks	40	27	67
Bicycles	0	0	0
	267	**151**	**418**

Trafalgar Rd N

Bicycles	0	0	0	0
Trucks	4	22	14	0
Cars	18	156	53	0
Totals	**22**	**178**	**67**	**0**

East Approach

	Out	In	Total
Cars	104	150	254
Trucks	19	19	38
Bicycles	0	0	0
	123	**169**	**292**

Peds: 0

Wellington Rd 22

Bicycles	Trucks	Cars	Totals
0	0	0	**0**
0	2	20	**22**
0	1	55	**56**
0	1	26	**27**

Peds: 0

Peds: 0

Wellington Rd 22

Totals	Cars	Trucks	Bicycles
0	0	0	0
30	24	6	0
39	37	2	0
54	43	11	0

Peds: 0

West Approach

	Out	In	Total
Cars	101	64	165
Trucks	4	6	10
Bicycles	0	0	0
	105	**70**	**175**

Trafalgar Rd N

Totals	**9**	**99**	**46**	**0**
Cars	9	80	42	0
Trucks	0	19	4	0
Bicycles	0	0	0	0

South Approach

	Out	In	Total
Cars	131	225	356
Trucks	23	34	57
Bicycles	0	0	0
	154	**259**	**413**

Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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
Cars	203	418	621
Trucks	7	11	18
Bicycles	0	0	0
	210	**429**	**639**

Trafalgar Rd N

Bicycles	0	0	0	0
Trucks	0	4	3	0
Cars	24	135	44	0
Totals	**24**	**139**	**47**	**0**

East Approach

	Out	In	Total
Cars	186	161	347
Trucks	5	4	9
Bicycles	0	0	0
	191	**165**	**356**

Peds: 0

Wellington Rd 22

Bicycles	Trucks	Cars	Totals
0	0	0	**0**
0	0	40	**40**
0	1	49	**50**
0	1	6	**7**

Peds: 0

Peds: 0

Wellington Rd 22

Totals	Cars	Trucks	Bicycles
0	0	0	0
86	84	2	0
58	57	1	0
47	45	2	0

Peds: 0

West Approach

	Out	In	Total
Cars	95	101	196
Trucks	2	6	8
Bicycles	0	0	0
	97	**107**	**204**

Trafalgar Rd N

Totals	**25**	**303**	**68**	**0**
Cars	20	294	68	0
Trucks	5	9	0	0
Bicycles	0	0	0	0

South Approach

	Out	In	Total
Cars	382	186	568
Trucks	14	7	21
Bicycles	0	0	0
	396	**193**	**589**

Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Map

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

	North Approach Totals						South Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
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**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
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**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	07:00:00	From:	07:15:00
To:	10:00:00	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
Cars	214	115	329
Trucks	33	30	63
Bicycles	0	0	0
	247	**145**	**392**

Trafalgar Rd N

Bicycles	0	0	0	0
Trucks	0	33	0	0
Cars	1	211	2	0
Totals	**1**	**244**	**2**	**0**

East Approach

	Out	In	Total
Cars	36	12	48
Trucks	3	1	4
Bicycles	0	0	0
	39	**13**	**52**

Peds: 0

George St

Bicycles	Trucks	Cars	Totals	
0	0	0	**0**	
0	0	1	**1**	
0	0	1	**1**	
0	1	5	**6**	

Peds: 0

Peds: 0

Mill St

	Totals	Cars	Trucks	Bicycles
	0	0	0	0
	11	10	1	0
	0	0	0	0
	28	26	2	0

Peds: 1

West Approach

	Out	In	Total
Cars	7	7	14
Trucks	1	0	1
Bicycles	0	0	0
	8	**7**	**15**

Trafalgar Rd N

Totals	**6**	**133**	**10**	**0**
Cars	6	104	9	0
Trucks	0	29	1	0
Bicycles	0	0	0	0

South Approach

	Out	In	Total
Cars	119	242	361
Trucks	30	36	66
Bicycles	0	0	0
	149	**278**	**427**

Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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
Cars	179	297	476
Trucks	19	22	41
Bicycles	0	2	2
	198	**321**	**519**

Trafalgar Rd N

Bicycles	0	0	0	0
Trucks	0	19	0	0
Cars	6	160	13	0
Totals	**6**	**179**	**13**	**0**

East Approach

	Out	In	Total
Cars	52	70	122
Trucks	4	1	5
Bicycles	0	0	0
	56	**71**	**127**

Peds: 0

George St

Bicycles	Trucks	Cars	Totals
0	0	0	**0**
2	3	14	**19**
0	0	13	**13**
0	0	36	**36**

Peds: 5

Peds: 3

Mill St

	Totals	Cars	Trucks	Bicycles
	0	0	0	0
	18	18	0	0
	11	11	0	0
	27	23	4	0

Peds: 0

West Approach

	Out	In	Total
Cars	63	71	134
Trucks	3	2	5
Bicycles	2	0	2
	68	**73**	**141**

Trafalgar Rd N

Totals	**56**	**284**	**45**	**0**
Cars	54	265	44	0
Trucks	2	19	1	0
Bicycles	0	0	0	0

South Approach

	Out	In	Total
Cars	363	219	582
Trucks	22	23	45
Bicycles	0	0	0
	385	**242**	**627**

Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Project #21-219 - Candevcon Limited

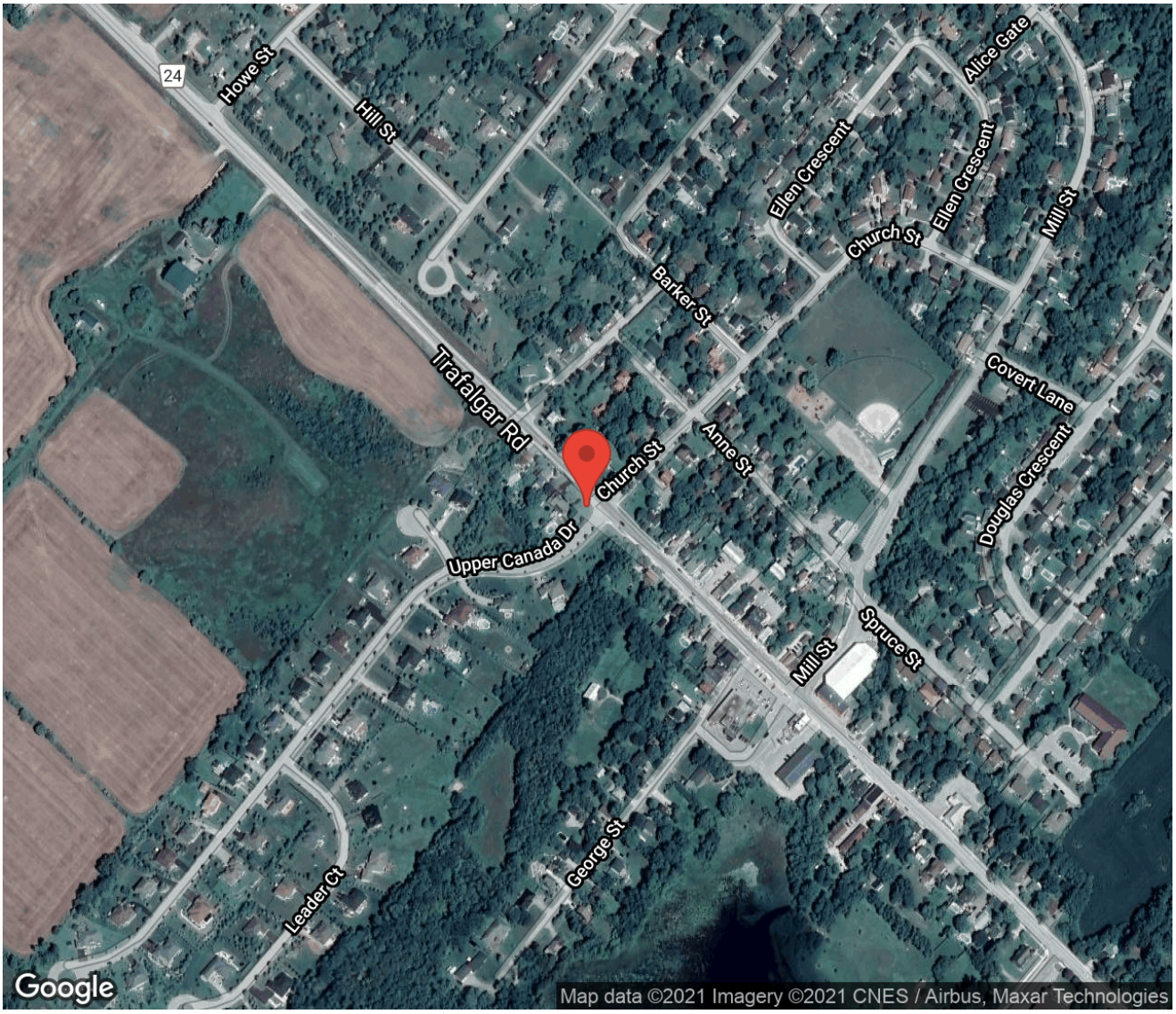
Intersection Count Report

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Map

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



Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

	North Approach Totals						South Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
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**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

	East Approach Totals						West Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
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**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	07:00:00	From:	07:15:00
To:	10:00:00	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
Cars	170	102	272
Trucks	29	30	59
Bicycles	0	0	0
	199	**132**	**331**

Trafalgar Rd N

Bicycles	0	0	0	0
Trucks	0	29	0	0
Cars	1	167	2	0
Totals	**1**	**196**	**2**	**0**

East Approach

	Out	In	Total
Cars	14	6	20
Trucks	1	0	1
Bicycles	0	0	0
	15	**6**	**21**

Peds: 0

Upper Canada Dr

Bicycles	Trucks	Cars	Totals
0	0	0	**0**
0	0	1	**1**
0	0	0	**0**
0	0	16	**16**

Peds: 0

Peds: 0

Church St

Totals	Cars	Trucks	Bicycles
0	0	0	0
4	4	0	0
1	0	1	0
10	10	0	0

Peds: 4

West Approach

	Out	In	Total
Cars	17	3	20
Trucks	0	1	1
Bicycles	0	0	0
	17	**4**	**21**

Totals	**2**	**127**	**4**	**0**
Cars	2	97	4	0
Trucks	0	30	0	0
Bicycles	0	0	0	0

Trafalgar Rd N

South Approach

	Out	In	Total
Cars	103	193	296
Trucks	30	29	59
Bicycles	0	0	0
	133	**222**	**355**

Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	15:00:00	From:	15:45:00
To:	18:00:00	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
Cars	188	298	486
Trucks	18	21	39
Bicycles	0	0	0
	206	**319**	**525**

Trafalgar Rd N

Bicycles	0	0	0	0
Trucks	0	18	0	0
Cars	1	182	5	0
Totals	**1**	**200**	**5**	**0**

East Approach

	Out	In	Total
Cars	15	21	36
Trucks	1	1	2
Bicycles	0	0	0
	16	**22**	**38**

Peds: 0

Upper Canada Dr

Bicycles	Trucks	Cars	Totals
0	0	0	**0**
0	0	0	**0**
0	0	0	**0**
0	0	2	**2**

Peds: 0

Peds: 1

Church St

Totals	Cars	Trucks	Bicycles
0	0	0	0
4	4	0	0
0	0	0	0
12	11	1	0

Peds: 5

West Approach

	Out	In	Total
Cars	2	15	17
Trucks	0	0	0
Bicycles	0	0	0
	2	**15**	**17**

Trafalgar Rd N

Totals	**14**	**315**	**17**	**0**
Cars	14	294	16	0
Trucks	0	21	1	0
Bicycles	0	0	0	0

South Approach

	Out	In	Total
Cars	324	195	519
Trucks	22	19	41
Bicycles	0	0	0
	346	**214**	**560**

Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Project #21-219 - Candevcon Limited

