Melrose Investments Inc.

TRANSPORTATION OPERATIONAL ASSESSMENT

PROPOSED RESIDENTIAL DEVELOPMENT

106-114 Robinson Street
& 71 Water Street,
Town of Oakville

May 2023
24009

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May 30, 2023 **Reference Number:** 24009

Leo Wu
Melrose Investments Inc.
145 Reynolds Street, Suite 400
Oakville, ON
L6J 0A7

Dear Mr. Wu:

RE: Transportation Operational Assessment
Proposed Residential Development
106-114 Robinson St & 71 Water St, Oakville, Ontario

LEA Consulting Ltd. is pleased to present the findings of our Transportation Operational Assessment for the proposed townhouse development located at 106-114 Robinson Street and 71 Water Street in the Town of Oakville. This transportation assessment has been prepared in support of the Zoning By-law Amendment (ZBA) application for the subject site. This report concludes that the traffic associated with the proposed development will have an acceptable impact on the surrounding road network.

Please do not hesitate to contact the undersigned should you have any additional questions or concerns at ZGeorgis@lea.ca

Yours truly,

LEA CONSULTING LTD.

Zara Georgis, M.Eng., P.Eng.
Project Manager, Transportation Planning & Engineering

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Encl. Transportation Operational Assessment – Proposed Residential Development, 106-114 Robinson Street & 71 Water Street, Town of Oakville

EXECUTIVE SUMMARY

LEA Consulting Ltd. (LEA) has been retained by Melrose Investments Inc. to undertake a Transportation Operational Assessment (TOA) in support of a Zoning By-law Amendment (ZBA) application for a proposed residential development located at 106-114 Robinson Street & 71 Water Street.

The application proposes to develop a vacant lot into a 10-unit townhome complex. Each unit will have two (2) parking spaces, as required by Town of Oakville Zoning By-law 2014-014. The underground parking garage will be accessed via a driveway on Water Street.

The subject site is located south of Downtown Oakville, is served by one Oakville Transit bus route, and has several active transportation facilities nearby.

Traffic data was collected by LEA in April 2023. Intersection capacity analysis was completed for the weekday PM and Saturday midday peak hours for the following intersections:

- Navy Street & Robinson Street (Unsignalized);
- Robinson Street & Water Street (Unsignalized);
- Navy Street & William Street (Unsignalized);
- Water Street & Oakville Club Guest Parking Access (Unsignalized); and
- Water Steet & Proposed Site Access (Unsignalized).

The results indicated that existing traffic conditions have excellent operations and level of service.

The site is expected to generate five (5) and four (4) two-way vehicle trips during the weekday PM and Saturday midday peak hours, respectively.

Three scenarios were considered for the future conditions:

- Scenario 1 – Existing One-Way Water Street (i.e. Navy St to Robinson St)
- Scenario 2 – Reverse One-Way Water Street (i.e. Robinson St to Navy St)
- Scenario 3 – Two-way Water Street

Future traffic conditions maintain very similar operations to the existing conditions, as the proposed development introduces a very minimal amount of new trips to the network. Of the three (3) future Water Street configurations assessed, there is no clear preference.

A review of the sightline requirements for the site access on Water Street was completed to ensure that adequate stopping sight distances will be provided.

A Construction Management Plan (CMP) was also prepared for the proposed development. Construction traffic will utilize two (2) gates on Robinson Street, and construction activities should not impact the adjacent streets.

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1 INTRODUCTION

LEA Consulting Ltd. (LEA) was retained by Melrose Investments Inc. to undertake a Transportation Operational Assessment (TOA) in support of a Zoning By-law Amendment (ZBA) application for a proposed residential development located at 106-114 Robinson Street & 71 Water Street (herein referred to as the "subject site") in the Town of Oakville. The subject site is located at the east corner of Robinson Street and Water Street, as shown in **Figure 1-1**.

