TRAFFIC BRIEF

1942 WOODVIEW AVENUE
CITY OF PICKERING
REGION OF DURHAM

PREPARED FOR:

11861808 CANADA CORP.

PREPARED BY:

C.F. CROZIER & ASSOCIATES INC.
211 YONGE STREET, SUITE 600
TORONTO, ON M5B 1M4

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CROZIER
CONSULTING ENGINEERS

Revision Number	Date	Comments
Rev.0	February 2023	Issued for First Submission

1.0 EXECUTIVE SUMMARY

C.F. Crozier & Associates Inc. (Crozier) was retained by 11861808 Canada Corp. to undertake a Traffic Brief in support of a Zoning By-Law Amendment (ZBA) and Plan of Subdivision for the proposed residential development at 1942 Woodview Avenue in the City of Pickering, Durham Region. The purpose of the study is to assess the impacts of the proposed development on the boundary road network and to recommend required mitigation measures, if warranted.

The development proposes three (3) building blocks consisting of Twenty-One (21) townhouses in total. All three (3) building blocks will front the proposed local road (Street A) which connects to Woodview Avenue. In the interim, Street A is proposed as a cul-de-sac at the Western limits. Ultimately, the cul-de-sac will connect to Street A from the adjacent northern lands when the lot immediately north is developed.

Under the 2022 existing conditions scenario, the intersection of Finch Avenue & Woodview Avenue/Nature Haven Crescent is operating at a Level of Service (LOS) "A" and "B" during weekday a.m. and p.m. peak hours, respectively. The maximum control delay is 9.8 s and 10.0 s in the weekday a.m. and p.m. peak hours, respectively, and the maximum volume-to-capacity ratio is 0.09 (NB) for both weekday a.m. and p.m. peak hours. The intersection is operating efficiently with reserve capacity to accommodate future increases in traffic volumes. The study intersections include:

- Finch Avenue and Woodview Avenue/Nature Haven Crescent
- Proposed Local Road (Street A) and Woodview Avenue

The proposed residential development is projected to generate a total of 29 and 30 two-way auto-trips during the weekday a.m. and p.m. peak hours, respectively.

Under 2027 full-buildout conditions, the intersection of Finch Avenue & Woodview Avenue/Nature Haven Crescent is projected to operate similarly to the 2027 future background traffic conditions, at a LOS "B" during both a.m. and p.m. peak hours. Similarly, the proposed site access at Woodview Avenue is forecast to operate at a LOS "A" during both peak hours.

Should the proposed developments north of the site be completed with a Street A connection to the Street A cul-de-sac, operations are expected to be unchanged and maintain the same LOS' at the study intersections under the 2027 horizon.

The proposed Street A connection to Woodview Avenue is satisfactory per the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR)with regards to sight distance and access spacing.

Based on the study findings, the development application can be supported from a traffic operations perspective as the boundary road network can accommodate the increase in traffic volumes attributable to the proposed development at 1942 Woodview Avenue in the City of Pickering, Durham Region. Further, the proposed access is forecast to be functionally adequate with immaterial impacts to the boundary road network.

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2.0 INTRODUCTION

C.F. Crozier & Associates Inc. (Crozier) was retained by 11861808 Canada Corp. to undertake a Traffic Brief in support of a Zoning By-Law Amendment (ZBA) and Plan of Subdivision for the proposed residential development at 1942 Woodview Avenue in the City of Pickering, Durham Region. The purpose of the study is to assess the impacts of the proposed development on the boundary road network and to recommend required mitigation measures, if warranted.

This study has been completed in conformance with the The City of Pickering Traffic Impact Assessment guideline. Further, the scope of work and terms of reference was coordinated with the City of Pickering staff via email correspondence in December 2022. Refer to **Appendix A** for relevant correspondence.

3.0 DEVELOPMENT PROPOSAL

Based on the Plan of Subdivision provided by PS Architect, dated October 03, 2022, the development proposal includes the following:

- Three (3) building blocks consisting of twenty-one (21) townhouses in total.
- All three (3) building blocks will front the proposed local road (Street A) which connects to Woodview Avenue.
- In the interim, Street A is proposed as a cul-de-sac at the Western limits. Ultimately, the cul-de-sac will connect to Street A from the adjacent northern lands when the lot immediately north is developed.

Refer to **Appendix B** for the Draft Plan of Subdivision.

4.0 EXISTING CONDITIONS

4.1 Development Lands

The subject property covers an area of approximately 1.21 ha and is bounded by Woodview Avenue to the east, woodlands to the west and south and two residential lots to the north (one lot built up with existing buildings and the other immediately north of the proposed development is meant for future development). Refer to **Figure 1** for the site location.

4.2 Study Area

Given the scale of development proposed, the Traffic Brief analyzes the following study intersections as identified in the terms of reference that was coordinated with the City of Pickering (refer to **Appendix A**).

- Finch Avenue and Woodview Avenue/Nature Haven Crescent
- Proposed Local Road (Street A) and Woodview Avenue

Details of the boundary road network is provided in **Section 4.3.**

4.3 Boundary Road Network

The boundary road network is described in **Table 1** below.

Table 1: Boundary Road Network

Feature	Roadway	
	Finch Avenue	Woodview Avenue
Alignment	Two-Way (East-West)	Two-Way (North-South)
Classification[1]	Arterial (Type B)	Collector
Jurisdiction	Region of Durham	City of Pickering
Speed Limit	50 km/h	40 km/h
Number of lanes	Two	Two
Pedestrian Facilities	Yes	Yes
Cycling Facilities	No	Yes

Note 1: Roadway classification per the City of Pickering Official Plan Edition 8

Table 2 outlines the existing traffic control, configurations, and pedestrian crossing provisions at the study intersection on the boundary road network.

Table 2: Study Intersection

Intersection	Control	App.[1]	Major Street	Lane Configurations
Finch Avenue and Woodview Avenue/Nature Haven Crescent	Stop (Minor)	4	Finch Avenue	EBLTR;WBLTR; NBLTR; SBLTR

Note 1: App. - number of approaches for a given intersection.

Figure 2 illustrates the existing boundary road network, including lane configurations, lane storage lengths, and intersection control.

4.4 Existing Active Transportation Network

The subject property is located near residential neighborhoods. Sidewalks are provided on at least one side of both Woodview Avenue and Finch Avenue. On-street bike lanes are available for both travel directions on Woodview Avenue.

4.5 Existing Transit Services

Durham Region Transit (DRT) operates local and regional transit services for Durham Region. Specifically, DRT provides transit services to the City of Pickering, City of Oshawa, Municipality of Clarington, Town of Whitby, Town of Ajax, Townships of Brock, Scugog and Uxbridge. GO Transit further offers services that connect passengers across the Golden Horseshoe region of Ontario.

Table 3 below outlines the existing transit routes, direction, days of operation, peak hour headways, and the location of bus stops in the study area.

Table 3: Existing Transit Services

Route	Start and End Points	Times of Operation	Peak Hour Headways	Nearest Bus Stops in Study Area
103 Glenanna	Valley Ridge Crescent & Pine Grove Avenue to Pickering Parkway	Monday to Friday	30 min	Pine Grove Avenue and Woodview Avenue (600 m; 7 min)
Lakeshore East GO Rail	Oshawa GO to Union Station	Monday-Sunday	15 min	Pickering GO (20-30 min bus ride)

The transit services described above, provide residents and visitors to the proposed development access to transit services that connects to most of the City of Pickering, Durham Region and Golden Horseshoe area. It is recommended that a bus stop on Woodview Avenue nearer to Finch Avenue be considered by DRT in future to enhance convenience of access by commuters at the site and surrounding area. Transit excerpts are provided in **Appendix D**.

4.6 Traffic Data

Existing turning movement counts (TMC) were collected at the study intersections from 6:00 to 10:00 a.m. and 3:00 to 7:00 p.m. on Tuesday, December 13, 2022, by Spectrum. The traffic count data is summarized in **Appendix C. Figure 3** illustrates the 2022 existing traffic volumes.

4.7 Traffic Modeling

The traffic operations assessment herein is based on the method outlined in the "Highway Capacity Manual, 2000" using Synchro 11 modeling software. The following sections details the modelling approach employed for analysis.

4.7.1 Level of Service

Intersections are assessed using a Level of Service metric, with ranges of delay assigned a letter from "A" to "F". A Level of Service "A" or "B" would typically be measured during off-peak hours when lesser traffic volumes are on the roadways with minimal delays to traffic. Levels of Service "C" through "F" would typically be measured in the commuter peak hours when greater vehicle volumes cause delays and longer travel times. The Level of Service (LOS) definitions for signalized and stop-controlled intersections are included in **Appendix E**.

4.8 Intersection Operations

The traffic operations at the study intersection were analyzed based on the 2022 existing traffic volumes illustrated in **Figure 3.** Detailed capacity analysis worksheets are included in **Appendix F**. **Table 4** outlines the 2022 existing traffic operations.

Table 4: 2022 Existing Traffic Operations Summary

Intersection	Control	Peak Hour	Level of Service	Average Delay per Vehicle(s)	Critical V/C Ratio	95th %ile Queues > Storage Length
Finch Avenue & Woodview Avenue/Nature Haven Crescent	Stop (Minor)	A.M.	A	9.8 s	0.09 (NB)	None
		P.M.	B	10.0 s	0.09 (NB)	None

Under the 2022 existing conditions, the intersection of Finch Avenue & Woodview Avenue/Nature Haven Crescent is operating at a Level of Service (LOS) "A" and "B" during weekday a.m. and p.m. peak hours, respectively. The maximum control delay is 9.8 s and 10.0 s in the weekday a.m. and p.m. peak hours, respectively, and the maximum volume-to-capacity ratio is 0.09 (NB) for both weekday a.m. and p.m. peak hours. The intersection is operating efficiently with reserve capacity to accommodate future increases in traffic volumes.

5.0 FUTURE BACKGROUND CONDITIONS

5.1 Study Horizons

As identified in the Terms of Reference correspondence with the City, the 2027 horizon representing a timeline that captures the full buildout year is analyzed to assess future operations of the boundary road network.

5.2 Future Roadway Improvements

Currently, there are no planned improvements to roadway network within the study area. Therefore, the future background and future total analysis herein assumes the existing roadway configurations in the 2027 horizon year.

5.3 Background Traffic Growth

Per correspondence with the City Staff, analysis of future background traffic operations should include trips generated by future developments near the site. Per the City's online tool, only the adjacent lot (located immediately north) is expected to substantially impact the study intersection herein; all other developments may be considered as part of the generic growth on the roadway corridors. Though no development application or documents currently exist, it is expected that the subject development may include 10 to 15 residential dwelling units. For conservative assessment of future conditions, 15 units was assumed. Further, City approved annual growth rate of 2%, compounded annually, was applied to all movements.

5.4 Intersection Operations

The traffic operations at the study intersection were analyzed based on the 2027 future background traffic volumes illustrated in **Figures 4**. Detailed capacity analysis worksheets are included in **Appendix F**. **Table 5** outlines the 2027 future background traffic operations.

Table 5: 2027 Future Background Traffic Operations

Intersection	Control	Peak Hour	Level of Service	Average Delay per Vehicle(s)	Critical V/C Ratio	95th %ile Queues > Storage Length
Finch Avenue & Woodview Avenue/Nature Haven Crescent	Stop (Minor)	A.M.	A	9.9 s	0.10 (NB)	None
		P.M.	B	10.3 s	0.11 (NB)	None

Under 2027 future background conditions, the intersection of Finch Avenue & Woodview Avenue/Nature Haven Crescent is projected to operate at a LOS "A" and "B" during a.m. and p.m. peak hours, respectively. A maximum control delay of 10.3 seconds, and a maximum individual volume-to-capacity ratio of 0.11 or better is forecast for any turn movement. The intersection is

forecast to operate efficiently with reserve capacity to accommodate future increases in traffic volumes.

6.0 SITE GENERATED TRAFFIC

The proposed development will result in new traffic turning movements on the boundary road network that would otherwise not exist. This section presents the generated trips and trip assignment through the study intersections.

6.1 ITE Trip Generation

To forecast the trips generated by the development, the ITE Trip Generation Manual, 11th Edition was used. The ITE Trip Generation Manual is a compendium of industry collected trip generation data across North America for a variety of land uses and is used industry wide as a source for trip generation forecasts.

Per the Draft Plan of Subdivision, the proposed residential development includes 3 building blocks consisting of 21 townhouses in total. Land Use Category (LUC) 220 "Multifamily Housing (Low Rise)" includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have two or three floors (levels).

Given the site location, the general urban/suburban setting was used; and the greater trip generation between the fitted curve equation and the average rate methodology was used conservatively as the average trip forecast is approximately only 30% of the fitted curve forecast used herein. This is attributable to most of the study sites being larger developments with an average of 249 units. The trips generated by the proposed residential development are presented in **Table 6**.

Table 6: Site Generated Traffic

Use	Number of Units	Peak Hour	Number of Trips		
			Inbound	Outbound	Total
Multifamily Housing (Low Rise) (LUC 220)	21 units	A.M.	7	22	29
		P.M.	19	11	30

As shown in **Table 6**, the proposed development is expected to generate 29 and 30 two-way trips in the a.m. and p.m. peak hours, respectively.

6.2 Trip Distribution

The trip distribution for the proposed development was estimated based on the Transportation Tomorrow Survey (TTS) data, and ease of access to the development from the boundary roads. (Refer to **Appendix G** for the TTS results)

A detailed illustration of the trip distribution in percentages and the assignment of trips generated by the proposed development to the boundary road network are presented in **Figure 5 and 6**, respectively.

7.0 TOTAL TRAFFIC CONDITIONS

This section discusses the traffic operations of the study intersections with the addition of the new site generated trips.

7.1 Intersection Operations

Traffic operations at the study intersections were assessed with the addition of the new site generated trips to the future background traffic volumes. The 2027 future total traffic volumes are illustrated in **Figure 7**.

Tables 7 outlines the future total traffic operations for the 2027 horizon year. Detailed capacity analysis worksheets are included in **Appendix F.**

Table 7: 2027 Future Total Traffic Operations Summary

Intersection	Control	Peak Hour	Level of Service	Average Delay per Vehicle(s)	Critical V/C Ratio	95th %ile Queues > Storage Length
Finch Avenue & Woodview Avenue/Nature Haven Crescent	Stop (Minor)	A.M.	B	10.1 s	0.12 (NB)	None
		P.M.	B	10.6 s	0.12 (NB)	None
Proposed Local Road (Street A) and Woodview Avenue	Stop (Minor)	A.M.	A	9.0 s	0.03 (EB)	None
		P.M.	A	9.4 s	0.06 (SB)	None

Under 2027 future total conditions, the intersection of Finch Avenue & Woodview Avenue/Nature Haven Crescent is projected to operate at a LOS "B" during both a.m. and p.m. peak hours. A maximum control delay of 10.6 seconds, and a maximum individual volume-to-capacity ratio of 0.12 is forecast for any turning movement. Compared to 2027 future background conditions, the maximum control delay increment is expected to be 0.2 s and 0.3 s for the a.m. and p.m. peak hours, respectively.

The proposed Street A connection at Woodview Avenue is forecast to operate at a LOS "A" during both the a.m. and p.m. peak hours.

Given the forecasted traffic operations at Finch Avenue and Woodview Avenue/Nature Haven Crescent and the proposed Street A connection to Woodview Avenue, no roadway improvements such as signalization or turn lanes are warranted. Refer to **Appendix H** for warrant excerpts under the 2027 horizon.

8.0 SENSITIVITY ANALYSIS

Given the proposed future connection of the cul-de-sac to the north segment of Street A, a sensitivity analysis under the ultimate 2027 study horizon is completed herein to assess operations of the Street A connections to Woodview Avenue on the southern and northern ends.

8.1 Traffic Redistribution for Street A (North & South Connections)

The trip distribution and assignment specifically for the mid-block future development through the Street A connection north and south at Woodview Avenue was slightly modified to account for the subject ultimate scenario.

Figure 8 presents the new background development traffic distribution with the full Street A connection representing ultimate condition. The total traffic volumes for the ultimate conditions is presented in **Figure 9**.

8.2 Intersection Operations

Table 8 presents the traffic operation at the study intersections for the sensitivity scenario under the 2027 total traffic conditions (based on the volumes presented in **Figure 9**).

Table 8: 2027 Future Total Traffic Operations Summary (Sensitivity Analysis)

Intersection	Control	Peak Hour	Level of Service	Average Delay per Vehicle (s)	Critical V/C Ratio	95th %ile Queues > Storage Length
Finch Avenue & Woodview Avenue/Nature Haven Crescent	Stop (Minor)	A.M.	B	10.1 s	0.12 (NB)	None
		P.M.	B	10.6 s	0.12 (NB)	None
Proposed Local Road (Southern End of Street A) and Woodview Avenue	Stop (Minor)	A.M.	A	9.0 s	0.03 (EB)	None
		P.M.	A	9.4 s	0.06 (SB)	None
Local Road (Northern End of Street A) and Woodview Avenue	Stop (Minor)	A.M.	A	9.0 s	0.03 (SB)	None
		P.M.	A	9.4 s	0.06 (SB)	None

As presented in **Table 8,** the study intersections are all expected to operate with similar LOS to the results of **Table 7**; therefore, no material changes in operations are forecast due to the proposed future connection of the cul-de-sac to the north segment of Street A.

9.0 SITE ACCESS LOCATION AND SAFETY REVIEW

This section reviews the proposed site accesses from a safety and operational feasibility perspective.

9.1 Sight Distance Assessment

The available sightlines at the proposed site access to Woodview Avenue were measured and compared to the standards set out in the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR). Sight distance was measured from the proposed site accesses using the following assumptions:

- A standard driver eye height of 1.08 metres for a passenger car, and
- A 4.4 metre setback from the approximate extension of the outer curb to represent a vehicle waiting to exit the site.

Intersection sight distance is calculated using equation 9.9.1 from the GDGCR as outlined below:

*ISD = 0.278 * V major * tg*

Where;
ISD = Intersection Sight Distance
V major = design speed of roadway (km/h)
tg = assumed time gap for vehicles to turn from stop onto roadway (s)

The design speed of a Collector Road in a suburban environment is typically 10-20 km/h greater than posted speed limit. The posted speed limit on Woodview Avenue at the site frontage is 40 km/h. Therefore, design speed of 50 km/h was assumed for Woodview Avenue. **Table 9** outlines the sight distance analysis for the proposed site access.

Table 9: Sight Distance Analysis

Feature	Street A at Woodview Avenue
Access Type	Full moves
Speed Limit of Roadway	40 km/h
Assumed Design Speed	50 km/h
Design Vehicle	Passenger Car
Base Time Gap	6.5 s (for right-turn) [1] 7.5 s (for left turn) [2]
Vertical Alignment of Roadway	Fairly flat
Horizontal Alignment of Roadway	Straight
Sight Distance Required [3]	95 m (right turn) 105 m (left turn)
Measured Sight Distance	> 110 m (looking right) > 100 m (looking left)
Minimum Sight Distance Satisfied?	Yes

Note 1: Time gap for right-turning passenger cars from a stop onto a two-lane highway with no median and with a grade less than 3%. Value from Table 9.9.5 in the GDGCR.
Note 2: Time gap for left-turning passenger cars from a stop onto a two-lane highway with no median and with a grade less than 3%. Value from Table 9.9.3 in the GDGCR.
Note 3: Sight distance value calculated from Intersection Sight Distance equation 9.9.1 in the GDGCR.

As outlined in **Table 9**, minimum sight distance requirements are satisfied at the proposed location of the access connection to Woodview Avenue **Appendix I** contains Sight Distance Assessment Drawings.

9.2 Access Spacing and Corner Clearance

The TAC GDGCR was used to review access spacing for the proposed site access along Woodview Avenue. The site access spacing requirements and proposed spacing are presented in **Table 10**.

Table 10: Access Spacing & Corner Clearance Review

Site Access	Available Spacing/ Corner clearance	Minimum Spacing Requirements	Evaluation	Source
Private Access connection to Woodview Avenue	450 m (Finch Avenue and Woodview Avenue/Nature Haven Crescent Intersection)	20 m corner clearance from a stop control intersection	Satisfied	TAC-GDGCR [1]

Note 1: Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads, June 2017

As presented in **Table 10**, the proposed access is satisfactory compared to the minimum spacing and corner clearance requirements of the TAC-GDGCR.

9.3 Site Circulation

Given the proposed roadway layout and 17m right of way, it is expected that the City's fire trucks and waste collection trucks will be able to access and circulate the subdivision without any constraints. Further, the subdivision roadway cross sectional elements and access connections will be designed in conformance with City of Pickering Standards.

10.0 TRANSPORTATION DEMAND MANAGEMENT REVIEW

The purpose of the Transportation Demand Management (TDM) section is to review the existing and future TDM opportunities and recommend site specific measures to enhance the development's efficiency in reducing site generated single occupancy vehicle (SOV) trips.

10.1 Existing TDM opportunities

As noted under **Sections 4.4 and 4.5**, there are some existing pedestrian and cycling facilities available within the study area. The existing transit service in City of Pickering allows for access to most of the Region during the peak commuting hours.

10.2 Future TDM opportunities

There are many significant transit expansion and transit improvement projects proposed by the Government of Ontario (Metrolinx/GO-transit) that will improve transit services within the study area, the City of Pickering, as well as in the Greater Toronto Hamilton Area (GTHA). Metrolinx proposes a Regional Express Rail service (RER) throughout the City of Toronto and Greater Toronto Hamilton Area by 2025.

Specifically, within the Study Area, Metrolinx has already completed several improvements to the Pickering GO station with upgraded staircases, upgraded rail platforms and a secure bike storage room.

