

**TRAFFIC IMPACT STUDY**

**EDGEWOOD GREENS  
TOWNSHIP OF SOUTHGATE**

**PREPARED FOR:  
FLATO DEVELOPMENTS INC.**

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<b>Revision Number</b>	<b>Date</b>	<b>Comments</b>
Rev.0	December 2015	Original TIS Submission
Rev.1	February 2016	TIS Update Submission
Rev.2	June 2016	TIS Update Submission
Rev.3	January 2020	TIS Update Submission
Rev.4	February 2021	TIS Update Submission
Rev.5	December 2022	TIS Update Submission

## 1.0 Executive Summary

C.F. Crozier & Associates Inc. (Crozier) was retained by Flato Developments Inc. (Flato) to complete an updated Traffic Impact Study (TIS) to support the proposed commercial block located within the Edgewood Greens subdivision in Dundalk, Township of Southgate.

The original TIS was submitted in December 2015 to the Ontario Ministry of Transportation (MTO) and Township of Southgate. The first update was prepared in response to discussions with MTO and to reflect the additional lands acquired by Flato (Flato North). Subsequent updates were completed in February 2016 and June 2016 in response to comments provided by the MTO. Since these updates, Phase 1 to 6 have been constructed and occupied. Phases 7, 8, and 10 are currently under construction, and the remaining Phases 9 and 11 are Draft Plan Approved and undergoing detailed design and Site Plan Approval.

A subsequent TIS Update was submitted in January 2020 to support the addition of a neighbourhood commercial block in the southeast corner of the property. Since the January 2020 submission, the change has been approved from an Official Plan Amendment, Zoning By-law Amendment and Redline Draft Plan Application perspective, and is now undergoing detailed design as part of the Site Plan Application process. Additional comments by the MTO were addressed in the January 2021 TIS Update. This TIS Update addresses changes to the Phase 11 commercial block to include a McDonald's restaurant (with drive-thru) and provides revised recommendations for external road improvements.

The McDonald's restaurant is proposed to have a gross floor area (GFA) of 454.1 square metres (4,888 square feet). The development includes 116 parking spaces. At the time of undertaking the turning movement counts, Phase 2 – 6 were constructed and occupied. As such, the trips generated by these dwelling units have been captured in the 2022 existing traffic volumes.

The total outstanding unit breakdown is as follows:

- 272 Single-detached Units
- 62 Semi-detached Units
- 157 Townhouse Units
- McDonald's restaurant with a GFA of 454 m<sup>2</sup> (4,888 ft<sup>2</sup>)

The analysis contained within this report included the following intersections:

- Highway 10 & Main Street,
- Main Street & Russell Street,
- Main Street & Mill Street/ Alice Street,
- Main Street & Osprey Street,
- Victoria Street & Elm Street, and
- Highway 10 & the proposed public road access.

Analysis of the 2022 existing traffic operations at the study intersections indicates that the intersections are operating with a LOS "B" or better in the weekday a.m. and p.m. peak hours, with reserve capacity for increase in traffic volumes.

The development is expected to be fully built-out by 2025, accordingly, the 2025, 2030 and 2035 horizon years were analysed, reflecting the full build-out and the 5-year and 10-year horizons. For consistency with the previous submissions, a growth rate of 1.5 percent compounded annually was applied to all movements on the boundary road network.

Analysis of the 2025 through 2035 future background conditions indicate that the study intersections are expected to continue operating with a LOS "C" or better with exception of Main Street and Alice Street/Mill Street which is expected to operate with a LOS "D" or better during p.m. peak hours. These results indicate that the intersections have reserve capacity for increases in traffic volumes. Ongoing monitoring is recommended for the intersection of Main Street and Highway 10.

The 95<sup>th</sup> percentile queues can be contained within their available storage lengths with exception of the northbound left-turn movement at Highway 10 and Main Street. The available taper length extends for more than 40 m which can accommodate the exceeding 14.9 m and is not anticipated to impact northbound-through flow. If the signal timing is optimized at this intersection by implementing a northbound left-turn permissive/protected phase, the existing storage is expected to be able to accommodate the 95<sup>th</sup> percentile queue length.

The development is forecasted to generate 422 and 502 two-way primary trips in the weekday a.m. and p.m. peak hours, respectively. The proposed McDonald's is forecasted to generate 147 and 163 pass-by trips in the a.m. and p.m. peak hours, respectively.

Based on the methodology described in the "Ontario Traffic Manual – Book 12", March 2012, signals are warranted at the intersection of Highway 10 and the site access under all horizon year traffic volume conditions. The signal timings for the proposed signals were determined and modelled using the MTO Traffic Signal Operating & Timing Policy (June 2016). Signal timings should be revised through the detailed design process as the intersection geometry is refined.

The analysis of the study intersections under future total traffic volume conditions indicates the following:

- An auxiliary northbound left-turn lane with a minimum of 45 meters storage length is proposed at the Highway 10 site access.
  - A 50 m storage length was accounted for in previous versions of the design when the intersection was stop-controlled on the access approach.
- An auxiliary southbound right-turn lane with a minimum storage length of 30 meters length is proposed at the Highway 10 site access as the volume of right-turns is 15% of the advancing volume.
- The intersection of Elm Street and Victoria Street is expected to continue operating with a LOS "B" or better in all time periods.
- The intersection of Highway 10 and Main Street is expected to continue operating with a LOS "C" or better during the p.m. peak time.
- The intersection of Main Street and Alice Street/Mill Street and Main Street and Osprey Street are expected to operate with a LOS "D" or better.
- The intersection of Main Street and Russell Street is expected to operate with a LOS "E" or better.
- The addition of the site generated traffic is expected to result in a maximum control delay increase of 25.8 seconds (p.m. – Russell Street) and a maximum volume-to-capacity ratio increase of 0.44 (NB, p.m. – Russell Street).

It is concluded that the traffic generated by the proposed residential and commercial development can be accommodated by the boundary road network, with the noted improvement.

The analysis undertaken herein was prepared using the most recent Draft Plans and Concept Plan (dated October 28, 2022). Any minor changes to the Plans will not materially affect the conclusion contained within this report. The proposed development can be supported from a traffic operations perspective, with the implementations of the noted improvement.

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## 2.0 Introduction

### 2.1 Background

C.F. Crozier & Associates Inc. (Crozier) was retained by Flato Developments Inc. (Flato) to complete an updated Traffic Impact Study (TIS) to support the proposed commercial block located within the Edgewood Greens subdivision in Dundalk, Township of Southgate.

The original TIS was submitted in December 2015 to the Ontario Ministry of Transportation (MTO) and Township of Southgate. The first update was prepared in response to discussions with MTO and to reflect the additional lands acquired by Flato (Flato North). Subsequent updates were completed in February 2016 and June 2016 in response to comments provided by the MTO. Since these updates, Phase 1 to 6 have been constructed and occupied. Phases 7, 8, and 10 are currently under construction, and the remaining Phases 9 and 11 are Draft Plan Approved and undergoing Detailed Design and Site Plan Approval.

A subsequent TIS Update was submitted in January 2020 to support the addition of a neighbourhood commercial block in the southeast corner of the property. Since the January 2020 submission, the change has been approved from an Official Plan Amendment, Zoning By-law Amendment and Redline Draft Plan Application perspective, and is now undergoing detailed design as part of the Site Plan Application process. Additional comments by the MTO were addressed in the January 2021 TIS Update. This TIS Update addresses changes to the Phase 11 commercial block to include a McDonald's restaurant (with drive-thru) and provides revised recommendations for external road improvements.

### 2.2 Development Proposal

As described above, Edgewood Greens is divided into 11 Phases, all of which have been Draft Plan Approved. **Table 1** summarizes the development details and the status of each of the Draft Plan Approved Phases.

**Table 1: Edgewood Greens Development Details and Status**

Phase Development Property	Units			Approval Status
	Singles	Semi-Detached	Townhouse	
Phase 1	70	-	-	Constructed and Occupied
Phase 2A	56	16	-	
Phase 2B	38	-	-	
Phase 3	32	14	-	
Phase 4	22	-	-	
Phase 5	43	16	-	
Phase 6	52	16	-	
Phase 7	57	-	-	Under Construction
Phase 8	54	-	56	
Phase 10	21	-	-	
Phase 9	47	-	-	Undergoing SPA and Detailed Design
Phase 11	93	-	101	
Total	585	62	157	-
Commercial Area	454 m <sup>2</sup> (4,888 ft <sup>2</sup> )			Draft Plan Approved/ Undergoing SPA and Detailed Design

The residential units will consist of a combination of single-detached units, semi-detached units and townhouse units. A total of 585 single-detached units, 62 semi-detached units and 157 townhouse units are Draft Plan Approved.

At the time of undertaking the turning movement counts, Phase 2 – 6 were constructed and occupied. As such, the trips generated by these dwelling units have been captured in the 2022 existing traffic volumes.

The McDonald's restaurant is proposed to have a gross floor area (GFA) of 454 square metres (4,888 square feet) and includes 116 parking spaces. The total outstanding unit breakdown is now as follows:

- 585 Single-detached Units
- 62 Semi-detached Units
- 157 Townhouse Units
- McDonald's restaurant with a GFA of 454 m<sup>2</sup> (4,888 ft<sup>2</sup>)

The Edgewood Greens development has three access points to the boundary road network. A direct connection is provided to Highway 10, access to Main Street is provided through Russell Street, and Hagan Street provides access to Elm Street which in turn connects with Victoria Street.



Access to the commercial block is proposed through two full-moves entrances to Colgan Crescent and Milliner Avenue. Milliner Avenue will intersect with Highway 10 to the east. The latest Edgewood Greens Composite Phasing Plan (January 19, 2021) has been included as **Figure 1** and the Conceptual Site Plan (October 28, 2022) for the McDonald's restaurant has been included as **Figure 2**.

### **2.3 Purpose and Scope**

The purpose of the study is to evaluate the transportation-related impacts of the proposed development on the boundary road network and to recommend or confirm any required mitigation measures, if warranted. Previous versions of the TIS had recommended a northbound left-turn lane on Highway 10 at the public road entrance to the site. This TIS Update includes a signal warrant analysis and verification of turn-lane requirements at the proposed intersection.

The study reviews the following main aspects of the proposed development from a transportation engineering perspective:

- Existing, future background, and future total traffic operations on the boundary road network during the weekday a.m. and p.m. peak hours.
- Forecasted trip generation of the proposed development.
- Signal and auxiliary turn-lane requirements.

The study has been completed in accordance with the MTO's "Guidelines for the Preparation of Traffic Impact Studies" (February 2021).

## **3.0 Existing Conditions**

### **3.1 Development Lands**

The site is bound by Highway 10 to the northeast, active agricultural lands/mixed woods to the southeast and existing residential dwellings to the northwest. Phases 1 – 6 have been fully built-out. The Site Location Plan has been included as **Figure 3**.

### **3.2 Study Intersections**

The Traffic Impact Study analyzes the following intersections:

- Highway 10 and Main Street
- Main Street and Russell Street
- Main Street and Alice Street/Mill Street
- Main Street and Osprey Street
- Elm Street and Victoria Street
- Highway 10 and the proposed public road access

Details relating to the boundary roadways are summarized in the subsequent section. **Figure 4** illustrates the existing traffic control and lane configuration at the study intersections.

### **3.3 Boundary Road Network**

Due to the skewed nature of the roadway, the directional orientation of the boundary road network is ambiguous. Accordingly, to provide clarity throughout the report, Highway 10, Russell Street, Alice Street/Mill Street, Osprey Street and Elm Street have been given a north-south orientation and Main Street and Victoria Street have been given an east-west orientation.

Highway 10 is a north-south two-way highway under the jurisdiction of the MTO. Highway 10 has a posted speed limit of 80 km/h. The roadway consists of two approximate 3.7 metre travel lanes with granular shoulders. No pedestrian facilities exist on either side of this highway.

Main Street (Grey County Road 9) is an east-west two-lane two-way arterial roadway under the jurisdiction of the Grey County. Main Street has a posted speed limit of 50 km/h. The roadway consists of two approximate 3.7 metre travel lanes with curb and gutter along both the north and south sides. Approximate 1.5 metre concrete pedestrian sidewalks exist along the north and south sides of Main Street.

Russell Street is a north-south two-lane two-way local roadway under the jurisdiction of the Township of Southgate. There is no posted speed limit; thus, the speed limit is assumed to be 50 km/h. The roadway consists of two approximate 3.2 metre travel lanes with curb and gutter to the east and west. On the east side of the roadway, approximate two metre grass strip separates an approximate 1.5 metre sidewalk from the curb.

Alice Street is a north-south two-lane two-way local roadway under the jurisdiction of the Township of Southgate. There is no posted speed limit; thus, the speed limit is assumed to be 50 km/h. The roadway consists of two approximate 3.2 metre travel lanes with asphalt swales to the east and earthen swales to the west. An approximate 1.5 metre concrete sidewalk exists on the east side of the roadway.

Mill Street is a north-south two-lane two-way local roadway under the jurisdiction of the Township of Southgate. It is offset approximately 15 metres westward from Alice Street. There is no posted speed limit; thus, the speed limit is assumed to be 50 km/h. The roadway consists of two approximate 3.2 metre travel lanes with asphalt swales to the west and earthen swales to the east. On the west side of the roadway, an approximate two metre grass strip separates an approximate 1.5 metre sidewalk from the curb.

Elm Street is a north-south two-lane two-way local roadway under the jurisdiction of the Township of Southgate. There is no posted speed limit; thus, the speed limit is assumed to be 50 km/h. The roadway consists of two approximate 3.2 metre travel lanes with earthen swales to the east and west. No pedestrian facilities exist on this section of roadway.

Victoria Street is an east-west two-lane two-way local roadway under the jurisdiction of the Township of Southgate. There is no posted speed limit; thus, the speed limit is assumed to be 50 km/h. The roadway consists of two approximate 3.5 metre travel lanes with an approximate 2.0 metre grass boulevard with a 1.5 metre concrete sidewalk.

Osprey Street is a north-south two-lane two-way local roadway under the jurisdiction of the Township of Southgate. There is no posted speed limit; thus, the speed limit is assumed to be 50 km/h. South of Main Street, the roadway consists of two approximate 3.5 metre travel lanes with asphalt swales and approximate 1.5 metre concrete sidewalks on the east and west sides. North of Main Street, the roadway consists of approximate 3.5 metre travel lanes approximate 1.5 metre concrete sidewalk on the east side of the roadway.

The signalized intersection of Highway 10 and Main Street is semi-actuated with left turn lanes in all approaches and crosswalks approximately two metres in width. The intersections of Main Street and Russell Street, Main Street and Mill Street/ Alice Street, Victoria Street North and Elm Street, and Main Street and Osprey Street are two-way stop-controlled with no dedicated turn lanes. **Figure 4** illustrates the existing boundary road network, including lane configurations and intersection control.

### 3.4 Traffic Data

Turning movement counts were conducted by Spectrum Traffic Data Inc. (Spectrum) staff at the study intersections on Thursday, September 29, 2022, between 6:00 a.m. – 10:00 a.m. and 3:00 p.m. – 7:00 p.m. Intersection analysis was conducted utilizing peak hour factors (PHFs) as calculated for each intersection during each time period. **Table 2** outlines the calculated peak hour factors at each intersection during each peak hour. The traffic count data is contained in **Appendix A. Figure 5** illustrates the 2022 existing traffic volumes that were recorded.

**Table 2: Peak Hour Factors**

Intersection	Peak Hour	Peak Hour Factor
Highway 10 and Main Street	Weekday A.M. 7:30 a.m. to 8:30 a.m.	0.86
	Weekday P.M. 4:30 p.m. – 5:30 p.m.	0.93
Main Street and Russell Street	Weekday A.M. 8:00 a.m. to 9:00 a.m.	0.90
	Weekday P.M. 4:30 p.m. – 5:30 p.m.	0.95
Main Street and Alice Street/Mill Street	Weekday A.M. 8:00 a.m. to 9:00 a.m.	0.93
	Weekday P.M. 4:15 p.m. – 5:15 p.m.	0.90
Main Street and Osprey Street	Weekday A.M. 8:15 a.m. to 9:15 a.m.	0.89
	Weekday P.M. 4:15 p.m. – 5:15 p.m.	0.85
Elm Street and Victoria Street	Weekday A.M. 8:15 a.m. to 9:15 a.m.	0.65
	Weekday P.M. 3:00 p.m. – 4:00 p.m.	0.65

### 3.5 Traffic Modelling

The boundary road network was modelled in Synchro 11.0 using existing roadway geometrics, collected traffic data, and default modelling parameters such as ideal saturation flow rates and lost time values. The signal timing plan was obtained from MTO staff and has been utilized for the existing, future background and future total analyses. 95<sup>th</sup> percentile queue lengths were derived from Synchro.

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. The LOS definitions for signalized and unsignalized intersections are included in **Appendix B.**

### 3.6 Intersection Operations

The existing operations at the study intersections were analyzed using the existing 2022 traffic volumes illustrated in **Figure 5.** Detailed capacity analysis worksheets are included in **Appendix C. Table 3** outlines the 2022 existing traffic operations.

**Table 3: 2022 Existing Levels of Service**

Intersection	Control	Peak Hour	Level of Service <sup>1</sup>	Control Delay	Maximum v/c ratio <sup>2</sup>	95 <sup>th</sup> Percentile Queues > Storage
Highway 10 and Main Street	Signal	A.M.	B	12.2 s	0.49 (EBT)	None
		P.M.	B	12.6 s	0.49 (EBT)	None
Main Street and Russell Street	Two-way Stop	A.M.	B	11.4 s	0.12 (NB)	None
		P.M.	B	11.3 s	0.09 (NB)	None
Main Street and Alice Street/Mill Street	Two-way Stop	A.M.	B	13.3 s	0.05 (NB)	None
		P.M.	B	12.9 s	0.04 (NB)	None
Main Street and Osprey Street	Two-way Stop	A.M.	B	13.0 s	0.06 (NB)	None
		P.M.	B	14.7 s	0.07 (SB)	None
Elm Street and Victoria Street	Two-way Stop	A.M.	A	9.5 s	0.09 (NB)	None
		P.M.	A	9.7 s	0.07 (NB)	None

Note<sup>1</sup>: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU). 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<sup>2</sup>: 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 study intersections operate at a LOS “B” or better in the weekday a.m. and p.m. peak hours. The maximum volume-to-capacity ratio of 0.49 (Highway 10 and Main Street, EBT, p.m.) indicates that the study intersections have reserve capacity for increases in traffic volumes. All 95<sup>th</sup> percentile queues can be contained within their respective auxiliary turn-lanes.

## 4.0 Future Background Conditions

### 4.1 Horizon Years

For the purpose of this assessment, it has been assumed that the entirety of Edgewood Greens will be built out by 2025. Although the expected year of completion may be aggressive, the year 2025 was selected to remain consistent with previous nearby reports. The MTO’s guidelines require analysis of the full build-out horizon and the five- and ten-year horizons from the estimated year of full build-out. Therefore, the 2025, 2030 and 2035 horizon years were analyzed.

### 4.2 Growth Rate

The MTO’s “Provincial Highways Traffic Volumes 1988-2016” 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 0.57 percent compounded annually was calculated for the Annual Average Daily Traffic (AADT) between 2010 and 2016.

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 2025, 2030 and 2035 future background traffic volumes.

**Appendix D** contains the growth rate analysis. The 2025, 2030 and 2035 future background traffic volumes are illustrated in **Figures 7, 8 and 9**, respectively.

### 4.3 Future Road Improvements

No capacity improvements have been identified for the boundary roads within the study horizons. Any external improvements triggered by the proposed development are discussed in **Section 5**.

### 4.4 Background Developments

The Glenelg residential development (Phase 1 and Phase 2) is located at 231 Glenelg Street in the northwest end of Dundalk. Phase 1 of the development has been Draft Plan Approved and is currently undergoing detailed design, with construction commenced. The development proposal includes 118 single detached units and 65 townhouse units.

Crozier completed the Glenelg Phase 1 TIS in September 2018. The report was based on an earlier version of the plan that proposed 127 single family detached units and 26 townhouse units. An updated trip generation estimate has been provided in **Table 4** which accounts for the change in units.

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 and proposed 83 single family detached units, 6 partial lot units and 66 townhouse units. Crozier completed the Glenelg Phase 2 TIS in September 2020. Trip Generation for this phase of the development has been provided in **Table 5**.

The Glenelg Expansion Lands (Phase 3) is located at the northeast of Phase 2 of the Glenelg Residential Development and 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 2022. The Expansion Lands proposed 369 single-family detached and 90 semi-detached units. Trip Generation for this phase of the development has been provided in **Table 6**.

**Table 4: Glenelg Phase 1 Trip Generation**

Use	Trip Type	Peak Hour	Number of Trips		
			Inbound	Outbound	Total
L.U. 210: Single Family Detached Housing (118 Units)	Primary	Weekday A.M.	22	67	89
	Primary	Weekday P.M.	75	44	119
L.U. 220: Multifamily Housing (Low-Rise) (65 Units)	Primary	Weekday A.M.	7	25	32
	Primary	Weekday P.M.	25	15	40
<b>Total</b>	<b>Primary</b>	<b>Weekday A.M.</b>	<b>29</b>	<b>92</b>	<b>121</b>
	<b>Primary</b>	<b>Weekday P.M.</b>	<b>100</b>	<b>59</b>	<b>159</b>

**Table 5: 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
<b>Total</b>	<b>Primary</b>	<b>Weekday A.M.</b>	<b>24</b>	<b>76</b>	<b>100</b>
	<b>Primary</b>	<b>Weekday P.M.</b>	<b>83</b>	<b>49</b>	<b>132</b>

**Table 6: Glenelg Phase 3 Expansion Lands**

	Peak Hour	Number of Trips		
		Inbound	Outbound	Total
LUC 210 'Single Family Homes' (369 Units)	Weekday A.M.	63	181	244
	Weekday P.M.	214	125	339
LUC 215 'Single Family Attached Housing' (90 Units)	Weekday A.M.	13	28	41
	Weekday P.M.	28	22	50
<b>TOTAL</b>	<b>Weekday A.M.</b>	<b>76</b>	<b>209</b>	<b>285</b>
	<b>Weekday P.M.</b>	<b>242</b>	<b>147</b>	<b>389</b>

Trips generated by Glenelg Phase 1, Glenelg Phase 2 and Phase 3 were assigned to the boundary road network based on the distributions described in the original TIS (Crozier, September 2018, September 2020, and August 2022, respectively). While the intersection Highway 10 and County Road 9 was not analyzed fully in those reports, 10 percent of trips were assumed to continue east on County Road 9 and 50 percent of trips were assumed to travel south on Highway 10.

The trip assignment for the Glenelg Development is illustrated in **Figure 6** and relevant excerpts from the Glenelg Phase 1, Phase 2 TIS, and Phase 3 TIS as well as the most recent Draft Plan have been included in **Appendix E**.

#### 4.5 Intersection Operations

The future background operations at the study intersections were analyzed using the 2025, 2030 and 2035 future background traffic volumes illustrated in **Figure 7, Figure 8, and Figure 9**, respectively. Detailed capacity analysis worksheets are included in **Appendix C. Table 7, Table 8, and Table 9** outline the 2025, 2030 and 2035 future background traffic operations, respectively.

The intersection of Main Street and Highway 10 was reviewed for potential signal timing optimizations given the increase in northbound left-turns at the intersection with the buildout of the Glenelg/Edgewood Green developments. The cycle length was not modified as the time allocated for the protected phase of the northbound left-turn movement was removed from the opposing southbound movement. Only the horizons where the northbound left-turn exceeds the current available left-turn storage were reviewed with permissive-protected phasing.

**Table 7: 2025 Future Background Levels of Service**

Intersection	Control	Peak Hour	Level of Service <sup>1</sup>	Control Delay	Maximum v/c ratio <sup>2</sup>	95 <sup>th</sup> Percentile Queues > Storage
Highway 10 and Main Street	Signal	A.M.	B	15.8 s	0.75 (EBT)	None
		P.M.	C	21.9 s	0.83 (NBL)	None
Main Street and Russell Street	Two-way Stop	A.M.	B	14.5 s	0.16 (NB)	None
		P.M.	B	13.5 s	0.11 (NB)	None
Main Street and Alice Street/Mill Street	Two-way Stop	A.M.	C	19.6 s	0.08 (SB)	None
		P.M.	C	21.3 s	0.08 (NB)	None
Main Street and Osprey Street	Two-way Stop	A.M.	C	17.6 s	0.23 (SB)	None
		P.M.	C	20.1 s	0.22 (SB)	None
Elm Street and Victoria Street	Two-way Stop	A.M.	A	9.5 s	0.09 (NB)	None
		P.M.	A	9.8 s	0.07 (NB)	None

Note<sup>1</sup>: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU).  
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<sup>2</sup>: 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 8: 2030 Future Background Levels of Service**

Intersection	Control	Peak Hour	Level of Service <sub>1</sub>	Control Delay	Maximum v/c ratio <sup>2</sup>	95 <sup>th</sup> Percentile Queues > Storage
Highway 10 and Main Street	Signal	A.M.	B	16.3 s	0.76 (EBT)	None
		P.M.	C	23.3 s	0.85 (NBL)	116.2 m > 110 m (NBL)
	Signal (Optimized)	P.M.	B	19.9 s	0.78 (EBT)	None
Main Street and Russell Street	Two-way Stop	A.M.	C	15.1 s	0.18 (NB)	None
		P.M.	B	14.2 s	0.13 (NB)	None
Main Street and Alice Street/Mill Street	Two-way Stop	A.M.	C	20.7 s	0.09 (NB)	None
		P.M.	C	22.7 s	0.09 (NB)	None
Main Street and Osprey Street	Two-way Stop	A.M.	C	18.8 s	0.25 (SB)	None
		P.M.	C	21.7 s	0.25 (SB)	None
Elm Street and Victoria Street	Two-way Stop	A.M.	A	9.6 s	0.10 (NB)	None
		P.M.	A	9.9 s	0.08 (NB)	None

Note<sup>1</sup>: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU).  
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<sup>2</sup>: 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 9: 2035 Future Background Levels of Service**

Intersection	Control	Peak Hour	Level of Service <sup>1</sup>	Control Delay	Maximum v/c ratio <sup>2</sup>	95 <sup>th</sup> Percentile Queues > Storage
Highway 10 and Main Street	Signal	A.M.	B	16.9 s	0.76 (EBT)	None
		P.M.	C	25.2 s	<b>0.89 (NBL)</b>	124.9 m > 110 m (NBL)
	Signal (Optimized)	P.M.	C	21.2 s	0.79 (EBT)	None
Main Street and Russell Street	Two-way Stop	A.M.	C	15.9 s	0.20 (NB)	None
		P.M.	B	14.6 s	0.14 (NB)	None
Main Street and Alice Street/Mill Street	Two-way Stop	A.M.	C	22.1 s	0.10 (SB)	None
		P.M.	D	25.0 s	0.11 (NB)	None
Main Street and Osprey Street	Two-way Stop	A.M.	C	20.0 s	0.27 (SB)	None
		P.M.	C	23.5 s	0.27 (SB)	None
Elm Street and Victoria Street	Two-way Stop	A.M.	A	9.7 s	0.11 (NB)	None
		P.M.	A	10.0 s	0.08 (NB)	None

Note<sup>1</sup>: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU). 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<sup>2</sup>: 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 study intersections are expected to continue operating with a LOS "C" or better except for Main Street and Alice Street/Mill Street, which is expected to operate with a LOS "D" during the p.m. peak hour. The maximum volume-to-capacity ratio of 0.87 (Highway 10 and Main Street, EBT, p.m.) indicates that the intersections have reserve capacity for increases in traffic volumes.

The 95<sup>th</sup> percentile queues through all horizon years and peak hours can be contained within their available storage lengths except for Highway 10 and Main Street. The 95<sup>th</sup> percentile queue in the p.m. peak hour is forecasted to exceed the available storage by 15 m which is equivalent to less than three cars. While the existing taper length can accommodate additional queues without impacting northbound-through traffic flow, it is recommended that a protected/permissive phase be implemented for the northbound left-turn movement to improve the overall intersection operations. Ongoing monitoring of the intersection is recommended with consideration of further signal optimization.

## 5.0 Future Total Conditions

### 5.1 Site Generated Traffic

The proposed mixed-use development will result in additional vehicles on the boundary road network that would otherwise not exist. The proposed development will also result in additional turning movements at the study intersections.



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

- 272 Single-detached Units
- 62 Semi-detached Units
- 157 Townhouse Units
- McDonald's restaurant with a GFA of 454 m<sup>2</sup> (4,888 ft<sup>2</sup>)

The trip generation of the proposed residential dwelling and commercial units was forecasted using published data from the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11<sup>th</sup> Edition. The ITE Trip Generation Manual is a compendium of industry collected trip generation data across North America for a variety of land uses and is used industry wide as a source for trip generation forecasts.

The applicable average rates and fitted curve equations for Land Use Category (LUC) 210 "Single Family Detached Housing" and LUC 220 "Multifamily Housing (Low-Rise)" were applied to the proposed residential dwelling units. Previous comments provided by the MTO requested that the "peak hour of generator" be used to establish the commercial trip generation. Accordingly, the fitted curve for the peak hour of generator for LUC 934 "Fast Food Restaurant with Drive Through" was applied to the proposed commercial GFA, as required.

As defined by the ITE Trip Generation Handbook, 3<sup>rd</sup> Edition, primary trips are 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 of the McDonald's was forecasted considering the ITE Trip Generation Manual, 3<sup>rd</sup> Edition. LUC 934 was used as reference to establish a pass-by percentage of 50 percent for the a.m. peak period and 55 percent for the p.m. peak period.

Relevant excerpts from the ITE Trip Generation Manual, 11<sup>th</sup> Edition and ITE Trip Generation Manual, 3<sup>rd</sup> Edition have been included in **Appendix F**. The forecasted trip generation of the mixed-use development is summarized in **Table 10**.

**Table 10: 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	5,812 ft <sup>2</sup>	A.M.	Primary	76	70	146
			Pass-by	76	71	147
		P.M.	Primary	67	65	132
			Pass-by	83	80	163
<b>Total</b>		<b>A.M.</b>	<b>Primary</b>	<b>146</b>	<b>276</b>	<b>422</b>
			<b>Pass-by</b>	<b>76</b>	<b>71</b>	<b>147</b>
		<b>P.M.</b>	<b>Primary</b>	<b>299</b>	<b>203</b>	<b>502</b>
			<b>Pass-by</b>	<b>83</b>	<b>80</b>	<b>163</b>

## 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 G**.

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 from the south as the new McDonald's in Shelburne is expected to service residents in that area.

Given the scale of the Edgewood Greens development, it is assumed that a percentage of the McDonald's will service residents from within the development. As such, thirty 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 30 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.

### 5.3 Signal Warrant Analysis

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%.

The analysis determined that as of the 2025 horizon year, assuming full-build-out of the residential and McDonald's development, traffic signals are warranted at the intersection of Highway 10 and the proposed site access.

The signal timings for Highway 10 and the site access were determined and modelled using the MTO Traffic Signal Operating & Timing Policy (June 2016). Signal timing should be revised during the detailed design process as the intersection geometry is refined. **Appendix H** contains the signal warrant results for the intersection of Highway 10 and the site access and **Appendix I** contains the MTO Generic Timing Sheet.

### 5.4 Left-Turn Lane Geometry

Under 2035 future total conditions, 238 vehicles are forecasted to turn left into the site. Accordingly, it is recommended that a northbound left-turn lane be provided to provide refuge for queued vehicles so as not to impede the northbound through flow of traffic.

The February 2021 TIS Update (Crozier) indicated an auxiliary left-turn lane of 50 meters of storage was warranted for the proposed stop-controlled site access. As discussed in **Section 5.3**, signals are warranted at Highway 10 and the proposed site access. Therefore, the left-turn lane storage was determined using the 95<sup>th</sup> percentile queues which were estimated using SimTraffic as the unsignalized left-turn lane warrants no longer apply.

The weekday a.m. peak hour Synchro/SimTraffic analysis resulted in a northbound left-turn 95<sup>th</sup> percentile queue of 21.6 m, while the weekday p.m. peak hour is forecasted to have a 95<sup>th</sup> percentile queue of 42.7 m. Therefore, a storage length of 45 m was applied to accommodate the 95<sup>th</sup> percentile queue of the last horizon year. The exact storage and parallel length will be confirmed through detailed design of the signalized intersection.

The deceleration component of the left-turn lane was established using the MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads Exhibit 9-R. Highway 10 has a posted speed limit of 80 km/h fronting the site access. Accordingly, a design speed of 100 km/h was selected, reflecting the engineering convention of a 20 km/h increase on higher speed roadways. **Table 11** summarizes the northbound left-turn lane geometry, which should be confirmed through detailed design.

The SimTraffic reports including the 95<sup>th</sup> percentile queues for the 2025, 2030 and 2035 horizon years have been included in **Appendix J** for reference. **Appendix K** contains excerpts from the MTO Design Supplement.

**Table 11: Auxiliary Left-Turn Design Elements**

Movement	Storage Length	Parallel Deceleration Length	Total Parallel Length	Taper Length
Northbound Left-turn	45 m	70 m	115 m	160 m

### 5.5 Right-Turn Lane Geometry

The Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR) Section 9.14.2 presents guidelines for the application of right-turn tapers with auxiliary lanes. TAC GDGCR states that for a signalized intersection “a right-turn lane without separate signal indication should be considered when the volume of right-turning traffic is 10% to 20% of the total approaching volume”. The MTO Design Supplement for TAC GDGCR states that “when the volume of right-turning vehicles is such that it creates a hazard and reduces capacity at an intersection, consideration should be given to the provision of a deceleration lane in the form of a taper and parallel lane for the right turning traffic.”

The forecasted volume of southbound right-turn vehicles under all horizon years is between 12% to 15% during the a.m. and p.m. peak hours. Accordingly, a southbound right-turn lane should be provided.

Per TAC GDGCR Section 9.14.4, at signalized intersections, “the storage lane length should accommodate twice the average number of vehicles per cycle length for design speeds greater than 60 km/h.”

The minimum taper and parallel length were established based on Exhibit 9-J of the MTO Design Supplement (April 2020). **Table 12** below shows the calculated storage, taper and full parallel length required for the southbound right-turn movement at Highway 10 and the proposed site access. It is noted that the 95<sup>th</sup> percentile queue for the southbound right-turn movement is anticipated to be 15 m, which can be accommodated by the 30 m storage length.

**Table 12: Auxiliary Right Turn Design Elements**

Movement	Storage Length	Parallel Deceleration Length	Total Parallel Length	Taper Length
Southbound right-turn	30 m	85 m	115 m	80 m

**Appendix L** contains excerpts from the TAC GDGCR. **Appendix K** contains excerpts from the MTO Design Supplement.

## 5.6 Intersection Operations

The site generated traffic volumes illustrated in **Figure 13, Figure 14 and Figure 15** were added to the 2025, 2030 and 2035 future background traffic volumes in **Figure 7, Figure 8 and Figure 9**, respectively, to determine the future total traffic volumes. **Figure 16, Figure 17 and Figure 18** outline the 2025, 2030 and 2035 future total traffic volumes, respectively. **Table 13, Table 14 and Table 15** outline the 2025, 2030 and 2035 future total traffic operations, respectively. Detailed capacity analysis worksheets are included in **Appendix C**.

As discussed in **Section 5.3**, the timing settings for the proposed site access were determined using the MTO Traffic Signal Operating & Timing Policy (June 2016). Similar to background conditions, the intersection of Main Street and Highway 10 was reviewed for potential signal timing optimizations given the increase in northbound left-turns at the intersection with the buildout of the Glenelg/Edgewood Green developments. The cycle length was not modified as the time allocated for the protected phase of the northbound left-turn movement was removed from the opposing southbound movement. Only the horizons where the northbound left-turn exceeds the current available left-turn storage were reviewed with permissive-protected phasing.

**Table 13: 2025 Future Total Levels of Service**

Intersection	Control	Peak Hour	Level of Service <sup>1</sup>	Control Delay	Maximum v/c ratio <sup>2</sup>	95 <sup>th</sup> Percentile Queues > Storage
Highway 10 and Main Street	Signal	A.M.	B	15.9 s	0.75 (EBT)	None
		P.M.	C	21.1 s	0.81 (NBL)	None
Main Street and Russell Street	Two-way Stop	A.M.	C	23.3 s	0.48 (NB)	None
		P.M.	D	30.3 s	0.48 (NB)	None
Main Street and Alice Street/Mill Street	Two-way Stop	A.M.	C	22.5 s	0.09 (NB)	None
		P.M.	D	25.0 s	0.10 (NB)	None
Main Street and Osprey Street	Two-way Stop	A.M.	C	21.1 s	0.27 (SB)	None
		P.M.	D	25.7 s	0.28 (SB)	None
Elm Street and Victoria Street	Two-way Stop	A.M.	B	10.4 s	0.21 (NB)	None
		P.M.	B	11.0 s	0.17 (NB)	None
Highway 10 and Site Access	Signal	A.M.	A	9.1 s	0.43 (SBT)	None
		P.M.	B	11.4 s	0.59 (NBT)	None

Note<sup>1</sup>: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU).  
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<sup>2</sup>: 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: 2030 Future Total Levels of Service**

Intersection	Control	Peak Hour	Level of Service <sup>1</sup>	Control Delay	Maximum v/c ratio <sup>2</sup>	95 <sup>th</sup> Percentile Queues > Storage
Highway 10 and Main Street	Signal	A.M.	B	16.4 s	0.76 (EBT)	None
		P.M.	C	22.6 s	0.84 (NBL)	114.7 m > 110 m (NBL)
	Optimized	P.M.	C	21.0 s	0.79 (EBT)	None
Main Street and Russell Street	Two-way Stop	A.M.	D	25.6 s	0.52 (NB)	None
		P.M.	D	34.3 s	0.52 (NB)	None
Main Street and Alice Street/Mill Street	Two-way Stop	A.M.	C	23.8 s	0.10 (NB)	None
		P.M.	D	26.8 s	0.11 (NB)	None
Main Street and Osprey Street	Two-way Stop	A.M.	C	22.6 s	0.29 (SB)	None
		P.M.	D	28.2 s	0.32 (SB)	None
Elm Street and Victoria Street	Two-way Stop	A.M.	B	10.5 s	0.22 (NB)	None
		P.M.	B	11.1 s	0.18 (NB)	None
Highway 10 and Site Access	Signal	A.M.	A	9.3 s	0.45 (SBT)	None
		P.M.	B	11.8 s	0.62 (NBT)	None

Note<sup>1</sup>: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU).  
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<sup>2</sup>: 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: 2035 Future Total Levels of Service**

Intersection	Control	Peak Hour	Level of Service <sup>1</sup>	Control Delay	Maximum v/c ratio <sup>2</sup>	95 <sup>th</sup> Percentile Queues > Storage
Highway 10 and Main Street	Signal	A.M.	B	16.9 s	0.76 (EBT)	None
		P.M.	C	24.4 s	<b>0.87 (NBL)</b>	123.6 m > 110.0 m (NBL)
	Optimized	P.M.	C	23.0 s	0.84 (NBL)	None
Main Street and Russell Street	Two-way Stop	A.M.	D	28.6 s	0.56 (NB)	None
		P.M.	E	40.0 s	0.58 (NB)	None
Main Street and Alice Street/Mill Street	Two-way Stop	A.M.	D	23.8 s	0.10 (NB)	None
		P.M.	D	30.0 s	0.13 (NB)	None
Main Street and Osprey Street	Two-way Stop	A.M.	C	24.3 s	0.32 (SB)	None
		P.M.	D	30.9 s	0.35 (SB)	None
Elm Street and Victoria Street	Two-way Stop	A.M.	B	10.7 s	0.23 (NB)	None
		P.M.	B	11.3 s	0.19 (NB)	None
Highway 10 and Site Access	Signal	A.M.	A	9.5 s	0.48 (SBT)	None
		P.M.	B	12.2 s	0.65 (NBT)	None

Note<sup>1</sup>: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU). 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<sup>2</sup>: 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 intersection of Elm Street and Victoria Street is expected to continue operating with a LOS “B” or better under 2035 future total traffic volume conditions in the weekday a.m. and p.m. peak hours. The intersections of Main Street and Alice Street/Mill Street and Main Street and Osprey Street are expected to operate at a LOS “D” or better under 2035 future total traffic volume conditions in the weekday a.m. and p.m. peak hours.

The intersection of Main Street and Russell Street is expected to operate at critical LOS “E” or better during the weekday p.m. peak hour. The intersection operates with 40 seconds of delay and volume-to-capacity ratio of 0.58 which is below the critical threshold (0.85) which indicates the intersection is anticipated to operate with moderate delays. Ongoing monitoring is recommended at the intersection as the proposed and surrounding developments are constructed and occupied.

Across all intersections, the maximum increase in control delay is forecasted to be 25.8 seconds in the p.m. peak hour at the intersection of Main Street and Russell Street, when compared to the 2035 future background operations. Similarly, the maximum increase in volume-to-capacity ratio across all intersections is forecasted to be 0.44 in the p.m. peak hour at the intersection of Main Street and Russell Street.

A SimTraffic analysis was completed to assess the 95<sup>th</sup> percentile queue lengths for turning movements at Highway 10 and Main Street and Highway 10 and the Site Access to confirm the sufficiency of the existing and proposed storage lengths. As noted in **Table 16**, all forecasted 95<sup>th</sup> percentile queues can be accommodated within their respective storage lengths with exception of the northbound left-turn movement at Highway 10 and the site access, consistent with future background operations. The queue is forecasted to exceed the available storage by 17 m which is

equivalent to less than three cars. While the existing taper length can accommodate additional queues without impacting northbound -through flow, it is recommended that a protected/permissive phase be implemented for the northbound left-turn movement to provide additional capacity and improve overall operations. Ongoing monitoring of the intersection is recommended with consideration of further signal optimization.

Furthermore, the northbound left-turn movement at Highway 10 and the Site Access is forecasted to experience a 95<sup>th</sup> percentile queue of 42.7 m, which can be accommodated within the 45 metres of storage modelled. As noted previously, this length should be confirmed through detailed design. Previous iterations of the design for the unsignalized intersection condition proposed a 50 m storage length.

**Table 16: SimTraffic 95th Percentile Queues**

Intersection	Control	Peak Hour	Turning Movement	Storage Length	SimTraffic 95 <sup>th</sup> % Queues
Highway 10 and Main Street	Signal	A.M.	EBL	120	25.0 m
			WBL	100	15.5 m
			NBL	110	29.6 m
			SBL	90	4.7 m
			SBR	85	15.9 m
		P.M.	EBL	120	30.4 m
			WBL	100	21.0 m
			NBL	<b>110</b>	<b>116.7 m</b>
			SBL	90	10.7 m
			SBR	85	14.1 m
Highway 10 and Site Access	Signal	A.M.	EBL	35	23.9 m
			NBL	45	18.6 m
			SBR	30	13.5 m
		P.M.	EBL	35	25.6 m
			NBL	45	42.7 m
			SBR	30	13.1 m

All of the study intersections are expected to continue operating with acceptable levels of service under 2035 future total traffic volume conditions. With the exception of the northbound left-turn movement, all 95<sup>th</sup> percentile queues can be accommodated with the existing storage lengths using existing signal timings. If signal timings at the Highway 10 and Main Street intersection are optimized with the addition of a northbound left-turn permissive/protected phase, all 95<sup>th</sup> percentile queues are forecasted to be contained with the existing storage lengths. Accordingly, the proposed development can be supported from an operations perspective.



## 6.0 Conclusions

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

- All study intersections are currently operating with a LOS "B" or better in the weekday a.m. and p.m. hours.
- Examination of the future background conditions indicates the following:
  - All intersections are expected to continue operating with a LOS of "C" or better under the future background conditions with exception of Main Street and Alice Street/Mill Street which is expected to operate with a LOS "D" or better during p.m. peak hours.
    - 95<sup>th</sup> percentile queues are not expected to exceed available storage lengths with exception of the northbound left-turn at Highway 10 and Main Street. However, the available taper length extends for more than 40 m which can accommodate the 14.9 m exceeding. If the signal timings at this intersection are optimized by implementing a northbound left-turn permissive/protected phase, the existing storage is expected to be able to accommodate the 95<sup>th</sup> percentile queue length.
- The development is forecasted to generate 422 and 502 two-way primary trips in the weekday a.m. and p.m. peak hours, respectively. The proposed McDonald's is forecasted to generate 147 and 163 pass-by trips in the a.m. and p.m. peak hours, respectively. The trips were distributed to the boundary road network based on TTS data as well as the location of the expected catchment areas for the commercial component of the development.
- The addition of site traffic to the boundary road network is expected to result in minor impacts to traffic operations. The analysis of future total traffic conditions indicates the following:
  - Signals are warranted under Justification 1 and 2 for the proposed Highway 10 site access. Signal timings were determined and modelled using the MTO Traffic Signal Operating & Timing Policy (June 2016).
  - An auxiliary northbound left-turn lane with a minimum storage length of 45 metres is proposed at the proposed Highway 10 site access.
    - A 50 m storage length was accounted for in previous versions of the design when the intersection was stop-controlled on the access approach.
  - An auxiliary southbound right-turn lane with a minimum storage length of 30 metres is proposed at the Highway 10 site access as the volume of right-turns is 15% of the advancing volume.
  - The intersection of Highway 10 and the site access is expected to operate with LOS "A" and LOS "B" in the a.m. and p.m. peak hours. The northbound left-turn movement is expected to experience a 95<sup>th</sup> percentile queue length of 42.7 metres, which can be accommodated within the 45-metre storage length.
  - The intersection of Highway 10 and Main Street is expected to operate with LOS "B" and LOS "C" in the a.m. and p.m. peak periods, respectively.
  - The intersections of Main Street and Osprey Street is expected to operate with a LOS "C" and LOS "D" in the a.m. and p.m. peak hours, respectively.
  - The intersection of Elm Street and Victoria Street is expected to continue operating with a LOS "B" in the a.m. and p.m. peak hours.
  - The intersections of Main Street and Mill Street/Alice Street is expected to operate with LOS "D" in the a.m. and p.m. peak hours.

- o The intersection of Main Street and Russell Street is expected to operate with LOS "D" and LOS "E" in the a.m. and p.m. peak hours, respectively.
- o The addition of the site generated traffic is expected to result in a maximum control delay increase of 25.8 seconds (p.m. – Russell Street) and a maximum volume-to-capacity ratio increase of 0.44 (NB, p.m. – Russell Street).

It is concluded that the traffic generated by the proposed development can be accommodated by the boundary road network, with the noted recommendation.

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

The proposed mixed-use residential/commercial development can be supported from a traffic operations and safety perspective.

Respectfully submitted by,

**C.F. CROZIER & ASSOCIATES INC.**



Diego Bustamante, EIT  
Engineering Intern, Transportation

**C.F. CROZIER & ASSOCIATES INC.**



Madeleine Ferguson, P. Eng.  
Manager of Transportation



MF/db

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# APPENDIX A

## Traffic Data



**Turning Movement Count (5 . ELM ST & VICTORIA ST)**

Start Time	E Approach VICTORIA ST					S Approach ELM ST					W Approach VICTORIA ST					Int. Total (15 min)	Int. Total (1 hr)
	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	UTurn W:W	Peds W:	Approach Total		
06:00:00	1	1	0	0	2	4	0	0	0	4	0	0	0	0	0	6	
06:15:00	2	0	0	0	2	3	0	0	2	3	1	0	0	0	1	6	
06:30:00	2	1	0	0	3	2	0	0	0	2	0	1	0	0	1	6	
06:45:00	3	0	0	0	3	6	1	0	0	7	1	1	0	0	2	12	30
07:00:00	2	2	0	0	4	1	6	0	0	7	1	2	0	0	3	14	38
07:15:00	2	1	0	0	3	5	4	0	0	9	1	1	0	0	2	14	46
07:30:00	4	3	0	0	7	4	1	0	0	5	2	6	0	0	8	20	60
07:45:00	3	0	0	0	3	2	3	0	0	5	1	2	0	0	3	11	59
08:00:00	1	1	0	0	2	5	4	0	10	9	3	1	0	0	4	15	60
08:15:00	4	1	0	0	5	2	9	0	3	11	0	4	0	0	4	20	66
08:30:00	8	3	0	0	11	5	23	0	0	28	7	7	0	0	14	53	99
08:45:00	6	2	0	0	8	1	10	0	0	11	20	8	0	0	28	47	135
09:00:00	2	2	0	1	4	1	3	0	1	4	5	5	0	0	10	18	138
09:15:00	3	1	0	0	4	1	2	0	0	3	3	2	0	0	5	12	130
09:30:00	0	2	0	0	2	3	2	0	0	5	4	1	0	0	5	12	89
09:45:00	2	0	0	0	2	2	3	0	0	5	1	0	0	0	1	8	50
***BREAK***																	
15:00:00	4	2	0	0	6	7	10	1	1	18	17	6	0	0	23	47	
15:15:00	8	4	0	0	12	5	4	0	9	9	19	14	0	20	33	54	
15:30:00	2	2	0	1	4	3	2	1	2	6	2	10	0	14	12	22	
15:45:00	1	4	0	1	5	1	5	0	2	6	2	4	0	0	6	17	140
16:00:00	0	5	0	0	5	4	5	0	0	9	3	3	0	0	6	20	113
16:15:00	4	2	0	0	6	1	1	0	3	2	2	9	0	3	11	19	78
16:30:00	1	4	0	0	5	0	4	0	1	4	4	8	0	0	12	21	77
16:45:00	3	6	0	0	9	2	3	0	0	5	4	3	0	0	7	21	81
17:00:00	1	6	0	0	7	4	5	0	1	9	8	8	0	0	16	32	93
17:15:00	3	2	0	0	5	7	2	0	0	9	7	3	0	0	10	24	98
17:30:00	4	2	0	0	6	1	3	0	0	4	5	7	0	0	12	22	99
17:45:00	5	5	0	0	10	6	5	0	2	11	7	4	0	0	11	32	110
18:00:00	4	5	0	0	9	2	2	0	2	4	7	8	0	0	15	28	106
18:15:00	2	2	0	0	4	3	2	0	1	5	3	4	0	0	7	16	98
18:30:00	2	4	0	0	6	1	8	0	2	9	4	5	0	0	9	24	100
18:45:00	4	3	0	0	7	0	0	0	5	0	5	3	0	0	8	15	83



Grand Total	93	78	0	3	171	94	132	2	47	228	149	140	0	37	289	688	-
<b>Approach%</b>	54.4%	45.6%	0%		-	41.2%	57.9%	0.9%		-	51.6%	48.4%	0%		-	-	-
<b>Totals %</b>	13.5%	11.3%	0%		24.9%	13.7%	19.2%	0.3%		33.1%	21.7%	20.3%	0%		42%	-	-
<b>Heavy</b>	9	1	0		-	2	4	0		-	4	10	0		-	-	-
<b>Heavy %</b>	9.7%	1.3%	0%		-	2.1%	3%	0%		-	2.7%	7.1%	0%		-	-	-
<b>Bicycles</b>	-	-	-		-	-	-	-		-	-	-	-		-	-	-
<b>Bicycle %</b>	-	-	-		-	-	-	-		-	-	-	-		-	-	-



**Peak Hour: 08:15 AM - 09:15 AM Weather: Scattered Clouds (3.88 °C)**

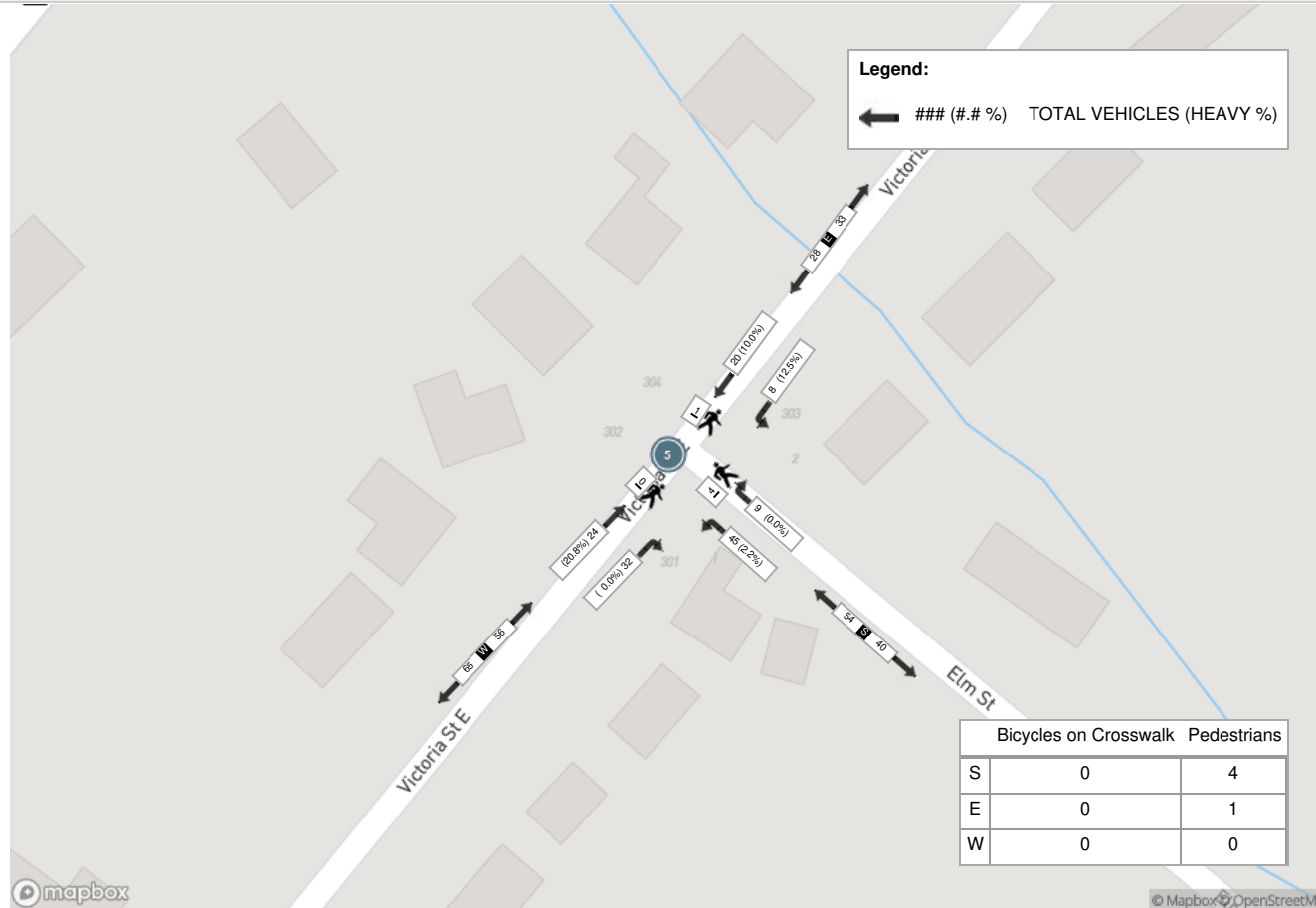
Start Time	E Approach VICTORIA ST					S Approach ELM ST					W Approach VICTORIA ST					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
08:15:00	4	1	0	0	5	2	9	0	3	11	0	4	0	0	4	20
08:30:00	8	3	0	0	11	5	23	0	0	28	7	7	0	0	14	53
08:45:00	6	2	0	0	8	1	10	0	0	11	20	8	0	0	28	47
09:00:00	2	2	0	1	4	1	3	0	1	4	5	5	0	0	10	18
<b>Grand Total</b>	<b>20</b>	<b>8</b>	<b>0</b>	<b>1</b>	<b>28</b>	<b>9</b>	<b>45</b>	<b>0</b>	<b>4</b>	<b>54</b>	<b>32</b>	<b>24</b>	<b>0</b>	<b>0</b>	<b>56</b>	<b>138</b>
<b>Approach%</b>	71.4%	28.6%	0%	-	-	16.7%	83.3%	0%	-	-	57.1%	42.9%	0%	-	-	-
<b>Totals %</b>	14.5%	5.8%	0%	-	20.3%	6.5%	32.6%	0%	-	39.1%	23.2%	17.4%	0%	-	40.6%	-
<b>PHF</b>	0.63	0.67	0	-	0.64	0.45	0.49	0	-	0.48	0.4	0.75	0	-	0.5	-
<b>Heavy</b>	2	1	0	-	3	0	1	0	-	1	0	5	0	-	5	-
<b>Heavy %</b>	10%	12.5%	0%	-	10.7%	0%	2.2%	0%	-	1.9%	0%	20.8%	0%	-	8.9%	-
<b>Lights</b>	15	7	0	-	22	9	43	0	-	52	32	19	0	-	51	-
<b>Lights %</b>	75%	87.5%	0%	-	78.6%	100%	95.6%	0%	-	96.3%	100%	79.2%	0%	-	91.1%	-
<b>Single-Unit Trucks</b>	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	-
<b>Single-Unit Trucks %</b>	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	-
<b>Buses</b>	2	1	0	-	3	0	1	0	-	1	0	5	0	-	5	-
<b>Buses %</b>	10%	12.5%	0%	-	10.7%	0%	2.2%	0%	-	1.9%	0%	20.8%	0%	-	8.9%	-
<b>Bicycles on Road</b>	3	0	0	-	3	0	1	0	-	1	0	0	0	-	0	-
<b>Bicycles on Road %</b>	15%	0%	0%	-	10.7%	0%	2.2%	0%	-	1.9%	0%	0%	0%	-	0%	-
<b>Pedestrians</b>	-	-	-	1	-	-	-	-	4	-	-	-	-	0	-	-
<b>Pedestrians%</b>	-	-	-	20%	-	-	-	-	80%	-	-	-	-	0%	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
<b>Bicycles on Crosswalk%</b>	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-



**Peak Hour: 03:00 PM - 04:00 PM Weather: Broken Clouds (19.31 °C)**

Start Time	E Approach VICTORIA ST					S Approach ELM ST					W Approach VICTORIA ST					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
15:00:00	4	2	0	0	6	7	10	1	1	18	17	6	0	0	23	47
15:15:00	8	4	0	0	12	5	4	0	9	9	19	14	0	20	33	54
15:30:00	2	2	0	1	4	3	2	1	2	6	2	10	0	14	12	22
15:45:00	1	4	0	1	5	1	5	0	2	6	2	4	0	0	6	17
<b>Grand Total</b>	<b>15</b>	<b>12</b>	<b>0</b>	<b>2</b>	<b>27</b>	<b>16</b>	<b>21</b>	<b>2</b>	<b>14</b>	<b>39</b>	<b>40</b>	<b>34</b>	<b>0</b>	<b>34</b>	<b>74</b>	<b>140</b>
<b>Approach%</b>	55.6%	44.4%	0%	-	-	41%	53.8%	5.1%	-	-	54.1%	45.9%	0%	-	-	-
<b>Totals %</b>	10.7%	8.6%	0%	-	19.3%	11.4%	15%	1.4%	-	27.9%	28.6%	24.3%	0%	-	52.9%	-
<b>PHF</b>	0.47	0.75	0	-	0.56	0.57	0.53	0.5	-	0.54	0.53	0.61	0	-	0.56	-
<b>Heavy</b>	4	0	0	-	4	1	0	0	-	1	1	4	0	-	5	-
<b>Heavy %</b>	26.7%	0%	0%	-	14.8%	6.3%	0%	0%	-	2.6%	2.5%	11.8%	0%	-	6.8%	-
<b>Lights</b>	11	12	0	-	23	15	20	2	-	37	38	28	0	-	66	-
<b>Lights %</b>	73.3%	100%	0%	-	85.2%	93.8%	95.2%	100%	-	94.9%	95%	82.4%	0%	-	89.2%	-
<b>Single-Unit Trucks</b>	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	-
<b>Single-Unit Trucks %</b>	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	-
<b>Buses</b>	4	0	0	-	4	1	0	0	-	1	1	4	0	-	5	-
<b>Buses %</b>	26.7%	0%	0%	-	14.8%	6.3%	0%	0%	-	2.6%	2.5%	11.8%	0%	-	6.8%	-
<b>Bicycles on Road</b>	0	0	0	-	0	0	1	0	-	1	1	2	0	-	3	-
<b>Bicycles on Road %</b>	0%	0%	0%	-	0%	0%	4.8%	0%	-	2.6%	2.5%	5.9%	0%	-	4.1%	-
<b>Pedestrians</b>	-	-	-	2	-	-	-	-	13	-	-	-	-	34	-	-
<b>Pedestrians%</b>	-	-	-	4%	-	-	-	-	26%	-	-	-	-	68%	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	-
<b>Bicycles on Crosswalk%</b>	-	-	-	0%	-	-	-	-	2%	-	-	-	-	0%	-	-

Peak Hour: 08:15 AM - 09:15 AM Weather: Scattered Clouds (3.88 °C)