Figure 1-1: Subject Site Location

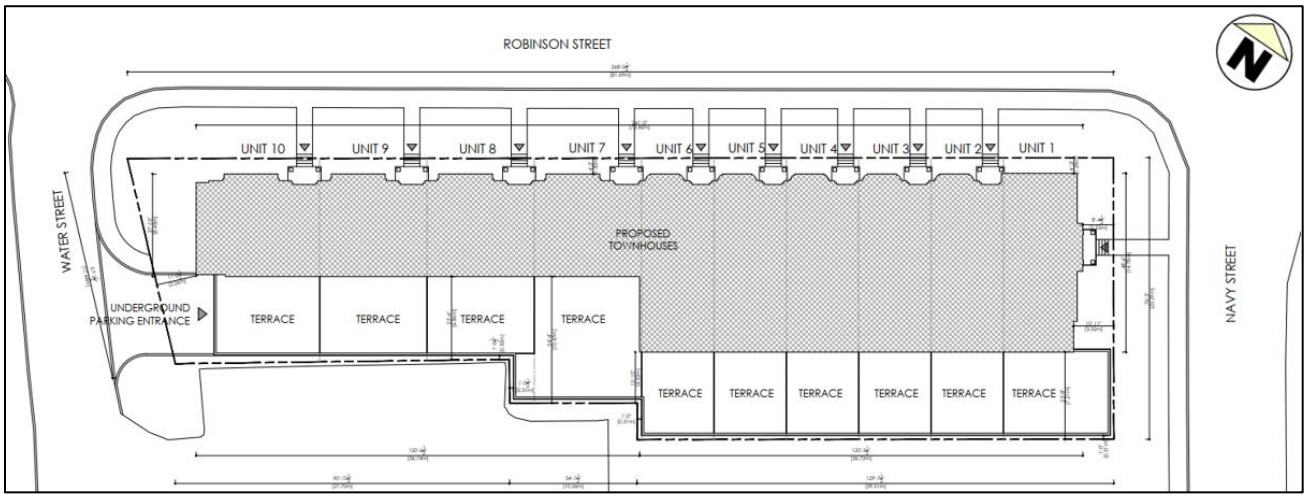
The subject site is currently a vacant lot. It is zoned as Residential Medium 4 (RM4), special provision 16, which permits the development of an apartment building with 13 units. However, the ZBA proposes re-zoning to Residential Medium (RM1) to allow for the development of townhome units on site.

1.1 DEVELOPMENT PROPOSAL

Ten (10) townhouse units are proposed on the site, each having two (2) underground parking spaces, accessed via a driveway on Water Street. The townhomes will front onto Robinson Street and Navy Street.

The proposed site plan is illustrated in **Figure 1-2**.

