

TRANSPORTATION IMPACT STUDY **ADDENDUM**

358 REYNOLDS STREET

**TOWN OF OAKVILLE
REGIONAL MUNICIPALITY OF HALTON**

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**FIRST SUBMISSION: JUNE 2023
SECOND SUBMISSION: **NOVEMBER 2023****

CFCA FILE NO. 1919-6732

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Revision Number	Date	Comments
Rev.0	June 2023	Issued for Internal Review
Rev.1	June 2023	Issued for First Submission
Rev. 2	November 2023	Issued for Second Submission

TABLE OF CONTENTS

1.0 INTRODUCTION 1

1.1 Background (UPDATED) 1

1.2 Development Proposal (UPDATED)..... 1

1.3 Development History 1

2.0 EXISTING CONDITIONS..... 2

2.1 Development Lands 2

2.2 Study Area..... 2

2.3 Boundary Road Network 2

2.4 Existing Pedestrian and Cycling Movements..... 3

2.5 Transit Operations (UPDATED) 3

2.6 Traffic Data 4

2.7 Intersection Modelling 5

3.0 FUTURE BACKGROUND 6

3.1 Horizon Years 6

3.2 Growth Rate 6

3.3 Background Developments 6

3.4 Future Roadway Improvements 6

3.5 Intersection Operations 6

4.0 SITE GENERATED TRAFFIC 7

4.1 Trip Generation 7

4.2 Trip Distribution..... 8

5.0 FUTURE TOTAL CONDITIONS 8

5.1 Intersection Operations 9

6.0 SIGHT DISTANCE REVIEW 9

7.0 SITE PLAN DESIGN REVIEW 10

7.1 Corner Clearance & Access Impact 10

7.2 Daylight Triangles 16

7.3 Corner Radius 16

8.0 PARKING REVIEW 16

8.1 Town of Oakville Zoning By-Law Requirements (UPDATED)..... 16

9.0 TRANSPORTATION DEMAND MANAGEMENT (TDM) MEASURES..... 17

9.1 Site Specific TDM Measures..... 17

10.0 TRAFFIC CONTROL PLAN 17

11.0 CONCLUSION 18

LIST OF APPENDICES

- Appendix A: Correspondence**
- Appendix B: Signal Timing Plans and Traffic Data**
- Appendix C: Level of Service Definitions**
- Appendix D: Detailed Capacity Analysis**
- Appendix E: TTS Results**
- Appendix F: TAC Excerpts**
- Appendix G: Traffic Control Plan**

LIST OF FIGURES

- Figure 1: Site Plan**
- Figure 2: Site Location**
- Figure 3: 2023 Existing Traffic Volumes**
- Figure 4: Trip Distribution**
- Figure 5: Trip Assignment**
- Figure 6: 2028 Future Background Traffic Volumes**
- Figure 7: 2028 Future Total Traffic Volumes**

1.0 Introduction

1.1 Background (UPDATED)

C.F. Crozier & Associates Inc. (Crozier) was retained by MacDonald Rose Inc. to undertake a Transportation Impact Study (TIS) in support of a Zoning By-Law Amendment and Draft Plan of Subdivision for the proposed residential development for the site located at 358 Reynolds Street, in the Town of Oakville (the Town), Regional Municipality of Halton (Halton Region).

A TIS was previously prepared in June 2023. The TIS Addendum herein, addresses the Town's comments dated August 31, 2023, as well as summarizes the most recent Site Plan changes. The Comment Response Matrix outlining the Town's comments and the associated responses are included in **Appendix A**.

The purpose of the study is to assess the impacts of the proposed development on the boundary road network and to recommend any required mitigation measures, if warranted. The study analyzes the operations of the boundary road intersections. The future traffic operations with and without the addition of the site generated vehicular trips are also analyzed.

The study has been completed in accordance with the agreed upon Terms of Reference with the Town staff. The Terms of Reference for the study can be found in correspondence included in **Appendix A**.

1.2 Development Proposal (UPDATED)

According to the Site Plan, the development proposes the construction of two 3-storey freehold townhouse blocks with a total of 11 units. With the exception of unit 1, each unit has an individual two-car garage and one-car equivalent driveway. Unit 1 has an individual two-car garage and a wider two-car equivalent driveway.

To supplement the development, 10 individual driveways are proposed at Macdonald Road, with Unit 1's driveway proposed at Reynolds Street.

The Site Plan is included as **Figure 1**. The Site Location Map is attached as **Figure 2**. **Table 1** below outlines the detailed site statistics of the development proposal.

Table 1: Proposed Development Breakdown (Comparison)

Development Proposal	June 2023	November 2023
Proposed Freehold Townhouses	11 units	11 units
Proposed Vehicle Parking Spaces	34 spaces ¹	34 spaces

Note 1: With the exception of Unit 1, a minimum of two-car garage and one-car equivalent driveway are proposed for each unit. Thus, a minimum equivalent three parking spaces per unit are proposed for each unit. Unit 1 has a wider, two-car equivalent driveway.

1.3 Development History

It is noted that the Subject Lands was previously approved for a 14-unit residential condominium apartment with underground parking. The development application herein, is separate from the

previous approvals and contains a different development proposal. As such, per the Town of Oakville staff request, a new Transportation Impact Study has been prepared.

2.0 Existing Conditions

The following section provides a description of the study area from a transportation context, as well as a traffic operations analysis of the study road network.

2.1 Development Lands

The subject lands cover an area of approximately 0.283 ha and currently consist of vacant 3-storey commercial-office building, with surface parking lot. The property, located in a residential neighbourhood, is bound by Reynolds Street to the east, MacDonald Road to the north, and residential properties to the west and south. The lands are currently zoned Residential Low (RL5-0).

2.2 Study Area

The intersection of MacDonald Road and Reynolds Street was reviewed as part of the study area per confirmation with the Town staff.

2.3 Boundary Road Network

The boundary road network is described in **Table 2** below.

To ease the ambiguity of the roadway directions, MacDonald and other parallel roadways have been assigned an east-west direction, while Reynolds Street and parallel roadways have been assigned a north-south direction for the purpose of this report.

Table 2: Boundary Road Network

Feature	Roadway	
	MacDonald Road	Reynolds Street
Direction	East-West	North-South
Classification	Minor Collector	Minor Arterial
Jurisdiction	Town of Oakville	Town of Oakville
Speed Limit	50 km/h (Assumed)	Posted: 40 km/h
Span	Trafalgar Road to Chartwell Road	Cornwall Road to Robinson Street
Number of lanes total	2	2
Median type	None	None
Pedestrian Facilities	Both Sides (East of the Site) North Side (West of the Site)	Both Sides (along Site Frontage) East Side (North of the Site)
Cycling Facilities	None	None
On-street Parking	None	None

2.4 Existing Pedestrian and Cycling Movements

As shown in **Table 2**, limited sidewalks are provided within the boundary road network. Cycling lanes are not provided in the study area.

2.5 Transit Operations (UPDATED)

Oakville Transit offers local transit services within the Town of Oakville, with connections to Clarkson GO station, Bronte GO station, as well as the Oakville GO station. **Table 3** below outlines the existing transit routes, and the location of bus stops in the study area as of May 2023.

Table 3: Existing Transit

Route	Direction	Span	Days of Operation	Peak Hour Headways	Bus Stops in Study Area	Walk Time to Bus Stop
4 Speers - Cornwall	East-West	Bronte Go to Clarkson Go	Monday – Sunday	18 minutes	Cornwall Road at Reynolds Street	5 min (400 metres)
11 Linbrook	East-West	Oakville Go Station to Clarkson Go Station	Monday – Friday	1 Hour	Reynolds Street at Bruce Street. MacDonalds Road	2 min (87 meters)
14/14A Lakeshore West	East-West	Oakville Go to Appleby Go	Monday - Sunday	15 minutes	Trafalgar Road at Randall Street	12 min (1.0 km)
83 Blakelock	East-West and North-South	Rebecca St at T.A. Blakelock H.S. to Oakville Go Station	Monday – Friday	Single Departure at 2:50 P.M.	Reynolds Street at Bruce Street	2 min (125 meters)

As shown, the Subject Property is located in an area with multiple transit services that connect the Subject Site to the rest of the Town, as well as to/from Oakville GO station, Bronte GO Station, Appleby GO Station and Clarkson GO station.

Via a short 12-minute walk and transit or 17-minute walk, residents and visitors can connect to the Oakville GO Station and Oakville GO Bus Terminal where a number of other local and regional transit services can be accessed. As such, the Subject Site is located in a convenient transit area with multitude of transit options available.

Per Town staff comments, Oakville Transit also provides on-demands specialized services, care-A-van and Home to Hub services. Care-A-van is Oakville Transit's door-to-door specialized transit service for individuals with disabilities and for those who cannot use conventional transit buses. The service uses fully accessible transit vehicles with transit staff assistance and may also be supplemented by local taxi providers. Additionally, Oakville Transit also offers Home to Hub services, which provides residential transit service to/from the nearest transit hub, allowing individuals to connect with regular fixed route transit services. This service is shared, on-demand transit service which uses smaller capacity busses for newer communities in Oakville without a regular fixed route transit, and/or for areas without regular fixed route transit during specific time periods. It is noted both care-A-van and Home to Hub services would park on-street in front of the residences for pick-up and drop-off.

2.6 Traffic Data

Traffic movement counts (TMC) were conducted by Spectrum Traffic Inc. at the study intersection. The traffic movement counts were conducted on Tuesday May 30th, 2023, between 6:00 A.M. to 10:00 A.M., and 3:00 P.M. to 7:00 P.M. to reflect typical commuter peak hours.

Existing signal timing plans were provided by the Town staff. Signal Timing Plans and traffic data are included in **Appendix B**.

2.7 Intersection Modelling

The intersection operations were modelled using Synchro and Sim Traffic 11.0. Intersections are assessed using a Level of Service (LOS) metric, with ranges of intersection delays assigned a letter from “A” to “F”. The Level of Service definitions for signalized and stop-controlled intersections are included in **Appendix C**.

In lieu of a Town of Oakville Synchro Guidelines, default synchro parameters were used, unless otherwise noted by the Town staff, where applicable. Sim Traffic modelling were prepared using a minimum of 3 simulations with 15 minutes seeding and 60 minutes recording.

2.8 Intersection Operations

The traffic operations at the study intersection were analyzed based on observed traffic volumes during the weekday A.M. and P.M. peak hours, as illustrated in **Figure 3**. Detailed capacity analyses are included in **Appendix D**. **Table 4** summarizes the existing traffic operations within the study area.

Table 4: 2023 Existing Levels of Service

Intersection	Movement	A.M. Peak Hour			P.M. Peak Hour		
		Level of Service ¹ (Control Delay)	Critical V/C Ratio	95 th Percentile Queue Length	Level of Service ¹ (Control Delay)	Critical V/C Ratio	95 th Percentile Queue Length
MacDonald Road at Reynolds Street (Signalized)	EBT	B (13.3 s)	0.25	27.0 m	B (18.4 s)	0.24	22.8 m
	WBT	B (16.9 s)	0.16	26.8 m	C (23.8 s)	0.22	19.9 m
	NBT	A (5.8 s)	0.07	21.5 m	A (5.1 s)	0.11	23.3 m
	SBT	A (6.3 s)	0.09	24.2 m	A (5.1 s)	0.11	18.1 m
	Overall	B (10.1 s)	0.25		B (10.8 s)	0.24	

Note 1: 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 stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM 2000).

Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection. In addition, all v/c ratios greater than 0.90 for through and shared turning movements are outlined and highlighted.

The signalized intersection of MacDonald Road and Reynolds Street is currently operating at a level of service (LOS) “B” during the weekday A.M and P.M peak hours. The intersection is currently operating at a low maximum control delay of 11 seconds or less, and at a maximum volume-to-capacity (V/C) ratio of 0.25 or less. The 95th percentile queue of 27.0 metres or less is currently expected at the signalized intersection of MacDonald Road and Reynolds Street using Sim Traffic modeling. This is considered conservative as existing traffic movement video did not regularly indicate queues of over one to two vehicles. Nevertheless, these metrics indicate that the signalized intersection is currently operating efficiently with minimal delays and with reserve capacity to accommodate future increases in traffic volume.

3.0 Future Background

3.1 Horizon Years

The Subject Development is anticipated to be fully build out prior to 2028; therefore, the horizon year of 2028 was reviewed, as agreed upon in the Terms of Reference with the Town staff.

3.2 Growth Rate

Future background traffic volumes at the study intersections were estimated using a 2% annual compounded growth rate.

This growth rate is considered conservative when compared to the 1% annual compounded growth used in the previously approved Transportation Impact Study for 358 Reynolds Street, as well as for the nearby hospital redevelopment at 327 Reynolds Street and 348 MacDonald Road.

3.3 Background Developments

The Town of Oakville development applications database was reviewed to determine applicable background developments in the study area.

Based on the database, redevelopment of the former hospital lands at 327 Reynolds Street and 348 MacDonald Road are identified. Although a portion of the hospital lands have been redeveloped, it is noted that the 38 residential townhouses, 16 units of single-detached dwellings, and 50 units of senior adult housing have not been built as of May 2023.

As such, the remaining background site generated traffic has been applied to the future background volumes per the approved background development Transportation Impact Study's trip distribution (Parsons, January 2018).

3.4 Future Roadway Improvements

Per the Town of Oakville Transportation Master Plan, Reynolds Street is proposed to be urbanized by 2026 and is expected to remain a two-lane cross-section.

Per the Town of Oakville's 2018 Transportation Master Plan and 2017 Active Transportation Master Plan, additional short, medium nor long term roadway improvements are not proposed for the study area.

3.5 Intersection Operations

Table 5 outlines the future background level of service for the 2028 horizon year. The level of service is based on the future background traffic volumes illustrated in **Figure 4**.

Detailed capacity analyses are included in **Appendix D**.

Table 5: 2028 Future Background

Intersection	Movement	A.M. Peak Hour			P.M. Peak Hour		
		Level of Service ¹ (Control Delay)	Critical V/C Ratio	95 th Percentile Queue	Level of Service ¹ (Control Delay)	Critical V/C Ratio	95 th Percentile Queue
MacDonald Road at Reynolds Street (Signalized)	EBT	B (13.5 s)	0.30	26.1 m	B (18.7 s)	0.29	22.2 m
	WBT	B (16.4 s)	0.22	23.1 m	C (24.1 s)	0.25	19.2 m
	NBT	A (6.1 s)	0.09	18.4 m	A (5.2 s)	0.12	17.4 m
	SBT	A (6.4 s)	0.12	21.1 m	A (5.2 s)	0.13	17.4 m
	Overall	B (10.2 s)	0.30		B (11.1 s)	0.29	

Note 1: 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 stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM 2000).

Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection. In addition, all v/c ratios greater than 0.90 for through and shared turning movements are outlined and highlighted.

The signalized intersection of MacDonald Road and Reynolds Street is anticipated to operate efficiently at an unchanged LOS “B” during the 2028 future background weekday A.M. and P.M. peak hours. The intersection is expected to experience an overall control delay of 11.1 seconds or less, and at a maximum volume-to-capacity ratio of 0.30 or less. Additionally, the 95th percentile queue is not expected to materially change. These metrics indicate that the intersection is expected to continue to operate efficiently in 2028 with reserve capacity to accommodate future traffic volume increases.

4.0 Site Generated Traffic

4.1 Trip Generation

The trip generation for the proposed development was forecasted using published data from the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th 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 Land Use Category (LUC) 220 “Multi-Family Housing Low-Rise” was determined to be the most applicable land use. The forecasted weekday A.M. and P.M. trip generation for the site is outlined in **Table 6** below.

Table 6: ITE Trip Generation for the Proposed Development

	Units	AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
LUC 220 (Multi-Use Family Low-Rise)	11	1	3	4	4	2	6

The Subject Development is expected to generate 4 and 6 two-way trips during the weekday A.M. and P.M. peak hour, respectively.

The trip generation forecasts are considered negligible from a traffic operations perspective and are typically not associated with traffic operational issues nor external roadway improvements.

4.2 Trip Distribution

The trips generated by the development were distributed to the boundary road network based on Transportation Tomorrow Survey (TTS) data. TTS is a comprehensive survey about the transportation characteristics of households in the Golden Horseshoe, Simcoe County, and surrounding areas. The passenger vehicle trips generated by the development are distributed to the boundary road network based on TTS 2016 data filtered to peak hour travel.

For the proposed development, TTS results were filtered to trips in 2006 GTA Zone 4015 and 4017, a comparable residential zone. Trips were filtered to the A.M. peak period. From this query, trip destinations were determined, and percentage of trips assigned to each destination was accounted for. Trips were assumed to travel to and from their destination based on the most convenient route possible.

The resultant inbound and outbound trip distribution is outlined in **Table 7**. **Figure 5** outlines the trip distribution for the proposed residential development and **Figure 6** outlines the trip assignment of the proposed residential development. These trip distributions are based on TTS data and optimized route per historic travel time provided by Google Maps Navigation. They are rounded to the nearest 5% to account for variations. These trip distributions are also supported by the existing travel patterns shown in the existing traffic volumes.

Table 7: Residential Trip Distribution

Direction	A.M. Peak Hour		P.M. Peak Hour	
	In	Out	In	Out
Reynolds Street (North)	25%	20%	25%	20%
Reynolds Street (South)	5%	5%	5%	5%
MacDonald Rod (East)	5%	5%	5%	5%
MacDonald Road (West)	65%	70%	65%	70%

These results are based on Google Map optimized routes during the typical weekday peak period and are comparable with the existing travel patterns found in the existing turning movement counts collected.

Appendix E contains the TTS results.

5.0 Future Total Conditions

The traffic impacts arising from the proposed development were assessed based on the site generated traffic superimposed on the 2028 future background traffic volumes in **Figure 4**. The resulting 2028 future total traffic volumes for the weekday A.M. and P.M. peak hours are illustrated in **Figure 7**.

Signal timing plans are kept consistent with future background conditions, for comparative purposes.

5.1 Intersection Operations

Table 8 outlines the 2028 future total traffic conditions associated with the boundary road network, with detailed capacity analysis included in **Appendix D**.

Table 8: 2028 Future Total

Intersection	Movement	A.M. Peak Hour			P.M. Peak Hour		
		Level of Service ¹ (Control Delay)	Critical V/C Ratio	95 th Percentile Queue Length	Level of Service ¹ (Control Delay)	Critical V/C Ratio	95 th Percentile Queue Length
MacDonald Road at Reynolds Street (Signalized)	EBT	B (13.7 s)	0.30	27.2 m	B (19.4 s)	0.29	26.1 m
	WBT	B (16.5 s)	0.22	23.2 m	C (24.2 s)	0.25	25.1 m
	NBT	A (6.1 s)	0.09	17.4 m	A (5.2 s)	0.12	21.8 m
	SBT	A (6.4 s)	0.12	21.4 m	A (5.2 s)	0.13	22.2 m
	Overall	B (10.3 s)	0.30		B (11.2 s)	0.29	

Note 1: 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 stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM 2000).

Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection. In addition, all v/c ratios greater than 0.90 for through and shared turning movements are outlined and highlighted.

The signalized intersection of MacDonald Road and Reynolds Street is expected to continue to operate efficiently at a level of service “B” during the weekday A.M. and P.M. peak hours. The intersection is expected to continue to operate efficiently with an overall control delay of 11.2 seconds or less, and an unchanged maximum volume-to capacity ratio of 0.30 or less. When compared to 2028 future background traffic conditions, the site generated traffic is expected to minimally increase the intersection’s control delays by 0.1 second and the 95th percentile queue are not expected to change materially. These metrics indicate that the site generated traffic does not materially change traffic operations of the boundary road network and the signalized intersection has reserve capacity to accommodate future increases in traffic volume.

6.0 Sight Distance Review

A review of the available sight distance at the proposed driveways were undertaken based on Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (June 2017). Sight distance was measured from the driveways using the following assumptions:

- A standard driver eye height of 1.08 m for a passenger car.
- A standard object height of 0.60 metres.
- A 4.4 m setback from the approximate extension of the outer curb to represent a vehicle waiting to exit the Site.

Intersection sight distance is calculated using Equation 9.9.1 from the Geometric Design Guide for Canadian Roads (June 2017):

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

Where;

ISD = Intersection Sight Distance (m)

V_{major} = design speed of major roadway (km/h)

t_g = assumed time gap for vehicles to turn from stop onto roadway (s)

The design speed of a roadway in an urban environment is typically 10 km/h greater than the posted speed limit. A posted speed of 50 km/h is assumed for MacDonald Road. As such, a design speed of 60 km/h is applied herein. Reynolds Street has a posted speed limit of 40 km/h. As such, a design speed of 50 km/h is used herein.

Table 9: Sight Distance Analysis

Feature	Driveways on MacDonald Road	Driveway on Reynolds Street
Access Type	Full Moves	Full Moves
Posted Speed Limit of Roadway	50 km/h (Posted)	40 km/h (Posted)
Assumed Design Speed	60 km/h	50 km/h
Base Time Gap	6.5 s (right) 7.5 s (left)	6.5 s (right) 7.5 s (left)
Additional Time Gap	None	None
Grade of Roadway	Less than 3%	Less than 3%
Horizontal Alignment of Roadway	Straight	Straight
Sight Distance Required	125 m	105 m
Measured Sight Distance	>125 m	>125 m
Minimum Sight Distances Satisfied?	Yes	Yes

As outlined in the table above, MacDonald Road and Reynolds Street are straight with minimal grade changes, and adequate sight distances are expected to be achieved.

7.0 Site Plan Design Review

Per the Town request, a review of the Site Plan design's corner clearance, corner radius, daylight triangles and access impacts are reviewed herein. The Town noted that the driveway spacing from the signalized intersection may create conflicts for inbound vehicles and queued traffic from MacDonald Road and Reynolds Street.

7.1 Corner Clearance & Access Impact

Per TAC GDGCR Section 8.8.2, "Suggested Minimum Corner Clearance Dimensions", collector roads (i.e., MacDonald Road) are recommended to have a corner clearance of 55 metres between a signalized intersection and site access. Similarly, per TAC GDGCR, arterial roads (i.e., Reynolds Street)

are recommended to have a corner clearance of 70 metres. As the Site Plan proposes individual driveways along MacDonald Road within 15 metres from the signalized intersection and proposes a driveway along Reynolds Street within 23 metres downstream of the signalized intersection, the Site Plan does not meet the TAC minimum recommended corner clearance.

Per TAC figure 8.9.2, a minimum of 2.0 m is required between the end of the intersection curb return and the start of the curb returns of the residential driveway. As the Site Plan proposes driveways at 15 metres or more from the signalized intersection of MacDonald Road and Reynolds Street, the Site Plan meets the TAC driveway spacing guidelines for local and collector roadways.

Regardless, queueing issues to/from the driveways are not often expected as the TAC recommended corner clearance does not take into account the development type, development size, nor the existing build form of the neighbourhood.

Development Type and Size of the Site

The corner clearance of the Subject Development is supportable as the development does not generate material number of trips. As shown in **Section 4.0**, the 11 townhouse units are expected to generate a maximum of 6 peak hour **two-way** trips or less during the weekday peak periods or an equivalent of approximately one inbound or outbound trip every 10 minutes. For inbound trips, the site is expected to generate a maximum of 4 inbound trips per hour, or an equivalent of one inbound trip every 15 minutes. As these trip generation forecasts are negligible from a traffic operations perspective and are typically not associated with traffic operational issues nor external roadway improvements, the proposed development is not expected to cause undue operational issues and safety concerns. As such, the proposed development can be supported from a transportation operational and safety perspectives.

Furthermore, each townhouse units are proposed to have separate individual driveways. When compared to TAC GDGCR minimum requirements, the TAC GDGCR does not take into account the size of the development, the proposed land use of the development, nor the trips generated at the individual driveways. On that basis, based on the 4 inbound peak hour trips or less and with individual driveways provided, the proposed development is not expected to materially affect traffic operations nor safety of the signalized intersection of Reynolds Street and MacDonald Road.

Aside from the low trip generation of the site (which is further distributed into 11 driveways), for Reynolds Street, as the lot frontage is approximately 35 metres, it would be impractical for the Subject Development to meet the corner clearance due to the lot dimension. Relocating Unit 1's driveway to MacDonald Road would place the driveway even closer to the signalized intersection. As such, the current development proposal is supportable and reflects the practical configuration of the Site and neighborhood build form.