Concurrently, as part of RER and GO Expansion program for Lakeshore East train services, Metrolinx proposes daily, all day two-way frequent electrified train services for the route with headways of 15 minutes or less, significantly improving transit connections between Durham Region, Downtown Toronto and the Greater Toronto and Hamilton Area. Metrolinx expects a 20% faster travel time along the Lakeshore East line. Similar improvements are also proposed for other GO lines such as Lakeshore West, Kitchener GO, Milton GO and more. These Metrolinx projects will significantly

improve transit connections, transit accessibility, and travel time as commuters and visitors have greater flexibility and transit options to and from downtown, and the Greater Toronto Hamilton Areas.

10.3 Site Specific TDM measures

There are some site specific TDM measures that can be implemented to capitalize on the TDM opportunities. Per the Draft Plan of Subdivision prepared by PS Architect, dated October 3, 2022, the following elements are expected to be provided:

- Internal sidewalks connecting the residents within the proposed development to pedestrian facilities on Woodview Avenue
- With every unit having a garage, there is opportunity to securely store bicycles
- Information regarding transit in the area may be provided to new tenants on purchase e.g., identifying nearest bus stops and how to download and access transit schedules etc.

The site specific TDM elements above are expected to further encourage and promote active transportation at the site.

11.0 PARKING REVIEW

The City of Pickering's Comprehensive Zoning By-Law – First Draft (May 2022) section 5.2 identifies a requirement of 2.0 resident spaces per unit plus 0.25 visitor spaces per unit for the proposed development. As part of the subdivision plan, the parking supply identified in the By-Law will be provided along with potential on-street visitor parking as applicable.

12.0 CONCLUSIONS AND RECOMMENDATIONS

This study has assessed the transportation impacts of the proposed residential development at 1942 Woodview Avenue in the City of Pickering, Region of Durham. The analyses herein regarding the proposed development has resulted in the following key findings.

- Under the 2022 existing conditions scenario, the intersection of Finch Avenue & Woodview Avenue/Nature Haven Crescent is operating at a Level of Service (LOS) "A" and "B" during weekday a.m. and p.m. peak hours, respectively. The maximum control delay is 9.8 s and 10.0 s in the weekday a.m. and p.m. peak hours, respectively, and the maximum volume-to-capacity ratio is 0.09 (NB) for both weekday a.m. and p.m. peak hours. The intersection is operating efficiently with reserve capacity to accommodate future increases in traffic volumes.

- The proposed residential development is projected to generate a total of 29 and 30 two-way auto-trips during the weekday a.m. and p.m. peak hours, respectively.

- Under 2027 full-buildout conditions, the intersection of Finch Avenue & Woodview Avenue/Nature Haven Crescent is projected to operate similarly to the 2027 future background traffic conditions, at a LOS "B" during both a.m. and p.m. peak hours. Similarly, the proposed site access at Woodview Avenue is forecast to operate at a LOS "A" during both peak hours.

- Should the proposed developments north of the site be completed with a Street A connection to the Street A cul-de-sac, operations are expected to be unchanged and maintain the same LOS' at the study intersections under the 2027 horizon.

- The proposed Street A connection to Woodview Avenue is satisfactory per the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR)with regards to sight distance and access spacing.

Based on the study findings, the development application can be supported from a traffic operations perspective as the boundary road network can accommodate the increase in traffic volumes attributable to the proposed development at 1942 Woodview Avenue in the City of Pickering, Region of Durham. Further, the proposed access is forecast to be functionally adequate with immaterial impacts to Woodview Avenue.

Prepared by,

C.F. CROZIER & ASSOCIATES INC.

Masoud Imaniboossejin,
Engineering Intern

C.F. CROZIER & ASSOCIATES INC.

Peter Apasnore, MASc., P. Eng., PTOE
Project Engineer

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APPENDIX A

Correspondence

Masoud Imaniboossejin

From: Zahoor, Nadeem <nzahoor@pickering.ca>
Sent: December 14, 2022 3:51 PM
To: Masoud Imaniboossejin
Subject: RE: Terms of Reference - 1942 Woodview Avenue, City of Pickering

Hi Masoud,

I have reviewed the terms of reference and overall they look good to me. Please use 2% growth rate for your study. Can you also add in your study that what is proposed in future?

Thanks Nadeem

From: Masoud Imaniboossejin <mimaniboossejin@cfcrozier.ca>
Sent: Thursday, December 8, 2022 4:46 PM
To: Zahoor, Nadeem <nzahoor@pickering.ca>
Cc: Peter Apasnore <papasnore@cfcrozier.ca>
Subject: RE: Terms of Reference - 1942 Woodview Avenue, City of Pickering

Hello Nadeem,

I am following up on this terms of reference. Please provide feedback or confirm.

Thanks,

Masoud Imaniboossejin | Engineering Intern
211 Yonge Street, Suite 600 | Toronto, ON M5B 1M4
T: 416.477.3392

Crozier Connections:

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From: Masoud Imaniboossejin
Sent: December 5, 2022 4:33 PM
To: Nzahoor@Pickering.ca
Cc: Peter Apasnore <papasnore@cfcrozier.ca>
Subject: Terms of Reference - 1942 Woodview Avenue, City of Pickering

Good afternoon Nadeem,

We have been retained to prepare a Traffic Brief for a proposed residential development located at 1942 Woodview Avenue in the City of Pickering, Region of Durham to support a Zoning By-Law Amendment (ZBA) and Plan of Subdivision. Below is an outline of our proposed scope and workplan. Please provide feedback at the earliest possible. Should you have any questions or concerns, please feel free to contact us, we would be happy to discuss.

Thanks,

Masoud

Traffic Brief - Scope

The subject property covers an area of approximately 1.21 ha and is bounded by Woodview Avenue to the east, woodlands to the west and south and two residential lots to the north (one lot built up with existing buildings and the other immediately north of the proposed development is meant for future development).

Per the attached conceptual site plan, the elements envisioned for this development include:

- Three (3) building blocks consisting of Twenty-One (21) townhouses in total.
- All three (3) building blocks will front the proposed local road (Street A) which connects to Woodview Avenue.
- In the interim, Street A is proposed as a cul-de-sac at the Western limits. Ultimately, the cul-de-sac will connect to Street A from the adjacent northern lands when the lot immediately north is developed.

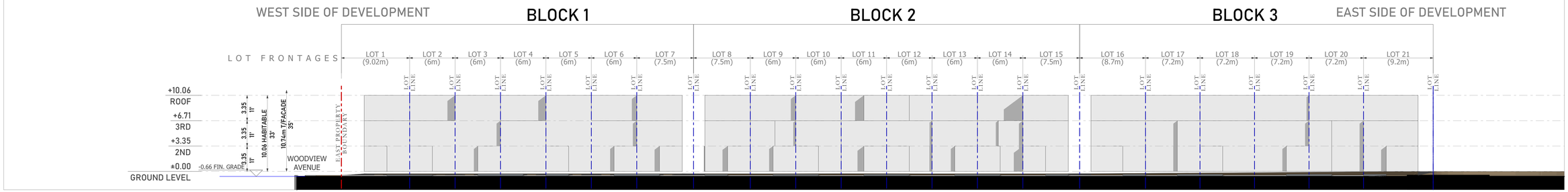
The Traffic Brief will evaluate the potential impacts of traffic generated by the proposed development during the weekday a.m. and p.m. peak hours. We have assumed that the development will be built and opened within 5 years; therefore, given the scale of the development, analysis of the existing year and five years afterwards (2027) should suffice in accordance with the *The City of Pickering Traffic Impact Assessment guideline*.

- The following intersections will be analyzed.
    - Finch Avenue and Woodview Avenue/Nature Haven Crescent
    - Proposed Local Road (Street A) and Woodview Avenue
- Existing, future background and future total traffic operations will be analyzed using Synchro 11. Standard traffic operations metrics for signalized and unsignalized intersections including delays, volume-to-capacity ratios, and 95th percentile queue length will be analyzed and reported on.
- Existing counts will be undertaken to establish the 2022 existing traffic volumes.
- **Please confirm what growth rates should be applied for future forecasting of traffic volumes on the Study roadways.**
- Per the City's online tool, only the adjacent lot (located immediately north) is expected to substantially impact the study intersections herein; all other developments may be considered as part of the generic growth on the roadway corridors.
- Trip generation will be forecast using the ITE Trip Generation Manual, 11th Edition.
- Trip distribution will be derived from a combination of 2016 Transportation Tomorrow Survey (TTS) data and existing travel patterns.

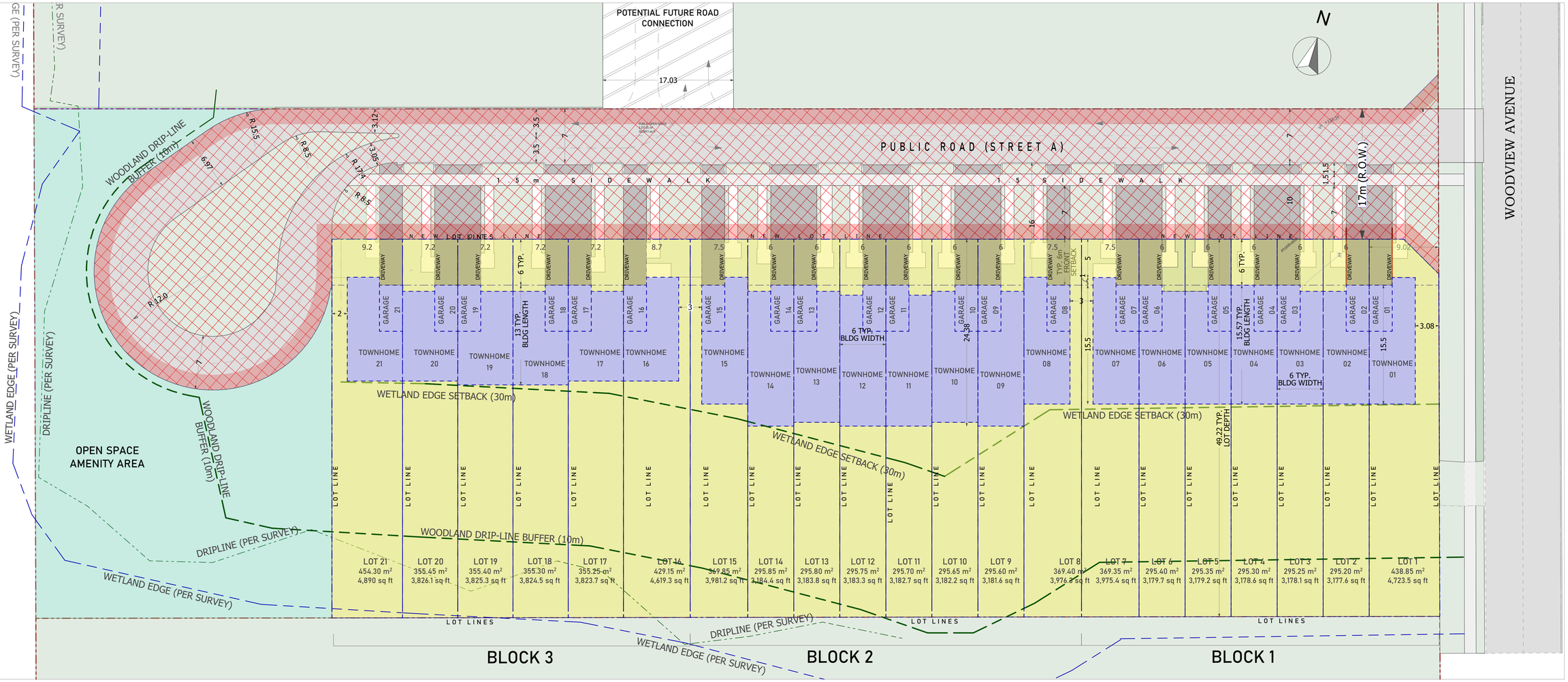
- Future total traffic operations will be compared to future background traffic operations under the future study horizon(s) to determine what mitigation measures are required on the boundary road network to accommodate the development. These mitigation measures may include auxiliary turn lanes, signalization, etc. as warranted.
- Auxiliary left-turn lane requirements will be analyzed using the MTO's "Design Supplement for the Geometric Design Guide for Canadian Roads" and traffic signal requirements will be analyzed using the warrants set out in the Ontario Traffic Manual (OTM) Book 12 "Traffic Signals".
- The proposed site access will be reviewed from a safety perspective with regards to design vehicle maneuverability (ie. waste vehicles and fire trucks), driver sight lines, intersection spacing, access configuration, and corner clearance. The safety assessment will be based on the standards set out by the Transportation Associates of Canada (TAC) Geometric Design Guide for Canadians Roads (GDGCR).
- Existing and future Transportation Demand Management (TDM) opportunities will be assessed, and site-specific measures will be recommended to reduce single-occupancy vehicle (SOV) trips and promote sustainable transportation.
- Given the proposed future connection of the cul-de-sac to the north segment of Street A, a sensitivity analysis under the ultimate study horizon will be completed to assess operations of the Street A connections to Woodview Avenue on the southern and northern ends.
- The study findings regarding traffic operations, recommendations and conclusions will all be compiled for City review.

APPENDIX B

Draft Plan of Subdivision



NORTH ELEVATION



P S A
312 - 3701 Chesswood Drive
Toronto, Ontario, M3J 2P6
T: (416) 849-0991 F: (416) 849-0992
psarchitect.ca
info@psarchitect.ca
PS ARCHITECT

PROPOSED SITE LAND USE PLAN

1942 WOODVIEW AVE RESIDENTIAL

PROJ. ID: 21012

1942 WOODVIEW AVE RESIDENTIAL

1942 WOODVIEW AVE PICKERING ONTARIO CANADA

SCALE: 1:250

PLANNING VERSION: Ai

2022-10-03

APPENDIX C

Traffic Data

Spectrum

Turning Movement Count
Location Name: FINCH AVE & WOODVIEW AVE / NATURE HAVEN CRES
Date: Tue, Dec 13, 2022 Deployment Lead: Peter Ilias

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Turning Movement Count (1 . FINCH AVE & WOODVIEW AVE / NATURE HAVEN CRES)

Start Time	N Approach NATURE HAVEN CRES						E Approach FINCH AVE						S Approach WOODVIEW AVE						W Approach FINCH AVE						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
06:00:00	0	2	0	0	0	2	0	5	0	0	0	5	3	0	1	0	0	4	0	0	0	0	0	0	11	
06:15:00	0	0	0	0	0	0	0	6	1	0	0	7	1	0	5	0	0	6	1	1	0	0	0	2	15	
06:30:00	0	0	1	0	0	1	0	5	2	0	0	7	2	0	8	0	0	10	0	3	0	0	0	3	21	
06:45:00	0	1	0	0	0	1	0	7	4	0	0	11	2	0	3	0	0	5	1	2	0	0	0	3	20	67
07:00:00	0	2	0	0	0	2	0	8	0	0	0	8	6	1	8	0	0	15	0	5	0	0	0	5	30	86
07:15:00	0	0	0	0	0	0	0	15	2	0	0	17	6	1	8	0	0	15	2	2	0	0	0	4	36	107
07:30:00	1	2	1	0	0	4	0	11	0	0	0	11	11	0	20	0	0	31	2	3	0	0	0	5	51	137
07:45:00	1	0	0	0	0	1	0	17	0	0	0	17	10	0	10	0	2	20	1	5	0	0	0	6	44	161
08:00:00	2	1	2	0	0	5	0	15	3	0	0	18	9	1	9	0	1	19	1	0	1	0	1	2	44	175
08:15:00	3	0	4	0	1	7	0	8	6	0	0	14	5	0	10	0	0	15	1	4	0	0	1	5	41	180
08:30:00	0	0	1	0	0	1	1	17	4	0	0	22	5	0	14	0	0	19	4	9	0	0	0	13	55	184
08:45:00	0	0	1	0	0	1	0	9	7	0	1	16	13	1	5	0	1	19	6	8	0	0	0	14	50	190
09:00:00	1	0	0	0	1	1	0	14	4	0	0	18	5	0	8	0	0	13	3	5	0	0	1	8	40	186
09:15:00	0	0	1	0	1	1	2	9	5	0	0	16	7	0	5	0	0	12	4	6	0	0	2	10	39	184
09:30:00	0	0	0	0	0	0	0	13	7	0	0	20	10	0	8	0	1	18	1	3	0	0	0	4	42	171
09:45:00	1	0	0	0	0	1	0	2	4	1	0	7	3	0	2	0	0	5	0	5	0	0	0	5	18	139
BREAK																										
15:00:00	0	2	2	0	1	4	0	10	3	0	0	13	6	0	3	0	0	9	9	9	0	0	1	18	44	
15:15:00	1	0	3	0	0	4	0	12	4	0	0	16	13	1	6	0	0	20	9	18	1	0	0	28	68	
15:30:00	2	2	0	0	0	4	1	7	10	0	0	18	7	0	1	0	0	8	10	15	1	0	0	26	56	
15:45:00	1	0	1	0	0	2	0	11	9	0	1	20	5	0	4	0	0	9	6	22	1	0	1	29	60	228
16:00:00	0	0	1	0	0	1	0	8	13	0	0	21	8	0	4	0	3	12	10	20	2	0	0	32	66	250
16:15:00	0	0	2	0	0	2	0	8	4	0	0	12	6	1	0	0	0	7	10	29	0	0	1	39	60	242
16:30:00	0	0	1	0	0	1	1	4	9	0	0	14	8	2	2	0	1	12	8	26	0	0	0	34	61	247
16:45:00	0	0	0	0	0	0	1	6	6	0	0	13	14	0	6	0	0	20	8	32	0	0	0	40	73	260
17:00:00	1	0	0	0	0	1	1	14	8	0	0	23	10	0	8	0	0	18	15	30	0	0	1	45	87	281
17:15:00	1	0	3	0	0	4	1	7	4	0	0	12	11	2	5	0	1	18	8	38	1	0	0	47	81	302
17:30:00	0	0	0	0	0	0	0	8	14	0	0	22	4	0	5	0	0	9	9	24	0	0	0	33	64	305
17:45:00	1	0	0	0	0	1	0	5	6	0	0	11	11	1	4	0	1	16	11	21	0	0	1	32	60	292
18:00:00	0	0	0	0	0	0	1	8	14	0	0	23	12	0	7	0	0	19	11	20	0	0	0	31	73	278
18:15:00	0	0	0	0	0	0	0	14	5	0	0	19	3	0	2	0	0	5	7	20	1	0	0	28	52	249
18:30:00	0	1	0	0	0	1	0	8	5	0	0	13	5	0	4	0	1	9	5	10	0	0	0	15	38	223
18:45:00	0	0	1	0	0	1	0	5	7	0	0	12	1	0	3	0	0	4	10	13	0	0	0	23	40	203
Grand Total	16	13	25	0	4	54	9	296	170	1	2	476	222	11	188	0	12	421	173	408	8	0	10	589	**1540**	-
Approach%	29.6%	24.1%	46.3%	0%		-	1.9%	62.2%	35.7%	0.2%		-	52.7%	2.6%	44.7%	0%		-	29.4%	69.3%	1.4%	0%		-	-	-
Totals %	1%	0.8%	1.6%	0%		3.5%	0.6%	19.2%	11%	0.1%		30.9%	14.4%	0.7%	12.2%	0%		27.3%	11.2%	26.5%	0.5%	0%		38.2%	-	-
Heavy	2	1	8	0		-	1	6	4	0		-	13	0	0	0		-	3	5	1	0		-	-	-
Heavy %	12.5%	7.7%	32%	0%		-	11.1%	2%	2.4%	0%		-	5.9%	0%	0%	0%		-	1.7%	1.2%	12.5%	0%		-	-	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-

Spectrum

Turning Movement Count
Location Name: FINCH AVE & WOODVIEW AVE / NATURE HAVEN CRES
Date: Tue, Dec 13, 2022 Deployment Lead: Peter Ilias

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 08:00 AM - 09:00 AM Weather: Clear Sky (-9.53 °C)

Start Time	N Approach NATURE HAVEN CRES						E Approach FINCH AVE						S Approach WOODVIEW AVE						W Approach FINCH AVE						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:00:00	2	1	2	0	0	5	0	15	3	0	0	18	9	1	9	0	1	19	1	0	1	0	1	2	44
08:15:00	3	0	4	0	1	7	0	8	6	0	0	14	5	0	10	0	0	15	1	4	0	0	1	5	41
08:30:00	0	0	1	0	0	1	1	17	4	0	0	22	5	0	14	0	0	19	4	9	0	0	0	13	55
08:45:00	0	0	1	0	0	1	0	9	7	0	1	16	13	1	5	0	1	19	6	8	0	0	0	14	50
Grand Total	5	1	8	0	1	14	1	49	20	0	1	70	32	2	38	0	2	72	12	21	1	0	2	34	**190**
Approach%	35.7%	7.1%	57.1%	0%		-	1.4%	70%	28.6%	0%		-	44.4%	2.8%	52.8%	0%		-	35.3%	61.8%	2.9%	0%		-	**-**
Totals %	2.6%	0.5%	4.2%	0%		7.4%	0.5%	25.8%	10.5%	0%		36.8%	16.8%	1.1%	20%	0%		37.9%	6.3%	11.1%	0.5%	0%		17.9%	**-**
PHF	0.42	0.25	0.5	0		0.5	0.25	0.72	0.71	0		0.8	0.62	0.5	0.68	0		0.95	0.5	0.58	0.25	0		0.61	**-**
Heavy	0	0	4	0		4	0	1	1	0		2	3	0	0	0		3	0	0	0	0		0	**-**
Heavy %	0%	0%	50%	0%		28.6%	0%	2%	5%	0%		2.9%	9.4%	0%	0%	0%		4.2%	0%	0%	0%	0%		0%	**-**
Lights	5	1	4	0		10	1	48	19	0		68	29	2	38	0		69	12	21	1	0		34	**-**
Lights %	100%	100%	50%	0%		71.4%	100%	98%	95%	0%		97.1%	90.6%	100%	100%	0%		95.8%	100%	100%	100%	0%		100%	**-**
Single-Unit Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Buses	0	0	4	0		4	0	1	1	0		2	3	0	0	0		3	0	0	0	0		0	**-**
Buses %	0%	0%	50%	0%		28.6%	0%	2%	5%	0%		2.9%	9.4%	0%	0%	0%		4.2%	0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	2	-	**-**
Pedestrians%	-	-	-	-	16.7%		-	-	-	-	16.7%		-	-	-	-	33.3%		-	-	-	-	33.3%		**-**