Figure 1-2: Proposed Site Plan



Source: Richard Wengle Architect Inc., January 31, 2023

2 EXISTING TRAFFIC CONDITIONS

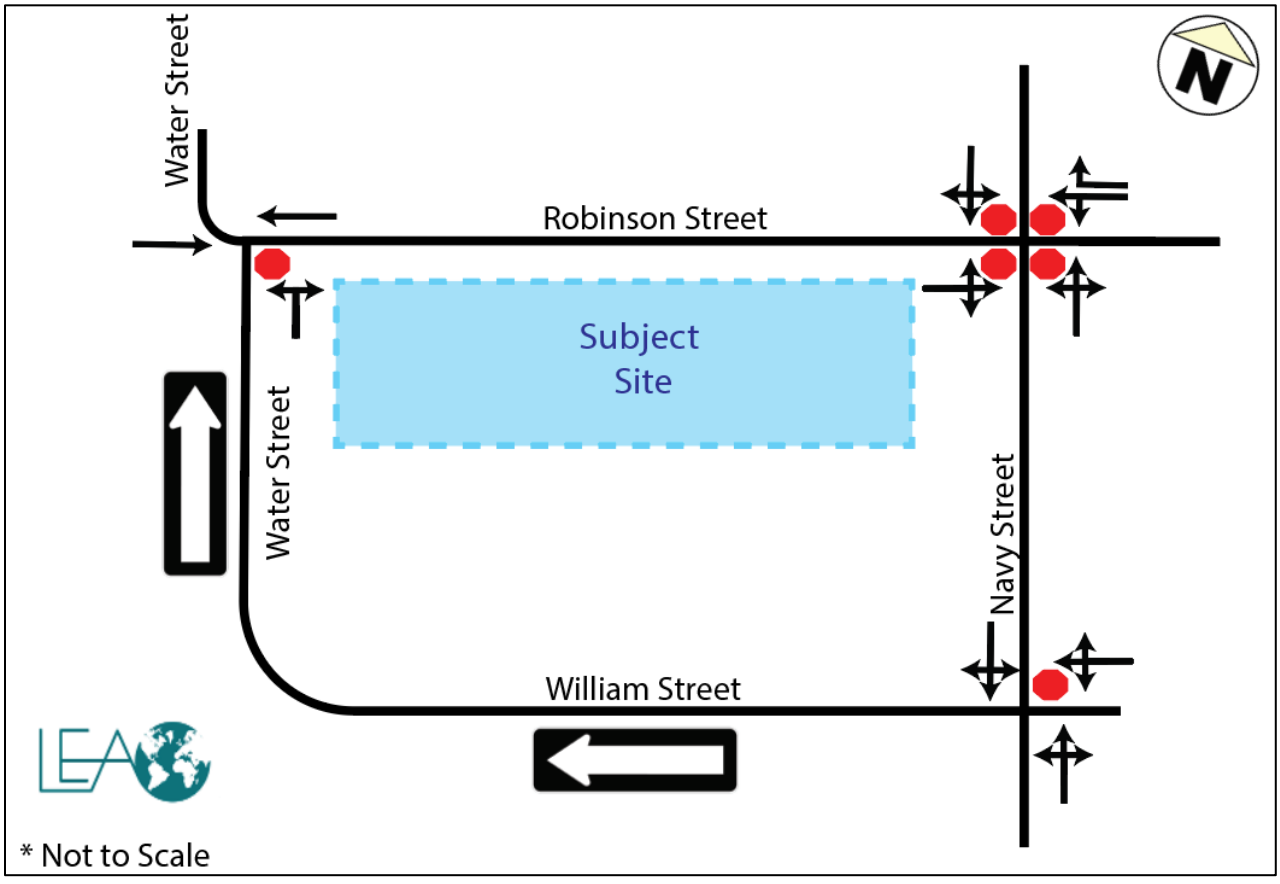
This section identifies and assesses the existing transportation conditions present in the study area, including the road, transit, cyclist, and pedestrian networks. The study area was determined through discussions with Town of Oakville Transportation and Engineering staff in April 2023. The study area will include the following intersections:

- Navy Street & Robinson Street (Unsignalized);
- Robinson Street & Water Street (Unsignalized); and,
- Navy Street & William Street (Unsignalized).

2.1 ROAD NETWORK

The following section provides a description and classification of the roadways within the study area, with **Figure 2-1** illustrating the existing lane configuration and traffic control.

Figure 2-1: Existing Lane Configuration and Traffic Control



Robinson Street is an east-west minor collector road that operates with a 2-lane cross-section (one lane per direction) in the area of the subject site. Robinson Street operates with a posted speed limit of 50 km/h in the study area. On-street parking is not permitted between Water Street and Navy Street, however some on-street parking is available east of Navy Street.

Water Street is a north-south local road that operates with a 2-lane cross-section (one lane per direction) between Navy Street in the north and Robinson Street in the south. This portion of Water Street has on-street paid parking available on both sides. South of Robinson Street, Water Street is a one-lane one-way northbound street, with a parking lane on the west side of the street. Water Street operates with a posted speed limit of 50 km/h.

Navy Street is a north-south minor arterial road, north of Lakeshore Road East, and a minor collector road south of Lakeshore Road East. The street operates with a 2-lane cross-section (one lane per direction) in the area of the subject site. Parking is permitted on the east side of the street, south of Robinson Street. Bicycle lanes are also present on both sides of the road, between Lakeshore Road East and Robinson Street. Navy Street operates with a posted speed limit of 50 km/h.

William Street is an east-west local road that operates as a one-way road in the westbound direction between Water Street and Navy Street, but as a two-lane two-way road east of Navy Street. On-street parking is permitted on the street. William Street operates with a posted speed limit of 50 km/h.