Moreover, as shown in **Table 14**, existing properties at 293 MacDonald Road and 303 MacDonald Road also have existing driveways in close proximity of the signalized intersection (less than 70 metres). Similar to the Subject Development, regardless of MacDonald Road or Reynolds Street, due to the lot constraints, driveways cannot be proposed outside of the minimum TAC corner clearance requirements. Nevertheless, as mentioned above, the trip generation for these properties and the Subject Properties are expected to be low and are typically not associated with traffic operational issues.

As confirmed in **Section 5** of the future total traffic conditions, the signalized intersection of MacDonald Road and Reynolds Street are expected to continue to operate efficiently with relatively low volumes and low control delays during the weekday A.M. and P.M. peak hours. It is noted that these operations reflect the peak hours of the adjacent street traffic and as such, are

expected to operate more efficiently during other parts of the day. As such, the proposed development can be supported from a traffic operation perspective.

Sensitivity Analysis – Driveway Operations

A sensitivity analysis was conducted using Synchro and Sim Traffic assuming all inbound traffic to enter a single driveway at MacDonald Road, closest to the signalized intersection of Reynolds Street and MacDonald Road.

Table 10 outlines the 2028 future total sensitivity traffic conditions, with detailed capacity analysis included in **Appendix D**.

Table 10: 2028 Future Total (Sensitivity Analysis)

Intersection	Movement	A.M. Peak Hour			P.M. Peak Hour		
		Level of Service ¹ (Control Delay)	Critical V/C Ratio	95 th Percentile Queue Length	Level of Service ¹ (Control Delay)	Critical V/C Ratio	95 th Percentile Queue Length
Driveway at MacDonald	EB	A (0.0 s)	0.08	1.0 m	A (0.0 s)	0.06	0.4 m
	WB	A (0.1 s)	0.00	0.1 m	A (0.5 s)	0.00	0.2 m
	NB	A (9.3 s)	0.00	0.8 m	A (9.1 s)	0.00	0.8 m
	Overall	A (9.3 s)	0.08		A (9.1 s)	0.06	

As shown, with a single driveway and all site generated traffic enter and exit from the driveway, the access is expected to operate efficiently at a level of service “A” during both weekday A.M. and P.M. peak hours in 2028 future total conditions. Despite the proximity to the signalized intersection of Reynolds Street and MacDonald Road, the inbound traffic into the driveway is not expected to affect the signalized intersection. Based on Sim Traffic simulations, the 95th percentile westbound queue at the driveway are expected to be 1.0 meter or less. These metrics indicate that the driveway is expected to operate efficiently, with no queueing concerns, and the proposed driveway configurations can be supported from a traffic operational perspective.

Existing Site Configuration

The existing/previous commercial-office building at 358 Reynold Street has an access at MacDonald Road, approximately 37 metres from the signalized intersection, as well as an access at Reynolds Street, approximately 23 metres from the signalized intersection. Both accesses do not meet the aforementioned TAC suggested minimum corner clearance for collector and arterial roads. As the proposed development is expected to generate less trips than the existing/previous use, the proposed development is considered an improvement from the existing conditions. **Table 11** outlines the approximate existing trip generation of the site.

Table 11: ITE Trip Generation of the Site

Land Use	Units/GFA	AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
LU 710 (General Office Building)	-12,843 ft ²	-17	-2	-19	-3	-15	-18
LUC 220 (Multi-Use Family Low-Rise)	11 Units	+1	+3	+4	+4	+2	+6
Net Trip Generation		-16	+1	-15	+1	-13	-12

As shown in **Table 11**, the previous commercial office is expected to generate 19 two-way trips or less during the weekday A.M. and P.M. peak hours. When compared to the 11 freehold townhouses proposed, the previous use generates 16 more inbound trips. As the existing/previous commercial building also has accesses at MacDonald Road, and at Reynold Street, the proposed development is considered an improvement from the existing conditions.

Roadway and Road Network Characteristics

The tables below outline the typical collector and minor arterial roadway characteristics per the Town of Oakville Standard STD 8-6 and TAC GDGCR.

Table 12: Typical Road Characteristics per Town of Oakville

	Collector Road	Minor Arterial Road
Design Speed	60 km/h	60-80 km/h
Minimum Right-of-way	26 m	35 m
Traffic Volumes (AADT- MAX)	3000	> 3000

Table 13: Typical Road Characteristics per TAC GDGCR

	Collector Road	Minor Arterial Road
Design Speed	50–70km/h	50-80 km/h
Minimum Right-of-way	20-24 m	20 – 45 m
Traffic Volumes (AADT)	8,000 or less	5,000-20,000

MacDonald Road has an existing right-of-way of approximately 17 to 18 metres. Thus, MacDonald Road does not conform to typical collector roads per the Town of Oakville standard and TAC GDGCR. Similarly, for Reynolds Street, the existing right-of-way is approximately 20 metres, thus, the existing roadway does not conform to typical minor arterial roads per the Town of Oakville standard and is in the lower range of a typical minor arterial roads per TAC GDGCR.

Similarly, as identified in the Town of Oakville Official Plan Schedule C, Reynolds Street is an arterial roadway, however, Reynolds Street has a 20-metre right-of-way (ROW), which is smaller than the 26 metre ROW outlined for minor arterials within the Official Plan and is comparable to lower class roadways. Moreover, driveway access, as well as driveway for high-density developments, is currently provided along Reynolds Street, which is atypical along arterial roads.

Furthermore, Reynolds Street is bound by Lake Ontario to the south, and terminates at Cornwall Road to the north. As such, Reynolds Street corridor only provides roadway connections within the southern neighbourhood of Oakville and does not provide the north-south connection that is typically expected for an arterial road.

Additionally, as shown in existing volumes in **Figure 3**, MacDonald Road and Reynolds Street have a relatively low peak hour volumes when compared to standard collector and arterial roads. Based on the forecasted 2028 future total volumes, MacDonald Road is expected to have an approximately average of 1400 vehicle per day or less by 2028, which falls significantly in the lower range of a typical "urban collector road" characteristics. Similarly, based on the forecasted 2028 future total volumes, Reynolds Street is expected to have an average of approximately 2600 vehicle per day or less. As such, the expected volumes do not meet the typical minor arterial roadway's daily volume.

Finally, the roadway layout of the study area is consistent with older neighborhoods in the Town of Oakville where smaller grid blocks are provided as opposed to larger residential neighbourhoods with multiple local roads, larger residential blocks, and longer spacings between major intersections. Due to the neighbourhood's smaller residential build form, limited opportunities for driveways are available and numerous driveways located in close proximity to a signalized intersections are observed in the area. **Table 14** highlights nearby and other existing residential properties in the Town that are located in close proximity to the signalized intersection.

Table 14: Existing Properties Driveways Located near a Signalized Intersection

Property Address	Signalized Intersection	Distance from Driveway to Signalized Intersection (Approximated)
283 MacDonald Road	Reynolds Street & MacDonald Road	21 m
293 MacDonald Road	Reynolds Street & MacDonald Road	26 m
303 MacDonald Road	Reynolds Street & MacDonald Road	20 m
152 Trafalgar Road	Trafalgar Road & Randall Street	18 m
462 Reynolds Street	Cornwall Road & Reynolds Street	2.4 m
451 Allan Street	Cornwall Road & Allan Street	15 m
97 Allan Street	Lakeshore Rd E & Allan Street	23.5 m
364 Lakeshore Road E	Lakeshore Rd E & Allan Street	6.5 m
95 Chartwell Road	Lakeshore Rd E & Chartwell Road	17.5 m
1860 Lakeshore Road W	Third Line & Lakeshore Rd W	31 m
2015 & 2019 Lakeshore Road W	Third Line & Lakeshore Rd W	37 m
62 Third Line	Third Line & Lakeshore Rd W	16 m
308 Third Line	Third Line & Rebecca St	26 m
1243 Rebecca Street	Rebecca St & Warminster Dr	33 m
306 Warminster Drive	Rebecca St & Warminster Dr	26 m
297 Sunset Drive	Rebecca St & Sunset Dr	20 m
298 Sunset Drive	Rebecca St & Sunset Dr	20 m
304 Sunset Drive	Rebecca St & Sunset Dr	19 m
295 Jones Street	Rebecca St & Jones Street	13 m
296 Jones Street	Rebecca St & Jones Street	13 m
313 Bronte Road	Rebecca St & Bronte Road	27 m
295 Bronte Road	Rebecca St & Bronte Road	22 m
1005 Rebecca Street	Rebecca St & Fourth Line	24 m
320 Fourth Line	Rebecca St & Fourth Line	37 m
55 Shore Gardens	Lakeshore Rd W & Chalmer	17 m
95 Mississauga Street	Lakeshore Rd W & Mississauga Street	5 m
96 Mississauga Street	Lakeshore Rd W & Mississauga Street	18 m
112 Mississauga Street	Lakeshore Rd W & Mississauga Street	30 m
3069 Lakeshore Rd W (Gas Station & Mechanic Shop)	Lakeshore Rd W & Mississauga Street	17 m

Property Address	Signalized Intersection	Distance from Driveway to Signalized Intersection (Approximated)
2330 Lakeshore Road W	Lakeshore Road W & Nelson Street	31 m
85 Martindale Avenue	Upper Middle Road & Sixth Line	17 m
2020 Grand Oak Trail	Upper Middle Road & Grand Oak Trail	34 m
2253, 2256, 2249 Munn's Avenue	Sixth Line & Munn's Avenue	5 to 10 m

7.2 Daylight Triangles

Per the Town of Oakville pre-consultation comments, 5 metres by 5 metres daylight triangle is required at the signalized intersection of MacDonald Road and Reynolds Street. As 5 metres by 5 metres are shown in the Site Plan, the proposed daylight triangle meet the Town's requested minimum.

7.3 Corner Radius

Per the Town of Oakville Road Geometric Design Standards STD 8-4, a collector and arterial road intersection should have an intersection radius of 10.5 metres. As 10.5 metres is shown in the Site Plan, the proposed corner radius meets the Town minimum requirements.

8.0 Parking Review

8.1 Town of Oakville Zoning By-Law Requirements (UPDATED)

The Town of Oakville Zoning By-Law 2014-014 Table 5.2.1 were assessed to determine the adequacy of the proposed parking supply.

Table 15 summarizes the parking requirements per the Zoning By-Law.

Table 15: Town of Oakville Parking Zoning By-Law

Land Use	Units	Required Parking Rate	Required Parking	Proposed Parking
Townhouse Dwelling	11 units	2.0 space per dwelling	22 spaces	34 spaces (+12 spaces)

Per the Town of Oakville Zoning By-Law, a minimum of 22 parking spaces are required for the proposed 11 townhouses. As 34 parking spaces are proposed, the proposed parking supply is adequate.

The relevant Town of Oakville Zoning By-Law excerpts are included in **Appendix G**.

Visitor Parking Requirements

Per the Town of Oakville Zoning By-Law, visitor spaces are only required for condominium townhouses. As the Subject Development is proposed to be freehold townhouses, no visitor parking spaces are required. Regardless, as a minimum of three parking spaces are provided for each unit, which is above the Town's minimum parking requirements, visitors are expected to utilize the individual driveway provided for each unit.

The relevant Town of Oakville Zoning By-Law excerpts are included in **Appendix G**.

9.0 Transportation Demand Management (TDM) Measures

Transportation Demand Management (TDM) measures are recommended to promote alternative modes of transportation, such as transit, cycling or walking, and reduce single-occupant vehicle (SOV) trips entering and exiting the proposed development. The following section outlines site specific TDM measures recommended for the proposed townhouse development.

9.1 Site Specific TDM Measures

Pre-Loaded PRESTO Card

To encourage residents to utilize transit, a pre-loaded \$50 PRESTO card is recommended with the purchase of an individual residential unit.

TDM Information Package

Upon occupancy, a TDM information package should be provided to residents.

TDM update and promotional material can be continuously distributed to residents via mailbox. Such measure is expected to increase awareness of available alternate travel modes and reduce the barriers to adopting more sustainable travel behavior. Such marketing allows prospective tenants to be aware of sustainable travel options, as well as allows existing residents to be aware of updates in the transit and cycling infrastructures improvements of the area.

Information on the future GO Expansion Project and Oakville Transit improvements could also be provided to prospective buyers to make them aware of pending mass transit opportunities, which can encourage measures such as reduced vehicle ownership.

Neighbourhood commercial, retail, and institutional facilities should also be included in the marketing package to promote local businesses and a walkable mixed-use community.

10.0 Traffic Control Plan

Per the Town of Oakville, a Traffic Control Plan has been prepared and is attached in **Appendix H**.

11.0 Conclusion

MacDonald Rose Inc. proposes a residential development, consisting of two 3-storey freehold townhouses, with 11 units, located at 358 Reynolds Street, in the Town of Oakville, Halton Region. The analysis contained within this report has resulted in the following key findings:

Existing Conditions

- MacDonald Road and Reynolds Street is currently operating at a level of service (LOS) "A" during the weekday A.M and P.M peak hours. The intersection is operating at a maximum control delay of 10.8 seconds or less, and at a maximum volume-to-capacity ratio of 0.25 or better.

Future Background Conditions

- Future traffic volumes were forecasted using a 2% annual compounded growth rate. Additional background development was also included.
- The signalized intersection of MacDonald Road and Reynolds Street is anticipated to operate efficiently at a LOS "B" during the 2028 future background weekday A.M. and P.M. peak hours. The intersection is expected to experience a maximum control delay of 11.1 seconds or less, and at a maximum volume-to-capacity ratio of 0.29 or less.

Future Total

- The development is forecasted to generate 4 and 6 two-way trips during the weekday A.M. and P.M. peak hours, respectively.
- The intersection of MacDonald Road and Reynolds Street is expected to operate at an unchanged LOS "B" during the weekday A.M. and P.M. peak hours. When compared to 2028 future background conditions, the intersection is expected to continue to operate efficiently with maximum increase in control delays of 0.1 second and an unchanged in volume-to-capacity ratios. These metrics indicate that the signalized intersection is expected to continue to operate efficiently with reserve capacity to accommodate future traffic growth and that the site generated traffic does not materially affect traffic operations of the boundary road network.

Other

- Although the Town has concerns with respect to the driveway proximity to the signalized intersection of Reynolds Street and MacDonald Road, the future volumes are expected to be low when compared to typical minor arterial and collector roadways.
- Moreover, based on future total operations, the signalized intersection of Reynolds Street and MacDonald Road are expected to continue to operate efficiently with low control delays. In addition, per the future total sensitivity analysis with all inbound trip entering a single driveway, the driveway at MacDonald Road is not expected to affect operations at the signalized intersection.
- A review of existing residential properties in the Town shows numerous existing properties with similar driveway conditions.
- The minimum vehicle parking requirements are met.

- No sight distance issues are anticipated at the proposed driveways.

The analysis contained within this report was prepared using the most recent Site Plan. Any minor revisions to the Site Plan are not expected to affect the conclusions contained within this report.

In conclusion, the development can be supported from a transportation operation, parking, and safety perspective.

Respectfully submitted by,

C.F. CROZIER & ASSOCIATES INC.



Martin Chan, P.Eng.
Project Engineer, Transportation

C.F. CROZIER & ASSOCIATES INC.



Shaira Ahmed, EIT
Engineering Intern, Transportation

/my/MC/SA/hn

J:\1900\1919 - Melrose Investments Inc\6732 - 358 Reynolds St. Oakville\Reports\2023.11.24 Second Submission\2023.11.24 358 Reynolds Street TIS Addendum.docx

APPENDIX A

Correspondence

Department/Agency	Comment	Crozier Response
<p>Oakville Transit</p> <p>J. Pheonix Dated August 31, 2023</p>	<p>Access to transit services would be via fixed route transit service on MacDonald, via On Demand service, and via specialized transit service (as required). Please note that both the On Demand service and the specialized transit service would park on street in front of the residences for pick up and drop off.</p>	<p>Noted. Section 2.5 has been updated to reflect this.</p>
<p>Transportation Services</p> <p>A. Khan Dated August 31, 2023</p>	<p>Section 8 – Please update the parking rate to reflect the Town of Oakville Zoning Bylaw 2014-014 Table 5.2.1 Pg. 5-3 rate for Townhouse.</p>	<p>Noted. Section 8.0 has been updated to reflect the parking rate for a townhouse dwelling.</p>
	<p>The work zone identified in TMP2 should not impact the residential dwelling access/driveway.</p>	<p>Noted. Please see the additional note on the updated Traffic Control Plan.</p> <p>The Traffic Control Plan is included as Appendix H.</p>
	<p>Proper signage should illustrate the following but not be limited to: detour sign, speed reduction sign, sidewalk close sign, etc.</p>	<p>Noted. A sidewalk closed sign has been included on the updated Traffic Control Plan.</p> <p>The updated Traffic Control Plan is included as Appendix H.</p>
	<p>Please identify temporary relocation for on-street parking along MacDonald Road during construction.</p>	<p>Currently, parking is not permitted along both sides of Reynolds Street and MacDonald Road, fronting the subject property. As such, on-street parking is not affected during construction.</p>

Martin Chan

From: Aquisha Khan <aquisha.khan@oakville.ca>
Sent: May 12, 2023 4:45 PM
To: Martin Chan; Hiba Naqvi
Cc: Aaron Wignall; Eric Chan
Subject: RE: Terms of Reference for a Transportation Memo for 358 Reynolds St.

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Martin;

Thank you for this. After reviewing the concept plan and your TOR please find my comments as follows:

A Transportation Operation analysis would be required.

Concern: The driveway accesses are considered too close to the signalized intersection, and it does not meet TAC minimum guidelines for corner clearances. Similarly, the proposed radius is too small and also does not meet the Towns curb radius requirements.

Please provide the following in the Transportation Operation Analysis:

- Introduction
- Existing Conditions
 - Undertake Existing traffic counts at Reynolds & McDonald
 - Undertake synchro analysis to confirm the back of queue.
- Site Conditions
- Future Conditions
- Sightline Conditions
- Design Details
 - Corner Clearance
 - Corner Radius
 - Daylight triangles
 - Access Impacts
- Parking Demand
 - Based on Zoning By-law
 - On-street Parking
 - Bicycle Parking (public)
- TDM
 - AT facilities
 - AT Connectivity
 - Transit Impact
 - Etc.
- Issues and mitigative measures.
- Final Conclusions
- Appendices

If you have any questions, please feel free to contact me.

I'm sending this message now because it works for me, but please note that I do not expect a response outside of your normal working hours.

Have a wonderful evening and an Amazing weekend!

Aquisha Khan, P. Eng.,

Transportation Engineer, East Oakville

Transportation Planning Services,

Town of Oakville | P: 905-845-6601, Ext. 3236 | C: 289-952-9345 | www.oakville.ca

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From: Martin Chan <mchan@cfcrozier.ca>

Sent: May 12, 2023 3:53 PM

To: Aquisha Khan <aquisha.khan@oakville.ca>; Hiba Naqvi <hnaqvi@cfcrozier.ca>

Cc: Aaron Wignall <awignall@cfcrozier.ca>

Subject: RE: Terms of Reference for a Transportation Memo for 358 Reynolds St.

SECURITY CAUTION: This email originated from outside of The Town of Oakville. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Aquisha,

Please find the attached Site Plan for 358 Reynolds Street.

Thanks,

Martin

Martin Chan, P.Eng.

Project Engineer, Transportation

2800 High Point Drive, Suite 100 | Milton, ON L9T 6P4

T: 905.875.0026



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From: Aquisha Khan <aquisha.khan@oakville.ca>

Sent: May 12, 2023 2:51 PM

To: Hiba Naqvi <hnaqvi@cfcrozier.ca>
Cc: Martin Chan <mchan@cfcrozier.ca>; Aaron Wignall <awignall@cfcrozier.ca>
Subject: RE: Terms of Reference for a Transportation Memo for 358 Reynolds St.

Hi Hiba;

Please provide a copy of the site concept plan before I complete my comments on the requirements for Transportation Impact Study/Brief.

Have a wonderful day 😊!

Aquisha Khan, P. Eng.,
Transportation Engineer, East Oakville
Transportation Planning Services,

Canada's Best Place to Live (MoneySense 2018)
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<http://www.oakville.ca/privacy.html>

Aquisha Khan, P. Eng.
Transportation Engineer
Transportation and Engineering
Town of Oakville | 905-845-6601, ext.3236 | www.oakville.ca

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From: Syed Rizvi <syed.rizvi@oakville.ca>
Sent: May 5, 2023 12:03 AM
To: 'Hiba Naqvi' <hnaqvi@cfcrozier.ca>
Cc: Martin Chan <mchan@cfcrozier.ca>; Aaron Wignall <awignall@cfcrozier.ca>; Aquisha Khan <aquisha.khan@oakville.ca>
Subject: RE: Terms of Reference for a Transportation Memo for 358 Reynolds St.

Hi Hiba,

The subject site is in Town's East District and Aquisha Khan is the Transportation Engineer for the East District, by way of copying her in this email I would request her to provide comments on attached TOR's.

Thanks,
Syed

I'm sending this message now because it works for me, but please note that I do not expect a response outside of your normal working hours.

Syed Rizvi, M.Sc., P. Eng
Transportation Engineer
Transportation and Engineering

Town of Oakville | 905-845-6601, ext.3981 | www.oakville.ca

Vision: To be the most livable town in Canada

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From: Hiba Naqvi <hnaqvi@cfcrozier.ca>

Sent: Thursday, May 4, 2023 4:35 PM

To: Syed Rizvi <syed.rizvi@oakville.ca>

Cc: Martin Chan <mchan@cfcrozier.ca>; Aaron Wignall <awignall@cfcrozier.ca>

Subject: Terms of Reference for a Transportation Memo for 358 Reynolds St.

SECURITY CAUTION: This email originated from outside of The Town of Oakville. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good Afternoon Syed,

C.F. Crozier and Associates (Crozier) has been retained to prepare a Transportation Memo for a proposed development located at 358 Reynolds Street in the Town of Oakville. The proposed development includes two 3-storey townhouse blocks, with a total of 12 residential units. Each unit is anticipated to have dedicated garage and driveway, with an equivalent parking space of 3 to 4 spaces per units. The Site Plan has been attached to this email for reference, we understand that changes are expected per the pre-consultation letter received.

We are kindly requesting that you review the Terms of Reference (ToR) and provide feedback regarding our scope of work. Should you not be the appropriate person for correspondence, please kindly direct us to the appropriate contact.

Transportation Memo

Based on the ITE trip generation 11th edition, the proposed 12 residential units are expected to generate 26 trips or less. Therefore, when compared to the previous use, the proposed development is not expected to materially impact the surrounding road network and a reduced scope of work has been proposed herein.

Transportation:

- Trip generation for the existing and proposed development will be forecasted using the Institute of Transportation Engineers (ITE): Trip Generation Manual, 11th Edition, Land Use Category 220: Multi-Family Low-Rise
- Confirm the development is not expected to generate material number of new trips.
- Assess Site Specific Transportation Demand Management (TDM) opportunities for the development to reduce single-occupancy vehicles (SOV) trips and promote alternate modes of transportation.

Parking:

- Confirm the proposed parking supply meets the requirements outlined in Town of Oakville Zoning By-Law

Please let us know if there are any questions or concerns.

Regards,

Hiba Naqvi, EIT
Engineering Intern, Transportation
DID: 905.864.3679

Hiba Naqvi, EIT
Engineering Intern, Transportation
2800 High Point Drive, Suite 100 | Milton, ON L9T 6P4
T: 905.875.0026



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APPENDIX B

Signal Timing Plans and Traffic Data

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK0216 - Reynolds St @ MacDonald Rd - Econolite Type - Cobalt

Configuration Controller Sequence

Phase Ring Sequence and Assignment (MM) 1-1-1

Hardware Alternate Sequence Enable: No

Phase Ring Sequence.....(Note: Sequences identical to the prior one are not printed)

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	B	B	B	B	B											
Sequence 1																
Ring 1	| 1	2 | 3	4 | 9	10 | 13	14 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 7	8 | 11	12 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 2																
Ring 1	| 2	1 | 3	4 | 10	9 | 13	14 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 7	8 | 11	12 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 3																
Ring 1	| 1	2 | 4	3 | 9	10 | 14	13 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 7	8 | 11	12 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 4																
Ring 1	| 2	1 | 4	3 | 10	9 | 14	13 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 7	8 | 11	12 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 5																
Ring 1	| 1	2 | 3	4 | 9	10 | 13	14 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 6	5 | 7	8 | 12	11 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 6																
Ring 1	| 2	1 | 3	4 | 10	9 | 13	14 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 6	5 | 7	8 | 12	11 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 7																
Ring 1	| 1	2 | 4	3 | 9	10 | 14	13 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 6	5 | 7	8 | 12	11 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 8																
Ring 1	| 2	1 | 4	3 | 10	9 | 14	13 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 6	5 | 7	8 | 12	11 | 15	16 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 9																
Ring 1	| 1	2 | 3	4 | 9	10 | 13	14 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 8	7 | 11	12 | 16	15 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 10																
Ring 1	| 2	1 | 3	4 | 10	9 | 13	14 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 8	7 | 11	12 | 16	15 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 11																
Ring 1	| 1	2 | 4	3 | 9	10 | 14	13 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 8	7 | 11	12 | 16	15 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Sequence 12																
Ring 1	| 2	1 | 4	3 | 10	9 | 14	13 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .
Ring 2	| 5	6 | 8	7 | 11	12 | 16	15 | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .	. | .