Spectrum

Turning Movement Count
Location Name: FINCH AVE & WOODVIEW AVE / NATURE HAVEN CRES
Date: Tue, Dec 13, 2022 Deployment Lead: Peter Ilias

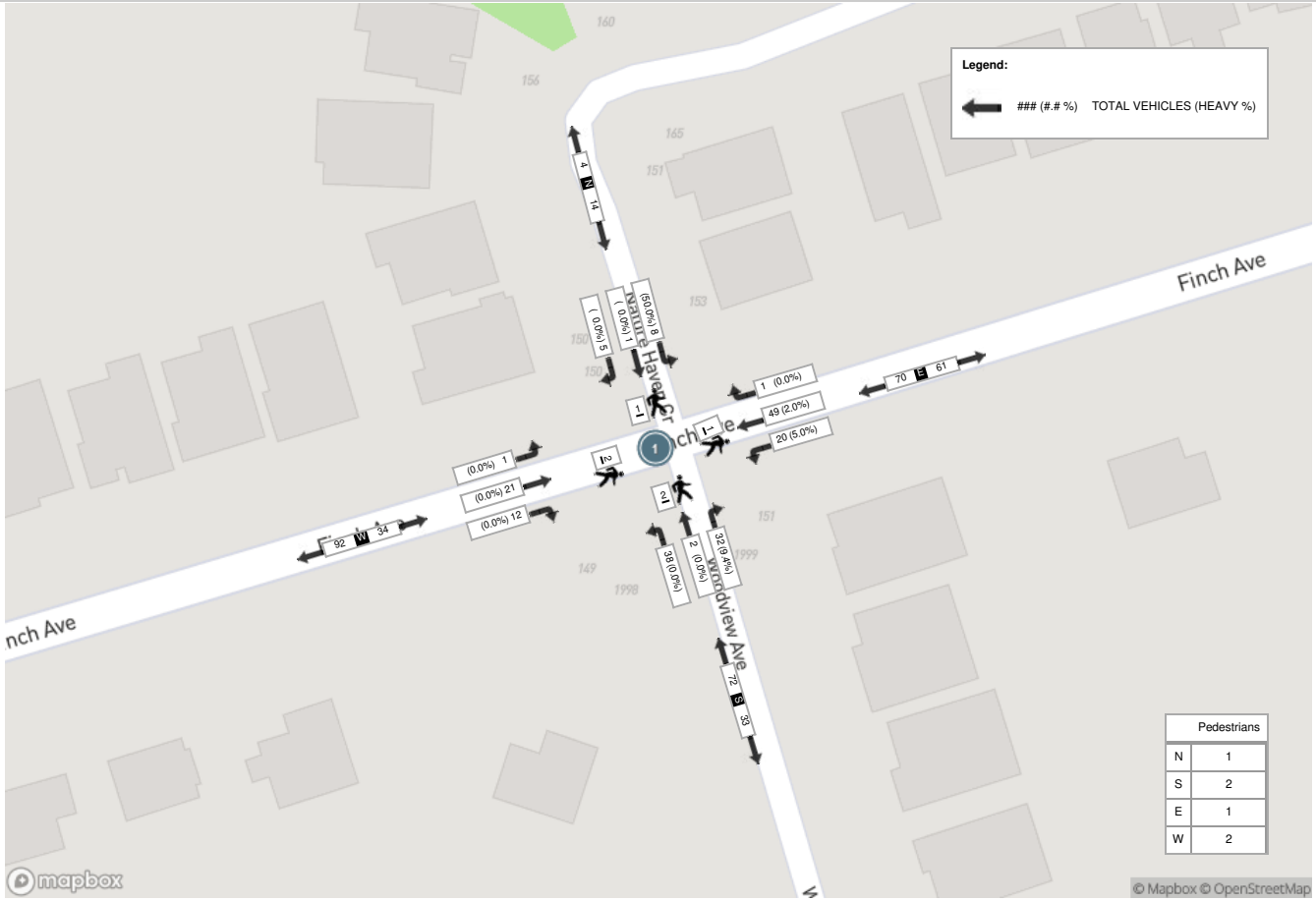
Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 04:45 PM - 05:45 PM **Weather: Clear Sky (0.01 °C)**

Start Time	N Approach NATURE HAVEN CRES						E Approach FINCH AVE						S Approach WOODVIEW AVE						W Approach FINCH AVE						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:45:00	0	0	0	0	0	0	1	6	6	0	0	13	14	0	6	0	0	20	8	32	0	0	0	40	73
17:00:00	1	0	0	0	0	1	1	14	8	0	0	23	10	0	8	0	0	18	15	30	0	0	1	45	87
17:15:00	1	0	3	0	0	4	1	7	4	0	0	12	11	2	5	0	1	18	8	38	1	0	0	47	81
17:30:00	0	0	0	0	0	0	0	8	14	0	0	22	4	0	5	0	0	9	9	24	0	0	0	33	64
Grand Total	2	0	3	0	0	5	3	35	32	0	0	70	39	2	24	0	1	65	40	124	1	0	1	165	**305**
Approach%	40%	0%	60%	0%		-	4.3%	50%	45.7%	0%		-	60%	3.1%	36.9%	0%		-	24.2%	75.2%	0.6%	0%		-	**-**
Totals %	0.7%	0%	1%	0%		1.6%	1%	11.5%	10.5%	0%		23%	12.8%	0.7%	7.9%	0%		21.3%	13.1%	40.7%	0.3%	0%		54.1%	**-**
PHF	0.5	0	0.25	0		0.31	0.75	0.63	0.57	0		0.76	0.7	0.25	0.75	0		0.81	0.67	0.82	0.25	0		0.88	**-**
Heavy	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Heavy %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Lights	2	0	3	0		5	3	35	32	0		70	39	2	24	0		65	40	124	1	0		165	**-**
Lights %	100%	0%	100%	0%		100%	100%	100%	100%	0%		100%	100%	100%	100%	0%		100%	100%	100%	100%	0%		100%	**-**
Single-Unit Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Buses	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Buses %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	1	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	50%		-	-	-	-	50%		**-**

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 08:00 AM - 09:00 AM Weather: Clear Sky (-9.53 °C)

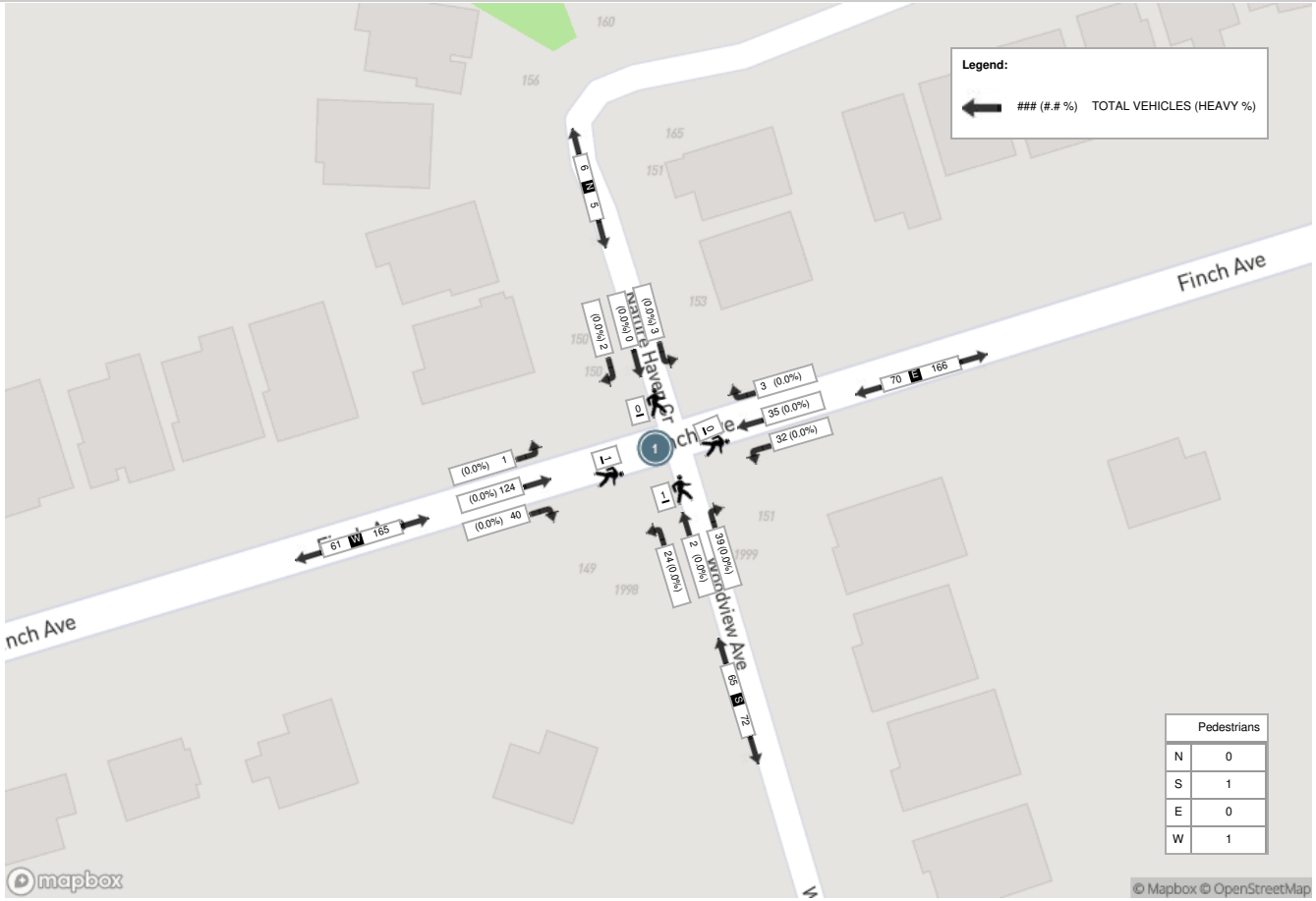


Spectrum

Turning Movement Count
Location Name: FINCH AVE & WOODVIEW AVE / NATURE HAVEN CRES
Date: Tue, Dec 13, 2022 Deployment Lead: Peter Ilias

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 04:45 PM - 05:45 PM **Weather: Clear Sky (0.01 °C)**



Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Turning Movement Count (2 . LOCAL ST A & WOODVIEW AVE)

Start Time	N Approach WOODVIEW AVE					S Approach WOODVIEW AVE					W Approach LOCAL ST A					Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	UTurn N:N	Peds N:	Approach Total	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Left W:N	UTurn W:W	Peds W:	Approach Total		
06:00:00	0	2	0	0	2	3	0	0	0	3	0	0	0	0	0	5	
06:15:00	0	2	0	0	2	9	0	0	0	9	0	0	0	0	0	11	
06:30:00	0	2	0	0	2	6	0	0	0	6	0	0	0	0	0	8	
06:45:00	1	6	0	0	7	5	0	0	0	5	1	0	0	0	1	13	37
07:00:00	0	2	0	0	2	14	0	0	0	14	0	1	0	0	1	17	49
07:15:00	0	4	0	0	4	15	0	0	0	15	0	0	0	0	0	19	57
07:30:00	0	3	0	0	3	26	0	0	0	26	2	1	0	0	3	32	81
07:45:00	0	0	0	0	0	19	0	0	0	19	1	1	0	2	2	21	89
08:00:00	0	4	0	0	4	19	0	0	0	19	2	0	0	1	2	25	97
08:15:00	0	10	0	0	10	12	1	0	0	13	1	2	0	1	3	26	104
08:30:00	0	8	0	0	8	17	4	0	0	21	2	2	0	0	4	33	105
08:45:00	2	11	0	0	13	17	2	0	0	19	0	2	0	0	2	34	118
09:00:00	1	5	0	0	6	10	0	0	0	10	2	0	0	2	2	18	111
09:15:00	1	8	0	0	9	14	0	0	0	14	0	0	0	1	0	23	108
09:30:00	1	6	0	0	7	14	0	0	0	14	0	1	0	1	1	22	97
09:45:00	0	2	0	0	2	5	0	0	0	5	0	0	0	0	0	7	70
BREAK																	
15:00:00	1	14	0	0	15	11	1	0	0	12	1	0	0	0	1	28	
15:15:00	0	14	0	0	14	18	2	0	0	20	1	0	0	0	1	35	
15:30:00	0	18	0	0	18	8	0	0	0	8	1	0	0	0	1	27	
15:45:00	3	13	0	0	16	10	0	0	2	10	1	0	0	1	1	27	117
16:00:00	2	21	0	0	23	7	2	0	0	9	2	1	0	1	3	35	124
16:15:00	0	13	0	0	13	8	1	0	0	9	0	0	0	2	0	22	111
16:30:00	0	14	0	0	14	8	1	0	0	9	0	2	0	1	2	25	109
16:45:00	1	12	0	0	13	19	0	0	0	19	1	0	0	0	1	33	115
17:00:00	2	17	0	0	19	16	0	0	0	16	0	1	0	1	1	36	116
17:15:00	2	12	0	0	14	14	1	0	0	15	1	1	0	0	2	31	125
17:30:00	1	19	0	1	20	9	0	0	0	9	1	1	1	2	3	32	132
17:45:00	0	15	0	0	15	13	0	0	0	13	0	1	0	1	1	29	128
18:00:00	3	21	0	0	24	15	0	0	0	15	0	4	0	0	4	43	135
18:15:00	1	11	0	0	12	3	1	0	0	4	0	2	0	0	2	18	122
18:30:00	0	10	0	0	10	8	0	0	0	8	0	1	0	1	1	19	109
18:45:00	0	15	0	0	15	3	1	0	0	4	0	1	0	0	1	20	100

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Grand Total	22	314	0	1	336	375	17	0	2	392	20	25	1	18	46	**774**	-
Approach%	6.5%	93.5%	0%		-	95.7%	4.3%	0%		-	43.5%	54.3%	2.2%		-	**-**	-
Totals %	2.8%	40.6%	0%		43.4%	48.4%	2.2%	0%		50.6%	2.6%	3.2%	0.1%		5.9%	**-**	-
Heavy	3	5	0		-	13	0	0		-	3	0	0		-	**-**	-
Heavy %	13.6%	1.6%	0%		-	3.5%	0%	0%		-	15%	0%	0%		-	**-**	-
Bicycles	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-
Bicycle %	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 08:00 AM - 09:00 AM Weather: Clear Sky (-9.53 °C)

Start Time	N Approach WOODVIEW AVE					S Approach WOODVIEW AVE					W Approach LOCAL ST A					Int. Total (15 min)
	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	
08:00:00	0	4	0	0	4	19	0	0	0	19	2	0	0	1	2	25
08:15:00	0	10	0	0	10	12	1	0	0	13	1	2	0	1	3	26
08:30:00	0	8	0	0	8	17	4	0	0	21	2	2	0	0	4	33
08:45:00	2	11	0	0	13	17	2	0	0	19	0	2	0	0	2	34
Grand Total	2	33	0	0	35	65	7	0	0	72	5	6	0	2	11	**118**
Approach%	5.7%	94.3%	0%		-	90.3%	9.7%	0%		-	45.5%	54.5%	0%		-	**-**
Totals %	1.7%	28%	0%		29.7%	55.1%	5.9%	0%		61%	4.2%	5.1%	0%		9.3%	**-**
PHF	0.25	0.75	0		0.67	0.86	0.44	0		0.86	0.63	0.75	0		0.69	**-**
Heavy	0	1	0		1	3	0	0		3	0	0	0		0	**-**
Heavy %	0%	3%	0%		2.9%	4.6%	0%	0%		4.2%	0%	0%	0%		0%	**-**
Lights	2	32	0		34	62	7	0		69	5	6	0		11	**-**
Lights %	100%	97%	0%		97.1%	95.4%	100%	0%		95.8%	100%	100%	0%		100%	**-**
Single-Unit Trucks	0	0	0		0	0	0	0		0	0	0	0		0	**-**
Single-Unit Trucks %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Buses	0	1	0		1	3	0	0		3	0	0	0		0	**-**
Buses %	0%	3%	0%		2.9%	4.6%	0%	0%		4.2%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	2	-	**-**
Pedestrians%	-	-	-	0%		-	-	-	0%		-	-	-	100%		**-**

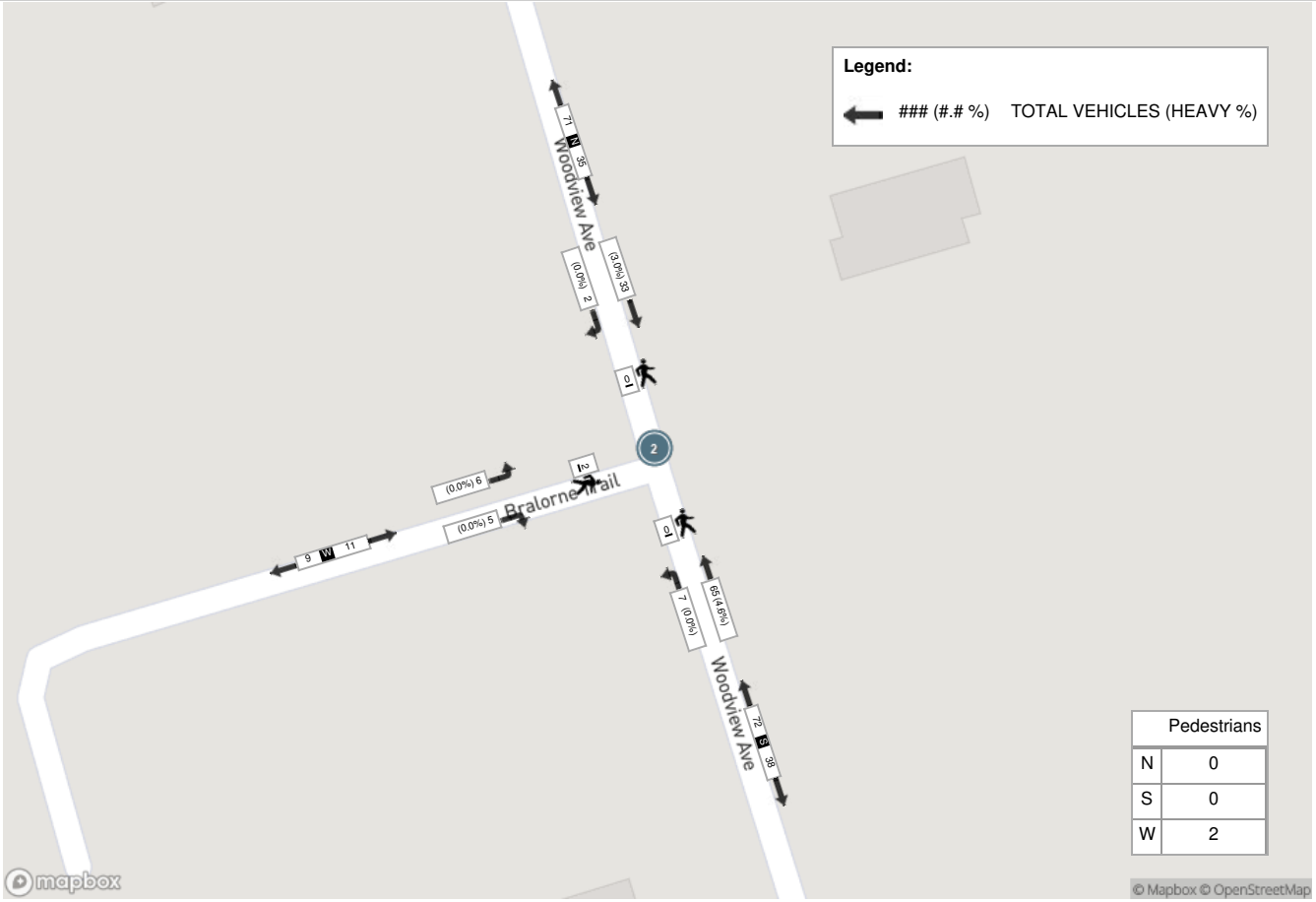
Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 05:15 PM - 06:15 PM Weather: Clear Sky (0.01 °C)

Start Time	N Approach WOODVIEW AVE					S Approach WOODVIEW AVE					W Approach LOCAL ST A					Int. Total (15 min)
	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	
17:15:00	2	12	0	0	14	14	1	0	0	15	1	1	0	0	2	31
17:30:00	1	19	0	1	20	9	0	0	0	9	1	1	1	2	3	32
17:45:00	0	15	0	0	15	13	0	0	0	13	0	1	0	1	1	29
18:00:00	3	21	0	0	24	15	0	0	0	15	0	4	0	0	4	43
Grand Total	6	67	0	1	73	51	1	0	0	52	2	7	1	3	10	**135**
Approach%	8.2%	91.8%	0%		-	98.1%	1.9%	0%		-	20%	70%	10%		-	**-**
Totals %	4.4%	49.6%	0%		54.1%	37.8%	0.7%	0%		38.5%	1.5%	5.2%	0.7%		7.4%	**-**
PHF	0.5	0.8	0		0.76	0.85	0.25	0		0.87	0.5	0.44	0.25		0.63	**-**
Heavy	0	0	0		0	1	0	0		1	0	0	0		0	**-**
Heavy %	0%	0%	0%		0%	2%	0%	0%		1.9%	0%	0%	0%		0%	**-**
Lights	6	67	0		73	50	1	0		51	2	7	1		10	**-**
Lights %	100%	100%	0%		100%	98%	100%	0%		98.1%	100%	100%	100%		100%	**-**
Single-Unit Trucks	0	0	0		0	1	0	0		1	0	0	0		0	**-**
Single-Unit Trucks %	0%	0%	0%		0%	2%	0%	0%		1.9%	0%	0%	0%		0%	**-**
Buses	0	0	0		0	0	0	0		0	0	0	0		0	**-**
Buses %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	1	-	-	-	-	0	-	-	-	-	3	-	**-**
Pedestrians%	-	-	-	25%		-	-	-	0%		-	-	-	75%		**-**