2.2 TRANSIT NETWORK

The subject site is served by the Oakville Transit network. One (1) bus route is located within walking distance. The local transit network is shown in **Figure 2-2**.

Figure 2-2: Existing Transit Network

Source: Oakville Transit, September 2021

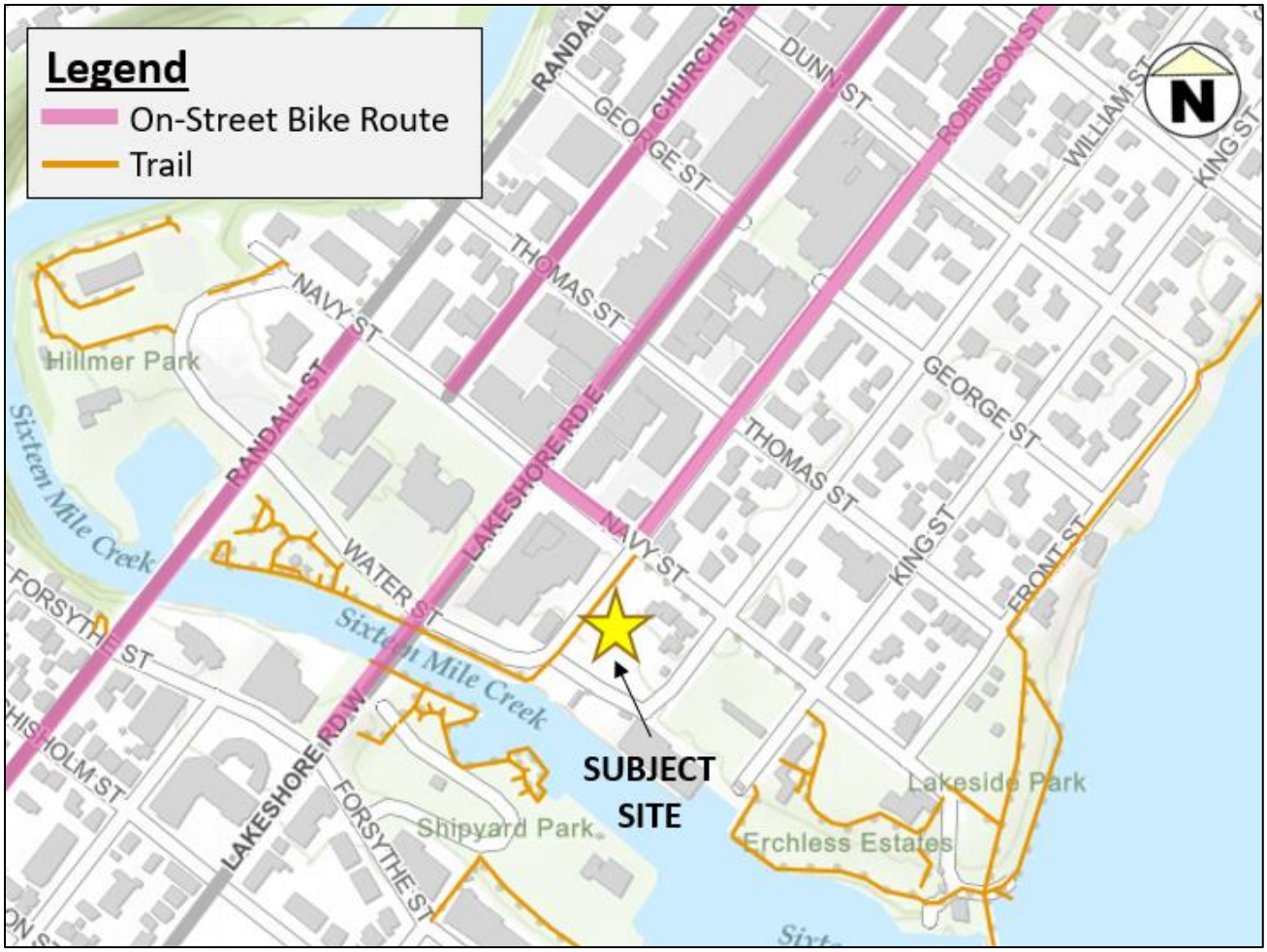
Route 14 (Lakeshore West) stops at the intersection of Navy Street and Church Street (350m away, or a 4-minute walk). This route provides connectivity from the study area to the Oakville GO Station, the Appleby GO Station, Kerr Village, and several amenities throughout Oakville. The route has two branches – 14 via Great Lakes Boulevard and 14A via Burloak Drive (connecting to RioCan Centre Burloak). Between the two branches, the bus has a headway of 15 minutes during weekday peak periods and 30 minutes off-peak and on weekends.