Sequence 13

Ring 1	| 1	2	| 3	4	| 9	10	| 13	14	| .	.	.	.	.	.	.	.
Ring 2	| 6	5	| 8	7	| 12	11	| 16	15	| .	.	.	.	.	.	.	.

Sequence 14

Ring 1	| 2	1	| 3	4	| 10	9	| 13	14	| .	.	.	.	.	.	.	.
Ring 2	| 6	5	| 8	7	| 12	11	| 16	15	| .	.	.	.	.	.	.	.

Sequence 15

Ring 1	| 1	2	| 4	3	| 9	10	| 14	13	| .	.	.	.	.	.	.	.
Ring 2	| 6	5	| 8	7	| 12	11	| 16	15	| .	.	.	.	.	.	.	.

Sequence 16

Ring 1	| 2	1	| 4	3	| 10	9	| 14	13	| .	.	.	.	.	.	.	.
Ring 2	| 6	5	| 8	7	| 12	11	| 16	15	| .	.	.	.	.	.	.	.

Phases In Use/Exclusive Ped (MM) 1-2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Phases In Use	X	X		X		X		X								
Exclusive Ped																

Phase Compatibility (MM) 1-1-2

Phase	
n/a	Barrier Mode

Phase and Overlap Descriptions

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Approach	N	N	N	E	N	S	N	W	N	N	N	N	N	N	N	N
Movement		T		T		T		T								
Associated PED																
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Approach	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Movement																

Administration (MM) 1-7-1

Enable Controller/Cabinet Interlock CRC No
 CRC (16 bit) D66F
 Enable Automatic Backup to Datakey No

Backup Prevent (MM) 1-1-3

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Timing	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phases	2	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	4	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.
	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	6	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.
	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	8	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.
	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Simultaneous Gap (MM) 1-1-4

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phase	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Must	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gap	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
With	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phase	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Disable		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Load Switch Assignments (MM) 1-3

	Phase / Overlap	Type	Dimming				Power Up	Auto		Flash Together
			Red	Yellow	Green	Dark		Red	Yellow	
1	1	V				-	Auto	X		
2	2	V				-	Auto	X		X
3	3	V				-	Auto	X		
4	4	V				-	Auto	X		X
5	5	V				+	Auto	X		
6	6	V				+	Auto	X		X
7	7	V				+	Auto	X		
8	8	V				+	Auto	X		X
9	2	P				-	Auto			

10	4	P				-	Auto			
11	6	P				+	Auto			
12	8	P				+	Auto			
13	1	O				-	Auto	X		
14	2	O				+	Auto	X		X
15	3	O				-	Auto	X		
16	4	O				+	Auto	X		X

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK0216 - Reynolds St @ MacDonald Rd - Econolite Type - Cobalt

Configuration Port 1 (SDLC)**Port 1 SDLC (MM) 1-4-1**

BIU	1	2	3	4	5	6	7	8
Term & Facility	X	X						
Detector Rack	X							

Enable TS2/MMU Type Cabinet: No
 Enable MMU Extended Status: Yes
 Enable SDLC Stop Time: No
 Enable 3 Critical RFE's Lockup: Yes

MMU Program (MM) 1-4-2

Channel Can Serve With Channel	
Channel 1	Channel 2

Color Check Enable (MM) 1-4-3

Enable Color Check: No

MMU/LS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Green	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Yellow	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Red	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Secondary Stations/Tests (MM) 1-4-4

ID	1	2	3	4	5	6	7	8	MMU
Term & Facility									

ID	1	2	3	4	5	6	7	8	Diag
Detector Rack									

Enable SDLC Diagnostic Test: No

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK0216 - Reynolds St @ MacDonald Rd - Econolite Type - Cobalt

Configuration Logging / Display**Event Logging (MM) 1-6-1**

Critical RFE's (MMU/TF)	Yes	3 Critical Errors Within 24 Hours	Yes
MMU Flash Faults	Yes	Local Flash Fault	Yes
Non-Critical RFE's (Det/Test)	Yes	Detector Errors	Yes
Coordination Errors	Yes	Controller Download	Yes
Preemption Events	Yes	TSP Events	Yes
Power On/Off	Yes	Low Battery	Yes
Access	Yes	Data Change	Yes
Online / Offline	Yes		

Alarm Event	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Enable Logging	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Display Options (MM) 1-7-2

Key Click Enable:	Yes
Switch to Graphics Mode:	No
LED Mode:	Auto
Display Mode:	Basic
Trans Mode Pop-Up Disable:	No

Sign On (MM) 8-5

Sign On Message Line 1: Dual Walk Term & Call Next Thru
 Sign On Message Line 2:

Software Modules (MM) 8-7

Application Version: 32.66.10
 OS (Boot) Version: 06.07.00

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK0216 - Reynolds St @ MacDonald Rd - Econolite Type - Cobalt

Logic Processor Page 1

Logic Statement Control (MM) 1-8-1

Logic #	Statement Control
---------	-------------------

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK0216 - Reynolds St @ MacDonald Rd - Econolite Type - Cobalt

Controller Timing Plan (MM) 2-1

Plan 1 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	N	N-T	N	E-T	N	S-T	N	W-T	N	N	N	N	N	N	N	N
Min Green	7	35	0	15	0	35	0	15	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	13	0	11	0	13	0	11	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	8	35	0	55	0	35	0	55	35	35	35	35	35	35	35	35
Max2	20	35	0	45	0	35	0	45	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	0.0	2.0	0.0	2.0	0.0	2.0	0.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK0216 - Reynolds St @ MacDonald Rd - Econolite Type - Cobalt

Controller Start / Flash Data (MM) 2-5**Start Up**

Phase	Phase Setting
1	.
2	.
3	.
4	Y
5	.
6	.
7	.
8	Y
9	.
10	.
11	.
12	.
13	.
14	.
15	.
16	.

Overlap
A
B
C
D

Flash Thru Mon: No
Flash Time: 0
All Red: 2
Power Start Seq: 1
MUTCD Enabled: No
Y->G: n/a

Automatic Flash

Entry
2
6

Exit
2
6

Overlap Exit
A
B
C
D

Flash Thru Mon: No
Exit Flash: W
Minimum Flash: 8
Minimum Recall: No
Cycle Through Phase: No

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK0216 - Reynolds St @ MacDonald Rd - Econolite Type - Cobalt

Controller Options

Controller Options (MM) 2-6-1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Flashing Grn Ph	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Guar Passage																
Non-Act I	X				X											
Non-Act II			X				X									
Dual Entry	X	X	X	X	X											
Cond Service																
Cond Reservice																
Ped Re-Service																
Rest In Walk	X				X											
Flashing Walk																
Ped Clr-Yel																
Ped Clr-Red																
IGRN + Veh Ext																

Ped Clear Protect: Off Unit Red Revert: 2.0 MUTCD 3 Seconds Don't Walk: No

Pre-Timed Mode (MM) 2-7

Enable Pre-Timed Mode: No Free Input Disables Pre-Timed: No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Pre-Timed																

Phase Recall Options (MM) 2-8

Plan # 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Lock Detector																
Vehicle Recall		X				X										
Ped Recall		X				X										
Max Recall																
Soft Recall																
No Rest																
AI Calc																

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK0216 - Reynolds St @ MacDonald Rd - Econolite Type - Cobalt

Coordination Options**Options (MM) 3-1**

Manual Pattern	Auto	ECPI Coord	Yes
System Source	TBC	System Format	STD
Splits In	Seconds	Offsets In	Seconds
Transition	Smooth	Max Select	MAXINH
Dwell / Add Time	0		
Delay Coord Wk-LZ	No	Force Off	Float
Offset Reference	Lag	Use Ped Time	Yes
Ped Recall	No	Ped Reservice	No
Local Zero	No	FO Added Ini	No
Override		Green	
Re-sync Count	0	Multisync	No

Auto Perm Minimum Green (Seconds) (MM) 3-4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Split Demand (MM) 3-5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0



MOVING TRAFFIC FORWARD

OAK0216 - Reynolds St @ MacDonald Rd - Econolite Type - Cobalt

Coordination Pattern Data
Coordinator Pattern Data (MM) 3-2

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK0216 - Reynolds St @ MacDonald Rd - Econolite Type - Cobalt

Preempt Plan

Preempt Plan (MM) 4-1

Preempt Plan 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dwell Veh	.	X	.	.	.	X	.	.	.	.	.	.	.	.	.	.
Dwell Ped																
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Ped																
Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exit Phases																
Exit Calls																
Special Function																

Enable	Yes	Preempt Override	Yes	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	No	Duration	10	CLR > GRN	No
Term Ovlp Asap	No	PC Through Yel	Yes	Terminate Phase	No
Ped Dark	No	Track Clear Rsrv	No	Dwell Flash	Off
Linked Pmt	0	FL Exit Color	Grn	Exit Options	Off
Exit Timing Plan	0	Reservice	0	Fault Type	Hard

Ring	1	2	3	4
Free During Pmt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	7	5	4.0	2.0
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	4.0	1.0
	Min Dwell	Pmt Ext	Max Time	Yellow	Red
Dwell / Cycle-Exit	0	0.0	0	4.0	1.0

Preemption Active On Out Preempt Act Dwell No
 Other - Priority Preempt Off Non-Priority Pmt Off
 Inhibit Extension Time 0.0 Ped Priority Return Off
 Veh Priority Return Off Queue Delay Off
 Conditional Delay Off

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



MOVING TRAFFIC FORWARD

OAK0216 - Reynolds St @ MacDonald Rd - Econolite Type - Cobalt

Time Base Clock/Calendar

Clock/Calendar Data (MM) 5-1

Manual Action Plan: 0
SYNC Reference Time: 03:15
SYNC Reference: Reference Time
Day Light Savings: No
Time Reset Input Set Time: 3:30:00
Standard Time From GMT: 0

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK0216 - Reynolds St @ MacDonald Rd - Econolite Type - Cobalt

Time Base Action Plan
Action Plan (MM) 5-2

Action Plan - 1 - "1"

Pattern	1	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	0	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)								
-----------------	--	--	--	--	--	--	--	--

Aux Func (1-3)			
----------------	--	--	--

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15
LP 16-30
LP 31-45
LP 46-60
LP 61-75
LP 76-90
LP 91-100

Action Plan - 2 - "2"

Pattern 2 Override Sys No
 Timing Plan 1 Sequence 0
 Veh Detector Plan 0 Det Log None
 Flash No Red Rest No
 Veh Det Diag Plan 0 Ped Det Diag 0
 Dimming Enable No Pmt Veh Priority Ret No
 Pmt Ped Priority Ret No Pmt Queue Delay No
 Pmt Cond Delay No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)																
-----------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Aux Func (1-3)			
----------------	--	--	--

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15
LP 16-30
LP 31-45
LP 46-60
LP 61-75
LP 76-90
LP 91-100

Action Plan - 3 - "3"

Pattern 3 Override Sys No
 Timing Plan 1 Sequence 0
 Veh Detector Plan 0 Det Log None
 Flash No Red Rest No
 Veh Det Diag Plan 0 Ped Det Diag 0
 Dimming Enable No Pmt Veh Priority Ret No
 Pmt Ped Priority Ret No Pmt Queue Delay No
 Pmt Cond Delay No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15	
LP 16-30	
LP 31-45	
LP 46-60	
LP 61-75	
LP 76-90	
LP 91-100	

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK0216 - Reynolds St @ MacDonald Rd - Econolite Type - Cobalt

Time Base Day Plan/Schedule
Day Plan (MM) 5-3**Day Plan #2 - "2"**

Event	Action Plan	Start Time
1	99	00:00
2	2	09:00
3	3	15:00
4	99	19:00

Schedule (MM) 5-4**Schedule Number - 1**

Day Plan No.: 1

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
-----------	-----	-----	-----	-----	-----	-----	-----

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
	23	24	25	26	27	28	29	30	31		

Schedule Number - 2

Day Plan No.: 2

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
-----------	-----	-----	-----	-----	-----	-----	-----

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
	23	24	25	26	27	28	29	30	31		

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK0216 - Reynolds St @ MacDonald Rd - Econolite Type - Cobalt

Detectors**Detectors - Pg 1****Veh Det Phase Assignment (MM) 6-1****Vehicle Detector Plan Number - 1**

Veh Detector	Assigned Phase	Called Phase	Type
1	1		N
2	2		N
3	4		N
4	4		N
5	5		N
6	6		N
7	7		N
8	8		N
9	9		N
10	10		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	16		N

Vehicle Detector Plan Number - 2

Veh Detector	Assigned Phase	Called Phase	Type
1	1		N
2	2		N
3	3		N
4	4		N
5	5		N
6	6		N
7	7		N
8	8		N
9	9		N
10	10		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	16		N

Vehicle Detector Setup (MM) 6-2

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Veh Detector	Type	TS2 Detector	Description
1	N-NTCIP	Yes	
2	N-NTCIP	Yes	
3	N-NTCIP	Yes	
4	N-NTCIP	Yes	
5	N-NTCIP	Yes	
6	N-NTCIP	Yes	
7	N-NTCIP	Yes	
8	N-NTCIP	Yes	
9	N-NTCIP	Yes	
10	N-NTCIP	Yes	
11	N-NTCIP	Yes	
12	N-NTCIP	Yes	
13	N-NTCIP	Yes	
14	N-NTCIP	Yes	
15	N-NTCIP	Yes	
16	N-NTCIP	Yes	
17	N-NTCIP	Yes	
18	N-NTCIP	Yes	
19	N-NTCIP	Yes	
20	N-NTCIP	Yes	
21	N-NTCIP	Yes	
22	N-NTCIP	Yes	
23	N-NTCIP	Yes	
24	N-NTCIP	Yes	
25	N-NTCIP	Yes	
26	N-NTCIP	Yes	
27	N-NTCIP	Yes	
28	N-NTCIP	Yes	
29	N-NTCIP	Yes	
30	N-NTCIP	Yes	
31	N-NTCIP	Yes	
32	N-NTCIP	Yes	
33	N-NTCIP	Yes	
34	N-NTCIP	Yes	
35	N-NTCIP	Yes	
36	N-NTCIP	Yes	
37	N-NTCIP	Yes	
38	N-NTCIP	Yes	
39	N-NTCIP	Yes	
40	N-NTCIP	Yes	
41	N-NTCIP	Yes	
42	N-NTCIP	Yes	
43	N-NTCIP	Yes	
44	N-NTCIP	Yes	
45	N-NTCIP	Yes	
46	N-NTCIP	Yes	
47	N-NTCIP	Yes	
48	N-NTCIP	Yes	
49	N-NTCIP	Yes	

50	N-NTCIP	Yes	
51	N-NTCIP	Yes	
52	N-NTCIP	Yes	
53	N-NTCIP	Yes	
54	N-NTCIP	Yes	
55	N-NTCIP	Yes	
56	N-NTCIP	Yes	
57	N-NTCIP	Yes	
58	N-NTCIP	Yes	
59	N-NTCIP	Yes	
60	N-NTCIP	Yes	
61	N-NTCIP	Yes	
62	N-NTCIP	Yes	
63	N-NTCIP	Yes	
64	N-NTCIP	Yes	

Vehicle Detector Plan Number - 1

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 2

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Ped Detector Phase Assignment (MM) 6-3

Mode: Econolite

Ped Detector Number	Called Phase															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	X	.	.	.	X	.	.	.	.	.	.	.	.
5	X	.	.	.	.	.	.	.	.	.	.	.
6	X	.	.	.	.	.	.	.	.	.	.
7	X	.	.	.	.	.	.	.	.
8	.	.	.	X	.	.	.	X	.	.	.	.	.	.	.	.
9	X	.	.	.	.	.	.	.
10	X	.	.	.	.	.	.
11	X	.	.	.	.	.
12	X	.	.	.	.
13	X	.	.	.
14	X	.	.
15	X	.
16	X



Turning Movement Count (1 . REYNOLDS ST & MACDONALD RD)

Start Time	N Approach REYNOLDS ST						E Approach MACDONALD RD						S Approach REYNOLDS ST						W Approach MACDONALD RD						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	1	0	0	0	1	0	0	0	0	1	0	0	4	1	0	0	5	1	2	0	0	0	3	9		
06:15:00	0	1	0	0	0	1	0	0	0	0	2	0	0	1	0	0	0	1	0	1	0	0	0	1	3		
06:30:00	0	2	0	0	1	2	1	3	0	0	2	4	0	4	1	0	1	5	3	3	0	0	2	6	17		
06:45:00	0	3	1	0	1	4	1	1	0	0	2	2	0	4	0	0	0	4	1	4	0	0	0	5	15	44	
07:00:00	0	9	1	0	4	10	1	3	0	0	4	4	0	9	1	0	1	10	7	13	0	0	0	20	44	79	
07:15:00	0	10	1	0	0	11	2	8	1	0	1	11	0	13	2	0	0	15	3	6	1	0	0	10	47	123	
07:30:00	0	17	2	0	0	19	6	5	0	0	3	11	2	17	2	0	1	21	4	7	0	0	1	11	62	168	
07:45:00	0	23	2	0	2	25	3	7	1	0	6	11	2	18	4	0	1	24	4	12	0	0	2	16	76	229	
08:00:00	0	26	2	0	10	28	2	8	3	0	3	13	1	20	2	0	0	23	22	12	1	0	0	35	99	284	
08:15:00	0	20	4	0	0	24	4	8	8	0	2	20	1	8	0	0	0	9	15	17	2	0	0	34	87	324	
08:30:00	0	27	1	0	0	28	6	4	4	0	11	14	3	17	0	0	0	20	10	6	2	1	0	19	81	343	
08:45:00	0	20	4	0	0	24	6	5	3	0	5	14	0	11	0	0	0	11	5	8	0	0	0	13	62	329	
09:00:00	1	38	0	0	0	39	3	6	2	0	4	11	0	14	1	0	0	15	4	6	1	0	0	11	76	306	
09:15:00	0	17	1	0	0	18	1	1	3	0	5	5	2	19	0	0	0	21	3	12	0	0	1	15	59	278	
09:30:00	1	13	2	0	3	16	3	4	1	0	4	8	1	18	0	0	0	19	6	6	1	0	0	13	56	253	
09:45:00	2	28	5	0	2	35	2	1	0	0	3	3	1	16	0	0	0	17	4	7	0	0	0	11	66	257	
BREAK																											
15:00:00	2	34	2	0	2	38	5	10	6	0	10	21	3	41	3	0	0	47	8	6	1	0	0	15	121		
15:15:00	2	46	1	0	3	49	5	7	5	0	6	17	3	25	3	0	2	31	11	13	1	0	0	25	122		
15:30:00	0	21	4	0	4	25	1	8	6	0	5	15	1	30	2	0	0	33	13	14	4	0	0	31	104		
15:45:00	0	14	2	0	1	16	2	7	3	0	6	12	3	15	1	0	0	19	4	6	1	0	0	11	58	405	
16:00:00	2	30	4	0	1	36	4	10	4	0	7	18	6	28	1	0	1	35	3	9	1	0	2	13	102	386	
16:15:00	0	27	1	0	2	28	1	6	2	0	2	9	0	36	1	0	0	37	9	9	2	0	0	20	94	358	
16:30:00	2	18	1	0	0	21	5	10	1	0	8	16	3	30	3	0	0	36	4	3	3	0	0	10	83	337	
16:45:00	0	39	2	0	0	41	5	5	2	0	10	12	1	16	5	0	0	22	7	5	0	0	0	12	87	366	
17:00:00	1	31	1	0	1	33	4	4	2	0	6	10	0	32	1	0	2	33	3	7	3	0	0	13	89	353	
17:15:00	2	23	0	0	0	25	4	5	3	0	9	12	0	22	0	0	0	22	2	3	3	0	0	8	67	326	
17:30:00	1	23	2	0	0	26	5	3	4	0	9	12	3	24	2	0	0	29	4	7	0	0	0	11	78	321	
17:45:00	1	30	5	0	1	36	5	6	1	0	4	12	1	28	2	0	0	31	4	3	0	0	0	7	86	320	
18:00:00	0	33	4	0	0	37	4	2	2	0	8	8	4	24	2	0	2	30	9	6	0	0	1	15	90	321	
18:15:00	0	22	3	0	0	25	2	2	3	0	7	7	3	21	1	0	0	25	8	5	0	0	0	13	70	324	
18:30:00	0	16	0	0	0	16	7	4	1	0	8	12	4	18	3	0	2	25	5	4	1	0	1	10	63	309	
18:45:00	0	22	4	0	0	26	4	4	1	0	3	9	1	22	3	0	2	26	4	1	0	0	0	5	66	289	
Grand Total	17	684	62	0	38	763	104	157	72	0	166	333	49	605	47	0	15	701	190	223	28	1	10	442	2239	-	
Approach%	2.2%	89.6%	8.1%	0%	-	-	31.2%	47.1%	21.6%	0%	-	-	7%	86.3%	6.7%	0%	-	-	43%	50.5%	6.3%	0.2%	-	-	-	-	
Totals %	0.8%	30.5%	2.8%	0%	-	34.1%	4.6%	7%	3.2%	0%	-	14.9%	2.2%	27%	2.1%	0%	-	31.3%	8.5%	10%	1.3%	0%	-	19.7%	-	-	
Heavy	0	7	11	0	-	-	15	3	3	0	-	-	1	5	0	0	-	-	3	5	0	0	-	-	-	-	
Heavy %	0%	1%	17.7%	0%	-	-	14.4%	1.9%	4.2%	0%	-	-	2%	0.8%	0%	0%	-	-	1.6%	2.2%	0%	0%	-	-	-	-	
Bicycles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycle %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Peak Hour: 07:45 AM - 08:45 AM Weather: Clear Sky (14.05 °C)