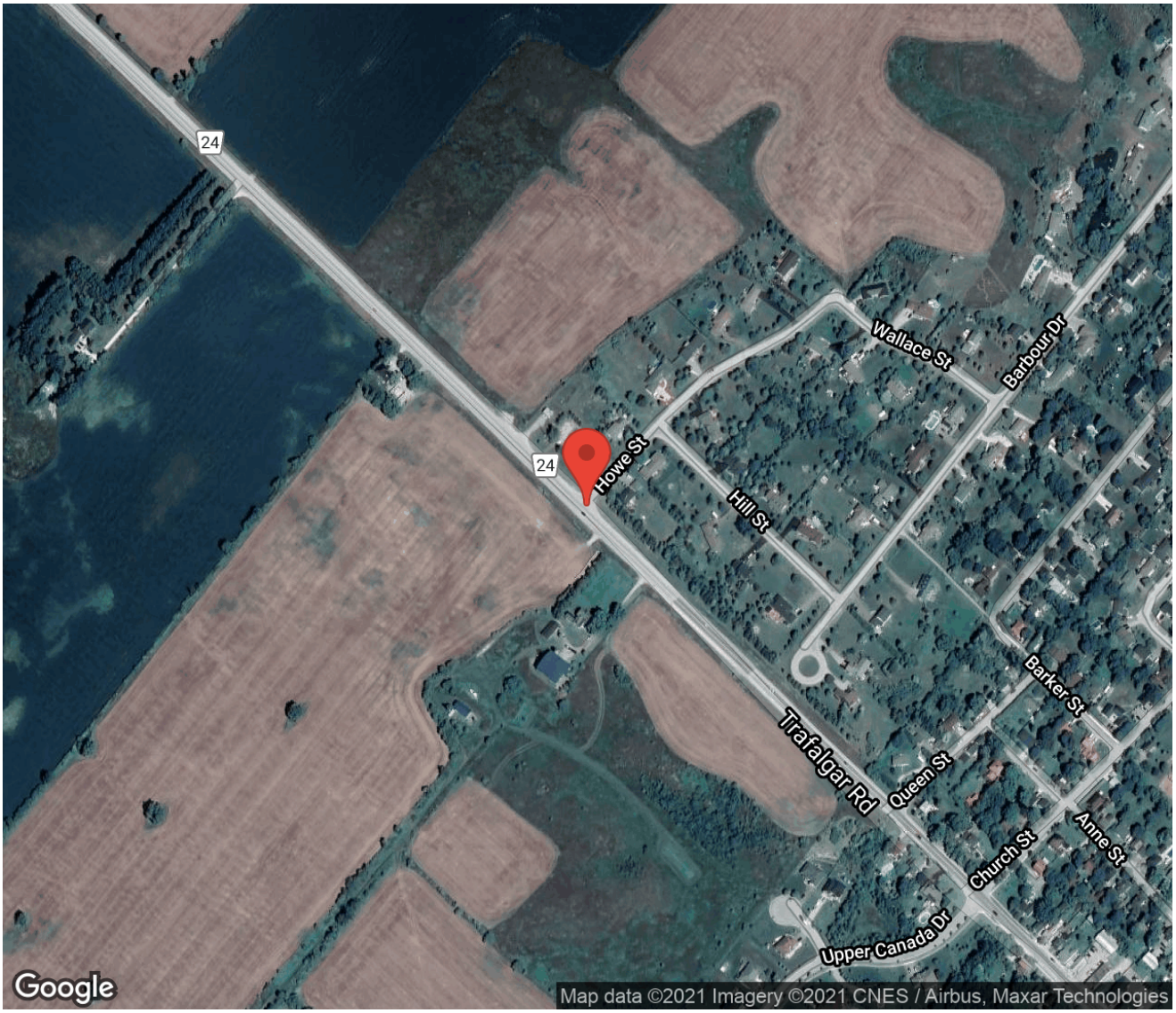
Intersection Count Report

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Map

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



Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

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

Trafalgar Rd N - Traffic Summary

	North Approach Totals						South Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
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**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
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**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	07:00:00	From:	08:00:00
To:	10:00:00	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
Cars	143	105	248
Trucks	26	23	49
Bicycles	0	0	0
	169	**128**	**297**

Trafalgar Rd N

Bicycles	0	0	0
Trucks	26	0	0
Cars	140	3	0
Totals	**166**	**3**	**0**

Peds: 0

Peds: 0

Peds: 0

Totals	**125**	**1**	**0**
Cars	102	1	0
Trucks	23	0	0
Bicycles	0	0	0

Trafalgar Rd N

East Approach

	Out	In	Total
Cars	3	4	7
Trucks	1	0	1
Bicycles	0	0	0
	4	**4**	**8**

Howe St

	Totals	Cars	Trucks	Bicycles
	0	0	0	0
	3	3	0	0
	1	0	1	0

South Approach

	Out	In	Total
Cars	103	140	243
Trucks	23	27	50
Bicycles	0	0	0
	126	**167**	**293**

Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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)

Start Time	North Approach Trafalgar Rd N						South Approach Trafalgar Rd N						East Approach Howe St						West Approach						Total Vehicles
					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
Cars	195	286	481
Trucks	18	19	37
Bicycles	0	0	0
	213	**305**	**518**

Trafalgar Rd N

Bicycles	0	0	0
Trucks	18	0	0
Cars	190	5	0
Totals	**208**	**5**	**0**

Peds: 0

Peds: 0

Peds: 0

Totals	**305**	**8**	**0**
Cars	286	7	0
Trucks	19	1	0
Bicycles	0	0	0

Trafalgar Rd N

East Approach

	Out	In	Total
Cars	3	12	15
Trucks	0	1	1
Bicycles	0	0	0
	3	**13**	**16**

Howe St

	Totals	Cars	Trucks	Bicycles
	0	0	0	0
	0	0	0	0
	3	3	0	0

South Approach

	Out	In	Total
Cars	293	193	486
Trucks	20	18	38
Bicycles	0	0	0
	313	**211**	**524**

- Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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)

Start Time	North Approach Trafalgar Rd N						South Approach Trafalgar Rd N						East Approach Howe St						West Approach						Total Vehicles
					Peds	Total					Peds	Total					Peds	Total					Peds	Total	
15:45	0	69		0	0	69		61	3	0	0	64	1		0	0	0	1					0		134
16:00	1	46		0	0	47		84	1	0	0	85	0		0	0	0	0					0		132
16:15	2	58		0	0	60		79	3	0	0	82	1		0	0	0	1					0		143
16:30	2	35		0	0	37		81	1	0	0	82	1		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

Wellington County 24-36 2 & 22 Hillsburg 7/4/2013 6:13

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

```
                Enable BIU: 1  2  3  4  5  6  7  8
Terminal/Facilities. . . . . .  .  .  .  .  .  .  .
Detector Rack. . . . . .  .  .  .  .  .  .  .  .

Type 2 Runs as Type 1. . .  .
MMU Disable. . . . . .  X
Diagnostic Enable. . . . .  .
Peer-Peer Comm Enable. . .  .

                              1    2    3    4    5    6    7    8    9   10
Peer To Peer Addresses . . 255  255  255  255  255  255  255  255  255  255
```

Port 2:

```
Port 2 Protocol . . . . . Terminal
Port 2 Enable . . . . . YES
AB3418 Address. . . . . 0
AB3418 Group Address. . . . . 0
AB3418 Response Delay . . . . . 0
AB3418 Single Flag Enable . . . NO
AB3418 Drop-Out Time. . . . . 0
AB3418 TOD SF Select. . . . . 0
Data Rate . . . . . 1200 bps
Data, Parity, Stop. . . . . 8, 0, 1
```

Port 3:

```
Port 3 Protocol . . . . . Telemetry
Port 3 Enable . . . . . NO
Telemetry Address . . . . . 0
System Detector 9-16 Address. . 0
Telemetry Response Delay. . . . 7800
AB3418 Address. . . . . 0
AB3418 Group Address. . . . . 0
AB3418 Response Delay . . . . . 0
AB3418 Single Flag Enable . . . NO
AB3418 Drop-Out Time. . . . . 0
AB3418 TOD SF Select. . . . . 0
Duplex. . . . . Full
Data Rate . . . . . 1200 bps
Data, Parity, Stop. . . . . 8, 0, 1
```

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

Wellington County 24-36 2 & 22 Hillsburg 7/4/2013 6:13

By-Phase Timing Data

	Phase											
Direction	1	2	3	4	5	6	7	8	9	10	11	12
Minimum Green	5	30	5	15	5	30	5	15	5	5	5	5
Bike Min Green	0	0	0	0	0	0	0	0	0	0	0	0
Cond Serv Min Grn	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	5	0	5	0	5	0	5	0	10	0	10
Ped Clearance	0	7	0	7	0	7	0	7	0	16	0	16
Veh Extension	5.0	5.0	5.0	4.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0
Alt Veh Exten	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Extension	0	0	0	0	0	0	0	0	0	0	0	0
Max 1	35	35	35	27	35	35	35	27	35	35	35	35
Max 2	40	15	40	40	40	15	40	40	40	40	40	40
Max 3	0	0	0	0	0	0	0	0	0	0	0	0
Det. Fail Max	0	0	0	0	0	0	0	0	0	0	0	0
Yellow Change	3.0	5.5	3.0	5.5	3.0	5.5	3.0	5.5	3.0	3.0	3.0	3.0
Red Clearance	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0	1.0	1.0	1.0	1.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act. B4 Init	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Actuation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Initial	30	30	30	30	30	30	30	30	30	30	30	30
Time B4 Reduction	0	0	0	0	0	0	0	0	0	0	0	0
Cars Waiting	0	0	0	0	0	0	0	0	0	0	0	0
Time To Reduce	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

No-Serve Phases

	Phase Cannot Serve With Phase										
Phase	12	11	10	9	8	7	6	5	4	3	2
1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	
3	.	.	.	.	.	.	.	.	.		
4	.	.	.	.	.	.	.	.			
5	.	.	.	.	.	.	.				
6	.	.	.	.	.	.					
7	.	.	.	.	.						
8	.	.	.	.							
9	.	.	.								
10	.	.									
11	.										

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

Vehicle/Ped Phase as Overlap

Ped Ovlap Phase	Ped Phase As Overlap Consists of Ped Phases											
	1	2	3	4	5	6	7	8	9	10	11	12
1	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.	.

Veh Ovlap Phase	Veh Phase As Overlap Consists of Veh Phases											
	1	2	3	4	5	6	7	8	9	10	11	12
1	X	.	.	.	.	.	.	.	.	.	.	.
2	.	X	.	.	.	.	.	.	.	.	.	.
3	.	.	X	.	.	.	.	.	.	.	.	.
4	.	.	.	X	.	.	.	.	.	.	.	.
5	.	.	.	.	X	.	.	.	.	.	.	.
6	.	.	.	.	.	X	.	.	.	.	.	.
7	.	.	.	.	.	.	X	.	.	.	.	.
8	.	.	.	.	.	.	.	X	.	.	.	.
9	.	.	.	.	.	.	.	.	X	.	.	.
10	.	.	.	.	.	.	.	.	.	X	.	.
11	.	.	.	.	.	.	.	.	.	.	X	.
12	.	.	.	.	.	.	.	.	.	.	.	X

Overlap Data

Overlap A	Phase: 1	2	3	4	5	6	7	8	9	10	11	12
Standard.												
Protected												
Permitted												
Enable Lag.												
Enable Lead												
Spare												
Advance Green Timer				0.0								

	Green	Yellow	Red
Lag/Lead Timers	0.0	0.0	0.0

Overlap B	Phase: 1	2	3	4	5	6	7	8	9	10	11	12
Standard.												
Protected												
Permitted												
Enable Lag.												
Enable Lead												
Spare												
Advance Green Timer				0.0								

	Green	Yellow	Red
Lag/Lead Timers	0.0	0.0	0.0

Overlap C	Phase: 1	2	3	4	5	6	7	8	9	10	11	12
Standard.												
Protected												
Permitted												
Enable Lag.												
Enable Lead												
Spare												
Advance Green Timer				0.0								

	Green	Yellow	Red
Lag/Lead Timers	0.0	0.0	0.0

Overlap D	Phase: 1	2	3	4	5	6	7	8	9	10	11	12
Standard.												
Protected												
Permitted												
Enable Lag.												
Enable Lead												
Spare												
Advance Green Timer				0.0								

	Green	Yellow	Red
Lag/Lead Timers	0.0	0.0	0.0

Power Start, Remote Flash

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

Recall Data, Dimming

	Phase											
	1	2	3	4	5	6	7	8	9	10	11	12
Locking Detector. . . .	.	.	.	.	.	.	.	.	.	.	.	.
Vehicle Recall.	.	X	.	.	.	X	.	.	.	.	.	.
Pedestrian Recall . . .	.	.	.	.	.	.	.	.	.	.	.	.
Recall To Max	.	.	.	.	.	.	.	.	.	.	.	.
Soft Recall	.	.	.	.	.	.	.	.	.	.	.	.
Don't Rest Here	.	.	.	.	.	.	.	.	.	.	.	.
Ped Dark if No Call . .	.	.	.	.	.	.	.	.	.	.	.	.