Peak Hour: 03:00 PM - 04:00 PM Weather: Broken Clouds (19.31 °C)





Turning Movement Count (1 - HWY 10 & MAIN ST)

Start Time	N Approach HWY 10						E Approach MAIN ST						S Approach HWY 10						W Approach MAIN ST						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
06:00:00	9	24	1	0	0	34	1	9	2	0	0	12	2	14	8	0	0	24	27	16	6	0	0	49	119	
06:15:00	10	32	3	0	0	45	2	9	0	0	0	11	10	24	8	0	0	42	29	10	7	0	0	46	144	
06:30:00	10	27	8	0	0	45	1	15	6	0	0	22	6	22	10	0	0	38	20	15	7	0	0	42	147	
06:45:00	15	37	3	0	0	55	1	7	3	0	0	11	15	30	9	0	0	54	17	12	12	0	0	41	161	571
07:00:00	18	22	0	0	0	40	3	10	1	0	0	14	12	41	8	0	0	61	35	20	8	0	0	63	178	630
07:15:00	14	33	1	0	0	48	0	15	2	0	0	17	2	34	11	0	0	47	27	14	20	0	0	61	173	659
07:30:00	22	35	3	0	0	60	3	18	3	0	0	24	10	47	15	0	0	72	38	20	16	0	0	74	230	742
07:45:00	18	39	2	0	0	59	0	16	2	0	0	18	8	41	14	0	0	63	17	12	10	0	0	39	179	760
08:00:00	22	36	1	0	0	59	1	29	4	0	0	34	8	36	7	0	0	51	21	15	20	0	0	56	200	782
08:15:00	14	35	0	0	0	49	0	16	5	0	0	21	9	35	10	0	0	54	24	19	17	0	0	60	184	793
08:30:00	14	30	4	0	0	48	3	20	6	0	0	29	4	41	13	0	0	58	27	12	24	0	0	63	198	761
08:45:00	19	44	3	0	0	66	2	19	3	0	0	24	8	34	16	0	0	58	23	12	22	0	0	57	205	787
09:00:00	18	41	5	0	0	64	3	20	3	0	0	26	5	38	13	0	0	56	16	15	13	0	0	44	190	777
09:15:00	17	34	1	0	0	52	2	10	6	0	0	18	4	42	17	0	0	63	14	15	12	0	0	41	174	767
09:30:00	14	42	1	0	0	57	1	20	6	0	0	27	4	42	20	0	0	66	21	9	7	0	0	37	187	756
09:45:00	8	42	1	0	0	51	0	17	1	0	0	18	8	46	17	0	0	71	15	22	15	0	0	52	192	743
***BREAK***																										
15:00:00	21	37	1	0	0	59	2	14	6	0	0	22	5	46	34	0	0	85	18	18	14	0	0	50	216	
15:15:00	20	37	4	0	0	61	2	23	4	0	0	29	11	52	25	0	0	88	23	24	9	0	0	56	234	
15:30:00	19	53	1	0	0	73	2	21	5	0	0	28	6	43	27	0	0	76	14	16	9	0	0	39	216	
15:45:00	9	36	1	0	0	46	2	28	5	0	0	35	5	45	40	0	0	90	22	22	22	0	0	66	237	903
16:00:00	16	34	1	0	0	51	5	21	7	0	0	33	11	50	31	0	0	92	25	21	20	0	0	66	242	929
16:15:00	19	36	1	0	0	56	2	20	5	0	0	27	7	51	17	0	0	75	23	23	23	0	0	69	227	922
16:30:00	22	36	3	0	0	61	4	29	8	0	0	41	10	55	39	0	0	104	26	18	16	0	0	60	266	972
16:45:00	14	46	3	0	0	63	2	22	5	0	0	29	6	44	36	0	0	86	29	20	16	0	0	65	243	978
17:00:00	23	53	5	0	0	81	5	32	6	0	0	43	8	54	44	0	0	106	22	20	20	0	0	62	292	1028
17:15:00	31	50	1	0	0	82	5	27	1	0	0	33	12	53	40	0	0	105	24	22	23	0	0	69	289	1090
17:30:00	23	43	0	0	0	66	3	26	6	0	0	35	3	44	38	0	0	85	21	14	13	0	0	48	234	1058
17:45:00	11	32	2	0	0	45	1	22	6	0	0	29	7	47	65	0	0	119	19	13	14	0	0	46	239	1054
18:00:00	12	42	0	0	0	54	4	12	7	0	0	23	6	42	33	0	0	81	16	15	14	0	1	45	203	965
18:15:00	11	33	0	0	0	44	1	14	6	0	0	21	2	31	45	0	0	78	10	11	11	0	0	32	175	851
18:30:00	17	36	2	0	0	55	0	16	2	0	0	18	4	33	27	0	0	64	13	11	8	0	0	32	169	786
18:45:00	11	26	0	0	0	37	2	17	4	0	0	23	3	25	29	0	0	57	8	7	8	0	0	23	140	687
<b>Grand Total</b>	<b>521</b>	<b>1183</b>	<b>62</b>	<b>0</b>	<b>0</b>	<b>1766</b>	<b>65</b>	<b>594</b>	<b>136</b>	<b>0</b>	<b>0</b>	<b>795</b>	<b>221</b>	<b>1282</b>	<b>766</b>	<b>0</b>	<b>0</b>	<b>2269</b>	<b>684</b>	<b>513</b>	<b>456</b>	<b>0</b>	<b>1</b>	<b>1653</b>	<b>6483</b>	<b>-</b>
<b>Approach%</b>	29.5%	67%	3.5%	0%	-	-	8.2%	74.7%	17.1%	0%	-	-	9.7%	56.5%	33.8%	0%	-	-	41.4%	31%	27.6%	0%	-	-	-	-
<b>Totals %</b>	8%	18.2%	1%	0%	-	27.2%	1%	9.2%	2.1%	0%	-	12.3%	3.4%	19.8%	11.8%	0%	-	35%	10.6%	7.9%	7%	0%	-	25.5%	-	-
<b>Heavy</b>	64	152	22	0	-	-	19	74	32	0	-	-	19	213	40	0	-	-	21	70	63	0	-	-	-	-
<b>Heavy %</b>	12.3%	12.8%	35.5%	0%	-	-	29.2%	12.5%	23.5%	0%	-	-	8.6%	16.6%	5.2%	0%	-	-	3.1%	13.6%	13.8%	0%	-	-	-	-
<b>Bicycles</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Bicycle %</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Peak Hour: 07:30 AM - 08:30 AM Weather: Scattered Clouds (3.88 °C)**

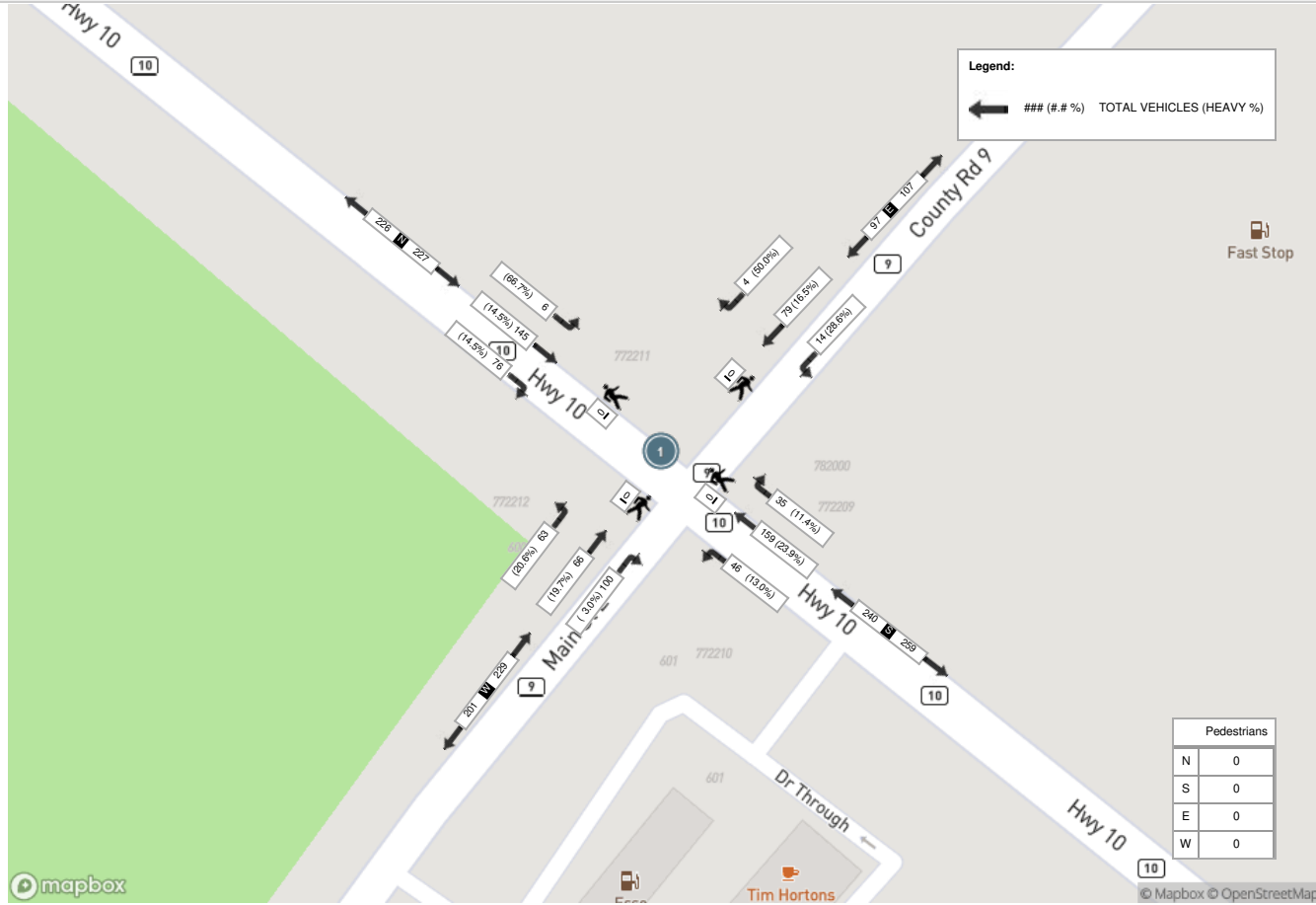
Start Time	N Approach HWY 10						E Approach MAIN ST						S Approach HWY 10						W Approach MAIN ST						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
07:30:00	22	35	3	0	0	60	3	18	3	0	0	24	10	47	15	0	0	72	38	20	16	0	0	74	230
07:45:00	18	39	2	0	0	59	0	16	2	0	0	18	8	41	14	0	0	63	17	12	10	0	0	39	179
08:00:00	22	36	1	0	0	59	1	29	4	0	0	34	8	36	7	0	0	51	21	15	20	0	0	56	200
08:15:00	14	35	0	0	0	49	0	16	5	0	0	21	9	35	10	0	0	54	24	19	17	0	0	60	184
<b>Grand Total</b>	<b>76</b>	<b>145</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>227</b>	<b>4</b>	<b>79</b>	<b>14</b>	<b>0</b>	<b>0</b>	<b>97</b>	<b>35</b>	<b>159</b>	<b>46</b>	<b>0</b>	<b>0</b>	<b>240</b>	<b>100</b>	<b>66</b>	<b>63</b>	<b>0</b>	<b>0</b>	<b>229</b>	<b>793</b>
<b>Approach%</b>	33.5%	63.9%	2.6%	0%		-	4.1%	81.4%	14.4%	0%		-	14.6%	66.3%	19.2%	0%		-	43.7%	28.8%	27.5%	0%		-	-
<b>Totals %</b>	9.6%	18.3%	0.8%	0%		28.6%	0.5%	10%	1.8%	0%		12.2%	4.4%	20.1%	5.8%	0%		30.3%	12.6%	8.3%	7.9%	0%		28.9%	-
<b>PHF</b>	0.86	0.93	0.5	0		0.95	0.33	0.68	0.7	0		0.71	0.88	0.85	0.77	0		0.83	0.66	0.83	0.79	0		0.77	-
<b>Heavy</b>	11	21	4	0		36	2	13	4	0		19	4	38	6	0		48	3	13	13	0		29	-
<b>Heavy %</b>	14.5%	14.5%	66.7%	0%		15.9%	50%	16.5%	28.6%	0%		19.6%	11.4%	23.9%	13%	0%		20%	3%	19.7%	20.6%	0%		12.7%	-
<b>Lights</b>	65	124	2	0		191	2	65	10	0		77	31	121	40	0		192	97	53	50	0		200	-
<b>Lights %</b>	85.5%	85.5%	33.3%	0%		84.1%	50%	82.3%	71.4%	0%		79.4%	88.6%	76.1%	87%	0%		80%	97%	80.3%	79.4%	0%		87.3%	-
<b>Single-Unit Trucks</b>	6	7	0	0		13	2	7	1	0		10	1	6	1	0		8	1	4	9	0		14	-
<b>Single-Unit Trucks %</b>	7.9%	4.8%	0%	0%		5.7%	50%	8.9%	7.1%	0%		10.3%	2.9%	3.8%	2.2%	0%		3.3%	1%	6.1%	14.3%	0%		6.1%	-
<b>Buses</b>	2	1	2	0		5	0	3	0	0		3	0	0	1	0		1	0	1	2	0		3	-
<b>Buses %</b>	2.6%	0.7%	33.3%	0%		2.2%	0%	3.8%	0%	0%		3.1%	0%	0%	2.2%	0%		0.4%	0%	1.5%	3.2%	0%		1.3%	-
<b>Articulated Trucks</b>	3	13	2	0		18	0	3	3	0		6	3	32	4	0		39	2	8	2	0		12	-
<b>Articulated Trucks %</b>	3.9%	9%	33.3%	0%		7.9%	0%	3.8%	21.4%	0%		6.2%	8.6%	20.1%	8.7%	0%		16.3%	2%	12.1%	3.2%	0%		5.2%	-
<b>Bicycles on Road</b>	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	0	0	0		0	-
<b>Bicycles on Road %</b>	0%	0%	0%	0%		0%	0%	1.3%	0%	0%		1%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
<b>Pedestrians</b>	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
<b>Pedestrians %</b>	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-



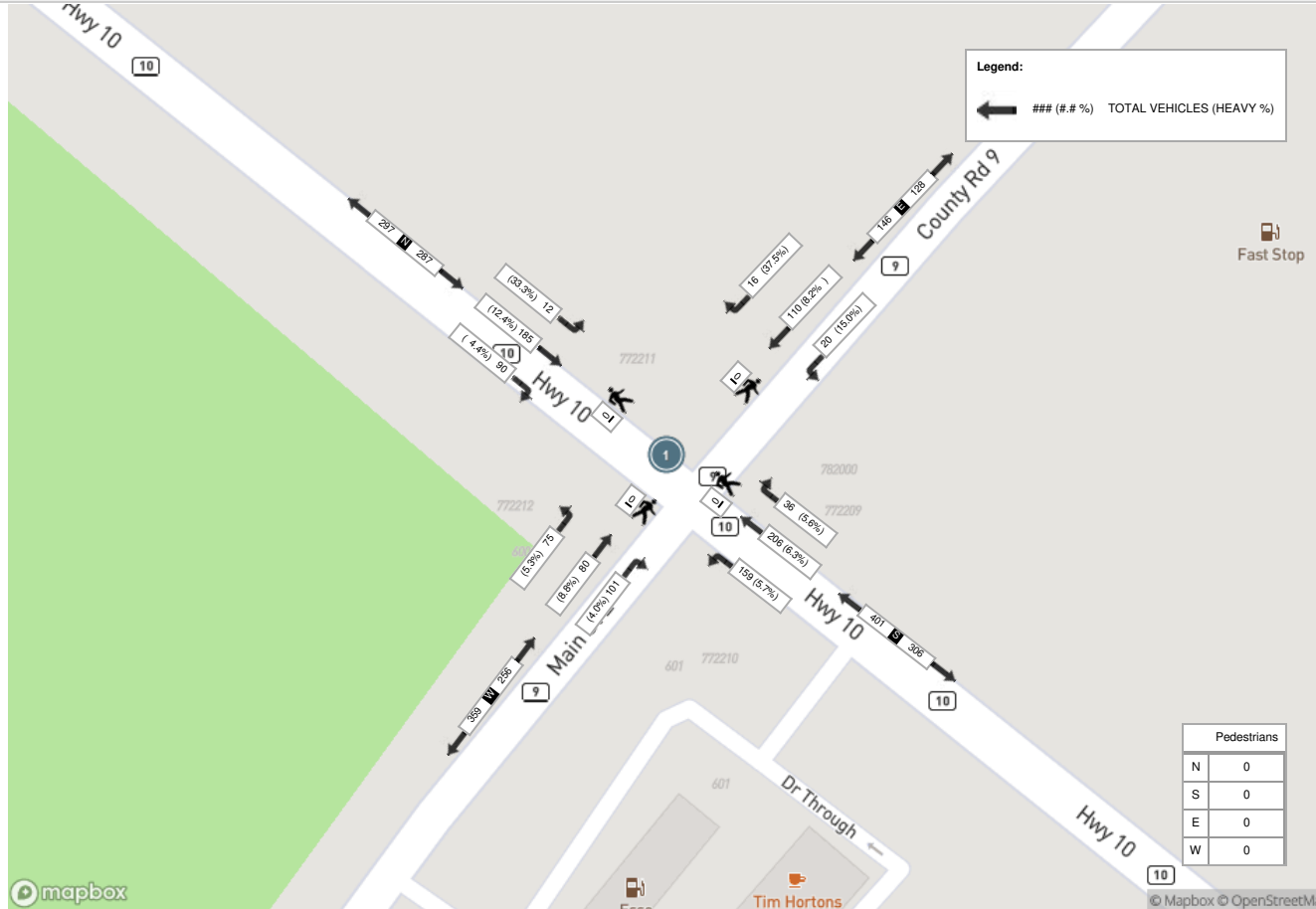
Peak Hour: 04:30 PM - 05:30 PM Weather: Broken Clouds (19.31 °C)

Start Time	N Approach HWY 10						E Approach MAIN ST						S Approach HWY 10						W Approach MAIN ST						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:30:00	22	36	3	0	0	61	4	29	8	0	0	41	10	55	39	0	0	104	26	18	16	0	0	60	266
16:45:00	14	46	3	0	0	63	2	22	5	0	0	29	6	44	36	0	0	86	29	20	16	0	0	65	243
17:00:00	23	53	5	0	0	81	5	32	6	0	0	43	8	54	44	0	0	106	22	20	20	0	0	62	292
17:15:00	31	50	1	0	0	82	5	27	1	0	0	33	12	53	40	0	0	105	24	22	23	0	0	69	289
<b>Grand Total</b>	<b>90</b>	<b>185</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>287</b>	<b>16</b>	<b>110</b>	<b>20</b>	<b>0</b>	<b>0</b>	<b>146</b>	<b>36</b>	<b>206</b>	<b>159</b>	<b>0</b>	<b>0</b>	<b>401</b>	<b>101</b>	<b>80</b>	<b>75</b>	<b>0</b>	<b>0</b>	<b>256</b>	<b>1090</b>
<b>Approach%</b>	31.4%	64.5%	4.2%	0%		-	11%	75.3%	13.7%	0%		-	9%	51.4%	39.7%	0%		-	39.5%	31.3%	29.3%	0%		-	-
<b>Totals %</b>	8.3%	17%	1.1%	0%		26.3%	1.5%	10.1%	1.8%	0%		13.4%	3.3%	18.9%	14.6%	0%		36.8%	9.3%	7.3%	6.9%	0%		23.5%	-
<b>PHF</b>	0.73	0.87	0.6	0		0.88	0.8	0.86	0.63	0		0.85	0.75	0.94	0.9	0		0.95	0.87	0.91	0.82	0		0.93	-
<b>Heavy</b>	4	23	4	0		31	6	9	3	0		18	2	13	9	0		24	4	7	4	0		15	-
<b>Heavy %</b>	4.4%	12.4%	33.3%	0%		10.8%	37.5%	8.2%	15%	0%		12.3%	5.6%	6.3%	5.7%	0%		6%	4%	8.8%	5.3%	0%		5.9%	-
<b>Lights</b>	86	162	8	0		256	10	101	17	0		128	34	193	150	0		377	97	73	71	0		241	-
<b>Lights %</b>	95.6%	87.6%	66.7%	0%		89.2%	62.5%	91.8%	85%	0%		87.7%	94.4%	93.7%	94.3%	0%		94%	96%	91.3%	94.7%	0%		94.1%	-
<b>Single-Unit Trucks</b>	1	7	1	0		9	1	2	1	0		4	2	1	4	0		7	1	2	1	0		4	-
<b>Single-Unit Trucks %</b>	1.1%	3.8%	8.3%	0%		3.1%	6.3%	1.8%	5%	0%		2.7%	5.6%	0.5%	2.5%	0%		1.7%	1%	2.5%	1.3%	0%		1.6%	-
<b>Buses</b>	3	1	1	0		5	3	2	0	0		5	0	3	1	0		4	0	1	2	0		3	-
<b>Buses %</b>	3.3%	0.5%	8.3%	0%		1.7%	18.8%	1.8%	0%	0%		3.4%	0%	1.5%	0.6%	0%		1%	0%	1.3%	2.7%	0%		1.2%	-
<b>Articulated Trucks</b>	0	15	2	0		17	2	5	2	0		9	0	9	4	0		13	3	4	1	0		8	-
<b>Articulated Trucks %</b>	0%	8.1%	16.7%	0%		5.9%	12.5%	4.5%	10%	0%		6.2%	0%	4.4%	2.5%	0%		3.2%	3%	5%	1.3%	0%		3.1%	-
<b>Bicycles on Road</b>	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
<b>Bicycles on Road %</b>	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
<b>Pedestrians</b>	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
<b>Pedestrians %</b>	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-

Peak Hour: 07:30 AM - 08:30 AM Weather: Scattered Clouds (3.88 °C)



Peak Hour: 04:30 PM - 05:30 PM Weather: Broken Clouds (19.31 °C)





Turning Movement Count (3 . MAIN ST & ALICE ST / MILL ST)

Start Time	N Approach MILL ST						E Approach MAIN ST						S Approach ALICE ST						W Approach MAIN ST						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
06:00:00	0	0	2	0	0	2	0	21	1	0	0	22	5	0	0	0	1	5	0	52	0	0	0	52	81	
06:15:00	0	0	2	0	0	2	0	29	0	0	0	29	3	0	1	0	2	4	0	45	0	0	0	45	80	
06:30:00	0	0	0	0	0	0	0	34	0	0	0	34	3	0	2	0	0	5	1	45	0	0	0	46	85	
06:45:00	0	0	0	0	0	0	0	31	0	0	0	31	4	0	2	0	0	6	3	42	0	0	0	45	82	328
07:00:00	2	0	2	0	0	4	0	39	0	0	0	39	5	0	0	0	1	5	1	54	0	0	1	55	103	350
07:15:00	0	0	1	0	0	1	0	50	1	0	0	51	7	0	0	0	0	7	2	61	0	0	0	63	122	392
07:30:00	0	0	0	0	1	0	3	48	2	0	0	53	10	0	0	0	1	10	0	60	0	0	0	60	123	430
07:45:00	0	0	1	0	0	1	0	53	1	0	0	54	3	0	0	0	0	3	0	59	1	0	0	60	118	466
08:00:00	0	0	1	0	2	1	0	63	1	0	0	64	5	0	2	0	0	7	0	54	0	0	0	54	126	489
08:15:00	0	0	1	0	0	1	0	46	1	0	1	47	3	0	3	0	1	6	0	54	0	0	0	54	108	475
08:30:00	0	0	0	0	1	0	0	53	3	0	0	56	6	0	3	0	0	9	2	66	1	0	0	69	134	486
08:45:00	0	0	1	0	1	1	1	51	2	0	0	54	1	0	2	0	1	3	0	77	1	0	0	78	136	504
09:00:00	0	0	2	0	0	2	0	54	1	0	0	55	3	0	1	0	2	4	1	56	0	0	0	57	118	496
09:15:00	0	0	0	0	0	0	0	47	1	0	0	48	1	0	0	0	1	1	1	46	0	0	0	47	96	484
09:30:00	0	0	0	0	0	0	0	43	1	0	0	44	3	0	0	0	1	3	0	40	0	0	0	40	87	437
09:45:00	0	0	1	0	4	1	0	36	0	0	1	36	3	0	0	0	1	3	1	51	1	0	0	53	93	394
***BREAK***																										
15:00:00	1	0	0	0	2	1	1	55	3	0	1	59	7	0	1	0	1	8	1	57	0	0	1	58	126	
15:15:00	1	0	1	0	0	2	2	71	5	0	0	78	8	0	2	0	2	10	1	59	0	0	0	60	150	
15:30:00	0	0	0	0	1	0	0	61	2	0	0	63	3	0	0	0	2	3	3	39	2	0	1	44	110	
15:45:00	1	0	2	0	1	3	1	71	6	0	1	78	1	0	2	0	0	3	2	67	2	0	1	71	155	541
16:00:00	1	0	0	0	0	1	0	65	1	1	0	67	4	0	2	0	0	6	6	60	0	0	0	66	140	555
16:15:00	2	0	1	0	0	3	1	66	3	0	0	70	1	0	4	0	2	5	0	79	1	0	0	80	158	563
16:30:00	0	0	0	0	7	0	1	71	4	0	0	76	1	0	4	0	3	5	4	59	0	0	0	63	144	597
16:45:00	0	0	1	0	0	1	3	66	5	0	0	74	2	0	0	0	0	2	4	65	0	0	1	69	146	588
17:00:00	1	0	1	0	4	2	1	83	5	0	0	89	3	0	2	0	1	5	4	72	1	0	0	77	173	621
17:15:00	0	0	1	0	1	1	0	82	3	0	0	85	4	0	3	0	3	7	3	59	1	0	0	63	156	619
17:30:00	0	0	1	0	2	1	2	73	3	0	0	78	6	0	0	0	2	6	1	52	0	0	0	53	138	613
17:45:00	0	0	0	0	2	0	1	66	5	0	0	72	4	0	3	0	4	7	5	50	3	0	1	58	137	604
18:00:00	0	0	2	0	1	2	0	53	4	0	0	57	4	0	1	0	2	5	7	51	0	0	0	58	122	553
18:15:00	0	0	2	0	2	2	1	61	4	0	0	66	1	0	3	0	9	4	2	32	0	0	0	34	106	503
18:30:00	0	0	0	0	1	0	2	49	3	0	0	54	2	0	2	0	0	4	5	32	1	0	0	38	96	461
18:45:00	0	0	0	0	2	0	0	51	5	0	0	56	3	0	2	0	7	5	2	26	0	0	0	28	89	413
<b>Grand Total</b>	<b>9</b>	<b>0</b>	<b>26</b>	<b>0</b>	<b>35</b>	<b>35</b>	<b>20</b>	<b>1742</b>	<b>76</b>	<b>1</b>	<b>4</b>	<b>1839</b>	<b>119</b>	<b>0</b>	<b>47</b>	<b>0</b>	<b>50</b>	<b>166</b>	<b>62</b>	<b>1721</b>	<b>15</b>	<b>0</b>	<b>6</b>	<b>1798</b>	<b>3838</b>	<b>-</b>
<b>Approach%</b>	25.7%	0%	74.3%	0%	-	-	1.1%	94.7%	4.1%	0.1%	-	-	71.7%	0%	28.3%	0%	-	-	3.4%	95.7%	0.8%	0%	-	-	-	-
<b>Totals %</b>	0.2%	0%	0.7%	0%	0.9%	0.9%	0.5%	45.4%	2%	0%	47.9%	3.1%	0%	1.2%	0%	4.3%	1.6%	44.8%	0.4%	0%	46.8%	-	-	-	-	-
<b>Heavy</b>	0	0	0	0	-	-	0	155	4	0	-	-	4	0	2	0	-	-	0	149	0	0	-	-	-	-
<b>Heavy %</b>	0%	0%	0%	0%	-	-	0%	8.9%	5.3%	0%	-	-	3.4%	0%	4.3%	0%	-	-	0%	8.7%	0%	0%	-	-	-	-
<b>Bicycles</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Bicycle %</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (3.88 °C)**

Start Time	N Approach MILL ST						E Approach MAIN ST						S Approach ALICE ST						W Approach MAIN ST						Int. Total (15 min)	
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total		
08:00:00	0	0	1	0	2	1	0	63	1	0	0	64	5	0	2	0	0	7	0	54	0	0	0	0	54	126
08:15:00	0	0	1	0	0	1	0	46	1	0	1	47	3	0	3	0	1	6	0	54	0	0	0	0	54	108
08:30:00	0	0	0	0	1	0	0	53	3	0	0	56	6	0	3	0	0	9	2	66	1	0	0	0	69	134
08:45:00	0	0	1	0	1	1	1	51	2	0	0	54	1	0	2	0	1	3	0	77	1	0	0	0	78	136
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>4</b>	<b>3</b>	<b>1</b>	<b>213</b>	<b>7</b>	<b>0</b>	<b>1</b>	<b>221</b>	<b>15</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>2</b>	<b>25</b>	<b>2</b>	<b>251</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>255</b>	<b>504</b>
<b>Approach%</b>	0%	0%	100%	0%	-	-	0.5%	96.4%	3.2%	0%	-	-	60%	0%	40%	0%	-	-	0.8%	98.4%	0.8%	0%	-	-	-	-
<b>Totals %</b>	0%	0%	0.6%	0%	0.6%	0.6%	0.2%	42.3%	1.4%	0%	43.8%	43.8%	3%	0%	2%	0%	5%	5%	0.4%	49.8%	0.4%	0%	50.6%	50.6%	-	-
<b>PHF</b>	0	0	0.75	0	0.75	0.75	0.25	0.85	0.58	0	0.86	0.86	0.63	0	0.83	0	0.69	0.69	0.25	0.81	0.5	0	0.82	0.82	-	-
<b>Heavy</b>	0	0	0	0	0	0	0	25	1	0	26	26	1	0	2	0	3	3	0	41	0	0	0	41	-	
<b>Heavy %</b>	0%	0%	0%	0%	0%	0%	0%	11.7%	14.3%	0%	11.8%	11.8%	6.7%	0%	20%	0%	12%	12%	0%	16.3%	0%	0%	0%	16.1%	-	
<b>Lights</b>	0	0	3	0	3	3	1	188	6	0	195	195	14	0	8	0	22	22	2	210	2	0	0	214	-	
<b>Lights %</b>	0%	0%	100%	0%	100%	100%	100%	88.3%	85.7%	0%	88.2%	88.2%	93.3%	0%	80%	0%	88%	88%	100%	83.7%	100%	0%	0%	83.9%	-	
<b>Single-Unit Trucks</b>	0	0	0	0	0	0	0	13	0	0	13	13	0	0	0	0	0	0	0	20	0	0	0	20	-	
<b>Single-Unit Trucks %</b>	0%	0%	0%	0%	0%	0%	0%	6.1%	0%	0%	5.9%	5.9%	0%	0%	0%	0%	0%	0%	0%	8%	0%	0%	0%	7.8%	-	
<b>Buses</b>	0	0	0	0	0	0	0	3	1	0	4	4	1	0	2	0	3	3	0	9	0	0	0	9	-	
<b>Buses %</b>	0%	0%	0%	0%	0%	0%	0%	1.4%	14.3%	0%	1.8%	1.8%	6.7%	0%	20%	0%	12%	12%	0%	3.6%	0%	0%	0%	3.5%	-	
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	9	0	0	9	9	0	0	0	0	0	0	0	12	0	0	0	12	-	
<b>Articulated Trucks %</b>	0%	0%	0%	0%	0%	0%	0%	4.2%	0%	0%	4.1%	4.1%	0%	0%	0%	0%	0%	0%	0%	4.8%	0%	0%	0%	4.7%	-	
<b>Bicycles on Road</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	
<b>Bicycles on Road %</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	
<b>Pedestrians</b>	-	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	0	-	-	
<b>Pedestrians %</b>	-	-	-	-	42.9%	-	-	-	-	-	14.3%	-	-	-	-	-	28.6%	-	-	-	-	-	0%	-	-	
<b>Bicycles on Crosswalk</b>	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	
<b>Bicycles on Crosswalk %</b>	-	-	-	-	14.3%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	

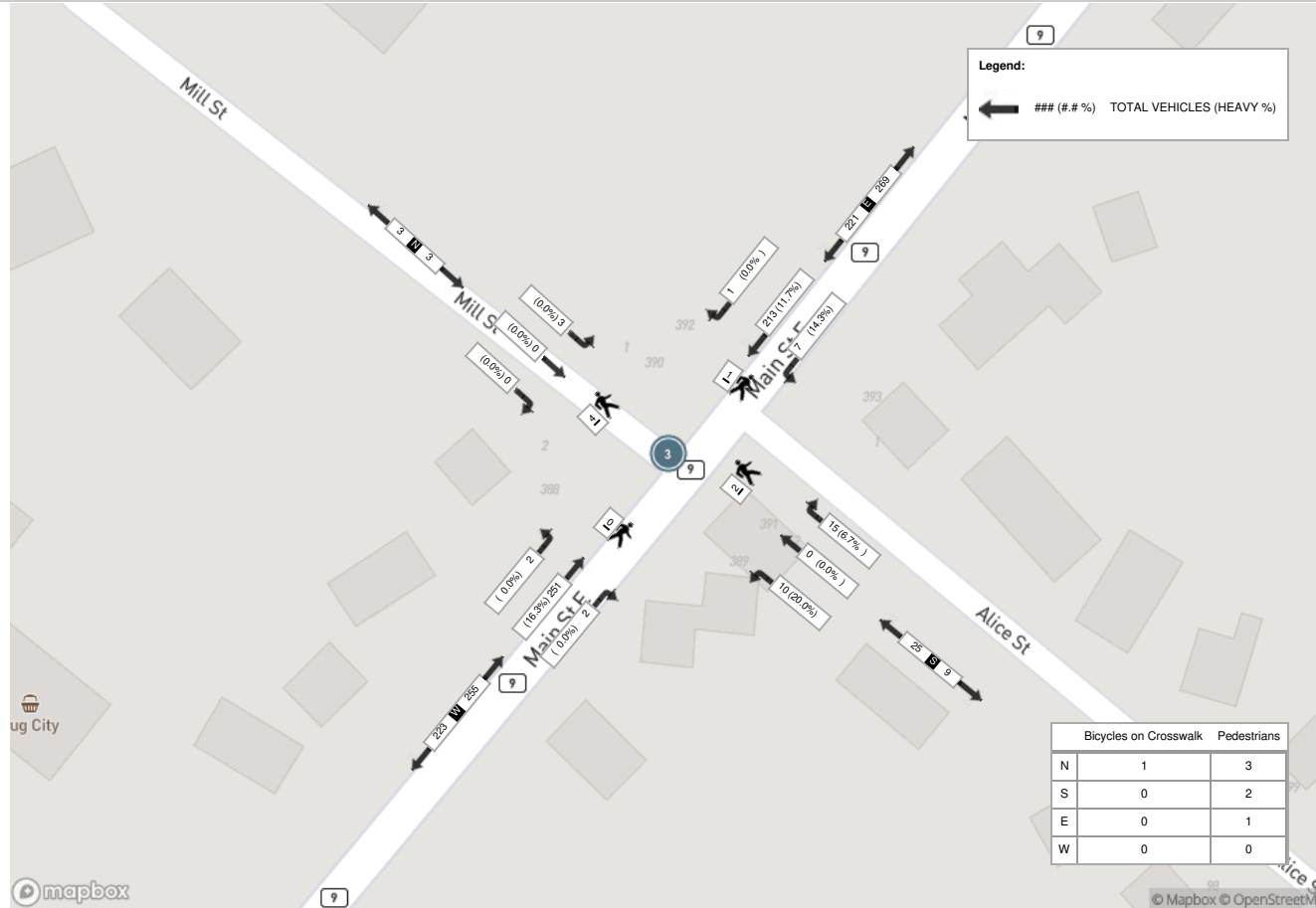




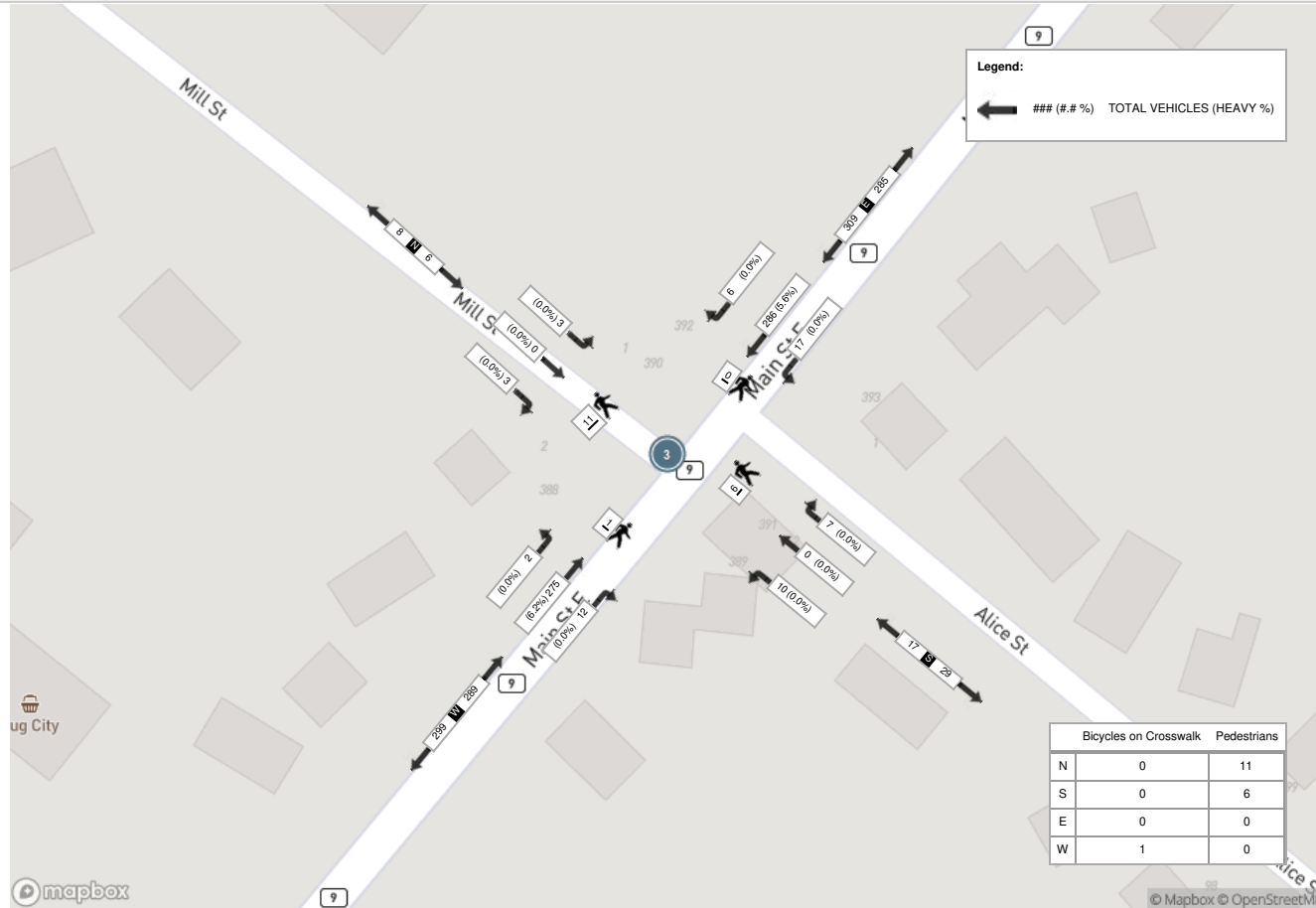
Peak Hour: 04:15 PM - 05:15 PM Weather: Broken Clouds (19.31 °C)

Start Time	N Approach MILL ST						E Approach MAIN ST						S Approach ALICE ST						W Approach MAIN ST						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:15:00	2	0	1	0	0	3	1	66	3	0	0	70	1	0	4	0	2	5	0	79	1	0	0	80	158
16:30:00	0	0	0	0	7	0	1	71	4	0	0	76	1	0	4	0	3	5	4	59	0	0	0	63	144
16:45:00	0	0	1	0	0	1	3	66	5	0	0	74	2	0	0	0	0	2	4	65	0	0	1	69	146
17:00:00	1	0	1	0	4	2	1	83	5	0	0	89	3	0	2	0	1	5	4	72	1	0	0	77	173
<b>Grand Total</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>11</b>	<b>6</b>	<b>6</b>	<b>286</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>309</b>	<b>7</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>6</b>	<b>17</b>	<b>12</b>	<b>275</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>289</b>	<b>621</b>
<b>Approach%</b>	50%	0%	50%	0%	-	-	1.9%	92.6%	5.5%	0%	-	-	41.2%	0%	58.8%	0%	-	-	4.2%	95.2%	0.7%	0%	-	-	-
<b>Totals %</b>	0.5%	0%	0.5%	0%	1%	1%	1%	46.1%	2.7%	0%	49.8%	1.1%	0%	1.6%	0%	2.7%	1.9%	44.3%	0.3%	0%	46.5%	-	-	-	
<b>PHF</b>	0.38	0	0.75	0	0.5	0.5	0.5	0.86	0.85	0	0.87	0.58	0	0.63	0	0.85	0.75	0.87	0.5	0	0.9	-	-	-	
<b>Heavy</b>	0	0	0	0	0	0	0	16	0	0	16	0	0	0	0	0	0	0	17	0	0	17	-	-	
<b>Heavy %</b>	0%	0%	0%	0%	0%	0%	0%	5.6%	0%	0%	5.2%	0%	0%	0%	0%	0%	0%	0%	6.2%	0%	0%	5.9%	-	-	
<b>Lights</b>	3	0	3	0	6	6	6	270	17	0	293	7	0	9	0	16	12	258	2	0	272	-	-	-	
<b>Lights %</b>	100%	0%	100%	0%	100%	100%	100%	94.4%	100%	0%	94.8%	100%	0%	90%	0%	94.1%	100%	93.8%	100%	0%	94.1%	-	-	-	
<b>Single-Unit Trucks</b>	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	5	0	0	5	-	-	-	
<b>Single-Unit Trucks %</b>	0%	0%	0%	0%	0%	0%	0%	2.1%	0%	0%	1.9%	0%	0%	0%	0%	0%	0%	1.8%	0%	0%	1.7%	-	-	-	
<b>Buses</b>	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	5	0	0	5	-	-	-	
<b>Buses %</b>	0%	0%	0%	0%	0%	0%	0%	0.7%	0%	0%	0.6%	0%	0%	0%	0%	0%	0%	1.8%	0%	0%	1.7%	-	-	-	
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	7	0	0	7	-	-	-	
<b>Articulated Trucks %</b>	0%	0%	0%	0%	0%	0%	0%	2.8%	0%	0%	2.6%	0%	0%	0%	0%	0%	0%	2.5%	0%	0%	2.4%	-	-	-	
<b>Bicycles on Road</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	-	-	-	
<b>Bicycles on Road %</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%	5.9%	0%	0%	0%	0%	0%	-	-	-	
<b>Pedestrians</b>	-	-	-	-	11	-	-	-	-	-	0	-	-	-	-	6	-	-	-	-	0	-	-	-	
<b>Pedestrians %</b>	-	-	-	-	61.1%	-	-	-	-	-	0%	-	-	-	-	33.3%	-	-	-	-	0%	-	-	-	
<b>Bicycles on Crosswalk</b>	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-	-	
<b>Bicycles on Crosswalk %</b>	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	5.6%	-	-	-	

Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (3.88 °C)



Peak Hour: 04:15 PM - 05:15 PM Weather: Broken Clouds (19.31 °C)





Turning Movement Count (4 . MAIN ST & OSPREY ST)

Start Time	N Approach OSPREY ST						E Approach MAIN ST					S Approach OSPREY ST					W Approach MAIN ST					Int. Total (15 min)	Int. Total (1 hr)				
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N			UTurn W:W	Peds W:	Approach Total	
06:00:00	0	0	7	0	0	7	1	19	0	0	0	20	0	0	0	0	1	0	0	41	0	0	0	41	68		
06:15:00	1	0	3	0	0	4	1	24	0	0	0	25	0	1	1	0	0	2	1	38	0	0	0	39	70		
06:30:00	0	0	5	0	0	5	0	25	1	0	0	26	1	0	1	0	0	2	0	39	0	0	0	39	72		
06:45:00	1	0	5	0	0	6	0	24	1	0	0	25	0	0	3	0	0	3	1	32	0	0	1	33	67	277	
07:00:00	0	0	8	0	0	8	0	29	0	0	1	29	4	1	2	0	2	7	0	39	0	0	0	39	83	292	
07:15:00	3	0	9	0	0	12	1	45	0	0	0	46	1	0	1	0	0	2	0	47	1	0	0	48	108	330	
07:30:00	1	0	3	0	0	4	0	40	1	0	1	41	0	1	2	0	0	3	1	49	0	0	0	50	98	356	
07:45:00	1	0	8	0	1	9	1	37	2	0	0	40	3	1	1	0	0	5	1	43	0	0	0	44	98	387	
08:00:00	0	0	3	0	1	3	0	54	0	0	0	54	2	0	2	0	0	4	0	41	2	0	0	43	104	408	
08:15:00	1	0	5	0	1	6	0	47	0	0	0	47	1	0	7	0	0	8	1	45	1	0	0	47	108	408	
08:30:00	1	2	4	0	0	7	0	49	2	0	0	51	4	1	6	0	1	11	1	60	0	0	0	61	130	440	
08:45:00	1	0	3	0	2	4	0	41	0	0	0	41	3	2	1	0	1	6	1	68	1	0	0	70	121	463	
09:00:00	0	0	1	0	2	1	1	43	2	0	1	46	3	0	0	0	3	3	1	50	5	0	0	56	106	465	
09:15:00	1	0	3	0	0	4	2	34	3	0	0	39	0	0	1	0	0	1	1	39	1	0	1	41	85	442	
09:30:00	2	0	1	0	2	3	0	37	1	0	0	38	2	0	0	0	0	2	2	39	0	0	0	41	84	396	
09:45:00	0	0	0	0	2	0	1	34	0	0	0	35	2	0	1	0	0	3	0	46	0	0	0	46	84	359	
***BREAK***																											
15:00:00	0	0	0	0	0	0	0	46	1	0	0	47	3	1	3	0	0	7	1	46	0	0	0	47	101		
15:15:00	2	1	3	0	14	6	0	58	3	0	0	61	5	2	3	0	1	10	2	54	7	0	1	63	140		
15:30:00	0	2	1	0	1	3	1	54	2	0	2	57	1	0	1	0	1	2	2	36	2	0	0	40	102		
15:45:00	0	2	5	0	3	7	0	56	0	0	8	56	4	1	2	0	4	7	2	56	4	0	0	62	132	475	
16:00:00	2	1	4	0	2	7	0	50	2	0	0	52	1	5	1	0	1	7	2	45	3	0	0	50	116	490	
16:15:00	1	3	4	0	6	8	0	54	2	0	1	56	0	0	0	0	5	0	1	63	2	0	0	66	130	480	
16:30:00	0	0	1	0	2	1	0	53	3	0	5	56	4	0	1	0	5	5	3	52	2	0	0	57	119	497	
16:45:00	1	0	6	0	5	7	0	53	3	0	0	56	2	1	0	0	12	3	2	50	1	0	0	53	119	484	
17:00:00	1	2	3	0	8	6	1	66	2	0	1	69	4	3	0	0	0	7	3	65	3	0	0	71	153	521	
17:15:00	1	0	0	0	3	1	1	63	2	0	4	66	2	1	1	0	0	4	3	49	5	0	0	57	128	519	
17:30:00	0	0	0	0	0	0	0	49	5	0	3	54	4	1	2	0	2	7	2	39	0	0	0	41	102	502	
17:45:00	2	1	5	0	2	8	0	47	0	0	2	47	1	2	4	0	0	7	0	43	0	0	0	43	105	488	
18:00:00	1	3	3	0	0	7	0	29	4	0	3	33	0	0	0	0	0	0	3	37	1	0	0	41	81	416	
18:15:00	1	1	2	0	0	4	0	44	1	0	0	45	0	0	1	0	3	1	1	27	3	0	1	31	81	369	
18:30:00	0	0	5	0	4	5	1	39	4	0	1	44	2	2	1	0	3	5	1	31	0	0	0	32	86	353	
18:45:00	1	0	1	0	5	2	0	40	1	0	8	41	1	0	0	0	2	1	1	22	1	0	1	24	68	316	
<b>Grand Total</b>	<b>26</b>	<b>18</b>	<b>111</b>	<b>0</b>	<b>66</b>	<b>155</b>	<b>12</b>	<b>1383</b>	<b>48</b>	<b>0</b>	<b>41</b>	<b>1443</b>	<b>60</b>	<b>26</b>	<b>49</b>	<b>0</b>	<b>47</b>	<b>135</b>	<b>40</b>	<b>1431</b>	<b>45</b>	<b>0</b>	<b>5</b>	<b>1516</b>	<b>3249</b>	<b>-</b>	
<b>Approach%</b>	16.8%	11.6%	71.6%	0%	-	-	0.8%	95.8%	3.3%	0%	-	-	44.4%	19.3%	36.3%	0%	-	-	2.6%	94.4%	3%	0%	-	-	-	-	
<b>Totals %</b>	0.8%	0.6%	3.4%	0%	4.8%	0.4%	42.6%	1.5%	0%	44.4%	1.8%	0.8%	1.5%	0%	4.2%	1.2%	44%	1.4%	0%	46.7%	-	-	-	-	-	-	
<b>Heavy</b>	1	0	4	0	-	1	145	1	0	-	4	0	2	0	-	0	130	1	0	-	-	-	-	-	-	-	
<b>Heavy %</b>	3.8%	0%	3.6%	0%	-	8.3%	10.5%	2.1%	0%	-	6.7%	0%	4.1%	0%	-	0%	9.1%	2.2%	0%	-	-	-	-	-	-	-	
<b>Bicycles</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Bicycle %</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Peak Hour: 08:15 AM - 09:15 AM Weather: Scattered Clouds (3.88 °C)**

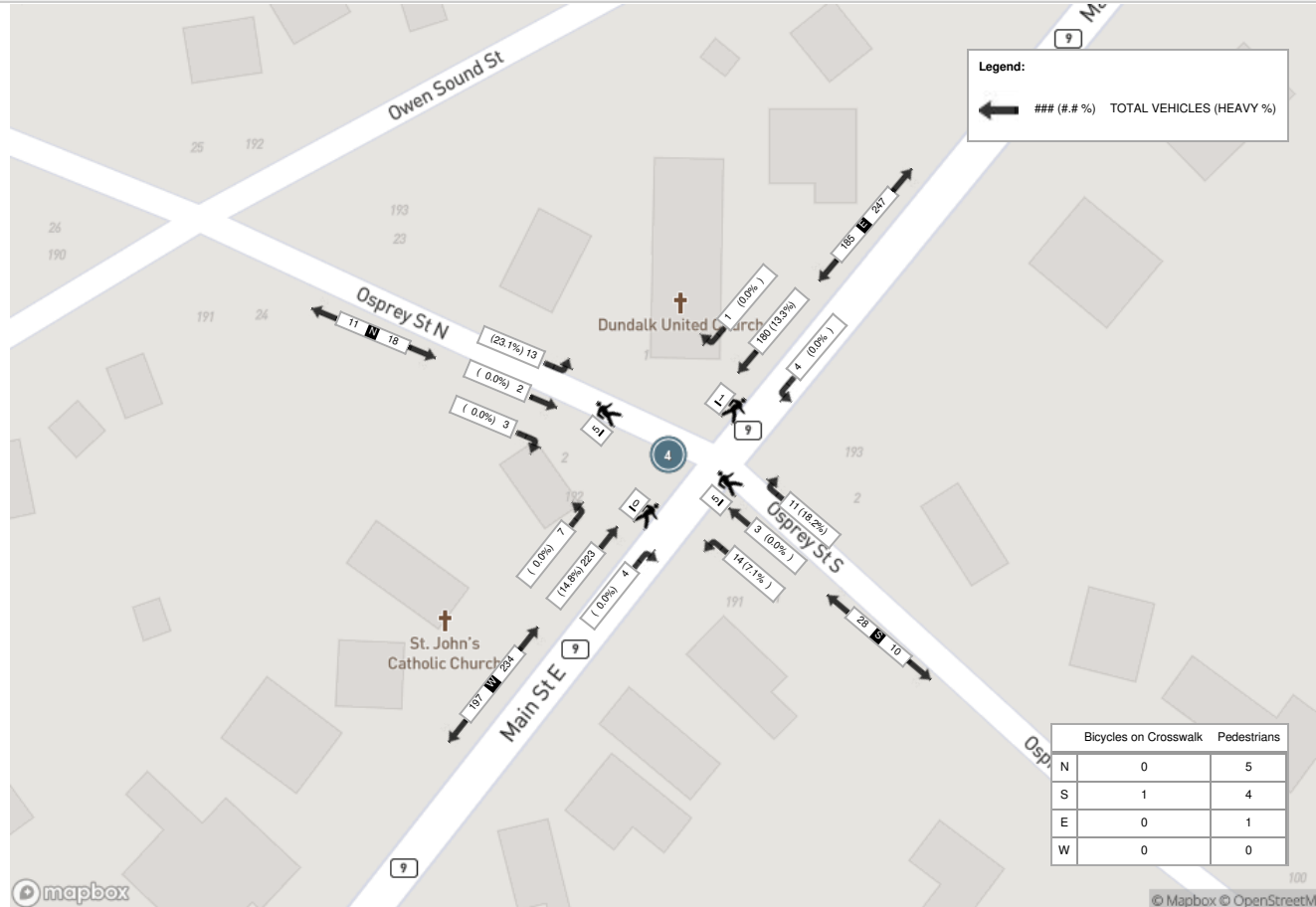
Start Time	N Approach OSPREY ST						E Approach MAIN ST						S Approach OSPREY ST						W Approach MAIN ST						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:15:00	1	0	5	0	1	6	0	47	0	0	0	47	1	0	7	0	0	8	1	45	1	0	0	47	108
08:30:00	1	2	4	0	0	7	0	49	2	0	0	51	4	1	6	0	1	11	1	60	0	0	0	61	130
08:45:00	1	0	3	0	2	4	0	41	0	0	0	41	3	2	1	0	1	6	1	68	1	0	0	70	121
09:00:00	0	0	1	0	2	1	1	43	2	0	1	46	3	0	0	0	3	3	1	50	5	0	0	56	106
<b>Grand Total</b>	<b>3</b>	<b>2</b>	<b>13</b>	<b>0</b>	<b>5</b>	<b>18</b>	<b>1</b>	<b>180</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>185</b>	<b>11</b>	<b>3</b>	<b>14</b>	<b>0</b>	<b>5</b>	<b>28</b>	<b>4</b>	<b>223</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>234</b>	<b>465</b>
<b>Approach%</b>	16.7%	11.1%	72.2%	0%	-	-	0.5%	97.3%	2.2%	0%	-	-	39.3%	10.7%	50%	0%	-	-	1.7%	95.3%	3%	0%	-	-	
<b>Totals %</b>	0.6%	0.4%	2.8%	0%	3.9%	3.9%	0.2%	38.7%	0.9%	0%	39.8%	39.8%	2.4%	0.6%	3%	0%	6%	6%	0.9%	48%	1.5%	0%	50.3%	-	
<b>PHF</b>	0.75	0.25	0.65	0	0.64	0.64	0.25	0.92	0.5	0	0.91	0.91	0.69	0.38	0.5	0	0.64	0.64	1	0.82	0.35	0	0.84	-	
<b>Heavy</b>	0	0	3	0	3	3	0	24	0	0	24	24	2	0	1	0	3	3	0	33	0	0	33	-	
<b>Heavy %</b>	0%	0%	23.1%	0%	16.7%	16.7%	0%	13.3%	0%	0%	13%	13%	18.2%	0%	7.1%	0%	10.7%	10.7%	0%	14.8%	0%	0%	14.1%	-	
<b>Lights</b>	3	2	10	0	15	15	1	156	4	0	161	161	9	3	13	0	25	25	4	190	7	0	201	-	
<b>Lights %</b>	100%	100%	76.9%	0%	83.3%	83.3%	100%	86.7%	100%	0%	87%	87%	81.8%	100%	92.9%	0%	89.3%	89.3%	100%	85.2%	100%	0%	85.9%	-	
<b>Single-Unit Trucks</b>	0	0	1	0	1	1	0	13	0	0	13	13	1	0	0	0	1	1	0	18	0	0	18	-	
<b>Single-Unit Trucks %</b>	0%	0%	7.7%	0%	5.6%	5.6%	0%	7.2%	0%	0%	7%	7%	9.1%	0%	0%	0%	3.6%	3.6%	0%	8.1%	0%	0%	7.7%	-	
<b>Buses</b>	0	0	2	0	2	2	0	4	0	0	4	4	1	0	1	0	2	2	0	5	0	0	5	-	
<b>Buses %</b>	0%	0%	15.4%	0%	11.1%	11.1%	0%	2.2%	0%	0%	2.2%	2.2%	9.1%	0%	7.1%	0%	7.1%	7.1%	0%	2.2%	0%	0%	2.1%	-	
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	7	0	0	7	7	0	0	0	0	0	0	0	10	0	0	10	-	
<b>Articulated Trucks %</b>	0%	0%	0%	0%	0%	0%	0%	3.9%	0%	0%	3.8%	3.8%	0%	0%	0%	0%	0%	0%	0%	4.5%	0%	0%	4.3%	-	
<b>Bicycles on Road</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	
<b>Bicycles on Road %</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	
<b>Pedestrians</b>	-	-	-	-	5	-	-	-	-	1	-	-	-	-	-	4	-	-	-	-	-	0	-	-	
<b>Pedestrians%</b>	-	-	-	-	45.5%	-	-	-	-	9.1%	-	-	-	-	-	36.4%	-	-	-	-	-	0%	-	-	
<b>Bicycles on Crosswalk</b>	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	
<b>Bicycles on Crosswalk%</b>	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	9.1%	-	-	-	-	-	0%	-	-	



**Peak Hour: 04:15 PM - 05:15 PM Weather: Broken Clouds (19.31 °C)**

Start Time	N Approach OSPREY ST						E Approach MAIN ST						S Approach OSPREY ST						W Approach MAIN ST						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:15:00	1	3	4	0	6	8	0	54	2	0	1	56	0	0	0	0	5	0	1	63	2	0	0	66	130
16:30:00	0	0	1	0	2	1	0	53	3	0	5	56	4	0	1	0	5	5	3	52	2	0	0	57	119
16:45:00	1	0	6	0	5	7	0	53	3	0	0	56	2	1	0	0	12	3	2	50	1	0	0	53	119
17:00:00	1	2	3	0	8	6	1	66	2	0	1	69	4	3	0	0	0	7	3	65	3	0	0	71	153
<b>Grand Total</b>	<b>3</b>	<b>5</b>	<b>14</b>	<b>0</b>	<b>21</b>	<b>22</b>	<b>1</b>	<b>226</b>	<b>10</b>	<b>0</b>	<b>7</b>	<b>237</b>	<b>10</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>22</b>	<b>15</b>	<b>9</b>	<b>230</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>247</b>	<b>521</b>
<b>Approach%</b>	13.6%	22.7%	63.6%	0%	-	-	0.4%	95.4%	4.2%	0%	-	-	66.7%	26.7%	6.7%	0%	-	-	3.6%	93.1%	3.2%	0%	-	-	-
<b>Totals %</b>	0.6%	1%	2.7%	0%	4.2%	4.2%	0.2%	43.4%	1.9%	0%	45.5%	45.5%	1.9%	0.8%	0.2%	0%	2.9%	2.9%	1.7%	44.1%	1.5%	0%	47.4%	47.4%	-
<b>PHF</b>	0.75	0.42	0.58	0	0.69	0.69	0.25	0.86	0.83	0	0.86	0.86	0.63	0.33	0.25	0	0.54	0.54	0.75	0.88	0.67	0	0.87	0.87	-
<b>Heavy</b>	1	0	0	0	1	1	0	15	0	0	15	15	0	0	0	0	0	0	0	15	0	0	15	15	-
<b>Heavy %</b>	33.3%	0%	0%	0%	4.5%	4.5%	0%	6.6%	0%	0%	6.3%	6.3%	0%	0%	0%	0%	0%	0%	0%	6.5%	0%	0%	6.1%	6.1%	-
<b>Lights</b>	2	5	14	0	21	21	1	211	10	0	222	222	10	4	1	0	15	15	9	214	8	0	231	231	-
<b>Lights %</b>	66.7%	100%	100%	0%	95.5%	95.5%	100%	93.4%	100%	0%	93.7%	93.7%	100%	100%	100%	0%	100%	100%	100%	93%	100%	0%	93.5%	93.5%	-
<b>Single-Unit Trucks</b>	1	0	0	0	1	1	0	6	0	0	6	6	0	0	0	0	0	0	0	5	0	0	5	5	-
<b>Single-Unit Trucks %</b>	33.3%	0%	0%	0%	4.5%	4.5%	0%	2.7%	0%	0%	2.5%	2.5%	0%	0%	0%	0%	0%	0%	0%	2.2%	0%	0%	2%	2%	-
<b>Buses</b>	0	0	0	0	0	0	0	2	0	0	2	2	0	0	0	0	0	0	0	6	0	0	6	6	-
<b>Buses %</b>	0%	0%	0%	0%	0%	0%	0%	0.9%	0%	0%	0.8%	0.8%	0%	0%	0%	0%	0%	0%	0%	2.6%	0%	0%	2.4%	2.4%	-
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	7	0	0	7	7	0	0	0	0	0	0	0	4	0	0	4	4	-
<b>Articulated Trucks %</b>	0%	0%	0%	0%	0%	0%	0%	3.1%	0%	0%	3%	3%	0%	0%	0%	0%	0%	0%	0%	1.7%	0%	0%	1.6%	1.6%	-
<b>Bicycles on Road</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	-
<b>Bicycles on Road %</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.4%	0%	0%	0.4%	0.4%	-
<b>Pedestrians</b>	-	-	-	-	21	-	-	-	-	-	6	-	-	-	-	-	22	-	-	-	-	-	0	-	-
<b>Pedestrians %</b>	-	-	-	-	42%	-	-	-	-	-	12%	-	-	-	-	-	44%	-	-	-	-	-	0%	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-
<b>Bicycles on Crosswalk %</b>	-	-	-	-	0%	-	-	-	-	-	2%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-