Route 14 connects the subject site to the rest of the transit network, including the GO Transit Lakeshore West line. The Oakville GO Station is located 2.2km from the subject site, which is a 25-minute walk or a 15-minute bus ride. The Lakeshore West GO train provides frequent service between Oakville and Toronto's Union Station, running every 15 minutes during weekday peak periods and every 30 minutes during off-peak periods and weekends.

2.3 ACTIVE TRANSPORTATION NETWORK

The subject site has a variety of active transportation facilities nearby, including on-street bike routes along several major streets and trails along the waterfront. The existing active transportation network surrounding the subject site is illustrated in **Figure 2-3**.

Figure 2-3: Existing Cycling Network



2.4 TRAFFIC DATA COLLECTION

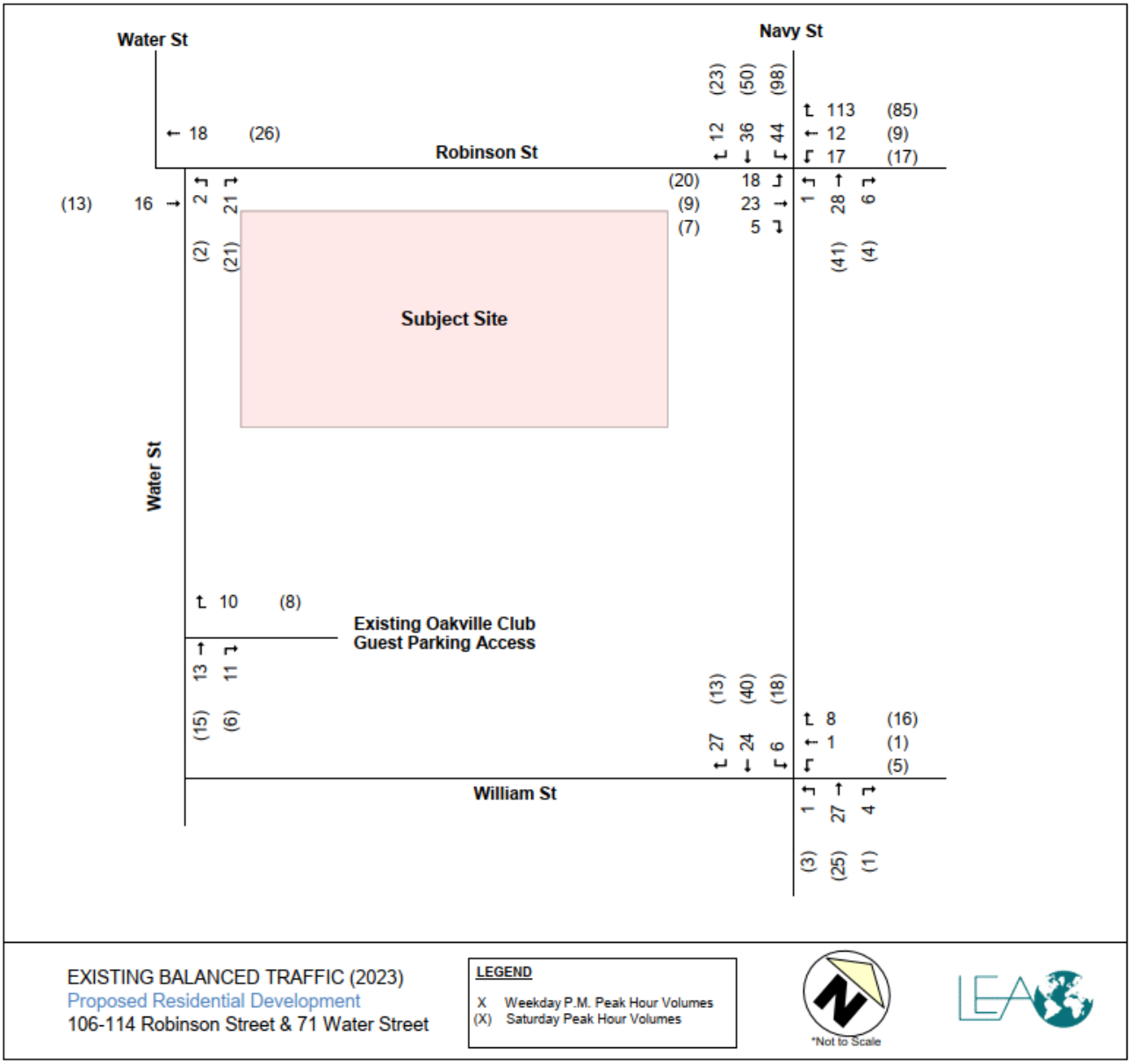
Turning movement counts (TMCs) were used as the source of traffic data in the intersection capacity analysis. Surveys were performed by LEA on Tuesday, April 18, 2023 and Saturday, April 22, 2023. A summary of the TMC collection is outlined in **Table 2-1**. Detailed traffic counts are available in **Appendix A**.