Dimming:

	Load Switch															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Green/Walk. . . .	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Yellow/Ped Clear.	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Red/Don't Walk. .	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Wellington County 24-36 2 & 22 Hillsburg 7/4/2013 6:13

Detector Type/Timers

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

Detector Phase Assignment

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

Detector Cross Switching

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

Detector Cross Switching

	Phase											
Det.	1	2	3	4	5	6	7	8	9	10	11	12
33	.	.	.	.	.	.	.	.	.	.	.	.
34	.	.	.	.	.	.	.	.	.	.	.	.
35	.	.	.	.	.	.	.	.	.	.	.	.
36	.	.	.	.	.	.	.	.	.	.	.	.
37	.	.	.	.	.	.	.	.	.	.	.	.
38	.	.	.	.	.	.	.	.	.	.	.	.
39	.	.	.	.	.	.	.	.	.	.	.	.
40	.	.	.	.	.	.	.	.	.	.	.	.
41	.	.	.	.	.	.	.	.	.	.	.	.
42	.	.	.	.	.	.	.	.	.	.	.	.
43	.	.	.	.	.	.	.	.	.	.	.	.
44	.	.	.	.	.	.	.	.	.	.	.	.
45	.	.	.	.	.	.	.	.	.	.	.	.
46	.	.	.	.	.	.	.	.	.	.	.	.
47	.	.	.	.	.	.	.	.	.	.	.	.
48	.	.	.	.	.	.	.	.	.	.	.	.
49	.	.	.	.	.	.	.	.	.	.	.	.
50	.	.	.	.	.	.	.	.	.	.	.	.
51	.	.	.	.	.	.	.	.	.	.	.	.
52	.	.	.	.	.	.	.	.	.	.	.	.
53	.	.	.	.	.	.	.	.	.	.	.	.
54	.	.	.	.	.	.	.	.	.	.	.	.
55	.	.	.	.	.	.	.	.	.	.	.	.
56	.	.	.	.	.	.	.	.	.	.	.	.
57	.	.	.	.	.	.	.	.	.	.	.	.
58	.	.	.	.	.	.	.	.	.	.	.	.
59	.	.	.	.	.	.	.	.	.	.	.	.
60	.	.	.	.	.	.	.	.	.	.	.	.
61	.	.	.	.	.	.	.	.	.	.	.	.
62	.	.	.	.	.	.	.	.	.	.	.	.
63	.	.	.	.	.	.	.	.	.	.	.	.
64	.	.	.	.	.	.	.	.	.	.	.	.

Ped/SD Local Assign,Log Interval

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

	*Local System Detector No.															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Is Local Detector No. . .	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 Tiime 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 Tiime from By-Phase Timing Data

Ped Diagnostic Plans

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

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

Wellington County 24-36 2 & 22 Hillsburg 7/4/2013 6:13

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. . . . . .

Split Demand:	Call	Time	Cyc Count	Phase 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

	Bus Preemptor 1	2	3	4
Preemptor Active	.	.	.	.
Detector Lock	.	.	.	.
Maximum Time	0	0	0	0
Reservice Time	0	0	0	0
Delay Time	0	0	0	0
Inhibit Time	0	0	0	0
Entrance Green	0	0	0	0
Entrance Ped Clearance	0	0	0	0
Entrance Yellow	0.0	0.0	0.0	0.0
Entrance Red	0.0	0.0	0.0	0.0
Minimum Hold Time	0	0	0	0

	Hold Phases 1	2	3	4	5	6	7	8	9	10	11	12
Preemptor 1	.	.	.	.	.	.	.	.	.	.	.	.
Preemptor 2	.	.	.	.	.	.	.	.	.	.	.	.
Preemptor 3	.	.	.	.	.	.	.	.	.	.	.	.
Preemptor 4	.	.	.	.	.	.	.	.	.	.	.	.

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

Wellington County 24-36 2 & 22 Hillsburg 7/4/2013 6:13

TOD Weekly/Yearly

Weekly Program Numbers

	1	2	3	4	5	6	7	8	9	10	
Sunday . . .	1	1	1	1	1	1	1	1	1	1	Program No.
Monday . . .	1	1	1	1	1	1	1	1	1	1	Program No.
Tuesday. . .	1	1	1	1	1	1	1	1	1	1	Program No.
Wednesday. .	1	1	1	1	1	1	1	1	1	1	Program No.
Thursday . .	1	1	1	1	1	1	1	1	1	1	Program No.
Friday . . .	1	1	1	1	1	1	1	1	1	1	Program No.
Saturday . .	1	1	1	1	1	1	1	1	1	1	Program No.

Week of Year

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Prog	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Prog	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
Prog	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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. . . . . .
Red Rest . . . . . .
Spare 5. . . . . .
Spare 3. . . . . .
Type 0 Dly Enable. . .
Det Diag Plan. . . . 0

Dimming Enable. . . . . .
Alt Veh Extension . . . .
Det Log Enable. . . . . .
Spare 4 . . . . . .
Spare 2 . . . . . .

	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. . . . . .
Red Rest . . . . . .
Spare 5. . . . . .
Spare 3. . . . . .
Type 0 Dly Enable. . .
Det Diag Plan. . . . 0

Dimming Enable. . . . . .
Alt Veh Extension . . . .
Det Log Enable. . . . . .
Spare 4 . . . . . .
Spare 2 . . . . . .

	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 & ≤ 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 & ≤ 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 & ≤ 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 & ≤ 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 & ≤ 15	**Very Good**. Fewer gaps exist in the traffic on the main roadway. Queuing on the minor street is minimal.
C	>15 & ≤ 25	**Good.** Fewer gaps exist in traffic on the main roadway. Delay on the minor approach becomes more noticeable.
D	>25 & ≤ 35	**Fair.** Infrequent & shorter gaps in traffic on the main roadway. Queuing lengths develop on the minor street.
E	>35 & ≤ 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

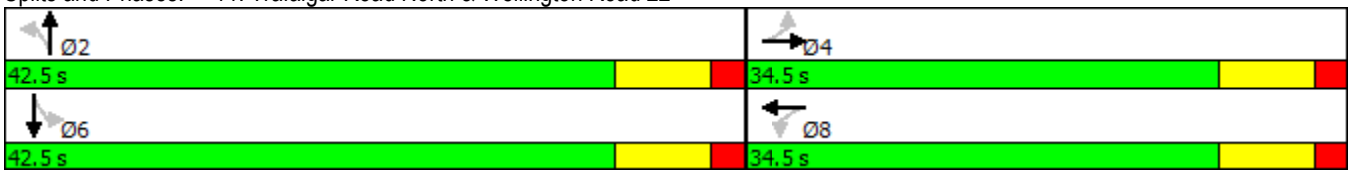
SIGNALIZED AND UN-SIGNALIZED INTERSECTION CAPACITY ANALYSIS FOR EXISTING (2021), FUTURE (2026 & 2031) TOTAL BACKGROUND AND FUTURE (2026 & 2031) TOTAL TRAFFIC SENARIOS

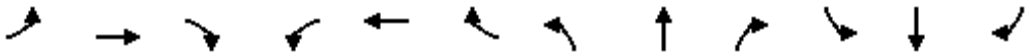
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	67	32	65	47	36	11	119	55	80	214	26
Future Volume (vph)	26	67	32	65	47	36	11	119	55	80	214	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (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	

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

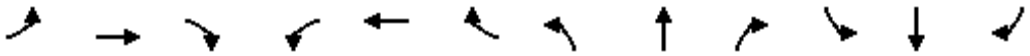




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	7	34	0	13	7	160	12	2	293	1
Future Volume (Veh/h)	1	1	7	34	0	13	7	160	12	2	293	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	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			



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		

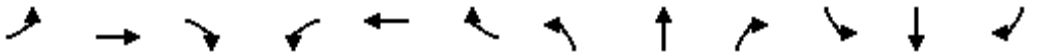
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	24	22	196	293
Volume Left	1	15	2	2
Volume Right	23	6	6	1
cSH	730	515	1282	1391
Volume to Capacity	0.03	0.04	0.00	0.00
Queue Length 95th (m)	0.8	1.1	0.0	0.0
Control Delay (s)	10.1	12.3	0.1	0.1
Lane LOS	B	B	A	A
Approach Delay (s)	10.1	12.3	0.1	0.1
Approach LOS	B	B		

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	26.4%	ICU Level of Service	A	
Analysis Period (min)	15			

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		

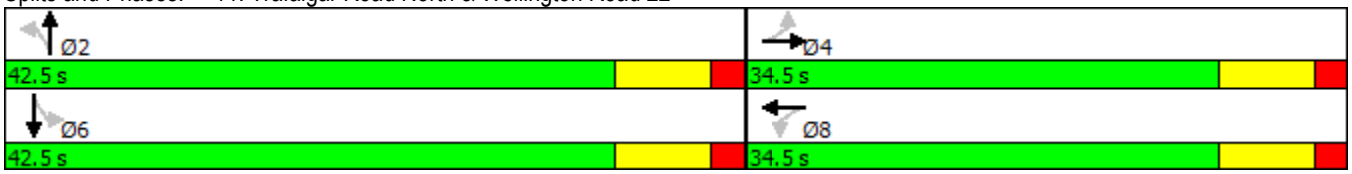


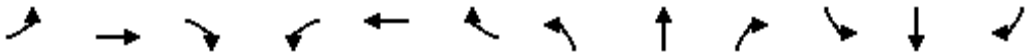
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	60	8	56	70	103	30	364	82	56	167	29
Future Volume (vph)	48	60	8	56	70	103	30	364	82	56	167	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (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	

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

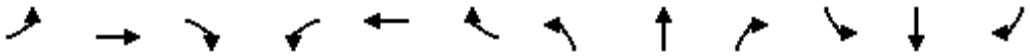




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	16	43	32	13	22	67	341	54	16	215	7
Future Volume (Veh/h)	23	16	43	32	13	22	67	341	54	16	215	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	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			



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			

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	

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	

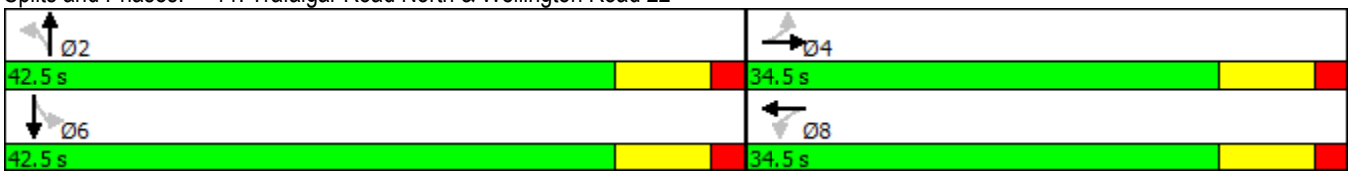
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.61			1.02		0.12	0.42		0.27	0.57	