Peak Hour: 08:15 AM - 09:15 AM Weather: Scattered Clouds (3.88 °C)



Peak Hour: 04:15 PM - 05:15 PM Weather: Broken Clouds (19.31 °C)







**Turning Movement Count (2 . MAIN ST & RUSSELL ST)**

Start Time	E Approach MAIN ST					S Approach RUSSELL ST					W Approach MAIN ST					Int. Total (15 min)	Int. Total (1 hr)
	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	UTurn W:W	Peds W:	Approach Total		
06:00:00	22	1	0	0	23	14	0	0	3	14	0	61	0	0	61	98	
06:15:00	27	3	0	0	30	12	1	0	0	13	2	48	0	0	50	93	
06:30:00	31	8	0	0	39	13	2	0	0	15	1	46	0	0	47	101	
06:45:00	30	8	0	0	38	19	2	0	0	21	3	46	0	0	49	108	400
07:00:00	35	7	0	0	42	23	0	0	1	23	2	61	0	0	63	128	430
07:15:00	47	5	0	0	52	12	5	0	0	17	3	69	0	0	72	141	478
07:30:00	49	4	0	0	53	12	4	0	0	16	0	70	0	0	70	139	516
07:45:00	51	3	0	0	54	12	3	0	1	15	1	63	0	0	64	133	541
08:00:00	63	1	0	0	64	9	2	0	0	11	3	58	0	0	61	136	549
08:15:00	44	5	0	1	49	15	4	0	0	19	3	59	0	0	62	130	538
08:30:00	49	5	0	0	54	13	6	0	1	19	2	65	0	0	67	140	539
08:45:00	48	11	0	0	59	12	6	0	0	18	5	74	0	0	79	156	562
09:00:00	49	8	0	0	57	8	5	0	2	13	4	61	0	0	65	135	561
09:15:00	44	7	0	2	51	15	4	0	0	19	2	44	0	0	46	116	547
09:30:00	41	9	0	0	50	9	3	0	2	12	2	37	0	0	39	101	508
09:45:00	37	9	0	0	46	5	1	0	0	6	1	60	0	0	61	113	465
***BREAK***																	
15:00:00	53	13	0	0	66	6	6	0	0	12	8	60	0	0	68	146	
15:15:00	77	13	0	1	90	7	2	0	0	9	7	62	0	0	69	168	
15:30:00	58	7	0	0	65	7	3	0	0	10	4	35	0	0	39	114	
15:45:00	73	10	0	2	83	16	6	0	0	22	2	66	0	0	68	173	601
16:00:00	69	10	0	0	79	12	1	0	1	13	8	58	0	0	66	158	613
16:15:00	64	9	0	0	73	12	6	0	0	18	2	74	0	0	76	167	612
16:30:00	74	12	0	8	86	12	5	0	6	17	4	56	0	3	60	163	661
16:45:00	70	14	0	0	84	12	5	0	0	17	7	59	0	0	66	167	655
17:00:00	84	8	0	0	92	12	4	0	1	16	2	72	0	3	74	182	679
17:15:00	84	15	0	0	99	6	3	0	4	9	6	63	0	0	69	177	689
17:30:00	78	14	0	0	92	10	0	1	2	11	3	50	0	0	53	156	682
17:45:00	76	24	0	0	100	15	0	0	1	15	4	55	0	0	59	174	689
18:00:00	54	16	0	1	70	5	0	0	1	5	5	52	0	0	57	132	639
18:15:00	65	8	0	0	73	10	2	0	2	12	7	27	0	0	34	119	581
18:30:00	53	17	0	0	70	8	4	0	0	12	2	36	0	0	38	120	545
18:45:00	50	6	0	0	56	6	4	0	1	10	2	27	0	0	29	95	466



Grand Total	1749	290	0	15	2039	359	99	1	29	459	107	1774	0	6	1881	4379	-
<b>Approach%</b>	85.8%	14.2%	0%		-	78.2%	21.6%	0.2%		-	5.7%	94.3%	0%		-	-	-
<b>Totals %</b>	39.9%	6.6%	0%		46.6%	8.2%	2.3%	0%		10.5%	2.4%	40.5%	0%		43%	-	-
<b>Heavy</b>	158	11	0		-	9	1	0		-	4	148	0		-	-	-
<b>Heavy %</b>	9%	3.8%	0%		-	2.5%	1%	0%		-	3.7%	8.3%	0%		-	-	-
<b>Bicycles</b>	-	-	-		-	-	-	-		-	-	-	-		-	-	-
<b>Bicycle %</b>	-	-	-		-	-	-	-		-	-	-	-		-	-	-



**Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (3.88 °C)**

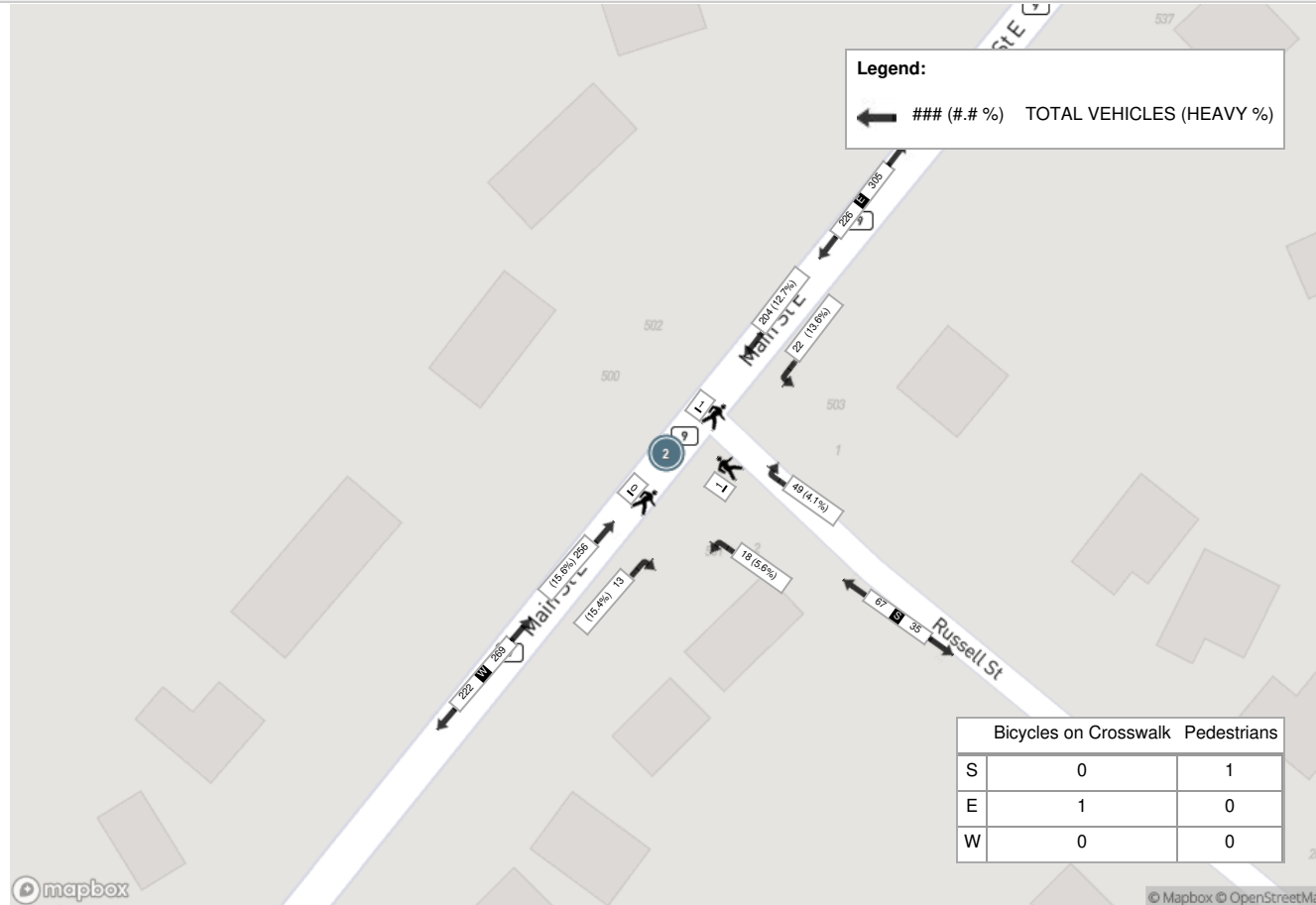
Start Time	E Approach MAIN ST					S Approach RUSSELL ST					W Approach MAIN ST					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
08:00:00	63	1	0	0	64	9	2	0	0	11	3	58	0	0	61	136
08:15:00	44	5	0	1	49	15	4	0	0	19	3	59	0	0	62	130
08:30:00	49	5	0	0	54	13	6	0	1	19	2	65	0	0	67	140
08:45:00	48	11	0	0	59	12	6	0	0	18	5	74	0	0	79	156
<b>Grand Total</b>	<b>204</b>	<b>22</b>	<b>0</b>	<b>1</b>	<b>226</b>	<b>49</b>	<b>18</b>	<b>0</b>	<b>1</b>	<b>67</b>	<b>13</b>	<b>256</b>	<b>0</b>	<b>0</b>	<b>269</b>	<b>562</b>
<b>Approach%</b>	90.3%	9.7%	0%	-	-	73.1%	26.9%	0%	-	-	4.8%	95.2%	0%	-	-	-
<b>Totals %</b>	36.3%	3.9%	0%	40.2%	8.7%	3.2%	0%	11.9%	2.3%	45.6%	0%	47.9%	-	-	-	-
<b>PHF</b>	0.81	0.5	0	0.88	0.82	0.75	0	0.88	0.65	0.86	0	0.85	-	-	-	-
<b>Heavy</b>	26	3	0	29	2	1	0	3	2	40	0	42	-	-	-	-
<b>Heavy %</b>	12.7%	13.6%	0%	12.8%	4.1%	5.6%	0%	4.5%	15.4%	15.6%	0%	15.6%	-	-	-	-
<b>Lights</b>	178	19	0	197	47	17	0	64	11	216	0	227	-	-	-	-
<b>Lights %</b>	87.3%	86.4%	0%	87.2%	95.9%	94.4%	0%	95.5%	84.6%	84.4%	0%	84.4%	-	-	-	-
<b>Single-Unit Trucks</b>	14	1	0	15	0	0	0	0	2	20	0	22	-	-	-	-
<b>Single-Unit Trucks %</b>	6.9%	4.5%	0%	6.6%	0%	0%	0%	0%	15.4%	7.8%	0%	8.2%	-	-	-	-
<b>Buses</b>	3	2	0	5	2	1	0	3	0	10	0	10	-	-	-	-
<b>Buses %</b>	1.5%	9.1%	0%	2.2%	4.1%	5.6%	0%	4.5%	0%	3.9%	0%	3.7%	-	-	-	-
<b>Articulated Trucks</b>	9	0	0	9	0	0	0	0	0	10	0	10	-	-	-	-
<b>Articulated Trucks %</b>	4.4%	0%	0%	4%	0%	0%	0%	0%	0%	3.9%	0%	3.7%	-	-	-	-
<b>Bicycles on Road</b>	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-
<b>Bicycles on Road %</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-	-	-
<b>Pedestrians</b>	-	-	-	0	-	-	-	1	-	-	-	-	0	-	-	-
<b>Pedestrians%</b>	-	-	-	0%	-	-	-	50%	-	-	-	0%	-	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	1	-	-	-	0	-	-	-	0	-	-	-	-
<b>Bicycles on Crosswalk%</b>	-	-	-	50%	-	-	-	0%	-	-	-	0%	-	-	-	-



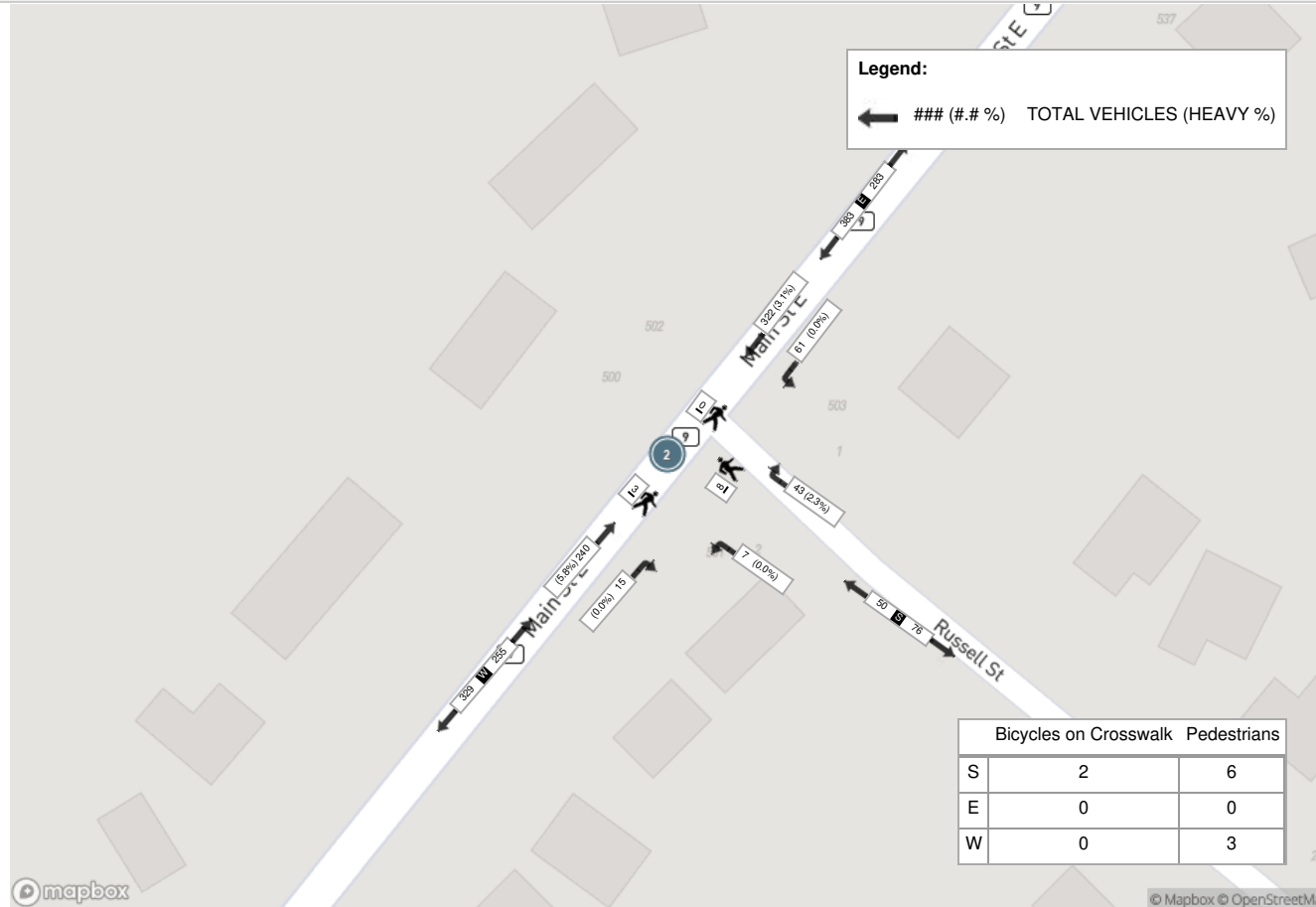
**Peak Hour: 05:00 PM - 06:00 PM Weather: Broken Clouds (19.31 °C)**

Start Time	E Approach MAIN ST					S Approach RUSSELL ST					W Approach MAIN ST					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
17:00:00	84	8	0	0	92	12	4	0	1	16	2	72	0	3	74	182
17:15:00	84	15	0	0	99	6	3	0	4	9	6	63	0	0	69	177
17:30:00	78	14	0	0	92	10	0	1	2	11	3	50	0	0	53	156
17:45:00	76	24	0	0	100	15	0	0	1	15	4	55	0	0	59	174
<b>Grand Total</b>	<b>322</b>	<b>61</b>	<b>0</b>	<b>0</b>	<b>383</b>	<b>43</b>	<b>7</b>	<b>1</b>	<b>8</b>	<b>51</b>	<b>15</b>	<b>240</b>	<b>0</b>	<b>3</b>	<b>255</b>	<b>689</b>
<b>Approach%</b>	84.1%	15.9%	0%	-	-	84.3%	13.7%	2%	-	-	5.9%	94.1%	0%	-	-	-
<b>Totals %</b>	46.7%	8.9%	0%	55.6%	6.2%	1%	0.1%	7.4%	2.2%	34.8%	0%	37%	-	-	-	-
<b>PHF</b>	0.96	0.64	0	0.96	0.72	0.44	0.25	0.8	0.63	0.83	0	0.86	-	-	-	-
<b>Heavy</b>	10	0	0	10	1	0	0	1	0	14	0	14	-	-	-	-
<b>Heavy %</b>	3.1%	0%	0%	2.6%	2.3%	0%	0%	2%	0%	5.8%	0%	5.5%	-	-	-	-
<b>Lights</b>	312	61	0	373	41	7	1	49	15	226	0	241	-	-	-	-
<b>Lights %</b>	96.9%	100%	0%	97.4%	95.3%	100%	100%	96.1%	100%	94.2%	0%	94.5%	-	-	-	-
<b>Single-Unit Trucks</b>	3	0	0	3	1	0	0	1	0	7	0	7	-	-	-	-
<b>Single-Unit Trucks %</b>	0.9%	0%	0%	0.8%	2.3%	0%	0%	2%	0%	2.9%	0%	2.7%	-	-	-	-
<b>Buses</b>	2	0	0	2	0	0	0	0	0	2	0	2	-	-	-	-
<b>Buses %</b>	0.6%	0%	0%	0.5%	0%	0%	0%	0%	0%	0.8%	0%	0.8%	-	-	-	-
<b>Articulated Trucks</b>	5	0	0	5	0	0	0	0	0	5	0	5	-	-	-	-
<b>Articulated Trucks %</b>	1.6%	0%	0%	1.3%	0%	0%	0%	0%	0%	2.1%	0%	2%	-	-	-	-
<b>Bicycles on Road</b>	0	0	0	0	1	0	0	1	0	0	0	0	-	-	-	-
<b>Bicycles on Road %</b>	0%	0%	0%	0%	2.3%	0%	0%	2%	0%	0%	0%	0%	-	-	-	-
<b>Pedestrians</b>	-	-	-	0	-	-	-	6	-	-	-	3	-	-	-	-
<b>Pedestrians%</b>	-	-	-	0%	-	-	-	54.5%	-	-	-	27.3%	-	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	0	-	-	-	2	-	-	-	0	-	-	-	-
<b>Bicycles on Crosswalk%</b>	-	-	-	0%	-	-	-	18.2%	-	-	-	0%	-	-	-	-

Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (3.88 °C)



Peak Hour: 05:00 PM - 06:00 PM Weather: Broken Clouds (19.31 °C)



# APPENDIX B

## Level of Service Definitions

## Level of Service Definitions

### Two-Way Stop Controlled Intersections

<b>Level of Service</b>	<b>Control Delay per Vehicle (seconds)</b>	<b>Interpretation</b>
A	$\leq 10$	EXCELLENT. Large and frequent gaps in traffic on the main roadway. Queuing on the minor street is rare.
B	$> 10$ and $\leq 15$	VERY GOOD. Many gaps exist in traffic on the main roadway. Queuing on the minor street is minimal.
C	$> 15$ and $\leq 25$	GOOD. Fewer gaps exist in traffic on the main roadway. Delay on minor approach becomes more noticeable.
D	$> 25$ and $\leq 35$	FAIR. Infrequent and shorter gaps in traffic on the main roadway. Queue lengths develop on the minor street.
E	$> 35$ and $\leq 50$	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



## Level of Service Definitions

### Signalized Intersections

<b>Level of Service</b>	<b>Control Delay per Vehicle (seconds)</b>	<b>Interpretation</b>
A	$\leq 10$	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 $\leq 20$	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 $\leq 35$	GOOD. Fair progression and longer cycle lengths lead to a greater number of vehicles stopping than LOS "B".
D	$> 35$ and $\leq 55$	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 $\leq 80$	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 C

## Detailed Capacity Analysis Worksheet

Lanes, Volumes, Timings  
1: Highway 10 & Main Street

2022 Existing Conditions A.M.  
10-14-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	66	100	14	79	4	46	159	35	6	145	76
Future Volume (vph)	63	66	100	14	79	4	46	159	35	6	145	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0		0.0	100.0		0.0	110.0		0.0	90.0		85.0
Storage Lanes	1		0	1		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		0.910			0.992			0.973				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1492	1575	0	1399	1601	0	1597	1520	0	1081	1667	1417
Flt Permitted	0.694			0.636			0.650			0.617		
Satd. Flow (perm)	1090	1575	0	937	1601	0	1093	1520	0	702	1667	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		87			3			18				88
Link Speed (k/h)		50			80			80				80
Link Distance (m)		580.5			384.6			1102.7				925.0
Travel Time (s)		41.8			17.3			49.6				41.6
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	21%	20%	3%	29%	16%	50%	13%	24%	11%	67%	14%	14%
Adj. Flow (vph)	73	77	116	16	92	5	53	185	41	7	169	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	73	193	0	16	97	0	53	226	0	7	169	88
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		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6

Lanes, Volumes, Timings  
1: Highway 10 & Main Street

2022 Existing Conditions A.M.  
10-14-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	32.6	32.6		32.6	32.6		32.6	32.6		32.6	32.6	32.6
Total Split (s)	35.0	35.0		35.0	35.0		55.0	55.0		55.0	55.0	55.0
Total Split (%)	38.9%	38.9%		38.9%	38.9%		61.1%	61.1%		61.1%	61.1%	61.1%
Maximum Green (s)	27.5	27.5		27.5	27.5		47.4	47.4		47.4	47.4	47.4
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.6	1.6		1.6	1.6		1.7	1.7		1.7	1.7	1.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		2.0	2.0		2.0	2.0	2.0
Total Lost Time (s)	7.5	7.5		7.5	7.5		9.6	9.6		9.6	9.6	9.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.5	4.5		4.5	4.5	4.5
Recall Mode	None	None		None	None		Ped	Ped		Ped	Ped	Ped
Walk Time (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	15.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	10.6	10.6		10.6	10.6		23.3	23.3		23.3	23.3	23.3
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.46	0.46		0.46	0.46	0.46
v/c Ratio	0.32	0.49		0.08	0.29		0.11	0.32		0.02	0.22	0.13
Control Delay	21.3	14.8		17.1	19.0		9.1	9.9		8.5	9.7	3.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	21.3	14.8		17.1	19.0		9.1	9.9		8.5	9.7	3.1
LOS	C	B		B	B		A	A		A	A	A
Approach Delay		16.6			18.7			9.8			7.4	
Approach LOS		B			B			A			A	
Queue Length 50th (m)	5.9	8.6		1.2	7.6		2.6	11.3		0.3	8.8	0.0
Queue Length 95th (m)	14.5	21.7		4.9	17.0		7.9	24.4		2.1	19.2	5.5
Internal Link Dist (m)		556.5			360.6			1078.7			901.0	
Turn Bay Length (m)	120.0			100.0			110.0			90.0		85.0
Base Capacity (vph)	588	889		505	865		973	1355		625	1484	1271
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	0.12	0.22		0.03	0.11		0.05	0.17		0.01	0.11	0.07

Intersection Summary	
Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	51
Natural Cycle:	70
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.49
Intersection Signal Delay:	12.2
Intersection LOS:	B
Intersection Capacity Utilization:	64.1%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 1: Highway 10 & Main Street



HCM Unsignalized Intersection Capacity Analysis  
2: Russell Street & Main Street

















2022 Existing Conditions A.M.  
10-14-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	256	13	22	204	18	49
Future Volume (Veh/h)	256	13	22	204	18	49
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	284	14	24	227	20	54
Pedestrians				1	1	
Lane Width (m)				3.6	3.6	
Walking Speed (m/s)				1.2	1.2	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			299		567	293
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			299		567	293
tC, single (s)			4.2		6.5	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.6	3.3
p0 queue free %			98		96	93
cM capacity (veh/h)			1196		468	740
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	298	251	74			
Volume Left	0	24	20			
Volume Right	14	0	54			
cSH	1700	1196	640			
Volume to Capacity	0.18	0.02	0.12			
Queue Length 95th (m)	0.0	0.5	3.1			
Control Delay (s)	0.0	0.9	11.4			
Lane LOS			A			B
Approach Delay (s)	0.0	0.9	11.4			
Approach LOS				B		
<b>Intersection Summary</b>						
Average Delay			1.7			
Intersection Capacity Utilization			40.1%	ICU Level of Service	A	
Analysis Period (min)			15			

















HCM Unsignalized Intersection Capacity Analysis  
3: Alice Street/Mill Street & Main Street

2022 Existing Conditions A.M.  
10-14-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	251	2	7	213	1	10	0	15	3	0	0
Future Volume (Veh/h)	2	251	2	7	213	1	10	0	15	3	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	2	270	2	8	229	1	11	0	16	3	0	0
Pedestrians					1			2			4	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.2			1.2			1.2	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	234			274			522	527	274	542	528	234
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	234			274			522	527	274	542	528	234
tC, single (s)	4.1			4.2			7.3	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.7	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			99			97	100	98	99	100	100
cM capacity (veh/h)	1341			1221			433	453	751	439	453	808
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	274	238	27	3								
Volume Left	2	8	11	3								
Volume Right	2	1	16	0								
cSH	1341	1221	578	439								
Volume to Capacity	0.00	0.01	0.05	0.01								
Queue Length 95th (m)	0.0	0.2	1.2	0.2								
Control Delay (s)	0.1	0.3	11.5	13.3								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.3	11.5	13.3								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			26.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
4: Osprey Street & Main Street

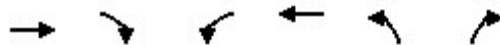
2022 Existing Conditions A.M.  
10-14-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	223	4	4	180	1	14	3	11	13	2	3
Future Volume (Veh/h)	7	223	4	4	180	1	14	3	11	13	2	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	8	251	4	4	202	1	16	3	12	15	2	3
Pedestrians					1			5			5	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.2			1.2			1.2	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	208			260			488	490	259	499	492	208
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	208			260			488	490	259	499	492	208
tC, single (s)	4.1			4.1			7.2	6.5	6.4	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.5	3.7	4.0	3.3
p0 queue free %	99			100			97	99	98	97	100	100
cM capacity (veh/h)	1369			1311			470	474	739	432	473	834
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	263	207	31	20								
Volume Left	8	4	16	15								
Volume Right	4	1	12	3								
cSH	1369	1311	548	470								
Volume to Capacity	0.01	0.00	0.06	0.04								
Queue Length 95th (m)	0.1	0.1	1.4	1.1								
Control Delay (s)	0.3	0.2	12.0	13.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.2	12.0	13.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			25.8%		ICU Level of Service				A			
Analysis Period (min)			15									



HCM Unsignalized Intersection Capacity Analysis  
5: Elm Street & Victoria Street /Victoria Street






















2022 Existing Conditions A.M.  
10-14-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	24	32	8	20	45	9
Future Volume (Veh/h)	24	32	8	20	45	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65
Hourly flow rate (vph)	37	49	12	31	69	14
Pedestrians				1	4	
Lane Width (m)				3.6	3.6	
Walking Speed (m/s)				1.2	1.2	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			90		120	66
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			90		120	66
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			99		92	99
cM capacity (veh/h)			1434		865	999
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	86	43	83			
Volume Left	0	12	69			
Volume Right	49	0	14			
cSH	1700	1434	885			
Volume to Capacity	0.05	0.01	0.09			
Queue Length 95th (m)	0.0	0.2	2.5			
Control Delay (s)	0.0	2.1	9.5			
Lane LOS			A			
Approach Delay (s)	0.0	2.1	9.5			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			4.2			
Intersection Capacity Utilization			18.4%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
1: Highway 10 & Main Street

2022 Existing Conditions P.M.  
12-13-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	80	101	20	110	16	159	206	36	12	185	90
Future Volume (vph)	75	80	101	20	110	16	159	206	36	12	185	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0		0.0	100.0		0.0	110.0		0.0	90.0		85.0
Storage Lanes	1		0	1		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		0.916			0.981			0.978				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1639	0	1570	1668	0	1703	1753	0	1357	1696	1553
Flt Permitted	0.671			0.635			0.633			0.598		
Satd. Flow (perm)	1214	1639	0	1049	1668	0	1135	1753	0	854	1696	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		73			8			14				97
Link Speed (k/h)		50			80			80				80
Link Distance (m)		580.5			384.6			1102.7				925.0
Travel Time (s)		41.8			17.3			49.6				41.6
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	5%	9%	4%	15%	8%	38%	6%	6%	6%	33%	12%	4%
Adj. Flow (vph)	81	86	109	22	118	17	171	222	39	13	199	97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	81	195	0	22	135	0	171	261	0	13	199	97
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		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6

Lanes, Volumes, Timings  
1: Highway 10 & Main Street

2022 Existing Conditions P.M.  
12-13-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	32.6	32.6		32.6	32.6		32.6	32.6		32.6	32.6	32.6
Total Split (s)	35.0	35.0		35.0	35.0		55.0	55.0		55.0	55.0	55.0
Total Split (%)	38.9%	38.9%		38.9%	38.9%		61.1%	61.1%		61.1%	61.1%	61.1%
Maximum Green (s)	27.5	27.5		27.5	27.5		47.4	47.4		47.4	47.4	47.4
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.6	1.6		1.6	1.6		1.7	1.7		1.7	1.7	1.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		2.0	2.0		2.0	2.0	2.0
Total Lost Time (s)	7.5	7.5		7.5	7.5		9.6	9.6		9.6	9.6	9.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.5	4.5		4.5	4.5	4.5
Recall Mode	None	None		None	None		Ped	Ped		Ped	Ped	Ped
Walk Time (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	15.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	10.7	10.7		10.7	10.7		23.0	23.0		23.0	23.0	23.0
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.45	0.45		0.45	0.45	0.45
v/c Ratio	0.32	0.49		0.10	0.38		0.33	0.33		0.03	0.26	0.13
Control Delay	20.7	15.8		17.2	19.6		11.6	10.1		8.6	10.0	3.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	20.7	15.8		17.2	19.6		11.6	10.1		8.6	10.0	3.0
LOS	C	B		B	B		B	B		A	B	A
Approach Delay		17.3			19.2			10.7			7.8	
Approach LOS		B			B			B			A	
Queue Length 50th (m)	6.6	10.0		1.7	10.4		9.5	13.5		0.6	10.6	0.0
Queue Length 95th (m)	16.3	25.0		6.3	22.8		23.2	29.5		3.2	23.8	6.3
Internal Link Dist (m)		556.5			360.6			1078.7			901.0	
Turn Bay Length (m)	120.0			100.0			110.0			90.0		85.0
Base Capacity (vph)	657	920		567	906		1014	1568		763	1515	1398
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	0.12	0.21		0.04	0.15		0.17	0.17		0.02	0.13	0.07

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	50.8
Natural Cycle:	70
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.49
Intersection Signal Delay:	12.6
Intersection LOS:	B
Intersection Capacity Utilization:	80.6%
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 1: Highway 10 & Main Street



HCM Unsignalized Intersection Capacity Analysis  
2: Russell Street & Main Street

















2022 Existing Conditions P.M.  
12-13-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	240	15	61	322	7	43
Future Volume (Veh/h)	240	15	61	322	7	43
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	270	17	69	362	8	48
Pedestrians	6			8	8	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			295		792	294
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			295		792	294
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		98	93
cM capacity (veh/h)			1269		337	735
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	287	431	56			
Volume Left	0	69	8			
Volume Right	17	0	48			
cSH	1700	1269	629			
Volume to Capacity	0.17	0.05	0.09			
Queue Length 95th (m)	0.0	1.4	2.3			
Control Delay (s)	0.0	1.7	11.3			
Lane LOS			A			B
Approach Delay (s)	0.0	1.7	11.3			
Approach LOS				B		
<b>Intersection Summary</b>						
Average Delay			1.8			
Intersection Capacity Utilization			47.2%	ICU Level of Service	A	
Analysis Period (min)			15			

















HCM Unsignalized Intersection Capacity Analysis  
3: Alice Street/Mill Street & Main Street

2022 Existing Conditions P.M.  
12-13-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	275	12	17	286	6	10	0	7	3	0	3
Future Volume (Veh/h)	2	275	12	17	286	6	10	0	7	3	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	306	13	19	318	7	11	0	8	3	0	3
Pedestrians		1						6			11	
Lane Width (m)		3.6						3.6			3.6	
Walking Speed (m/s)		1.2						1.2			1.2	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	336			325			686	696	318	695	700	334
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	336			325			686	696	318	695	700	334
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			97	100	99	99	100	100
cM capacity (veh/h)	1223			1240			352	356	723	344	355	706
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	321	344	19	6								
Volume Left	2	19	11	3								
Volume Right	13	7	8	3								
cSH	1223	1240	449	462								
Volume to Capacity	0.00	0.02	0.04	0.01								
Queue Length 95th (m)	0.0	0.4	1.1	0.3								
Control Delay (s)	0.1	0.6	13.4	12.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.6	13.4	12.9								
Approach LOS			B	B								
<b>Intersection Summary</b>												
Average Delay			0.8									
Intersection Capacity Utilization			37.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
4: Osprey Street & Main Street

2022 Existing Conditions P.M.  
12-13-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	230	9	10	226	1	1	4	10	14	5	3
Future Volume (Veh/h)	8	230	9	10	226	1	1	4	10	14	5	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	9	271	11	12	266	1	1	5	12	16	6	4
Pedestrians					7			22			21	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.2			1.2			1.2	
Percent Blockage					1			2			2	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	288			304			614	628	306	628	634	288
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	288			304			614	628	306	628	634	288
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.6
p0 queue free %	99			99			100	99	98	96	98	99
cM capacity (veh/h)	1263			1245			377	381	721	364	379	672
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	291	279	18	26								
Volume Left	9	12	1	16								
Volume Right	11	1	12	4								
cSH	1263	1245	555	396								
Volume to Capacity	0.01	0.01	0.03	0.07								
Queue Length 95th (m)	0.2	0.2	0.8	1.7								
Control Delay (s)	0.3	0.4	11.7	14.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.4	11.7	14.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			29.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
5: Elm Street & Victoria Street /Victoria Street

2022 Existing Conditions P.M.  
12-13-2022
























Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→	↘	↙	←	↖	↗
Traffic Volume (veh/h)	34	40	12	15	21	16
Future Volume (Veh/h)	34	40	12	15	21	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65
Hourly flow rate (vph)	52	62	18	23	32	25
Pedestrians	34			2	14	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	3			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			128		190	99
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			128		190	99
tC, single (s)			4.1		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			99		96	97
cM capacity (veh/h)			1453		762	933
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	114	41	57			
Volume Left	0	18	32			
Volume Right	62	0	25			
cSH	1700	1453	829			
Volume to Capacity	0.07	0.01	0.07			
Queue Length 95th (m)	0.0	0.3	1.8			
Control Delay (s)	0.0	3.3	9.7			
Lane LOS			A			
Approach Delay (s)	0.0	3.3	9.7			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			3.2			
Intersection Capacity Utilization			18.8%	ICU Level of Service	A	
Analysis Period (min)			15			



Lanes, Volumes, Timings  
1: Highway 10 & Main Street

2025 Future Background A.M.  
12-14-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	106	295	15	95	4	112	166	37	7	152	79
Future Volume (vph)	66	106	295	15	95	4	112	166	37	7	152	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0		0.0	100.0		0.0	110.0		0.0	90.0		85.0
Storage Lanes	1		0	1		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		0.890			0.993			0.973				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1504	1577	0	1410	1606	0	1597	1530	0	1087	1667	1417
Flt Permitted	0.684			0.363			0.648			0.615		
Satd. Flow (perm)	1083	1577	0	539	1606	0	1090	1530	0	704	1667	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		161			3			18				90
Link Speed (k/h)		50			80			80				80
Link Distance (m)		580.5			384.6			399.0				925.0
Travel Time (s)		41.8			17.3			18.0				41.6
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	20%	19%	3%	28%	16%	50%	13%	23%	11%	66%	14%	14%
Adj. Flow (vph)	75	120	335	17	108	5	127	189	42	8	173	90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	455	0	17	113	0	127	231	0	8	173	90
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		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	

Lanes, Volumes, Timings  
1: Highway 10 & Main Street

2025 Future Background A.M.  
12-14-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	32.6	32.6		32.6	32.6		32.6	32.6		32.6	32.6	32.6
Total Split (s)	35.0	35.0		35.0	35.0		55.0	55.0		55.0	55.0	55.0
Total Split (%)	38.9%	38.9%		38.9%	38.9%		61.1%	61.1%		61.1%	61.1%	61.1%
Maximum Green (s)	27.5	27.5		27.5	27.5		47.4	47.4		47.4	47.4	47.4
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.6	1.6		1.6	1.6		1.7	1.7		1.7	1.7	1.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		2.0	2.0		2.0	2.0	2.0
Total Lost Time (s)	7.5	7.5		7.5	7.5		9.6	9.6		9.6	9.6	9.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.5	4.5		4.5	4.5	4.5
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	15.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	16.4	16.4		16.4	16.4		18.3	18.3		18.3	18.3	18.3
Actuated g/C Ratio	0.32	0.32		0.32	0.32		0.35	0.35		0.35	0.35	0.35
v/c Ratio	0.22	0.75		0.10	0.22		0.33	0.42		0.03	0.29	0.16
Control Delay	14.1	18.3		13.1	13.3		17.4	16.2		14.1	15.6	5.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	14.1	18.3		13.1	13.3		17.4	16.2		14.1	15.6	5.0
LOS	B	B		B	B		B	B		B	B	A
Approach Delay		17.7			13.3			16.6			12.0	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	5.2	23.7		1.1	7.7		8.7	14.9		0.5	11.6	0.0
Queue Length 95th (m)	12.7	49.5		4.6	16.4		24.5	37.5		3.3	29.4	8.2
Internal Link Dist (m)		556.5			360.6			375.0			901.0	
Turn Bay Length (m)	120.0			100.0			110.0			90.0		85.0
Base Capacity (vph)	578	918		288	860		960	1350		620	1469	1259
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	0.13	0.50		0.06	0.13		0.13	0.17		0.01	0.12	0.07

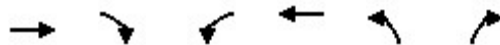
Intersection Summary	
Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	52
Natural Cycle:	70
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.75
Intersection Signal Delay:	15.8
Intersection Capacity Utilization	79.3%
Analysis Period (min)	15
Intersection LOS:	B
ICU Level of Service	D

Splits and Phases: 1: Highway 10 & Main Street



HCM Unsignalized Intersection Capacity Analysis  
2: Russell Street & Main Street

2025 Future Background A.M.  
12-14-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↘	↙
Traffic Volume (veh/h)	495	14	23	289	19	51
Future Volume (Veh/h)	495	14	23	289	19	51
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	516	15	24	301	20	53
Pedestrians	1			1	1	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			532			526
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			532			526
tC, single (s)			4.2			6.2
tC, 2 stage (s)						
tF (s)			2.3			3.3
p0 queue free %			98			90
cM capacity (veh/h)			981			547
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	531	325	73			
Volume Left	0	24	20			
Volume Right	15	0	53			
cSH	1700	981	451			
Volume to Capacity	0.31	0.02	0.16			
Queue Length 95th (m)	0.0	0.6	4.6			
Control Delay (s)	0.0	0.9	14.5			
Lane LOS			A	B		
Approach Delay (s)	0.0	0.9	14.5			
Approach LOS				B		
<b>Intersection Summary</b>						
Average Delay			1.5			
Intersection Capacity Utilization			45.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 3: Alice Street/Mill Street & Main Street

2025 Future Background A.M.  
 12-14-2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	2	489	2	7	299	1	10	0	16	3	0	0
Future Volume (Veh/h)	2	489	2	7	299	1	10	0	16	3	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	532	2	8	325	1	11	0	17	3	0	0
Pedestrians		1			1			4			4	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	330			538			884	887	538	900	888	330
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	330			538			884	887	538	900	888	330
tC, single (s)	4.1			4.2			7.3	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.7	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			99			95	100	97	99	100	100
cM capacity (veh/h)	1237			969			244	281	533	249	280	713
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	536	334	28	3								
Volume Left	2	8	11	3								
Volume Right	2	1	17	0								
cSH	1237	969	363	249								
Volume to Capacity	0.00	0.01	0.08	0.01								
Queue Length 95th (m)	0.0	0.2	2.0	0.3								
Control Delay (s)	0.0	0.3	15.7	19.6								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.0	0.3	15.7	19.6								
Approach LOS			C	C								
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization			37.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
4: Osprey Street & Main Street

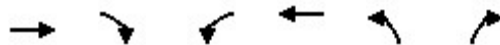
2025 Future Background A.M.  
12-14-2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	7	334	4	4	219	1	15	3	12	77	2	3
Future Volume (Veh/h)	7	334	4	4	219	1	15	3	12	77	2	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	7	344	4	4	226	1	15	3	12	79	2	3
Pedestrians		1			1			5			5	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	232			353			604	605	352	614	606	232
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	232			353			604	605	352	614	606	232
tC, single (s)	4.1			4.1			7.2	6.5	6.4	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.5	3.7	4.0	3.3
p0 queue free %	99			100			96	99	98	78	100	100
cM capacity (veh/h)	1342			1212			393	408	654	360	407	808
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	355	231	30	84								
Volume Left	7	4	15	79								
Volume Right	4	1	12	3								
cSH	1342	1212	469	368								
Volume to Capacity	0.01	0.00	0.06	0.23								
Queue Length 95th (m)	0.1	0.1	1.6	6.9								
Control Delay (s)	0.2	0.2	13.2	17.6								
Lane LOS	A	A	B	C								
Approach Delay (s)	0.2	0.2	13.2	17.6								
Approach LOS			B	C								
Intersection Summary												
Average Delay			2.8									
Intersection Capacity Utilization			35.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
5: Elm Street & Victoria Street /Victoria Street

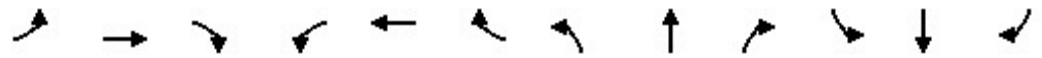
2025 Future Background A.M.  
12-14-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↘	↙
Traffic Volume (veh/h)	25	33	8	21	47	9
Future Volume (Veh/h)	25	33	8	21	47	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Hourly flow rate (vph)	36	48	12	30	68	13
Pedestrians	1			1	4	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			88		119	65
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			88		119	65
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			99		92	99
cM capacity (veh/h)			1442		866	1001
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	84	42	81			
Volume Left	0	12	68			
Volume Right	48	0	13			
cSH	1700	1442	885			
Volume to Capacity	0.05	0.01	0.09			
Queue Length 95th (m)	0.0	0.2	2.4			
Control Delay (s)	0.0	2.2	9.5			
Lane LOS			A			
Approach Delay (s)	0.0	2.2	9.5			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			4.2			
Intersection Capacity Utilization			18.5%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
1: Highway 10 & Main Street

2025 Future Background P.M.  
12-14-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	109	234	21	158	17	378	215	38	13	193	94
Future Volume (vph)	78	109	234	21	158	17	378	215	38	13	193	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0		0.0	100.0		0.0	110.0		0.0	90.0		85.0
Storage Lanes	1		0	1		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		0.898			0.986			0.978				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1621	0	1570	1691	0	1719	1756	0	1357	1696	1553
Flt Permitted	0.633			0.356			0.621			0.584		
Satd. Flow (perm)	1145	1621	0	588	1691	0	1124	1756	0	834	1696	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		124			6			14				107
Link Speed (k/h)		50			80			80				80
Link Distance (m)		580.5			384.6			399.0				925.0
Travel Time (s)		41.8			17.3			18.0				41.6
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	5%	8%	4%	15%	8%	37%	5%	6%	5%	33%	12%	4%
Adj. Flow (vph)	89	124	266	24	180	19	430	244	43	15	219	107
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	390	0	24	199	0	430	287	0	15	219	107
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		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6



Lanes, Volumes, Timings  
1: Highway 10 & Main Street

2025 Future Background P.M.  
12-14-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	32.6	32.6		32.6	32.6		32.6	32.6		32.6	32.6	32.6
Total Split (s)	35.0	35.0		35.0	35.0		55.0	55.0		55.0	55.0	55.0
Total Split (%)	38.9%	38.9%		38.9%	38.9%		61.1%	61.1%		61.1%	61.1%	61.1%
Maximum Green (s)	27.5	27.5		27.5	27.5		47.4	47.4		47.4	47.4	47.4
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.6	1.6		1.6	1.6		1.7	1.7		1.7	1.7	1.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		2.0	2.0		2.0	2.0	2.0
Total Lost Time (s)	7.5	7.5		7.5	7.5		9.6	9.6		9.6	9.6	9.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.5	4.5		4.5	4.5	4.5
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	15.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	17.8	17.8		17.8	17.8		31.2	31.2		31.2	31.2	31.2
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.46	0.46		0.46	0.46	0.46
v/c Ratio	0.29	0.75		0.15	0.44		0.83	0.35		0.04	0.28	0.14
Control Delay	24.9	26.4		24.7	25.1		31.5	12.6		11.1	12.6	3.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	24.9	26.4		24.7	25.1		31.5	12.6		11.1	12.6	3.1
LOS	C	C		C	C		C	B		B	B	A
Approach Delay		26.1			25.0			24.0				9.5
Approach LOS		C			C			C				A
Queue Length 50th (m)	9.0	30.6		2.4	20.4		44.2	20.5		1.0	16.0	0.0
Queue Length 95th (m)	24.2	71.8		9.4	45.6		#99.0	43.6		4.4	34.9	7.4
Internal Link Dist (m)		556.5			360.6			375.0			901.0	
Turn Bay Length (m)	120.0			100.0			110.0			90.0		85.0
Base Capacity (vph)	501	779		257	743		810	1270		601	1223	1150
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	0.18	0.50		0.09	0.27		0.53	0.23		0.02	0.18	0.09

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 67.3  
 Natural Cycle: 75  
 Control Type: Semi Act-Uncoord  
 Maximum v/c Ratio: 0.83  
 Intersection Signal Delay: 21.9  
 Intersection Capacity Utilization 94.6%  
 Analysis Period (min) 15

Intersection LOS: C  
 ICU Level of Service F

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 10 & Main Street



HCM Unsignalized Intersection Capacity Analysis  
2: Russell Street & Main Street

2025 Future Background P.M.  
12-14-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	404	16	64	592	7	45
Future Volume (Veh/h)	404	16	64	592	7	45
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	421	17	67	617	7	47
Pedestrians	3			3	8	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			446		1192	440
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			446		1192	440
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		96	92
cM capacity (veh/h)			1117		195	611
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	438	684	54			
Volume Left	0	67	7			
Volume Right	17	0	47			
cSH	1700	1117	478			
Volume to Capacity	0.26	0.06	0.11			
Queue Length 95th (m)	0.0	1.5	3.0			
Control Delay (s)	0.0	1.5	13.5			
Lane LOS			A			B
Approach Delay (s)	0.0	1.5	13.5			
Approach LOS				B		
<b>Intersection Summary</b>						
Average Delay			1.5			
Intersection Capacity Utilization			70.3%	ICU Level of Service	C	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 3: Alice Street/Mill Street & Main Street

2025 Future Background P.M.  
 12-14-2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	2	441	13	18	554	6	10	0	7	3	0	3
Future Volume (Veh/h)	2	441	13	18	554	6	10	0	7	3	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	479	14	20	602	7	11	0	8	3	0	3
Pedestrians		1			1			11			11	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	620			504			1150	1161	498	1156	1164	618
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	620			504			1150	1161	498	1156	1164	618
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			93	100	99	98	100	99
cM capacity (veh/h)	961			1061			169	189	571	166	188	488
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	495	629	19	6								
Volume Left	2	20	11	3								
Volume Right	14	7	8	3								
cSH	961	1061	240	248								
Volume to Capacity	0.00	0.02	0.08	0.02								
Queue Length 95th (m)	0.1	0.5	2.0	0.6								
Control Delay (s)	0.1	0.5	21.3	19.9								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.1	0.5	21.3	19.9								
Approach LOS			C	C								
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			52.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
4: Osprey Street & Main Street

2025 Future Background P.M.  
12-14-2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	8	306	9	10	346	1	1	4	10	59	5	3
Future Volume (Veh/h)	8	306	9	10	346	1	1	4	10	59	5	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	8	315	9	10	357	1	1	4	10	61	5	3
Pedestrians		7			9			22			22	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			1			2			2	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	380			346			748	758	350	756	762	386
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	380			346			748	758	350	756	762	386
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.6
p0 queue free %	99			99			100	99	99	80	98	99
cM capacity (veh/h)	1168			1202			306	322	680	299	320	584
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	332	368	15	69								
Volume Left	8	10	1	61								
Volume Right	9	1	10	3								
cSH	1168	1202	493	307								
Volume to Capacity	0.01	0.01	0.03	0.22								
Queue Length 95th (m)	0.2	0.2	0.8	6.8								
Control Delay (s)	0.3	0.3	12.5	20.1								
Lane LOS	A	A	B	C								
Approach Delay (s)	0.3	0.3	12.5	20.1								
Approach LOS			B	C								
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			40.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
5: Elm Street & Victoria Street /Victoria Street

2025 Future Background P.M.  
12-14-2022
























Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↔	↔
Traffic Volume (veh/h)	36	42	13	16	22	17
Future Volume (Veh/h)	36	42	13	16	22	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Hourly flow rate (vph)	52	61	19	23	32	25
Pedestrians	34			34	14	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	3			3	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			127		192	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			127		192	130
tC, single (s)			4.1		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			99		96	97
cM capacity (veh/h)			1454		760	872
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	113	42	57			
Volume Left	0	19	32			
Volume Right	61	0	25			
cSH	1700	1454	806			
Volume to Capacity	0.07	0.01	0.07			
Queue Length 95th (m)	0.0	0.3	1.8			
Control Delay (s)	0.0	3.5	9.8			
Lane LOS			A			
Approach Delay (s)	0.0	3.5	9.8			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			3.3			
Intersection Capacity Utilization			18.9%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
1: Highway 10 & Main Street

2030 Future Background A.M.

12-14-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	111	303	16	101	5	116	179	39	7	163	86
Future Volume (vph)	71	111	303	16	101	5	116	179	39	7	163	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0		0.0	100.0		0.0	110.0		0.0	90.0		85.0
Storage Lanes	1		0	1		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		0.890			0.993			0.973				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1504	1576	0	1410	1603	0	1597	1530	0	1087	1667	1417
Flt Permitted	0.679			0.349			0.641			0.606		
Satd. Flow (perm)	1075	1576	0	518	1603	0	1078	1530	0	694	1667	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		157			3			17				98
Link Speed (k/h)		50			80			80				80
Link Distance (m)		580.5			384.6			399.0				925.0
Travel Time (s)		41.8			17.3			18.0				41.6
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	20%	19%	3%	28%	16%	50%	13%	23%	11%	66%	14%	14%
Adj. Flow (vph)	81	126	344	18	115	6	132	203	44	8	185	98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	81	470	0	18	121	0	132	247	0	8	185	98
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		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	

Lanes, Volumes, Timings  
1: Highway 10 & Main Street

2030 Future Background A.M.

12-14-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	32.6	32.6		32.6	32.6		32.6	32.6		32.6	32.6	32.6
Total Split (s)	35.0	35.0		35.0	35.0		55.0	55.0		55.0	55.0	55.0
Total Split (%)	38.9%	38.9%		38.9%	38.9%		61.1%	61.1%		61.1%	61.1%	61.1%
Maximum Green (s)	27.5	27.5		27.5	27.5		47.4	47.4		47.4	47.4	47.4
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.6	1.6		1.6	1.6		1.7	1.7		1.7	1.7	1.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		2.0	2.0		2.0	2.0	2.0
Total Lost Time (s)	7.5	7.5		7.5	7.5		9.6	9.6		9.6	9.6	9.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.5	4.5		4.5	4.5	4.5
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	15.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	17.5	17.5		17.5	17.5		18.5	18.5		18.5	18.5	18.5
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.35	0.35		0.35	0.35	0.35
v/c Ratio	0.23	0.76		0.11	0.23		0.35	0.46		0.03	0.32	0.18
Control Delay	14.1	18.6		13.2	13.3		18.5	17.5		14.9	16.5	5.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	14.1	18.6		13.2	13.3		18.5	17.5		14.9	16.5	5.1
LOS	B	B		B	B		B	B		B	B	A
Approach Delay		18.0			13.3			17.8			12.6	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	5.7	25.9		1.2	8.2		9.5	17.1		0.5	13.1	0.0
Queue Length 95th (m)	13.8	54.1		4.9	17.8		26.4	42.0		3.4	32.6	8.8
Internal Link Dist (m)		556.5			360.6			375.0			901.0	
Turn Bay Length (m)	120.0			100.0			110.0			90.0		85.0
Base Capacity (vph)	560	897		270	837		928	1319		597	1435	1233
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	0.14	0.52		0.07	0.14		0.14	0.19		0.01	0.13	0.08

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	53.4
Natural Cycle:	70
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.76
Intersection Signal Delay:	16.3
Intersection Capacity Utilization:	80.1%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	D



Splits and Phases: 1: Highway 10 & Main Street



HCM Unsignalized Intersection Capacity Analysis  
2: Russell Street & Main Street

2030 Future Background A.M.  
12-14-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	515	15	25	306	20	55
Future Volume (Veh/h)	515	15	25	306	20	55
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	536	16	26	319	21	57
Pedestrians	1			1	1	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			553		917	546
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			553		917	546
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			97		93	89
cM capacity (veh/h)			963		290	533
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	552	345	78			
Volume Left	0	26	21			
Volume Right	16	0	57			
cSH	1700	963	435			
Volume to Capacity	0.32	0.03	0.18			
Queue Length 95th (m)	0.0	0.7	5.2			
Control Delay (s)	0.0	0.9	15.1			
Lane LOS			A	C		
Approach Delay (s)	0.0	0.9	15.1			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			1.5			
Intersection Capacity Utilization			48.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
3: Alice Street/Mill Street & Main Street

















2030 Future Background A.M.  
12-14-2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	2	510	2	8	316	1	11	0	17	3	0	0
Future Volume (Veh/h)	2	510	2	8	316	1	11	0	17	3	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	554	2	9	343	1	12	0	18	3	0	0
Pedestrians		1			1			4			4	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	348			560			926	929	560	944	930	348
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	348			560			926	929	560	944	930	348
tC, single (s)	4.1			4.2			7.3	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.7	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			99			95	100	97	99	100	100
cM capacity (veh/h)	1218			951			228	265	518	232	265	696
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	558	353	30	3								
Volume Left	2	9	12	3								
Volume Right	2	1	18	0								
cSH	1218	951	343	232								
Volume to Capacity	0.00	0.01	0.09	0.01								
Queue Length 95th (m)	0.0	0.2	2.3	0.3								
Control Delay (s)	0.0	0.3	16.5	20.7								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.0	0.3	16.5	20.7								
Approach LOS			C	C								
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization			38.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
4: Osprey Street & Main Street

2030 Future Background A.M.  
12-14-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	352	5	5	234	1	16	3	12	78	2	3
Future Volume (Veh/h)	8	352	5	5	234	1	16	3	12	78	2	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	8	363	5	5	241	1	16	3	12	80	2	3
Pedestrians		1			1			5			5	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	247			373			643	644	372	652	646	248
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	247			373			643	644	372	652	646	248
tC, single (s)	4.1			4.1			7.2	6.5	6.4	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.5	3.7	4.0	3.3
p0 queue free %	99			100			96	99	98	76	99	100
cM capacity (veh/h)	1325			1192			369	387	637	338	386	792
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	376	247	31	85								
Volume Left	8	5	16	80								
Volume Right	5	1	12	3								
cSH	1325	1192	443	346								
Volume to Capacity	0.01	0.00	0.07	0.25								
Queue Length 95th (m)	0.1	0.1	1.8	7.6								
Control Delay (s)	0.2	0.2	13.7	18.8								
Lane LOS	A	A	B	C								
Approach Delay (s)	0.2	0.2	13.7	18.8								
Approach LOS			B	C								
Intersection Summary												
Average Delay			2.9									
Intersection Capacity Utilization			37.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
5: Elm Street & Victoria Street /Victoria Street

2030 Future Background A.M.  
12-14-2022
























Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↘
Traffic Volume (veh/h)	27	36	9	23	51	10
Future Volume (Veh/h)	27	36	9	23	51	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Hourly flow rate (vph)	39	52	13	33	74	14
Pedestrians	1			1	4	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			95		129	70
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			95		129	70
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			99		91	99
cM capacity (veh/h)			1434		854	994
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	91	46	88			
Volume Left	0	13	74			
Volume Right	52	0	14			
cSH	1700	1434	874			
Volume to Capacity	0.05	0.01	0.10			
Queue Length 95th (m)	0.0	0.2	2.7			
Control Delay (s)	0.0	2.2	9.6			
Lane LOS			A			
Approach Delay (s)	0.0	2.2	9.6			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			4.2			
Intersection Capacity Utilization			18.8%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
1: Highway 10 & Main Street

2030 Future Background P.M.

12-14-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	115	242	23	167	18	391	232	41	14	208	101
Future Volume (vph)	84	115	242	23	167	18	391	232	41	14	208	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0		0.0	100.0		0.0	110.0		0.0	90.0		85.0
Storage Lanes	1		0	1		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		0.898			0.986			0.977				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1620	0	1570	1691	0	1719	1754	0	1357	1696	1553
Flt Permitted	0.626			0.324			0.612			0.571		
Satd. Flow (perm)	1133	1620	0	535	1691	0	1107	1754	0	816	1696	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		121			6			14				115
Link Speed (k/h)		50			80			80				80
Link Distance (m)		580.5			384.6			399.0				925.0
Travel Time (s)		41.8			17.3			18.0				41.6
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	5%	8%	4%	15%	8%	37%	5%	6%	5%	33%	12%	4%
Adj. Flow (vph)	95	131	275	26	190	20	444	264	47	16	236	115
Shared Lane Traffic (%)												
Lane Group Flow (vph)	95	406	0	26	210	0	444	311	0	16	236	115
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		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	