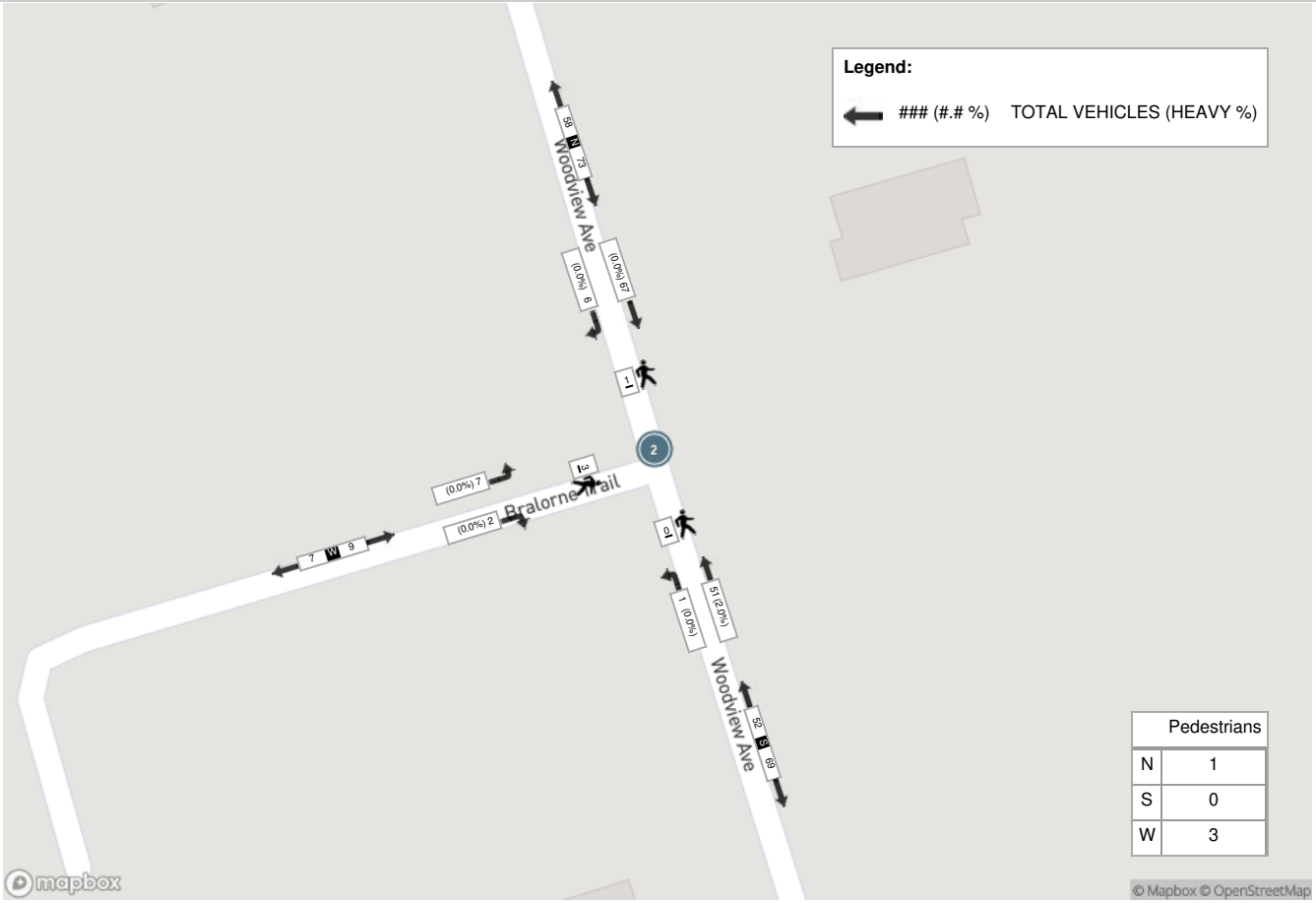
Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 08:00 AM - 09:00 AM Weather: Clear Sky (-9.53 °C)



Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 05:15 PM - 06:15 PM Weather: Clear Sky (0.01 °C)



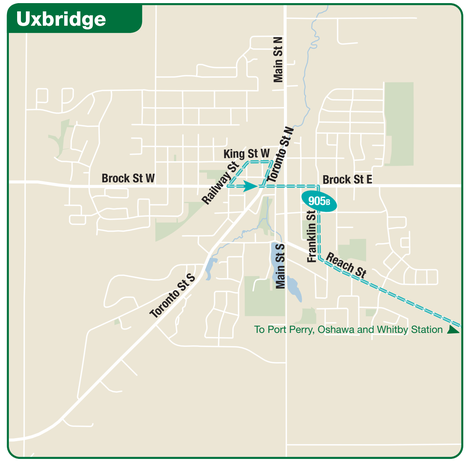
APPENDIX D

Transit Excerpts

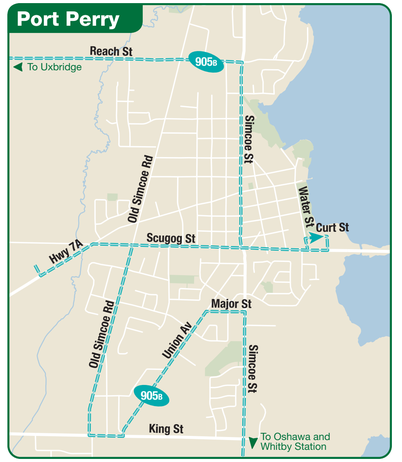
Durham Region Transit

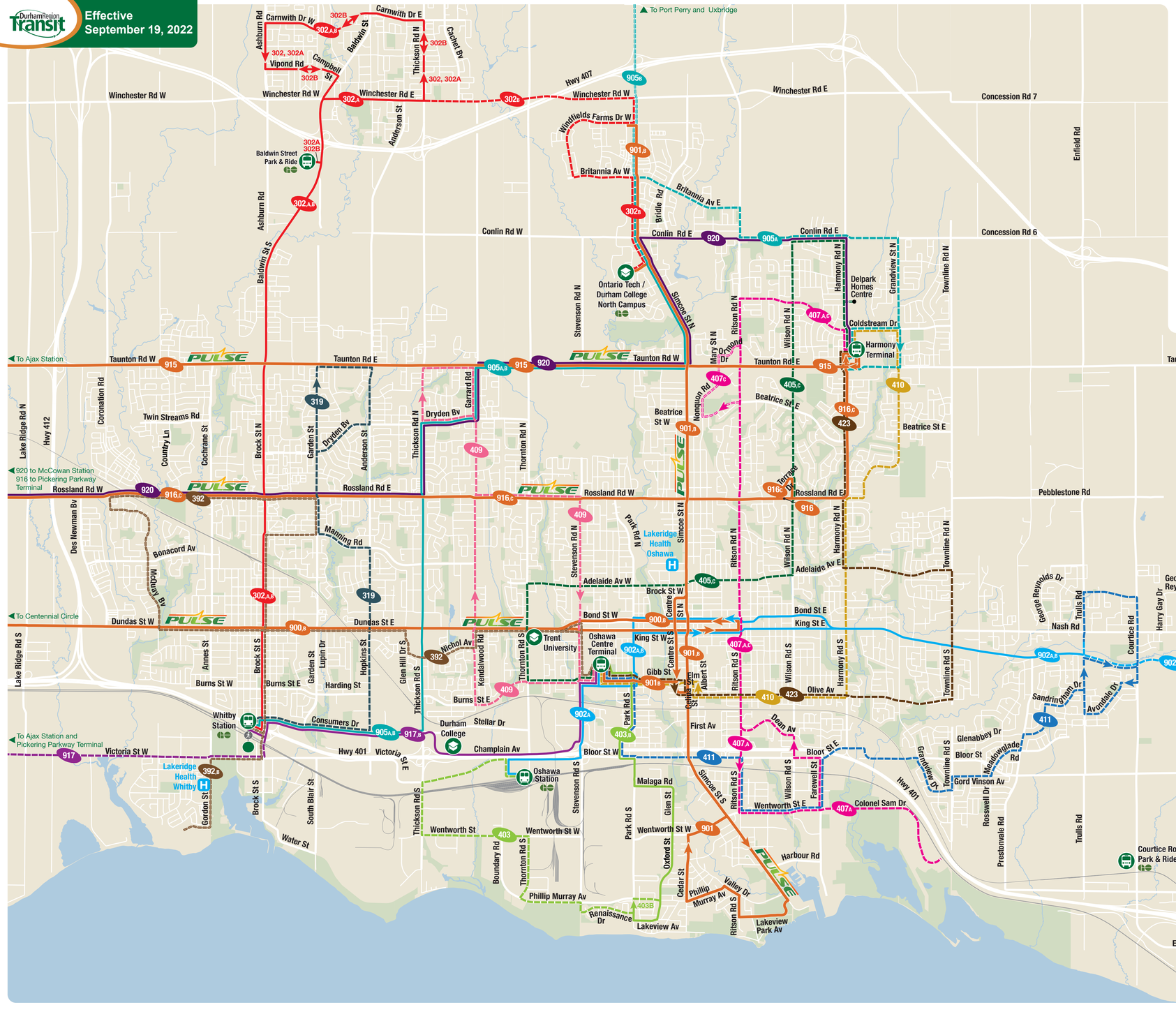
Effective September 19, 2022

Uxbridge

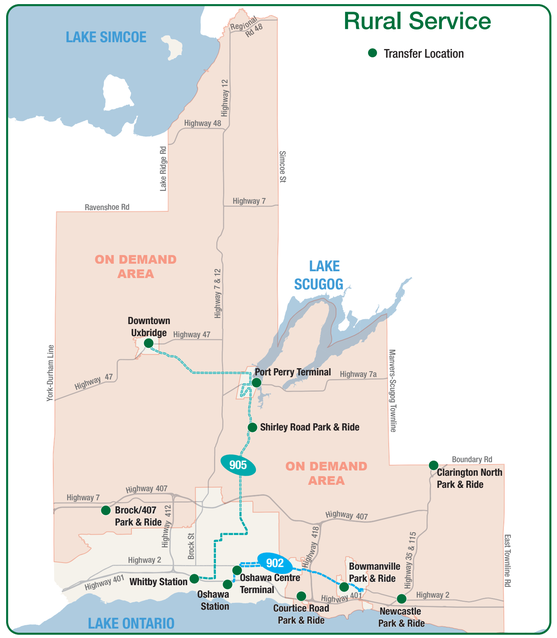


Port Perry





Rural Service



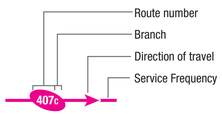
- Transfer Location

Route Frequency

Route	Weekday			Saturday / Sunday	
	AM / PM Peak Start - 9:00 I 16:00 - 19:00	Midday 9:00 - 16:00	Evening After 19:00	Daytime Start to 19:00	Evening After 19:00
101	30 min	-	-	-	-
103	30 min	30 min	-	-	-
110	30 min	30 min	30 min	30 min	30 min
112	30 min	30 min	-	-	-
120	30 min	30 min	30 min	30 min	30 min
211	30 min	-	-	-	-
216	15 min	30 min	30 min	30 min	30 min
222	30 min	-	-	-	-
224	15 min	30 min	30 min	30 min	30 min
291	-	120 min	-	30 min	-
302	15 min	30 min	30 min	30 min	30 min
319	30 min	-	-	-	-
392	30 min	120 min	-	-	-
403	15 min	30 min	30 min	30 min	30 min
405	30 min	30 min	30 min	30 min	30 min
407	30 min	30 min	30 min	30 min	30 min
409	30 min	30 min	-	-	-
410	30 min	30 min	30 min	30 min	30 min
411	30 min	30 min	-	30 min	-
423	30 min	-	-	-	-
502	30 min	30 min	-	-	-
900	10 min	10 min	15-30 min	15 min	15-30 min
901	10 min	10 min	15-30 min	15 min	15-30 min
902	15 min	15 min	30 min	30 min	30 min
905	15-30 min	30 min	30 min	30 min	30 min
915	15 min	15 min	15 min	15 min	30 min
916	15 min	15 min	30 min	30 min	30 min
917	15 min	30 min	30 min	30 min	30 min
920	15 min	15 min	30 min	-	-

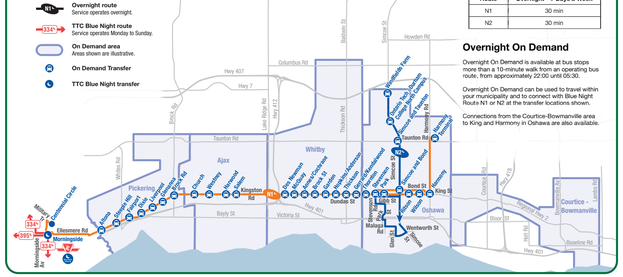
Legend

- PULSE — Operates at least every 20 minutes, weekdays, from AM peak through PM peak. Operates at least every 30 minutes at other times.
- Operates at least every 15 minutes during weekday AM and PM peak periods, operates at least every 30 minute at other times.
- Operates at least every 30 minutes
- Operates at least every two hours
- Pedestrian bridge or tunnel



- Hospital
- Train station
- Terminal
- College / University

Blue Night Network



Blue Night Routes

Route	Overnight – 7 Days a Week
N1	30 min
N2	30 min

Overnight On Demand

Overnight On Demand is available at bus stops more than a 10-minute walk from an operating bus route, from approximately 22:00 until 05:30.

Overnight On Demand can be used to travel within your municipality and to connect with Blue Night Routs N1 or N2 at the transfer locations shown.

Connections from the Courtice-Bowmanville area to King and Harmony in Oshawa are also available.

On Demand

On Demand is available in areas where scheduled service is not operating. Please see DurhamRegionTransit.com for schedules or use Transit App to plan your trip

All DRT routes do not provide local service in Toronto; pick-up only towards Durham Region, drop-off only from Durham Region.

Contact us

durhamregiontransit.com

Customer Service Centre
1-866-247-0055

@durham_transit

/durhamregiontransit

transit

OSHAWA / CLARINGTON / BOWMANVILLE / NEWCASTLE

OSHAWA

UXBRIDGE

90 90A 90C 90D

Durham Hwy 2 @ Courtice Rd.

90 90A 90C 90D

90 90A 90C 90D 91

Clarington Blvd. @ Durham Hwy 2 (Bowmanville) Park & Ride

90 90A 90C 90D

King St. E @ Liberty St.

90 90C 91

King Ave. E @ Beaver St.

Hwy 2 @ Hwy 35/115 Park & Ride

90 90C 91

Waverly Rd. @ Baseline Rd.

90A 91

King St. E @ Centre St. N / Bond St. W @ Centre St. N

Stevenson Rd. S @ Cartier Ave.

91

Oshawa

WHITCHURCH-STOUFFVILLE

Lincolnville

Stouffville

CLARINGTON

See Inset

WHITBY

WESTNEY RD

THICKSON RD

OSHAWA

KING AVE

HWY 401

KING ST

MARKHAM

Mount Joy

Markham

Centennial

Unionville

Richmond Hill

Langstaff

AJAX

90B 90C

BROCK ROAD

HWY 401

Ajax

Whitby

Oshawa

PICKERING

Pickering

90B 90C

90 90A 90B 90C 91

Milliken

Richmond Hill

Old Cummer

Agincourt

90B 90C

Rouge Hill

HWY 401

Lakeshore East

Stouffville

Oriole

Guildwood

Kennedy

Eglinton

Scarborough

TORONTO

Danforth

TORONTO Union Stn – GO Bus Term.

Union

Exhibition

90B 90C

Lake Ontario

Legend / Légende

- Lakeshore East train line / Corridor ferroviaire Lakeshore East
- Bus route / Ligne d'autobus
  - 90 Newcastle – Oshawa
  - 91 Newcastle – Oshawa Express
- GO Train station / Gare GO
- Major bus stop / Arrêt d'autobus principal
- (P) Major bus stop with parking / Arrêt d'autobus principal avec stationnement
- Subway or RT connection / Correspondance Métro ou RT

v: 201606

103 Glenanna

Effective September 19, 2022

Web **durhamregiontransit.com**
Phone **1-866-247-0055**

Weekday			West
Pickering Parkway **Stop #93112**	Whites Southbound @ Strouds (South side stop) **Stop #94100**	Strouds Lane Westbound @ Whites **Stop #1586**	Pine Grove Westbound @ Altona **Stop #93232**
C 06:38	-	06:48	06:53
C 07:08	-	07:18	07:23
C 07:38	-	07:48	07:53
C 08:08	-	08:18	08:23
C 08:38	-	08:48	08:53
C 09:08	-	09:18	09:23
C 09:38	-	09:48	09:53
C 10:08	-	10:18	10:23
C 10:38	-	10:48	10:53
C 11:08	-	11:18	11:23
C 11:38	-	11:48	11:53
12:05	12:15	-	12:23
12:35	12:45	-	12:53
13:05	13:15	-	13:23

C To Altona via Strouds

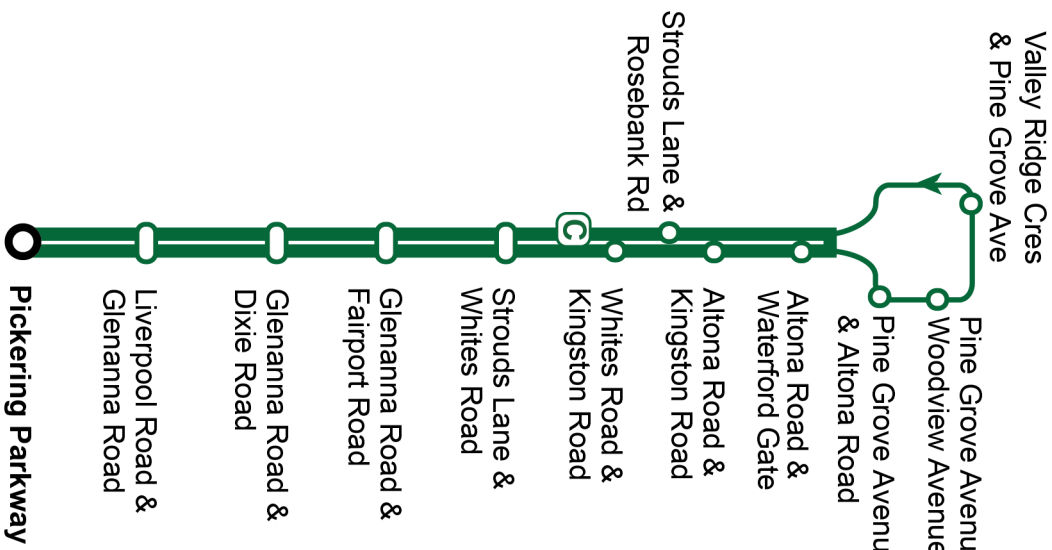
Weekday			West
Pickering Parkway **Stop #93112**	Whites Southbound @ Strouds (South side stop) **Stop #94100**	Strouds Lane Westbound @ Whites **Stop #1586**	Pine Grove Westbound @ Altona **Stop #93232**
13:35	13:45	-	13:53
14:05	14:15	-	14:23
14:35	14:45	-	14:53
15:05	15:15	-	15:23
15:35	15:45	-	15:53
16:05	16:15	-	16:23
16:35	16:45	-	16:53
17:05	17:15	-	17:23
17:35	17:45	-	17:53
18:05	18:15	-	18:23
18:35	18:45	-	18:53
19:05	19:15	-	19:23

C To Altona via Strouds

On Demand service is available at stops on this route when scheduled bus service is not operating.

See **DurhamRegionTransit.com** for more information.

Trip notes are indicated by a letter or symbol and explained at the bottom of each timetable. Schedule times are shown in 24-hour clock. If you require this information in an accessible format, please contact Customer Service at 1-866-247-0055. See **durhamregiontransit.com** for more information.



103 Glenanna

Effective September 19, 2022

103 Glenanna

Effective September 19, 2022

Web **durhamregiontransit.com**
Phone **1-866-247-0055**

Weekday				East
Pine Grove Westbound @ Altona **Stop #93232**	Waterford Eastbound @ Forestview **Stop #3004**	Strouds Eastbound @ Whites **Stop #94190**	Whites Northbound @ Strouds **Stop #1746**	Pickering Parkway **Stop #93112**
05:23	05:30	-	05:38	05:48
05:53	06:00	-	06:08	06:18
06:23	06:30	-	06:38	06:48
06:53	07:00	-	07:08	07:18
07:23	07:30	-	07:38	07:48
07:53	08:00	-	08:08	08:18
08:23	08:30	-	08:38	08:48
08:53	09:00	-	09:08	09:18
09:23	09:30	-	09:38	09:48
09:53	10:00	-	10:08	10:18
10:23	10:30	-	10:38	10:48
10:53	11:00	-	11:08	11:18
11:23	11:30	-	11:38	11:48
11:53	12:00	-	12:08	12:18

C To Pickering Parkway via Strouds

Weekday				East
Pine Grove Westbound @ Altona **Stop #93232**	Waterford Eastbound @ Forestview **Stop #3004**	Strouds Eastbound @ Whites **Stop #94190**	Whites Northbound @ Strouds **Stop #1746**	Pickering Parkway **Stop #93112**
C 12:23	12:30	12:35	-	12:45
C 12:53	13:00	13:05	-	13:15
C 13:23	13:30	13:35	-	13:45
C 13:53	14:00	14:05	-	14:15
C 14:23	14:30	14:35	-	14:45
C 14:53	15:00	15:05	-	15:15
C 15:23	15:30	15:35	-	15:45
C 15:53	16:00	16:05	-	16:15
C 16:23	16:30	16:35	-	16:45
C 16:53	17:00	17:05	-	17:15
C 17:23	17:30	17:35	-	17:45
C 17:53	18:00	18:05	-	18:15
C 18:23	18:30	18:35	-	18:45
C 18:53	19:00	19:05	-	19:15
19:23	19:30	-	-	-

C To Pickering Parkway via Strouds

On Demand service is available at stops on this route when scheduled bus service is not operating.

