TRANSPORTATION IMPACT STUDY

DUNDALK SOUTHEAST
ECO PARK

TOWNSHIP OF SOUTHGATE
GREY COUNTY

PREPARED FOR:

FLATO DEVELOPMENTS INC.

PREPARED BY:

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OCTOBER 2024

CFCA FILE NO. 1060-6489

CROZIER

Revision Number	Date	Comments
Rev.1	October 2024	TIS First Submission

Executive Summary

C.F. Crozier & Associates Inc. (Crozier) was retained by Flato Developments Inc. (Flato) to complete a Transportation (Traffic) Impact Study (TIS) to analyze the proposed mixed-use development at Highway 10 and Side Road 240 (the 'Site') in Dundalk, Township of Southgate (the 'Township'). The assessment includes a review and analysis of the proposed Eco Park Way extension to Highway 10.

Per the Draft Plan prepared by MHBC Planning, dated October 9, 2024, the proposed development includes the Eco Park Way extension to Highway 10 through 17.96 ha of industrial area, 8.93 ha of commercial area and a residential area. The residential area proposes 138 apartment units, 154 townhouse units and 191 single-detached units.

As confirmed in the Terms of Reference, this Transportation Impact Study considers the following future intersections:

- Highway 10 and Milliner Avenue
- Highway 10 and Eco Park Way / Sideroad 240

Existing Conditions

The existing traffic volumes used for the analysis were established based on data collected at the intersection of Highway 10 and Sideroad 240. The study road network is operating acceptably under existing conditions with a Level of Service 'B' and a maximum delay of 12.5 s (WB) in the p.m. peak hour.

Future Background Conditions

A growth rate of 0.89 percent compounded annually was calculated for the Annual Average Daily Traffic (AADT) between 2010 and 2019. For the purpose of a conservative analysis, and to be consistent with the previous submissions of the TIS, a growth rate of 1.5 percent compounded annually was applied to all movements on the boundary road network.

A number of background developments were considered to reach full build-out by 2034. These developments have a combined total of 1,301 residential units and include commercial, institutional and industrial uses. These developments include:

- Edgewood Greens Phases 1-11
- Glenelg Phases 1-3
- White Rose Development
- Dundalk Northwest
- Dundalk Northeast
- Town Industrial Lands

It is noted that the combination of the 1.5% growth rate and multiple background developments could be double counting the expected background traffic. Background traffic volumes are expected to more than triple the existing volumes on Highway 10 in the next 20 years. The majority of the volumes are forecasted, and the actual future traffic volumes may vary from the forecast. Therefore, the background traffic volumes are considered conservative and monitoring of future roadway volumes is recommended.

As part of the Edgewood Greens development a new signalized intersection is being constructed at the intersection of Highway 10 and Milliner Avenue. The signalized intersection will contain northbound and southbound auxiliary left-turn lanes as well as a southbound auxiliary right-turn lane. The Milliner Avenue approach will consist of eastbound through-right and left turn lanes.

The intersection of Highway 10 and Milliner Avenue is forecasted to operate at a LOS 'D' with 40.3 s of delay in the Saturday peak hour. The southbound through movement is forecasted to have a LOS 'D' and a maximum delay of 53.6 s. A maximum v/c ratio of 1.02 is forecasted for the same movement.

The intersection of Highway 10 and Sideroad 240 is forecasted to operate with a LOS 'F' with 81.7 s of delay in the weekday p.m. peak hour. This is related to the increase in through volumes on Highway 10 as there are very few volumes expected on Sideroad 240 during the peak hours.

SimTraffic modelling found that the 95th percentile queues are anticipated to be contained within their dedicated storage lengths.

Site Generated Traffic

The Site received a Minister Zoning Order in March 2022, which defined a maximum lot coverage of 40% for the commercial and industrial areas. Buildings with a combined gross floor area (GFA) of 40% of the development area are not anticipated given the future population size of Dundalk and surrounding communities is low. For the purposes of this study the trip generation has been established on the zoning lot coverage as well as the expected lot coverage. Operations analysis has been conducted based on the trip generation estimates from the Institute of Transportation Engineers' Trip Generation Manual, 11th Edition for the expected lot coverage.

Considering the zoning lot coverage of 40% for both the commercial and industrial areas a total of 864 a.m. and 1,548 p.m. two-way weekday external primary trips and 416 p.m. two-way weekday external pass-by trips. Additionally, 1,873 two-way weekend external primary trips and 517 two-way weekend external pass-by trips are forecasted.

For the purpose of this analysis the expected lot coverage for the commercial and industrial lands was considered. Based on a lot coverage of 25% for the commercial GFA and a lot of coverage of 20% for the industrial GFA a total of 882 a.m. and 967 p.m. two-way weekday peak hour external primary trips and 267 p.m. two-way weekday peak hour external pass-by trip, as well as 1,319 two-way Saturday peak hour primary trips and 360 two-way Saturday peak hour pass-by trips are anticipated.

Eco Park Way Extension

An extension to the existing Eco Park Way is proposed through the development lands, connecting to Highway 10 at Sideroad 240. The extension is proposed to have a right-of-way (ROW) of 30 m and will cross the Grey County Rail Trail outside of the development lands.

The proposed location of the Eco Park Way extension is approximately 1,260 m south of the intersection Highway 10 and Milliner Ave. This spacing is in excess of the MTO's minimum intersection spacing requirement of 800 m. Additionally, adequate stopping and intersection sight distance are available for the proposed location.

The first public road intersection internal to the site is proposed to be a roundabout approximately 490 m from the intersection of Highway 10 and the Eco Park/Sideroad 240. A future connection

between the Glenelg and Eco Park developments should be encouraged as it would provide access between the residential and commercial lands without the use of Highway 10, helping to reduce traffic volumes on Highway 10 travelling between the two lands.

With the opening of the Eco Park Way extension existing volumes travelling on Highway 10 to and from Main Street may divert to the new roadway. The June 2017 TIS prepared by Triton reviewed a redistribution of 30% of the volumes on Main Street. Based on the split of turning volumes on Main Street under existing conditions as outlined in the September 2023 Edgewood Green's TIS prepared by Crozier, the volumes collected in 2024 have been reassigned.

Future Total Conditions

A Signal Warrants Assessment was conducted to understand the traffic related requirements to support the development proposal. The intersection of Highway 10 and Milliner Avenue is planned to be signalized based on the Edgewood Greens TIS, and it currently under construction. Based on Justification 7 from Book 12 of the Ontario Traffic Manual (OTM), signals are warranted at full build-out (2034) at the intersection of Highway 10 and Eco Park Way / Sideroad 240. Signals are operationally recommended based on 50% build-out in the opening horizon of 2029.

Auxiliary turn lane storage was calculated based on TAC and the MTO's Signal Timing Policy for the intersection of Highway 10 and Eco Park Way / Sideroad 240:

- 173 m Northbound Left-Turn Lane
- 225 m Eastbound Left-Turn Lane
- 15 m Southbound Left-Turn Lane
- 298 m Southbound Right-Turn Lane
- 15 m Northbound Right-Turn Lane

The intersection of Highway 10 and Milliner Avenue is forecasted to operate with a LOS 'D' with an overall delay of 52.3 s in the p.m. peak hour. A maximum delay of 94.1 s and a maximum v/c ratio of 1.11 for the southbound through volumes are forecasted in the p.m. peak hour. During the Saturday peak hour, the intersection is anticipated to operate at a LOS 'F' with an overall delay of 104.4 s. A maximum delay of 196.6 s and a maximum v/c ratio of 1.36 for the southbound through movement are forecasted for the Saturday peak hour.

The intersection of Highway 10 and Sideroad 240 is forecasted to operate with a LOS 'F' with an overall delay of 94.9 s in the p.m. peak hour. A maximum delay in excel of 200 s and a maximum v/c ratio of 1.36 is forecasted for the eastbound left movement the p.m. peak hour. During the Saturday peak hour, the intersection operates at a LOS 'F' with an overall delay of 127.8 s. A maximum delay in excess of 200 s and a maximum v/c ratio of 1.51 for the southbound through movement are forecasted for the Saturday peak hour.

At the intersection of Highway 10 and Milliner Avenue the eastbound left and southbound right 95th percentile queues are forecasted to exceed the available storage by 11.8 m and 19.3 m, respectively. The Synchro 50th percentile and SimTraffic average queues are not expected to exceed the provided storage or impact the adjacent through lanes.

For the intersection of Highway 10 and 240 Sideroad / Eco Park Way, 95th percentile queues for the eastbound left and northbound left movements are forecasted to exceed the provided storage by 159.7 m and 100.3 m, respectively under the Synchro Model.

At Highway 10 and Eco Park Way/Sideroad 240 the eastbound left movement 95th percentile queue is forecasted to exceed the provided storage by 24.7 m under the SimTraffic model. Only the eastbound left is forecasted to exceed the calculated storage based on the Synchro 50th percentile and SimTraffic average queues, by 80.5 m and 5.7 m, respectively. The eastbound left-turn lane may be a through lane, should Eco Park Way have a four-lane cross-section, turning vehicles can be stored until the next internal intersection.

It should be recognized that background traffic volumes are expected to more than triple the existing volumes on Highway 10 in the next 20 years. As the majority of the volume growth is forecasted from proposed developments, the actual future volumes on Highway 10 may vary from the forecasted volumes. Additionally, the industrial and commercial occupants of the proposed lands, may impact the trip generation forecasts once confirmed. Updated studies including assessments for mitigations, and optimizations are recommended as development proceeds to reflect up-to-date roadway volumes and development statistics.

Roadway Mitigations

In review of the MTO capacity methodology a number of improvements were considered. The capacity thresholds for an additional through lane on Highway 10 is met under both future background and future total conditions. Dual northbound and eastbound left turn lanes at Highway 10 and Eco Park Way / Sideroad 240 were also considered under the future total volume conditions.

These improvements are based on many forecasted volumes. For this reason, as well as limited Right-of-Way for Highway 10, these improvements have been noted but not modelled. Only warranted turn lanes were considered. It is recommended that the roadways be monitored for additional improvements as build-out in Dundalk proceeds.

Consideration for a roundabout was also undertaken. Based on operations a dual lane roundabout would be recommended. As the proponent only owns the lands in the northwest quadrant of the intersection, the full area cannot be provided to accommodate a roundabout, expansion of the existing ROW would be required. As such, signalization has been carried forward for the basis of the analysis.

Conclusion and Recommendations

The conclusions and findings resulting from this study have led to the following recommendations:

- Northbound, southbound and eastbound left as well as northbound and southbound right auxiliary turn lanes are recommended at the intersection of Highway 10 and Eco Park Way / Sideroad 240.

- Provisions for traffic signals should be provided during the construction of the roadway. Signalization should occur at such a time that roadway traffic volumes warrant the implementation of a signalized intersection. Design elements can be confirmed once exact development details are known. The intersection can be monitored by the Township and MTO as forecasted background traffic is confirmed.

- Protected-Permissive northbound left-turn signals are recommended at full build-out of developments in Dundalk at both Highway 10 & Milliner Avenue and Highway 10 & Eco Park Way / Sideroad 240.

- Ongoing monitoring of Highway 10 is recommended as development in Dundalk proceeds. Given the current population and traffic volumes in Dundalk, most future volumes are forecasted. Three quarters of the 2044 future total volumes on Highway 10 are forecasted based on estimated growth and trip generation. Accordingly, the analysis contained within this report is considered conservative, and the proposed intersections should be monitored as build-out continues in Dundalk.

The analysis undertaken herein was prepared using the most recent Draft Plan. Any minor changes to the Plan will not materially affect the conclusions contained within this report.

In conclusion, the proposed mixed-use development can be supported from a traffic operations and safety perspective, with ongoing monitoring to determine when mitigation measures are required.

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1.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) was retained by Flato Developments Inc. (Flato) to complete a Transportation Impact Study (TIS) to analyze the proposed mixed-use development at Highway 10 and Side Road 240 (the 'Site') in Dundalk, Township of Southgate (the 'Township'). The assessment includes a review and analysis of the proposed Eco Park Way extension to Highway 10.

1.1 Study Purpose and Scope

The purpose of the study is to evaluate the transportation-related impacts of the proposed development on the study road network and to recommend or confirm any required mitigation measures, if warranted. The study reviews the following main aspects of the proposed development from a transportation engineering perspective:

- Impacts of development traffic on the study road network through analyzing future background and future total traffic operations;
- Need for external roadway improvements to mitigate traffic impacts;
- Sight distance assessment; and
- Transportation Demand Management opportunities.

The study has been completed in accordance with the Ministry of Transportation's (MTO) "General Guidelines for the Preparation of Traffic Impact Studies" (March 2023).

Appendix A includes the Terms of Reference for the study. Including recent communications with the MTO in October 2024.

As confirmed in the Terms of Reference, this Transportation Impact Study considers the following future intersections:

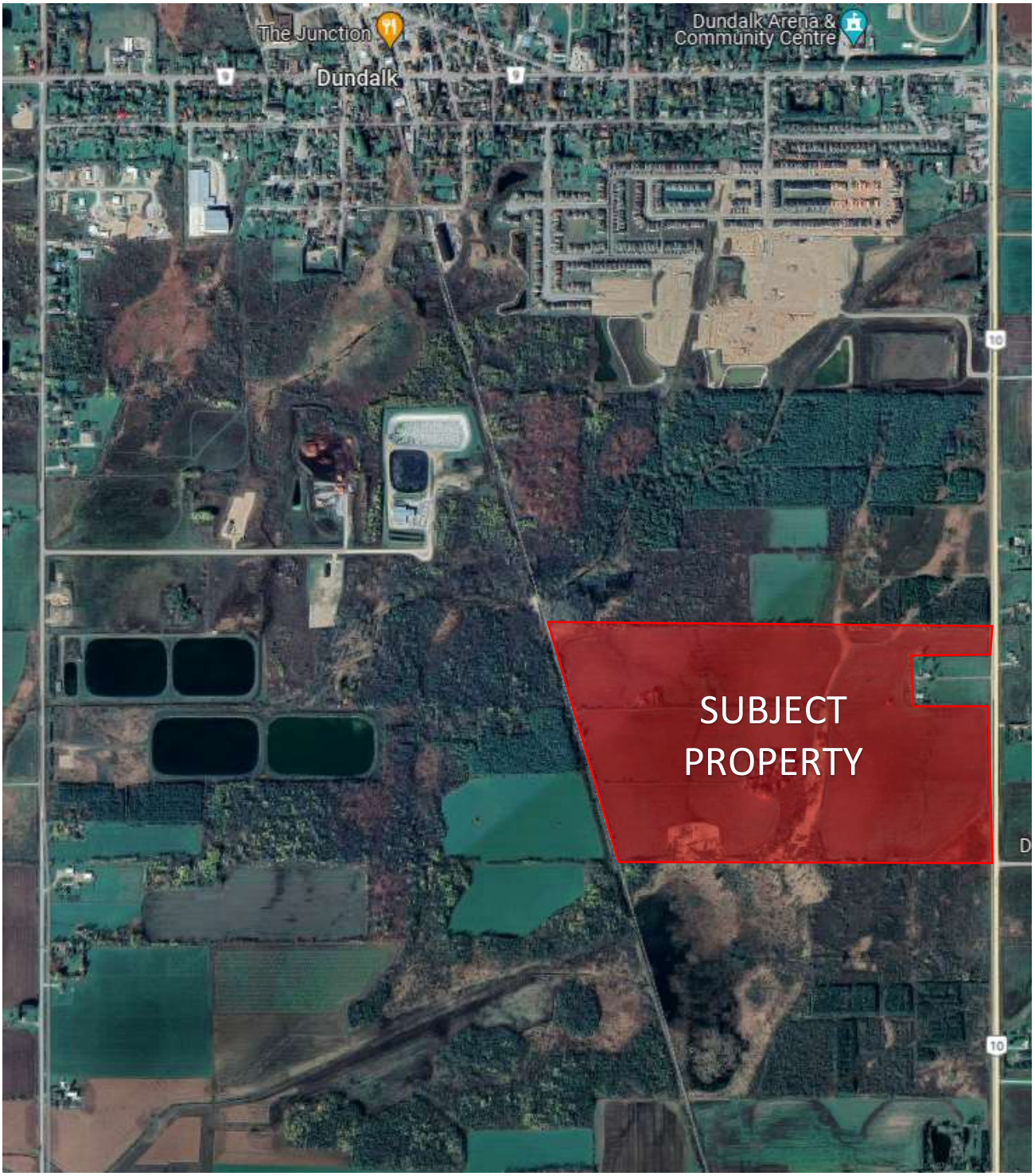
- Highway 10 and Milliner Avenue
- Highway 10 and Eco Park Way / Sideroad 240

As established through the Terms of Reference the development will be reviewed under a 50% build-out in the 2029 horizon year and full build-out in the 2034 horizon. An interim horizon is utilized to understand if phasing of improvements should be considered and to align with previous transportation studies completed for Eco Park Way. Five and ten years beyond build-out, 2039 and 2044, respectively, will also be assessed.

1.2 Developments Lands

The site is bound by Highway 10 to the east, industrial lands and the Grey County Rail Trail to the west, and active agricultural lands / mixed woods to the north and south. Further to the northwest is the built-up area of Dundalk.

Figure 1 includes the Site Location Plan.



PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**SITE LOCATION**				
DRAWN BY:	**KH**	SCALE:	**N.T.S.**		
CHECK BY:	**MF**	PROJECT NO.	**1060-6489**	FIGURE NO.	**1**

CROZIER CONSULTING ENGINEERS
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L9Y 4L4

1.3 Project History

The Township's Official Plan (May 2022) illustrates the extension of Eco Park Way as a potential future Grey County roadway under Schedule F. The Township's support of the roadway is noted in Section 3.8 of the Official Plan.

The Eco Park Way extension is to have a 30 m Right-of-Way as illustrated in the current Draft Plan (MHBC Planning, October 9, 2024). At its full extent the roadway will connect Ida Street to Highway 10 through both Town industrial lands and the Site, crossing the Grey County Rail Trail north of the Site boundary.

In March 2022 the Site received a Minister Zoning Order (MZO) for the development of the lands including residential, industrial and commercial uses. The extension of Eco Park Way was included on the Concept Plan as part of the MZO applications.

In May 2023, the Township and their Consulting Engineer, Triton Engineering Services Limited, issued a Notice of Project Commencement for a Class Environmental Assessment for the extension of Eco Park Way. A TIS for the Industrial Access Road was prepared previously by Triton in June 2017.

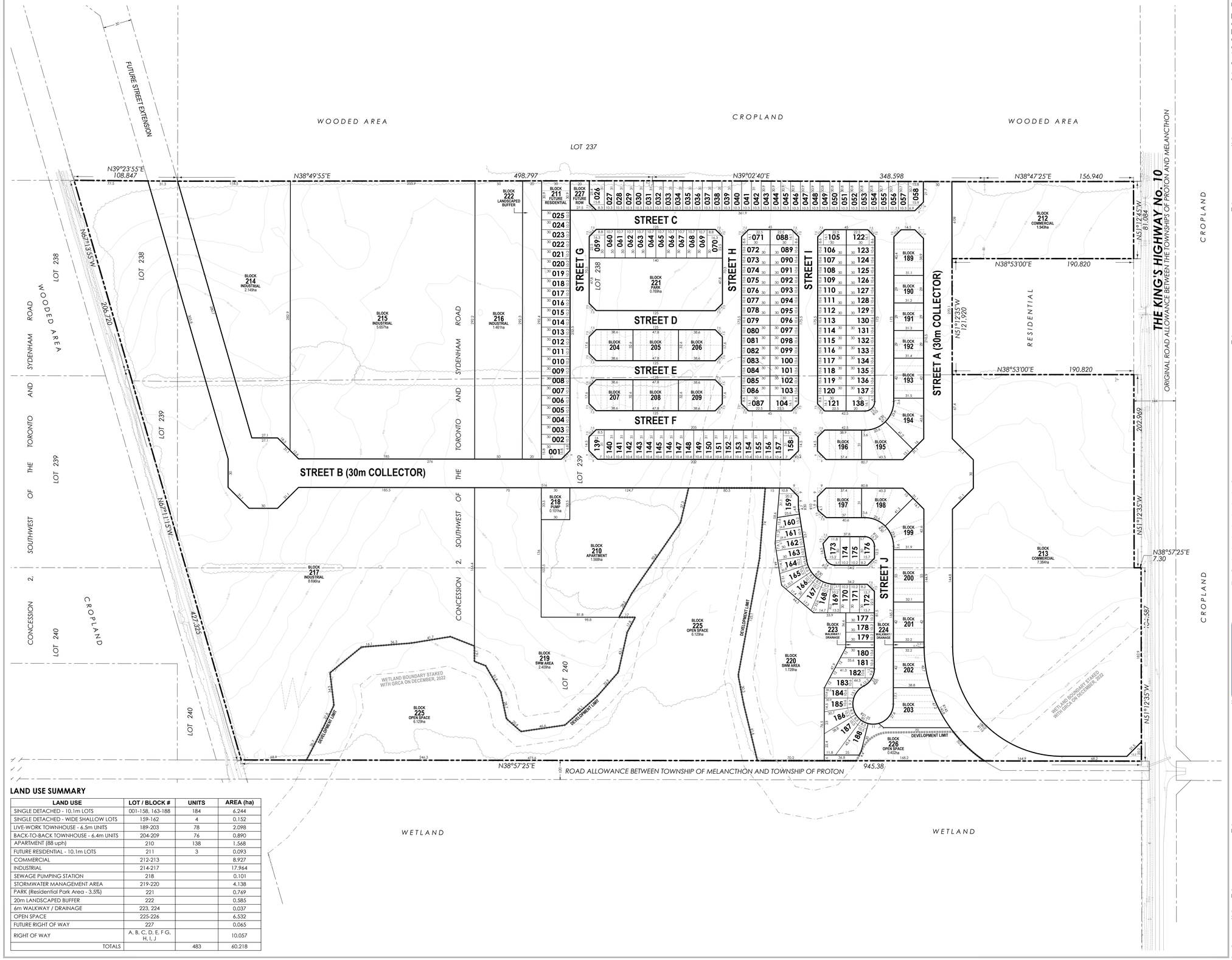
Appendix B includes relevant excerpts from the Industrial Access Road TIS (Triton, June 2017)

1.4 Development Proposal

Per the Draft Plan prepared by MHBC Planning, dated October 9th, 2024, the proposed development includes the Eco Park Way extension to Highway 10 through 17.96 ha of industrial area, 8.93 ha of commercial area and a residential area. The residential area proposes 138 apartment units, 154 townhouse units and 191 single-detached units.

Three north/south roadways connecting to the Eco Park Way extension are proposed. The western local road and eastern arterial roadway will provide provision for extension to the north, into lands not owned by the proponent.

Figure 2 outlines the current Draft Plan (dated October 9, 2024).



LAND USE SUMMARY

LAND USE	LOT / BLOCK #	UNITS	AREA (ha)
SINGLE DETACHED - 10.1m LOTS	001-158, 163-188	184	6.244
SINGLE DETACHED - WIDE SHALLOW LOTS	159-162	4	0.152
LIVE-WORK TOWNHOUSE - 6.5m UNITS	189-203	78	2.098
BACK-TO-BACK TOWNHOUSE - 6.4m UNITS	204-209	76	0.890
APARTMENT (88 uph)	210	138	1.568
FUTURE RESIDENTIAL - 10.1m LOTS	211	3	0.093
COMMERCIAL	212-213		8.927
INDUSTRIAL	214-217		17.964
SEWAGE PUMPING STATION	218		0.101
STORMWATER MANAGEMENT AREA	219-220		4.138
PARK (Residential Park Area - 3.5%)	221		0.769
20m LANDSCAPED BUFFER	222		0.585
6m WALKWAY / DRAINAGE	223, 224		0.037
OPEN SPACE	225-226		6.532
FUTURE RIGHT OF WAY	227		0.065
RIGHT OF WAY	A, B, C, D, E, F G, H, I, J		10.057
TOTALS		483	60.218

LEGAL DESCRIPTION

PART OF LOTS 238, 239 AND 240
CONCESSION 1, SWTSR AND
PART OF LOTS 238 AND 239
CONCESSION 2, SWTSR
GEOGRAPHIC TOWNSHIP OF PROTON
TOWNSHIP OF SOUTHGATE
COUNTY OF GREY

OWNER'S CERTIFICATE

I HEREBY AUTHORIZE MACNAUGHTON HERMSEN BRITTON CLARKSON PLANNING LIMITED TO SUBMIT THIS PLAN FOR APPROVAL.

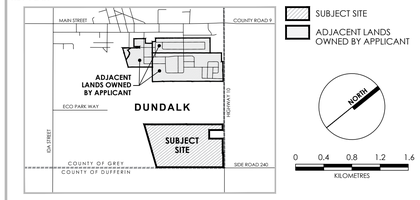
DATE: _____ _____

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE: _____ _____

KEY PLAN



LEGEND

- PROJECT BOUNDARY LINE
- RIGHT OF WAY LINE
- BLOCK LINE
- LOT LINE
- PARCEL FABRIC

REVISION No.	DATE	ISSUED / REVISION	BY

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT R.S.O. 1990 C.P.13 AS AMENDED

- **A.** AS SHOWN
- **B.** AS SHOWN
- **C.** AS SHOWN
- **D.** AS SHOWN
- **E.** AS SHOWN
- **F.** AS SHOWN
- **G.** AS SHOWN
- **H.** MUNICIPAL WATER SUPPLY
- **I.** SILT LOAM
- **J.** AS SHOWN
- **K.** ALL SERVICES AS REQUIRED (WATER, SANITARY, STORMWATER, HYDRO)
- **L.** AS SHOWN

MHBC PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE
113 COLLIER STREET, BARRIE, ON, L4M 1H2 | P: 705.728.0045 | WWW.MHBCPLAN.COM

STAMP

DATE	OCT. 9, 2024
FILE No.	15184AS
SCALE	1:1,800 (ARCH D)
DRAWN BY	M.M.
CHECKED BY	K.C.
OTHER	

PROJECT

FLATO SOUTHEAST (ECO PARK)

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MARKHAM, ON L3R 0G6
P:(905) 479-9292 P:(905) 429-9165
WWW.FLATOGROUP.COM

NORTH

FILE NAME DRAFT PLAN OF SUBDIVISION

DWG No. 1 of 1

SCALE BAR

0 9 18 27 36 45 37.5 90 135 180m

MEASUREMENTS SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

N:\Southgate\Flato - Eco Park - 15184AS\Drawings\Draft Plan\CAD\15184AS - Draft Plan - 2024-10-09.dwg

2.0 Existing Conditions

This section outlines the current conditions of the transportation network in the vicinity of the site. Details of the road network, including traffic controls, lane configurations, speed limits, transit routes pedestrian connections and other relevant transportation elements are identified. The existing traffic operations are also summarized.

2.1 Study Road Network

The roadway system in the area of Dundalk is skewed from the geographic north/south axis. For the purposes of this report and the analysis included herein, Highway 10 has been given a north/south orientation, while Eco Park Way, Milliner Avenue and Sideroad 240 have been given east/west orientations.

Highway 10 is a two-way (north-south) provincial highway under the jurisdiction of the MTO. The roadway is one lane per direction with full width granular shoulders and has a posted speed limit of 80 km/h along the site frontage.

Under existing conditions, the roadways of Milliner Avenue and the Eco Park Way extension are not yet constructed and operational. Eco Park Way between Ida Street and the Grey County Rail Trail has been in operational for more than a decade and operates with one lane per direction. Milliner Avenue is currently under constructed as part of the Edgewood Greens Subdivision and will be a two-lane local roadway with a posted 50 km/h speed limit.

Sideroad 240 is a gravel east-west roadway classified as a municipal local road under the jurisdiction of the Township of Melancthon, Dufferin County. It is a two-lane two-way local roadway without a posted speed limit. The unsignalized intersection of Highway 10 (major road) and Sideroad 240 (minor road) form a T-intersection with a northbound right-turn taper on Highway 10.

There are no existing transit services in the area. Highway 10 and Sideroad 240 do not offer any pedestrian or separated cycling facilities. West of the development lands is the Grey County CP Rail Trail. The Rail Trail is 77 km long and runs from the community of Dundalk to the City of Orillia. The trail is not paved but is available for hiking, cycling, snow showing and skiing use.

2.2 Traffic Data

Turning movement counts were conducted by Spectrum Traffic Data Inc. (Spectrum) at the study intersection of Highway 10 and Sideroad 240 on Tuesday, January 16, 2024, between 6:00 a.m. – 10:00 a.m. and 3:00 p.m. – 7:00 p.m. After a meeting on Monday September 16, the MTO requested the Saturday peak hour also be analyzed as part of the study. Additional traffic counts were collected on Saturday September 21st, 2024, from 9:00 a.m. – 5:00 p.m. **Table 1** outlines the peak hours and peak hour factors of the collected data. **Appendix C** includes the traffic count data**. Figure 3** illustrates the 2024 existing traffic volumes.

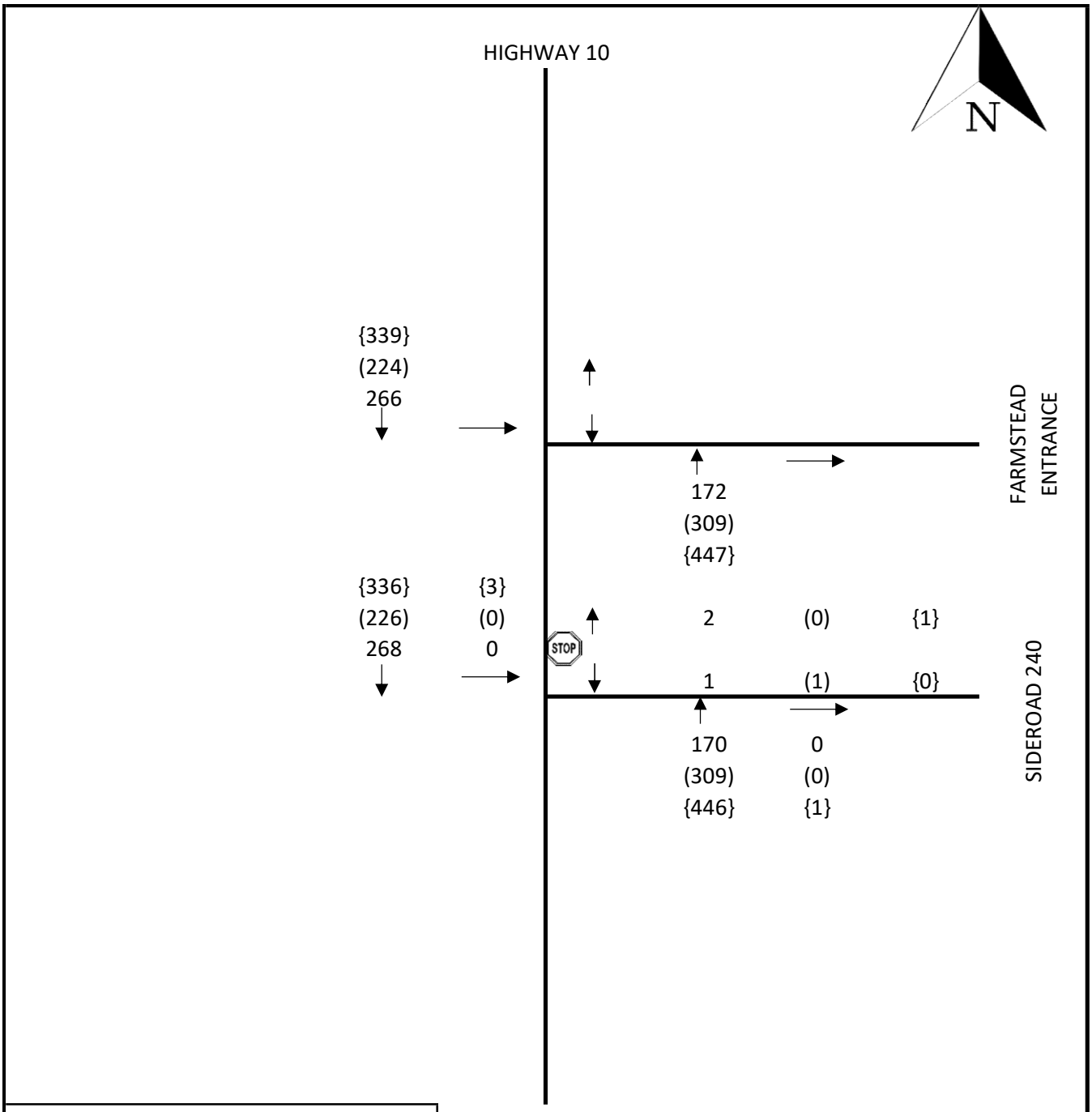
Table 1: Peak Hour Factors

Date	Peak Hour	Peak Hour Factor
Tuesday January 16th	7:15 a.m. – 8:15 a.m.	0.85
	4:30 p.m. – 5: 30 p.m.	0.93
Saturday September 16th	12:00 p.m. – 1:00 p.m.	0.95

2.3 Traffic Modelling

The boundary road network was modelled in Synchro 11.0 using existing roadway geometrics, collected traffic data, and default modelling parameters. The assessment of intersections is based on the "Highway Capacity Manual (HCM)" methodology. Intersections are assessed using a Level of Service (LOS) metric with ranges of delay assigned a letter from "A" to "F"; "A" representing low delays and "F" representing heavy delays.

Appendix D includes LOS definitions for reference.



LEGEND

STOP CONTROL

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**2024 EXISTING TRAFFIC VOLUMES**				
DRAWN BY:	**KH**	SCALE:	**N.T.S.**		
CHECK BY:	**MF**	PROJECT NO.	**1060-6489**	FIGURE NO.	**3**

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2.4 Intersection Operations

The existing operations at the study intersection were analyzed using the existing 2024 traffic volumes**. Appendix E** includes the detailed capacity analysis worksheets. **Table 2** outlines the 2024 existing traffic operations.

Table 2: 2024 Existing Levels of Service

Intersection	Performance Metrics									
	Movement	AM			PM			Saturday		
		LOS[1]	Delay	v/c	LOS[1]	Delay	v/c	LOS[1]	Delay	v/c
Highway 10 & Sideroad 240 (minor road stop-control)	**Overall**	**B**	**-**	**-**	**B**	**-**	**-**	**B**	**-**	**-**
	WB	B	11.0	0.00	B	12.5	0.00	B	11.0	0.00
	NBT	-	0.0	0.12	-	0.0	0.20	-	0.0	0.31
	NBR	-	0.0	0.00	-	0.0	0.00	-	0.0	0.00
	SB	-	0.0	0.00	-	0.0	0.00	-	0.1	0.00

Note[1]: The Level of Service of a two-way stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM 2000).

Note[2]: The maximum v/c ratio for two-way stop-controlled intersections represents the maximum v/c for the minor road approach movements at the intersection. Any movements that experience a v/c ratio in excess of 0.85 are considered critical per the MTO TIS Guidelines.

The metrics summarized above indicate that the stop-controlled intersection of Highway 10 and Sideroad 240 operates at LOS 'B' with a maximum delay of 12.5 s (WB) in the p.m. peak hour. This indicates that the study intersection is operating well with capacity for growth.

3.0 Future Background Conditions

This section summarizes the future background conditions of the study road network and provides details relating to growth rates, future transportation network improvements, and background developments within the study area. As established in **Section 1.1** (per the Terms of Reference), this study considers the 2029, 2034, 2039, 2044 horizon years in the future background traffic analysis, the results of which are summarized in **Section 3.4**.

3.1 Future Transportation Network

As part of the Edgewood Greens development (outlined further in **Section 3.3.1**) a new signalized intersection (Highway 10 and Milliner Avenue) has been commissioned. The intersection will have a northbound auxiliary left-turn lane with 130 m of parallel length (storage and deceleration), a southbound left-turn lane with 85 m of parallel length and a southbound right turn-lane with 115 m of parallel length. The intersection will operate with three-phases, with the east leg operating under its own phase only when triggered.

Appendix F includes intersection design drawings, prepared by Cozier (August 30, 2023).

3.2 Growth Rates

The MTO's "Provincial Highways Traffic Volumes 1988-2021" document was reviewed to analyze historical traffic volumes on Highway 10. The document provides historical traffic data for the segment of Highway 10 between Shelburne and Flesherton. A growth rate of 0.87 percent compounded annually was calculated for the Annual Average Daily Traffic (AADT) between 2010 and 2021.

As discussed with the MTO, for the purpose of a conservative analysis, and to be consistent with the previous submissions of the TIS, a growth rate of 1.5 percent compounded annually was applied to all movements on the boundary road network to forecast the future background traffic volumes. **Appendix G** contains the growth rate analysis.

3.3 Background Developments

As identified through the Terms of Reference, several developments are forecasted to have future trips travelling past the site on Highway 10. The development details and respective traffic volume forecasts are discussed in the subsequent sections, and the forecasted volumes have been incorporated into the future background volumes as of their respective horizon years.

Table 3 summarizes the background developments.

Table 3: Summary of Background Developments

Development	Build-Out Horizon	Land Use & Site Statistics	Background Report/Reference
Edgewood Green Phase 1-11	2029	209 single-detached units 139 townhouse units 4, 888 ft^2 commercial units	C. F. Crozier & Associates Inc. (September 2023) Remaining units confirmed by Flato
Glenelg Phase 1		6 single-detached units 15 townhouse units	C. F. Crozier & Associates Inc. (September 2020) Remaining units confirmed by Flato
Glenelg Phase 2		89 single-detached units 66 townhouse units	C. F. Crozier & Associates Inc. (September 2020)
Glenelg Phase 3		89 single-detached units 66 townhouse units Elementary School	C. F. Crozier & Associates Inc. (September 2023)
White Rose Development		33 single-detached units 24 condo/townhouse units 34 seniors housing units	Triton Engineering Services Limited. (September 2020)
Dundalk Northwest (Ida Street)		266 single-detached units 55 townhouse units Government Offices and Services Building (Recreation Centre)	C. F. Crozier & Associates Inc. (May 2024)
Dundalk Northeast	2034	210 single detached units	Information Provided by MHBC
Town Industrial Lands	50% - 2029 Full - 2034	1,930,579 ft^2 Industrial GFA[1]	Triton Engineering Services Limited. (June 2017)

Note 1: Industrial GFA is based on a 20% lot coverage of the industrial lands west of the Grey County Rail Trail.

Figure 4 illustrates the location of the background developments in Dundalk. It is noted that the combination of the 1.5% growth rate and multiple background developments could be double counting the expected background traffic. Therefore, the volumes assessed may be conservative and monitoring of future roadway volumes is recommended.

PROJECT:	**DUNDALK SOUTHEAST**		
DRAWING:	**Background Development Locations**		
DRAWN BY:	**KH**	SCALE:	**N.T.S.**
CHECK BY:	**MF**	PROJECT NO.	**1060-6489**
		FIGURE NO.	**4**

CROZIER CONSULTING ENGINEERS
70 HURON STREET,
SUITE 100
COLLINGWOOD, ON,
L9Y 4L4

3.3.1 Edgewood Greens

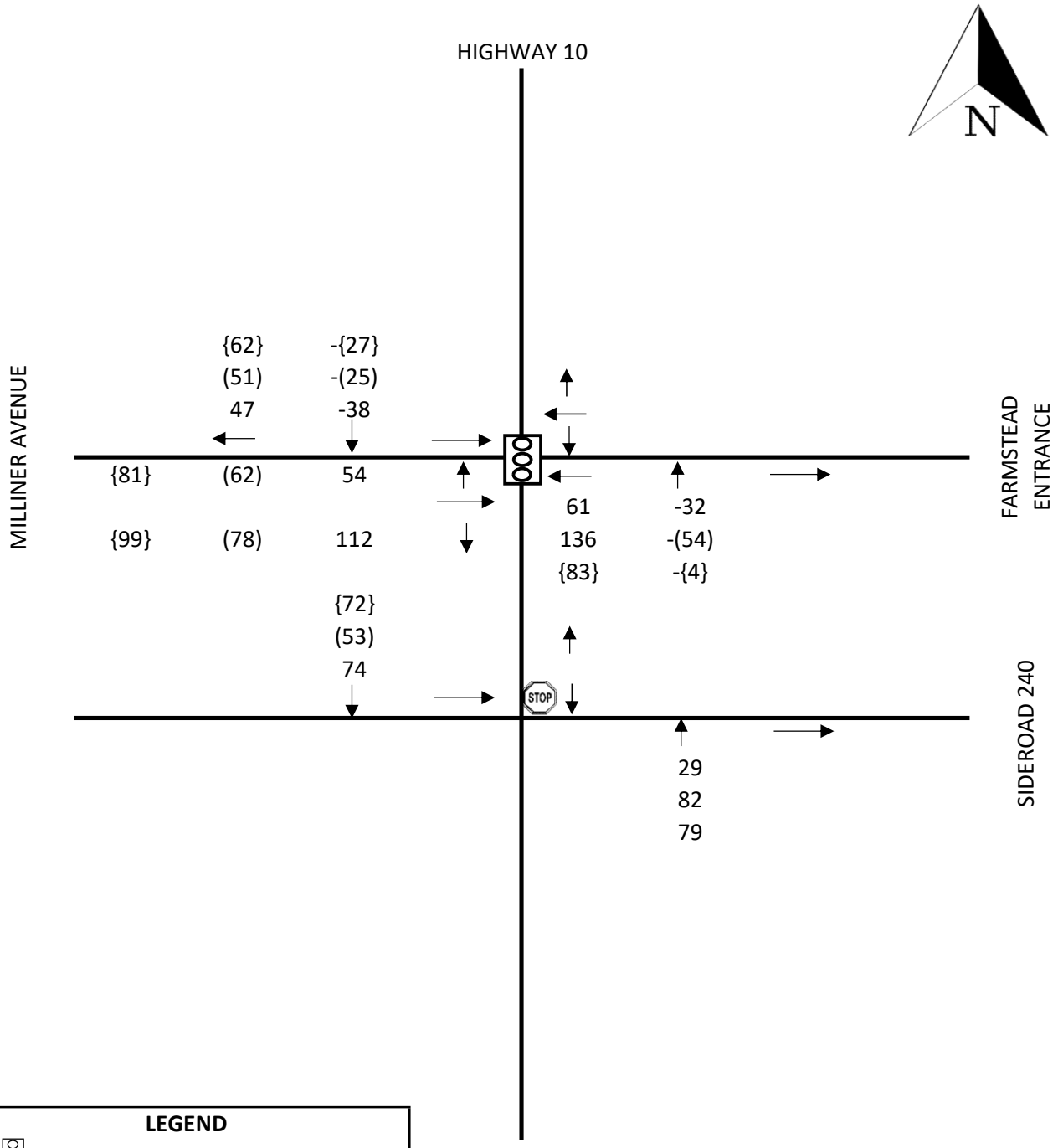
The Edgewood Greens development is located at the northeast corner of the future signalized intersection of Highway 10 and Milliner Avenue. The mixed-use development is broken down into 11 phases out of which Phases 2 – 6 have been constructed and occupied and thus their trip generation will have been caught in the turning movement counts. Phases 7, 8 and 10 are under construction and Phases 9 and 11 are Draft Approved and undergoing detailed design and Site Plan Approval. Discussions with the proponent Flato indicate that there are 209 single-detached homes and 139 townhouses remaining in Phases 7 to 11 along with a 4,888 ft^2 McDonald's restaurant. **Table 4** outlines the trip generation for the Edgewood Greens development.

Table 4: Edgewood Greens Trip Generation (Phases 7 to 11)

Land Use	Peak Hour	Number of Trips		
		Inbound	Outbound	Total
LUC 210 'Single Family Homes' (209 Units)	Weekday A.M.	36	110	146
	Weekday P.M.	125	74	199
	Saturday	102	87	189
LUC 220 'Townhomes' (139 Units)	Weekday A.M.	16	50	66
	Weekday P.M.	51	29	80
	Saturday	42	46	88
LUC 934 'Convenience Restaurant' (4,888 ft^2)	Primary Weekday A.M.	65	59	124
	Primary Weekday P.M.	57	55	112
	Saturday	138	132	270
	Pass-by Weekday A.M.	64	59	123
	Pass-by Weekday P.M.	70	67	137
	Pass-by Saturday	76	73	149
TOTAL PRIMARY	**Weekday A.M.**	**117**	**219**	**336**
	Weekday P.M.	**233**	**158**	**391**
	Saturday	**282**	**265**	**547**
TOTAL PASS-BY	**Weekday A.M.**	**64**	**59**	**123**
	Weekday P.M.	**70**	**67**	**137**
	Saturday	**76**	**73**	**149**

Trips generated by the Edgewood Greens development were assigned to the boundary road network based on the distribution from the Edgewood Greens TIS (Crozier, September 2023). The p.m. peak hour trip distribution has been applied to the Saturday volumes forecasted. It is noted that the Farmstead entrance has been modelled conservatively with an estimate of four inbound and four outbound volumes in both peak hours, as consistent with the September 2023 TIS.

Figure 5 illustrates the trip assignment for the Edgewood Greens development. **Appendix H** includes relevant excerpts from the Edgewood Greens Commercial Block TIS (Crozier, September 2023).



LEGEND

SIGNALIZED

STOP CONTROL

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**EDGEWOOD GREENS TRIP ASSIGNMENT**				
DRAWN BY:	**KH**	SCALE:	**N.T.S.**		
CHECK BY:	**MF**	PROJECT NO.	**1060-6489**	FIGURE NO.	**5**

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3.3.2 Glenelg Phases 1, 2 and 3

The Glenelg residential development (Phase 1 and Phase 2) is located at 231 Glenelg Street in the northwest area of Dundalk. Phase 1 of the development has been Draft Plan Approved and construction has been completed. **Table 5** accounts for the trip generation of 6 single-detached units and 15 townhome units that are left to be closed and were not captured in traffic count collection on January 16, 2024.

Development Applications (County Official Plan Amendment, Zoning By-law Amendment and Draft Plan Approval for Settlement Boundary Expansion) for Phase 2 of the development were submitted in September 2020. **Table 6** accounts for the trip generation of 6 single-detached units and 15 townhome units that are left to be closed and were not captured in traffic count collection on January 16, 2024.

The Glenelg Expansion Lands (Phase 3) is located at the northeast of Phase 2 of the Glenelg Residential Development. The development applications (County Official Plan Amendment, Zoning By-Law Amendment and Draft Plan Approval Settlement Boundary Expansion) for Phase 3 were submitted in August 2023. The Expansion Lands propose residential units and an elementary school with a capacity of 700 students.
Table 7 outlines the trip generation for Phase 3 of the development.

Table 5: Glenelg Phase 1 Trip Generation

Land Use	Peak Hour	Number of Trips		
		Inbound	Outbound	Total
LUC 210: Single Family Detached Housing (6 Units)	Weekday A.M.	1	5	6
	Weekday P.M.	4	3	7
	Saturday	8	7	15
LUC 220: Multifamily Housing (Low-Rise) (15 Units)	Weekday A.M.	7	21	28
	Weekday P.M.	17	10	27
	Saturday	7	7	14
Total	**Weekday A.M.**	**8**	**26**	**34**
	Weekday P.M.	**21**	**13**	**34**
	Saturday	**15**	**14**	**29**

Table 6: Glenelg Phase 2 Trip Generation

Land Use	Peak Hour	Number of Trips		
		Inbound	Outbound	Total
LUC 210: Single Family Detached Housing (89 Units)	Weekday A.M.	17	51	68
	Weekday P.M.	57	34	91
	Saturday	47	39	86
LUC 220: Multifamily Housing (Low-Rise) (66 Units)	Weekday A.M.	7	25	32
	Weekday P.M.	26	15	41
	Saturday	23	25	48
Total	**Weekday A.M.**	**24**	**76**	**100**
	Weekday P.M.	**83**	**49**	**132**
	Saturday	**70**	**64**	**134**

Table 7: Glenelg Phase 3 Trip Generation

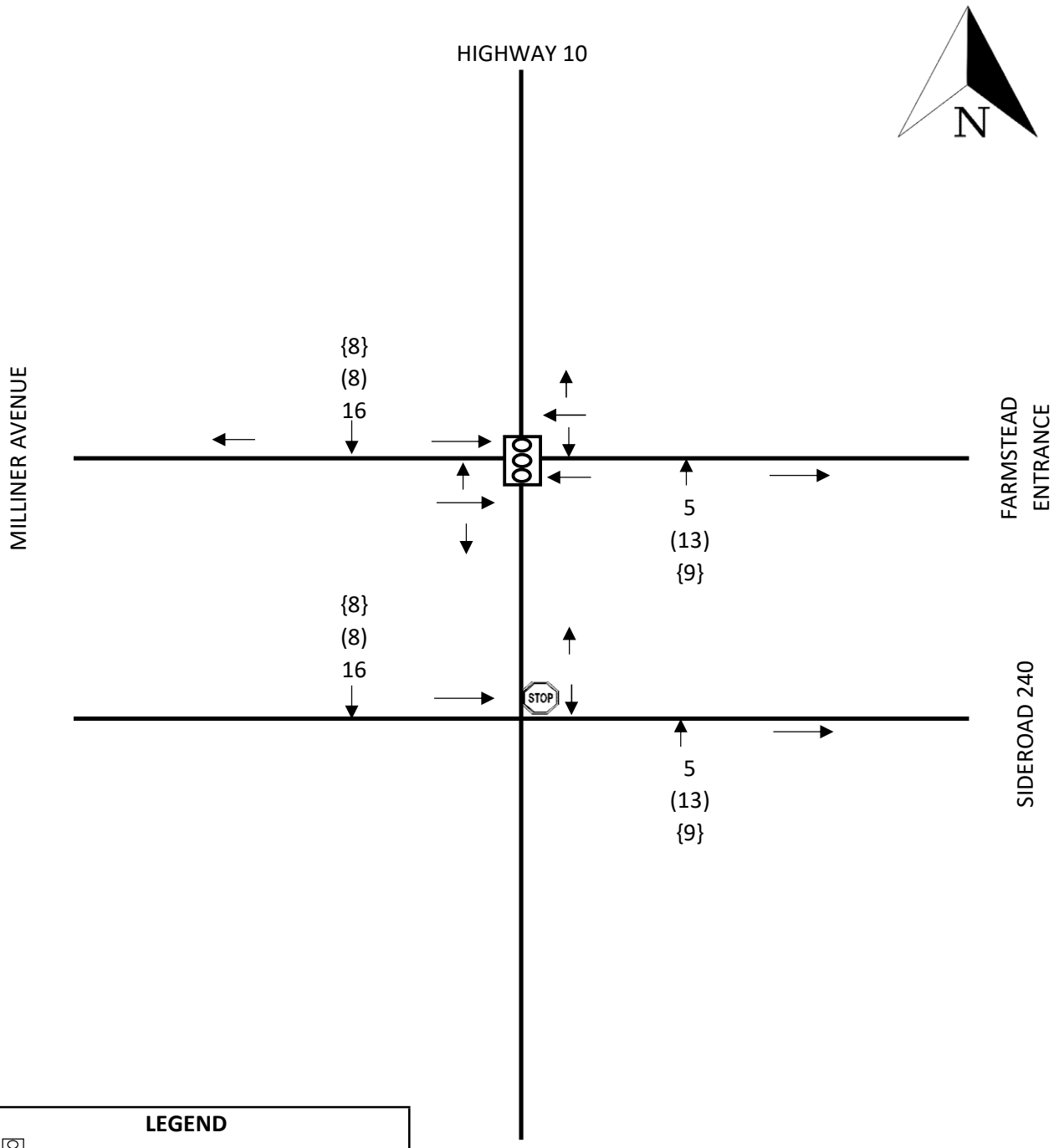
Land Use	Peak Hour	Number of Trips		
		Inbound	Outbound	Total
LUC 210 'Single Family Homes' (89 Units)	Weekday A.M.	56	161	217
	Weekday P.M.	190	111	301
	Saturday	47	39	86
LUC 215 'Single Family Attached Housing' (66 Units)	Weekday A.M.	10	23	33
	Weekday P.M.	23	18	41
	Saturday	23	25	48
LUC 520 'Elementary School' (700 Students)	Weekday A.M.	196	167	363
	Weekday P.M.	36	42	78
	Saturday	0	0	0
TOTAL	**Weekday A.M.**	**262**	**351**	**613**
	Weekday P.M.	**249**	**171**	**420**
	Saturday	**70**	**64**	**134**

Trips generated by Glenelg Phase 1, Phase 2 and Phase 3 were assigned to the boundary road network based on the distributions described in the Crozier TIS. The 60% of traffic assigned east on Main Street was assumed to continue south on Highway 10. It is noted that the elementary school trips generated by Phase 3 are expected to remain within the community of Dundalk and are not assigned south on Highway 10.

Figure 6, Figure 7, and **Figure 8** illustrate the trip assignment for the Glenelg Development Phases 1, 2 and 3, respectively. **Appendix H** includes relevant excerpts from the Glen Eng Transportation Impact Studies (Crozier, September 2020-2023).

Based on the location of Glen Eng Phase 1 and Phase 2, there is the opportunity for trips from the developments to use the proposed Eco Park Way extension to access Highway 10 and by-pass Dundalk's Main Street. As existing volumes have been adjusted for this new travel route as outlined in **Section 5.1,** the distribution of the forecasted volumes has been adjusted to reflect 60% of the trips assigned to Highway 10 under future background conditions to utilize Eco Park Way. The trip assignment for Phase 3 remains unchanged.

Figure 9, and **Figure 10** illustrate the redistributed trip assignment for the Glenelg Development Phases 1 and 2, respectively.



LEGEND

	SIGNALIZED
STOP	STOP CONTROL
	MOVEMENT
XX(XX){XX}	AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**			
DRAWING:	**GLENELG PHASE 1** **FUTURE BACKGROUND TRIP ASSIGNMENT**			
DRAWN BY:	**DB**	SCALE:	**N.T.S.**	
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO. **6**

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1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705-446-3510 T
705-446-3520 F
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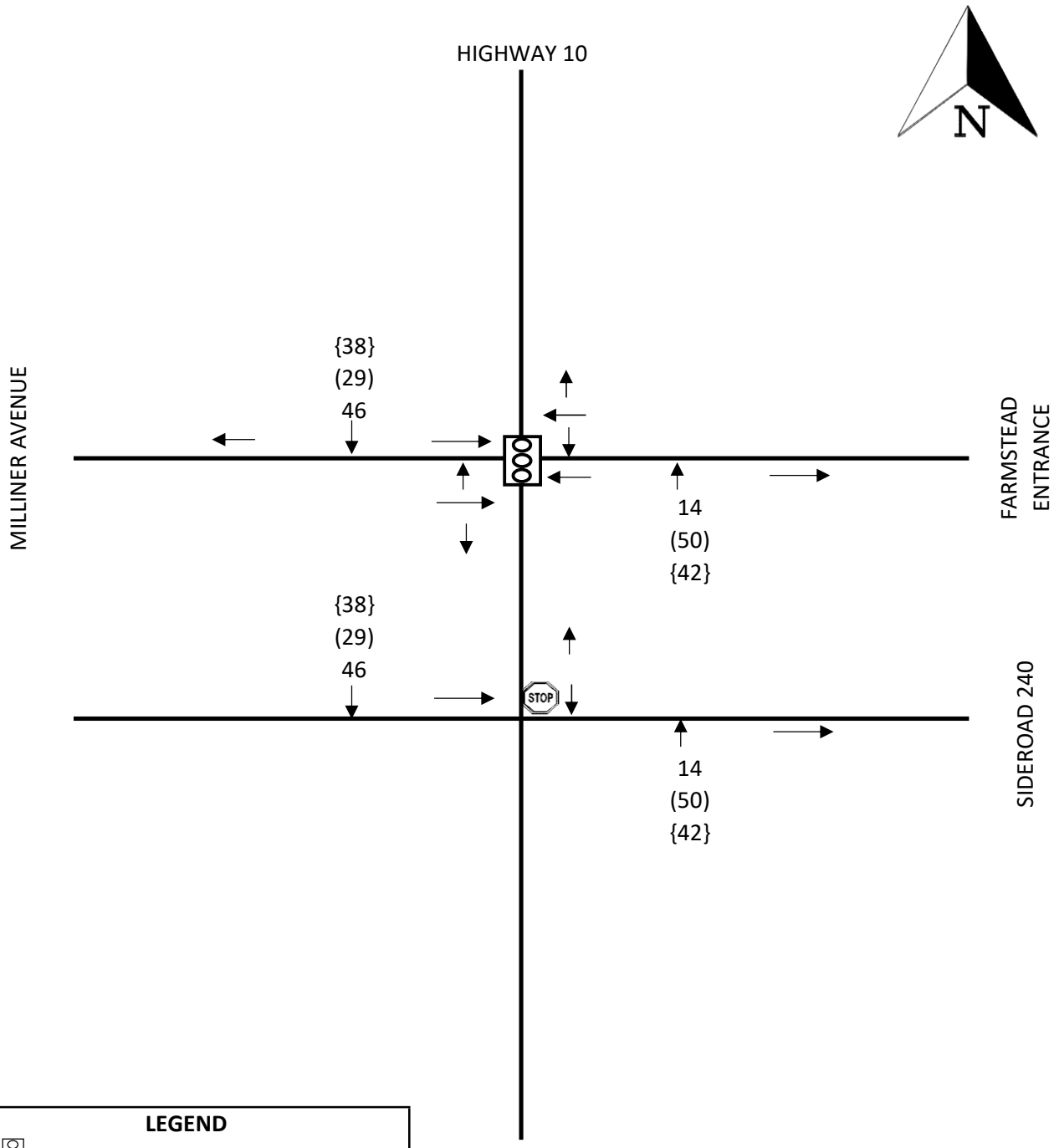
INFO@CFCROZIER.CA



LEGEND

	SIGNALIZED
STOP	STOP CONTROL
	MOVEMENT
XX(XX){XX}	AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**		
DRAWING:	**GLENELG PHASE 2** **FUTURE BACKGROUND TRIP ASSIGNMENT**		
DRAWN BY:	**DB**	SCALE:	**N.T.S.**
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**
		FIGURE NO.	**7**

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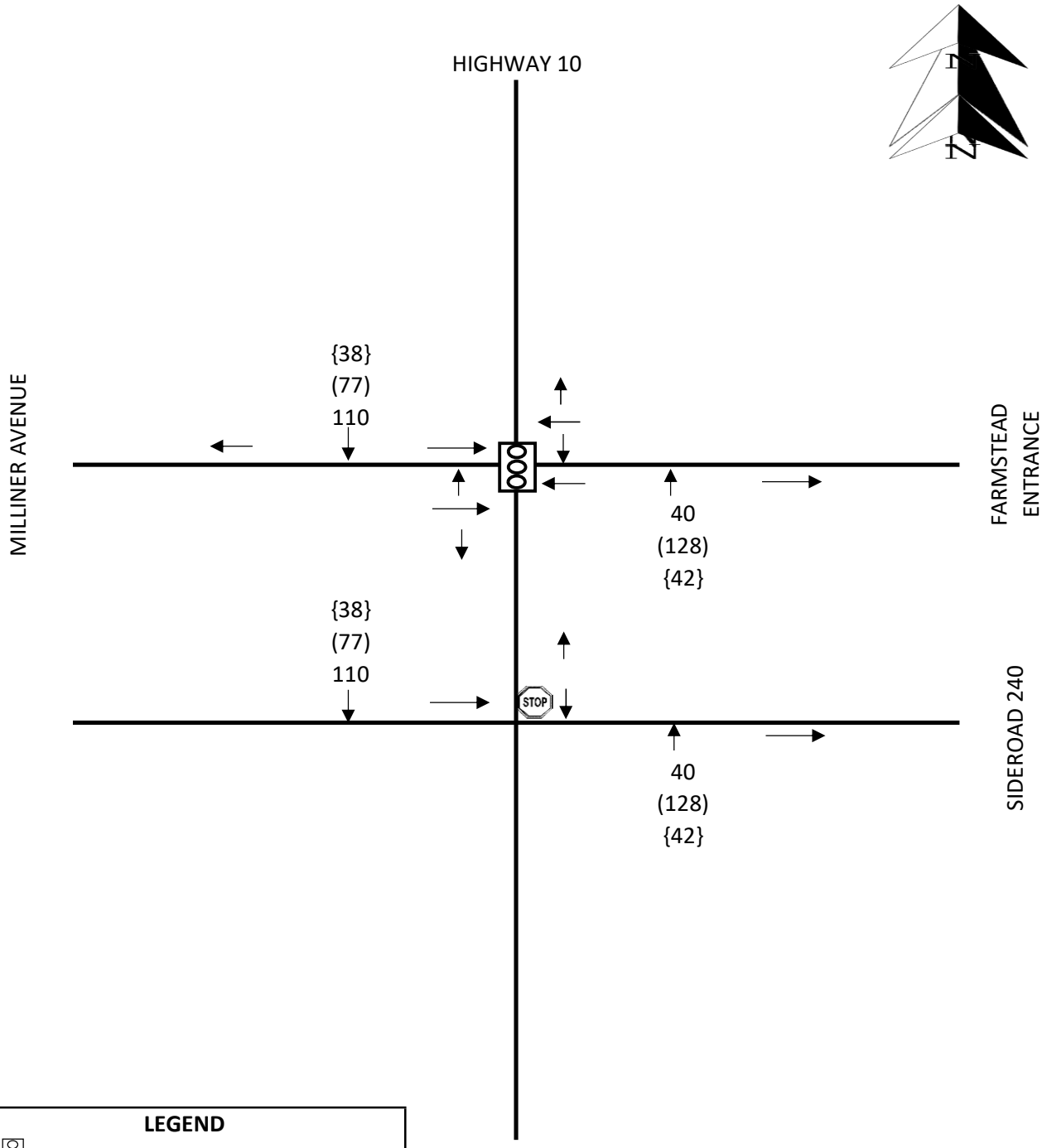
INFO@CFCROZIER.CA



LEGEND

SIGNALIZED

STOP CONTROL

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**GLENELG PHASE 3 TRIP ASSIGNMENT**				
DRAWN BY:	**DB**	SCALE:	**N.T.S.**		
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO.	**8**

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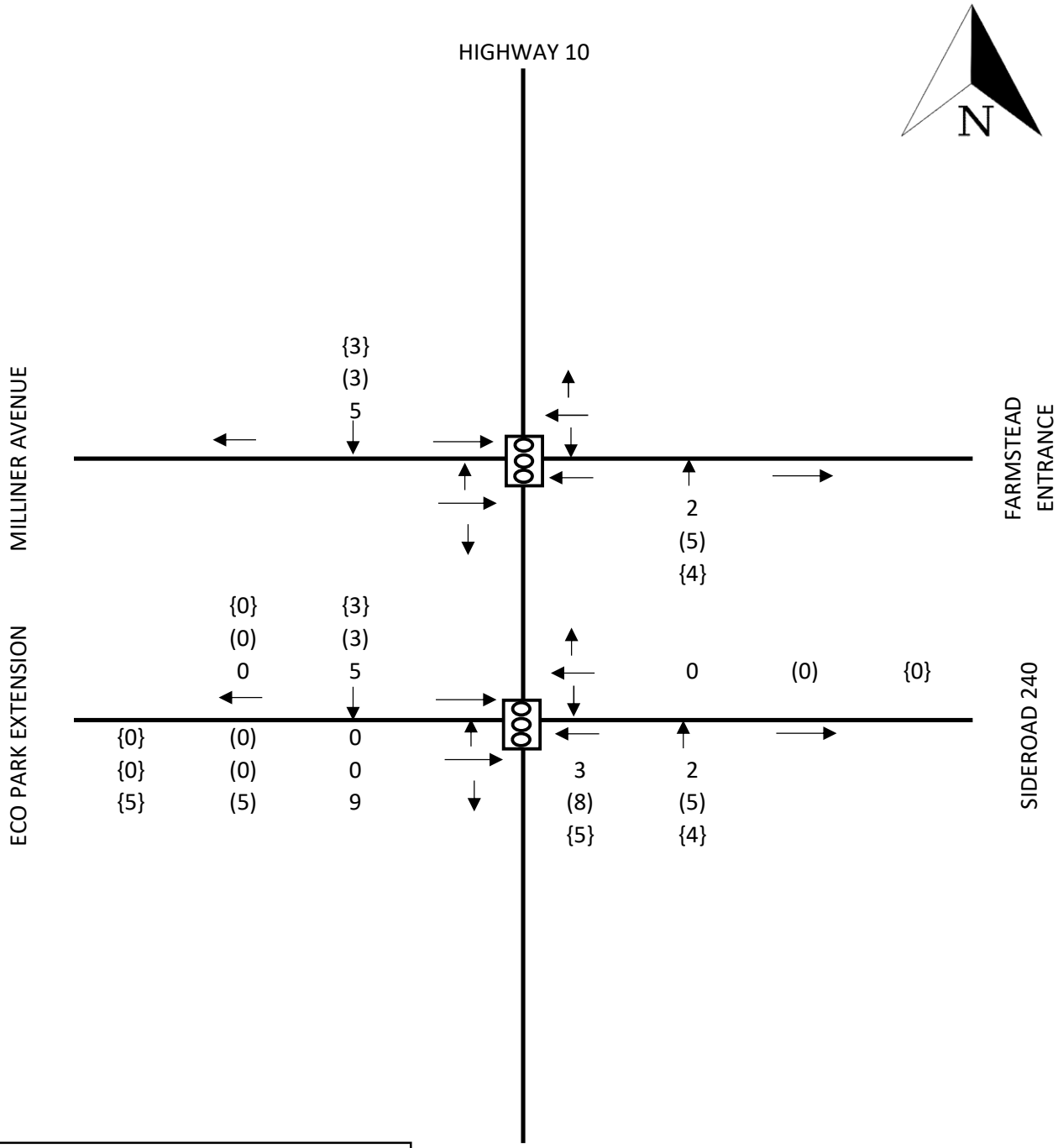

LEGEND

SIGNALIZED

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**GLENELG PHASE 1 FUTURE TOTAL ASSIGNMENT**				
DRAWN BY:	**DB**	SCALE:	**N.T.S.**		
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO.	**9**

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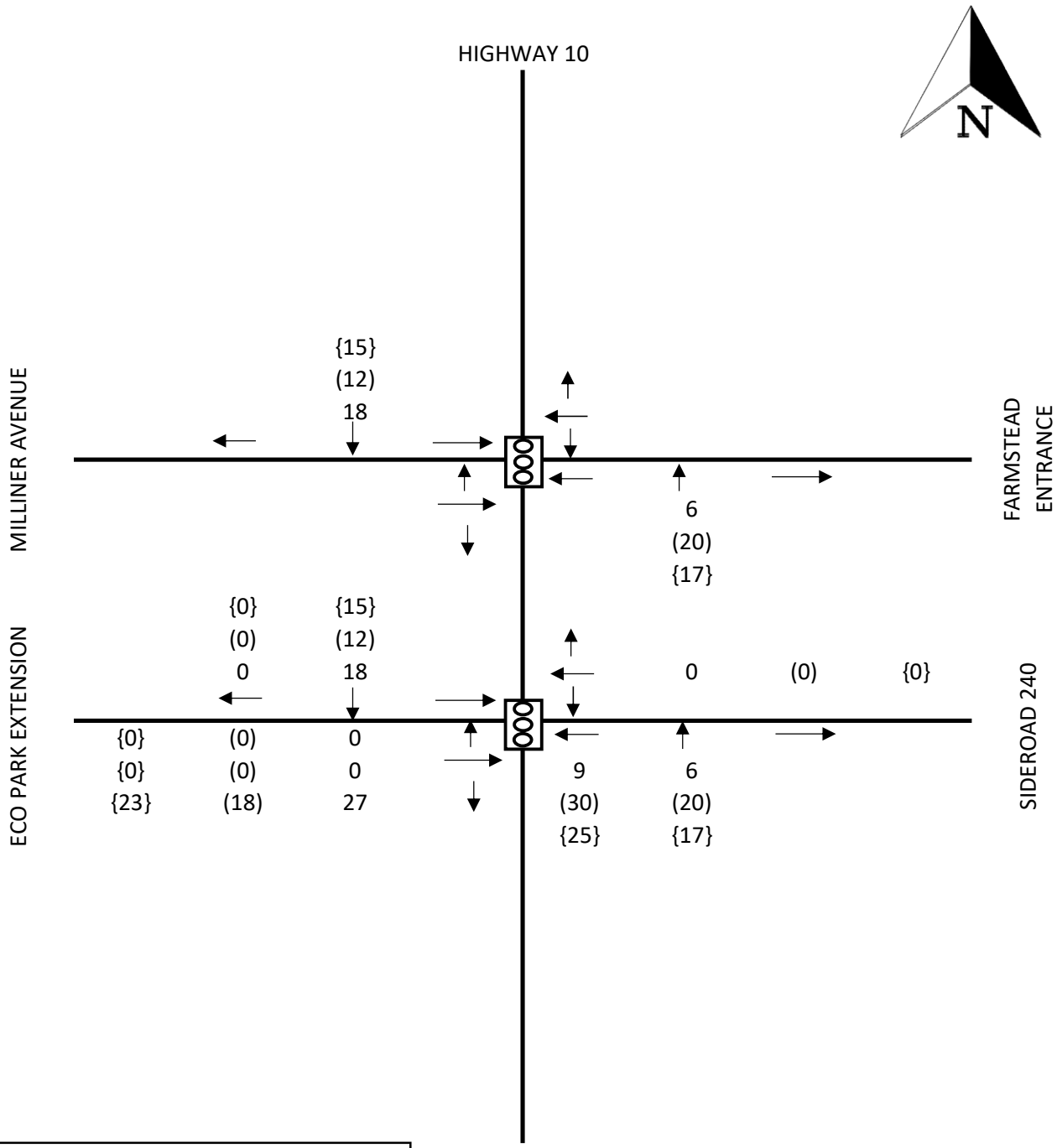

LEGEND

SIGNALIZED

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**GLENELG PHASE 2 FUTURE TOTAL ASSIGNMENT**				
DRAWN BY:	**DB**	SCALE:	**N.T.S.**		
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO.	**10**

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3.3.3 White Rose Park Phase 3

The White Rose Phase 3 development is located north of Wilcon Crescent and is south of the future Glenelg Phase 3 development. Based on the White Rose Phase 3 TIS (Triton Engineering Services, September 2020). **Table 8** summarizes the trip generation estimates.

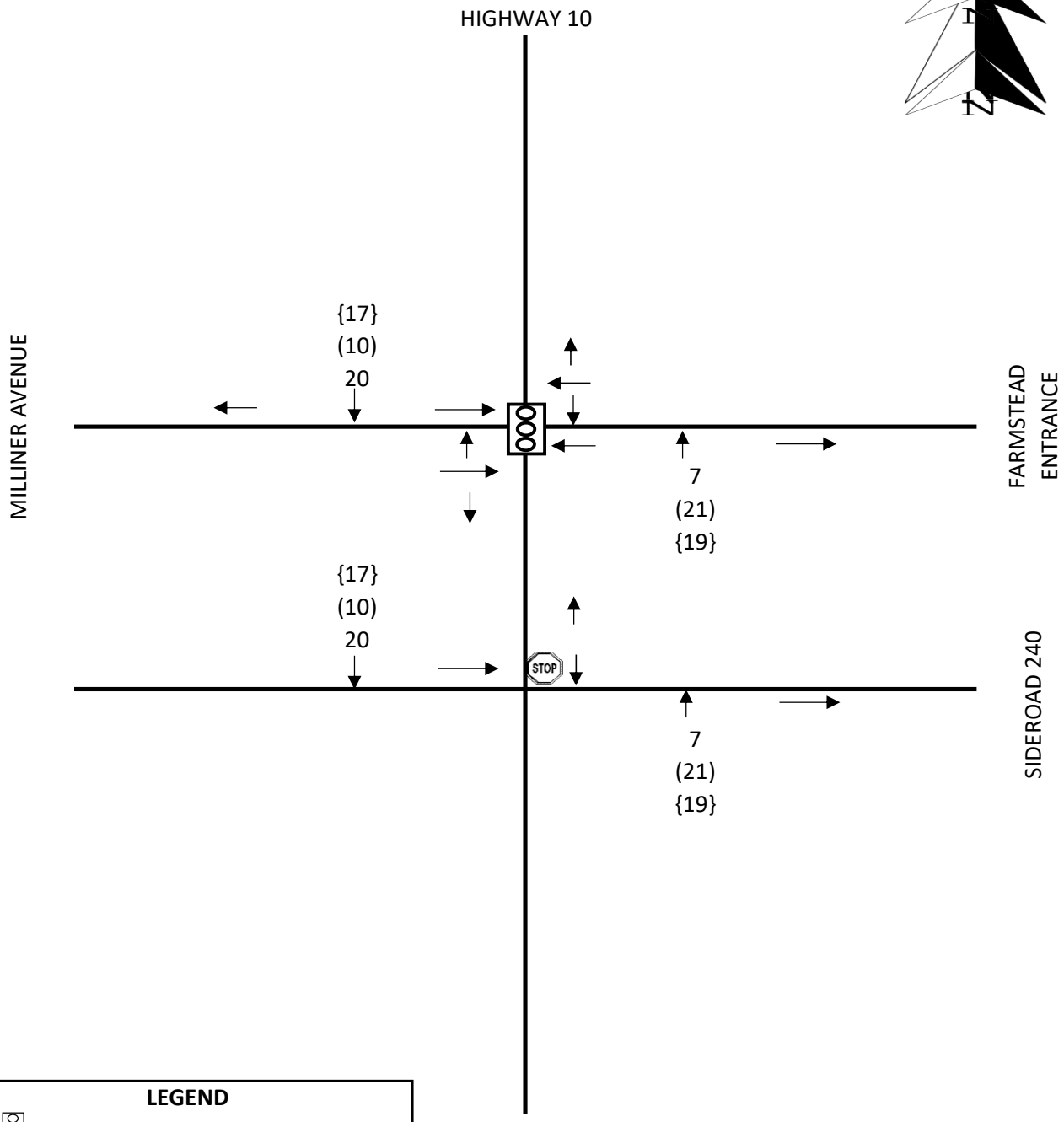
Table 8: White Rose Phase 3 Trip Generation

Use	Peak Hour	Number of Trips		
		Inbound	Outbound	Total
L.U. 210: Single Family Detached Housing (33 Units)	Weekday A.M.	8	23	31
	Weekday P.M.	23	13	36
	Saturday	21	17	38
L.U. 230: Residential Condominium/ Townhouse (24 Units)	Weekday A.M.	3	14	17
	Weekday P.M.	13	6	19
	Saturday	10	11	21
L.U. 252: Senior Adult Housing (Attached) (34 Units)	Weekday A.M.	2	3	5
	Weekday P.M.	5	1	6
	Saturday	6	6	12
Total	**Weekday A.M.**	**13**	**40**	**53**
	Weekday P.M.	**41**	**20**	**61**
	Saturday	**37**	**34**	**71**

Trips generated by the White Rose development were assigned to the boundary road network based on the distributions described in the original TIS (Triton Engineering, September 2020). Out of the 60% of traffic volumes going/coming to/from Highway 10 via Owen Sound Street, it was assumed that 50% is would be to/from south on Highway 10 consistent with the Edgewood Greens Commercial Block TIS (Crozier, September 2023).

With the completion of Eco Park Way, 60% of the 50% of trips assigned to the Highway 10 are expected to by-pass Main Street.