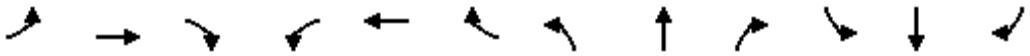
Intersection Summary			
Area Type:	Other		
Cycle Length: 77			
Actuated Cycle Length: 77			
Natural Cycle: 75			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 31.9		Intersection LOS: C	
Intersection Capacity Utilization 109.2%		ICU Level of Service H	
Analysis 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

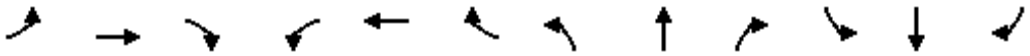




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	8	34	0	13	12	212	14	2	335	1
Future Volume (Veh/h)	1	1	8	34	0	13	12	212	14	2	335	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	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			



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			

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		

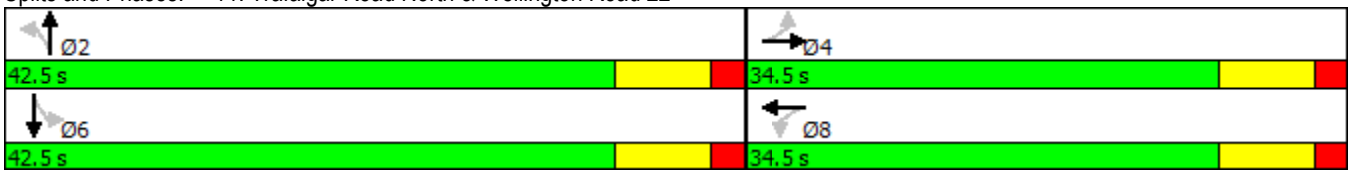
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	130	68	122	192	114	123	536	198	65	261	34
Future Volume (vph)	54	130	68	122	192	114	123	536	198	65	261	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage 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	

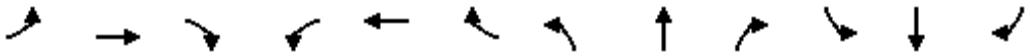
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.55			0.89		0.34	0.96		0.76	0.38	

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

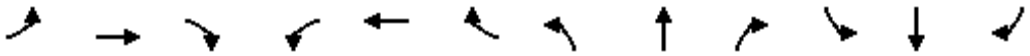




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	16	48	34	13	22	71	397	54	16	275	7
Future Volume (Veh/h)	23	16	48	34	13	22	71	397	54	16	275	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	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			



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			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	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		

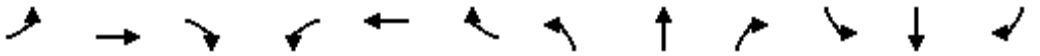
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	2	19	469	280
Volume Left	0	14	18	6
Volume Right	2	5	21	1
cSH	762	350	1301	1118
Volume to Capacity	0.00	0.05	0.01	0.01
Queue Length 95th (m)	0.1	1.4	0.3	0.1
Control Delay (s)	9.7	15.9	0.4	0.2
Lane LOS	A	C	A	A
Approach Delay (s)	9.7	15.9	0.4	0.2
Approach LOS	A	C		

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	46.1%	ICU Level of Service	A	
Analysis Period (min)	15			

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		



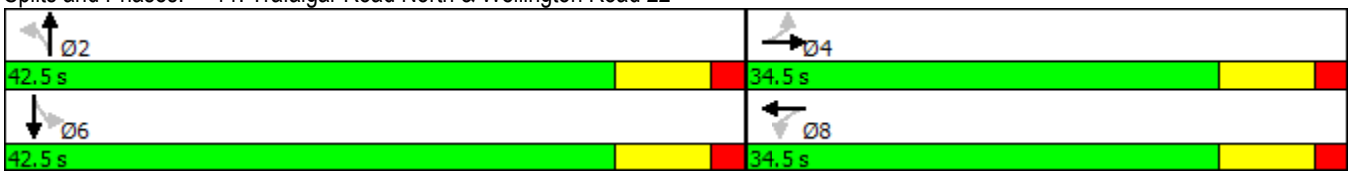
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	178	124	176	91	44	40	186	100	103	376	33
Future Volume (vph)	33	178	124	176	91	44	40	186	100	103	376	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage 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	

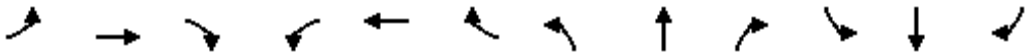
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.64			1.10		0.14	0.45		0.31	0.62	

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

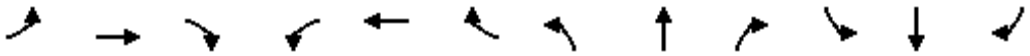




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	8	34	0	13	12	230	14	2	369	1
Future Volume (Veh/h)	1	1	8	34	0	13	12	230	14	2	369	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	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			



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			

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		

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	

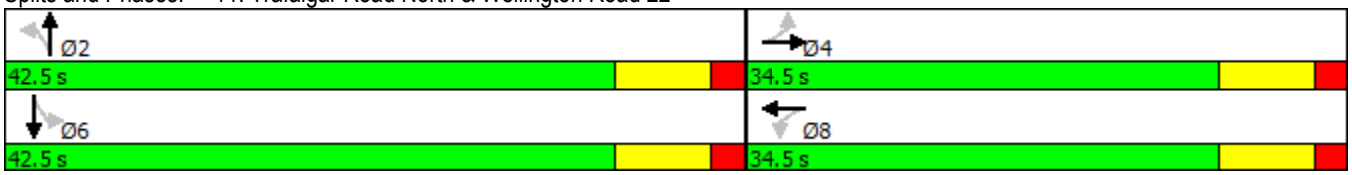
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.60			0.97		0.38	1.04		0.85	0.42	

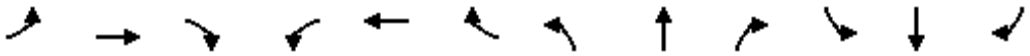
Intersection Summary			
Area Type:	Other		
Cycle Length: 77			
Actuated Cycle Length: 77			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.04			
Intersection Signal Delay: 48.5		Intersection LOS: D	
Intersection Capacity Utilization 123.6%		ICU Level of Service H	
Analysis 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

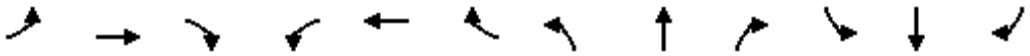




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	16	48	34	13	22	71	437	54	16	300	7
Future Volume (Veh/h)	23	16	48	34	13	22	71	437	54	16	300	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	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			



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		

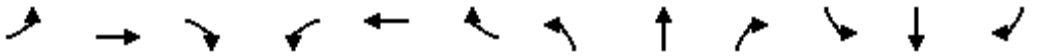
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	2	19	514	309
Volume Left	0	14	18	6
Volume Right	2	5	21	1
cSH	734	315	1269	1076
Volume to Capacity	0.00	0.06	0.01	0.01
Queue Length 95th (m)	0.1	1.5	0.3	0.1
Control Delay (s)	9.9	17.2	0.4	0.2
Lane LOS	A	C	A	A
Approach Delay (s)	9.9	17.2	0.4	0.2
Approach LOS	A	C		

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	48.7%	ICU Level of Service	A	
Analysis Period (min)	15			

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		



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	195	94	237	482	30
Future Volume (vph)	30	170	120	169	86	66	39	195	94	237	482	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		0.280			0.528		
Satd. Flow (perm)	0	1637	0	0	949	0	532	1561	0	829	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	332	0	272	588	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	0.45		0.72	0.77	
Control Delay		23.3			95.1		15.1	15.0		30.8	26.0	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		23.3			95.1		15.1	15.0		30.8	26.0	
LOS		C			F		B	B		C	C	
Approach Delay		23.3			95.1			15.0			27.5	
Approach LOS		C			F			B			C	
Queue Length 50th (m)		40.1			~61.9		3.9	28.9		32.4	71.9	
Queue Length 95th (m)		64.7			#108.6		10.4	47.9		#68.1	107.6	
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		241	731		376	764	

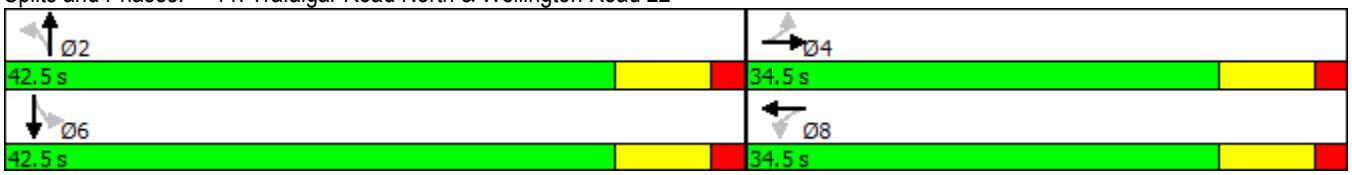
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.61			1.07		0.19	0.45		0.72	0.77	

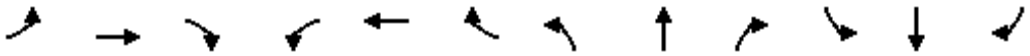
Intersection Summary			
Area Type:	Other		
Cycle Length: 77			
Actuated Cycle Length: 77			
Natural Cycle: 75			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.07			
Intersection Signal Delay: 37.0		Intersection LOS: D	
Intersection Capacity Utilization 113.0%		ICU Level of Service H	
Analysis 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

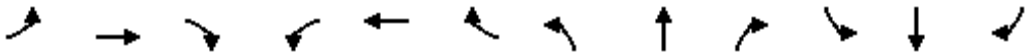




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1	8	34	0	36	12	262	14	2	617	1
Future Volume (Veh/h)	5	1	8	34	0	36	12	262	14	2	617	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	1	9	37	0	39	13	285	15	2	671	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	1033	1002	672	1004	994	292	672			300		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1033	1002	672	1004	994	292	672			300		
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)	199	241	430	208	243	730	928			1273		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	76	313	674
Volume Left	5	37	13	2
Volume Right	9	39	15	1
cSH	299	328	928	1273
Volume to Capacity	0.05	0.23	0.01	0.00
Queue Length 95th (m)	1.3	7.0	0.3	0.0
Control Delay (s)	17.7	19.2	0.5	0.0
Lane LOS	C	C	A	A
Approach Delay (s)	17.7	19.2	0.5	0.0
Approach LOS	C	C		

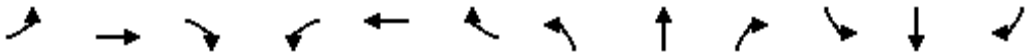
Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	46.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	19	12	1	27	2	245	5	2	543	1
Future Volume (Veh/h)	10	0	19	12	1	27	2	245	5	2	543	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	33	2	302	6	2	670	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	1017	986	674	1010	984	305	671			308		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1017	986	674	1010	984	305	671			308		
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	93	99	96	100			100		
cM capacity (veh/h)	207	249	456	208	171	740	929			1264		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	35	49	310	673
Volume Left	12	15	2	2
Volume Right	23	33	6	1
cSH	323	399	929	1264
Volume to Capacity	0.11	0.12	0.00	0.00
Queue Length 95th (m)	2.9	3.3	0.1	0.0
Control Delay (s)	17.5	15.3	0.1	0.0
Lane LOS	C	C	A	A
Approach Delay (s)	17.5	15.3	0.1	0.0
Approach LOS	C	C		