Lanes, Volumes, Timings  
1: Highway 10 & Main Street

2030 Future Background P.M.  
12-14-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	32.6	32.6		32.6	32.6		32.6	32.6		32.6	32.6	32.6
Total Split (s)	35.0	35.0		35.0	35.0		55.0	55.0		55.0	55.0	55.0
Total Split (%)	38.9%	38.9%		38.9%	38.9%		61.1%	61.1%		61.1%	61.1%	61.1%
Maximum Green (s)	27.5	27.5		27.5	27.5		47.4	47.4		47.4	47.4	47.4
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.6	1.6		1.6	1.6		1.7	1.7		1.7	1.7	1.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		2.0	2.0		2.0	2.0	2.0
Total Lost Time (s)	7.5	7.5		7.5	7.5		9.6	9.6		9.6	9.6	9.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.5	4.5		4.5	4.5	4.5
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	15.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	18.7	18.7		18.7	18.7		33.0	33.0		33.0	33.0	33.0
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.47	0.47		0.47	0.47	0.47
v/c Ratio	0.31	0.78		0.18	0.46		0.85	0.37		0.04	0.30	0.15
Control Delay	26.0	29.0		26.1	26.2		34.5	13.1		11.2	12.9	3.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	26.0	29.0		26.1	26.2		34.5	13.1		11.2	12.9	3.0
LOS	C	C		C	C		C	B		B	B	A
Approach Delay		28.4			26.2			25.7				9.7
Approach LOS		C			C			C				A
Queue Length 50th (m)	10.5	36.4		2.8	23.6		50.0	24.1		1.1	18.5	0.0
Queue Length 95th (m)	25.4	77.1		10.1	48.2		#116.2	47.8		4.7	37.6	7.7
Internal Link Dist (m)		556.5			360.6			375.0			901.0	
Turn Bay Length (m)	120.0			100.0			110.0			90.0		85.0
Base Capacity (vph)	477	752		225	715		768	1221		566	1177	1113
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	0.20	0.54		0.12	0.29		0.58	0.25		0.03	0.20	0.10

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	70
Natural Cycle:	80
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.85
Intersection Signal Delay:	23.3
Intersection LOS:	C
Intersection Capacity Utilization:	96.1%
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 & Main Street





Lanes, Volumes, Timings  
1: Highway 10 & Main Street

2030 Future Background P.M. Optimized  
12-15-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	115	242	23	167	18	391	232	41	14	208	101
Future Volume (vph)	84	115	242	23	167	18	391	232	41	14	208	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0		0.0	100.0		0.0	110.0		0.0	90.0		85.0
Storage Lanes	1		0	1		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		0.898			0.986			0.977				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1620	0	1570	1691	0	1719	1754	0	1357	1696	1553
Flt Permitted	0.626			0.336			0.513			0.571		
Satd. Flow (perm)	1133	1620	0	555	1691	0	928	1754	0	816	1696	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		121			6			15				115
Link Speed (k/h)		50			80			80				80
Link Distance (m)		580.5			384.6			399.0				925.0
Travel Time (s)		41.8			17.3			18.0				41.6
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	5%	8%	4%	15%	8%	37%	5%	6%	5%	33%	12%	4%
Adj. Flow (vph)	95	131	275	26	190	20	444	264	47	16	236	115
Shared Lane Traffic (%)												
Lane Group Flow (vph)	95	406	0	26	210	0	444	311	0	16	236	115
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		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2				6

Lanes, Volumes, Timings  
1: Highway 10 & Main Street

2030 Future Background P.M. Optimized  
12-15-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	20.0		20.0	20.0	20.0
Minimum Split (s)	32.6	32.6		32.6	32.6		11.0	32.6		32.6	32.6	32.6
Total Split (s)	35.0	35.0		35.0	35.0		11.0	55.0		44.0	44.0	44.0
Total Split (%)	38.9%	38.9%		38.9%	38.9%		12.2%	61.1%		48.9%	48.9%	48.9%
Maximum Green (s)	27.5	27.5		27.5	27.5		7.0	47.4		36.4	36.4	36.4
Yellow Time (s)	5.9	5.9		5.9	5.9		3.0	5.9		5.9	5.9	5.9
All-Red Time (s)	1.6	1.6		1.6	1.6		1.0	1.7		1.7	1.7	1.7
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)	7.5	7.5		7.5	7.5		4.0	7.6		7.6	7.6	7.6
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	4.5		4.5	4.5	4.5
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)	15.0	15.0		15.0	15.0			15.0		15.0	15.0	15.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0			10.0		10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	0
Act Effct Green (s)	17.3	17.3		17.3	17.3		35.5	31.9		20.7	20.7	20.7
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.55	0.50		0.32	0.32	0.32
v/c Ratio	0.31	0.78		0.18	0.46		0.74	0.36		0.06	0.43	0.20
Control Delay	21.2	25.8		20.3	22.0		21.5	12.2		18.6	21.8	5.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	21.2	25.8		20.3	22.0		21.5	12.2		18.6	21.8	5.4
LOS	C	C		C	C		C	B		B	C	A
Approach Delay		24.9			21.9			17.7			16.5	
Approach LOS		C			C			B			B	
Queue Length 50th (m)	9.3	31.8		2.4	20.7		29.9	20.6		1.4	22.6	0.0
Queue Length 95th (m)	20.6	61.3		8.1	38.3		#83.1	47.2		6.1	48.4	10.5
Internal Link Dist (m)		556.5			360.6			375.0			901.0	
Turn Bay Length (m)	120.0			100.0			110.0			90.0		85.0
Base Capacity (vph)	489	768		239	733		598	1309		466	969	936
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	0.19	0.53		0.11	0.29		0.74	0.24		0.03	0.24	0.12

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	64.4
Natural Cycle:	80
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.78
Intersection Signal Delay:	19.9
Intersection LOS:	B
Intersection Capacity Utilization:	89.7%
ICU Level of Service:	E
Analysis Period (min):	15

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

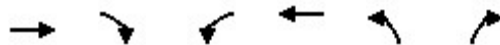
Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 10 & Main Street



HCM Unsignalized Intersection Capacity Analysis  
2: Russell Street & Main Street

2030 Future Background P.M.  
12-14-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		
Traffic Volume (veh/h)	423	17	69	618	8	48
Future Volume (Veh/h)	423	17	69	618	8	48
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	441	18	72	644	8	50
Pedestrians	3			3	8	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			467		1249	461
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			467		1249	461
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		96	92
cM capacity (veh/h)			1098		179	595
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	459	716	58			
Volume Left	0	72	8			
Volume Right	18	0	50			
cSH	1700	1098	450			
Volume to Capacity	0.27	0.07	0.13			
Queue Length 95th (m)	0.0	1.7	3.5			
Control Delay (s)	0.0	1.7	14.2			
Lane LOS	A		B			
Approach Delay (s)	0.0	1.7	14.2			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay			1.6			
Intersection Capacity Utilization			73.1%	ICU Level of Service	D	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
3: Alice Street/Mill Street & Main Street

















2030 Future Background P.M.  
12-14-2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	2	463	14	19	577	7	11	0	8	3	0	3
Future Volume (Veh/h)	2	463	14	19	577	7	11	0	8	3	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	503	15	21	627	8	12	0	9	3	0	3
Pedestrians		1			1			11			11	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	646			529			1202	1214	522	1208	1217	643
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	646			529			1202	1214	522	1208	1217	643
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			92	100	98	98	100	99
cM capacity (veh/h)	940			1039			155	176	553	152	175	472
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	520	656	21	6								
Volume Left	2	21	12	3								
Volume Right	15	8	9	3								
cSH	940	1039	224	230								
Volume to Capacity	0.00	0.02	0.09	0.03								
Queue Length 95th (m)	0.1	0.5	2.4	0.6								
Control Delay (s)	0.1	0.5	22.7	21.1								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.1	0.5	22.7	21.1								
Approach LOS			C	C								
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			54.8%		ICU Level of Service				A			
Analysis Period (min)			15									

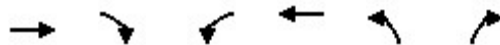
HCM Unsignalized Intersection Capacity Analysis  
4: Osprey Street & Main Street

2030 Future Background P.M.  
12-14-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	324	10	11	365	1	1	5	11	60	6	3
Future Volume (Veh/h)	9	324	10	11	365	1	1	5	11	60	6	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	9	334	10	11	376	1	1	5	11	62	6	3
Pedestrians		7			9			22			22	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			1			2			2	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	399			366			790	800	370	800	804	406
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	399			366			790	800	370	800	804	406
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.6
p0 queue free %	99			99			100	98	98	78	98	99
cM capacity (veh/h)	1149			1182			284	304	663	277	302	569
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	353	388	17	71								
Volume Left	9	11	1	62								
Volume Right	10	1	11	3								
cSH	1149	1182	465	286								
Volume to Capacity	0.01	0.01	0.04	0.25								
Queue Length 95th (m)	0.2	0.2	0.9	7.7								
Control Delay (s)	0.3	0.3	13.0	21.7								
Lane LOS	A	A	B	C								
Approach Delay (s)	0.3	0.3	13.0	21.7								
Approach LOS			B	C								
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			41.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
5: Elm Street & Victoria Street /Victoria Street

2030 Future Background P.M.  
12-14-2022
























Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→	↘	↙	←	↖	↗
Traffic Volume (veh/h)	38	45	14	17	24	18
Future Volume (Veh/h)	38	45	14	17	24	18
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Hourly flow rate (vph)	55	65	20	25	35	26
Pedestrians	34			34	14	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	3			3	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			134		200	136
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			134		200	136
tC, single (s)			4.1		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			99		95	97
cM capacity (veh/h)			1446		751	867
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	120	45	61			
Volume Left	0	20	35			
Volume Right	65	0	26			
cSH	1700	1446	796			
Volume to Capacity	0.07	0.01	0.08			
Queue Length 95th (m)	0.0	0.3	2.0			
Control Delay (s)	0.0	3.4	9.9			
Lane LOS			A			
Approach Delay (s)	0.0	3.4	9.9			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			3.3			
Intersection Capacity Utilization			19.1%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
1: Highway 10 & Main Street

2035 Future Background A.M.

12-14-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	117	311	17	108	5	120	193	42	7	176	92
Future Volume (vph)	76	117	311	17	108	5	120	193	42	7	176	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0		0.0	100.0		0.0	110.0		0.0	90.0		85.0
Storage Lanes	1		0	1		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		0.891			0.993			0.973				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1504	1577	0	1410	1605	0	1597	1530	0	1087	1667	1417
Flt Permitted	0.674			0.337			0.632			0.595		
Satd. Flow (perm)	1067	1577	0	500	1605	0	1063	1530	0	681	1667	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		153			3			18				105
Link Speed (k/h)		50			80			80				80
Link Distance (m)		580.5			384.6			399.0				925.0
Travel Time (s)		41.8			17.3			18.0				41.6
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	20%	19%	3%	28%	16%	50%	13%	23%	11%	66%	14%	14%
Adj. Flow (vph)	86	133	353	19	123	6	136	219	48	8	200	105
Shared Lane Traffic (%)												
Lane Group Flow (vph)	86	486	0	19	129	0	136	267	0	8	200	105
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		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6



Lanes, Volumes, Timings  
1: Highway 10 & Main Street

2035 Future Background A.M.  
12-14-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	32.6	32.6		32.6	32.6		32.6	32.6		32.6	32.6	32.6
Total Split (s)	35.0	35.0		35.0	35.0		55.0	55.0		55.0	55.0	55.0
Total Split (%)	38.9%	38.9%		38.9%	38.9%		61.1%	61.1%		61.1%	61.1%	61.1%
Maximum Green (s)	27.5	27.5		27.5	27.5		47.4	47.4		47.4	47.4	47.4
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.6	1.6		1.6	1.6		1.7	1.7		1.7	1.7	1.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		2.0	2.0		2.0	2.0	2.0
Total Lost Time (s)	7.5	7.5		7.5	7.5		9.6	9.6		9.6	9.6	9.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.5	4.5		4.5	4.5	4.5
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	15.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	18.8	18.8		18.8	18.8		18.8	18.8		18.8	18.8	18.8
Actuated g/C Ratio	0.34	0.34		0.34	0.34		0.34	0.34		0.34	0.34	0.34
v/c Ratio	0.24	0.76		0.11	0.23		0.37	0.50		0.03	0.35	0.19
Control Delay	14.2	19.1		13.5	13.3		19.4	18.7		15.1	17.3	5.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	14.2	19.1		13.5	13.3		19.4	18.7		15.1	17.3	5.0
LOS	B	B		B	B		B	B		B	B	A
Approach Delay		18.3			13.3			19.0			13.1	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	6.1	28.2		1.3	8.8		10.3	19.6		0.5	15.0	0.0
Queue Length 95th (m)	15.0	59.7		5.2	19.4		27.3	45.6		3.4	34.9	8.9
Internal Link Dist (m)		556.5			360.6			375.0			901.0	
Turn Bay Length (m)	120.0			100.0			110.0			90.0		85.0
Base Capacity (vph)	542	876		254	817		891	1286		571	1398	1205
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	0.16	0.55		0.07	0.16		0.15	0.21		0.01	0.14	0.09

Intersection Summary

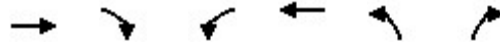
Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	54.9
Natural Cycle:	70
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.76
Intersection Signal Delay:	16.9
Intersection Capacity Utilization	80.9%
Analysis Period (min)	15
Intersection LOS:	B
ICU Level of Service	D

Splits and Phases: 1: Highway 10 & Main Street



HCM Unsignalized Intersection Capacity Analysis  
2: Russell Street & Main Street

2035 Future Background A.M.  
12-14-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↘	↙
Traffic Volume (veh/h)	538	16	27	324	22	59
Future Volume (Veh/h)	538	16	27	324	22	59
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	560	17	28	338	23	61
Pedestrians	1			1	1	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			578			570
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			578			570
tC, single (s)			4.2			6.2
tC, 2 stage (s)						
tF (s)			2.3			3.3
p0 queue free %			97			88
cM capacity (veh/h)			943			516
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	577	366	84			
Volume Left	0	28	23			
Volume Right	17	0	61			
cSH	1700	943	413			
Volume to Capacity	0.34	0.03	0.20			
Queue Length 95th (m)	0.0	0.7	6.0			
Control Delay (s)	0.0	1.0	15.9			
Lane LOS			A	C		
Approach Delay (s)	0.0	1.0	15.9			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			1.7			
Intersection Capacity Utilization			51.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
3: Alice Street/Mill Street & Main Street

2035 Future Background A.M.  
12-14-2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	2	532	2	8	334	1	12	0	18	4	0	0
Future Volume (Veh/h)	2	532	2	8	334	1	12	0	18	4	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	578	2	9	363	1	13	0	20	4	0	0
Pedestrians		1			1			4			4	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	368			584			970	973	584	990	974	368
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	368			584			970	973	584	990	974	368
tC, single (s)	4.1			4.2			7.3	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.7	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			99			94	100	96	98	100	100
cM capacity (veh/h)	1198			931			212	250	502	215	249	679
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	582	373	33	4								
Volume Left	2	9	13	4								
Volume Right	2	1	20	0								
cSH	1198	931	326	215								
Volume to Capacity	0.00	0.01	0.10	0.02								
Queue Length 95th (m)	0.0	0.2	2.7	0.5								
Control Delay (s)	0.0	0.3	17.3	22.1								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.0	0.3	17.3	22.1								
Approach LOS			C	C								
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			39.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
4: Osprey Street & Main Street

2035 Future Background A.M.  
12-14-2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	8	372	5	5	249	1	17	4	13	79	2	4
Future Volume (Veh/h)	8	372	5	5	249	1	17	4	13	79	2	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	8	384	5	5	257	1	18	4	13	81	2	4
Pedestrians		1			1			5			5	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	263			394			681	680	392	691	682	264
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	263			394			681	680	392	691	682	264
tC, single (s)	4.1			4.1			7.2	6.5	6.4	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.5	3.7	4.0	3.3
p0 queue free %	99			100			95	99	98	74	99	99
cM capacity (veh/h)	1307			1171			348	368	620	317	367	776
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	397	263	35	87								
Volume Left	8	5	18	81								
Volume Right	5	1	13	4								
cSH	1307	1171	419	326								
Volume to Capacity	0.01	0.00	0.08	0.27								
Queue Length 95th (m)	0.1	0.1	2.2	8.4								
Control Delay (s)	0.2	0.2	14.4	20.0								
Lane LOS	A	A	B	C								
Approach Delay (s)	0.2	0.2	14.4	20.0								
Approach LOS			B	C								
Intersection Summary												
Average Delay			3.0									
Intersection Capacity Utilization			38.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
5: Elm Street & Victoria Street /Victoria Street

2035 Future Background A.M.  
12-14-2022

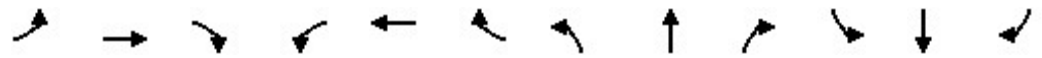


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↘	↙
Traffic Volume (veh/h)	29	39	10	24	55	11
Future Volume (Veh/h)	29	39	10	24	55	11
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Hourly flow rate (vph)	42	57	14	35	80	16
Pedestrians	1			1	4	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			103		138	76
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			103		138	76
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			99		91	98
cM capacity (veh/h)			1424		843	987
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	99	49	96			
Volume Left	0	14	80			
Volume Right	57	0	16			
cSH	1700	1424	864			
Volume to Capacity	0.06	0.01	0.11			
Queue Length 95th (m)	0.0	0.2	3.0			
Control Delay (s)	0.0	2.2	9.7			
Lane LOS			A			
Approach Delay (s)	0.0	2.2	9.7			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			4.3			
Intersection Capacity Utilization			19.2%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
1: Highway 10 & Main Street

2035 Future Background P.M.

12-14-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	122	251	24	176	19	405	250	44	15	225	109
Future Volume (vph)	91	122	251	24	176	19	405	250	44	15	225	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0		0.0	100.0		0.0	110.0		0.0	90.0		85.0
Storage Lanes	1		0	1		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		0.899			0.985			0.978				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1622	0	1570	1688	0	1719	1755	0	1357	1696	1553
Flt Permitted	0.620			0.294			0.601			0.559		
Satd. Flow (perm)	1122	1622	0	486	1688	0	1088	1755	0	799	1696	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		118			6			14				124
Link Speed (k/h)		50			80			80				80
Link Distance (m)		580.5			384.6			399.0				925.0
Travel Time (s)		41.8			17.3			18.0				41.6
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	5%	8%	4%	15%	8%	37%	5%	6%	5%	33%	12%	4%
Adj. Flow (vph)	103	139	285	27	200	22	460	284	50	17	256	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	424	0	27	222	0	460	334	0	17	256	124
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		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6

Lanes, Volumes, Timings  
1: Highway 10 & Main Street

2035 Future Background P.M.  
12-14-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	32.6	32.6		32.6	32.6		32.6	32.6		32.6	32.6	32.6
Total Split (s)	35.0	35.0		35.0	35.0		55.0	55.0		55.0	55.0	55.0
Total Split (%)	38.9%	38.9%		38.9%	38.9%		61.1%	61.1%		61.1%	61.1%	61.1%
Maximum Green (s)	27.5	27.5		27.5	27.5		47.4	47.4		47.4	47.4	47.4
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.6	1.6		1.6	1.6		1.7	1.7		1.7	1.7	1.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		2.0	2.0		2.0	2.0	2.0
Total Lost Time (s)	7.5	7.5		7.5	7.5		9.6	9.6		9.6	9.6	9.6
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.5	4.5		4.5	4.5	4.5
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	15.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	19.9	19.9		19.9	19.9		34.8	34.8		34.8	34.8	34.8
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.48	0.48		0.48	0.48	0.48
v/c Ratio	0.34	0.80		0.20	0.48		0.89	0.40		0.04	0.32	0.15
Control Delay	26.8	31.5		27.3	26.9		39.6	13.7		11.5	13.4	3.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	26.8	31.5		27.3	26.9		39.6	13.7		11.5	13.4	3.0
LOS	C	C		C	C		D	B		B	B	A
Approach Delay		30.6			27.0			28.7			10.1	
Approach LOS		C			C			C			B	
Queue Length 50th (m)	12.8	44.5		3.2	27.9		58.2	28.7		1.3	22.1	0.0
Queue Length 95th (m)	27.6	82.7		10.4	50.9		#124.9	51.8		4.9	40.8	7.9
Internal Link Dist (m)		556.5			360.6			375.0			901.0	
Turn Bay Length (m)	120.0			100.0			110.0			90.0		85.0
Base Capacity (vph)	451	724		195	683		723	1172		531	1128	1074
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	0.23	0.59		0.14	0.33		0.64	0.28		0.03	0.23	0.12

Intersection Summary	
Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	73
Natural Cycle:	80
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.89
Intersection Signal Delay:	25.2
Intersection LOS:	C
Intersection Capacity Utilization:	97.8%
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 & Main Street



Lanes, Volumes, Timings  
1: Highway 10 & Main Street

2035 Future Background P.M. Optimized  
12-15-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	122	251	24	176	19	405	250	44	15	225	109
Future Volume (vph)	91	122	251	24	176	19	405	250	44	15	225	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0		0.0	100.0		0.0	110.0		0.0	90.0		85.0
Storage Lanes	1		0	1		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		0.899			0.985			0.978				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1622	0	1570	1688	0	1719	1755	0	1357	1696	1553
Flt Permitted	0.620			0.315			0.505			0.559		
Satd. Flow (perm)	1122	1622	0	520	1688	0	914	1755	0	799	1696	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		118			6			15				124
Link Speed (k/h)		50			80			80				80
Link Distance (m)		580.5			384.6			399.0				925.0
Travel Time (s)		41.8			17.3			18.0				41.6
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	5%	8%	4%	15%	8%	37%	5%	6%	5%	33%	12%	4%
Adj. Flow (vph)	103	139	285	27	200	22	460	284	50	17	256	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	424	0	27	222	0	460	334	0	17	256	124
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		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2				6

Lanes, Volumes, Timings  
1: Highway 10 & Main Street

2035 Future Background P.M. Optimized  
12-15-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	20.0		20.0	20.0	20.0
Minimum Split (s)	32.6	32.6		32.6	32.6		11.0	32.6		32.6	32.6	32.6
Total Split (s)	35.0	35.0		35.0	35.0		11.0	55.0		44.0	44.0	44.0
Total Split (%)	38.9%	38.9%		38.9%	38.9%		12.2%	61.1%		48.9%	48.9%	48.9%
Maximum Green (s)	27.5	27.5		27.5	27.5		7.0	47.4		36.4	36.4	36.4
Yellow Time (s)	5.9	5.9		5.9	5.9		3.0	5.9		5.9	5.9	5.9
All-Red Time (s)	1.6	1.6		1.6	1.6		1.0	1.7		1.7	1.7	1.7
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)	7.5	7.5		7.5	7.5		4.0	7.6		7.6	7.6	7.6
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	4.5		4.5	4.5	4.5
Recall Mode	None	None		None	None		None	None		None	None	None
Walk Time (s)	15.0	15.0		15.0	15.0			15.0		15.0	15.0	15.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0			10.0		10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	0
Act Effct Green (s)	18.2	18.2		18.2	18.2		35.9	32.2		21.1	21.1	21.1
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.55	0.49		0.32	0.32	0.32
v/c Ratio	0.33	0.79		0.19	0.47		0.79	0.38		0.07	0.47	0.21
Control Delay	21.6	27.2		21.0	22.4		24.5	12.9		18.8	22.7	5.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	21.6	27.2		21.0	22.4		24.5	12.9		18.8	22.7	5.2
LOS	C	C		C	C		C	B		B	C	A
Approach Delay		26.1			22.2			19.6			17.1	
Approach LOS		C			C			B			B	
Queue Length 50th (m)	10.1	34.8		2.6	22.1		33.0	23.6		1.5	25.6	0.0
Queue Length 95th (m)	22.7	68.0		8.7	41.5		#90.3	50.8		6.3	52.4	10.6
Internal Link Dist (m)		556.5			360.6			375.0			901.0	
Turn Bay Length (m)	120.0			100.0			110.0			90.0		85.0
Base Capacity (vph)	475	755		220	718		585	1286		448	951	925
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	0.22	0.56		0.12	0.31		0.79	0.26		0.04	0.27	0.13

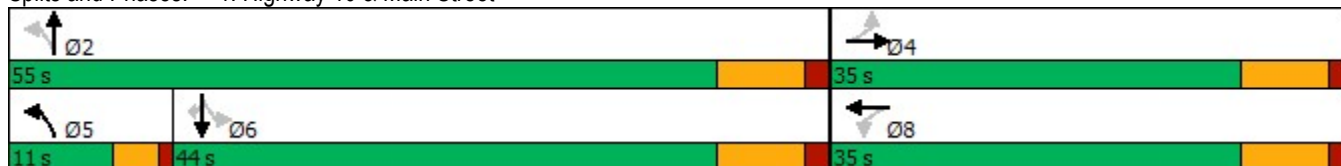
Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	65.7
Natural Cycle:	80
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.79
Intersection Signal Delay:	21.2
Intersection LOS:	C
Intersection Capacity Utilization:	91.4%
ICU Level of Service:	F
Analysis Period (min):	15

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

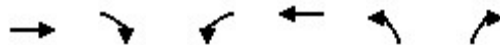
Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 10 & Main Street



HCM Unsignalized Intersection Capacity Analysis  
2: Russell Street & Main Street

2035 Future Background P.M.  
12-14-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↗
Traffic Volume (veh/h)	444	18	74	646	8	52
Future Volume (Veh/h)	444	18	74	646	8	52
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	462	19	77	673	8	54
Pedestrians	3			3	8	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			489		1310	482
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			489		1310	482
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		95	91
cM capacity (veh/h)			1077		163	579
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	481	750	62			
Volume Left	0	77	8			
Volume Right	19	0	54			
cSH	1700	1077	435			
Volume to Capacity	0.28	0.07	0.14			
Queue Length 95th (m)	0.0	1.8	3.9			
Control Delay (s)	0.0	1.8	14.6			
Lane LOS			A	B		
Approach Delay (s)	0.0	1.8	14.6			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			1.7			
Intersection Capacity Utilization			76.2%	ICU Level of Service	D	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
3: Alice Street/Mill Street & Main Street

















2035 Future Background P.M.  
12-14-2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	2	487	15	21	602	7	12	0	8	4	0	4
Future Volume (Veh/h)	2	487	15	21	602	7	12	0	8	4	0	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	529	16	23	654	8	13	0	9	4	0	4
Pedestrians		1			1			11			11	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	673			556			1261	1271	549	1266	1275	670
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	673			556			1261	1271	549	1266	1275	670
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			91	100	98	97	100	99
cM capacity (veh/h)	919			1015			141	162	534	139	161	456
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	547	685	22	8								
Volume Left	2	23	13	4								
Volume Right	16	8	9	4								
cSH	919	1015	202	213								
Volume to Capacity	0.00	0.02	0.11	0.04								
Queue Length 95th (m)	0.1	0.6	2.9	0.9								
Control Delay (s)	0.1	0.6	25.0	22.6								
Lane LOS	A	A	D	C								
Approach Delay (s)	0.1	0.6	25.0	22.6								
Approach LOS			D	C								
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			57.7%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
4: Osprey Street & Main Street

2035 Future Background P.M.  
12-14-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	344	11	12	384	1	1	5	12	61	6	4
Future Volume (Veh/h)	10	344	11	12	384	1	1	5	12	61	6	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	10	355	11	12	396	1	1	5	12	63	6	4
Pedestrians		7			9			22			22	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			1			2			2	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	419			388			837	846	392	846	850	426
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	419			388			837	846	392	846	850	426
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.6
p0 queue free %	99			99			100	98	98	75	98	99
cM capacity (veh/h)	1130			1160			264	285	645	257	283	554
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	376	409	18	73								
Volume Left	10	12	1	63								
Volume Right	11	1	12	4								
cSH	1130	1160	451	267								
Volume to Capacity	0.01	0.01	0.04	0.27								
Queue Length 95th (m)	0.2	0.3	1.0	8.7								
Control Delay (s)	0.3	0.3	13.3	23.5								
Lane LOS	A	A	B	C								
Approach Delay (s)	0.3	0.3	13.3	23.5								
Approach LOS			B	C								
Intersection Summary												
Average Delay			2.5									
Intersection Capacity Utilization			42.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
5: Elm Street & Victoria Street /Victoria Street

2035 Future Background P.M.  
12-14-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↘	↙
Traffic Volume (veh/h)	41	49	15	18	25	19
Future Volume (Veh/h)	41	49	15	18	25	19
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Hourly flow rate (vph)	59	71	22	26	36	28
Pedestrians	34			34	14	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	3			3	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			144		212	142
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			144		212	142
tC, single (s)			4.1		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			98		95	97
cM capacity (veh/h)			1434		738	859
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	130	48	64			
Volume Left	0	22	36			
Volume Right	71	0	28			
cSH	1700	1434	786			
Volume to Capacity	0.08	0.02	0.08			
Queue Length 95th (m)	0.0	0.4	2.1			
Control Delay (s)	0.0	3.5	10.0			
Lane LOS			A			
Approach Delay (s)	0.0	3.5	10.0			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			3.3			
Intersection Capacity Utilization			19.3%	ICU Level of Service		A
Analysis Period (min)			15			



Lanes, Volumes, Timings  
1: Highway 10 & Main Street/Grey Road 9

2025 Future Total A.M.  
12-14-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	123	295	20	100	4	112	194	53	6	168	85
Future Volume (vph)	83	123	295	20	100	4	112	194	53	6	168	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0		0.0	100.0		0.0	110.0		0.0	90.0		85.0
Storage Lanes	1		0	1		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		0.894			0.994			0.968				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1504	1577	0	1410	1608	0	1597	1527	0	1087	1667	1417
Flt Permitted	0.681			0.352			0.637			0.588		
Satd. Flow (perm)	1078	1577	0	522	1608	0	1071	1527	0	673	1667	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		138			3			23				97
Link Speed (k/h)		60			60			100				100
Link Distance (m)		570.6			258.9			783.0				495.7
Travel Time (s)		34.2			15.5			28.2				17.8
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	20%	19%	3%	28%	16%	50%	13%	23%	11%	66%	14%	14%
Adj. Flow (vph)	94	140	335	23	114	5	127	220	60	7	191	97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	94	475	0	23	119	0	127	280	0	7	191	97
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		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6

Lanes, Volumes, Timings  
1: Highway 10 & Main Street/Grey Road 9

2025 Future Total A.M.  
12-14-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	32.6	32.6		32.6	32.6		32.6	32.6		32.6	32.6	32.6
Total Split (s)	35.0	35.0		35.0	35.0		55.0	55.0		55.0	55.0	55.0
Total Split (%)	38.9%	38.9%		38.9%	38.9%		61.1%	61.1%		61.1%	61.1%	61.1%
Maximum Green (s)	27.5	27.5		27.5	27.5		47.4	47.4		47.4	47.4	47.4
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.6	1.6		1.6	1.6		1.7	1.7		1.7	1.7	1.7
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)	7.5	7.5		7.5	7.5		7.6	7.6		7.6	7.6	7.6
Lead/Lag												
Lead-Lag Optimize?												
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)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	15.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	18.6	18.6		18.6	18.6		20.5	20.5		20.5	20.5	20.5
Actuated g/C Ratio	0.34	0.34		0.34	0.34		0.38	0.38		0.38	0.38	0.38
v/c Ratio	0.25	0.75		0.13	0.22		0.32	0.48		0.03	0.30	0.16
Control Delay	14.2	19.1		13.4	12.8		16.8	16.6		13.8	15.3	4.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	14.2	19.1		13.4	12.8		16.8	16.6		13.8	15.3	4.7
LOS	B	B		B	B		B	B		B	B	A
Approach Delay		18.3			12.9			16.7			11.8	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	6.7	28.6		1.6	8.1		8.9	19.0		0.4	13.2	0.0
Queue Length 95th (m)	15.4	56.9		5.7	17.4		24.4	45.3		3.0	32.1	8.4
Internal Link Dist (m)		546.6			234.9			759.0			471.7	
Turn Bay Length (m)	120.0			100.0			110.0			90.0		85.0
Base Capacity (vph)	552	874		267	824		941	1344		591	1464	1256
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	0.17	0.54		0.09	0.14		0.13	0.21		0.01	0.13	0.08

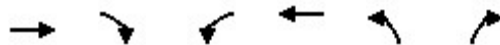
Intersection Summary	
Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	54.4
Natural Cycle:	70
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.75
Intersection Signal Delay:	15.9
Intersection Capacity Utilization	76.9%
Analysis Period (min)	15
Intersection LOS:	B
ICU Level of Service	D

Splits and Phases: 1: Highway 10 & Main Street/Grey Road 9



HCM Unsignalized Intersection Capacity Analysis  
2: Russell Street & Main Street

















2025 Future Total A.M.  
12-14-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	495	49	34	289	87	85
Future Volume (Veh/h)	495	49	34	289	87	85
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	516	51	35	301	91	89
Pedestrians	1			1	1	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			568		914	544
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			568		914	544
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			96		68	83
cM capacity (veh/h)			951		288	535
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	567	336	180			
Volume Left	0	35	91			
Volume Right	51	0	89			
cSH	1700	951	373			
Volume to Capacity	0.33	0.04	0.48			
Queue Length 95th (m)	0.0	0.9	20.3			
Control Delay (s)	0.0	1.3	23.3			
Lane LOS			A			C
Approach Delay (s)	0.0	1.3	23.3			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			4.3			
Intersection Capacity Utilization			60.5%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 3: Alice Street/Mill Street & Main Street

2025 Future Total A.M.  
 12-14-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	525	2	7	366	1	10	0	16	3	0	0
Future Volume (Veh/h)	2	525	2	7	366	1	10	0	16	3	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	571	2	8	398	1	11	0	17	3	0	0
Pedestrians		1			1			4			4	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	403			577			996	999	577	1012	1000	404
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	403			577			996	999	577	1012	1000	404
tC, single (s)	4.1			4.2			7.3	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.7	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			99			95	100	97	99	100	100
cM capacity (veh/h)	1163			937			204	241	507	209	241	649
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	575	407	28	3								
Volume Left	2	8	11	3								
Volume Right	2	1	17	0								
cSH	1163	937	320	209								
Volume to Capacity	0.00	0.01	0.09	0.01								
Queue Length 95th (m)	0.0	0.2	2.3	0.3								
Control Delay (s)	0.0	0.3	17.3	22.5								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.0	0.3	17.3	22.5								
Approach LOS			C	C								
<b>Intersection Summary</b>												
Average Delay			0.7									
Intersection Capacity Utilization			39.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
4: Osprey Street & Grey Road 9/Main Street

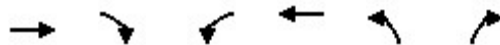
2025 Future Total A.M.  
12-14-2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	7	369	20	4	287	1	65	3	12	77	2	3
Future Volume (Veh/h)	7	369	20	4	287	1	65	3	12	77	2	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	7	380	21	4	296	1	67	3	12	79	2	3
Pedestrians		1			1			5			5	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	302			406			719	720	396	728	730	302
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	302			406			719	720	396	728	730	302
tC, single (s)	4.1			4.1			7.2	6.5	6.4	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.5	3.7	4.0	3.3
p0 queue free %	99			100			80	99	98	74	99	100
cM capacity (veh/h)	1265			1159			328	350	616	300	346	738
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	408	301	82	84								
Volume Left	7	4	67	79								
Volume Right	21	1	12	3								
cSH	1265	1159	353	307								
Volume to Capacity	0.01	0.00	0.23	0.27								
Queue Length 95th (m)	0.1	0.1	7.1	8.7								
Control Delay (s)	0.2	0.1	18.2	21.1								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.2	0.1	18.2	21.1								
Approach LOS			C	C								
Intersection Summary												
Average Delay			3.9									
Intersection Capacity Utilization			36.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
5: Elm Street & Victoria Street East

2025 Future Total A.M.  
12-14-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↘
Traffic Volume (veh/h)	25	69	8	21	115	9
Future Volume (Veh/h)	25	69	8	21	115	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Hourly flow rate (vph)	36	100	12	30	167	13
Pedestrians	1			1	4	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			140		145	91
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			140		145	91
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			99		80	99
cM capacity (veh/h)			1379		837	968
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	136	42	180			
Volume Left	0	12	167			
Volume Right	100	0	13			
cSH	1700	1379	845			
Volume to Capacity	0.08	0.01	0.21			
Queue Length 95th (m)	0.0	0.2	6.4			
Control Delay (s)	0.0	2.2	10.4			
Lane LOS			A			B
Approach Delay (s)	0.0	2.2	10.4			
Approach LOS				B		
<b>Intersection Summary</b>						
Average Delay			5.5			
Intersection Capacity Utilization			21.9%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
6: Highway 10 & Site Access

2025 Future Total A.M.  
12-14-2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	80	207	96	277	423	60
Future Volume (vph)	80	207	96	277	423	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0	0.0	45.0			30.0
Storage Lanes	1	1	1			1
Taper Length (m)	7.5		100.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.950		0.455			
Satd. Flow (perm)	1770	1583	848	1863	1863	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		225				65
Link Speed (k/h)	50			100	50	
Link Distance (m)	187.9			433.4	783.0	
Travel Time (s)	13.5			15.6	56.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	225	104	301	460	65
Shared Lane Traffic (%)						
Lane Group Flow (vph)	87	225	104	301	460	65
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	2.0
Trailing Detector (m)	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
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	2.0
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6



Lanes, Volumes, Timings  
6: Highway 10 & Site Access

2025 Future Total A.M.  
12-14-2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	17.0	17.0	39.0	39.0	39.0	39.0
Minimum Split (s)	22.6	22.6	52.7	52.7	52.7	52.7
Total Split (s)	24.0	24.0	66.0	66.0	66.0	66.0
Total Split (%)	26.7%	26.7%	73.3%	73.3%	73.3%	73.3%
Maximum Green (s)	18.4	18.4	59.3	59.3	59.3	59.3
Yellow Time (s)	4.1	4.1	5.4	5.4	5.4	5.4
All-Red Time (s)	1.5	1.5	1.3	1.3	1.3	1.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	6.7	6.7	6.7	6.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.2	3.2	4.2	4.2	4.2	4.2
Recall Mode	None	None	None	None	None	None
Walk Time (s)	7.0	7.0	27.0	27.0	27.0	27.0
Flash Dont Walk (s)	10.0	10.0	19.0	19.0	19.0	19.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effect Green (s)	17.0	17.0	39.0	39.0	39.0	39.0
Actuated g/C Ratio	0.25	0.25	0.57	0.57	0.57	0.57
v/c Ratio	0.20	0.40	0.21	0.28	0.43	0.07
Control Delay	21.8	5.8	8.6	8.4	9.9	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	5.8	8.6	8.4	9.9	2.2
LOS	C	A	A	A	A	A
Approach Delay	10.2			8.4	9.0	
Approach LOS	B			A	A	
Queue Length 50th (m)	9.2	0.0	6.1	18.6	31.7	0.0
Queue Length 95th (m)	19.9	15.3	13.8	31.4	51.0	4.4
Internal Link Dist (m)	163.9			409.4	759.0	
Turn Bay Length (m)	35.0		45.0			30.0
Base Capacity (vph)	476	590	736	1617	1617	1382
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.38	0.14	0.19	0.28	0.05

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	68.3
Natural Cycle:	80
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.43
Intersection Signal Delay:	9.1
Intersection LOS:	A
Intersection Capacity Utilization:	95.0%
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 6: Highway 10 & Site Access



Lanes, Volumes, Timings  
1: Highway 10 & Main Street/Grey Road 9

2025 Future Total P.M.  
12-14-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	119	234	39	176	17	378	236	48	13	222	112
Future Volume (vph)	89	119	234	39	176	17	378	236	48	13	222	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0		0.0	100.0		0.0	110.0		0.0	90.0		85.0
Storage Lanes	1		0	1		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		0.900			0.987			0.974				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1623	0	1570	1697	0	1719	1749	0	1357	1696	1553
Flt Permitted	0.621			0.348			0.603			0.565		
Satd. Flow (perm)	1124	1623	0	575	1697	0	1091	1749	0	807	1696	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		113			5			17				127
Link Speed (k/h)		60			60			100				100
Link Distance (m)		570.6			258.9			783.0				495.7
Travel Time (s)		34.2			15.5			28.2				17.8
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	5%	8%	4%	15%	8%	37%	5%	6%	5%	33%	12%	4%
Adj. Flow (vph)	101	135	266	44	200	19	430	268	55	15	252	127
Shared Lane Traffic (%)												
Lane Group Flow (vph)	101	401	0	44	219	0	430	323	0	15	252	127
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		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6

Lanes, Volumes, Timings  
1: Highway 10 & Main Street/Grey Road 9

2025 Future Total P.M.  
12-14-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	32.6	32.6		32.6	32.6		32.6	32.6		32.6	32.6	32.6
Total Split (s)	35.0	35.0		35.0	35.0		55.0	55.0		55.0	55.0	55.0
Total Split (%)	38.9%	38.9%		38.9%	38.9%		61.1%	61.1%		61.1%	61.1%	61.1%
Maximum Green (s)	27.5	27.5		27.5	27.5		47.4	47.4		47.4	47.4	47.4
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.6	1.6		1.6	1.6		1.7	1.7		1.7	1.7	1.7
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)	7.5	7.5		7.5	7.5		7.6	7.6		7.6	7.6	7.6
Lead/Lag												
Lead-Lag Optimize?												
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)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	15.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	18.3	18.3		18.3	18.3		32.7	32.7		32.7	32.7	32.7
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.49	0.49		0.49	0.49	0.49
v/c Ratio	0.33	0.77		0.28	0.47		0.81	0.38		0.04	0.31	0.15
Control Delay	25.2	27.8		27.5	25.3		29.1	12.0		10.2	12.0	2.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	25.2	27.8		27.5	25.3		29.1	12.0		10.2	12.0	2.7
LOS	C	C		C	C		C	B		B	B	A
Approach Delay		27.3			25.7			21.8			8.9	
Approach LOS		C			C			C			A	
Queue Length 50th (m)	10.2	33.2		4.4	22.5		43.1	22.6		0.9	18.0	0.0
Queue Length 95th (m)	27.1	77.2		15.0	50.2		96.4	46.9		4.2	38.1	7.6
Internal Link Dist (m)		546.6			234.9			759.0			471.7	
Turn Bay Length (m)	120.0			100.0			110.0			90.0		85.0
Base Capacity (vph)	493	776		252	748		815	1311		602	1267	1192
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	0.20	0.52		0.17	0.29		0.53	0.25		0.02	0.20	0.11

Intersection Summary	
Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	67.1
Natural Cycle:	75
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.81
Intersection Signal Delay:	21.1
Intersection Capacity Utilization	91.7%
Analysis Period (min)	15
Intersection LOS:	C
ICU Level of Service	F

Splits and Phases: 1: Highway 10 & Main Street/Grey Road 9



HCM Unsignalized Intersection Capacity Analysis  
2: Russell Street & Main Street

2025 Future Total P.M.  
12-14-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↘	↙
Traffic Volume (veh/h)	404	87	100	592	55	66
Future Volume (Veh/h)	404	87	100	592	55	66
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	421	91	104	617	57	69
Pedestrians	3			3	8	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			520		1302	478
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			520		1302	478
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			90		64	88
cM capacity (veh/h)			1049		160	582
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	512	721	126			
Volume Left	0	104	57			
Volume Right	91	0	69			
cSH	1700	1049	265			
Volume to Capacity	0.30	0.10	0.48			
Queue Length 95th (m)	0.0	2.6	19.1			
Control Delay (s)	0.0	2.4	30.3			
Lane LOS		A	D			
Approach Delay (s)	0.0	2.4	30.3			
Approach LOS			D			
<b>Intersection Summary</b>						
Average Delay			4.1			
Intersection Capacity Utilization			80.5%	ICU Level of Service	D	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 3: Alice Street/Mill Street & Main Street

2025 Future Total P.M.  
 12-14-2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	2	512	13	18	602	6	10	0	7	3	0	3
Future Volume (Veh/h)	2	512	13	18	602	6	10	0	7	3	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	557	14	20	654	7	11	0	8	3	0	3
Pedestrians		1			1			11			11	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	672			582			1280	1291	576	1286	1294	670
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	672			582			1280	1291	576	1286	1294	670
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			92	100	98	98	100	99
cM capacity (veh/h)	920			993			137	158	515	135	157	456
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	573	681	19	6								
Volume Left	2	20	11	3								
Volume Right	14	7	8	3								
cSH	920	993	199	208								
Volume to Capacity	0.00	0.02	0.10	0.03								
Queue Length 95th (m)	0.1	0.5	2.5	0.7								
Control Delay (s)	0.1	0.5	25.0	22.8								
Lane LOS	A	A	D	C								
Approach Delay (s)	0.1	0.5	25.0	22.8								
Approach LOS			D	C								
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			55.5%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 4: Osprey Street & Grey Road 9/Main Street

2025 Future Total P.M.  
 12-14-2022

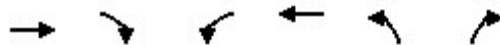


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	8	377	64	10	394	1	33	4	10	59	5	3
Future Volume (Veh/h)	8	377	64	10	394	1	33	4	10	59	5	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	8	389	66	10	406	1	34	4	10	61	5	3
Pedestrians		7			9			22			22	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			1			2			2	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	429			477			899	909	453	908	942	436
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	429			477			899	909	453	908	942	436
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.6
p0 queue free %	99			99			86	98	98	74	98	99
cM capacity (veh/h)	1120			1076			240	263	595	235	251	547
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	463	417	48	69								
Volume Left	8	10	34	61								
Volume Right	66	1	10	3								
cSH	1120	1076	277	242								
Volume to Capacity	0.01	0.01	0.17	0.28								
Queue Length 95th (m)	0.2	0.2	4.9	9.1								
Control Delay (s)	0.2	0.3	20.7	25.7								
Lane LOS	A	A	C	D								
Approach Delay (s)	0.2	0.3	20.7	25.7								
Approach LOS			C	D								
Intersection Summary												
Average Delay			3.0									
Intersection Capacity Utilization			40.4%		ICU Level of Service				A			
Analysis Period (min)			15									



HCM Unsignalized Intersection Capacity Analysis  
5: Elm Street & Victoria Street East

2025 Future Total P.M.  
12-14-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	36	113	13	16	70	17
Future Volume (Veh/h)	36	113	13	16	70	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Hourly flow rate (vph)	52	164	19	23	101	25
Pedestrians	34			34	14	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	3			3	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			230		243	182
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			230		243	182
tC, single (s)			4.1		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			99		86	97
cM capacity (veh/h)			1334		710	817
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	216	42	126			
Volume Left	0	19	101			
Volume Right	164	0	25			
cSH	1700	1334	729			
Volume to Capacity	0.13	0.01	0.17			
Queue Length 95th (m)	0.0	0.3	5.0			
Control Delay (s)	0.0	3.6	11.0			
Lane LOS			A			B
Approach Delay (s)	0.0	3.6	11.0			
Approach LOS				B		
<b>Intersection Summary</b>						
Average Delay			4.0			
Intersection Capacity Utilization			24.6%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
6: Highway 10 & Site Access

2025 Future Total P.M.  
12-14-2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	83	137	238	578	419	75
Future Volume (vph)	83	137	238	578	419	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0	0.0	45.0			30.0
Storage Lanes	1	1	1			1
Taper Length (m)	7.5		100.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.950		0.459			
Satd. Flow (perm)	1770	1583	855	1863	1863	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		149				82
Link Speed (k/h)	50			50	50	
Link Distance (m)	187.9			433.4	783.0	
Travel Time (s)	13.5			31.2	56.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	149	259	628	455	82
Shared Lane Traffic (%)						
Lane Group Flow (vph)	90	149	259	628	455	82
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
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)	100	100	100			100
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	2.0
Trailing Detector (m)	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
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	2.0
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6

Lanes, Volumes, Timings  
6: Highway 10 & Site Access

2025 Future Total P.M.  
12-14-2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	17.0	17.0	39.0	39.0	39.0	39.0
Minimum Split (s)	22.6	22.6	52.7	52.7	52.7	52.7
Total Split (s)	24.0	24.0	66.0	66.0	66.0	66.0
Total Split (%)	26.7%	26.7%	73.3%	73.3%	73.3%	73.3%
Maximum Green (s)	18.4	18.4	59.3	59.3	59.3	59.3
Yellow Time (s)	4.1	4.1	5.4	5.4	5.4	5.4
All-Red Time (s)	1.5	1.5	1.3	1.3	1.3	1.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	6.7	6.7	6.7	6.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.2	3.2	4.2	4.2	4.2	4.2
Recall Mode	None	None	None	None	None	None
Walk Time (s)	7.0	7.0	27.0	27.0	27.0	27.0
Flash Dont Walk (s)	10.0	10.0	19.0	19.0	19.0	19.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effect Green (s)	17.0	17.0	39.0	39.0	39.0	39.0
Actuated g/C Ratio	0.25	0.25	0.57	0.57	0.57	0.57
v/c Ratio	0.20	0.30	0.53	0.59	0.43	0.09
Control Delay	21.8	5.9	14.0	12.4	9.9	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	5.9	14.0	12.4	9.9	2.1
LOS	C	A	B	B	A	A
Approach Delay	11.9			12.9	8.7	
Approach LOS	B			B	A	
Queue Length 50th (m)	9.6	0.0	19.3	49.1	31.2	0.0
Queue Length 95th (m)	20.6	12.7	40.0	78.3	50.3	4.9
Internal Link Dist (m)	163.9			409.4	759.0	
Turn Bay Length (m)	35.0		45.0			30.0
Base Capacity (vph)	476	535	742	1617	1617	1385
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.28	0.35	0.39	0.28	0.06

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	68.3
Natural Cycle:	80
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.59
Intersection Signal Delay:	11.4
Intersection LOS:	B
Intersection Capacity Utilization:	95.0%
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 6: Highway 10 & Site Access



Lanes, Volumes, Timings  
1: Highway 10 & Main Street/Grey Road 9

2030 Future Total A.M.  
12-14-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	128	303	21	106	5	116	206	56	7	180	91
Future Volume (vph)	88	128	303	21	106	5	116	206	56	7	180	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0		0.0	100.0		0.0	110.0		0.0	90.0		85.0
Storage Lanes	1		0	1		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		0.894			0.993			0.968				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1504	1577	0	1410	1604	0	1597	1527	0	1087	1667	1417
Flt Permitted	0.676			0.341			0.629			0.578		
Satd. Flow (perm)	1070	1577	0	506	1604	0	1058	1527	0	662	1667	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		137			3			23				103
Link Speed (k/h)		60			60			100				100
Link Distance (m)		570.6			258.9			783.0				495.7
Travel Time (s)		34.2			15.5			28.2				17.8
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	20%	19%	3%	28%	16%	50%	13%	23%	11%	66%	14%	14%
Adj. Flow (vph)	100	145	344	24	120	6	132	234	64	8	205	103
Shared Lane Traffic (%)												
Lane Group Flow (vph)	100	489	0	24	126	0	132	298	0	8	205	103
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		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6

Lanes, Volumes, Timings  
1: Highway 10 & Main Street/Grey Road 9

2030 Future Total A.M.  
12-14-2022

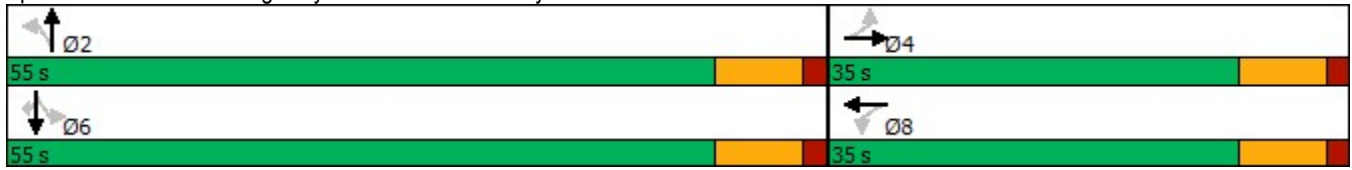


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	32.6	32.6		32.6	32.6		32.6	32.6		32.6	32.6	32.6
Total Split (s)	35.0	35.0		35.0	35.0		55.0	55.0		55.0	55.0	55.0
Total Split (%)	38.9%	38.9%		38.9%	38.9%		61.1%	61.1%		61.1%	61.1%	61.1%
Maximum Green (s)	27.5	27.5		27.5	27.5		47.4	47.4		47.4	47.4	47.4
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.6	1.6		1.6	1.6		1.7	1.7		1.7	1.7	1.7
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)	7.5	7.5		7.5	7.5		7.6	7.6		7.6	7.6	7.6
Lead/Lag												
Lead-Lag Optimize?												
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)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	15.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	19.7	19.7		19.7	19.7		20.7	20.7		20.7	20.7	20.7
Actuated g/C Ratio	0.35	0.35		0.35	0.35		0.37	0.37		0.37	0.37	0.37
v/c Ratio	0.26	0.76		0.13	0.22		0.34	0.51		0.03	0.33	0.17
Control Delay	14.4	19.4		13.7	12.9		17.5	17.7		14.0	15.9	4.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	14.4	19.4		13.7	12.9		17.5	17.7		14.0	15.9	4.6
LOS	B	B		B	B		B	B		B	B	A
Approach Delay		18.5			13.0			17.6			12.2	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	7.2	30.4		1.6	8.6		9.7	21.5		0.5	15.0	0.0
Queue Length 95th (m)	16.8	61.9		6.1	18.7		25.2	48.5		3.3	34.0	8.5
Internal Link Dist (m)		546.6			234.9			759.0			471.7	
Turn Bay Length (m)	120.0			100.0			110.0			90.0		85.0
Base Capacity (vph)	535	856		252	803		911	1319		570	1436	1235
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	0.19	0.57		0.10	0.16		0.14	0.23		0.01	0.14	0.08

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	55.7
Natural Cycle:	70
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.76
Intersection Signal Delay:	16.4
Intersection Capacity Utilization	77.6%
Analysis Period (min)	15
Intersection LOS:	B
ICU Level of Service	D

Splits and Phases: 1: Highway 10 & Main Street/Grey Road 9



Lanes, Volumes, Timings  
1: Highway 10 & Main Street/Grey Road 9

2030 Future Total P.M. Optimized  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	126	242	41	185	18	391	252	51	14	237	119
Future Volume (vph)	95	126	242	41	185	18	391	252	51	14	237	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0		0.0	100.0		0.0	110.0		0.0	90.0		85.0
Storage Lanes	1		0	1		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		0.901			0.987			0.975				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1625	0	1570	1697	0	1719	1750	0	1357	1696	1553
Flt Permitted	0.615			0.327			0.493			0.554		
Satd. Flow (perm)	1113	1625	0	540	1697	0	892	1750	0	791	1696	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		111			5			17				135
Link Speed (k/h)		60			60			100				100
Link Distance (m)		570.6			258.9			783.0				495.7
Travel Time (s)		34.2			15.5			28.2				17.8
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	5%	8%	4%	15%	8%	37%	5%	6%	5%	33%	12%	4%
Adj. Flow (vph)	108	143	275	47	210	20	444	286	58	16	269	135
Shared Lane Traffic (%)												
Lane Group Flow (vph)	108	418	0	47	230	0	444	344	0	16	269	135
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		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2				6



Lanes, Volumes, Timings  
1: Highway 10 & Main Street/Grey Road 9

2030 Future Total P.M. Optimized  
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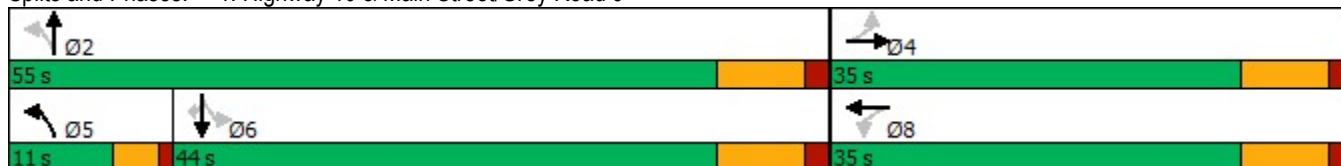
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	20.0		20.0	20.0	20.0
Minimum Split (s)	32.6	32.6		32.6	32.6		11.0	32.6		32.6	32.6	32.6
Total Split (s)	35.0	35.0		35.0	35.0		11.0	55.0		44.0	44.0	44.0
Total Split (%)	38.9%	38.9%		38.9%	38.9%		12.2%	61.1%		48.9%	48.9%	48.9%
Maximum Green (s)	27.5	27.5		27.5	27.5		7.0	47.4		36.4	36.4	36.4
Yellow Time (s)	5.9	5.9		5.9	5.9		3.0	5.9		5.9	5.9	5.9
All-Red Time (s)	1.6	1.6		1.6	1.6		1.0	1.7		1.7	1.7	1.7
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)	7.5	7.5		7.5	7.5		4.0	7.6		7.6	7.6	7.6
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)	15.0	15.0		15.0	15.0			15.0		15.0	15.0	15.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0			10.0		10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0		0	0			0		0	0	0
Act Effct Green (s)	18.1	18.1		18.1	18.1		35.5	31.8		20.7	20.7	20.7
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.54	0.49		0.32	0.32	0.32
v/c Ratio	0.35	0.79		0.31	0.48		0.77	0.40		0.06	0.50	0.23
Control Delay	21.7	26.9		24.2	22.4		24.0	13.0		19.0	23.4	5.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	21.7	26.9		24.2	22.4		24.0	13.0		19.0	23.4	5.2
LOS	C	C		C	C		C	B		B	C	A
Approach Delay		25.8			22.7			19.2			17.4	
Approach LOS		C			C			B			B	
Queue Length 50th (m)	10.7	34.8		4.6	23.1		31.3	24.3		1.4	27.1	0.0
Queue Length 95th (m)	23.0	65.5		13.0	41.9		#86.9	52.7		6.1	55.4	11.2
Internal Link Dist (m)		546.6			234.9			759.0			471.7	
Turn Bay Length (m)	120.0			100.0			110.0			90.0		85.0
Base Capacity (vph)	474	756		230	726		574	1289		446	956	934
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	0.23	0.55		0.20	0.32		0.77	0.27		0.04	0.28	0.14

Intersection Summary	
Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	65.2
Natural Cycle:	80
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.79
Intersection Signal Delay:	21.0
Intersection LOS:	C
Intersection Capacity Utilization:	90.3%
ICU Level of Service:	E
Analysis Period (min):	15

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 10 & Main Street/Grey Road 9



HCM Unsignalized Intersection Capacity Analysis  
2: Russell Street & Main Street

















2030 Future Total A.M.  
12-14-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↘	↙
Traffic Volume (veh/h)	515	50	36	306	88	89
Future Volume (Veh/h)	515	50	36	306	88	89
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	536	52	38	319	92	93
Pedestrians	1			1	1	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			589		959	564
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			589		959	564
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			96		66	82
cM capacity (veh/h)			934		270	520
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	588	357	185			
Volume Left	0	38	92			
Volume Right	52	0	93			
cSH	1700	934	356			
Volume to Capacity	0.35	0.04	0.52			
Queue Length 95th (m)	0.0	1.0	22.9			
Control Delay (s)	0.0	1.4	25.6			
Lane LOS		A	D			
Approach Delay (s)	0.0	1.4	25.6			
Approach LOS			D			
<b>Intersection Summary</b>						
Average Delay			4.6			
Intersection Capacity Utilization			63.4%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 3: Alice Street/Mill Street & Main Street

2030 Future Total A.M.  
 12-14-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	545	2	8	384	1	11	0	17	3	0	0
Future Volume (Veh/h)	2	545	2	8	384	1	11	0	17	3	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	592	2	9	417	1	12	0	18	3	0	0
Pedestrians		1			1			4			4	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	422			598			1038	1041	598	1056	1042	422
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	422			598			1038	1041	598	1056	1042	422
tC, single (s)	4.1			4.2			7.3	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.7	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			99			94	100	96	98	100	100
cM capacity (veh/h)	1144			920			190	228	493	194	227	633
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	596	427	30	3								
Volume Left	2	9	12	3								
Volume Right	2	1	18	0								
cSH	1144	920	301	194								
Volume to Capacity	0.00	0.01	0.10	0.02								
Queue Length 95th (m)	0.0	0.2	2.6	0.4								
Control Delay (s)	0.0	0.3	18.3	23.8								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.0	0.3	18.3	23.8								
Approach LOS			C	C								
<b>Intersection Summary</b>												
Average Delay			0.7									
Intersection Capacity Utilization			40.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
4: Osprey Street & Grey Road 9/Main Street

2030 Future Total A.M.  
12-14-2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	8	387	21	5	302	1	66	3	12	78	2	3
Future Volume (Veh/h)	8	387	21	5	302	1	66	3	12	78	2	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	8	399	22	5	311	1	68	3	12	80	2	3
Pedestrians		1			1			5			5	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	317			426			758	758	416	767	768	318
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	317			426			758	758	416	767	768	318
tC, single (s)	4.1			4.1			7.2	6.5	6.4	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.5	3.7	4.0	3.3
p0 queue free %	99			100			78	99	98	72	99	100
cM capacity (veh/h)	1249			1139			309	332	601	281	328	724
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	429	317	83	85								
Volume Left	8	5	68	80								
Volume Right	22	1	12	3								
cSH	1249	1139	333	288								
Volume to Capacity	0.01	0.00	0.25	0.29								
Queue Length 95th (m)	0.2	0.1	7.7	9.6								
Control Delay (s)	0.2	0.2	19.4	22.6								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.2	0.2	19.4	22.6								
Approach LOS			C	C								
Intersection Summary												
Average Delay			4.0									
Intersection Capacity Utilization			37.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
5: Elm Street & Victoria Street East