Figure 11 and **Figure 12** illustrate the future background and future total trip assignments, respectively. **Appendix H** includes relevant excerpts from the White Rose TIS (Triton, September 2020).



LEGEND

SIGNALIZED

STOP CONTROL

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**WHITE ROSE FUTURE BACKGROUND ASSIGNMENT**				
DRAWN BY:	**DB**	SCALE:	**N.T.S.**		
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO.	**11**

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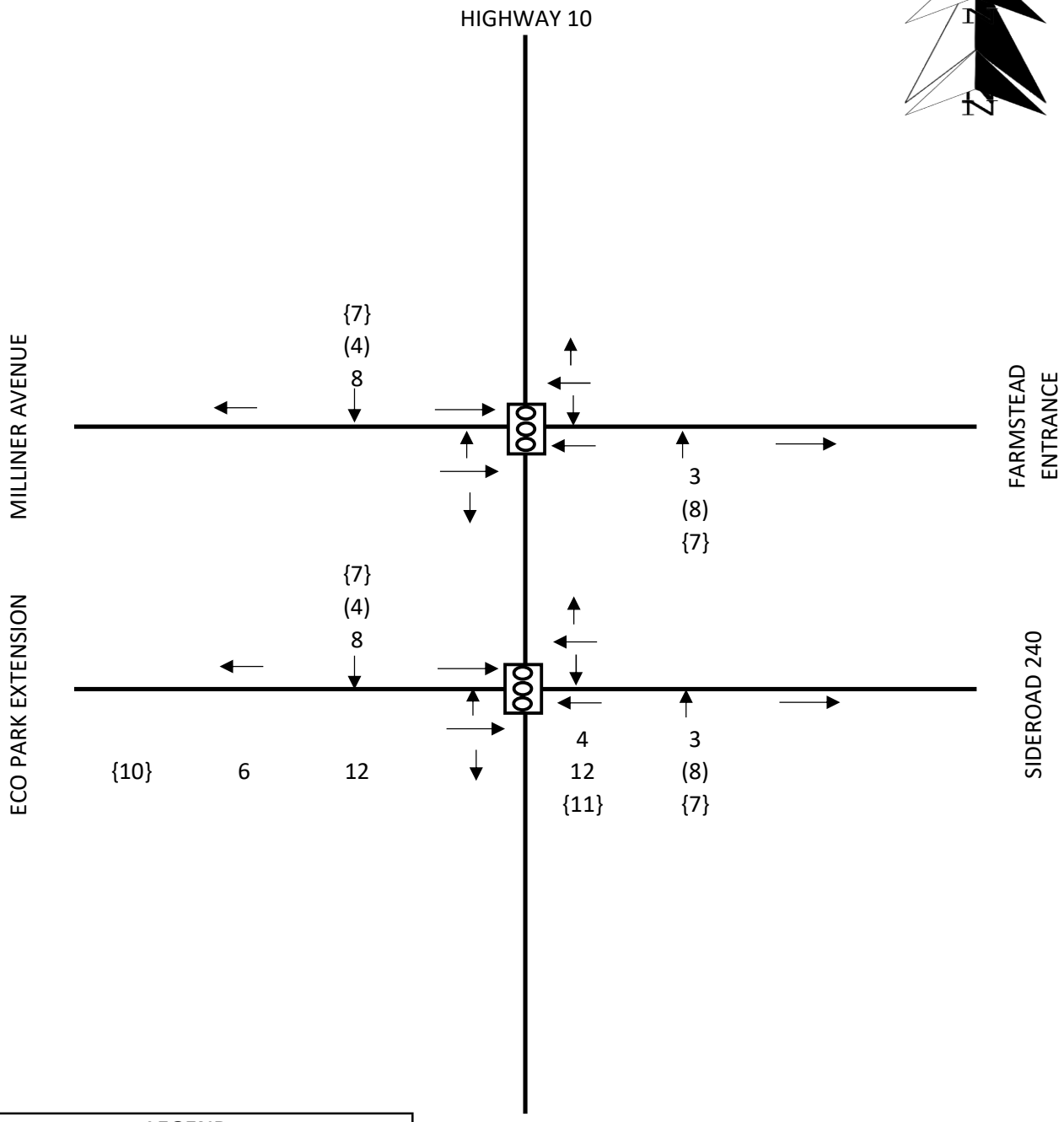

LEGEND

SIGNALIZED

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**WHITE ROSE FUTURE TOTAL ASSIGNMENT**				
DRAWN BY:	**DB**	SCALE:	**N.T.S.**		
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO.	**12**

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3.3.4 Ida Street

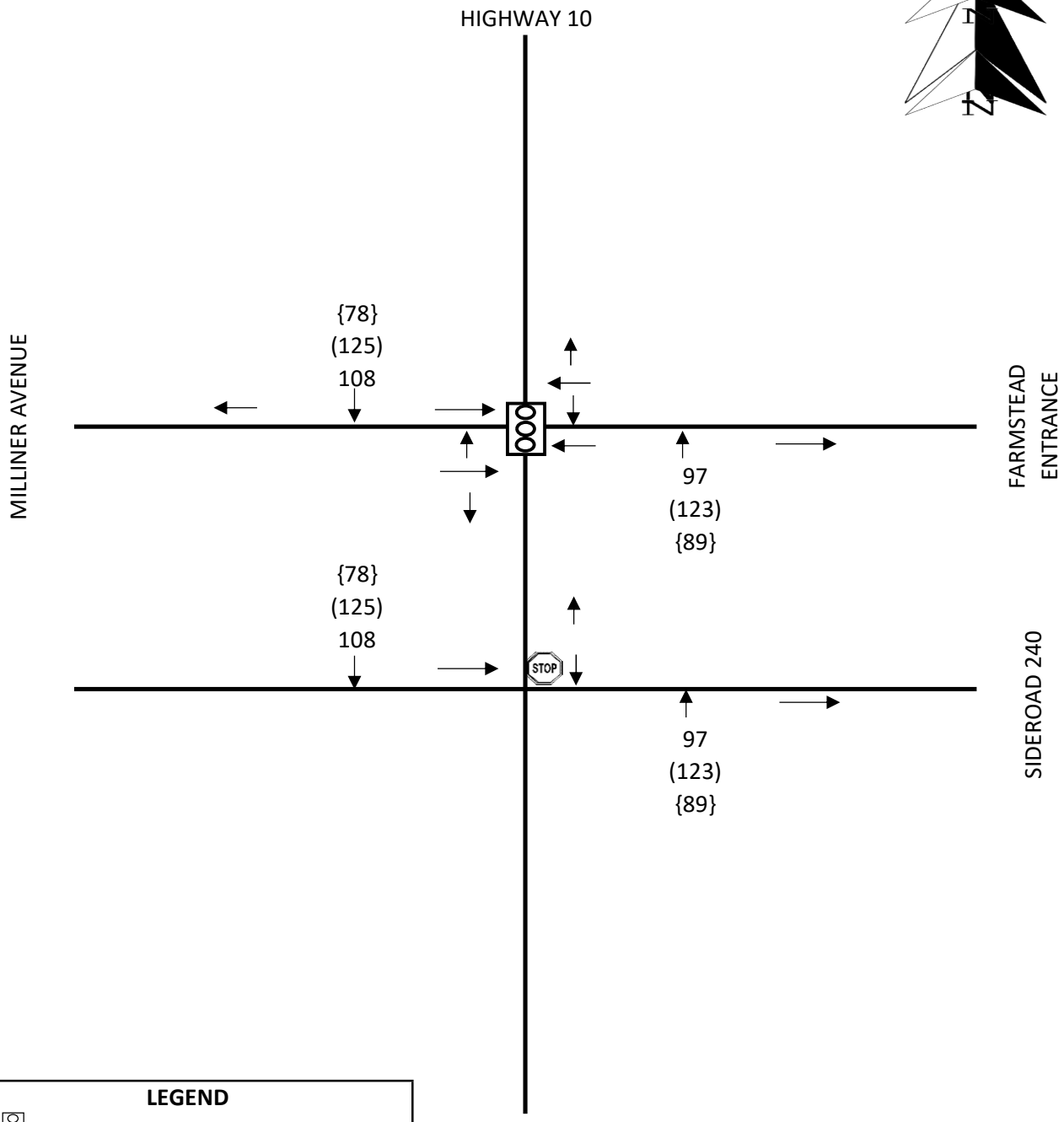
The Ida Street development is located at the northeast corner of the unsignalized intersection of Ida Street and Grey Road 9. The Township provided guidance for what may be accommodated within these lands as part of the development proposal. To establish a trip generation estimate the trip generation for office uses and a recreation centre, each with a lot coverage of 10% of the lands, was assessed. **Table 9** outlined the trip generation for the Ida Street development.

Table 9: Ida Street Trip Generation

Use	Peak Hour	Number of Trips		
		Inbound	Outbound	Total
LUC 210 'Single Family Homes' (266 Units)	Weekday A.M.	45	136	181
	Weekday P.M.	157	92	249
	Saturday	129	109	238
LUC 220 'Multifamily Housing (Low-Rise)' (55 Units)	Weekday A.M.	10	30	40
	Weekday P.M.	28	16	44
	Saturday	20	21	41
LUC 730 'Government Office Building' (68,000 ft^2)	Weekday A.M.	106	14	120
	Weekday P.M.	20	101	121
	Saturday	0	0	0
LUC 495 'Recreational Community Center" (68,000 ft^2)	Weekday A.M.	86	44	130
	Weekday P.M.	95	107	202
	Saturday	39	34	73
TOTAL	**Weekday A.M.**	**247**	**224**	**471**
	Weekday P.M.	**300**	**316**	**616**
	Saturday	**188**	**164**	**352**

It is expected that trips generated by the recreation community center will generate trips internal to central Dundalk and is not expected to pull from external communities. Therefore trips are not considered south on Highway 10. The residential and office trip distribution assigned 60% of trips to Highway 10 as outlined in the May 2024 TIS. The May 2024 report also included an Eco Park Scenario which review the change in distribution, sending 60% of trips to and from the south on Highway 10 utilizing the Eco Street by-pass. The weekday peak hour trip distribution outlined in the May 2024 TIS was applied to the Saturday trip generation for the purpose of this assessment.

Figure 13 and **Figure 14** illustrate the future background and future total trip assignments, respectively. **Appendix H** includes relevant excerpts from the Ida Street TIS (Crozier, May 2024).



LEGEND

SIGNALIZED

STOP CONTROL

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**IDA STREET FUTURE BACKGROUND ASSIGNMENT**				
DRAWN BY:	**DB**	SCALE:	**N.T.S.**		
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO.	**13**

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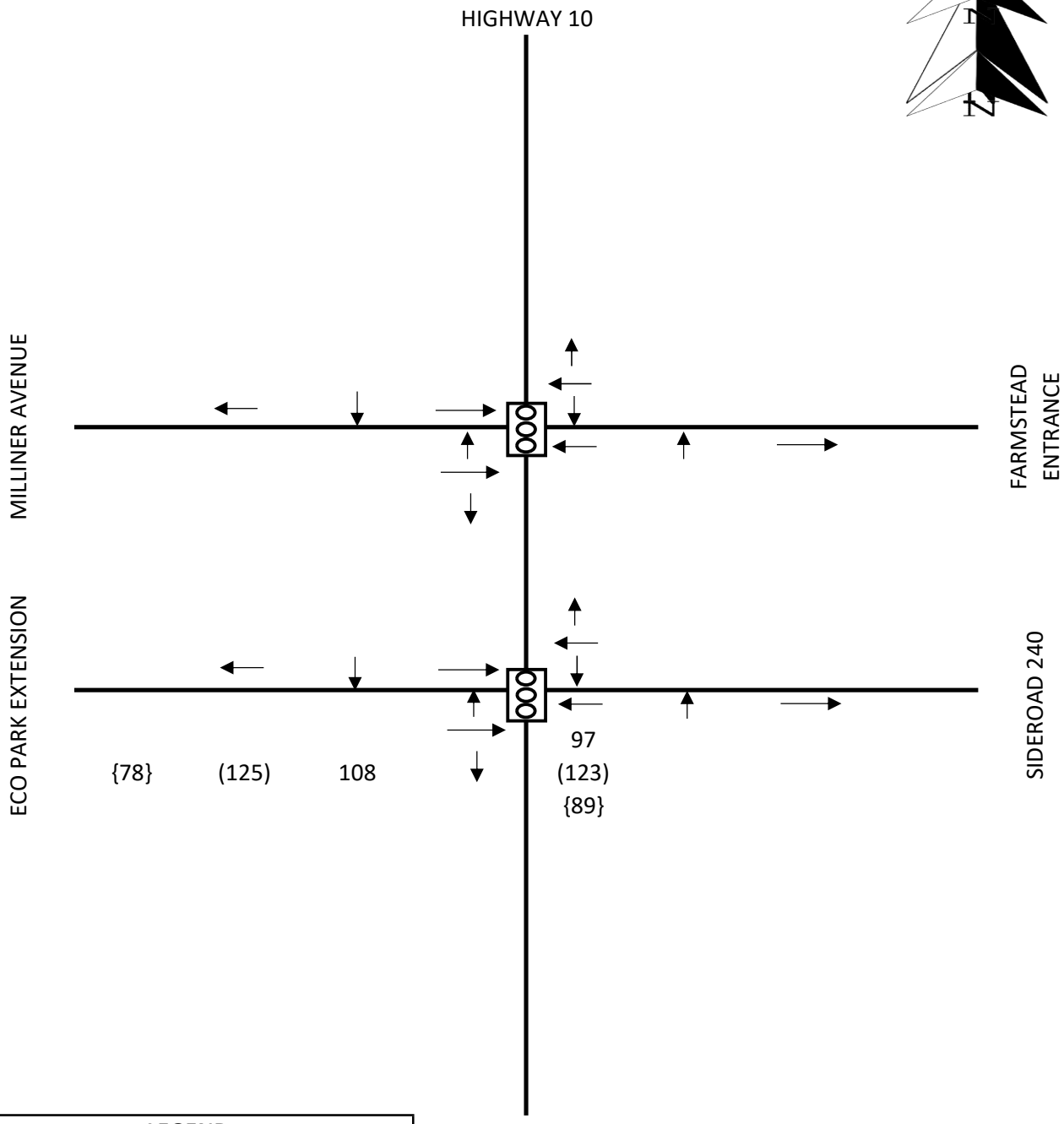

LEGEND

SIGNALIZED

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**IDA STREET FUTURE TOTAL ASSIGNMENT**				
DRAWN BY:	**DB**	SCALE:	**N.T.S.**		
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO.	**14**

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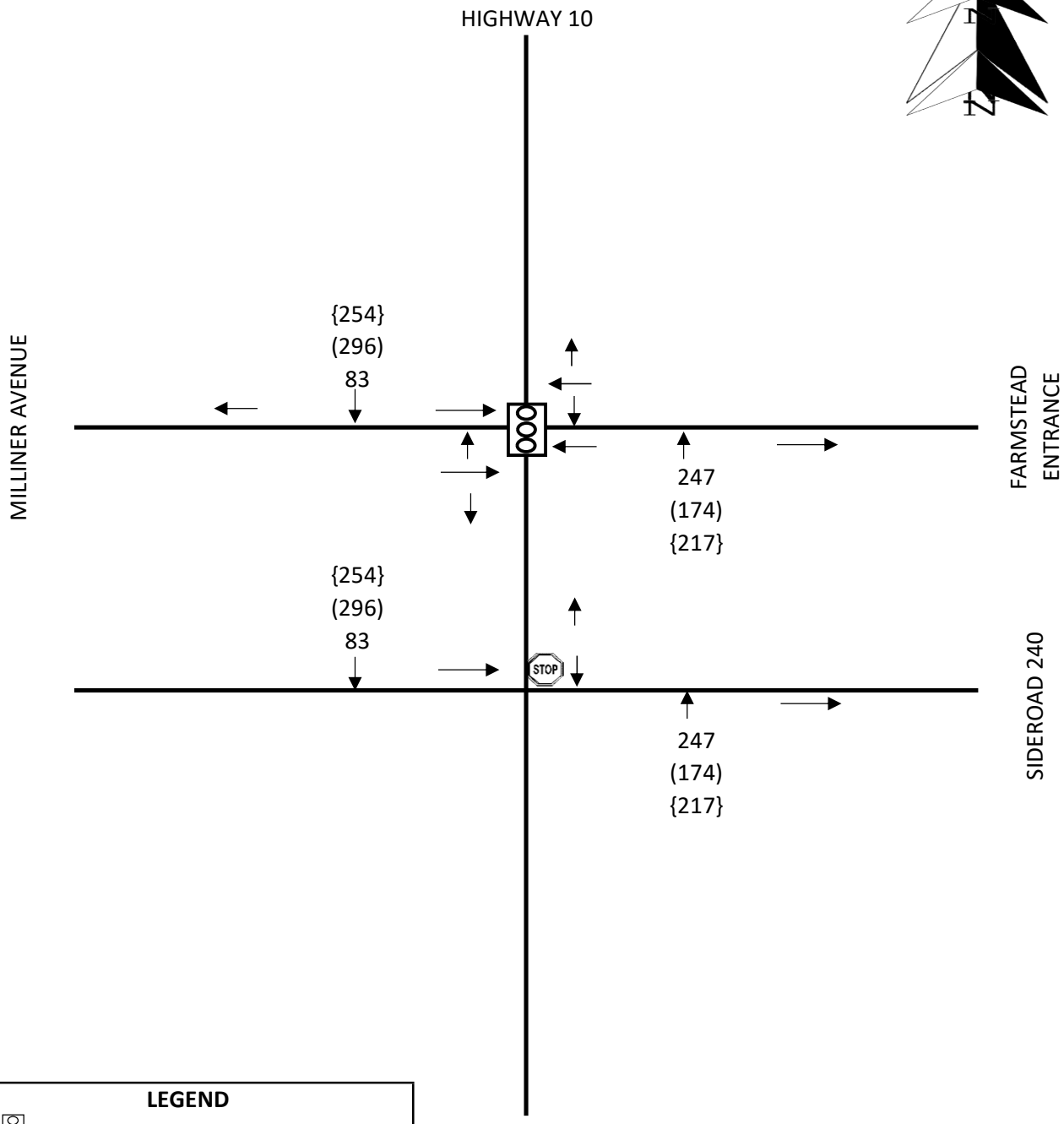
3.3.5 Dundalk Northeast

Flato Developments Inc. owns 99 ha in the northeast corner of Dundalk, fronting Highway 10. No formal application and reports have been prepared for the lands at this time. Based on communications with MHBC Planning, 900 single-detached homes have been assessed as the future development potential for the lands. **Table 10** outlines the trip generation forecast for the lands.

Table 10: Dundalk Northeast Trip Generation

Use	Peak Hour	Number of Trips		
		Inbound	Outbound	Total
LUC 210 'Single Family Homes' (900 Units)	Weekday A.M.	138	412	550
	Weekday P.M.	494	290	784
	Saturday	423	361	784

Based on the location of the lands along Highway 10, the completion of Eco Park Way is not anticipated to have an impact on the trip distribution for these lands. 60% of generated volumes have been assigned to Highway 10 consistent with the trip assignments for other developments in the area. **Figure 15** illustrates the Dundalk Northeast trip assignment.



LEGEND

	SIGNALIZED
STOP	STOP CONTROL
	MOVEMENT
XX(XX){XX}	AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**DUNDALK NORTHEAST TRIP ASSIGNMENT**				
DRAWN BY:	**DB**	SCALE:	**N.T.S.**		
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO.	**15**

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3.3.6 Town Industrial Lands

The Industrial Access Road TIS (Triton, June 2017) reviewed Eco Park Way through lands owned by the Township and destined for industrial uses. The Site now under development by Flato was part of the overall development area assessed in the TIS. When looking at the remaining lands west of the Grey County Rail Trail approximately 110.8 acres remain as part of the background development.

The Triton TIS utilized the 8th Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual which reviewed an industrial park based on acreage. The 11th Edition Trip Generation Manual provides trip estimates based on gross floor area (GFA). A lot coverage of 20% was established based on the methodology outlined in **Section 4.1.5**. **Table 11** outlines the trip generation for a 50% build-out in 2029 and 100% build-out in 2034 of the industrial lands, consistent with the 2017 TIS.

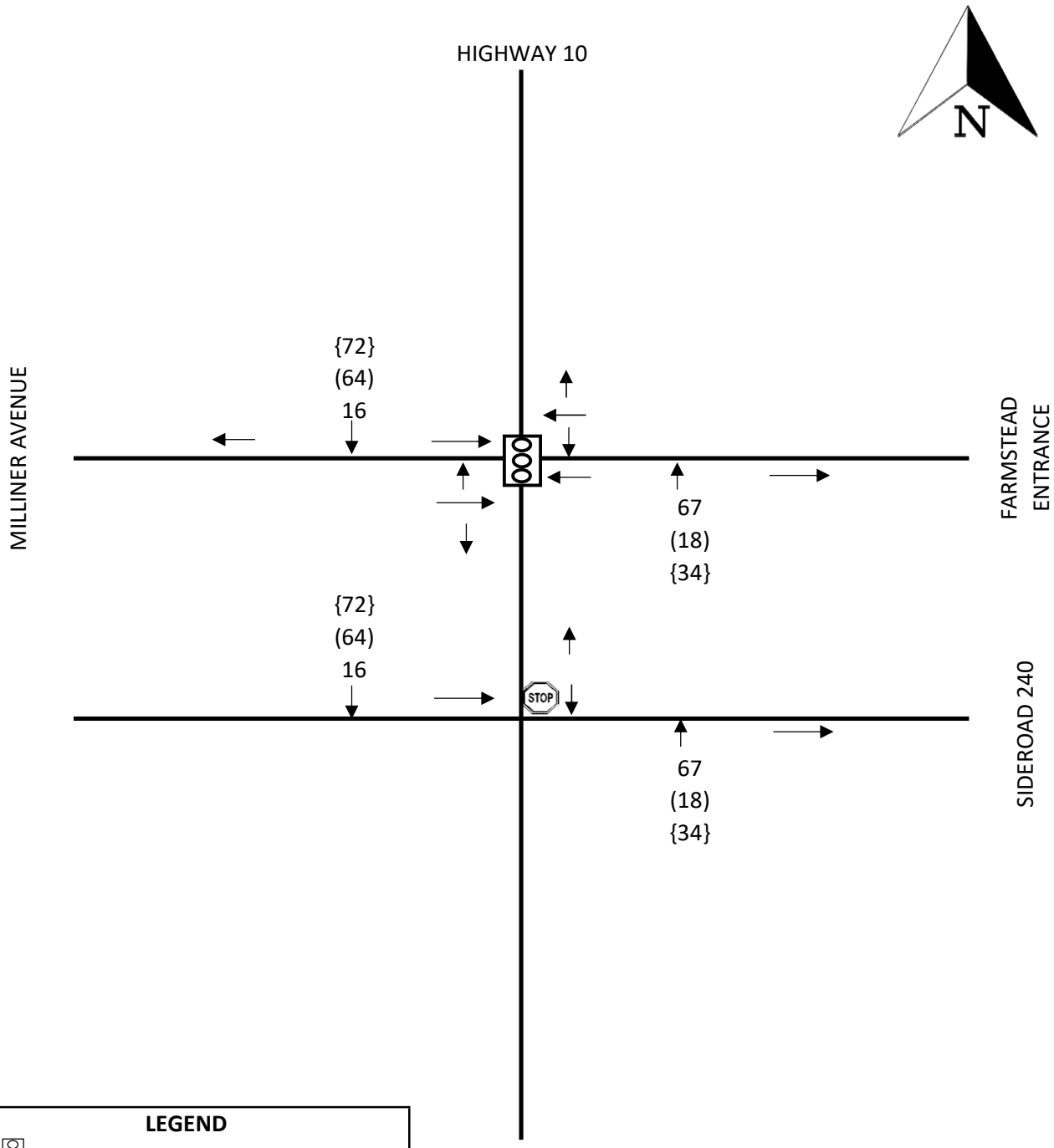
Table 11: Town Industrial Lands Trip Generation

Use	Build-Out	Peak Hour	Number of Trips		
			Inbound	Outbound	Total
LUC 130: Industrial Park (965,290 ft²)	50% Build-Out	Weekday A.M.	133	31	164
		Weekday P.M.	36	128	164
		Saturday	68	144	212
	100% Build-Out	Weekday A.M.	266	62	328
		Weekday P.M.	72	256	328
		Saturday	136	289	425

Trips generated by the Industrial lands were distributed based on the 2017 TIS with 50% of trips travelling south and 20% travelling north on Highway 10. It is assumed that the remaining 30% will utilize Ida Street. With the completion of Eco Park Way, volumes are assumed to utilize the extension, rather than travelling to Main Street. For the purposes of this assessment the p.m. peak hour trip distribution has been applied to the Saturday volumes forecasted.

Figure 16 and **Figure 17** illustrate the 2029 and 2034 Future background trip assignments, respectively. **Figure 18** and **Figure 19** illustrate the 2029 and 2034 Future total trip assignments, respectively.

Appendix B contains excerpts from the Industrial Access Road TIS (Triton Engineering, June 2017).

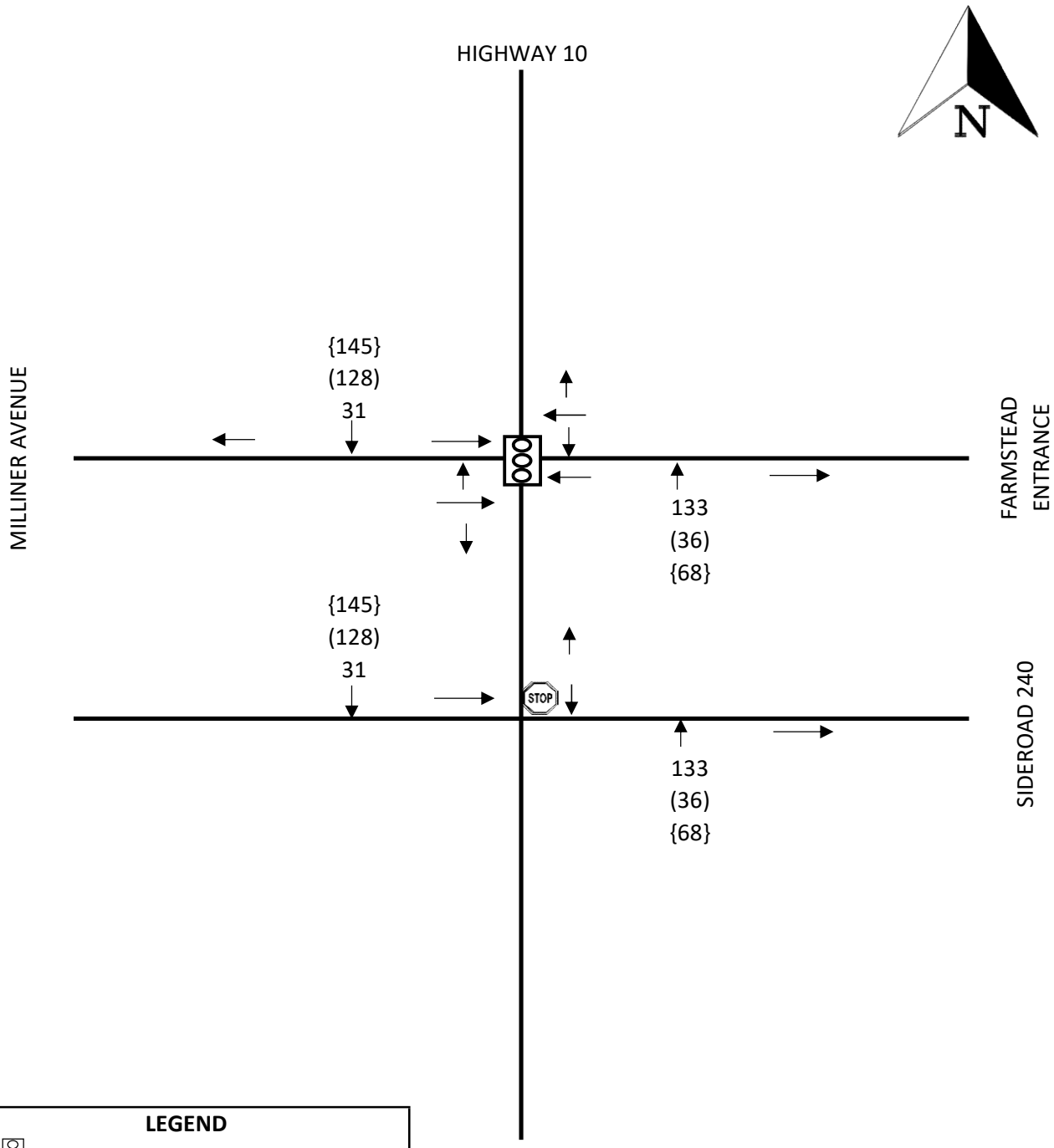


LEGEND

	SIGNALIZED
STOP	STOP CONTROL
	MOVEMENT
XX(XX){XX}	AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**INDUSTRIAL LANDS 2029 FUTURE BACKGROUND TRIP ASSIGNMENT**				
DRAWN BY:	**KH**	SCALE:	**N.T.S.**		
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO.	**16**

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705-446-3510 T
705-446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA



LEGEND

	SIGNALIZED
STOP	STOP CONTROL
	MOVEMENT
XX(XX){XX}	AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**INDUSTRIAL LANDS 2034 FUTURE BACKGROUND TRIP ASSIGNMENT**				
DRAWN BY:	**KH**	SCALE:	**N.T.S.**		
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO.	**17**

CROZIER CONSULTING ENGINEERS
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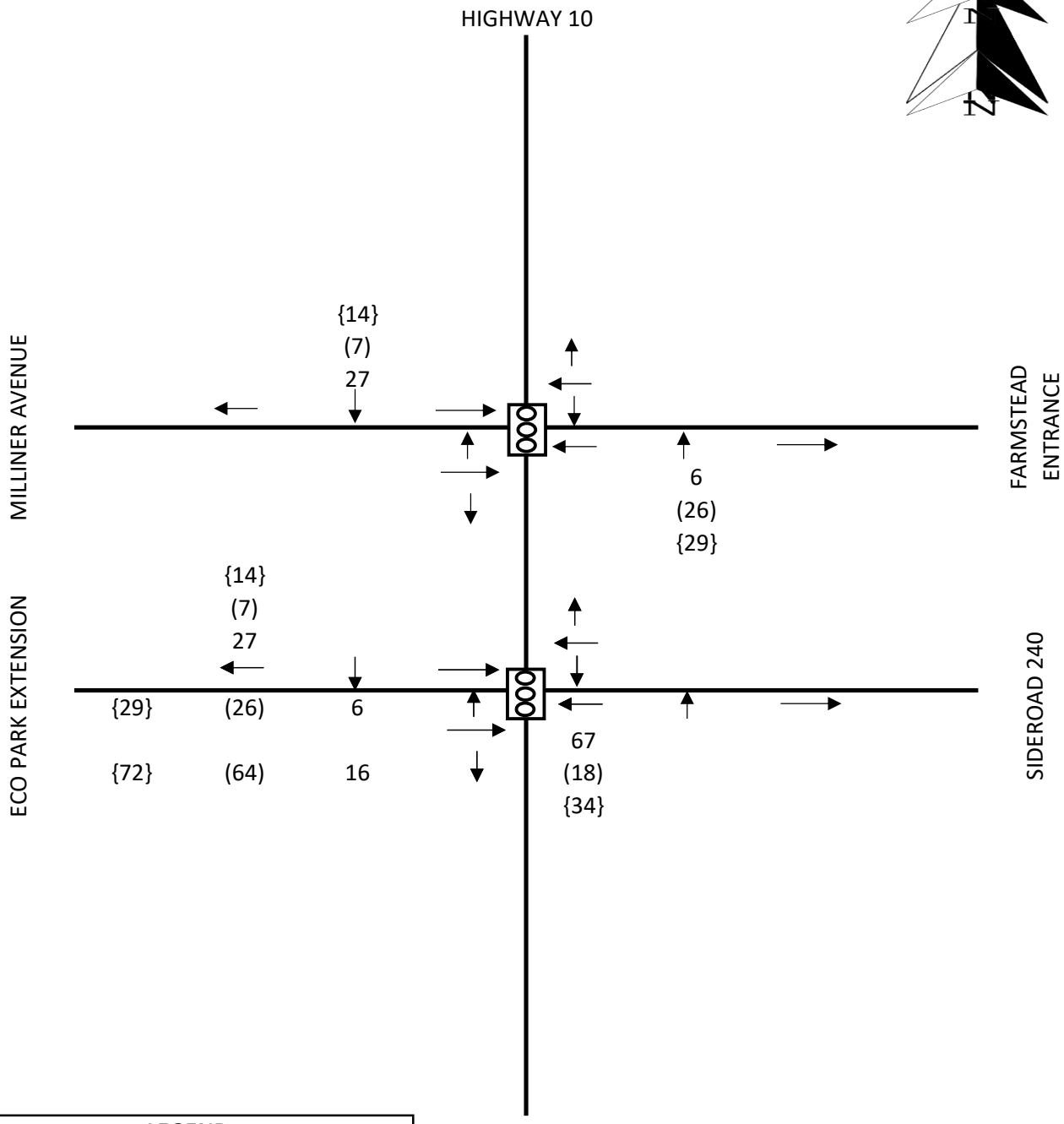

LEGEND

SIGNALIZED

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**INDUSTRIAL LANDS 2029 FUTURE TOTAL ASSIGNMENT**				
DRAWN BY:	**DB**	SCALE:	**N.T.S.**		
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO.	**18**

CROZIER CONSULTING ENGINEERS
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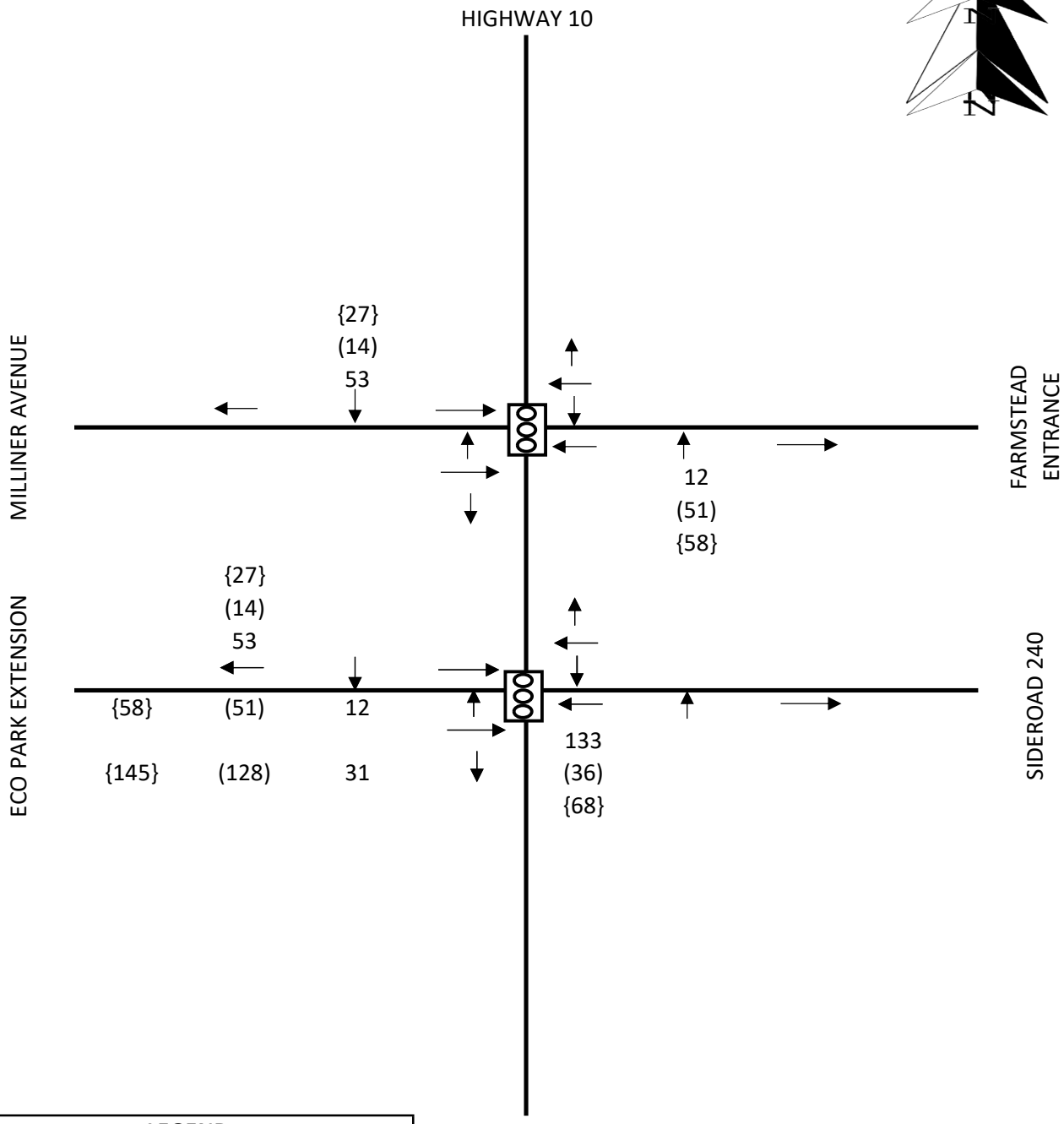

LEGEND

SIGNALIZED

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**INDUSTRIAL LANDS 2034 FUTURE TOTAL ASSIGNMENT**				
DRAWN BY:	**DB**	SCALE:	**N.T.S.**		
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO.	**19**

CROZIER CONSULTING ENGINEERS
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3.4 Roadway Mitigations

Historically the MTO has advised that the following capacity methodology be considered to review the need for network improvements:

- Dual left-turn lanes should be considered when the peak left turn volumes exceed 300 vehicles per hour per lane (vphpl).
- A separate right-turn lane should be considered when the right-turn volumes exceed 200 vphpl.
- Channelized right-turn should be considered when the peak right turn volumes exceed 500 vphpl.
- Additional though lanes should be considered when the though volumes exceed 800 vphpl.

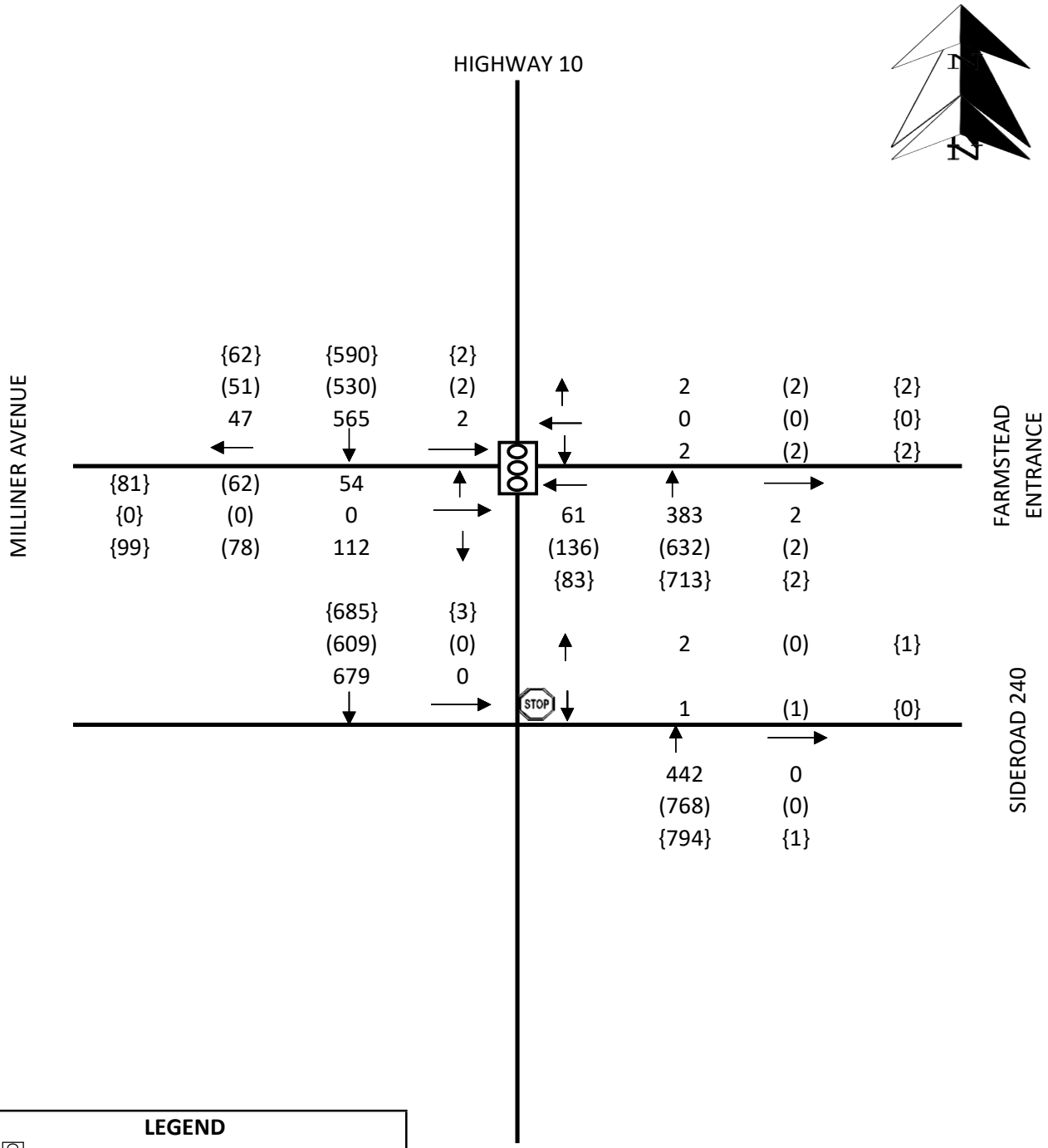
Based on this methodology, under 2044 future background conditions an additional through lane on Highway 10 should be considered as p.m. peak hour and Saturday peak hour northbound and southbound volumes exceed 1000 vehicles along the corridor. As the background traffic volumes are expected to more than triple the existing volumes on Highway 10 in the next 20 years and most of the volumes are forecasted from proposed developments, the actual future volumes may vary from the forecast. Therefore, widening has not been considered as a mitigation measure and monitoring by the MTO and the Township is recommended.

3.5 Intersection Operations

Future background conditions were established by growing the existing volumes to the forecasted horizon year and applying the assigned trips of the background developments. **Figure 20**, **Figure 21**, **Figure 22**, and **Figure 23** illustrate the 2029, 2034, 2039 and 2044 future background traffic volumes, respectively.

Table 12, Table 13, Table 14, and **Table 15** outline the 2029, 2034, 2039, 2044 future background traffic operations, respectively. Synchro 11 was used to determine intersection operations at both the signalized and unsignalized study intersections. Future background signal timings have been reviewed with the inclusion of the three-phase signal plan determined with the MTO as part of the Highway 10 and Milliner Avenue intersection design. The intersection has been modelled with an updated cycle length of 98 seconds and the inclusion of a permitted/protected northbound left-turn movement based on the additional background development volumes assessed.

Appendix D contains level of service definitions. **Appendix E** contains the detailed capacity analysis worksheets.



LEGEND

	SIGNALIZED
STOP	STOP CONTROL
→	MOVEMENT
XX(XX){XX}	AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**		
DRAWING:	**2029 FUTURE BACKGROUND TRAFFIC VOLUMES**		
DRAWN BY:	**DB**	SCALE:	**N.T.S.**
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**
		FIGURE NO.	**20**

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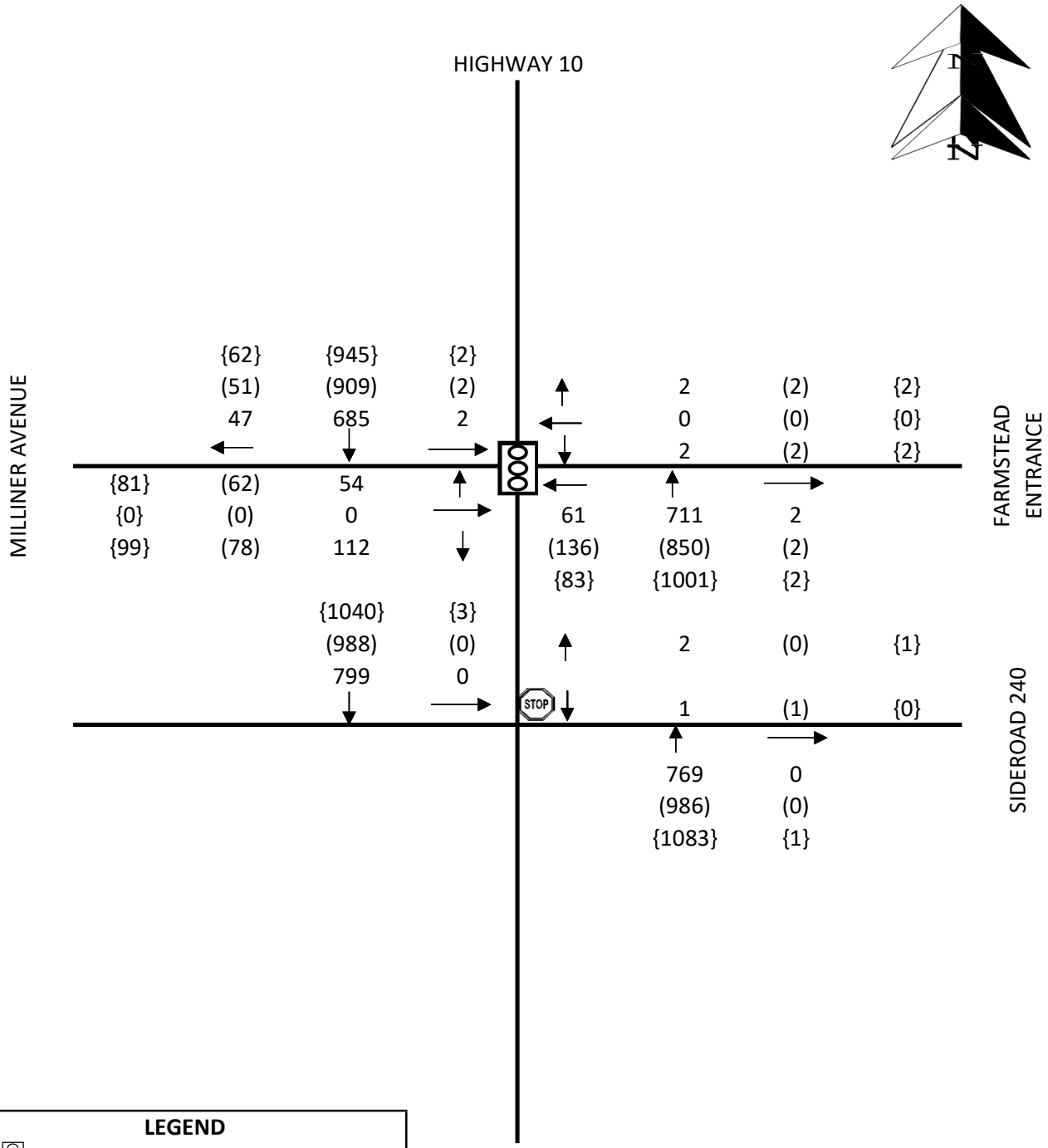

LEGEND

SIGNALIZED

STOP CONTROL

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**		
DRAWING:	**2034 FUTURE BACKGROUND TRAFFIC VOLUMES**		
DRAWN BY:	**DB**	SCALE:	**N.T.S.**
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**
		FIGURE NO.	**21**

CROZIER CONSULTING ENGINEERS
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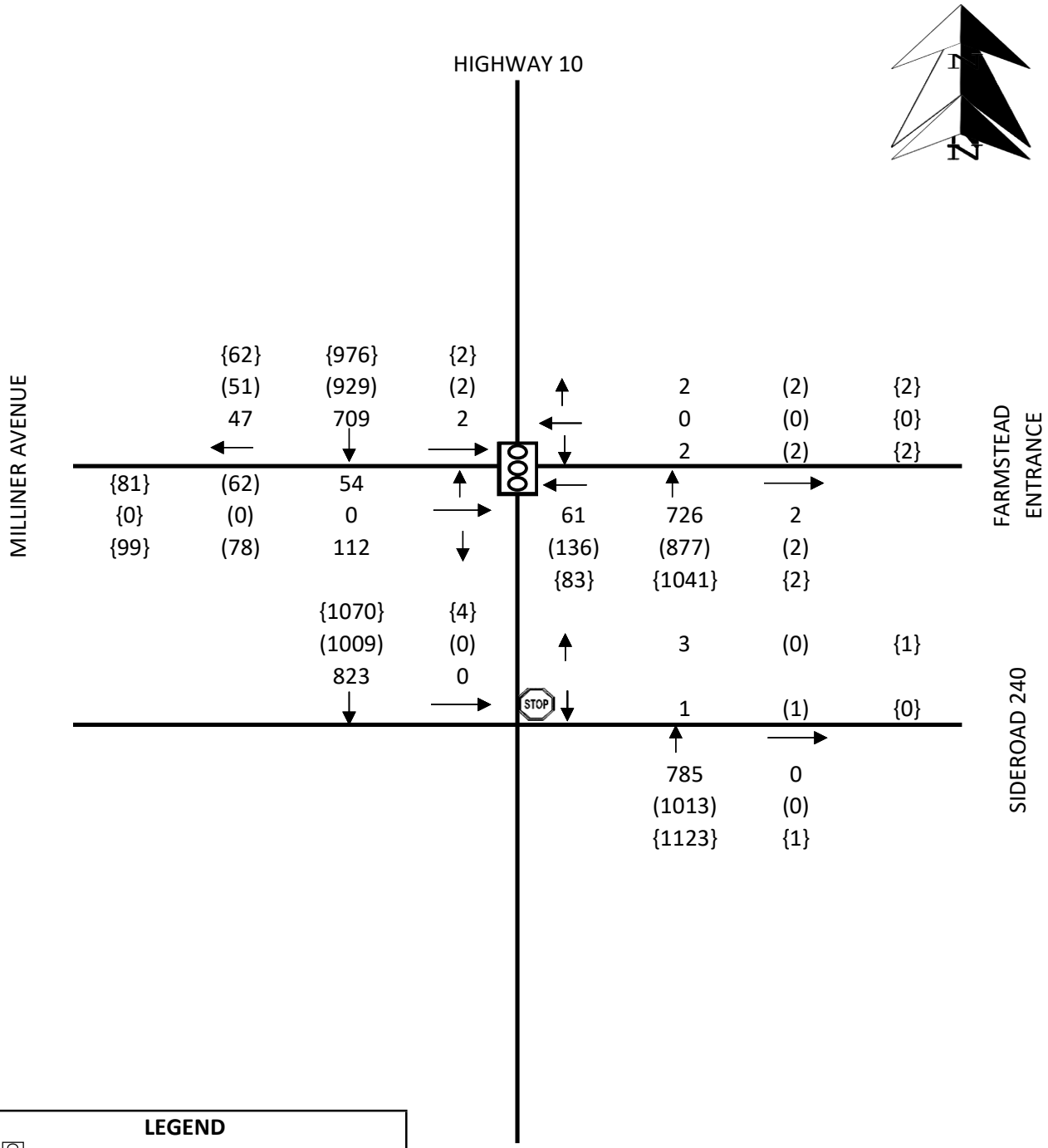

LEGEND

	SIGNALIZED
STOP	STOP CONTROL
→	MOVEMENT
XX(XX){XX}	AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**2034 FUTURE BACKGROUND TRAFFIC VOLUMES**				
DRAWN BY:	**DB**	SCALE:	**N.T.S.**		
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO.	**22**

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
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705-446-3510 T
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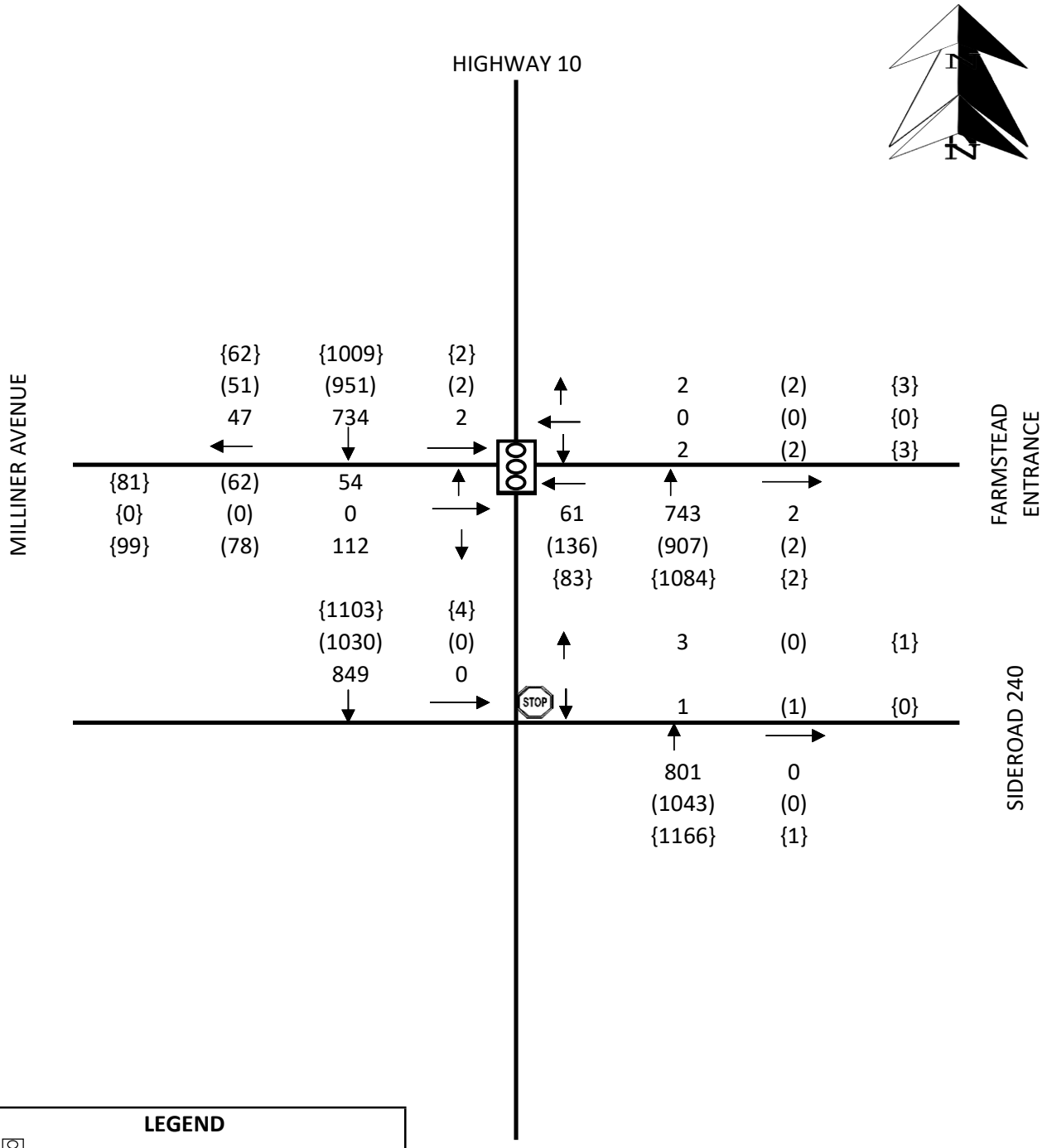

LEGEND

	SIGNALIZED
STOP	STOP CONTROL
→	MOVEMENT
XX(XX){XX}	AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**2034 FUTURE BACKGROUND TRAFFIC VOLUMES**				
DRAWN BY:	**DB**	SCALE:	**N.T.S.**		
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO.	**23**

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
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Table 12: 2029 Future Background Traffic Operations

Intersection	Performance Metrics									
	Movement	AM			PM			Saturday		
		LOS[1]	Delay	v/c	LOS[1]	Delay	v/c	LOS[1]	Delay	v/c
Highway 10 & Milliner Ave (signalized)	**Overall**	**B**	**12.1**	**0.55**	**B**	**13.1**	**0.57**	**B**	**13.7**	**0.60**
	EBL	C	31.8	0.43	C	32.1	0.30	D	35.7	0.38
	EBTR	A	0.6	0.36	A	0.4	0.13	A	0.6	0.17
	WB	A	0.0	0.02	A	0.0	0.02	A	0.0	0.02
	NBL	A	6.9	0.29	A	8.6	0.34	A	7.2	0.22
	NBTR	A	8.8	0.37	B	11.8	0.54	B	12.7	0.60
	SBL	B	11.0	0.00	B	11.5	0.01	B	11.0	0.01
	SBT	B	16.3	0.64	B	16.7	0.57	B	16.5	0.57
	SBR	A	0.1	0.07	A	0.1	0.06	A	0.1	0.06
Highway 10 & Sideroad 240 (stop-control)	**Overall**	**C**	**-**	**-**	**D**	**-**	**-**	**B**	**-**	**-**
	WB	C	20.6	0.02	D	31.1	0.01	B	14.8	0.00
	NBT	-	0.0	0.00	-	0.0	0.00	-	0.0	0.00
	NBR	-	0.0	0.00	-	0.0	0.00	-	0.0	0.00
	SB	-	0.0	0.00	-	0.0	0.00	-	0.0	0.00

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro).
Note 2: The maximum v/c ratio for two-way stop-controlled intersections represents the maximum v/c for the minor road approach movements at the intersection. Any movements that experience a v/c ratio in excess of 0.85 are considered critical per the MTO TIS Guidelines.

Table 13: 2034 Future Background Traffic Operations

Intersection	Performance Metrics									
	Movement	AM			PM			Saturday		
		LOS[1]	Delay	v/c	LOS[1]	Delay (s)	v/c	LOS[1]	Delay	v/c
Highway 10 & Milliner Ave (signalized)	**Overall**	**B**	**14.5**	**0.66**	**C**	**23.2**	**0.88**	**C**	**30.7**	**0.96**
	EBL	C	32.9	0.26	D	38.9	0.35	D	43.9	0.49
	EBTR	A	0.7	0.20	A	0.7	0.17	A	1.0	0.22
	WB	A	0.0	0.02	A	0.2	0.02	A	0.2	0.02
	NBL	A	7.4	0.20	D	51.8	0.84	B	19.0	0.53
	NBTR	B	12.7	0.60	B	14.6	0.69	C	26.1	0.90
	SBL	B	11.0	0.01	B	10.5	0.01	B	11.5	0.02
	SBT	B	18.8	0.66	C	29.2	0.88	D	40.8	0.96
	SBR	A	0.1	0.05	A	0.1	0.05	A	0.1	0.07
Highway 10 & Sideroad 240 (stop-control)	**Overall**	**E**	**-**	**-**	**F**	**-**	**-**	**C**	**-**	**-**
	WB	E	39.5	0.03	F	70.5	0.02	C	19.6	0.00
	NBT	-	0.0	0.00	-	0.0	0.00	-	0.0	0.00
	NBR	-	0.0	0.00	-	0.0	0.00	-	0.0	0.00
	SB	-	0.0	0.00	-	0.0	0.00	-	0.0	0.00

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro).
Note 2: The maximum v/c ratio for two-way stop-controlled intersections represents the maximum v/c for the minor road approach movements at the intersection. Any movements that experience a v/c ratio in excess of 0.85 are considered critical per the MTO TIS Guidelines.

Table 14: 2039 Future Background Traffic Operations

Intersection	Performance Metrics									
	Movement	AM			PM			Saturday		
		LOS[1]	Delay	v/c	LOS[1]	Delay (s)	v/c	LOS[1]	Delay	v/c
Highway 10 & Milliner Ave (signalized)	**Overall**	**B**	**14.8**	**0.68**	**C**	**24.3**	**0.90**	**C**	**34.0**	**0.98**
	EBL	C	33.5	0.26	D	38.9	0.35	D	44.4	0.50
	EBTR	A	0.8	0.20	A	0.7	0.17	A	1.1	0.23
	WB	A	0.0	0.02	A	0.2	0.02	A	0.2	0.02
	NBL	A	7.5	0.22	D	51.8	0.84	C	20.1	0.54
	NBTR	B	12.8	0.61	B	15.3	0.71	C	29.2	0.93
	SBL	B	11.0	0.01	B	10.5	0.01	B	11.5	0.02
	SBT	B	19.4	0.68	C	31.3	0.90	D	45.1	0.98
	SBR	A	0.1	0.05	A	0.1	0.05	A	0.1	0.07
Highway 10 & Sideroad 240 (stop-control)	**Overall**	**E**	**-**	**-**	**F**	**-**	**-**	**C**	**-**	**-**
	WB	E	41.6	0.04	F	75.7	0.02	C	20.5	0.01
	NBT	-	0.0	0.00	-	0.0	0.00	-	0.0	0.00
	NBR	-	0.0	0.00	-	0.0	0.00	-	0.0	0.00
	SB	-	0.0	0.00	-	0.0	0.00	-	0.0	0.01

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro).
Note 2: The maximum v/c ratio for two-way stop-controlled intersections represents the maximum v/c for the minor road approach movements at the intersection. Any movements that experience a v/c ratio in excess of 0.85 are considered critical per the MTO TIS Guidelines.

Table 15: 2044 Future Background Traffic Operations

Intersection	Performance Metrics									
	Movement	AM			PM			Saturday		
		LOS[1]	Delay	v/c	LOS[1]	Delay (s)	v/c	LOS[1]	Delay	v/c
Highway 10 & Milliner Ave (signalized)	**Overall**	**B**	**15.2**	**0.70**	**C**	**25.8**	**0.92**	**D**	**40.3**	**1.02**
	EBL	C	34.0	0.26	D	38.9	0.35	D	44.4	0.50
	EBTR	A	0.8	0.21	A	0.7	0.17	A	1.1	0.23
	WB	A	0.0	0.02	A	0.2	0.02	A	0.2	0.03
	NBL	A	7.7	0.23	D	51.8	0.84	C	20.1	0.54
	NBTR	B	13.1	0.63	B	16.2	0.74	D	35.4	0.96
	SBL	B	10.5	0.01	B	10.5	0.01	B	11.5	0.02
	SBT	B	20.0	0.70	C	33.9	0.92	D	53.6	1.02
	SBR	A	0.1	0.05	A	0.1	0.05	A	0.1	0.07
Highway 10 & Sideroad 240 (stop-control)	**Overall**	**E**	**-**	**-**	**F**	**-**	**-**	**C**	**-**	**-**
	WB	E	37.1	0.04	F	81.7	0.02	C	21.4	0.01
	NBT	-	0.0	0.00	-	0.0	0.00	-	0.0	0.00
	NBR	-	0.0	0.00	-	0.0	0.00	-	0.0	0.00
	SB	-	0.0	0.00	-	0.0	0.00	-	0.0	0.01

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro).
Note 2: The maximum v/c ratio for two-way stop-controlled intersections represents the maximum v/c for the minor road approach movements at the intersection. Any movements that experience a v/c ratio in excess of 0.85 are considered critical per the MTO TIS Guidelines.

Table 16 outlines the results of the 2044 future background queuing assessment completed using the SimTraffic program within Synchro 11.

Table 16: 2044 Future Background Queueing

Intersection	Movement	Queue Length (m)						Auxiliary Lane Storage Length (m)
		Synchro			SimTraffic			
		95th Percentile						
		AM	PM	Saturday	AM	PM	Saturday	
Highway 10 & Milliner Ave (signalized)	EBL	23.4	26.0	33.7	16.6	21.3	28.0	35.0
	NBL	9.9	38.7	15.6	30.3	51.6	63.6	130.0
	SBL	1.4	1.4	1.4	3.7	4.5	3.3	85.0
	SBR	0.0	0.0	0.0	11.9	90.7	91.2	115.0
		50th Percentile			Average			
	EBL	7.5	10.3	13.9	8.0	10.5	13.9	35.0
	NBL	3.2	9.1	4.3	11.1	23.9	19.5	130.0
	SBL	0.1	0.1	0.1	0.5	0.7	0.4	85.0
	SBR	0.0	0.0	0.0	4.0	21.4	23.0	115.0

Under 2044 future background conditions the intersection of Highway 10 and Milliner Avenue is forecasted to operate at a LOS 'D' with 40.3 s of delay in the Saturday peak hour. The southbound through movement is forecasted to have a LOS 'D' and a maximum delay of 53.6 s. A maximum v/c ratio of 1.02 is forecasted for the same movement.

Based on the MTO volume thresholds a second northbound and southbound through lane should be considered, which would allow additional through volumes to proceed during a cycle and impacts the signal timing calculation per the MTO Signal Timing Policy.

The intersection of Highway 10 and Sideroad 240 is forecasted to operate with a LOS 'F' with 81.7 s of delay in the weekday p.m. peak hour. This is related to the increase of through volumes on Highway 10 as there are very few volumes expected on Sideroad 240 during the peak hours.

SimTraffic modelling found that the 95th percentile queues are anticipated to be contained within their dedicated storage lengths. The average/50th percentile queue using both modelling tools are expected to be contained within the provided storage.

As previously noted, the background traffic volumes are expected to more than triple the number of volumes on Highway 10 in the next 20 years. As most of the volumes are forecasted, the actual future volumes of planned developments may vary from the forecast. Ongoing monitoring of operations and mitigation measures requirements is recommended.

4.0 Site Generated Traffic

The proposed development will result in additional turning movements at the study intersections. Therefore, this section describes the trip forecasting methodology and results for the development proposal.

4.1 Trip Generation

As previously noted, the development is proposed to consist of the following:

- 191 Single-detached Units
- 154 Townhouse Units
- 138 Apartment Units
- Commercial Area of 8.93 ha
- Industrial Area of 17.96 ha
- Stormwater Management and Park Blocks

4.1.1 Land Use Category

The trip generation of the proposed residential dwelling, industrial and commercial units was forecasted using published data from the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition.

Land Use Category (LUC) 210 "Single Family Detached Housing", LUC 215 "Single Family Attached Housing", LUC 221 "Multifamily Housing (Mid-Rise)" and LUC 820 "Shopping Centre" were assessed based on the fitted curve equation for the peak hour of adjacent street traffic in the a.m. and p.m. peak hours. The fitted curve for the peak hour of generator was applied for Saturday, as no data for peak hour of the roadway is available on ITE.

LUC 130 "Industrial Park" was assessed based on the assessed based on the average rate for the peak hour of adjacent street traffic in the a.m. and p.m. peak hours. The average rate for the peak hour of generator was applied for Saturday, as no data for peak hour of the roadway is available on ITE.

4.1.2 Internal Trip Capture

The commercial area internal to the development is expected to generate trips from within the residential areas. Residents may choose to drive, walk, or cycle to the commercial centre and trips will not be added to the boundary road network. As defined by the ITE Trip Generation Handbook, 3rd Edition an internal capture rate is defined as the percentage of trips generated by a site in which the origin, destination and travel path are all within the site.

The National Cooperative Highway Research program (NCHRP) spreadsheet provided by ITE uses the internal capture rate between multiple uses and calculates the total vehicle trips for the individual land uses. **Appendix I** includes the Internal Reduction Spreadsheets for reference.

4.1.3 Pass-By Volumes

The ITE Trip Generation Handbook, 3rd Edition defines primary trips as trips made for the specific purpose of visiting the generator. Pass-by trips are made as intermediate stops on the way from an origin to a primary destination without a route diversion. Accordingly, these vehicles do not increase the volume of vehicles on the roadway.
The pass-by trip percentage for LUC 820 "Shopping Centre" was established based on the 2021 Pass-By Tables from the 11th Edition ITE Trip Generation Manual. In the weekday a.m. peak hour there is no pass-by percentage considered. In the weekday p.m. peak hour, a site with a GFA between 150,000 and 300,000 ft^2 has a pass-by percentage of 29%. For a GFA between 300,000 and 900,000 ft^2 a pass-by percentage of 19% is applied. It is noted that the 2021 Pass-By Tables do not have a percentage for Saturday while there is a Saturday percentage for buildings of a lower GFA. For the purposes of this assessment the p.m. pass-by percentage has been applied to the Saturday trip generation.

It is noted that for the analysis contained herein the pass-by percentage is based on the total GFA at full build-out and does not change for phasing of the site.

4.1.4 Zoning Lot Coverage

The Site received a Minister Zoning Order in March 2022, which defined a maximum lot coverage of 40% for the commercial and industrial areas. Buildings with a combined GFA of 40% of the development area (total development area of 17.96 ha for industrial and 8.93 ha for commercial uses) is not anticipated given the future population size of Dundalk and surrounding communities is low. For the purposes of this study the trip generation has been established for a lot coverage of 40% as well as the expected lot coverage based on the methodology outlined in **Section 4.1.5**. Analysis has been conducted based on the expected lot coverage.

Table 17 outlines the 2029 trip generation based on 50% build-out of the site. **Table 18** outlines the 2034 trip generation based on full build-out of the site.

Table 17: 50% Build-Out Zoning Trip Generation (40% Lot Coverage)

Land Use Category	Units	Peak Hour	Trip Generation		
			Inbound	Outbound	Total
210 "Single Family Detached"	96	AM	18	54	72
		PM	60	36	96
		Saturday	50	42	92
215 "Single Family Attached"	77	AM	9	25	34
		PM	25	17	42
		Saturday	26	28	54
221 "Multifamily Housing (Mid-Rise)"	69	AM	4	15	19
		PM	17	10	27
		Saturday	14	14	28
Internal Reduction		AM	-1	-3	-4
		PM	-10	-16	-26
		Saturday	-9	-22	-31
Residential Total		AM	30	91	121
		PM	92	47	139
		Saturday	81	62	143
820 "Shopping Centre"	192,179 ft^2	AM	153	94	247
		PM	434	469	903
		Saturday	568	525	1093
Internal Reduction		AM	-3	-1	-4
		PM	-16	-10	-26
		Saturday	-22	-9	-31
External (Primary)		AM	150	93	243
		PM	297	326	623
		Saturday	388	366	754
External (Pass-By)		AM	0	0	0
		PM	121	133	254
		Saturday	158	150	308
130 "Industrial Park"	377,942 ft^2	AM	104	24	128
		PM	28	100	128
		Saturday	53	113	166
Total External Primary		**AM**	**284**	**208**	**492**
		PM	**417**	**473**	**890**
		Saturday	**522**	**541**	**1063**
Total External Pass-By		**AM**	**0**	**0**	**0**
		PM	**121**	**133**	**254**
		Saturday	**158**	**150**	**308**

Table 18: 100% Build-Out Zoning Trip Generation (40% Lot Coverage)

Land Use Category	Units	Peak Hour	Trip Generation		
			Inbound	Outbound	Total
210 "Single Family Detached"	191	AM	34	100	134
		PM	115	68	183
		Saturday	94	80	174
215 "Single Family Attached"	154	AM	19	55	74
		PM	52	36	88
		Saturday	46	50	96
221 "Multifamily Housing (Mid-Rise)"	138	AM	11	38	49
		PM	33	21	54
		Saturday	28	28	56
Internal Reduction		AM	-1	-4	-5
		PM	-20	-33	-53
		Saturday	-17	-41	-58
Residential Total		AM	63	189	252
		PM	180	92	272
		Saturday	151	117	268
820 "Shopping Centre"	384,358 ft^2	AM	223	137	360
		PM	714	774	1488
		Saturday	962	888	1850
Internal Reduction		AM	-4	-1	-5
		PM	-33	-20	-53
		Saturday	-41	-17	-58
External (Primary)		AM	219	136	355
		PM	484	535	1019
		Saturday	654	618	1262
External (Pass-By)		AM	0	0	0
		PM	197	219	416
		Saturday	267	253	520
130 "Industrial Park"	755,885 ft^2	AM	208	49	257
		PM	57	200	257
		Saturday	106	227	333
Total External Primary		**AM**	**490**	**374**	**864**
		PM	**721**	**827**	**1548**
		Saturday	**911**	**962**	**1873**
Total External Pass-By		**AM**	**0**	**0**	**0**
		PM	**197**	**219**	**416**
		Saturday	**267**	**253**	**517**

With a 40% lot coverage, the full build-out of the proposed development is expected to generate a total of 864 a.m. and 1,548 p.m. two-way weekday peak hour external primary trips and 416 p.m. two-way weekday peak hour external pass-by trip, as well as 1,873 two-way Saturday peak hour primary trips and 517 two-way Saturday peak hour pass-by trips.

4.1.5 Expected Lot Coverage

As previously noted, a 40% lot coverage for the industrial and commercial areas is anticipated to overestimate the expected trip generation for the development. A review of existing commercial and industrial areas in smaller communities was undertaken to establish an expected lot coverage. The communities reviewed were:

- Dundalk (1,055 dwellings)
- Collingwood (13,216 dwellings)
- Stayner (1,864 dwellings))
- Shelburne (3,150 dwellings)
- New Tecumseth (16,249 dwellings))
- Wasaga Beach (13,768 dwellings))
- Midland (8,295 dwellings)
- Hanover (3,788 dwellings)

Based on existing commercial and industrial areas within these communities an estimated lot coverage of 25% for commercial GFA and 20% for industrial GFA was established. **Appendix J** includes the review of existing development GFA for reference.

It is noted that the commercial and industrial GFA and land uses would be reassessed at the Site Plan application stage to confirm and/or revise the study assumptions.

Table 19 outlines the 2029 trip generation based on 50% build-out of the site. **Table 20** outlines the 2034 trip generation based on full build-out of the site.

Table 19: 50% Build-Out Trip Generation (25% & 20% Lot Coverage)

Land Use Category	Units	Peak Hour	Trip Generation		
			Inbound	Outbound	Total
210 "Single Family Detached"	96	AM	18	54	72
		PM	60	36	96
		Saturday	50	42	92
215 "Single Family Attached"	77	AM	9	25	34
		PM	25	17	42
		Saturday	26	28	54
221 "Multifamily Housing (Mid-Rise)"	69	AM	4	15	19
		PM	17	10	27
		Saturday	14	14	28
Internal Reduction		AM	-1	-1	-1
		PM	-10	-47	-26
		Saturday	-9	-9	-22
Residential Total		AM	30	30	93
		PM	92	55	37
		Saturday	81	81	62
820 "Shopping Centre"	120,112 ft^2	AM	127	78	205
		PM	310	336	646
		Saturday	399	368	767
Internal Reduction		AM	-3	-1	-1
		PM	-16	-26	-47
		Saturday	-22	-22	-9
External (Primary)		AM	111	126	77
		PM	208	202	205
		Saturday	267	268	255
External (Pass-By)		AM	0	0	0
		PM	85	82	84
		Saturday	109	109	104
130 "Industrial Park"	188,971 ft^2	AM	53	12	65
		PM	14	51	65
		Saturday	27	57	84
Total External Primary		**AM**	**209**	**182**	**391**
		PM	**271**	**293**	**564**
		Saturday	**376**	**374**	**750**
Total External Pass-By		**AM**	**0**	**0**	**0**
		PM	**85**	**84**	**166**
		Saturday	**109**	**104**	**213**

Table 20: 100% Build-Out Trip Generation (25% and 20% Lot Coverage)

Land Use Category	Units	Peak Hour	Trip Generation		
			Inbound	Outbound	Total
210 "Single Family Detached"	191	AM	34	101	135
		PM	116	67	183
		Saturday	94	81	175
215 "Single Family Attached"	154	AM	19	55	74
		PM	52	36	88
		Saturday	46	50	96
221 "Multifamily Housing (Mid-Rise)"	138	AM	11	38	49
		PM	33	21	54
		Saturday	28	28	56
Internal Reduction		AM	-1	-1	-2
		PM	-20	-92	-51
		Saturday	-17	-17	-41
Residential Total		AM	63	63	192
		PM	180	109	73
		Saturday	151	91	94
820 "Shopping Centre"	240,224 ft^2	AM	171	105	276
		PM	511	553	1064
		Saturday	676	623	1299
Internal Reduction		AM	-3	-2	-1
		PM	-33	-51	-92
		Saturday	-41	-41	-17
External (Primary)		AM	168	169	327
		PM	338	327	327
		Saturday	449	451	430
External (Pass-By)		AM	0	0	0
		PM	138	133	134
		Saturday	183	184	176
130 "Industrial Park"	377,942 ft^2	AM	106	25	131
		PM	29	102	131
		Saturday	54	115	169
Total External Primary		**AM**	**338**	**544**	**882**
		PM	**465**	**502**	**967**
		Saturday	**656**	**663**	**1319**
Total External Pass-By		**AM**	**0**	**0**	**0**
		PM	**133**	**134**	**267**
		Saturday	**184**	**176**	**360**

With a 25% commercial and 20% industrial lot coverage, the full build-out of the proposed development is expected to generate a total of 882 a.m. and 967 p.m. two-way weekday peak hour external primary trips and 267 p.m. two-way weekday peak hour external pass-by trip, as well as 1,319 two-way Saturday peak hour primary trips and 360 two-way Saturday peak hour pass-by trips.