Table 2-1: Data Collection Summary

Intersections	Survey Period	Source
Navy St & Robinson St	Tuesday, April 18, 2023 Saturday, April 22, 2023	LEA Consulting Ltd.
Navy St & William St		
Water St & Robinston St		

Peak Hour Factors (PHF) under existing conditions have been calculated for each movement based on TMC data. Volumes were balanced at some movements due to differing peak hours. The existing traffic volumes in the study area during the weekday PM and Saturday midday peak hours are illustrated in **Figure 2-4**.

Figure 2-4: Existing Peak Hour Traffic Volumes



3 SITE GENERATED TRAFFIC

The proposed site plan includes a 10-unit townhouse development. The subject site will be accessible by vehicle via a site driveway on Water Street. The sections below discuss in detail the calculation, distribution and assignment of site-generated trips.

3.1 VEHICLE TRIP GENERATION

Trip generation rates for the townhouses were calculated based on the ITE Trip Generation Manual, 11th Edition, for Land Use Code 200 (Multi-family Low-rise). The site trip generation rates and resulting trip generation calculations for the proposed development are summarized in **Table 3-1**.

Table 3-1: Trip Generation Summary

Land Use	Description	Weekday PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total
Residential LUC *220* Low Rise Multi-Family Housing - 10 Units	Auto Trip Rate (/Unit)	0.32	0.19	0.51	0.21	0.21	0.41
	Total Auto Trips	**3**	**2**	**5**	**2**	**2**	**4**

The proposed development is anticipated to generate 5 two-way auto trips (3 inbound and 2 outbound) during the weekday PM peak hour and 4 two-way auto trips (2 inbound and 2 outbound) during the Saturday peak hour.

3.2 TRIP DISTRIBUTION AND ASSIGNMENT

The trip distribution of site traffic was estimated using Transportation Tomorrow Survey (TTS) 2016 data for local zones 4011, 4015 and 4016. The TTS data were filtered for home-based trip purposes during the weekday AM peak period. **Table 3-2** below summarizes the trip distribution for this study. Detailed TTS calculations are provided in **Appendix B**.

Table 3-2: General Trip Distribution

Predicted Route Summary	Inbound	Outbound
North via Navy St	52%	50%
East via Robinson St	48%	50%
Total	**100%**	**100%**

The trip assignment was subsequently determined based on the trip origin and destination, site access, and the most logical routing. Three scenarios were provided with differing trip assignments:

- Scenario 1 – Existing One-Way Water Street (i.e. Navy St to Robinson St)
- Scenario 2 – Reverse One-Way Water Street (i.e. Robinson St to Navy St)
- Scenario 3 – Two-way Water Street

Site-generated traffic volumes for each scenario are shown in **Figure 3-1**, **Figure 3-2** and **Figure 3-3**.