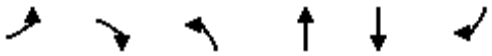
Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	41.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	0	195	1	27	4	79	177	1	4	224	2
Future Volume (Veh/h)	14	0	195	1	27	4	79	177	1	4	224	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)	14	0	201	1	28	4	81	182	1	4	231	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	602	585	232	786	586	182	233			183		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	602	585	232	786	586	182	233			183		
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 %	96	100	75	99	93	100	94			100		
cM capacity (veh/h)	369	396	807	155	396	865	1335			1404		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	215	33	264	237
Volume Left	14	1	81	4
Volume Right	201	4	1	2
cSH	749	403	1335	1404
Volume to Capacity	0.29	0.08	0.06	0.00
Queue Length 95th (m)	9.5	2.1	1.5	0.1
Control Delay (s)	11.7	14.7	2.8	0.2
Lane LOS	B	B	A	A
Approach Delay (s)	11.7	14.7	2.8	0.2
Approach LOS	B	B		

Intersection Summary				
Average Delay			5.0	
Intersection Capacity Utilization			55.0%	ICU Level of Service
Analysis Period (min)			15	



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	89	29	253	416	4
Future Volume (Veh/h)	11	89	29	253	416	4
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)	12	97	32	275	452	4
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	793	454	456			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	793	454	456			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	84	97			
cM capacity (veh/h)	347	606	1105			

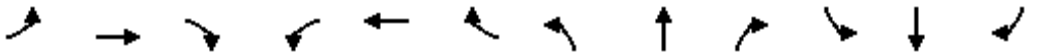
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	109	307	456
Volume Left	12	32	0
Volume Right	97	0	4
cSH	560	1105	1700
Volume to Capacity	0.19	0.03	0.27
Queue Length 95th (m)	5.7	0.7	0.0
Control Delay (s)	13.0	1.1	0.0
Lane LOS	B	A	
Approach Delay (s)	13.0	1.1	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	4.8
Intersection LOS	A

Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	223	116	28
Demand Flow Rate, veh/h	227	118	29
Vehicles Circulating, veh/h	1	25	227
Vehicles Exiting, veh/h	142	230	1
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	5.1	4.3	4.4
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	227	118	29
Cap Entry Lane, veh/h	1129	1102	900
Entry HV Adj Factor	0.980	0.981	0.966
Flow Entry, veh/h	223	116	28
Cap Entry, veh/h	1107	1081	869
V/C Ratio	0.201	0.107	0.032
Control Delay, s/veh	5.1	4.3	4.4
LOS	A	A	A
95th %tile Queue, veh	1	0	0



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	130	68	122	192	217	123	629	198	116	306	34
Future Volume (vph)	54	130	68	122	192	217	123	629	198	116	306	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	1733	0	1504	1791	0	1703	1822	0
Flt Permitted		0.741			0.834		0.486			0.114		
Satd. Flow (perm)	0	1293	0	0	1461	0	770	1791	0	204	1822	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			50			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	583	0	135	909	0	127	373	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			1.07		0.39	1.10		1.38	0.45	
Control Delay		24.5			84.6		18.0	84.3		250.8	16.2	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		24.5			84.6		18.0	84.3		250.8	16.2	
LOS		C			F		B	F		F	B	
Approach Delay		24.5			84.6			75.8			75.8	
Approach LOS		C			F			E			E	
Queue Length 50th (m)		30.7			~95.6		13.1	~158.8		~26.2	36.5	
Queue Length 95th (m)		56.0			#158.0		27.8	#230.1		#46.4	58.8	
Internal Link Dist (m)		280.3			317.1			223.9			1432.2	
Turn Bay Length (m)							40.0			45.0		
Base Capacity (vph)		470			544		350	828		92	833	

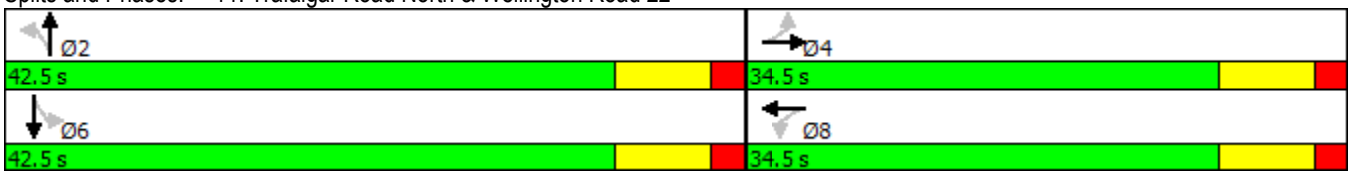
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.59			1.07		0.39	1.10		1.38	0.45	

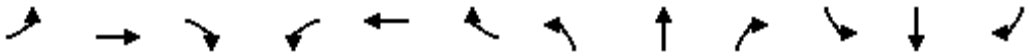
Intersection Summary			
Area Type:	Other		
Cycle Length: 77			
Actuated Cycle Length: 77			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.38			
Intersection Signal Delay: 72.0		Intersection LOS: E	
Intersection Capacity Utilization 130.2%		ICU Level of Service H	
Analysis 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

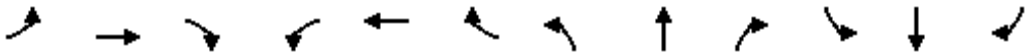




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	16	48	34	13	22	71	596	54	22	372	8
Future Volume (Veh/h)	23	16	48	34	13	22	71	596	54	22	372	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	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	627	57	23	392	8
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	1282	1284	401	1310	1260	658	405			687		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1282	1284	401	1310	1260	658	405			687		
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 %	78	89	92	64	91	95	93			97		
cM capacity (veh/h)	109	150	651	100	156	466	1138			914		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	92	73	759	423
Volume Left	24	36	75	23
Volume Right	51	23	57	8
cSH	223	146	1138	914
Volume to Capacity	0.41	0.50	0.07	0.03
Queue Length 95th (m)	15.1	19.1	1.7	0.6
Control Delay (s)	32.0	52.3	1.7	0.8
Lane LOS	D	F	A	A
Approach Delay (s)	32.0	52.3	1.7	0.8
Approach LOS	D	F		

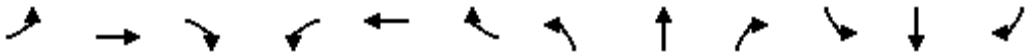
Intersection Summary				
Average Delay	6.2			
Intersection Capacity Utilization	72.4%	ICU Level of Service	C	
Analysis Period (min)	15			



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	616	20	11	369	3
Future Volume (Veh/h)	0	0	2	14	0	5	17	616	20	11	369	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	635	21	11	380	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	1090	1096	386	1093	1088	646	383			657		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1090	1096	386	1093	1088	646	383			657		
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)	188	209	663	181	212	474	1187			939		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	2	19	674	394
Volume Left	0	14	18	11
Volume Right	2	5	21	3
cSH	663	216	1187	939
Volume to Capacity	0.00	0.09	0.02	0.01
Queue Length 95th (m)	0.1	2.3	0.4	0.3
Control Delay (s)	10.4	23.2	0.4	0.4
Lane LOS	B	C	A	A
Approach Delay (s)	10.4	23.2	0.4	0.4
Approach LOS	B	C		

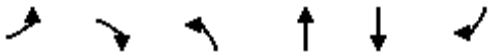
Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	55.5%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	6	53	4	0	0	101	412	10	6	288	9
Future Volume (Veh/h)	4	6	53	4	0	0	101	412	10	6	288	9
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)	4	7	58	4	0	0	110	448	11	7	313	10
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	1006	1011	318	1067	1010	454	323			459		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1006	1011	318	1067	1010	454	323			459		
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 %	98	97	92	98	100	100	91			99		
cM capacity (veh/h)	204	217	723	168	217	611	1237			1113		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	69	4	569	330
Volume Left	4	4	110	7
Volume Right	58	0	11	10
cSH	522	168	1237	1113
Volume to Capacity	0.13	0.02	0.09	0.01
Queue Length 95th (m)	3.6	0.6	2.3	0.2
Control Delay (s)	12.9	27.0	2.4	0.2
Lane LOS	B	D	A	A
Approach Delay (s)	12.9	27.0	2.4	0.2
Approach LOS	B	D		

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	57.6%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	58	98	523	333	12
Future Volume (Veh/h)	8	58	98	523	333	12
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)	9	63	107	568	362	13
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	1150	368	375			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1150	368	375			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	91	91			
cM capacity (veh/h)	199	677	1183			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	72	675	375
Volume Left	9	107	0
Volume Right	63	0	13
cSH	521	1183	1700
Volume to Capacity	0.14	0.09	0.22
Queue Length 95th (m)	3.8	2.4	0.0
Control Delay (s)	13.0	2.3	0.0
Lane LOS	B	A	
Approach Delay (s)	13.0	2.3	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	4.0
Intersection LOS	A

Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	66	118	2
Demand Flow Rate, veh/h	67	120	2
Vehicles Circulating, veh/h	4	0	67
Vehicles Exiting, veh/h	116	69	4
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	3
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.8	4.2	3.4
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	67	120	2
Cap Entry Lane, veh/h	1125	1130	1057
Entry HV Adj Factor	0.980	0.981	1.000
Flow Entry, veh/h	66	118	2
Cap Entry, veh/h	1103	1109	1056
V/C Ratio	0.060	0.106	0.002
Control Delay, s/veh	3.8	4.2	3.4
LOS	A	A	A
95th %tile Queue, veh	0	0	0

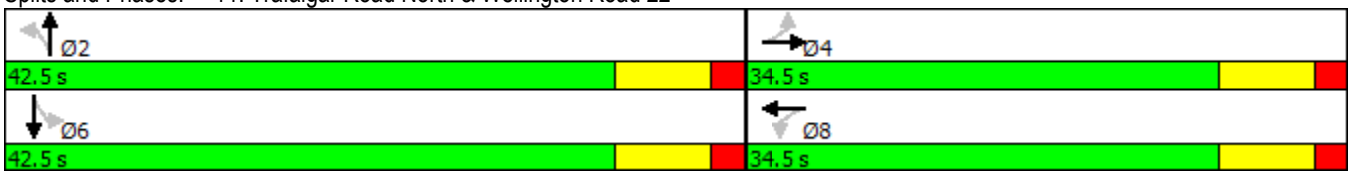
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	178	124	176	91	76	40	214	100	264	522	33
Future Volume (vph)	33	178	124	176	91	76	40	214	100	264	522	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage 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	1549	0	1805	1562	0	1492	1676	0
Flt Permitted		0.931			0.586		0.235			0.498		
Satd. Flow (perm)	0	1625	0	0	931	0	446	1562	0	782	1676	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42			20			40			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	386	0	0	394	0	46	361	0	303	638	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			1.16		0.23	0.49		0.85	0.84	
Control Delay		24.6			126.8		16.5	15.8		44.1	30.3	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		24.6			126.8		16.5	15.8		44.1	30.3	
LOS		C			F		B	B		D	C	
Approach Delay		24.6			126.8			15.9			34.8	
Approach LOS		C			F			B			C	
Queue Length 50th (m)		43.4			~71.1		4.1	32.7		39.6	81.8	
Queue Length 95th (m)		69.6			#118.8		11.1	53.3		#83.2	#136.2	
Internal Link Dist (m)		280.3			317.1			223.9			1432.2	
Turn Bay Length (m)							40.0			45.0		
Base Capacity (vph)		597			339		202	731		355	764	

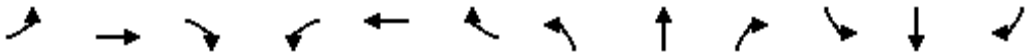
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.65			1.16		0.23	0.49		0.85	0.84	

Intersection Summary

Area Type: Other
Cycle Length: 77
Actuated Cycle Length: 77
Natural Cycle: 75
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 1.16
Intersection Signal Delay: 46.4 Intersection LOS: D
Intersection Capacity Utilization 117.4% 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