See **DurhamRegionTransit.com** for more information.

Trip notes are indicated by a letter or symbol and explained at the bottom of each timetable. Schedule times are shown in 24-hour clock. If you require this information in an accessible format, please contact Customer Service at 1-866-247-0055. See **durhamregiontransit.com** for more information.

APPENDIX E

Level of Service Definitions

Level of Service Definitions

Two-Way Stop Controlled Intersections

Level of Service	Control Delay per Vehicle (seconds)	Interpretation
A	≤ 10	EXCELLENT. Large and frequent gaps in traffic on the main roadway. Queuing on the minor street is rare.
B	> 10 and ≤ 15	VERY GOOD. Many gaps exist in traffic on the main roadway. Queuing on the minor street is minimal.
C	> 15 and ≤ 25	GOOD. Fewer gaps exist in traffic on the main roadway. Delay on minor approach becomes more noticeable.
D	> 25 and ≤ 35	FAIR. Infrequent and shorter gaps in traffic on the main roadway. Queue lengths develop on the minor street.
E	> 35 and ≤ 50	POOR. Very infrequent gaps in traffic on the main roadway. Queue lengths become noticeable.
F	> 50	UNSATISFACTORY. Very few gaps in traffic on the main roadway. Excessive delay with significant queue lengths on the minor street.

Adapted from Highway Capacity Manual 2000, Transportation Research Board

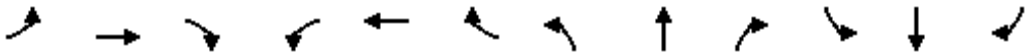
Signalized Intersections

Level of Service	Control Delay per Vehicle (seconds)	Interpretation
A	≤ 10	EXCELLENT. Extremely favourable progression with most vehicles arriving during the green phase. Most vehicles do not stop and short cycle lengths may contribute to low delay.
B	> 10 and ≤ 20	VERY GOOD. Very good progression and/or short cycle lengths with slightly more vehicles stopping than LOS "A" causing slightly higher levels of average delay.
C	> 20 and ≤ 35	GOOD. Fair progression and longer cycle lengths lead to a greater number of vehicles stopping than LOS "B".
D	> 35 and ≤ 55	FAIR. Congestion becomes noticeable with higher average delays resulting from a combination of long cycle lengths, high volume-to-capacity ratios and unfavourable progression.
E	> 55 and ≤ 80	POOR. Lengthy delays values are indicative of poor progression, long cycle lengths and high volume-to-capacity ratios. Individual cycle failures are common with individual movement failures also common.
F	> 80	UNSATISFACTORY. Indicative of oversaturated conditions with vehicular demand greater than the capacity of the intersection.

Adapted from Highway Capacity Manual 2000, Transportation Research Board

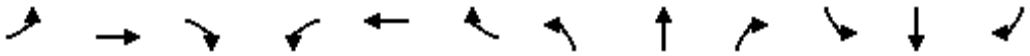
APPENDIX F

Detailed Capacity Analysis Reports



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	21	12	20	49	1	38	2	32	8	1	5
Future Volume (vph)	1	21	12	20	49	1	38	2	32	8	1	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.953			0.998			0.939			0.955	
Flt Protected		0.999			0.986			0.974			0.971	
Satd. Flow (prot)	0	1809	0	0	1818	0	0	1670	0	0	1355	0
Flt Permitted		0.999			0.986			0.974			0.971	
Satd. Flow (perm)	0	1809	0	0	1818	0	0	1670	0	0	1355	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		410.2			348.1			324.2			49.4	
Travel Time (s)		29.5			25.1			23.3			3.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	5%	2%	0%	0%	0%	9%	50%	0%	0%
Adj. Flow (vph)	1	23	13	22	53	1	41	2	35	9	1	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	37	0	0	76	0	0	78	0	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

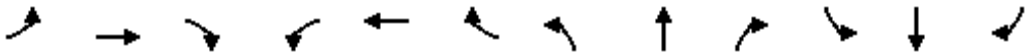
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 22.0%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	21	12	20	49	1	38	2	32	8	1	5
Future Volume (Veh/h)	1	21	12	20	49	1	38	2	32	8	1	5
Sign Control		Free			Free			Stop			Stop	
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	23	13	22	53	1	41	2	35	9	1	5
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	54			36			134	130	30	165	136	54
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	54			36			134	130	30	165	136	54
tC, single (s)	4.1			4.1			7.1	6.5	6.3	7.6	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	4.0	4.0	3.3
p0 queue free %	100			99			95	100	97	99	100	100
cM capacity (veh/h)	1564			1556			827	754	1025	670	748	1019

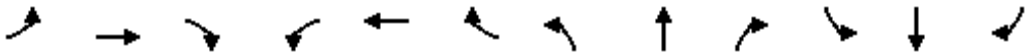
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	37	76	78	15
Volume Left	1	22	41	9
Volume Right	13	1	35	5
cSH	1564	1556	903	763
Volume to Capacity	0.00	0.01	0.09	0.02
Queue Length 95th (m)	0.0	0.3	2.3	0.5
Control Delay (s)	0.2	2.2	9.4	9.8
Lane LOS	A	A	A	A
Approach Delay (s)	0.2	2.2	9.4	9.8
Approach LOS			A	A

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	22.0%	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)	1	124	40	32	35	3	24	2	39	3	0	2
Future Volume (vph)	1	124	40	32	35	3	24	2	39	3	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.968			0.995			0.919			0.946	
Flt Protected					0.977			0.982			0.971	
Satd. Flow (prot)	0	1839	0	0	1847	0	0	1715	0	0	1745	0
Flt Permitted					0.977			0.982			0.971	
Satd. Flow (perm)	0	1839	0	0	1847	0	0	1715	0	0	1745	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		410.2			348.1			324.2			49.4	
Travel Time (s)		29.5			25.1			23.3			3.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1	135	43	35	38	3	26	2	42	3	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	179	0	0	76	0	0	70	0	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

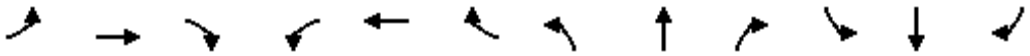
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 26.9%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	124	40	32	35	3	24	2	39	3	0	2
Future Volume (Veh/h)	1	124	40	32	35	3	24	2	39	3	0	2
Sign Control		Free			Free			Stop			Stop	
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	135	43	35	38	3	26	2	42	3	0	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	41			178			270	270	156	311	290	40
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	41			178			270	270	156	311	290	40
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			96	100	95	100	100	100
cM capacity (veh/h)	1581			1410			672	624	894	602	608	1038

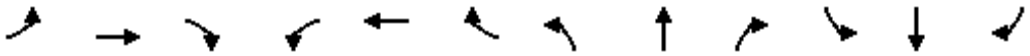
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	179	76	70	5
Volume Left	1	35	26	3
Volume Right	43	3	42	2
cSH	1581	1410	788	723
Volume to Capacity	0.00	0.02	0.09	0.01
Queue Length 95th (m)	0.0	0.6	2.3	0.2
Control Delay (s)	0.0	3.6	10.0	10.0
Lane LOS	A	A	B	B
Approach Delay (s)	0.0	3.6	10.0	10.0
Approach LOS			B	B

Intersection Summary				
Average Delay	3.1			
Intersection Capacity Utilization	26.9%	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)	1	23	14	24	54	1	43	2	39	9	1	6
Future Volume (vph)	1	23	14	24	54	1	43	2	39	9	1	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.951			0.998			0.938			0.947	
Flt Protected		0.999			0.985			0.975			0.973	
Satd. Flow (prot)	0	1805	0	0	1815	0	0	1668	0	0	1370	0
Flt Permitted		0.999			0.985			0.975			0.973	
Satd. Flow (perm)	0	1805	0	0	1815	0	0	1668	0	0	1370	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		410.2			348.1			324.2			49.4	
Travel Time (s)		29.5			25.1			23.3			3.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	5%	2%	0%	0%	0%	9%	50%	0%	0%
Adj. Flow (vph)	1	25	15	26	59	1	47	2	42	10	1	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	41	0	0	86	0	0	91	0	0	18	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

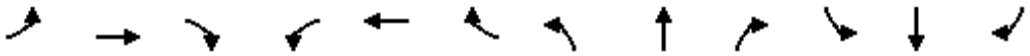
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 23.3%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	23	14	24	54	1	43	2	39	9	1	6
Future Volume (Veh/h)	1	23	14	24	54	1	43	2	39	9	1	6
Sign Control		Free			Free			Stop			Stop	
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	25	15	26	59	1	47	2	42	10	1	7
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	60			40			154	146	32	189	154	60
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	60			40			154	146	32	189	154	60
tC, single (s)	4.1			4.1			7.1	6.5	6.3	7.6	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	4.0	4.0	3.3
p0 queue free %	100			98			94	100	96	98	100	99
cM capacity (veh/h)	1556			1550			801	736	1021	639	729	1012

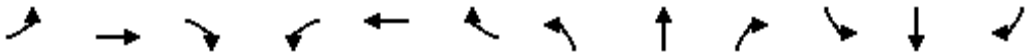
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	41	86	91	18
Volume Left	1	26	47	10
Volume Right	15	1	42	7
cSH	1556	1550	888	752
Volume to Capacity	0.00	0.02	0.10	0.02
Queue Length 95th (m)	0.0	0.4	2.7	0.6
Control Delay (s)	0.2	2.3	9.5	9.9
Lane LOS	A	A	A	A
Approach Delay (s)	0.2	2.3	9.5	9.9
Approach LOS			A	A

Intersection Summary				
Average Delay	5.3			
Intersection Capacity Utilization	23.3%	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)	1	137	45	39	39	3	26	2	48	3	0	2
Future Volume (vph)	1	137	45	39	39	3	26	2	48	3	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967			0.995			0.914			0.946	
Flt Protected					0.976			0.983			0.971	
Satd. Flow (prot)	0	1837	0	0	1845	0	0	1707	0	0	1745	0
Flt Permitted					0.976			0.983			0.971	
Satd. Flow (perm)	0	1837	0	0	1845	0	0	1707	0	0	1745	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		410.2			348.1			324.2			49.4	
Travel Time (s)		29.5			25.1			23.3			3.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1	149	49	42	42	3	28	2	52	3	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	199	0	0	87	0	0	82	0	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

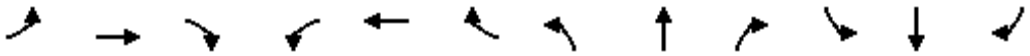
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 29.1%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	137	45	39	39	3	26	2	48	3	0	2
Future Volume (Veh/h)	1	137	45	39	39	3	26	2	48	3	0	2
Sign Control		Free			Free			Stop			Stop	
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	149	49	42	42	3	28	2	52	3	0	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	45			198			305	304	174	356	328	44
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	45			198			305	304	174	356	328	44
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			96	100	94	99	100	100
cM capacity (veh/h)	1576			1387			635	593	875	552	576	1032

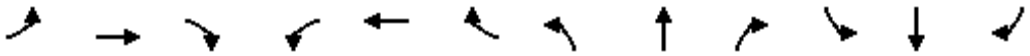
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	199	87	82	5
Volume Left	1	42	28	3
Volume Right	49	3	52	2
cSH	1576	1387	767	679
Volume to Capacity	0.00	0.03	0.11	0.01
Queue Length 95th (m)	0.0	0.7	2.9	0.2
Control Delay (s)	0.0	3.8	10.3	10.3
Lane LOS	A	A	B	B
Approach Delay (s)	0.0	3.8	10.3	10.3
Approach LOS			B	B

Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	29.1%	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)	1	23	15	29	54	1	46	2	47	9	1	6
Future Volume (vph)	1	23	15	29	54	1	46	2	47	9	1	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.949			0.999			0.933			0.947	
Flt Protected		0.999			0.983			0.976			0.973	
Satd. Flow (prot)	0	1801	0	0	1811	0	0	1656	0	0	1370	0
Flt Permitted		0.999			0.983			0.976			0.973	
Satd. Flow (perm)	0	1801	0	0	1811	0	0	1656	0	0	1370	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		410.2			348.1			324.2			49.4	
Travel Time (s)		29.5			25.1			23.3			3.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	5%	2%	0%	0%	0%	9%	50%	0%	0%
Adj. Flow (vph)	1	25	16	32	59	1	50	2	51	10	1	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	0	92	0	0	103	0	0	18	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

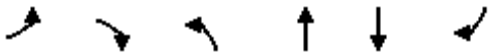
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 24.3%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	23	15	29	54	1	46	2	47	9	1	6
Future Volume (Veh/h)	1	23	15	29	54	1	46	2	47	9	1	6
Sign Control		Free			Free			Stop			Stop	
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	25	16	32	59	1	50	2	51	10	1	7
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	60			41			166	159	33	210	166	60
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	60			41			166	159	33	210	166	60
tC, single (s)	4.1			4.1			7.1	6.5	6.3	7.6	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	4.0	4.0	3.3
p0 queue free %	100			98			94	100	95	98	100	99
cM capacity (veh/h)	1556			1549			783	721	1021	610	714	1012

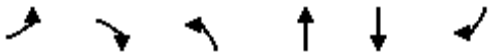
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	42	92	103	18
Volume Left	1	32	50	10
Volume Right	16	1	51	7
cSH	1556	1549	884	729
Volume to Capacity	0.00	0.02	0.12	0.02
Queue Length 95th (m)	0.0	0.5	3.2	0.6
Control Delay (s)	0.2	2.7	9.6	10.1
Lane LOS	A	A	A	B
Approach Delay (s)	0.2	2.7	9.6	10.1
Approach LOS			A	B

Intersection Summary				
Average Delay	5.6			
Intersection Capacity Utilization	24.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	11	11	1	80	47	6
Future Volume (vph)	11	11	1	80	47	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932				0.984	
Flt Protected	0.976			0.999		
Satd. Flow (prot)	1694	0	0	1861	1833	0
Flt Permitted	0.976			0.999		
Satd. Flow (perm)	1694	0	0	1861	1833	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	113.4			139.0	140.2	
Travel Time (s)	8.2			10.0	10.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	12	1	87	51	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	0	0	88	58	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

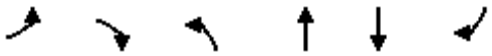
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 15.0%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	11	1	80	47	6
Future Volume (Veh/h)	11	11	1	80	47	6
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	12	1	87	51	7
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	144	54	58			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	144	54	58			
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	99	100			
cM capacity (veh/h)	849	1012	1546			

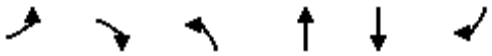
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	24	88	58
Volume Left	12	1	0
Volume Right	12	0	7
cSH	923	1546	1700
Volume to Capacity	0.03	0.00	0.03
Queue Length 95th (m)	0.6	0.0	0.0
Control Delay (s)	9.0	0.1	0.0
Lane LOS	A	A	
Approach Delay (s)	9.0	0.1	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	15.0%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	11	10	8	83	42	4
Future Volume (vph)	11	10	8	83	42	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.935				0.989	
Flt Protected	0.975			0.995		
Satd. Flow (prot)	1732	0	0	1808	1829	0
Flt Permitted	0.975			0.995		
Satd. Flow (perm)	1732	0	0	1808	1829	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	111.5			140.2	324.2	
Travel Time (s)	8.0			10.1	23.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	5%	3%	0%
Adj. Flow (vph)	12	11	9	90	46	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	0	0	99	50	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

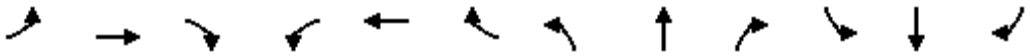
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 21.0%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	10	8	83	42	4
Future Volume (Veh/h)	11	10	8	83	42	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	11	9	90	46	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	156	48	50			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	156	48	50			
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	99	99			
cM capacity (veh/h)	835	1027	1570			

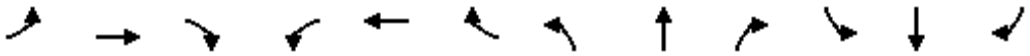
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	23	99	50
Volume Left	12	9	0
Volume Right	11	0	4
cSH	917	1570	1700
Volume to Capacity	0.03	0.01	0.03
Queue Length 95th (m)	0.6	0.1	0.0
Control Delay (s)	9.0	0.7	0.0
Lane LOS	A	A	
Approach Delay (s)	9.0	0.7	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	21.0%	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)	1	137	47	46	39	3	27	2	56	3	0	2
Future Volume (vph)	1	137	47	46	39	3	27	2	56	3	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.966			0.996			0.910			0.946	
Flt Protected					0.974			0.984			0.971	
Satd. Flow (prot)	0	1835	0	0	1843	0	0	1701	0	0	1745	0
Flt Permitted					0.974			0.984			0.971	
Satd. Flow (perm)	0	1835	0	0	1843	0	0	1701	0	0	1745	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		410.2			348.1			324.2			49.4	
Travel Time (s)		29.5			25.1			23.3			3.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1	149	51	50	42	3	29	2	61	3	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	201	0	0	95	0	0	92	0	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

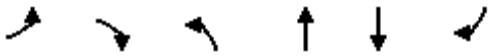
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 30.1%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	137	47	46	39	3	27	2	56	3	0	2
Future Volume (Veh/h)	1	137	47	46	39	3	27	2	56	3	0	2
Sign Control		Free			Free			Stop			Stop	
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	149	51	50	42	3	29	2	61	3	0	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	45			200			322	322	174	382	346	44
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	45			200			322	322	174	382	346	44
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			95	100	93	99	100	100
cM capacity (veh/h)	1576			1384			616	577	874	523	559	1032

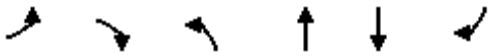
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	201	95	92	5
Volume Left	1	50	29	3
Volume Right	51	3	61	2
cSH	1576	1384	764	651
Volume to Capacity	0.00	0.04	0.12	0.01
Queue Length 95th (m)	0.0	0.9	3.3	0.2
Control Delay (s)	0.0	4.2	10.4	10.6
Lane LOS	A	A	B	B
Approach Delay (s)	0.0	4.2	10.4	10.6
Approach LOS			B	B

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	30.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	9	2	10	63	77	9
Future Volume (vph)	9	2	10	63	77	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.977				0.986	
Flt Protected	0.960			0.993		
Satd. Flow (prot)	1747	0	0	1850	1837	0
Flt Permitted	0.960			0.993		
Satd. Flow (perm)	1747	0	0	1850	1837	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	113.4			139.0	140.2	
Travel Time (s)	8.2			10.0	10.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	2	11	68	84	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	79	94	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

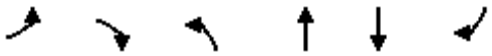
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 20.5%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	2	10	63	77	9
Future Volume (Veh/h)	9	2	10	63	77	9
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)	10	2	11	68	84	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	179	89	94			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	179	89	94			
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)	805	969	1500			

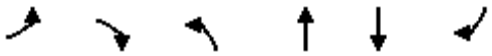
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	12	79	94
Volume Left	10	11	0
Volume Right	2	0	10
cSH	828	1500	1700
Volume to Capacity	0.01	0.01	0.06
Queue Length 95th (m)	0.4	0.2	0.0
Control Delay (s)	9.4	1.1	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	1.1	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	20.5%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	12	3	7	65	83	11
Future Volume (vph)	12	3	7	65	83	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.975				0.984	
Flt Protected	0.961			0.995		
Satd. Flow (prot)	1780	0	0	1857	1870	0
Flt Permitted	0.961			0.995		
Satd. Flow (perm)	1780	0	0	1857	1870	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	111.5			140.2	324.2	
Travel Time (s)	8.0			10.1	23.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%
Adj. Flow (vph)	13	3	8	71	90	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	16	0	0	79	102	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

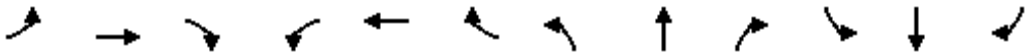
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 19.3%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	12	3	7	65	83	11
Future Volume (Veh/h)	12	3	7	65	83	11
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)	13	3	8	71	90	12
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	183	96	102			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	183	96	102			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	99			
cM capacity (veh/h)	807	966	1503			

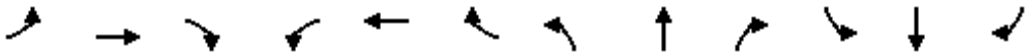
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	16	79	102
Volume Left	13	8	0
Volume Right	3	0	12
cSH	832	1503	1700
Volume to Capacity	0.02	0.01	0.06
Queue Length 95th (m)	0.5	0.1	0.0
Control Delay (s)	9.4	0.8	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	0.8	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	19.3%	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)	1	23	15	29	54	1	46	2	47	9	1	6
Future Volume (vph)	1	23	15	29	54	1	46	2	47	9	1	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.949			0.999			0.933			0.947	
Flt Protected		0.999			0.983			0.976			0.973	
Satd. Flow (prot)	0	1801	0	0	1811	0	0	1656	0	0	1370	0
Flt Permitted		0.999			0.983			0.976			0.973	
Satd. Flow (perm)	0	1801	0	0	1811	0	0	1656	0	0	1370	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		410.2			348.1			324.2			49.4	
Travel Time (s)		29.5			25.1			23.3			3.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	5%	2%	0%	0%	0%	9%	50%	0%	0%
Adj. Flow (vph)	1	25	16	32	59	1	50	2	51	10	1	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	0	92	0	0	103	0	0	18	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