2030 Future Total A.M.  
12-14-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↘	↙
Traffic Volume (veh/h)	27	71	9	23	118	10
Future Volume (Veh/h)	27	71	9	23	118	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Hourly flow rate (vph)	39	103	13	33	171	14
Pedestrians	1			1	4	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			146		154	96
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			146		154	96
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			99		79	99
cM capacity (veh/h)			1372		826	963
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	142	46	185			
Volume Left	0	13	171			
Volume Right	103	0	14			
cSH	1700	1372	835			
Volume to Capacity	0.08	0.01	0.22			
Queue Length 95th (m)	0.0	0.2	6.8			
Control Delay (s)	0.0	2.2	10.5			
Lane LOS			A			B
Approach Delay (s)	0.0	2.2	10.5			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			5.5			
Intersection Capacity Utilization			22.4%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
6: Highway 10 & Site Access

2030 Future Total A.M.  
12-14-2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	80	207	96	296	444	60
Future Volume (vph)	80	207	96	296	444	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0	0.0	45.0			30.0
Storage Lanes	1	1	1			1
Taper Length (m)	7.5		100.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.950		0.437			
Satd. Flow (perm)	1770	1583	814	1863	1863	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		225				65
Link Speed (k/h)	50			100	50	
Link Distance (m)	187.9			433.4	783.0	
Travel Time (s)	13.5			15.6	56.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	225	104	322	483	65
Shared Lane Traffic (%)						
Lane Group Flow (vph)	87	225	104	322	483	65
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	2.0
Trailing Detector (m)	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
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	2.0
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6

Lanes, Volumes, Timings  
6: Highway 10 & Site Access

2030 Future Total A.M.  
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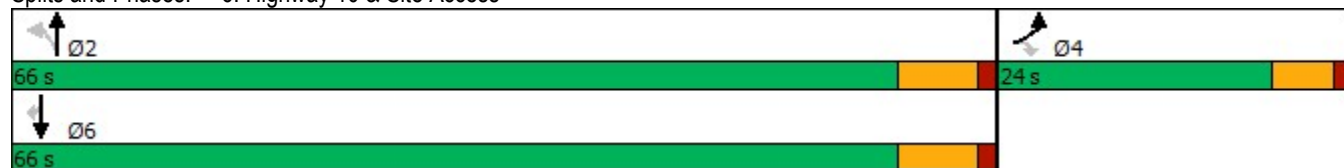
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	17.0	17.0	39.0	39.0	39.0	39.0
Minimum Split (s)	22.6	22.6	52.7	52.7	52.7	52.7
Total Split (s)	24.0	24.0	66.0	66.0	66.0	66.0
Total Split (%)	26.7%	26.7%	73.3%	73.3%	73.3%	73.3%
Maximum Green (s)	18.4	18.4	59.3	59.3	59.3	59.3
Yellow Time (s)	4.1	4.1	5.4	5.4	5.4	5.4
All-Red Time (s)	1.5	1.5	1.3	1.3	1.3	1.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	6.7	6.7	6.7	6.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.2	3.2	4.2	4.2	4.2	4.2
Recall Mode	None	None	None	None	None	None
Walk Time (s)	7.0	7.0	27.0	27.0	27.0	27.0
Flash Dont Walk (s)	10.0	10.0	19.0	19.0	19.0	19.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effect Green (s)	17.0	17.0	39.0	39.0	39.0	39.0
Actuated g/C Ratio	0.25	0.25	0.57	0.57	0.57	0.57
v/c Ratio	0.20	0.40	0.22	0.30	0.45	0.07
Control Delay	21.8	5.8	8.8	8.6	10.2	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	5.8	8.8	8.6	10.2	2.2
LOS	C	A	A	A	B	A
Approach Delay	10.2			8.6	9.3	
Approach LOS	B			A	A	
Queue Length 50th (m)	9.2	0.0	6.2	20.2	33.8	0.0
Queue Length 95th (m)	19.9	15.3	14.0	33.7	54.4	4.4
Internal Link Dist (m)	163.9			409.4	759.0	
Turn Bay Length (m)	35.0		45.0			30.0
Base Capacity (vph)	476	590	706	1617	1617	1382
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.38	0.15	0.20	0.30	0.05

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	68.3
Natural Cycle:	80
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.45
Intersection Signal Delay:	9.3
Intersection LOS:	A
Intersection Capacity Utilization:	95.0%
ICU Level of Service:	F
Analysis Period (min):	15

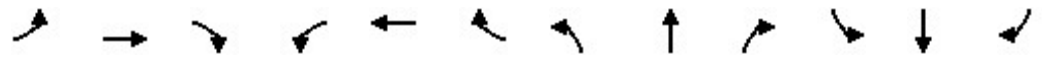


Splits and Phases: 6: Highway 10 & Site Access



Lanes, Volumes, Timings  
1: Highway 10 & Main Street/Grey Road 9

2030 Future Total P.M.  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	126	242	41	185	18	391	252	51	14	237	119
Future Volume (vph)	95	126	242	41	185	18	391	252	51	14	237	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0		0.0	100.0		0.0	110.0		0.0	90.0		85.0
Storage Lanes	1		0	1		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		0.901			0.987			0.975				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1625	0	1570	1697	0	1719	1750	0	1357	1696	1553
Flt Permitted	0.615			0.315			0.594			0.545		
Satd. Flow (perm)	1113	1625	0	520	1697	0	1075	1750	0	779	1696	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		111			5			17				135
Link Speed (k/h)		60			60			100				100
Link Distance (m)		570.6			258.9			783.0				495.7
Travel Time (s)		34.2			15.5			28.2				17.8
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	5%	8%	4%	15%	8%	37%	5%	6%	5%	33%	12%	4%
Adj. Flow (vph)	108	143	275	47	210	20	444	286	58	16	269	135
Shared Lane Traffic (%)												
Lane Group Flow (vph)	108	418	0	47	230	0	444	344	0	16	269	135
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		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6

Lanes, Volumes, Timings  
1: Highway 10 & Main Street/Grey Road 9

2030 Future Total P.M.  
12-14-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	32.6	32.6		32.6	32.6		32.6	32.6		32.6	32.6	32.6
Total Split (s)	35.0	35.0		35.0	35.0		55.0	55.0		55.0	55.0	55.0
Total Split (%)	38.9%	38.9%		38.9%	38.9%		61.1%	61.1%		61.1%	61.1%	61.1%
Maximum Green (s)	27.5	27.5		27.5	27.5		47.4	47.4		47.4	47.4	47.4
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.6	1.6		1.6	1.6		1.7	1.7		1.7	1.7	1.7
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)	7.5	7.5		7.5	7.5		7.6	7.6		7.6	7.6	7.6
Lead/Lag												
Lead-Lag Optimize?												
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)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	15.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	19.4	19.4		19.4	19.4		34.8	34.8		34.8	34.8	34.8
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.49	0.49		0.49	0.49	0.49
v/c Ratio	0.35	0.79		0.33	0.49		0.84	0.39		0.04	0.32	0.16
Control Delay	26.5	30.5		30.3	26.5		32.1	12.5		10.5	12.4	2.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	26.5	30.5		30.3	26.5		32.1	12.5		10.5	12.4	2.7
LOS	C	C		C	C		C	B		B	B	A
Approach Delay		29.7			27.1			23.6				9.2
Approach LOS		C			C			C				A
Queue Length 50th (m)	12.1	39.6		5.2	26.1		49.5	26.3		1.1	20.9	0.0
Queue Length 95th (m)	28.8	82.5		16.3	52.7		#114.7	50.6		4.4	40.8	7.8
Internal Link Dist (m)		546.6			234.9			759.0				471.7
Turn Bay Length (m)	120.0			100.0			110.0			90.0		85.0
Base Capacity (vph)	467	746		218	715		767	1253		555	1210	1146
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	0.23	0.56		0.22	0.32		0.58	0.27		0.03	0.22	0.12

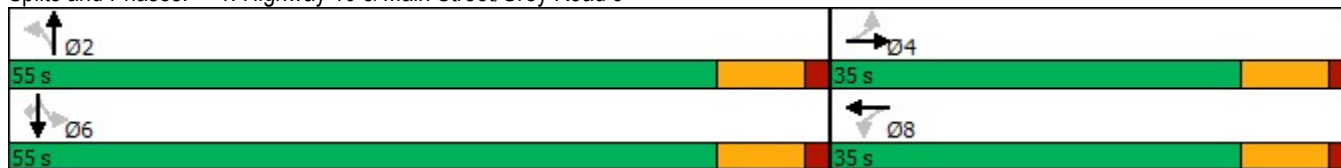
Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	70.4
Natural Cycle:	80
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.84
Intersection Signal Delay:	22.6
Intersection LOS:	C
Intersection Capacity Utilization:	93.3%
ICU Level of Service:	F
Analysis Period (min):	15

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

















Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 10 & Main Street/Grey Road 9



HCM Unsignalized Intersection Capacity Analysis  
 3: Alice Street/Mill Street & Main Street

2030 Future Total P.M.  
 12-14-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	534	14	19	625	7	11	0	8	3	0	3
Future Volume (Veh/h)	2	534	14	19	625	7	11	0	8	3	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	580	15	21	679	8	12	0	9	3	0	3
Pedestrians		1			1			11			11	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	698			606			1332	1342	600	1338	1346	695
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	698			606			1332	1342	600	1338	1346	695
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			91	100	98	98	100	99
cM capacity (veh/h)	899			973			126	147	500	124	146	441
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	597	708	21	6								
Volume Left	2	21	12	3								
Volume Right	15	8	9	3								
cSH	899	973	186	193								
Volume to Capacity	0.00	0.02	0.11	0.03								
Queue Length 95th (m)	0.1	0.5	3.0	0.8								
Control Delay (s)	0.1	0.6	26.8	24.2								
Lane LOS	A	A	D	C								
Approach Delay (s)	0.1	0.6	26.8	24.2								
Approach LOS			D	C								
<b>Intersection Summary</b>												
Average Delay			0.9									
Intersection Capacity Utilization			57.5%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
4: Osprey Street & Grey Road 9/Main Street

2030 Future Total P.M.  
12-14-2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	9	395	64	11	413	1	33	5	11	60	6	3
Future Volume (Veh/h)	9	395	64	11	413	1	33	5	11	60	6	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	9	407	66	11	426	1	34	5	11	62	6	3
Pedestrians		7			9			22			22	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			1			2			2	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	449			495			942	951	471	951	984	456
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	449			495			942	951	471	951	984	456
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.6
p0 queue free %	99			99			85	98	98	72	97	99
cM capacity (veh/h)	1101			1059			224	248	582	218	237	532
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	482	438	50	71								
Volume Left	9	11	34	62								
Volume Right	66	1	11	3								
cSH	1101	1059	262	225								
Volume to Capacity	0.01	0.01	0.19	0.32								
Queue Length 95th (m)	0.2	0.3	5.5	10.4								
Control Delay (s)	0.2	0.3	22.0	28.2								
Lane LOS	A	A	C	D								
Approach Delay (s)	0.2	0.3	22.0	28.2								
Approach LOS			C	D								
<b>Intersection Summary</b>												
Average Delay			3.2									
Intersection Capacity Utilization			41.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
5: Elm Street & Victoria Street East

2030 Future Total P.M.  
12-14-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↘	↙
Traffic Volume (veh/h)	38	116	14	17	72	18
Future Volume (Veh/h)	38	116	14	17	72	18
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Hourly flow rate (vph)	55	168	20	25	104	26
Pedestrians	34			34	14	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	3			3	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			237		252	187
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			237		252	187
tC, single (s)			4.1		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			98		85	97
cM capacity (veh/h)			1326		701	811
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	223	45	130			
Volume Left	0	20	104			
Volume Right	168	0	26			
cSH	1700	1326	720			
Volume to Capacity	0.13	0.02	0.18			
Queue Length 95th (m)	0.0	0.4	5.2			
Control Delay (s)	0.0	3.5	11.1			
Lane LOS			A	B		
Approach Delay (s)	0.0	3.5	11.1			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			4.0			
Intersection Capacity Utilization			25.7%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
6: Highway 10 & Site Access

2030 Future Total P.M.  
12-14-2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	83	137	238	610	444	75
Future Volume (vph)	83	137	238	610	444	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0	0.0	45.0			30.0
Storage Lanes	1	1	1			1
Taper Length (m)	7.5		100.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.950		0.438			
Satd. Flow (perm)	1770	1583	816	1863	1863	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		149				82
Link Speed (k/h)	50			50	50	
Link Distance (m)	187.9			433.4	783.0	
Travel Time (s)	13.5			31.2	56.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	149	259	663	483	82
Shared Lane Traffic (%)						
Lane Group Flow (vph)	90	149	259	663	483	82
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
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)	100	100	100			100
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	2.0
Trailing Detector (m)	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
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	2.0
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6



Lanes, Volumes, Timings  
6: Highway 10 & Site Access

2030 Future Total P.M.  
12-14-2022

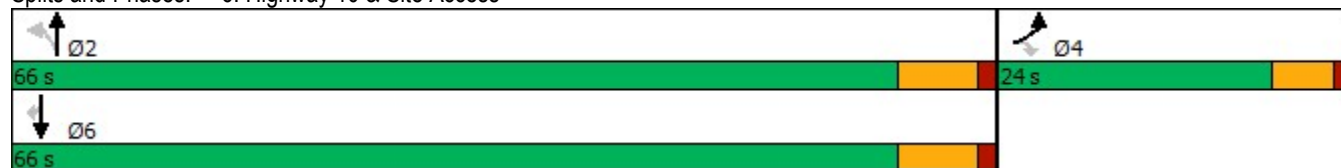


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	17.0	17.0	39.0	39.0	39.0	39.0
Minimum Split (s)	22.6	22.6	52.7	52.7	52.7	52.7
Total Split (s)	24.0	24.0	66.0	66.0	66.0	66.0
Total Split (%)	26.7%	26.7%	73.3%	73.3%	73.3%	73.3%
Maximum Green (s)	18.4	18.4	59.3	59.3	59.3	59.3
Yellow Time (s)	4.1	4.1	5.4	5.4	5.4	5.4
All-Red Time (s)	1.5	1.5	1.3	1.3	1.3	1.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	6.7	6.7	6.7	6.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.2	3.2	4.2	4.2	4.2	4.2
Recall Mode	None	None	None	None	None	None
Walk Time (s)	7.0	7.0	27.0	27.0	27.0	27.0
Flash Dont Walk (s)	10.0	10.0	19.0	19.0	19.0	19.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	17.0	17.0	39.3	39.3	39.3	39.3
Actuated g/C Ratio	0.25	0.25	0.57	0.57	0.57	0.57
v/c Ratio	0.21	0.30	0.55	0.62	0.45	0.09
Control Delay	22.2	6.0	14.8	12.9	10.1	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.2	6.0	14.8	12.9	10.1	2.0
LOS	C	A	B	B	B	A
Approach Delay	12.1			13.5	9.0	
Approach LOS	B			B	A	
Queue Length 50th (m)	9.6	0.0	19.7	53.3	33.8	0.0
Queue Length 95th (m)	21.1	12.9	41.5	84.6	54.0	4.9
Internal Link Dist (m)	163.9			409.4	759.0	
Turn Bay Length (m)	35.0		45.0			30.0
Base Capacity (vph)	474	533	705	1610	1610	1379
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.28	0.37	0.41	0.30	0.06

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	68.6
Natural Cycle:	80
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.62
Intersection Signal Delay:	11.8
Intersection LOS:	B
Intersection Capacity Utilization:	95.0%
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 6: Highway 10 & Site Access



Lanes, Volumes, Timings  
1: Highway 10 & Main Street/Grey Road 9

2035 Future Total A.M.  
12-14-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	134	311	22	113	5	120	220	59	7	193	98
Future Volume (vph)	93	134	311	22	113	5	120	220	59	7	193	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0		0.0	100.0		0.0	110.0		0.0	90.0		85.0
Storage Lanes	1		0	1		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		0.895			0.993			0.968				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1504	1577	0	1410	1605	0	1597	1527	0	1087	1667	1417
Flt Permitted	0.671			0.331			0.621			0.564		
Satd. Flow (perm)	1062	1577	0	491	1605	0	1044	1527	0	646	1667	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		134			3			23				111
Link Speed (k/h)		60			60			100				100
Link Distance (m)		570.6			258.9			783.0				495.7
Travel Time (s)		34.2			15.5			28.2				17.8
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	20%	19%	3%	28%	16%	50%	13%	23%	11%	66%	14%	14%
Adj. Flow (vph)	106	152	353	25	128	6	136	250	67	8	219	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	106	505	0	25	134	0	136	317	0	8	219	111
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		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6

Lanes, Volumes, Timings  
1: Highway 10 & Main Street/Grey Road 9

2035 Future Total A.M.  
12-14-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	32.6	32.6		32.6	32.6		32.6	32.6		32.6	32.6	32.6
Total Split (s)	35.0	35.0		35.0	35.0		55.0	55.0		55.0	55.0	55.0
Total Split (%)	38.9%	38.9%		38.9%	38.9%		61.1%	61.1%		61.1%	61.1%	61.1%
Maximum Green (s)	27.5	27.5		27.5	27.5		47.4	47.4		47.4	47.4	47.4
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.6	1.6		1.6	1.6		1.7	1.7		1.7	1.7	1.7
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)	7.5	7.5		7.5	7.5		7.6	7.6		7.6	7.6	7.6
Lead/Lag												
Lead-Lag Optimize?												
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)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	15.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	21.2	21.2		21.2	21.2		20.9	20.9		20.9	20.9	20.9
Actuated g/C Ratio	0.37	0.37		0.37	0.37		0.36	0.36		0.36	0.36	0.36
v/c Ratio	0.27	0.76		0.14	0.23		0.36	0.56		0.03	0.36	0.19
Control Delay	14.5	19.6		13.9	12.9		18.3	19.1		14.3	16.7	4.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	14.5	19.6		13.9	12.9		18.3	19.1		14.3	16.7	4.5
LOS	B	B		B	B		B	B		B	B	A
Approach Delay		18.7			13.1			18.9			12.7	
Approach LOS		B			B			B			B	
Queue Length 50th (m)	7.6	32.7		1.7	9.3		10.7	25.1		0.6	17.3	0.0
Queue Length 95th (m)	18.5	68.2		6.5	20.6		25.9	51.9		3.2	36.1	8.6
Internal Link Dist (m)		546.6			234.9			759.0			471.7	
Turn Bay Length (m)	120.0			100.0			110.0			90.0		85.0
Base Capacity (vph)	514	833		237	779		871	1279		539	1392	1201
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	0.21	0.61		0.11	0.17		0.16	0.25		0.01	0.16	0.09

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	57.4
Natural Cycle:	70
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.76
Intersection Signal Delay:	16.9
Intersection Capacity Utilization	78.4%
Analysis Period (min)	15
Intersection LOS:	B
ICU Level of Service	D

Splits and Phases: 1: Highway 10 & Main Street/Grey Road 9



HCM Unsignalized Intersection Capacity Analysis  
2: Russell Street & Main Street

















2035 Future Total A.M.  
12-14-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	538	51	37	324	90	93
Future Volume (Veh/h)	538	51	37	324	90	93
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	560	53	39	338	94	97
Pedestrians	1			1	1	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			614		1004	588
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			614		1004	588
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			96		63	81
cM capacity (veh/h)			913		253	504
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	613	377	191			
Volume Left	0	39	94			
Volume Right	53	0	97			
cSH	1700	913	338			
Volume to Capacity	0.36	0.04	0.56			
Queue Length 95th (m)	0.0	1.1	26.4			
Control Delay (s)	0.0	1.4	28.6			
Lane LOS		A	D			
Approach Delay (s)	0.0	1.4	28.6			
Approach LOS			D			
<b>Intersection Summary</b>						
Average Delay			5.1			
Intersection Capacity Utilization			65.5%	ICU Level of Service	C	
Analysis Period (min)			15			

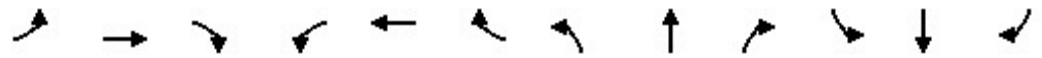
HCM Unsignalized Intersection Capacity Analysis  
3: Alice Street/Mill Street & Main Street

2035 Future Total A.M.  
12-14-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	567	2	8	402	1	12	0	18	4	0	0
Future Volume (Veh/h)	2	567	2	8	402	1	12	0	18	4	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	616	2	9	437	1	13	0	20	4	0	0
Pedestrians		1			1			4			4	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	442			622			1082	1085	622	1102	1086	442
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	442			622			1082	1085	622	1102	1086	442
tC, single (s)	4.1			4.2			7.3	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.7	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			99			93	100	96	98	100	100
cM capacity (veh/h)	1125			900			177	214	478	180	214	617
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	620	447	33	4								
Volume Left	2	9	13	4								
Volume Right	2	1	20	0								
cSH	1125	900	286	180								
Volume to Capacity	0.00	0.01	0.12	0.02								
Queue Length 95th (m)	0.0	0.2	3.1	0.5								
Control Delay (s)	0.0	0.3	19.2	25.5								
Lane LOS	A	A	C	D								
Approach Delay (s)	0.0	0.3	19.2	25.5								
Approach LOS			C	D								
<b>Intersection Summary</b>												
Average Delay			0.8									
Intersection Capacity Utilization			41.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 4: Osprey Street & Grey Road 9/Main Street

2035 Future Total A.M.  
 12-14-2022

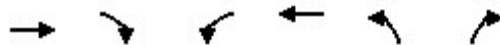


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	8	407	21	5	317	1	67	4	13	79	2	4
Future Volume (Veh/h)	8	407	21	5	317	1	67	4	13	79	2	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	8	420	22	5	327	1	69	4	13	81	2	4
Pedestrians		1			1			5			5	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	333			447			796	795	437	806	806	334
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	333			447			796	795	437	806	806	334
tC, single (s)	4.1			4.1			7.2	6.5	6.4	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.5	3.7	4.0	3.3
p0 queue free %	99			100			76	99	98	69	99	99
cM capacity (veh/h)	1233			1119			290	316	584	263	312	709
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	450	333	86	87								
Volume Left	8	5	69	81								
Volume Right	22	1	13	4								
cSH	1233	1119	316	272								
Volume to Capacity	0.01	0.00	0.27	0.32								
Queue Length 95th (m)	0.2	0.1	8.7	10.7								
Control Delay (s)	0.2	0.2	20.6	24.3								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.2	0.2	20.6	24.3								
Approach LOS			C	C								
<b>Intersection Summary</b>												
Average Delay			4.2									
Intersection Capacity Utilization			39.2%		ICU Level of Service				A			
Analysis Period (min)			15									



HCM Unsignalized Intersection Capacity Analysis  
5: Elm Street & Victoria Street East

2035 Future Total A.M.  
12-14-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	←
Traffic Volume (veh/h)	29	74	10	24	122	11
Future Volume (Veh/h)	29	74	10	24	122	11
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Hourly flow rate (vph)	42	107	14	35	177	16
Pedestrians	1			1	4	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			153		164	100
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			153		164	100
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			99		78	98
cM capacity (veh/h)			1364		815	956
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	149	49	193			
Volume Left	0	14	177			
Volume Right	107	0	16			
cSH	1700	1364	825			
Volume to Capacity	0.09	0.01	0.23			
Queue Length 95th (m)	0.0	0.2	7.2			
Control Delay (s)	0.0	2.2	10.7			
Lane LOS			A			B
Approach Delay (s)	0.0	2.2	10.7			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			5.6			
Intersection Capacity Utilization			22.8%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
6: Highway 10 & Site Access

2035 Future Total A.M.  
12-14-2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	80	207	96	317	466	60
Future Volume (vph)	80	207	96	317	466	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0	0.0	45.0			30.0
Storage Lanes	1	1	1			1
Taper Length (m)	7.5		100.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.950		0.418			
Satd. Flow (perm)	1770	1583	779	1863	1863	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		225				65
Link Speed (k/h)	50			100	50	
Link Distance (m)	187.9			433.4	783.0	
Travel Time (s)	13.5			15.6	56.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	225	104	345	507	65
Shared Lane Traffic (%)						
Lane Group Flow (vph)	87	225	104	345	507	65
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	2.0
Trailing Detector (m)	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
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	2.0
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6

Lanes, Volumes, Timings  
6: Highway 10 & Site Access

2035 Future Total A.M.  
12-14-2022

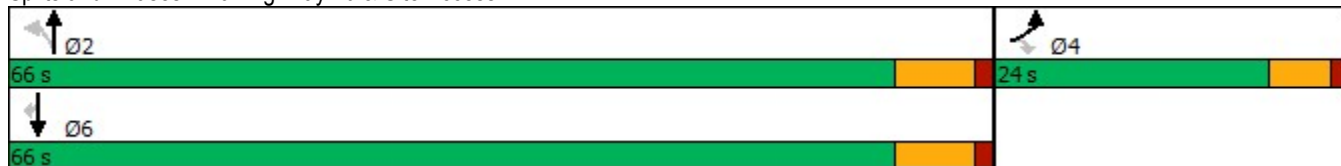


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	17.0	17.0	39.0	39.0	39.0	39.0
Minimum Split (s)	22.6	22.6	52.7	52.7	52.7	52.7
Total Split (s)	24.0	24.0	66.0	66.0	66.0	66.0
Total Split (%)	26.7%	26.7%	73.3%	73.3%	73.3%	73.3%
Maximum Green (s)	18.4	18.4	59.3	59.3	59.3	59.3
Yellow Time (s)	4.1	4.1	5.4	5.4	5.4	5.4
All-Red Time (s)	1.5	1.5	1.3	1.3	1.3	1.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	6.7	6.7	6.7	6.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.2	3.2	4.2	4.2	4.2	4.2
Recall Mode	None	None	None	None	None	None
Walk Time (s)	7.0	7.0	27.0	27.0	27.0	27.0
Flash Dont Walk (s)	10.0	10.0	19.0	19.0	19.0	19.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effect Green (s)	17.0	17.0	39.0	39.0	39.0	39.0
Actuated g/C Ratio	0.25	0.25	0.57	0.57	0.57	0.57
v/c Ratio	0.20	0.40	0.23	0.32	0.48	0.07
Control Delay	21.8	5.8	9.0	8.8	10.5	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	5.8	9.0	8.8	10.5	2.2
LOS	C	A	A	A	B	A
Approach Delay	10.2			8.8	9.6	
Approach LOS	B			A	A	
Queue Length 50th (m)	9.2	0.0	6.2	22.0	36.1	0.0
Queue Length 95th (m)	19.9	15.3	14.2	36.5	57.9	4.4
Internal Link Dist (m)	163.9			409.4	759.0	
Turn Bay Length (m)	35.0		45.0			30.0
Base Capacity (vph)	476	590	676	1617	1617	1382
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.38	0.15	0.21	0.31	0.05

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	68.3
Natural Cycle:	80
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.48
Intersection Signal Delay:	9.5
Intersection LOS:	A
Intersection Capacity Utilization:	95.0%
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 6: Highway 10 & Site Access



Lanes, Volumes, Timings  
1: Highway 10 & Main Street/Grey Road 9

2035 Future Total P.M.  
12-14-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	133	251	42	195	19	405	270	54	15	253	127
Future Volume (vph)	102	133	251	42	195	19	405	270	54	15	253	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	120.0		0.0	100.0		0.0	110.0		0.0	90.0		85.0
Storage Lanes	1		0	1		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		0.902			0.986			0.975				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1626	0	1570	1694	0	1719	1750	0	1357	1696	1553
Flt Permitted	0.588			0.285			0.583			0.518		
Satd. Flow (perm)	1064	1626	0	471	1694	0	1055	1750	0	740	1696	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		109			6			17				144
Link Speed (k/h)		60			60			100				100
Link Distance (m)		570.6			258.9			783.0				495.7
Travel Time (s)		34.2			15.5			28.2				17.8
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	5%	8%	4%	15%	8%	37%	5%	6%	5%	33%	12%	4%
Adj. Flow (vph)	116	151	285	48	222	22	460	307	61	17	288	144
Shared Lane Traffic (%)												
Lane Group Flow (vph)	116	436	0	48	244	0	460	368	0	17	288	144
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		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2				6

Lanes, Volumes, Timings  
1: Highway 10 & Main Street/Grey Road 9

2035 Future Total P.M.  
12-14-2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		20.0	20.0	20.0
Minimum Split (s)	32.6	32.6		32.6	32.6		32.6	32.6		32.6	32.6	32.6
Total Split (s)	35.0	35.0		35.0	35.0		55.0	55.0		55.0	55.0	55.0
Total Split (%)	38.9%	38.9%		38.9%	38.9%		61.1%	61.1%		61.1%	61.1%	61.1%
Maximum Green (s)	27.5	27.5		27.5	27.5		47.4	47.4		47.4	47.4	47.4
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.6	1.6		1.6	1.6		1.7	1.7		1.7	1.7	1.7
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)	7.5	7.5		7.5	7.5		7.6	7.6		7.6	7.6	7.6
Lead/Lag												
Lead-Lag Optimize?												
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)	15.0	15.0		15.0	15.0		15.0	15.0		15.0	15.0	15.0
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	10.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	20.8	20.8		20.8	20.8		37.0	37.0		37.0	37.0	37.0
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.50	0.50		0.50	0.50	0.50
v/c Ratio	0.39	0.81		0.36	0.51		0.87	0.42		0.05	0.34	0.17
Control Delay	28.1	33.1		32.9	27.5		36.6	13.0		10.7	12.8	2.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	28.1	33.1		32.9	27.5		36.6	13.0		10.7	12.8	2.6
LOS	C	C		C	C		D	B		B	B	A
Approach Delay		32.1			28.4			26.1			9.4	
Approach LOS		C			C			C			A	
Queue Length 50th (m)	15.0	49.3		6.2	31.9		58.9	31.8		1.3	25.1	0.0
Queue Length 95th (m)	31.1	#89.2		17.2	55.9		#123.6	54.7		4.7	43.9	8.0
Internal Link Dist (m)		546.6			234.9			759.0			471.7	
Turn Bay Length (m)	120.0			100.0			110.0			90.0		85.0
Base Capacity (vph)	422	711		186	676		716	1194		502	1152	1101
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	0.27	0.61		0.26	0.36		0.64	0.31		0.03	0.25	0.13

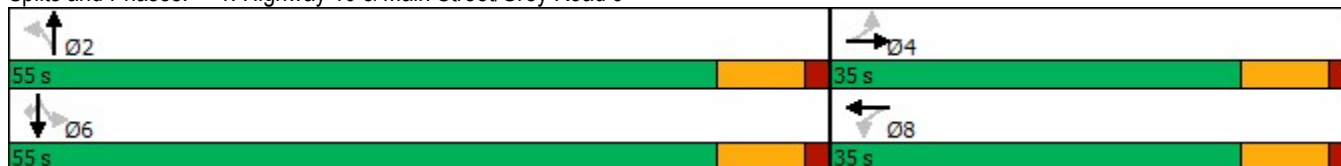
Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	73.9
Natural Cycle:	80
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.87
Intersection Signal Delay:	24.4
Intersection LOS:	C
Intersection Capacity Utilization:	95.0%
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 & Main Street/Grey Road 9



HCM Unsignalized Intersection Capacity Analysis  
2: Russell Street & Main Street

2035 Future Total P.M.  
12-14-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↘	↙
Traffic Volume (veh/h)	444	89	110	646	57	73
Future Volume (Veh/h)	444	89	110	646	57	73
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	462	93	115	673	59	76
Pedestrians	3			3	8	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	0			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			563		1422	520
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			563		1422	520
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			89		56	86
cM capacity (veh/h)			1012		133	551
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	555	788	135			
Volume Left	0	115	59			
Volume Right	93	0	76			
cSH	1700	1012	232			
Volume to Capacity	0.33	0.11	0.58			
Queue Length 95th (m)	0.0	3.1	26.3			
Control Delay (s)	0.0	2.8	40.0			
Lane LOS		A	E			
Approach Delay (s)	0.0	2.8	40.0			
Approach LOS			E			
<b>Intersection Summary</b>						
Average Delay			5.1			
Intersection Capacity Utilization			86.6%	ICU Level of Service	E	
Analysis Period (min)			15			



HCM Unsignalized Intersection Capacity Analysis  
 3: Alice Street/Mill Street & Main Street

2035 Future Total P.M.  
 12-14-2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	2	558	15	21	650	7	12	0	8	4	0	4
Future Volume (Veh/h)	2	558	15	21	650	7	12	0	8	4	0	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	607	16	23	707	8	13	0	9	4	0	4
Pedestrians		1			1			11			11	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	726			634			1392	1402	627	1397	1406	723
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	726			634			1392	1402	627	1397	1406	723
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			89	100	98	96	100	99
cM capacity (veh/h)	878			950			114	135	482	112	134	425
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	625	738	22	8								
Volume Left	2	23	13	4								
Volume Right	16	8	9	4								
cSH	878	950	166	178								
Volume to Capacity	0.00	0.02	0.13	0.05								
Queue Length 95th (m)	0.1	0.6	3.6	1.1								
Control Delay (s)	0.1	0.6	30.0	26.2								
Lane LOS	A	A	D	D								
Approach Delay (s)	0.1	0.6	30.0	26.2								
Approach LOS			D	D								
<b>Intersection Summary</b>												
Average Delay			1.0									
Intersection Capacity Utilization			60.4%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 4: Osprey Street & Grey Road 9/Main Street

2035 Future Total P.M.  
 12-14-2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	10	415	65	12	432	1	33	5	12	61	6	4
Future Volume (Veh/h)	10	415	65	12	432	1	33	5	12	61	6	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	10	428	67	12	445	1	34	5	12	63	6	4
Pedestrians		7			9			22			22	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		1			1			2			2	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	468			517			987	996	492	996	1028	474
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	468			517			987	996	492	996	1028	474
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.6
p0 queue free %	99			99			84	98	98	69	97	99
cM capacity (veh/h)	1084			1040			207	233	566	202	223	519
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	505	458	51	73								
Volume Left	10	12	34	63								
Volume Right	67	1	12	4								
cSH	1084	1040	247	211								
Volume to Capacity	0.01	0.01	0.21	0.35								
Queue Length 95th (m)	0.2	0.3	6.1	11.7								
Control Delay (s)	0.3	0.4	23.4	30.9								
Lane LOS	A	A	C	D								
Approach Delay (s)	0.3	0.4	23.4	30.9								
Approach LOS			C	D								
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			43.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
5: Elm Street & Victoria Street East

2035 Future Total P.M.  
12-14-2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↘	↙
Traffic Volume (veh/h)	41	120	15	18	74	19
Future Volume (Veh/h)	41	120	15	18	74	19
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69
Hourly flow rate (vph)	59	174	22	26	107	28
Pedestrians	34			34	14	
Lane Width (m)	3.6			3.6	3.6	
Walking Speed (m/s)	1.2			1.2	1.2	
Percent Blockage	3			3	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			247		264	194
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			247		264	194
tC, single (s)			4.1		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			98		84	97
cM capacity (veh/h)			1315		689	804
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	233	48	135			
Volume Left	0	22	107			
Volume Right	174	0	28			
cSH	1700	1315	710			
Volume to Capacity	0.14	0.02	0.19			
Queue Length 95th (m)	0.0	0.4	5.6			
Control Delay (s)	0.0	3.6	11.3			
Lane LOS			A			B
Approach Delay (s)	0.0	3.6	11.3			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			4.1			
Intersection Capacity Utilization			26.8%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings  
6: Highway 10 & Site Access

2035 Future Total P.M.  
12-14-2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	83	137	238	645	470	75
Future Volume (vph)	83	137	238	645	470	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	35.0	0.0	45.0			30.0
Storage Lanes	1	1	1			1
Taper Length (m)	7.5		100.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	1863	1863	1583
Flt Permitted	0.950		0.417			
Satd. Flow (perm)	1770	1583	777	1863	1863	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		149				82
Link Speed (k/h)	50			50	50	
Link Distance (m)	187.9			433.4	783.0	
Travel Time (s)	13.5			31.2	56.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	149	259	701	511	82
Shared Lane Traffic (%)						
Lane Group Flow (vph)	90	149	259	701	511	82
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
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)	100	100	100			100
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (m)	2.0	2.0	2.0	10.0	10.0	2.0
Trailing Detector (m)	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
Detector 1 Size(m)	2.0	2.0	2.0	0.6	0.6	2.0
Detector 1 Type	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
Detector 1 Queue (s)	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
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6

Lanes, Volumes, Timings  
6: Highway 10 & Site Access

2035 Future Total P.M.  
12-14-2022

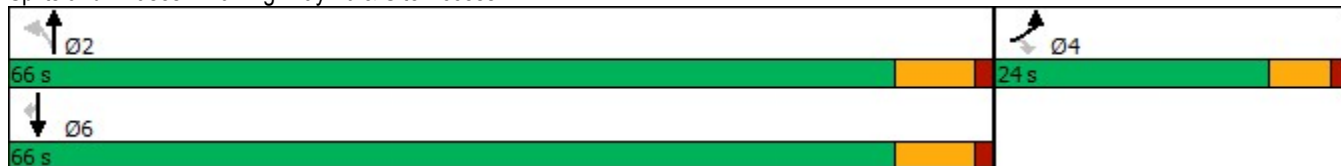


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	17.0	17.0	39.0	39.0	39.0	39.0
Minimum Split (s)	22.6	22.6	52.7	52.7	52.7	52.7
Total Split (s)	24.0	24.0	66.0	66.0	66.0	66.0
Total Split (%)	26.7%	26.7%	73.3%	73.3%	73.3%	73.3%
Maximum Green (s)	18.4	18.4	59.3	59.3	59.3	59.3
Yellow Time (s)	4.1	4.1	5.4	5.4	5.4	5.4
All-Red Time (s)	1.5	1.5	1.3	1.3	1.3	1.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	6.7	6.7	6.7	6.7
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.2	3.2	4.2	4.2	4.2	4.2
Recall Mode	None	None	None	None	None	None
Walk Time (s)	7.0	7.0	27.0	27.0	27.0	27.0
Flash Dont Walk (s)	10.0	10.0	19.0	19.0	19.0	19.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	17.0	17.0	40.1	40.1	40.1	40.1
Actuated g/C Ratio	0.24	0.24	0.58	0.58	0.58	0.58
v/c Ratio	0.21	0.30	0.58	0.65	0.48	0.09
Control Delay	23.0	6.3	15.6	13.4	10.3	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	6.3	15.6	13.4	10.3	1.9
LOS	C	A	B	B	B	A
Approach Delay	12.6			14.0	9.1	
Approach LOS	B			B	A	
Queue Length 50th (m)	9.6	0.0	20.1	58.2	36.5	0.0
Queue Length 95th (m)	22.4	13.5	42.7	91.2	57.3	4.7
Internal Link Dist (m)	163.9			409.4	759.0	
Turn Bay Length (m)	35.0		45.0			30.0
Base Capacity (vph)	469	529	664	1593	1593	1366
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.28	0.39	0.44	0.32	0.06

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	69.4
Natural Cycle:	80
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.65
Intersection Signal Delay:	12.2
Intersection LOS:	B
Intersection Capacity Utilization:	95.0%
ICU Level of Service:	F
Analysis Period (min):	15

Splits and Phases: 6: Highway 10 & Site Access



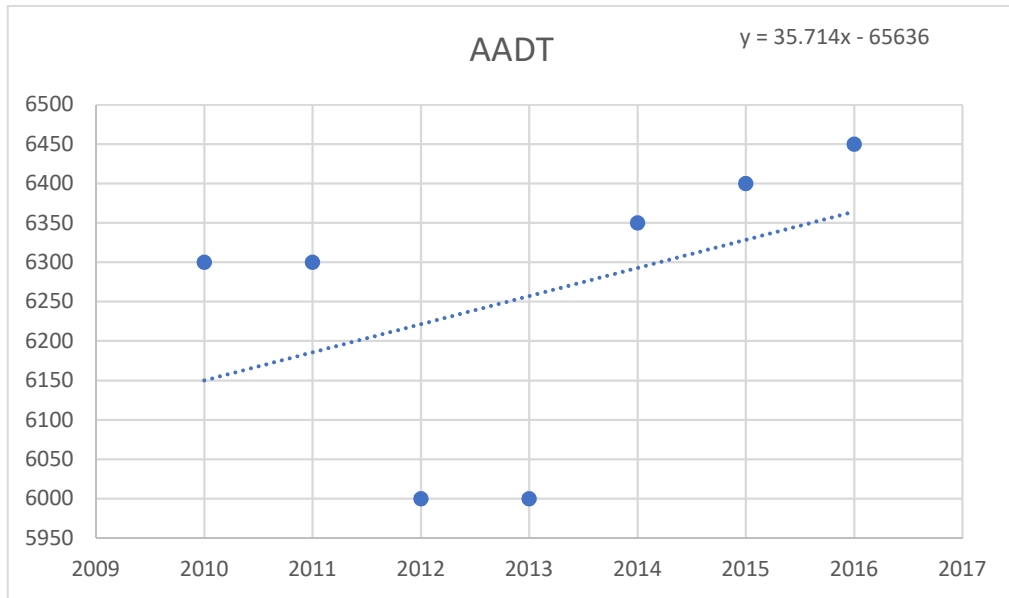
# APPENDIX D

## Growth Rate Analysis

MTO Data - Hwy 10 b/w Shelburn and Flesherton

Year	AADT
2010	6300
2011	6300
2012	6000
2013	6000
2014	6350
2015	6400
2016	6450

AADT	
2010	6149.14
2016	6363.424
Growth Rate	0.57%







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## **Provincial Highways**

## **Traffic Volumes**

**1988-2016**

King's Highways / Secondary Highways / Tertiary Roads

### **Ministry Contact:**

Traffic Office (905)-704-2960

### **Abstract:**

This annual publication contains averaged traffic volume information and accident rate information for each of the sections of highway under MTO jurisdiction.

### **Key Words:**

Annual Average Daily Traffic volume (AADT), Summer Average Daily Traffic volume (SADT), Summer Average Weekday Traffic volume (SAWDT), Winter Average Daily Traffic volume (WADT), Accident Rate (AR)

## PREFACE

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Traffic volume information is used by many people to assist them in assessing the viability of business proposals, land use options, marketing, advertising, and a host of other activities. This publication, **Provincial Highways Traffic Volumes 1988-2016**, provides traffic volumes on an annual and seasonal average basis for selected links in the provincial highway network. The traffic pattern type and accident rates on the selected links are also indicated.

Some highway routes which have not yet been assigned an official highway number, are included under the title Selected 7000 Series Highways. **The Highway 407 ETR is maintained by 407 ETR Concession Company Ltd. and is not included in this publication. For information contact the 407 ETR Traffic**

**Department at (905) 265-4070.** Site or time specific information not contained herein may be obtained from the Ministry of Transportation's Regional Traffic Sections, located in London, Toronto, Kingston, North Bay and Thunder Bay. Contact MTO INFO at 1-800-268-4686 for the appropriate regional phone number.

The statistics contained herein have been prepared based on data (both electronic and otherwise) obtained from sources considered to be reliable. The Ministry makes no representation or warranty, expressed or implied with respect to its accuracy or completeness. This publication also supersedes any previously published publications.

Highway	Location Description	Dist. (KM)	Year	Pattern Type	AADT	SADT	SAWDT	WADT	AR
			2002	IR	16,200	19,800	17,400	14,200	0.6
			2003	IR	16,600	20,300	17,800	14,600	0.6
			2004	IR	16,900	20,200	18,000	14,900	1.1
			2005	IR	17,200	20,500	18,200	15,100	0.0
			2006	IR	17,600	21,200	19,200	14,900	2.1
			2007	IR	17,900	21,700	21,600	15,200	0.5
			2008	IR	18,200	22,000	21,600	15,600	0.0
			2009	IR	18,800	22,200	19,800	16,500	0.5
			2010	IR	19,200	22,500	20,100	16,800	0.0
			2011	IR	19,200	22,800	22,500	16,300	N/A
			2012	IR	19,200	22,800	22,300	16,500	N/A
			2013	IR	19,400	23,100	24,800	16,500	N/A
			2014	IR	20,300	24,200	24,200	17,300	N/A
			2015	IR	20,700	24,600	24,600	17,600	N/A
			2016	IR	21,000	25,000	25,000	17,900	N/A
10	SHELBURNE S LTS - START OF NA	1.0							
10	SHELBURNE N LTS - END OF NA	33.7	1988	LT	4,300	5,500	4,700	3,400	1.1
			1989	LT	4,500	5,800	4,950	3,650	1.4
			1990	LT	4,850	6,100	5,300	3,950	0.8
			1991	LT	5,150	6,400	5,700	4,250	1.0
			1992	LT	4,900	6,000	5,300	4,150	1.2
			1993	LT	5,050	6,200	5,200	4,200	0.6
			1994	LT	5,100	6,400	5,450	4,350	1.1
			1995	LT	5,250	6,500	5,600	4,400	0.8
			1996	LT	4,950	6,150	5,450	4,350	1.0
			1997	LT	5,550	6,900	6,100	4,900	0.9
			1998	LT	5,750	7,050	6,350	5,050	0.5
			1999	LT	5,900	7,250	6,450	5,150	0.8
			2000	LT	5,650	6,850	6,050	4,950	0.8
			2001	LT	5,750	7,000	6,150	5,000	0.6
			2002	LT	6,300	7,700	6,750	5,500	0.8
			2003	LT	5,900	7,200	6,300	5,200	0.9
			2004	LT	5,800	7,250	6,500	4,700	1.0

Highway	Location Description	Dist. (KM)	Year	Pattern Type	AADT	SADT	SAWDT	WADT	AR
			2005	LT	5,950	7,400	6,600	4,800	0.8
			2006	LT	5,900	7,100	6,450	5,000	0.8
			2007	LT	6,100	7,400	7,350	5,150	1.0
			2008	LT	5,900	7,150	7,000	5,050	0.5
			2009	LT	6,250	7,100	6,900	5,650	0.5
			2010	LT	6,300	7,150	6,900	5,700	0.3
			2011	LT	6,300	7,500	7,350	5,350	N/A
			2012	LT	6,000	8,050	7,700	4,450	N/A
			2013	LT	6,000	8,050	8,200	4,450	N/A
			2014	LT	6,350	8,550	8,650	4,700	N/A
			2015	LT	6,400	8,600	8,700	4,750	N/A
			2016	LT	6,450	8,650	8,800	4,800	N/A
10	CAMPBELL ST-FLESHERTON - START OF NA	0.5							
10	MARGARET ST - END OF NA	9.0	1988	LT	4,150	5,300	4,550	3,300	1.0
			1989	LT	4,350	5,600	4,800	3,550	0.6
			1990	LT	4,550	5,700	5,000	3,700	0.5
			1991	LT	4,550	5,700	5,000	3,750	0.9
			1992	LT	4,650	5,700	5,100	3,950	0.5
			1993	LT	4,800	5,800	5,100	4,100	0.3
			1994	LT	4,900	6,000	5,300	4,150	0.6
			1995	LT	5,050	6,200	5,450	4,400	0.7
			1996	LT	5,050	6,250	5,550	4,450	0.7
			1997	LT	5,350	6,650	5,900	4,700	1.0
			1998	LT	5,450	6,700	6,000	4,750	0.5
			1999	LT	5,700	7,000	6,200	5,000	0.7
			2000	LT	5,900	7,150	6,350	5,150	1.1
			2001	LT	6,050	7,400	6,450	5,250	0.8
			2002	LT	6,300	7,700	6,750	5,500	0.6
			2003	LT	6,650	8,100	7,100	5,850	0.6
			2004	LT	6,600	7,900	7,000	5,800	0.9
			2005	LT	6,650	7,950	7,050	5,800	0.7
			2006	LT	6,600	7,950	7,200	5,600	0.8
			2007	LT	6,700	8,100	8,100	5,700	0.6

# APPENDIX E

## Glenelg Development Phase 1 – 3 TIS Excerpts

**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**

The material in this report reflects best judgment in light of the information available at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. C.F. Crozier & Associates Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.



## 2 INTRODUCTION

### 2.1 Background

CF Crozier & Associates Inc. (Crozier) was retained by 2358737 Ontario Inc. ("the Developer") to complete a Traffic Impact Study (TIS) to support a Zoning By-law Amendment, Official Plan Amendment and Draft Plan Application for a proposed residential development located in the west end of the Community of Dundalk, Township of Southgate, County of Grey.

### 2.2 Purpose

This TIS is being prepared to support the Zoning By-law Amendment, Official Plan Amendment and Draft Plan Application for the proposed residential development (referred to as "Glenelg") in the Community of Dundalk.

The purpose of the study was to assess the impacts of the proposed development on the boundary road network and to recommend any mitigation measures, if warranted.

The study reviews the following main aspects of the proposed residential development from a transportation engineering perspective:

- Existing, future background, and future total traffic operations at the study intersections
- Forecasted trip generation of the proposed development
- Auxiliary lane requirements at the proposed site accesses
- Sight distance requirements at the proposed site accesses

The Terms of Reference for the study were confirmed with staff from Triton Engineering, who are the engineering reviewers for the Township of Southgate, with correspondence included in **Appendix A**.

### 2.3 Development Proposal

The site statistics proposed on the Draft Plan have been summarized in **Table 1** below. Access to the site will be provided by two accesses to Glenelg Street, spaced approximately 220 metres apart. The two internal roads connecting to Glenelg Street are described as Street "A" and Street "B" on the Draft Plan. Street "B" is located approximately 130 metres west of the intersection of Dundalk Street and Glenelg Street/Grey Street.

The development also proposes an internal walkway and pedestrian connection to the open space, park space and the existing Grey County CP Rail Trail.

It has been assumed that for the purposes of this analysis, the entire development will be built in one phase.

**Table 1: Development Site Statistics**

Development Type	Unit Type	Conceptual Site Plan (October 25, 2017)
Residential	Single Family Detached	127
	Townhomes	26

The Draft Plan prepared by MHBC Planning (September 24, 2018) has been included as **Figure 1**.

“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, 10<sup>th</sup> 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, 10<sup>th</sup> 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, 10<sup>th</sup> 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
<b>Total</b>	<b>Primary</b>	<b>Weekday A.M.</b>	<b>26</b>	<b>81</b>	<b>107</b>
	<b>Primary</b>	<b>Weekday P.M.</b>	<b>92</b>	<b>54</b>	<b>146</b>

### 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

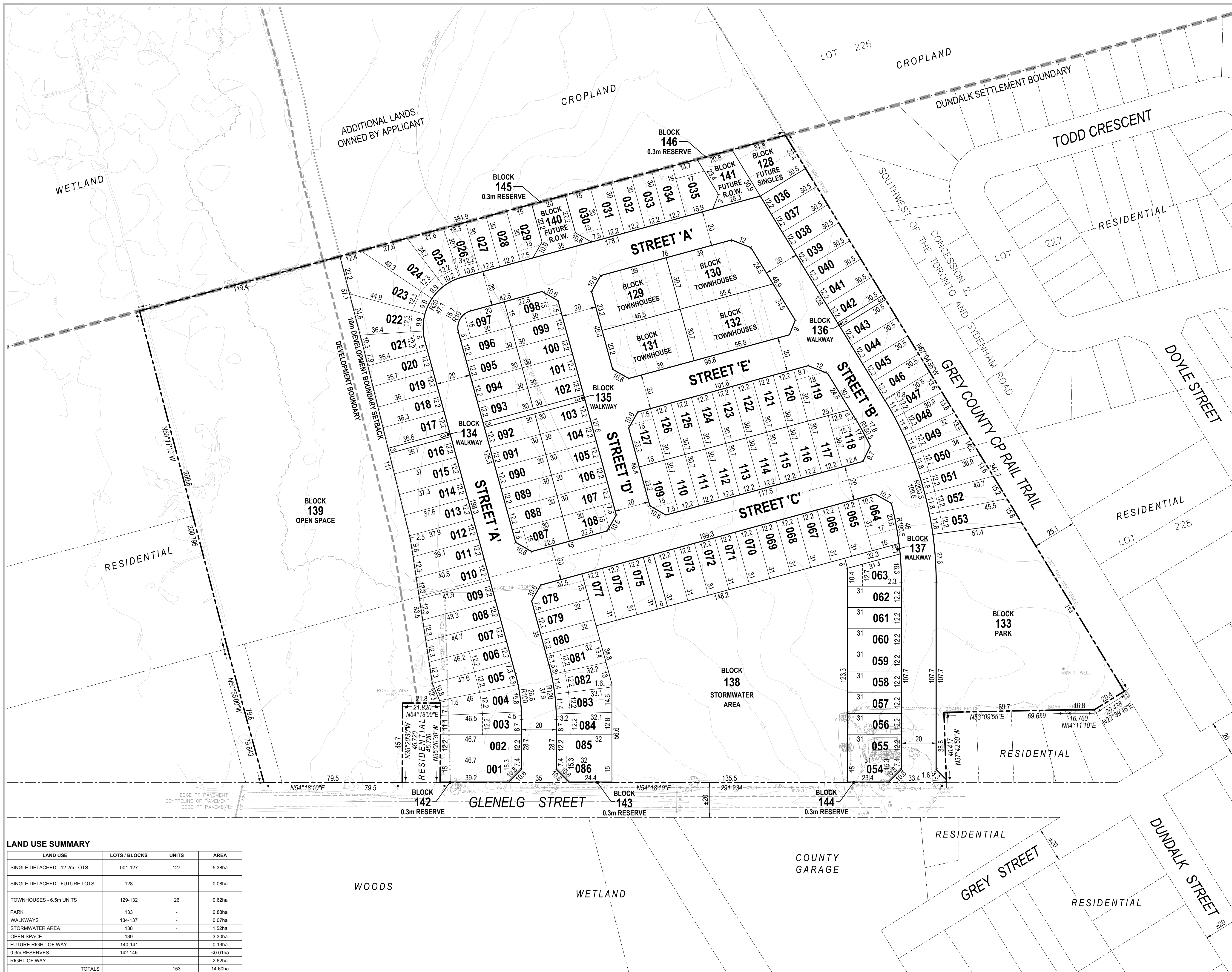
Traffic volumes at the intersections of Ida Street and Glenelg Street, Glenelg Street and the Site Access, and Dundalk Street and Main Street West do not meet the threshold to warrant auxiliary left-turn lanes. Accordingly, the future total traffic volumes were analyzed under existing lane configurations. 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

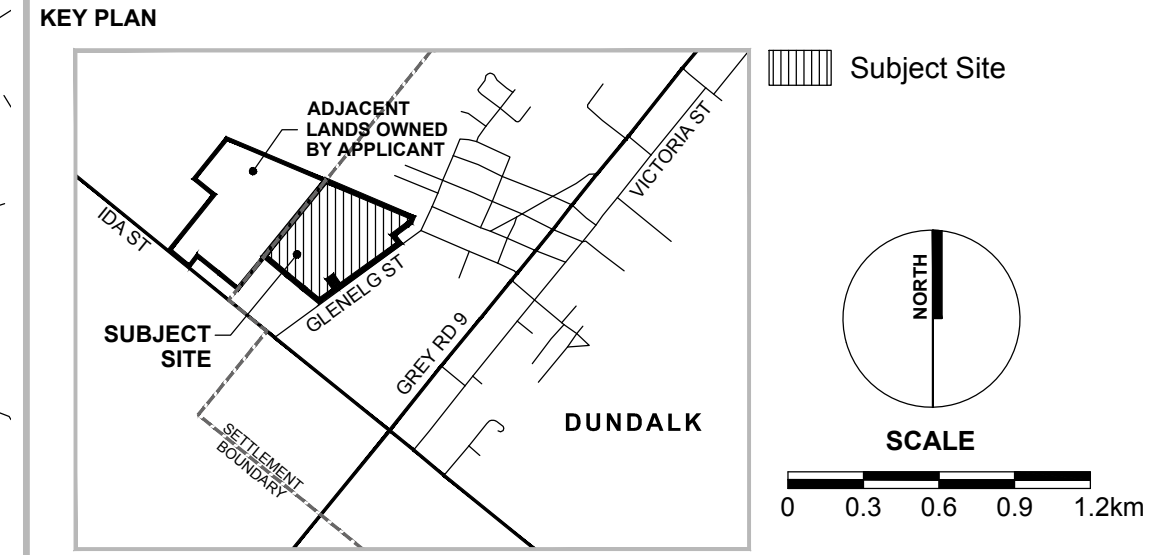
The 2023 through 2028 future total traffic operations of the boundary road network are summarized in **Table 9 and Table 10**. The detailed capacity analysis is included in **Appendix F**, and LOS definitions are included in **Appendix E**.