4.2 Trip Distribution and Assignment

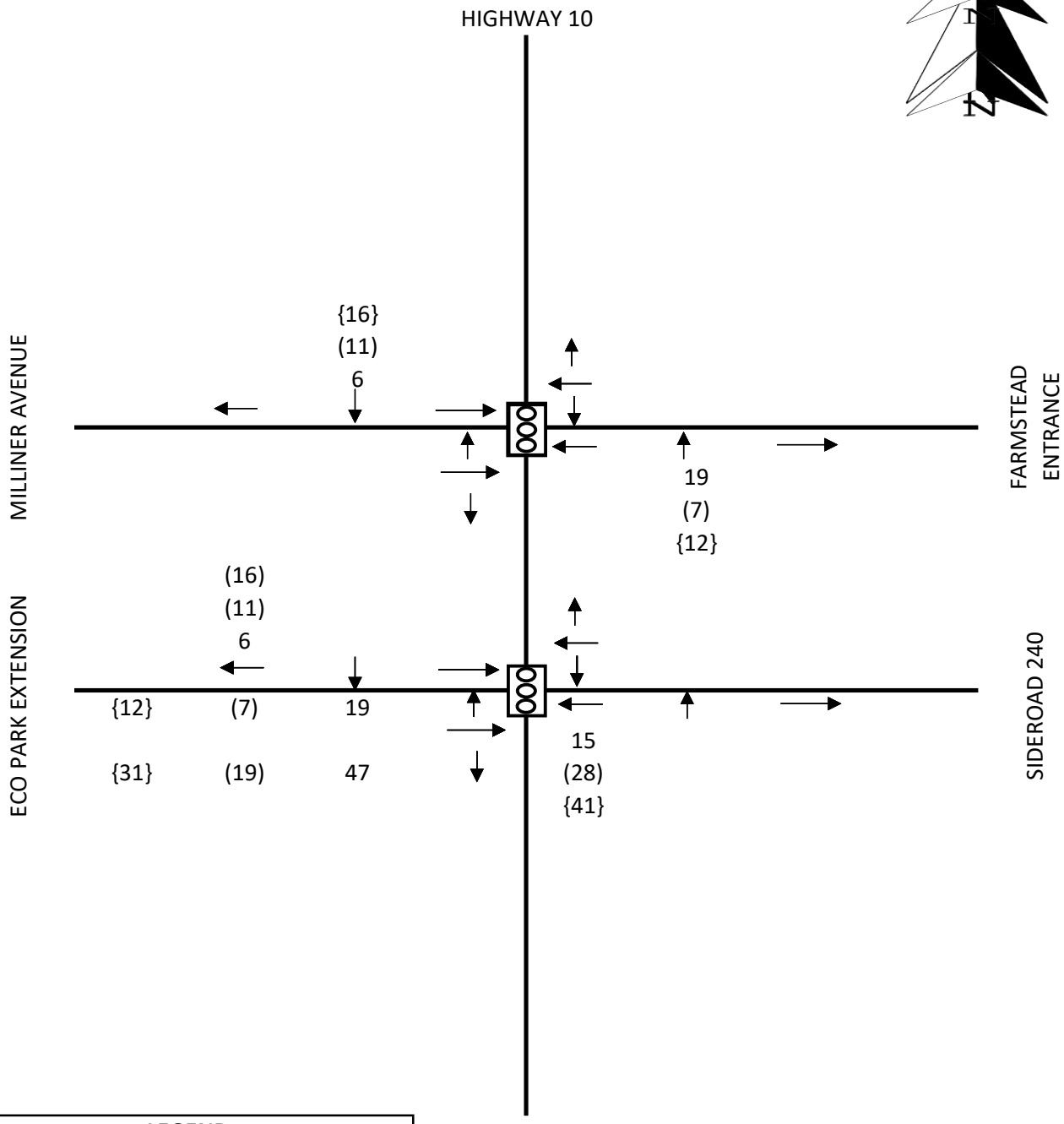
The trips generated by the proposed development were distributed to the study road network based on the assumptions of the background developments in Dundalk.

4.2.1 Residential

The trips generated by the proposed residential portion of the development were distributed to the study road network gateways as listed below:

- 20% to and from the north on Highway 10
- 50% to and from the south on Highway 10
- 30% to and from the west via Ida Street

Figure 24 and **Figure 25** illustrate the 50% and full build-out external residential trip assignments, respectively.



LEGEND

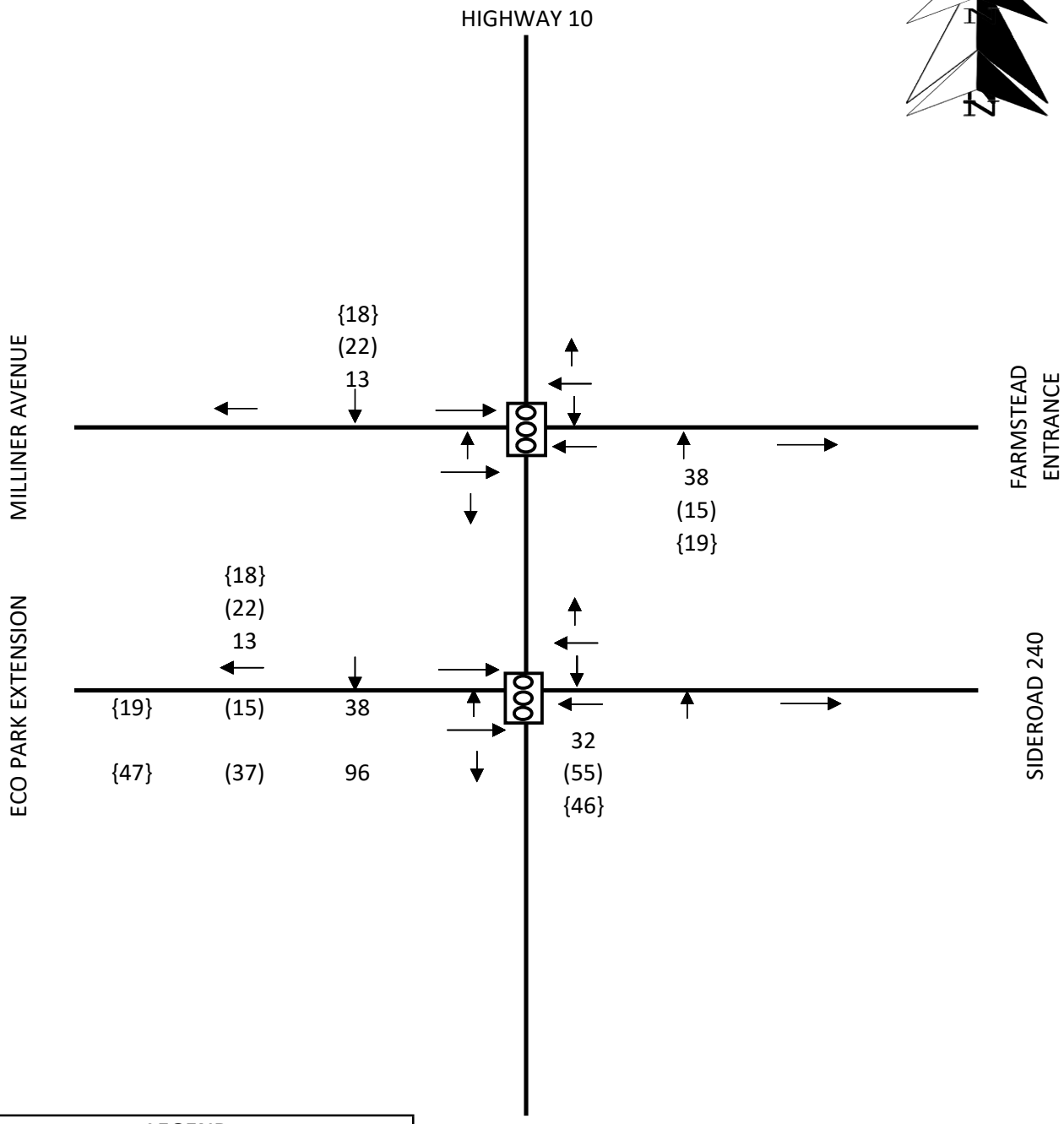
SIGNALIZED

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**50% BUILD-OUT RESIDENTIAL TRIP ASSIGNMENT**				
DRAWN BY:	**DB**	SCALE:	**N.T.S.**		
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO.	**24**

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705-446-3510 T
705-446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA



LEGEND

SIGNALIZED

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**FULL BUILD-OUT RESIDENTIAL TRIP ASSIGNMENT**				
DRAWN BY:	**DB**	SCALE:	**N.T.S.**		
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO.	**25**

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705-446-3510 T
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4.2.2 Commercial

The primary trips generated by the proposed commercial portion of the development were distributed to the road network as listed below:

- 60% to and from the south on Highway 10
- 10% to and from Milliner Avenue via Highway 10
- 5% to and from the north on Highway 10
- 20% to and from the west via Ida Street

Figure 26 and **Figure 27** illustrate the 50% and full build-out external primary commercial trip assignments, respectively.

The pass-by trips generated by the proposed commercial portion of the development were distributed to the study road network gateways as listed below:

- 65% northbound on Highway 10
- 35% southbound on Highway 10

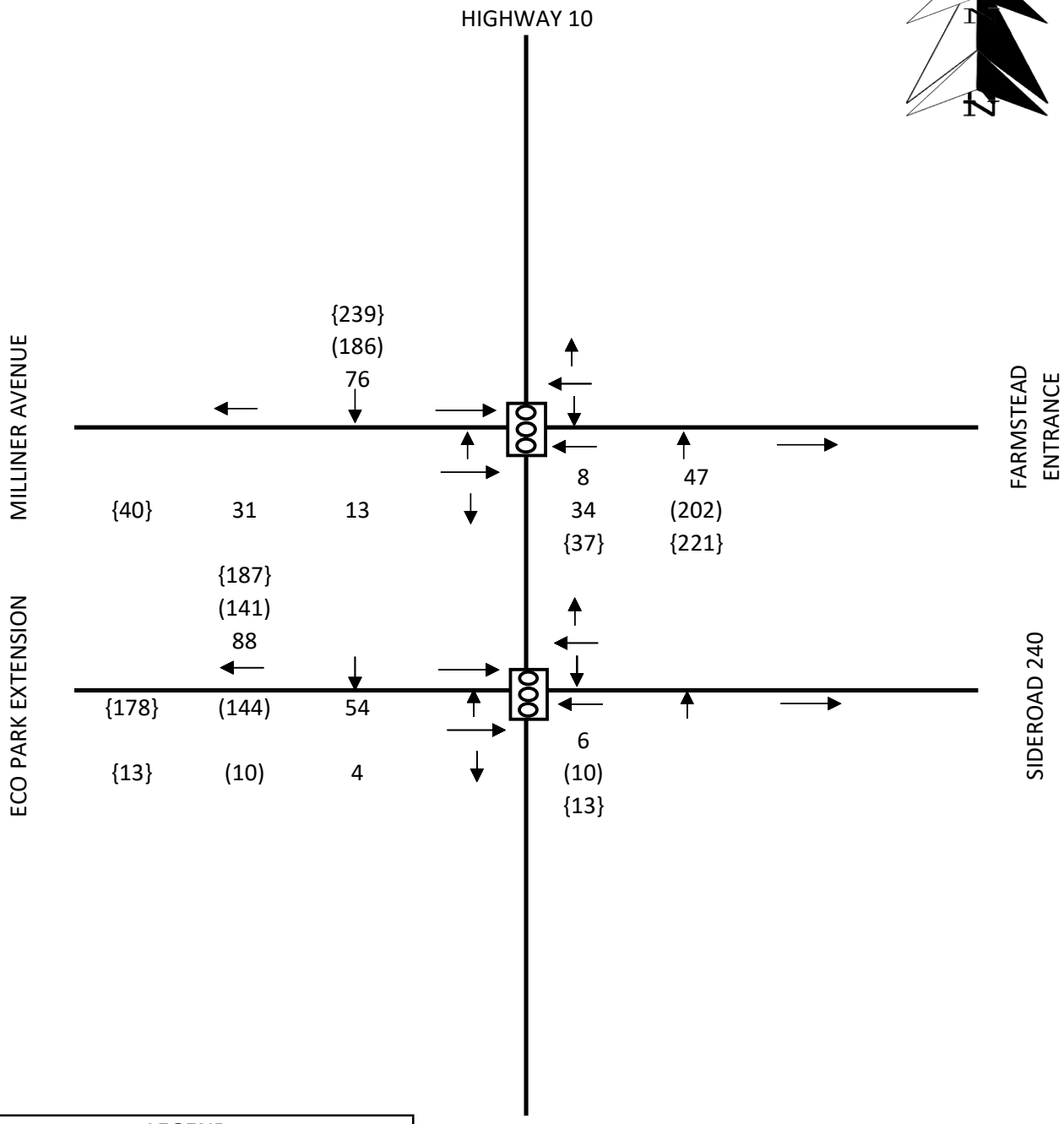
Figure 28 and **Figure 29** illustrate the 50% and full build-out external pass-by commercial trip assignments, respectively.

4.2.3 Industrial

The trips generated by the proposed industrial portion of the development were distributed to the road network as listed below:

- 50% to and from the south on Highway 10
- 20% to and from the north on Highway 10
- 30% to and from the west via Ida Street

Figure 30 and **Figure 31** illustrate the 50% and full build-out industrial trip assignments, respectively.



LEGEND

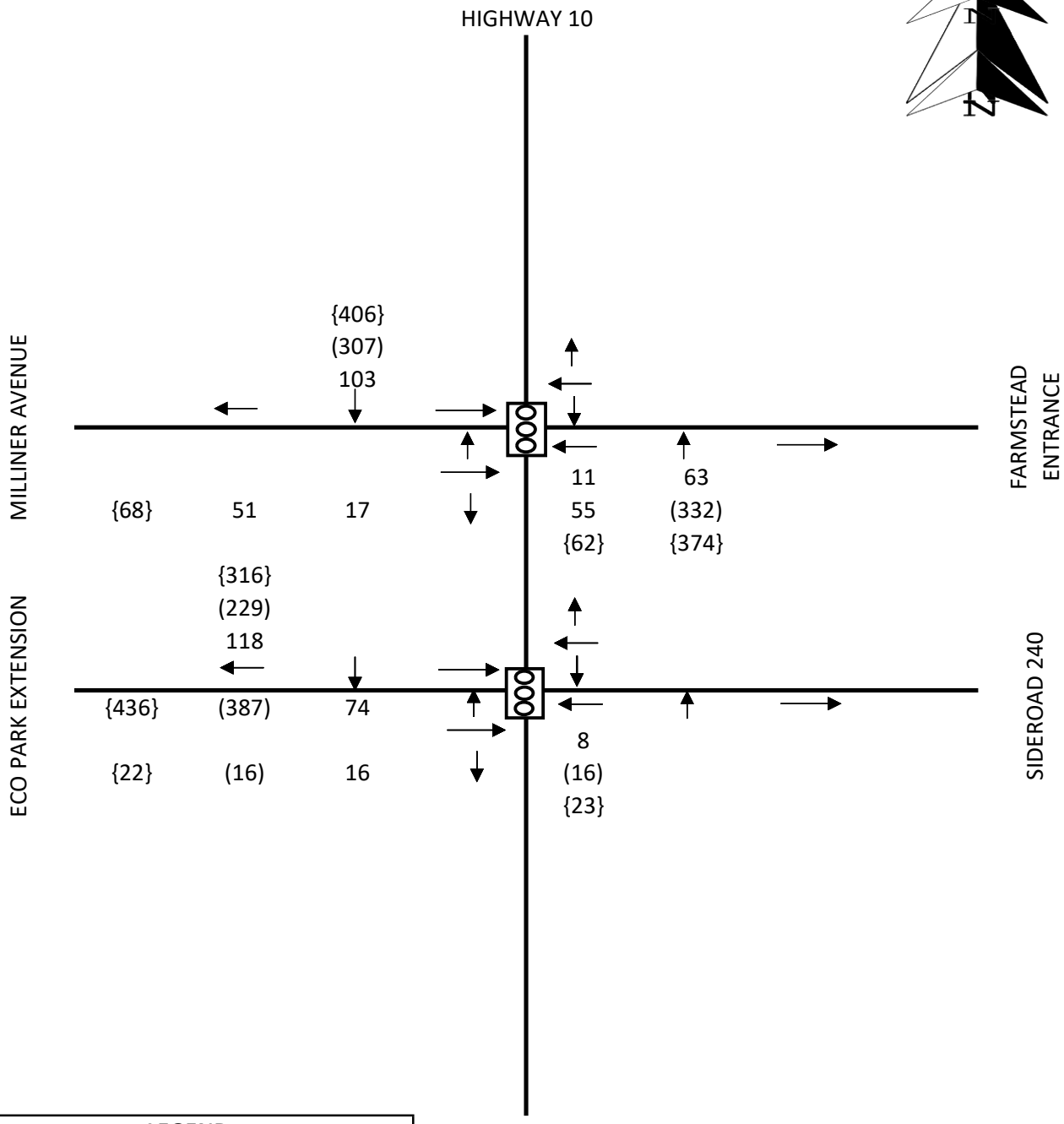
SIGNALIZED

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**50% BUILD-OUT PRIMARY COMMERCIAL TRIP ASSIGNMENT**				
DRAWN BY:	**DB**	SCALE:	**N.T.S.**		
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO.	**26**

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705-446-3510 T
705-446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA



LEGEND

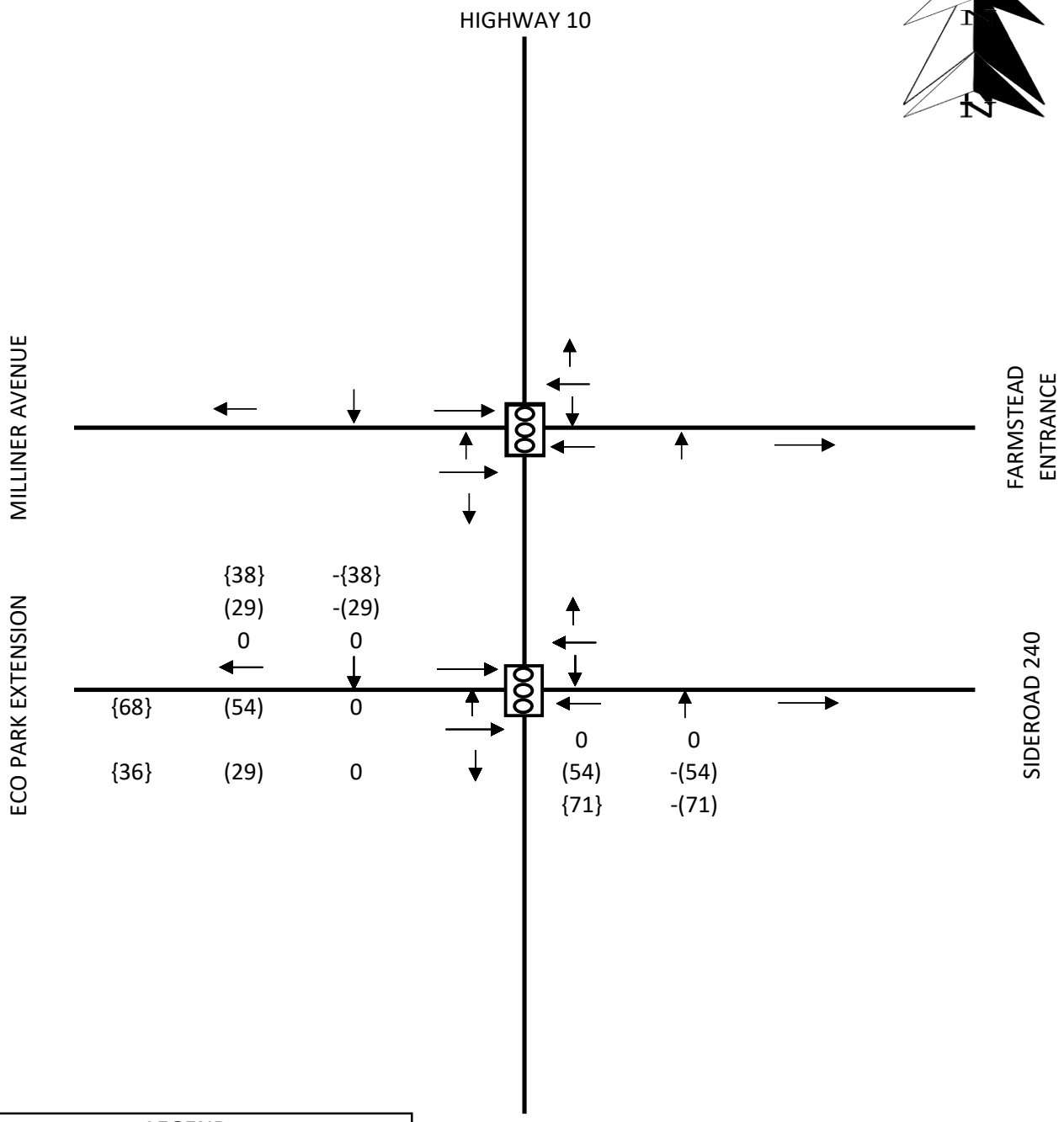
SIGNALIZED

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**FULL BUILD-OUT PRIMARY COMMERCIAL TRIP ASSIGNMENT**				
DRAWN BY:	**DB**	SCALE:	**N.T.S.**		
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO.	**27**

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705-446-3510 T
705-446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA



LEGEND

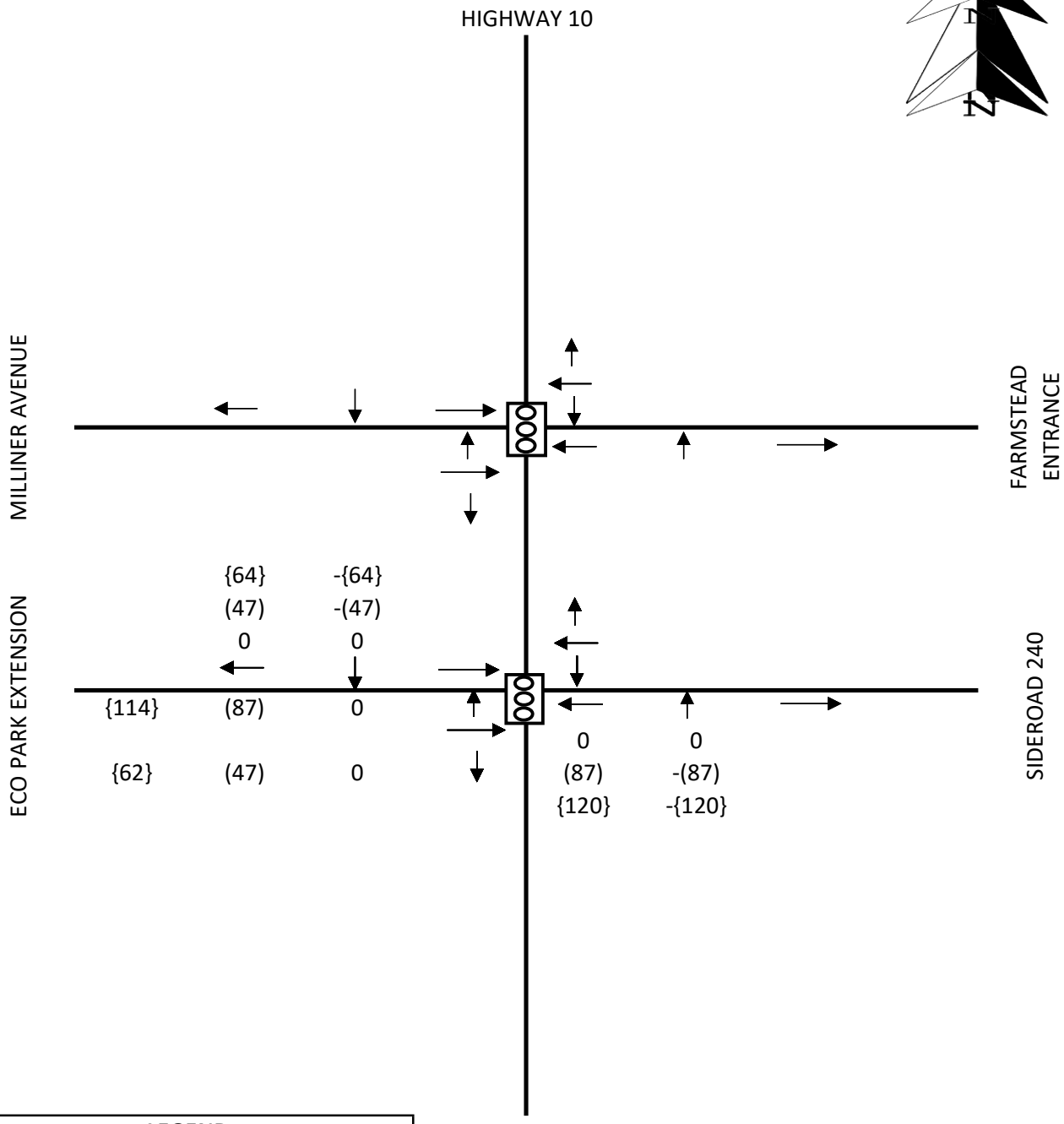
SIGNALIZED

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**		
DRAWING:	**50% BUILD-OUT PASS-BY COMMERCIAL TRIP ASSIGNMENT**		
DRAWN BY:	**DB**	SCALE:	**N.T.S.**
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**
		FIGURE NO.	**28**

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705-446-3510 T
705-446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA



LEGEND

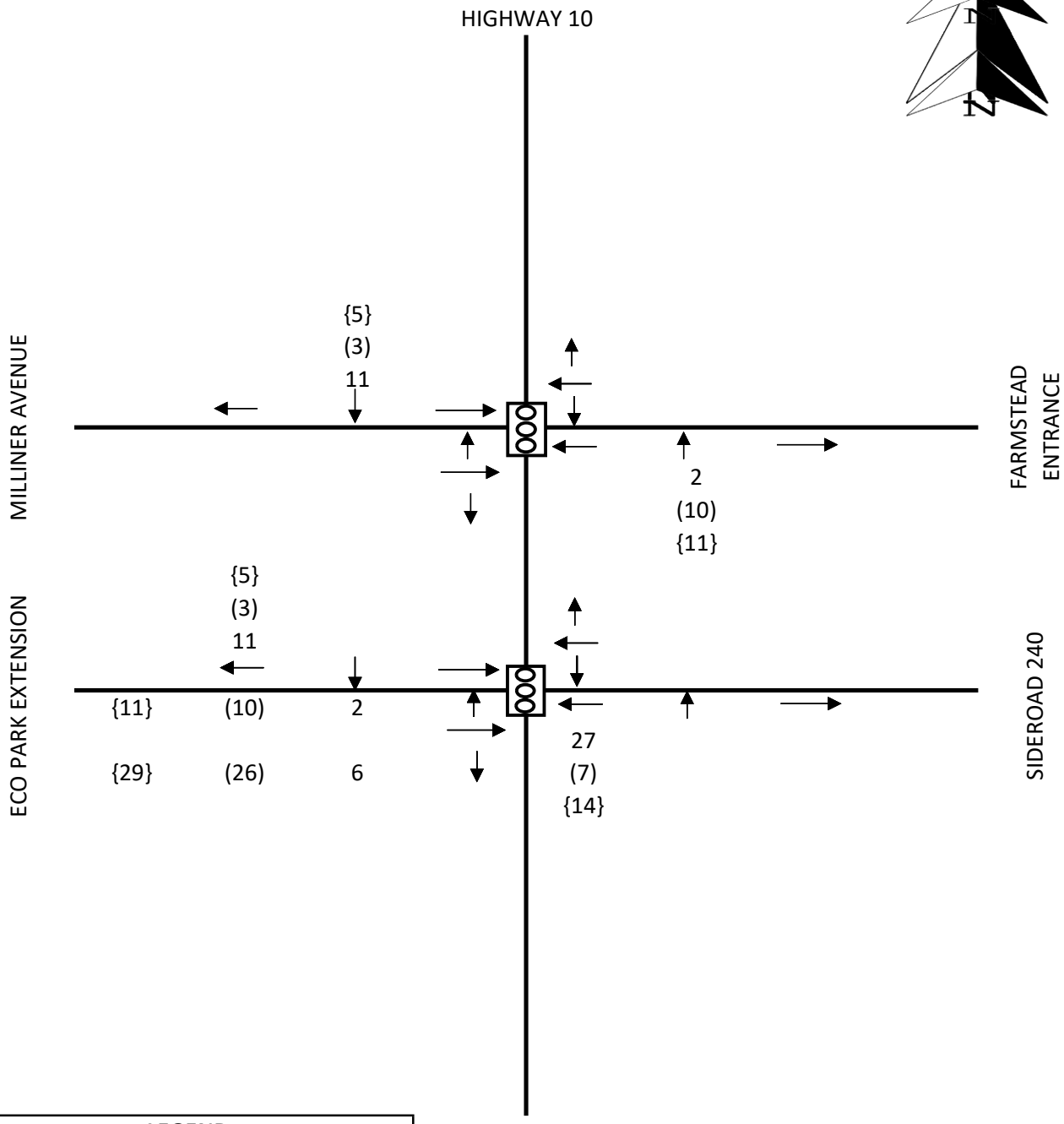
SIGNALIZED

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**FULL BUILD-OUT PASS-BY COMMERCIAL TRIP ASSIGNMENT**				
DRAWN BY:	**DB**	SCALE:	**N.T.S.**		
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO.	**29**

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705-446-3510 T
705-446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA



LEGEND

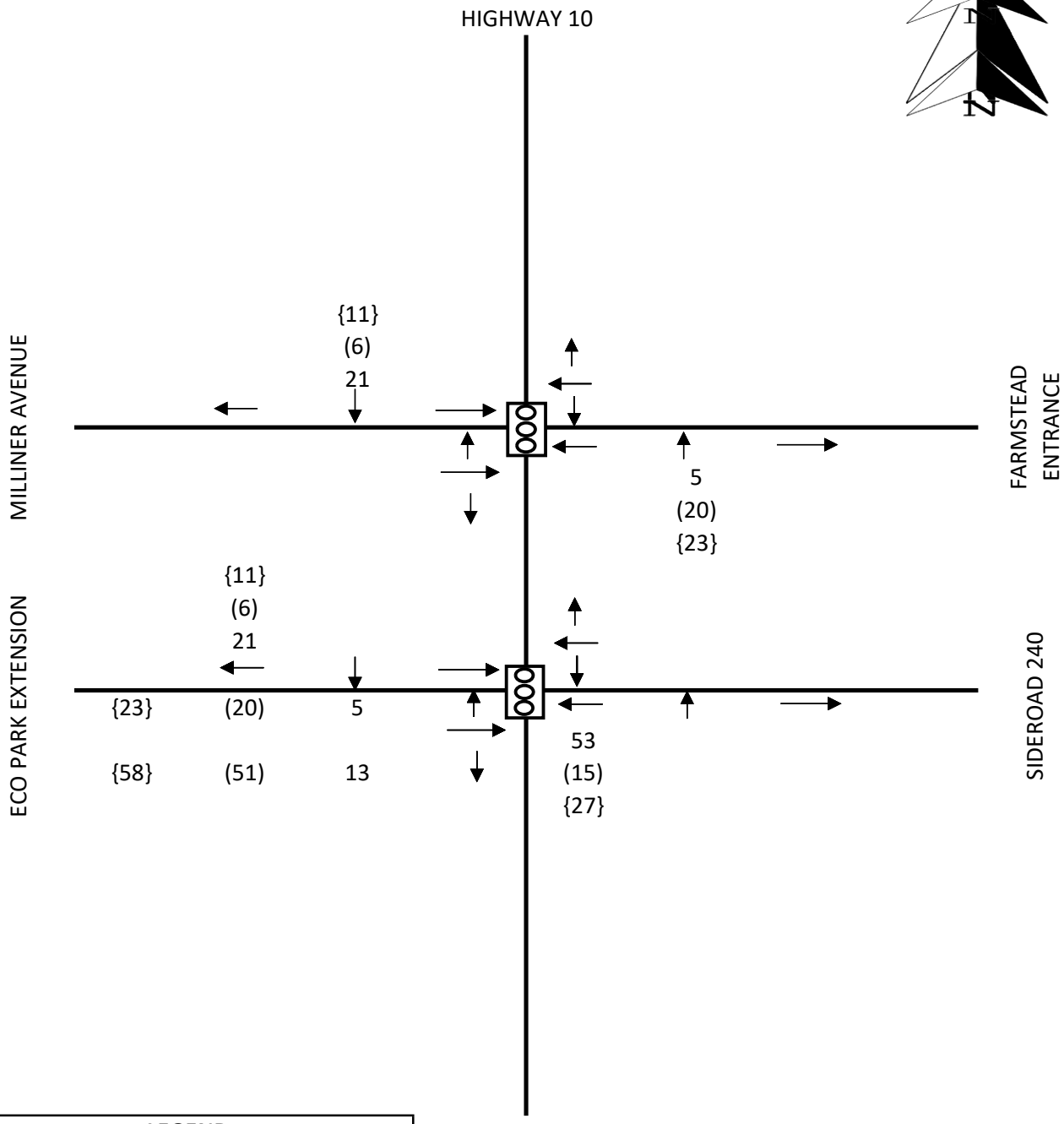
SIGNALIZED

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**50% BUILD-OUT INDUSTRIAL TRIP ASSIGNMENT**				
DRAWN BY:	**DB**	SCALE:	**N.T.S.**		
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO.	**30**

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705-446-3510 T
705-446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA



LEGEND

SIGNALIZED

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**FULL BUILD-OUT INDUSTRIAL TRIP ASSIGNMENT**				
DRAWN BY:	**DB**	SCALE:	**N.T.S.**		
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**	FIGURE NO.	**31**

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705-446-3510 T
705-446-3520 F
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5.0 Future Total Conditions

This section will summarize the future total conditions of the study road network. The future total traffic volumes for the horizon years consist of the following components:

- Future background traffic volumes from the corresponding horizon year.
- Redistribution of existing volumes to the Eco Park Way extension.
- Proposed development site generated traffic volumes.

5.1 Redistribution of Existing Volumes

With the opening of the Eco Park Way extension existing volumes travelling on Highway 10 to and from Main Street may divert to the new roadway. The June 2017 TIS prepared by Triton reviewed a redistribution of 30% of the volumes on Main Street.

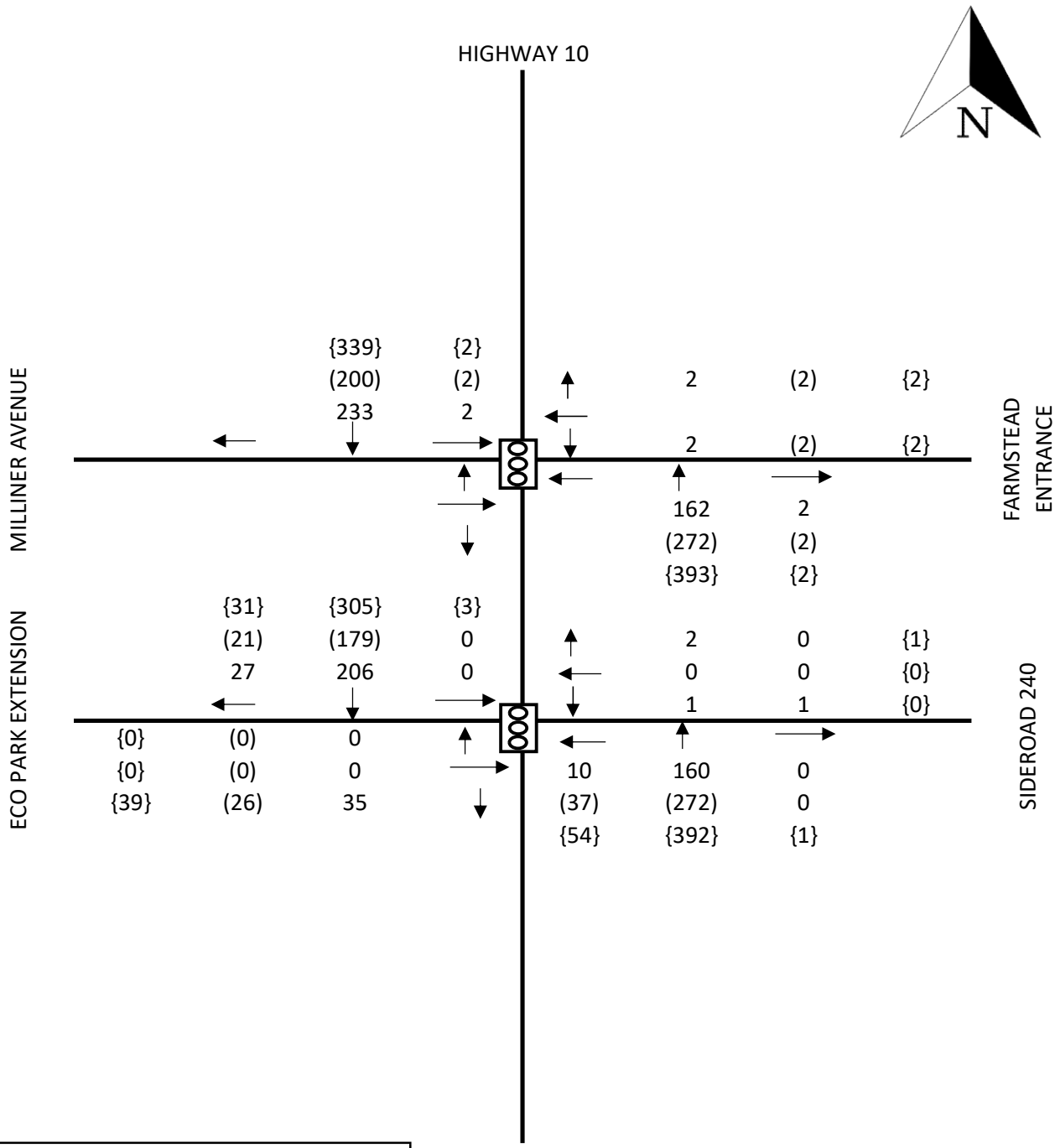
Based on the split of turning volumes on Main Street under existing conditions as outlined in the September 2023 Edgewood Green's TIS prepared by Crozier, the volumes collected in 2024 have been reassigned. **Table 21** outlines the percentage of through volumes on Highway 10 that turn to and from Main Street. 30% of the turning volumes were redistributed to Eco Park Way. As no existing Saturday data was available the p.m. redistribution has been applied to the Saturday volumes.

Figure 32 illustrates the redistributed existing volumes.

Table 21: Existing Redistribution

Direction	% of A.M. Peak Hour Volumes	% of P.M. Peak Hour Volumes
Northbound Left	19%	40%
Southbound Right	33%	31%
Eastbound Left	0%	0%
Eastbound Right	44%	39%

With the addition of background developments and site volumes the resulting total volumes in the horizon years 2029, 2034, 2039 and 2044 are presented in **Figure 33, Figure 34, Figure 35,** and **Figure 36,** respectively.



LEGEND

SIGNALIZED

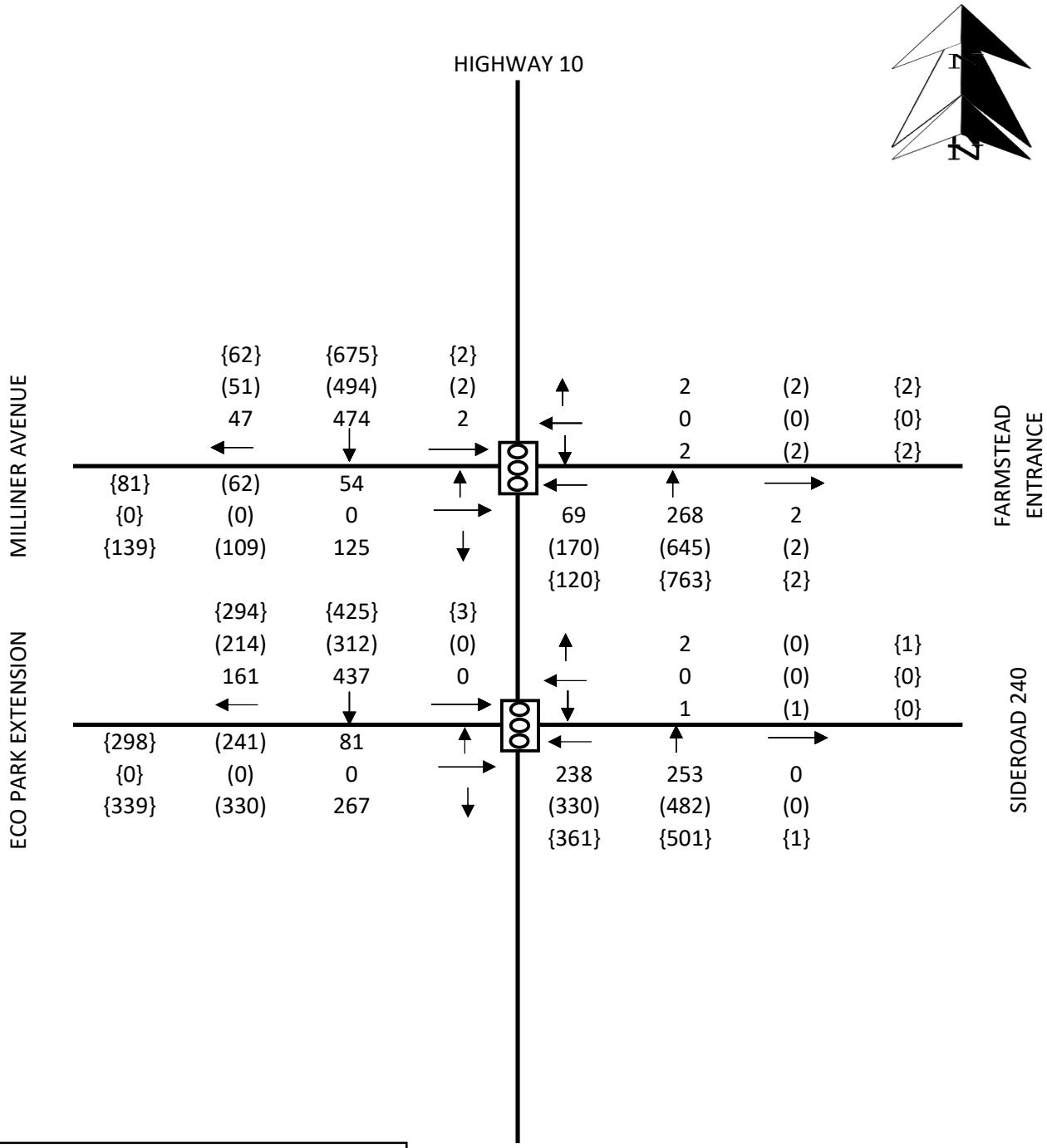
MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

NOTE: FARMSTEAD VOLUMES HAVE BEEN ASSUMED PER EDGEWOOD GREENS TRANSPORTATION IMPACT STUDY FOR THE PURPOSES OF ASSESSMENT

PROJECT:	**DUNDALK SOUTHEAST**				
DRAWING:	**EXISTING REDISTRIBUTION**				
DRAWN BY:	**KH**	SCALE:	**N.T.S.**		
CHECK BY:	**MF**	PROJECT NO.	**1060-6489**	FIGURE NO.	**32**

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705-446-3510 T
705-446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA



LEGEND

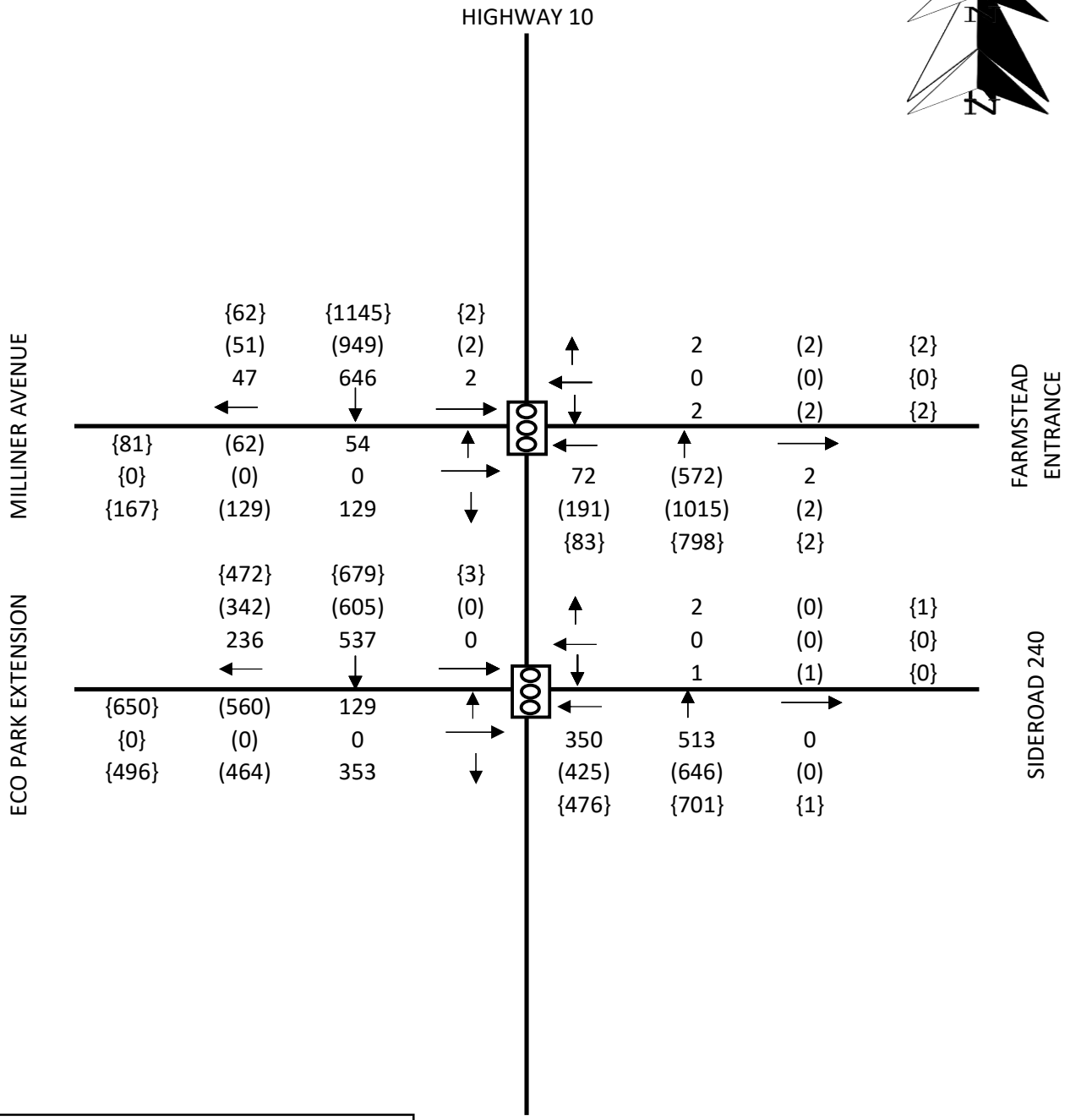
SIGNALIZED

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**		
DRAWING:	**2029 FUTURE TOTAL TRAFFIC VOLUMES**		
DRAWN BY:	**DB**	SCALE:	**N.T.S.**
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**
		FIGURE NO.	**33**

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705-446-3510 T
705-446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA



LEGEND

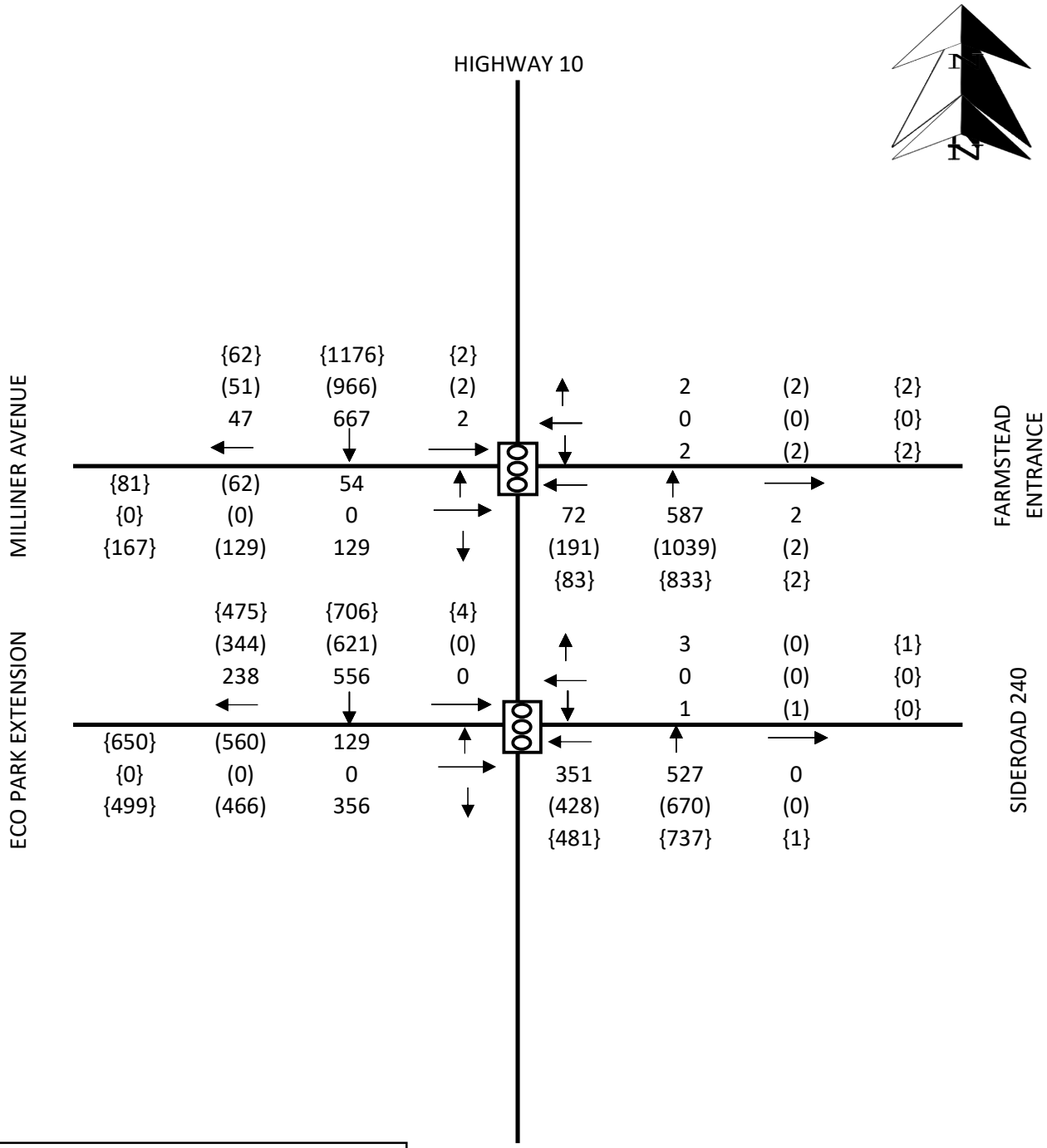
SIGNALIZED

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**		
DRAWING:	**2034 FUTURE TOTAL TRAFFIC VOLUMES**		
DRAWN BY:	**DB**	SCALE:	**N.T.S.**
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**
		FIGURE NO.	**34**

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705-446-3510 T
705-446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA



LEGEND

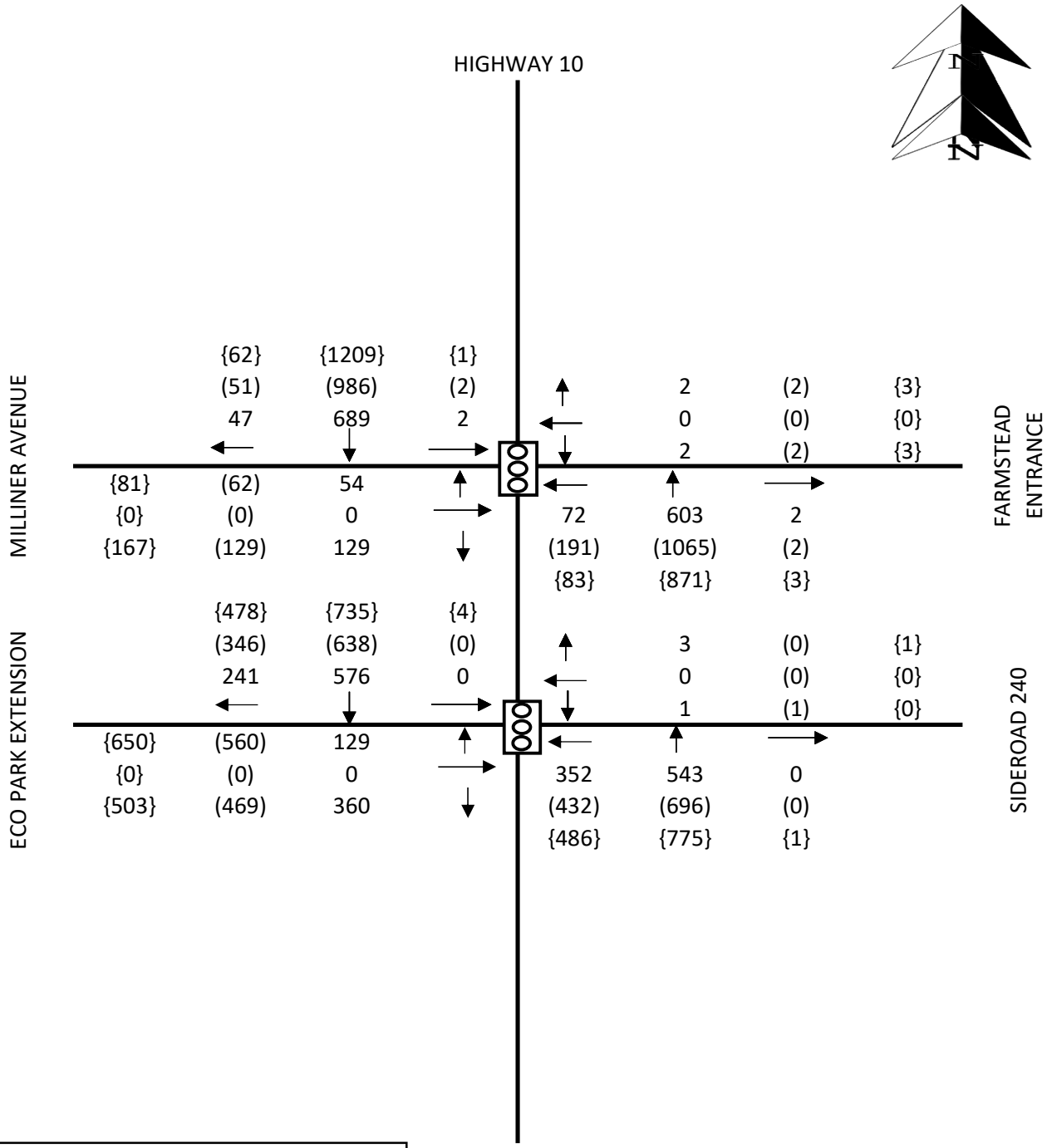
SIGNALIZED

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**		
DRAWING:	**2039 FUTURE TOTAL TRAFFIC VOLUMES**		
DRAWN BY:	**DB**	SCALE:	**N.T.S.**
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**
		FIGURE NO.	**35**

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705-446-3510 T
705-446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA



LEGEND

SIGNALIZED

MOVEMENT

XX(XX){XX} AM (PM) {SAT} PEAK HOUR VOLUMES

PROJECT:	**DUNDALK SOUTHEAST**		
DRAWING:	**2044 FUTURE TOTAL TRAFFIC VOLUMES**		
DRAWN BY:	**DB**	SCALE:	**N.T.S.**
CHECK BY:	**KH**	PROJECT NO.	**1060-6489**
		FIGURE NO.	**36**

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705-446-3510 T
705-446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

5.2 Signal Warrant Assessment

Justification 7 from Book 12 of the Ontario Traffic Manual (OTM) is recommended for planned intersections where 8-hour counts are not available. Instead, the average hourly volume was established based on the sum of the peak hour hours divided by four. Analysis of the 2029 and 2034 horizons at the intersection of Highway 10 and Eco Park Way / Sideroad 240 was undertaken. Based on past feedback from the MTO, signal warrants were only completed for weekday volumes.

Table 22 outlines the justification compliance under both horizons. **Appendix K** includes the signal warrant for reference.

Table 22: Justification 7 Signal Warrants

Horizon Year	Justification	Compliance	Signal Justified
2029	Minimum Vehicular Volume	117%	No
	Delay to Cross Traffic	150%	
2034	Minimum Vehicular Volume	180%	Yes
	Delay to Cross Traffic	150%	

Based on the volumes analysed, it is concluded that signalization is warranted based on the volumes in the 2034 horizon year. Given the forecasted operations and the high level of delay for east and west approaching vehicles under the 2029 horizon (50% build-out assessed), signalization at the time of construction of the Eco Park Way extension is recommended. It is understood that the MTO may desire to wait until signalization is warranted. As the majority of the future volumes on Eco Park Way and Highway 10 are forecasted from proposed development, ongoing monitoring of the intersection and protection for signalization may be preferred. This can be confirmed with the MTO through detailed design of the intersection.

5.3 Signal Timing Assessment

The signal timings for Highway 10 were determined and modelled using the MTO Traffic Signal Operating & Timing Policy (June 2016). The process included:

1) Determination of initial cycle length based on Synchro model natural cycle.

2) Calculation of m-values of the forecasted volumes

3) Green + amber time obtained from Table 1 – Vehicle Arrival Rates and Green Plus Amber Times for Rural Intersections.

4) Calculation of "Flashing Don't Walk" given a minimum 7 sec walk interval time and estimated intersection geometry

5) Calculation of "Amber & All Red Clearances" using the "Clearance Period" equation from Section 5.

6) Calculation of Minimum Green Time by subtracting the amber time from the green + amber value obtained from Step 3.

7) Calculation of Left-Turn signals using the equation from Section 6.0.

8) Obtain Vehicle Extension based on operating speed.

9) Calculation of maximum green time.

The future background signal timings were established from detailed design analysis ongoing with the MTO for Highway 10 and Miliner Avenue.

The future total signal timings for both Milliner and Eco Parkway were established based on the MTO's Signal Timing policy at a cycle length of 150 s under the 2034 and 2044 future total weekday scenarios and carried backward to the 2029 and 2039 horizons, respectively. Based on the high number of volumes forecasted, signal timing adjustments were required through optimization within Synchro.

5.4 Left-Turn Lane Requirements

The storage lengths for the auxiliary left-turn lanes at the proposed signalized intersection of Highway 10 and Eco Park Way / Sideroad 240 were calculated based on the MTO Traffic Signal Timing Policy Section 6.2 – "Length of Left Turn Storage Length". The calculations were completed based on the 2044 future total traffic volumes.

Northbound Left-Turn Lane

$$\text{m} = \frac{\text{Volume x Cycle Length}}{3600} = \frac{486 \text{ x } 150}{3600} = 20 \text{ passenger cars per cycle}$$

Using Table 1 as it is a rural intersection, for an average arrival time of 20 passenger cars per cycle, 23 vehicles or less will arrive 95% of the time.

Therefore, $\text{Left Turn Storage Length} = 23 \text{ x } 7.5 = 173 \text{ m}$

The MTO analysis resulted in a forecasted storage length of 173 m for the northbound left-turn movement.

Eastbound Left-turn Lane

$$\text{m} = \frac{\text{Volume x Cycle Length}}{3600} = \frac{650 \text{ x } 150}{3600} = 27 \text{ passenger cars per cycle}$$

Using Table 1 as it is a rural intersection, for an average arrival time of 27 passenger cars per cycle, 30 vehicles or less will arrive 95% of the time.

Therefore, $\text{Left Turn Storage Length} = 30 \text{ x } 7.5 = 225 \text{ m}$

The MTO analysis resulted in a forecasted storage length of 225 m has been provided for the eastbound left-turn movement. It is noted that a 30 m Right-of-Way (ROW) would be able to accommodate a four-lane cross-section for Eco Park Way. Should a four-lane cross-section be provided a storage length for the eastbound left movement would not be required.

Southbound Left-turn Lane

$$\text{m} = \frac{\text{Volume x Cycle Length}}{3600} = \frac{4 \text{ x } 120}{3600} = 0.1 \text{ passenger cars per cycle}$$

While the volume of southbound left-turns into Sideroad 240 is anticipated to be quite low, a full southbound left-turn lane with a storage length of 15 m has been considered based on a large volume of northbound through volumes. The storage has been modelled under future total traffic volume conditions.

In addition to the storage lengths noted above, Exhibit 9-R from the MTO Design Supplement (April 2020) was used to calculate the parallel deceleration length and taper length for the northbound left-turn and southbound left-turn lanes on Highway 10 at Eco Park Way. The taper and parallel deceleration lengths are obtained based on the design speed of the road. For Highway 10, a design speed of 100 km/h was assumed. The parallel and taper length for the eastbound left-turn lane were established based in the Transportation Association of Canada (TAC) Geometric Design Guidelines for Canadian Roads (GDGCR) Section 9.17.

Table 23 summarizes the proposed northbound, eastbound and southbound left-turn lane geometry. **Appendix L** includes a conceptual intersection layout prepared for Highway 10 and Sideroad 240/Eco Park Way.

Table 23: Auxiliary Left-Turn Design Elements – Highway 10 and Eco Park Way

Movement	Storage Length	Parallel Deceleration Length	Taper Length
Northbound Left-Turn	173 m	70 m	160 m
Eastbound Left-Turn	225 m	30 m	60 m
Southbound Left-Turn	15 m	70 m	160 m

5.5 Right-Turn Lane Requirements

The storage lengths for the auxiliary right-turn lanes at the proposed signalized intersection of Highway 10 and Eco Park Way / Sideroad 240 were calculated based on the Transportation Association of Canada (TAC) Geometric Design Guidelines for Canadian Road (GDGCR)Section 9.14.4. The calculations were completed based on the 2044 future total traffic volumes.

Southbound Right-Turn Lane

$$\text{Right Turn Storage Length}$$
$$= 2 \text{ x Number of Vehicles x } \frac{\text{Cycle Length}}{3600 \text{ s}} \text{ x (Passenger Vehicle Length + Spacing between Stopped Vehicles)}$$
$$= 2 \text{ x } 478 \text{ x} \frac{150}{3600} \text{ x } 7.5 = 298 \text{ m}$$

The analysis resulted in a forecasted storage length of 298 m for the southbound left-turn movement.

Northbound Right-Turn Lane

As there is a low number of northbound right turns, a right turn lane with the minimum of 15 m of storage would suffice. Exhibit 9-J from the MTO Design Supplement (April 2020) was used to calculate the parallel deceleration length and taper length for the right-turns on Highway 10 and Eco Park Way / Sideroad 240. The parallel and deceleration length is obtained based on the design speed of the road. As noted previously, a design speed of 100 km/h was selected for Highway 10.

Table 24 summarizes the calculated storage, taper and parallel deceleration lengths proposed for the right-turn movements on Highway 10 at the site access. **Appendix L** includes a conceptual intersection layout prepared for Highway 10 and Sideroad 240/Eco Park Way.

Table 24: Auxiliary Right Turn Design Elements – Highway 10 and Eco Park Way

Movement	Storage Length	Parallel Deceleration Length	Taper Length
Southbound Right-Turn	298 m	85 m	80 m
Northbound Right-Turn	15 m	85 m	80 m

5.6 Roadway Mitigations

In review of the MTO capacity methodology a number of improvements were considered. The capacity thresholds for an additional through lane on Highway 10 remain from future background conditions. Dual northbound left turn lanes at Eco Park Way were also considered based on the 300 vphpl threshold as the p.m. peak hour forecast of 432 vehicles and the Saturday peak hour forecast of 486 vehicles.

Dual eastbound left turn lanes should also be considered on Eco Park Way as 560 and 650 p.m. and Saturday peak hour vehicles are forecasted. While the threshold for a southbound channelized right turn lane (500 vehicles per hour) is not forecasted to be exceeded, a channelized right turn lane may mitigate the need for over 200 m of right-turn lane storage. Should a four-lane cross-section be provided on Eco Park, to the first internal roundabout at a minimum, a channelized right-turn lane could become or merge with the second lane. The cross-section of the roadway is reviewed further in **Section 6.1.**

As outlined under the future background scenario, these improvements are based on many forecasted volumes, more than triple that of existing traffic. For this reason, as well as limited Right-of-Way for Highway 10, these improvements have been noted but not modelled. Only warranted turn lanes have been considered. It is recommended that the roadways be monitored for additional improvements as build-out in Dundalk proceeds.

Consideration for a roundabout was also undertaken. Based on operations a dual lane roundabout would be recommended. As the proponent cannot provide the full area to accommodate a roundabout, expansion of the existing ROW (owned by others) would be required. As such, signalization has been carried forward for the basis of this analysis.

5.7 Heavy Vehicle Considerations

Based on Terms of Reference discussion with the MTO, consideration for future heavy vehicle volumes from the industrial lands on the Eco Park Way Extension and turning at Highway 10 was undertaken. A review of forecasted truck volumes was undertaken based on the ITE Trip Generation Manual. It is noted that the number of studies for each of the scenarios were low.

It is assumed that 70% of truck volumes would be going south onto Highway 10 and 30% would be travelling north on Highway 10. This distribution was applied to the truck volumes to determine the percentage of heavy vehicles at the proposed intersection. **Table 25** outline the calculation of heavy vehicle percentages of the overall tuning volumes at the Highway 10 & Eco Park/ Sideroad 240 intersection.

Table 25: Truck Trip Generation Distribution

Future Total Year	Movement (Highway 10 & Eco Park/ Sideroad 240)	A.M. (% Heavy Vehicle)	P.M. (% Heavy Vehicle)	Saturday (% Heavy Vehicle)
2029	Northbound Left	2.90	2.11	2.04
	Eastbound Left	10.84	4.17	3.27
	Southbound Right	10.49	7.01	6.07
	Eastbound Right	7.69	6.95	6.36
2034	Northbound Left	2.00	1.65	1.49
	Eastbound Left	6.98	1.79	1.41
	Southbound Right	7.20	4.39	3.73
	Eastbound Right	5.95	4.96	4.32
2039	Northbound Left	1.99	1.64	1.47
	Eastbound Left	7.03	1.79	1.41
	Southbound Right	7.14	4.36	3.70
	Eastbound Right	5.90	4.94	4.29
2044	Northbound Left	1.99	1.62	1.46
	Eastbound Left	6.98	1.79	1.41
	Southbound Right	7.05	4.34	3.68
	Eastbound Right	5.83	4.90	4.26

Note 1: All calculated percentages under 2.0% were rounded up to 2.0% heavy vehicles when inputted into Synchro.

5.8 Intersection Operations

Table 26, **Table 27**, **Table 28**, and **Table 29** outline the 2029, 2034, 2039, 2044 future total traffic operations, respectively. Synchro 11 was used to determine intersection operations at both the signalized and unsignalized study intersections. **Appendix D** contains level of service definitions for reference. **Appendix E** contains the detailed capacity analysis worksheets.

Table 26: 2029 Future Total Traffic Operations

Intersection	Performance Metrics									
	Movement	AM			PM			Saturday		
		LOS[1]	Delay	v/c	LOS[1]	Delay	v/c	LOS[1]	Delay	v/c
Highway 10 & Milliner Ave (signalized)	**Overall**	**B**	**16.1**	**0.50**	**B**	**16.4**	**0.56**	**C**	**21.4**	**0.76**
	EBL	E	61.4	0.39	E	64.2	0.46	E	72.1	0.60
	EBTR	A	0.7	0.20	A	0.6	0.18	A	1.0	0.26
	WB	A	0.2	0.02	A	0.2	0.02	A	0.2	0.02
	NBL	A	6.2	0.12	A	7.5	0.31	A	7.8	0.30
	NBTR	A	7.5	0.22	B	11.2	0.53	B	13.3	0.62
	SBL	B	18.0	0.00	B	18.5	0.01	B	18.5	0.01
	SBT	C	23.0	0.50	C	25.6	0.5	C	33.2	0.76
	SBR	A	0.1	0.06	A	0.1	0.06	A	0.3	0.08
Highway 10 & Sideroad 240/ Eco Park Way (signalized)	**Overall**	**D**	**17.7**	**0.59**	**C**	**22.3**	**0.68**	**C**	**29.6**	**0.82**
	EBL	E	58.6	0.37	E	55.3	0.68	E	60.0	0.78
	EBTR	A	1.6	0.40	A	1.4	0.41	A	1.6	0.43
	WB	A	0.0	0.00	D	36.0	0.01	A	0.0	0.00
	NBL	A	7.9	0.37	B	15.3	0.52	C	29.5	0.69
	NBT	A	7.6	0.23	B	16.5	0.46	B	18.3	0.48
	NBR	-	-	-	-	-	-	A	0.0	0.00
	SBL	-	-	-	-	-	-	D	37.7	0.01
	SBT	D	36.2	0.59	D	46.6	0.60	E	60.2	0.82
	SBR	A	4.2	0.24	A	6.0	0.36	A	6.4	0.47

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro).
Note 2: The maximum v/c ratio for two-way stop-controlled intersections represents the maximum v/c for the minor road approach movements at the intersection. Any movements that experience a v/c ratio in excess of 0.85 are considered critical per the MTO TIS Guidelines.

Table 27: 2034 Future Total Traffic Operations

Intersection	Performance Metrics									
	Movement	AM			PM			Saturday		
		LOS[1]	Delay	v/c	LOS[1]	Delay	v/c	LOS[1]	Delay	v/c
Highway 10 & Milliner Ave (signalized)	**Overall**	**B**	**19.5**	**0.72**	**D**	**45.5**	**1.07**	**F**	**89.4**	**1.29**
	EBL	E	62.4	0.41	E	64.6	0.46	E	72.5	0.60
	EBTR	A	0.9	0.23	A	1.2	0.26	A	1.8	0.35
	WB	A	0.2	0.02	A	0.2	0.02	A	0.0	0.02
	NBL	A	6.5	0.17	D	41.6	0.63	B	1.9	0.27
	NBTR	A	9.9	0.47	C	21.0	0.83	B	14.0	0.65
	SBL	B	18.0	0.00	B	19.0	0.01	B	18.5	0.01
	SBT	C	31.2	0.72	E	79.8	1.07	F	166.5	1.29
	SBR	A	0.1	0.06	A	0.1	0.06	A	0.3	0.08
Highway 10 & Sideroad 240/ Eco Park Way (signalized)	**Overall**	**C**	**20.6**	**0.73**	**F**	**89.3**	**1.36**	**F**	**116.9**	**1.50**
	EBL	E	65.5	0.56	F	>200	1.36	F	270.5	1.50
	EBTR	A	3.1	0.55	A	5.6	0.60	A	6.9	0.62
	WB	A	0.0	0.01	D	36.0	0.01	A	0.0	0.00
	NBL	B	16.0	0.62	E	74.4	0.95	F	102.4	1.07
	NBT	B	10.4	0.46	C	24.7	0.66	C	28.2	0.71
	NBR	-	-	-	-	-	-	A	0.0	0.00
	SBL	-	-	-	-	-	-	D	39.3	0.01
	SBT	D	41.7	0.73	F	164.5	1.23	F	>200	1.40
	SBR	A	3.9	0.32	A	6.3	0.51	A	7.2	0.63

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro).
Note 2: The maximum v/c ratio for two-way stop-controlled intersections represents the maximum v/c for the minor road approach movements at the intersection. Any movements that experience a v/c ratio in excess of 0.85 are considered critical per the MTO TIS Guidelines.

Table 28: 2039 Future Total Traffic Operations

Intersection	Performance Metrics									
	Movement	AM			PM			Saturday		
		LOS[1]	Delay	v/c	LOS[1]	Delay	v/c	LOS[1]	Delay	v/c
Highway 10 & Milliner Ave (signalized)	**Overall**	**C**	**20.2**	**0.75**	**D**	**48.5**	**1.08**	**F**	**96.6**	**1.32**
	EBL	E	62.4	0.41	E	64.6	0.46	E	72.5	0.60
	EBTR	A	0.9	0.24	A	1.2	0.26	A	1.8	0.35
	WB	A	0.2	0.02	A	0.2	0.02	A	0.2	0.02
	NBL	A	6.6	0.17	D	41.6	0.63	B	15.9	0.27
	NBTR	B	10.1	0.48	C	22.2	0.84	B	14.9	0.68
	SBL	B	18.0	0.00	B	19.0	0.02	B	18.5	0.01
	SBT	C	32.3	0.75	F	86.1	1.08	F	180.9	1.32
	SBR	A	0.1	0.06	A	0.1	0.06	A	0.3	0.08
Highway 10 & Sideroad 240/ Eco Park Way (signalized)	**Overall**	**C**	**21.6**	**0.76**	**F**	**91.9**	**1.36**	**F**	**122.0**	**1.50**
	EBL	E	65.5	0.56	F	>200	1.36	F	>200	1.50
	EBTR	A	3.3	0.56	A	5.8	0.60	A	7.2	0.63
	WB	A	0.2	0.02	D	36.0	0.01	A	0.0	0.00
	NBL	C	18.9	0.63	E	75.7	0.96	F	106.1	1.08
	NBT	B	10.6	0.47	C	25.5	0.68	C	29.9	0.75
	NBR	-	-	-	-	-	-	A	0.0	0.00
	SBL	-	-	-	-	-	-	D	39.5	0.02
	SBT	D	43.1	0.76	F	176.8	1.27	F	>200	1.45
	SBR	A	3.9	0.32	A	6.2	0.51	A	7.2	0.64

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro).
Note 2: The maximum v/c ratio for two-way stop-controlled intersections represents the maximum v/c for the minor road approach movements at the intersection. Any movements that experience a v/c ratio in excess of 0.85 are considered critical per the MTO TIS Guidelines.