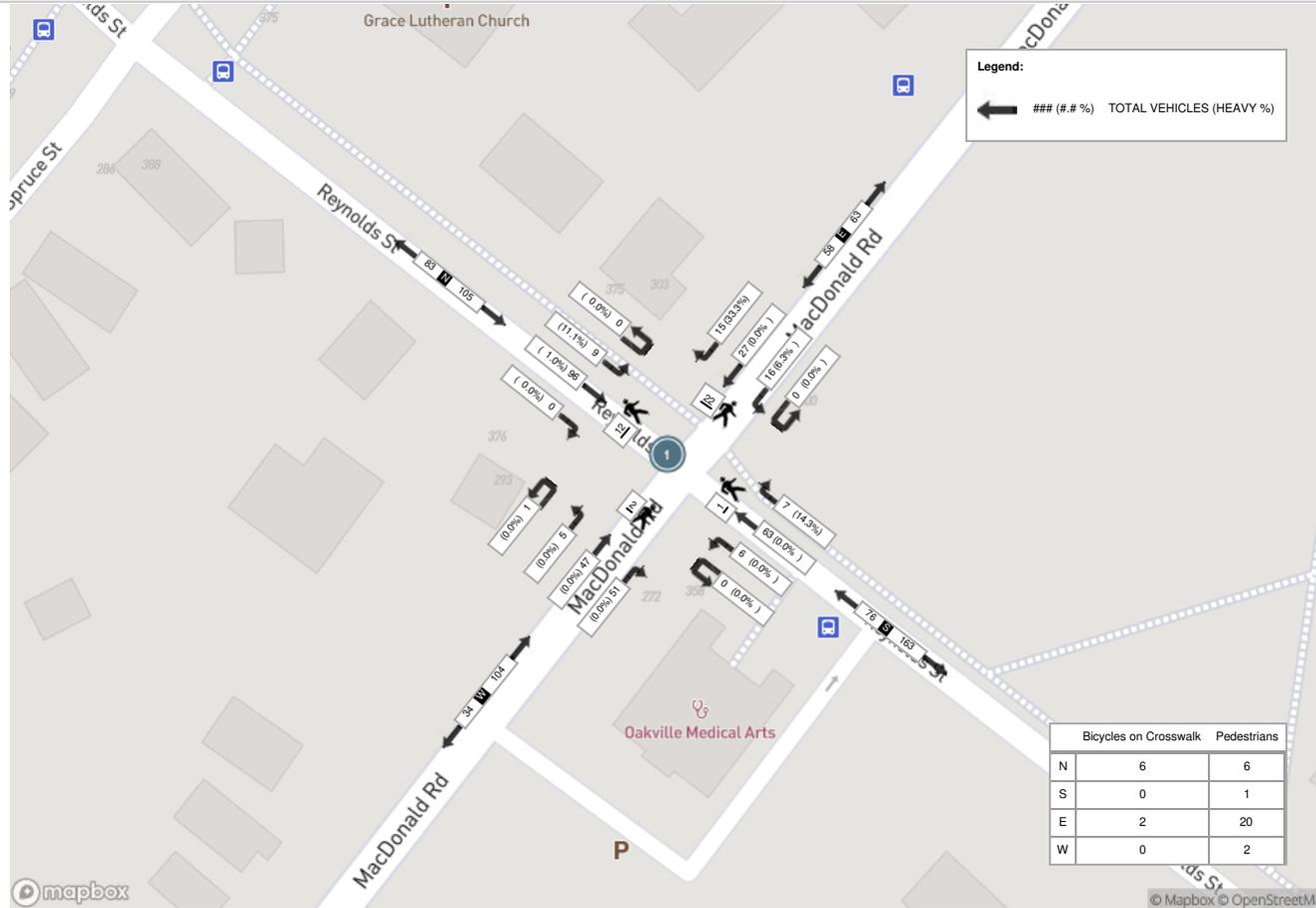
Start Time	N Approach REYNOLDS ST						E Approach MACDONALD RD						S Approach REYNOLDS ST						W Approach MACDONALD RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
07:45:00	0	23	2	0	2	25	3	7	1	0	6	11	2	18	4	0	1	24	4	12	0	0	2	16	76
08:00:00	0	26	2	0	10	28	2	8	3	0	3	13	1	20	2	0	0	23	22	12	1	0	0	35	99
08:15:00	0	20	4	0	0	24	4	8	8	0	2	20	1	8	0	0	0	9	15	17	2	0	0	34	87
08:30:00	0	27	1	0	0	28	6	4	4	0	11	14	3	17	0	0	0	20	10	6	2	1	0	19	81
Grand Total	0	96	9	0	12	105	15	27	16	0	22	58	7	63	6	0	1	76	51	47	5	1	2	104	343
Approach%	0%	91.4%	8.6%	0%	-	-	25.9%	46.6%	27.6%	0%	-	-	9.2%	82.9%	7.9%	0%	-	-	49%	45.2%	4.8%	1%	-	-	-
Totals %	0%	28%	2.6%	0%	30.6%	30.6%	4.4%	7.9%	4.7%	0%	16.9%	16.9%	2%	18.4%	1.7%	0%	22.2%	22.2%	14.9%	13.7%	1.5%	0.3%	30.3%	30.3%	-
PHF	0	0.89	0.56	0	0.94	0.94	0.63	0.84	0.5	0	0.73	0.73	0.58	0.79	0.38	0	0.79	0.79	0.58	0.69	0.63	0.25	0.74	0.74	-
Heavy	0	1	1	0	2	2	5	0	1	0	6	6	1	0	0	0	1	1	0	0	0	0	0	0	-
Heavy %	0%	1%	11.1%	0%	1.9%	1.9%	33.3%	0%	6.3%	0%	10.3%	10.3%	14.3%	0%	0%	0%	1.3%	1.3%	0%	0%	0%	0%	0%	0%	-
Lights	0	93	8	0	101	101	10	27	15	0	52	52	6	59	6	0	71	71	51	47	5	1	104	104	-
Lights %	0%	96.9%	88.9%	0%	96.2%	96.2%	66.7%	100%	93.8%	0%	89.7%	89.7%	85.7%	93.7%	100%	0%	93.4%	93.4%	100%	100%	100%	100%	100%	100%	-
Single-Unit Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Single-Unit Trucks %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Buses	0	1	1	0	2	2	5	0	1	0	6	6	1	0	0	0	1	1	0	0	0	0	0	0	-
Buses %	0%	1%	11.1%	0%	1.9%	1.9%	33.3%	0%	6.3%	0%	10.3%	10.3%	14.3%	0%	0%	0%	1.3%	1.3%	0%	0%	0%	0%	0%	0%	-
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Bicycles on Road	0	2	0	0	2	2	0	0	0	0	0	0	0	4	0	0	4	4	0	0	0	0	0	0	-
Bicycles on Road %	0%	2.1%	0%	0%	1.9%	1.9%	0%	0%	0%	0%	0%	0%	0%	6.3%	0%	0%	5.3%	5.3%	0%	0%	0%	0%	0%	0%	-
Pedestrians	-	-	-	-	6	6	-	-	-	-	20	20	-	-	-	-	1	1	-	-	-	-	2	2	-
Pedestrians%	-	-	-	-	16.2%	16.2%	-	-	-	-	54.1%	54.1%	-	-	-	-	2.7%	2.7%	-	-	-	-	5.4%	5.4%	-
Bicycles on Crosswalk	-	-	-	-	6	6	-	-	-	-	2	2	-	-	-	-	0	0	-	-	-	-	0	0	-
Bicycles on Crosswalk%	-	-	-	-	16.2%	16.2%	-	-	-	-	5.4%	5.4%	-	-	-	-	0%	0%	-	-	-	-	0%	0%	-



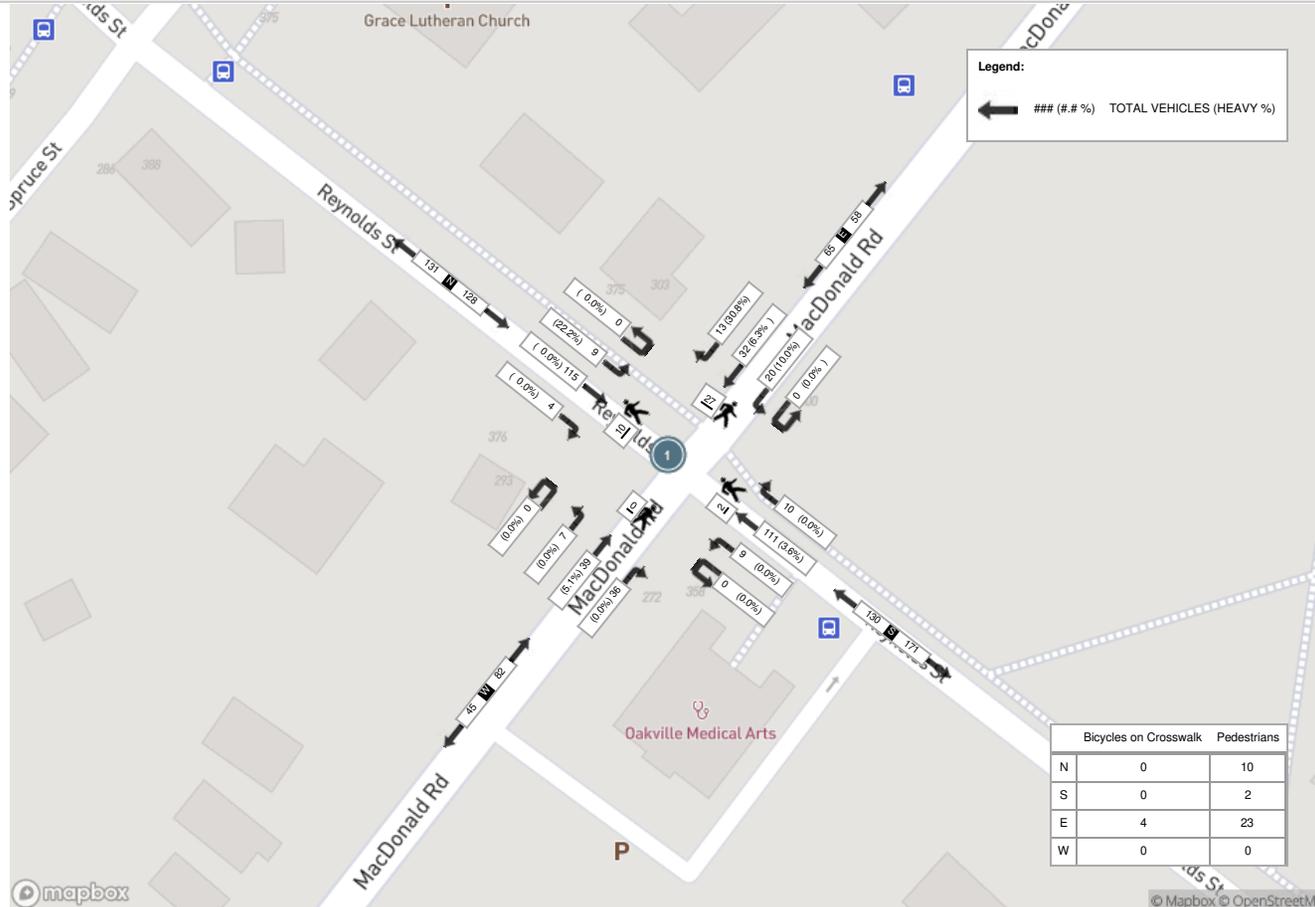
Peak Hour: 03:00 PM - 04:00 PM Weather: Few Clouds (24.45 °C)

Start Time	N Approach REYNOLDS ST						E Approach MACDONALD RD						S Approach REYNOLDS ST						W Approach MACDONALD RD						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	
15:00:00	2	34	2	0	2	38	5	10	6	0	10	21	3	41	3	0	0	47	8	6	1	0	0	15	121
15:15:00	2	46	1	0	3	49	5	7	5	0	6	17	3	25	3	0	2	31	11	13	1	0	0	25	122
15:30:00	0	21	4	0	4	25	1	8	6	0	5	15	1	30	2	0	0	33	13	14	4	0	0	31	104
15:45:00	0	14	2	0	1	16	2	7	3	0	6	12	3	15	1	0	0	19	4	6	1	0	0	11	58
Grand Total	4	115	9	0	10	128	13	32	20	0	27	65	10	111	9	0	2	130	36	39	7	0	0	82	405
Approach%	3.1%	89.8%	7%	0%	-	-	20%	49.2%	30.8%	0%	-	-	7.7%	85.4%	6.9%	0%	-	-	43.9%	47.6%	8.5%	0%	-	-	-
Totals %	1%	28.4%	2.2%	0%	31.6%	31.6%	3.2%	7.9%	4.9%	0%	16%	16%	2.5%	27.4%	2.2%	0%	32.1%	32.1%	8.9%	9.6%	1.7%	0%	20.2%	20.2%	-
PHF	0.5	0.63	0.56	0	0.65	0.65	0.65	0.8	0.83	0	0.77	0.77	0.83	0.68	0.75	0	0.69	0.69	0.69	0.7	0.44	0	0.66	0.66	-
Heavy	0	0	2	0	2	2	4	2	2	0	8	8	0	4	0	0	4	4	0	2	0	0	2	2	-
Heavy %	0%	0%	22.2%	0%	1.6%	1.6%	30.8%	6.3%	10%	0%	12.3%	12.3%	0%	3.6%	0%	0%	3.1%	3.1%	0%	5.1%	0%	0%	2.4%	2.4%	-
Lights	4	114	7	0	125	125	9	30	17	0	56	56	10	107	9	0	126	126	36	37	7	0	80	80	-
Lights %	100%	99.1%	77.8%	0%	97.7%	97.7%	69.2%	93.8%	85%	0%	86.2%	86.2%	100%	96.4%	100%	0%	96.9%	96.9%	100%	94.9%	100%	0%	97.6%	97.6%	-
Single-Unit Trucks	0	0	0	0	0	0	0	2	0	0	2	2	0	1	0	0	1	1	0	1	0	0	1	1	-
Single-Unit Trucks %	0%	0%	0%	0%	0%	0%	0%	6.3%	0%	0%	3.1%	3.1%	0%	0.9%	0%	0%	0.8%	0.8%	0%	2.6%	0%	0%	1.2%	1.2%	-
Buses	0	0	2	0	2	2	4	0	2	0	6	6	0	2	0	0	2	2	0	1	0	0	1	1	-
Buses %	0%	0%	22.2%	0%	1.6%	1.6%	30.8%	0%	10%	0%	9.2%	9.2%	0%	1.8%	0%	0%	1.5%	1.5%	0%	2.6%	0%	0%	1.2%	1.2%	-
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	-
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.9%	0%	0%	0.8%	0.8%	0%	0%	0%	0%	0%	0%	-
Bicycles on Road	0	1	0	0	1	1	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	-
Bicycles on Road %	0%	0.9%	0%	0%	0.8%	0.8%	0%	0%	5%	0%	1.5%	1.5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Pedestrians	-	-	-	-	10	-	-	-	-	-	23	-	-	-	-	-	2	-	-	-	-	-	0	-	-
Pedestrians%	-	-	-	-	25.6%	-	-	-	-	-	59%	-	-	-	-	-	5.1%	-	-	-	-	-	0%	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	4	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	0%	-	-	-	-	-	10.3%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-

Peak Hour: 07:45 AM - 08:45 AM Weather: Clear Sky (14.05 °C)



Peak Hour: 03:00 PM - 04:00 PM Weather: Few Clouds (24.45 °C)



APPENDIX C

Level of Service Definitions

Level of Service Definitions

Two-Way Stop Controlled Intersections

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

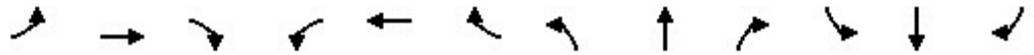
Adapted from Highway Capacity Manual 2000, Transportation Research Board

APPENDIX D

Detailed Capacity Analysis

Lanes, Volumes, Timings
1: MacDonald Road & Reynolds Street

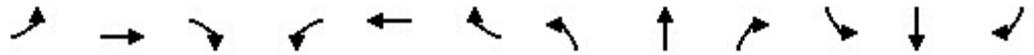
06-12-2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	5	47	51	16	27	15	6	63	7	9	96	0
Future Volume (vph)	5	47	51	16	27	15	6	63	7	9	96	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.933			0.965			0.987				
Fl _t Protected		0.998			0.986			0.996			0.996	
Satd. Flow (prot)	0	1734	0	0	1772	0	0	1831	0	0	1855	0
Fl _t Permitted		0.986			0.889			0.984			0.983	
Satd. Flow (perm)	0	1714	0	0	1598	0	0	1809	0	0	1831	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		55			16			6				
Link Speed (k/h)		50			50			40			50	
Link Distance (m)		153.3			157.7			212.2			113.9	
Travel Time (s)		11.0			11.4			19.1			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	51	55	17	29	16	7	68	8	10	104	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	111	0	0	62	0	0	83	0	0	114	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1		1	1		1	0		1	0	
Detector Template	Left			Left			Left			Left		
Leading Detector (m)	2.0	6.5		2.0	6.5		2.0	0.0		2.0	0.0	
Trailing Detector (m)	0.0	-0.5		0.0	-0.5		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	-0.5		0.0	-0.5		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	7.0		2.0	7.0		2.0	0.6		2.0	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0		2.0	7.0	
Minimum Split (s)	21.0	21.0		21.0	21.0		13.0	13.0		8.0	13.0	
Total Split (s)	55.0	55.0		55.0	55.0		35.0	35.0		8.0	43.0	
Total Split (%)	56.1%	56.1%		56.1%	56.1%		35.7%	35.7%		8.2%	43.9%	
Maximum Green (s)	49.0	49.0		49.0	49.0		29.0	29.0		5.0	37.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	

Lanes, Volumes, Timings
 1: MacDonald Road & Reynolds Street

06-12-2023

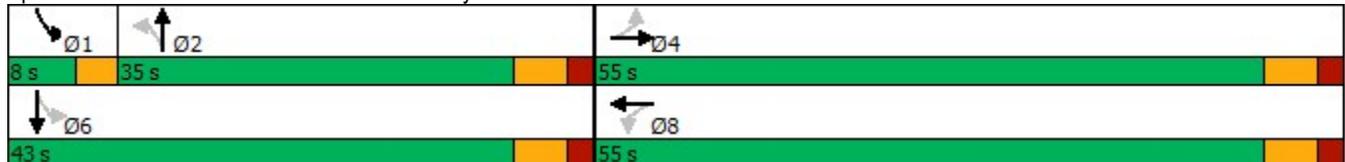


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		0.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		None	Max	
Walk Time (s)	10.0	10.0		10.0	10.0		7.0	7.0			10.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		13.0	13.0			13.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)		15.0			15.0			42.7			42.7	
Actuated g/C Ratio		0.24			0.24			0.67			0.67	
v/c Ratio		0.25			0.16			0.07			0.09	
Control Delay		13.3			16.9			5.8			6.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		13.3			16.9			5.8			6.3	
LOS		B			B			A			A	
Approach Delay		13.3			16.9			5.8			6.3	
Approach LOS		B			B			A			A	
Queue Length 50th (m)		5.5			4.5			3.8			5.7	
Queue Length 95th (m)		17.1			13.2			8.8			11.8	
Internal Link Dist (m)		129.3			133.7			188.2			89.9	
Turn Bay Length (m)												
Base Capacity (vph)		1332			1234			1212			1224	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.08			0.05			0.07			0.09	

Intersection Summary

Area Type: Other
 Cycle Length: 98
 Actuated Cycle Length: 63.8
 Natural Cycle: 45
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.25
 Intersection Signal Delay: 10.1
 Intersection Capacity Utilization 29.9%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

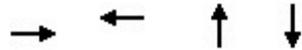
Splits and Phases: 1: MacDonald Road & Reynolds Street



Queues

1: MacDonald Road & Reynolds Street

06-12-2023



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	111	62	83	114
v/c Ratio	0.25	0.16	0.07	0.09
Control Delay	13.3	16.9	5.8	6.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.3	16.9	5.8	6.3
Queue Length 50th (m)	5.5	4.5	3.8	5.7
Queue Length 95th (m)	17.1	13.2	8.8	11.8
Internal Link Dist (m)	129.3	133.7	188.2	89.9
Turn Bay Length (m)				
Base Capacity (vph)	1332	1234	1212	1224
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.08	0.05	0.07	0.09
Intersection Summary				

Intersection: 1: MacDonald Road & Reynolds Street

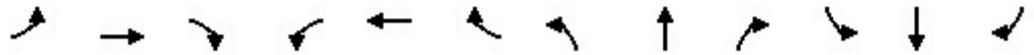
Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	29.9	28.4	24.7	21.9
Average Queue (m)	11.9	8.3	6.6	7.8
95th Queue (m)	22.2	19.2	17.4	17.4
Link Distance (m)	144.9	149.3	203.8	105.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Lanes, Volumes, Timings
1: MacDonald Road & Reynolds Street

06-12-2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	7	39	36	20	32	13	9	111	10	9	115	4
Future Volume (vph)	7	39	36	20	32	13	9	111	10	9	115	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.941			0.973			0.990			0.996	
Fl _t Protected		0.996			0.985			0.996			0.996	
Satd. Flow (prot)	0	1746	0	0	1785	0	0	1837	0	0	1848	0
Fl _t Permitted		0.968			0.873			0.984			0.984	
Satd. Flow (perm)	0	1697	0	0	1582	0	0	1815	0	0	1826	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		39			14			4			2	
Link Speed (k/h)		50			50			40			50	
Link Distance (m)		153.3			157.7			212.2			113.9	
Travel Time (s)		11.0			11.4			19.1			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	42	39	22	35	14	10	121	11	10	125	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	89	0	0	71	0	0	142	0	0	139	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1		1	1		1	0		1	0	
Detector Template	Left			Left			Left			Left		
Leading Detector (m)	2.0	6.5		2.0	6.5		2.0	0.0		2.0	0.0	
Trailing Detector (m)	0.0	-0.5		0.0	-0.5		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	-0.5		0.0	-0.5		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	7.0		2.0	7.0		2.0	0.6		2.0	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	21.0	21.0		21.0	21.0		35.0	35.0		10.0	35.0	
Total Split (s)	45.0	45.0		45.0	45.0		35.0	35.0		20.0	55.0	
Total Split (%)	45.0%	45.0%		45.0%	45.0%		35.0%	35.0%		20.0%	55.0%	
Maximum Green (s)	39.0	39.0		39.0	39.0		29.0	29.0		17.0	49.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	

Lanes, Volumes, Timings

1: MacDonald Road & Reynolds Street

06-12-2023

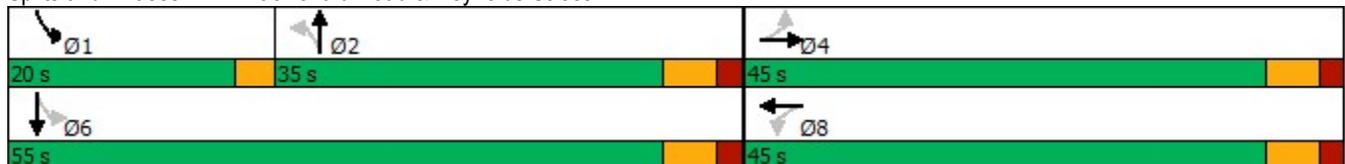


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		0.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		None	Max	
Walk Time (s)	10.0	10.0		10.0	10.0		7.0	7.0			10.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		13.0	13.0			13.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)		15.0			15.0			55.1			55.1	
Actuated g/C Ratio		0.20			0.20			0.72			0.72	
v/c Ratio		0.24			0.22			0.11			0.11	
Control Delay		18.4			23.8			5.1			5.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		18.4			23.8			5.1			5.1	
LOS		B			C			A			A	
Approach Delay		18.4			23.8			5.1			5.1	
Approach LOS		B			C			A			A	
Queue Length 50th (m)		6.3			7.2			7.0			6.9	
Queue Length 95th (m)		18.2			18.1			13.3			13.1	
Internal Link Dist (m)		129.3			133.7			188.2			89.9	
Turn Bay Length (m)												
Base Capacity (vph)		888			817			1312			1319	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.10			0.09			0.11			0.11	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 76.3
 Natural Cycle: 70
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.24
 Intersection Signal Delay: 10.8
 Intersection Capacity Utilization 31.5%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

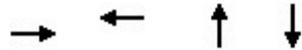
Splits and Phases: 1: MacDonald Road & Reynolds Street



Queues

1: MacDonald Road & Reynolds Street

06-12-2023



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	89	71	142	139
v/c Ratio	0.24	0.22	0.11	0.11
Control Delay	18.4	23.8	5.1	5.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	18.4	23.8	5.1	5.1
Queue Length 50th (m)	6.3	7.2	7.0	6.9
Queue Length 95th (m)	18.2	18.1	13.3	13.1
Internal Link Dist (m)	129.3	133.7	188.2	89.9
Turn Bay Length (m)				
Base Capacity (vph)	888	817	1312	1319
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.10	0.09	0.11	0.11
Intersection Summary				

Intersection: 1: MacDonald Road & Reynolds Street

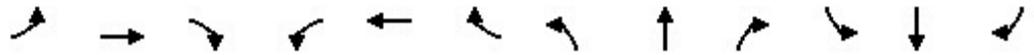
Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	30.5	24.3	29.7	22.2
Average Queue (m)	11.8	10.0	10.2	7.6
95th Queue (m)	22.8	19.9	23.3	18.2
Link Distance (m)	144.9	149.3	203.8	105.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Lanes, Volumes, Timings
1: MacDonald Road & Reynolds Street