**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 PRONON  
 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: \_\_\_\_\_



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

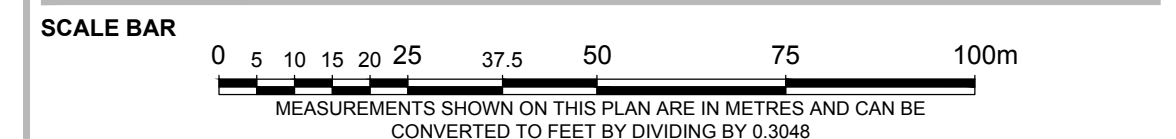
**PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE**  
**MHBC PLANNING**  
 113 COLLIER STREET  
 3rd FLOOR  
 MARKHAM, ON L3R 0G6  
 P: (905) 479-9292 F: (905) 429-9165  
 WWW.MHBCPLAN.COM

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

**FILE NAME**  
 DRAFT PLAN OF SUBDIVISION

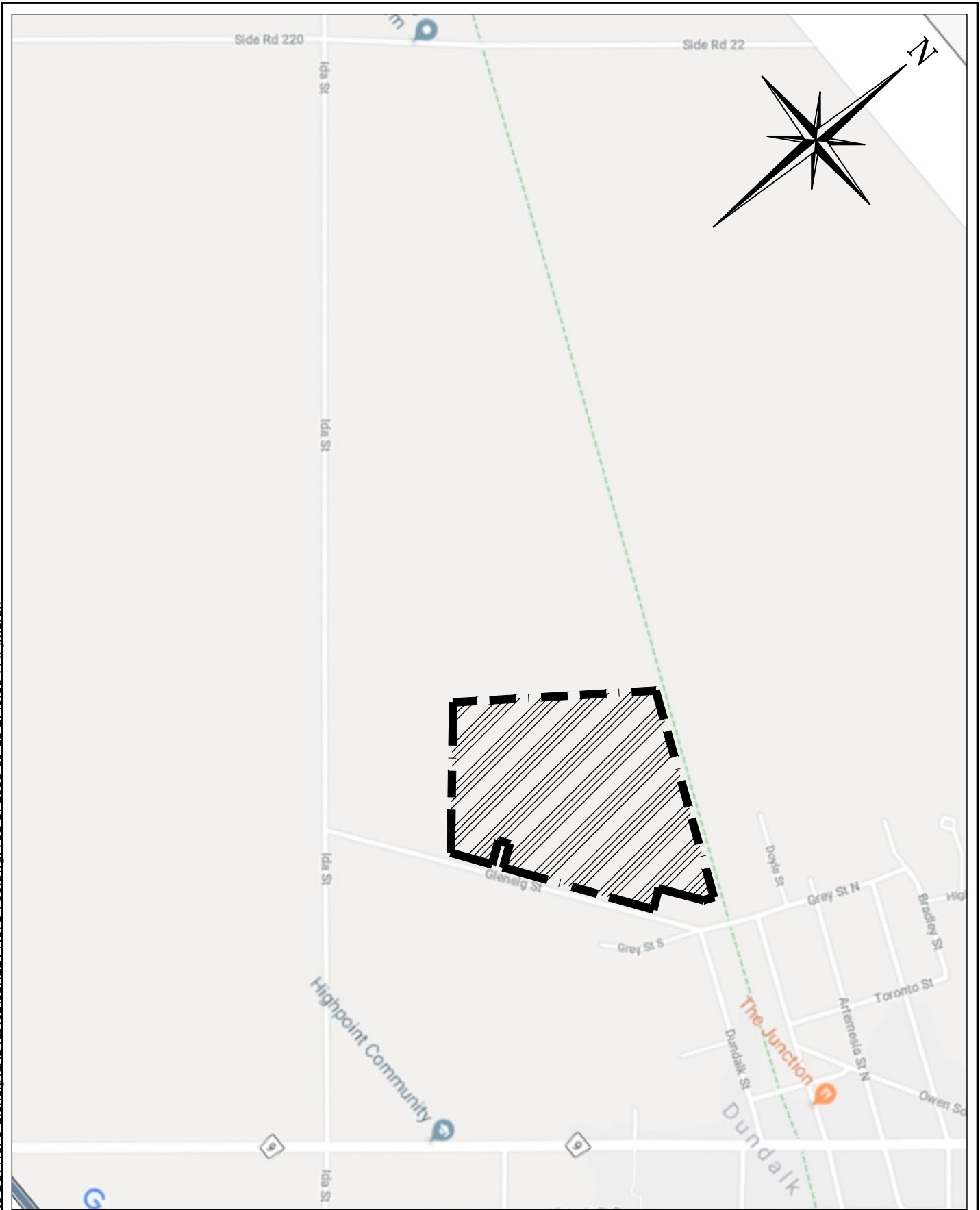
**DWG No.**  
 1 of 1




**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	-	0.89ha
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
<b>TOTALS</b>		153	14.60ha

J:\1000\1060-Flato\_Dev\4171-Glenelg\CAD\CIVIL\1 SHEET\4171-700.dwg, FIG. 1, 2018-09-25 2:46:33 PM, imatur



Legend	Project
 = SUBJECT PROPERTY	<b>GLENELG TOWNSHIP OF SOUTHGATE</b>
	Drawing
	<b>SITE LOCATION</b>

Drawn By	B.K.	Design By	B.P.	Project	<b>1060-4171</b>
Scale	N.T.S.	Date	09/26/2018	Check By	B.N.R.
					Drawing
					<b>FIG. 2</b>

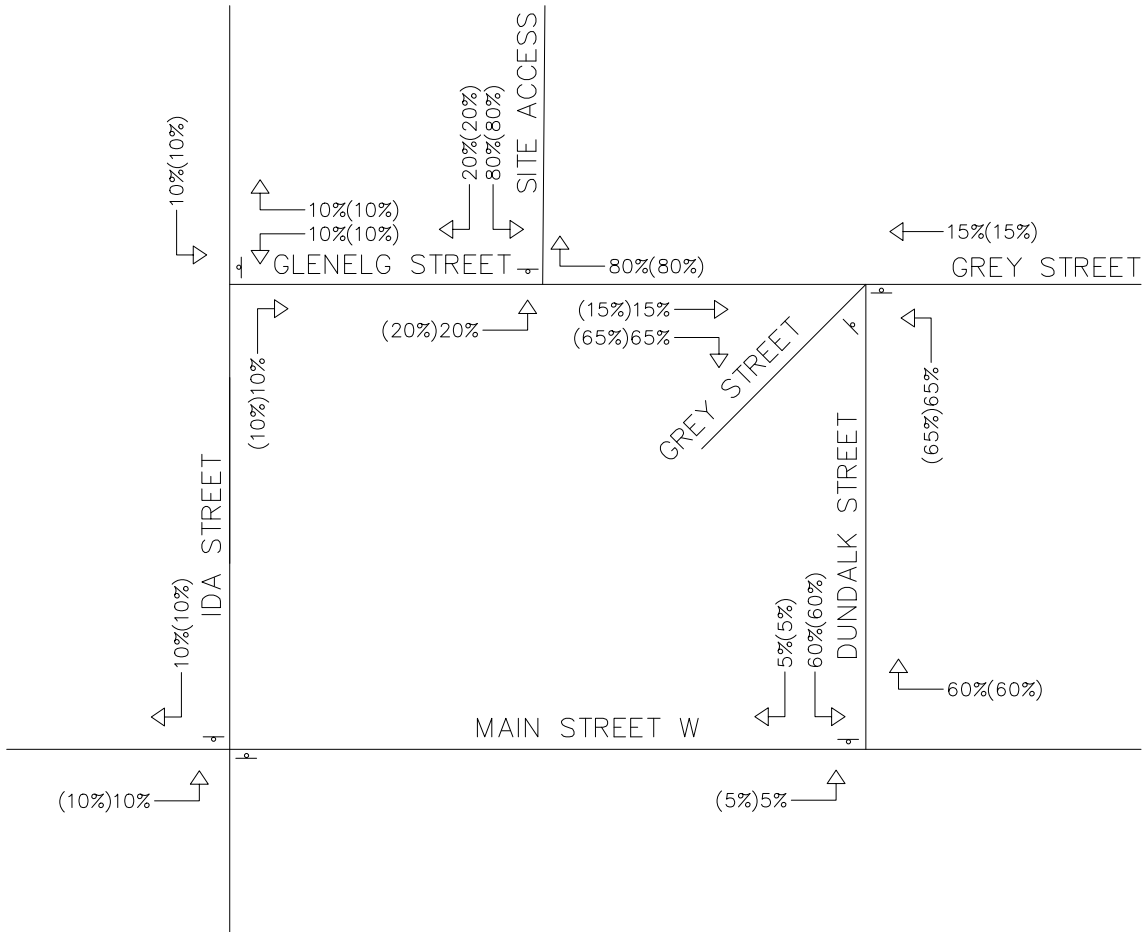
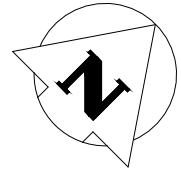


**CROZIER**  
CONSULTING ENGINEERS

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**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**



**CROZIER  
& ASSOCIATES**  
Consulting Engineers

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705 446-3520 F  
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info@cfrozier.ca

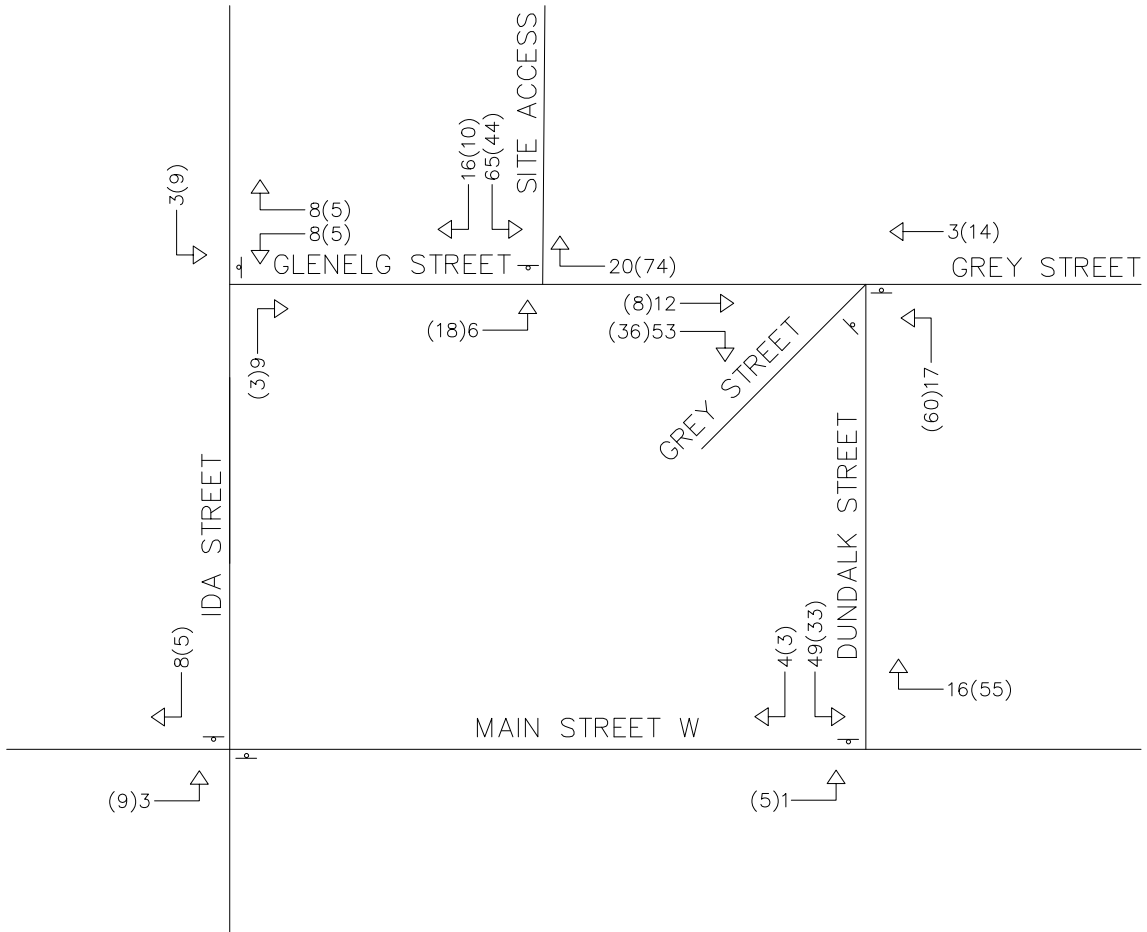
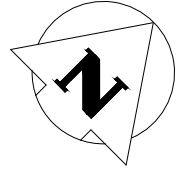
Title

TRIP DISTRIBUTION

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

**NOTE:**

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**LEGEND:**

↓ STOP CONTROL

XX(YY) WEEKDAY AM(PM)

Project

**GLEENELG  
TOWNSHIP OF SOUTHGATE**



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Title

TRIP ASSIGNMENT

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

The material in this report reflects best judgment in light of the information available at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. C.F. Crozier & Associates Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.



## 2 INTRODUCTION

### 2.1 Background

C.F. Crozier & Associates Inc. (Crozier) was retained by Southgate Meadows Inc. (“the Developer”) to complete a Traffic Impact Study (TIS) in support of a County Official Plan Amendment, Township Official Plan Amendment, Zoning By-law Amendment and Draft Plan of Subdivision Application for a Settlement Boundary Expansion for Phase 2 of the proposed Glenelg residential development located in the west end of the Community of Dundalk, Township of Southgate, County of Grey (the site).

In September 2018, Crozier completed a TIS to support Phase 1 of the Glenelg Residential Development. Phase 1 is located directly south of the Phase 2 lands fronting Glenelg Street. The Phase 1 Official Plan Amendment, Zoning By-law Amendment and Draft Plan Applications have been approved and a Redline Draft Plan Application has also recently been submitted and approved. Phase 1 of the development is currently undergoing detailed design and working towards registration. The scope of this TIS is consistent with that of the Phase 1 TIS.

### 2.2 Purpose

The purpose of the study was to assess the impacts of the proposed development on the boundary road network and to recommend any mitigation measures, if warranted.

The study reviews the following main aspects of the proposed residential development from a transportation engineering perspective:

- Existing, future background, and future total traffic operations at the study intersections
- Forecasted trip generation of the proposed development
- Auxiliary lane requirements at the proposed site accesses

### 2.3 Development Proposal

The site statistics proposed on the Draft Plan have been summarized in **Table 1** below. The Draft Plan prepared by MHBC Planning (September 24, 2020) has been included as **Figure 1**. It has been assumed that for the purposes of this analysis, the entire Phase 2 development will be built out concurrently.

**Table 1: Development Site Statistics**

Development Type	Unit Type	Draft Plan (September 24, 2020)
Residential	Single Detached	83
	Townhomes	66
	Partial Lots	6

For the purpose of this analysis, the six partial lots were assessed as single detached units. Access to the site will be provided by two accesses to Glenelg Street through the previous Glenelg Phase 1 lands and are spaced approximately 220 metres apart. The internal roads within Phase 2 are described as Corbett Street, Aitchison Avenue, Street “A” and Street “B”. Street “A” and Aitchison Avenue provide connectivity to the Phase 1 lands.

**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
<b>Total</b>	<b>Primary</b>	<b>Weekday A.M.</b>	<b>24</b>	<b>76</b>	<b>100</b>
	<b>Primary</b>	<b>Weekday P.M.</b>	<b>83</b>	<b>49</b>	<b>132</b>

## 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

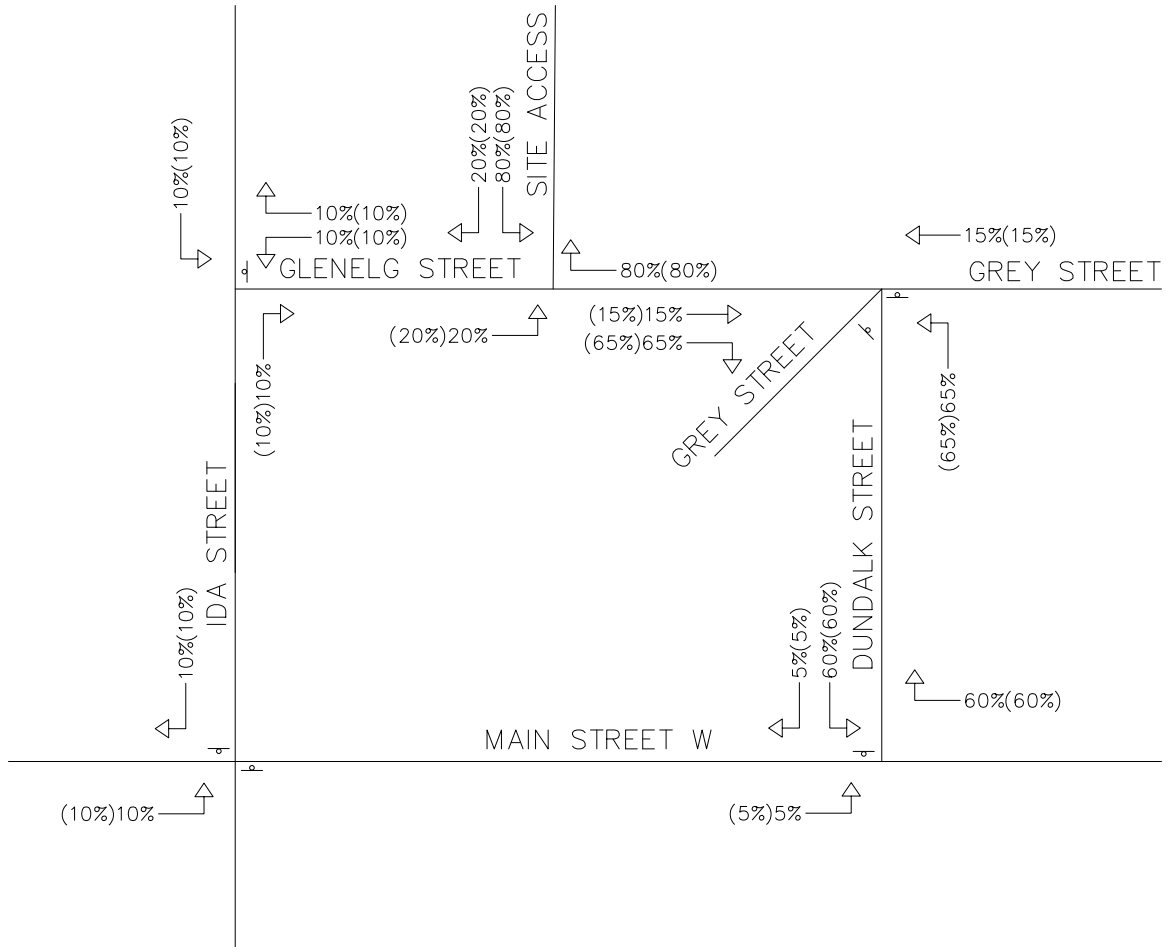
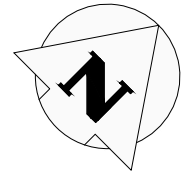
Of the 20 percent remaining in Dundalk, five percent were assumed to travel south on Dundalk Street and then turn right to travel west on Main Street West. The remaining 15 percent were assumed to travel east on Grey Street South and use Proton Street North to access the main downtown commercial corridor.


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**.



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



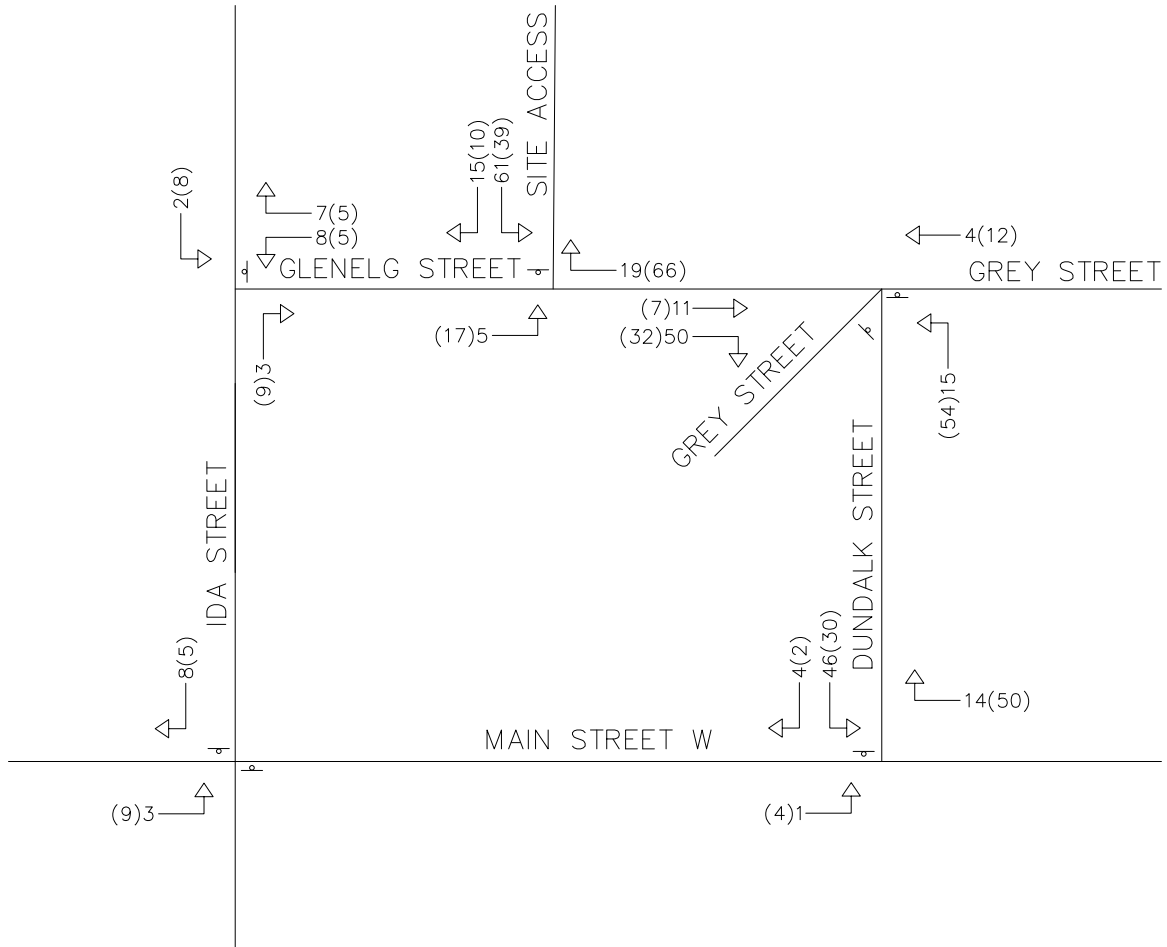
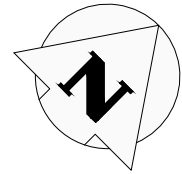
**CROZIER**  
 CONSULTING ENGINEERS

THE HARBOUREDGE BUILDING,  
 40 HURON STREET, SUITE 301,  
 COLLINGWOOD, ON L9Y 4R3  
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 INFO@CFCROZIER.CA

Drawn	S.K.	Design	Project No.	1060-5545	
Check	M.F.	Check	Scale	N.T.S	Dwg. FIG. 9

**NOTE:**

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**LEGEND:**

⊥ STOP CONTROL  
AM(PM) WEEKDAY AM(PM)  
TRIP DISTRIBUTION

Project

GLENELG PHASE 2  
TOWNSHIP OF SOUTHGATE

Title

TRIP ASSIGNMENT



**CROZIER**  
CONSULTING ENGINEERS

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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 AND ASSOCIATES INC.  
1 FIRST STREET, SUITE 200  
COLLINGWOOD, ONTARIO  
L9Y 1A1**

**1<sup>ST</sup> SUBMISSION: AUGUST 2022**

**CFCA FILE NO. 1060-6220**

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## 2.0 Introduction

### 2.1 Background

C. F. Crozier and Associates Inc. (Crozier) was retained by Flato Dundalk Meadows Inc. (Client) to undertake a Traffic Impact Study (TIS) to support a Draft Plan of Subdivision Application for Glenelg Phase 3 (Subject Property) located in the west end of the Community of Dundalk, Township of Southgate, County of Grey. The Subject Property is located northeast of Phase 2 of the Glenelg Residential Development.

### 2.2 Development Proposal

The most recent Draft Plan for Glenelg Phase 3 includes 369 single detached dwelling units, 72 townhouse dwelling units, and 18 semi-detached dwelling units.

Access to the subject property is proposed by three connections to the external road network; one through the White Rose Phase 3 Development (Bradley Street Extension) and two through Glenelg Phase 1. Street A and Street B are proposed to extend westerly from the subject property to Corbett Street in Glenelg Phase 2, which has further connections to the two Glenelg Phase 1 site accesses. Bradley Street is proposed to be extended northerly into the subject property after the construction of the White Rose Phase 3 development.

**Figure 1** contains the Draft Plan prepared by MHBC dated August 18<sup>th</sup>, 2022.

### 2.3 Purpose and Scope

The purpose of the study is to assess the impacts of the proposed residential development on the boundary road network and to recommend the required remedial measures to mitigate the transportation impacts.

The scope of the study includes:

- Determine and assess the existing, future background, and future total traffic operations of the boundary road network.
- Forecast the trip generation and distribution of the proposed development.
- Assess and if necessary, recommend, changes in intersection traffic control.

The Township of Southgate peer reviewer confirmed the scope and assumptions noted in this report during pre-study consultations. **Appendix A** contains the Terms of Reference correspondence.

## 3.0 Existing Traffic Conditions

### 3.1 Development Lands

The subject property is currently vacant and is bound by existing residential land uses to the south, future residential developments to the west, and vacant agricultural land to the east and north. The subject property is approximately 33.27 ha, of which approximately 24.54 ha are proposed to be developed.

**Figure 2** illustrates the Site Location Plan.

## 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, 11<sup>th</sup> Edition. Per the most recent draft plan, the development is proposed to consist of 369 single detached dwelling units, 72 townhouse dwelling units, and 18 semi-detached dwelling. Accordingly, LUC 210 "Single-Family Detached Housing", and LUC 215 "Single Family Attached Housing" were used to forecast trips generated by the site. **Table 10** summarizes the residential trip generation of the subject property. **Appendix F** contains relevant excerpts from the ITE Trip Generation Manual.

**Table 10: Site Trip Generation**

	Peak Hour	Number of Trips		
		Inbound	Outbound	Total
LUC 210 'Single Family Homes' (369 Units)	Weekday A.M.	63	181	244
	Weekday P.M.	214	125	339
LUC 215 'Single Family Attached Housing' (90 Units)	Weekday A.M.	13	28	41
	Weekday P.M.	28	22	50
<b>TOTAL</b>	<b>Weekday A.M.</b>	<b>76</b>	<b>209</b>	<b>285</b>
	<b>Weekday P.M.</b>	<b>242</b>	<b>147</b>	<b>389</b>

### 5.2 Trip Distribution and Assignment

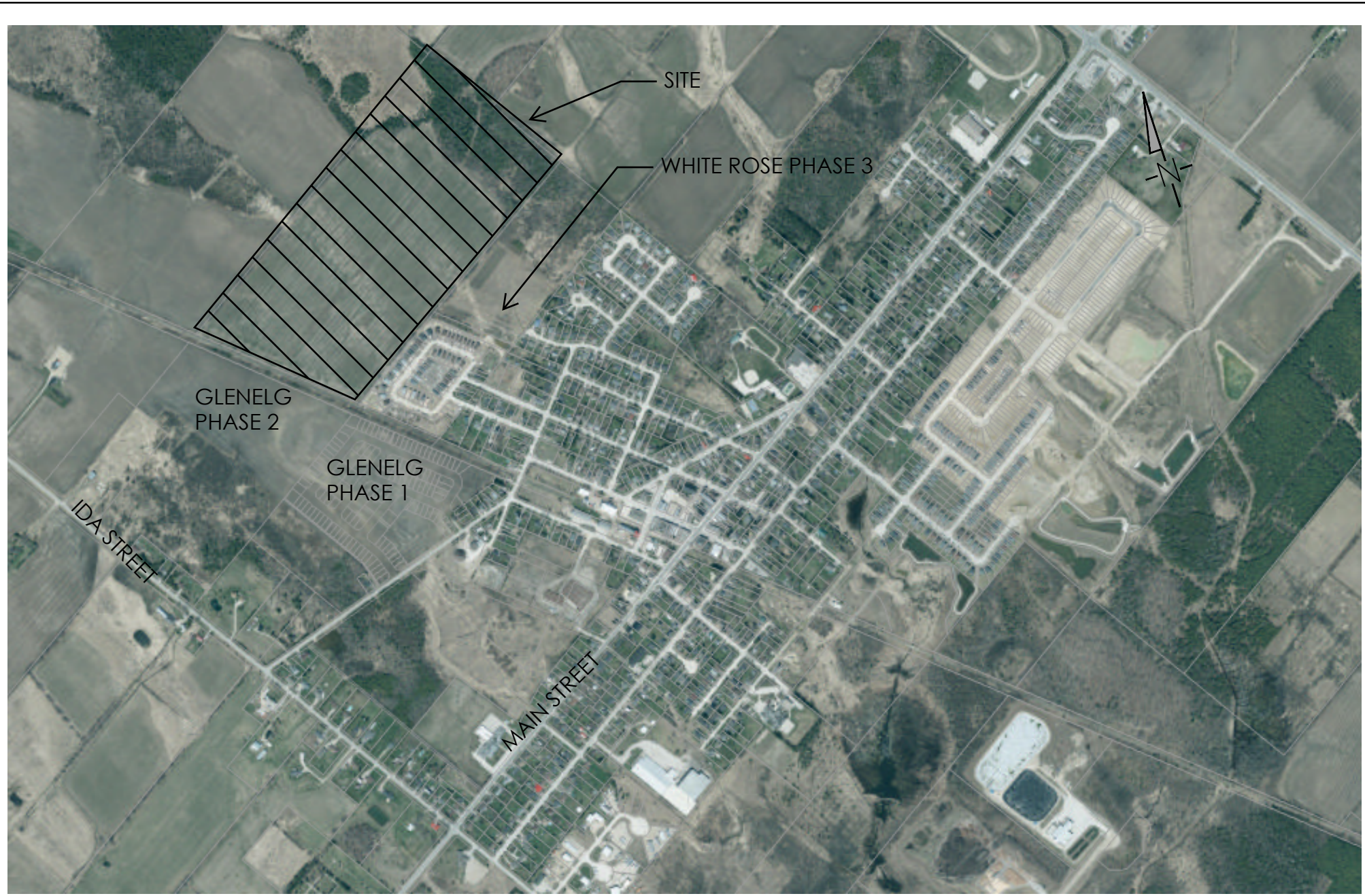
Trips generated by Glenelg Phase 3 were distributed to the boundary road network similar to what was applied in the Glenelg Phase 1 TIS and Glenelg Phase 2 TIS. The trip distribution was based on Transportation Tomorrow Survey (TTS) data. The TTS is a comprehensive survey of transportation characteristics 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 J**. 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.

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



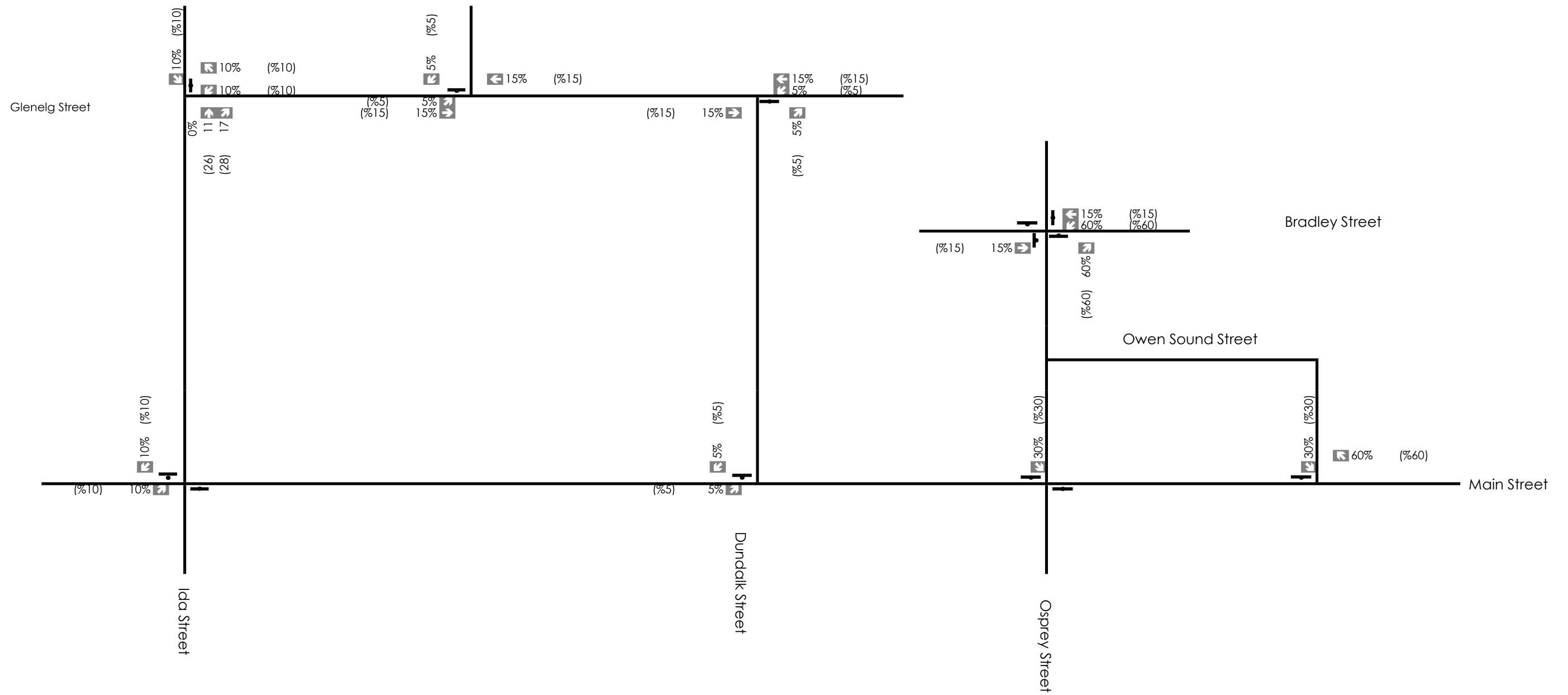
Project  
**GLENELG PHASE 3**  
**TOWNSHIP OF SOUTHGATE, COUNTY OF GREY**

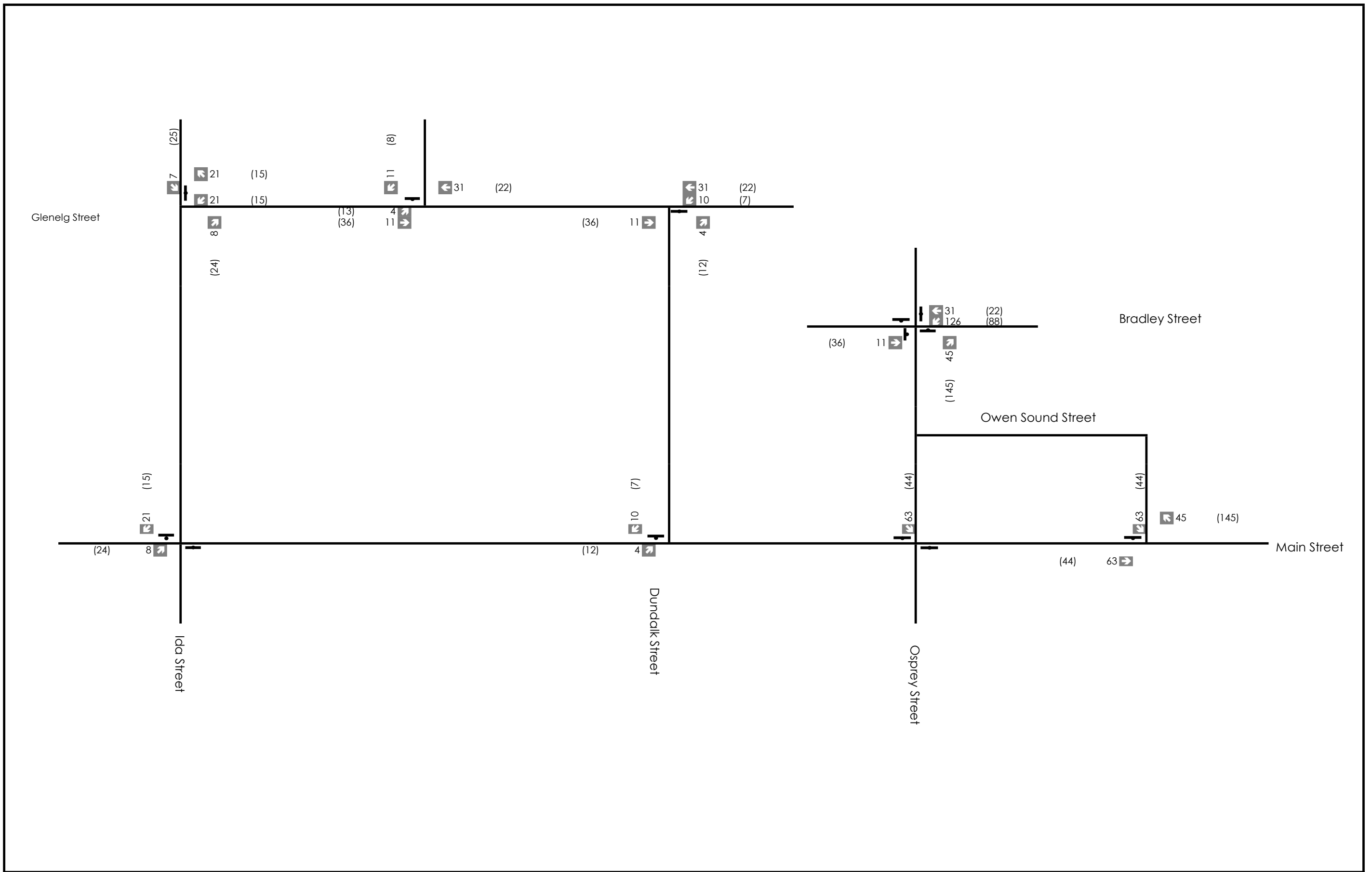
Drawing  
**SITE LOCATION PLAN**



THE HARBOUREDGE BUILDING,  
 40 HURON STREET, SUITE 301,  
 COLLINGWOOD, ON L9Y 4R3  
 705 446-3510 T  
 705 446-3520 F  
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Drawn By	E.H.	Design By	E.H.	Project	1060-6220	
Scale	N.T.S.	Date	2022.08/15	Check By	E.H.	
					Drawing	FIG. 2





**Legend**

- xx A.M. Peak Hour Traffic Volumes
- (XX) P.M. Peak Hour Traffic Volumes
- Stop Sign

**Glenelg Phase 3**

**Site Trip Assignment**



**Figure 14**

Project No. 1060-6220  
 Date. 2022/08/31  
 Analyst. E.H.



# APPENDIX F

## ITE Trip Generation Excerpts

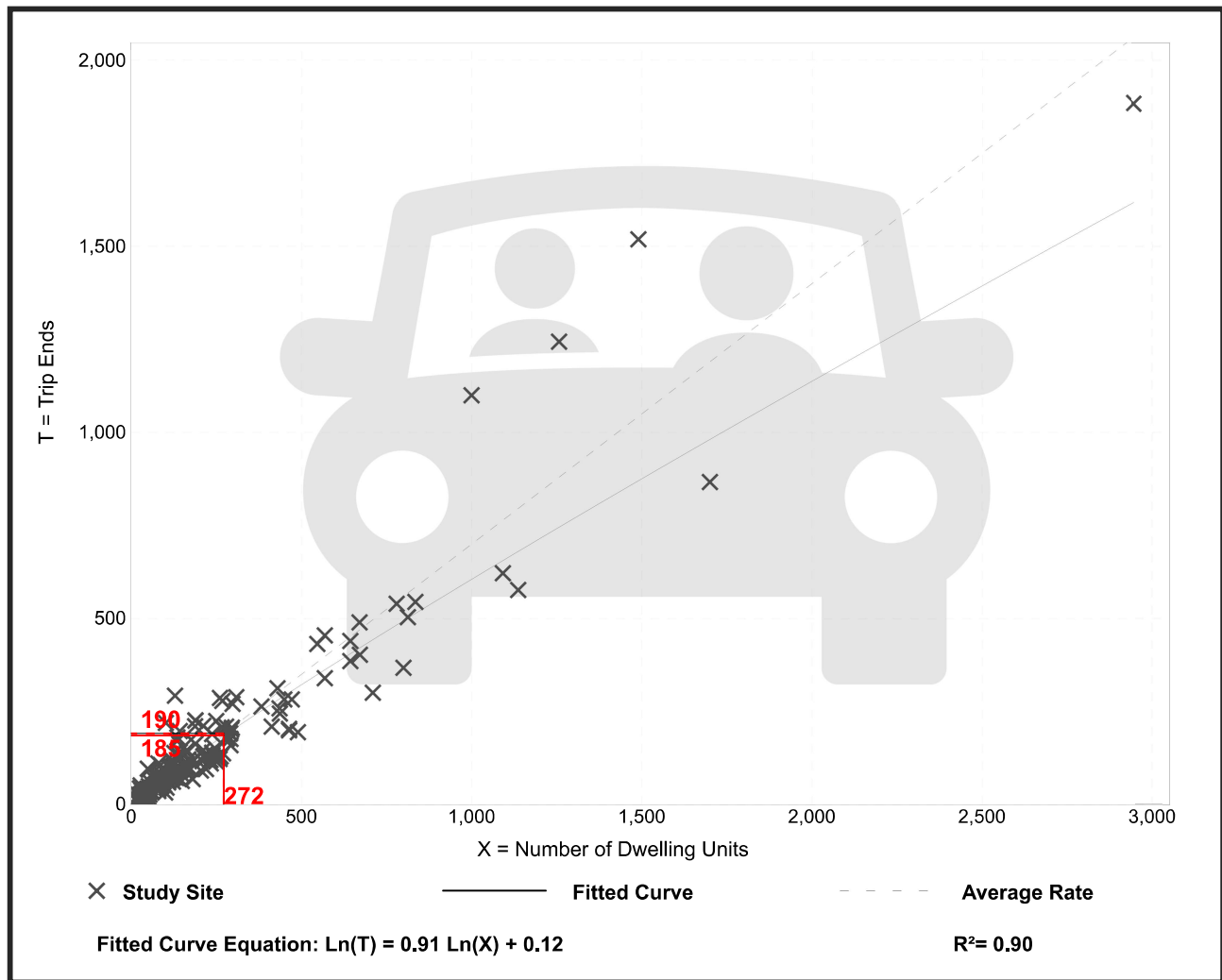
# Single-Family Detached Housing (210)

**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 7 and 9 a.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 192  
 Avg. Num. of Dwelling Units: 226  
 Directional Distribution: 26% entering, 74% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

## Data Plot and Equation



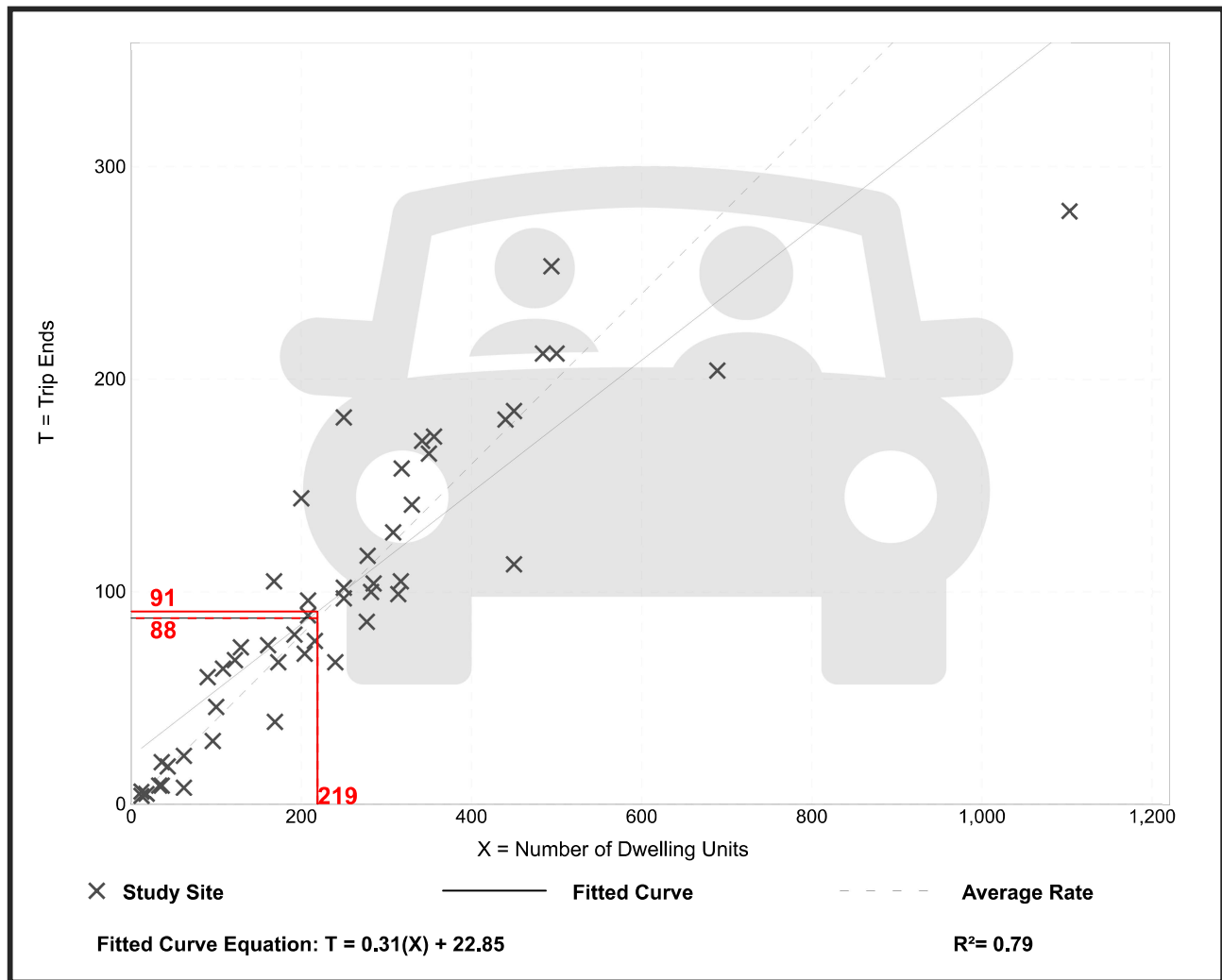
# Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 7 and 9 a.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 49  
 Avg. Num. of Dwelling Units: 249  
 Directional Distribution: 24% entering, 76% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.40	0.13 - 0.73	0.12

## Data Plot and Equation



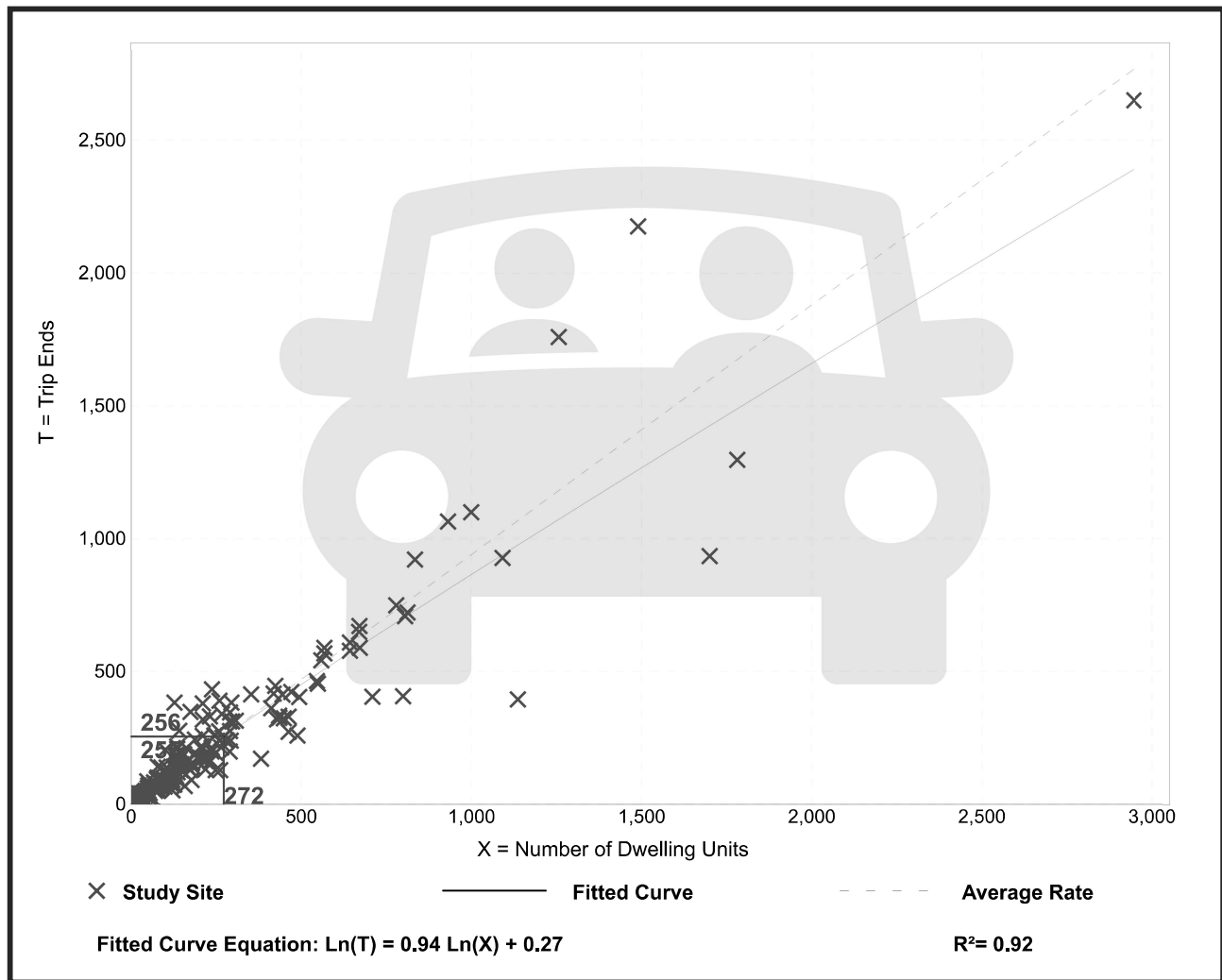
# Single-Family Detached Housing (210)

**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 4 and 6 p.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 208  
 Avg. Num. of Dwelling Units: 248  
 Directional Distribution: 63% entering, 37% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

## Data Plot and Equation



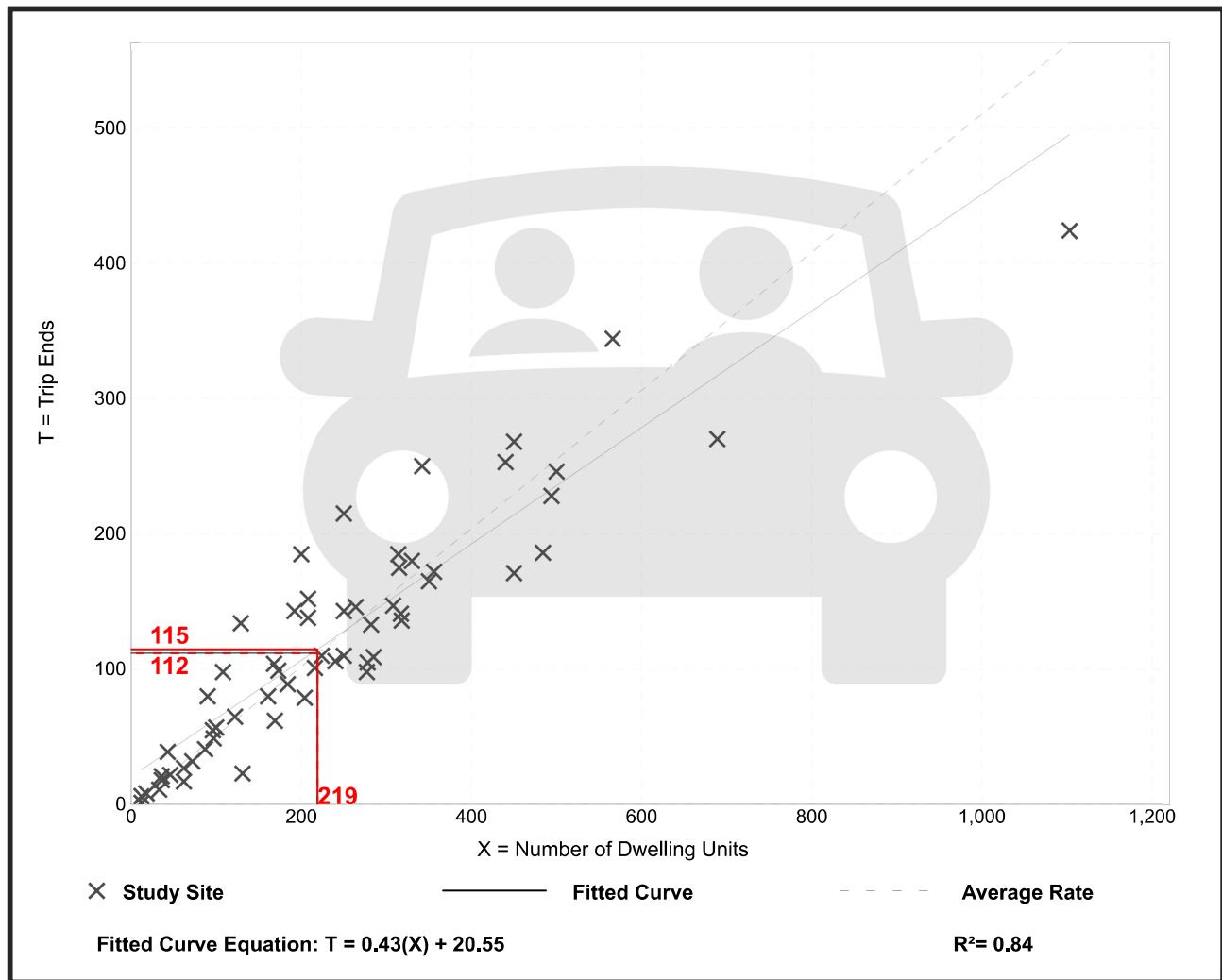
# Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units  
 On a: Weekday,  
 Peak Hour of Adjacent Street Traffic,  
 One Hour Between 4 and 6 p.m.  
 Setting/Location: General Urban/Suburban  
 Number of Studies: 59  
 Avg. Num. of Dwelling Units: 241  
 Directional Distribution: 63% entering, 37% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.51	0.08 - 1.04	0.15

## Data Plot and Equation



# Fast-Food Restaurant with Drive-Through Window (934)

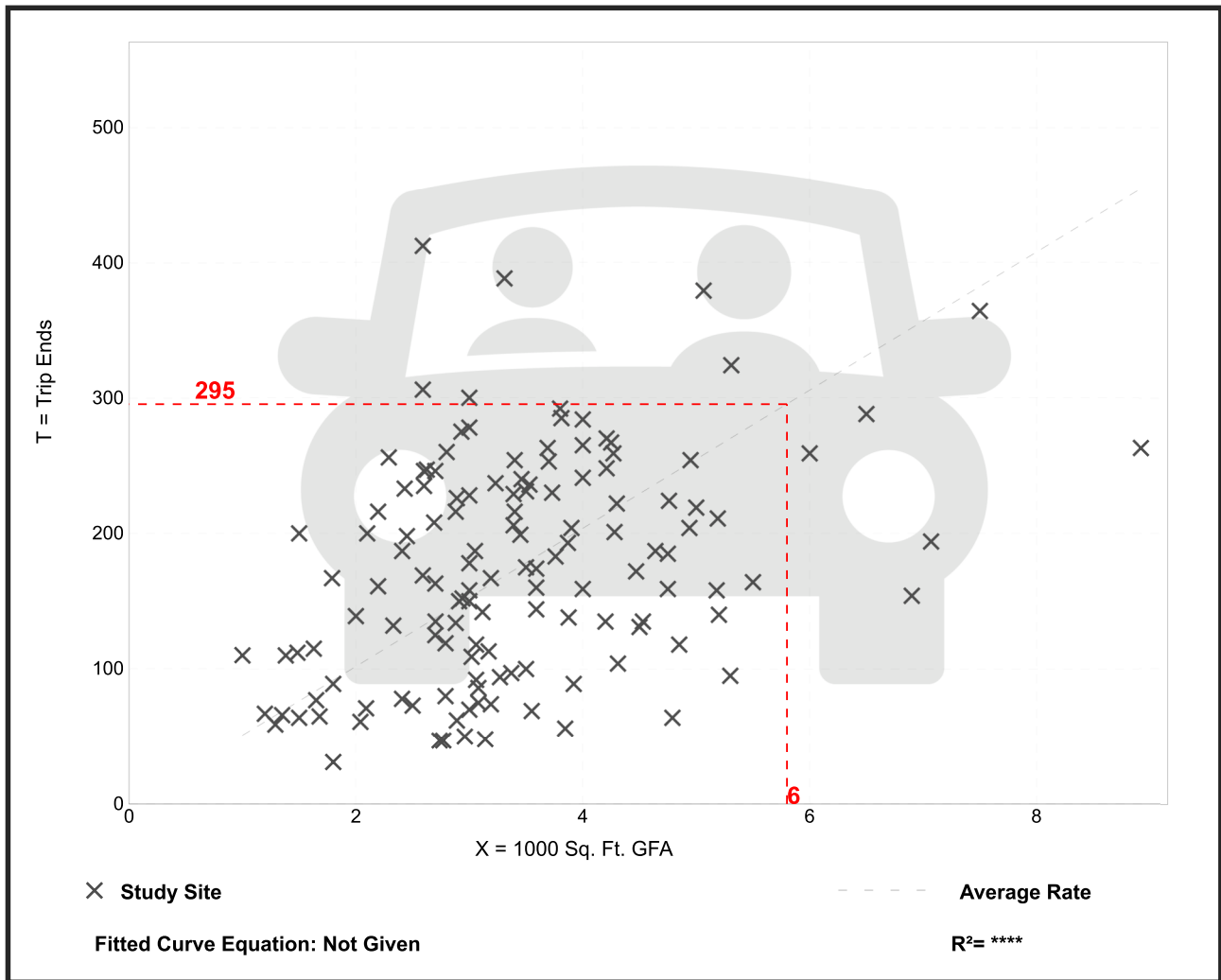
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA  
On a: Weekday,  
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban  
Number of Studies: 135  
Avg. 1000 Sq. Ft. GFA: 3  
Directional Distribution: 51% entering, 49% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
50.94	13.36 - 159.07	24.91

## Data Plot and Equation









# APPENDIX G

February 2021 TIS Excerpts and TTS Data

**TRAFFIC IMPACT STUDY**

**EDGEWOOD GREENS  
TOWNSHIP OF SOUTHGATE**

**PREPARED FOR:  
FLATO DEVELOPMENTS INC.**

**PREPARED BY:**

**C.F. CROZIER & ASSOCIATES INC.  
40 HURON STREET, SUITE 301  
COLLINGWOOD, ONTARIO  
L9T 6P4**

**ORIGINAL – DECEMBER 2015  
UPDATE – FEBRUARY 2016  
UPDATE – JUNE 2016  
UPDATE – JANUARY 2020  
UPDATE – FEBRUARY 2021**

**CFCA FILE NO. 1060-5384**

The material in this report reflects best judgment in light of the information available at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. C.F. Crozier & Associates Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.



**Table 7: 2030 Future Background Levels of Service**

Intersection	Control	Peak Hour	Level of Service <sup>1</sup>	Control Delay	Maximum v/c ratio <sup>2</sup>	95 <sup>th</sup> Percentile Queues > Storage
Highway 10 and Main Street	Signal	A.M.	B	10.6 s	0.50 (EBT)	None
		P.M.	B	13.1 s	0.54 (EBT)	None
Main Street and Russell Street	Two-way Stop	A.M.	B	10.7 s	0.07 (NB)	None
		P.M.	B	11.5 s	0.06 (NB)	None
Main Street and Alice Street/Mill Street	Two-way Stop	A.M.	B	11.5 s	0.06 (NB)	None
		P.M.	C	15.1 s	0.07 (NB)	None
Main Street and Osprey Street	Two-way Stop	A.M.	B	11.9 s	0.04 (SB)	None
		P.M.	B	14.8 s	0.05 (SB)	None
Elm Street and Victoria Street	Two-way Stop	A.M.	A	9.1 s	0.07 (NB)	None
		P.M.	A	9.1 s	0.04 (NB)	None

Note<sup>1</sup>: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU). 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<sup>2</sup>: 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 8: 2035 Future Background Levels of Service**

Intersection	Control	Peak Hour	Level of Service <sup>1</sup>	Control Delay	Maximum v/c ratio <sup>2</sup>	95 <sup>th</sup> Percentile Queues > Storage
Highway 10 and Main Street	Signal	A.M.	B	10.9 s	0.52 (EBT)	None
		P.M.	B	13.6 s	0.56 (EBT)	None
Main Street and Russell Street	Two-way Stop	A.M.	B	11.0 s	0.08 (NB)	None
		P.M.	B	11.9 s	0.07 (NB)	None
Main Street and Alice Street/Mill Street	Two-way Stop	A.M.	B	11.9 s	0.07 (NB)	None
		P.M.	C	16.6 s	0.08 (NB)	None
Main Street and Osprey Street	Two-way Stop	A.M.	B	12.3 s	0.05 (SB)	None
		P.M.	C	15.5 s	0.06 (SB)	None
Elm Street and Victoria Street	Two-way Stop	A.M.	A	9.2 s	0.07 (NB)	None
		P.M.	A	9.2 s	0.04 (NB)	None

Note<sup>1</sup>: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU). 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<sup>2</sup>: 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 study intersections are expected to continue operating with a LOS "B" or better, with the exception of Main Street and Alice Street/Mill Street and Main Street and Osprey Street, which are expected to operate with a LOS "C" in the weekday p.m. peak hour. The maximum volume-to-capacity ratio of 0.56 (Highway 10 and Main Street, EBT, p.m.) indicates that the intersections have reserve capacity for increases in traffic volumes. The 95<sup>th</sup> percentile queues through all horizon years and peak hours can be contained within their available storage lengths.

## 5.0 Future Total Conditions

### 5.1 Site Generated Traffic

The proposed mixed-use development will result in additional vehicles on the boundary road network that would otherwise not exist. The proposed development will also result in additional turning movements at the study intersections.

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

- 477 Single-detached Units
- 62 Semi-detached Units
- 157 Townhouse Units
- Commercial Building with a GFA of 1,448 m<sup>2</sup> (15,586 ft<sup>2</sup>)

The trip generation of the proposed residential dwelling and commercial units was forecasted using published data from the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10<sup>th</sup> Edition. The ITE Trip Generation Manual is a compendium of industry collected trip generation data across North America for a variety of land uses and is used industry wide as a source for trip generation forecasts.

The applicable average rates and fitted curve equations for Land Use Category (LUC) 210 "Single Family Detached Housing" and LUC 220 "Multifamily Housing (Low-Rise)" were applied to the proposed residential dwelling units. The fitted curve for the peak hour of generator for LUC 820 "Shopping Centre" was applied to the proposed commercial GFA, per the January 2021 MTO comments.

As defined by the ITE Trip Generation Handbook, 3<sup>rd</sup> Edition, primary trips are 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 of the commercial retail pass-by trips was forecasted using the rates provided by the ITE Trip Generation Handbook. LUC 820 was used to establish a pass-by percentage of 34 percent for the p.m. peak period. A pass-by percentage was not applied to the a.m. peak period as this trip generation generally captures employees of the commercial uses.

Relevant excerpts from the ITE Trip Generation Manual, 10<sup>th</sup> Edition and ITE Trip Generation Handbook, 3<sup>rd</sup> Edition have been included in **Appendix I**. The forecasted trip generation of the mixed-use development is summarized in **Table 9**.

**Table 9: Trip Generation**

Land Use	Units/GFA	Peak Hour	Trip Type	Trips Generated		
				Inbound	Outbound	Total
LUC 210: Single Family Detached Housing	477 Units	A.M.	Primary	85	258	343
		P.M.		287	168	455
LUC 220: Multifamily Housing (Low-Rise)	219 Units	A.M.	Primary	23	77	100
		P.M.		75	44	119
LUC 820: Shopping Centre	15,586 ft <sup>2</sup>	A.M.	Primary	43	36	79
			Pass-by	22	19	41
		P.M.	Primary	49	49	98
			Pass-by	25	25	50
<b>Total</b>		<b>A.M.</b>	<b>Primary</b>	<b>151</b>	<b>371</b>	<b>522</b>
			<b>Pass-by</b>	<b>22</b>	<b>19</b>	<b>41</b>
		<b>P.M.</b>	<b>Primary</b>	<b>411</b>	<b>261</b>	<b>672</b>
			<b>Pass-by</b>	<b>25</b>	<b>25</b>	<b>50</b>

## 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 June 2016 TIS Update, which was completed using Transportation Tomorrow Survey (TTS) data. Excerpts from the June 2016 TIS as well as the TTS data have been included in **Appendix G**.