Table 29: 2044 Future Total Traffic Operations

Intersection	Performance Metrics									
	Movement	AM			PM			Saturday		
		LOS[1]	Delay	v/c	LOS[1]	Delay	v/c	LOS[1]	Delay	v/c
Highway 10 & Milliner Ave (signalized)	**Overall**	**C**	**20.8**	**0.77**	**D**	**52.3**	**1.11**	**F**	**104.4**	**1.36**
	EBL	E	62.4	0.41	E	64.6	0.46	E	72.5	0.60
	EBTR	A	1.0	0.24	A	1.2	0.26	A	1.8	0.35
	WB	A	0.2	0.02	A	0.2	0.02	A	0.3	0.03
	NBL	A	6.7	0.18	D	41.7	0.63	B	15.9	0.27
	NBTR	B	10.3	0.49	C	23.8	0.87	B	15.9	0.71
	SBL	B	18.0	0.00	B	19.5	0.02	B	19.0	0.00
	SBT	C	33.5	0.77	F	94.1	1.11	F	196.6	1.36
	SBR	A	0.1	0.06	A	0.1	0.06	A	0.3	0.08
Highway 10 & Sideroad 240/ Eco Park Way (signalized)	**Overall**	**C**	**22.8**	**0.78**	**F**	**94.9**	**1.36**	**F**	**127.8**	**1.51**
	EBL	E	65.5	0.56	F	>200	1.36	F	>200	1.50
	EBTR	A	3.8	0.57	A	6.1	0.61	A	7.6	0.63
	WB	A	0.2	0.02	D	36.0	0.01	A	0.0	0.00
	NBL	C	22.5	0.65	E	78.0	0.97	F	109.3	1.09
	NBT	B	10.8	0.49	C	26.6	0.71	C	32.0	0.79
	NBR	-	-	-	-	-	-	A	0.0	0.00
	SBL	-	-	-	-	-	-	D	39.8	0.03
	SBT	D	44.7	0.78	F	190.0	1.30	F	>200	1.51
	SBR	A	3.9	0.33	A	6.3	0.52	A	7.2	0.64

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro).
Note 2: The maximum v/c ratio for two-way stop-controlled intersections represents the maximum v/c for the minor road approach movements at the intersection. Any movements that experience a v/c ratio in excess of 0.85 are considered critical per the MTO TIS Guidelines.

Table 30 outlines the results of the 2044 future total queuing assessment completed using the SimTraffic program within Synchro 11.

Table 30: 2044 Future Total Queueing

Intersection	Movement	Queue Length (m)						Auxiliary Lane Storage Length (m)
		Synchro			SimTraffic			
		95th Percentile						
		AM	PM	Saturday	AM	PM	Saturday	
Highway 10 & Milliner Ave (signalized)	EBL	32.8	**36.6**	**46.8**	25.8	30.5	**38.9**	35.0
	NBL	13.6	74.9	26.0	22.8	85.2	28.7	130.0
	SBL	1.9	2.1	1.3	4.3	19.2	1.4	85.0
	SBR	0.0	0.0	0.7	28.4	**116.0**	**134.3**	115.0
Highway 10 & 240 Sideroad/ Eco Park Way (signalized)	EBL	65.0	**326.1**	**384.7**	60.6	**249.7**	**244.8**	225.0
	NBL	90.4	**203.3**	**243.3**	91.1	152.8	164.4	173.0
	NBR	-	-	-	-	-	-	15.0
	SBL	-	-	-	-	-	-	15.0
	SBR	17.0	25.6	31.8	42.7	**414.5**	**396.0**	298.0
		50th Percentile			Average			
Highway 10 & Milliner Ave (signalized)	EBL	14.8	17.0	22.9	12.2	14.6	19.6	35.0
	NBL	4.9	36.1	5.7	11.0	38.9	15.0	130.0
	SBL	0.3	0.3	0.1	0.5	1.6	0.1	85.0
	SBR	0.0	0.0	0.0	5.1	33.2	41.9	115.0
Highway 10 & 240 Sideroad/ Eco Park Way (signalized)	EBL	40.4	**249.5**	**305.5**	34.4	**229.4**	**230.7**	225.0
	NBL	52.1	129.3	168.3	51.2	102.0	136.0	173.0
	NBR	-	-	-	-	-	-	15.0
	SBL	-	-	-	-	-	-	15.0
	SBR	0.0	0.0	0.0	21.7	243.5	270.0	298.0

The intersection of Highway 10 and Milliner Avenue is forecasted to operate with a LOS 'D' with an overall delay of 52.3 s in the p.m. peak hour. A maximum delay of 94.1 s and a maximum v/c ratio of 1.11 for the southbound through volumes are forecasted in the p.m. peak hour. During the Saturday peak hour, the intersection operates at a LOS 'F' with an overall delay of 104.4. A maximum delay of 196.6 s and a maximum v/c ratio of 1.36 for the southbound through movement are forecasted for the Saturday peak hour.

The intersection of Highway 10 and Sideroad 240 is forecasted to operate with a LOS 'F' with an overall delay of 94.9 s in the p.m. peak hour. A maximum delay in excel of 200 s and a maximum v/c ratio of 1.36 is forecasted for the eastbound left movement the p.m. peak hour. During the Saturday peak hour, the intersection operates at a LOS 'F' with an overall delay of 127.8. A maximum delay in excess of 200 s and a maximum v/c ratio of 1.51 for the southbound through movement are forecasted for the Saturday peak hour.

At the intersection of Highway 10 and Milliner Avenue the eastbound left and southbound right 95th percentile queues are forecasted to exceed the available storage based on SimTraffic modelling. The Synchro 50th percentile and SimTraffic average queues are not expected to exceed the provided storage or impact the adjacent through lanes. As the 95th percentile queue length is an instance that is only expected for up to 5% of peak hour queues, the occurrence of a storage

exceedance can be monitored and updated signal timings may be required to provide more time to queueing volumes, should the storage exceedance occur.

The intersection of Highway 10 and 240 Sideroad / Eco Park Way is forecasted to exceed the provided storage under both Synchro and SimTraffic models for the eastbound left and northbound left 95th percentile queues. Only the eastbound left is forecasted to exceed the calculated storage based on the Synchro 50th percentile and SimTraffic average queues. The turn lane storage at the intersection was established based on the MTO signal timing policy. As previously noted, the eastbound left turn lane may be a through lane, should Eco Park Way have a four-lane cross-section and will not have a set storage that tapers down. Also previously noted, the forecasted volumes meet the threshold for dual eastbound left turn lanes consideration, should two accepting lanes be provided on Highway 10.

It should be reiterated that background traffic volumes are expected to more than triple the existing volumes on Highway 10 in the next 20 years and most of the volumes are forecasted from proposed developments. Therefore, the actual future volumes on Highway 10 may vary from the forecasted volumes. Additionally, the industrial and commercial occupants of the proposed lands, both for background developments and the Site, may impact the trip generation forecasts analyzed. Updated studies, assessments for mitigations, and optimizations are recommended as development proceeds to reflect up-to-date roadway volumes and development statistics.

6.0 Eco Park Way Extension Review

The development proposal includes a 30 m Right-of-Way (ROW) arterial road extension that will provide transportation servicing to and from the site. The roadway is planned to connect the existing portion of Eco Park Way to the intersection of Highway 10 and Sideroad 240. The following sections review the roadway and intersection connection to Highway 10.

6.1 Right-of-Way

The proposed industrial road extension (Eco Park Way) is proposed to have a ROW of 30 m. The Township and County do not have 30 m cross-sections on file. As the roadway could potentially be uploaded to Grey County, the County and Township should provide input on the roadway cross-section as detailed design proceeds. Based on forecast volumes on Eco Park Way a four-lane cross section is recommended. Providing two eastbound lanes would eliminate the need for the eastbound left-turn lane and will provide continual storage for the queue.

The cross-section should provide at a minimum of 1.5 m sidewalks on both sides of the roadway. On-road cycling provisions (bike lanes or signed route) can be provided or a minimum 3 m multi-use path on one side of the roadway to promote active transportation between the commercial and residential areas with the Grey County Trail.

6.2 Internal Network

At the request of the MTO, a high level review of the internal intersections was undertaken. Based on the proposed Draft Plan, there are two roundabouts proposed between the crossing of the County Rail Trail and the intersection with Highway 10.

The eastern roundabout is located approximately 490 m from the intersection of Highway 10 and the Eco Park/Sideroad 240. The western roundabout is located approximately 1,200 m from the intersection.

It is noted that, based on the volumes assessed, the 95th percentile queue for the eastbound left turn movement is forecasted to be 385 m, therefore not impacting the proposed roundabout. As the secondary roadway connection to the eastern roundabout is expected to service the commercial volumes, an extended westbound queue is not anticipated and is not expected to impact Highway 10 or its operations.

6.3 Intersection Sight Distance

Section 9.9 of TAC GDGCR provides intersection sight distance for different intersection control types. The applicable cases are as follows:

- Case B – Intersections with stop control on the minor road
  - Case B1 – Left turn from the minor road
  - Case B2 – Right turn from the minor road

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

$$ISD = 0.278 * V_{major} * t_g$$

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

Highway 10 has a posted speed limit of 80 km/h. Accordingly, a design speed of 100 km/h was selected. In this case, the passenger design vehicle was used for the assessment given that this vehicle is expected to be the most common vehicle profile to use the intersection

The calculated and design sight distance is further summarized in TAC GDGCR Table 9.9.6 for vehicles turning right from stop and Table 9.9.4 for vehicles turning left from stop. **Table 31** summarizes the site distance calculations.

Table 31: Intersection Sight Distance Assessment

Feature	Case B1 – Left Turn	Case B2/B3 – Right Turn
Time Gap	Left Turn = 7.5s	Right Turn = 6.5s
Required Sight Distance	210m (looking north)	185m (looking south)
Available Sight Distance	> 300m	> 300m

The available sight distance on Highway 10 at Sideroad 240 / Eco Park Way to the north and south exceeds the minimum sight distance requirements. Accordingly, the proposed intersection of Highway 10 and Side Road 240 can be supported from an intersection sight distance perspective.

6.4 Stopping Sight Distance

TAC GDGCR also provides the requirement for stopping sight distance on Highway 10. As previously mentioned, Highway 10 is straight and relatively flat adjacent to the site. For level roadways, the stopping sight distance requirements are tabulated in Table 2.5.2 of TAC GDGCR. **Table 32** outlines the required and available stopping sight distance.

Table 32: Stopping Sight Distance Assessment

Formula (TAC GDGCR 2.5.2)	SSD = 0.278 * V * t + 0.039 * (V^2/a)
Design Speed (V)	100 km/h
Brake Reaction Time (t)	2.5 s
Deceleration Rate (a)	3.4 m/s^2
Required Stopping Sight Distance	185 m
Available Sight Distance	> 300m (looking north and south)

Per TAC GDGCR Table 2.5.2, the minimum stopping sight distance is 185 meters. Clear visibility more than 300 meters is available to the north and south of Side Road 240 / Eco Park Way. Accordingly, there is sufficient stopping sight distance for vehicles approaching Side Road 240 from Highway 10.

The proposed intersection with Highway 10 can be supported from an intersection turning and stopping site distance perspective.

6.5 Intersection Spacing

Per the MTO's Highway Corridor Management Manual (April 2022), a minimum intersection spacing of 800 meters is requested for classification 3-Collector roadways such as Highway 10. This spacing is measured between intersections regardless of which side of the roadway the intersecting roadway is located and is for both signalized and unsignalized intersections. The measured distance between the intersection of Highway 10 and Milliner Avenue and Highway 10 and Eco Park Way / Sideroad 240 is approximately 1260 m. Therefore, adequate intersection spacing is provided for the proposed location of Eco Park Way, which also aligns with the existing location of Sideroad 240.

6.6 Pedestrian Safety

The proposed Eco Park Way extension to Highway 10 is expected to cross over the Grey County Rail Trail. This crossing is not within the Site. However, active transportation connections to the trail, for use by existing and future residents of Dundalk is recommended.

According to Book 15 of the Ontario Traffic Manual (June 2016), controlled pedestrian crossing treatments should be assessed and implemented based on the methodology provided in Section 5 - Treatment System Selection. Section 5 outlines the methodology for selecting an appropriate pedestrian crossing treatment system for controlled crossings. The County and Township should consider collecting data on the use of the rail trail to determine the pedestrian demand at the future road crossing. In the event that a controlled crossing is not warranted, the Town should consider implementing pedestrian crossings in accordance with Section 7 - Pedestrian Crossing Facility Design: Uncontrolled Crossings.

6.7 Internal Connections

The Draft Plan (MHBC Planning, October 9, 2024) illustrates the arterial roadway connecting the industrial, commercial and residential areas of the plan. Individual accesses to the roadway will be proposed and refined through site plan applications. Intersection and access spacing should adhere to the recommendations outlined the TAC GDGCR.

Three connecting north/south roadways are proposed, two arterial and one local. The westerly arterial is the extension of Eco Park Way. The central local road and eastern arterial roadway will terminate at the northern boundary of the lands and be held to provide future connection to the north. Currently the lands to the north have no development plans. Further to the north, the

Edgewood Greens subdivision provides a future 20 ROW block which could complete the connection across the unowned lands.

A connection between the Glenelg and Eco Park developments would provide access between the residential and commercial lands without the use of Highway 10, helping to reduce traffic volumes on Highway 10 travelling between the two lands.

The transportation capacity analysis contained herein has not accounted for these potential future links.

7.0 Transportation Demand Management

Transportation Demand Management (TDM) refers to policies, programs, mobility services, design, and infrastructure that encourage people to use more sustainable modes of transportation.

Some benefits of TDM strategies include the following:

- Reduced auto-related emissions to improve air quality;
- Decreased traffic congestion to reduce travel time;
- Increased travel options for residents and commuters;
- Reduced personal transportation costs and energy consumption; and
- Support of Provincial Smart Growth Objectives.

Overall, the site should provide pedestrian and cycling connections with sidewalks, multi-use paths or bike lanes. Site Plans for individual industrial and commercial buildings should review TDM opportunities further, such as carpool parking, bicycle storage, etc.

8.0 Conclusions and Recommendations

This study has assessed the transportation impacts of the proposed development in the community of Dundalk. The existing conditions, the future conditions, and the potential net impacts of the development proposal on the study road network have been evaluated.

A number of conclusions have been identified as a result of the study process. Furthermore, given these conclusions, several transportation planning recommendations have been produced for the consideration of the relevant reviewing agencies.

8.1 Conclusions

The analysis contained within this study has resulted in the following key findings:

- Under the 2024 existing conditions scenario the intersection of Highway 10 and Sideroad 240 is operating with a LOS 'B' with minimal delay and excess capacity for traffic growth.

- A number of background developments were considered to reach full build-out by 2034. These developments have a combined total of 1,301 residential units and include commercial, institutional and industrial uses. These developments include:

    - Edgewood Greens Phases 1-11

    - Glenelg Phases 1-3

  - White Road Development
  - Dundalk Northwest
  - Dundalk Northeast
  - Town Industrial Lands

- The combination of the 1.5% growth rate and multiple background developments could be double counting the expected background traffic. Background traffic volumes are expected to more than triple the existing volumes on Highway 10 in the next 20 years. Most of the volumes are forecasted, and the actual future traffic volumes may vary from the forecast. The volumes assessed may be conservative and monitoring of future roadway volumes is recommended.

- Under the 2044 future background conditions:

  - The intersection of Highway 10 and Milliner Avenue is forecasted to operate at a LOS 'D' with 40.3 s of delay in the Saturday peak hour.

  - The intersection of Highway 10 and Sideroad 240 is forecasted to operate with a LOS 'F' with 81.7 s of delay in the weekday p.m. peak hour. This is related to the increase of through volumes on Highway 10 as there are very few volumes expected on Sideroad 240 during the peak hours.

  - SimTraffic modelling found that the 95th percentile queues are anticipated to be contained within their dedicated storage lengths.

  - Reviewing the MTO capacity thresholds for network improvements, an additional through lane on Highway 10 be considered based on the p.m. peak hour northbound and southbound volumes. As most of the volumes are based on forecasted trip generation, widening was not considered in this analysis.

- Considering the zoning lot coverage of 40% for both the commercial and industrial areas, a total of 864 a.m. and 1,548 p.m. two-way weekday external primary trips and 416 p.m. two-way weekday external pass-by trips are expected. Additionally, a total of 1,873 two-way weekend external primary trips and 517 two-way weekend external pass-by trips are forecast.

- For the purpose of this analysis the expected lot coverage for the commercial and industrial lands was considered. Based on a lot coverage of 25% for the commercial GFA and a lot of coverage of 20% for the industrial GFA, a total of 882 a.m. and 967 p.m. two-way weekday external primary trips and 267 p.m. two-way weekday external pass-by trips, as well as 1,319 two-way weekend external primary trips and 360 two-way weekend external pass-by trips are forecast.

- Under the ultimate horizon 2044 future total conditions and full build-out of the proposed development:

  - Traffic signals were found to be warranted under full build-out of the development at Highway 10 and Eco Park Way and operationally required by the 2029 horizon year.

- Auxiliary turn lane storage was calculated based on TAC and the MTO's Signal Timing Policy for the intersection of Highway 10 and Sideroad 240 / Eco Park Way:
    - 173 m Northbound Left-Turn Lane
    - 225 m Eastbound Left-Turn Lane
    - 15 m Southbound Left-Turn Lane
    - 298 m Southbound Right-Turn Lane
    - 15 m Northbound Right-Turn Lane
- Reviewing the MTO capacity thresholds for network improvements, dual northbound and eastbound left turn lanes at Eco Park Way could be considered. In addition, the potential widening of Highway 10 identified under the future background scenario remains. As previously stated, most of the volumes are forecasted trip generation, therefore these mitigations were not considered in this analysis.
- The intersection of Highway 10 and Milliner Avenue is forecasted to operate with a LOS 'D' with an overall delay of 52.3 s in the p.m. peak hour. A maximum delay of 94.1 s and a maximum v/c ratio of 1.11 for the southbound through volumes are forecasted in the p.m. peak hour.
    - During the Saturday peak hour, the intersection operates at a LOS 'F' with an overall delay of 104.4 s. A maximum delay of 196.6 s and a maximum v/c ratio of 1.36 for the southbound through movement are forecasted for the Saturday peak hour.
- The intersection of Highway 10 and Sideroad 240 is forecasted to operate with a LOS 'F' with an overall delay of 94.9 s in the p.m. peak hour. A maximum delay in excel of 200 s and a maximum v/c ratio of 1.36 is forecasted for the eastbound left movement the p.m. peak hour.
    - During the Saturday peak hour, the intersection operates at a LOS 'F' with an overall delay of 127.8. A maximum delay in excess of 200 s and a maximum v/c ratio of 1.51 for the southbound through movement are forecasted for the Saturday peak hour.
- Reviewing the MTO capacity thresholds for network improvements, an additional through lane on Highway 10 should be considered. As the majority of the volumes are forecasted trip generation, widening was not considered in this analysis.
- At the intersection of Highway 10 and Milliner Avenue the eastbound left and southbound right 95th percentile queues are forecasted to exceed the available storage by 11.8 m and 19.3 m, respectively.
    - The Synchro 50th percentile and SimTraffic average queues are not expected to exceed the provided storage or impact the adjacent through lanes.
- For the intersection of Highway 10 and 240 Sideroad / Eco Park Way, 95th percentile queues for the eastbound left and northbound left movements are forecasted to exceed the provided storage by 159.7 m and 100.3 m, respectively under the Synchro Model.

- The eastbound left movement 95th percentile queue is forecasted to exceed the provided storage by 24.7 m under the SimTraffic model.
- Only the eastbound left is forecasted to exceed the calculated storage based on the Synchro 50th percentile and SimTraffic average queues, by 80.5 m and 5.7 m, respectively.
- The eastbound left turn lane may be a through lane, should Eco Park Way have a four-lane cross-section and would not have a set storage length.

- Review of the Eco Park Way intersection with Highway 10 indicates the following:
  - The first internal roundabout on Eco Park Way is 490 m from the intersection with Highway 10.
  - The proposed intersection spacing exceeds 1,200 metres on Highway 10, exceeding the MTO's minimum intersection spacing requirement.
  - The available sight distance at the intersection exceeds the minimum sight distance requirements set out in the TAC GDGCR.

8.2 Recommendations

The conclusions and findings resulting from this study has led to the following recommendations:

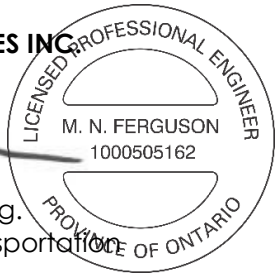
- Northbound, southbound and eastbound left as well as northbound and southbound right auxiliary turn lanes are recommended at the intersection of Highway 10 and Eco Park Way / Sideroad 240.
- Provisions for traffic signals should be provided during the construction of the roadway. Signalization should occur at such a time that roadway traffic volumes warrant the implementation of a signalized intersection. Design elements can be confirmed once exact development details are known. The intersection can be monitored by the Township and MTO as forecasted background traffic is confirmed.
- Protected-Permissive northbound left turn signals are recommended at full build-out of developments in Dundalk at both Highway 10 & Milliner Avenue and Highway 10 & Eco Park Way / Sideroad 240.
- A future connection between the Glenelg and Eco Park developments should be encouraged as it would provide access between the residential and commercial lands without the use of Highway 10, helping to reduce traffic volumes on Highway 10 travelling between the two lands.
- Ongoing monitoring of Highway 10 is recommended as development in Dundalk proceeds. Given the current population and traffic volumes in Dundalk, most future volumes are forecasted. Three quarters of the 2044 future total volumes on Highway 10 are forecasted based on estimated growth and trip generation. Actual future total volumes on the corridor may differ and the proposed intersections should be monitored as build-out continues in Dundalk.

The analysis undertaken herein was prepared using the most recent Draft Plan. Any minor changes to the Plan will not materially affect the conclusions contained within this report.

In conclusion, the proposed mixed-use development can be supported from a traffic operations and safety perspective, with ongoing monitoring to determine if and when mitigation measures are required.

Respectfully submitted by,

C.F. CROZIER & ASSOCIATES INC.



Madeleine Ferguson, P.Eng.
Manager (Planning), Transportation

October 23, 2024

C.F. CROZIER & ASSOCIATES INC.

Kerianne Hagan, EIT
Engineering Intern, Transportation

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Appendix A

Terms of Reference Correspondence

MTO Comments regarding TOR and TIS Requirements – October 10, 2024

MTO have re-assessed the TOR provided based on the new information received along with some clarification requested by Crozier. Additional comments not previous provided are identified below in red. Please review MTO's comments, concerns and/or requirements:

- MTO require the submission of a full TIS (following MTO TIS guidelines and by a RAQS qualified consultant) to assess the future impact of the proposed developments and to identify any warranted highway/road improvements.
- Digital Synchro version 12 files are required at the time of submission – we will accept Version 11 until Dec 2024.
- MTO require that data collection must be completed by a RAQS qualified consultant/company.
- The TIS shall identify the stages or phasing schemes of the development as well as the expected dates of full and partial completion/occupancy, estimated length of construction and opening dates if available, for each phase. Three analysis years will be required for the TIS - the opening date of the development, five years, and 10 years from the opening date. Where applicable, each major phase in a multi-phased development shall be assessed separately for the five and 10-year horizons beyond full build-out of the site.
- MTO require that all intersection capacity analysis on impacted intersections or interchanges within MTO facilities follow MTO/TAC protocols.
- MTO require that the need for traffic signals and/or underground traffic signal utility provisions be reviewed at all locations affected by the proposed development and for each proposed development stage. Determination of whether traffic signals or provisions for signals are warranted shall be made according to the process described in OTM Book 12. Intersection timing and traffic signal improvements required due to development or redevelopment shall be considered as improvements in the TIS. If signals are warranted, they must follow AODA requirements.
- AM, PM and Saturday analysis is required. A Saturday analysis is required since there is commercial and retail development proposed.
- MTO require that a 2% growth rate be used. MTO have determined that a 1.5% growth rate can be used.
- As part of the TIS, additional LT and RT lanes from the highway are required to be analyzed. If signals are warranted, MTO require that left-turn storage lanes be included on the major road (Hwy 10), RTLs should be reviewed and warranted based on TAC.
- The need for geometric improvements shall be reviewed at all locations in the study area and for each proposed development stage. Each TIS shall clearly identify transportation impacts by movement, the transportation system improvements that are needed to mitigate these impacts, and the timing of any recommended improvements. MTO require that a schematic representation of all geometric improvements be included as part of the TIS, identifying lane

arrangements and intersection improvements for each horizon year. Road improvements to be included conceptually in TIS.

- Unique traffic generators such as a Tim Horton's or a McDonald's have higher trip generation rates than those provided by the ITE manual. If unique traffic generators are proposed to be located at the site in the future, MTO will require further analysis. MTO require that the attached drive-thru report be used to complete the analysis.
- Roundabouts and possible signals are shown at Hwy 10. Synchro is not the right choice/tool for analysing roundabouts. MTO require that Vissim/Aimsun be used. Arcady is for the design (which RIT would review). Since the roundabout is in close proximity to other potential signalized intersections/Hwy 10, MTO require that a microsimulation using Aimsun or Vissim be completed.
- Please provide the distance from Highway 10 to the proposed internal roundabout on Eco Parkway.
- The MTO Roundabout Implementation Team (RIT) will review the roundabout.
- If it is individual studies/proponents, a Multi-Development TIS is required as it will evaluate the extent to which provincial highway improvements are required as a direct result of the combined effects of multiple developments within a single study area.
- The use of any proxy site information or data must be reviewed and approved by the MTO before being included in the TIS. If required, 3 proxy sites must be used. Currently, the use of proxy sites is not proposed. The TIS will be based on ITE.
- Crozier is required to ensure that the TIS will analyze/identify that trucks will use Eco Parkway.
- The submission of a TIS will be required for review and acceptance prior to the development of each block/part.

Appendix B

Industrial Access Road Traffic Impact Study (Triton, June 2017) Excerpts

INDUSTRIAL ACCESS ROAD
GREY ROAD 9 AND IDA STREET
TRAFFIC IMPACT STUDY

JUNE, 2017

TRITON ENGINEERING SERVICES LIMITED
Consulting Engineers

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Orangeville, Ontario
L9W 3L2
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ORANGEVILLE • FERGUS • GRAVENHURST

1.0 INTRODUCTION

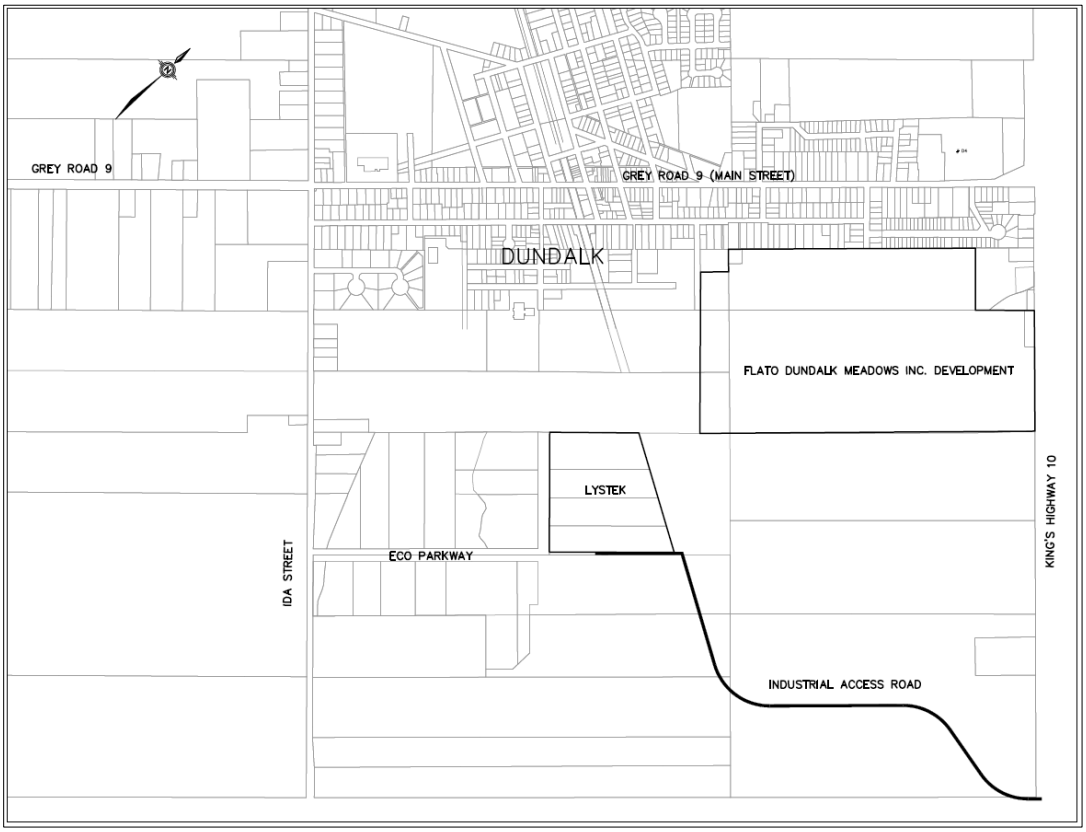
Triton Engineering Services Limited was retained by the Township of Southgate to undertake a Traffic Impact Study to assess the impact on the intersection of Grey Road 9 (Main Street) and Ida Street resulting from the construction of the proposed Industrial Access Road south of Dundalk.

This report summarizes the following:

- Future traffic volumes from the proposed industrial land developments at 50% build-out and full build-out;
- Existing and future levels of service at the Grey Road 9 and Ida Street intersection;
- Future intersection configuration and traffic control to meet future traffic demands.

2.0 PROPOSED DEVELOPMENTS AND ROAD NETWORK

The proposed Industrial Access Road will be an east-west arterial road that connects Ida Street (via Eco Parkway) and King's Highway 10 south of Dundalk. The location of the proposed road is shown below.



The lands on both sides of the Industrial Access Road have been designated for industrial use. Eco Parkway currently ends at the entrance to Lystek International (an organic materials revcovery centre), which is only one of two existing developments on Eco Parkway.

The land surrounding the industrial use zones is a mix of agriculture and natural areas, with the community of Dundalk to the north. There is a residential development (Flato Dundalk Meadows Inc.) to be constructed south of Dundalk by 2020.

The Township of Southgate has undertaken a Class EA for the Access Road. As part of the review process, Grey County requested a traffic impact study to assess the impact of constructing the Industrial Access Road on the intersection of Grey Road 9 and Ida Street. This report will investigate the effects of a 50% build-out and a full build-out of the industrial lands surrounding the Access Road.

Grey Road 9 is an east-west arterial road with a posted speed of 50 km/h. Ida Street is a north-south rural local road with a posted speed of 50 km/h. Both roads have one lane in each direction with stop control provided on Ida Street.

3.0 EXISTING TRAFFIC

Weekday morning and afternoon peak period traffic counts were obtained on April 19, 2018 at the Grey Road 9 and Ida Street intersection. The existing Weekday AM and PM peak hours were determined and the traffic volumes are illustrated in Figure 1.

Existing levels of service were analyzed based on the *Highway Capacity Manual, 2000*, using Synchro 10, Version 10.1. Level of Service definitions are included in Appendix A. The detailed capacity analyses are included in Appendix B. Table 1 outlines the existing traffic levels of service and volume to capacity ratios for the Grey Road 9 and Ida Street intersection.

Table 1: Existing Traffic Levels of Service

Intersection	Movement	Level of Service		v/c Ratio	
		AM	PM	AM	PM
Grey Road 9 and Ida Street (Unsignalized)	EB Overall	A	A	0.00	0.00
	WB Overall	A	A	0.02	0.02
	NB Overall	A	B	0.03	0.09
	SB Overall	B	B	0.06	0.05

The unsignalized Grey Road 9 and Ida Street intersection is currently operating at a very good and good level of service during both the Weekday AM and PM Peak hours.

4.0 BACKGROUND TRAFFIC

Background traffic is traffic growth generated from sources other than the developments being studied. This will allow an analysis of the effect that the developments will have on the existing road network.

For the purpose of this study, it was assumed that the road construction of the industrial Access Road would be completed in 2019. This study will analyze the traffic volumes at the Grey Road 9 and Ida Street intersection in 2019 (after the road is completed), in 2024 (full and 50% build-out of industrial lands), and a 5 year horizon (2029). A conservative growth rate of 2% was applied to existing traffic volumes to establish background volumes for 2019, 2024, and 2029.

Flato Dundalk Meadows Inc. (residential development site) is located immediately south of Dundalk and is expected to be constructed and fully occupied by 2030. C.F. Crozier & Associates Inc. completed a traffic impact study (Addendum – June 2016) for the development with the trips generated distributed on the existing local roads. C.F. Crozier had assumed that 30% of the trips generated would travel to and from the west (including downtown Dundalk). To incorporate the additional traffic from this residential development, it is assumed that only 10% of the trips generated would travel to and from Grey Road 9 past Ida Street (with the remaining 20% dispersing in downtown Dundalk). This additional traffic is shown on Figure 2 and was added to the background traffic.

Once the Industrial Access Road is constructed, some traffic will re-route based on more direct connections. It was assumed for the purpose of this study that 30% of the traffic on Grey Road 9 through Dundalk would use the Access Road as a bypass route around the community. This is considered to be a conservative estimate. It was also assumed that all truck traffic currently going through Dundalk would use the Access Road to bypass the village or access the industrial lands.

The following list summarizes the movements that are affected by these assumptions:

- 30% of SB-left cars will be added to SB-thru;
- 30% of EB-thru cars will be added to EB-right;
- 30% of WB-thru cars will be added to NB-left;
- 30% of WB-right cars will be added to NB-thru;
- SB-left trucks will be added to SB-thru;
- EB-thru trucks will be added to EB-right;
- WB-left trucks will be removed;
- WB-thru trucks will be added to NB-left;
- WB-right trucks will be added to NB-thru; and,
- NB-right trucks will be removed.

5.0 SITE GENERATED TRAFFIC

5.1 Trip Generation

Trip generation is a forecast of the additional traffic created by future developments from studies of similar developments to assess the impact of the additional traffic on the surrounding road network. The *Institute of Transportation Engineers (ITE) Trip Generation Manual, 8th Edition* (ITE Code 130 – Industrial Park) was used in this analysis.

The types of developments surrounding the Access Road are not known at this time. The ITE Code 130 – Industrial Park will provide a conservative trip generation. To account for a level of uncertainty, and that a full build-out of the industrial lands is expected to take longer than 5 years, a scenario of 50% build-out was also analyzed to assess when improvements to the Grey Road 9 and Ida Street intersection will be required.

Based on the legal plan provided, an approximate area of 259.75 acres was used to forecast the trips generated by a full build-out of the industrial lands surrounding the proposed Access Road. The 50% build-out area used was 129.875 acres. For this study, it is assumed that all trips generated by the developments are primary trips, thus providing a conservative approach.

The total number of trips generated by the developments for the Weekday AM and PM peak hours are summarized in Table 5 for both 50% build-out and full build-out. The equations used to calculate the number of trips, can be found in Appendix C. It is noted that the 50% development scenario still generates a conservative estimate of 802 and 769 additional trips in the AM and PM peak hours respectively.

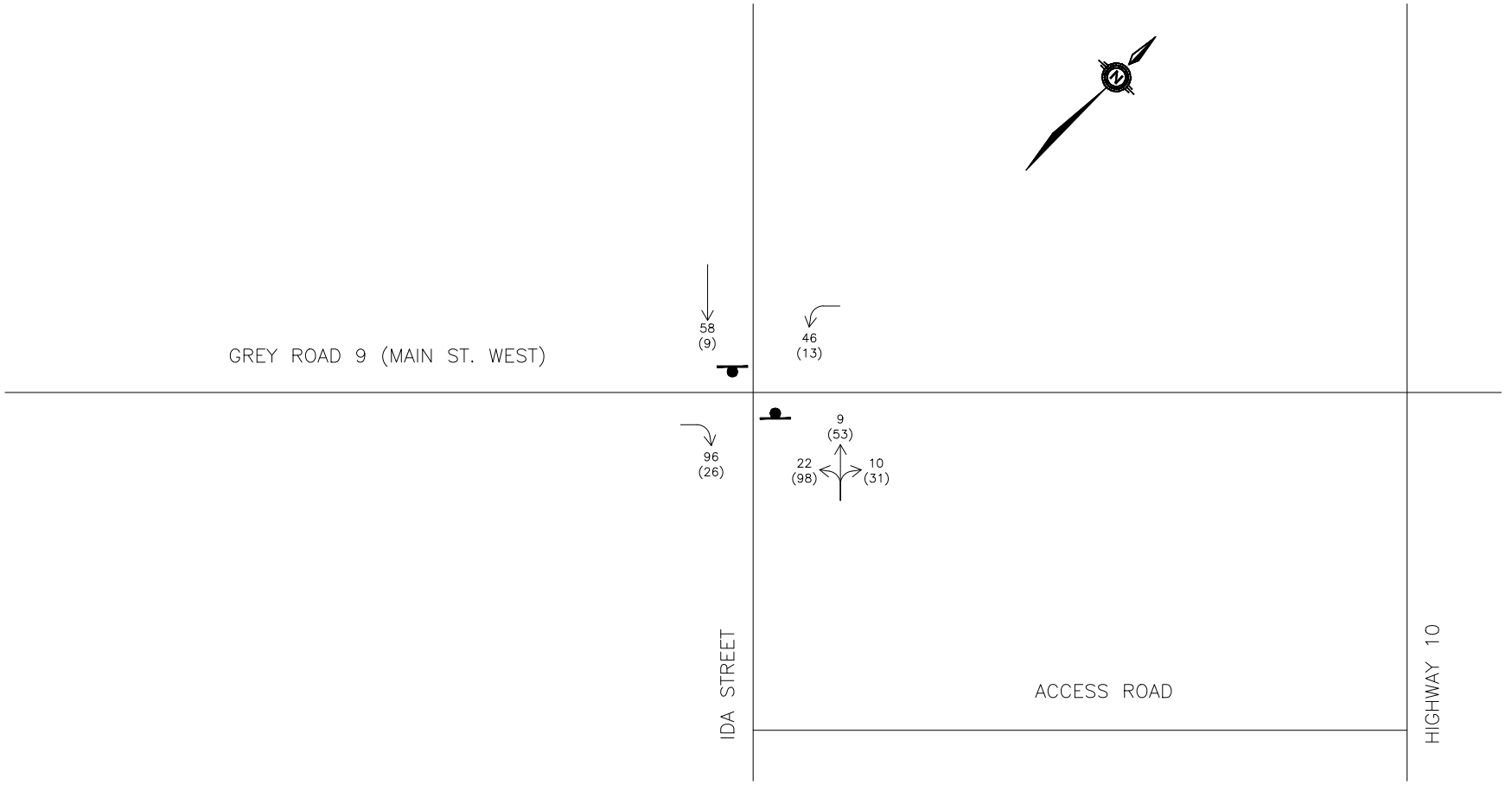
Table 5: Trip Generation Summary

Land Use	Weekday AM			Weekday PM		
	Trips Entering	Trips Exiting	Total Trips	Trips Entering	Trips Exiting	Total Trips
Industrial Lands – 50% build-out	666	136	802	161	608	769
Industrial Lands – full build-out	1142	234	1376	266	1000	1266

5.2 Trip Distribution

The trips generated by the developments were distributed and assigned to the road network based on local traffic patterns, as well as expected origin and destination. It was assumed that 70% of the trips generated would head towards/come from Highway 10 on the Access Road. For a conservative approach, it was assumed that all of the site

FIGURES



LEGEND:

STOP CONTROL

25 (25) 8:00am – 9:00am 4:30pm – 5:30pm TRAFFIC VOLUMES

EXISTING ROAD

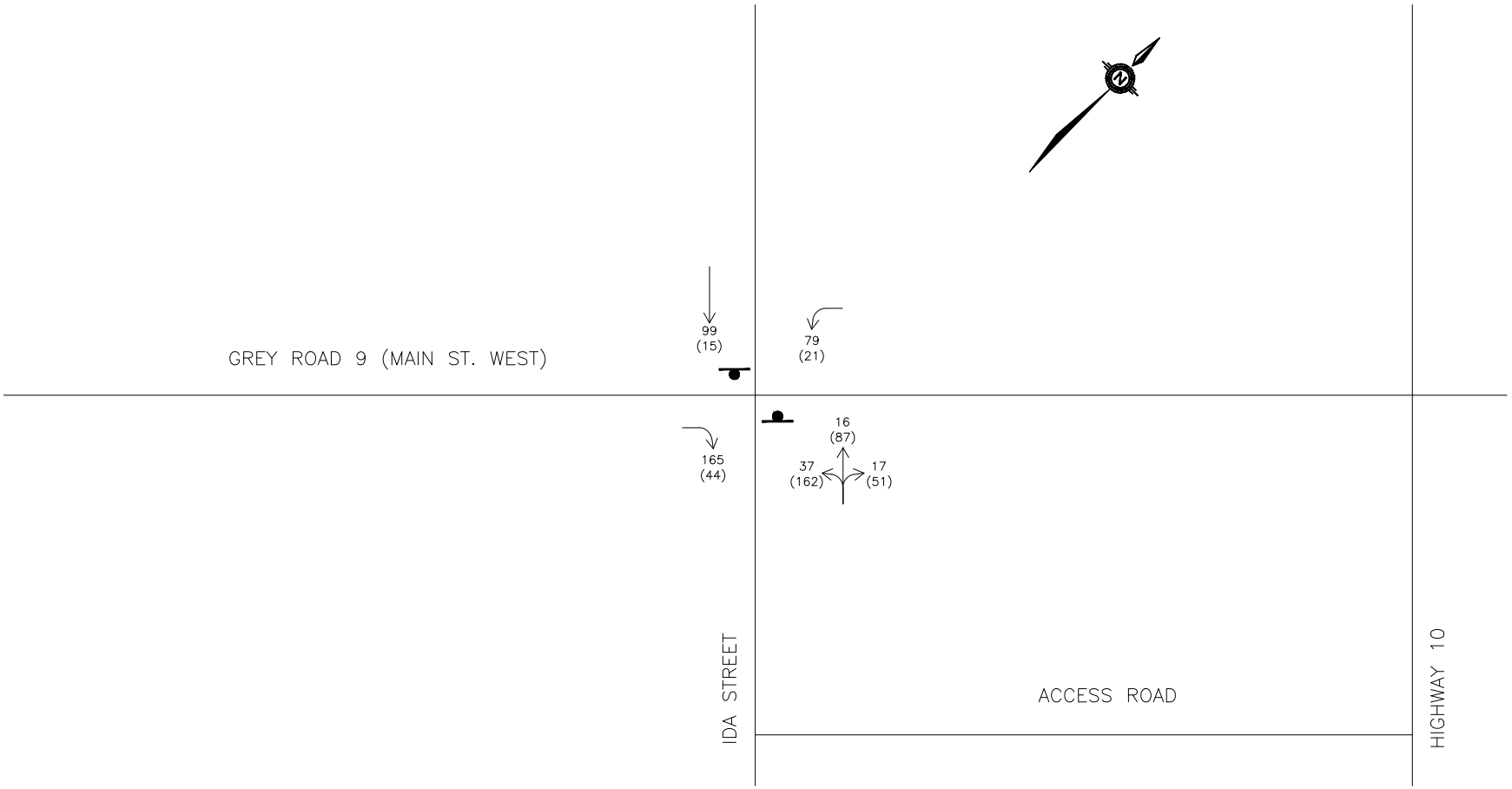
TRAFFIC FLOW

TRAFFIC SIGNALS

PROPOSED ENTRANCE

TRITON ENGINEERING SERVICES LIMITED
Consulting Engineers

FIGURE 6:
DEVELOPMENT PEAK HOUR TRIP DISTRIBUTION - 50% BUILD-OUT
(NOT TO SCALE)



LEGEND:

STOP CONTROL

25 (25) 8:00am – 9:00am 4:30pm – 5:30pm TRAFFIC VOLUMES

EXISTING ROAD

TRAFFIC FLOW

TRAFFIC SIGNALS

PROPOSED ENTRANCE

TRITON ENGINEERING SERVICES LIMITED
Consulting Engineers

FIGURE 7:
DEVELOPMENT PEAK HOUR TRIP DISTRIBUTION - FULL BUILD-OUT
(NOT TO SCALE)

APPENDIX C

Trip Generation

Dundalk Access Road
Township of Southgate
M5616T

Trip Generation - Industrial Park

Land Use	ITE Code	Description	Units	Trips Generated per Unit					
				Weekday AM			Weekday PM		
				Total	Entering	Exiting	**Total**	Entering	Exiting
Proposed Industrial	130	Industrial Park	259.75 acres	**1376**	1142	234	**1266**	266	1000
Total				**1376**	**1142**	**234**	**1266**	**266**	**1000**

Equations Used

Code	Description	Equation	Distribution
ITE Code 130	Average Vehicle Trip Ends vs Acres on a Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7-9 am	Ln(T) = 0.78Ln(X)+2.89	83% Entering
ITE Code 130	Average Vehicle Trip Ends vs Acres on a Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4-6 pm	Ln(T) = 0.72Ln(X)+3.14	21% Entering

Trip Generation 50% build out- Industrial Park

Land Use	ITE Code	Description	Units	Trips Generated per Unit					
				Weekday AM			Weekday PM		
				Total	Entering	Exiting	**Total**	Entering	Exiting
Proposed Industrial	130	Industrial Park	129.875 acres	**802**	666	136	**769**	161	608
Total				**802**	**666**	**136**	**769**	**161**	**608**

Appendix C

Traffic Volume Data

Turning Movement Count (1 . HWY 10 & SIDEROAD 240)

Start Time	N Approach HWY 10					E Approach SIDEROAD 240					S Approach HWY 10					Int. Total (15 min)	Int. Total (1 hr)
	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	UTurn S:S	Peds S:	Approach Total		
06:00:00	54	0	0	0	54	0	0	0	0	0	0	14	0	0	14	68	
06:15:00	69	0	0	0	69	0	0	0	0	0	0	19	0	0	19	88	
06:30:00	56	0	0	0	56	0	0	0	0	0	0	20	0	0	20	76	
06:45:00	48	0	0	0	48	0	0	0	0	0	0	27	0	0	27	75	307
07:00:00	54	1	0	0	55	0	0	0	0	0	0	17	0	0	17	72	311
07:15:00	70	0	0	0	70	2	0	0	0	2	0	34	0	0	34	106	329
07:30:00	66	0	0	0	66	0	1	0	0	1	0	37	0	0	37	104	357
07:45:00	63	0	0	0	63	0	0	0	0	0	0	39	0	0	39	102	384
08:00:00	69	0	0	0	69	0	0	0	0	0	0	60	0	0	60	129	441
08:15:00	58	0	0	0	58	1	0	0	0	1	0	34	0	0	34	93	428
08:30:00	49	0	0	0	49	1	0	0	0	1	0	44	0	0	44	94	418
08:45:00	71	0	1	0	72	1	0	0	0	1	0	35	0	0	35	108	424
09:00:00	60	1	0	0	61	0	0	0	0	0	0	38	0	0	38	99	394
09:15:00	63	0	0	0	63	0	0	0	0	0	0	42	0	0	42	105	406
09:30:00	47	0	0	0	47	1	0	0	0	1	0	28	0	0	28	76	388
09:45:00	50	0	0	0	50	0	0	0	0	0	0	33	0	0	33	83	363
BREAK																	
15:00:00	43	0	1	0	44	0	0	0	0	0	0	61	0	0	61	105	
15:15:00	45	0	0	0	45	0	0	0	0	0	0	72	0	0	72	117	
15:30:00	47	0	0	0	47	0	2	0	0	2	1	64	0	0	65	114	
15:45:00	49	0	0	0	49	0	0	0	0	0	0	71	0	0	71	120	456
16:00:00	36	0	0	0	36	0	0	0	0	0	0	58	0	0	58	94	445
16:15:00	56	0	0	0	56	0	1	0	0	1	0	71	0	0	71	128	456
16:30:00	58	0	0	0	58	0	0	0	0	0	0	76	0	0	76	134	476
16:45:00	45	0	0	0	45	0	0	0	0	0	0	74	0	0	74	119	475
17:00:00	67	0	0	0	67	0	0	0	0	0	0	72	0	0	72	139	520
17:15:00	56	0	0	0	56	0	1	0	0	1	0	87	0	0	87	144	536
17:30:00	33	0	0	0	33	0	0	0	0	0	0	76	0	0	76	109	511
17:45:00	53	0	0	0	53	0	0	0	0	0	0	88	0	0	88	141	533
18:00:00	30	0	0	0	30	0	0	0	0	0	0	76	0	0	76	106	500
18:15:00	27	1	0	0	28	0	0	0	0	0	0	61	0	0	61	89	445
18:30:00	16	0	0	0	16	0	0	0	0	0	0	71	0	0	71	87	423
18:45:00	42	1	0	0	43	1	0	0	0	1	0	51	0	0	51	95	377

Grand Total	1650	4	2	0	1656	7	5	0	0	12	1	1650	0	0	1651	**3319**	-
Approach%	99.6%	0.2%	0.1%		-	58.3%	41.7%	0%		-	0.1%	99.9%	0%		-	**-**	-
Totals %	49.7%	0.1%	0.1%		49.9%	0.2%	0.2%	0%		0.4%	0%	49.7%	0%		49.7%	**-**	-
Heavy	115	1	0		-	3	1	0		-	0	118	0		-	**-**	-
Heavy %	7%	25%	0%		-	42.9%	20%	0%		-	0%	7.2%	0%		-	**-**	-
Bicycles	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-
Bicycle %	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-

Peak Hour: 07:15 AM - 08:15 AM Weather: Light Snow (-13.53 °C)

Start Time	N Approach HWY 10					E Approach SIDEROAD 240					S Approach HWY 10					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
07:15:00	70	0	0	0	70	2	0	0	0	2	0	34	0	0	34	106
07:30:00	66	0	0	0	66	0	1	0	0	1	0	37	0	0	37	104
07:45:00	63	0	0	0	63	0	0	0	0	0	0	39	0	0	39	102
08:00:00	69	0	0	0	69	0	0	0	0	0	0	60	0	0	60	129
Grand Total	268	0	0	0	268	2	1	0	0	3	0	170	0	0	170	**441**
Approach%	100%	0%	0%		-	66.7%	33.3%	0%		-	0%	100%	0%		-	**-**
Totals %	60.8%	0%	0%		60.8%	0.5%	0.2%	0%		0.7%	0%	38.5%	0%		38.5%	**-**
PHF	0.96	0	0		0.96	0.25	0.25	0		0.38	0	0.71	0		0.71	**-**
Heavy	9	0	0		9	0	1	0		1	0	22	0		22	**-**
Heavy %	3.4%	0%	0%		3.4%	0%	100%	0%		33.3%	0%	12.9%	0%		12.9%	**-**
Lights	259	0	0		259	2	0	0		2	0	148	0		148	**-**
Lights %	96.6%	0%	0%		96.6%	100%	0%	0%		66.7%	0%	87.1%	0%		87.1%	**-**
Single-Unit Trucks	8	0	0		8	0	0	0		0	0	20	0		20	**-**
Single-Unit Trucks %	3%	0%	0%		3%	0%	0%	0%		0%	0%	11.8%	0%		11.8%	**-**
Buses	0	0	0		0	0	1	0		1	0	0	0		0	**-**
Buses %	0%	0%	0%		0%	0%	100%	0%		33.3%	0%	0%	0%		0%	**-**
Articulated Trucks	1	0	0		1	0	0	0		0	0	2	0		2	**-**
Articulated Trucks %	0.4%	0%	0%		0.4%	0%	0%	0%		0%	0%	1.2%	0%		1.2%	**-**

Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (-11.16 °C)

Start Time	N Approach HWY 10					E Approach SIDEROAD 240					S Approach HWY 10					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
16:30:00	58	0	0	0	58	0	0	0	0	0	0	76	0	0	76	134
16:45:00	45	0	0	0	45	0	0	0	0	0	0	74	0	0	74	119
17:00:00	67	0	0	0	67	0	0	0	0	0	0	72	0	0	72	139
17:15:00	56	0	0	0	56	0	1	0	0	1	0	87	0	0	87	144
Grand Total	226	0	0	0	226	0	1	0	0	1	0	309	0	0	309	**536**
Approach%	100%	0%	0%		-	0%	100%	0%		-	0%	100%	0%		-	**-**
Totals %	42.2%	0%	0%		42.2%	0%	0.2%	0%		0.2%	0%	57.6%	0%		57.6%	**-**
PHF	0.84	0	0		0.84	0	0.25	0		0.25	0	0.89	0		0.89	**-**
Heavy	16	0	0		16	0	0	0		0	0	13	0		13	**-**
Heavy %	7.1%	0%	0%		7.1%	0%	0%	0%		0%	0%	4.2%	0%		4.2%	**-**
Lights	210	0	0		210	0	1	0		1	0	296	0		296	**-**
Lights %	92.9%	0%	0%		92.9%	0%	100%	0%		100%	0%	95.8%	0%		95.8%	**-**
Single-Unit Trucks	15	0	0		15	0	0	0		0	0	8	0		8	**-**
Single-Unit Trucks %	6.6%	0%	0%		6.6%	0%	0%	0%		0%	0%	2.6%	0%		2.6%	**-**
Buses	0	0	0		0	0	0	0		0	0	3	0		3	**-**
Buses %	0%	0%	0%		0%	0%	0%	0%		0%	0%	1%	0%		1%	**-**
Articulated Trucks	1	0	0		1	0	0	0		0	0	2	0		2	**-**
Articulated Trucks %	0.4%	0%	0%		0.4%	0%	0%	0%		0%	0%	0.6%	0%		0.6%	**-**

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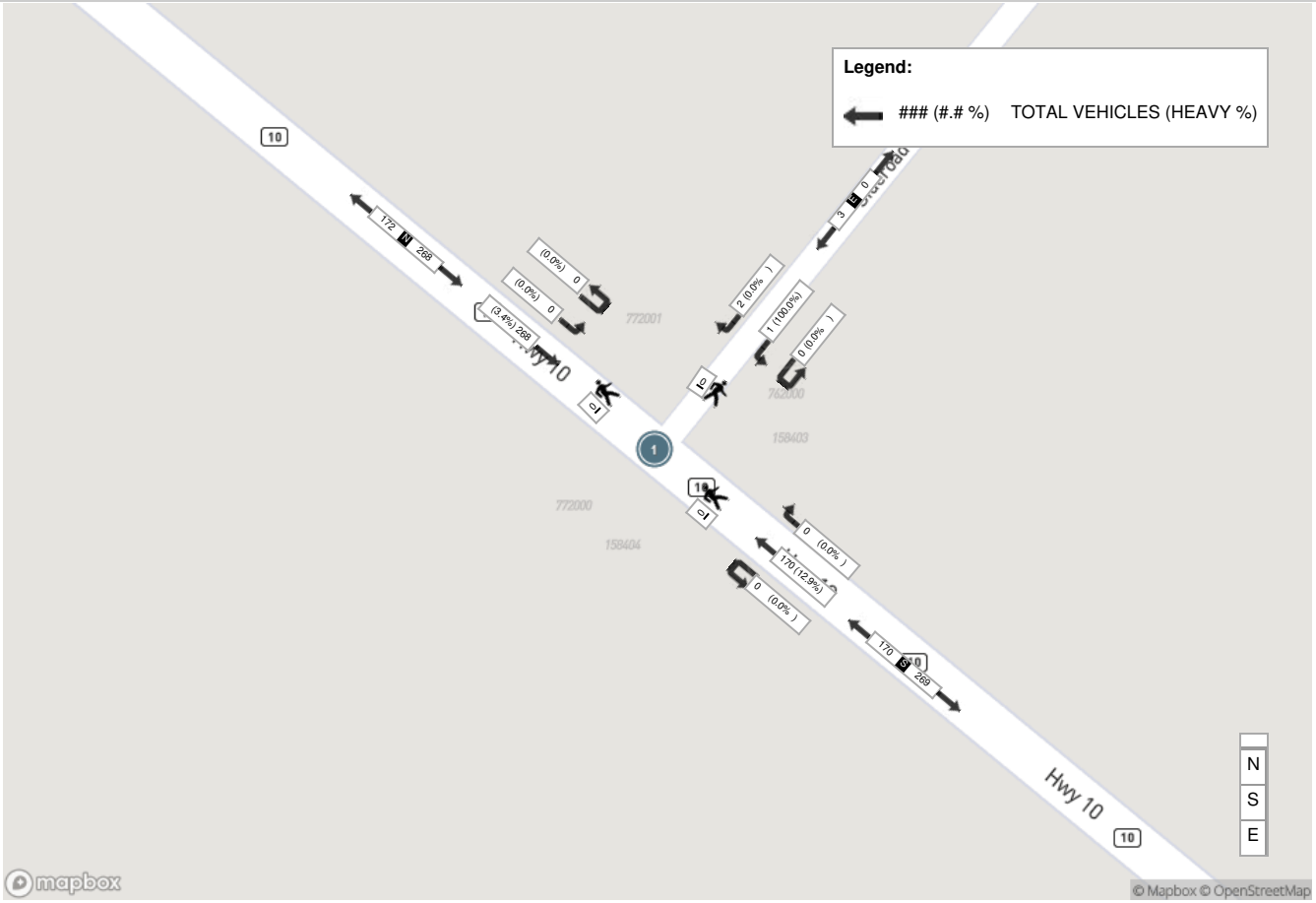
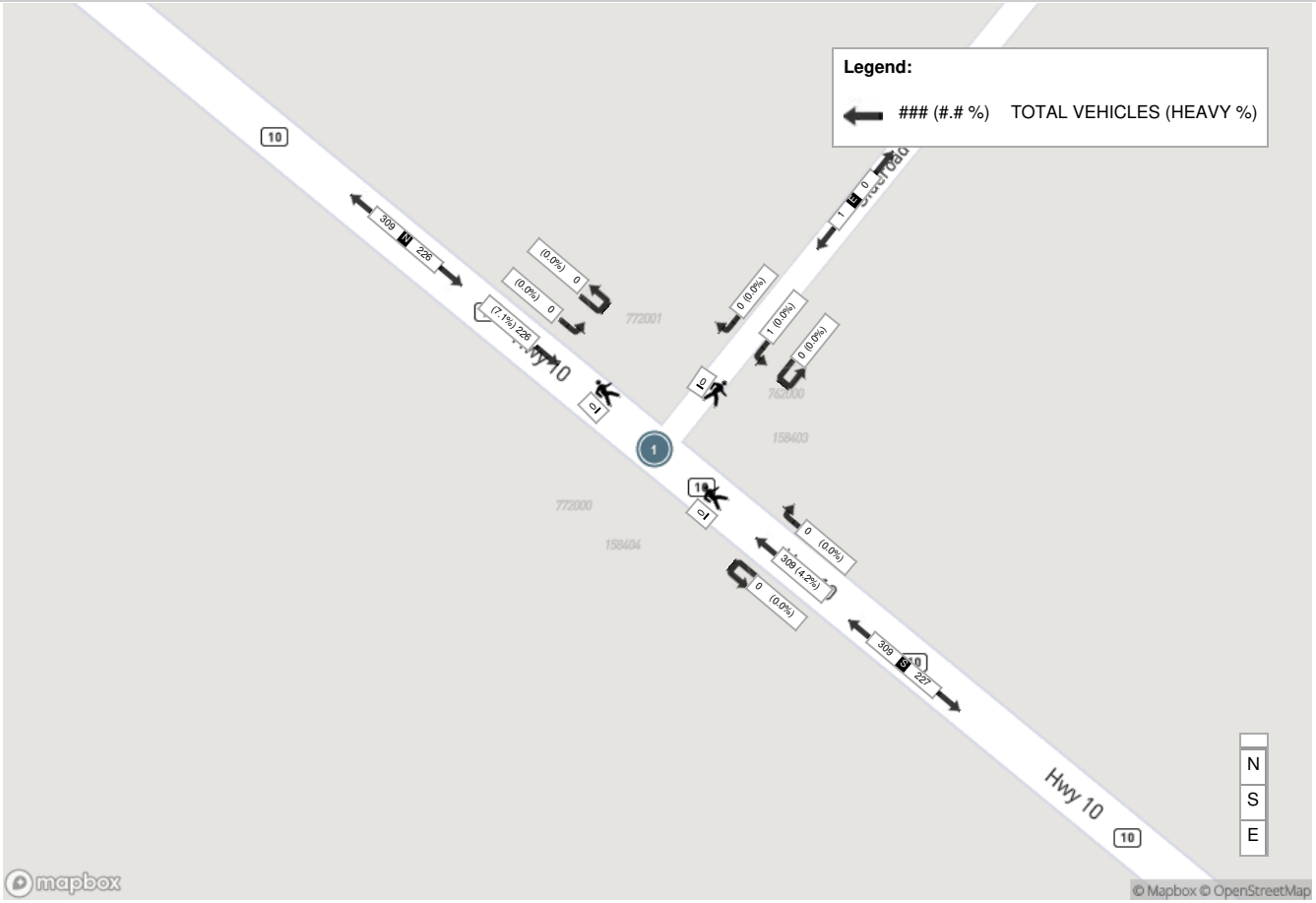
ACCOUNTS PAYABLE
TORONTO - SELECT PROVINCE -, M1W1Y6
- SELECT COUNTRY -

Peak Hour: 07:15 AM - 08:15 AM Weather: Light Snow (-13.53 °C)



Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (-11.16 °C)



Spectrum

Turning Movement Count
Location Name: HIGHWAY 10 & SIDEROAD 240
Date: Sat, Sep 21, 2024 Deployment Lead: Rey Fernandez

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Turning Movement Count (1 . HIGHWAY 10 & SIDEROAD 240)

Start Time	N Approach HWY 10					E Approach SIDEROAD 240					S Approach HWY 10					Int. Total (15 min)	Int. Total (1 hr)
	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	UTurn S:S	Peds S:	Approach Total		
09:00:00	60	0	0	0	60	0	0	0	0	0	0	74	0	0	74	134	
09:15:00	76	1	0	0	77	0	0	0	0	0	0	77	0	0	77	154	
09:30:00	64	0	0	0	64	0	0	0	0	0	1	87	0	0	88	152	
09:45:00	68	0	0	0	68	1	0	0	0	1	0	89	0	0	89	158	598
10:00:00	68	0	0	0	68	1	0	0	0	1	1	101	0	0	102	171	635
10:15:00	112	0	0	0	112	2	0	0	0	2	0	92	0	0	92	206	687
10:30:00	87	1	0	0	88	1	0	0	0	1	0	107	0	0	107	196	731
10:45:00	72	0	0	0	72	0	0	0	0	0	0	118	0	0	118	190	763
11:00:00	80	1	0	0	81	1	0	0	0	1	0	87	0	0	87	169	761
11:15:00	75	0	0	0	75	0	1	0	0	1	0	112	0	0	112	188	743
11:30:00	90	0	0	0	90	0	0	0	0	0	0	109	0	0	109	199	746
11:45:00	57	1	0	0	58	1	0	0	0	1	0	113	0	0	113	172	728
12:00:00	99	1	0	0	100	0	0	0	0	0	0	108	0	0	108	208	767
12:15:00	77	1	0	0	78	0	0	0	0	0	0	120	0	0	120	198	777
12:30:00	85	0	0	0	85	1	0	0	0	1	1	101	0	0	102	188	766
12:45:00	75	1	0	0	76	0	0	0	0	0	0	117	0	0	117	193	787
13:00:00	81	0	0	0	81	0	0	0	0	0	0	99	0	0	99	180	759
13:15:00	74	2	0	0	76	1	0	0	0	1	1	117	0	0	118	195	756
13:30:00	78	1	0	0	79	0	1	0	0	1	0	110	0	0	110	190	758
13:45:00	80	0	0	0	80	0	0	0	0	0	1	87	0	0	88	168	733
14:00:00	83	0	0	0	83	0	0	0	0	0	0	91	0	0	91	174	727
14:15:00	81	0	1	0	82	1	0	0	0	1	0	87	0	0	87	170	702
14:30:00	60	0	0	0	60	0	0	0	0	0	0	76	0	0	76	136	648
14:45:00	65	0	0	0	65	1	0	0	0	1	0	76	0	0	76	142	622
15:00:00	81	0	0	0	81	1	0	0	0	1	1	88	0	0	89	171	619
15:15:00	75	1	0	0	76	0	0	0	0	0	0	77	0	0	77	153	602
15:30:00	64	0	0	0	64	1	0	0	0	1	0	97	0	0	97	162	628
15:45:00	69	0	0	0	69	0	1	0	0	1	0	105	0	0	105	175	661
16:00:00	75	0	0	0	75	0	0	0	0	0	0	95	0	0	95	170	660
16:15:00	61	0	0	0	61	0	0	0	0	0	0	73	0	0	73	134	641
16:30:00	65	2	0	0	67	0	0	0	0	0	0	87	0	0	87	154	633
16:45:00	96	0	0	0	96	1	0	0	0	1	0	90	0	0	90	187	645
Grand Total	2433	13	1	0	2447	14	3	0	0	17	6	3067	0	0	3073	**5537**	-

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Approach%	99.4%	0.5%	0%	-	82.4%	17.6%	0%	-	0.2%	99.8%	0%	-	**-**	-
Totals %	43.9%	0.2%	0%	44.2%	0.3%	0.1%	0%	0.3%	0.1%	55.4%	0%	55.5%	**-**	-
Heavy	39	0	0	-	0	0	0	-	0	35	0	-	**-**	-
Heavy %	1.6%	0%	0%	-	0%	0%	0%	-	0%	1.1%	0%	-	**-**	-
Bicycles	-	-	-	-	-	-	-	-	-	-	-	-	**-**	-
Bicycle %	-	-	-	-	-	-	-	-	-	-	-	-	**-**	-

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Peak Hour: 12:00 PM - 01:00 PM Weather: Overcast Clouds (15.55 °C)

Start Time	N Approach HWY 10					E Approach SIDEROAD 240					S Approach HWY 10					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
12:00:00	99	1	0	0	100	0	0	0	0	0	0	108	0	0	108	208
12:15:00	77	1	0	0	78	0	0	0	0	0	0	120	0	0	120	198
12:30:00	85	0	0	0	85	1	0	0	0	1	1	101	0	0	102	188
12:45:00	75	1	0	0	76	0	0	0	0	0	0	117	0	0	117	193
Grand Total	336	3	0	0	339	1	0	0	0	1	1	446	0	0	447	**787**
Approach%	99.1%	0.9%	0%		-	100%	0%	0%		-	0.2%	99.8%	0%		-	**-**
Totals %	42.7%	0.4%	0%		43.1%	0.1%	0%	0%		0.1%	0.1%	56.7%	0%		56.8%	**-**
PHF	0.85	0.75	0		0.85	0.25	0	0		0.25	0.25	0.93	0		0.93	**-**
Heavy	8	0	0		8	0	0	0		0	0	6	0		6	**-**
Heavy %	2.4%	0%	0%		2.4%	0%	0%	0%		0%	0%	1.3%	0%		1.3%	**-**
Lights	328	3	0		331	1	0	0		1	1	440	0		441	**-**
Lights %	97.6%	100%	0%		97.6%	100%	0%	0%		100%	100%	98.7%	0%		98.7%	**-**
Single-Unit Trucks	4	0	0		4	0	0	0		0	0	5	0		5	**-**
Single-Unit Trucks %	1.2%	0%	0%		1.2%	0%	0%	0%		0%	0%	1.1%	0%		1.1%	**-**
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%	**-**
Articulated Trucks	4	0	0		4	0	0	0		0	0	1	0		1	**-**
Articulated Trucks %	1.2%	0%	0%		1.2%	0%	0%	0%		0%	0%	0.2%	0%		0.2%	**-**

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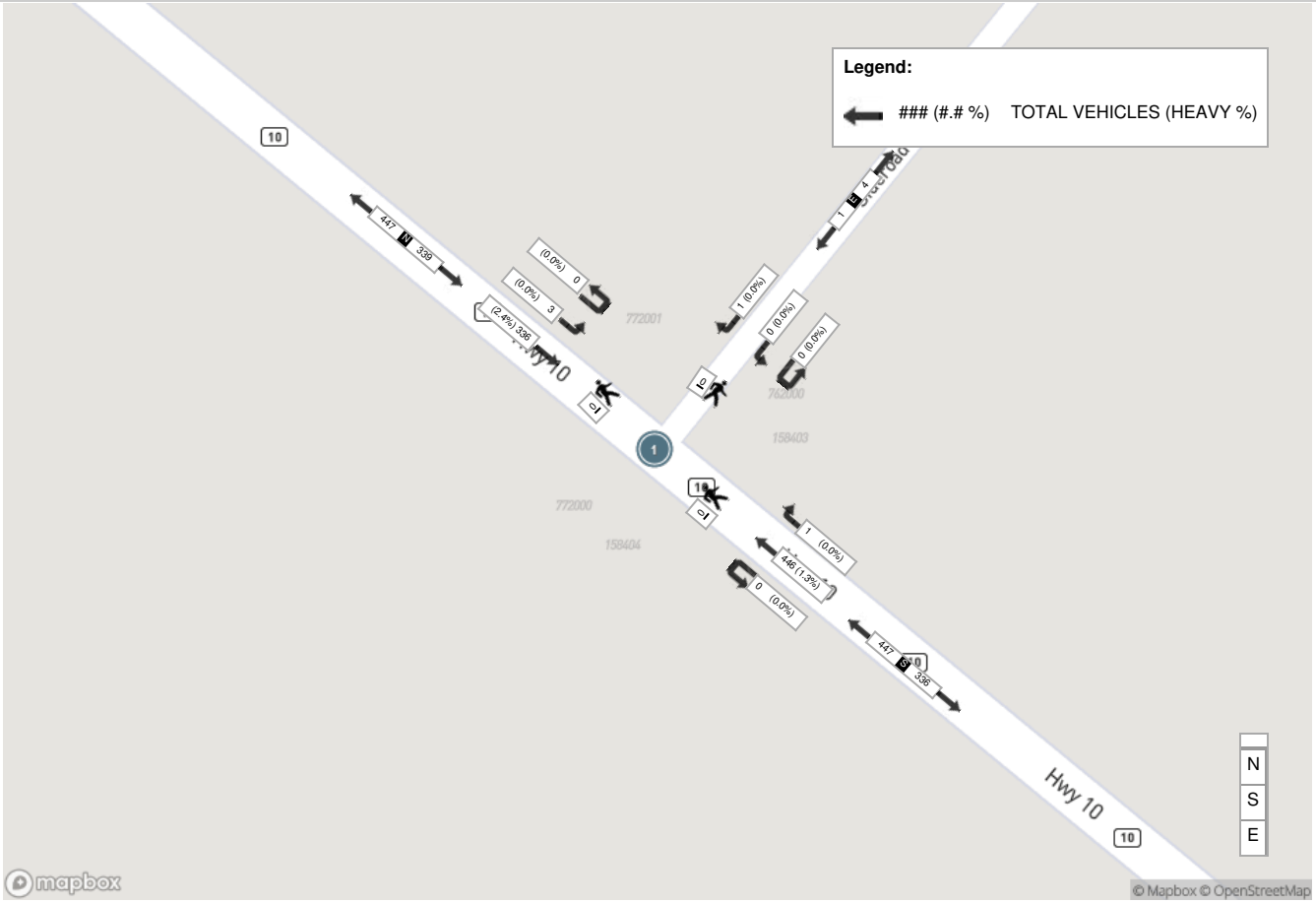
CANADA

Peak Hour: 12:00 PM - 01:00 PM Weather: Overcast Clouds (15.55 °C)



Appendix D

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 E

Detailed Capacity Analysis Reports

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	2	170	0	0	268
Future Volume (Veh/h)	1	2	170	0	0	268
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	2	200	0	0	315
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	515	200			200	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	515	200			200	
tC, single (s)	7.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	4.4	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	383	846			1384	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	3	200	0	315
Volume Left	1	0	0	0
Volume Right	2	0	0	0
cSH	603	1700	1700	1384
Volume to Capacity	0.00	0.12	0.00	0.00
Queue Length 95th (m)	0.1	0.0	0.0	0.0
Control Delay (s)	11.0	0.0	0.0	0.0
Lane LOS	B			
Approach Delay (s)	11.0	0.0		0.0
Approach LOS	B			

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	24.1%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	0	309	0	0	226
Future Volume (Veh/h)	1	0	309	0	0	226
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	1	0	332	0	0	243
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	575	332			332	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	575	332			332	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	483	714			1239	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	1	332	0	243
Volume Left	1	0	0	0
Volume Right	0	0	0	0
cSH	483	1700	1700	1239
Volume to Capacity	0.00	0.20	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	12.5	0.0	0.0	0.0
Lane LOS	B			
Approach Delay (s)	12.5	0.0		0.0
Approach LOS	B			

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	26.3%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	1	446	1	3	336
Future Volume (vph)	0	1	446	1	3	336
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		15.0	0.0	
Storage Lanes	1	0		1	0	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865			0.850		
Flt Protected						
Satd. Flow (prot)	1644	0	1881	1615	0	1863
Flt Permitted						
Satd. Flow (perm)	1644	0	1881	1615	0	1863
Link Speed (k/h)	80		80			80
Link Distance (m)	436.8		163.1			604.6
Travel Time (s)	19.7		7.3			27.2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	1%	0%	0%	2%
Adj. Flow (vph)	0	1	469	1	3	354
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1	0	469	1	0	357
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
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		15	25	
Sign Control	Stop		Free			Free

Intersection Summary		
Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization 33.5%		ICU Level of Service A
Analysis Period (min) 15		