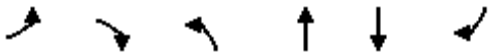
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 24.3%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	23	15	29	54	1	46	2	47	9	1	6
Future Volume (Veh/h)	1	23	15	29	54	1	46	2	47	9	1	6
Sign Control		Free			Free			Stop			Stop	
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	25	16	32	59	1	50	2	51	10	1	7
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	60			41			166	159	33	210	166	60
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	60			41			166	159	33	210	166	60
tC, single (s)	4.1			4.1			7.1	6.5	6.3	7.6	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	4.0	4.0	3.3
p0 queue free %	100			98			94	100	95	98	100	99
cM capacity (veh/h)	1556			1549			783	721	1021	610	714	1012

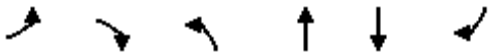
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	42	92	103	18
Volume Left	1	32	50	10
Volume Right	16	1	51	7
cSH	1556	1549	884	729
Volume to Capacity	0.00	0.02	0.12	0.02
Queue Length 95th (m)	0.0	0.5	3.2	0.6
Control Delay (s)	0.2	2.7	9.6	10.1
Lane LOS	A	A	A	B
Approach Delay (s)	0.2	2.7	9.6	10.1
Approach LOS			A	B

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	24.3%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	13	14	2	79	44	7
Future Volume (vph)	13	14	2	79	44	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.930				0.981	
Flt Protected	0.976			0.999		
Satd. Flow (prot)	1691	0	0	1861	1827	0
Flt Permitted	0.976			0.999		
Satd. Flow (perm)	1691	0	0	1861	1827	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	113.4			139.0	140.2	
Travel Time (s)	8.2			10.0	10.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	15	2	86	48	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	29	0	0	88	56	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

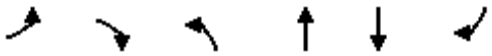
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 15.8%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	14	2	79	44	7
Future Volume (Veh/h)	13	14	2	79	44	7
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)	14	15	2	86	48	8
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	142	52	56			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	142	52	56			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	100			
cM capacity (veh/h)	850	1016	1549			

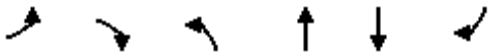
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	29	88	56
Volume Left	14	2	0
Volume Right	15	0	8
cSH	928	1549	1700
Volume to Capacity	0.03	0.00	0.03
Queue Length 95th (m)	0.8	0.0	0.0
Control Delay (s)	9.0	0.2	0.0
Lane LOS	A	A	
Approach Delay (s)	9.0	0.2	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	15.8%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	9	7	7	85	43	3
Future Volume (vph)	9	7	7	85	43	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.940				0.992	
Flt Protected	0.973			0.996		
Satd. Flow (prot)	1738	0	0	1809	1833	0
Flt Permitted	0.973			0.996		
Satd. Flow (perm)	1738	0	0	1809	1833	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	111.5			140.2	324.2	
Travel Time (s)	8.0			10.1	23.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	5%	3%	0%
Adj. Flow (vph)	10	8	8	92	47	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	0	0	100	50	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

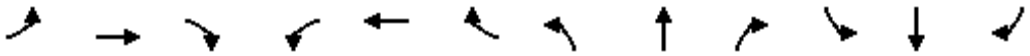
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 20.3%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	7	7	85	43	3
Future Volume (Veh/h)	9	7	7	85	43	3
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)	10	8	8	92	47	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	156	48	50			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	156	48	50			
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	99	99			
cM capacity (veh/h)	835	1026	1570			

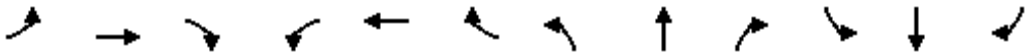
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	18	100	50
Volume Left	10	8	0
Volume Right	8	0	3
cSH	910	1570	1700
Volume to Capacity	0.02	0.01	0.03
Queue Length 95th (m)	0.5	0.1	0.0
Control Delay (s)	9.0	0.6	0.0
Lane LOS	A	A	
Approach Delay (s)	9.0	0.6	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	20.3%	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)	1	137	47	46	39	3	27	2	56	3	0	2
Future Volume (vph)	1	137	47	46	39	3	27	2	56	3	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.966			0.996			0.910			0.946	
Flt Protected					0.974			0.984			0.971	
Satd. Flow (prot)	0	1835	0	0	1843	0	0	1701	0	0	1745	0
Flt Permitted					0.974			0.984			0.971	
Satd. Flow (perm)	0	1835	0	0	1843	0	0	1701	0	0	1745	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		410.2			348.1			324.2			49.4	
Travel Time (s)		29.5			25.1			23.3			3.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1	149	51	50	42	3	29	2	61	3	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	201	0	0	95	0	0	92	0	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

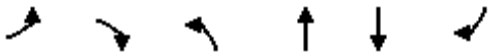
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 30.1%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	137	47	46	39	3	27	2	56	3	0	2
Future Volume (Veh/h)	1	137	47	46	39	3	27	2	56	3	0	2
Sign Control		Free			Free			Stop			Stop	
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	149	51	50	42	3	29	2	61	3	0	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	45			200			322	322	174	382	346	44
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	45			200			322	322	174	382	346	44
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			95	100	93	99	100	100
cM capacity (veh/h)	1576			1384			616	577	874	523	559	1032

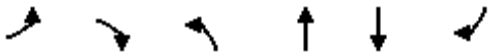
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	201	95	92	5
Volume Left	1	50	29	3
Volume Right	51	3	61	2
cSH	1576	1384	764	651
Volume to Capacity	0.00	0.04	0.12	0.01
Queue Length 95th (m)	0.0	0.9	3.3	0.2
Control Delay (s)	0.0	4.2	10.4	10.6
Lane LOS	A	A	B	B
Approach Delay (s)	0.0	4.2	10.4	10.6
Approach LOS			B	B

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	30.1%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	11	3	13	60	76	11
Future Volume (vph)	11	3	13	60	76	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.973				0.983	
Flt Protected	0.962			0.991		
Satd. Flow (prot)	1744	0	0	1846	1831	0
Flt Permitted	0.962			0.991		
Satd. Flow (perm)	1744	0	0	1846	1831	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	113.4			139.0	140.2	
Travel Time (s)	8.2			10.0	10.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	3	14	65	83	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	15	0	0	79	95	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

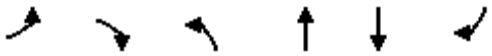
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 20.5%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	3	13	60	76	11
Future Volume (Veh/h)	11	3	13	60	76	11
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	3	14	65	83	12
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	182	89	95			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	182	89	95			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	99			
cM capacity (veh/h)	800	969	1499			

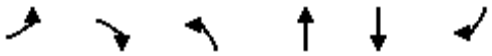
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	15	79	95
Volume Left	12	14	0
Volume Right	3	0	12
cSH	829	1499	1700
Volume to Capacity	0.02	0.01	0.06
Queue Length 95th (m)	0.4	0.2	0.0
Control Delay (s)	9.4	1.4	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	1.4	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	20.5%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	2	4	67	85	9
Future Volume (vph)	10	2	4	67	85	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.979				0.987	
Flt Protected	0.959			0.997		
Satd. Flow (prot)	1784	0	0	1859	1875	0
Flt Permitted	0.959			0.997		
Satd. Flow (perm)	1784	0	0	1859	1875	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	111.5			140.2	324.2	
Travel Time (s)	8.0			10.1	23.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%
Adj. Flow (vph)	11	2	4	73	92	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	0	0	77	102	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 16.8%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	2	4	67	85	9
Future Volume (Veh/h)	10	2	4	67	85	9
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)	11	2	4	73	92	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	178	97	102			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	178	97	102			
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	100			
cM capacity (veh/h)	814	965	1503			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	13	77	102
Volume Left	11	4	0
Volume Right	2	0	10
cSH	834	1503	1700
Volume to Capacity	0.02	0.00	0.06
Queue Length 95th (m)	0.4	0.1	0.0
Control Delay (s)	9.4	0.4	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	0.4	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	16.8%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX G

TTS Data

Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8	Column9	Column10	Column11	Column12	Column13	Column14	Column15	Column16	Column17	Column18	Column19	Column20	Column21	Column22	Column23	Column24
Thu Dec 08 2022 09:14:16 GMT-0500 (Eastern Standard Time) - Run Time: 2892ms																							
Cross Tabulation Query Form - Trip - 2016 v1.1																							
Row: 2006 GTA zone of origin - gta06_orig																							
Column: Planning district of destination - pd_dest																							
Filters:																							
(2006 GTA zone of origin - gta06_orig In 1034																							
and																							
Primary travel mode of trip - mode_prime In D	M																						
and																							
Start time of trip - start_time In 600-900																							
and																							
2006 GTA zone of household - gta06_hhld In 1034)																							
Trip 2016																							
Table:																							
	PD 1 of Toronto	PD 2 of Toronto	PD 4 of Toronto	PD 5 of Toronto	PD 6 of Toronto	PD 9 of Toronto	PD 10 of Toronto	PD 11 of Toronto	PD 12 of Toronto	PD 13 of Toronto	PD 14 of Toronto	PD 15 of Toronto	PD 16 of Toronto	Pickering	Ajax	Whitby	Oshawa	Aurora	Richmond Hill	Whitchurch-Stouffville	Markham	Brampton	Mississauga
1034	142	46	44	6	9	23	10	31	107	159	23	131	172	474	125	84	70	8	34	13	189	46	13

Column1	Column2	Column3	Column4	Column5	Column6
Thu Dec 08 2022 09:24:58 GMT-0500 (Eastern Standard Time) - Run Time: 2581ms					
Cross Tabulation Query Form - Trip - 2016 v1.1					
Row: 2006 GTA zone of destination - gta06_dest					
Column: Planning district of origin - pd_orig					
Filters:					
(2006 GTA zone of destination - gta06_dest In 1034					
and					
Primary travel mode of trip - mode_prime In D	M				
and					
Start time of trip - start_time In 600-900					
and					
2006 GTA zone of household - gta06_hhld In 1034)					
Trip 2016					
Table:					
	PD 3 of Toronto	PD 4 of Toronto	Pickering	Oshawa	Markham
1034	45	22	277	10	30

Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8	Column9	Column10	Column11	Column12	Column13	Column14	Column15	Column16	Column17	Column18	Column19	Column20	Column21	Column22	Column23
Thu Dec 08 2022 09:27:57 GMT-0500 (Eastern Standard Time) - Run Time: 3092ms																						
Cross Tabulation Query Form - Trip - 2016 v1.1																						
Row: 2006 GTA zone of destination - gta06_dest																						
Column: Planning district of origin - pd_orig																						
Filters:																						
(2006 GTA zone of destination - gta06_dest In 1034																						
and																						
Primary travel mode of trip - mode_prime In D	M																					
and																						
Start time of trip - start_time In 1600-1900																						
and																						
2006 GTA zone of household - gta06_hhld In 1034)																						
Trip 2016																						
Table:																						
	PD 1 of Toronto	PD 2 of Toronto	PD 3 of Toronto	PD 4 of Toronto	PD 5 of Toronto	PD 6 of Toronto	PD 9 of Toronto	PD 11 of Toronto	PD 12 of Toronto	PD 13 of Toronto	PD 14 of Toronto	PD 15 of Toronto	PD 16 of Toronto	Pickering	Ajax	Whitby	Oshawa	Aurora	Richmond Hill	Whitchurch-Stouffville	Markham	Brampton
1034	142	32	15	13	24	9	10	48	38	181	11	64	266	412	117	44	90	8	34	13	158	27

Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8
Thu Dec 08 2022 09:19:52 GMT-0500 (Eastern Standard Time) - Run Time: 2551ms							
Cross Tabulation Query Form - Trip - 2016 v1.1							
Row: 2006 GTA zone of origin - gta06_orig							
Column: Planning district of destination - pd_dest							
Filters:							
(2006 GTA zone of origin - gta06_orig In 1034							
and							
Primary travel mode of trip - mode_prime In D	M						
and							
Start time of trip - start_time In 1600-1900							
and							
2006 GTA zone of household - gta06_hhld In 1034)							
Trip 2016							
Table:							
	PD 3 of Toronto	PD 13 of Toronto	PD 15 of Toronto	PD 16 of Toronto	Pickering	Ajax	Unknown
1034	15	23	19	67	297	72	13

APPENDIX H

Signal Warrant and Auxiliary Turn Lane Assessment

Input Data Sheet

Analysis Sheet | Results Sheet | Proposed Collision

GO TO Justification:

What are the intersecting roadways? Finch Avenue & Woodview Avenue/Nature Haven Crescent

What is the direction of the Main Road street? East-West

When was the data collected? 2027

Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road? 1

b.- Number of lanes on the Minor Road? 1

c.- How many approaches? 4

d.- What is the operating environment? Urban **Population >= 10,000 AND Speed < 70 km/hr**

e.- What is the eight hour vehicle volume at the intersection? (Please fill in table below)

Hour Ending	Main Eastbound Approach			Minor Northbound Approach			Main Westbound Approach			Minor Southbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:00	1	40	16	18	1	26	19	23	1	3	0	2	0
8:00	1	40	16	18	1	26	19	23	1	3	0	2	0
9:00	1	40	16	18	1	26	19	23	1	3	0	2	0
12:00	1	40	16	18	1	26	19	23	1	3	0	2	0
13:00	1	40	16	18	1	26	19	23	1	3	0	2	0
16:00	1	40	16	18	1	26	19	23	1	3	0	2	0
17:00	1	40	16	18	1	26	19	23	1	3	0	2	0
18:00	1	40	16	18	1	26	19	23	1	3	0	2	0
Total	**8**	**320**	**128**	**144**	**8**	**208**	**152**	**184**	**8**	**24**	**0**	**16**	**0**

Justification 5: Collision Experience

Preceding Months	Number of Collisions*
1-12	0
13-24	0
25-36	0

* Include only collisions that are susceptable to correction through the installation of traffic signal control

Justification 6: Pedestrian Volume

a.- Please fill in table below summarizing total pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	10,000	5	10	5	0	0	0	0	
Factored 8 hour pedestrian volume	20,005		25		0		0		
% Assigned to crossing rate	23%		34%		30%		100%		
Net 8 Hour Pedestrian Volume at Crossing									4,610
Net 8 Hour Vehicular Volume on Street Being Crossed									2,000

b.- Please fill in table below summarizing delay to pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	10,000	5	10	5	0	0	0	0	
Total 8 hour pedestrians delayed greater than 10 seconds	10	10	1	6	2	4	0	0	
Factored volume of total pedestrians	20,005		25		0		0		
Factored volume of delayed pedestrians	30		8		8		0		
% Assigned to Crossing Rate	23%		34%		30%		100%		
Net 8 Hour Volume of Total Pedestrians									4,610
Net 8 Hour Volume of Delayed Pedestrians									12

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

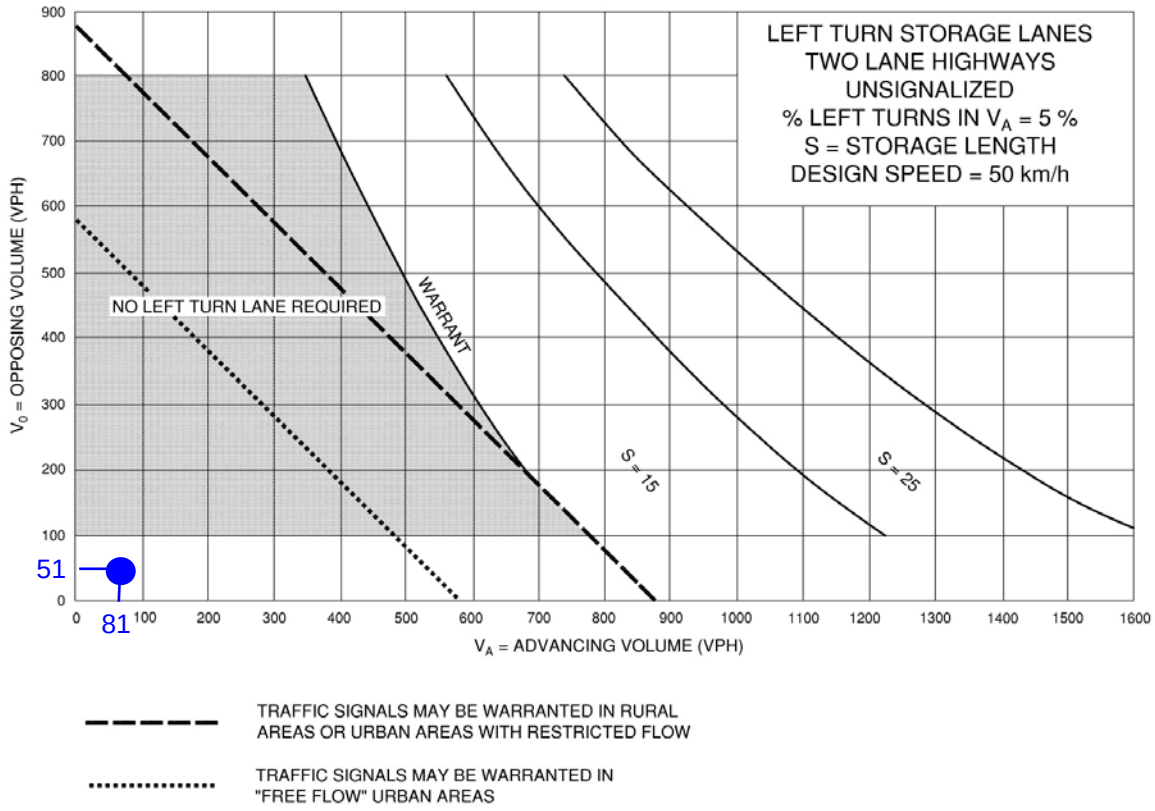
Intersection: Finch Avenue & Woodview Avenue/Nature Haven Cr Count Date: 2027

Summary Results

Justification			Compliance		Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	21	%	☐	☑
	B	Crossing Volume	29	%		
2. Delay to Cross Traffic	A	Main Road	14	%	☐	☑
	B	Crossing Road	29	%		
3. Combination	A	Justificaton 1	21	%	☐	☑
	B	Justification 2	14	%		
4. 4-Hr Volume			9	%	☐	☑
5. Collision Experience			0	%	☐	☑
6. Pedestrians	A	Volume	Justification met		☐	☑
	B	Delay	Justification not met			

Northbound Left Turn Lane at Intersection of Street A and Woodview Avenue (2027 AM peak Hour)