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 commercial component of the proposed development 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.

Given the scale of the Edgewood Greens development, it is assumed that the commercial development will primarily service residents from within the development. As such, half the primary

USER : Alexander Fleming - CF Crozier and Associates  
 DATE : Jan 18 2016 (09:56:04)  
 DATA : 2011 TTS V1.0 Trips  
 TABLE : pd\_orig (Melancthon)  
 FILTER 1 : pd\_orig => Melancthon  
 ROW : pd\_dest  
 COLUMN : mode\_prime

Origin	Other	Auto passenger	Schoolbus	Auto driver	%
PD 1 of Toronto	0	65	0	0	0.0%
Oshawa	0	0	0	37	1.5%
Newmarket	0	37	0	37	1.5%
Caledon	0	0	0	37	1.5%
Brampton	0	0	0	30	1.2%
Wellesley	15	0	0	0	0.0%
Guelph	0	21	0	0	0.0%
Orangeville	0	0	0	180	7.2%
Innisfil	0	26	0	26	1.0%
New Tecumseth	0	0	0	148	5.9%
Adjala-Tosorontio	0	0	0	37	1.5%
Clearview	0	15	0	156	6.2%
Grey	0	0	0	73	2.9%
Collingwood	0	37	37	51	2.0%
Mulmur	0	28	0	26	1.0%
Shelburne	0	183	183	828	33.1%
Amaranth	0	73	0	325	13.0%
Melancthon	0	73	0	514	20.5%

USER : Alexander Fleming - CF Crozier and Associates  
 DATE : Jan 18 2016 (11:26:42)  
 DATA : 2011 TTS V1.0 Trips  
 TABLE : pd\_orig (Melancthon)  
 FILTER 1 : pd\_orig => Melancthon  
 ROW : pd\_dest  
 COLUMN : mode\_prime

Destination	Other	Auto passenger	Schoolbus	Auto driver	%
PD 1 of Toronto	0	65	0	0	0.0%
Oshawa	0	0	0	37	1.5%
Newmarket	0	37	0	37	1.5%
Caledon	0	0	0	37	1.5%
Brampton	0	0	0	30	1.2%
Wellesley	15	0	0	0	0.0%
Guelph	0	21	0	0	0.0%
Orangeville	0	0	0	180	7.2%
Innisfil	0	26	0	26	1.0%
New Tecumseth	0	0	0	148	5.9%
Adjala-Tosorontio	0	0	0	37	1.5%
Clearview	0	15	0	156	6.2%
Grey	0	0	0	73	2.9%
Collingwood	0	37	37	51	2.0%
Mulmur	0	28	0	26	1.0%
Shelburne	0	183	183	828	33.1%
Amaranth	0	73	0	325	13.0%
Melancthon	0	73	0	514	20.5%

# APPENDIX H

## OTM Signal Warrant Results



# Input Data Sheet

Analysis Sheet

Results Sheet

Proposed Collision

What are the intersecting roadways?

Highway 10 and Site Access

GO TO Justification:

What is the direction of the Main Road street?

North-South

When was the data collected?

2025 (Future Total)

## Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road?

b.- Number of lanes on the Minor Road?

c.- How many approaches?

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

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

Hour Ending	Main Northbound Approach			Minor Eastbound Approach			Main Southbound Approach			Minor Westbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
6:00	74	213	0	61	0	159	0	325	46	0	0	0	0
7:00	96	277	0	80	0	207	0	423	60	0	0	0	0
8:00	92	267	0	77	0	199	0	408	58	0	0	0	0
9:00	96	277	0	80	0	207	0	423	60	0	0	0	0
15:00	204	496	0	71	0	118	0	360	65	0	0	0	0
16:00	217	527	0	76	0	125	0	382	69	0	0	0	0
17:00	238	578	0	83	0	137	0	419	75	0	0	0	0
18:00	165	400	0	57	0	95	0	290	52	0	0	0	0
<b>Total</b>	<b>1,182</b>	<b>3,035</b>	<b>0</b>	<b>584</b>	<b>0</b>	<b>1,246</b>	<b>0</b>	<b>3,030</b>	<b>485</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## Justification 5: Collision Experience

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

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

## Justification 6: Pedestrian Volume

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

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

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

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

**Justification 1: Minimum Vehicle Volumes**

**Free Flow Rural Conditions**

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent				
	1 Lanes		2 or More Lanes		Hour Ending													
Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW	6:00	7:00	8:00	9:00	15:00	16:00	17:00	18:00						
1A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	480	720	600	900	878	1,142	1,101	1,142	1,313	1,397	1,530	1,059		
	COMPLIANCE %				100	100	100	100	100	100	100	100	100	800	100			
1B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	180	255	180	255	220	286	276	286	189	201	220	152		
	COMPLIANCE %				100	100	100	100	100	100	100	100	85	785	98			
<b>Free Flow Signal Justification 1:</b>					Both 1A and 1B 100% Fulfilled each of 8 hours Lesser of 1A or 1B at least 80% fulfilled each of 8 hours								Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>				

**Justification 2: Delay to Cross Traffic**

**Free Flow Rural Conditions**

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent				
	1 lanes		2 or More lanes		Hour Ending													
Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW	6:00	7:00	8:00	9:00	15:00	16:00	17:00	18:00						
2A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	480	720	600	900	658	856	825	856	1,124	1,196	1,310	907		
	COMPLIANCE %				100	100	100	100	100	100	100	100	100	800	100			
2B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	50	75	50	75	61	80	77	80	71	76	83	57		
	COMPLIANCE %				100	100	100	100	100	100	100	100	100	800	100			
<b>Free Flow Signal Justification 2:</b>					Both 2A and 2B 100% Fulfilled each of 8 hours Lesser of 2A or 2B at least 80% fulfilled each of 8 hours								Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>				

**Justification 3: Combination**

**Combination Justification 1 and 2**

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicular Volume	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>
Justification 2	Delay Cross Traffic	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	JUSTIFIED	

**Justification 4: Four Hour Volume**

Justification	Time Period	Total Volume of Both Approaches (Main) X	Heaviest Minor Approach Y (actual)	Required Value Y (warrant threshold)	Average % Compliance	Overall % Compliance
Justification 4	15:00	1,124	189	92	100 %	100 %
	16:00	1,196	201	81	100 %	
	17:00	1,310	220	80	100 %	
	18:00	907	152	140	100 %	

**Justification 5: Collision Experience**

Justification	Preceding Months	% Fulfillment	Overall % Compliance
Justification 5	1-12	0 %	0 %
	13-24	0 %	
	25-36	0 %	

**Justification 6: Pedestrian Volume**

**Pedestrian Volume Analysis**

	8 Hour Vehicular Volume $V_8$	Net 8 Hour Pedestrian Volume				
		< 200	200 - 275	276 - 475	476 - 1000	>1000
Justification 6A	< 1440					
	1440 - 2600					Justified
	2601 - 7000					
	> 7000					

**Pedestrian Delay Analysis**

	Net Total 8 Hour Volume of Total Pedestrians	Net Total 8 Hour Volume of Delayed Pedestrians		
		< 75	75 - 130	> 130
Justification 6B	< 200			
	200 - 300			
	> 300	Not Justified		

# Results Sheet

[Input Sheet](#)

[Analysis Sheet](#)

[Proposed Collision](#)

Intersection: Highway 10 and Site Access

Count Date: 2025 (Future Total)

## Summary Results

	Justification	Compliance	Signal Justified?	
			YES	NO
1. Minimum Vehicular Volume	A Total Volume	100 %		
	B Crossing Volume	98 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Delay to Cross Traffic	A Main Road	100 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	B Crossing Road	100 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Combination	A Justificaton 1	98 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	B Justification 2	100 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. 4-Hr Volume		100 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>

5. Collision Experience		0 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
-------------------------	--	-----	--------------------------	-------------------------------------

6. Pedestrians	A Volume	Justification met	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	B Delay	Justification not met	<input checked="" type="checkbox"/>	<input type="checkbox"/>

# Input Data Sheet

Analysis Sheet

Results Sheet

Proposed Collision

What are the intersecting roadways?

Highway 10 and Site Access

GO TO Justification:

What is the direction of the Main Road street?

North-South

When was the data collected?

2030 (Future Total)

## Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road?

b.- Number of lanes on the Minor Road?

c.- How many approaches?

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

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

Hour Ending	Main Northbound Approach			Minor Eastbound Approach			Main Southbound Approach			Minor Westbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
6:00	74	228	0	61	0	159	0	341	46	0	0	0	0
7:00	96	296	0	80	0	207	0	444	60	0	0	0	0
8:00	92	285	0	77	0	199	0	428	58	0	0	0	0
9:00	96	296	0	80	0	207	0	444	60	0	0	0	0
15:00	204	523	0	71	0	118	0	381	65	0	0	0	0
16:00	217	557	0	76	0	125	0	405	69	0	0	0	0
17:00	238	610	0	83	0	137	0	444	75	0	0	0	0
18:00	165	422	0	57	0	95	0	307	52	0	0	0	0
<b>Total</b>	<b>1,182</b>	<b>3,217</b>	<b>0</b>	<b>584</b>	<b>0</b>	<b>1,246</b>	<b>0</b>	<b>3,195</b>	<b>485</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## Justification 5: Collision Experience

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

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

## Justification 6: Pedestrian Volume

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

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

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

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

**Justification 1: Minimum Vehicle Volumes**

Free Flow Rural Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW	6:00	7:00	8:00	9:00	15:00	16:00	17:00	18:00		
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
1A	480	720	600	900	908	1,182	1,139	1,182	1,362	1,449	1,587	1,098		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
1B	180	255	180	255	220	286	276	286	189	201	220	152		
	COMPLIANCE %				100	100	100	100	100	100	100	85	785	98
<b>Free Flow Signal Justification 1:</b>					Both 1A and 1B 100% Fulfilled each of 8 hours Lesser of 1A or 1B at least 80% fulfilled each of 8 hours								Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

**Justification 2: Delay to Cross Traffic**

Free Flow Rural Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW	6:00	7:00	8:00	9:00	15:00	16:00	17:00	18:00		
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
2A	480	720	600	900	689	896	864	896	1,173	1,248	1,367	946		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
2B	50	75	50	75	61	80	77	80	71	76	83	57		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
<b>Free Flow Signal Justification 2:</b>					Both 2A and 2B 100% Fulfilled each of 8 hours Lesser of 2A or 2B at least 80% fulfilled each of 8 hours								Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

**Justification 3: Combination**

Combination Justification 1 and 2

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More		
Justification 1	Minimum Vehicular Volume	YE <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	
Justification 2	Delay Cross Traffic	YE <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	JUSTIFIED		

**Justification 4: Four Hour Volume**

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	15:00	1,173	189	84	100 %	100 %
	16:00	1,248	201	80	100 %	
	17:00	1,367	220	80	100 %	
	18:00	946	152	130	100 %	

**Justification 5: Collision Experience**

Justification	Preceding Months	% Fulfillment	Overall % Compliance
Justification 5	1-12	0 %	0 %
	13-24	0 %	
	25-36	0 %	

**Justification 6: Pedestrian Volume**

**Pedestrian Volume Analysis**

	8 Hour Vehicular Volume $V_8$	Net 8 Hour Pedestrian Volume				
		< 200	200 - 275	276 - 475	476 - 1000	>1000
Justification 6A	< 1440					
	1440 - 2600					Justified
	2601 - 7000					
	> 7000					

**Pedestrian Delay Analysis**

	Net Total 8 Hour Volume of Total Pedestrians	Net Total 8 Hour Volume of Delayed Pedestrians		
		< 75	75 - 130	> 130
Justification 6B	< 200			
	200 - 300			
	> 300	Not Justified		

# Results Sheet

[Input Sheet](#)

[Analysis Sheet](#)

[Proposed Collision](#)

Intersection: Highway 10 and Site Access

Count Date: 2030 (Future Total)

## Summary Results

	Justification	Compliance	Signal Justified?	
			YES	NO
1. Minimum Vehicular Volume	A Total Volume	100 %		
	B Crossing Volume	98 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Delay to Cross Traffic	A Main Road	100 %		
	B Crossing Road	100 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Combination	A Justificaton 1	98 %		
	B Justification 2	100 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. 4-Hr Volume		100 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>

5. Collision Experience		0 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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6. Pedestrians	A Volume	Justification met		
	B Delay	Justification not met	<input type="checkbox"/>	<input checked="" type="checkbox"/>



# Input Data Sheet

Analysis Sheet

Results Sheet

Proposed Collision

What are the intersecting roadways?

Highway 10 and Site Access

GO TO Justification:

What is the direction of the Main Road street?

North-South

When was the data collected?

2035 (Future Total)

## Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road?

1

b.- Number of lanes on the Minor Road?

1

c.- How many approaches?

3

d.- What is the operating environment?

Rural

Population < 10,000

AND Speed >= 70 km/hr

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

Hour Ending	Main Northbound Approach			Minor Eastbound Approach			Main Southbound Approach			Minor Westbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
6:00	74	244	0	61	0	159	0	358	46	0	0	0	0
7:00	96	317	0	80	0	207	0	466	60	0	0	0	0
8:00	92	306	0	77	0	199	0	449	58	0	0	0	0
9:00	96	317	0	80	0	207	0	466	60	0	0	0	0
15:00	204	554	0	71	0	118	0	403	65	0	0	0	0
16:00	217	589	0	76	0	125	0	429	69	0	0	0	0
17:00	238	645	0	83	0	137	0	470	75	0	0	0	0
18:00	165	446	0	57	0	95	0	325	52	0	0	0	0
<b>Total</b>	<b>1,182</b>	<b>3,417</b>	<b>0</b>	<b>584</b>	<b>0</b>	<b>1,246</b>	<b>0</b>	<b>3,367</b>	<b>485</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## Justification 5: Collision Experience

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

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

## Justification 6: Pedestrian Volume

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

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

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

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

**Justification 1: Minimum Vehicle Volumes**

Free Flow Rural Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW	6:00	7:00	8:00	9:00	15:00	16:00	17:00	18:00		
1A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
	480	720	600	900	942	1,225	1,181	1,225	1,415	1,504	1,648	1,141		
COMPLIANCE %					100	100	100	100	100	100	100	100	800	100
1B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
	180	255	180	255	220	286	276	286	189	201	220	152		
COMPLIANCE %					100	100	100	100	100	100	100	85	785	98
<b>Free Flow</b>					Both 1A and 1B 100% Fulfilled each of 8 hours								Yes	No
<b>Signal Justification 1:</b>					Lesser of 1A or 1B at least 80% fulfilled each of 8 hours								Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

**Justification 2: Delay to Cross Traffic**

Free Flow Rural Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW	RESTR. FLOW	FREE FLOW	RESTR. FLOW	6:00	7:00	8:00	9:00	15:00	16:00	17:00	18:00		
2A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
	480	720	600	900	722	939	905	939	1,226	1,303	1,428	988		
COMPLIANCE %					100	100	100	100	100	100	100	100	800	100
2B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
	50	75	50	75	61	80	77	80	71	76	83	57		
COMPLIANCE %					100	100	100	100	100	100	100	100	800	100
<b>Free Flow</b>					Both 2A and 2B 100% Fulfilled each of 8 hours								Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<b>Signal Justification 2:</b>					Lesser of 2A or 2B at least 80% fulfilled each of 8 hours								Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

**Justification 3: Combination**

Combination Justification 1 and 2

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More		
Justification 1	Minimum Vehicular Volume	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	
Justification 2	Delay Cross Traffic	YES <input type="checkbox"/>	NO <input type="checkbox"/>	JUSTIFIED		

**Justification 4: Four Hour Volume**

Justification	Time Period	Total Volume of Both Approaches (Main) X	Heaviest Minor Approach Y (actual)	Required Value Y (warrant threshold)	Average % Compliance	Overall % Compliance
Justification 4	8:00	1,221	276	80	100 %	100 %
	15:00	1,226	189	80	100 %	
	16:00	1,303	201	80	100 %	
	17:00	1,428	220	80	100 %	

**Justification 5: Collision Experience**

Justification	Preceding Months	% Fulfillment	Overall % Compliance
Justification 5	1-12	0 %	0 %
	13-24	0 %	
	25-36	0 %	

**Justification 6: Pedestrian Volume**

**Pedestrian Volume Analysis**

	8 Hour Vehicular Volume $V_8$	Net 8 Hour Pedestrian Volume				
		< 200	200 - 275	276 - 475	476 - 1000	>1000
Justification 6A	< 1440					
	1440 - 2600					Justified
	2601 - 7000					
	> 7000					

**Pedestrian Delay Analysis**

	Net Total 8 Hour Volume of Total Pedestrians	Net Total 8 Hour Volume of Delayed Pedestrians		
		< 75	75 - 130	> 130
Justification 6B	< 200			
	200 - 300			
	> 300	Not Justified		

# Results Sheet

[Input Sheet](#)

[Analysis Sheet](#)

[Proposed Collision](#)

Intersection: Highway 10 and Site Access

Count Date: 2035 (Future Total)

## Summary Results

	Justification	Compliance	Signal Justified?	
			YES	NO
1. Minimum Vehicular Volume	A Total Volume	100 %		
	B Crossing Volume	98 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Delay to Cross Traffic	A Main Road	100 %		
	B Crossing Road	100 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Combination	A Justificaton 1	98 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	B Justification 2	100 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. 4-Hr Volume		100 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>

5. Collision Experience		0 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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6. Pedestrians	A Volume	Justification met	<input type="checkbox"/>	<input type="checkbox"/>
	B Delay	Justification not met	<input type="checkbox"/>	<input checked="" type="checkbox"/>

# APPENDIX I

## MTO Generic Timing Sheet

### GENERIC SIGNAL TIMING SHEET

ACTUATED  PRE-TIMED  SIGNAL TO BE MAINTAINED BY: M T O

LOCATION: Highway 10 and Site Access SIGNAL TO BE OPERATED BY: M T O

MAINSTREET (HWY): Highway 10 TIMING DEVELOPED BY: M T O

DATE TIMING DEVELOPED : 2022-12-15

**GENERIC TIMING IDENTIFIED HERE SHALL BE TRANSCRIBED ONTO "OFFICIAL" TIMING SHEETS FOR THE TRAFFIC SIGNAL CONTROLLER BEING USED AT THIS SIGNALIZED INTERSECTION. A COPY OF THE "OFFICIAL" LOCAL TIMING SHEETS AND COORDINATION SHEETS IF USED, SHALL BE ATTACHED TO THIS FORM AND FILED IN THE MTO REGIONAL TRAFFIC OFFICE**

- OPERATIONAL NOTES:**
- 1 All Prot/Perm left turn movements shall be followed by parent through movements without exception
  - 2 If serving F2 and F6 the signal must cycle to F4 and/or F8 prior to serving a call for F1 and/or F5 if these left turn movements are protected/permissive.
  - 3 If serving F4 and F8, the signal must cycle to F2 and/or F6 prior to serving a call for F3 and /or F7 if these left turn movements are protected/permissive.
  - 4 Through Movements shall lag left turn movements unless otherwise specified.

FUNCTION/OPERATION	MOVEMENT (FAZE)							
	NB LEFT	NB THRU	WB LEFT	WB THRU	SB LEFT	SB THRU	EB LEFT	EB THRU
PERMITTED MOVEMENTS		X				X		X
RED LOCK								
AMBER LOCK								
VEHICLE RECALL								
PEDESTRIAN RECALL		X				X		X
VEHICLE MAX RECALL								
OVERLAP A								
OVERLAP B								
PROT/PERM LEFT TURN ARROW								
PROT/PERM FAST FLASH ADVANCE GREEN								
FULLY PROTECTED LEFT TURN								
DISPLAY AMBER ON STARTUP		X				X		
PLACE PED CALLS ON STARTUP		X				X		X
PLACE VEHICLE CALLS ON STARTUP		X				X		X
REST IN WALK								
MOVEMENTS MUST GAP OUT SIMULTANEOUSLY		X				X		X
DOUBLE ENTRY		X				X		X
EXCLUSIVE (SEPERATE) PHASING BY APPORACH								

INTERVAL TIMES	MOVEMENT (FAZE)							
	NB LEFT	NB THRU	WB LEFT	WB THRU	SB LEFT	SB THRU	EB LEFT	EB THRU
WALK		27.0				27.0		7.0
FLASHING DON'T WALK		19.0				19.0		10.0
MINIMUM GREEN		39.0				39.0		17.0
VEHICLE EXTENSION (PASSAGE TIME)		4.2				3.0		4.2
MAXIMUM GREEN (INCLUDES MIN GREEN)		59				59		18
MAXIMUM GREEN 2 (ALTERNATE MAX GREEN)								
AMBER CLEARANCE		5.4				5.4		4.1
ALL RED CLEARANCE		1.3				1.3		1.5
MAX GAP (VEH. EXTENSION)								
MIN GAP (VEH. EXTENSION)								
REDUCE GAP BY								
REDUCE GAP EVERY								
MAX INITIAL GREEN TIME (VARIABLE INIT)								
TIME ADDED/VEHICLE (VARIABLE INIT)								

DETECTOR SETUP	MOVEMENT (FAZE)							
	NB LEFT	NB THRU	WB LEFT	WB THRU	SB LEFT	SB THRU	EB LEFT	EB THRU
DELAY TIME ON PRESENCE DETECTION								
DELAY ON LONG DISTANCE DETECTION								
CARRY-OVER ON PRESENCE DETECTION								
CARRY-OVER ON LONG DISTANCE DETECTION								

PRE-EMPTION	MOVEMENT (FAZE)							
	NB LEFT	NB THRU	WB LEFT	WB THRU	SB LEFT	SB THRU	EB LEFT	EB THRU
1ST EMERG. PRE-EMPT MOVEMENTS								
1ST EMERG. PRE-EMPT DELAY TIME								
1ST EMERG. PRE-EMPT CLEARANCE TIME								
2ND EMERG. PRE-EMPT MOVEMENTS								
2ND EMERG. PRE-EMPT DELAY TIME								
2ND EMERG. PRE-EMPT CLEARANCE TIME								
RR PRE-EMPT TRACK CLEARANCE MOVEMENTS								
RR PRE-EMPT CLEARANCE TIME								
RR PRE-EMPT DELAY TIME								
RR PRE-EMPT LIMITED SERVICE MOVEMENTS								

TIME OF DAY OPERATIONS	TIME OF DAY		DAY OF WEEK							MOVEMENT (FAZE)							
	START	END	S	M	T	W	T	F	S	NB LEFT	NB THRU	WB LEFT	WB THRU	SB LEFT	SB THRU	EB LEFT	EB THRU
PHASE OMIT																	
MAX RECALL																	
PED RECALL																	
MIN RECALL																	
MAX GREEN 2																	
REST IN WALK																	
AMBER LOCK																	
RED LOCK																	

# APPENDIX J

## SimTraffic Reports



**Intersection: 1: Highway 10 & Main Street/Grey Road 9**

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	T	R
Maximum Queue (m)	33.3	54.5	15.8	28.0	34.4	60.8	9.2	39.8	21.9
Average Queue (m)	13.6	30.5	6.0	11.3	16.6	22.3	0.8	17.3	7.8
95th Queue (m)	25.0	50.9	15.5	22.6	29.6	42.5	4.7	33.9	15.9
Link Distance (m)		550.0		248.7		762.6		485.5	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)	120.0		100.0		110.0		90.0		85.0
Storage Blk Time (%)									
Queuing Penalty (veh)									

**Intersection: 2: Russell Street & Main Street**

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	34.5	41.5
Average Queue (m)	8.4	19.3
95th Queue (m)	25.5	34.9
Link Distance (m)	550.0	147.9
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 3: Alice Street/Mill Street & Main Street**

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	9.0	9.2	9.0
Average Queue (m)	0.6	5.9	2.2
95th Queue (m)	4.2	12.4	8.3
Link Distance (m)	329.0	85.2	83.0
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 4: Osprey Street & Grey Road 9/Main Street**

Movement	EB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	9.0	15.6	22.5
Average Queue (m)	0.3	8.7	9.8
95th Queue (m)	3.0	14.8	16.9
Link Distance (m)	64.7	105.5	86.7
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 5: Elm Street & Victoria Street East**

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	15.1	32.7
Average Queue (m)	1.0	18.5
95th Queue (m)	7.2	28.9
Link Distance (m)	143.1	181.3
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 6: Highway 10 & Site Access**

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	R
Maximum Queue (m)	38.8	38.6	21.5	41.0	67.5	15.8
Average Queue (m)	12.2	15.5	10.5	12.2	34.3	4.2
95th Queue (m)	23.9	28.2	18.6	27.9	64.7	13.5
Link Distance (m)		173.9		423.2	762.6	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)	35.0		45.0			30.0
Storage Blk Time (%)	0	0		0	7	
Queuing Penalty (veh)	0	0		0	4	

**Network Summary**

Network wide Queuing Penalty: 5
---------------------------------

**Intersection: 1: Highway 10 & Main Street/Grey Road 9**

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	T	R
Maximum Queue (m)	33.3	82.7	32.7	42.0	117.3	159.4	15.4	53.1	15.7
Average Queue (m)	17.2	43.5	10.3	24.0	76.3	41.4	2.9	22.7	7.2
95th Queue (m)	30.4	71.7	21.0	36.0	116.7	104.6	10.2	42.9	16.0
Link Distance (m)		550.0		248.7		762.6		485.5	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)	120.0		100.0		110.0		90.0		85.0
Storage Blk Time (%)					3	0			
Queuing Penalty (veh)					10	0			

**Intersection: 2: Russell Street & Main Street**

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (m)	12.8	53.9	41.0
Average Queue (m)	0.4	15.5	19.4
95th Queue (m)	4.2	36.8	35.7
Link Distance (m)	329.0	550.0	147.9
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

**Intersection: 3: Alice Street/Mill Street & Main Street**

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	15.5	28.6	9.2	9.0
Average Queue (m)	0.5	4.3	3.5	2.5
95th Queue (m)	5.1	18.1	10.6	9.0
Link Distance (m)	342.9	329.0	85.2	83.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 4: Osprey Street & Grey Road 9/Main Street**

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	8.6	41.0	22.0	22.8
Average Queue (m)	0.3	3.6	8.9	9.3
95th Queue (m)	2.8	19.4	17.8	16.6
Link Distance (m)	64.7	342.9	105.5	86.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

**Intersection: 5: Elm Street & Victoria Street East**

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	21.7	27.6
Average Queue (m)	1.0	17.0
95th Queue (m)	7.9	27.1
Link Distance (m)	143.1	181.3
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 6: Highway 10 & Site Access**

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	R
Maximum Queue (m)	30.0	32.4	54.8	72.2	71.6	16.6
Average Queue (m)	14.3	10.8	24.7	35.8	33.0	4.4
95th Queue (m)	25.6	20.2	42.7	60.8	55.3	13.1
Link Distance (m)		173.9		423.2	762.6	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)	35.0		45.0			30.0
Storage Blk Time (%)	0	0	1	3	8	
Queuing Penalty (veh)	0	0	5	8	6	

**Network Summary**

Network wide Queuing Penalty: 29
----------------------------------

# APPENDIX K

MTO Design Supplement (April 2020) Excerpts

**MTO DESIGN SUPPLEMENT**  
**FOR**  
**TAC GEOMETRIC DESIGN GUIDE (GDG) FOR**  
**CANADIAN ROADS**

APRIL 2020

STANDARDS &  
SPECIFICATIONS BRANCH  
DESIGN STANDARDS &  
SPECIFICATIONS OFFICE

**Table 9.14.1 – Right-Turn Tapers Without Auxiliary Lanes**

- This Table is Not Applicable and is replaced with **Exhibit 9-I**.

**Exhibit 9-I**  
**Right-Turn Tapers Without Auxiliary Lanes**

Design Speed (km/h)	Taper Length (m)	Horizontal Curve <sup>a</sup>
50	50	500
60	60	750
70	70	1000

Note: a) Flat radii as indicated can be used rather than tangent alignment for right-turn tapers.

**Section 9.14.4 – Design Elements for Right-Turn Tapers with Auxiliary Lanes**

- This Section is Applicable including the following:
  - When the volume of right turning vehicles is such that it creates a hazard and reduces capacity at an intersection, consideration should be given to the provision of a deceleration lane in the form of a taper and parallel lane for the right turning traffic.
  - The width of the parallel lane (w) may be 0.25 m less than the width of the through lane, but should not be less than 3.25 m.
  - Similar to the right-turn taper design, a 30 m recovery taper with a 1.5 m offset should be applied beyond the intersection when using the taper and parallel lane design on two-lane highways. It is not required on a four-lane highway, at 'T' intersections or where a left-turn lane has been provided.
  - Equation 9.14.1 is only applicable for determining right-turn storage length.
  - For left-turn storage length at unsignalized intersections, refer to **Appendix 9A**.
  - For left-turn storage length at signalized intersections, refer to the latest edition of *Traffic Signal and Timing Policy # 2010-02* issued by Traffic Policy Office.

**Table 9.14.2 – Right-Turn Taper with Parallel Deceleration Lane Design**

- This Table is Not Applicable and is replaced with **Exhibit 9-J**.

**Exhibit 9-J****Right-Turn Taper with Parallel Deceleration Lane Lengths<sup>a</sup>**

Highway Design Speed (km/h)	Length of Taper (m)	Length of Parallel Lane (m)	Total length of Deceleration Lane (m)
50	40	20	60
60	50	30	80
70	60	45	105
80	70	60	130
90	75	70	145
100	80	85	165
110	85	100	185
120	90	110	200

Note: a) Flat Grade 2% or Less

**Table 9.14.3 – Grade Factors for Deceleration Length**

- This Table is Not Applicable and is replaced with **Exhibit 9-K**.

**Exhibit 9-K****GRADE FACTORS FOR DECELETARION LENGTH**

ALL DESIGN SPEEDS km/h	DOWN GRADE %	GRADE FACTOR > 1	UP GRADE %	GRADE FACTOR ≤ 1
8 – 7	8 – 7	1.5	2 – 3	1.0
7 – 6	7 – 6	1.4	3 – 4	0.9
6 – 5	6 – 5	1.4	4 – 5	0.9
5 – 4	5 – 4	1.3	5 – 6	0.8
4 – 3	4 – 3	1.2	6 – 7	0.8
3 – 2	3 – 2	1.1	7 – 8	0.7

**Section 9.15.2 – Smart Channels**

- This Section is Applicable with the following additional guidance:

**Angle of Intersection with Cross Street**

The alignment of a channelized right-turn lane and the angle between the channelized right-turn roadway and the cross street has great effect on safety and capacity. This can



- $d_2$  = storage length for stopped vehicles waiting to turn.
- $d_3$  = distance travelled during deceleration after lane change
- $d_4$  = distance travelled while decelerating and changing lanes from through-lane into turn-lane.
- $d_5$  = perception and reaction distance travelled while driver recognizes upcoming turn lane and prepares for the left maneuver.

### Section 9.17.3 – Approach and Departure Tapers

- This Section is Applicable including the following additional guidance:

#### Taper Length

Long tapers approximate the path drivers follow when entering an auxiliary lane from a high-speed through lane. However, with exceptionally long tapers some through drivers may tend to drift into the deceleration lane especially when the taper is on a horizontal curve. In addition, long tapers may constrain the lateral movement of a driver desiring to enter the auxiliary lanes.

The width of left turn lanes should be one increment (0.25 m) less than the through lane with a minimum of 3.25 m and separated from through lanes by a solid painted line and indicated by painted arrow according to the *OTM Book 11 – Pavement, Hazard and Delineation Markings*.

For grades greater than 2%, the length of deceleration lane should be corrected according to the factors shown in **Exhibit 9-K**. The correction is attained by multiplying the deceleration length and added to taper; it will comprise the total deceleration length. The length of taper, parallel, horizontal curve to smooth taper, and corresponding design speeds are provided in **Exhibit 9-R**.

#### Table 9.17.1 – Approach and Departure Taper Ratios and Lengths for Left Turns at Intersections

- This Table is Not Applicable and is replaced with **Exhibit 9-R**.

**Exhibit 9-R**  
**DECELERATION LENGTH FOR LEFT-TURN LANES, 2-LANES AND 4-LANE HIGHWAYS**  
**FLAT GRADE 2% OR LESS**

Design Speed (km/h)	Deceleration Length		Horizontal Curve to Smooth Taper R (m)
	Taper (m)	Parallel (m)	
50	85	20	500
60	100	30	750
70	115	40	1000
80	130	50	1200
90	145	60	1500
100	160	70	2000
110	170	80	2500

#### Section 9.17.4.2 – Deceleration Requirements

- This Section is Applicable including the following additional guidance:

The designer may have to determine which distance would be appropriate for the driver to brake comfortably. The designer should choose amongst the worlds of desirable, acceptable and minimum based on site specific conditions. For parallel lane length only, it is desirable to include perception-reaction time but in acceptable practice perception-reaction time may not be feasible and not cost effective. It is assumed that when driver enters a left-turn lane (taper) they should be expecting to brake. In most cases the driver would be expected to already transition their speed as they go through the taper using perception-reaction time. According to Section 9.17.3 decision sight distance should be considered in taper length to accommodate perception-reaction distance. Using minimums all the way around in the process should be avoided. The minimum desirable length of the taper and parallel length combined should not be less than the stopping sight distance provided in *Table 2.5.2 of Chapter 2*.

#### Section 9.17.4.5 – Left-Turn Lanes on Both Approaches

- This Section is Applicable including the following additional guidance:

##### Positive Offset for Left-Turn Lanes

A potential for conflict exists when vehicles in opposing left-turn lanes on the major

# APPENDIX L

## TAC GDGCR Excerpts



Transportation Association of Canada

# Geometric Design Guide for Canadian Roads



June 2017

The paved shoulder with concrete curb and gutter is considered to be the most effective design. It discourages drivers from deviating from the appropriate turning path onto the shoulder. Curbing may however, cause difficulty for some oversized vehicles requiring the use of the shoulder and may also cause drifting and present a roadside hazard on high speed facilities.

### 9.13.3.5 Summary

The following table provides a summary of guidelines for shoulder treatment at simple intersections.<sup>80</sup>

**Table 9.13.1: Guidelines for Shoulder Treatment at Simple Intersections**

Type of Treatment	Criteria
Gravel shoulders	<ul style="list-style-type: none"> <li>• Lightly travelled minor roadways</li> <li>• Few commercial vehicle turns</li> <li>• No recorded maintenance problems</li> </ul>
Paved shoulders	<ul style="list-style-type: none"> <li>• Moderately travelled minor roadways</li> <li>• Moderate commercial vehicle turns</li> <li>• Identifiable shoulder maintenance problems</li> <li>• When major shoulders are paved, or partially paved</li> </ul>
Concrete curb and gutter	<ul style="list-style-type: none"> <li>• Heavily travelled minor roadways</li> <li>• High volume of commercial vehicle turns</li> <li>• Identifiable shoulder maintenance problems</li> <li>• At superelevated roadway sections to control drainage and erosion</li> <li>• Areas of limited right-of-way</li> </ul>

## 9.14 TAPERS AND AUXILIARY LANES

### 9.14.1 OVERVIEW

The flaring of one or more legs of an at-grade intersection using tapers and auxiliary lanes reduces the severity of conflicts between through and turning traffic by separating slower, right-, and left-turning vehicles from faster, through vehicles. The flaring of an intersection can also assist vehicles, particularly larger trucks, in negotiating a turn. The use of tapers and auxiliary lanes at an intersection is typically considered on the basis of vehicular capacity requirements and safety. However, tapers and auxiliary lanes increase roadway crossing distances for pedestrians; therefore, the effect on pedestrians is an important consideration when assessing the need for a flared intersection. Tapers and right-turn auxiliary lanes may be disadvantageous to cyclists due to the increased conflict created between through cyclists and right-turning vehicles. Transit operations may also be affected with respect to transit stop locations, and the difficulty of buses re-entering the through traffic stream from a stop located along an auxiliary lane.

In an urban setting, intersection flaring is rare along local roads and is used only occasionally along collector roads. The use of tapers and auxiliary lanes is common at intersections along arterial roads, particularly major arterials with high design speeds where the hazard to through traffic caused by slow turning or stopped vehicles in the through lanes is significant. Tapers and auxiliary lanes are also commonly used in a rural setting on higher-speed roads.

Auxiliary lanes, at an intersection, serve as storage lanes, deceleration lanes, or a combination of the two. They can be used to minimize hazard and inconvenience, to increase capacity, and to promote operating efficiency where vehicles exit or enter the roadway. Acceleration lanes are seldom used along urban roads, except for freeways and expressways, and are commonly used for higher-speed rural roads. Added lanes on the departure legs of an intersection may be considered for capacity, access, or safety reasons.

Auxiliary lanes may be either left- or right-turn lanes adjacent to the through lanes and in the same direction of travel. Left-turn lanes can be added with or without divisional islands. A divisional island effectively provides a measure of protection for vehicles queued to make a left turn at an intersection, and can be used for the placement of traffic control devices and as a pedestrian refuge. In existing urban locations where right-of-way is limited or where opportunities for widening are restricted by adjacent development, it may not be possible to introduce a divisional island. The feasibility of an island may also be influenced by the access needs of the adjacent land uses.

#### **9.14.2 GUIDELINES FOR THE APPLICATION OF RIGHT-TURN TAPER AND BAY TAPERS WITH AUXILIARY LANES**

Right- and left-turn tapers are normally provided at all at-grade intersections along major roads and expressways. The consistent use of auxiliary lanes along major roads is often achieved through local policies related to classification, design speed, and volume warrants. Along minor arterials and collectors, the implementation of auxiliary turn lanes is considered on the basis of many factors, including speed, design volumes, right-of-way availability, collision potential, access locations, intersection spacing, cyclist and pedestrian needs, and implications on transit operation.

Right-turn tapers may be provided without auxiliary lanes on intersection approach legs to permit the right-turn movement at the intersection with less interference to the through traffic. Right-turn tapers normally connect to a separate right-turning roadway at a major channelized intersection.

Where it is desirable to flare an intersection to better accommodate the right-turn movement, it is generally preferable to incorporate a right-turn auxiliary lane as part of the design. The auxiliary lane serves to separate the through and right-turning traffic well in advance of the intersection, causes less deceleration of the turning traffic in the through lanes, and provides a storage area for turning vehicles stopped for pedestrians crossing the roadway on the green signal. Tapers without parallel lanes may also be a disadvantage to through cyclists in determining a safe travel path through the intersection.

The following guidelines are suggested for the use of a right-turn auxiliary lane on urban and rural roads. Refer to other publications, including the latest version of the TRB *Highway Capacity Manual*, for more detailed procedures on determining the need for tapers and auxiliary lanes.

Unsignalized:

- When the volume of decelerating or accelerating vehicles compared with the through traffic volume causes undue hazard.

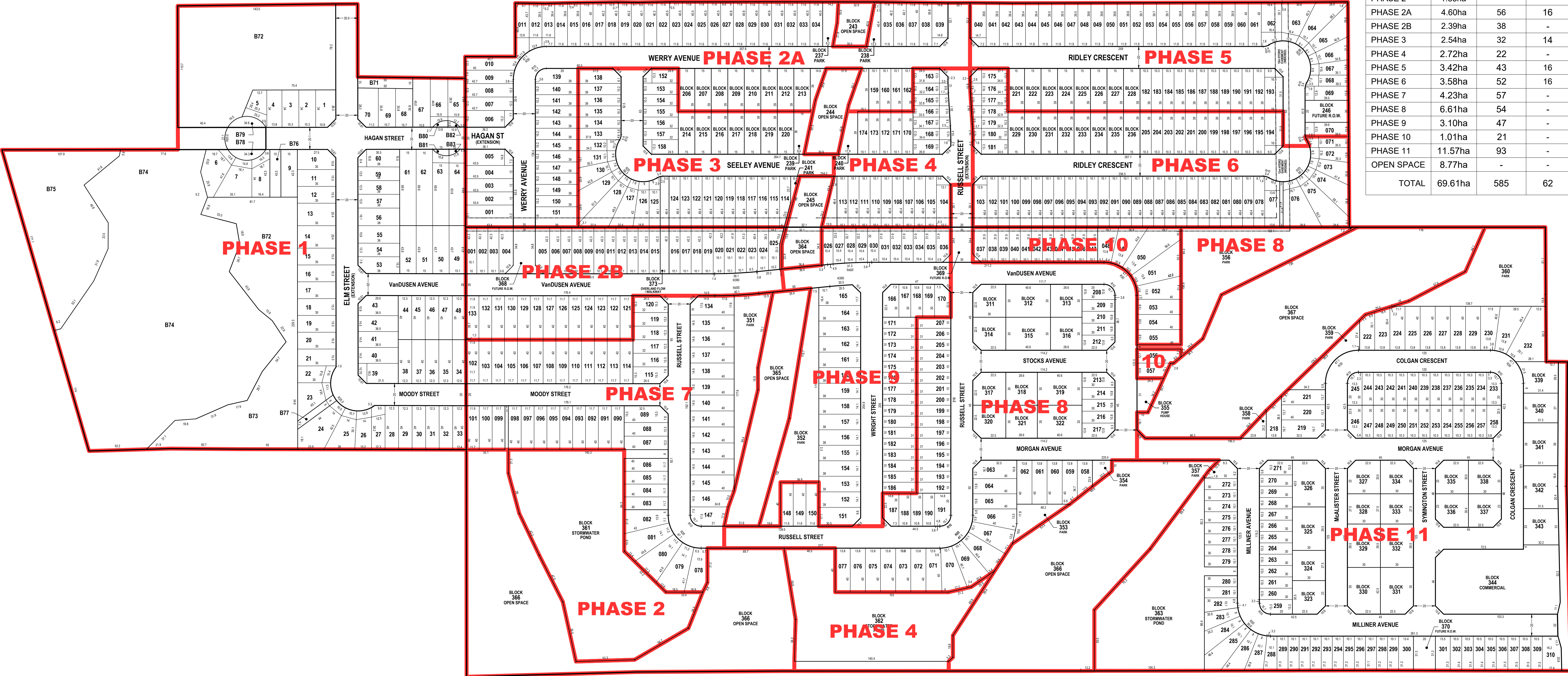
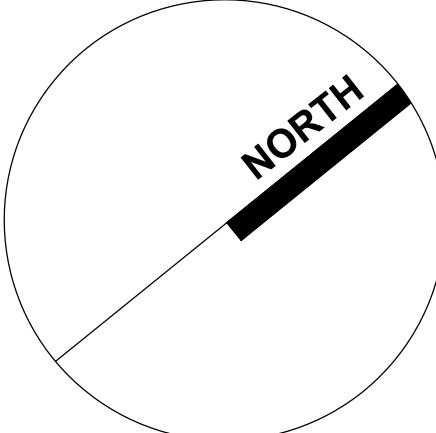
Signalized:

- Right-turn lane without separate signal indication when the volume of right-turning traffic is 10% to 20% of the total approaching volume.
- Right-turn lane with separate indication when right-turn traffic is greater than 20% of the total approaching volume.

## LIST OF FIGURES

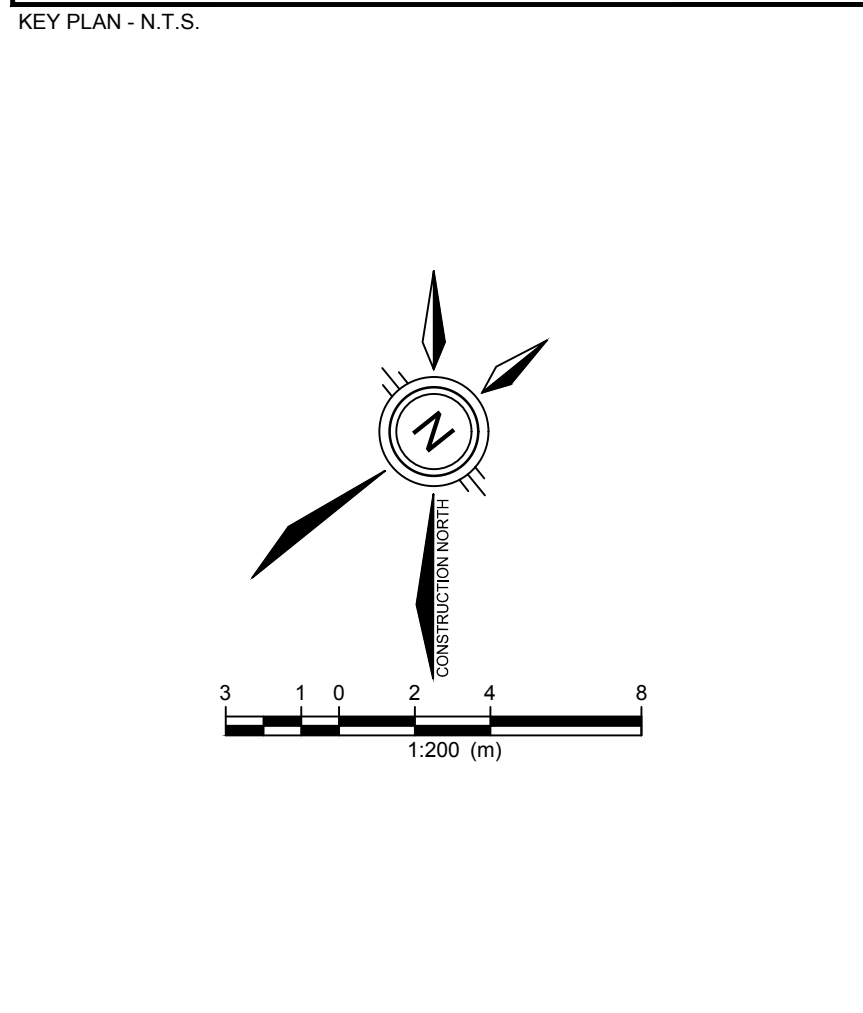
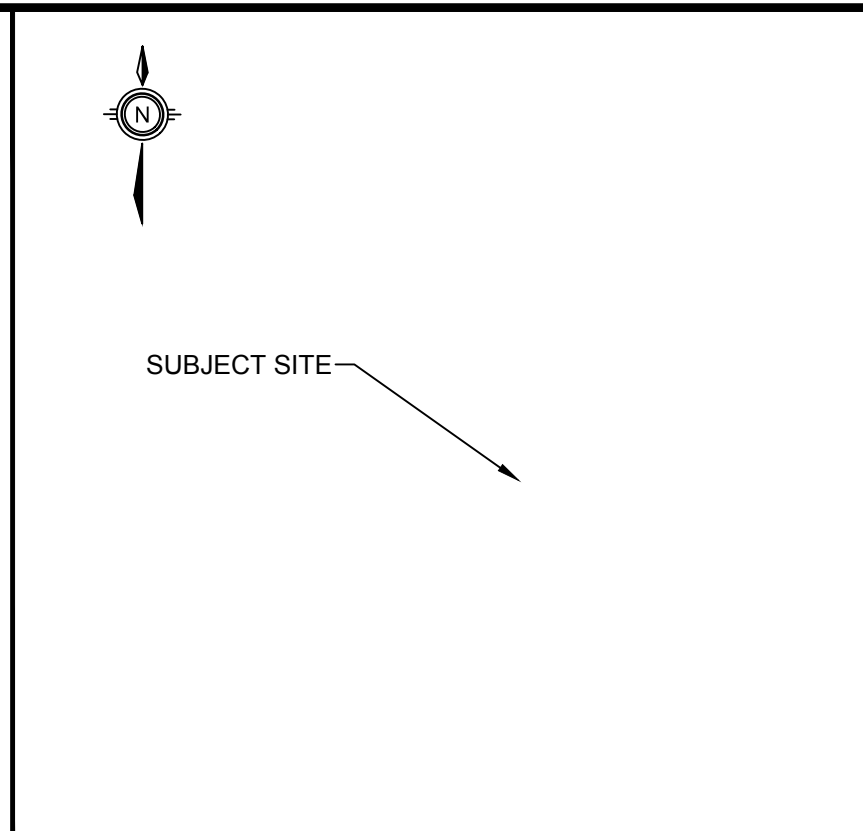
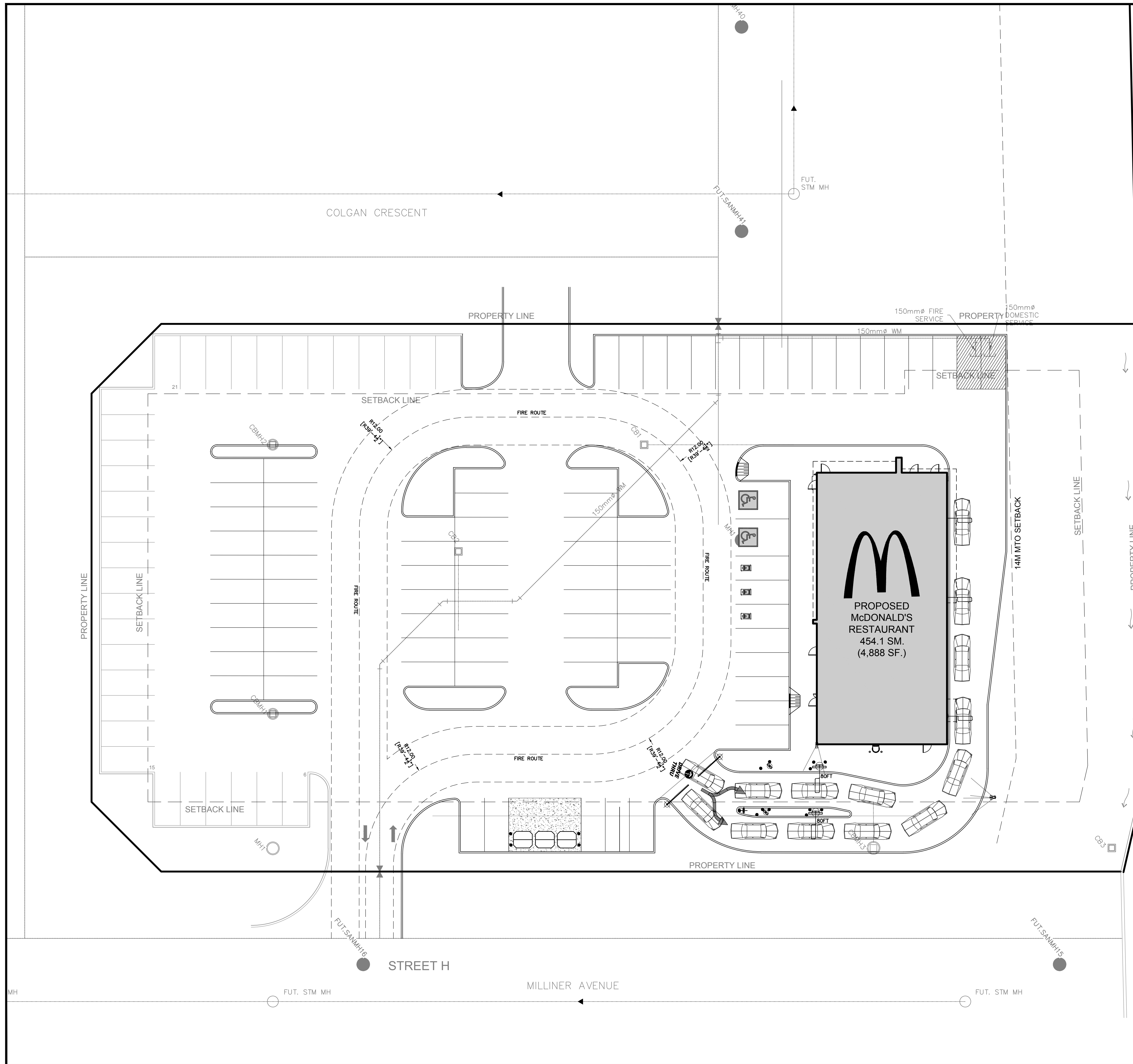
- Figure 1:** Edgewood Greens Composite Phasing Plan
- Figure 2:** Flato East McDonald's Restaurant Concept Plan (October 28, 2022)
- Figure 3:** Site Location Plan
- Figure 4:** Boundary Road Network
- Figure 5:** 2022 Existing Traffic Volumes
- Figure 6:** Glenelg Trip Assignment
- Figure 7:** 2025 Future Background Traffic Volumes
- Figure 8:** 2030 Future Background Traffic Volumes
- Figure 9:** 2035 Future Background Traffic Volumes
- Figure 10:** Residential Trip Distribution
- Figure 11:** Commercial Primary Trip Distribution
- Figure 12:** Commercial Pass-By Trip Distribution
- Figure 13:** Residential Trip Assignment
- Figure 14:** Commercial Primary Trip Assignment
- Figure 15:** Commercial Pass-By Trip Assignment
- Figure 16:** 2025 Future Total Traffic Volumes
- Figure 17:** 2030 Future Total Traffic Volumes
- Figure 18:** 2035 Future Total Traffic Volumes

# EDGEWOOD GREENS COMPOSITE PHASING PLAN




PHASE	AREA	SINGLES	SEMIS	TOWNS	TOTAL
PHASE 1	13.22ha	70	-	-	70
PHASE 2	1.85ha	-	-	-	-
PHASE 2A	4.60ha	56	16	-	72
PHASE 2B	2.39ha	38	-	-	38
PHASE 3	2.54ha	32	14	-	46
PHASE 4	2.72ha	22	-	-	22
PHASE 5	3.42ha	43	16	-	59
PHASE 6	3.58ha	52	16	-	68
PHASE 7	4.23ha	57	-	-	57
PHASE 8	6.61ha	54	-	56	110
PHASE 9	3.10ha	47	-	-	47
PHASE 10	1.01ha	21	-	-	21
PHASE 11	11.57ha	93	-	101	194
OPEN SPACE	8.77ha	-	-	-	-
<b>TOTAL</b>	<b>69.61ha</b>	<b>585</b>	<b>62</b>	<b>157</b>	<b>804</b>





CLIENT


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

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 IBI GROUP PROFESSIONAL SERVICES (CANADA) INC.

DATE	BY	DESCRIPTION

DRAWING ISSUE RECORD

DETAILS OF DEVELOPMENT			
	DATA	REQUIRED	PROPOSED
ZONING	FY		
SETBACK	RY		
	SY		
	SY		
LOT AREA			
RESTAURANT AREA			
GARBAGE ENCLOSURE			
SEATS			
LOT COVERAGE			
# OF LOADING SPACES			
LANDSCAPE AREA			
DT STACKING			
PARKING REQUIRED			
PARKING PROVIDED			


SEALS

SUB-CONSULTANT

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.