HCM 2010 LANE	NBT	NBR	WBLn1	SBL	SBT
Capacity (vph)	-	-	598	1102	-
HCM Lane V/C Ratio	-	-	0.002	0.003	-
HCM Control Delay (s)	-	-	11	8.276	0
HCM Lane LOS	-	-	B	A	A
HCM 95th Percentile Queue (veh)	-	-	0	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	0	112	2	0	2	61	383	2	2	565	47
Future Volume (vph)	54	0	112	2	0	2	61	383	2	2	565	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932			0.999				0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1694	0	1770	1861	0	1770	1863	1583
Flt Permitted	0.507				0.976		0.273			0.518		
Satd. Flow (perm)	944	1583	0	0	1694	0	509	1861	0	965	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		354			148							136
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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
Adj. Flow (vph)	59	0	122	2	0	2	66	416	2	2	614	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	122	0	0	4	0	66	418	0	2	614	51
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	
Permitted Phases	4			7			6			2		2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	17.0	17.0		5.0	5.0		4.0	3.1		39.0	39.0	39.0
Minimum Split (s)	22.6	22.6		10.6	10.6		8.0	9.8		52.7	52.7	52.7
Total Split (s)	22.6	22.6		10.6	10.6		8.0	64.8		56.8	56.8	56.8
Total Split (%)	23.1%	23.1%		10.8%	10.8%		8.2%	66.1%		58.0%	58.0%	58.0%
Maximum Green (s)	17.0	17.0		5.0	5.0		4.0	58.1		50.1	50.1	50.1
Yellow Time (s)	4.1	4.1		4.1	4.1		3.5	5.4		5.4	5.4	5.4
All-Red Time (s)	1.5	1.5		1.5	1.5		0.5	1.3		1.3	1.3	1.3
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6			5.6		4.0	6.7		6.7	6.7	6.7
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										17.6	17.6	17.6
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	18.0	18.0			5.3		51.0	50.3		44.4	44.4	44.4
Actuated g/C Ratio	0.24	0.24			0.07		0.69	0.68		0.60	0.60	0.60
v/c Ratio	0.26	0.19			0.02		0.16	0.33		0.00	0.55	0.05
Control Delay	31.8	0.6			0.0		6.9	8.8		11.0	16.3	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	31.8	0.6			0.0		6.9	8.8		11.0	16.3	0.1
LOS	C	A			A		A	A		B	B	A
Approach Delay		10.8						8.5			15.1	
Approach LOS		B						A			B	
Queue Length 50th (m)	7.5	0.0			0.0		3.2	27.9		0.2	63.8	0.0
Queue Length 95th (m)	22.2	0.0			0.0		10.1	61.0		1.3	125.2	0.0
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	231	654			259		425	1455		677	1307	1151
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.26	0.19			0.02		0.16	0.29		0.00	0.47	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 98			
Actuated Cycle Length: 73.5			
Natural Cycle: 95			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 12.1		Intersection LOS: B	
Intersection Capacity Utilization 75.1%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	2	442	0	0	679
Future Vol, veh/h	1	2	442	0	0	679
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	100	0	13	0	0	3
Mvmt Flow	1	2	520	0	0	799

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1319	520	0	0	520	0
Stage 1	520	-	-	-	-	-
Stage 2	799	-	-	-	-	-
Critical Hdwy	7.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	109	560	-	-	1056	-
Stage 1	439	-	-	-	-	-
Stage 2	310	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	109	560	-	-	1056	-
Mov Cap-2 Maneuver	109	-	-	-	-	-
Stage 1	439	-	-	-	-	-
Stage 2	310	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 235	1056	-
HCM Lane V/C Ratio	-	- 0.015	-	-
HCM Control Delay (s)	-	- 20.6	0	-
HCM Lane LOS	-	- C	A	-
HCM 95th %tile Q(veh)	-	- 0	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	0	78	2	0	2	136	632	2	2	530	51
Future Volume (vph)	62	0	78	2	0	2	136	632	2	2	530	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1694	0	1770	1863	0	1770	1863	1583
Flt Permitted	0.506				0.976		0.288			0.356		
Satd. Flow (perm)	943	1583	0	0	1694	0	536	1863	0	663	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		375			148							136
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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
Adj. Flow (vph)	67	0	85	2	0	2	148	687	2	2	576	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	85	0	0	4	0	148	689	0	2	576	55
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	
Permitted Phases	4			7			6			2		2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	17.0	17.0		5.0	5.0		4.0	3.1		39.0	39.0	39.0
Minimum Split (s)	22.6	22.6		10.6	10.6		8.0	9.8		52.7	52.7	52.7
Total Split (s)	22.6	22.6		10.6	10.6		8.0	64.8		56.8	56.8	56.8
Total Split (%)	23.1%	23.1%		10.8%	10.8%		8.2%	66.1%		58.0%	58.0%	58.0%
Maximum Green (s)	17.0	17.0		5.0	5.0		4.0	58.1		50.1	50.1	50.1
Yellow Time (s)	4.1	4.1		4.1	4.1		3.5	5.4		5.4	5.4	5.4
All-Red Time (s)	1.5	1.5		1.5	1.5		0.5	1.3		1.3	1.3	1.3
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6			5.6		4.0	6.7		6.7	6.7	6.7
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										17.6	17.6	17.6
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	17.5	17.5			5.1		51.5	50.6		40.5	40.5	40.5
Actuated g/C Ratio	0.24	0.24			0.07		0.69	0.68		0.54	0.54	0.54
v/c Ratio	0.30	0.13			0.02		0.34	0.54		0.01	0.57	0.06
Control Delay	32.1	0.4			0.0		8.6	11.8		11.5	16.7	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	32.1	0.4			0.0		8.6	11.8		11.5	16.7	0.1
LOS	C	A			A		A	B		B	B	A
Approach Delay		14.4						11.2			15.3	
Approach LOS		B						B			B	
Queue Length 50th (m)	8.5	0.0			0.0		7.4	56.6		0.1	58.1	0.0
Queue Length 95th (m)	23.8	0.0			0.0		20.1	122.3		1.4	115.3	0.0
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	221	659			254		439	1466		459	1291	1138
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.30	0.13			0.02		0.34	0.47		0.00	0.45	0.05

Intersection Summary			
Area Type:	Other		
Cycle Length: 98			
Actuated Cycle Length: 74.4			
Natural Cycle: 95			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay: 13.1		Intersection LOS: B	
Intersection Capacity Utilization 95.9%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	768	0	0	609
Future Vol, veh/h	1	0	768	0	0	609
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	4	0	0	7
Mvmt Flow	1	0	826	0	0	655

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1481	826	0	0	826	0
Stage 1	826	-	-	-	-	-
Stage 2	655	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	139	375	-	-	813	-
Stage 1	433	-	-	-	-	-
Stage 2	521	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	139	375	-	-	813	-
Mov Cap-2 Maneuver	139	-	-	-	-	-
Stage 1	433	-	-	-	-	-
Stage 2	521	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	31.1	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	139	813	-
HCM Lane V/C Ratio	-	-	0.008	-	-
HCM Control Delay (s)	-	-	31.1	0	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	0	99	2	0	2	83	713	2	2	590	62
Future Volume (vph)	81	0	99	2	0	2	83	713	2	2	590	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1728	0	1805	1881	0	1805	1863	1615
Flt Permitted	0.507				0.976		0.256			0.285		
Satd. Flow (perm)	944	1583	0	0	1728	0	486	1881	0	542	1863	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		341			148							136
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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 (%)	2%	2%	2%	0%	0%	0%	0%	1%	0%	0%	2%	0%
Adj. Flow (vph)	88	0	108	2	0	2	90	775	2	2	641	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	108	0	0	4	0	90	777	0	2	641	67
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			7			6			2		2
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	17.0	17.0		5.0	5.0		4.0	3.1		39.0	39.0	39.0
Minimum Split (s)	22.6	22.6		10.6	10.6		8.0	9.8		52.7	52.7	52.7
Total Split (s)	22.6	22.6		10.6	10.6		8.0	64.8		56.8	56.8	56.8
Total Split (%)	23.1%	23.1%		10.8%	10.8%		8.2%	66.1%		58.0%	58.0%	58.0%
Maximum Green (s)	17.0	17.0		5.0	5.0		4.0	58.1		50.1	50.1	50.1
Yellow Time (s)	4.1	4.1		4.1	4.1		3.5	5.4		5.4	5.4	5.4
All-Red Time (s)	1.5	1.5		1.5	1.5		0.5	1.3		1.3	1.3	1.3
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6			5.6		4.0	6.7		6.7	6.7	6.7
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										17.6	17.6	17.6
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	18.1	18.1			5.3		51.7	51.0		45.1	45.1	45.1
Actuated g/C Ratio	0.24	0.24			0.07		0.70	0.69		0.61	0.61	0.61
v/c Ratio	0.38	0.17			0.02		0.22	0.60		0.01	0.57	0.06
Control Delay	35.7	0.6			0.0		7.2	12.7		11.0	16.5	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	35.7	0.6			0.0		7.2	12.7		11.0	16.5	0.1
LOS	D	A			A		A	B		B	B	A
Approach Delay		16.3						12.1			15.0	
Approach LOS		B						B			B	
Queue Length 50th (m)	11.5	0.0			0.0		4.3	68.6		0.1	68.0	0.0
Queue Length 95th (m)	32.5	0.0			0.0		12.8	145.1		1.3	132.5	0.0
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	229	643			260		413	1462		378	1300	1168
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.38	0.17			0.02		0.22	0.53		0.01	0.49	0.06

Intersection Summary			
Area Type:	Other		
Cycle Length: 98			
Actuated Cycle Length: 74.2			
Natural Cycle: 95			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 13.7		Intersection LOS: B	
Intersection Capacity Utilization 93.4%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	1	794	1	3	685
Future Vol, veh/h	0	1	794	1	3	685
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	4	0	0	7
Mvmt Flow	0	1	836	1	3	721

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1563	836	0	0	837	0
Stage 1	836	-	-	-	-	-
Stage 2	727	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	124	370	-	-	806	-
Stage 1	429	-	-	-	-	-
Stage 2	482	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	123	370	-	-	806	-
Mov Cap-2 Maneuver	123	-	-	-	-	-
Stage 1	429	-	-	-	-	-
Stage 2	479	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 370	806	-
HCM Lane V/C Ratio	-	- 0.003	0.004	-
HCM Control Delay (s)	-	- 14.8	9.5	0
HCM Lane LOS	-	- B	A	A
HCM 95th %tile Q(veh)	-	- 0	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	0	112	2	0	2	61	711	2	2	685	47
Future Volume (vph)	54	0	112	2	0	2	61	711	2	2	685	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1694	0	1770	1863	0	1770	1863	1583
Flt Permitted	0.507				0.976		0.186			0.287		
Satd. Flow (perm)	944	1583	0	0	1694	0	346	1863	0	535	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		298			148							136
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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
Adj. Flow (vph)	59	0	122	2	0	2	66	773	2	2	745	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	122	0	0	4	0	66	775	0	2	745	51
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	
Permitted Phases	4			7			6			2		2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	17.0	17.0		5.0	5.0		4.0	3.1		39.0	39.0	39.0
Minimum Split (s)	22.6	22.6		10.6	10.6		8.0	9.8		52.7	52.7	52.7
Total Split (s)	22.6	22.6		10.6	10.6		8.0	64.8		56.8	56.8	56.8
Total Split (%)	23.1%	23.1%		10.8%	10.8%		8.2%	66.1%		58.0%	58.0%	58.0%
Maximum Green (s)	17.0	17.0		5.0	5.0		4.0	58.1		50.1	50.1	50.1
Yellow Time (s)	4.1	4.1		4.1	4.1		3.5	5.4		5.4	5.4	5.4
All-Red Time (s)	1.5	1.5		1.5	1.5		0.5	1.3		1.3	1.3	1.3
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6			5.6		4.0	6.7		6.7	6.7	6.7
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										17.6	17.6	17.6
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	18.1	18.1			5.3		52.0	51.3		45.4	45.4	45.4
Actuated g/C Ratio	0.24	0.24			0.07		0.70	0.69		0.61	0.61	0.61
v/c Ratio	0.26	0.20			0.02		0.20	0.60		0.01	0.66	0.05
Control Delay	32.9	0.7			0.0		7.4	12.7		11.0	18.8	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	32.9	0.7			0.0		7.4	12.7		11.0	18.8	0.1
LOS	C	A			A		A	B		B	B	A
Approach Delay		11.2						12.3			17.6	
Approach LOS		B						B			B	
Queue Length 50th (m)	7.5	0.0			0.0		3.2	68.8		0.1	86.3	0.0
Queue Length 95th (m)	23.4	0.0			0.0		9.9	145.7		1.3	167.7	0.0
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	229	610			258		322	1444		372	1297	1143
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.26	0.20			0.02		0.20	0.54		0.01	0.57	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 98			
Actuated Cycle Length: 74.5			
Natural Cycle: 95			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 14.5		Intersection LOS: B	
Intersection Capacity Utilization 75.1%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	2	769	0	0	799
Future Vol, veh/h	1	2	769	0	0	799
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	100	0	13	0	0	3
Mvmt Flow	1	2	905	0	0	940

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1845	905	0	0	905	0
Stage 1	905	-	-	-	-	-
Stage 2	940	-	-	-	-	-
Critical Hdwy	7.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	46	338	-	-	760	-
Stage 1	271	-	-	-	-	-
Stage 2	259	-	-	-	-	-
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	46	338	-	-	760	-
Mov Cap-2 Maneuver	46	-	-	-	-	-
Stage 1	271	-	-	-	-	-
Stage 2	259	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	39.5	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	108	760	-
HCM Lane V/C Ratio	-	-	0.033	-	-
HCM Control Delay (s)	-	-	39.5	0	-
HCM Lane LOS	-	-	E	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

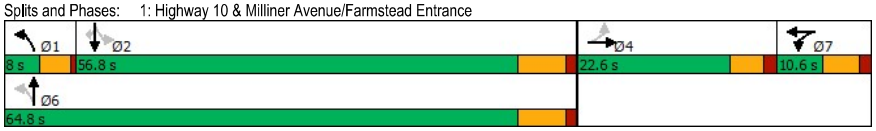
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	0	78	2	0	2	136	850	2	2	909	51
Future Volume (vph)	62	0	78	2	0	2	136	850	2	2	909	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1694	0	1770	1863	0	1770	1863	1583
Flt Permitted	0.506				0.976		0.073			0.204		
Satd. Flow (perm)	943	1583	0	0	1694	0	136	1863	0	380	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		232			148							136
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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
Adj. Flow (vph)	67	0	85	2	0	2	148	924	2	2	988	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	85	0	0	4	0	148	926	0	2	988	55
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	
Permitted Phases	4			7			6			2		2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	17.0	17.0		5.0	5.0		4.0	3.1		39.0	39.0	39.0
Minimum Split (s)	22.6	22.6		10.6	10.6		8.0	9.8		52.7	52.7	52.7
Total Split (s)	22.6	22.6		10.6	10.6		8.0	64.8		56.8	56.8	56.8
Total Split (%)	23.1%	23.1%		10.8%	10.8%		8.2%	66.1%		58.0%	58.0%	58.0%
Maximum Green (s)	17.0	17.0		5.0	5.0		4.0	58.1		50.1	50.1	50.1
Yellow Time (s)	4.1	4.1		4.1	4.1		3.5	5.4		5.4	5.4	5.4
All-Red Time (s)	1.5	1.5		1.5	1.5		0.5	1.3		1.3	1.3	1.3
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6			5.6		4.0	6.7		6.7	6.7	6.7
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										17.6	17.6	17.6
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	17.3	17.3			5.1		62.0	61.0		51.1	51.1	51.1
Actuated g/C Ratio	0.20	0.20			0.06		0.73	0.72		0.60	0.60	0.60
v/c Ratio	0.35	0.17			0.02		0.84	0.69		0.01	0.88	0.05
Control Delay	38.9	0.7			0.2		51.8	14.6		10.5	29.2	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	38.9	0.7			0.2		51.8	14.6		10.5	29.2	0.1
LOS	D	A			A		D	B		B	C	A
Approach Delay		17.6			0.3			19.7			27.7	
Approach LOS		B			A			B			C	
Queue Length 50th (m)	10.3	0.0			0.0		9.1	95.6		0.1	146.6	0.0
Queue Length 95th (m)	26.0	0.0			0.0		#38.7	#206.1		1.4	#290.4	0.0
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	192	507			240		177	1336		228	1119	1005
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.35	0.17			0.02		0.84	0.69		0.01	0.88	0.05

Intersection Summary

Area Type: Other
Cycle Length: 98
Actuated Cycle Length: 85
Natural Cycle: 105
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 23.2 Intersection LOS: C
Intersection Capacity Utilization 107.4% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance



Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	986	0	0	988
Future Vol, veh/h	1	0	986	0	0	988
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	4	0	0	7
Mvmt Flow	1	0	1060	0	0	1062

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2122	1060	0	0	1060	0
Stage 1	1060	-	-	-	-	-
Stage 2	1062	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	56	275	-	-	665	-
Stage 1	336	-	-	-	-	-
Stage 2	335	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	56	275	-	-	665	-
Mov Cap-2 Maneuver	56	-	-	-	-	-
Stage 1	336	-	-	-	-	-
Stage 2	335	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	70.5	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 56	665	-
HCM Lane V/C Ratio	-	- 0.019	-	-
HCM Control Delay (s)	-	- 70.5	0	-
HCM Lane LOS	-	- F	A	-
HCM 95th %tile Q(veh)	-	- 0.1	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	0	99	2	0	2	83	1001	2	2	945	62
Future Volume (vph)	81	0	99	2	0	2	83	1001	2	2	945	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1728	0	1805	1881	0	1805	1863	1615
Flt Permitted	0.501				0.976		0.074			0.080		
Satd. Flow (perm)	933	1583	0	0	1728	0	141	1881	0	152	1863	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		225			148							136
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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 (%)	2%	2%	2%	0%	0%	0%	0%	1%	0%	0%	2%	0%
Adj. Flow (vph)	88	0	108	2	0	2	90	1088	2	2	1027	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	108	0	0	4	0	90	1090	0	2	1027	67
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			7			6			2		2
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	17.0	17.0		5.0	5.0		4.0	3.1		39.0	39.0	39.0
Minimum Split (s)	22.6	22.6		10.6	10.6		8.0	9.8		52.7	52.7	52.7
Total Split (s)	22.6	22.6		10.6	10.6		8.0	64.8		56.8	56.8	56.8
Total Split (%)	23.1%	23.1%		10.8%	10.8%		8.2%	66.1%		58.0%	58.0%	58.0%
Maximum Green (s)	17.0	17.0		5.0	5.0		4.0	58.1		50.1	50.1	50.1
Yellow Time (s)	4.1	4.1		4.1	4.1		3.5	5.4		5.4	5.4	5.4
All-Red Time (s)	1.5	1.5		1.5	1.5		0.5	1.3		1.3	1.3	1.3
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6			5.6		4.0	6.7		6.7	6.7	6.7
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										17.6	17.6	17.6
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	17.1	17.1			5.0		59.3	56.6		50.3	50.3	50.3
Actuated g/C Ratio	0.19	0.19			0.06		0.67	0.64		0.57	0.57	0.57
v/c Ratio	0.49	0.22			0.02		0.53	0.90		0.02	0.96	0.07
Control Delay	43.9	1.0			0.2		19.0	26.1		11.5	40.8	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	43.9	1.0			0.2		19.0	26.1		11.5	40.8	0.1
LOS	D	A			A		B	C		B	D	A
Approach Delay		20.3			0.3			25.6			38.3	
Approach LOS		C			A			C			D	
Queue Length 50th (m)	13.9	0.0			0.0		4.3	134.3		0.1	159.4	0.0
Queue Length 95th (m)	#33.7	0.0			0.0		#15.1	#300.7		1.4	#307.6	0.0
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	181	488			238		171	1248		87	1066	982
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.49	0.22			0.02		0.53	0.87		0.02	0.96	0.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 98			
Actuated Cycle Length: 87.9			
Natural Cycle: 105			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 30.7		Intersection LOS: C	
Intersection Capacity Utilization 93.4%		ICU Level of Service F	
Analysis Period (min) 15			

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	1	1083	1	3	1040
Future Vol, veh/h	0	1	1083	1	3	1040
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	4	0	0	7
Mvmt Flow	0	1	1140	1	3	1095

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2241	1140	0	0	1141	0
Stage 1	1140	-	-	-	-	-
Stage 2	1101	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	47	247	-	-	620	-
Stage 1	308	-	-	-	-	-
Stage 2	321	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	46	247	-	-	620	-
Mov Cap-2 Maneuver	46	-	-	-	-	-
Stage 1	308	-	-	-	-	-
Stage 2	317	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	247	620	-
HCM Lane V/C Ratio	-	-	0.004	0.005	-
HCM Control Delay (s)	-	-	19.6	10.8	0
HCM Lane LOS	-	-	C	B	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	0	112	2	0	2	61	726	2	2	709	47
Future Volume (vph)	54	0	112	2	0	2	61	726	2	2	709	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1694	0	1770	1863	0	1770	1863	1583
Flt Permitted	0.507				0.976		0.172			0.276		
Satd. Flow (perm)	944	1583	0	0	1694	0	320	1863	0	514	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		289			148							136
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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
Adj. Flow (vph)	59	0	122	2	0	2	66	789	2	2	771	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	122	0	0	4	0	66	791	0	2	771	51
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	
Permitted Phases	4			7			6			2		2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	17.0	17.0		5.0	5.0		4.0	3.1		39.0	39.0	39.0
Minimum Split (s)	22.6	22.6		10.6	10.6		8.0	9.8		52.7	52.7	52.7
Total Split (s)	22.6	22.6		10.6	10.6		8.0	64.8		56.8	56.8	56.8
Total Split (%)	23.1%	23.1%		10.8%	10.8%		8.2%	66.1%		58.0%	58.0%	58.0%
Maximum Green (s)	17.0	17.0		5.0	5.0		4.0	58.1		50.1	50.1	50.1
Yellow Time (s)	4.1	4.1		4.1	4.1		3.5	5.4		5.4	5.4	5.4
All-Red Time (s)	1.5	1.5		1.5	1.5		0.5	1.3		1.3	1.3	1.3
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6			5.6		4.0	6.7		6.7	6.7	6.7
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										17.6	17.6	17.6
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	18.1	18.1			5.3		52.7	52.0		46.1	46.1	46.1
Actuated g/C Ratio	0.24	0.24			0.07		0.70	0.69		0.61	0.61	0.61
v/c Ratio	0.26	0.20			0.02		0.22	0.61		0.01	0.68	0.05
Control Delay	33.5	0.8			0.0		7.5	12.8		11.0	19.4	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	33.5	0.8			0.0		7.5	12.8		11.0	19.4	0.1
LOS	C	A			A		A	B		B	B	A
Approach Delay		11.4						12.4			18.1	
Approach LOS		B						B			B	
Queue Length 50th (m)	7.5	0.0			0.0		3.2	71.3		0.1	91.6	0.0
Queue Length 95th (m)	23.4	0.0			0.0		9.9	150.5		1.4	177.8	0.0
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	227	600			257		306	1432		355	1286	1135
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.26	0.20			0.02		0.22	0.55		0.01	0.60	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 98			
Actuated Cycle Length: 75.2			
Natural Cycle: 95			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 14.8		Intersection LOS: B	
Intersection Capacity Utilization 75.1%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	2	785	0	0	823
Future Vol, veh/h	1	2	785	0	0	823
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	100	0	13	0	0	3
Mvmt Flow	1	2	924	0	0	968

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1892	924	0	0	924	0
Stage 1	924	-	-	-	-	-
Stage 2	968	-	-	-	-	-
Critical Hdwy	7.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	43	329	-	-	748	-
Stage 1	264	-	-	-	-	-
Stage 2	250	-	-	-	-	-
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	43	329	-	-	748	-
Mov Cap-2 Maneuver	43	-	-	-	-	-
Stage 1	264	-	-	-	-	-
Stage 2	250	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	41.6	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	102	748	-
HCM Lane V/C Ratio	-	-	0.035	-	-
HCM Control Delay (s)	-	-	41.6	0	-
HCM Lane LOS	-	-	E	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	0	78	2	0	2	136	877	2	2	929	51
Future Volume (vph)	62	0	78	2	0	2	136	877	2	2	929	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1694	0	1770	1863	0	1770	1863	1583
Flt Permitted	0.506				0.976		0.073			0.185		
Satd. Flow (perm)	943	1583	0	0	1694	0	136	1863	0	345	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		228			148							136
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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
Adj. Flow (vph)	67	0	85	2	0	2	148	953	2	2	1010	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	85	0	0	4	0	148	955	0	2	1010	55
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	
Permitted Phases	4			7			6			2		2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	17.0	17.0		5.0	5.0		4.0	3.1		39.0	39.0	39.0
Minimum Split (s)	22.6	22.6		10.6	10.6		8.0	9.8		52.7	52.7	52.7
Total Split (s)	22.6	22.6		10.6	10.6		8.0	64.8		56.8	56.8	56.8
Total Split (%)	23.1%	23.1%		10.8%	10.8%		8.2%	66.1%		58.0%	58.0%	58.0%
Maximum Green (s)	17.0	17.0		5.0	5.0		4.0	58.1		50.1	50.1	50.1
Yellow Time (s)	4.1	4.1		4.1	4.1		3.5	5.4		5.4	5.4	5.4
All-Red Time (s)	1.5	1.5		1.5	1.5		0.5	1.3		1.3	1.3	1.3
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6			5.6		4.0	6.7		6.7	6.7	6.7
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										17.6	17.6	17.6
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	17.3	17.3			5.1		62.0	61.0		51.1	51.1	51.1
Actuated g/C Ratio	0.20	0.20			0.06		0.73	0.72		0.60	0.60	0.60
v/c Ratio	0.35	0.17			0.02		0.84	0.71		0.01	0.90	0.05
Control Delay	38.9	0.7			0.2		51.8	15.3		10.5	31.3	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	38.9	0.7			0.2		51.8	15.3		10.5	31.3	0.1
LOS	D	A			A		D	B		B	C	A
Approach Delay		17.6			0.3			20.2			29.6	
Approach LOS		B			A			C			C	
Queue Length 50th (m)	10.3	0.0			0.0		9.1	101.6		0.1	153.7	0.0
Queue Length 95th (m)	26.0	0.0			0.0		#38.7	#244.4		1.4	#300.0	0.0
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	192	504			240		177	1336		207	1119	1005
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.35	0.17			0.02		0.84	0.71		0.01	0.90	0.05

Intersection Summary

Area Type: Other
Cycle Length: 98
Actuated Cycle Length: 85
Natural Cycle: 105
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 24.3 Intersection LOS: C
Intersection Capacity Utilization 108.8% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	1013	0	0	1009
Future Vol, veh/h	1	0	1013	0	0	1009
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	4	0	0	7
Mvmt Flow	1	0	1089	0	0	1085

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2174	1089	0	0	1089	0
Stage 1	1089	-	-	-	-	-
Stage 2	1085	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	52	264	-	-	648	-
Stage 1	326	-	-	-	-	-
Stage 2	327	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	52	264	-	-	648	-
Mov Cap-2 Maneuver	52	-	-	-	-	-
Stage 1	326	-	-	-	-	-
Stage 2	327	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	75.7	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 52	648	-
HCM Lane V/C Ratio	-	- 0.021	-	-
HCM Control Delay (s)	-	- 75.7	0	-
HCM Lane LOS	-	- F	A	-
HCM 95th %tile Q(veh)	-	- 0.1	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	0	99	2	0	2	83	1041	2	2	976	61
Future Volume (vph)	81	0	99	2	0	2	83	1041	2	2	976	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1728	0	1805	1881	0	1805	1863	1615
Flt Permitted	0.501				0.976		0.072			0.077		
Satd. Flow (perm)	933	1583	0	0	1728	0	137	1881	0	146	1863	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		220			148							136
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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 (%)	2%	2%	2%	0%	0%	0%	0%	1%	0%	0%	2%	0%
Adj. Flow (vph)	88	0	108	2	0	2	90	1132	2	2	1061	66
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	108	0	0	4	0	90	1134	0	2	1061	66
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	

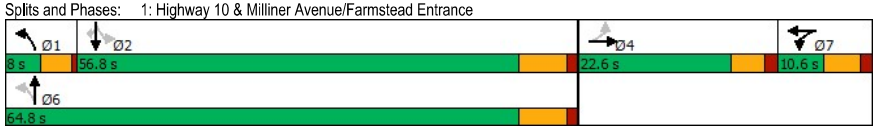
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			7			6			2		2
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	17.0	17.0		5.0	5.0		4.0	3.1		39.0	39.0	39.0
Minimum Split (s)	22.6	22.6		10.6	10.6		8.0	9.8		52.7	52.7	52.7
Total Split (s)	22.6	22.6		10.6	10.6		8.0	64.8		56.8	56.8	56.8
Total Split (%)	23.1%	23.1%		10.8%	10.8%		8.2%	66.1%		58.0%	58.0%	58.0%
Maximum Green (s)	17.0	17.0		5.0	5.0		4.0	58.1		50.1	50.1	50.1
Yellow Time (s)	4.1	4.1		4.1	4.1		3.5	5.4		5.4	5.4	5.4
All-Red Time (s)	1.5	1.5		1.5	1.5		0.5	1.3		1.3	1.3	1.3
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6			5.6		4.0	6.7		6.7	6.7	6.7
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										17.6	17.6	17.6
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	17.0	17.0			5.0		60.9	58.2		51.8	51.8	51.8
Actuated g/C Ratio	0.19	0.19			0.06		0.68	0.65		0.58	0.58	0.58
v/c Ratio	0.50	0.23			0.02		0.54	0.93		0.02	0.98	0.07
Control Delay	44.4	1.1			0.2		20.1	29.2		11.5	45.1	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	44.4	1.1			0.2		20.1	29.2		11.5	45.1	0.1
LOS	D	A			A		C	C		B	D	A
Approach Delay		20.5			0.3			28.6			42.4	
Approach LOS		C			A			C			D	
Queue Length 50th (m)	13.9	0.0			0.0		4.3	148.1		0.1	171.8	0.0
Queue Length 95th (m)	#33.7	0.0			0.0		#15.6	#320.0		1.4	#322.2	0.0
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	177	479			236		167	1223		84	1078	992
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.50	0.23			0.02		0.54	0.93		0.02	0.98	0.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 98			
Actuated Cycle Length: 89.5			
Natural Cycle: 105			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 34.0		Intersection LOS: C	
Intersection Capacity Utilization 93.4%		ICU Level of Service F	
Analysis Period (min) 15			

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance



Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	1	1123	1	4	1070
Future Vol, veh/h	0	1	1123	1	4	1070
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	4	0	0	7
Mvmt Flow	0	1	1182	1	4	1126

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2316	1182	0	0	1183	0
Stage 1	1182	-	-	-	-	-
Stage 2	1134	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	42	233	-	-	597	-
Stage 1	294	-	-	-	-	-
Stage 2	310	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	41	233	-	-	597	-
Mov Cap-2 Maneuver	41	-	-	-	-	-
Stage 1	294	-	-	-	-	-
Stage 2	304	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.5	0	0
HCM LOS	C		

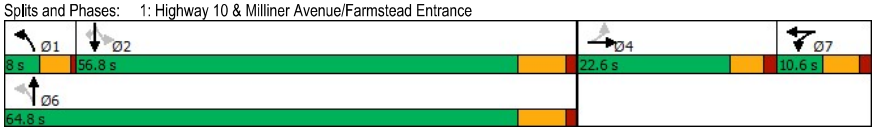
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	233	597	-
HCM Lane V/C Ratio	-	-	0.005	0.007	-
HCM Control Delay (s)	-	-	20.5	11.1	0
HCM Lane LOS	-	-	C	B	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	0	112	2	0	2	61	743	2	2	734	47
Future Volume (vph)	54	0	112	2	0	2	61	743	2	2	734	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1694	0	1770	1863	0	1770	1863	1583
Flt Permitted	0.507				0.976		0.157			0.264		
Satd. Flow (perm)	944	1583	0	0	1694	0	292	1863	0	492	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		280			148							136
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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
Adj. Flow (vph)	59	0	122	2	0	2	66	808	2	2	798	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	122	0	0	4	0	66	810	0	2	798	51
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	
Permitted Phases	4			7			6			2		2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	17.0	17.0		5.0	5.0		4.0	3.1		39.0	39.0	39.0
Minimum Split (s)	22.6	22.6		10.6	10.6		8.0	9.8		52.7	52.7	52.7
Total Split (s)	22.6	22.6		10.6	10.6		8.0	64.8		56.8	56.8	56.8
Total Split (%)	23.1%	23.1%		10.8%	10.8%		8.2%	66.1%		58.0%	58.0%	58.0%
Maximum Green (s)	17.0	17.0		5.0	5.0		4.0	58.1		50.1	50.1	50.1
Yellow Time (s)	4.1	4.1		4.1	4.1		3.5	5.4		5.4	5.4	5.4
All-Red Time (s)	1.5	1.5		1.5	1.5		0.5	1.3		1.3	1.3	1.3
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6			5.6		4.0	6.7		6.7	6.7	6.7
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										17.6	17.6	17.6
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	18.1	18.1			5.3		53.3	52.6		46.7	46.7	46.7
Actuated g/C Ratio	0.24	0.24			0.07		0.70	0.69		0.62	0.62	0.62
v/c Ratio	0.26	0.21			0.02		0.23	0.63		0.01	0.70	0.05
Control Delay	34.0	0.8			0.0		7.7	13.1		10.5	20.0	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	34.0	0.8			0.0		7.7	13.1		10.5	20.0	0.1
LOS	C	A			A		A	B		B	B	A
Approach Delay		11.6						12.7			18.8	
Approach LOS		B						B			B	
Queue Length 50th (m)	7.5	0.0			0.0		3.2	74.3		0.1	97.1	0.0
Queue Length 95th (m)	23.4	0.0			0.0		9.9	157.5		1.4	#197.8	0.0
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	226	592			256		288	1423		337	1278	1129
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.26	0.21			0.02		0.23	0.57		0.01	0.62	0.05

Intersection Summary			
Area Type:	Other		
Cycle Length: 98			
Actuated Cycle Length: 75.8			
Natural Cycle: 95			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 15.2		Intersection LOS: B	
Intersection Capacity Utilization 75.1%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance



Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	3	801	0	0	849
Future Vol, veh/h	1	3	801	0	0	849
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	100	0	13	0	0	3
Mvmt Flow	1	4	942	0	0	999

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1941	942	0	0	942	0
Stage 1	942	-	-	-	-	-
Stage 2	999	-	-	-	-	-
Critical Hdwy	7.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	40	322	-	-	736	-
Stage 1	258	-	-	-	-	-
Stage 2	240	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	40	322	-	-	736	-
Mov Cap-2 Maneuver	40	-	-	-	-	-
Stage 1	258	-	-	-	-	-
Stage 2	240	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	37.1	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 117	736	-
HCM Lane V/C Ratio	-	- 0.04	-	-
HCM Control Delay (s)	-	- 37.1	0	-
HCM Lane LOS	-	- E	A	-
HCM 95th %tile Q(veh)	-	- 0.1	0	-

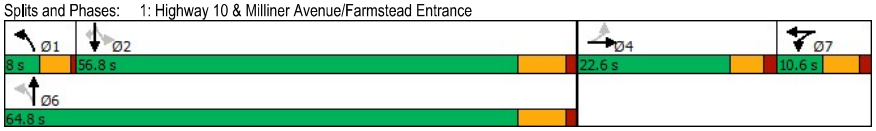
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	0	78	2	0	2	136	907	2	2	951	51
Future Volume (vph)	62	0	78	2	0	2	136	907	2	2	951	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1694	0	1770	1863	0	1770	1863	1583
Flt Permitted	0.506				0.976		0.073			0.163		
Satd. Flow (perm)	943	1583	0	0	1694	0	136	1863	0	304	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		224			148							136
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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
Adj. Flow (vph)	67	0	85	2	0	2	148	986	2	2	1034	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	85	0	0	4	0	148	988	0	2	1034	55
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	
Permitted Phases	4			7			6			2		2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	17.0	17.0		5.0	5.0		4.0	3.1		39.0	39.0	39.0
Minimum Split (s)	22.6	22.6		10.6	10.6		8.0	9.8		52.7	52.7	52.7
Total Split (s)	22.6	22.6		10.6	10.6		8.0	64.8		56.8	56.8	56.8
Total Split (%)	23.1%	23.1%		10.8%	10.8%		8.2%	66.1%		58.0%	58.0%	58.0%
Maximum Green (s)	17.0	17.0		5.0	5.0		4.0	58.1		50.1	50.1	50.1
Yellow Time (s)	4.1	4.1		4.1	4.1		3.5	5.4		5.4	5.4	5.4
All-Red Time (s)	1.5	1.5		1.5	1.5		0.5	1.3		1.3	1.3	1.3
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6			5.6		4.0	6.7		6.7	6.7	6.7
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										17.6	17.6	17.6
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	17.3	17.3			5.1		62.0	61.0		51.1	51.1	51.1
Actuated g/C Ratio	0.20	0.20			0.06		0.73	0.72		0.60	0.60	0.60
v/c Ratio	0.35	0.17			0.02		0.84	0.74		0.01	0.92	0.05
Control Delay	38.9	0.7			0.2		51.8	16.2		10.5	33.9	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	38.9	0.7			0.2		51.8	16.2		10.5	33.9	0.1
LOS	D	A			A		D	B		B	C	A
Approach Delay		17.6			0.3			20.9			32.2	
Approach LOS		B			A			C			C	
Queue Length 50th (m)	10.3	0.0			0.0		9.1	109.2		0.1	161.9	0.0
Queue Length 95th (m)	26.0	0.0			0.0		#38.7	#258.7		1.4	#310.9	0.0
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	192	501			240		177	1336		182	1119	1005
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.35	0.17			0.02		0.84	0.74		0.01	0.92	0.05

Intersection Summary

Area Type: Other
Cycle Length: 98
Actuated Cycle Length: 85
Natural Cycle: 105
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 25.8 Intersection LOS: C
Intersection Capacity Utilization 110.4% ICU Level of Service H
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance



Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	1043	0	0	1030
Future Vol, veh/h	1	0	1043	0	0	1030
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	4	0	0	7
Mvmt Flow	1	0	1122	0	0	1108

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2230	1122	0	0	1122	0
Stage 1	1122	-	-	-	-	-
Stage 2	1108	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	48	253	-	-	630	-
Stage 1	314	-	-	-	-	-
Stage 2	319	-	-	-	-	-
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	48	253	-	-	630	-
Mov Cap-2 Maneuver	48	-	-	-	-	-
Stage 1	314	-	-	-	-	-
Stage 2	319	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	81.7	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	48	630	-
HCM Lane V/C Ratio	-	-	0.022	-	-
HCM Control Delay (s)	-	-	81.7	0	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	0	99	3	0	3	83	1084	2	2	1009	62
Future Volume (vph)	81	0	99	3	0	3	83	1084	2	2	1009	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1728	0	1805	1881	0	1805	1863	1615
Flt Permitted	0.501				0.976		0.072			0.077		
Satd. Flow (perm)	933	1583	0	0	1728	0	137	1881	0	146	1863	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		212			148							136
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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 (%)	2%	2%	2%	0%	0%	0%	0%	1%	0%	0%	2%	0%
Adj. Flow (vph)	88	0	108	3	0	3	90	1178	2	2	1097	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	108	0	0	6	0	90	1180	0	2	1097	67
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			7			6			2		2
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	17.0	17.0		5.0	5.0		4.0	3.1		39.0	39.0	39.0
Minimum Split (s)	22.6	22.6		10.6	10.6		8.0	9.8		52.7	52.7	52.7
Total Split (s)	22.6	22.6		10.6	10.6		8.0	64.8		56.8	56.8	56.8
Total Split (%)	23.1%	23.1%		10.8%	10.8%		8.2%	66.1%		58.0%	58.0%	58.0%
Maximum Green (s)	17.0	17.0		5.0	5.0		4.0	58.1		50.1	50.1	50.1
Yellow Time (s)	4.1	4.1		4.1	4.1		3.5	5.4		5.4	5.4	5.4
All-Red Time (s)	1.5	1.5		1.5	1.5		0.5	1.3		1.3	1.3	1.3
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6			5.6		4.0	6.7		6.7	6.7	6.7
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										17.6	17.6	17.6
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	17.0	17.0			5.0		60.9	58.2		51.8	51.8	51.8
Actuated g/C Ratio	0.19	0.19			0.06		0.68	0.65		0.58	0.58	0.58
v/c Ratio	0.50	0.23			0.03		0.54	0.96		0.02	1.02	0.07
Control Delay	44.4	1.1			0.2		20.1	35.4		11.5	53.6	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	44.4	1.1			0.2		20.1	35.4		11.5	53.6	0.1
LOS	D	A			A		C	D		B	D	A
Approach Delay		20.6			0.2			34.3			50.4	
Approach LOS		C			A			C			D	
Queue Length 50th (m)	13.9	0.0			0.0		4.3	164.3		0.1	~208.8	0.0
Queue Length 95th (m)	#33.7	0.0			0.0		#15.6	#339.6		1.4	#337.7	0.0
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	177	472			236		167	1223		84	1078	992
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.50	0.23			0.03		0.54	0.96		0.02	1.02	0.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 98			
Actuated Cycle Length: 89.5			
Natural Cycle: 115			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 40.3		Intersection LOS: D	
Intersection Capacity Utilization 93.4%		ICU Level of Service F	
Analysis Period (min) 15			

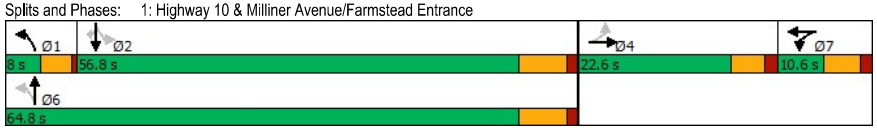
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance



Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	1	1166	1	4	1103
Future Vol, veh/h	0	1	1166	1	4	1103
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	15	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	4	0	0	7
Mvmt Flow	0	1	1227	1	4	1161

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2396	1227	0	0	1228	0
Stage 1	1227	-	-	-	-	-
Stage 2	1169	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	38	220	-	-	575	-
Stage 1	280	-	-	-	-	-
Stage 2	298	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	37	220	-	-	575	-
Mov Cap-2 Maneuver	37	-	-	-	-	-
Stage 1	280	-	-	-	-	-
Stage 2	292	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 220	575	-
HCM Lane V/C Ratio	-	- 0.005	0.007	-
HCM Control Delay (s)	-	- 21.4	11.3	0
HCM Lane LOS	-	- C	B	A
HCM 95th %tile Q(veh)	-	- 0	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	0	125	2	0	2	69	268	2	2	474	47
Future Volume (vph)	54	0	125	2	0	2	69	268	2	2	474	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932			0.999				0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1694	0	1770	1861	0	1770	1863	1583
Flt Permitted	0.500				0.976		0.325			0.581		
Satd. Flow (perm)	931	1583	0	0	1694	0	605	1861	0	1082	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		494			126							116
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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
Adj. Flow (vph)	59	0	136	2	0	2	75	291	2	2	515	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	136	0	0	4	0	75	293	0	2	515	51
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	
Permitted Phases	4			7			6			2		2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	20.6	20.6		7.0	7.0		21.0	70.1		70.1	70.1	70.1
Minimum Split (s)	27.1	27.1		13.5	13.5		27.0	78.0		78.5	78.5	78.5
Total Split (s)	31.0	31.0		13.5	13.5		27.0	105.5		78.5	78.5	78.5
Total Split (%)	20.7%	20.7%		9.0%	9.0%		18.0%	70.3%		52.3%	52.3%	52.3%
Maximum Green (s)	24.5	24.5		7.0	7.0		21.1	97.6		70.6	70.6	70.6
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9		7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										42.2	42.2	42.2
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	21.1	21.1			7.1		93.6	91.5		71.0	71.0	71.0
Actuated g/C Ratio	0.16	0.16			0.05		0.72	0.71		0.55	0.55	0.55
v/c Ratio	0.39	0.20			0.02		0.12	0.22		0.00	0.50	0.06
Control Delay	61.4	0.7			0.2		6.2	7.5		18.0	23.0	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	61.4	0.7			0.2		6.2	7.5		18.0	23.0	0.1
LOS	E	A			A		A	A		B	C	A
Approach Delay		19.1			0.3			7.2			20.9	
Approach LOS		B			A			A			C	
Queue Length 50th (m)	14.8	0.0			0.0		4.7	22.4		0.3	88.4	0.0
Queue Length 95th (m)	33.0	0.0			0.0		13.2	47.9		2.1	149.9	0.0
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	178	702			211		628	1418		596	1027	924
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.33	0.19			0.02		0.12	0.21		0.00	0.50	0.06

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 129.6			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.50			
Intersection Signal Delay: 16.1		Intersection LOS: B	
Intersection Capacity Utilization 98.7%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	0	267	1	0	2	238	253	0	0	437	161
Future Volume (vph)	81	0	267	1	0	2	238	253	0	0	437	161
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	225.0		0.0	0.0		0.0	173.0		15.0	15.0		289.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.910							0.850
Flt Protected	0.950				0.984		0.950					
Satd. Flow (prot)	1626	1495	0	0	1701	0	1752	1681	1900	1900	1845	1468
Flt Permitted	0.756				0.923		0.295					
Satd. Flow (perm)	1294	1495	0	0	1596	0	544	1681	1900	1900	1845	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		561			79							175
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		410.4			436.8			163.1			604.6	
Travel Time (s)		29.5			19.7			7.3			27.2	
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 (%)	11%	2%	8%	0%	2%	0%	3%	13%	0%	0%	3%	10%
Adj. Flow (vph)	88	0	290	1	0	2	259	275	0	0	475	175
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	290	0	0	3	0	259	275	0	0	475	175
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	27.8	27.8		7.0	7.0		36.8	65.1	65.1	65.1	65.1	65.1
Minimum Split (s)	34.3	34.3		34.3	34.3		42.7	73.0	73.0	73.0	73.0	73.0
Total Split (s)	34.3	34.3		34.3	34.3		42.7	115.7	115.7	73.0	73.0	73.0
Total Split (%)	22.9%	22.9%		22.9%	22.9%		28.5%	77.1%	77.1%	48.7%	48.7%	48.7%
Maximum Green (s)	27.8	27.8		27.8	27.8		36.8	107.8	107.8	65.1	65.1	65.1
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9	5.9	5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9	7.9	7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	4.2	4.2		4.2	4.2		4.2	4.2	4.2	4.2	4.2	4.2
Recall Mode	None	None		None	None		None	None	None	None	None	None
Act Effct Green (s)	27.8	27.8			27.8		109.8	107.8			65.1	65.1
Actuated g/C Ratio	0.19	0.19			0.19		0.73	0.72			0.43	0.43
v/c Ratio	0.37	0.40			0.01		0.37	0.23			0.59	0.24
Control Delay	58.6	1.6			0.0		7.9	7.6			36.2	4.2
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Delay	58.6	1.6			0.0		7.9	7.6			36.2	4.2
LOS	E	A			A		A	A			D	A
Approach Delay		14.9						7.8			27.6	
Approach LOS		B						A			C	
Queue Length 50th (m)	24.4	0.0			0.0		23.1	26.4			112.2	0.0
Queue Length 95th (m)	43.2	0.0			0.0		33.3	37.9			150.6	14.7
Internal Link Dist (m)		386.4			412.8			139.1			580.6	
Turn Bay Length (m)	225.0						173.0					289.0
Base Capacity (vph)	239	734			360		694	1208			800	736
Starvation Cap Reductn	0	0			0		0	0			0	0
Spillback Cap Reductn	0	0			0		0	0			0	0
Storage Cap Reductn	0	0			0		0	0			0	0
Reduced v/c Ratio	0.37	0.40			0.01		0.37	0.23			0.59	0.24

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 17.7		Intersection LOS: B	
Intersection Capacity Utilization 150.3%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 2: Highway 10 & Eco Park/Side Road 240

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	0	109	2	0	2	170	645	2	2	494	51
Future Volume (vph)	62	0	109	2	0	2	170	645	2	2	494	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1694	0	1770	1863	0	1770	1863	1583
Flt Permitted	0.500				0.976		0.294			0.398		
Satd. Flow (perm)	931	1583	0	0	1694	0	548	1863	0	741	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		483			126							116
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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
Adj. Flow (vph)	67	0	118	2	0	2	185	701	2	2	537	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	118	0	0	4	0	185	703	0	2	537	55
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	
Permitted Phases	4			7			6			2		2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	20.6	20.6		7.0	7.0		21.0	70.1		70.1	70.1	70.1
Minimum Split (s)	27.1	27.1		13.5	13.5		27.0	78.0		78.5	78.5	78.5
Total Split (s)	31.0	31.0		13.5	13.5		27.0	105.5		78.5	78.5	78.5
Total Split (%)	20.7%	20.7%		9.0%	9.0%		18.0%	70.3%		52.3%	52.3%	52.3%
Maximum Green (s)	24.5	24.5		7.0	7.0		21.1	97.6		70.6	70.6	70.6
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9		7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										42.2	42.2	42.2
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	21.3	21.3			7.0		99.3	97.3		70.3	70.3	70.3
Actuated g/C Ratio	0.16	0.16			0.05		0.73	0.72		0.52	0.52	0.52
v/c Ratio	0.46	0.18			0.02		0.31	0.53		0.01	0.56	0.06
Control Delay	64.2	0.6			0.2		7.5	11.2		18.5	25.6	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	64.2	0.6			0.2		7.5	11.2		18.5	25.6	0.1
LOS	E	A			A		A	B		B	C	A
Approach Delay		23.6			0.3			10.4			23.2	
Approach LOS		C			A			B			C	
Queue Length 50th (m)	16.9	0.0			0.0		12.4	72.9		0.3	93.7	0.0
Queue Length 95th (m)	36.4	0.0			0.0		30.5	151.2		2.0	162.5	0.0
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	168	682			207		592	1346		387	973	882
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.40	0.17			0.02		0.31	0.52		0.01	0.55	0.06

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 135.4			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 16.4		Intersection LOS: B	
Intersection Capacity Utilization 152.6%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	241	0	330	1	0	0	330	482	0	0	312	214
Future Volume (vph)	241	0	330	1	0	0	330	482	0	0	312	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	225.0		0.0	0.0		0.0	173.0		15.0	15.0		289.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850										0.850
Flt Protected	0.950				0.950		0.950					
Satd. Flow (prot)	1736	1509	0	0	1805	0	1770	1827	1900	1900	1776	1509
Flt Permitted	0.757				0.285		0.334					
Satd. Flow (perm)	1383	1509	0	0	542	0	622	1827	1900	1900	1776	1509
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		628										233
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		410.4			436.8			163.1			604.6	
Travel Time (s)		29.5			19.7			7.3			27.2	
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 (%)	4%	2%	7%	0%	2%	0%	2%	4%	0%	0%	7%	7%
Adj. Flow (vph)	262	0	359	1	0	0	359	524	0	0	339	233
Shared Lane Traffic (%)												
Lane Group Flow (vph)	262	359	0	0	1	0	359	524	0	0	339	233
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	100		100	25		15	100		15	25		100
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	37.8	37.8		7.0	7.0		36.8	45.1	45.1	45.1	45.1	45.1
Minimum Split (s)	54.3	54.3		54.3	54.3		42.7	53.0	53.0	53.0	53.0	53.0
Total Split (s)	54.3	54.3		54.3	54.3		42.7	95.7	95.7	53.0	53.0	53.0
Total Split (%)	36.2%	36.2%		36.2%	36.2%		28.5%	63.8%	63.8%	35.3%	35.3%	35.3%
Maximum Green (s)	47.8	47.8		47.8	47.8		36.8	87.8	87.8	45.1	45.1	45.1
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9	5.9	5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9	7.9	7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	4.2	4.2		4.2	4.2		4.2	4.2	4.2	4.2	4.2	4.2
Recall Mode	None	None		None	None		None	None	None	None	None	None
Act Effct Green (s)	39.6	39.6			39.6		89.8	87.8			45.1	45.1
Actuated g/C Ratio	0.28	0.28			0.28		0.63	0.62			0.32	0.32
v/c Ratio	0.68	0.41			0.01		0.52	0.46			0.60	0.36
Control Delay	55.3	1.4			36.0		15.3	16.5			46.6	6.0
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Delay	55.3	1.4			36.0		15.3	16.5			46.6	6.0
LOS	E	A			D		B	B			D	A
Approach Delay		24.2			36.0			16.0			30.1	
Approach LOS		C			D			B			C	
Queue Length 50th (m)	69.1	0.0			0.2		44.2	75.4			82.8	0.0
Queue Length 95th (m)	101.8	0.0			1.8		74.1	121.0			127.4	20.2
Internal Link Dist (m)		386.4			412.8			139.1			580.6	
Turn Bay Length (m)	225.0						173.0					289.0
Base Capacity (vph)	466	924			182		691	1130			564	639
Starvation Cap Reductn	0	0			0		0	0			0	0
Spillback Cap Reductn	0	0			0		0	0			0	0
Storage Cap Reductn	0	0			0		0	0			0	0
Reduced v/c Ratio	0.56	0.39			0.01		0.52	0.46			0.60	0.36

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 141.9			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 22.3		Intersection LOS: C	
Intersection Capacity Utilization 125.3%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 2: Highway 10 & Eco Park/Side Road 240

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	0	139	2	0	2	120	763	2	2	675	62
Future Volume (vph)	81	0	139	2	0	2	120	763	2	2	675	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1694	0	1770	1863	0	1770	1863	1583
Flt Permitted	0.500				0.976		0.150			0.341		
Satd. Flow (perm)	931	1583	0	0	1694	0	279	1863	0	635	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		406			126							116
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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
Adj. Flow (vph)	88	0	151	2	0	2	130	829	2	2	734	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	151	0	0	4	0	130	831	0	2	734	67
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	
Permitted Phases	4			7			6			2		2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	20.6	20.6		7.0	7.0		21.0	70.1		70.1	70.1	70.1
Minimum Split (s)	27.1	27.1		13.5	13.5		27.0	78.0		78.5	78.5	78.5
Total Split (s)	31.0	31.0		13.5	13.5		27.0	105.5		78.5	78.5	78.5
Total Split (%)	20.7%	20.7%		9.0%	9.0%		18.0%	70.3%		52.3%	52.3%	52.3%
Maximum Green (s)	24.5	24.5		7.0	7.0		21.1	97.6		70.6	70.6	70.6
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9		7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										42.2	42.2	42.2
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	21.4	21.4			7.0		99.4	97.4		70.4	70.4	70.4
Actuated g/C Ratio	0.16	0.16			0.05		0.73	0.72		0.52	0.52	0.52
v/c Ratio	0.60	0.26			0.02		0.30	0.62		0.01	0.76	0.08
Control Delay	72.1	1.0			0.2		7.8	13.3		18.5	33.2	0.3
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	72.1	1.0			0.2		7.8	13.3		18.5	33.2	0.3
LOS	E	A			A		A	B		B	C	A
Approach Delay		27.2			0.3			12.5			30.4	
Approach LOS		C			A			B			C	
Queue Length 50th (m)	22.8	0.0			0.0		8.4	96.7		0.3	150.5	0.0
Queue Length 95th (m)	46.7	0.0			0.0		22.2	203.0		2.0	258.7	0.7
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	168	619			207		436	1343		331	972	881
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.52	0.24			0.02		0.30	0.62		0.01	0.76	0.08

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 135.7			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 21.4		Intersection LOS: C	
Intersection Capacity Utilization 128.9%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	298	0	339	0	0	1	361	501	1	3	425	294
Future Volume (vph)	298	0	339	0	0	1	361	501	1	3	425	294
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	225.0		0.0	0.0		0.0	173.0		15.0	15.0		289.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.865				0.850			0.850
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1752	1524	0	0	1644	0	1770	1881	1615	1805	1863	1524
Flt Permitted	0.757						0.167			0.461		
Satd. Flow (perm)	1396	1524	0	0	1644	0	311	1881	1615	876	1863	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		574			314				25			320
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		410.4			436.8			163.1			604.6	
Travel Time (s)		29.5			19.7			7.3			27.2	
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 (%)	3%	2%	6%	0%	0%	0%	2%	1%	0%	0%	2%	6%
Adj. Flow (vph)	324	0	368	0	0	1	392	545	1	3	462	320
Shared Lane Traffic (%)												
Lane Group Flow (vph)	324	368	0	0	1	0	392	545	1	3	462	320
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	100		100	25		15	100		15	25		100
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA			NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	37.8	37.8		7.0	7.0		36.8	42.6	42.6	42.6	42.6	42.6
Minimum Split (s)	56.8	56.8		56.8	56.8		42.7	50.5	50.5	50.5	50.5	50.5
Total Split (s)	56.8	56.8		56.8	56.8		42.7	93.2	93.2	50.5	50.5	50.5
Total Split (%)	37.9%	37.9%		37.9%	37.9%		28.5%	62.1%	62.1%	33.7%	33.7%	33.7%
Maximum Green (s)	50.3	50.3		50.3	50.3		36.8	85.3	85.3	42.6	42.6	42.6
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9	5.9	5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9	7.9	7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	4.2	4.2		4.2	4.2		4.2	4.2	4.2	4.2	4.2	4.2
Recall Mode	None	None		None	None		None	None	None	None	None	None
Act Effct Green (s)	42.1	42.1			42.1		87.4	85.4	85.4	42.7	42.7	42.7
Actuated g/C Ratio	0.30	0.30			0.30		0.62	0.60	0.60	0.30	0.30	0.30
v/c Ratio	0.78	0.43			0.00		0.69	0.48	0.00	0.01	0.82	0.47
Control Delay	60.0	1.6			0.0		29.5	18.3	0.0	37.7	60.2	6.4
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	1.6			0.0		29.5	18.3	0.0	37.7	60.2	6.4
LOS	E	A			A		C	B	A	D	E	A
Approach Delay		28.9						22.9			38.2	
Approach LOS		C						C			D	
Queue Length 50th (m)	87.9	0.0			0.0		63.1	81.7	0.0	0.6	123.7	0.0
Queue Length 95th (m)	125.9	0.0			0.0		116.1	132.7	0.0	3.4	#199.6	24.7
Internal Link Dist (m)		386.4			412.8			139.1			580.6	
Turn Bay Length (m)	225.0						173.0		15.0	15.0		289.0
Base Capacity (vph)	495	911			785		570	1132	982	263	560	682
Starvation Cap Reductn	0	0			0		0	0	0	0	0	0
Spillback Cap Reductn	0	0			0		0	0	0	0	0	0
Storage Cap Reductn	0	0			0		0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.40			0.00		0.69	0.48	0.00	0.01	0.82	0.47

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 141.9			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 29.6		Intersection LOS: C	
Intersection Capacity Utilization 121.1%		ICU Level of Service H	
Analysis Period (min) 15			

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

Splits and Phases: 2: Highway 10 & Eco Park/Side Road 240

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	0	129	2	0	2	72	572	2	2	646	47
Future Volume (vph)	54	0	129	2	0	2	72	572	2	2	646	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1694	0	1770	1863	0	1770	1863	1583
Flt Permitted	0.500				0.976		0.175			0.428		
Satd. Flow (perm)	931	1583	0	0	1694	0	326	1863	0	797	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		416			126							116
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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
Adj. Flow (vph)	59	0	140	2	0	2	78	622	2	2	702	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	140	0	0	4	0	78	624	0	2	702	51
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	
Permitted Phases	4			7			6			2		2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	20.6	20.6		7.0	7.0		21.0	70.1		70.1	70.1	70.1
Minimum Split (s)	27.1	27.1		13.5	13.5		27.0	78.0		78.5	78.5	78.5
Total Split (s)	31.0	31.0		13.5	13.5		27.0	105.5		78.5	78.5	78.5
Total Split (%)	20.7%	20.7%		9.0%	9.0%		18.0%	70.3%		52.3%	52.3%	52.3%
Maximum Green (s)	24.5	24.5		7.0	7.0		21.1	97.6		70.6	70.6	70.6
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9		7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										42.2	42.2	42.2
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	20.9	20.9			7.0		99.3	97.3		70.3	70.3	70.3
Actuated g/C Ratio	0.15	0.15			0.05		0.74	0.72		0.52	0.52	0.52
v/c Ratio	0.41	0.23			0.02		0.17	0.47		0.00	0.72	0.06
Control Delay	62.4	0.9			0.2		6.5	9.9		18.0	31.2	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	62.4	0.9			0.2		6.5	9.9		18.0	31.2	0.1
LOS	E	A			A		A	A		B	C	A
Approach Delay		19.2			0.3			9.6			29.0	
Approach LOS		B			A			A			C	
Queue Length 50th (m)	14.8	0.0			0.0		4.9	60.5		0.3	140.0	0.0
Queue Length 95th (m)	32.8	0.0			0.0		13.6	121.1		1.9	233.5	0.0
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	168	627			207		465	1348		417	975	884
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.35	0.22			0.02		0.17	0.46		0.00	0.72	0.06

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 135.1			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 19.5		Intersection LOS: B	
Intersection Capacity Utilization 98.7%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	129	0	353	1	0	2	350	513	0	0	537	236
Future Volume (vph)	129	0	353	1	0	2	350	513	0	0	537	236
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	225.0		0.0	0.0		0.0	173.0		15.0	15.0		289.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.910							0.850
Flt Protected	0.950				0.984		0.950					
Satd. Flow (prot)	1687	1524	0	0	1276	0	1770	1681	1900	1900	1845	1509
Flt Permitted	0.756				0.687		0.202					
Satd. Flow (perm)	1342	1524	0	0	891	0	376	1681	1900	1900	1845	1509
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		513			79							257
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		410.4			436.8			163.1			604.6	
Travel Time (s)		29.5			19.7			7.3			27.2	
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 (%)	7%	2%	6%	100%	2%	0%	2%	13%	0%	0%	3%	7%
Adj. Flow (vph)	140	0	384	1	0	2	380	558	0	0	584	257
Shared Lane Traffic (%)												
Lane Group Flow (vph)	140	384	0	0	3	0	380	558	0	0	584	257
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	100		100	25		15	100		15	25		100
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	27.8	27.8		7.0	7.0		36.8	65.1	65.1	65.1	65.1	65.1
Minimum Split (s)	34.3	34.3		34.3	34.3		42.7	73.0	73.0	73.0	73.0	73.0
Total Split (s)	34.3	34.3		34.3	34.3		42.7	115.7	115.7	73.0	73.0	73.0
Total Split (%)	22.9%	22.9%		22.9%	22.9%		28.5%	77.1%	77.1%	48.7%	48.7%	48.7%
Maximum Green (s)	27.8	27.8		27.8	27.8		36.8	107.8	107.8	65.1	65.1	65.1
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9	5.9	5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9	7.9	7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	4.2	4.2		4.2	4.2		4.2	4.2	4.2	4.2	4.2	4.2
Recall Mode	None	None		None	None		None	None	None	None	None	None
Act Effct Green (s)	27.8	27.8			27.8		109.8	107.8			65.1	65.1
Actuated g/C Ratio	0.19	0.19			0.19		0.73	0.72			0.43	0.43
v/c Ratio	0.56	0.55			0.01		0.62	0.46			0.73	0.32
Control Delay	65.5	3.1			0.0		16.0	10.4			41.7	3.9
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Delay	65.5	3.1			0.0		16.0	10.4			41.7	3.9
LOS	E	A			A		B	B			D	A
Approach Delay		19.8						12.6			30.2	
Approach LOS		B						B			C	
Queue Length 50th (m)	40.4	0.0			0.0		37.7	67.3			149.8	0.0
Queue Length 95th (m)	65.0	0.0			0.0		74.4	90.4			198.4	16.8
Internal Link Dist (m)		386.4			412.8			139.1			580.6	
Turn Bay Length (m)	225.0						173.0					289.0
Base Capacity (vph)	248	700			229		617	1208			800	800
Starvation Cap Reductn	0	0			0		0	0			0	0
Spillback Cap Reductn	0	0			0		0	0			0	0
Storage Cap Reductn	0	0			0		0	0			0	0
Reduced v/c Ratio	0.56	0.55			0.01		0.62	0.46			0.73	0.32

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 20.6		Intersection LOS: C	
Intersection Capacity Utilization 150.3%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 2: Highway 10 & Eco Park/Side Road 240

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	0	129	2	0	2	191	1015	2	2	949	51
Future Volume (vph)	62	0	129	2	0	2	191	1015	2	2	949	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1694	0	1770	1863	0	1770	1863	1583
Flt Permitted	0.500				0.976		0.052			0.141		
Satd. Flow (perm)	931	1583	0	0	1694	0	97	1863	0	263	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		348			126							116
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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
Adj. Flow (vph)	67	0	140	2	0	2	208	1103	2	2	1032	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	140	0	0	4	0	208	1105	0	2	1032	55
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	
Permitted Phases	4			7			6			2		2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	20.6	20.6		7.0	7.0		21.0	70.1		70.1	70.1	70.1
Minimum Split (s)	27.1	27.1		13.5	13.5		27.0	78.0		78.5	78.5	78.5
Total Split (s)	31.0	31.0		13.5	13.5		27.0	105.5		78.5	78.5	78.5
Total Split (%)	20.7%	20.7%		9.0%	9.0%		18.0%	70.3%		52.3%	52.3%	52.3%
Maximum Green (s)	24.5	24.5		7.0	7.0		21.1	97.6		70.6	70.6	70.6
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9		7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										42.2	42.2	42.2
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	21.3	21.3			7.0		99.8	97.7		70.8	70.8	70.8
Actuated g/C Ratio	0.16	0.16			0.05		0.73	0.72		0.52	0.52	0.52
v/c Ratio	0.46	0.26			0.02		0.63	0.83		0.01	1.07	0.06
Control Delay	64.6	1.2			0.2		41.6	21.0		19.0	79.8	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	64.6	1.2			0.2		41.6	21.0		19.0	79.8	0.1
LOS	E	A			A		D	C		B	E	A
Approach Delay		21.7			0.3			24.3			75.7	
Approach LOS		C			A			C			E	
Queue Length 50th (m)	17.0	0.0			0.0		36.1	175.5		0.3	~306.0	0.0
Queue Length 95th (m)	36.6	0.0			0.0		74.9	#406.2		2.0	#467.1	0.0
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	168	571			206		331	1341		137	969	879
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.40	0.25			0.02		0.63	0.82		0.01	1.07	0.06

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 135.9			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.07			
Intersection Signal Delay: 45.5		Intersection LOS: D	
Intersection Capacity Utilization 152.6%		ICU Level of Service H	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			

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

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

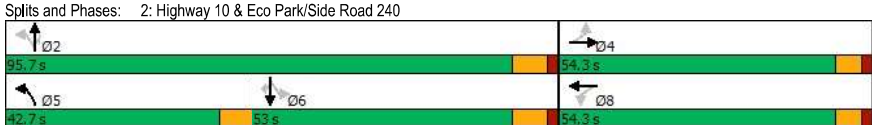
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	560	0	464	1	0	0	425	646	0	0	605	342
Future Volume (vph)	560	0	464	1	0	0	425	646	0	0	605	342
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	225.0		0.0	0.0		0.0	173.0		15.0	15.0		289.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850										0.850
Flt Protected	0.950				0.950		0.950					
Satd. Flow (prot)	1770	1538	0	0	1805	0	1770	1827	1900	1900	1776	1553
Flt Permitted	0.757				0.146		0.078					
Satd. Flow (perm)	1410	1538	0	0	277	0	145	1827	1900	1900	1776	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		522										372
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		410.4			436.8			163.1			604.6	
Travel Time (s)		29.5			19.7			7.3			27.2	
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 (%)	2%	2%	5%	0%	2%	0%	2%	4%	0%	0%	7%	4%
Adj. Flow (vph)	609	0	504	1	0	0	462	702	0	0	658	372
Shared Lane Traffic (%)												
Lane Group Flow (vph)	609	504	0	0	1	0	462	702	0	0	658	372
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	100		100	25		15	100		15	25		100
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	37.8	37.8		7.0	7.0		36.8	45.1	45.1	45.1	45.1	45.1
Minimum Split (s)	54.3	54.3		54.3	54.3		42.7	53.0	53.0	53.0	53.0	53.0
Total Split (s)	54.3	54.3		54.3	54.3		42.7	95.7	95.7	53.0	53.0	53.0
Total Split (%)	36.2%	36.2%		36.2%	36.2%		28.5%	63.8%	63.8%	35.3%	35.3%	35.3%
Maximum Green (s)	47.8	47.8		47.8	47.8		36.8	87.8	87.8	45.1	45.1	45.1
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9	5.9	5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9	7.9	7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	4.2	4.2		4.2	4.2		4.2	4.2	4.2	4.2	4.2	4.2
Recall Mode	None	None		None	None		None	None	None	None	None	None
Act Effct Green (s)	47.8	47.8			47.8		89.8	87.8			45.1	45.1
Actuated g/C Ratio	0.32	0.32			0.32		0.60	0.59			0.30	0.30
v/c Ratio	1.36	0.60			0.01		0.95	0.66			1.23	0.51
Control Delay	213.8	5.6			36.0		74.4	24.7			164.5	6.3
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Delay	213.8	5.6			36.0		74.4	24.7			164.5	6.3
LOS	F	A			D		E	C			F	A
Approach Delay		119.5			36.0			44.4			107.4	
Approach LOS		F			D			D			F	
Queue Length 50th (m)	~249.5	0.0			0.2		125.9	142.5			~253.8	0.0
Queue Length 95th (m)	#326.1	22.3			1.8		#197.4	187.4			#332.4	25.2
Internal Link Dist (m)		386.4			412.8			139.1			580.6	
Turn Bay Length (m)	225.0						173.0					289.0
Base Capacity (vph)	449	845			88		485	1069			533	727
Starvation Cap Reductn	0	0			0		0	0			0	0
Spillback Cap Reductn	0	0			0		0	0			0	0
Storage Cap Reductn	0	0			0		0	0			0	0
Reduced v/c Ratio	1.36	0.60			0.01		0.95	0.66			1.23	0.51

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Natural Cycle: 150
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 1.36
Intersection Signal Delay: 89.3 Intersection LOS: F
Intersection Capacity Utilization 125.3% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Highway 10 & Eco Park/Side Road 240



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	0	167	2	0	2	83	798	2	2	1145	62
Future Volume (vph)	81	0	167	2	0	2	83	798	2	2	1145	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1694	0	1770	1863	0	1770	1863	1583
Flt Permitted	0.500				0.976		0.052			0.312		
Satd. Flow (perm)	931	1583	0	0	1694	0	97	1863	0	581	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		328			126							116
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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
Adj. Flow (vph)	88	0	182	2	0	2	90	867	2	2	1245	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	182	0	0	4	0	90	869	0	2	1245	67
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	
Permitted Phases	4			7			6			2		2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	20.6	20.6		7.0	7.0		21.0	70.1		70.1	70.1	70.1
Minimum Split (s)	27.1	27.1		13.5	13.5		27.0	78.0		78.5	78.5	78.5
Total Split (s)	31.0	31.0		13.5	13.5		27.0	105.5		78.5	78.5	78.5
Total Split (%)	20.7%	20.7%		9.0%	9.0%		18.0%	70.3%		52.3%	52.3%	52.3%
Maximum Green (s)	24.5	24.5		7.0	7.0		21.1	97.6		70.6	70.6	70.6
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9		7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										42.2	42.2	42.2
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	21.5	21.5			7.0		99.8	97.7		70.8	70.8	70.8
Actuated g/C Ratio	0.16	0.16			0.05		0.73	0.72		0.52	0.52	0.52
v/c Ratio	0.60	0.35			0.02		0.27	0.65		0.01	1.29	0.08
Control Delay	72.5	1.8			0.2		15.9	14.0		18.5	166.5	0.3
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	72.5	1.8			0.2		15.9	14.0		18.5	166.5	0.3
LOS	E	A			A		B	B		B	F	A
Approach Delay		24.9			0.3			14.2			157.8	
Approach LOS		C			A			B			F	
Queue Length 50th (m)	22.9	0.0			0.0		5.7	105.0		0.3	~427.7	0.0
Queue Length 95th (m)	46.7	0.0			0.0		26.0	220.8		2.0	#608.0	0.7
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	168	554			206		331	1339		302	968	878
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.52	0.33			0.02		0.27	0.65		0.01	1.29	0.08

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 136.1			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.29			
Intersection Signal Delay: 89.4		Intersection LOS: F	
Intersection Capacity Utilization 98.7%		ICU Level of Service F	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	650	0	496	0	0	1	476	701	1	3	679	472
Future Volume (vph)	650	0	496	0	0	1	476	701	1	3	679	472
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	225.0		0.0	0.0		0.0	173.0		15.0	15.0		289.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.865				0.850			0.850
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1770	1553	0	0	1644	0	1770	1881	1615	1805	1863	1553
Flt Permitted	0.757						0.082			0.377		
Satd. Flow (perm)	1410	1553	0	0	1644	0	153	1881	1615	716	1863	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		523			188				25			513
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		410.4			436.8			163.1			604.6	
Travel Time (s)		29.5			19.7			7.3			27.2	
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 (%)	2%	2%	4%	0%	0%	0%	2%	1%	0%	0%	2%	4%
Adj. Flow (vph)	707	0	539	0	0	1	517	762	1	3	738	513
Shared Lane Traffic (%)												
Lane Group Flow (vph)	707	539	0	0	1	0	517	762	1	3	738	513
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	100		100	25		15	100		15	25		100
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA			NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	37.8	37.8		7.0	7.0		36.8	42.6	42.6	42.6	42.6	42.6
Minimum Split (s)	56.8	56.8		56.8	56.8		42.7	50.5	50.5	50.5	50.5	50.5
Total Split (s)	56.8	56.8		56.8	56.8		42.7	93.2	93.2	50.5	50.5	50.5
Total Split (%)	37.9%	37.9%		37.9%	37.9%		28.5%	62.1%	62.1%	33.7%	33.7%	33.7%
Maximum Green (s)	50.3	50.3		50.3	50.3		36.8	85.3	85.3	42.6	42.6	42.6
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9	5.9	5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9	7.9	7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	4.2	4.2		4.2	4.2		4.2	4.2	4.2	4.2	4.2	4.2
Recall Mode	None	None		None	None		None	None	None	None	None	None
Act Effct Green (s)	50.3	50.3			50.3		87.3	85.3	85.3	42.6	42.6	42.6
Actuated g/C Ratio	0.34	0.34			0.34		0.58	0.57	0.57	0.28	0.28	0.28
v/c Ratio	1.50	0.62			0.00		1.07	0.71	0.00	0.01	1.40	0.63
Control Delay	270.5	6.9			0.0		102.4	28.2	0.0	39.3	228.8	7.2
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	270.5	6.9			0.0		102.4	28.2	0.0	39.3	228.8	7.2
LOS	F	A			A		F	C	A	D	F	A
Approach Delay		156.5						58.1			137.7	
Approach LOS		F						E			F	
Queue Length 50th (m)	~305.5	3.4			0.0		~161.0	167.2	0.0	0.7	~307.3	0.0
Queue Length 95th (m)	#384.7	34.8			0.0		#235.4	218.7	0.0	3.5	#387.2	31.2
Internal Link Dist (m)		386.4			412.8			139.1			580.6	
Turn Bay Length (m)	225.0						173.0		15.0	15.0		289.0
Base Capacity (vph)	472	868			676		485	1069	929	203	529	808
Starvation Cap Reductn	0	0			0		0	0	0	0	0	0
Spillback Cap Reductn	0	0			0		0	0	0	0	0	0
Storage Cap Reductn	0	0			0		0	0	0	0	0	0
Reduced v/c Ratio	1.50	0.62			0.00		1.07	0.71	0.00	0.01	1.40	0.63

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Natural Cycle: 150
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 1.50
Intersection Signal Delay: 116.9 Intersection LOS: F
Intersection Capacity Utilization 133.7% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Highway 10 & Eco Park/Side Road 240