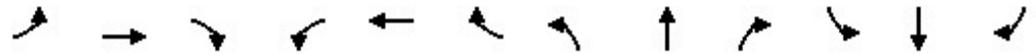
06-12-2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	6	58	61	18	38	25	10	78	8	16	116	0
Future Volume (vph)	6	58	61	18	38	25	10	78	8	16	116	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.934			0.959			0.988				
Fl _t Protected		0.997			0.989			0.995			0.994	
Satd. Flow (prot)	0	1735	0	0	1767	0	0	1831	0	0	1852	0
Fl _t Permitted		0.982			0.906			0.975			0.971	
Satd. Flow (perm)	0	1708	0	0	1618	0	0	1794	0	0	1809	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		66			27			5				
Link Speed (k/h)		50			50			40			50	
Link Distance (m)		153.3			157.7			212.2			113.9	
Travel Time (s)		11.0			11.4			19.1			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	63	66	20	41	27	11	85	9	17	126	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	136	0	0	88	0	0	105	0	0	143	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1		1	1		1	0		1	0	
Detector Template	Left			Left			Left			Left		
Leading Detector (m)	2.0	6.5		2.0	6.5		2.0	0.0		2.0	0.0	
Trailing Detector (m)	0.0	-0.5		0.0	-0.5		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	-0.5		0.0	-0.5		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	7.0		2.0	7.0		2.0	0.6		2.0	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0		2.0	7.0	
Minimum Split (s)	21.0	21.0		21.0	21.0		13.0	13.0		8.0	13.0	
Total Split (s)	55.0	55.0		55.0	55.0		35.0	35.0		8.0	43.0	
Total Split (%)	56.1%	56.1%		56.1%	56.1%		35.7%	35.7%		8.2%	43.9%	
Maximum Green (s)	49.0	49.0		49.0	49.0		29.0	29.0		5.0	37.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	

Lanes, Volumes, Timings
 1: MacDonald Road & Reynolds Street

06-12-2023

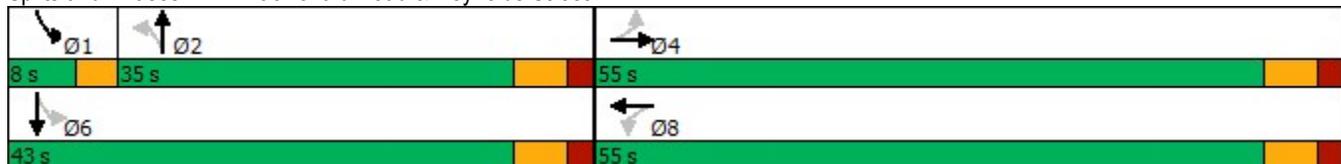


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		0.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		None	Max	
Walk Time (s)	10.0	10.0		10.0	10.0		7.0	7.0			10.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		13.0	13.0			13.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)		15.0			15.0			41.6			41.6	
Actuated g/C Ratio		0.24			0.24			0.66			0.66	
v/c Ratio		0.30			0.22			0.09			0.12	
Control Delay		13.5			16.4			6.1			6.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		13.5			16.4			6.1			6.4	
LOS		B			B			A			A	
Approach Delay		13.5			16.4			6.1			6.4	
Approach LOS		B			B			A			A	
Queue Length 50th (m)		7.0			6.1			4.9			7.3	
Queue Length 95th (m)		19.9			16.6			10.7			14.3	
Internal Link Dist (m)		129.3			133.7			188.2			89.9	
Turn Bay Length (m)												
Base Capacity (vph)		1349			1270			1190			1198	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.10			0.07			0.09			0.12	

Intersection Summary

Area Type:	Other
Cycle Length:	98
Actuated Cycle Length:	62.8
Natural Cycle:	45
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.30
Intersection Signal Delay:	10.2
Intersection LOS:	B
Intersection Capacity Utilization:	32.2%
ICU Level of Service:	A
Analysis Period (min):	15

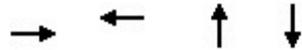
Splits and Phases: 1: MacDonald Road & Reynolds Street



Queues

1: MacDonald Road & Reynolds Street

06-12-2023



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	136	88	105	143
v/c Ratio	0.30	0.22	0.09	0.12
Control Delay	13.5	16.4	6.1	6.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.5	16.4	6.1	6.4
Queue Length 50th (m)	7.0	6.1	4.9	7.3
Queue Length 95th (m)	19.9	16.6	10.7	14.3
Internal Link Dist (m)	129.3	133.7	188.2	89.9
Turn Bay Length (m)				
Base Capacity (vph)	1349	1270	1190	1198
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.10	0.07	0.09	0.12
Intersection Summary				

Intersection: 1: MacDonald Road & Reynolds Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	30.5	24.4	22.4	26.3
Average Queue (m)	14.7	11.5	8.0	10.1
95th Queue (m)	26.1	23.1	18.4	21.1
Link Distance (m)	144.9	149.3	203.8	105.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Lanes, Volumes, Timings
1: MacDonald Road & Reynolds Street

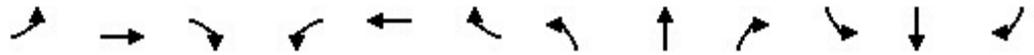
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	8	48	42	23	38	17	11	125	12	14	133	5
Future Volume (vph)	8	48	42	23	38	17	11	125	12	14	133	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.942			0.971			0.989			0.996	
Fl _t Protected		0.996			0.985			0.996			0.995	
Satd. Flow (prot)	0	1748	0	0	1782	0	0	1835	0	0	1846	0
Fl _t Permitted		0.969			0.896			0.981			0.975	
Satd. Flow (perm)	0	1700	0	0	1621	0	0	1807	0	0	1809	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		45			16			4			2	
Link Speed (k/h)		50			50			40			50	
Link Distance (m)		153.3			157.7			212.2			113.9	
Travel Time (s)		11.0			11.4			19.1			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	52	46	25	41	18	12	136	13	15	145	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	107	0	0	84	0	0	161	0	0	165	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1		1	1		1	0		1	0	
Detector Template	Left			Left			Left			Left		
Leading Detector (m)	2.0	6.5		2.0	6.5		2.0	0.0		2.0	0.0	
Trailing Detector (m)	0.0	-0.5		0.0	-0.5		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	-0.5		0.0	-0.5		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	7.0		2.0	7.0		2.0	0.6		2.0	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	21.0	21.0		21.0	21.0		35.0	35.0		10.0	35.0	
Total Split (s)	45.0	45.0		45.0	45.0		35.0	35.0		20.0	55.0	
Total Split (%)	45.0%	45.0%		45.0%	45.0%		35.0%	35.0%		20.0%	55.0%	
Maximum Green (s)	39.0	39.0		39.0	39.0		29.0	29.0		17.0	49.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	

Lanes, Volumes, Timings
 1: MacDonald Road & Reynolds Street

06-12-2023

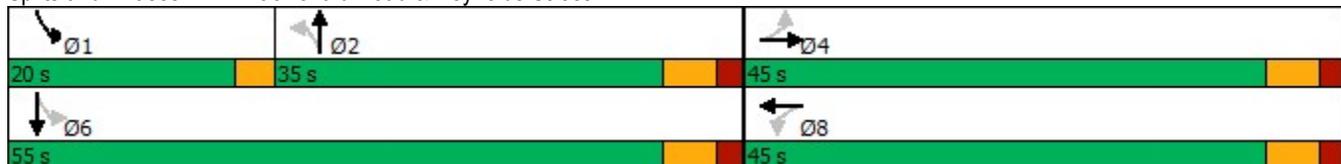


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		0.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		None	Max	
Walk Time (s)	10.0	10.0		10.0	10.0		7.0	7.0			10.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		13.0	13.0			13.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)		15.0			15.0			54.1			54.1	
Actuated g/C Ratio		0.20			0.20			0.72			0.72	
v/c Ratio		0.29			0.25			0.12			0.13	
Control Delay		18.7			24.1			5.2			5.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		18.7			24.1			5.2			5.2	
LOS		B			C			A			A	
Approach Delay		18.7			24.1			5.2			5.2	
Approach LOS		B			C			A			A	
Queue Length 50th (m)		7.9			8.7			8.0			8.4	
Queue Length 95th (m)		21.1			20.7			14.9			15.2	
Internal Link Dist (m)		129.3			133.7			188.2			89.9	
Turn Bay Length (m)												
Base Capacity (vph)		903			848			1299			1300	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.12			0.10			0.12			0.13	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	75.3
Natural Cycle:	70
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.29
Intersection Signal Delay:	11.1
Intersection LOS:	B
Intersection Capacity Utilization:	33.7%
ICU Level of Service:	A
Analysis Period (min):	15

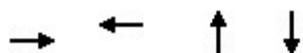
Splits and Phases: 1: MacDonald Road & Reynolds Street



Queues

1: MacDonald Road & Reynolds Street

06-12-2023



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	107	84	161	165
v/c Ratio	0.29	0.25	0.12	0.13
Control Delay	18.7	24.1	5.2	5.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	18.7	24.1	5.2	5.2
Queue Length 50th (m)	7.9	8.7	8.0	8.4
Queue Length 95th (m)	21.1	20.7	14.9	15.2
Internal Link Dist (m)	129.3	133.7	188.2	89.9
Turn Bay Length (m)				
Base Capacity (vph)	903	848	1299	1300
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.12	0.10	0.12	0.13
Intersection Summary				

Intersection: 1: MacDonald Road & Reynolds Street

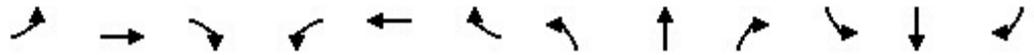
Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	32.3	37.5	24.3	31.0
Average Queue (m)	15.1	12.5	9.1	10.7
95th Queue (m)	27.0	26.8	21.5	24.2
Link Distance (m)	144.9	149.3	203.8	105.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Lanes, Volumes, Timings
1: MacDonald Road & Reynolds Street

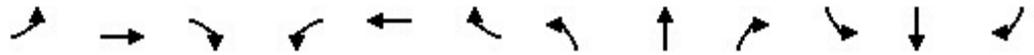
06-12-2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	7	59	61	18	39	25	10	78	8	16	116	1
Future Volume (vph)	7	59	61	18	39	25	10	78	8	16	116	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.935			0.959			0.988			0.999	
Fl _t Protected		0.997			0.989			0.995			0.994	
Satd. Flow (prot)	0	1736	0	0	1767	0	0	1831	0	0	1850	0
Fl _t Permitted		0.979			0.909			0.975			0.971	
Satd. Flow (perm)	0	1705	0	0	1624	0	0	1794	0	0	1807	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		66			27			5				
Link Speed (k/h)		50			50			40			50	
Link Distance (m)		153.3			157.7			212.2			113.9	
Travel Time (s)		11.0			11.4			19.1			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	64	66	20	42	27	11	85	9	17	126	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	138	0	0	89	0	0	105	0	0	144	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1		1	1		1	0		1	0	
Detector Template	Left			Left			Left			Left		
Leading Detector (m)	2.0	6.5		2.0	6.5		2.0	0.0		2.0	0.0	
Trailing Detector (m)	0.0	-0.5		0.0	-0.5		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	-0.5		0.0	-0.5		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	7.0		2.0	7.0		2.0	0.6		2.0	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0		2.0	7.0	
Minimum Split (s)	21.0	21.0		21.0	21.0		13.0	13.0		8.0	13.0	
Total Split (s)	55.0	55.0		55.0	55.0		35.0	35.0		8.0	43.0	
Total Split (%)	56.1%	56.1%		56.1%	56.1%		35.7%	35.7%		8.2%	43.9%	
Maximum Green (s)	49.0	49.0		49.0	49.0		29.0	29.0		5.0	37.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	

Lanes, Volumes, Timings
 1: MacDonald Road & Reynolds Street

06-12-2023

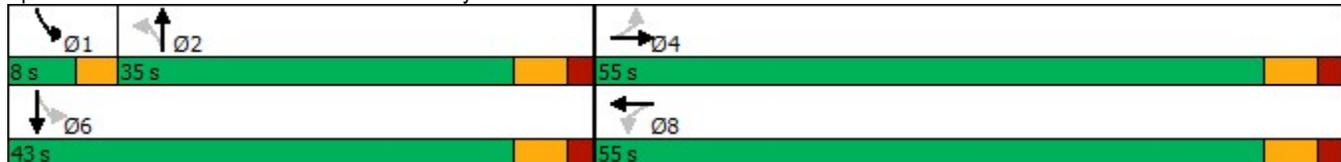


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		0.0	2.0	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		None	Max	
Walk Time (s)	10.0	10.0		10.0	10.0		7.0	7.0			10.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		13.0	13.0			13.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)		15.0			15.0			41.6			41.6	
Actuated g/C Ratio		0.24			0.24			0.66			0.66	
v/c Ratio		0.30			0.22			0.09			0.12	
Control Delay		13.7			16.5			6.1			6.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		13.7			16.5			6.1			6.4	
LOS		B			B			A			A	
Approach Delay		13.7			16.5			6.1			6.4	
Approach LOS		B			B			A			A	
Queue Length 50th (m)		7.2			6.2			4.9			7.3	
Queue Length 95th (m)		20.3			16.7			10.7			14.4	
Internal Link Dist (m)		129.3			133.7			188.2			89.9	
Turn Bay Length (m)												
Base Capacity (vph)		1346			1274			1190			1197	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.10			0.07			0.09			0.12	

Intersection Summary

Area Type:	Other
Cycle Length:	98
Actuated Cycle Length:	62.8
Natural Cycle:	45
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.30
Intersection Signal Delay:	10.3
Intersection LOS:	B
Intersection Capacity Utilization:	32.2%
ICU Level of Service:	A
Analysis Period (min):	15

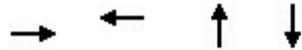
Splits and Phases: 1: MacDonald Road & Reynolds Street



Queues

1: MacDonald Road & Reynolds Street

06-12-2023



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	138	89	105	144
v/c Ratio	0.30	0.22	0.09	0.12
Control Delay	13.7	16.5	6.1	6.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.7	16.5	6.1	6.4
Queue Length 50th (m)	7.2	6.2	4.9	7.3
Queue Length 95th (m)	20.3	16.7	10.7	14.4
Internal Link Dist (m)	129.3	133.7	188.2	89.9
Turn Bay Length (m)				
Base Capacity (vph)	1346	1274	1190	1197
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.10	0.07	0.09	0.12
Intersection Summary				

Intersection: 1: MacDonald Road & Reynolds Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	30.9	26.9	20.6	26.3
Average Queue (m)	15.4	11.8	7.1	10.2
95th Queue (m)	27.2	23.2	17.4	21.4
Link Distance (m)	144.9	149.3	203.8	105.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Lanes, Volumes, Timings
1: MacDonald Road & Reynolds Street

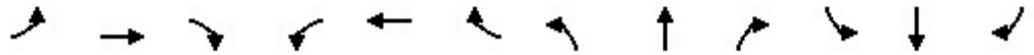
06-12-2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	9	49	42	23	39	17	11	125	12	14	133	7
Future Volume (vph)	9	49	42	23	39	17	11	125	12	14	133	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.943			0.971			0.989			0.994	
Fl _t Protected		0.995			0.986			0.996			0.996	
Satd. Flow (prot)	0	1748	0	0	1783	0	0	1835	0	0	1844	0
Fl _t Permitted		0.965			0.897			0.981			0.976	
Satd. Flow (perm)	0	1695	0	0	1622	0	0	1807	0	0	1807	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		43			16			4			4	
Link Speed (k/h)		50			50			40			50	
Link Distance (m)		153.3			157.7			212.2			113.9	
Travel Time (s)		11.0			11.4			19.1			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	53	46	25	42	18	12	136	13	15	145	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	109	0	0	85	0	0	161	0	0	168	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1		1	1		1	0		1	0	
Detector Template	Left			Left			Left			Left		
Leading Detector (m)	2.0	6.5		2.0	6.5		2.0	0.0		2.0	0.0	
Trailing Detector (m)	0.0	-0.5		0.0	-0.5		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	-0.5		0.0	-0.5		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	7.0		2.0	7.0		2.0	0.6		2.0	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	21.0	21.0		21.0	21.0		35.0	35.0		10.0	35.0	
Total Split (s)	45.0	45.0		45.0	45.0		35.0	35.0		20.0	55.0	
Total Split (%)	45.0%	45.0%		45.0%	45.0%		35.0%	35.0%		20.0%	55.0%	
Maximum Green (s)	39.0	39.0		39.0	39.0		29.0	29.0		17.0	49.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	

Lanes, Volumes, Timings
 1: MacDonald Road & Reynolds Street

06-12-2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		0.0	2.0	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		None	Max	
Walk Time (s)	10.0	10.0		10.0	10.0		7.0	7.0			10.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		13.0	13.0			13.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)		15.0			15.0			54.1			54.1	
Actuated g/C Ratio		0.20			0.20			0.72			0.72	
v/c Ratio		0.29			0.25			0.12			0.13	
Control Delay		19.4			24.2			5.2			5.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		19.4			24.2			5.2			5.2	
LOS		B			C			A			A	
Approach Delay		19.4			24.2			5.2			5.2	
Approach LOS		B			C			A			A	
Queue Length 50th (m)		8.4			8.8			8.0			8.4	
Queue Length 95th (m)		21.7			20.8			14.9			15.5	
Internal Link Dist (m)		129.3			133.7			188.2			89.9	
Turn Bay Length (m)												
Base Capacity (vph)		900			849			1298			1298	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.12			0.10			0.12			0.13	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	75.3
Natural Cycle:	70
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.29
Intersection Signal Delay:	11.2
Intersection LOS:	B
Intersection Capacity Utilization:	33.8%
ICU Level of Service:	A
Analysis Period (min):	15

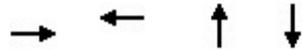
Splits and Phases: 1: MacDonald Road & Reynolds Street



Queues

1: MacDonald Road & Reynolds Street

06-12-2023



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	109	85	161	168
v/c Ratio	0.29	0.25	0.12	0.13
Control Delay	19.4	24.2	5.2	5.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	19.4	24.2	5.2	5.2
Queue Length 50th (m)	8.4	8.8	8.0	8.4
Queue Length 95th (m)	21.7	20.8	14.9	15.5
Internal Link Dist (m)	129.3	133.7	188.2	89.9
Turn Bay Length (m)				
Base Capacity (vph)	900	849	1298	1298
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.12	0.10	0.12	0.13
Intersection Summary				

Intersection: 1: MacDonald Road & Reynolds Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	30.0	32.6	24.6	26.6
Average Queue (m)	14.6	12.0	10.1	9.5
95th Queue (m)	26.1	25.1	21.8	22.2
Link Distance (m)	144.9	149.3	203.8	105.5
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Sensitivity Analysis

Lanes, Volumes, Timings

1: MacDonald/MacDonald Road & Reynolds Street

06-13-2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	7	59	61	18	39	25	10	78	8	16	116	1
Future Volume (vph)	7	59	61	18	39	25	10	78	8	16	116	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.935			0.959			0.988			0.999	
Fl _t Protected		0.997			0.989			0.995			0.994	
Satd. Flow (prot)	0	1736	0	0	1767	0	0	1831	0	0	1850	0
Fl _t Permitted		0.979			0.909			0.975			0.971	
Satd. Flow (perm)	0	1705	0	0	1624	0	0	1794	0	0	1807	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		66			27			5				
Link Speed (k/h)		50			50			40			50	
Link Distance (m)		39.0			157.7			212.2			113.9	
Travel Time (s)		2.8			11.4			19.1			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	64	66	20	42	27	11	85	9	17	126	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	138	0	0	89	0	0	105	0	0	144	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1		1	1		1	0		1	0	
Detector Template	Left			Left			Left			Left		
Leading Detector (m)	2.0	6.5		2.0	6.5		2.0	0.0		2.0	0.0	
Trailing Detector (m)	0.0	-0.5		0.0	-0.5		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	-0.5		0.0	-0.5		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	7.0		2.0	7.0		2.0	0.6		2.0	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0		2.0	7.0	
Minimum Split (s)	21.0	21.0		21.0	21.0		13.0	13.0		8.0	13.0	
Total Split (s)	55.0	55.0		55.0	55.0		35.0	35.0		8.0	43.0	
Total Split (%)	56.1%	56.1%		56.1%	56.1%		35.7%	35.7%		8.2%	43.9%	
Maximum Green (s)	49.0	49.0		49.0	49.0		29.0	29.0		5.0	37.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	

Lanes, Volumes, Timings

1: MacDonald/MacDonald Road & Reynolds Street

06-13-2023

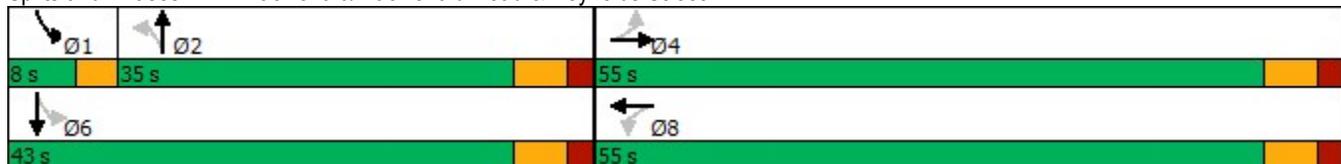


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		0.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		None	Max	
Walk Time (s)	10.0	10.0		10.0	10.0		7.0	7.0			10.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		13.0	13.0			13.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)		15.0			15.0			41.6			41.6	
Actuated g/C Ratio		0.24			0.24			0.66			0.66	
v/c Ratio		0.30			0.22			0.09			0.12	
Control Delay		13.7			16.5			6.1			6.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		13.7			16.5			6.1			6.4	
LOS		B			B			A			A	
Approach Delay		13.7			16.5			6.1			6.4	
Approach LOS		B			B			A			A	
Queue Length 50th (m)		7.2			6.2			4.9			7.3	
Queue Length 95th (m)		20.3			16.7			10.7			14.4	
Internal Link Dist (m)		15.0			133.7			188.2			89.9	
Turn Bay Length (m)												
Base Capacity (vph)		1346			1274			1190			1197	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.10			0.07			0.09			0.12	

Intersection Summary

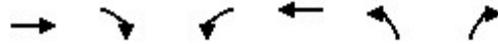
Area Type:	Other
Cycle Length:	98
Actuated Cycle Length:	62.8
Natural Cycle:	45
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.30
Intersection Signal Delay:	10.3
Intersection LOS:	B
Intersection Capacity Utilization:	32.2%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 1: MacDonald/MacDonald Road & Reynolds Street



Lanes, Volumes, Timings
6: Site Access & MacDonald

06-13-2023



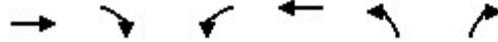
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	126	0	1	50	2	1
Future Volume (vph)	126	0	1	50	2	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t					0.955	
Fl _t Protected				0.999	0.968	
Satd. Flow (prot)	1863	0	0	1861	1722	0
Fl _t Permitted				0.999	0.968	
Satd. Flow (perm)	1863	0	0	1861	1722	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	114.3			39.0	52.7	
Travel Time (s)	8.2			2.8	3.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	137	0	1	54	2	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	137	0	0	55	3	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	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
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	16.6%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
 6: Site Access & MacDonald

06-13-2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	126	0	1	50	2	1
Future Volume (Veh/h)	126	0	1	50	2	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	137	0	1	54	2	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	39					
pX, platoon unblocked						
vC, conflicting volume			137		193	137
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			137		193	137
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1447		795	911
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	137	55	3			
Volume Left	0	1	2			
Volume Right	0	0	1			
cSH	1700	1447	831			
Volume to Capacity	0.08	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.1			
Control Delay (s)	0.0	0.1	9.3			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.1	9.3			
Approach LOS			A			
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			16.6%	ICU Level of Service	A	
Analysis Period (min)			15			

Intersection: 1: MacDonald/MacDonald Road & Reynolds Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	26.4	30.2	23.5	26.8
Average Queue (m)	14.5	11.4	8.2	10.5
95th Queue (m)	24.9	21.8	18.7	23.1
Link Distance (m)	23.7	149.3	203.5	105.5
Upstream Blk Time (%)	2			
Queuing Penalty (veh)	2			
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Site Access & MacDonald

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (m)	13.1	3.0	9.0
Average Queue (m)	1.0	0.1	0.8
95th Queue (m)	7.1	1.7	4.9
Link Distance (m)	104.2	23.7	44.3
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 2

Lanes, Volumes, Timings

1: MacDonald/MacDonald Road & Reynolds Street

06-13-2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	9	49	42	23	39	17	11	125	12	14	133	7
Future Volume (vph)	9	49	42	23	39	17	11	125	12	14	133	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.943			0.971			0.989			0.994	
Fl _t Protected		0.995			0.986			0.996			0.996	
Satd. Flow (prot)	0	1748	0	0	1783	0	0	1835	0	0	1844	0
Fl _t Permitted		0.965			0.897			0.981			0.976	
Satd. Flow (perm)	0	1695	0	0	1622	0	0	1807	0	0	1807	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		43			16			4			4	
Link Speed (k/h)		50			50			40			50	
Link Distance (m)		39.0			157.7			212.2			113.9	
Travel Time (s)		2.8			11.4			19.1			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	53	46	25	42	18	12	136	13	15	145	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	109	0	0	85	0	0	161	0	0	168	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	1		1	1		1	0		1	0	
Detector Template	Left			Left			Left			Left		
Leading Detector (m)	2.0	6.5		2.0	6.5		2.0	0.0		2.0	0.0	
Trailing Detector (m)	0.0	-0.5		0.0	-0.5		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	-0.5		0.0	-0.5		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	7.0		2.0	7.0		2.0	0.6		2.0	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	21.0	21.0		21.0	21.0		35.0	35.0		10.0	35.0	
Total Split (s)	45.0	45.0		45.0	45.0		35.0	35.0		20.0	55.0	
Total Split (%)	45.0%	45.0%		45.0%	45.0%		35.0%	35.0%		20.0%	55.0%	
Maximum Green (s)	39.0	39.0		39.0	39.0		29.0	29.0		17.0	49.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	