Exhibit 9A-2



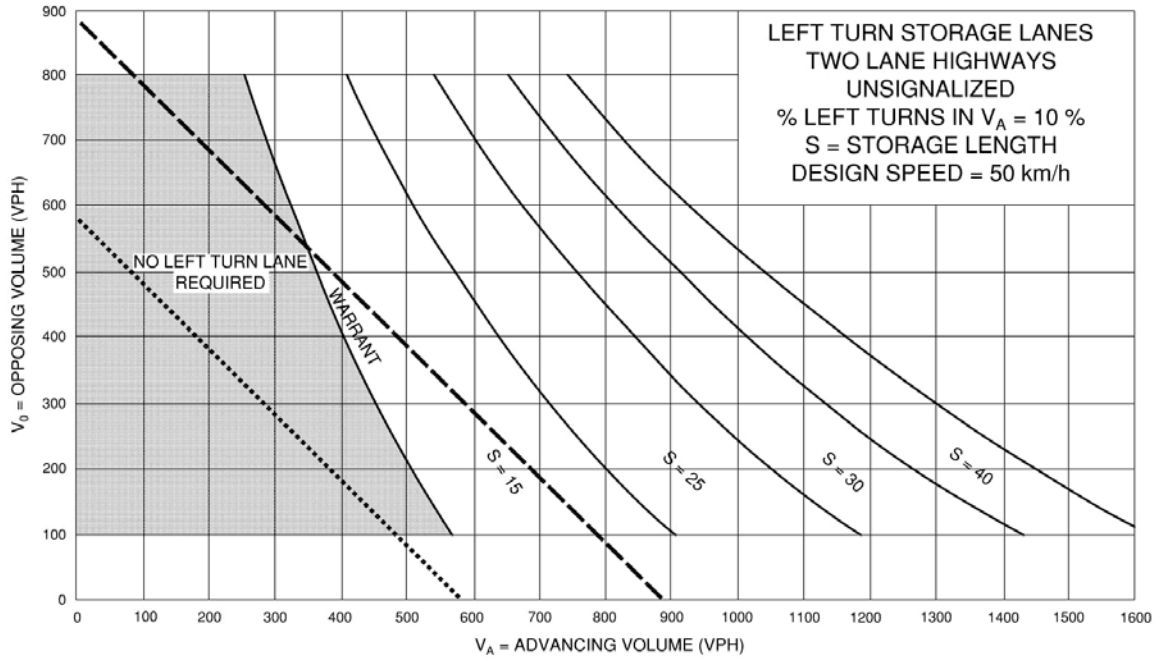
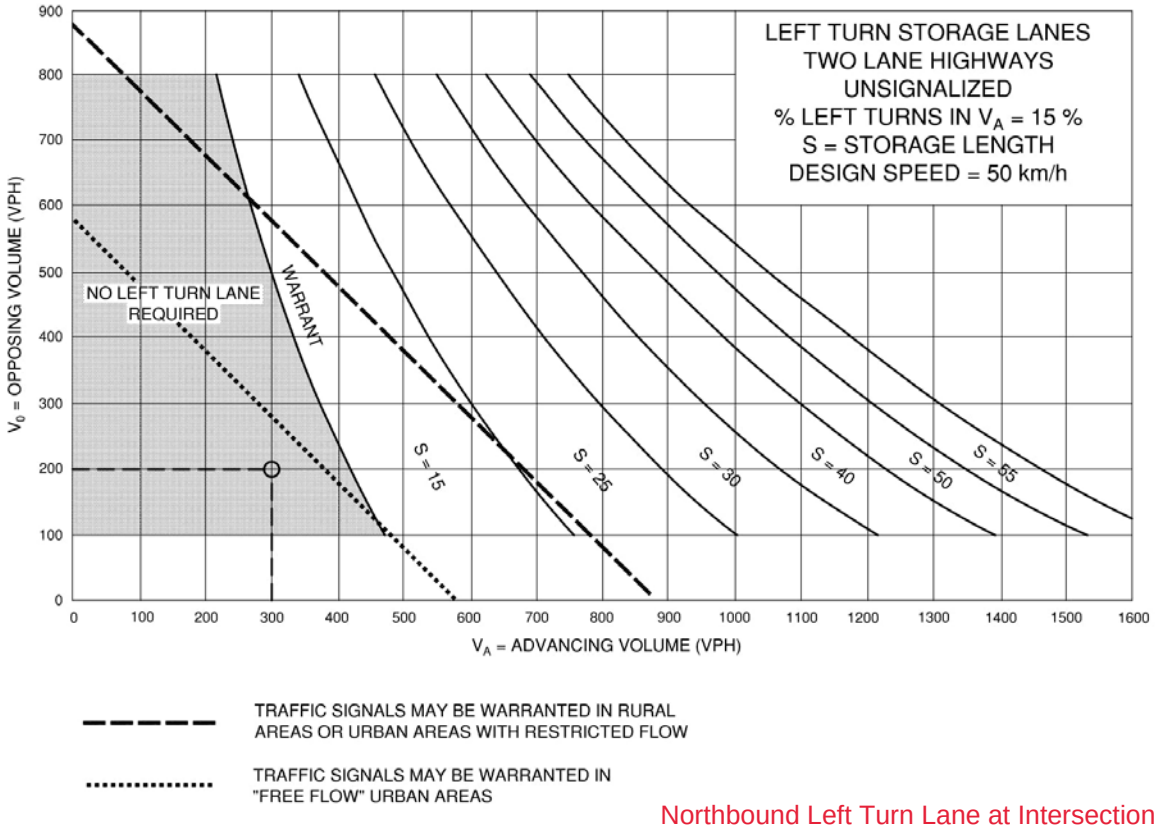
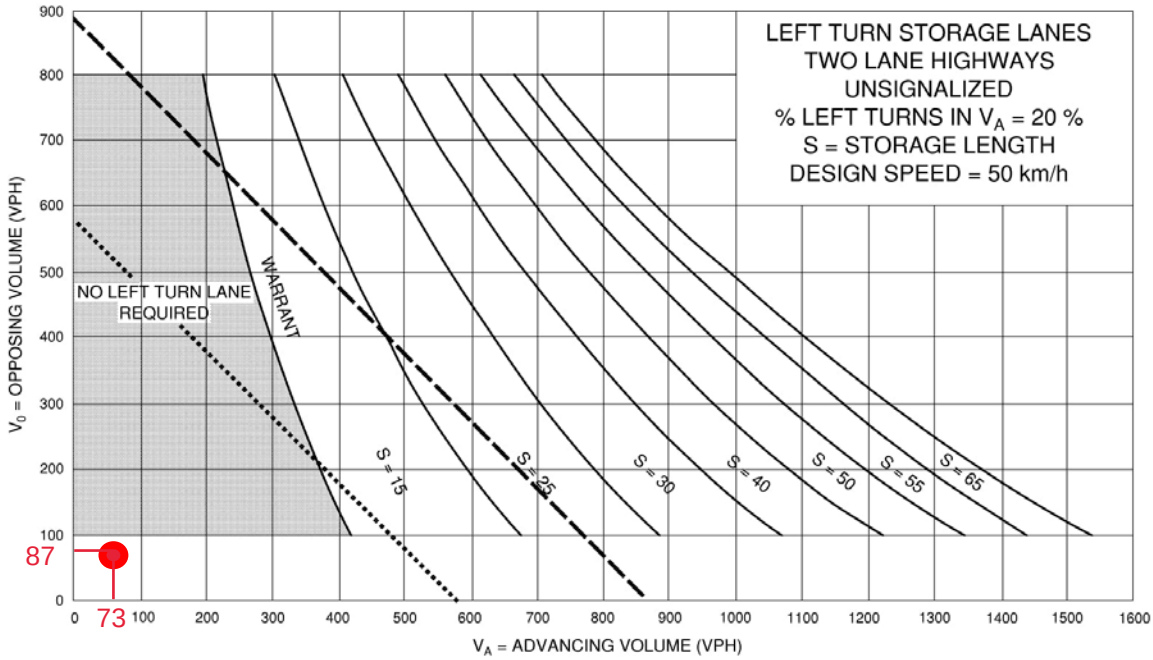


Exhibit 9A-3

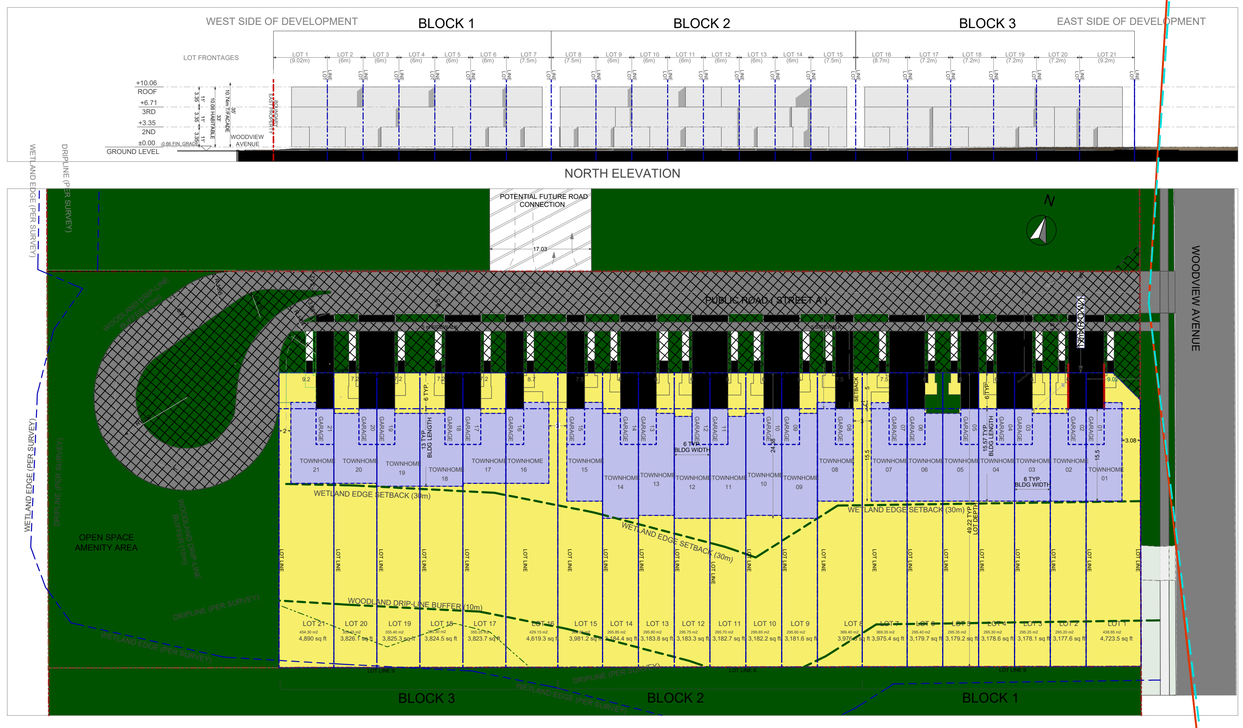


Northbound Left Turn Lane at Intersection of Street A and Woodview Avenue (2027 PM peak Hour)



APPENDIX I

Sight Distance Assessment Drawings



AVAILABLE SIGHT DISTANCE: 100m+

REQUIRED SIGHT DISTANCE: 95m

REQUIRED SIGHT DISTANCE: 105m

AVAILABLE SIGHT DISTANCE: 110m+

N

FOR REVIEW

NOT TO BE USED FOR CONSTRUCTION

LEGEND:

AVAILABLE SIGHT DISTANCE

REQUIRED SIGHT DISTANCE

10 0m 10 20 30 40

SCALE: 1:500

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR SUBMISSION	01/09/2023

Project

1942 WOODVIEW AVENUE
CITY OF PICKERING

Drawing

SIGHT DISTANCE ASSESSMENT

CROZIER CONSULTING ENGINEERS
211 YONGE STREET
SUITE 600
TORONTO, ON, M5B 1M4
416.477.3392 T
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

Drawn By	Design By	Project
R.L.	R.L.	2417-6623
Check By	Check By	Scale / Drawing
M.I.		1:500 / S-01

Figures

1942 WOODVIEW AVENUE

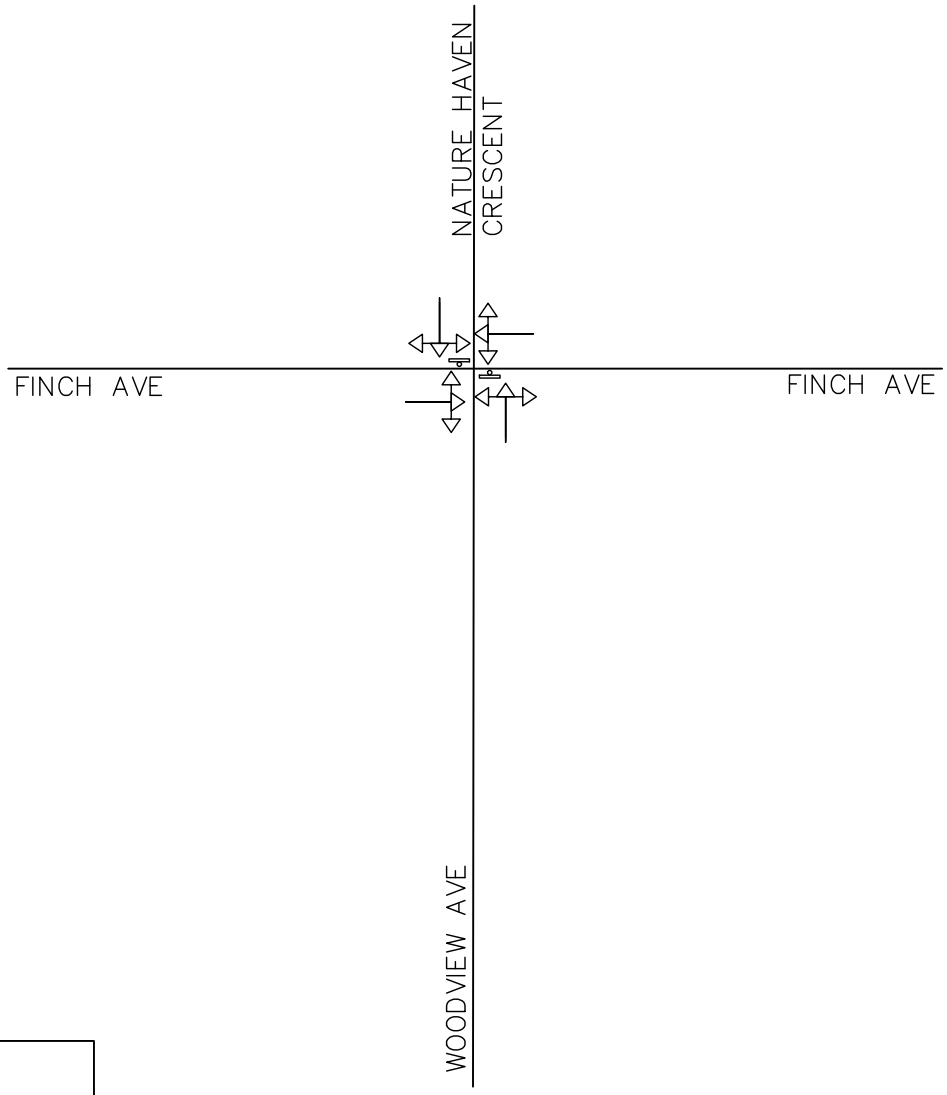
SITE LOCATION

CROZIER
CONSULTING ENGINEERS

211 YONGE STREET
SUITE 600
TORONTO, ON M5B 1M4
416-477-3392 T
WWW.CFCROZIER.CA

Drawn	Design	Project No.	
I.A	I.A		2417-6623
Date	Check	Scale	Dwg.
2023/01/05	M.I	N.T.S	FIG 1

NOTE:
THIS FIGURE IS SCHEMATIC ONLY AND IS NOT TO BE SCALED.



LEGEND:

- SIGNAL CONTROL
- STOP CONTROL
- YEILD CONTROL
- ROUND ABOUT
- AM(PM) WEEKDAY AM(PM) TRAFFIC VOLUMES

1942 WOODVIEW AVENUE

BOUNDARY ROAD NETWORK

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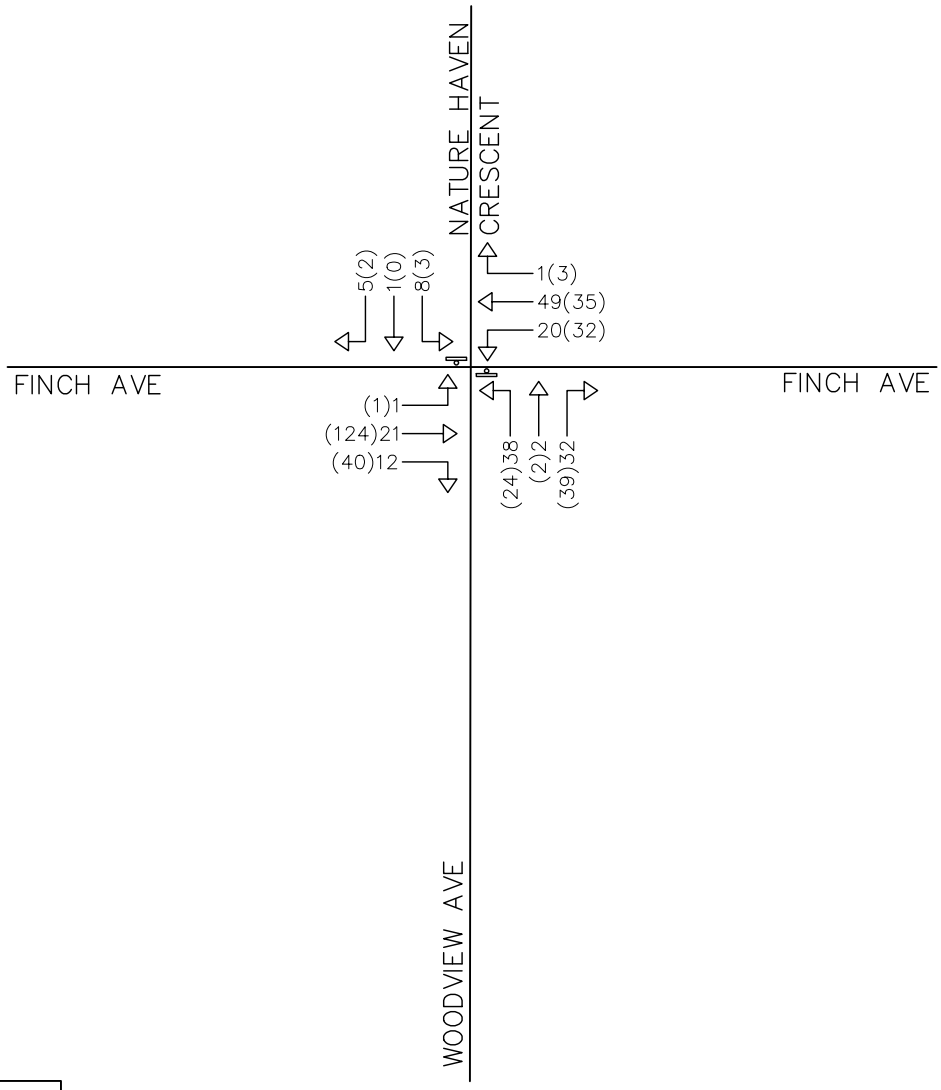
Drawn	Design	Project No.	
I.A	I.A		2417-6623
Date	Check	Scale	Dwg.
2023/01/05	M.I	N.T.S	FIG 2

NOTE:
THIS FIGURE IS SCHEMATIC ONLY AND IS NOT TO BE SCALED.



LEGEND:

- SIGNAL CONTROL
- STOP CONTROL
- YEILD CONTROL
- ROUND ABOUT
- AM(PM) WEEKDAY AM(PM) TRAFFIC VOLUMES

1942 WOODVIEW AVENUE

2022 EXISTING TRAFFIC VOLUMES

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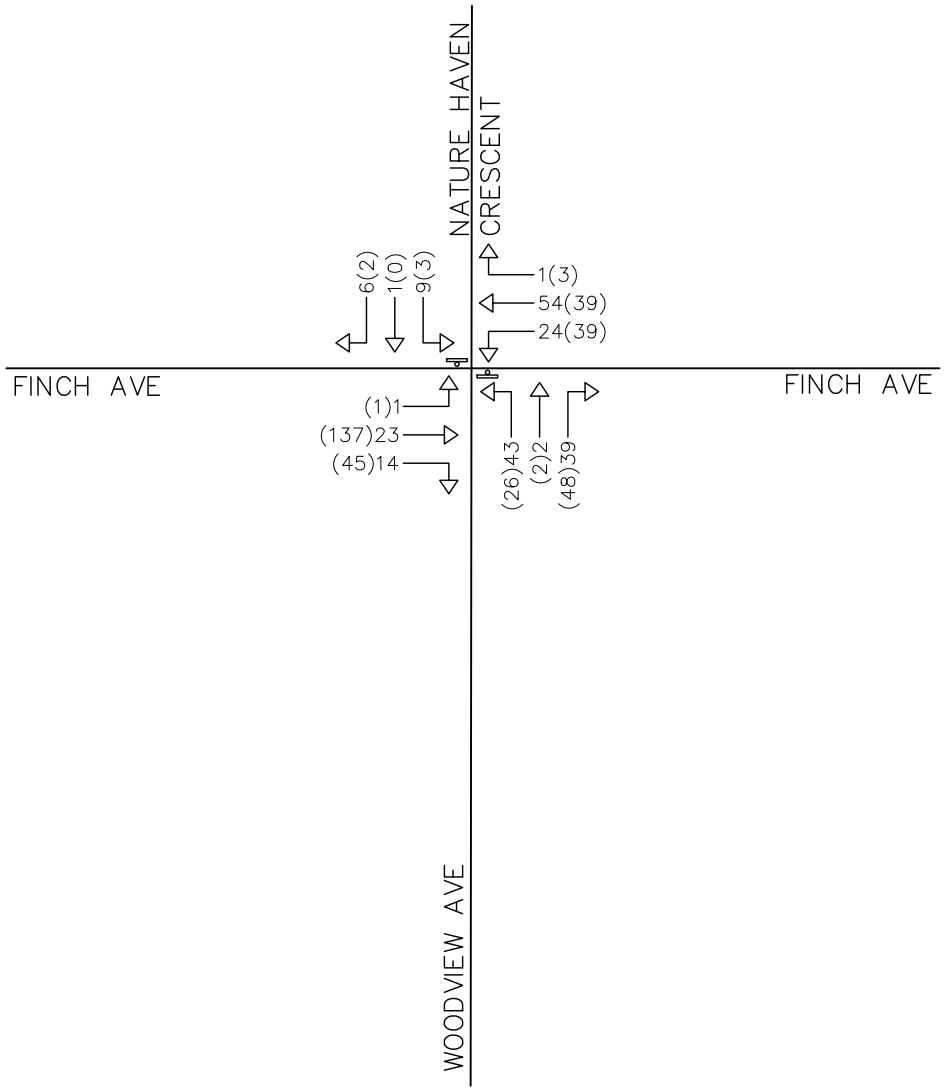
Drawn	Design	Project No.	
I.A	I.A		2417-6623
Date	Check	Scale	Dwg.
2023/01/05	M.I	N.T.S	FIG 3

NOTE:
THIS FIGURE IS SCHEMATIC ONLY AND IS NOT TO BE SCALED.