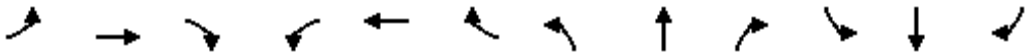




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1	8	34	0	34	12	292	14	2	683	1
Future Volume (Veh/h)	4	1	8	34	0	34	12	292	14	2	683	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	1	9	37	0	37	13	317	15	2	742	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	1134	1104	744	1108	1098	324	743			332		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1134	1104	744	1108	1098	324	743			332		
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 %	98	100	98	79	100	95	99			100		
cM capacity (veh/h)	170	209	391	176	211	701	873			1239		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	14	74	345	745
Volume Left	4	37	13	2
Volume Right	9	37	15	1
cSH	272	281	873	1239
Volume to Capacity	0.05	0.26	0.01	0.00
Queue Length 95th (m)	1.3	8.2	0.4	0.0
Control Delay (s)	18.9	22.3	0.5	0.0
Lane LOS	C	C	A	A
Approach Delay (s)	18.9	22.3	0.5	0.0
Approach LOS	C	C		

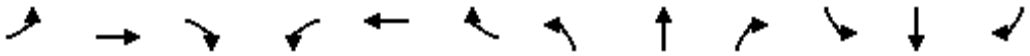
Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	50.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	19	12	1	29	2	271	5	5	602	4
Future Volume (Veh/h)	15	0	19	12	1	29	2	271	5	5	602	4
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)	19	0	23	15	1	36	2	335	6	6	743	5
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	1136	1102	750	1126	1102	338	748			341		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1136	1102	750	1126	1102	338	748			341		
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 %	89	100	94	91	99	95	100			100		
cM capacity (veh/h)	170	212	413	172	142	709	870			1229		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	42	52	343	754
Volume Left	19	15	2	6
Volume Right	23	36	6	5
cSH	251	358	870	1229
Volume to Capacity	0.17	0.15	0.00	0.00
Queue Length 95th (m)	4.7	4.0	0.1	0.1
Control Delay (s)	22.2	16.7	0.1	0.1
Lane LOS	C	C	A	A
Approach Delay (s)	22.2	16.7	0.1	0.1
Approach LOS	C	C		

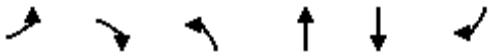
Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	46.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	0	227	1	39	4	95	216	1	12	257	3
Future Volume (Veh/h)	18	0	227	1	39	4	95	216	1	12	257	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)	19	0	234	1	40	4	98	223	1	12	265	3
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	734	710	266	944	712	224	268			224		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	734	710	266	944	712	224	268			224		
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 %	93	100	70	99	88	100	92			99		
cM capacity (veh/h)	284	328	772	108	328	821	1296			1357		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	253	45	322	280
Volume Left	19	1	98	12
Volume Right	234	4	1	3
cSH	684	330	1296	1357
Volume to Capacity	0.37	0.14	0.08	0.01
Queue Length 95th (m)	13.7	3.7	2.0	0.2
Control Delay (s)	13.3	17.6	2.9	0.4
Lane LOS	B	C	A	A
Approach Delay (s)	13.3	17.6	2.9	0.4
Approach LOS	B	C		

Intersection Summary				
Average Delay	5.8			
Intersection Capacity Utilization	62.8%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	89	29	286	481	4
Future Volume (Veh/h)	11	89	29	286	481	4
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)	12	97	32	311	523	4
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	900	525	527			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	900	525	527			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	82	97			
cM capacity (veh/h)	300	552	1040			

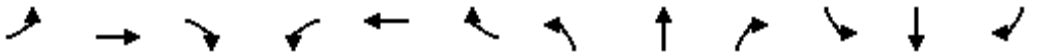
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	109	343	527
Volume Left	12	32	0
Volume Right	97	0	4
cSH	506	1040	1700
Volume to Capacity	0.22	0.03	0.31
Queue Length 95th (m)	6.5	0.8	0.0
Control Delay (s)	14.1	1.1	0.0
Lane LOS	B	A	
Approach Delay (s)	14.1	1.1	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	5.5
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	299	143	60	57
Demand Flow Rate, veh/h	305	146	62	58
Vehicles Circulating, veh/h	40	110	327	162
Vehicles Exiting, veh/h	180	277	18	93
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	6.1	4.9	5.3	4.4
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	305	146	62	58
Cap Entry Lane, veh/h	1086	1012	815	961
Entry HV Adj Factor	0.981	0.983	0.976	0.980
Flow Entry, veh/h	299	143	60	57
Cap Entry, veh/h	1065	995	795	942
V/C Ratio	0.281	0.144	0.076	0.060
Control Delay, s/veh	6.1	4.9	5.3	4.4
LOS	A	A	A	A
95th %tile Queue, veh	1	1	0	0



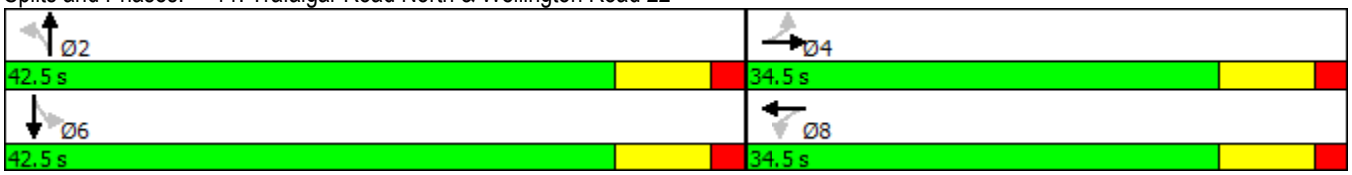
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	137	69	128	200	247	127	688	207	133	335	37
Future Volume (vph)	60	137	69	128	200	247	127	688	207	133	335	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	1728	0	1504	1792	0	1703	1822	0
Flt Permitted		0.697			0.830		0.450			0.114		
Satd. Flow (perm)	0	1221	0	0	1450	0	713	1792	0	204	1822	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			54			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	632	0	140	983	0	146	409	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		0.66			1.16		0.43	1.19		1.59	0.49	
Control Delay		27.7			117.3		19.5	119.2		333.1	16.9	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		27.7			117.3		19.5	119.2		333.1	16.9	
LOS		C			F		B	F		F	B	
Approach Delay		27.7			117.3			106.8			100.1	
Approach LOS		C			F			F			F	
Queue Length 50th (m)		34.1			~111.8		14.0	~183.6		~32.4	41.0	
Queue Length 95th (m)		62.2			#175.8		30.0	#256.6		#54.8	65.4	
Internal Link Dist (m)		280.3			317.1			223.9			1432.2	
Turn Bay Length (m)							40.0			45.0		
Base Capacity (vph)		444			543		324	828		92	833	

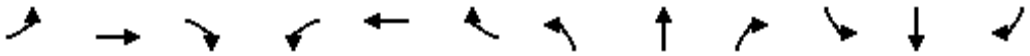
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.66			1.16		0.43	1.19		1.59	0.49	

Intersection Summary

Area Type: Other
Cycle Length: 77
Actuated Cycle Length: 77
Natural Cycle: 150
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 1.59
Intersection Signal Delay: 99.0 Intersection LOS: F
Intersection Capacity Utilization 136.1% 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

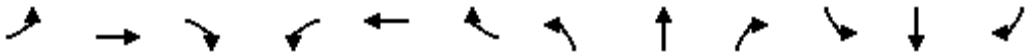




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	16	48	34	13	22	71	671	54	21	417	8
Future Volume (Veh/h)	23	16	48	34	13	22	71	671	54	21	417	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	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	706	57	22	439	8
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	1406	1408	448	1434	1384	738	452			766		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1406	1408	448	1434	1384	738	452			766		
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	55	89	95	93			97		
cM capacity (veh/h)	87	126	612	79	131	420	1093			854		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	92	73	838	469
Volume Left	24	36	75	22
Volume Right	51	23	57	8
cSH	186	119	1093	854
Volume to Capacity	0.49	0.62	0.07	0.03
Queue Length 95th (m)	19.4	24.9	1.8	0.6
Control Delay (s)	41.9	75.0	1.7	0.7
Lane LOS	E	F	A	A
Approach Delay (s)	41.9	75.0	1.7	0.7
Approach LOS	E	F		

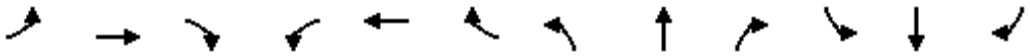
Intersection Summary				
Average Delay	7.6			
Intersection Capacity Utilization	78.3%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	2	14	0	9	17	695	20	14	416	10
Future Volume (Veh/h)	6	0	2	14	0	9	17	695	20	14	416	10
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	2	14	0	9	18	716	21	14	429	10
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	1234	1236	439	1232	1230	728	439			738		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1234	1236	439	1232	1230	728	439			738		
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 %	96	100	100	90	100	98	98			98		
cM capacity (veh/h)	148	172	620	145	173	427	1132			877		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	8	23	755	453
Volume Left	6	14	18	14
Volume Right	2	9	21	10
cSH	183	195	1132	877
Volume to Capacity	0.04	0.12	0.02	0.02
Queue Length 95th (m)	1.1	3.2	0.4	0.4
Control Delay (s)	25.6	25.9	0.4	0.5
Lane LOS	D	D	A	A
Approach Delay (s)	25.6	25.9	0.4	0.5
Approach LOS	D	D		

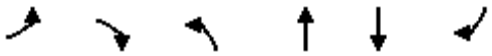
Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	56.4%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	6	72	4	14	0	146	476	10	22	331	13
Future Volume (Veh/h)	7	6	72	4	14	0	146	476	10	22	331	13
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)	8	7	78	4	15	0	159	517	11	24	360	14
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1263	1261	367	1337	1262	522	374			528		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1263	1261	367	1337	1262	522	374			528		
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 %	93	95	89	96	90	100	87			98		
cM capacity (veh/h)	119	144	678	99	144	558	1184			1049		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	93	19	687	398
Volume Left	8	4	159	24
Volume Right	78	0	11	14
cSH	403	131	1184	1049
Volume to Capacity	0.23	0.14	0.13	0.02
Queue Length 95th (m)	7.0	3.9	3.7	0.6
Control Delay (s)	16.6	37.0	3.2	0.7
Lane LOS	C	E	A	A
Approach Delay (s)	16.6	37.0	3.2	0.7
Approach LOS	C	E		

Intersection Summary				
Average Delay	4.0			
Intersection Capacity Utilization	68.8%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	58	98	612	395	12
Future Volume (Veh/h)	8	58	98	612	395	12
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)	9	63	107	665	429	13
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	1314	436	442			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1314	436	442			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	90	90			
cM capacity (veh/h)	158	621	1118			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	72	772	442
Volume Left	9	107	0
Volume Right	63	0	13
cSH	454	1118	1700
Volume to Capacity	0.16	0.10	0.26
Queue Length 95th (m)	4.5	2.5	0.0
Control Delay (s)	14.4	2.3	0.0
Lane LOS	B	A	
Approach Delay (s)	14.4	2.3	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	4.9
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	152	197	31	71
Demand Flow Rate, veh/h	155	200	32	72
Vehicles Circulating, veh/h	43	90	156	177
Vehicles Exiting, veh/h	206	98	42	113
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	4.7	5.4	4.1	4.6
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	155	200	32	72
Cap Entry Lane, veh/h	1082	1033	967	947
Entry HV Adj Factor	0.983	0.985	0.983	0.982
Flow Entry, veh/h	152	197	31	71
Cap Entry, veh/h	1064	1017	951	930
V/C Ratio	0.143	0.194	0.033	0.076
Control Delay, s/veh	4.7	5.4	4.1	4.6
LOS	A	A	A	A
95th %tile Queue, veh	0	1	0	0