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	0	129	2	0	2	72	587	2	2	667	47
Future Volume (vph)	54	0	129	2	0	2	72	587	2	2	667	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1694	0	1770	1863	0	1770	1863	1583
Flt Permitted	0.500				0.976		0.159			0.422		
Satd. Flow (perm)	931	1583	0	0	1694	0	296	1863	0	786	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		409			126							116
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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
Adj. Flow (vph)	59	0	140	2	0	2	78	638	2	2	725	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	140	0	0	4	0	78	640	0	2	725	51
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	
Permitted Phases	4			7			6			2		2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	20.6	20.6		7.0	7.0		21.0	70.1		70.1	70.1	70.1
Minimum Split (s)	27.1	27.1		13.5	13.5		27.0	78.0		78.5	78.5	78.5
Total Split (s)	31.0	31.0		13.5	13.5		27.0	105.5		78.5	78.5	78.5
Total Split (%)	20.7%	20.7%		9.0%	9.0%		18.0%	70.3%		52.3%	52.3%	52.3%
Maximum Green (s)	24.5	24.5		7.0	7.0		21.1	97.6		70.6	70.6	70.6
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9		7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										42.2	42.2	42.2
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	20.9	20.9			7.0		99.3	97.3		70.3	70.3	70.3
Actuated g/C Ratio	0.15	0.15			0.05		0.74	0.72		0.52	0.52	0.52
v/c Ratio	0.41	0.24			0.02		0.17	0.48		0.00	0.75	0.06
Control Delay	62.4	0.9			0.2		6.6	10.1		18.0	32.3	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	62.4	0.9			0.2		6.6	10.1		18.0	32.3	0.1
LOS	E	A			A		A	B		B	C	A
Approach Delay		19.2			0.3			9.7			30.1	
Approach LOS		B			A			A			C	
Queue Length 50th (m)	14.8	0.0			0.0		4.9	62.9		0.3	147.5	0.0
Queue Length 95th (m)	32.8	0.0			0.0		13.6	125.9		1.9	246.4	0.0
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	168	622			207		448	1348		411	975	884
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.35	0.23			0.02		0.17	0.47		0.00	0.74	0.06

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 135.1			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 20.2		Intersection LOS: C	
Intersection Capacity Utilization 98.7%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	129	0	356	1	0	3	351	527	0	0	556	238
Future Volume (vph)	129	0	356	1	0	3	351	527	0	0	556	238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	225.0		0.0	0.0		0.0	173.0		15.0	15.0		289.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.899							0.850
Flt Protected	0.950				0.988		0.950					
Satd. Flow (prot)	1687	1524	0	0	1350	0	1770	1681	1900	1900	1845	1509
Flt Permitted	0.755				0.680		0.185					
Satd. Flow (perm)	1341	1524	0	0	929	0	345	1681	1900	1900	1845	1509
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		506			79							259
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		410.4			436.8			163.1			604.6	
Travel Time (s)		29.5			19.7			7.3			27.2	
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 (%)	7%	2%	6%	100%	2%	0%	2%	13%	0%	0%	3%	7%
Adj. Flow (vph)	140	0	387	1	0	3	382	573	0	0	604	259
Shared Lane Traffic (%)												
Lane Group Flow (vph)	140	387	0	0	4	0	382	573	0	0	604	259
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	100		100	25		15	100		15	25		100
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	27.8	27.8		7.0	7.0		36.8	65.1	65.1	65.1	65.1	65.1
Minimum Split (s)	34.3	34.3		34.3	34.3		42.7	73.0	73.0	73.0	73.0	73.0
Total Split (s)	34.3	34.3		34.3	34.3		42.7	115.7	115.7	73.0	73.0	73.0
Total Split (%)	22.9%	22.9%		22.9%	22.9%		28.5%	77.1%	77.1%	48.7%	48.7%	48.7%
Maximum Green (s)	27.8	27.8		27.8	27.8		36.8	107.8	107.8	65.1	65.1	65.1
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9	5.9	5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9	7.9	7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	4.2	4.2		4.2	4.2		4.2	4.2	4.2	4.2	4.2	4.2
Recall Mode	None	None		None	None		None	None	None	None	None	None
Act Effct Green (s)	27.8	27.8			27.8		109.8	107.8			65.1	65.1
Actuated g/C Ratio	0.19	0.19			0.19		0.73	0.72			0.43	0.43
v/c Ratio	0.56	0.56			0.02		0.63	0.47			0.76	0.32
Control Delay	65.5	3.3			0.2		18.9	10.6			43.1	3.9
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Delay	65.5	3.3			0.2		18.9	10.6			43.1	3.9
LOS	E	A			A		B	B			D	A
Approach Delay		19.9			0.3			13.9			31.3	
Approach LOS		B			A			B			C	
Queue Length 50th (m)	40.4	0.0			0.0		44.8	70.0			157.5	0.0
Queue Length 95th (m)	65.0	0.0			0.0		82.5	94.1			208.0	17.0
Internal Link Dist (m)		386.4			412.8			139.1			580.6	
Turn Bay Length (m)	225.0						173.0					289.0
Base Capacity (vph)	248	694			236		602	1208			800	801
Starvation Cap Reductn	0	0			0		0	0			0	0
Spillback Cap Reductn	0	0			0		0	0			0	0
Storage Cap Reductn	0	0			0		0	0			0	0
Reduced v/c Ratio	0.56	0.56			0.02		0.63	0.47			0.76	0.32

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 21.6		Intersection LOS: C	
Intersection Capacity Utilization 150.3%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 2: Highway 10 & Eco Park/Side Road 240

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	0	129	2	0	2	191	1039	2	2	966	51
Future Volume (vph)	62	0	129	2	0	2	191	1039	2	2	966	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1694	0	1770	1863	0	1770	1863	1583
Flt Permitted	0.500				0.976		0.052			0.121		
Satd. Flow (perm)	931	1583	0	0	1694	0	97	1863	0	225	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		346			126							116
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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
Adj. Flow (vph)	67	0	140	2	0	2	208	1129	2	2	1050	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	140	0	0	4	0	208	1131	0	2	1050	55
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	
Permitted Phases	4			7			6			2		2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	20.6	20.6		7.0	7.0		21.0	70.1		70.1	70.1	70.1
Minimum Split (s)	27.1	27.1		13.5	13.5		27.0	78.0		78.5	78.5	78.5
Total Split (s)	31.0	31.0		13.5	13.5		27.0	105.5		78.5	78.5	78.5
Total Split (%)	20.7%	20.7%		9.0%	9.0%		18.0%	70.3%		52.3%	52.3%	52.3%
Maximum Green (s)	24.5	24.5		7.0	7.0		21.1	97.6		70.6	70.6	70.6
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9		7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										42.2	42.2	42.2
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	21.3	21.3			7.0		99.8	97.7		70.8	70.8	70.8
Actuated g/C Ratio	0.16	0.16			0.05		0.73	0.72		0.52	0.52	0.52
v/c Ratio	0.46	0.26			0.02		0.63	0.84		0.02	1.08	0.06
Control Delay	64.6	1.2			0.2		41.6	22.2		19.0	86.1	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	64.6	1.2			0.2		41.6	22.2		19.0	86.1	0.1
LOS	E	A			A		D	C		B	F	A
Approach Delay		21.7			0.3			25.3			81.7	
Approach LOS		C			A			C			F	
Queue Length 50th (m)	17.0	0.0			0.0		36.1	185.9		0.3	~316.3	0.0
Queue Length 95th (m)	36.6	0.0			0.0		74.9	#423.0		2.1	#479.4	0.0
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	168	569			206		331	1341		116	969	879
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.40	0.25			0.02		0.63	0.84		0.02	1.08	0.06

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 135.9			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.08			
Intersection Signal Delay: 48.5		Intersection LOS: D	
Intersection Capacity Utilization 152.6%		ICU Level of Service H	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	560	0	466	1	0	0	428	670	0	0	621	344
Future Volume (vph)	560	0	466	1	0	0	428	670	0	0	621	344
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	225.0		0.0	0.0		0.0	173.0		15.0	15.0		289.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850										0.850
Flt Protected	0.950				0.950		0.950					
Satd. Flow (prot)	1770	1538	0	0	1805	0	1770	1827	1900	1900	1776	1553
Flt Permitted	0.757				0.142		0.078					
Satd. Flow (perm)	1410	1538	0	0	270	0	145	1827	1900	1900	1776	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		520										374
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		410.4			436.8			163.1			604.6	
Travel Time (s)		29.5			19.7			7.3			27.2	
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 (%)	2%	2%	5%	0%	2%	0%	2%	4%	0%	0%	7%	4%
Adj. Flow (vph)	609	0	507	1	0	0	465	728	0	0	675	374
Shared Lane Traffic (%)												
Lane Group Flow (vph)	609	507	0	0	1	0	465	728	0	0	675	374
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	100		100	25		15	100		15	25		100
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	

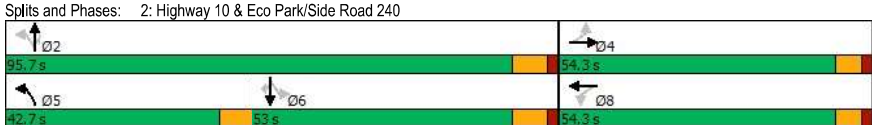
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	37.8	37.8		7.0	7.0		36.8	45.1	45.1	45.1	45.1	45.1
Minimum Split (s)	54.3	54.3		54.3	54.3		42.7	53.0	53.0	53.0	53.0	53.0
Total Split (s)	54.3	54.3		54.3	54.3		42.7	95.7	95.7	53.0	53.0	53.0
Total Split (%)	36.2%	36.2%		36.2%	36.2%		28.5%	63.8%	63.8%	35.3%	35.3%	35.3%
Maximum Green (s)	47.8	47.8		47.8	47.8		36.8	87.8	87.8	45.1	45.1	45.1
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9	5.9	5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9	7.9	7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	4.2	4.2		4.2	4.2		4.2	4.2	4.2	4.2	4.2	4.2
Recall Mode	None	None		None	None		None	None	None	None	None	None
Act Effct Green (s)	47.8	47.8			47.8		89.8	87.8			45.1	45.1
Actuated g/C Ratio	0.32	0.32			0.32		0.60	0.59			0.30	0.30
v/c Ratio	1.36	0.60			0.01		0.96	0.68			1.27	0.51
Control Delay	213.8	5.8			36.0		75.7	25.5			176.8	6.2
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Delay	213.8	5.8			36.0		75.7	25.5			176.8	6.2
LOS	F	A			D		E	C			F	A
Approach Delay		119.3			36.0			45.1			116.0	
Approach LOS		F			D			D			F	
Queue Length 50th (m)	~249.5	0.0			0.2		127.1	151.3			~264.8	0.0
Queue Length 95th (m)	#326.1	23.9			1.8		#199.4	199.1			#343.4	25.6
Internal Link Dist (m)		386.4			412.8			139.1			580.6	
Turn Bay Length (m)	225.0						173.0					289.0
Base Capacity (vph)	449	844			86		485	1069			533	728
Starvation Cap Reductn	0	0			0		0	0			0	0
Spillback Cap Reductn	0	0			0		0	0			0	0
Storage Cap Reductn	0	0			0		0	0			0	0
Reduced v/c Ratio	1.36	0.60			0.01		0.96	0.68			1.27	0.51

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.36			
Intersection Signal Delay: 91.9		Intersection LOS: F	
Intersection Capacity Utilization 125.3%		ICU Level of Service H	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 2: Highway 10 & Eco Park/Side Road 240



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	0	167	2	0	2	83	833	2	2	1176	62
Future Volume (vph)	81	0	167	2	0	2	83	833	2	2	1176	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1694	0	1770	1863	0	1770	1863	1583
Flt Permitted	0.500				0.976		0.052			0.285		
Satd. Flow (perm)	931	1583	0	0	1694	0	97	1863	0	531	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		326			126							116
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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
Adj. Flow (vph)	88	0	182	2	0	2	90	905	2	2	1278	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	182	0	0	4	0	90	907	0	2	1278	67
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	
Permitted Phases	4			7			6			2		2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	20.6	20.6		7.0	7.0		21.0	70.1		70.1	70.1	70.1
Minimum Split (s)	27.1	27.1		13.5	13.5		27.0	78.0		78.5	78.5	78.5
Total Split (s)	31.0	31.0		13.5	13.5		27.0	105.5		78.5	78.5	78.5
Total Split (%)	20.7%	20.7%		9.0%	9.0%		18.0%	70.3%		52.3%	52.3%	52.3%
Maximum Green (s)	24.5	24.5		7.0	7.0		21.1	97.6		70.6	70.6	70.6
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9		7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										42.2	42.2	42.2
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	21.5	21.5			7.0		99.8	97.7		70.8	70.8	70.8
Actuated g/C Ratio	0.16	0.16			0.05		0.73	0.72		0.52	0.52	0.52
v/c Ratio	0.60	0.35			0.02		0.27	0.68		0.01	1.32	0.08
Control Delay	72.5	1.8			0.2		15.9	14.9		18.5	180.9	0.3
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	72.5	1.8			0.2		15.9	14.9		18.5	180.9	0.3
LOS	E	A			A		B	B		B	F	A
Approach Delay		24.9			0.3			15.0			171.7	
Approach LOS		C			A			B			F	
Queue Length 50th (m)	22.9	0.0			0.0		5.7	114.2		0.3	~446.6	0.0
Queue Length 95th (m)	46.7	0.0			0.0		26.0	240.5		2.0	#629.4	0.7
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	168	552			206		331	1339		275	968	878
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.52	0.33			0.02		0.27	0.68		0.01	1.32	0.08

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 136.1			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.32			
Intersection Signal Delay: 96.6		Intersection LOS: F	
Intersection Capacity Utilization 98.7%		ICU Level of Service F	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	650	0	499	0	0	1	481	737	1	4	706	475
Future Volume (vph)	650	0	499	0	0	1	481	737	1	4	706	475
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	225.0		0.0	0.0		0.0	173.0		15.0	15.0		289.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.865				0.850			0.850
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1770	1553	0	0	1644	0	1770	1881	1615	1805	1863	1553
Flt Permitted	0.757						0.082			0.352		
Satd. Flow (perm)	1410	1553	0	0	1644	0	153	1881	1615	669	1863	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		521			172				25			516
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		410.4			436.8			163.1			604.6	
Travel Time (s)		29.5			19.7			7.3			27.2	
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 (%)	2%	2%	4%	0%	0%	0%	2%	1%	0%	0%	2%	4%
Adj. Flow (vph)	707	0	542	0	0	1	523	801	1	4	767	516
Shared Lane Traffic (%)												
Lane Group Flow (vph)	707	542	0	0	1	0	523	801	1	4	767	516
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	100		100	25		15	100		15	25		100
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA			NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	37.8	37.8		7.0	7.0		36.8	42.6	42.6	42.6	42.6	42.6
Minimum Split (s)	56.8	56.8		56.8	56.8		42.7	50.5	50.5	50.5	50.5	50.5
Total Split (s)	56.8	56.8		56.8	56.8		42.7	93.2	93.2	50.5	50.5	50.5
Total Split (%)	37.9%	37.9%		37.9%	37.9%		28.5%	62.1%	62.1%	33.7%	33.7%	33.7%
Maximum Green (s)	50.3	50.3		50.3	50.3		36.8	85.3	85.3	42.6	42.6	42.6
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9	5.9	5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9	7.9	7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	4.2	4.2		4.2	4.2		4.2	4.2	4.2	4.2	4.2	4.2
Recall Mode	None	None		None	None		None	None	None	None	None	None
Act Effct Green (s)	50.3	50.3			50.3		87.3	85.3	85.3	42.6	42.6	42.6
Actuated g/C Ratio	0.34	0.34			0.34		0.58	0.57	0.57	0.28	0.28	0.28
v/c Ratio	1.50	0.63			0.00		1.08	0.75	0.00	0.02	1.45	0.64
Control Delay	270.5	7.2			0.0		106.1	29.9	0.0	39.5	251.3	7.2
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	270.5	7.2			0.0		106.1	29.9	0.0	39.5	251.3	7.2
LOS	F	A			A		F	C	A	D	F	A
Approach Delay		156.2						59.9			152.7	
Approach LOS		F						E			F	
Queue Length 50th (m)	~305.5	4.4			0.0		~165.0	182.0	0.0	0.9	~326.2	0.0
Queue Length 95th (m)	#384.7	37.2			0.0		#239.3	238.2	0.0	4.2	#406.7	31.2
Internal Link Dist (m)		386.4			412.8			139.1			580.6	
Turn Bay Length (m)	225.0						173.0		15.0	15.0		289.0
Base Capacity (vph)	472	867			665		485	1069	929	189	529	810
Starvation Cap Reductn	0	0			0		0	0	0	0	0	0
Spillback Cap Reductn	0	0			0		0	0	0	0	0	0
Storage Cap Reductn	0	0			0		0	0	0	0	0	0
Reduced v/c Ratio	1.50	0.63			0.00		1.08	0.75	0.00	0.02	1.45	0.64

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.50			
Intersection Signal Delay: 122.0		Intersection LOS: F	
Intersection Capacity Utilization 135.6%		ICU Level of Service H	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 2: Highway 10 & Eco Park/Side Road 240

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	0	129	2	0	2	72	603	2	2	689	47
Future Volume (vph)	54	0	129	2	0	2	72	603	2	2	689	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1694	0	1770	1863	0	1770	1863	1583
Flt Permitted	0.500				0.976		0.142			0.415		
Satd. Flow (perm)	931	1583	0	0	1694	0	265	1863	0	773	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		402			126							116
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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
Adj. Flow (vph)	59	0	140	2	0	2	78	655	2	2	749	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	140	0	0	4	0	78	657	0	2	749	51
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	
Permitted Phases	4			7			6			2		2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	20.6	20.6		7.0	7.0		21.0	70.1		70.1	70.1	70.1
Minimum Split (s)	27.1	27.1		13.5	13.5		27.0	78.0		78.5	78.5	78.5
Total Split (s)	31.0	31.0		13.5	13.5		27.0	105.5		78.5	78.5	78.5
Total Split (%)	20.7%	20.7%		9.0%	9.0%		18.0%	70.3%		52.3%	52.3%	52.3%
Maximum Green (s)	24.5	24.5		7.0	7.0		21.1	97.6		70.6	70.6	70.6
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9		7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										42.2	42.2	42.2
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	20.9	20.9			7.0		99.3	97.3		70.3	70.3	70.3
Actuated g/C Ratio	0.15	0.15			0.05		0.74	0.72		0.52	0.52	0.52
v/c Ratio	0.41	0.24			0.02		0.18	0.49		0.00	0.77	0.06
Control Delay	62.4	1.0			0.2		6.7	10.3		18.0	33.5	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	62.4	1.0			0.2		6.7	10.3		18.0	33.5	0.1
LOS	E	A			A		A	B		B	C	A
Approach Delay		19.2			0.3			9.9			31.3	
Approach LOS		B			A			A			C	
Queue Length 50th (m)	14.8	0.0			0.0		4.9	65.5		0.3	155.7	0.0
Queue Length 95th (m)	32.8	0.0			0.0		13.6	131.0		1.9	259.4	0.0
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	168	616			207		430	1348		404	975	884
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.35	0.23			0.02		0.18	0.49		0.00	0.77	0.06

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 135.1			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 20.8		Intersection LOS: C	
Intersection Capacity Utilization 98.7%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	129	0	360	1	0	3	352	543	0	0	576	241
Future Volume (vph)	129	0	360	1	0	3	352	543	0	0	576	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	225.0		0.0	0.0		0.0	173.0		15.0	15.0		289.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.899							0.850
Flt Protected	0.950				0.988		0.950					
Satd. Flow (prot)	1687	1524	0	0	1350	0	1770	1681	1900	1900	1845	1509
Flt Permitted	0.755				0.667		0.167					
Satd. Flow (perm)	1341	1524	0	0	911	0	311	1681	1900	1900	1845	1509
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		499			79							262
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		410.4			436.8			163.1			604.6	
Travel Time (s)		29.5			19.7			7.3			27.2	
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 (%)	7%	2%	6%	100%	2%	0%	2%	13%	0%	0%	3%	7%
Adj. Flow (vph)	140	0	391	1	0	3	383	590	0	0	626	262
Shared Lane Traffic (%)												
Lane Group Flow (vph)	140	391	0	0	4	0	383	590	0	0	626	262
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	100		100	25		15	100		15	25		100
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	27.8	27.8		7.0	7.0		36.8	65.1	65.1	65.1	65.1	65.1
Minimum Split (s)	34.3	34.3		34.3	34.3		42.7	73.0	73.0	73.0	73.0	73.0
Total Split (s)	34.3	34.3		34.3	34.3		42.7	115.7	115.7	73.0	73.0	73.0
Total Split (%)	22.9%	22.9%		22.9%	22.9%		28.5%	77.1%	77.1%	48.7%	48.7%	48.7%
Maximum Green (s)	27.8	27.8		27.8	27.8		36.8	107.8	107.8	65.1	65.1	65.1
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9	5.9	5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9	7.9	7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	4.2	4.2		4.2	4.2		4.2	4.2	4.2	4.2	4.2	4.2
Recall Mode	None	None		None	None		None	None	None	None	None	None
Act Effct Green (s)	27.8	27.8			27.8		109.8	107.8			65.1	65.1
Actuated g/C Ratio	0.19	0.19			0.19		0.73	0.72			0.43	0.43
v/c Ratio	0.56	0.57			0.02		0.65	0.49			0.78	0.33
Control Delay	65.5	3.8			0.2		22.5	10.8			44.7	3.9
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Delay	65.5	3.8			0.2		22.5	10.8			44.7	3.9
LOS	E	A			A		C	B			D	A
Approach Delay		20.1			0.3			15.4			32.7	
Approach LOS		C			A			B			C	
Queue Length 50th (m)	40.4	0.0			0.0		52.1	73.2			166.0	0.0
Queue Length 95th (m)	65.0	0.0			0.0		90.4	98.3			219.3	17.0
Internal Link Dist (m)		386.4			412.8			139.1			580.6	
Turn Bay Length (m)	225.0						173.0					289.0
Base Capacity (vph)	248	688			233		585	1208			800	803
Starvation Cap Reductn	0	0			0		0	0			0	0
Spillback Cap Reductn	0	0			0		0	0			0	0
Storage Cap Reductn	0	0			0		0	0			0	0
Reduced v/c Ratio	0.56	0.57			0.02		0.65	0.49			0.78	0.33

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 22.8		Intersection LOS: C	
Intersection Capacity Utilization 150.3%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 2: Highway 10 & Eco Park/Side Road 240

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	0	129	2	0	2	191	1065	2	2	986	51
Future Volume (vph)	62	0	129	2	0	2	191	1065	2	2	986	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1694	0	1770	1863	0	1770	1863	1583
Flt Permitted	0.500				0.976		0.052			0.098		
Satd. Flow (perm)	931	1583	0	0	1694	0	97	1863	0	183	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		343			126							116
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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
Adj. Flow (vph)	67	0	140	2	0	2	208	1158	2	2	1072	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	140	0	0	4	0	208	1160	0	2	1072	55
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	
Permitted Phases	4			7			6			2		2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	20.6	20.6		7.0	7.0		21.0	70.1		70.1	70.1	70.1
Minimum Split (s)	27.1	27.1		13.5	13.5		27.0	78.0		78.5	78.5	78.5
Total Split (s)	31.0	31.0		13.5	13.5		27.0	105.5		78.5	78.5	78.5
Total Split (%)	20.7%	20.7%		9.0%	9.0%		18.0%	70.3%		52.3%	52.3%	52.3%
Maximum Green (s)	24.5	24.5		7.0	7.0		21.1	97.6		70.6	70.6	70.6
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9		7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										42.2	42.2	42.2
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	21.3	21.3			7.0		99.8	97.8		70.8	70.8	70.8
Actuated g/C Ratio	0.16	0.16			0.05		0.73	0.72		0.52	0.52	0.52
v/c Ratio	0.46	0.26			0.02		0.63	0.87		0.02	1.11	0.06
Control Delay	64.6	1.2			0.2		41.7	23.8		19.5	94.1	0.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	64.6	1.2			0.2		41.7	23.8		19.5	94.1	0.1
LOS	E	A			A		D	C		B	F	A
Approach Delay		21.7			0.3			26.5			89.4	
Approach LOS		C			A			C			F	
Queue Length 50th (m)	17.0	0.0			0.0		36.1	198.4		0.3	~328.9	0.0
Queue Length 95th (m)	36.6	0.0			0.0		74.9	#442.4		2.1	#493.0	0.0
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	168	567			206		331	1341		95	970	879
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.40	0.25			0.02		0.63	0.87		0.02	1.11	0.06

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 135.9			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.11			
Intersection Signal Delay: 52.3		Intersection LOS: D	
Intersection Capacity Utilization 152.6%		ICU Level of Service H	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			

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

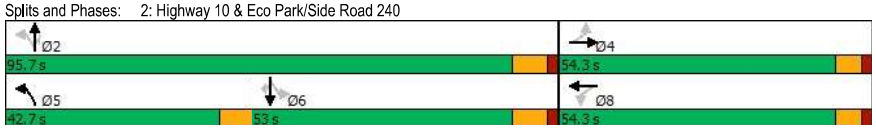
Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	560	0	469	1	0	0	432	696	0	0	638	346
Future Volume (vph)	560	0	469	1	0	0	432	696	0	0	638	346
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	225.0		0.0	0.0		0.0	173.0		15.0	15.0		289.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850										0.850
Flt Protected	0.950				0.950		0.950					
Satd. Flow (prot)	1770	1538	0	0	1805	0	1770	1827	1900	1900	1776	1553
Flt Permitted	0.757				0.138		0.078					
Satd. Flow (perm)	1410	1538	0	0	262	0	145	1827	1900	1900	1776	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		517										376
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		410.4			436.8			163.1			604.6	
Travel Time (s)		29.5			19.7			7.3			27.2	
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 (%)	2%	2%	5%	0%	2%	0%	2%	4%	0%	0%	7%	4%
Adj. Flow (vph)	609	0	510	1	0	0	470	757	0	0	693	376
Shared Lane Traffic (%)												
Lane Group Flow (vph)	609	510	0	0	1	0	470	757	0	0	693	376
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	100		100	25		15	100		15	25		100
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	37.8	37.8		7.0	7.0		36.8	45.1	45.1	45.1	45.1	45.1
Minimum Split (s)	54.3	54.3		54.3	54.3		42.7	53.0	53.0	53.0	53.0	53.0
Total Split (s)	54.3	54.3		54.3	54.3		42.7	95.7	95.7	53.0	53.0	53.0
Total Split (%)	36.2%	36.2%		36.2%	36.2%		28.5%	63.8%	63.8%	35.3%	35.3%	35.3%
Maximum Green (s)	47.8	47.8		47.8	47.8		36.8	87.8	87.8	45.1	45.1	45.1
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9	5.9	5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9	7.9	7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	4.2	4.2		4.2	4.2		4.2	4.2	4.2	4.2	4.2	4.2
Recall Mode	None	None		None	None		None	None	None	None	None	None
Act Effct Green (s)	47.8	47.8			47.8		89.8	87.8			45.1	45.1
Actuated g/C Ratio	0.32	0.32			0.32		0.60	0.59			0.30	0.30
v/c Ratio	1.36	0.61			0.01		0.97	0.71			1.30	0.52
Control Delay	213.8	6.1			36.0		78.0	26.6			190.0	6.3
Queue Delay	0.0	0.0			0.0		0.0	0.0			0.0	0.0
Total Delay	213.8	6.1			36.0		78.0	26.6			190.0	6.3
LOS	F	A			D		E	C			F	A
Approach Delay		119.1			36.0			46.3			125.4	
Approach LOS		F			D			D			F	
Queue Length 50th (m)	~249.5	0.0			0.2		129.3	161.6			~276.5	0.0
Queue Length 95th (m)	#326.1	26.7			1.8		#203.3	212.7			#355.7	25.6
Internal Link Dist (m)		386.4			412.8			139.1			580.6	
Turn Bay Length (m)	225.0						173.0					289.0
Base Capacity (vph)	449	842			83		485	1069			533	729
Starvation Cap Reductn	0	0			0		0	0			0	0
Spillback Cap Reductn	0	0			0		0	0			0	0
Storage Cap Reductn	0	0			0		0	0			0	0
Reduced v/c Ratio	1.36	0.61			0.01		0.97	0.71			1.30	0.52

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.36			
Intersection Signal Delay: 94.9		Intersection LOS: F	
Intersection Capacity Utilization 125.3%		ICU Level of Service H	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 2: Highway 10 & Eco Park/Side Road 240



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	0	167	3	0	3	83	871	3	1	1209	62
Future Volume (vph)	81	0	167	3	0	3	83	871	3	1	1209	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0		0.0	0.0		0.0	130.0		0.0	85.0		115.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.932							0.850
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1770	1583	0	0	1694	0	1770	1863	0	1770	1863	1583
Flt Permitted	0.500				0.976		0.052			0.254		
Satd. Flow (perm)	931	1583	0	0	1694	0	97	1863	0	473	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		322			126							116
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		340.5			205.8			657.5			373.7	
Travel Time (s)		24.5			14.8			47.3			26.9	
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
Adj. Flow (vph)	88	0	182	3	0	3	90	947	3	1	1314	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	182	0	0	6	0	90	950	0	1	1314	67
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		custom	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4		7	7		1	6			2	
Permitted Phases	4			7			6			2		2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		7	7		1	6		2	2	2
Switch Phase												
Minimum Initial (s)	20.6	20.6		7.0	7.0		21.0	70.1		70.1	70.1	70.1
Minimum Split (s)	27.1	27.1		13.5	13.5		27.0	78.0		78.5	78.5	78.5
Total Split (s)	31.0	31.0		13.5	13.5		27.0	105.5		78.5	78.5	78.5
Total Split (%)	20.7%	20.7%		9.0%	9.0%		18.0%	70.3%		52.3%	52.3%	52.3%
Maximum Green (s)	24.5	24.5		7.0	7.0		21.1	97.6		70.6	70.6	70.6
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9		7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)										42.2	42.2	42.2
Flash Dont Walk (s)										28.4	28.4	28.4
Pedestrian Calls (#/hr)										0	0	0
Act Effct Green (s)	21.5	21.5			7.0		99.8	97.8		70.8	70.8	70.8
Actuated g/C Ratio	0.16	0.16			0.05		0.73	0.72		0.52	0.52	0.52
v/c Ratio	0.60	0.35			0.03		0.27	0.71		0.00	1.36	0.08
Control Delay	72.5	1.8			0.3		15.9	15.9		19.0	196.6	0.3
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	72.5	1.8			0.3		15.9	15.9		19.0	196.6	0.3
LOS	E	A			A		B	B		B	F	A
Approach Delay		24.9			0.3			15.9			187.0	
Approach LOS		C			A			B			F	
Queue Length 50th (m)	22.9	0.0			0.0		5.7	125.3		0.1	~467.2	0.0
Queue Length 95th (m)	46.8	0.0			0.0		26.0	263.9		1.3	#653.0	0.7
Internal Link Dist (m)		316.5			181.8			633.5			349.7	
Turn Bay Length (m)	35.0						130.0			85.0		115.0
Base Capacity (vph)	168	549			206		331	1339		246	968	878
Starvation Cap Reductn	0	0			0		0	0		0	0	0
Spillback Cap Reductn	0	0			0		0	0		0	0	0
Storage Cap Reductn	0	0			0		0	0		0	0	0
Reduced v/c Ratio	0.52	0.33			0.03		0.27	0.71		0.00	1.36	0.08

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 136.1			
Natural Cycle: 150			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.36			
Intersection Signal Delay: 104.4		Intersection LOS: F	
Intersection Capacity Utilization 98.7%		ICU Level of Service F	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			

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

Splits and Phases: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	650	0	503	0	0	1	486	775	1	4	735	478
Future Volume (vph)	650	0	503	0	0	1	486	775	1	4	735	478
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	225.0		0.0	0.0		0.0	173.0		15.0	15.0		289.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
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		0.850			0.865				0.850			0.850
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1770	1553	0	0	1644	0	1770	1881	1615	1805	1863	1553
Flt Permitted	0.757						0.082			0.298		
Satd. Flow (perm)	1410	1553	0	0	1644	0	153	1881	1615	566	1863	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		518			155				25			520
Link Speed (k/h)		50			80			80			80	
Link Distance (m)		410.4			436.8			163.1			604.6	
Travel Time (s)		29.5			19.7			7.3			27.2	
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 (%)	2%	2%	4%	0%	0%	0%	2%	1%	0%	0%	2%	4%
Adj. Flow (vph)	707	0	547	0	0	1	528	842	1	4	799	520
Shared Lane Traffic (%)												
Lane Group Flow (vph)	707	547	0	0	1	0	528	842	1	4	799	520
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	100		100	25		15	100		15	25		100
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA			NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4			8		5	2			6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	37.8	37.8		7.0	7.0		36.8	42.6	42.6	42.6	42.6	42.6
Minimum Split (s)	56.8	56.8		56.8	56.8		42.7	50.5	50.5	50.5	50.5	50.5
Total Split (s)	56.8	56.8		56.8	56.8		42.7	93.2	93.2	50.5	50.5	50.5
Total Split (%)	37.9%	37.9%		37.9%	37.9%		28.5%	62.1%	62.1%	33.7%	33.7%	33.7%
Maximum Green (s)	50.3	50.3		50.3	50.3		36.8	85.3	85.3	42.6	42.6	42.6
Yellow Time (s)	4.5	4.5		4.5	4.5		5.9	5.9	5.9	5.9	5.9	5.9
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5			6.5		5.9	7.9	7.9	7.9	7.9	7.9
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	4.2	4.2		4.2	4.2		4.2	4.2	4.2	4.2	4.2	4.2
Recall Mode	None	None		None	None		None	None	None	None	None	None
Act Effct Green (s)	50.3	50.3			50.3		87.3	85.3	85.3	42.6	42.6	42.6
Actuated g/C Ratio	0.34	0.34			0.34		0.58	0.57	0.57	0.28	0.28	0.28
v/c Ratio	1.50	0.63			0.00		1.09	0.79	0.00	0.03	1.51	0.64
Control Delay	270.5	7.6			0.0		109.3	32.0	0.0	39.8	276.3	7.2
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	270.5	7.6			0.0		109.3	32.0	0.0	39.8	276.3	7.2
LOS	F	A			A		F	C	A	D	F	A
Approach Delay		155.8						61.7			169.8	
Approach LOS		F						E			F	
Queue Length 50th (m)	~305.5	6.2			0.0		~168.3	199.0	0.0	0.9	~346.9	0.0
Queue Length 95th (m)	#384.7	40.4			0.0		#243.3	260.2	0.0	4.2	#428.1	31.8
Internal Link Dist (m)		386.4			412.8			139.1			580.6	
Turn Bay Length (m)	225.0						173.0		15.0	15.0		289.0
Base Capacity (vph)	472	865			654		485	1069	929	160	529	813
Starvation Cap Reductn	0	0			0		0	0	0	0	0	0
Spillback Cap Reductn	0	0			0		0	0	0	0	0	0
Storage Cap Reductn	0	0			0		0	0	0	0	0	0
Reduced v/c Ratio	1.50	0.63			0.00		1.09	0.79	0.00	0.03	1.51	0.64

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Natural Cycle: 150
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 1.51
Intersection Signal Delay: 127.8 Intersection LOS: F
Intersection Capacity Utilization 137.6% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Highway 10 & Eco Park/Side Road 240

Intersection: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Movement	EB	EB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	LTR	L	TR	L	T	R
Maximum Queue (m)	19.2	25.6	9.0	43.8	107.5	7.1	97.4	13.1
Average Queue (m)	8.0	10.7	1.2	11.1	49.1	0.5	47.5	4.0
95th Queue (m)	16.6	21.6	6.0	30.3	90.5	3.7	83.4	11.9
Link Distance (m)		326.2	195.4		638.8		363.2	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)	35.0			130.0		85.0		115.0
Storage Blk Time (%)		0			0		1	
Queuing Penalty (veh)		0			0		0	

Intersection: 2: Highway 10 & Side Road 240

Movement	WB
Directions Served	LR
Maximum Queue (m)	8.3
Average Queue (m)	0.8
95th Queue (m)	4.7
Link Distance (m)	424.4
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Movement	EB	EB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	LTR	L	TR	L	T	R
Maximum Queue (m)	25.1	28.0	10.3	65.8	148.2	8.9	266.0	102.3
Average Queue (m)	10.5	9.0	1.4	23.9	60.5	0.7	118.9	21.4
95th Queue (m)	21.3	20.3	6.9	51.6	115.1	4.5	251.4	90.7
Link Distance (m)		326.2	195.4		638.8		363.2	
Upstream Blk Time (%)							0	
Queuing Penalty (veh)							0	
Storage Bay Dist (m)	35.0			130.0		85.0		115.0
Storage Blk Time (%)	0	0			0		16	0
Queuing Penalty (veh)	0	0			1		9	0

Intersection: 2: Highway 10 & Side Road 240

Movement	WB
Directions Served	LR
Maximum Queue (m)	4.1
Average Queue (m)	0.4
95th Queue (m)	2.5
Link Distance (m)	424.4
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 9

Intersection: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Movement	EB	EB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	LTR	L	TR	L	T	R
Maximum Queue (m)	33.4	37.3	11.4	93.8	228.6	7.1	289.3	122.4
Average Queue (m)	13.9	13.5	1.7	19.5	96.5	0.4	175.4	23.0
95th Queue (m)	28.0	27.9	7.5	63.6	185.6	3.3	346.6	91.2
Link Distance (m)		326.2	195.4		638.8		363.2	
Upstream Blk Time (%)							8	
Queuing Penalty (veh)							0	
Storage Bay Dist (m)	35.0			130.0		85.0		115.0
Storage Blk Time (%)	0	0			4		25	0
Queuing Penalty (veh)	0	0			3		16	0

Intersection: 2: Highway 10 & Side Road 240

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	3.8	127.4
Average Queue (m)	0.2	9.4
95th Queue (m)	2.0	66.2
Link Distance (m)	424.4	589.5
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 20

Intersection: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Movement	EB	EB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	LTR	L	TR	L	T	R
Maximum Queue (m)	34.4	38.4	8.9	28.7	94.1	10.1	160.0	55.8
Average Queue (m)	12.2	14.0	1.3	11.0	38.3	0.5	68.1	5.1
95th Queue (m)	25.8	29.3	6.0	22.8	78.6	4.3	130.2	28.4
Link Distance (m)		326.2	195.4		638.8		363.2	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)	35.0			130.0		85.0		115.0
Storage Blk Time (%)	0	1					5	0
Queuing Penalty (veh)	0	0					2	0

Intersection: 2: Highway 10 & Eco Park/Side Road 240

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	TR	LTR	L	T	T	R
Maximum Queue (m)	68.8	104.6	10.2	111.6	108.6	167.5	54.5
Average Queue (m)	34.4	49.3	0.6	51.2	43.8	101.8	21.7
95th Queue (m)	60.6	87.3	4.6	91.1	84.6	157.7	42.7
Link Distance (m)		396.1	422.9		144.5	585.8	
Upstream Blk Time (%)				0	0		
Queuing Penalty (veh)				0	0		
Storage Bay Dist (m)	225.0			173.0			289.0
Storage Blk Time (%)				0	17	47	
Queuing Penalty (veh)				0	61	112	

Network Summary

Network wide Queuing Penalty: 176

Intersection: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Movement	EB	EB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	LTR	L	TR	L	T	R
Maximum Queue (m)	36.2	46.5	10.3	136.4	173.9	23.8	376.4	122.5
Average Queue (m)	14.6	19.1	1.4	38.9	91.0	1.6	352.5	33.2
95th Queue (m)	30.5	37.9	6.7	85.2	163.5	19.2	426.0	116.0
Link Distance (m)		326.2	195.4		638.8		363.2	
Upstream Blk Time (%)							44	
Queuing Penalty (veh)							0	
Storage Bay Dist (m)	35.0			130.0		85.0		115.0
Storage Blk Time (%)	0	2			2		49	0
Queuing Penalty (veh)	0	1			4		26	1

Intersection: 2: Highway 10 & Eco Park/Side Road 240

Movement	EB	EB	WB	NB	NB	B5	B8	SB	SB	B6
Directions Served	L	TR	LTR	L	T	T	T	T	R	T
Maximum Queue (m)	232.5	411.6	2.5	141.6	164.3	190.8	4.6	616.0	296.5	635.5
Average Queue (m)	229.4	382.5	0.1	102.0	111.3	40.5	0.6	528.5	243.5	266.7
95th Queue (m)	249.7	489.7	1.1	152.8	181.7	188.8	5.9	752.3	414.5	674.6
Link Distance (m)		396.1	422.9		144.5	358.3	6.8	585.8		638.8
Upstream Blk Time (%)		47		1	9	1	1	38		0
Queuing Penalty (veh)		0		0	0	0	0	427		3
Storage Bay Dist (m)	225.0			173.0					289.0	
Storage Blk Time (%)	30	34		1	35			69	0	
Queuing Penalty (veh)	139	188		6	150			240	2	

Network Summary

Network wide Queuing Penalty: 1187

Queuing and Blocking Report
10-22-2024

Intersection: 1: Highway 10 & Milliner Avenue/Farmstead Entrance

Movement	EB	EB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	LTR	L	TR	L	T	R
Maximum Queue (m)	42.2	68.3	10.3	36.1	118.9	1.8	379.7	122.5
Average Queue (m)	19.6	27.6	2.0	15.0	65.3	0.1	369.3	41.9
95th Queue (m)	38.9	52.5	8.2	28.7	112.0	1.4	377.9	134.3
Link Distance (m)		326.2	195.4		638.8		363.2	
Upstream Blk Time (%)							65	
Queuing Penalty (veh)							0	
Storage Bay Dist (m)	35.0			130.0		85.0		115.0
Storage Blk Time (%)	1	6			0		57	0
Queuing Penalty (veh)	2	5			0		36	0

Intersection: 2: Highway 10 & Eco Park/Side Road 240

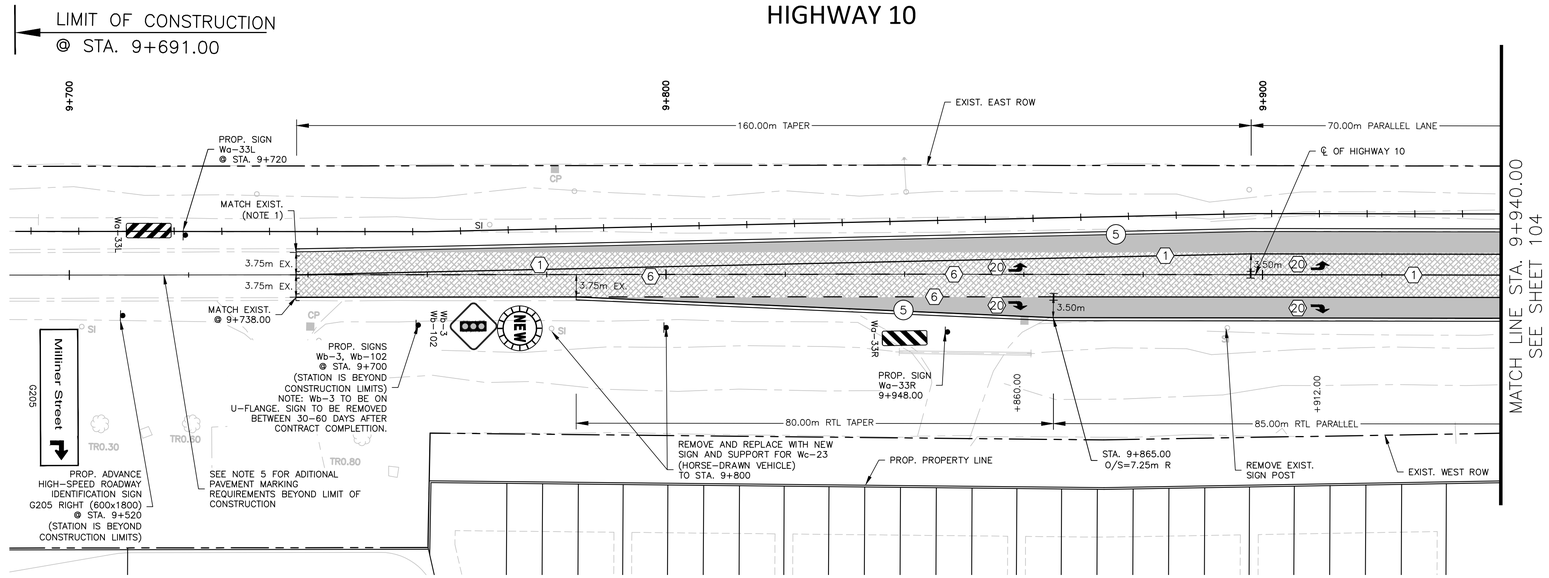
Movement	EB	EB	WB	NB	NB	NB	B5	B8	SB	SB	SB	B6
Directions Served	L	TR	LTR	L	T	R	T	T	L	T	R	T
Maximum Queue (m)	232.5	411.2	1.6	144.5	171.0	4.5	385.2	15.4	15.6	616.6	296.5	641.2
Average Queue (m)	230.7	398.4	0.1	136.0	155.4	0.1	249.1	5.4	0.8	570.8	270.0	427.4
95th Queue (m)	244.8	432.2	0.8	164.4	197.3	3.2	507.7	14.7	6.3	732.1	396.0	853.6
Link Distance (m)		396.1	422.9		144.5		358.3	6.8		585.8		638.8
Upstream Blk Time (%)		50		6	26		24	13		50		2
Queuing Penalty (veh)		0		0	0		0	0		685		28
Storage Bay Dist (m)	225.0			173.0		15.0			15.0		289.0	
Storage Blk Time (%)	33	31		6	40				0	71	0	
Queuing Penalty (veh)	164	201		48	194				0	342	3	

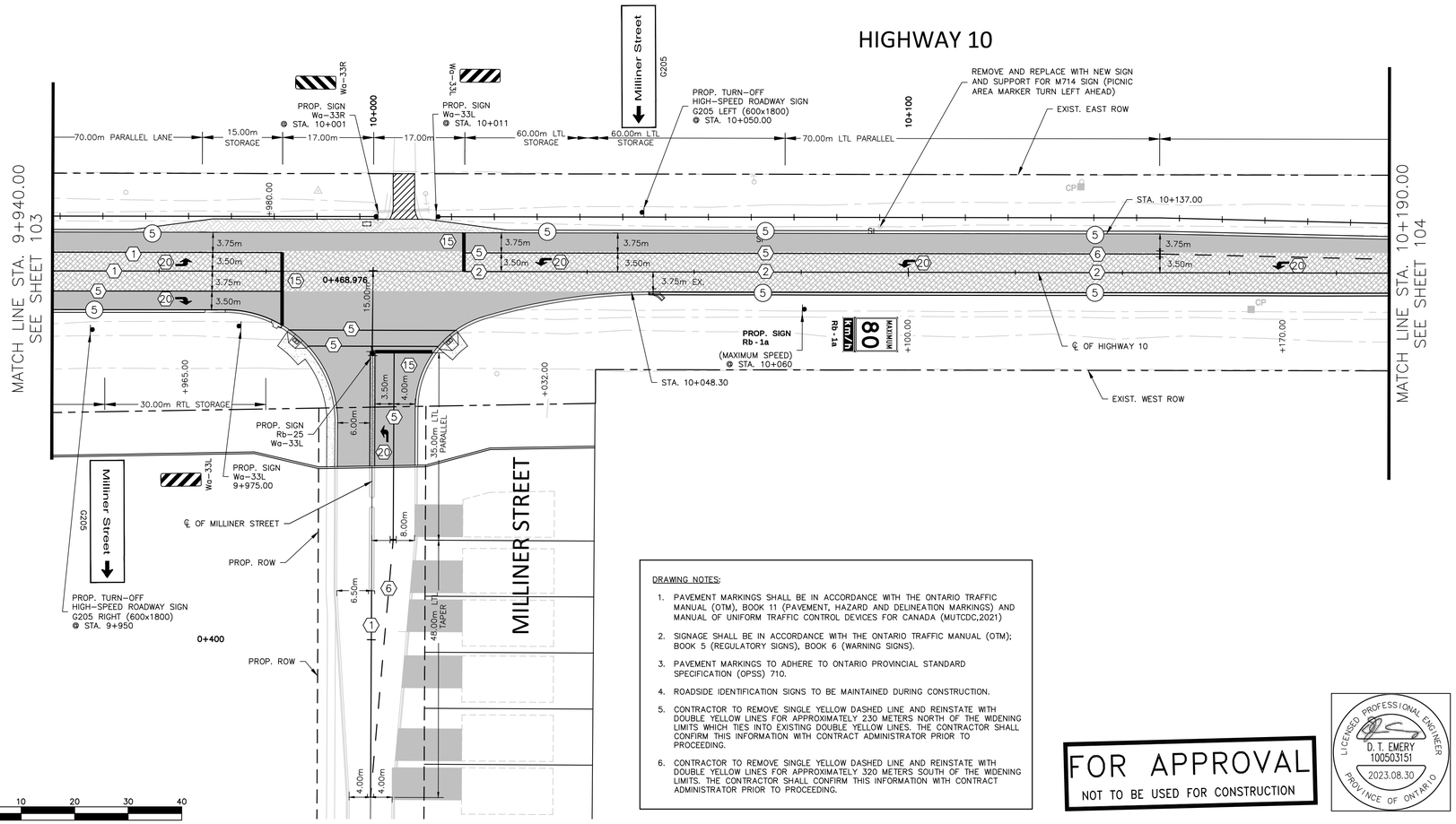
Network Summary

Network wide Queuing Penalty: 1709

Appendix F

Intersection Design Drawings (Crozier, 2023)





10 0m 10 20 30 40
SCALE: 1:500

DRAWING NOTES:

1. PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE ONTARIO TRAFFIC MANUAL (OTM), BOOK 11 (PAVEMENT, HAZARD AND DELINEATION MARKINGS) AND MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR CANADA (MUTCDC,2021)
2. SIGNAGE SHALL BE IN ACCORDANCE WITH THE ONTARIO TRAFFIC MANUAL (OTM); BOOK 5 (REGULATORY SIGNS), BOOK 6 (WARNING SIGNS).
3. PAVEMENT MARKINGS TO ADHERE TO ONTARIO PROVINCIAL STANDARD SPECIFICATION (OPSS) 710.
4. ROADSIDE IDENTIFICATION SIGNS TO BE MAINTAINED DURING CONSTRUCTION.
5. CONTRACTOR TO REMOVE SINGLE YELLOW DASHED LINE AND REINSTATE WITH DOUBLE YELLOW LINES FOR APPROXIMATELY 230 METERS NORTH OF THE WIDENING LIMITS WHICH TIES INTO EXISTING DOUBLE YELLOW LINES. THE CONTRACTOR SHALL CONFIRM THIS INFORMATION WITH CONTRACT ADMINISTRATOR PRIOR TO PROCEEDING.
6. CONTRACTOR TO REMOVE SINGLE YELLOW DASHED LINE AND REINSTATE WITH DOUBLE YELLOW LINES FOR APPROXIMATELY 320 METERS SOUTH OF THE WIDENING LIMITS. THE CONTRACTOR SHALL CONFIRM THIS INFORMATION WITH CONTRACT ADMINISTRATOR PRIOR TO PROCEEDING.

FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

LICENSED PROFESSIONAL ENGINEER
D. T. EMERY
100503151
2023.08.30
PROVINCE OF ONTARIO

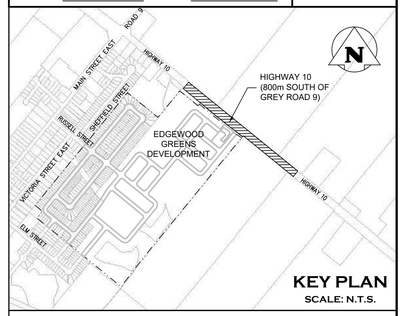
LICENSED PROFESSIONAL ENGINEER
R. MACLAUGHLAN
100201141
AUG 30 2023
PROVINCE OF ONTARIO

Ontario Ministry of Transportation

CONT –
WP –

PAVEMENT MARKING AND SIGANGE
STA 9+690.00 TO 10+190.00
Survey Revised

SHEET 111



KEY PLAN
SCALE: N.T.S.

LEGEND

- EXISTING ROW
- PROPOSED ROW
- PROPOSED PROPERTY LINE
- NEW ASPHALT PAVEMENT
- ASPHALT RESURFACING
- PROPOSED TRAFFIC SIGN

1	SOLID YELLOW,10cm
2	SOLID DOUBLE YELLOW,10cm
3	3\3 BROKEN YELLOW,10cm
4	SOLID YELLOW,20cm
5	SOLID WHITE,10cm
6	3\3 BROKEN WHITE,10cm
7	3\9 BROKEN WHITE,10cm
8	9\3 BROKEN WHITE,10cm
9	SOLID WHITE,20cm
10	1\1 BROKEN WHITE,20cm
11	3\3 BROKEN WHITE,20cm
12	3\3 BROKEN WHITE,30cm
13	SOLID WHITE,30cm
14	SOLID WHITE,45cm
15	SOLID WHITE,60cm
20	SYMBOLS
] [	LIMITS OF MARKINGS

NOTES:

1. 3\3, 3\9, 9\3, Denotes Pavement Marking Spacing (ie., 3 m line, 3 m gap, 3 m line)
2. Use (1) to Denote PAVEMENT MARKING
3. Use [1] to Denote PAVEMENT MARKING, TEMPORARY
4. Use △ to Denote PAVEMENT MARKING, TEMPORARY-REMOVABLE
5. Use (1) to Denote PAVEMENT MARKING, DURABLE

MINISTRY OF TRANSPORTATION ONTARIO DRAWING | Date 1994 04 01 | Rev

LEGEND
PAVEMENT MARKINGS

Issue Date
WP
Issued By
MTOD – 101.070

PROJECT No.: 1060-5771

CROZIER
CONSULTING ENGINEERS

REVISIONS	DATE	BY	DESCRIPTION
	2023.08.30	R.M.	ISSUED FOR MTO APPROVAL
	2023.04.27	R.M.	ISSUED FOR 90% DESIGN REVIEW
	2021.12.13	R.M.	ISSUED FOR 60% DESIGN REVIEW
	2020.09.25	R.M.	ISSUED FOR 30% DESIGN REVIEW

DESIGN	I.Z.	CHK	S.S.	CODE	DATE
DRAWN	I.Z.	CHK	R.M.	SITE	DWG

FILE NAME: J:\1060\1060-Flato Dev\5771-Dundalk Ph.11\CAD\Transportation_Base\5771-PM.dwg
MODIFIED: 2023-08-28 14:17

Appendix G

Growth Rate Analysis

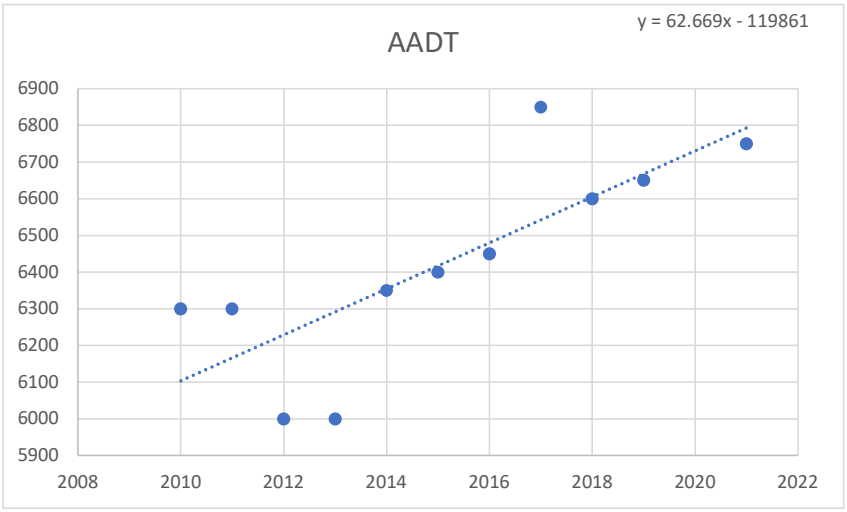
MTO Data - Highway 10 between Shelburn and Flesherton

Year	AADT
2010	6300
2011	6300
2012	6000
2013	6000
2014	6350
2015	6400
2016	6450
2017	6850
2018	6600
2019	6650
2021	6750

Growth Rate 2011-2021 0.69%

Trendline AADT

2011	6207
2021	6768
Growth Rate	0.87%



Appendix H

Background Development Traffic Impact Study Excerpts

TRAFFIC IMPACT STUDY UPDATE

EDGEWOOD GREENS
TOWNSHIP OF SOUTHGATE

PREPARED FOR:
FLATO DEVELOPMENTS INC.

PREPARED BY:

C.F. CROZIER & ASSOCIATES INC.
1 FIRST STREET, SUITE 200
COLLINGWOOD, ONTARIO
L9Y A1A

ORIGINAL – DECEMBER 2015
UPDATE – SEPTEMBER 2023

CFCA FILE NO. 1060-5384

CROZIER
CONSULTING ENGINEERS

Relevant excerpts from the ITE Trip Generation Manual, 11th Edition have been included in **Appendix H**. The forecasted trip generation of the mixed-use development is summarized in **Table 13**.

Table 13: Trip Generation

Land Use	Units/GFA	Peak Hour	Trip Type	Trips Generated		
				Inbound	Outbound	Total
LUC 210: Single Family Detached Housing	272 Units	A.M.	Primary	48	137	185
		P.M.		160	95	255
LUC 220: Multifamily Housing (Low-Rise)	219 Units	A.M.	Primary	22	69	91
		P.M.		72	43	115
LUC 934: Fast Food Restaurant with Drive Through	4,888 ft²	A.M.	Primary	65	59	124
			Pass-by	64	59	123
		P.M.	Primary	57	55	112
			Pass-by	70	67	137
Total		**A.M.**	**Primary**	**135**	**265**	**400**
			Pass-by	**64**	**59**	**123**
		P.M.	**Primary**	**289**	**193**	**482**
			Pass-by	**70**	**67**	**137**

5.2 Trip Distribution and Assignment

5.2.1. Residential Trips

The trips generated by the proposed residential portion of the development were distributed to the boundary road network using the distribution described in the February 2021 TIS Update, which was completed using Transportation Tomorrow Survey (TTS) data. Excerpts from the February 2021 TIS as well as the TTS data have been included in **Appendix I.**

The following residential trip distribution was established:

- 50% to and from the south on Highway 10 via the Highway 10 Access
- 5% to and from the north on Highway 10 via the Highway 10 Access
- 5% to and from the east on Main Street via the Highway 10 Access
- 15% travelling to and from the west on Main Street via Elm Street and Osprey Street
- 15% to and from the west on Main Street via Russell Street
- 5% to and from the east on Main Street via Russell Street
- 5% to and from the north on Highway 10 via Russell Street

Figure 10 outlines the residential trip distribution for the development. The associated primary trip assignment is illustrated in **Figure 13**.

5.2.2. Commercial Primary Trips

The primary trips generated by the proposed McDonald's were distributed to the boundary road network based on the expected catchment areas in the community. The main catchment area is expected to be comprised of the surrounding residential dwellings in the urban area of the Community of Dundalk. Additionally, residents of Flesherton were also assumed to travel to this McDonald's. Less trips were assumed to travel to and form the south as the new McDonald's in Shelburne is expected to service residents in that area.

Based on the 2016 Statistics Canada Census, Dundalk had 816 private dwellings in 2016. The Edgewood Greens Development (Phases 1-11) consists of a total of 804 units. At the time of the 2016 census, the early phases of the Edgewood Greens development had not been constructed. Accordingly, the Edgewood Greens Development would represent approximately 50% of the private dwelling units in Dundalk. Acknowledging that 797 units are proposed within the Glenelg Subdivision (Phases 1-3), the Edgewood Greens development would represent about one third of the private dwellings in Dundalk. Accordingly, 30 percent of commercial trips were assumed to remain within Edgewood Greens. In addition, 50 percent of trips were distributed to the west on Main Street and Victoria Street via Russell Street and Elm Street, respectively. The remaining 20 percent of trips were distributed to north and south via Highway 10.

Figure 11 outlines the McDonald's primary trip distribution. The associated primary trip assignment is illustrated in **Figure 14**.

5.2.3. Commercial Pass-By Trips

The pass-by trips generated by the proposed McDonald's are expected to utilize the proposed site access to Highway 10. Existing turning movement counts were used to establish the pass-by trip distribution. In the weekday a.m. peak hour, 50 percent of trips were observed to be travelling to the north and south on Highway 10. In the weekday p.m. peak hour, 35 percent of trips were observed travelling south on Highway 10, with the remaining 65 percent travelling north on Highway 10. **Figure 12** outlines the pass-by trip distribution for the McDonald's and **Figure 15** outlines the corresponding pass-by trip assignment.

5.2.4. Existing Farmstead Driveway

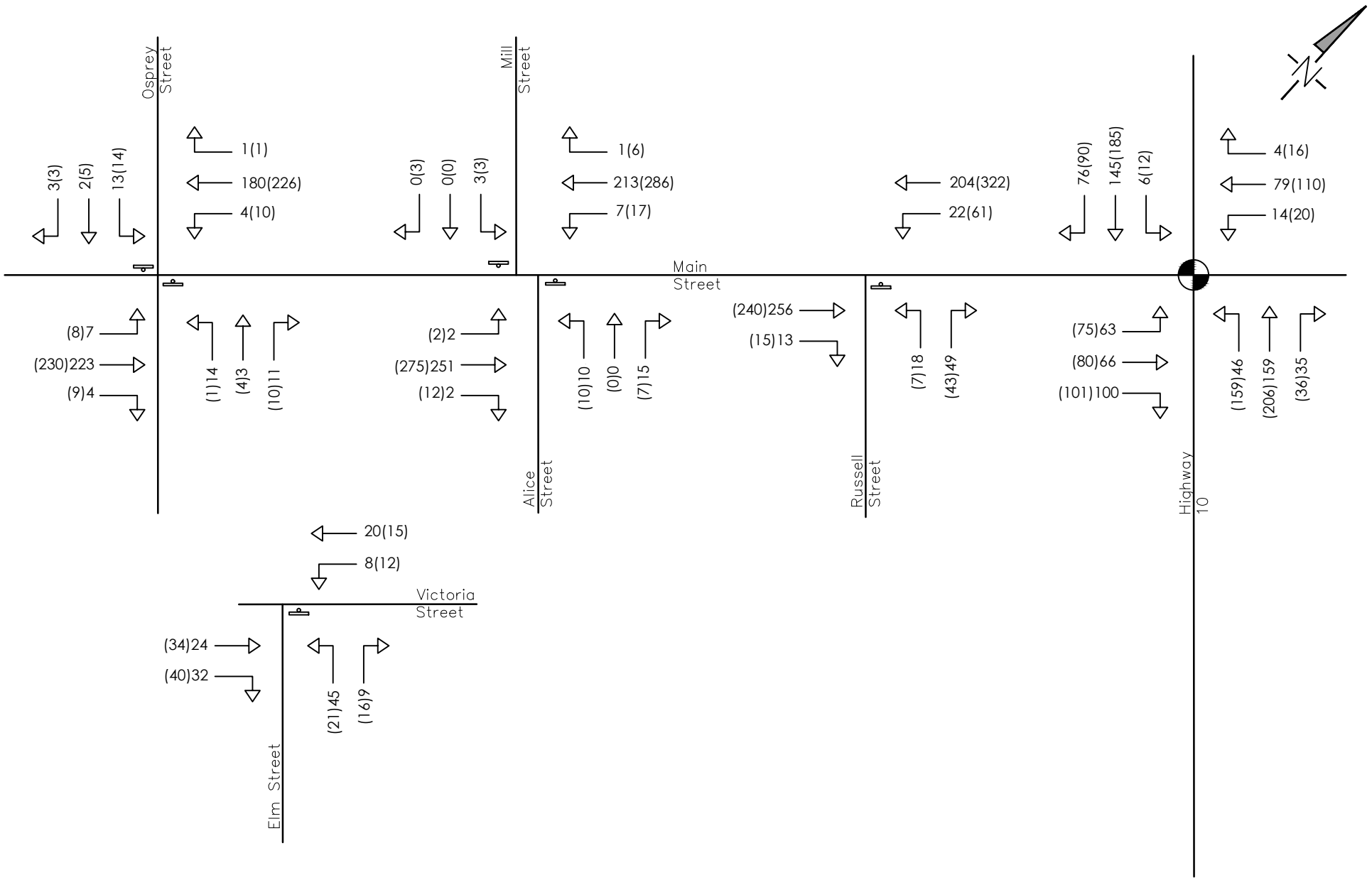
Milliner Avenue is proposed to be constructed opposite the existing farmstead driveway on the east side of Highway 10. To assess the future operations of the intersection, 2 trips have been added to the northbound right, southbound left, and westbound right and left-turning movements. This trip generation is higher than what would be expected for a single family/farmstead use and is therefore considered conservative.

5.3 Signal Warrant Analysis – Highway 10 and Milliner Avenue

A signal warrant analysis was undertaken for the intersection at Highway 10 and the proposed site access for the 2025, 2030 and 2035 horizon years. The analysis followed the procedures specified in Chapter 4 of the "Ontario Traffic Manual – Book 12", March 2012. Justifications 1 (Minimum Vehicular Volume), 2 (Delay to Cross Traffic), and 3 (Combination of Justifications 1 and 2), were selected as the most appropriate warrants with which to assess the site access.

Through the study area, Highway 10 has a rural cross-section and posted speed limit of 80 km/h. Accordingly, the analysis was completed for rural conditions.

The eight-hour traffic volumes collected at the intersection of Highway 10 and Main Street were used to establish the north and southbound volumes at the site access. The proportional distribution of the collected counts in relation to the a.m. and p.m. peak hour volumes was utilized to determine the future 8-hours volumes. The future total peak hour traffic volumes were proportionally distributed across the 8-hours based on the collected data. For example, the existing 6:00 to 7:00 a.m. weekday roadway volumes are 77% of the a.m. peak hour volumes so the future total volumes were factored by the same 77%. Similar to the peak hours, 2 inbound and 2 outbound trips in north and southbound directions were included for each of the eight-hours.



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) A.M. (P.M.) PEAK HOUR TRAFFIC VOLUMES

Project

Edgewood Greens
Dundalk, Township of Southgate

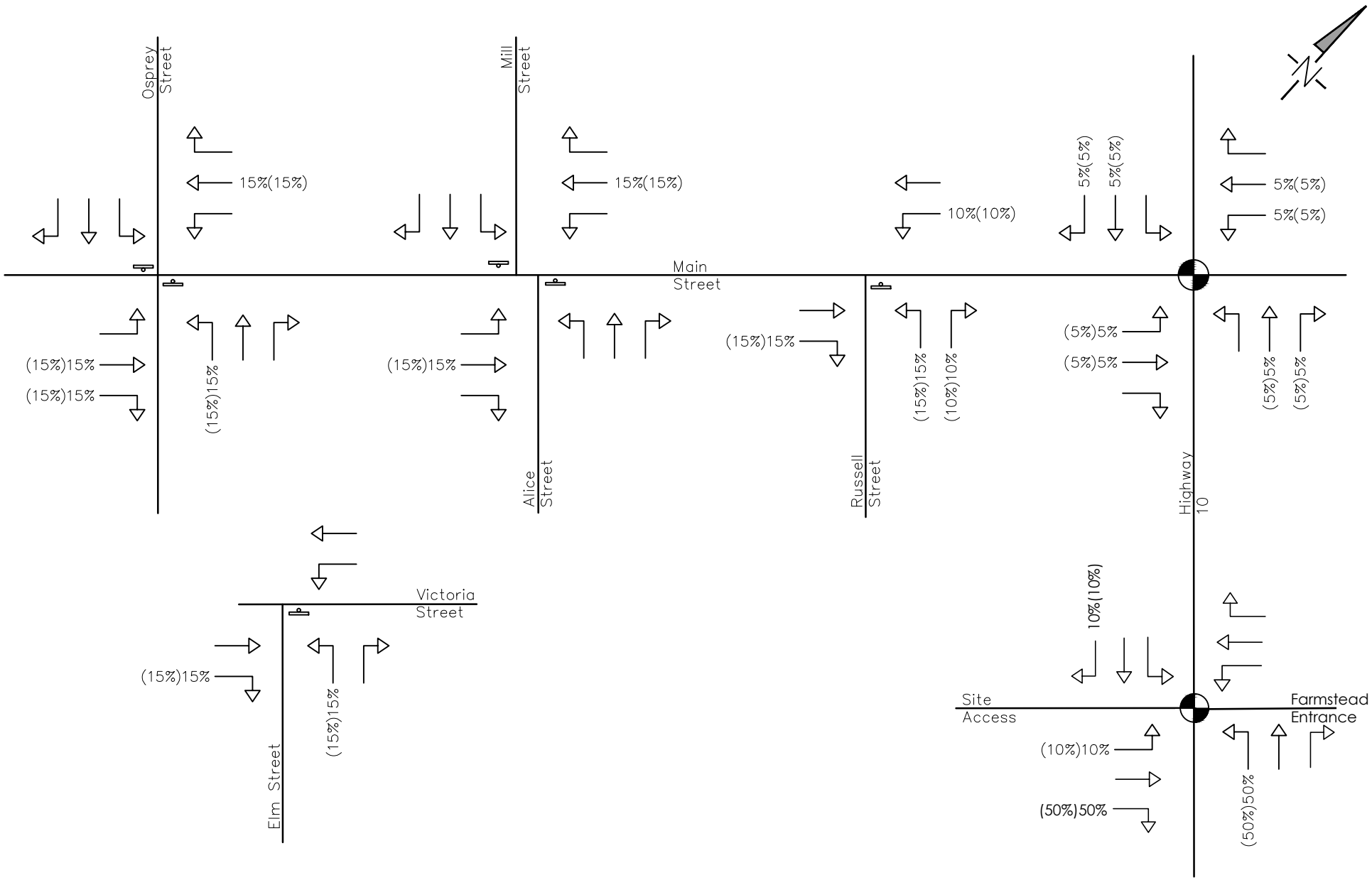
Drawing

2022 Existing Traffic Volumes

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON L9Y 1A1
705 446-3510 T
705 446-3520 F
WWW.CFCROZIER.CA

Drawn By	Design By	Project
S.K.	S.K.	1060-5384

Scale	Date	Check By	Drawing
N.T.S.	DEC. 16, 2022	M.F.	FIG. 5



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) A.M. (P.M.) PEAK HOUR TRAFFIC VOLUMES

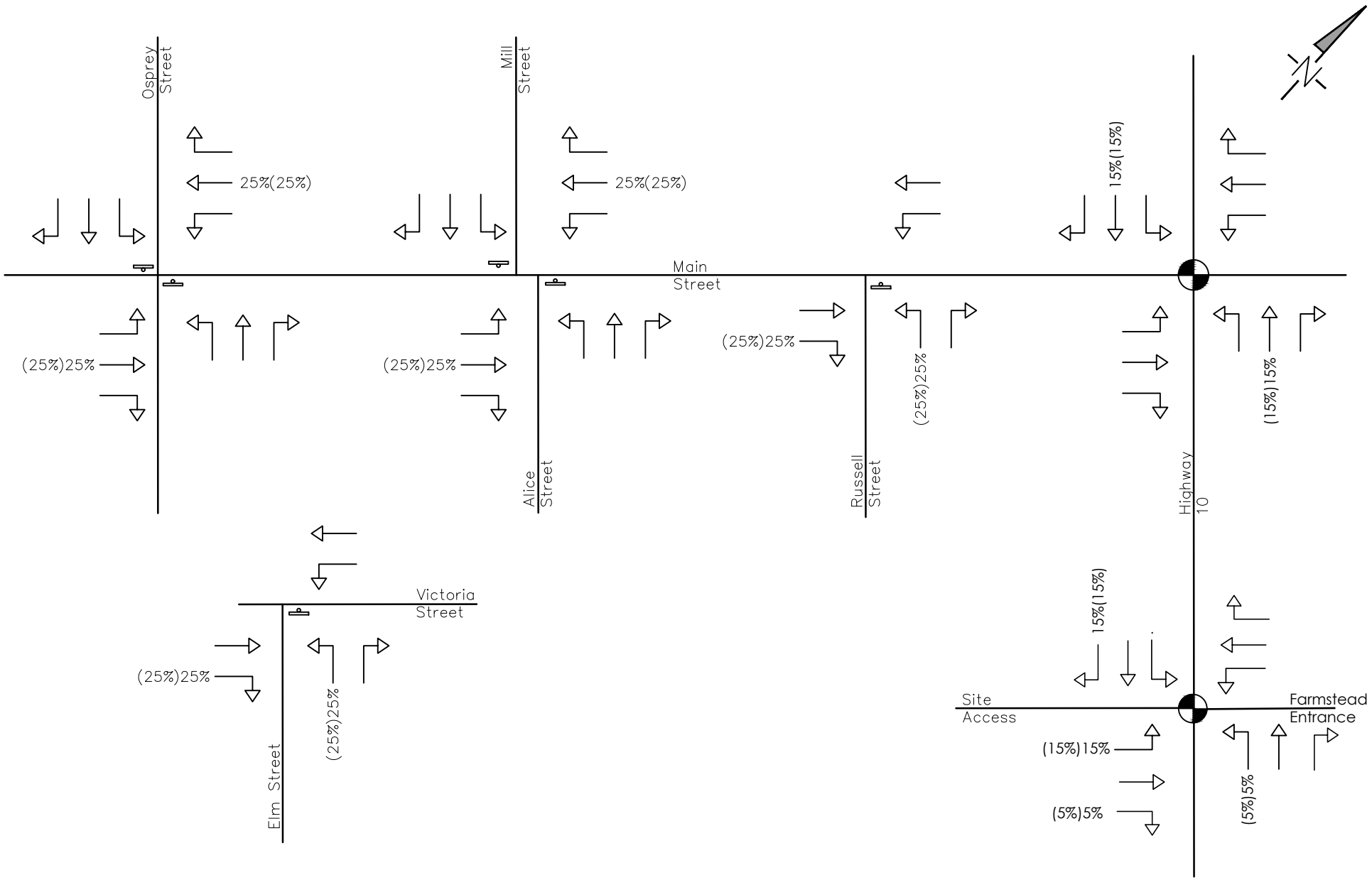
Project: Edgewood Greens
Dundalk, Township of Southgate

Drawing: Residential Trip Distribution

CROZIER CONSULTING ENGINEERS
The HarbourEdge Building,
40 Huron Street, Suite 301,
Collingwood, ON L9Y 4R3
705 446-3510 T
705 446-3520 F
www.cfcrozier.ca
info@cfcrozier.ca

Drawn By	Design By	Project
S.K.	S.K.	1060–5384

Scale	Date	Check By	Drawing
N.T.S.	AUG. 30, 2023	M.F.	FIG. 10



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) A.M. (P.M.) PEAK HOUR TRAFFIC VOLUMES

Project

Edgewood Greens
Dundalk, Township of Southgate

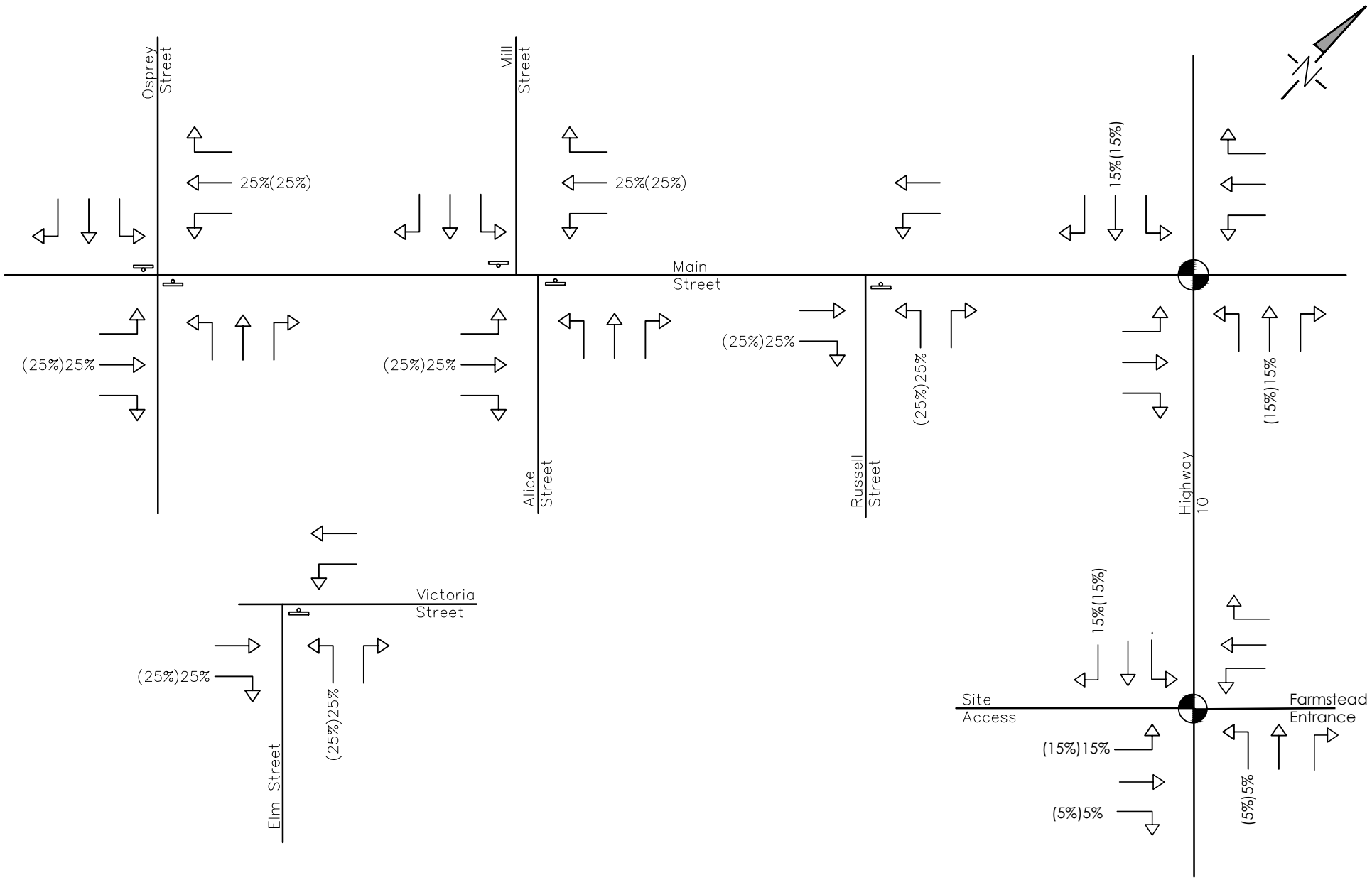
Drawing

Commercial Primary Trip Distribution

CROZIER CONSULTING ENGINEERS
The HarbourEdge Building,
40 Huron Street, Suite 301,
Collingwood, ON L9Y 4R3
705 446-3510 T
705 446-3520 F
www.cfcrozier.ca
info@cfcrozier.ca

Drawn By	Design By	Project
S.K.	S.K.	1060-5384

Scale	Date	Check By	Drawing
N.T.S.	AUG. 30, 2023	M.F.	FIG. 11



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL
- XX(YY) A.M. (P.M.) PEAK HOUR TRAFFIC VOLUMES

Project

Edgewood Greens
Dundalk, Township of Southgate

Drawing

Commercial Primary Trip Distribution

CROZIER CONSULTING ENGINEERS
The HarbourEdge Building,
40 Huron Street, Suite 301,
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705 446-3510 T
705 446-3520 F
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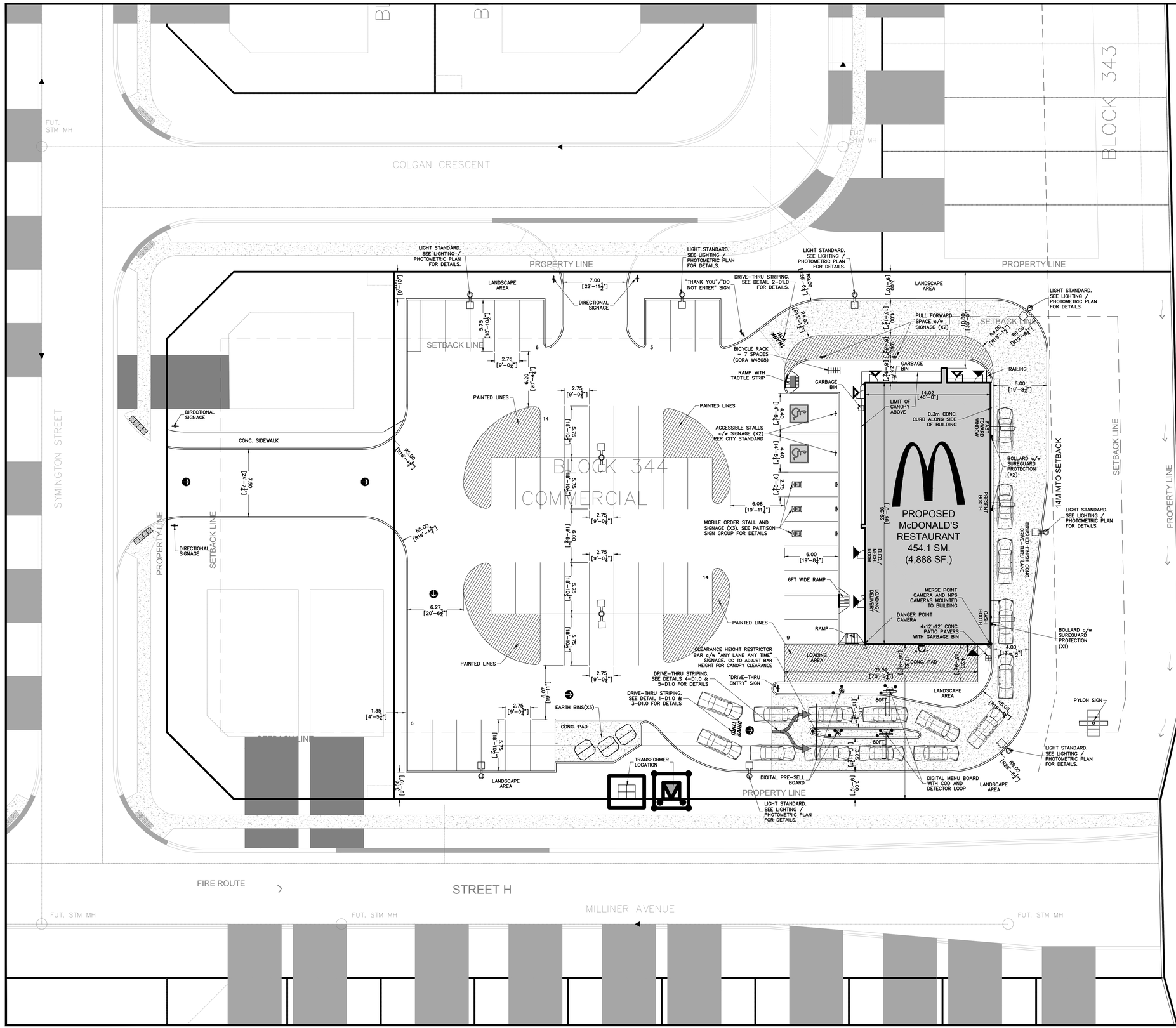
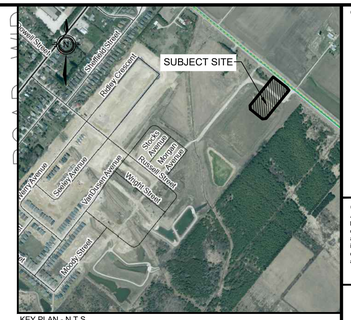
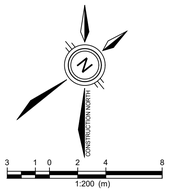
Drawn By	Design By	Project
S.K.	S.K.	1060-5384

Scale	Date	Check By	Drawing
N.T.S.	AUG. 30, 2023	M.F.	FIG. 11





KEY PLAN - N.T.S.