Lanes, Volumes, Timings
6: Site Access & MacDonald

06-13-2023



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	100	0	4	53	1	1
Future Volume (vph)	100	0	4	53	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t					0.932	
Fl _t Protected				0.997	0.976	
Satd. Flow (prot)	1863	0	0	1857	1694	0
Fl _t Permitted				0.997	0.976	
Satd. Flow (perm)	1863	0	0	1857	1694	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	114.3			39.0	52.7	
Travel Time (s)	8.2			2.8	3.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	0	4	58	1	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	109	0	0	62	2	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	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
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	16.1%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

6: Site Access & MacDonald

06-13-2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	100	0	4	53	1	1
Future Volume (Veh/h)	100	0	4	53	1	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	109	0	4	58	1	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	39					
pX, platoon unblocked						
vC, conflicting volume			109		175	109
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			109		175	109
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1481		813	945
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	109	62	2			
Volume Left	0	4	1			
Volume Right	0	0	1			
cSH	1700	1481	874			
Volume to Capacity	0.06	0.00	0.00			
Queue Length 95th (m)	0.0	0.1	0.1			
Control Delay (s)	0.0	0.5	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.5	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			16.1%	ICU Level of Service	A	
Analysis Period (min)			15			

Intersection: 1: MacDonald Road & Reynolds Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	28.0	31.3	31.1	30.5
Average Queue (m)	14.8	12.1	10.7	10.7
95th Queue (m)	24.9	24.7	24.2	23.7
Link Distance (m)	23.7	149.3	203.5	105.5
Upstream Blk Time (%)	3			
Queuing Penalty (veh)	3			
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6:

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (m)	5.3	6.1	9.0
Average Queue (m)	0.4	0.2	0.8
95th Queue (m)	4.6	2.4	4.9
Link Distance (m)	104.2	23.7	44.3
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 3

APPENDIX E

TTS Results

Mon Jun 05 2023 15:06:58 GMT-0400 (Eastern Daylight Time) - Run Time: 2870ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig

Column: 2006 GTA zone of destination - gta06_dest

Filters:

(2006 GTA zone of destination - gta06_dest In 4015,4017

and

Start time of trip - start_time In 0630-0930

and

Trip purpose of destination - purp_dest In H,)

Trip 2016

Table:

,4015,4017

3605,29,0

4012,50,0

4014,9,20

4017,0,60

4018,0,42

4020,37,14

4021,0,8

4036,0,33

4079,8,0

Mon Jun 05 2023 15:11:44 GMT-0400 (Eastern Daylight Time) - Run Time: 2399ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06_dest

Column: 2006 GTA zone of origin - gta06_orig

Filters:

(2006 GTA zone of origin - gta06_orig In 4015,4017

and

Start time of trip - start_time In 0630-0930

and

Trip purpose of origin - purp_orig In H,)

Trip 2016

Table:

,4015,4017
36,0,31
54,12,15
55,0,14
62,15,0
68,0,33
114,0,15
204,8,0
243,0,21
295,0,14
387,37,0
2387,0,12
3421,0,42
3627,0,27
3639,9,0
3693,14,0
3695,50,0
3709,8,0
3851,0,38
4005,0,12
4008,0,41
4009,15,32
4011,14,0
4012,50,0
4014,17,47
4016,15,15
4017,0,98
4018,48,366
4020,37,14
4021,0,8
4027,0,31
4029,34,31
4036,0,66
4040,0,38
4060,0,19
4062,34,0
4079,8,0
4114,14,0
4180,0,126
5142,0,66
5184,37,0
7537,15,0
8145,0,12



Mon Jun 05 2023 15:21:42 GMT-0400 (Eastern Daylight Time) - Run Time: 2686ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig

Column: 2006 GTA zone of destination - gta06_dest

Filters:

(2006 GTA zone of destination - gta06_dest In 4015,4017

and

Start time of trip - start_time In 1530-1830

and

Trip purpose of destination - purp_dest In H,)

Trip 2016

Table:

,4015,4017

54,12,0

55,0,14

65,0,39

114,0,15

203,0,12

204,8,0

210,0,15

243,0,21

316,0,19

379,0,31

387,37,0

463,0,17

2387,0,12

3627,0,27

3639,9,0

3695,50,0

3709,0,42

3851,0,38

4005,0,8

4007,0,66

4008,0,41

4009,15,15

4011,0,43

4012,50,15

4014,65,21

4015,29,0

4016,25,0

4017,0,77
4018,12,102
4020,0,14
4021,0,40
4029,0,12
4036,0,33
4040,0,94
4062,34,0
4079,8,0
4180,0,84
5184,37,0
8145,0,12



Mon Jun 05 2023 15:15:31 GMT-0400 (Eastern Daylight Time) - Run Time: 2351ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06_dest

Column: 2006 GTA zone of origin - gta06_orig

Filters:

(2006 GTA zone of origin - gta06_orig In 4015,4017

and

Start time of trip - start_time In 1530-1830

and

Trip purpose of origin - purp_orig In H,)

Trip 2016

Table:

,4015,4017
59,0,10
316,0,19
4005,31,8
4007,0,33
4011,0,32
4012,50,15
4014,48,15
4016,10,0
4017,0,38
4020,8,14
4021,0,56
4029,12,12
4037,0,14

4040,0,94

4047,0,42

4185,0,27

APPENDIX F

TAC Excerpts

contrasting construction materials across the driveway assists in defining a pedestrian crossing zone to the driver.

The radius of the curb return style or the flare required to accommodate an equivalent turning radius is meaningful only when considered in combination with the width of the driveway throat.

8.9.5 WIDTH

The width of a two-way driveway is measured parallel to the road since turns are generally oriented at right angles. The dimension is typically measured beyond any entrance flare. The width of one-way driveways, which are normally skewed, is measured perpendicular to the driveway.

It is desirable to state suitable driveway widths as a design domain. Dimensions at the lower end of the domain are intended to define the minimum spatial and operational requirements. The maximum dimensions assist in preventing driveways from becoming unwieldy with large paved areas and poorly defined travel paths. The most appropriate width of a driveway is determined in combination with the radius of the curb return (or the design vehicle turning radius and flare dimensions, if a straight flared design is adopted), the desired operating characteristics such as turning speed, and physical limitations which may exist at the site.

Table 8.9.1 provides a typical design domain for driveway throat widths and radii for both two-way and one-way operation. In locations where special vehicles such as long combination vehicles or similar vehicles are present, wider driveway throat dimensions or larger radii may be required.

Table 8.9.1: Typical Driveway^c Dimensions

Dimension (m)	Land Use		
	Residential	Commercial	Industrial
Width (W)			
- One way	3.0 ^a – 4.3	4.5 ^a – 7.5	5.0 – 9.0
- Two way	2.0 ^a – 7.3	7.2 ^a – 12.0 ^b	9.0 ^a – 15.0 ^b
Right turn radius (R)	3.0 – 4.5	4.5 – 12.0	9.0 – 15.0

Notes:

- Minimum widths are normally used with radii at or near the upper end of the specified range
- Increased widths may be considered for capacity purposes; where up to 3 exit lanes and 2 entry lanes are employed, 17.0 m is the maximum width exclusive of any median
- Applicable to driveways only, not road intersections

8.9.6 ANGLE OF DRIVEWAY

Two-way driveways normally intersect the roadway curb at or near 90°. However, a minimum acute angle of 70°, as measured from the roadway curb line, normally operates in an acceptable manner.

For one-way driveways, where a skewed intersection assists in efficient traffic operation, skews in the range of 45° to 60° are appropriate in industrial areas where pedestrians are infrequent. For commercial and residential land uses, where pedestrian volumes are normally moderate to high, minimum skew angles in the range of 60° to 70° are preferred to improve the driver's visibility of the pedestrian, and vice versa, and to encourage lower turning speeds.

Table 9.9.3: Time Gap for Case B1, Left Turn from Stop

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	7.5
Single-unit truck	9.5
Combination truck (WB 19 and WB 20)	11.5
Longer truck	To be established by road authority

Notes: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and with grades of 3% or less. The table values should be adjusted as follows:

- For multi-lane highways: For left turns onto highways with more than a single lane in each direction, add 0.5 s for passenger cars and 0.7 s for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.
- For minor approach grades: If the approach grade is an upgrade that exceeds 3%, add 0.2 s for each percent grade for left turns.
- Some road authorities use higher values for certain specialized vehicles (e.g., Alberta uses 22 s for very long log trucks).

Revised
June 2019

The intersection sight distance along the major road (distance b in **Figure 9.9.2**) is determined by:

$$ISD = 0.278 V_{major} t_g \quad (9.9.1)$$

Where:

ISD = intersection sight distance (length of the leg of sight triangle along the major road) (m)

V_{major} = design speed of the major road (km/h)

t_g = time gap for minor road vehicle to enter the major road (s)

For example, a passenger car turning left onto a two-lane major road should be provided sight distance equivalent to a time gap of 7.5 s in major-road traffic. If the design speed of the major road is 100 km/h, this corresponds to a sight distance of $0.278(100)(7.5) = 208.5$ or 210 m, rounded for design.

A passenger car turning left onto a four-lane undivided roadway will need to cross two near lanes, rather than one. This increases the recommended gap in major-road traffic from 7.5 to 8.0 s. The corresponding value of sight distance for this example would be 223 m. If the minor-road approach to such an intersection is located on a 4% upgrade, then the time gap selected for intersection sight distance design for left turns should be increased from 8.0 to 8.8 s, equivalent to an increase of 0.2 s for each percent grade.

The design values for intersection sight distance for passenger cars are shown in **Table 9.9.4**. **Figure 9.9.4** includes design values, based on the time gaps for the design vehicles included in **Table 9.9.3**.

No adjustment of the recommended sight distance values for the major-road grade is generally needed because both the major- and minor-road vehicle will be on the same grade when departing from the intersection. However, if the minor-road design vehicle is a heavy truck and the intersection is located near a sag vertical curve with grades over 3%, then an adjustment to extend the recommended sight distance based on the major-road grade should be considered.



Table 9.9.4: Design Intersection Sight Distance – Case B1, Left Turn From Stop

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	41.7	45
30	35	62.6	65
40	50	83.4	85
50	65	104.3	105
60	85	125.1	130
70	105	146.0	150
80	130	166.8	170
90	160	187.7	190
100	185	208.5	210
110	220	229.4	230
120	250	250.2	255
130	285	271.1	275

Note: Intersection sight distance shown is for a stopped passenger car to turn left onto a two-lane highway with no median and grades 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

Sight distance design for left turns at divided-highway intersections should consider multiple design vehicles and median width. If the design vehicle used to determine sight distance for a divided-highway intersection is larger than a passenger car, then sight distance for left turns will need to be checked for that selected design vehicle and for smaller design vehicles as well. If the divided-highway median is wide enough to store the design vehicle with a clearance to the through lanes of approximately 1 m at both ends of the vehicle, no separate analysis for the departure sight triangle for left turns is needed on the minor-road approach for the near roadway to the left. In most cases, the departure sight triangle for right turns (case B2) will provide sufficient sight distance for a passenger car to cross the near roadway to reach the median. Possible exceptions are addressed in the discussion of case B3.

The time gaps in **Table 9.9.3** can be decreased by 1.0 s for right-turn maneuvers without undue interference with major-road traffic. These adjusted time gaps for the right turn from the minor road are shown in **Table 9.9.5**. Design values based on these adjusted time gaps are shown in **Table 9.9.6** for passenger cars. **Figure 9.9.5** includes the design values for the design vehicles for each of the time gaps in **Table 9.9.5**.

Table 9.9.5: Time Gap for Case B2—Right Turn from Stop and Case B3—Crossing Maneuver

Design Vehicle	Time Gap (t_a)(s) at Design Speed of Major Road
Passenger car	6.5
Single-unit truck	8.5
Combination truck (WB 19 and WB 20)	10.5

Note: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and with grades of 3% or less. The table values should be adjusted as follows:

- For multi-lane highways: For left turns onto two-lane highways with more than two lanes, add 0.5 s for passenger cars and 0.7 s for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.
- For minor approach grades: If the approach grade is an upgrade that exceeds 3%, add 0.1 s for each percent grade for left turns.

Table 9.9.6: Design Intersection Sight Distance – Case B2, Right Turn from Stop, and Case B3, Crossing Maneuver

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	36.1	40
30	35	54.2	55
40	50	72.3	75
50	65	90.4	95
60	85	108.4	110
70	105	126.5	130
80	130	144.6	145
90	160	162.6	165
100	185	180.7	185
110	220	198.8	200
120	250	216.8	220
130	285	234.9	235

Note: Intersection sight distance shown is for a stopped passenger car to turn right onto or to cross a two-lane highway with no median and with grades of 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

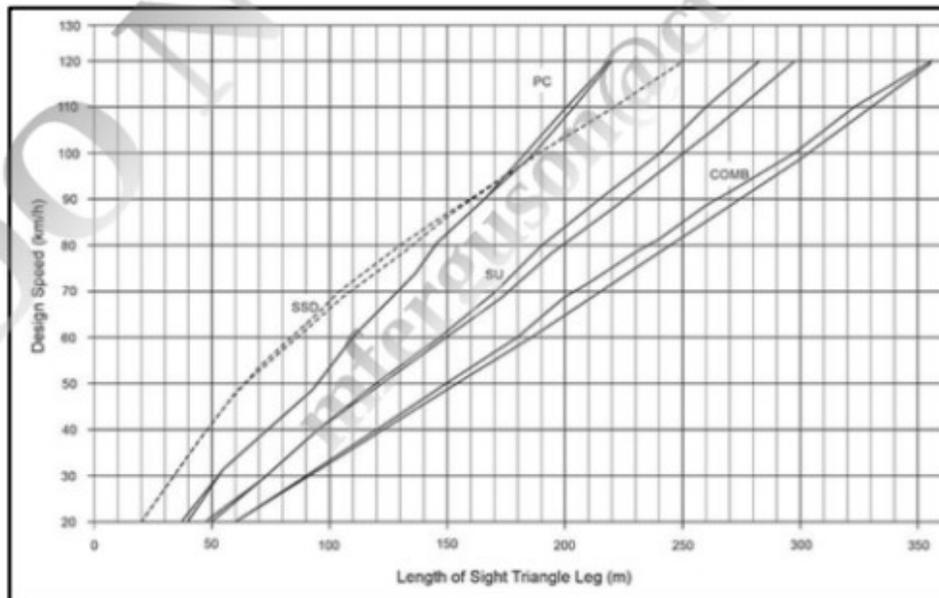


Figure 9.9.5: Intersection Sight Distance – Case B2, Right Turn from Stop, and Case B3, Crossing Maneuver (Calculated and Design Values Plotted)

APPENDIX G

Town of Oakville Zoning By-Law Excerpts

Parking, Loading, & Stacking Lane Provisions

Portions of this by-law not yet in effect are covered with a blue tone. This version consolidates all amendments and orders of the OMB up to the consolidation date shown below. Contact the Building Services or Planning Services departments for more information.

5.1 General Provisions

5.1.1 Applicability

- a) The *parking space*, *barrier-free parking space*, *bicycle parking space*, and *stacking space* requirements of this By-law shall not apply to any legal or legal non-conforming *use* existing on the effective date of this By-law.
- b) Additional *parking spaces*, *barrier-free parking spaces*, *bicycle parking spaces*, or *stacking spaces* shall be provided in accordance with the provisions of this By-law for all *uses* and all additional *net floor area* on a *lot* in the following circumstances: (PL140317)
 - i) Where a new *building* is erected or additional *net floor area* is added to a legal or legal non-conforming *building* existing on the effective date of this By-law.
 - ii) Where a change in *use* occurs that has the effect of requiring the additional spaces identified in subsection (b) above.

For an addition to an existing building, a cumulative minimum number of parking spaces is calculated for the additional floor area only. Contact a zoning officer in the Building Services department for more information.

5.1.2 Exclusive Use

Any minimum *parking space*, *barrier-free parking space*, *bicycle parking space*, *stacking space*, and *loading space* required by this By-law and any *driveway* or *aisle* leading to those spaces shall be unobstructed, available, and exclusively *used* for that purpose at all times, unless otherwise specified by this By-law.

5.1.3 More than One Use on a Lot

The *parking space*, *barrier-free parking space*, *bicycle parking space*, and *stacking space* requirements for more than one *use* on a single *lot* or for a *building* containing more than one *use* shall be the sum total of the requirements for each of the component *uses* or *buildings*, unless otherwise permitted by this By-law.

Examples of where a sum total of individual uses would not be calculated is where a “blended rate” is provided in Section 5.2: namely, on lots with multiple premises meeting specified locational or size criteria. Contact a zoning officer in the Building Services department for more information.

5.1.4 Location of Required Parking

- a) Any *parking space*, *barrier-free parking space*, *bicycle parking space*, and *loading space* required by this By-law shall be located on the same *lot* on which the *use* is located.
- b) Notwithstanding subsection (a) above, on a *lot* in a Mixed Use Zone on Maps 19(19a) and 19(22a), any *parking space* or *barrier-free parking space* required by this By-law can be provided on another *lot* within 300.0 metres if both *lots* are in a Mixed Use Zone.

5.1.5 Rounding Provision

- a) Where the application of any ratio in this Part of the By-law results in a fraction of a *parking space* or *bicycle parking space* being required, the minimum number of spaces required shall be increased to the next highest whole number if the fraction is greater than 0.25.
- b) Where the application of any ratio in this Part of the By-law results in a fraction of a *barrier-free parking space* being required, the minimum number of *barrier-free parking spaces* required shall be increased to the next highest whole number.

Parking, Loading, & Stacking Lane Provisions

5.1.6 Cash-in-Lieu of Parking

Parking spaces and bicycle parking spaces required by this By-law for non-residential *uses* shall not be required for a *lot* in any Mixed Use Zone on Maps 19(2a) and 19(7a) if the *Town* enters into an agreement with the land-owner respecting the payment of cash-in-lieu for some or all of the *parking spaces, bicycle parking spaces, aisles, or driveways* required, in accordance with Section 40 of the Planning Act.

The Town currently only entertains cash-in-lieu of parking requests in Kerr Village and Bronte Village. Contact Planning Services or Legal Services for more information.

5.1.7 Shared Driveways and Access Lanes Recognition

- a) Notwithstanding any other provision of this By-law, a *driveway* or *aisle* shared across two *lots* in a Residential Medium (RM) Zone, Residential High (RH) Zone, Commercial Zone, Mixed Use Zone, Employment Zone, Institutional (I) Zone, and Community Use (CU) Zone shall be permitted.
- b) Compliance with any regulations of this By-law for a *driveway* or *aisle* permitted by subsection (a) above shall be based upon the entire width of the applicable *driveway* or *aisle*. (2016-013)

5.1.8 Hardscape Surface Treatment

All *parking areas, loading spaces, and stacking spaces* in any Zone other than an Environmental Zone or Other Zone shall be surface treated with asphalt, concrete, interlocking brick, similar hardscaped surface, or other material sufficient to provide stability, prevent erosion, be usable in all seasons, and allow infiltration of surface water.

Gravel is not a permitted surface treatment for driveways outside of the Environmental or Other Zones.

5.1.9 Approved Locations for Visitors Parking (2016-013)

Visitors *parking spaces* may be provided in any combination of an above or below *grade parking structure* or *surface parking area*.

5.1.10 Tandem and Stacked Parking Spaces (2017-025)

Tandem and stacked parking spaces are permitted for any *dwelling*.

5.2 Motor Vehicle Parking Spaces

5.2.1 Minimum Number of Parking Spaces

The minimum number of *parking spaces* required for *uses* permitted by this By-law are established and calculated in accordance with the ratios set out in Table 5.2.1, below.

Table 5.2.1: Ratios of Minimum Number of Parking Spaces	
Use	Minimum Number of Parking Spaces
Blended Rates for Lots with Multiple Premises	
Where multiple <i>premises</i> are located on a <i>lot</i> in the Neighbourhood Commercial (C1) Zone	1.0 per 22.0 m ² <i>net floor area</i>

Parking, Loading, & Stacking Lane Provisions

Table 5.2.1: Ratios of Minimum Number of Parking Spaces	
Use	Minimum Number of Parking Spaces
Where multiple <i>premises</i> are located on a <i>lot</i> in all other Commercial <i>Zones</i>	a) 1.0 per 18.0 m ² <i>net floor area</i> for the first 2,500.0 m ² <i>net floor area</i> ; plus, b) 1.0 per 22.0 m ² <i>net floor area</i> for any additional <i>net floor area</i>
On a <i>lot</i> in the Office Employment (E1), Business Employment (E2), and Industrial (E3) <i>Zones</i> where: a) The <i>lot</i> has a minimum of five <i>premises</i> ; b) The <i>lot</i> has a minimum of 5,000.0 m ² total <i>floor area</i> ; c) No <i>use</i> cumulatively occupies more than 50% of the <i>net floor area</i> on the <i>lot</i> ; d) None of the following <i>uses</i> , where permitted, together cumulatively occupy no more than 20% of the <i>net floor area</i> on the <i>lot</i> : <ul style="list-style-type: none"> • <i>Financial institutions</i>; • <i>Restaurants</i>; and, • <i>Service commercial establishments</i>; e) A <i>hotel</i> is not located on the <i>lot</i> ; and, f) The maximum number of <i>storeys</i> is two.	The lesser of the sum total of the requirements for each of the component uses or 1.0 per 50.0 m ² <i>net floor area</i>
On a <i>lot</i> in the Business Commercial (E4) <i>Zone</i> where: a) The <i>lot</i> has a minimum of three <i>premises</i> ; b) A minimum of two <i>uses</i> occur on the <i>lot</i> ; c) A <i>hotel</i> is not located on the <i>lot</i> ; and, d) The maximum number of <i>storeys</i> is two.	The lesser of the sum total of the requirements for each of the component uses or 1.0 per 40.0 m ² <i>net floor area</i>
Residential Uses	
<i>Apartment dwelling</i> (2021-068)	a) 1.0 per <i>dwelling</i> where the unit has less than 75.0 square metres <i>net floor area</i> ; b) 1.5 per <i>dwelling</i> for all other units (1)(2a)(3)
<i>Back-to-back townhouse dwelling</i>	2.0 per <i>dwelling</i>
<i>Detached dwelling</i>	2.0 per <i>dwelling</i>
<i>Dormitory</i>	0.2 per bed (1)
<i>Duplex dwelling</i>	2.0 per <i>dwelling</i>
<i>Long term care facility</i>	0.25 per bed
<i>Multiple dwelling</i>	1.5 per <i>dwelling</i> (1)(2)
<i>Retirement home</i>	0.33 per <i>assisted living unit</i> and <i>dwelling unit</i>
<i>Semi-detached dwelling</i>	2.0 per <i>dwelling</i>
<i>Stacked townhouse dwelling</i>	1.5 per <i>dwelling</i> (1)(3)
<i>Townhouse dwelling</i>	2.0 per <i>dwelling</i> (1)(2)