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, DUNDALK, ON

PROJECT NO: 140787

DRAWN BY: SC

CHKD BY: TW

SCALE: 1:200

DATE: 2022 10 28

SHEET TITLE

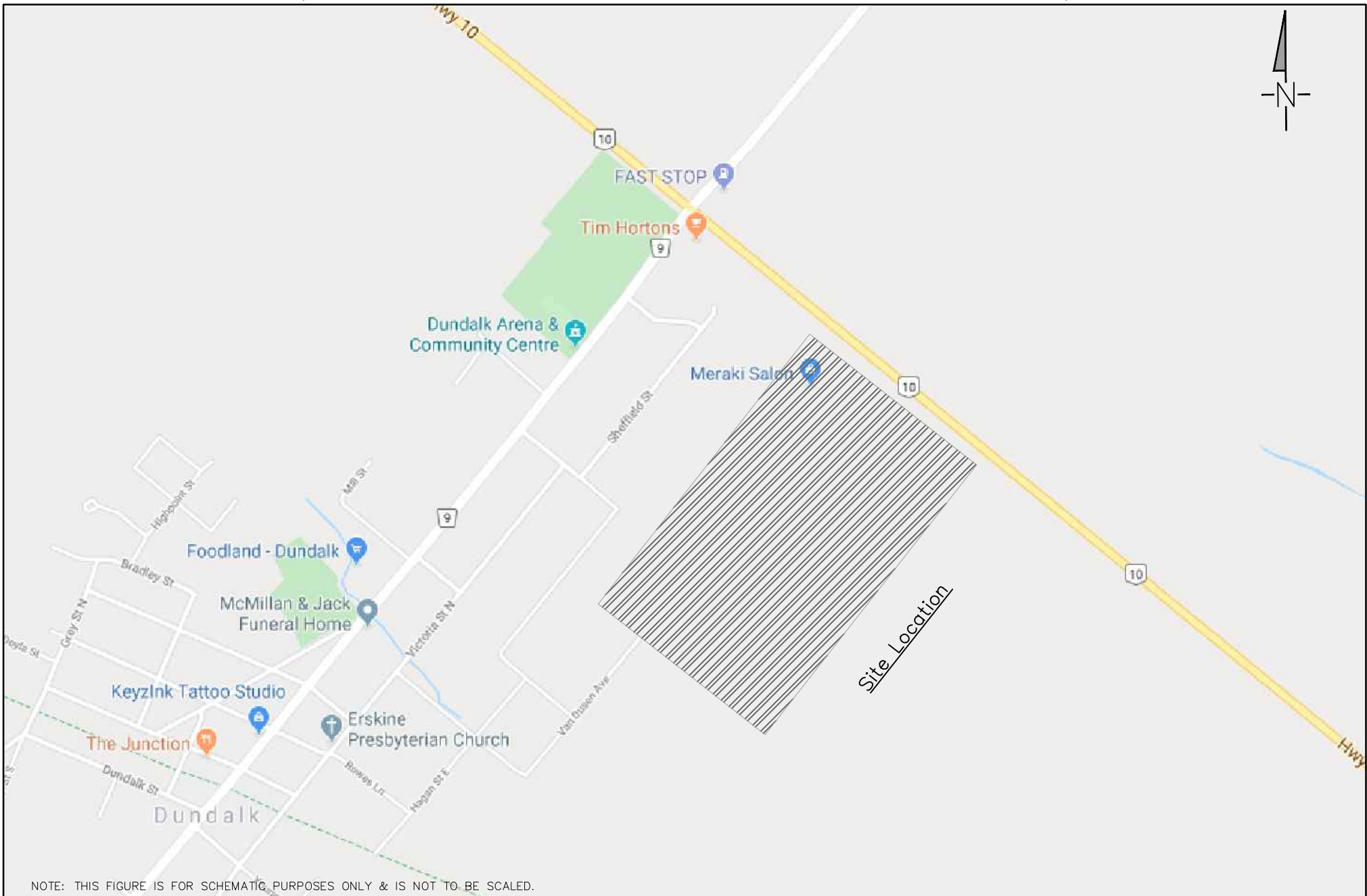
**CONCEPT PLAN**

LEGAL DESCRIPTION


**CP7.0**

SHEET 1 OF 1


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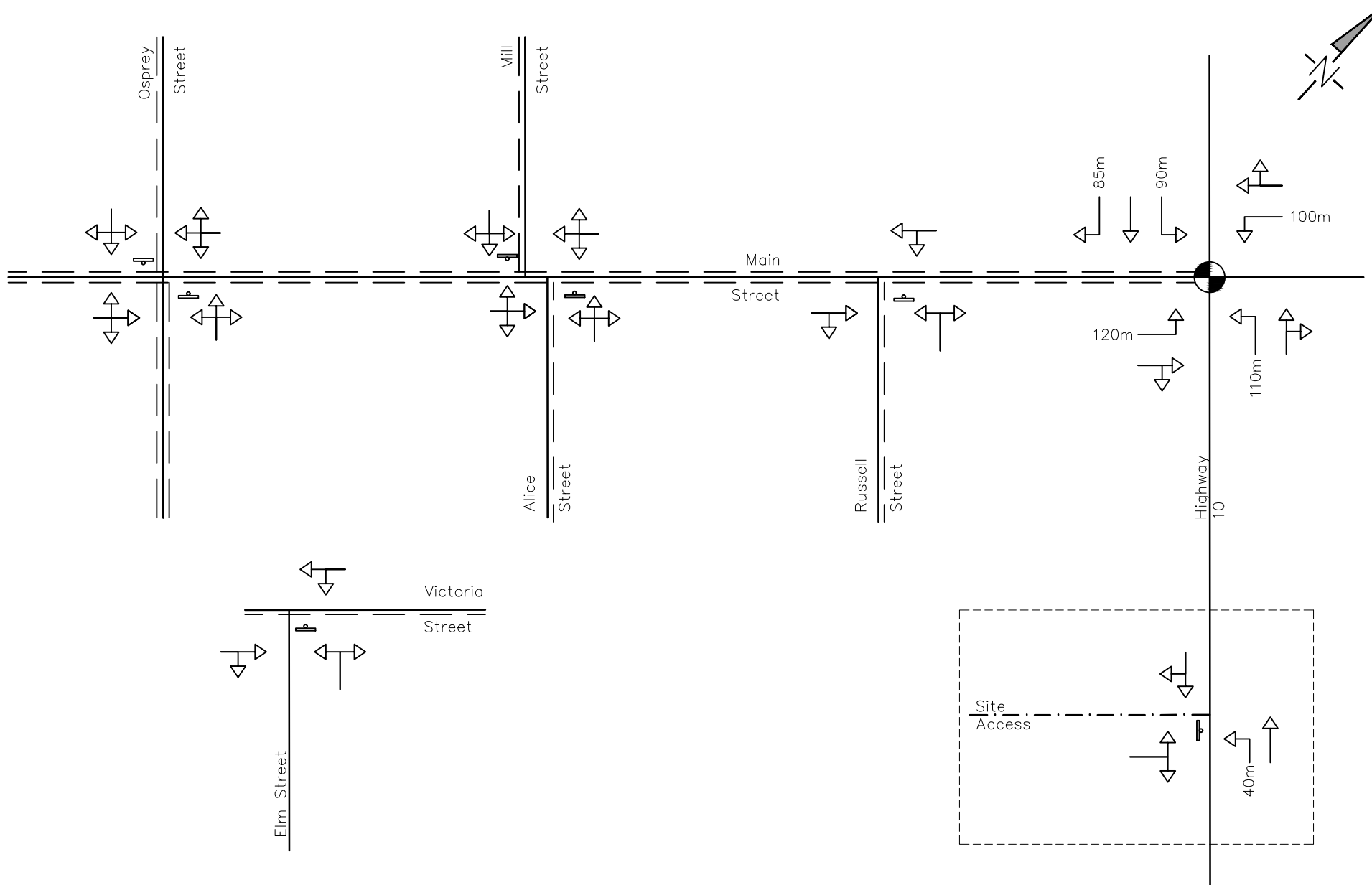


NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend	
	= SUBJECT LANDS

Project	Edgewood Greens Dundalk, Township of Southgate	
Drawing	Site Location	

		<b>CROZIER</b> 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	S.K.	Design By	S.K.	Project	1060-5384	
Scale	N.T.S.	Date	DEC. 16, 2022	Check By	M.F.	
					Drawing	FIG. 3



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

Legend	
	SIGNAL CONTROL
	STOP CONTROL
	PEDESTRIAN SIDEWALK
	Future Access
	Future Conditions Area

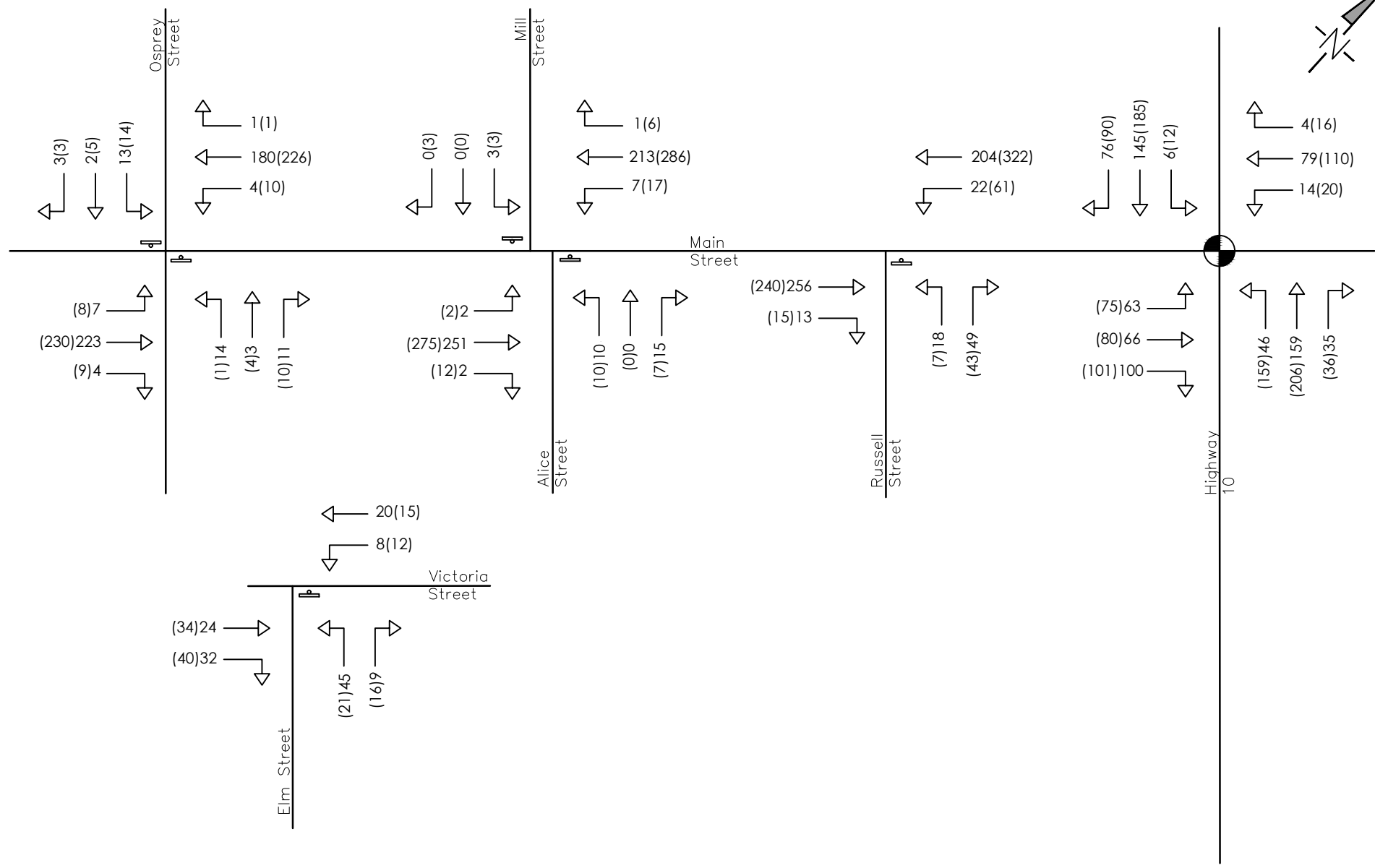
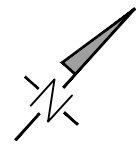
Project	Edgewood Greens Dundalk, Township of Southgate	
Drawing	Boundary Road Network	



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CONSULTING ENGINEERS

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1 FIRST STREET, SUITE 200  
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705 446-3510 T  
705 446-3520 F  
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Drawn By	S.K.	Design By	S.K.	Project	1060-5384	
Scale	N.T.S.	Date	DEC. 16, 2022	Check By	M.F.	
					Drawing	FIG. 4



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

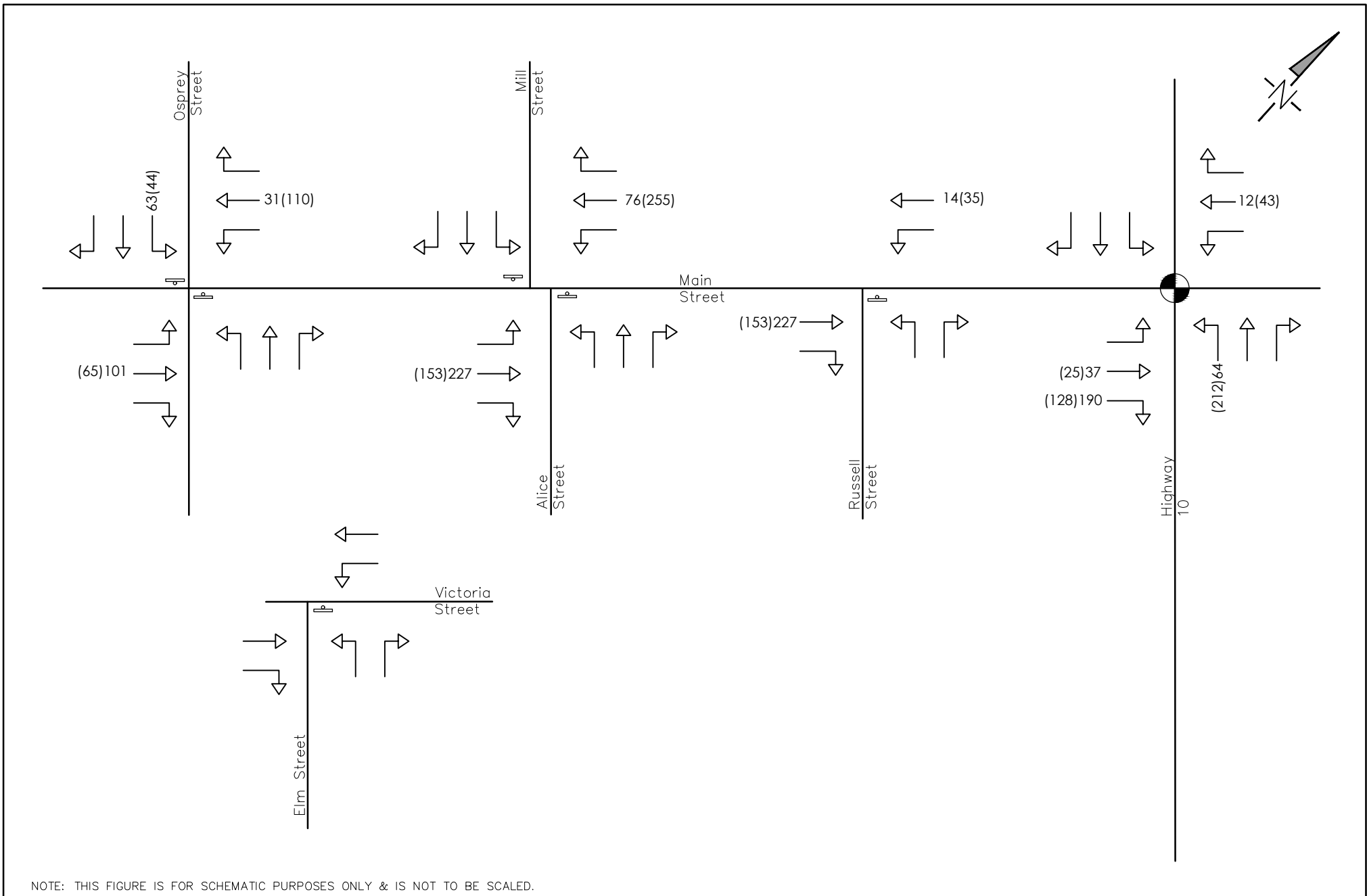
<b>Legend</b>	<b>Project</b>
SIGNAL CONTROL	Edgewood Greens Dundalk, Township of Southgate
STOP CONTROL	
xx(yy) A.M. (P.M.) PEAK HOUR TRAFFIC VOLUMES	<b>Drawing</b>
	2022 Existing Traffic Volumes





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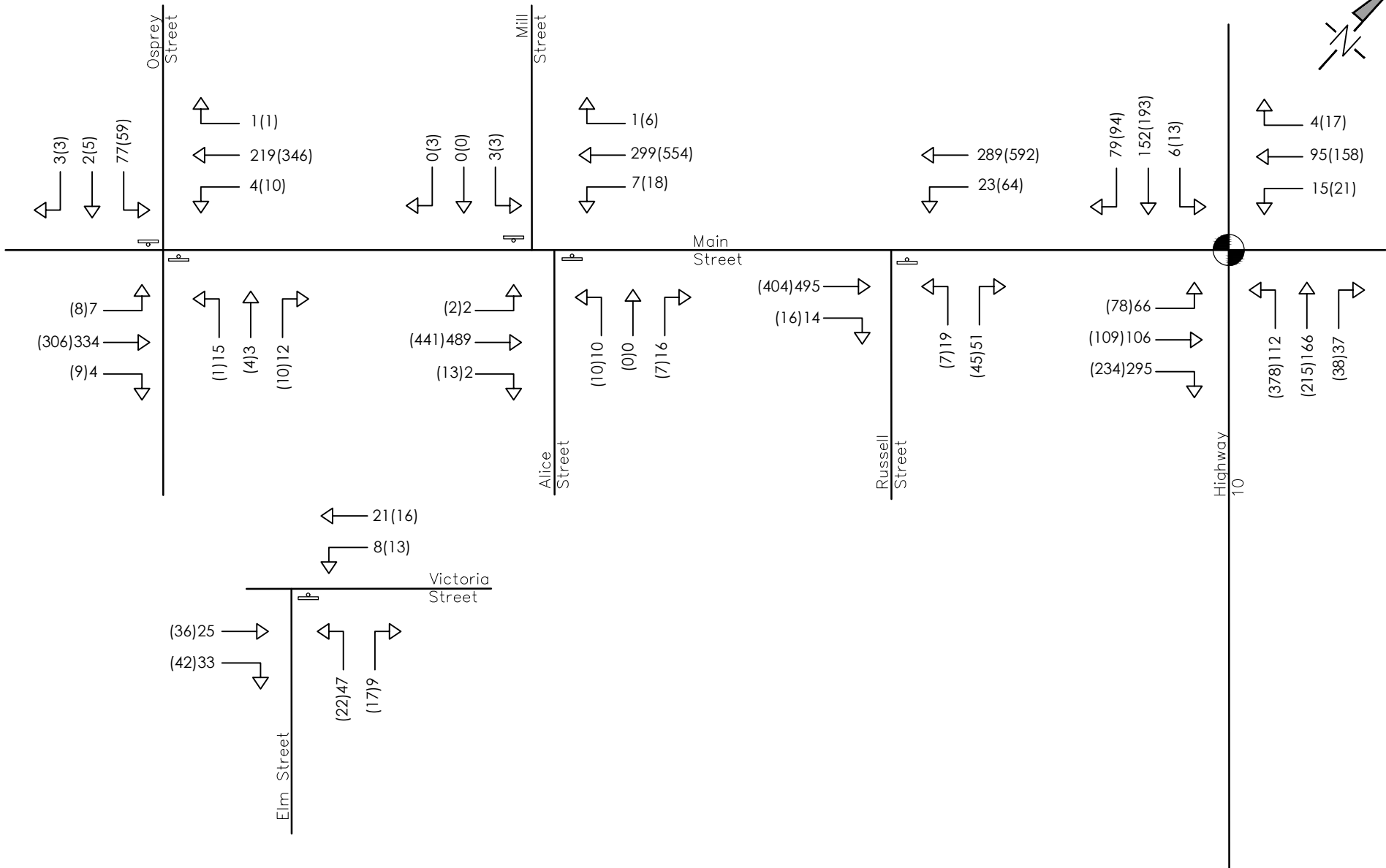
Drawn By	S.K.	Design By	S.K.	Project	1060-5384	
Scale	N.T.S.	Date	DEC. 16, 2022	Check By	M.F.	
					Drawing	FIG. 5



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

Project	Edgewood Greens Dundalk, Township of Southgate	
Drawing	Glenelg Trip Assignment	

		<b>CROZIER</b> CONSULTING ENGINEERS		The Harbour Edge 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	S.K.	Design By	S.K.	Project	1060-5384	
Scale	N.T.S.	Date	FEB. 22, 2021	Check By	M.F.	
					Drawing	FIG. 6

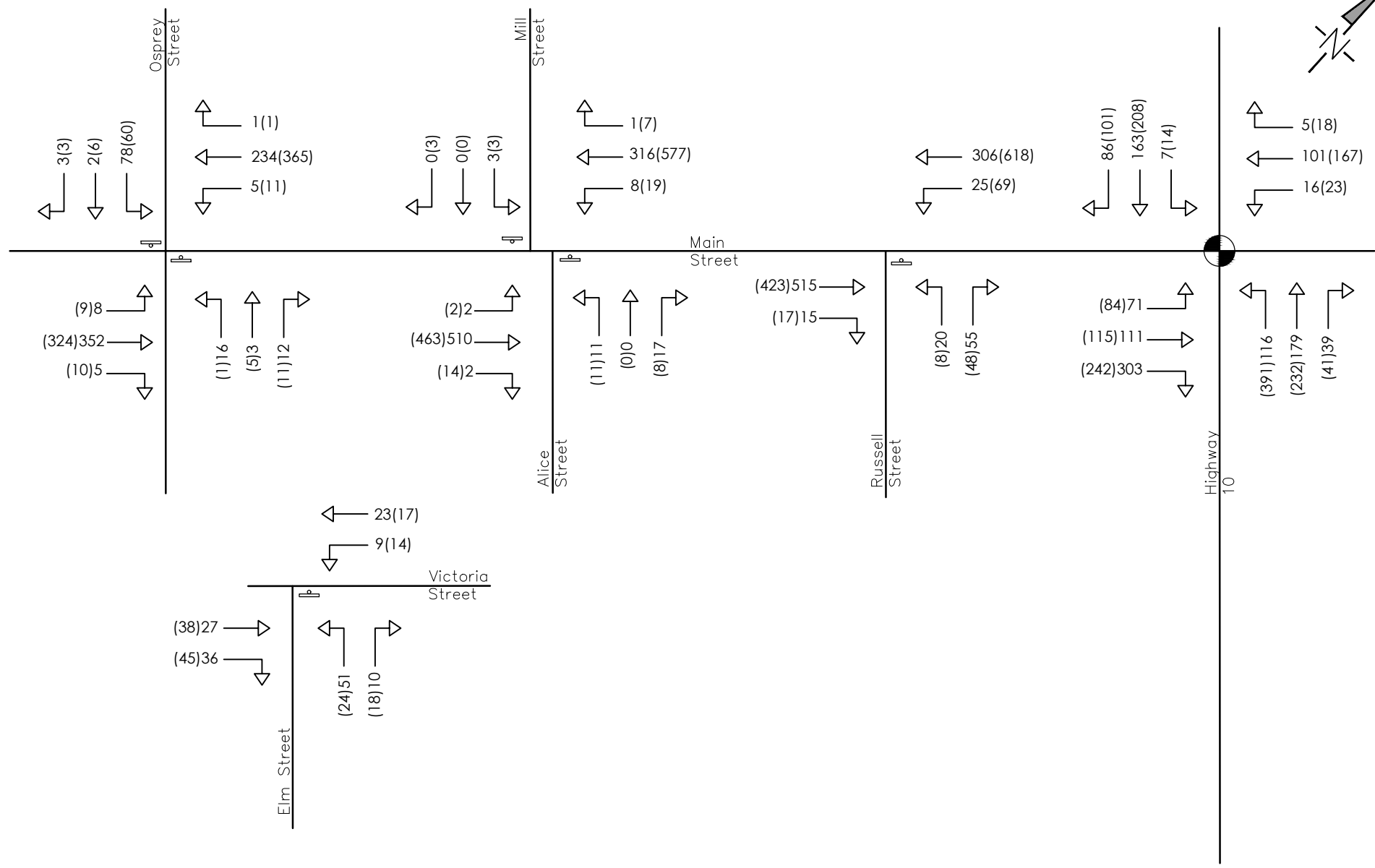


NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

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

Project	Edgewood Greens Dundalk, Township of Southgate	
Drawing	2025 Future Background Traffic Volumes	


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Scale	N.T.S.	Date	DEC. 16, 2022
Check By	M.F.	Project	1060-5384
			Drawing
			FIG. 7



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

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

Project	Edgewood Greens Dundalk, Township of Southgate	
Drawing	2030 Future Background Traffic Volumes	

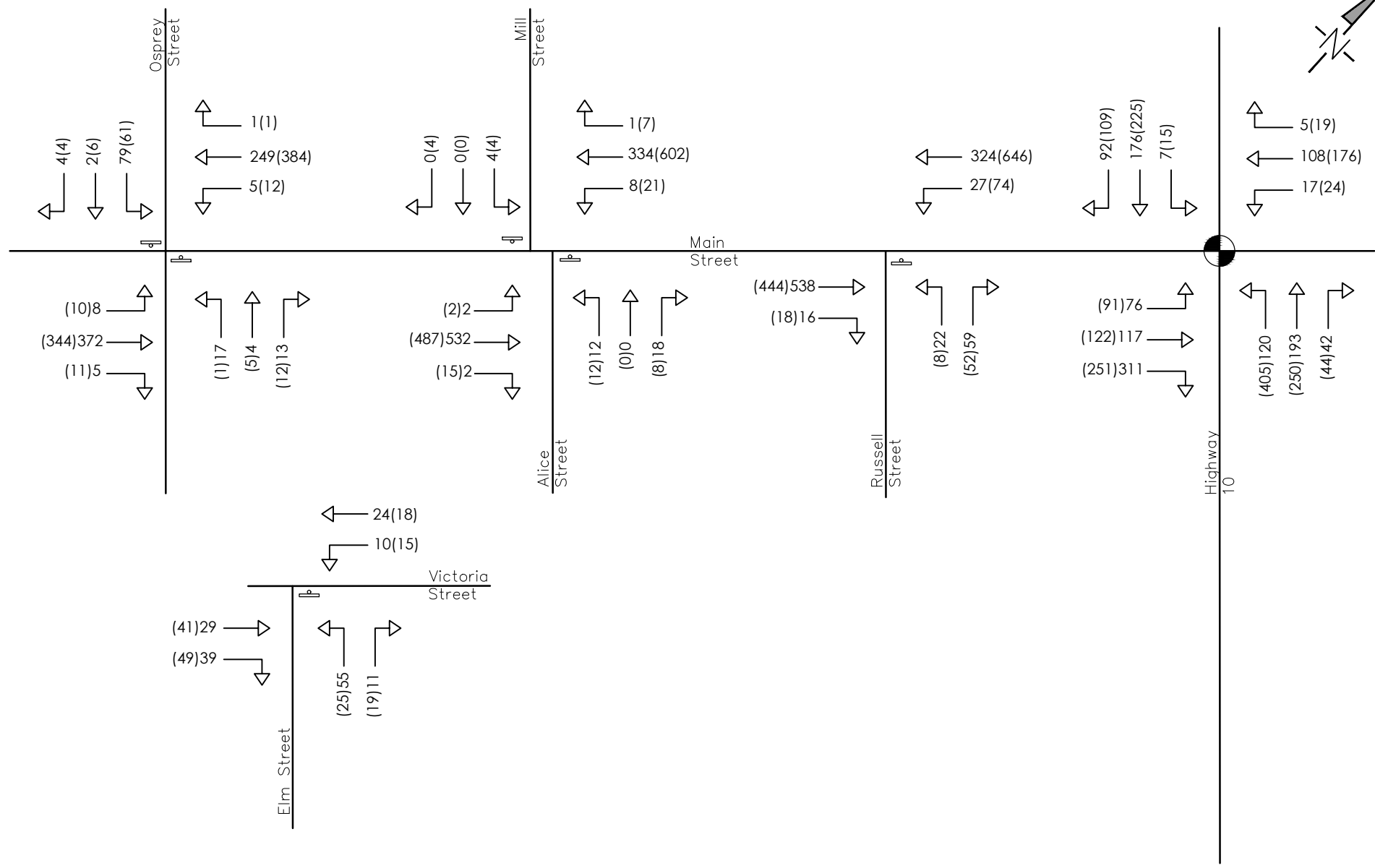


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Scale	N.T.S.	Date	DEC. 16, 2022	Check By	M.F.


Drawing FIG. 8



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

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

Project	Edgewood Greens Dundalk, Township of Southgate	
Drawing	2035 Future Background Traffic Volumes	



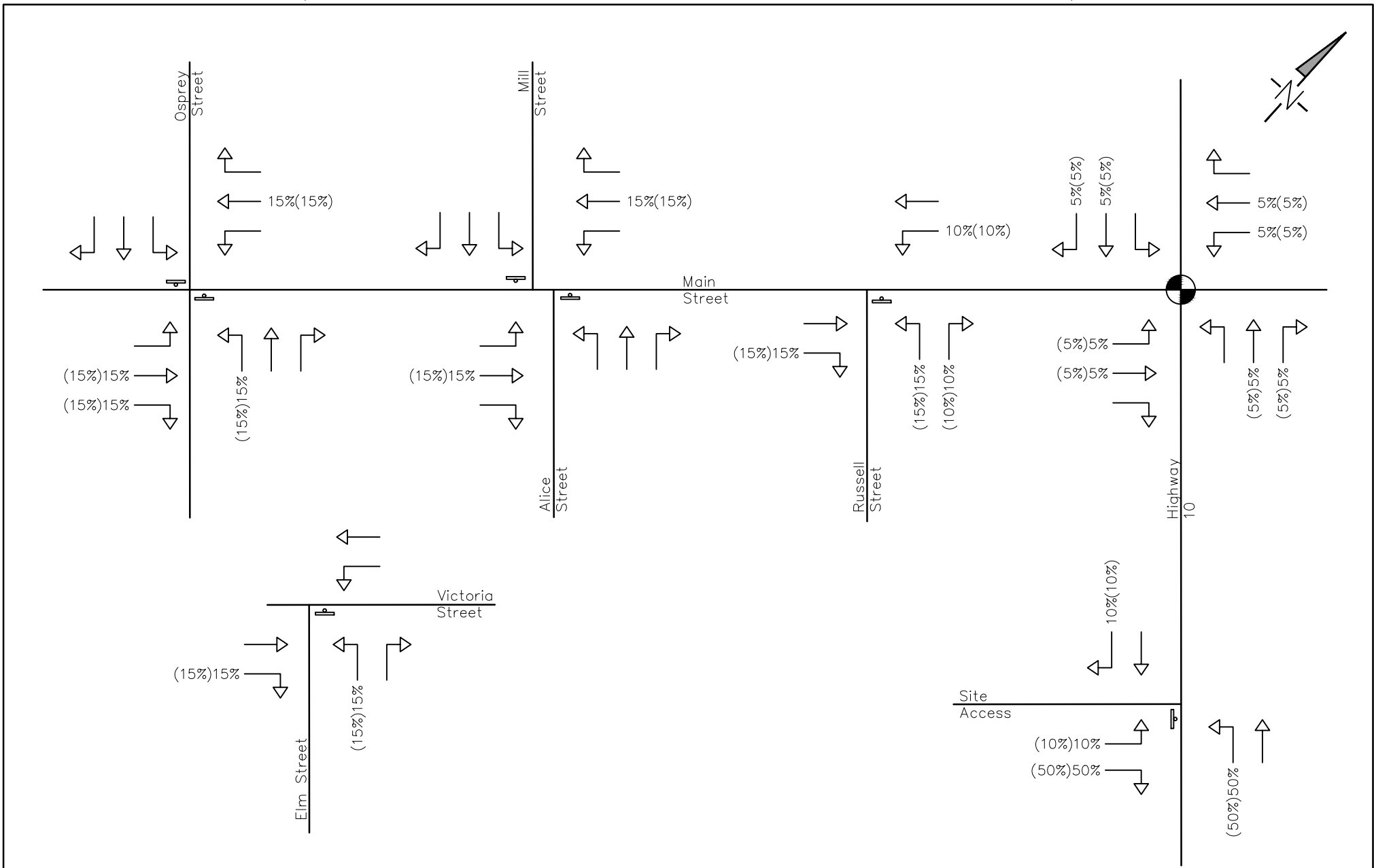
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Drawn By	S.K.	Design By	S.K.	Project	1060-5384
Scale	N.T.S.	Date	DEC. 16, 2022	Check By	M.F.

FIG. 9






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

	SIGNAL CONTROL
	STOP CONTROL
xx(yy)	A.M. (P.M.) PEAK HOUR TRAFFIC VOLUMES

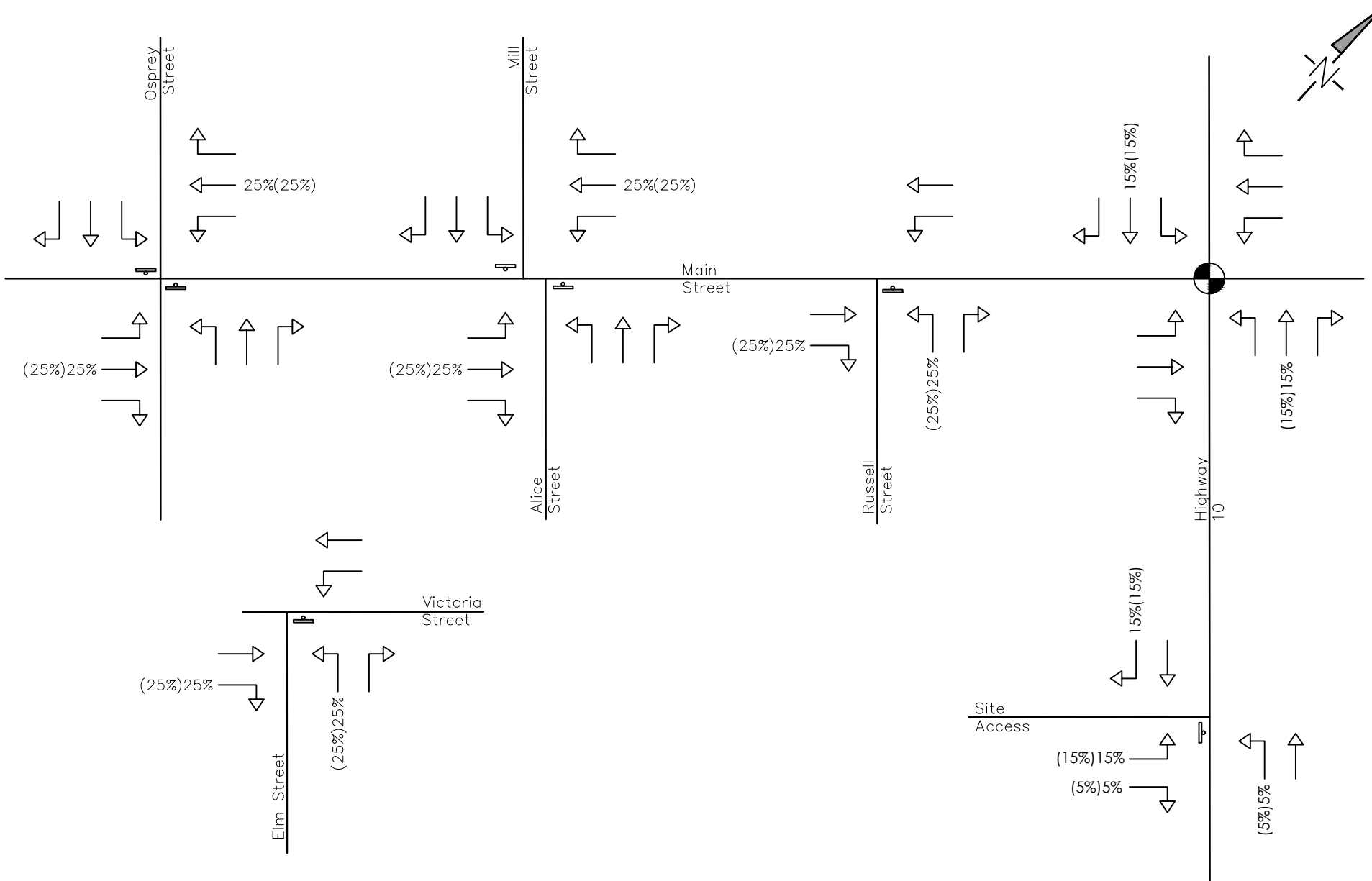
Project	Edgewood Greens Dundalk, Township of Southgate	
Drawing	Residential Trip Distribution	



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Drawn By	S.K.	Design By	S.K.	Project	1060-5384	
Scale	N.T.S.	Date	JAN. 20, 2020	Check By	M.F.	
					Drawing	FIG. 10



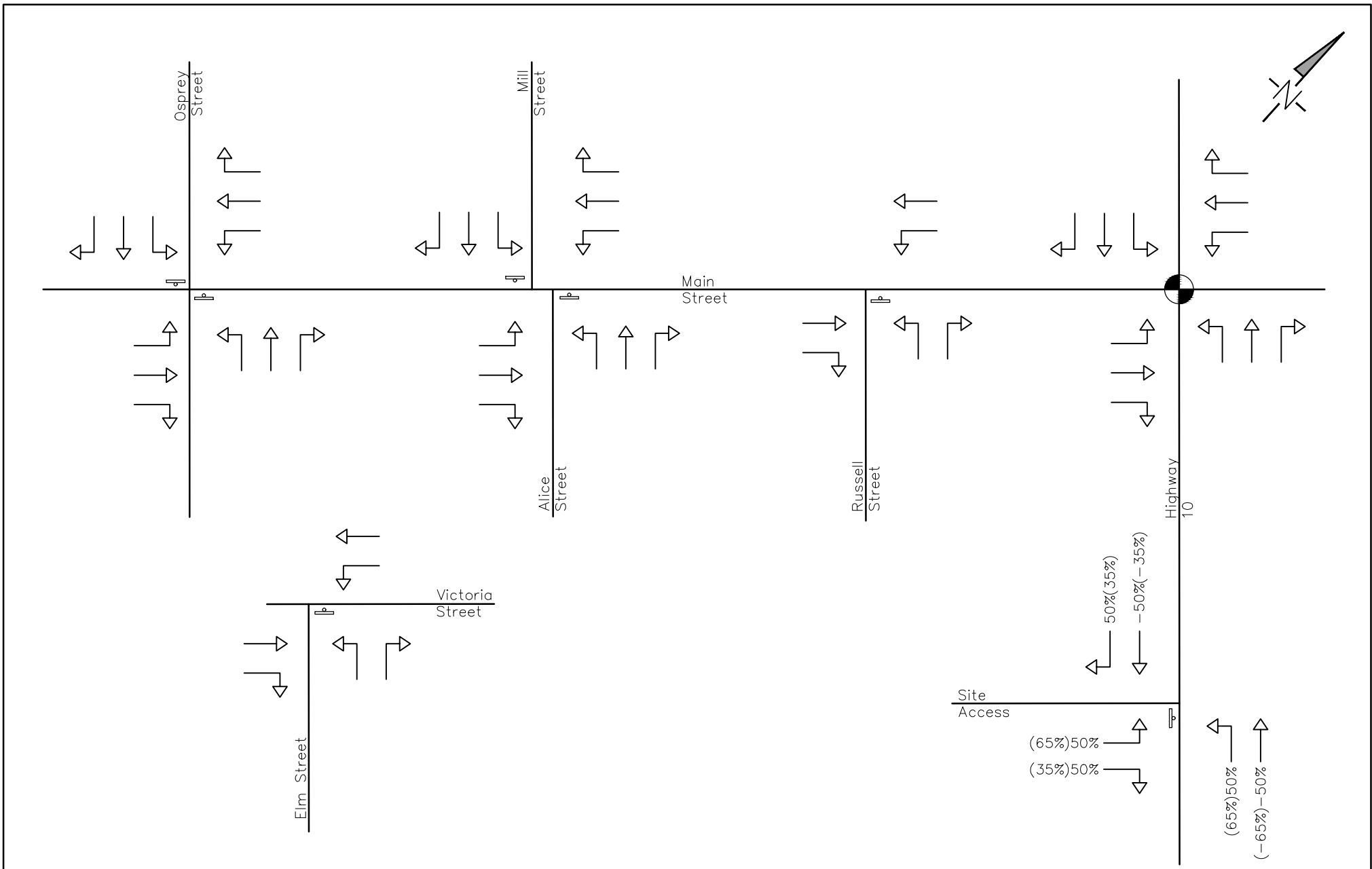
NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

<b>Legend</b>	<b>Project</b>
SIGNAL CONTROL	Edgewood Greens Dundalk, Township of Southgate
STOP CONTROL	
<b>xx(yy)</b> A.M. (P.M.) PEAK HOUR TRAFFIC VOLUMES	<b>Drawing</b>
	Commercial Primary Trip Distribution



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Drawn By	S.K.	Design By	S.K.	Project	1060-5384	
Scale	N.T.S.	Date	DEC. 16, 2022	Check By	M.F.	
					Drawing	FIG. 11



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

<b>Legend</b>	
	SIGNAL CONTROL
	STOP CONTROL
XX(YY)	A.M. (P.M.) PEAK HOUR TRAFFIC VOLUMES

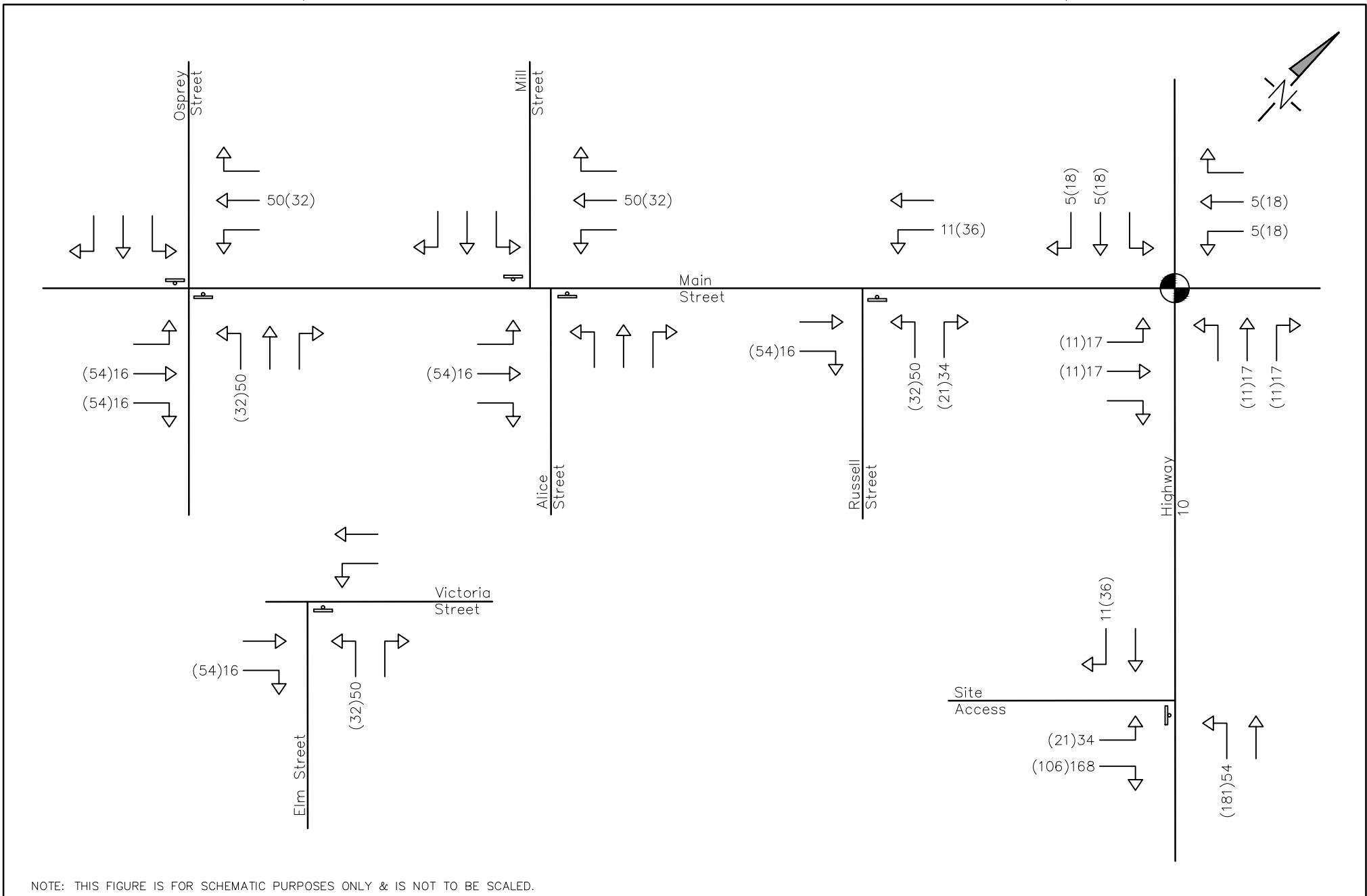
<b>Project</b>	
Edgewood Greens Dundalk, Township of Southgate	
<b>Drawing</b>	
Commercial Pass-by Trip Distribution	





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Drawn By	S.K.	Design By	S.K.	Project	1060-5384	
Scale	N.T.S.	Date	FEB. 22, 2021	Check By	M.F.	
					Drawing	FIG. 12



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

<b>Legend</b>	
	SIGNAL CONTROL
	STOP CONTROL
xx(yy)	A.M. (P.M.) PEAK HOUR TRAFFIC VOLUMES

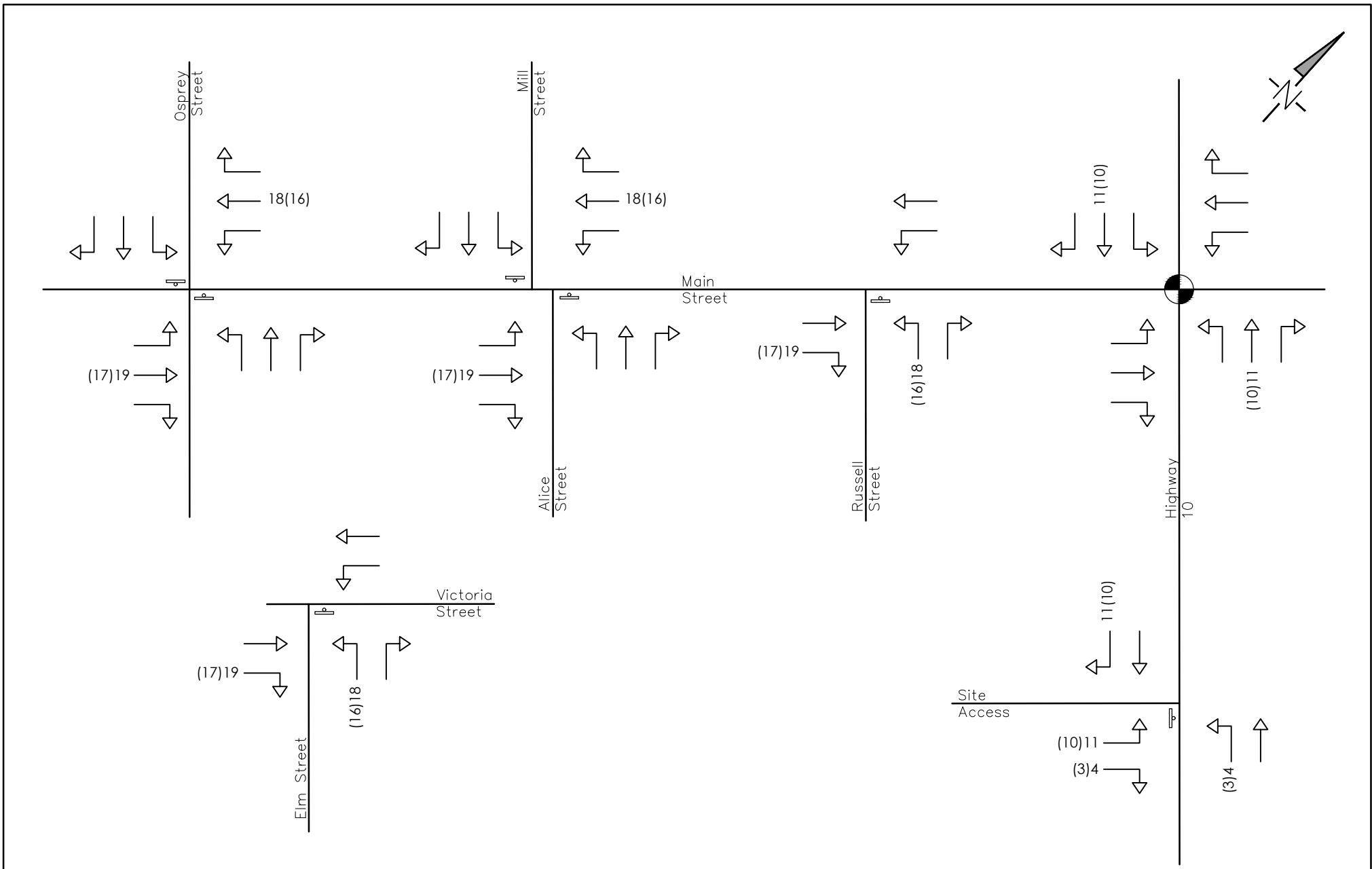
Project	Edgewood Greens Dundalk, Township of Southgate	
Drawing	Residential Trip Assignment	





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Drawn By	S.K.	Design By	S.K.	Project	1060-5384	
Scale	N.T.S.	Date	JAN. 20, 2020	Check By	M.F.	
					Drawing	FIG. 13



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

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

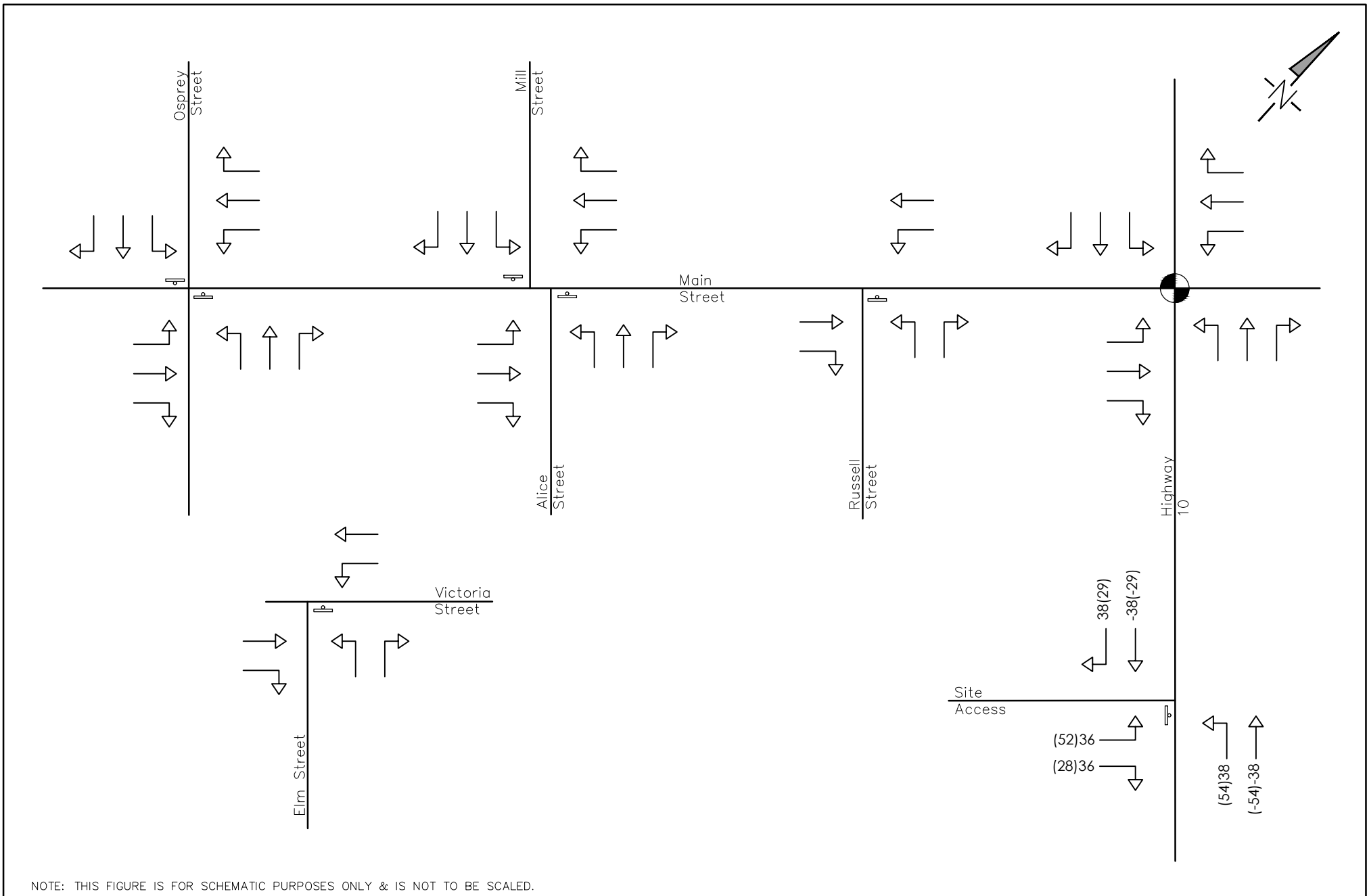
Project	Edgewood Greens Dundalk, Township of Southgate	
Drawing	Commercial Primary Trip Assignment	





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Drawn By	S.K.	Design By	S.K.	Project	1060-5384	
Scale	N.T.S.	Date	DEC. 16, 2022	Check By	M.F.	
					Drawing	FIG. 14



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

<b>Legend</b>	
	SIGNAL CONTROL
	STOP CONTROL
XX(YY)	A.M. (P.M.) PEAK HOUR TRAFFIC VOLUMES

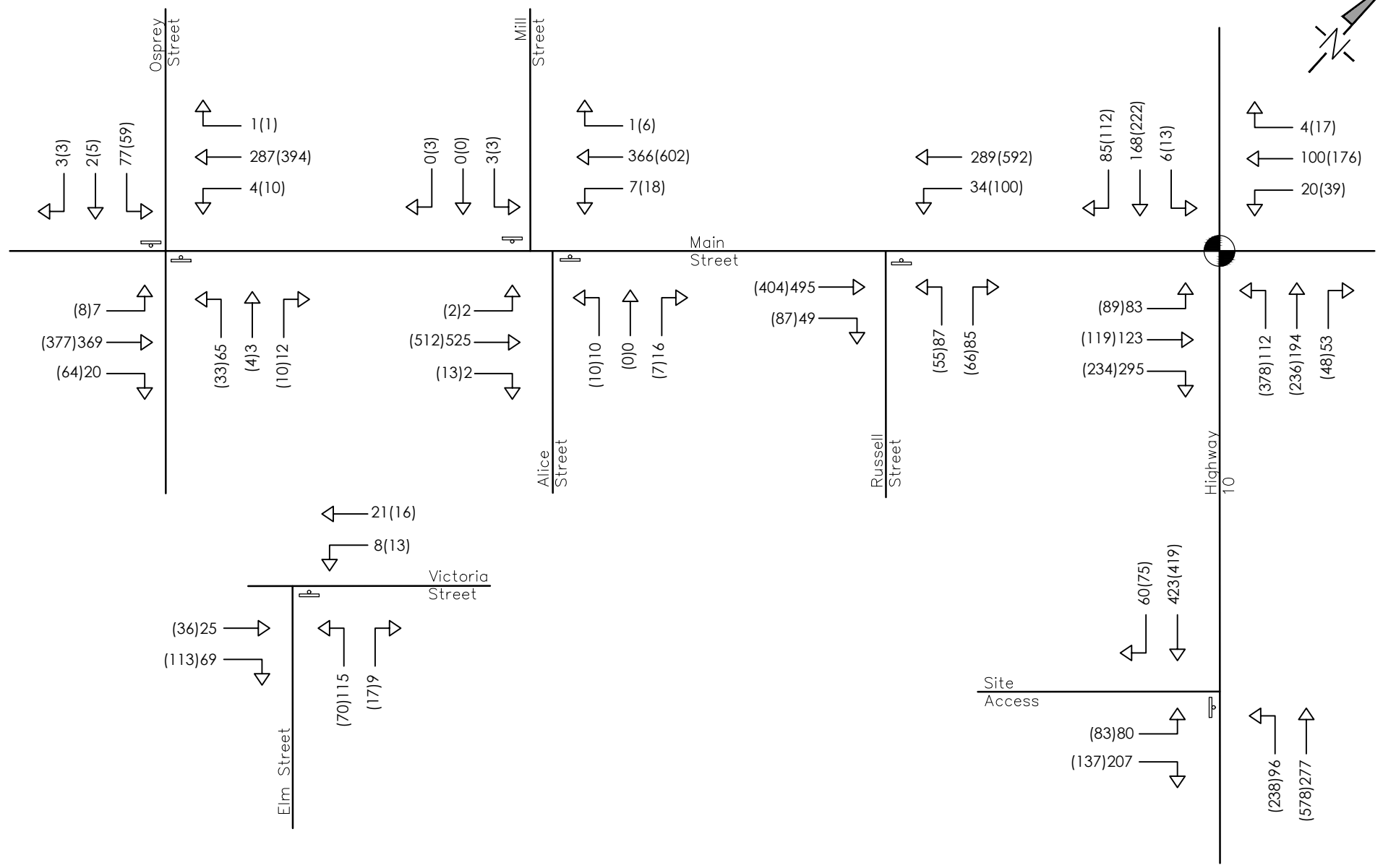
<b>Project</b>	Edgewood Greens Dundalk, Township of Southgate	
<b>Drawing</b>	Commercial Pass-by Trip Assignment	



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Drawn By	S.K.	Design By	S.K.	Project	1060-5384	
Scale	N.T.S.	Date	DEC. 16, 2022	Check By	M.F.	
					Drawing	FIG. 15



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

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

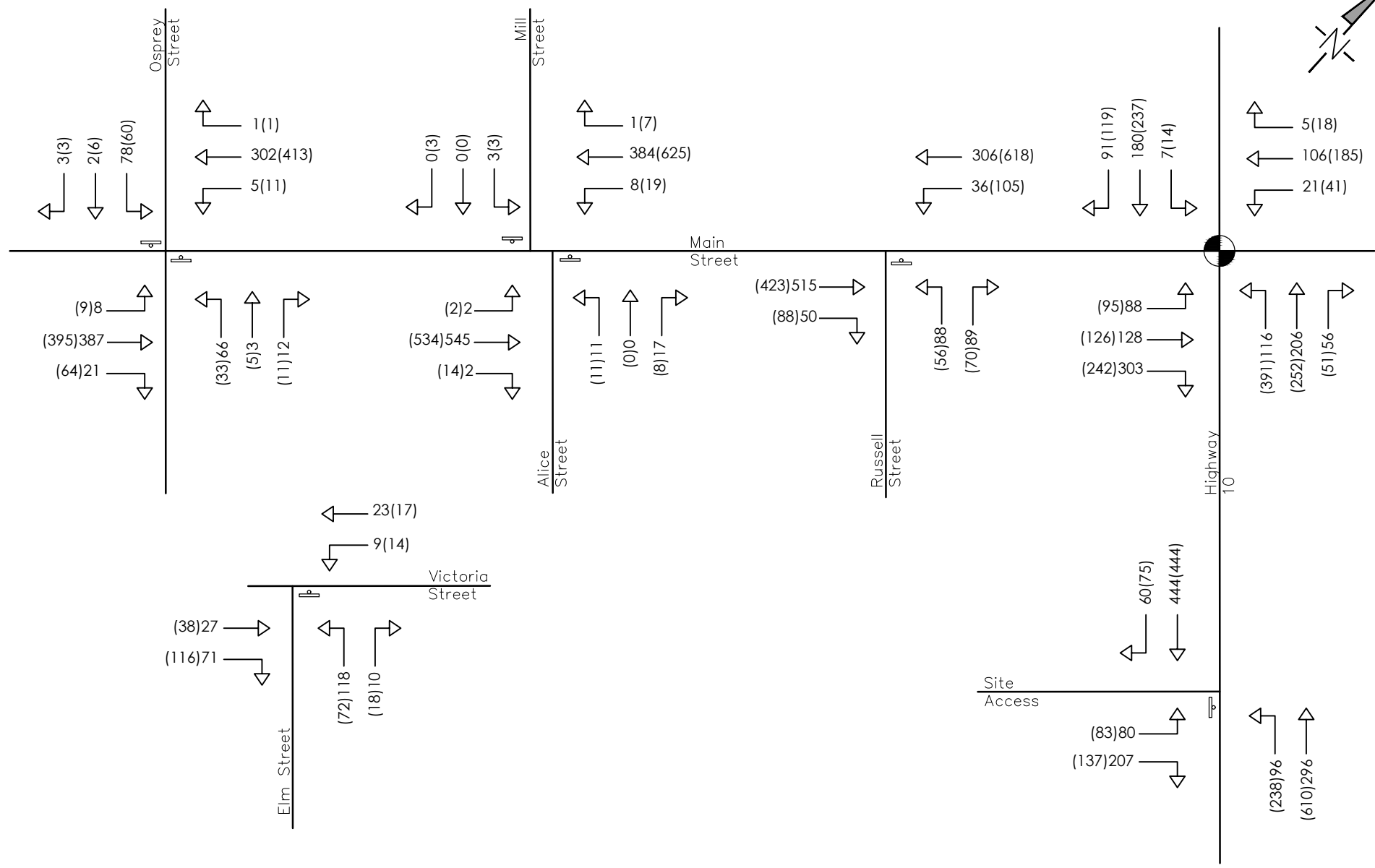
Project	Edgewood Greens Dundalk, Township of Southgate	
Drawing	2025 Future Total Traffic Volumes	



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Drawn By	S.K.	Design By	S.K.	Project	1060-5384	
Scale	N.T.S.	Date	DEC. 16, 2022	Check By	M.F.	
					Drawing	FIG. 16



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

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

Project	Edgewood Greens Dundalk, Township of Southgate	
Drawing	2030 Future Total Traffic Volumes	

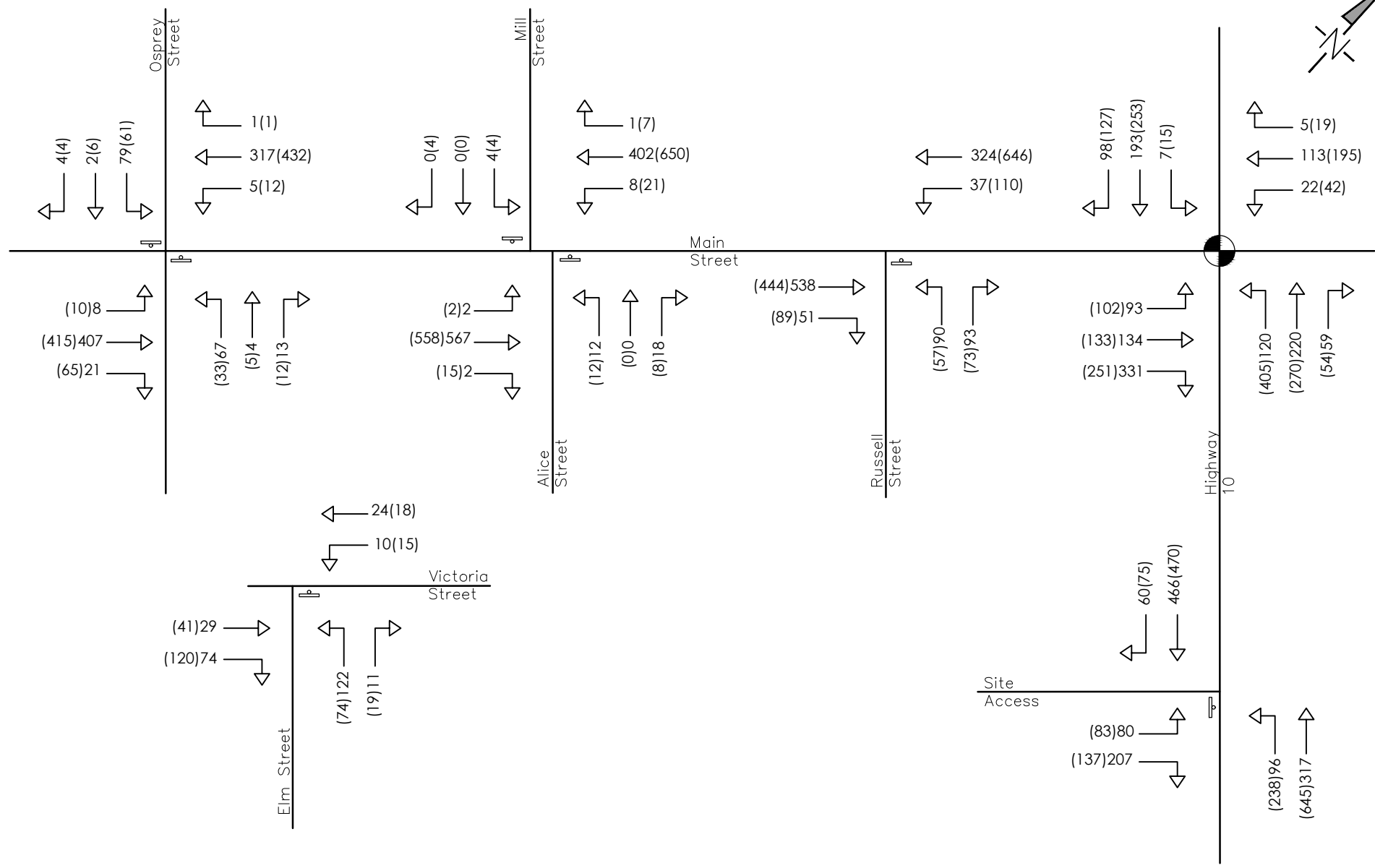


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Drawn By	S.K.	Design By	S.K.	Project	1060-5384	
Scale	N.T.S.	Date	DEC. 16, 2022	Check By	M.F.	
					Drawing	FIG. 17






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

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

Project	Edgewood Greens Dundalk, Township of Southgate	
Drawing	2035 Future Total Traffic Volumes	



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Drawn By	S.K.	Design By	S.K.	Project	1060-5384	
Scale	N.T.S.	Date	DEC. 16, 2022	Check By	M.F.	
					Drawing	FIG. 18