DETAILS OF DEVELOPMENT

DATA		REQUIRED	PROPOSED
ZONING	C1-465		
SETBACK	FY (FROM C/L OF ROAD)	32.0 m	>32.0 m
	RY	10.0 m	>10.0 m
	SY (WEST)	3.0 m	10.8 m
	SY (EAST)	3.0 m	17.32 m
LOT AREA			
RESTAURANT AREA		454.1 SM	
SEATS		90	
LOT COVERAGE		6.7%	
# OF LOADING SPACES		1	
LANDSCAPE AREA		-	
DT STACKING		15	
PARKING REQUIRED		33	
PARKING PROVIDED		44	

NOTES

- ALL SITE FEATURES ARE EXISTING UNLESS OTHERWISE NOTED.
- THESE DRAWINGS ARE COMPILED FROM INFORMATION SUPPLIED BY McDONALD'S AND SHALL BE SITE VERIFIED BY CONTRACTOR AT BID TIME.
- GC. TO COORDINATE AND PROVIDE SERVICING LOCATES TO IBI GROUP PRIOR TO CONSTRUCTION START TO CONFIRM THERE ARE NO CONFLICTS WITH PROPOSED.
- CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS PERTINENT TO WORK BEING PERFORMED, PRIOR TO STARTING CONSTRUCTION, AND REPORT ANY DISCREPANCIES OR VARIANCES TO PROJECT MANAGER.
- CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION AND BE RESPONSIBLE FOR SAME.
- ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF LOCAL CODES.

LEGAL DESCRIPTION

--

CLIENT

McDonald's Restaurants of Canada Ltd.
McDonald's Place
Toronto, Ontario
M3C 3L4
Tel: 416-443-1000
Fax: 416-446-3376

#	DATE	BY	DESCRIPTION

DRAWING ISSUE RECORD

SEALS

SUB-CONSULTANT

PRIME CONSULTANT

ARCADIS | IBI GROUP
ARCADIS + IBI GROUP
200-360 James Street North
Hamilton ON L8L 1H5 Canada
tel 905 546 1010
ibigroup.com

PROJECT

McDONALD'S 41288-DUNDALK

HIGHWAY 10, DUNDULK, ON

PROJECT NO:	140787
DRAWN BY:	SC
CHK'D BY:	TW
SCALE:	1:200
DATE:	2023 04 21

SHEET TITLE

SITE PLAN

SP1.0

SHEET 1 OF 2

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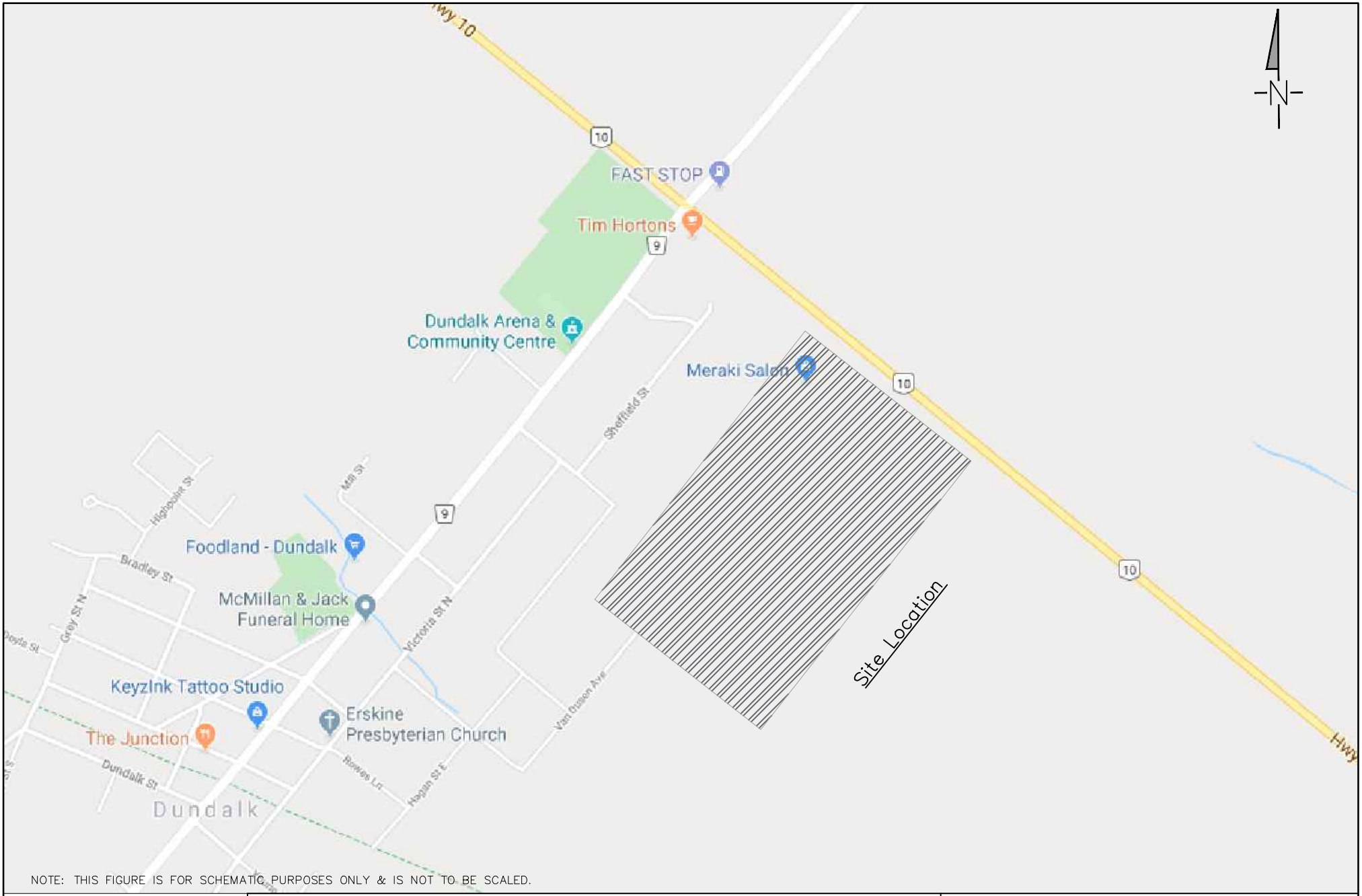


NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

= SUBJECT LANDS

Project

Edgewood Greens
Dundalk, Township of Southgate

Drawing

Site Location

CROZIER
CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON L9Y 1A1
705 446-3510 T
705 446-3520 F
WWW.CFCROZIER.CA

Drawn By	Design By	Project
S.K.	S.K.	1060–5384

Scale	Date	Check By	Drawing
N.T.S.	DEC. 16, 2022	M.F.	FIG. 3

TRAFFIC IMPACT STUDY

2358737 ONTARIO INC.
TOWNSHIP OF SOUTHGATE

GLENELG RESIDENTIAL DEVELOPMENT

PREPARED BY:

C.F. CROZIER & ASSOCIATES INC.
40 HURON STREET
COLLINGWOOD, ONTARIO
L9Y 4R3

SEPTEMBER 2018

CFCA FILE NO. 1060-4171

CROZIER
CONSULTING ENGINEERS

"B" or better under 2028 future background conditions, with minimal delays and reserve capacity for increases in traffic volumes.

5 SITE GENERATED TRAFFIC

The proposed development will result in additional vehicles on the boundary road network that previously did not exist. The proposed development will also result in additional turning movements at the boundary road intersections.

5.1 Trip Generation

The trip generation of the single detached residential lots was forecasted using the fitted curve equations provided in the ITE Trip Generation Manual, 10th Edition, under the Land Use Category 210 "Single Family Detached Dwelling".

The trip generation of the townhouse residential lots was forecasted using the fitted curve equations provided in the ITE Trip Generation Manual, 10th Edition, under the Land Use Category 220 "Multifamily Housing (Low-Rise)".

The trip generation of Glenelg is summarized in **Table 8**. Relevant excerpts from the ITE Trip Generation Manual, 10th Edition are included in **Appendix I**.

Table 8: Glenelg Trip Generation

Use	Trip Type	Peak Hour	Number of Trips		
			Inbound	Outbound	Total
L.U. 210: Single Family Detached Housing (Glenelg: 127 Units)	Primary	Weekday A.M.	23	71	94
	Primary	Weekday P.M.	81	47	128
L.U. 220: Multifamily Housing (Low-Rise) (Glenelg: 26 Units)	Primary	Weekday A.M.	3	10	13
	Primary	Weekday P.M.	11	7	18
Total	**Primary**	**Weekday A.M.**	**26**	**81**	**107**
	Primary	**Weekday P.M.**	**92**	**54**	**146**

5.2 Trip Distribution and Assignment

The trip distribution utilized in the Flato North and East development was used as a basis for the Glenelg development. This distribution was compared with recent Transportation Tomorrow Survey (TTS) data for the Township of Melancthon. The TTS is a comprehensive survey of transportation characteristics in the Golden Horseshoe, Simcoe County and Grey County areas. In order to obtain survey data most applicable to the Subject Property, TTS data was filtered for the Township of Melancthon. TTS data is not available for the Community of Dundalk, accordingly, the Township of Melancthon (abutting the Dundalk to the south and east) was selected as it is considered most representative of the subject area.

The TTS data was found to be consistent with the distribution utilized in the Flato East and Flato North TIS, and thus was used for this analysis. TTS Data has been included in **Appendix J**. The trip distribution is as follows:

- 10 % to/from the north on Ida Street
- 10% to/from the west on Ida Street
- 10% to/from the east on Grey Road 9
- 50% to/from the south on Highway 10
- 20% to/from Dundalk (downtown)

Of the 20 percent remaining in Dundalk, five percent were assumed to travel south on Dundalk Street and then turn right to travel west on Main Street West. The remaining 15 percent were assumed to travel east on Grey Street South and use Proton Street North to access the main downtown commercial corridor.

The development was analyzed under a consolidated access configuration to obtain a conservative analysis. The future operations of the site accesses to Glenelg Street are expected to be better than listed herein as traffic volumes will be diffused across both accesses.

The trips generated by the proposed development were assigned to the boundary road network per the distributions illustrated in **Figure 9**. The corresponding trip assignment is illustrated in **Figure 10**.

6 TOTAL FUTURE CONDITIONS

6.1 Basis of Assessment

The traffic impacts arising from the proposed development were assessed on the basis of the site generated traffic, illustrated in **Figure 10** being superimposed on the future background traffic volumes in **Figures 7 and 8**. The resulting total traffic volumes for the weekday a.m. and p.m. peak hours are illustrated in **Figures 11 and 12** for the 2023 through 2028 horizon years.

6.2 Auxiliary Lane Assessment

Traffic volumes at the intersections of Ida Street and Glenelg Street, Glenelg Street and the Site Access, and Dundalk Street and Main Street West do not meet the threshold to warrant auxiliary left-turn lanes. Accordingly, the future total traffic volumes were analyzed under existing lane configurations. The intersection of Glenelg Street and the Site Access was analyzed with shared through/turn lanes on all approaches.

The left-turn lane warrant charts for 60 km/h design speed roads have been included in **Appendix K** for reference.

The requirement for a westbound right-turn lane at the site entrance was also analyzed. According to the TAC GDGCR, a right-turn lane is required when the volume of vehicles compared with the through traffic volume causes undue hazard. In the 2028 horizon year, 20 and 74 vehicles are forecasted to make a westbound right-turn at the site entrance. This can be compared with the westbound through volumes of 12 and 29 in the a.m. and p.m. peak hours, respectively. Considering these volumes in combination with the traffic modelling results, it is demonstrated that a right-turn lane is not required to facilitate right turns at the site entrance. The intersection is anticipated to operate at an excellent level of service, and the through movements are not expected to be impeded.

6.3 Intersection Operations

The 2023 through 2028 future total traffic operations of the boundary road network are summarized in **Table 9 and Table 10**. The detailed capacity analysis is included in **Appendix F**, and LOS definitions are included in **Appendix E**.

LAND USE SUMMARY

LAND USE	LOTS / BLOCKS	UNITS	AREA
SINGLE DETACHED - 12.2m LOTS	001-127	127	5.38ha
SINGLE DETACHED - FUTURE LOTS	128	-	0.08ha
TOWNHOUSES - 6.5m UNITS	129-132	26	0.62ha
PARK	133	-	0.88ha
WALKWAYS	134-137	-	0.07ha
STORMWATER AREA	138	-	1.52ha
OPEN SPACE	139	-	3.30ha
FUTURE RIGHT OF WAY	140-141	-	0.13ha
0.3m RESERVES	142-146	-	<0.01ha
RIGHT OF WAY	-	-	2.62ha
TOTALS		153	14.60ha

LEGAL DESCRIPTION

PART OF LOTS 227 AND 228
CONCESSION 2, SOUTHWEST OF THE TORONTO AND SYDENHAM ROAD
ALL OF LOT Y AND PART OF THE UNNAMED STREET,
LYING NORTHEAST OF PART LOT 3, BLOCK S, PLAN 480
GEOGRAPHIC TOWNSHIP OF PROTON
TOWNSHIP OF SOUTHGATE
COUNTY OF GREY

OWNER'S CERTIFICATE

I HEREBY AUTHORIZE MACNAUGHTON HERMSEN BRITTON CLARKSON PLANNING LIMITED TO SUBMIT THIS PLAN FOR APPROVAL.

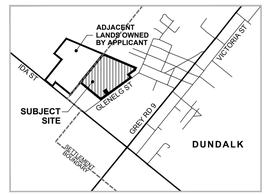
DATE: _____

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE: _____

KEY PLAN



LEGEND

- PROJECT BOUNDARY LINE
- RIGHT OF WAY LINE
- BLOCK LINE
- LOT LINE
- 0.3m RESERVE
- PARCEL FABRIC

REVISION No.	DATE	ISSUED / REVISION	BY

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT R.S.O. 1990 C.P.13 AS AMENDED

- **A.** AS SHOWN
- **B.** AS SHOWN
- **C.** AS SHOWN
- **D.** 127 SINGLE DETACHED LOTS & 56 TOWNHOUSE UNITS
- **E.** AS SHOWN
- **F.** AS SHOWN
- **G.** AS SHOWN
- **H.** MUNICIPAL WATER SUPPLY
- **I.** LOAM/SILT LOAM
- **J.** AS SHOWN
- **K.** ALL MUNICIPAL SERVICES AS REQUIRED
- **L.** AS SHOWN

113 COLLIER STREET
BARRIE, ON, L4M 1H2
P: 705 728 0045 F: 705 728 2010
WWW.MHBCPLAN.COM

PLANNING
URBAN DESIGN
& LANDSCAPE
ARCHITECTURE
MHBC PLANNING

STAMP

DATE	SEPT. 24, 2018
FILE No.	15184H
SCALE	1:1,000 (ARCH D)
DRAWN BY	M.M.
CHECKED BY	K.M.
OTHER	

PROJECT

231 GLENELG STREET
FLATO WEST MEADOWS INC.
3621 HIGHWAY 7 EAST, SUITE 503
MARKHAM, ON L3R 0G6
P:(905) 479-9292 F:(905) 429-9165
WWW.FLATOGROUP.COM

NORTH

FILE NAME
DRAFT PLAN OF SUBDIVISION

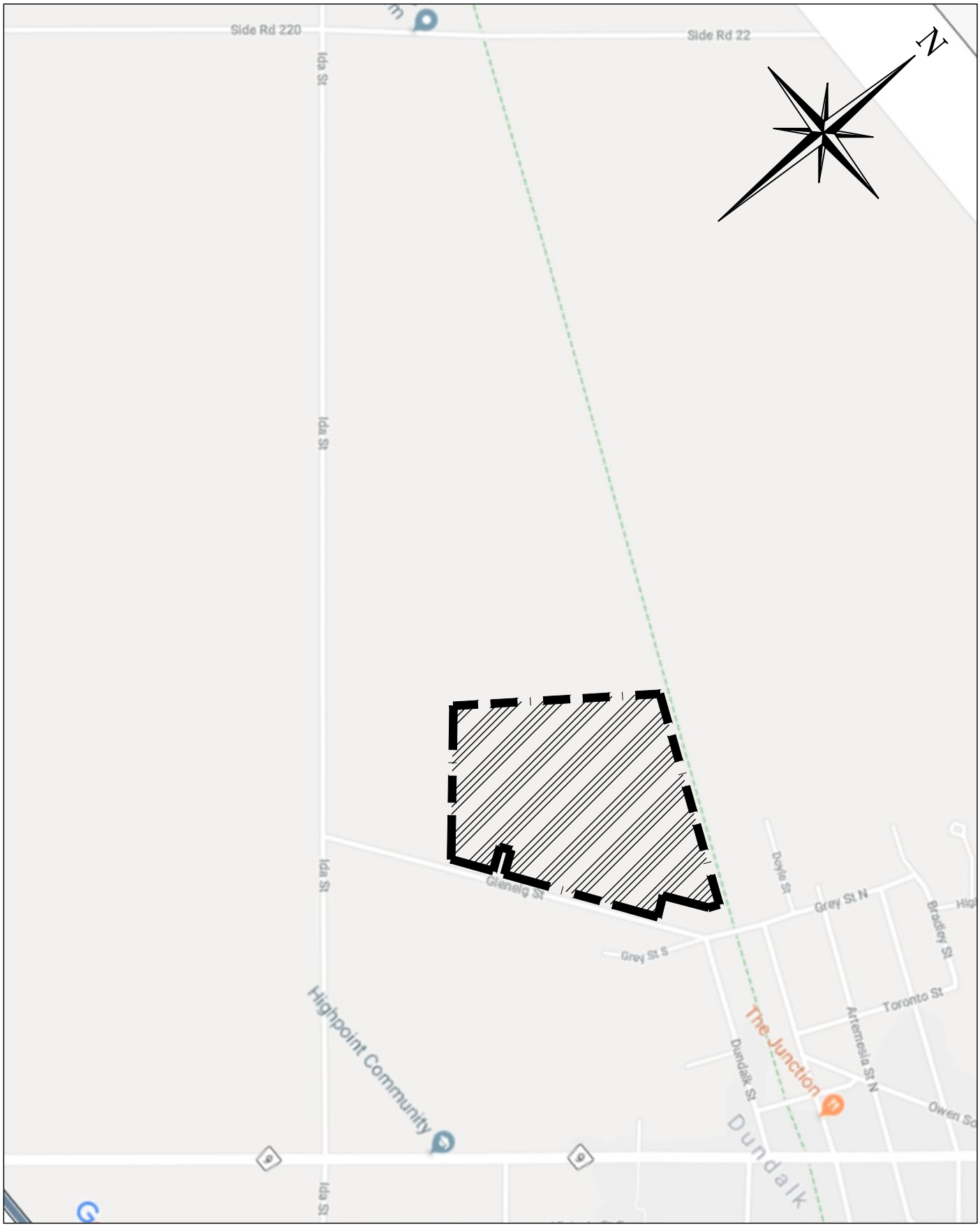
DWG No.
1 of 1

SCALE BAR

0 5 10 15 20 25 37.5 50 75 100m

MEASUREMENTS SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

N:\Southgate\231 Glenelg Street – 15184H\Drawings\Draft Plan\CAD\DraftPlan_2018-09-24.dwg



J:\1000\1060-Flato Dev\4171-Glenelg\CAD\CIVIL\1SHEET\4171-Z00.dwg, FIG 1, 2018-09-25 2:46:33 PM, jmaruri

Legend

= SUBJECT PROPERTY

Project

GLENELG
TOWNSHIP OF SOUTHGATE

Drawing

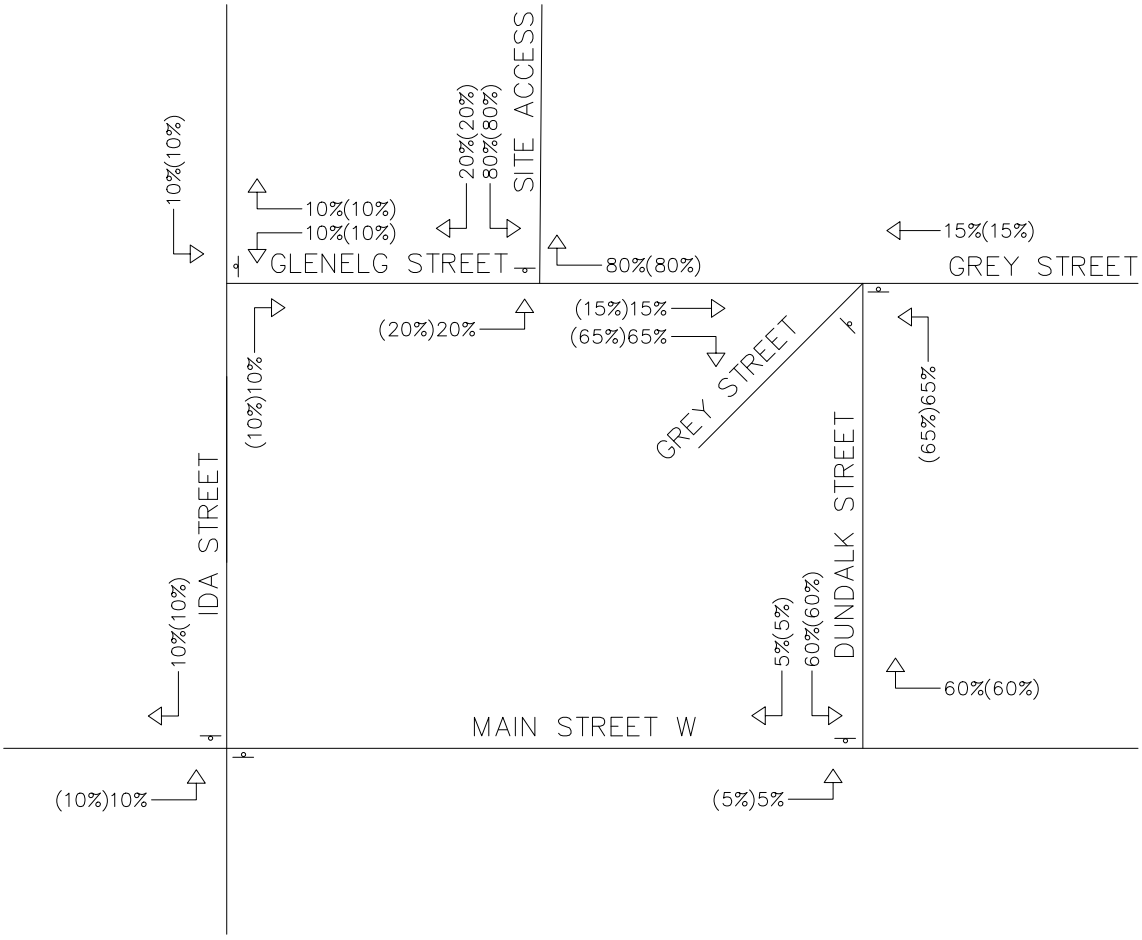
SITE LOCATION

CROZIER CONSULTING ENGINEERS
The HarbourEdge Building,
40 Huron Street, Suite 301,
Collingwood, ON L9Y 4R3
705 446-3510 T
705 446-3520 F
www.cfcrozier.ca
info@cfcrozier.ca

Drawn By	Design By	Project
B.K.	B.P.	1060–4171

Scale	Date	Check By	Drawing
N.T.S.	09/26/2018	B.N.R.	FIG. 2

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



LEGEND:

STOP CONTROL

XX%(YY%) WEEKDAY AM(PM)

Project

GLENELG
TOWNSHIP OF SOUTHGATE

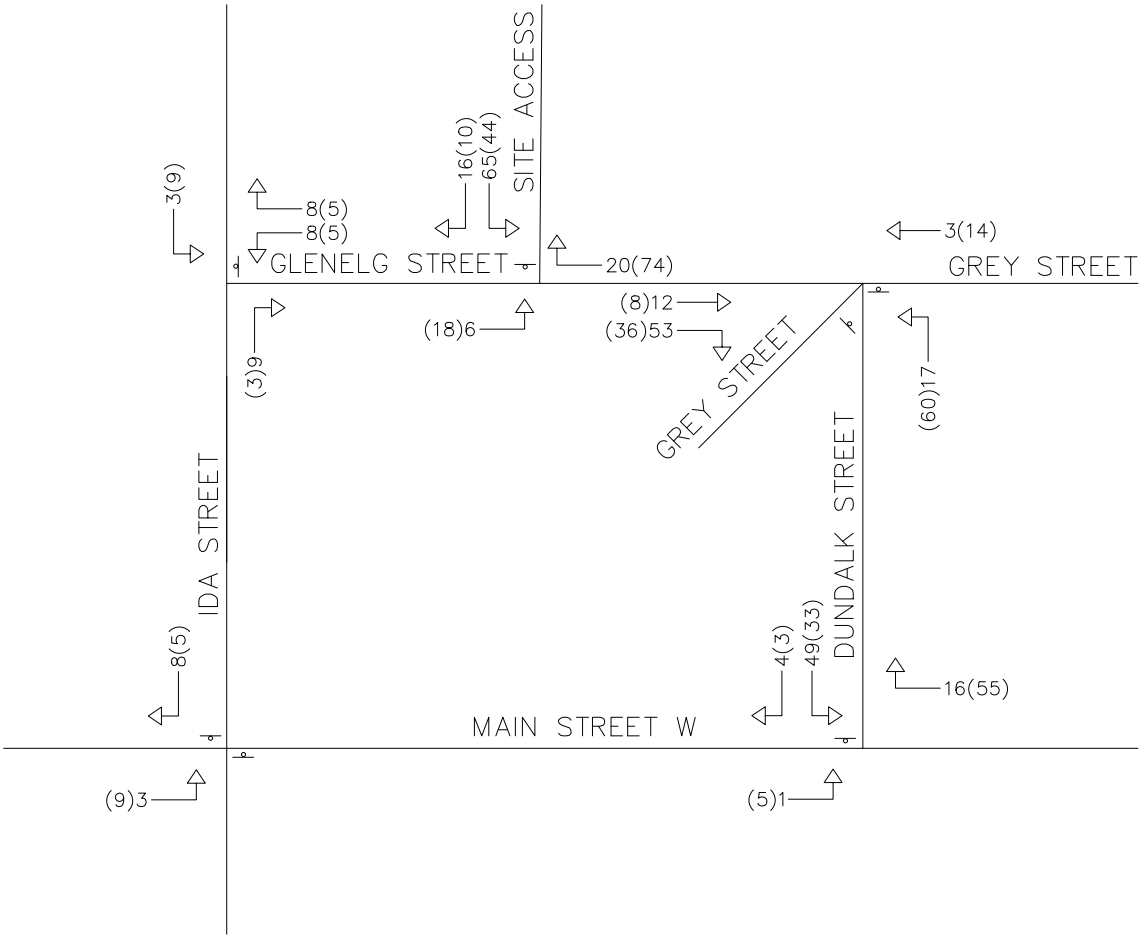
Title

TRIP DISTRIBUTION

CROZIER & ASSOCIATES Consulting Engineers
The HarbourEdge Building
40 Huron Street, Suite 301
Collingwood, ON L9Y 4R3
705 446-3510 T
705 446-3520 F
www.cfcrozier.ca
info@cfcrozier.ca

Drawn	Design	Project No.	
A.J.D.	T.W.		1060-4171
Check	Check	Scale	Dwg.
T.W.	M.F.	N.T.S	FIG. 7

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



LEGEND:

⊣	STOP CONTROL
XX(YY)	WEEKDAY AM(PM)

Project

GLENELG
TOWNSHIP OF SOUTHGATE

Title

TRIP ASSIGNMENT

CROZIER & ASSOCIATES Consulting Engineers
The HarbourEdge Building
40 Huron Street, Suite 301
Collingwood, ON L9Y 4R3
705 446-3510 T
705 446-3520 F
www.cfcrozier.ca
info@cfcrozier.ca

Drawn	Design	Project No.	
A.J.D.	T.W.		1060-4171
Check	**Check**	**Scale**	**Dwg.**
T.W.	M.F.	N.T.S	FIG. 8

TRAFFIC IMPACT STUDY

SOUTHGATE MEADOWS INC.
TOWNSHIP OF SOUTHGATE

GLENELG RESIDENTIAL DEVELOPMENT
PHASE 2

PREPARED BY:

C.F. CROZIER & ASSOCIATES INC.
40 HURON STREET
COLLINGWOOD, ONTARIO
L9Y 4R3

SEPTEMBER 2020

CFCA FILE NO. 1060-5545

CROZIER
CONSULTING ENGINEERS

Table 9: Glenelg Phase 2 Trip Generation

Use	Trip Type	Peak Hour	Number of Trips		
			Inbound	Outbound	Total
L.U. 210: Single Family Detached Housing (89 Units)	Primary	Weekday A.M.	17	51	68
	Primary	Weekday P.M.	57	34	91
L.U. 220: Multifamily Housing (Low-Rise) (66 Units)	Primary	Weekday A.M.	7	25	32
	Primary	Weekday P.M.	26	15	41
Total	**Primary**	**Weekday A.M.**	**24**	**76**	**100**
	Primary	**Weekday P.M.**	**83**	**49**	**132**

5.2 Trip Distribution and Assignment

Trips generated by Phase 2 of the Glenelg residential development were distributed to the boundary road network maintaining the distribution described in the Glenelg Phase 1 TIS. The trip distribution was based on Transportation Tomorrow Survey (TTS) data. The TTS is a comprehensive survey of transportation characteristics in the Golden Horseshoe, Simcoe County and Grey County areas. TTS data is not available for the Community of Dundalk, accordingly, the Township of Melancthon (abutting the Dundalk to the south and east) was selected as it is considered most representative of the subject area.

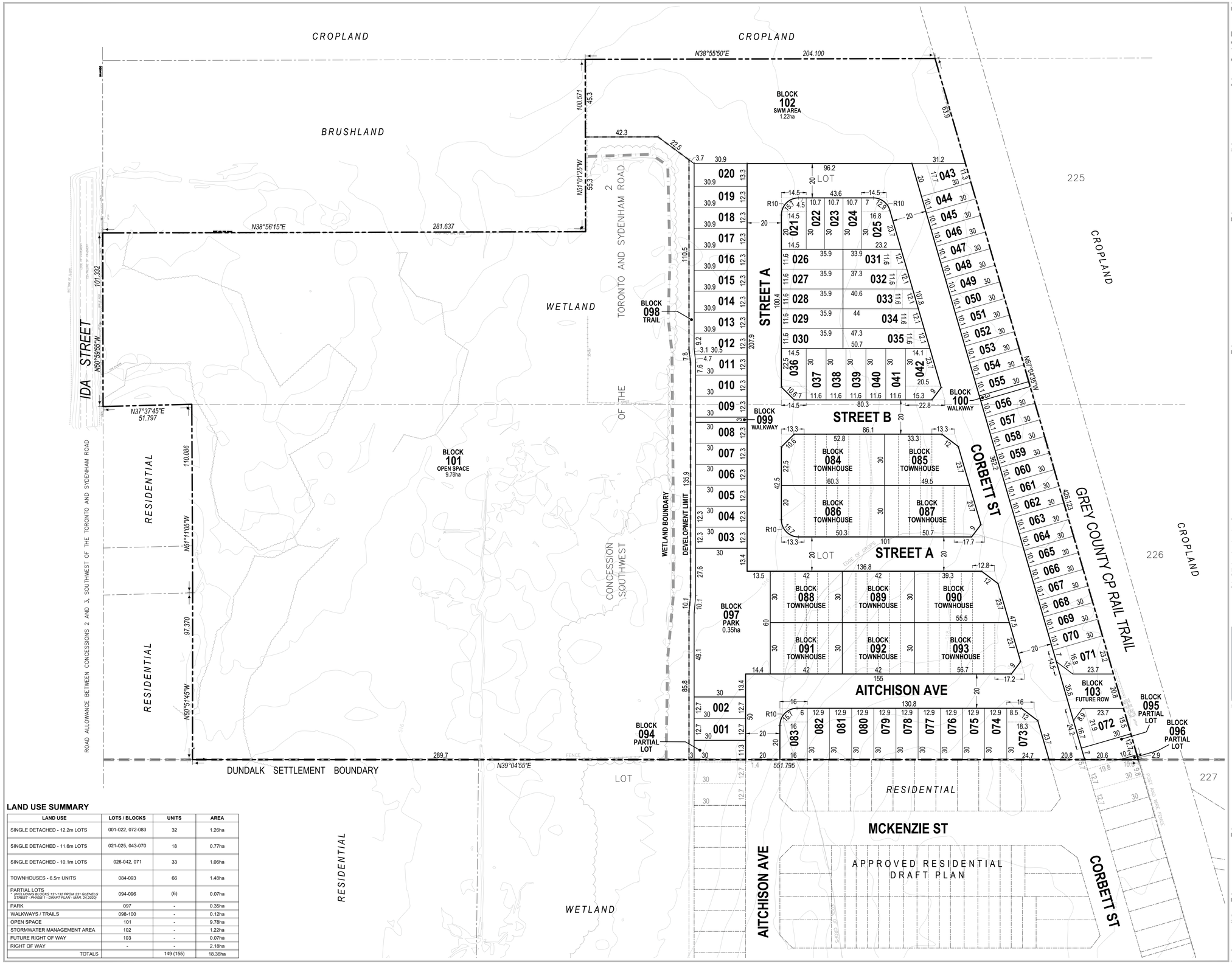
TTS Data has been included in **Appendix J**. The trip distribution is as follows:

- 10% to/from the north on Ida Street
- 10% to/from the west on Ida Street
- 60% to/from the south on Highway 10
- 20% to/from Dundalk (downtown)
    - 15% to/from the east on Grey Road 9
    - 5% to/from the west on Main Street

Of the 20 percent remaining in Dundalk, five percent were assumed to travel south on Dundalk Street and then turn right to travel west on Main Street West. The remaining 15 percent were assumed to travel east on Grey Street South and use Proton Street North to access the main downtown commercial corridor.

The development was analyzed under a consolidated access configuration to provide a conservative analysis. The future operations of the site accesses to Glenelg Street are expected to be better than listed herein as traffic volumes will be dispersed across both accesses.

The trips generated by the proposed development were assigned to the boundary road network per the distributions illustrated in **Figure 9**. The corresponding trip assignment is illustrated in **Figure 10**.



LAND USE SUMMARY

LAND USE	LOTS / BLOCKS	UNITS	AREA
SINGLE DETACHED - 12.2m LOTS	001-022, 072-083	32	1.26ha
SINGLE DETACHED - 11.6m LOTS	021-025, 043-070	18	0.77ha
SINGLE DETACHED - 10.1m LOTS	026-042, 071	33	1.06ha
TOWNHOUSES - 6.5m UNITS	084-093	66	1.48ha
PARTIAL LOTS *(INCLUDING BLOCKS 131-132 FROM 231 GLENELG STREET - PHASE 1 - DRAFT PLAN - MAR. 24,2020)*	094-096	(6)	0.07ha
PARK	097	-	0.35ha
WALKWAYS / TRAILS	098-100	-	0.12ha
OPEN SPACE	101	-	9.78ha
STORMWATER MANAGEMENT AREA	102	-	1.22ha
FUTURE RIGHT OF WAY	103	-	0.07ha
RIGHT OF WAY	-	-	2.18ha
TOTALS		149 (155)	18.36ha

LEGAL DESCRIPTION

PART OF LOTS 225 AND 226
CONCESSION 2, SOUTHWEST OF THE TORONTO AND SYDENHAM ROAD
TOWNSHIP OF SOUTHGATE
COUNTY OF GREY

OWNER'S CERTIFICATE

I HEREBY AUTHORIZE MACNAUGHTON HERMSEN BRITTON CLARKSON PLANNING LIMITED TO SUBMIT THIS PLAN FOR APPROVAL.

DATE: _____

_____
SHAKIR REHMATULLAH - PRESIDENT
2358737 ONTARIO INC.

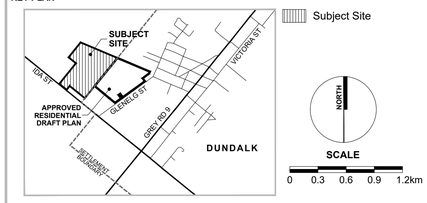
SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE: _____

_____
DAN DZALDOV - OLS
SCHAEFFER DZALDOV BENNETT LTD.
P: 416-987-0101

KEY PLAN



LEGEND

- RIGHT OF WAY LINE
- BLOCK LINE
- LOT LINE
- PROJECT BOUNDARY LINE
- PARCEL FABRIC

REVISION No.	DATE	ISSUED / REVISION	BY

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT R.S.O. 1990 C.P.13 AS AMENDED

- **A.** AS SHOWN
- **B.** AS SHOWN
- **C.** AS SHOWN
- **D.** 83 SINGLE DETACHED LOTS & 64 TOWNHOUSE UNITS
- **E.** AS SHOWN
- **F.** AS SHOWN
- **G.** AS SHOWN
- **H.** MUNICIPAL WATER SUPPLY
- **I.** LOAM/SILT LOAM
- **J.** AS SHOWN
- **K.** ALL MUNICIPAL SERVICES AS REQUIRED
- **L.** AS SHOWN

PLANNING
URBAN DESIGN
& LANDSCAPE
ARCHITECTURE
MHBC PLANNING
113 COLLIER STREET
BARRIE, ON, L4M 1H2
P: 705 728 0045 F: 705 728 2010
WWW.MHBCPLAN.COM

STAMP

DATE	SEPT. 24, 2020
FILE No.	15184H
SCALE	1:1,000 (ARCH D)
DRAWN BY	M.M.
CHECKED BY	K.M.
OTHER	

PROJECT
231 GLENELG STREET PHASE 2
2358737 ONTARIO INC.
3621 HIGHWAY 7 EAST, SUITE 503
MARKHAM, ON L3R 0G6
P:(905) 479-9292 F:(905) 429-9165
WWW.FLATOGROUP.COM

NORTH

FILE NAME
DRAFT PLAN OF SUBDIVISION

DWG No. 1 of 1

SCALE BAR

0 5 10 15 20 25 37.5 50 75 100m

MEASUREMENTS SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

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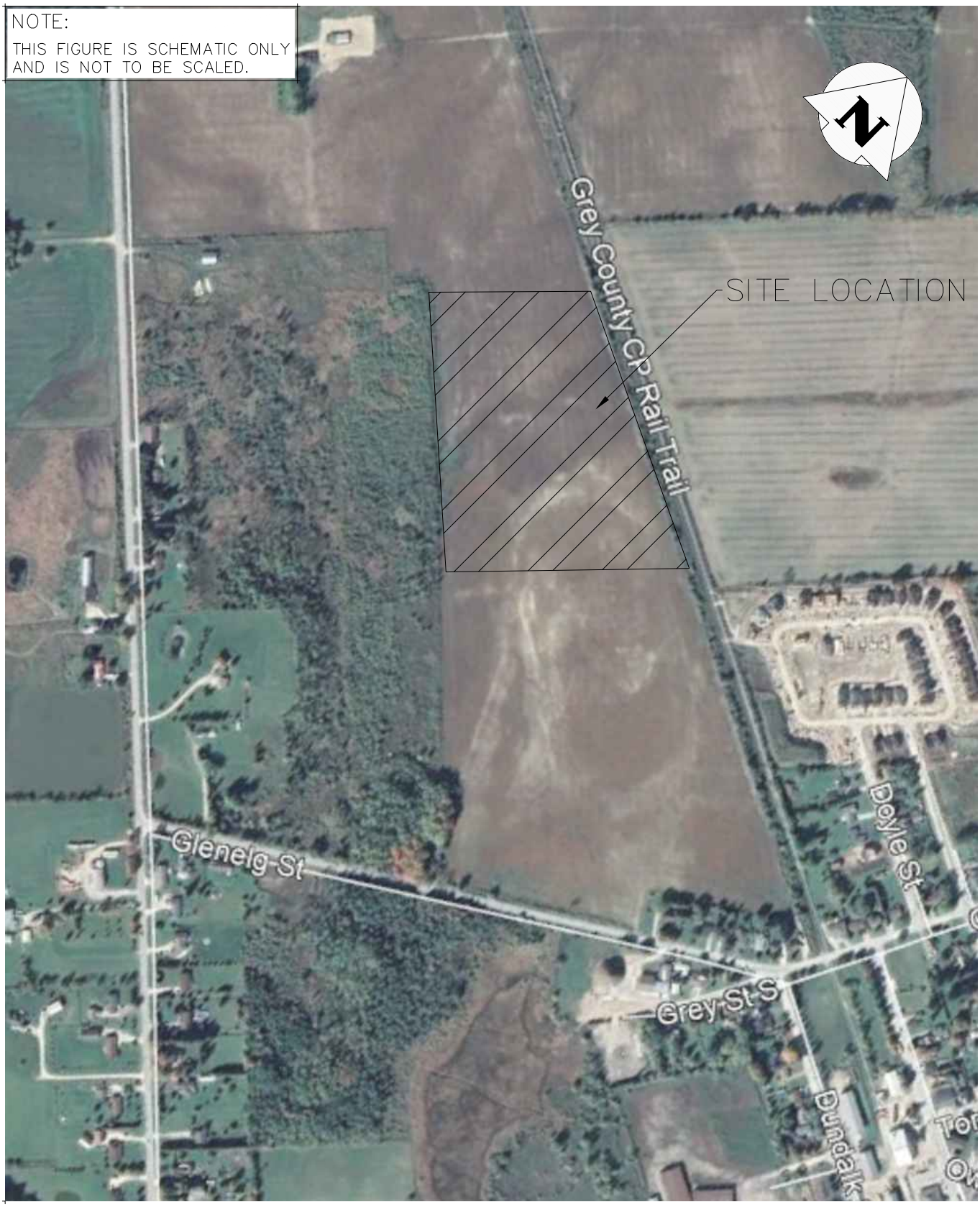
NOTE:
THIS FIGURE IS SCHEMATIC ONLY AND IS NOT TO BE SCALED.



Project

GLENELG PHASE 2
TOWNSHIP OF SOUTHGATE

Title

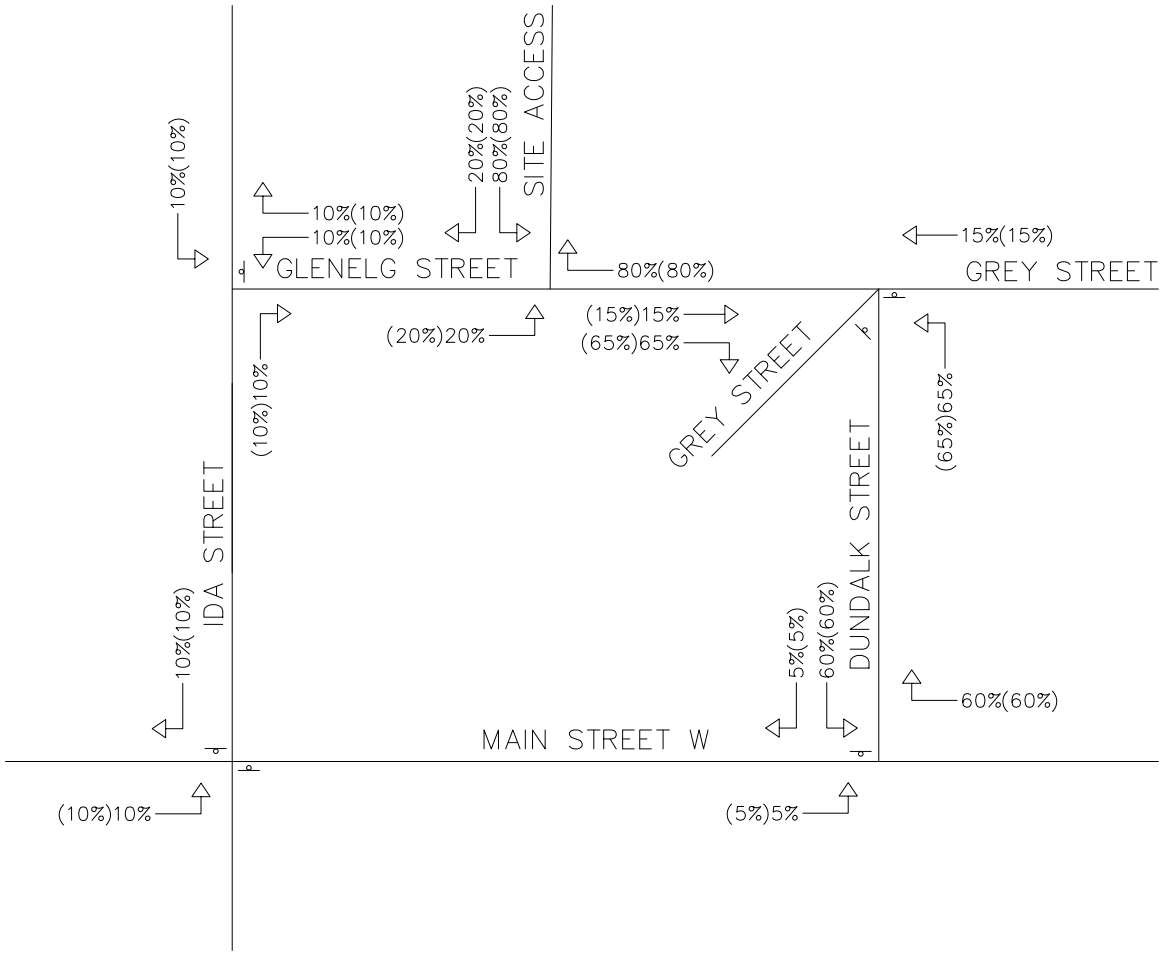
SITE LOCATION PLAN

CROZIER
CONSULTING ENGINEERS

THE HARBOUREDGE BUILDING,
40 HURON STREET, SUITE 301,
COLLINGWOOD, ON L9Y 4R3
705 446-3510 T
705 446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

Drawn	Design	Project No.	
S.K.		1060–5545	
Check	Check	Scale	Dwg.
M.F.		N.T.S	FIG. 2

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



LEGEND:

⊲	STOP CONTROL
AM(PM)	WEEKDAY AM(PM) TRIP DISTRIBUTION

Project

GLENELG PHASE 2
TOWNSHIP OF SOUTHGATE

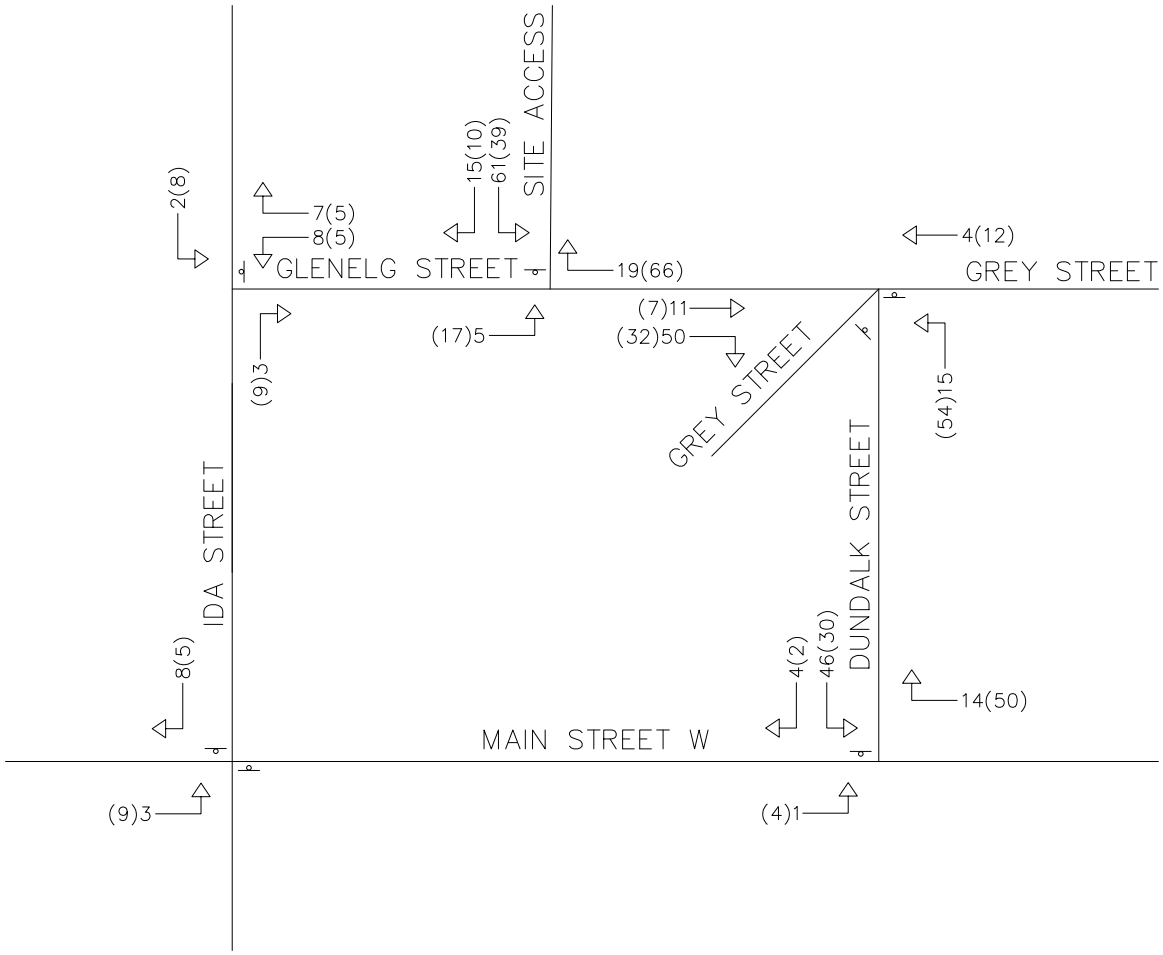
Title

TRIP DISTRIBUTION

CROZIER
CONSULTING ENGINEERS
THE HARBOUREDGE BUILDING,
40 HURON STREET, SUITE 301,
COLLINGWOOD, ON L9Y 4R3
705 446-3510 T
705 446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

Drawn	Design	Project No.	
S.K.			1060–5545
Check	Check	Scale	Dwg.
M.F.		N.T.S	FIG. 9

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



LEGEND:

⊲	STOP CONTROL
AM(PM)	WEEKDAY AM(PM) TRIP DISTRIBUTION

Project

GLENELG PHASE 2
TOWNSHIP OF SOUTHGATE

Title

TRIP ASSIGNMENT

CROZIER
CONSULTING ENGINEERS
THE HARBOUREDGE BUILDING,
40 HURON STREET, SUITE 301,
COLLINGWOOD, ON L9Y 4R3
705 446-3510 T
705 446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

Drawn	S.K.	Design		Project No.	1060–5545
Check	M.F.	Check		Scale	N.T.S
				Dwg.	FIG. 10

TRAFFIC IMPACT STUDY

GLENELG PHASE 3

DUNDALK
GREY COUNTY, ONTARIO

PREPARED FOR:

DUNDALK VILLAGE TWO INC.

PREPARED BY:

C.F. CROZIER & ASSOCIATES INC.
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON L9Y 1A1

ORIGINAL: AUGUST 2022

UPDATE: AUGUST 2023

CFCA FILE NO. 1060-6220

CROZIER
CONSULTING ENGINEERS

The Glenelg Phase 1 Site Access is anticipated to operate with a LOS "B" with a maximum control delay of 10.7 seconds and a maximum v/c ratio of 0.20(SB). The metrics indicate that the site access has reserve capacity for increases in traffic volumes.

5.0 Site Generated Traffic

5.1 Trip Generation

Development of the subject property will result in additional vehicles on the boundary road network above background conditions. The trip generation of the development was forecast using the fitted curve equations provided in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition. Per the most recent draft plan, the development is proposed to consist of 300 single detached dwelling units, 24 semi-detached units, 75 townhouse units, 1 future residential lot, and a school that can accommodate 700 students. Accordingly, LUC 210 "Single-Family Detached Housing", LUC 215 "Single Family Attached Housing", and LUC 520 "Elementary School" were used to forecast the trips generated by the site. **Table 11** summarizes the trip generation of the Subject Property. **Appendix H** contains relevant excerpts from the ITE Trip Generation Manual.

To remain conservative, LUC 210 was used to forecast the trip generated by the semi-detached units and the future residential lot. As Glenelg phase 1, 2, and 3 are expected to encompass approximately 30% of the catchment area for the school, the trip generation of the school was reduced by 30% as these trips are not expected to enter the study area road network.

Table 11: Site Trip Generation

	Peak Hour	Number of Trips		
		Inbound	Outbound	Total
LUC 210 'Single Family Homes' (325 Units)	Weekday A.M.	56	161	217
	Weekday P.M.	190	111	301
LUC 215 'Single Family Attached Housing' (70 Units)	Weekday A.M.	10	23	33
	Weekday P.M.	23	18	41
LUC 520 'Elementary School' (700 Students)	Weekday A.M.	196	167	363
	Weekday P.M.	36	42	78
TOTAL	**Weekday A.M.**	**262**	**351**	**613**
	Weekday P.M.	**249**	**171**	**420**

It is noted that the addition of the school block results in an increase in trips of 328 vehicles in the a.m. peak hour and 31 vehicles in the p.m. peak hour when compared to the original TIS (August 2022). **Appendix A** contains excerpts from the original TIS for comparison.

5.2 Trip Distribution and Assignment

Trips generated by the residential land uses of Glenelg Phase 3 were distributed to the boundary road network similar to what was applied in the Glenelg Phase 1 TIS and Glenelg Phase 2 TIS. **Figure 13** illustrates the future traffic control and lane configuration of the study area road network.

Based on discussions with Triton staff, the trip assignment was revised to reflect a larger percentage of site-generated trips using Osprey Street instead of Bradley Street south of Grey Street. It was assumed that this travel path would be encourage by the designation of Osprey Street as a collector road and traffic calming measures would be considered on Bradley Street south of Grey

Street. Further details and a mutually agreed-upon modified cross-section for Grey Street and Osprey Street will be assessed through detailed design.

The trip distribution was based on Transportation Tomorrow Survey (TTS) data. The TTS is a comprehensive survey of transportation characteristics in the Golden Horseshoe, and Simcoe County areas. TTS data is unavailable for the Community of Dundalk; however, data was available for the Township of Melancthon which is adjacent to Dundalk. This data is considered representative of the subject area.

TTS Data has been included in **Appendix I**. The trip distribution is as follows:

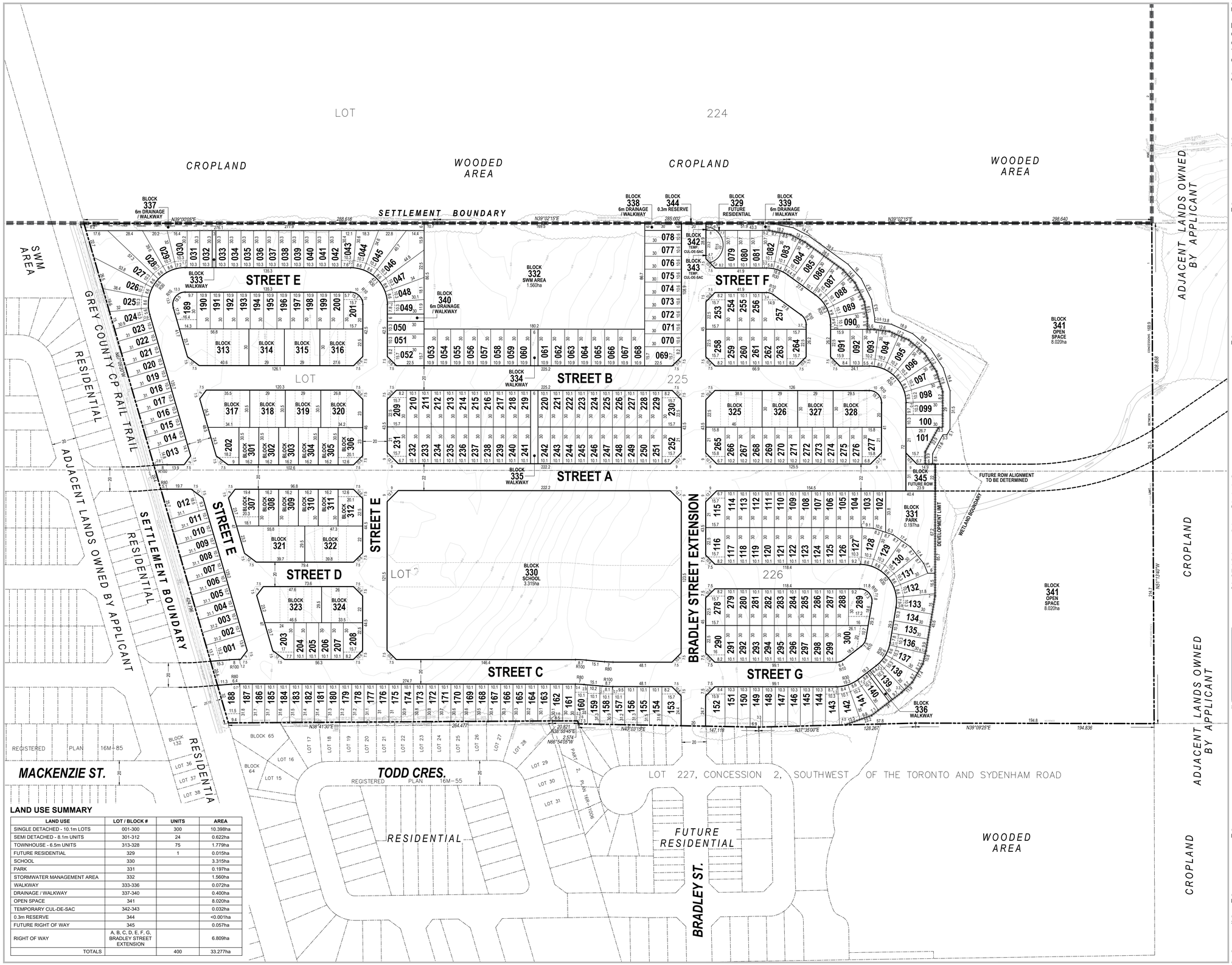
- 10 % to/from the north on Ida Street
  - 5 % Via Glenelg Phase 1 Site Access
  - 5 % Via Grey Street
- 10 % to/from the west on Grey Road 9 (Main Street) via Ida Street and via Grey Street
- 60 % to/from the south on Highway 10 via Bradley Street
  - 60 % westbound right movements at Owen Sound Street
  - 30 % southbound left movements at Owen Sound Street and 30% southbound left
- 20 % to/from Dundalk (downtown)
  - 15 % to/from the west on Toronto Street
  - 5 % to/from the west on Main Street at Dundalk Street

It is noted that 20% of the site-generated traffic volumes are expected to travel through the community outside of the study area road network. **Figure 14** illustrates the trip distribution for the residential land uses.

The trip generated by the school were assigned to the study area road network based on the location of the population of the nearby area. It is noted that approximately 15% of trips are expected to have an origin and destination between study area intersections. **Figure 15** illustrates the trip distribution for the school.

The Subject Property is proposed to connect to the boundary road network through the Bradley Street extension and two accesses through Glenelg Phase 1. The Subject Property will directly connect to Glenelg Phase 2 which then connects to the Glenelg Phase 1 accesses. Glenelg Phase 3 was analyzed with the Bradley Street extension and one access through Glenelg Phase 1. This provides a conservative analysis as two accesses have already been constructed for Glenelg Phase 1.

Figure 16 and **Figure 17** illustrates the trip assignment for the residential land uses and school, respectively. **Figure 18** illustrates the trip assignment for the Subject Property.



LAND USE SUMMARY

LAND USE	LOT / BLOCK #	UNITS	AREA
SINGLE DETACHED - 10.1m LOTS	001-300	300	10.398ha
SEMI DETACHED - 8.1m UNITS	301-312	24	0.622ha
TOWNHOUSE - 6.5m UNITS	313-328	75	1.779ha
FUTURE RESIDENTIAL	329	1	0.015ha
SCHOOL	330		3.315ha
PARK	331		0.197ha
STORMWATER MANAGEMENT AREA	332		1.560ha
WALKWAY	333-336		0.072ha
DRAINAGE / WALKWAY	337-340		0.400ha
OPEN SPACE	341		8.020ha
TEMPORARY CUL-DE-SAC	342-343		0.032ha
0.3m RESERVE	344		<0.001ha
FUTURE RIGHT OF WAY	345		0.057ha
RIGHT OF WAY	A, B, C, D, E, F, G, BRADLEY STREET EXTENSION		6.809ha
TOTALS		400	33.277ha

LEGAL DESCRIPTION

PART OF LOTS 225 AND 226
CONCESSION 2, SOUTHWEST OF THE TORONTO AND SYDENHAM ROAD
GEOGRAPHIC TOWNSHIP OF PROTON
TOWNSHIP OF SOUTHGATE
COUNTY OF GREY

OWNER'S CERTIFICATE

I HEREBY AUTHORIZE MACNAUGHTON HERMSEN BRITTON CLARKSON PLANNING LIMITED TO SUBMIT THIS PLAN FOR APPROVAL.

DATE: _____

SHAKIR REHMATULLAH - PRESIDENT
DUNDALK VILLAGE TWO INC.

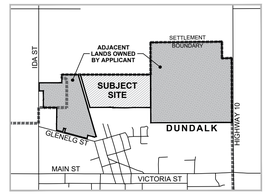
SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE: _____

DAN DZALDOV - O.L.S.
SCHAEFFER DZALDOV BENNETT LTD.

KEY PLAN



SUBJECT SITE

NORTH

SCALE
0 .25 .5 .75 1km

LEGEND

- PROJECT BOUNDARY LINE
- RIGHT OF WAY LINE
- BLOCK LINE
- LOT LINE
- PARCEL FABRIC

REV. No.	DATE	ISSUED / REVISION	BY
03	AUG. 14, 2023	ADD WETLAND BOUNDARY AND TEMPORARY CUL-DE-SAC; REVISE PARK, AND LOT LAYOUTS; WIDEN STREET 'A' TO 22m ROW	R.K. / M.M.
02	JUN. 28, 2023	ADD SCHOOL, WALKWAYS, DRAINAGE BLOCKS; REMOVE STREET; CREATE CRESCENT STREET G AND STREET F; REVISE PARK, SWM AREA, AND LOT LAYOUTS	M.M.
01	AUG. 18, 2022	1st SUBMISSION	M.M.

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT R.S.O. 1990 C.P.13 AS AMENDED

- **A.** AS SHOWN
- **B.** AS SHOWN
- **C.** AS SHOWN
- **D.** 301 SINGLES, 24 SEMIS, & 70 TOWNHOUSES
- **E.** AS SHOWN
- **F.** AS SHOWN
- **G.** AS SHOWN
- **H.** MUNICIPAL WATER SUPPLY
- **I.** LOAM/SILT LOAM
- **J.** AS SHOWN
- **K.** ALL SERVICES AS REQUIRED (WATER, SANITARY, STORMWATER, HYDRO)
- **L.** AS SHOWN

113 COLLIER STREET
BARRIE, ON, L4M 1H2
P: 705 728 0045 F: 705 728 2010
WWW.MHBCPLAN.COM
PLANNING
URBAN DESIGN
& LANDSCAPE
ARCHITECTURE
MHBC PLANNING

STAMP

DATE	AUG. 18, 2022
FILE No.	15184AT
SCALE	1:1,400 (ARCH D)
DRAWN BY	M.M.
CHECKED BY	K.C.
OTHER	

PROJECT

GLENELG PHASE 3

DUNDALK VILLAGE TWO INC.
3621 HIGHWAY 7 EAST, SUITE 503
MARKHAM, ON L3R 0G6
P:(905) 479-9292 F:(905) 429-9165
WWW.FLATOGROUP.COM

NORTH

FILE NAME
DRAFT
PLAN OF SUBDIVISION

DWG No. 1 of 1

SCALE BAR

0 7 14 21 28 35 52.5 70 105 140m

MEASUREMENTS SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

N:\Southgate\15184AT\Drawings\Draft Plan\CAD\

Project

GLENELG PHASE 3
TOWNSHIP OF SOUTHGATE, COUNTY OF GREY

Drawing

SITE LOCATION

CROZIER
CONSULTING ENGINEERS
THE HARBOUREDGE BUILDING,
40 HURON STREET, SUITE 301,
COLLINGWOOD, ON L9Y 4R3
705 446-3510 T
705 446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

Drawn By	Design By	Project
E.H.	E.H.	1060-6220

Scale	Date	Check By	Drawing
N.T.S.	2022.08/15	E.H.	FIG. 2

WHITE ROSE (PHASE 3)

PLAN OF SUBDIVISION

TOWNSHIP OF SOUTHGATE (DUNDALK)

GREY COUNTY

TRAFFIC IMPACT STUDY

SEPTEMBER, 2020

TRITON ENGINEERING SERVICES LIMITED
Consulting Engineers

18 Robb Boulevard, Unit 8
Orangeville, Ontario
L9W 3L2
Tel: (519) 941-0330
Fax: (519) 941-1830
ORANGEVILLE X FERGUS X GRAVENHURST X HARRISTON

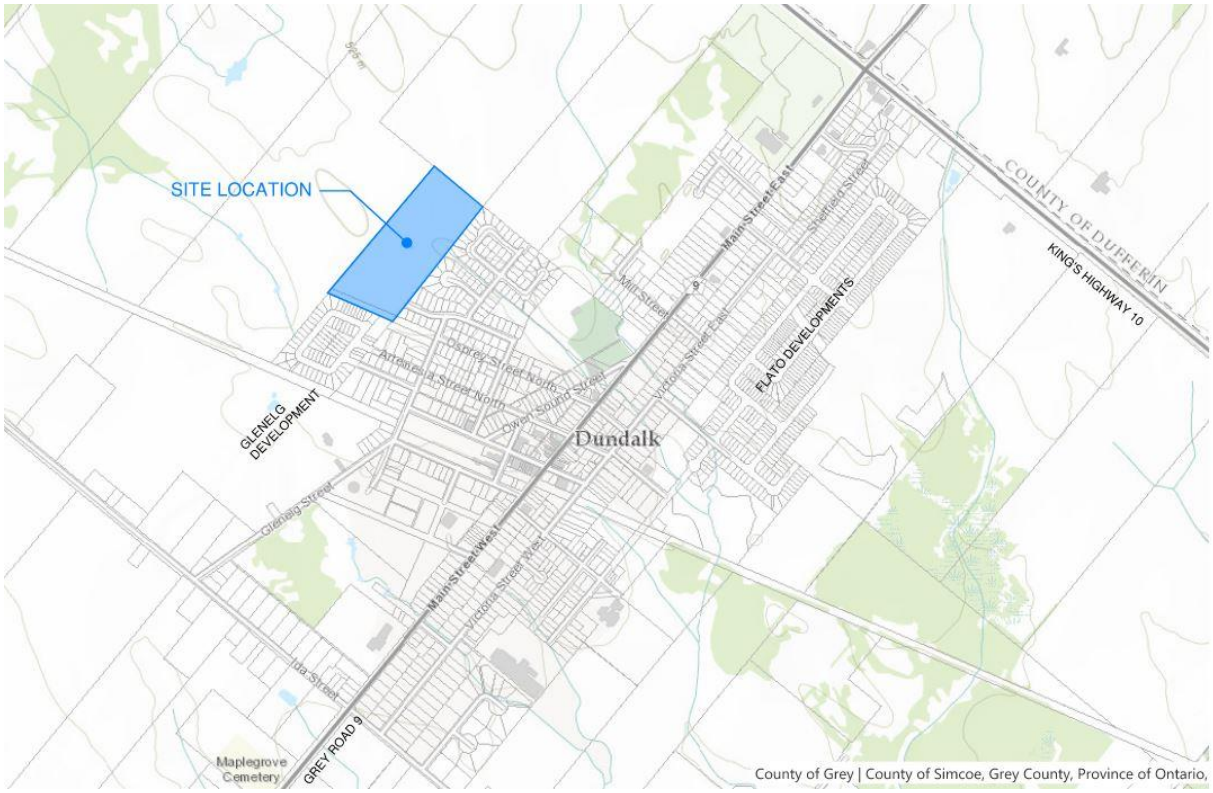
1.0 INTRODUCTION

Triton Engineering Services Limited (TESL) has been retained by White Rose Park to prepare a Traffic Impact Study (TIS) in support of a Draft Plan Application for a proposed residential development located in the Community of Dundalk, Township of Southgate. The purpose of this study is to address the impact of this development on Grey Road 9 (Main Street East) and to determine what road and intersection improvements may be required.