LEGEND:

- SIGNAL CONTROL
- STOP CONTROL
- YEILD CONTROL
- ROUND ABOUT
- AM(PM) WEEKDAY AM(PM) TRAFFIC VOLUMES

1942 WOODVIEW AVENUE

2027 FUTURE BACKGROUND TRAFFIC VOLUMES

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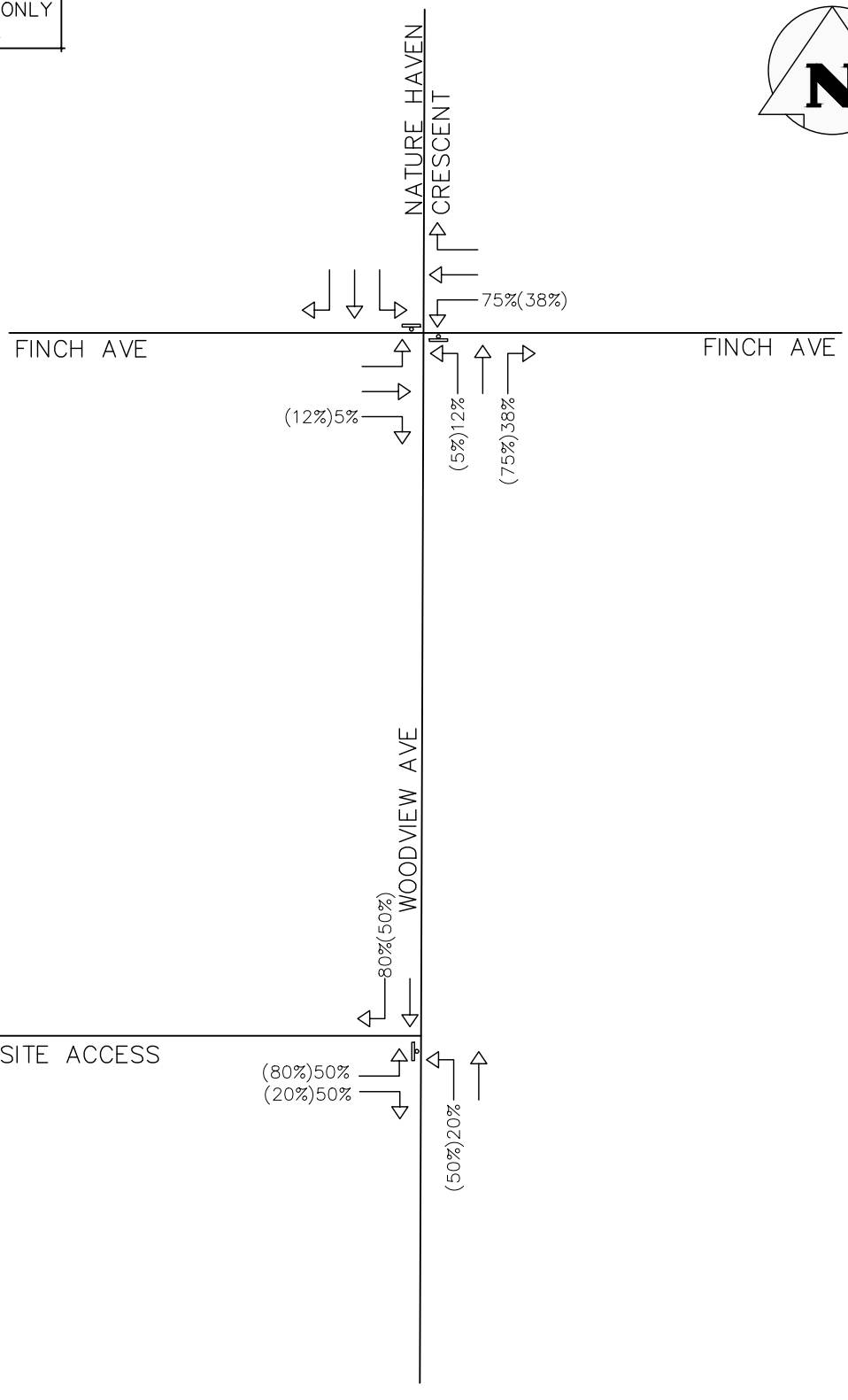
Drawn	Design	Project No.	
I.A	I.A		2417-6623
Date	Check	Scale	Dwg.
2023/01/05	M.I	N.T.S	FIG 4

NOTE:
THIS FIGURE IS SCHEMATIC ONLY AND IS NOT TO BE SCALED.



LEGEND:

- SIGNAL CONTROL
- STOP CONTROL
- YEILD CONTROL
- ROUND ABOUT
- AM(PM) WEEKDAY AM(PM) TRAFFIC VOLUMES

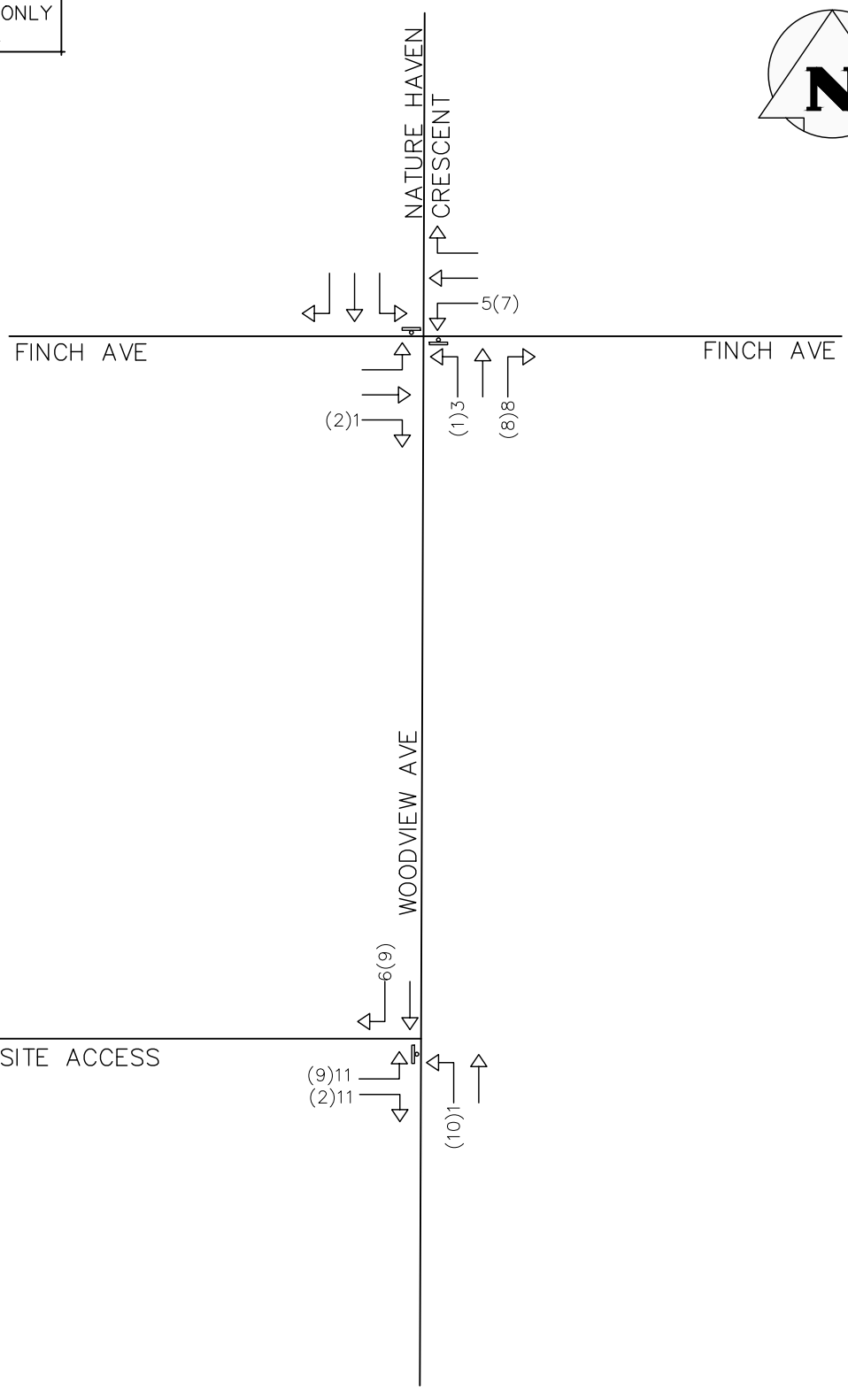
1942 WOODVIEW AVENUE

TRIP DISTRIBUTION

CROZIER CONSULTING ENGINEERS
211 YONGE STREET
SUITE 600
TORONTO, ON M5B 1M4
416-477-3392 T
WWW.CFCROZIER.CA

Drawn	Design	Project No.	
I.A	I.A		2417-6623
Date	Check	Scale	Dwg.
2023/01/05	M.I	N.T.S	FIG 5

NOTE:
THIS FIGURE IS SCHEMATIC ONLY AND IS NOT TO BE SCALED.



LEGEND:

- SIGNAL CONTROL
- STOP CONTROL
- YEILD CONTROL
- ROUND ABOUT
- AM(PM) WEEKDAY AM(PM) TRAFFIC VOLUMES

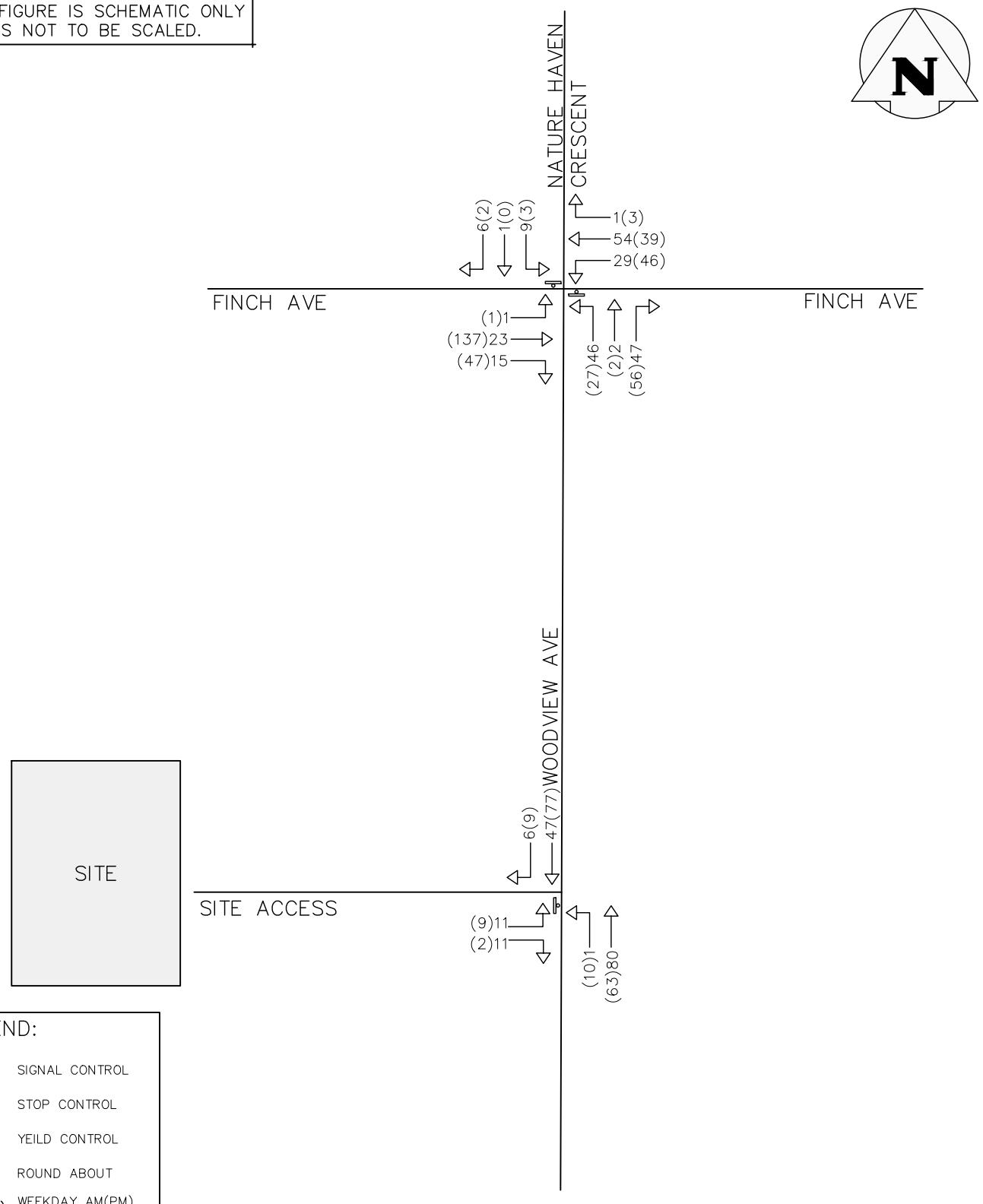
1942 WOODVIEW AVENUE

TRIP ASSIGNMENT

CROZIER CONSULTING ENGINEERS
211 YONGE STREET
SUITE 600
TORONTO, ON M5B 1M4
416-477-3392 T
WWW.CFCROZIER.CA

Drawn	Design	Project No.	
I.A	I.A		2417-6623
Date	Check	Scale	Dwg.
2023/01/05	M.I	N.T.S	FIG 6

NOTE:
THIS FIGURE IS SCHEMATIC ONLY AND IS NOT TO BE SCALED.



LEGEND:

- SIGNAL CONTROL
- STOP CONTROL
- YEILD CONTROL
- ROUND ABOUT
- AM(PM) WEEKDAY AM(PM) TRAFFIC VOLUMES

1942 WOODVIEW AVENUE

2027 TOTAL TRAFFIC VOLUMES

CROZIER CONSULTING ENGINEERS
211 YONGE STREET
SUITE 600
TORONTO, ON M5B 1M4
416-477-3392 T
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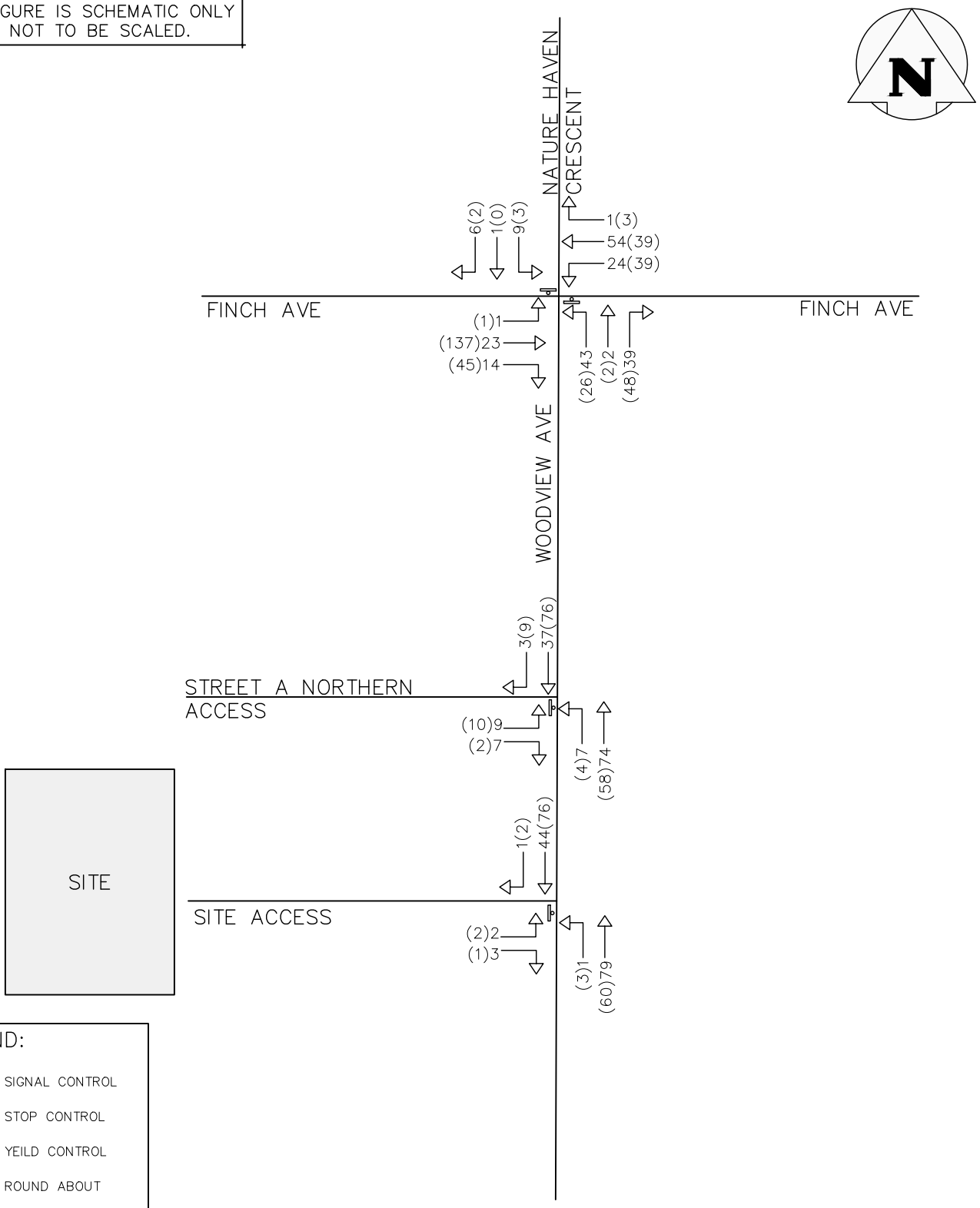
Drawn	Design	Project No.	
I.A	I.A		2417-6623
Date	Check	Scale	Dwg.
2023/01/05	M.I	N.T.S	FIG 7

NOTE:
THIS FIGURE IS SCHEMATIC ONLY AND IS NOT TO BE SCALED.



LEGEND:

- SIGNAL CONTROL
- STOP CONTROL
- YEILD CONTROL
- ROUND ABOUT
- AM(PM) WEEKDAY AM(PM) TRAFFIC VOLUMES

1942 WOODVIEW AVENUE

2027 FUTURE BACKGROUND TRAFFIC VOLUMES SENSITIVITY ANALYSIS

CROZIER CONSULTING ENGINEERS
211 YONGE STREET
SUITE 600
TORONTO, ON M5B 1M4
416-477-3392 T
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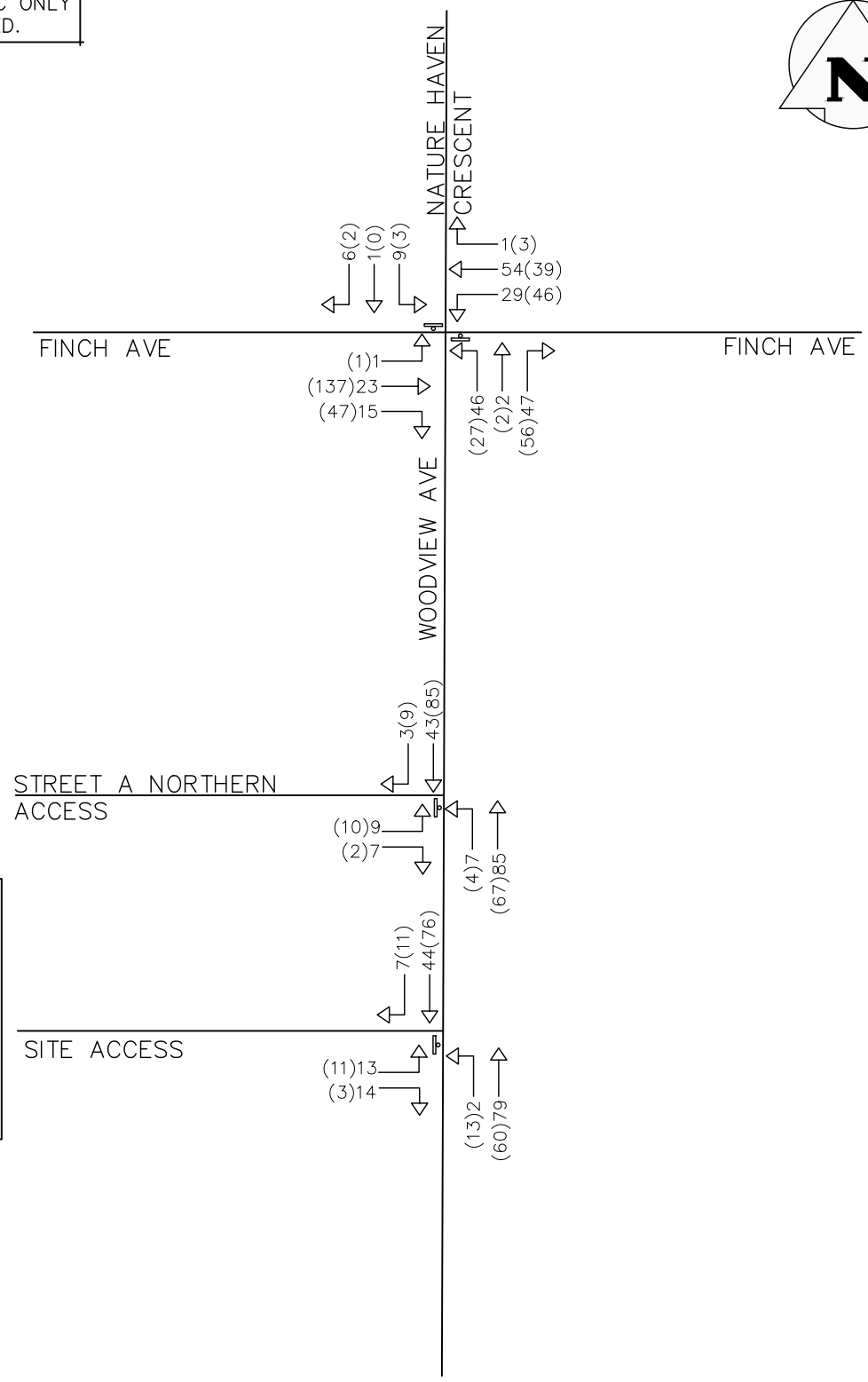
Drawn	Design	Project No.	
I.A	I.A		2417-6623
Date	Check	Scale	Dwg.
2023/01/05	M.I	N.T.S	FIG 8

NOTE:
THIS FIGURE IS SCHEMATIC ONLY AND IS NOT TO BE SCALED.



LEGEND:

- SIGNAL CONTROL
- STOP CONTROL
- YEILD CONTROL
- ROUND ABOUT
- AM(PM) WEEKDAY AM(PM) TRAFFIC VOLUMES

1942 WOODVIEW AVENUE

2027 TOTAL TRAFFIC VOLUMES SENSITIVITY ANALYSIS

CROZIER CONSULTING ENGINEERS
211 YONGE STREET
SUITE 600
TORONTO, ON M5B 1M4
416-477-3392 T
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Drawn	Design	Project No.	
I.A	I.A		2417-6623
Date	Check	Scale	Dwg.
2023/01/05	M.I	N.T.S	FIG 9