Parking, Loading, & Stacking Lane Provisions

Table 5.2.1: Ratios of Minimum Number of Parking Spaces	
Use	Minimum Number of Parking Spaces
Accessory Residential Uses	
<i>Accessory dwelling unit (2023-024)</i>	1.0 additional <i>parking space</i>
<i>Bed and breakfast establishment</i>	1.0 additional <i>parking space</i> per <i>lodging unit</i>
<i>Day care</i>	<See “Institutional and Community Uses” row>
<i>Home occupation</i>	No minimum requirement
<i>Lodging house</i>	1.0 additional <i>parking space</i> per <i>lodging unit</i>
<i>Private home day care</i>	No minimum requirement
<i>Short-term accommodation</i>	1.0 additional <i>parking space</i> (5)
Retail Uses	
<i>Retail propane transfer facility</i>	1.0 per 40.0 m ² <i>net floor area</i>
<i>Retail store</i> or any other “store” permitted by this By-law	1.0 per 18.0 m ² <i>net floor area</i>
Service Commercial Uses	
<i>Adult entertainment establishment</i>	1.0 per 18.0 m ² <i>net floor area</i>
<i>Commercial school</i>	1.0 per 22.0 m ² <i>net floor area</i>
<i>Dry cleaning/laundry</i>	1.0 per 22.0 m ² <i>net floor area</i>
<i>Financial institution</i>	1.0 per 22.0 m ² <i>net floor area</i>
<i>Food production</i>	1.0 per 40.0 m ² <i>net floor area</i>
<i>Funeral home</i>	1.0 per 14.0 m ² <i>net floor area</i>
<i>Pet care establishment</i>	1.0 per 22.0 m ² <i>net floor area</i>
<i>Place of entertainment</i>	1.0 per 22.0 m ² <i>net floor area</i>
<i>Rental establishment</i>	1.0 per 18.0 m ² <i>net floor area</i>
<i>Restaurant</i>	1.0 per 10.0 m ² <i>net floor area</i>
<i>Service commercial establishment</i>	1.0 per 22.0 m ² <i>net floor area</i>
<i>Sports facility</i>	a) 1.0 per 18.0 m ² <i>net floor area</i> ; plus, b) 4 <i>parking spaces</i> per outdoor playing court; plus, c) 12 <i>parking spaces</i> per outdoor playing field
<i>Taxi dispatch</i>	1.0 per 22.0 m ² <i>net floor area</i>
<i>Veterinary clinic</i>	1.0 per 22.0 m ² <i>net floor area</i>
Office Uses	
<i>Business office</i>	1.0 per 35.0 m ² <i>net floor area</i> (4)
<i>Medical office</i>	a) For the first 60% of the <i>net floor area</i> on the <i>lot</i> occupied by <i>medical offices</i> , 1.0 per 35.0 m ² <i>net floor area</i> b) Where <i>medical offices</i> occupy greater than 60% of the <i>net floor area</i> of the <i>building</i> , 1.0 per 18.0 m ² <i>net floor area</i> for the entire <i>building</i>

Parking, Loading, & Stacking Lane Provisions

Table 5.2.1: Ratios of Minimum Number of Parking Spaces	
Use	Minimum Number of Parking Spaces
Employment Uses	
<i>Bulk storage facility</i>	1.0 per 100.0 m ² <i>net floor area</i>
<i>Commercial self-storage</i>	1.0 per 100.0 m ² <i>net floor area</i> , to a maximum minimum requirement of 8 <i>parking spaces</i>
<i>Contractors establishment</i>	1.0 per 100.0 m ² <i>net floor area</i>
<i>Manufacturing</i>	a) 1.0 per 100.0 m ² <i>net floor area</i> for the first 7,500.0 m ² <i>net floor area</i> ; plus, b) 1.0 per 200.0 m ² <i>net floor area</i> for any additional <i>net floor area</i>
<i>Public works yard</i>	No minimum requirement
<i>Repair shop</i>	a) 1.0 per 100.0 m ² <i>net floor area</i> for the first 7,500.0 m ² <i>net floor area</i> ; plus, b) 1.0 per 200.0 m ² <i>net floor area</i> for any additional <i>net floor area</i>
<i>Transportation terminal</i>	1.0 per 100.0 m ² <i>net floor area</i>
<i>Training facility</i>	1.0 per 22.0 m ² <i>net floor area</i>
<i>Warehousing</i>	a) 1.0 per 100.0 m ² <i>net floor area</i> for the first 7,500.0 m ² <i>net floor area</i> ; plus, b) 1.0 per 200.0 m ² <i>net floor area</i> for any additional <i>net floor area</i>
<i>Waste processing station</i>	1.0 per 100.0 m ² <i>net floor area</i>
<i>Waste transfer station</i>	1.0 per 100.0 m ² <i>net floor area</i>
<i>Wholesaling</i>	1.0 per 100.0 m ² <i>net floor area</i>
Institutional and Community Uses	
<i>Art gallery</i>	1.0 per 28.0 m ² <i>net floor area</i>
<i>Community centre</i>	1.0 per 22.0 m ² <i>net floor area</i>
<i>Day care</i>	1.0 per 40.0 m ² <i>net floor area</i>
<i>Emergency service facility</i>	No minimum requirement
<i>Emergency shelter (PL140317)</i>	1.0 per 4.0 <i>beds</i>
<i>Food bank</i>	1.0 per 40.0 m ² <i>net floor area</i>
<i>Hospital</i>	1.0 per 50.0 m ² <i>net floor area</i>
<i>Library</i>	1.0 per 28.0 m ² <i>net floor area</i>
<i>Marina</i>	0.6 spaces per berth
<i>Museum</i>	1.0 per 28.0 m ² <i>net floor area</i>
<i>Place of worship</i>	a) 1.0 per 5 persons capacity for the <i>place of worship area of worship</i> ; plus, b) 1.0 per 22.0 m ² <i>net floor area</i> for any additional <i>accessory assembly area</i>
<i>School, post-secondary</i>	No minimum requirement

Parking, Loading, & Stacking Lane Provisions

Table 5.2.1: Ratios of Minimum Number of Parking Spaces	
Use	Minimum Number of Parking Spaces
<ul style="list-style-type: none"> • <i>School, private</i> • <i>School, public</i> 	a) For elementary schools, 1.5 per classroom, not including any portables b) For secondary schools, 4.0 per classroom, not including any portables
Open Space Uses	
<i>Agriculture</i>	No minimum requirement
<i>Boarding kennel</i>	1.0 per 35.0 m ² <i>net floor area</i> , to a maximum minimum requirement of 6 <i>parking spaces</i>
<i>Cemetery</i>	No minimum requirement
<i>Conservation use</i>	No minimum requirement
<i>Golf course</i>	a) 6.0 per hole; plus, b) 1.0 per 22.0 m ² <i>net floor area</i> for any <i>accessory uses</i>
<i>Outdoor miniature golf course</i>	1.0 per hole
<ul style="list-style-type: none"> • <i>Park, private</i> • <i>Park, public</i> 	No minimum requirement
Hospitality Uses	
<i>Hotel</i>	a) 1.0 per <i>lodging unit</i> ; plus, b) 1.0 per 30.0 m ² <i>net floor area</i> outside of a <i>lodging unit</i>
<i>Public hall</i>	1.0 per 18.0 m ² <i>net floor area</i>
Motor Vehicle Uses	
<i>Motor vehicle body shop</i>	1.0 per 100.0 m ² <i>net floor area</i>
<i>Motor vehicle dealership</i>	1.0 per 100.0 m ² <i>net floor area</i>
<i>Motor vehicle rental facility</i>	1.0 per 100.0 m ² <i>net floor area</i>
<i>Motor vehicle repair facility</i>	1.0 per 100.0 m ² <i>net floor area</i>
<i>Motor vehicle service station</i>	1.0 per 100.0 m ² <i>net floor area</i>
<i>Motor vehicle storage compound</i>	1.0 per 100.0 m ² <i>net floor area</i>
<i>Motor vehicle washing facility</i>	1.0 per 100.0 m ² <i>net floor area</i>

A “classroom” includes teaching rooms such as a library or gymnasium.

Additional Regulations for Minimum Parking Ratios Table 5.2.1

(2017-025)

1. Of the total number of *parking spaces* required, 0.25 of the *parking spaces* required per *dwelling* shall be designated as visitors *parking spaces*.
2.
 - a) The location of visitors *parking spaces* shall be in accordance with Section 5.1.9. (2017-025)
 - b) The visitors *parking spaces* for a *multiple* or *townhouse dwelling* shall only be required in a *condominium* and shall be located on a parcel of land tied to a *common element condominium*. (2017-025)

Inventory motor vehicles are not to be parked in required parking spaces, per Section 5.1.2 of this By-law.

APPENDIX H

Traffic Control Plan



LEGEND

	PROPERTY LINE
	TEMPORARY TRAFFIC SIGN OTM BOOK 7
	TRAFFIC CONTROL DEVICE TC-54
	WORK ZONE

- NOTES:**
1. STAGING TO BE READ IN CONJUNCTION WITH ONTARIO TRAFFIC MANUAL (OTM) BOOK 7 (TEMPORARY CONDITIONS).
 2. TEMPORARY WORKZONE ILLUMINATION TO ADHERE TO OTM BOOK 7/OHSA REGULATIONS ACCORDINGLY.
 3. TRANSIT STOPS AND ACCESS TO/FROM THESE STOPS FOR TRANSIT USERS MUST BE MAINTAINED DURING THE COMPLETION OF THE WORK.
 4. PEDESTRIANS MUST BE ACCOMMODATED DURING CONSTRUCTION. A SAFE PASSAGE FOR PEDESTRIANS MUST BE PROVIDED THROUGH THE CONSTRUCTION AREA AT ALL TIMES.
 5. ACCESS SHALL BE MAINTAINED AT ALL TIMES TO ALL BUSINESSES AND RESIDENCES PRESENTLY HAVING ACCESS TO THE ROAD.
 6. ALL TRAFFIC CONTROL MEASURES ARE THE RESPONSIBILITY OF THE CONTRACTOR. ANY ADJUSTMENTS TO THE TRAFFIC MANAGEMENT PLAN SHALL ADHERE TO OTM BOOK 7.
 7. ALL LANES TO BE RE-INSTATED AND OPEN AT THE END OF EACH WORKING DAY WHEN NO CONSTRUCTION IS TAKING PLACE.
 8. THE TRAFFIC MANAGEMENT PLAN IMPLEMENTED WILL FULLY REMAIN THE RESPONSIBILITY OF THE CONTRACTOR. THIS PLAN SHOULD BE CONSIDERED A GUIDELINE ONLY.
 9. CONTRACTOR TO SHIFT STAGE 1 (TYPICAL) TO ACCOMMODATE PROGRESSION OF WORK TOWARDS THE INTERSECTION.
 10. CONTRACTOR TO ENSURE THERE WILL BE A PAID DUTY OFFICER MANAGING THE TRAFFIC IN THE INTERSECTION.



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2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.

3. THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT.

4. DO NOT SCALE THE DRAWINGS.

5. ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

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2	ISSUED FOR 2ND SUBMISSION	11/10/2023	

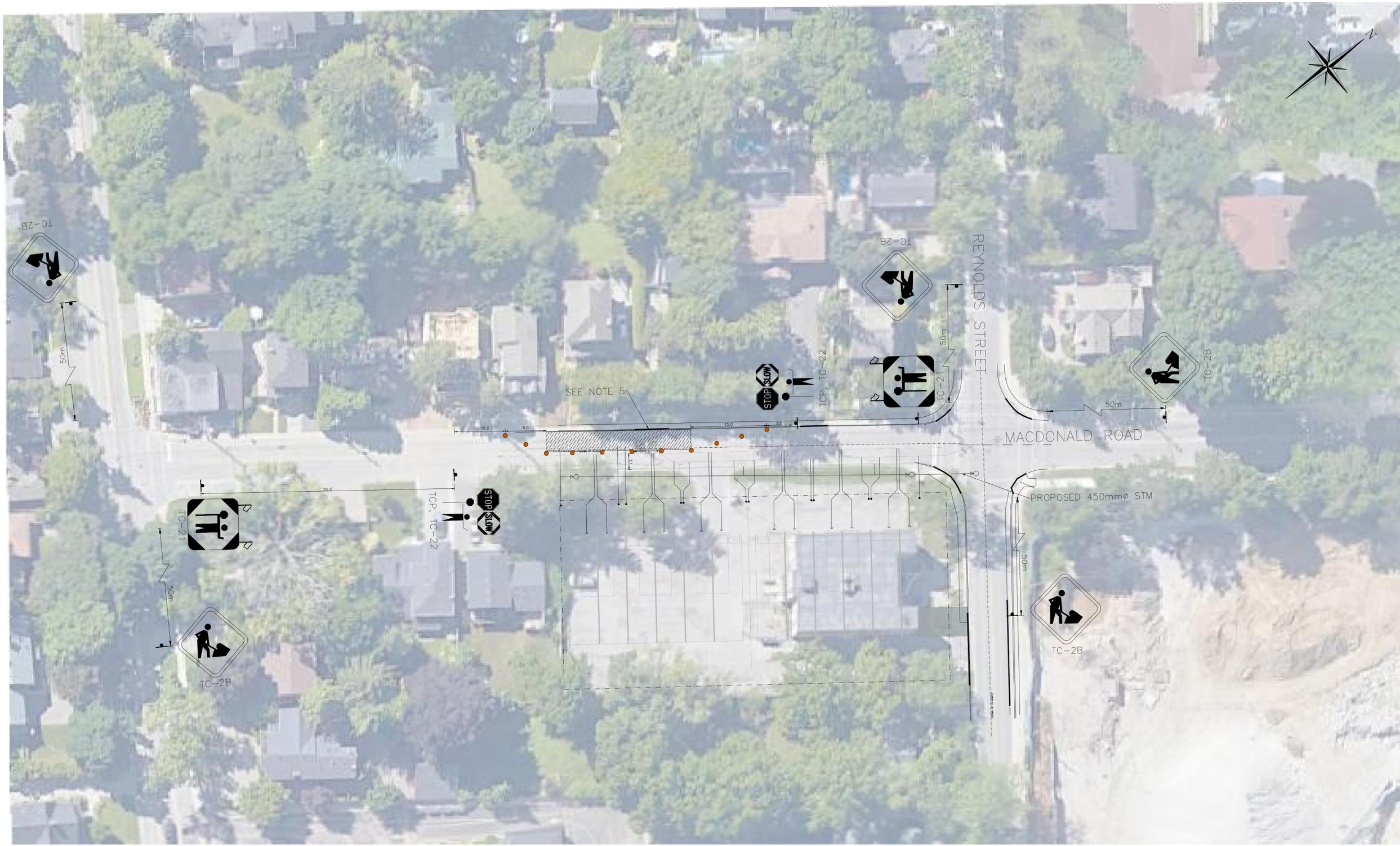
FOR REVIEW
 NOT TO BE USED FOR CONSTRUCTION

Project: MELROSE INVESTMENTS INC.
358 REYNOLDS STREET
TOWN OF OAKVILLE

Drawing: TRAFFIC MANAGEMENT PLAN
STAGE 1 – TYPICAL

2800 HIGH POINT DRIVE
SUITE 100
MILTON, ON, L9T 6P4
905-875-0026 T
905-875-4915 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

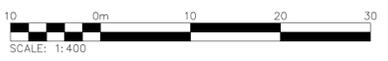
Drawn By	S.S.	Design By	S.S.	Project	1919-6732
Check By	S.R.S.	Check By	S.R.S.	Scale	1:400 Drawing
					TMP-1



LEGEND

	PROPERTY LINE
	TEMPORARY TRAFFIC SIGN OTM BOOK 7
	TRAFFIC CONTROL DEVICE TC-54
	WORK ZONE

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 8. THE TRAFFIC MANAGEMENT PLAN IMPLEMENTED WILL FULLY REMAIN THE RESPONSIBILITY OF THE CONTRACTOR. THIS PLAN SHOULD BE CONSIDERED A GUIDELINE ONLY.
 9. CONTRACTOR TO ENSURE TRAFFIC CONTROL PERSONS TO WORK IN CONJUNCTION WITH TRAFFIC SIGNALS.



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2	ISSUED FOR 2ND SUBMISSION	11/10/2023	

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Project: MELROSE INVESTMENTS INC.
358 REYNOLDS STREET
TOWN OF OAKVILLE

Drawing: TRAFFIC MANAGEMENT PLAN
STAGE 2

CROZIER
CONSULTING ENGINEERS

2800 HIGH POINT DRIVE
SUITE 100
MILTON, ON, L9T 6P4
905-875-0026 T
905-875-4915 F
WWW.CROZIER.CA
INFO@CROZIER.CA

Drawn By	S.S.	Design By	S.S.	Project	1919-6732
Check By	S.R.S.	Check By	S.R.S.	Scale	1:400
				Drawing	TMP-2

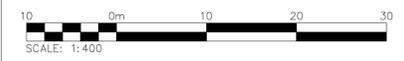


LEGEND

- PROPERTY LINE
- TEMPORARY TRAFFIC SIGN OTM BOOK 7
- TRAFFIC CONTROL DEVICE TC-54
- WORK ZONE

NOTES:

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Project: MELROSE INVESTMENTS INC.
 358 REYNOLDS STREET
 TOWN OF OAKVILLE
 Drawing: TRAFFIC MANAGEMENT PLAN – STAGE 3



2800 HIGH POINT DRIVE
 SUITE 100
 MILTON, ON, L9T 6P4
 905-875-0026 T
 905-875-4915 F
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Check By	S.R.S.	Check By	S.R.S.	Scale	1:400 Drawing
					TMP-3

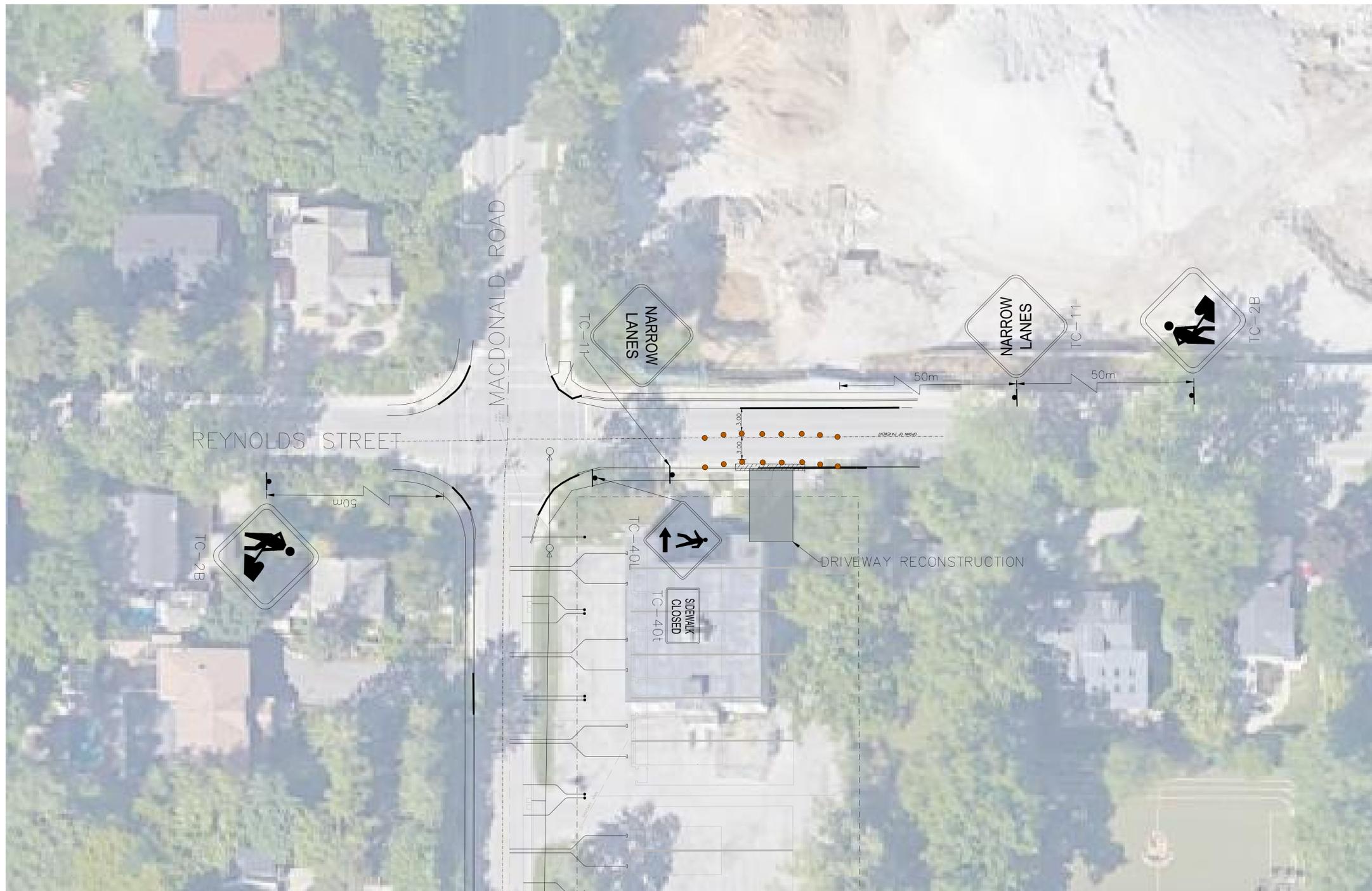


LEGEND

- PROPERTY LINE
- ⚠ TEMPORARY TRAFFIC SIGN OTM BOOK 7
- TRAFFIC CONTROL DEVICE TC-54
- WORK ZONE

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358 REYNOLDS STREET
TOWN OF OAKVILLE

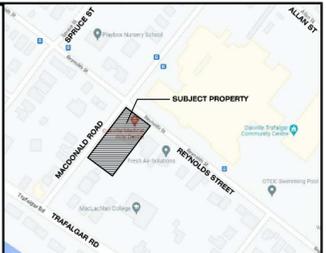
Drawing: TRAFFIC MANAGEMENT PLAN – STAGE 4

CROZIER
CONSULTING ENGINEERS

2800 HIGH POINT DRIVE
SUITE 100
MILTON, ON, L9T 6P4
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905-875-4915 F
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INFO@CROZIER.CA

Drawn By	S.S.	Design By	S.S.	Project	1919-6732
Check By	S.R.S.	Check By	S.R.S.	Scale	1:300
				Drawing	TMP-4

FIGURES



KEY MAP - NOT TO SCALE



SITE STATISTICS

SITE AREA:
 GROSS SITE AREA = 2827.03 s.m. (0.283 HA)
 ROAD WIDENING = 76.26 s.m.
 DAYLIGHT TRIANGLE = 12.44 s.m.
 NET SITE AREA = 2738.33 S.M. (0.274 HA)

TOTAL UNITS:
 11 UNITS (38.9 UNITS/HA)

PROPOSED ZONING STANDARDS:
 MINIMUM FRONT YARD: 6.0m
 MINIMUM REAR YARD: 7.5m
 MINIMUM INTERIOR SIDE YARD: 1.2m
 MINIMUM EXTERIOR SIDE YARD: 3.0m
 MAXIMUM BUILDING HEIGHT : 14.0m

LOT	AREA CALCULATIONS		UNIT COVERAGE			
	LOT AREA (S.M.)	UNIT AREA (S.M.)	(S.F.)	(S.M.)	(S.F.)	(%)
1	439.93	344.58	3709	134.62	1449	30.6%
2	213.91	281.59	3031	129.69	1396	60.6%
3	214.03	281.59	3031	129.69	1396	60.6%
4	214.15	281.59	3031	129.69	1396	60.6%
5	269.48	284.75	3065	132.57	1427	49.2%
6	269.72	281.59	3031	132.57	1427	49.2%
7	214.58	281.59	3031	129.69	1396	60.4%
8	214.70	281.59	3031	129.69	1396	60.4%
9	214.82	281.59	3031	129.69	1396	60.4%
10	214.94	281.59	3031	129.69	1396	60.3%
11	270.52	284.75	3065	132.57	1427	49.0%

THE UNDERSIGNED HAS REVIEWED AND TAKES RESPONSIBILITY FOR THIS DESIGN AND HAS THE QUALIFICATIONS AND MEETS THE REQUIREMENTS SET OUT IN THE ONTARIO BUILDING CODE TO BE A DESIGNER.