2.0 EXISTING CONDITIONS

2.1 Road Network

The proposed site is located on the northwest side of Dundalk at the end of Bradley Street. The location of the proposed site is shown on the Key Plan below.



Key Plan

The road network in Dundalk has a skewed orientation. To provide clarity throughout this study, King's Highway 10, Osprey Street, Artemesia Street, Proton Street, Dundalk Street, and Ida Street have been designated as north-south roads and Glenelg Street and Grey Road 9 (Main Street) have been designated as east-west roads.

3.0 PROPOSED DEVELOPMENT

MHBC have provided a draft plan of subdivision, enclosed in Appendix A.

The proposed development consists of 33 single-family dwellings, 24 townhouses, and 34 senior dwellings. The development has two proposed accesses, with 'Street A' connecting to Todd Crescent (Phase 1/2 of White Rose Park) and 'Street B' connecting to the north end of Bradley Street.

4.0 EXISTING TRAFFIC

Weekday morning and afternoon peak period traffic counts were undertaken as part of the Glenelg Residential Subdivision TIS in 2018 by C.F. Crozier & Associates Inc. (Crozier) at the intersection of Glenelg Street and Ida Street, the intersection of Grey Road 9 and Ida Street, and the intersection of Grey Road 9 and Dundalk Street. Since these counts were undertaken, there have been no major developments in the surrounding area and are considered acceptable. The traffic volumes were converted into 2020 existing traffic volumes by applying a 1.5% growth rate. This growth rate is consistent with the Glenelg development TIS and the Flato development TIS conducted in 2016 by Crozier.

A traffic count was undertaken at the intersection of Owen Sound Street and Grey Road 9 during the morning and afternoon peak periods on September 8, 2020. Traffic counts were not undertaken at the Proton Street and Artemesia Street intersections with Grey Road 9 as the increase to traffic volumes generated by White Rose Park at these intersections is expected to be very minor, as shown in Figure 5. It is assumed that if increased traffic volumes can be accommodated by the Dundalk Street and Grey Road 9 intersection, then the Proton Street and Artemesia Street intersections will also be able to accommodate the increased traffic volumes.

The existing peak hours for the four intersections and their respective traffic volumes are illustrated on Figure 1 and Table 1 lists the peak hours for each traffic count.

Table 1: Peak Hours

Intersection	Peak Hour
Ida Street and Glenelg Street	8:00-9:00 am
	4:15-5:15 pm
Grey Road 9 and Ida Street	7:45-8:45 am
	5:00-6:00 pm
Grey Road 9 and Dundalk Street	8:00-9:00 am
	5:00-6:00 pm
Grey Road 9 and Owen Sound Street	8:00-9:00 am
	4:15-5:15 pm

Intersection	Movement	Level of Service (Delay, s)	
		Weekday AM	Weekday PM
Grey Road 9 and Owen Sound Street (Unsignalized)	EB left-thru WB thru-right SB left-right	A (0.1) A (0.0) B (14.0)	A (0.1) A (0.0) C (17.4)

The levels of service remain consistent for most movements due to the increase in traffic volumes during the 2025 and 2030 years with slightly increased delays. The northbound movement at the Ida Street and Grey Road 9 intersection operates at a LOS 'B' during the 2025 AM peak hour, the southbound movement at the Grey Road 9 and Dundalk Street operates at a LOS 'B' during the 2025 AM and PM peak hours, and the southbound movement at the Grey Road 9 and Owen Sound Street intersection operates at a LOS 'C' during the 2025 PM peak hour. All movements are still operating with acceptable delays.

6.0 SITE GENERATED TRAFFIC

6.1 General

Trip generation is forecast for future developments from studies of similar developments. The *Institute of Transportation Engineers (ITE) Trip Generation Manual, 8th Edition* was used in this analysis. Trips generated from residential condominium/townhouse land uses are considered primary trips.

6.2 Trip Generation

The ITE Code and the calculated number of trips generated by the development are shown in Table 5.

Table 5: Trip Generation Codes and Distribution

Land Use	ITE Code	Description	Trips Generated per Unit					
			Weekday AM			Weekday PM		
			Total	Entering	Exiting	Total	Entering	Exiting
Residential	210	Single-Family Detached Housing	31	8	23	36	23	13
Residential	230	Residential Condominium/ Townhouse	17	3	14	19	13	6
Residential	252	Senior Adult Housing – Attached	5	2	3	6	5	1
Development Total			**53**	**13**	**40**	**61**	**41**	**20**

The trip distribution used by the Glenelg and Flato Developments was applied to the White Rose Phase 3 development and is described below:

- 60% to/from Highway 10 via the Owen Sound Street/Grey Road 9 intersection;
- 10% to/from the north via the Ida Street/Glenelg Street intersection;
- 10% to/from the west via Dundalk Street and Grey Road 9; and,
- 20% to/from downtown Dundalk via Dundalk Street, Proton Street, Artemesia Street, and Osprey Street.

This distribution is illustrated on Figure 4 and the trips assigned to the road network is illustrated on Figure 5.

7.0 FUTURE TRAFFIC

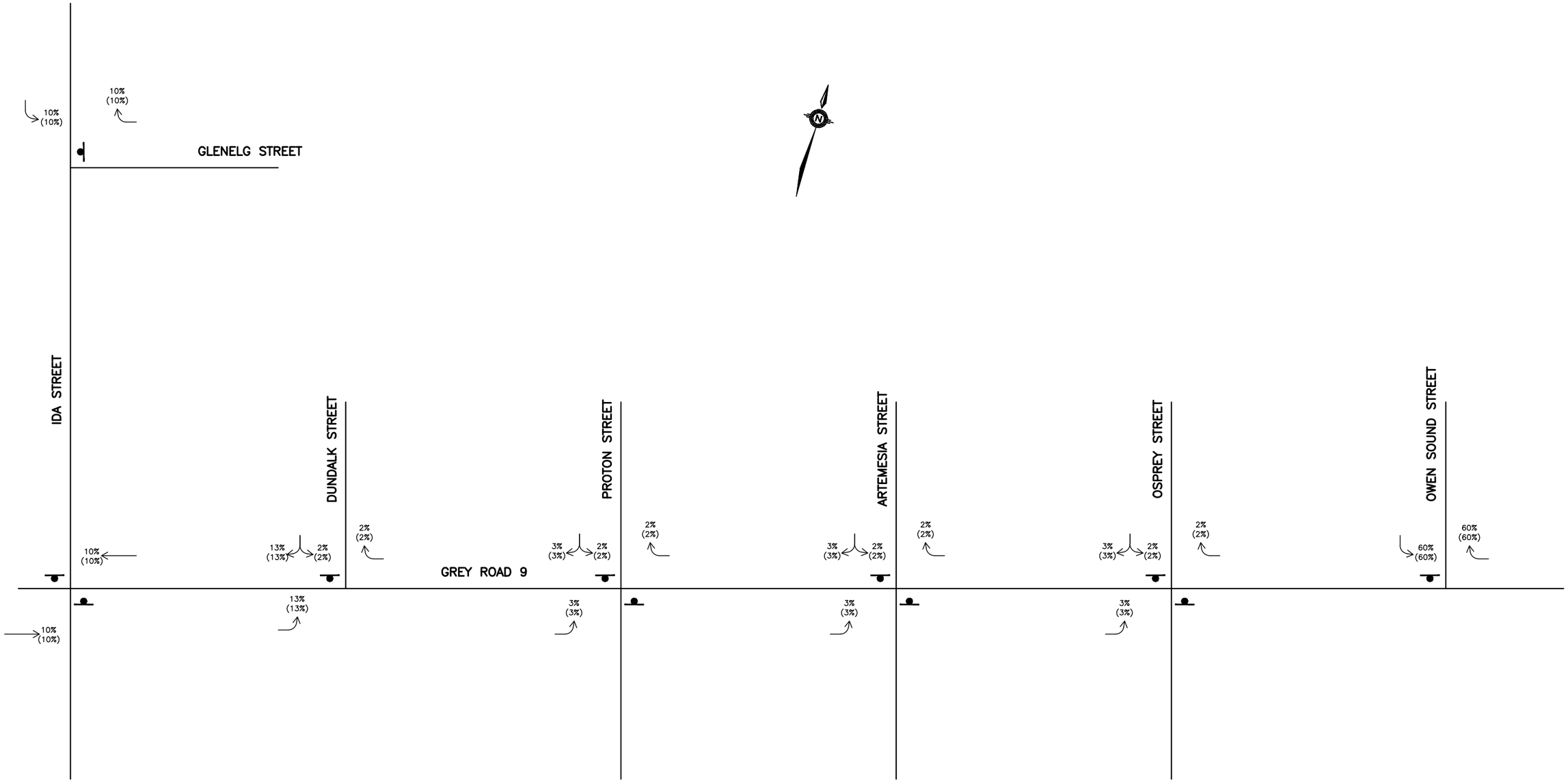
The total development generated traffic was added to the 2025 and 2030 background traffic volumes to determine the total 2025 and 2030 future peak hour traffic, as illustrated in Figures 6 and 7, respectively.

7.1 Level of Service Analysis

A level of service analysis was carried out to determine the impact of the trips generated by the development on the existing intersections during the Weekday AM and PM peak hours. The detailed capacity analyses are included in Appendix C. Table 6 and Table 7 summarize the future levels of service for 2025 and 2030 respectively.

Table 6: 2025 Future Traffic Level of Service

Intersection	Movement	Level of Service (Delay, s)	
		Weekday AM	Weekday PM
Ida Street and Glenelg Street (Unsignalized)	EB left-right NB thru-right SB thru-left	A (8.8) A (0.0) A (2.7)	A (8.9) A (0.0) A (3.2)
Ida Street and Grey Road 9 (Unsignalized)	EB left-thru-right WB left-thru-right NB left-thru-right SB left-thru-right	A (0.5) A (1.7) B (10.2) B (11.4)	A (0.9) A (0.7) B (12.9) B (13.3)
Grey Road 9 and Dundalk Street (Unsignalized)	EB left-thru WB thru-right SB left-right	A (0.7) A (0.0) B (12.6)	A (0.5) A (0.0) B (13.7)
Grey Road 9 and Owen Sound Street (Unsignalized)	EB left-thru WB thru-right SB left-right	A (0.1) A (0.0) B (14.2)	A (0.1) A (0.0) C (17.5)

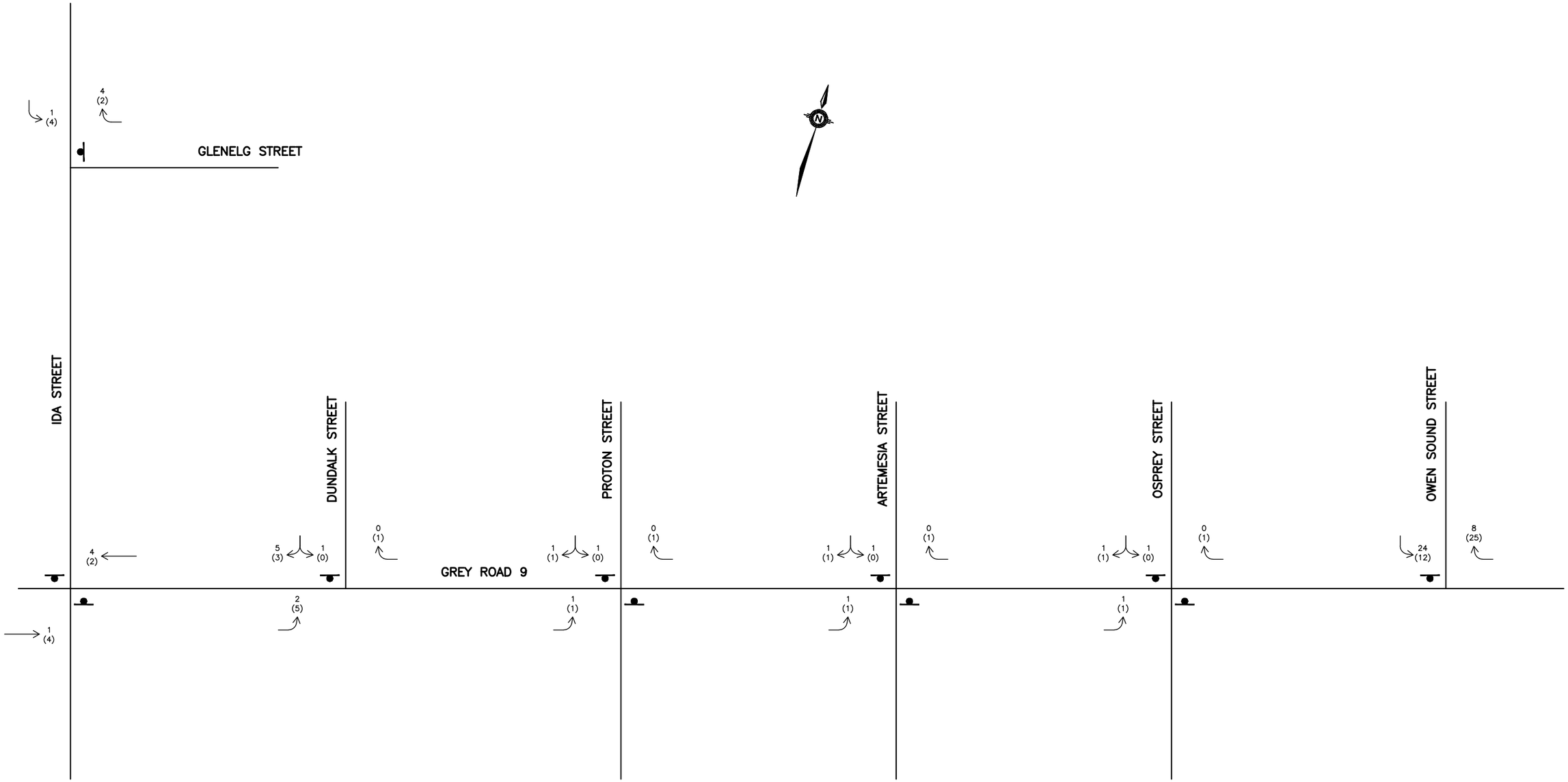


LEGEND:

- STOP CONTROL
- TRAFFIC FLOW
- 25 am Peak / (25) pm Peak TRAFFIC VOLUMES
- TRAFFIC SIGNALS
- EXISTING ROAD
- PROPOSED ENTRANCE

TRITON ENGINEERING SERVICES LIMITED
Consulting Engineers

FIGURE 4:
DEVELOPMENT PEAK HOUR TRIP ASSIGNMENT
(NOT TO SCALE)



LEGEND:

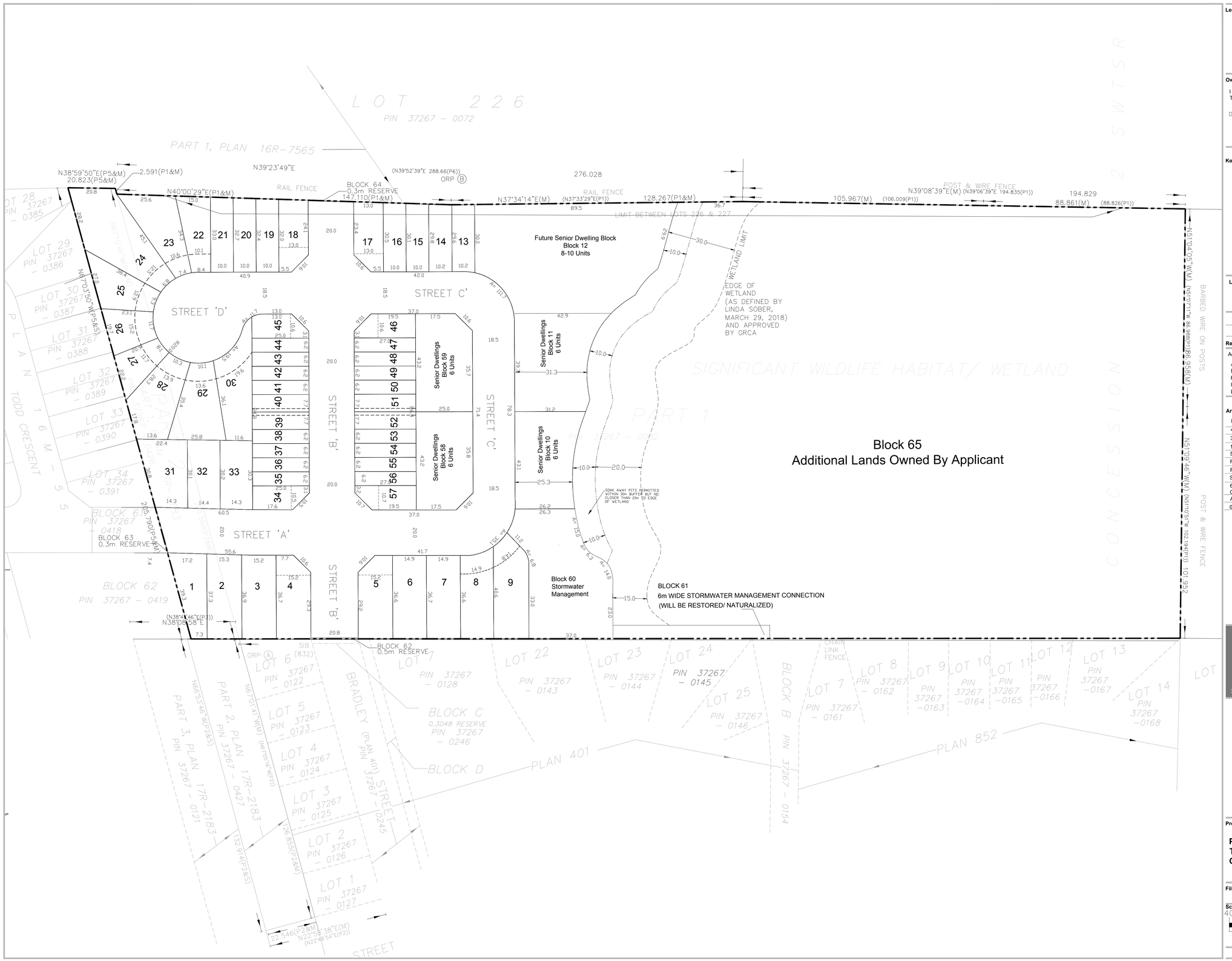
- STOP CONTROL
- TRAFFIC FLOW
- 25 am Peak / (25) pm Peak TRAFFIC VOLUMES
- TRAFFIC SIGNALS
- EXISTING ROAD
- PROPOSED ENTRANCE

TRITON ENGINEERING SERVICES LIMITED
Consulting Engineers

FIGURE 5:
DEVELOPMENT PEAK HOUR TRIP DISTRIBUTION
(NOT TO SCALE)

APPENDIX A

Draft Plan of Subdivision



Legal Description

PART OF LOT 227, CONCESSION 2 SWTSR
PART 1 17R2183 AND AS IN R480846
(VILLAGE OF DUNDALK)
NOW IN THE TOWNSHIP OF SOUTHGATE
(GEOGRAPHIC TOWNSHIP OF PROTON)
COUNTY OF GREY

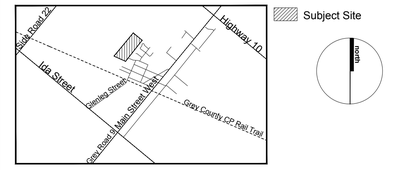
Owner's Certificate

I HEREBY AUTHORIZE MACNAUGHTON HERMSEN BRITTON CLARKSON PLANNING LIMITED TO SUBMIT THIS PLAN FOR APPROVAL.

DATE: _____

_____
DOMENIC DE PALMA
2570970 ONTARIO INC.

Key Plan NOT TO SCALE



Legend

Revision No.	Date	Issued / Revision	By

Additional Information Required Under Section 51(17) of the Planning Act R.S.O. 1990, c.P.13 as Amended

A. As Shown	B. As Shown	C. As Shown
D. Residential, Stormwater Management		E. As Shown
F. As Shown	G. As Shown	H. Municipal Water Supply
I. Listowel Silt Loam	J. As Shown	K. All Services As Required
L. As Shown		

Area Schedule

Description	Lots/Blocks	Units	Area
40' (12.2m) Single Detached	1-9,31-33	12	0.64ha (1.57ac)
30' (10.0m) Single Detached	13-30	18	0.80ha (1.98ac)
19.5' (6.0m) Townhouses	34-57	24	0.44ha (1.08ac)
Senior Dwelling Blocks (20' (6.2m))	Block 10-11,58-,59	24	0.47ha (1.17ac)
Future Senior Dwelling Block	Block 12	8-10	0.36ha (0.89ac)
Roads	Street 'A' - Street 'D'		1.14ha (2.82ac)
Stormwater Management	Block 60		0.19ha (0.48ac)
6m Stormwater Management Connection	Block 61		0.04ha (0.10ac)
Additional Lands Owned by Applicant	Block 65		4.79ha (11.84ac)
0.3m & 0.5m Reserve	Block 62-64		0.01ha (0.02ac)
		86-88	8.88ha (21.94ac)

White Rose Park

MHBC PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE
230-7050 WESTON ROAD WOODBRIDGE, ON. L4L 8G7 | P: 905 761 5588 F: 905 761 5589 | WWW.MHBCPLAN.COM

Date	May 11, 2020
File No.	13126B
Plan Scale	1:750
Drawn By	T.H.
Checked By	D.K & A.P.
Other	

Project

**Part of Lot 227 Concession 2,
Township of Southgate,
County of Grey**

North

File Name DRAFT PLAN OF SUBDIVISION

Dwg No. 1 of 1

Scale Bar

40 0 40 80

MEASUREMENTS SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

N:\13126\B – Dundalk\2020\06. June\Draft Plan\CAD\8876 WHITE ROSE June 04 2020–C.dwg

TRANSPORTATION IMPACT STUDY

IDA STREET DEVELOPMENT

TOWNSHIP OF SOUTHGATE
GREY COUNTY

PREPARED FOR:

FLATO IDA DUNDALK INC.

PREPARED BY:

C.F. CROZIER & ASSOCIATES INC.
70 HURON STREET, SUITE 100
COLLINGWOOD, ON L9Y 4L4

MAY 2024

CFCA FILE NO. 1060-5590

CROZIER
CONSULTING ENGINEERS

5.0 Site Generated Traffic

The proposed development will result in additional vehicles on the study area road network that previously did not exist.

5.1 Trip Generation

The trip generation of the proposed development was forecast using the fitted curve equations from the ITE Trip Generation Manual 11th Edition for Land Use Code (LUC) 210 "Single Family Detached Housing", LUC 220 "Multifamily Housing (Low-Rise)", LUC 730 "Government Office Building" and LUC 495 "Recreation Center". **Table 11** summarizes the estimated trip generation of the Subject Development. **Appendix G** contains ITE Trip Generation Manual Excerpts.

Table 11: Subject Development Trip Generation

Use	Trip Type	Peak Hour	Number of Trips		
			Inbound	Outbound	Total
LUC 210: Single Family Detached Housing (266 Units)	Primary	Weekday A.M.	45	136	181
	Primary	Weekday P.M.	157	92	249
LUC 220: Multifamily Housing (Low-Rise) (55 Units)	Primary	Weekday A.M.	10	30	40
	Primary	Weekday P.M.	28	16	44
Residential Total	**Primary**	**Weekday A.M.**	**55**	**166**	**221**
	Primary	**Weekday P.M.**	**185**	**108**	**293**
LUC 730: Government Office Building (68,000 sq. ft.)	Primary	Weekday A.M.	106	14	120
	Primary	Weekday P.M.	20	101	121
LUC 495: Recreational Community Center (68,000 sq. ft.)	Primary	Weekday A.M.	86	44	130
	Primary	Weekday P.M.	95	107	202
Township Lands Total	**Primary**	**Weekday A.M.**	**192**	**58**	**250**
	Primary	**Weekday P.M.**	**115**	**208**	**323**
Subject Development Total	**Primary**	**Weekday A.M.**	**247**	**224**	**471**
	Primary	**Weekday P.M.**	**300**	**316**	**616**

The Subject Development is estimated to generate 471 and 616 two-way trips during the weekday a.m. and p.m. peak hours, respectively. Based on the currently assumed office and recreational centre land uses for the Township lands, the Township lands are estimated to account for approximately 50% of the traffic generated by the Subject Development.

5.2 Trip Distribution and Assignment

Trips generated by the Ida Street Development were distributed to the boundary road network similar to the distribution used in the Glenelg Phase 1 TIS and Glenelg Phase 2 TIS. The trip distribution was based on Transportation Tomorrow Survey (TTS) data. The TTS is a comprehensive survey of transportation characteristics which includes the Golden Horseshoe, Simcoe County, and Grey County. As TTS data is not available for the Community of Dundalk, the Township of Melancthon (adjacent Dundalk to the south and east) was selected as it is considered most representative of the subject area. The TTS Data used in the Glenelg studies have been included in **Appendix F**.

The trip distribution is as follows:

- 80% to/from the east on Main Street.
    - 20% to/from downtown Dundalk
    - 60% to/from Highway 10
- 10% to/from the west on Main Street/Grey Road 9
- 10% to/from the north on Ida Street

The trip assignment of the Subject Development is illustrated in **Figure 14**.

6.0 Future Total Conditions

6.1 Basis of Assessment

The total traffic volumes combine the background traffic volumes with the traffic volumes generated by the Subject Development. **Figure 15** and **Figure 16** illustrate the 2027 and 2032 future total traffic volumes for the weekday a.m. and p.m. peak hours.

6.2 Left-Turn Lane Warrant

Auxiliary left-turn lane warrants were assessed at the proposed site accesses to Grey Road 9 and Ida Street based on the methodology described in the MTO Design Supplement for the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR). As a roundabout is planned for the Ida Street and Main Street/Grey Road 9 intersection, left-turn lanes were not assessed at this location.

There is a 40 km/h posted speed limit throughout Dundalk. As the proposed development is adjacent to the built-up area of Dundalk and will extend the built-up area to the west, it is expected that the 40 km/h posted speed limit could be extended to the western limits of the Subject Development's frontage on Grey Road 9. If the 40 km/h posted speed limit is not extended, it is recommended that a speed transition area of 60 km/h is implemented between the posted 40 km/h and 80 km/h locations. It was assumed that the existing posted speed limit of 40 km/h on Ida Street would not be increased in the future.

Auxiliary left-turn lane warrants have been evaluated at the site access to Ida Street for a posted speed limit of 40 km/h, the easterly access to Grey Road 9 for posted speed limits of 40 km/h and 60 km/h, and the westerly access to Grey Road 9 for posted speed limits of 40 km/h, 60 km/hr, and 80 km/h which correspond to design speeds of 50 km/h, 80 km/h, and 100 km/h, respectively. As left-turn lane warrants for higher speeds are more likely to require a left-turn lane, warrants were not evaluated at the lower speed thresholds if they were not warranted at the higher design speeds.

part of the environmental assessment ("Eco Parkway TIS", September 2017). **Appendix F** contains the Eco Parkway TIS excerpts. It is recognized that the TIS referred to the proposed roadway as Industrial Access Road, however the most recent naming is Eco Parkway.

7.1 Eco Parkway Site Generated Trips

Construction of the Eco Parkway extension will provide a bypass to Dundalk and is expected to reroute existing traffic. For the purposes of their study and to remain consistent with the Eco Parkway TIS, it was assumed that 30% of the existing traffic on Grey Road 9 through Dundalk would use Eco Parkway to bypass the community. The Eco Parkway TIS also assumed that existing truck traffic would use Eco Parkway to bypass Main Street or to access the industrial lands.

To remain consistent with the Eco Parkway TIS, existing traffic volumes, which includes background traffic growth, were redistributed as follows:

- 30% of southbound left vehicles will complete southbound through movements
- 30% of eastbound through vehicles will complete eastbound right movements
- 30% of westbound through vehicles will complete northbound left movements
- 30% of westbound right vehicles will complete northbound through movements

Trips from the background developments were not re-distributed based on the Eco Parkway construction because most of the developments are located to the north of Eco Parkway and would have to detour to use Eco Parkway. It should be noted that most of the new developments are residential while the proposed site is industrial, therefore some synergies will likely occur, but this was not investigated in this study. Trips may have been counted in both the industrial site generated trips and other background development generated trips to ensure a conservative analysis. **Figure 17** illustrates the adjusted vehicular volumes that are forecast to bypass Main Street.

7.2 Eco Parkway Site Generated Trips

The development of the industrial area serviced by the Eco Parkway extension is anticipated to result in new trips to the study area road network. The full build-out of the Eco Parkway extension industrial lands was assumed to be completed prior to the 2032 horizon year, so the trip generation associated with full build-out has been used in this analysis.

The ITE Trip Generation Manual, 8th Edition was used in the Eco Parkway TIS to estimate the trip generation of the industrial lands. LUC 130 "Industrial Park" was applied to the 259.75 acre site as specific industrial land uses were unknown at that time. The Eco Parkway TIS assumed that all site-generate trips were primary trips. **Table 15** summarizes the estimated trip generation noted in the Eco Parkway TIS. **Appendix F** contains relevant excerpts from the Eco Parkway TIS.

Table 15: Eco Parkway Industrial Lands Trip Generation

Peak Hour	Number of Trips		
	Inbound	Outbound	Total
Weekday A.M.	1,142	234	1,376
Weekday P.M.	266	1,000	1,266

The development of the industrial lands surrounding the Eco Parkway extension is estimated to generate approximately 1,376 and 1,266 two-way trips in the a.m. and p.m. peak hours, respectively. The trips were assigned to the road network consistent with the Eco Parkway TIS. The Eco Parkway TIS assumed 70% of trips would travel towards Highway 10 on the Eco Parkway

extension and the remainder would travel into Dundalk. **Figure 18** contains the Eco Parkway Industrial Lands trip assignment as noted in the Eco Parkway TIS.

7.3 Eco Parkway Future Total Scenario

Based on the proximity of the Subject Development to Eco Parkway, it is anticipated that the bypass will provide an alternative path for site-generated trips. The revised trip distribution is as follows:

- 20% to/from the east on Main Street to/from downtown Dundalk
- 60% to/from the south to access Highway 10 via Eco Parkway
- 10% to/from the west on Main Street/Grey Road 9
- 10% to/from the north on Ida Street

The alternative site trip assignment is illustrated in **Figure 19** and the 2032 Eco Parkway Scenario total traffic volumes are illustrated in **Figure 20.**

7.3.1 Left Turn Lane Warrant

The need for left-turn lanes were evaluated using TAC GDGCR methodology, similar to **Section 6.2** of this study.

Table 16 summarizes the results of the left-turn lane warrants for the site accesses under the 2032 Eco Parkway Scenario total traffic conditions. **Appendix H** contains the left-turn lane warrant nomographs and **Appendix I** contains excerpts from the TAC Manual.

Table 16: Left-Turn Lane Warrant Summary – Eco Parkway

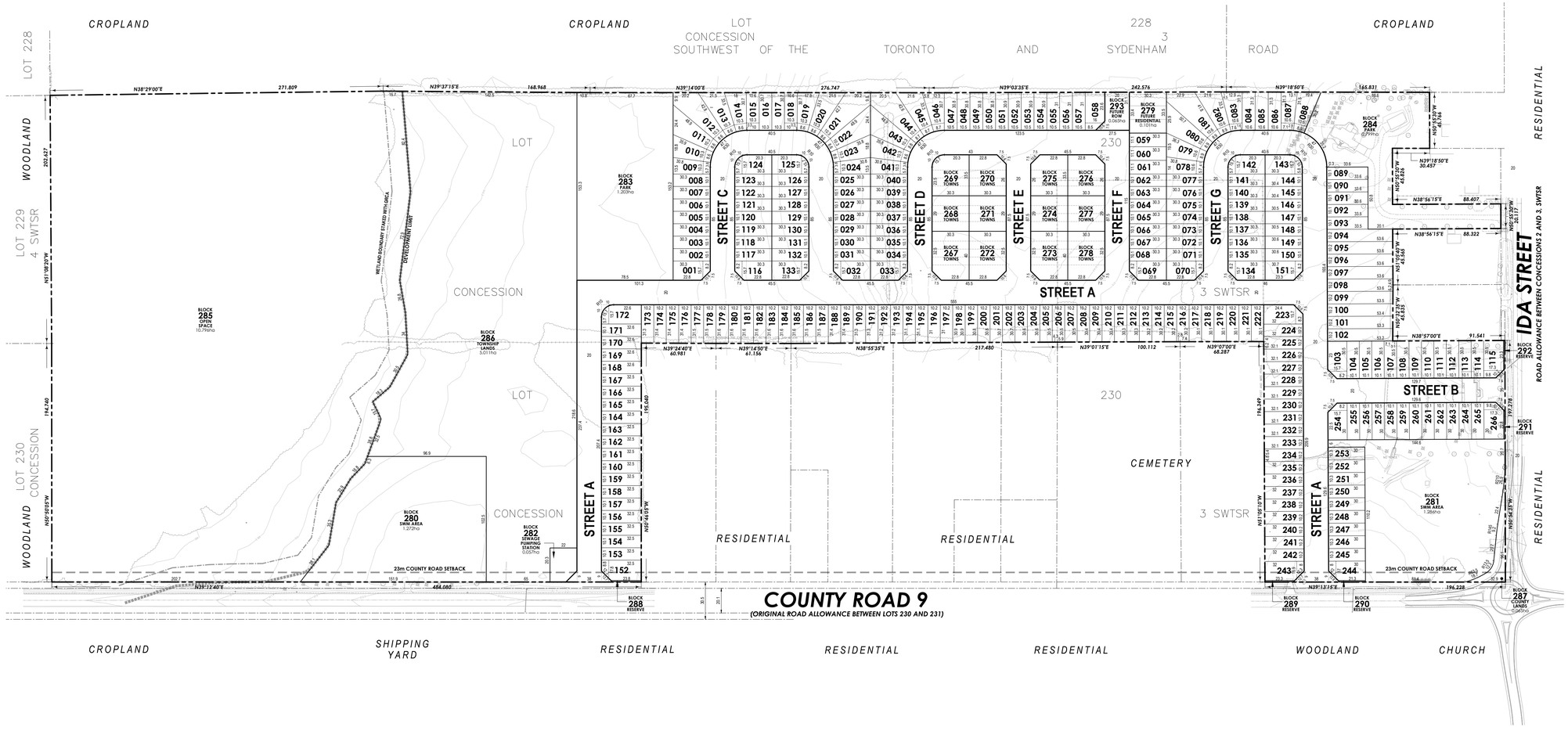
Access	Peak Hour	Design Speed		
		50 km/h	80 km/h	100 km/h
Access A Eastbound-Left	A.M.	X	X	15 m
	P.M	X	X	15 m
Access B Eastbound-Left	A.M.	X	15 m	N/A
	P.M	15 m	15 m	N/A
Access 1 Northbound-Left	A.M.	X	N/A	N/A
	P.M	X	N/A	N/A

An eastbound left-turn lane is warranted at Access A for a posted speed limit of 80 km/h and at Access B for all assessed design speeds under 2032 total conditions.

It is noted that based on the 2032 total operations, the eastbound movements on Grey Road 9 at the site accesses are forecast to operate at LOS A with delays of less than 2 seconds without the implementation of eastbound left-turn lanes. Further, there are 7 or fewer eastbound left-turning vehicles on Grey Road 9 at Access B forecast under 2032 total conditions, which is approximately one vehicle every 10 minutes.

If the speed limit is not reduced across the Subject Development's frontage to Grey Road 9, it is recommended an eastbound left-turn lane is implemented at Access A with 15 metres of storage. However, due to the low future volumes forecast to use Access B and due to the lower speed limit, it is recommended that the Township monitors Access B for the need of an eastbound left-turn.

FIGURES



LAND USE SUMMARY

LAND USE	LOT / BLOCK #	UNITS	AREA
SINGLE DETACHED - 10.1m LOTS	001-266	266	9.454ha
TOWNHOUSE - 6.5m UNITS	267-278	52	1.218ha
FUTURE RESIDENTIAL	279	3	0.101ha
STORMWATER MANAGEMENT AREA	280, 281		2.558ha
SEWAGE PUMPING STATION	282		0.057ha
PARK	283, 284		2.002ha
OPEN SPACE	285		10.796ha
TOWNSHIP LANDS	286		5.011ha
COUNTY LANDS	287		0.065ha
0.3m RESERVE	288-292		0.003ha
FUTURE RIGHT OF WAY	293		0.065ha
RIGHT OF WAY	A, B, C, D, E, F, G		4.610ha
TOTALS		321	35.940ha

LEGAL DESCRIPTION

PART OF LOTS 229 AND 230
CONCESSION 3, SOUTHWEST OF THE TORONTO AND SYDENHAM ROAD
GEOGRAPHIC TOWNSHIP OF PROTON
TOWNSHIP OF SOUTHGATE
COUNTY OF GREY

OWNER'S CERTIFICATE

I HEREBY AUTHORIZE MACNAUGHTON HERMSEN BRITTON CLARKSON PLANNING LIMITED TO SUBMIT THIS PLAN FOR APPROVAL.

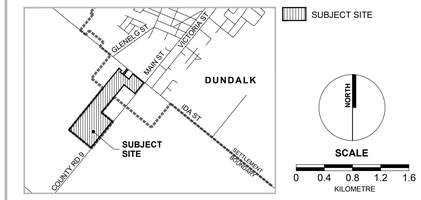
DATE: _____ _____

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE: _____ _____

KEY PLAN



LEGEND

- PROJECT BOUNDARY LINE
- RIGHT OF WAY LINE
- BLOCK LINE
- LOT LINE
- PARCEL FABRIC

REVISION No.	DATE	ISSUED / REVISION	BY

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT R.S.O. 1990 C.P.13 AS AMENDED

- **A.** AS SHOWN
- **B.** AS SHOWN
- **C.** AS SHOWN
- **D.** 321 SINGLE RESIDENTIAL LOTS
- **E.** AS SHOWN
- **F.** AS SHOWN
- **G.** AS SHOWN
- **H.** MUNICIPAL WATER SUPPLY
- **I.** SANDY SILT/SILTY SAND DEPOSITS WITH LOCALIZED SAND LAYERS
- **J.** AS SHOWN
- **K.** ALL SERVICES AS REQUIRED (WATER, SANITARY, STORMWATER, HYDRO)
- **L.** AS SHOWN

MHBC PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE
113 COLLIER STREET, BARRIE, ON, L4M 1H2 | P: 705.728.0045 | WWW.MHBCPLAN.COM

STAMP

DATE	APR. 30, 2024
FILE No.	15184AC
SCALE	1:1,800 (ARCH D)
DRAWN BY	M.M.
CHECKED BY	K.C.
OTHER	

PROJECT

FLATO IDA
FLATO IDA DUNDALK INC.
3621 HIGHWAY 7 EAST, SUITE 503
MARKHAM, ON L3R 0G6
P:(905) 479-9292 F:(905) 429-9165
WWW.FLATOGROUP.COM

NORTH

FILE NAME
DRAFT
PLAN OF SUBDIVISION

DWG No. 1 of 1

SCALE BAR
0 9 18 27 36 45 60 90 135 180m
MEASUREMENTS SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

N:\Southgate\752212 Ida Street, Dundalk – 15184AC\Drawings\Draft Plan\CAD\15184AC – Draft Plan – 2024-04-30.dwg

NTS

Legend

xx A.M. Peak Hour Traffic Volumes
(xx) P.M. Peak Hour Traffic Volumes
Stop sign

Ida Street

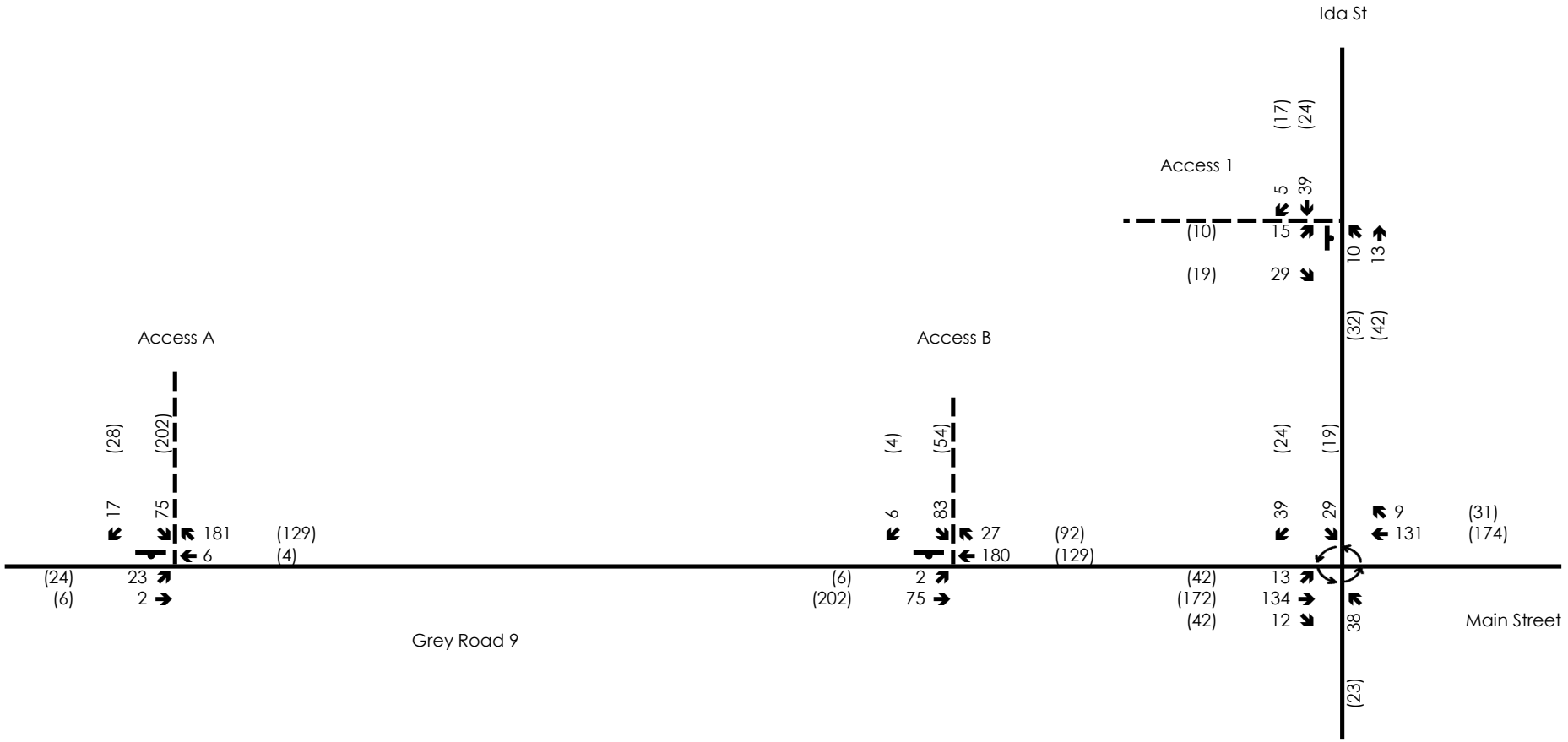
Site Location Plan

CROZIER CONSULTING ENGINEERS

Figure 2

Project No. 1060-5590

Date: May 2024



Legend

xx A.M. Peak Hour Traffic Volumes
(xx) P.M. Peak Hour Traffic Volumes
Stop sign
Roundabout

Ida Street

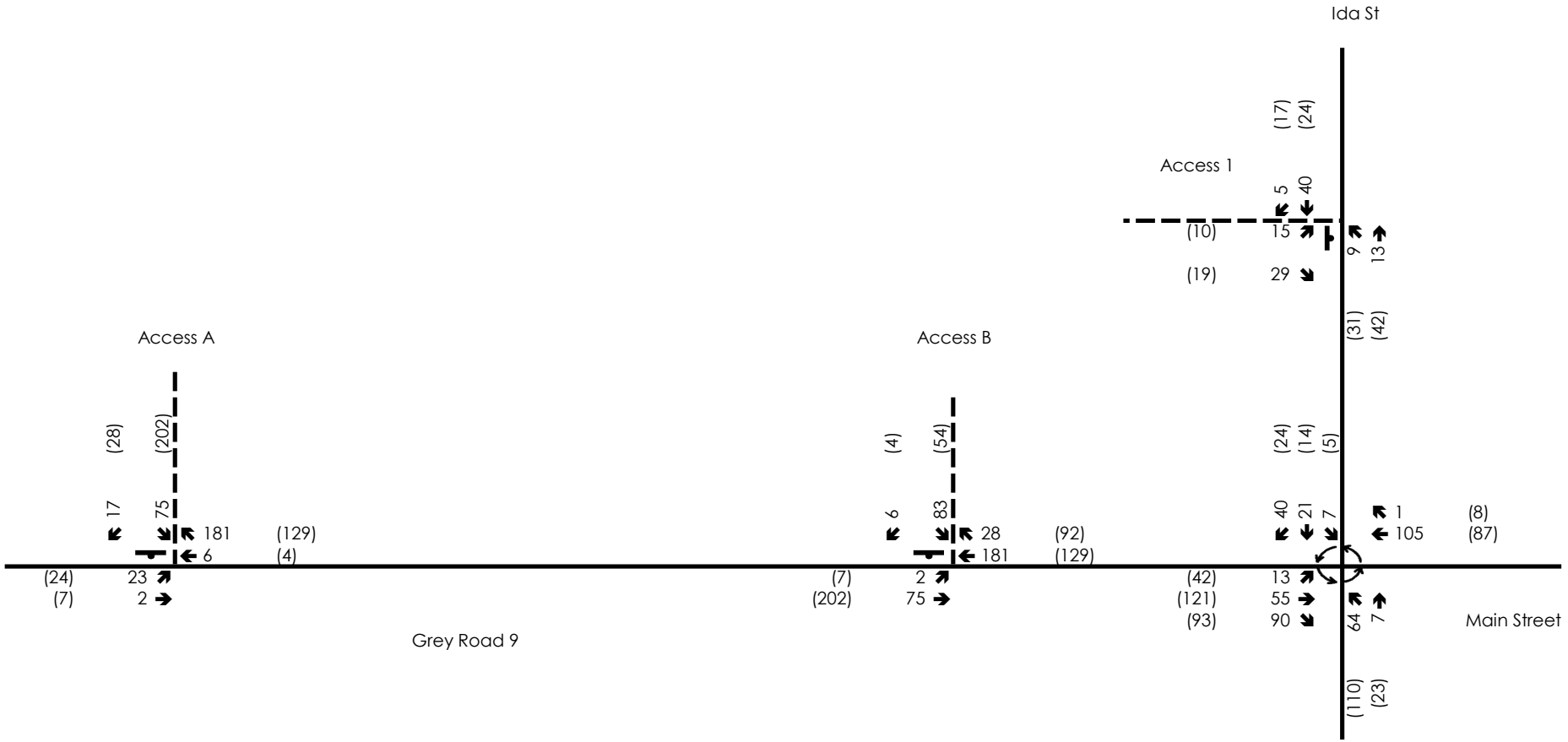
Subject Development Trip Assignment

CROZIER CONSULTING ENGINEERS

Figure 14

Project No. 1060-5590

Date: May 2024



Legend

xx A.M. Peak Hour Traffic Volumes
(xx) P.M. Peak Hour Traffic Volumes
Stop sign
Roundabout

Ida Street

Subject Development Site Trip Assignment (Eco-Parkway)

CROZIER CONSULTING ENGINEERS

Figure 19

Project No. 1060-5590

Date: May 2024

Appendix I

Internal Reduction Spreadsheets

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Eco Park - 50% Build-Out	**Organization:**	C.F. Crozier & Associates
Project Location:		**Performed By:**	Kerianne Hagan
Scenario Description:		**Date:**	24-Jul-24
Analysis Year:	2029	**Checked By:**	
Analysis Period:	**AM Street Peak Hour**	**Date:**	

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

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				205	127	78
Restaurant				0		
Cinema/Entertainment				0		
Residential				125	31	94
Hotel				0		
All Other Land Uses[2]				65	53	12
				395	211	184

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

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

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

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

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

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	395	211	184
Internal Capture Percentage	1%	1%	1%
External Vehicle-Trips[5]	391	209	182
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

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

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	1%	1%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	3%	1%
Hotel	N/A	N/A

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

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

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

[4]Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

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

[6]Person-Trips

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

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

Project Name:	Eco Park - 50% Build-Out
Analysis Period:	**AM Street Peak Hour**

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

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	127	127	1.00	78	78
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	31	31	1.00	94	94
Hotel	1.00	0	0	1.00	0	0

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

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	23		10	0	11	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	2	1	19	0		0
Hotel	0	0	0	0	0	

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

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		41	0	0	0	0
Retail	0		0	0	1	0
Restaurant	0	10		0	2	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	22	0	0		0
Hotel	0	5	0	0	0	

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

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	1	126	127	126	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	1	30	31	30	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	53	53	53	0	0

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

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	1	77	78	77	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	1	93	94	93	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	12	12	12	0	0

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

[2]Person-Trips

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

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

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Eco Park - 50% Build-Out	**Organization:**	C.F. Crozier & Associates
Project Location:		**Performed By:**	Kerianne Hagan
Scenario Description:		**Date:**	24-Jul-24
Analysis Year:	2029	**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

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

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	281			646	310	336
Restaurant				0		
Cinema/Entertainment				0		
Residential	210/230			165	102	63
Hotel				0		
All Other Land Uses[2]				65	14	51
				876	426	450

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

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

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

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

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	47	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	26	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	876	426	450
Internal Capture Percentage	17%	17%	16%
External Vehicle-Trips[5]	730	353	377
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

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

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	8%	14%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	46%	41%
Hotel	N/A	N/A

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

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

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

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

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

[6]Person-Trips

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

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

Project Name:	Eco Park - 50% Build-Out
Analysis Period:	**PM Street Peak Hour**

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

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	310	310	1.00	336	336
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	102	102	1.00	63	63
Hotel	1.00	0	0	1.00	0	0

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

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	7		97	13	87	17
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	3	26	13	0		2
Hotel	0	0	0	0	0	

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

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		25	0	0	4	0
Retail	0		0	0	47	0
Restaurant	0	155		0	16	0
Cinema/Entertainment	0	12	0		4	0
Residential	0	31	0	0		0
Hotel	0	6	0	0	0	

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

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	26	284	310	284	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	47	55	102	55	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	14	14	14	0	0

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

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	47	289	336	289	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	26	37	63	37	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	51	51	51	0	0

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

[2]Person-Trips

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

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

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Eco Park - Full Build-Out	**Organization:**	C.F. Crozier & Associates
Project Location:		**Performed By:**	Kerianne Hagan
Scenario Description:		**Date:**	22-Oct-24
Analysis Year:	2034	**Checked By:**	
Analysis Period:	**AM Street Peak Hour**	**Date:**	

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

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				276	171	105
Restaurant				0		
Cinema/Entertainment				0		
Residential				258	64	194
Hotel				0		
All Other Land Uses[2]				131	106	25
				665	341	324

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

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

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

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

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

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	665	341	324
Internal Capture Percentage	1%	1%	1%
External Vehicle-Trips[5]	659	338	321
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

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

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	1%	1%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	2%	1%
Hotel	N/A	N/A

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

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

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

[4]Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

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

[6]Person-Trips

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

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

Project Name:	Eco Park - Full Build-Out
Analysis Period:	**AM Street Peak Hour**

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

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	171	171	1.00	105	105
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	64	64	1.00	194	194
Hotel	1.00	0	0	1.00	0	0

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

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	30		14	0	15	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	4	2	39	0		0
Hotel	0	0	0	0	0	

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

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		55	0	0	0	0
Retail	0		0	0	1	0
Restaurant	0	14		0	3	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	29	0	0		0
Hotel	0	7	0	0	0	

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

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	2	169	171	169	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	1	63	64	63	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	106	106	106	0	0

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

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	1	104	105	104	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	2	192	194	192	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	25	25	25	0	0

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

[2]Person-Trips

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

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

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Eco Park - Full Build-Out	**Organization:**	C.F. Crozier & Associates
Project Location:		**Performed By:**	Kerianne Hagan
Scenario Description:		**Date:**	24-Jul-24
Analysis Year:	2034	**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

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

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				1,064	511	553
Restaurant				0		
Cinema/Entertainment				0		
Residential				325	201	124
Hotel				0		
All Other Land Uses[2]				131	29	102
				1,520	741	779

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

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

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

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

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	92	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	51	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	1,520	741	779
Internal Capture Percentage	19%	19%	18%
External Vehicle-Trips[5]	1,234	598	636
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

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

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	10%	17%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	46%	41%
Hotel	N/A	N/A

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

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

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

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

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

[6]Person-Trips

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

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

Project Name:	Eco Park - Full Build-Out
Analysis Period:	**PM Street Peak Hour**

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

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	511	511	1.00	553	553
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	201	201	1.00	124	124
Hotel	1.00	0	0	1.00	0	0

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

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	11		160	22	144	28
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	5	52	26	0		4
Hotel	0	0	0	0	0	

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

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		41	0	0	8	0
Retail	0		0	0	92	0
Restaurant	0	256		0	32	0
Cinema/Entertainment	0	20	0		8	0
Residential	0	51	0	0		0
Hotel	0	10	0	0	0	

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

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	51	460	511	460	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	92	109	201	109	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	29	29	29	0	0

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

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	92	461	553	461	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	51	73	124	73	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	102	102	102	0	0

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

[2]Person-Trips

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

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

Appendix J

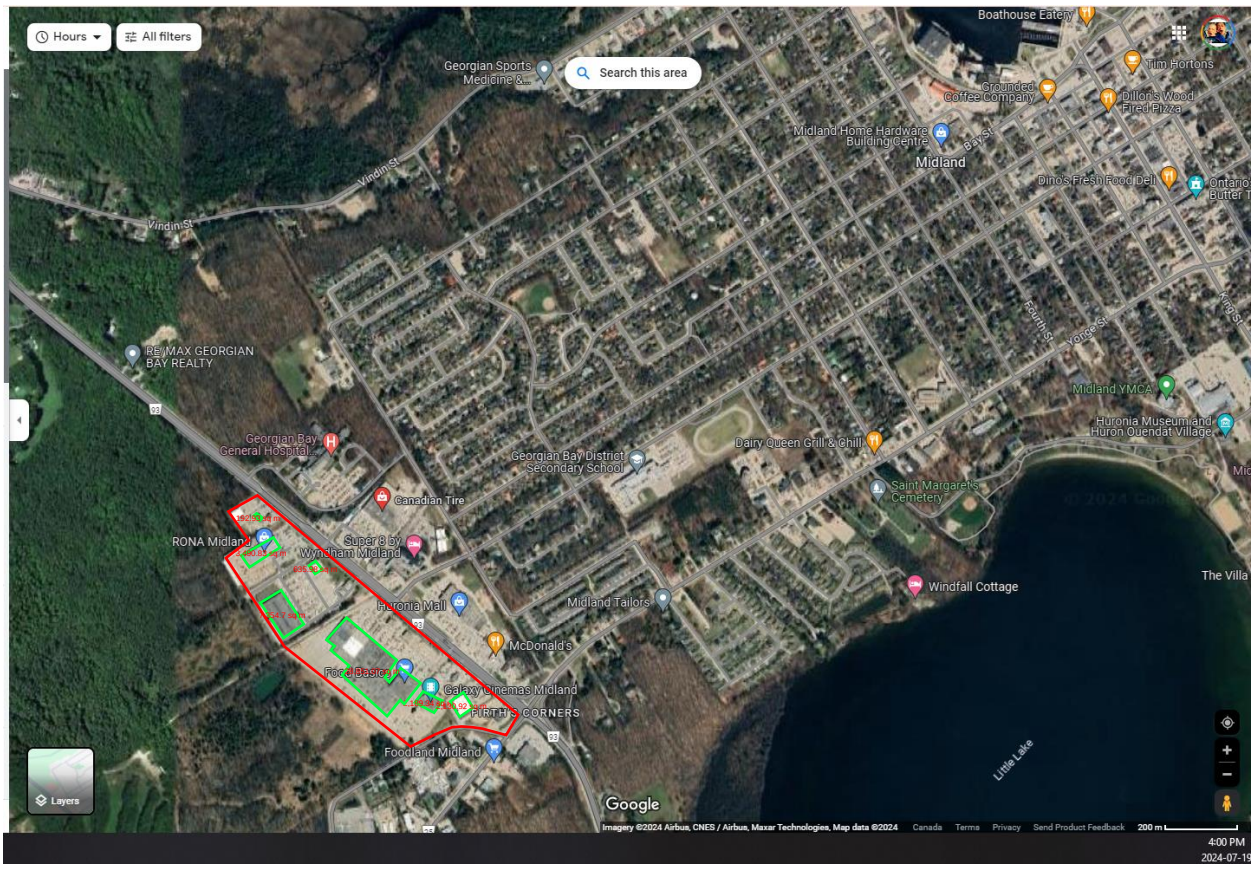
Lot Coverage Examples

New Tecumseth - 41,439 (2019)

Approximate Lot Coverage = 26%

Legend

Description	Quantity	Unit
Area Measurement	30,727.79	sq m
Area Measurement	118,352.20	sq m



Midland – 27,894 (2021)

Approximate Lot Coverage = 23%

Legend

Description	Quantity	Unit
Area Measurement	44,845.77	sq m
Area Measurement	201,039.90	sq m

Legend

Description	Quantity	Unit
Area Measurement	29,265.33	sq m
Area Measurement	131,205.40	sq m

Collingwood - 24,811 (2021)

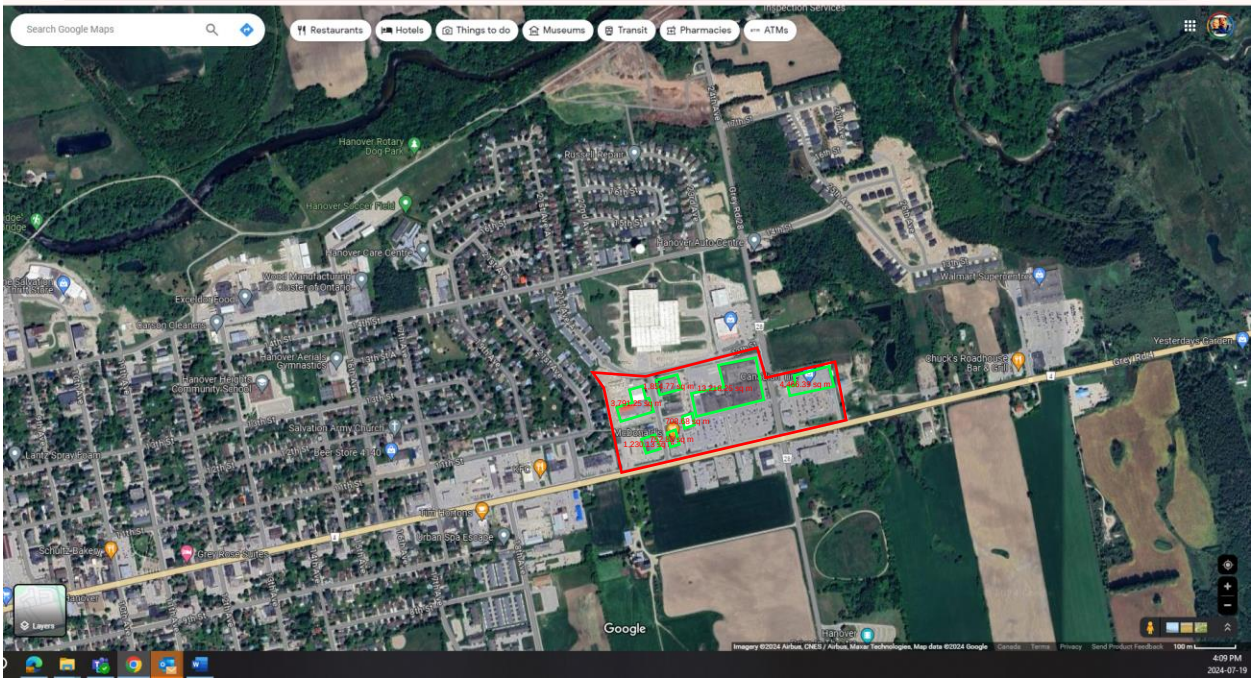
Approximate Lot Coverage = 23%

Wasaga Beach – 24,862 (2021)

Approximate Lot Coverage = 26%

Legend

Description	Quantity	Unit
Area Measurement	14,112.59	sq m
Area Measurement	54,537.82	sq m



Hanover – 7,761 (2021)

Approximate Lot Coverage = 25%

Legend

Description	Quantity	Unit
Area Measurement	26,022.27	sq m
Area Measurement	104,819.70	sq m

Location	Total Parcel Area (m^2)	GFA (m^2)	Percent GFA
Dundalk West	32468.29	11839.16	36%
	3675.23	426.74	12%
	3707.73	265.85	7%
	3611.84	346.73	10%
	3684.24	279.1	8%
	2756.11	299.58	11%
	3760.28	779.96	21%
	2730.43	412.42	15%
	3690.03	623.02	17%
	1930.67	357.55	19%
	3855.62	905.29	23%
Collingwood East	149163.9	39087.11	26%
	66453.27	18129.3	27%
	47343.76	6290.06	13%
	189558.6	30473.23	16%
Collingwood West	4632.8	786.04	17%
	37970.27	6206.49	16%
	11374.53	3969.43	35%
	4109.48	305.92	7%
	12737.59	1876.77	15%
	3259.15	565.73	17%
	1701.48	338.86	20%
	1721.21	394.98	23%
	2104.65	346.78	16%
	3991.69	954.05	24%
	7573.62	2510.09	33%
	6397.51	1766.92	28%
Shelburne - CR11	161874	41194.51	25%
	93118.166	21185.84	23%
	83203.368	9870.68	12%
Stayner West	13909.57	2386	17%
	33126.67	3296.3	10%
	20559.07	403.42	2%
	21153.87	425.95	2%
	30162.33	143.3	0%
	4711.69	639.58	14%
	4005.79	867.68	22%
	3654.85	214.99	6%
	2619.65	702.22	27%
	2496.75	388.68	16%
	2521.29	574.53	23%
	3775.75	562.41	15%
	3646.77	481.46	13%
		AVG	17%

Grey County GIS

Legend

Assessment Parcel

Notes

Print Date: 07/22/2024 12:25:36

0 150 300 m


Streets
2023
2022
2018
2016
2013
2012
2008
2002
1997
1989
1978
1954
Hwy 26
Hume St.
South Service Rd.
Pretty River Pkwy S.
Macdonald Rd.
Saint Clair St.
Robert Ave.
Elliott Ave.
Newport Blvd. (PVT)
Connell St.
River Run
Bush St.
Peel St.
Dillon Dr.
George Zubek Dr.
Williams St.
Lynden St.
Ron Emo
Sandford Fleming Dr.
Sixth Line
Barrington Dr.
Huronia Parkway
Parkside Ave.
Georgian Manor Dr.
Lakeview Ave.
Summer View Ave.
Scale: 1:9,028
200 m


2018
2016
2013
2012
2008
2002
1997
1989
1978
1954
Stewart Rd.
Braniff Ct.
Watts Cres.
Hickory St.
Cedar St.
Fifth St.
Sixth St.
Spruce St.
Walnut St.
Courtice Cres.
37,970.27 sq m
3623 sq m
2,038.51 sq m
1,525.87 sq m
5,273.07 sq m
Scale: 1:4,514
100 m


County Rd. 91
Quebec St
Warden St
Centre St
Coates Dr
Side St
Industrial Rd
Poplar St
Aspen Ridge D
Atkinson
30,162.33 sq m
12,803.16 sq m
21,153.87 sq m
20,559.07 sq m
29,281.52 sq m
Scale: 1:4,514
100 m

Untitled map

7/22/2024

1:9,028

0 0.05 0.1 0.2 mi

0 0.07 0.15 0.3 km

World Imagery

Low Resolution 15m Imagery

High Resolution 60cm Imagery

High Resolution 30cm Imagery

Citations

2.4m Resolution Metadata

Dufferin County, Maxar

Appendix K

Signal Warrants

TRAFFIC SIGNAL WARRANTS - JUSTIFICATION 7 (PROJECTED VOLUMES)
PER OTM BOOK 12

Project and Scenario Summary

Project	Eco Park	**Project Number**	1060-6489
		Date	2024.07.25
Horizon	2029	**Analyst**	KH

Study Intersection Summary

Major Street	Highway 10	**Direction**	North/South
Minor Street	Eco Park Way/ Side Road 240	**Direction**	East/West

Intersection Details for Warrant Parameters

Flow Conditions	Restricted Flow (Urban)	**Number of Lanes**	1
T-Intersection?	No	**Intersection Type**	New

Notes: Free Flow (Rural) is used when the operating speed is greater than or equal to 70km/h. Restricted Flow (Urban) is used otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered New if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Highway 10						Minor: Eco Park Way/ Side Road 240						Pedestrians Crossing Major Street
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
AM	238	253.25	0	0	437.45	161	81	0	267	1	0	2	0
PM	330	482.35	0	0	312.2	214	241	0	330	1	0	0	0
AHV	142	184	0	0	187	94	81	0	149	1	0	1	0

The AHV is determined by the availability of the peak hour estimates. If both Peak 1 and Peak 2 Peak Hour Volume estimates are available then AHV = (Peak1phv + Peak2phv)/4. In only the case that one estimate is available then AHV = Peak1phv/2 **or** Peak2phv/2.

Justification 7 - OTM Book 12

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT 1 LANE HIGHWAYS		MINIMUM REQUIREMENT 2 OR MORE LANE HIGHWAYS		COMPLIANCE		
						Sectional		Entire Percentage
		Free Flow	Restricted Flow	Free Flow	Restricted Flow	Numerical	Percentage	
1. Minimum Vehicular Volume	A. Vehicle Volume, All Approaches (Avg. Hour)	480	720	600	900	839	116.5%	117%
	B. Vehicle Volume, Along Minor Streets (Avg. Hour)	120	170	120	170	232	136.5%	
2. Delay to Cross Traffic	A. Vehicle Volume, Major Street (Avg. Hour)	480	720	600	900	607	84.3%	84%
	B. Combined Vehicle and Pedestrian Volume Crossing Artery From Minor Streets (Avg. Hour)	50	75	50	75	82	109.3%	
Applicable Threshold			X					

Note: For T-intersections the thresholds for 1B have been increased by 50% per OTM Book 12.
Existing Intersections Require 120% Justification
New/Proposed Intersections Require 150% Justification

Percent Compliance: 117%
Percentage Required to be Justified: 150%

Signal Justification 7 Met: [ ] **Yes** [X] **No**

TRAFFIC SIGNAL WARRANTS - JUSTIFICATION 7 (PROJECTED VOLUMES)
PER OTM BOOK 12

Project and Scenario Summary

Project	Eco Park	**Project Number**	1060-6489
		Date	2024.07.25
Horizon	2034	**Analyst**	KH

Study Intersection Summary

Major Street	Highway 10	**Direction**	North/South
Minor Street	Eco Park Way/ Side Road 240	**Direction**	East/West

Intersection Details for Warrant Parameters

Flow Conditions	Restricted Flow (Urban)	**Number of Lanes**	1
T-Intersection?	No	**Intersection Type**	New

Notes: Free Flow (Rural) is used when the operating speed is greater than or equal to 70km/h. Restricted Flow (Urban) is used otherwise.
The Number of Lanes greater than 1 only needs to be for one direction along the major road.
An intersection is considered New if at least 1-leg is added to an existing intersection.

Input Volumes and Average Hourly Volume Determination

Peak Hour	Major: Highway 10						Minor: Eco Park Way/ Side Road 240						Pedestrians Crossing Major Street
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
AM	350	513.25	0	0	537.45	236	129	0	353	1	0	2	0
PM	425	646.35	0	0	605.2	342	560	0	464	1	0	0	0
AHV	194	290	0	0	286	145	172	0	204	1	0	1	0

The AHV is determined by the availability of the peak hour estimates. If both Peak 1 and Peak 2 Peak Hour Volume estimates are available then AHV = (Peak1phv + Peak2phv)/4. In only the case that one estimate is available then AHV = Peak1phv/2 **or** Peak2phv/2.

Justification 7 - OTM Book 12

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT 1 LANE HIGHWAYS		MINIMUM REQUIREMENT 2 OR MORE LANE HIGHWAYS		COMPLIANCE		
						Sectional		Entire Percentage
		Free Flow	Restricted Flow	Free Flow	Restricted Flow	Numerical	Percentage	
1. Minimum Vehicular Volume	A. Vehicle Volume, All Approaches (Avg. Hour)	480	720	600	900	1293	179.6%	180%
	B. Vehicle Volume, Along Minor Streets (Avg. Hour)	120	170	120	170	378	222.4%	
2. Delay to Cross Traffic	A. Vehicle Volume, Major Street (Avg. Hour)	480	720	600	900	915	127.1%	127%
	B. Combined Vehicle and Pedestrian Volume Crossing Artery From Minor Streets (Avg. Hour)	50	75	50	75	173	230.7%	
Applicable Threshold			**X**					

Note: For T-intersections the thresholds for 1B have been increased by 50% per OTM Book 12.
Existing Intersections Require 120% Justification
New/Proposed Intersections Require 150% Justification

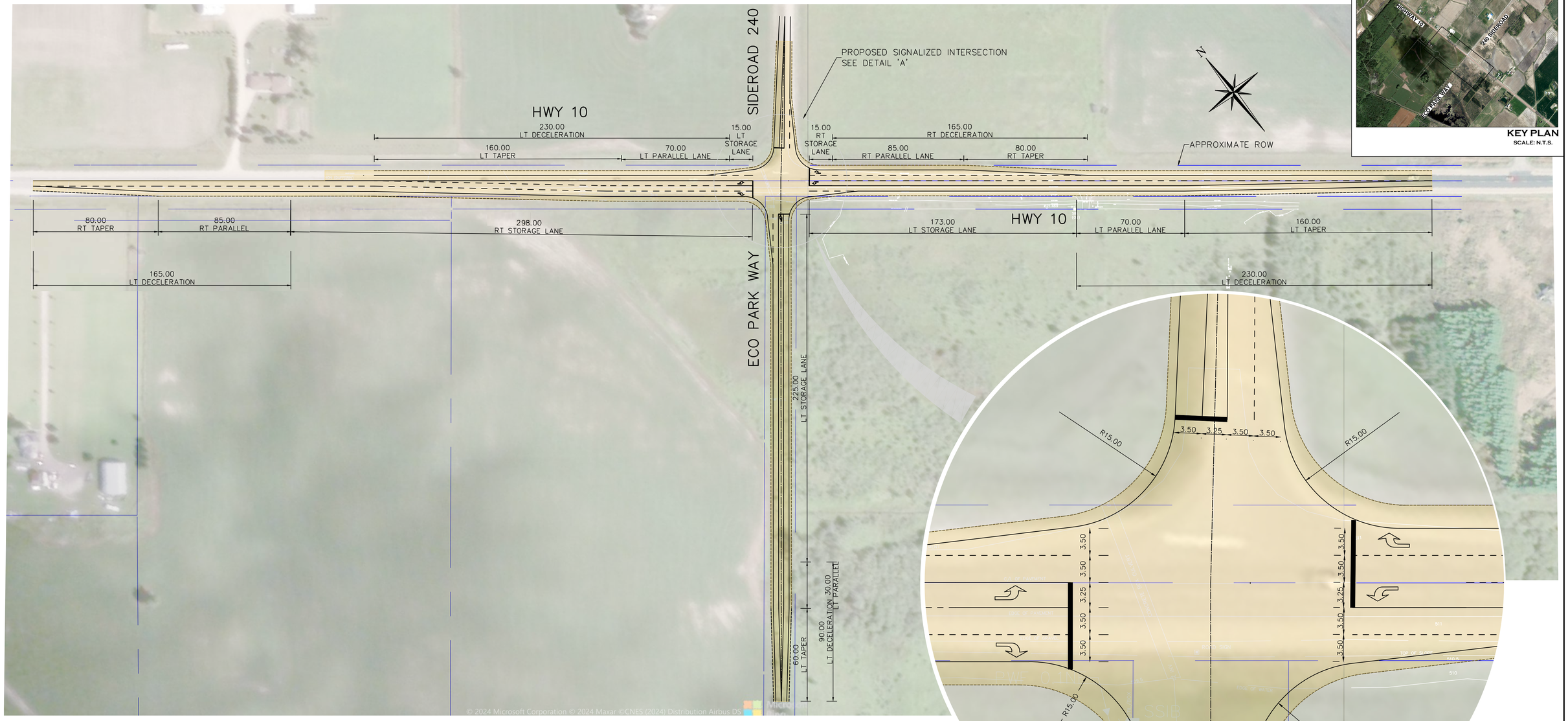
Percent Compliance: 180%
Percentage Required to be Justified: 150%

Signal Justification 7 Met: [X] **Yes** [ ] **No**

Appendix L

Highway 10 and Eco Park Way/Sideroad 240

Conceptual Intersection Layout



NOTES:

1. CONCEPTUAL DESIGN DETAILS ARE BASED ON AERIAL IMAGERY ONLY AND ARE SUBJECT TO CHANGE PENDING DETAILED DESIGN
2. AUXILIARY LANE GEOMETRY REFLECTS THE CURRENT STORAGE REQUIREMENTS (SEPTEMBER 2024) NOTED IN THE TRAFFIC IMPACT STUDY. THESE REQUIREMENTS ARE SUBJECT TO CHANGE.
3. UTILITIES PRESENT WITHIN THE RIGHT-OF-WAY ARE UNKNOWN AT THIS TIME AND WILL BE INVESTIGATED DURING DETAILED DESIGN EFFORTS. THIS MAY IMPACT THE PROPOSED CONCEPTUAL DESIGN.

Town

No.	ISSUE	DATE: MMM./DD/YYYY
1	ISSUED FOR REVIEW	10/01/2024

Engineer

Engineer

FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

Project

HWY 10 AND SIDEROAD 240
CONCEPTUAL INTERSECTION LAYOUT

Drawing

CONCEPT DESIGN PLAN

CROZIER
CONSULTING ENGINEERS

Drawn By	Design By	Project
I.M./Y.G.	I.M./Y.G.	1060-6489
Check By	Check By	Scale / Drawing
R.M./Y.G.	R.M./Y.G.	1:300 / C101