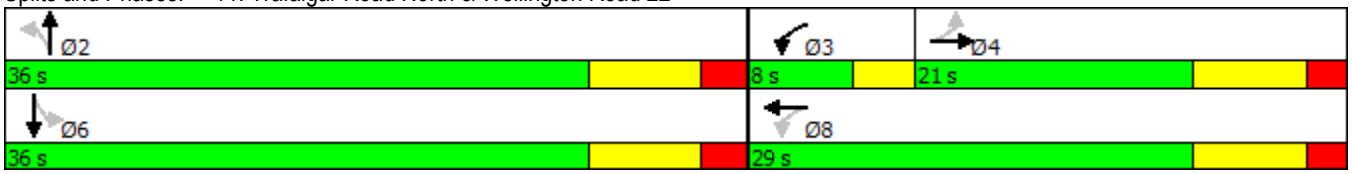
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	170	120	169	86	66	39	195	94	237	482	30
Future Volume (vph)	30	170	120	169	86	66	39	195	94	237	482	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	45.0		0.0	40.0		0.0	65.0		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)	1573	1646	0	1429	1504	0	1805	1561	0	1492	1676	0
Flt Permitted	0.630	0.996		0.278	0.846		0.286			0.550		
Satd. Flow (perm)	1043	1639	0	418	1279	0	543	1561	0	864	1676	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		49			53			47			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 (%)	10%			10%								
Lane Group Flow (vph)	31	336	0	175	194	0	45	332	0	272	588	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	19.5	19.5		8.0	22.5		22.7	22.7		22.7	22.7	
Total Split (s)	21.0	21.0		8.0	29.0		36.0	36.0		36.0	36.0	
Total Split (%)	32.3%	32.3%		12.3%	44.6%		55.4%	55.4%		55.4%	55.4%	
Yellow Time (s)	5.5	5.5		3.0	5.5		5.5	5.5		5.5	5.5	
All-Red Time (s)	2.0	2.0		0.0	2.0		2.3	2.3		2.3	2.3	
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		7.8	7.8		7.8	7.8	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)	13.4	13.4		25.9	21.4		28.2	28.2		28.2	28.2	
Actuated g/C Ratio	0.21	0.21		0.40	0.33		0.43	0.43		0.43	0.43	
v/c Ratio	0.14	0.89		0.72	0.42		0.19	0.47		0.73	0.80	
Control Delay	23.1	50.1		34.1	15.5		14.0	13.8		29.5	26.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	23.1	50.1		34.1	15.5		14.0	13.8		29.5	26.7	
LOS	C	D		C	B		B	B		C	C	
Approach Delay		47.8			24.3			13.8			27.6	
Approach LOS		D			C			B			C	
Queue Length 50th (m)	3.3	37.5		15.3	13.6		3.4	24.0		27.2	61.3	
Queue Length 95th (m)	10.0	#80.0		#36.2	28.5		9.5	42.4		#60.9	#109.7	
Internal Link Dist (m)		280.3			317.1			223.9			1432.2	
Turn Bay Length (m)	35.0			45.0			40.0			65.0		
Base Capacity (vph)	216	379		244	460		235	704		375	731	

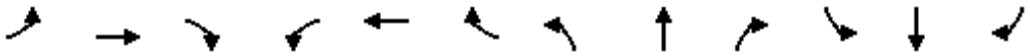
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.14	0.89		0.72	0.42		0.19	0.47		0.73	0.80	

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 64.9			
Natural Cycle: 65			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 28.1		Intersection LOS: C	
Intersection Capacity Utilization 79.4%		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

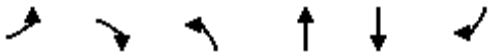




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	0	195	1	27	4	79	177	1	4	224	2
Future Volume (Veh/h)	14	0	195	1	27	4	79	177	1	4	224	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	14	0	201	1	28	4	81	182	1	4	231	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	602	585	232	784	586	182	233			183		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	602	585	232	784	586	182	233			183		
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 %	96	100	75	99	93	100	94			100		
cM capacity (veh/h)	369	396	807	156	396	865	1335			1404		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	215	33	81	183	4	233
Volume Left	14	1	81	0	4	0
Volume Right	201	4	0	1	0	2
cSH	749	404	1335	1700	1404	1700
Volume to Capacity	0.29	0.08	0.06	0.11	0.00	0.14
Queue Length 95th (m)	9.5	2.1	1.5	0.0	0.1	0.0
Control Delay (s)	11.7	14.7	7.9	0.0	7.6	0.0
Lane LOS	B	B	A		A	
Approach Delay (s)	11.7	14.7	2.4		0.1	
Approach LOS	B	B				

Intersection Summary				
Average Delay	4.9			
Intersection Capacity Utilization	45.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	89	29	253	416	4
Future Volume (Veh/h)	11	89	29	253	416	4
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)	12	97	32	275	452	4
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	793	454	456			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	793	454	456			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	84	97			
cM capacity (veh/h)	347	606	1105			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	109	32	275	456
Volume Left	12	32	0	0
Volume Right	97	0	0	4
cSH	560	1105	1700	1700
Volume to Capacity	0.19	0.03	0.16	0.27
Queue Length 95th (m)	5.7	0.7	0.0	0.0
Control Delay (s)	13.0	8.4	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	13.0	0.9		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	130	68	122	192	217	123	629	198	116	306	34
Future Volume (vph)	54	130	68	122	192	217	123	629	198	116	306	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	45.0		0.0	40.0		0.0	65.0		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	0.186			0.566			0.540			0.083		
Satd. Flow (perm)	353	1697	0	1034	1714	0	855	1791	0	149	1822	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28			59			25			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)	59	218	0	134	449	0	135	909	0	127	373	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		8.0	8.0		5.0	8.0	
Minimum Split (s)	19.5	19.5		19.5	19.5		22.7	22.7		8.0	22.7	
Total Split (s)	29.0	29.0		29.0	29.0		53.0	53.0		8.0	61.0	
Total Split (%)	32.2%	32.2%		32.2%	32.2%		58.9%	58.9%		8.9%	67.8%	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.5	5.5		3.0	5.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.3	2.3		0.0	2.3	
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		7.5	7.5		7.8	7.8		3.0	7.8	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Recall Mode	None	None		None	None		Max	Max		None	Max	
Act Effct Green (s)	21.5	21.5		21.5	21.5		45.2	45.2		58.0	53.2	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.50	0.50		0.64	0.59	
v/c Ratio	0.70	0.51		0.54	0.99		0.31	1.00		0.70	0.35	
Control Delay	75.4	30.7		39.4	71.3		15.8	52.8		32.0	10.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	75.4	30.7		39.4	71.3		15.8	52.8		32.0	10.2	
LOS	E	C		D	E		B	D		C	B	
Approach Delay		40.2			64.0			48.0			15.8	
Approach LOS		D			E			D			B	
Queue Length 50th (m)	9.8	29.8		21.4	72.4		13.8	154.4		7.9	31.0	
Queue Length 95th (m)	#31.7	52.7		40.8	#135.7		27.1	#245.9		#21.7	48.1	
Internal Link Dist (m)		280.3			317.1			223.9			1432.2	
Turn Bay Length (m)	35.0			45.0			40.0			65.0		
Base Capacity (vph)	84	426		247	454		429	911		182	1081	

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	0.70	0.51		0.54	0.99		0.31	1.00		0.70	0.35	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.00			
Intersection Signal Delay: 44.3		Intersection LOS: D	
Intersection Capacity Utilization 107.3%		ICU Level of Service G	
Analysis Period (min) 15			

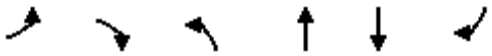
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	6	53	4	0	0	101	412	10	6	288	9
Future Volume (Veh/h)	4	6	53	4	0	0	101	412	10	6	288	9
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)	4	7	58	4	0	0	110	448	11	7	313	10
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	1000	1011	318	1062	1010	454	323			459		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1000	1011	318	1062	1010	454	323			459		
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 %	98	97	92	98	100	100	91			99		
cM capacity (veh/h)	206	217	723	169	217	611	1237			1113		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	69	4	110	459	7	323
Volume Left	4	4	110	0	7	0
Volume Right	58	0	0	11	0	10
cSH	523	169	1237	1700	1113	1700
Volume to Capacity	0.13	0.02	0.09	0.27	0.01	0.19
Queue Length 95th (m)	3.6	0.6	2.3	0.0	0.2	0.0
Control Delay (s)	12.9	26.8	8.2	0.0	8.3	0.0
Lane LOS	B	D	A		A	
Approach Delay (s)	12.9	26.8	1.6		0.2	
Approach LOS	B	D				

Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	39.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	58	98	523	333	12
Future Volume (Veh/h)	8	58	98	523	333	12
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)	9	63	107	568	362	13
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	1150	368	375			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1150	368	375			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	91	91			
cM capacity (veh/h)	199	677	1183			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	72	107	568	375
Volume Left	9	107	0	0
Volume Right	63	0	0	13
cSH	521	1183	1700	1700
Volume to Capacity	0.14	0.09	0.33	0.22
Queue Length 95th (m)	3.8	2.4	0.0	0.0
Control Delay (s)	13.0	8.3	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	13.0	1.3		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	38.2%	ICU Level of Service	A
Analysis Period (min)	15		

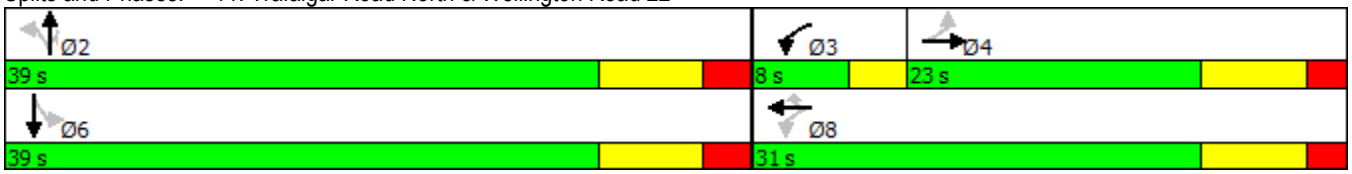
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	178	124	176	91	76	40	214	100	264	522	33
Future Volume (vph)	33	178	124	176	91	76	40	214	100	264	522	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	45.0		35.0	40.0		20.0	70.0		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			0.291			0.244			0.606		
Satd. Flow (perm)	1201	1733	0	461	1810	1346	464	1597	1482	952	1676	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		46				87			120		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)	38	348	0	202	105	87	46	246	115	303	638	0
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	4	4		3	8	8	2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	12.0	12.0		5.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	22.6	22.6		8.0	22.6	22.6	25.9	25.9	25.9	25.9	25.9	
Total Split (s)	23.0	23.0		8.0	31.0	31.0	39.0	39.0	39.0	39.0	39.0	
Total Split (%)	32.9%	32.9%		11.4%	44.3%	44.3%	55.7%	55.7%	55.7%	55.7%	55.7%	
Yellow Time (s)	5.5	5.5		3.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	
All-Red Time (s)	2.2	2.2		0.0	2.2	2.2	2.6	2.6	2.6	2.6	2.6	
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)	7.7	7.7		3.0	7.7	7.7	8.1	8.1	8.1	8.1	8.1	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None	None	Max	Max	Max	Max	Max	
Act Effct Green (s)	14.8	14.8		27.5	22.8	22.8	30.9	30.9	30.9	30.9	30.9	
Actuated g/C Ratio	0.21	0.21		0.40	0.33	0.33	0.44	0.44	0.44	0.44	0.44	
v/c Ratio	0.15	0.86		0.79	0.18	0.17	0.22	0.35	0.16	0.72	0.85	
Control Delay	23.9	45.6		40.6	17.6	5.4	15.7	14.6	3.1	28.0	31.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	23.9	45.6		40.6	17.6	5.4	15.7	14.6	3.1	28.0	31.0	
LOS	C	D		D	B	A	B	B	A	C	C	
Approach Delay		43.4			26.7			11.5			30.0	
Approach LOS		D			C			B			C	
Queue Length 50th (m)	4.2	40.2		18.7	10.1	0.0	3.8	21.4	0.0	32.7	75.1	
Queue Length 95th (m)	11.4	#79.2		#43.5	20.0	8.1	10.6	36.1	7.1	#68.1	#130.0	
Internal Link Dist (m)		280.3			317.1			223.9			1432.2	
Turn Bay Length (m)	35.0			45.0		35.0	40.0		20.0	70.0		
Base Capacity (vph)	264	417		257	606	509	206	709	725	423	748	

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	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.14	0.83		0.79	0.17	0.17	0.22	0.35	0.16	0.72	0.85	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 69.5			
Natural Cycle: 70			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 28.3		Intersection LOS: C	
Intersection Capacity Utilization 86.1%		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.