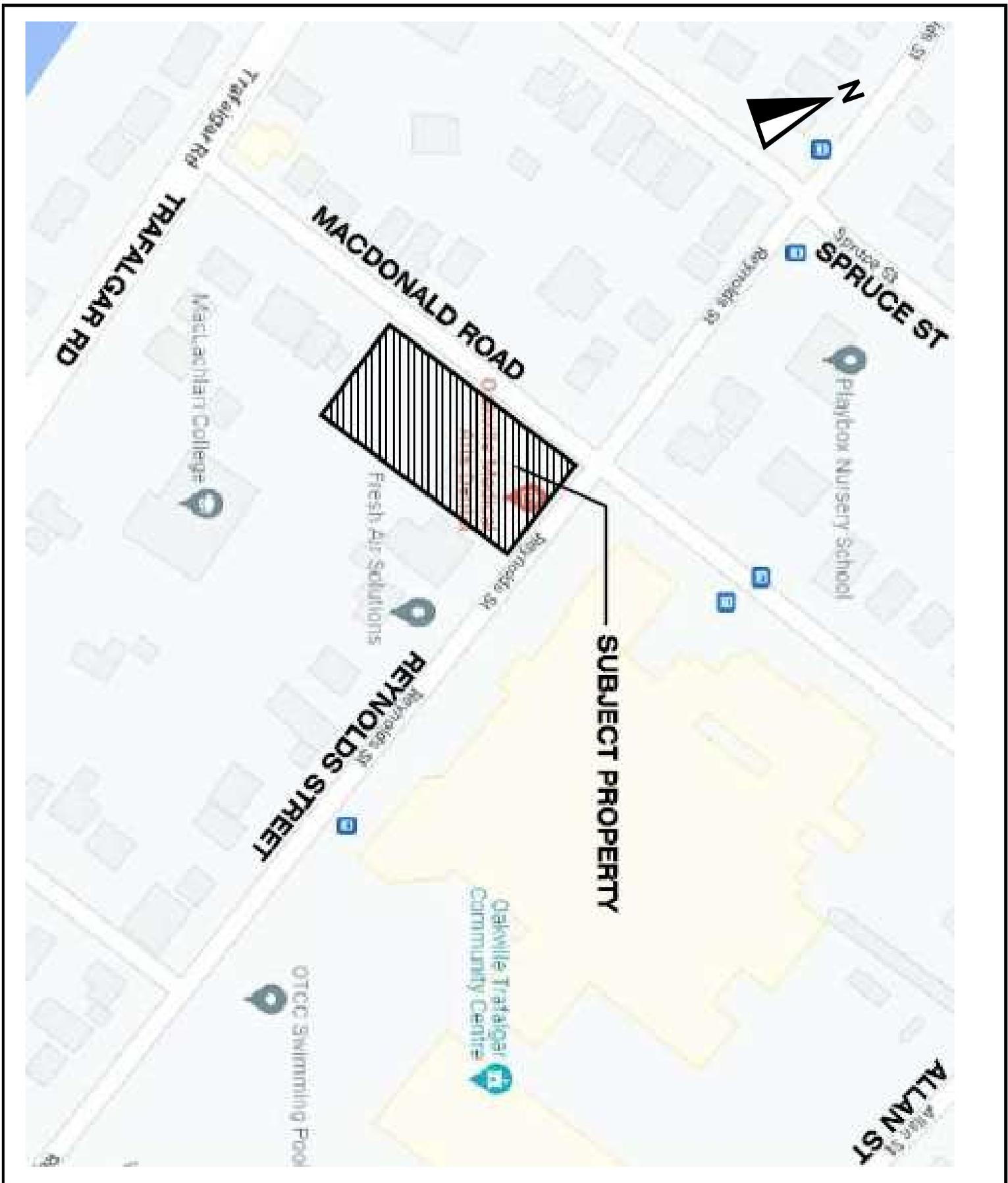
NAME: _____ SIGNATURE: _____ BCIN: _____
 REGISTRATION INFORMATION:
 HUNT DESIGN ASSOCIATES INC. 19695

HUNT DESIGN ASSOCIATES INC.
 www.huntdesign.ca
 8966 Woodbine Ave, Markham, ON L3R 0J7
 T 905.737.5133 email: hda@huntdesign.ca

SITE PLAN
 Street Name: 358 REYNOLDS STREET, OAKVILLE, ON. Plan No. _____

ROSEHAVEN HOMES - 223005

Drawn By: DC Checked By: _____ Scale: 1:250 Lot / Page Number: _____
 DC File Number: 223005DSP



Legend

- xx A.M. Peak Hour Traffic Volumes
- (xx) P.M. Peak Hour Traffic Volumes
- {xx} Weekend Peak Hour Traffic Volumes

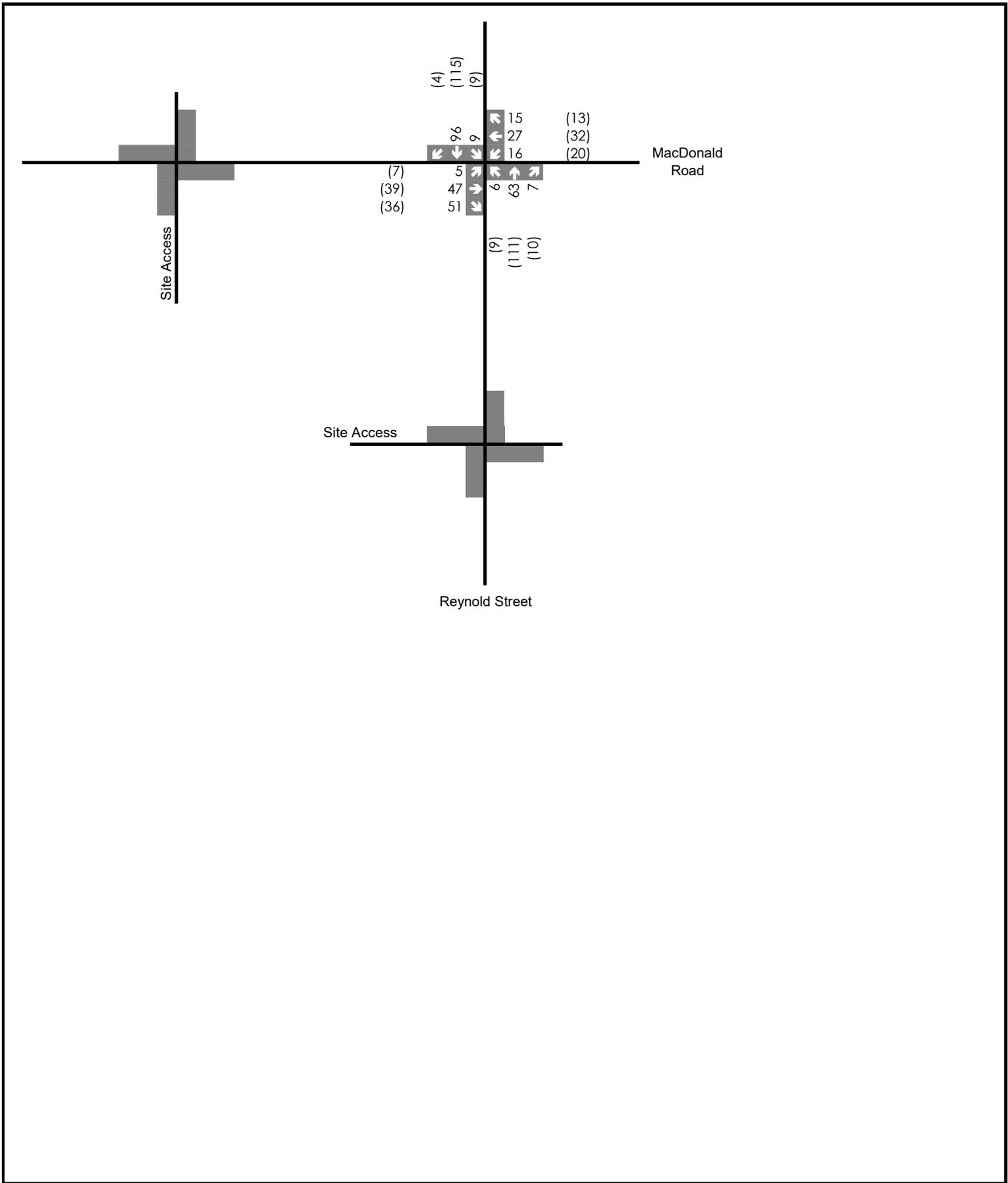
358 Reynolds St. Oakville

Site Location



Figure 2

Project No. 1919-6732
 07-Jun-23
 Analyst: Shaira Ahmed



Legend

- xx A.M. Peak Hour Traffic Volumes
- {xx} P.M. Peak Hour Traffic Volumes
- {xx} Weekend Peak Hour Traffic Volumes

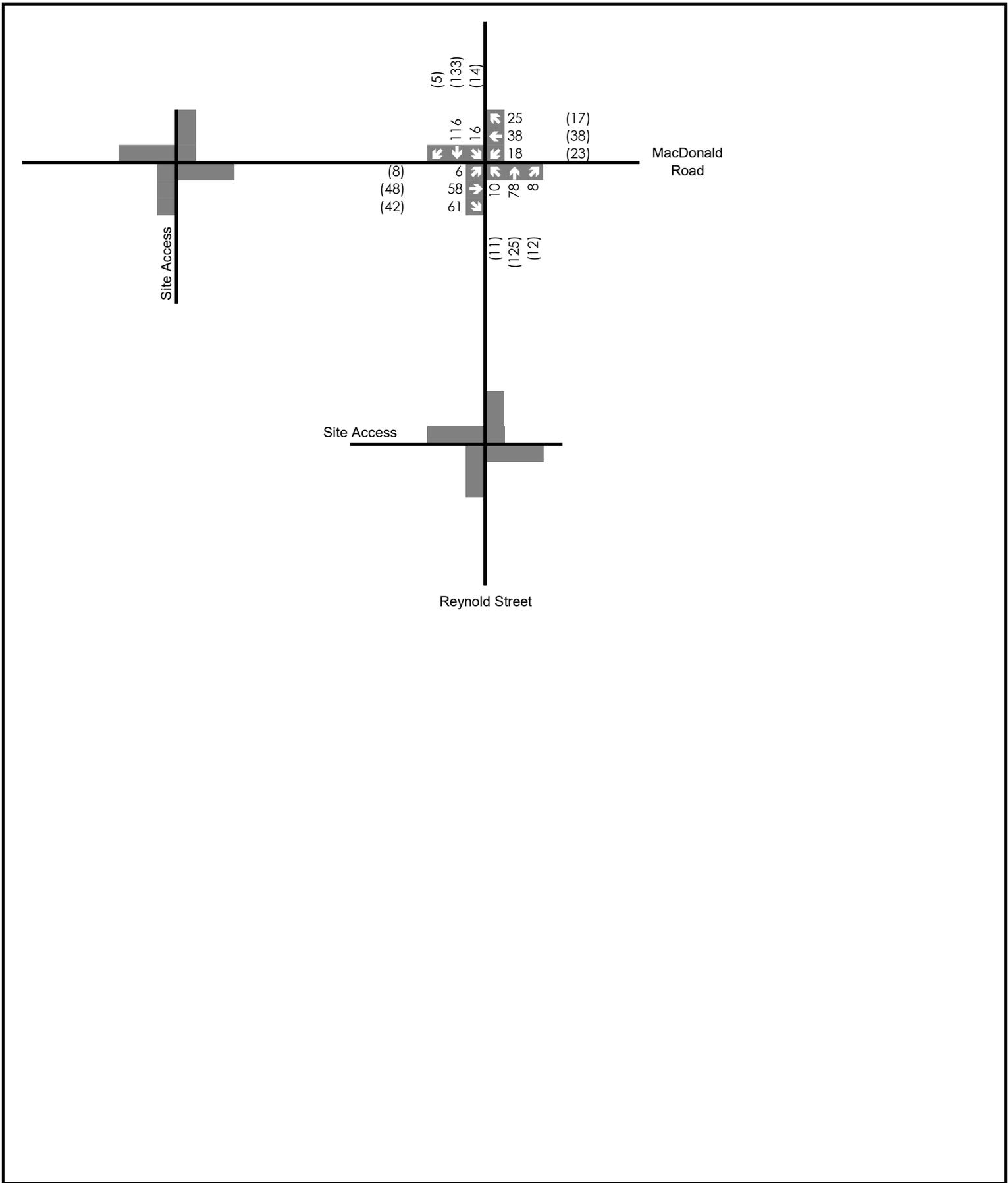
358 Reynolds St. Oakville

2023 Existing Traffic Volumes



Figure 3

Project No. 1919-6732
 Date. June 7, 2023
 Analyst. Shaira Ahmed



Legend

- xx A.M. Peak Hour Traffic Volumes
- {xx} P.M. Peak Hour Traffic Volumes
- {xx} Weekend Peak Hour Traffic Volumes

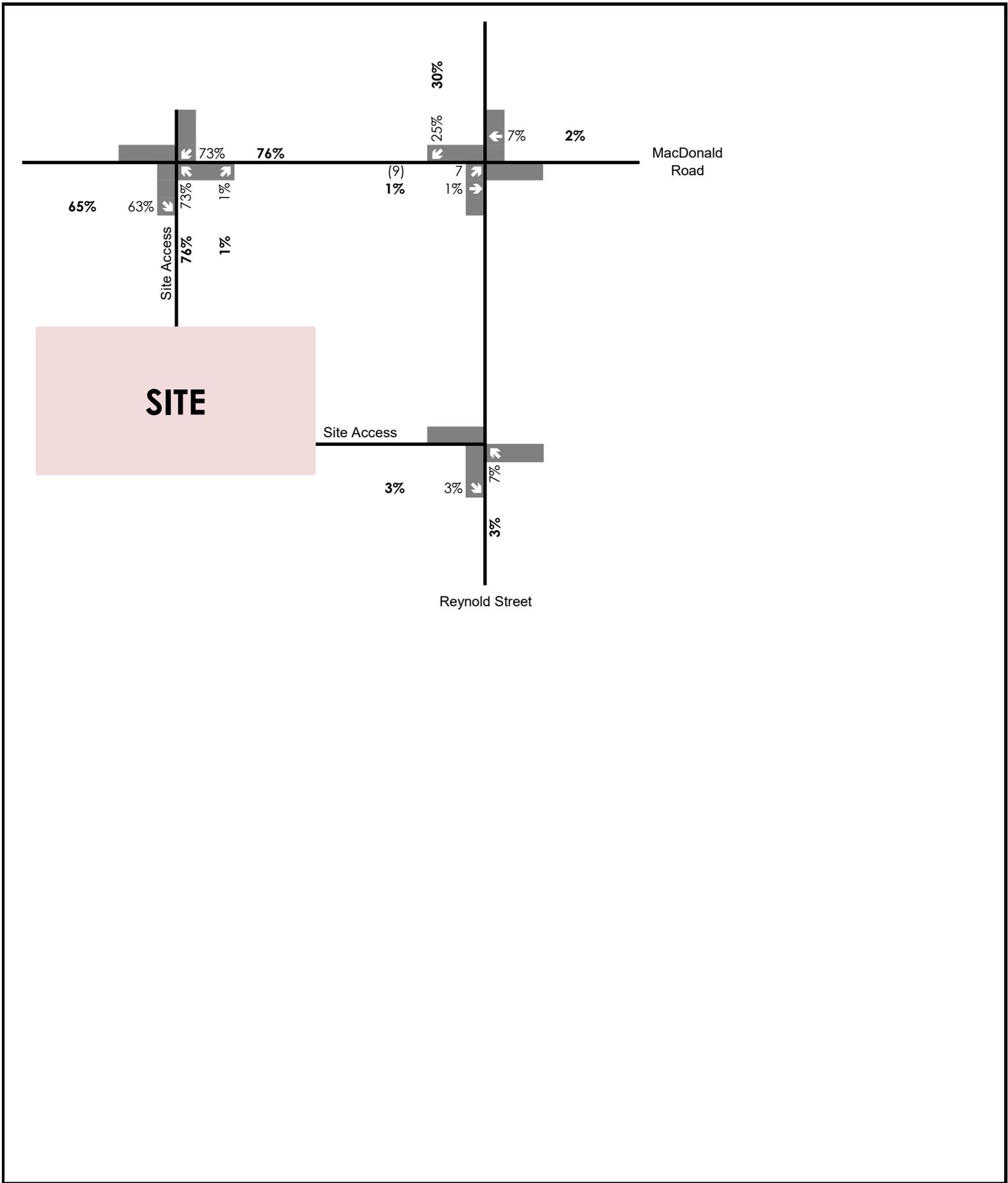
358 Reynolds St. Oakville

2028 Future Background Traffic Volumes



Figure 4

Project No. 1919-6732
 Date. June 9, 2023
 Analyst. Shaira Ahmed



Legend

- xx A.M. Peak Hour Traffic Volumes
- {xx} P.M. Peak Hour Traffic Volumes
- {xx} Weekend Peak Hour Traffic Volumes

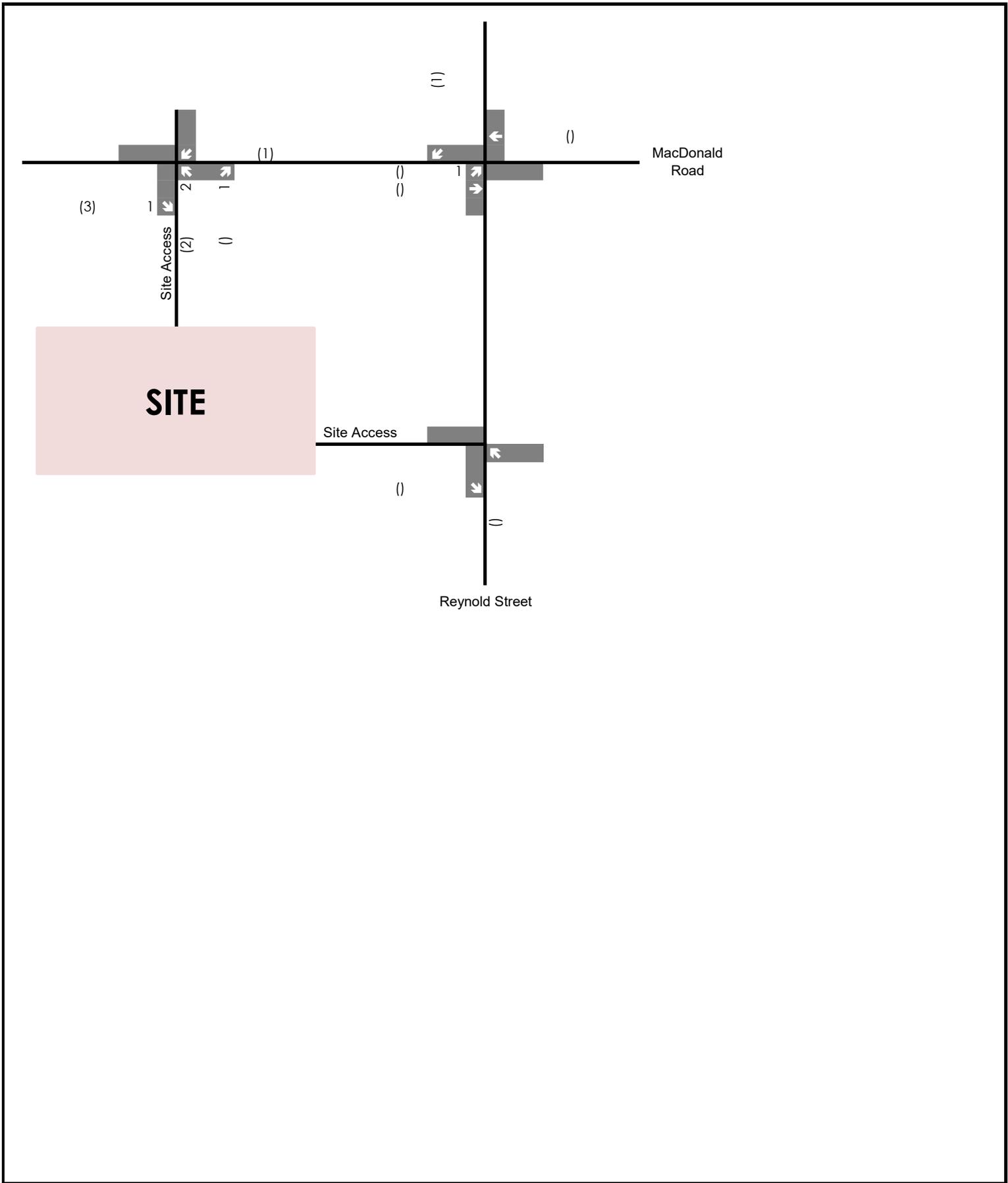
358 Reynolds St. Oakville

Trip Distribution



Figure 5

Project No. 1919-6732
 Date. June 9, 2023
 Analyst. Shaira Ahmed



Legend

- xx A.M. Peak Hour Traffic Volumes
- {xx} P.M. Peak Hour Traffic Volumes
- {xx} Weekend Peak Hour Traffic Volumes

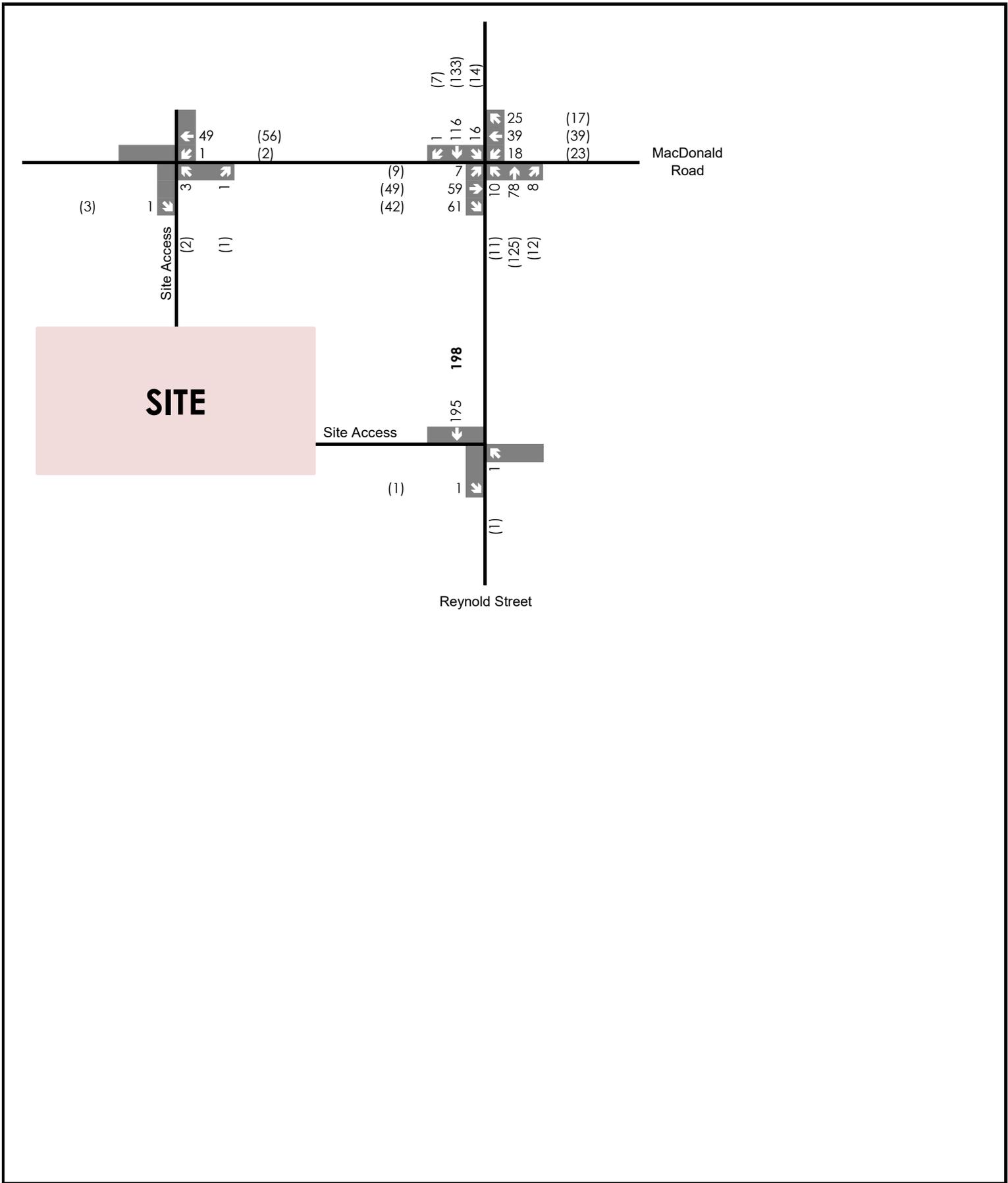
358 Reynolds St. Oakville

Trip Assignment



Figure 6

Project No. 1919-6732
 Date. June 9, 2023
 Analyst. Shaira Ahmed



Legend

- xx A.M. Peak Hour Traffic Volumes
- {xx} P.M. Peak Hour Traffic Volumes
- {xx} Weekend Peak Hour Traffic Volumes

358 Reynolds St. Oakville

2028 Future Total Traffic Volumes



Figure 7

Project No. 1919-6732
 Date. June 9, 2023
 Analyst. Shaira Ahmed