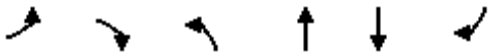
Splits and Phases: 11: Trafalgar Road North & Wellington Road 22



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	0	227	1	39	4	95	216	1	12	257	3
Future Volume (Veh/h)	18	0	227	1	39	4	95	216	1	12	257	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)	19	0	234	1	40	4	98	223	1	12	265	3
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	734	710	266	942	712	224	268			224		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	734	710	266	942	712	224	268			224		
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 %	93	100	70	99	88	100	92			99		
cM capacity (veh/h)	284	328	772	108	328	821	1296			1357		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	253	45	98	224	12	268
Volume Left	19	1	98	0	12	0
Volume Right	234	4	0	1	0	3
cSH	684	331	1296	1700	1357	1700
Volume to Capacity	0.37	0.14	0.08	0.13	0.01	0.16
Queue Length 95th (m)	13.7	3.7	2.0	0.0	0.2	0.0
Control Delay (s)	13.3	17.6	8.0	0.0	7.7	0.0
Lane LOS	B	C	A		A	
Approach Delay (s)	13.3	17.6	2.4		0.3	
Approach LOS	B	C				

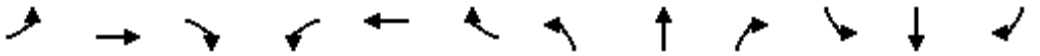
Intersection Summary				
Average Delay	5.6			
Intersection Capacity Utilization	50.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	89	29	286	481	4
Future Volume (Veh/h)	11	89	29	286	481	4
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)	12	97	32	311	523	4
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	900	525	527			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	900	525	527			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	82	97			
cM capacity (veh/h)	300	552	1040			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	109	32	311	527
Volume Left	12	32	0	0
Volume Right	97	0	0	4
cSH	506	1040	1700	1700
Volume to Capacity	0.22	0.03	0.18	0.31
Queue Length 95th (m)	6.5	0.8	0.0	0.0
Control Delay (s)	14.1	8.6	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	14.1	0.8		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		



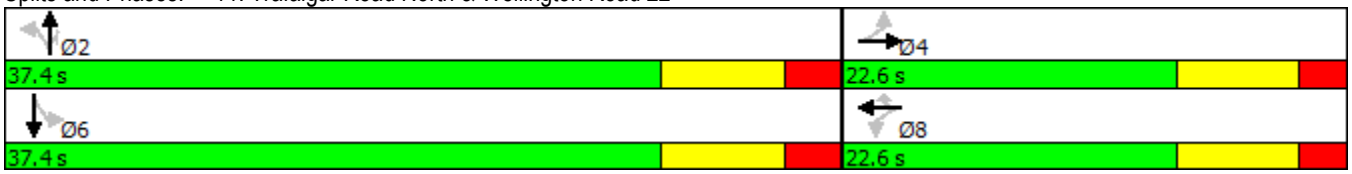
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	137	69	128	200	247	127	688	207	133	335	37
Future Volume (vph)	60	137	69	128	200	247	127	688	207	133	335	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	45.0		35.0	40.0		20.0	70.0		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	0.621			0.617			0.512			0.208		
Satd. Flow (perm)	1180	1703	0	1127	1863	1583	811	1845	1615	373	1822	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40				142			123		13	
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	271	140	756	227	146	409	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	4	4		8	8	8	2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0	12.0	8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	22.6	22.6		22.6	22.6	22.6	25.9	25.9	25.9	25.9	25.9	
Total Split (s)	22.6	22.6		22.6	22.6	22.6	37.4	37.4	37.4	37.4	37.4	
Total Split (%)	37.7%	37.7%		37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%	62.3%	
Yellow Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	
All-Red Time (s)	2.2	2.2		2.2	2.2	2.2	2.6	2.6	2.6	2.6	2.6	
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)	7.7	7.7		7.7	7.7	7.7	8.1	8.1	8.1	8.1	8.1	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None	None	Max	Max	Max	Max	Max	
Act Effct Green (s)	13.6	13.6		13.6	13.6	13.6	29.3	29.3	29.3	29.3	29.3	
Actuated g/C Ratio	0.23	0.23		0.23	0.23	0.23	0.50	0.50	0.50	0.50	0.50	
v/c Ratio	0.24	0.54		0.54	0.51	0.57	0.35	0.82	0.26	0.78	0.45	
Control Delay	20.9	21.3		28.5	24.3	15.0	12.4	22.8	5.1	47.3	11.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	20.9	21.3		28.5	24.3	15.0	12.4	22.8	5.1	47.3	11.4	
LOS	C	C		C	C	B	B	C	A	D	B	
Approach Delay		21.2			21.2			17.9			20.8	
Approach LOS		C			C			B			C	
Queue Length 50th (m)	6.1	18.3		14.0	21.7	12.2	9.1	68.6	6.0	12.9	27.2	
Queue Length 95th (m)	15.3	36.9		29.9	39.9	32.3	21.3	#135.6	16.5	#44.6	47.8	
Internal Link Dist (m)		280.3			317.1			223.9			1432.2	
Turn Bay Length (m)	35.0			45.0		35.0	40.0		20.0	70.0		
Base Capacity (vph)	299	461		286	473	507	405	920	867	186	916	

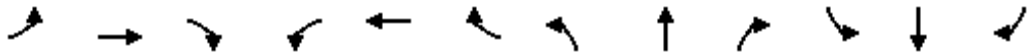
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.22	0.49		0.49	0.47	0.53	0.35	0.82	0.26	0.78	0.45	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 58.7			
Natural Cycle: 60			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 19.7		Intersection LOS: B	
Intersection Capacity Utilization 91.3%		ICU Level of Service F	
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

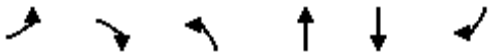




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	6	72	4	14	0	146	476	10	22	331	13
Future Volume (Veh/h)	7	6	72	4	14	0	146	476	10	22	331	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	7	78	4	15	0	159	517	11	24	360	14
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1258	1261	367	1330	1262	522	374			528		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1258	1261	367	1330	1262	522	374			528		
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 %	93	95	89	96	90	100	87			98		
cM capacity (veh/h)	120	144	678	100	144	558	1184			1049		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	93	19	159	528	24	374
Volume Left	8	4	159	0	24	0
Volume Right	78	0	0	11	0	14
cSH	404	132	1184	1700	1049	1700
Volume to Capacity	0.23	0.14	0.13	0.31	0.02	0.22
Queue Length 95th (m)	7.0	3.9	3.7	0.0	0.6	0.0
Control Delay (s)	16.6	36.9	8.5	0.0	8.5	0.0
Lane LOS	C	E	A		A	
Approach Delay (s)	16.6	36.9	2.0		0.5	
Approach LOS	C	E				

Intersection Summary				
Average Delay	3.2			
Intersection Capacity Utilization	44.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	58	98	612	395	12
Future Volume (Veh/h)	8	58	98	612	395	12
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)	9	63	107	665	429	13
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	1314	436	442			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1314	436	442			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	90	90			
cM capacity (veh/h)	158	621	1118			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	72	107	665	442
Volume Left	9	107	0	0
Volume Right	63	0	0	13
cSH	454	1118	1700	1700
Volume to Capacity	0.16	0.10	0.39	0.26
Queue Length 95th (m)	4.5	2.5	0.0	0.0
Control Delay (s)	14.4	8.6	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	14.4	1.2		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		

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

APPENDIX G

SIGNAL WARRANT ANALYSIS

Intersection	Trafalgar Road North at George Street/Mill Street - Future (2026) Total Traffic
Number of Lanes on Main Road (1 = 2 lane 2= more than 2 lanes)	1
Rural (enter 1) or Urban (enter 2)	2
Existing (enter 1) or New (enter 2) intersection	1
T Intersection (yes =1 no = 2)	2

Peak Hour	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	12	262	14	2	617	1	5	1	8	34	0	36
PM	71	596	54	22	372	8	23	16	48	34	13	22
Average Hourly Volume	21	215	17	6	247	2	7	4	14	17	3	15

Justification 7

Justification	Description	Minimum Requirement 1 Lane		Minimum Requirement 2 lane		Initial Requirment	T intersection Factor	Existing /New Intersection Factor	Scenario Requirement	Scenario Volume			Compliance %			Justification
		Rural	Urban	Rural	Urban					AM	PM	AHV	AM	PM	AHV	
1A Minimum Veh. Volume	All Approaches	480	720	600	900	720	1	1.2	864	992	1279	568	100%	100%	66%	No
1B Minimum Veh. Volume	Minor Street	120	170	120	170	170	1	1.2	204	84	156	60	41%	76%	29%	
2A Crossing Traffic	Major Street Volume	480	720	600	900	720	1	1.2	864	908	1123	508	100%	100%	59%	No
2B Crossing Traffic	Crossing volume of Minor Street	50	75	120	170	75	1	1.2	90	40	73	28.25	44%	81%	31%	

Intersection	Trafalgar Road North at George Street/Mill Street - Future (2031) Total Traffic
Number of Lanes on Main Road (1 = 2 lane 2= more than 2 lanes)	1
Rural (enter 1) or Urban (enter 2)	2
Existing (enter 1) or New (enter 2) intersection	1
T Intersection (yes =1 no = 2)	2

Peak Hour	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	12	292	14	2	683	1	4	1	8	34	0	34
PM	71	596	54	22	372	8	23	16	48	34	13	22
Average Hourly Volume	21	222	17	6	264	2	7	4	14	17	3	14

Justification 7

Justification	Description	Minimum Requirement 1 Lane		Minimum Requirement 2 lane		Initial Requirment	T intersection Factor	Existing /New Intersection Factor	Scenario Requirement	Scenario Volume			Compliance %			Justification
		Rural	Urban	Rural	Urban					AM	PM	AHV	AM	PM	AHV	
1A Minimum Veh. Volume	All Approaches	480	720	600	900	720	1	1.2	864	1085	1279	591	100%	100%	68%	No
1B Minimum Veh. Volume	Minor Street	120	170	120	170	170	1	1.2	204	81	156	59	40%	76%	29%	
2A Crossing Traffic	Major Street Volume	480	720	600	900	720	1	1.2	864	1004	1123	532	100%	100%	62%	No
2B Crossing Traffic	Crossing volume of Minor Street	50	75	120	170	75	1	1.2	90	39	73	28	43%	81%	31%	

APPENDIX H

SITE VISIT PICTURES FOR SIGHT DISTANCE MEASUREMENTS

PROPOSED STREET ‘A’/HOWE STREET AT TRAFALGAR ROAD NORTH – LOOKING NORTH

PROPOSED STREET ‘A’/HOWE STREET AT TRAFALGAR ROAD NORTH – LOOKING SOUTH

PROPOSED STREET ‘E’ AT TRAFALGAR ROAD NORTH – LOOKING NORTH

PROPOSED STREET ‘E’ AT TRAFALGAR ROAD NORTH – LOOKING SOUTH