Figure 3-1: Scenario 1 Site Traffic Volumes

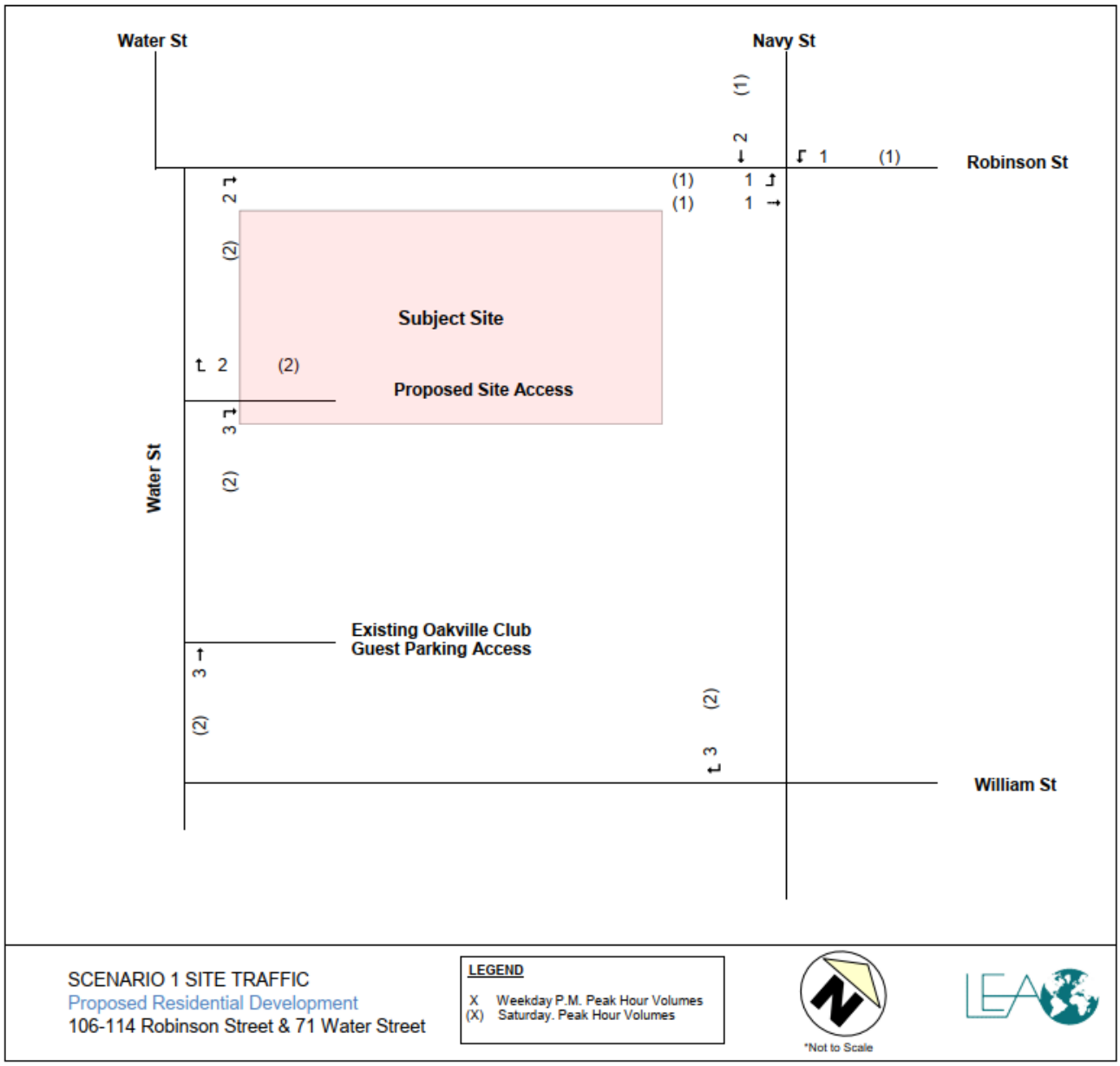


Figure 3-2: Scenario 2 Site Traffic Volumes

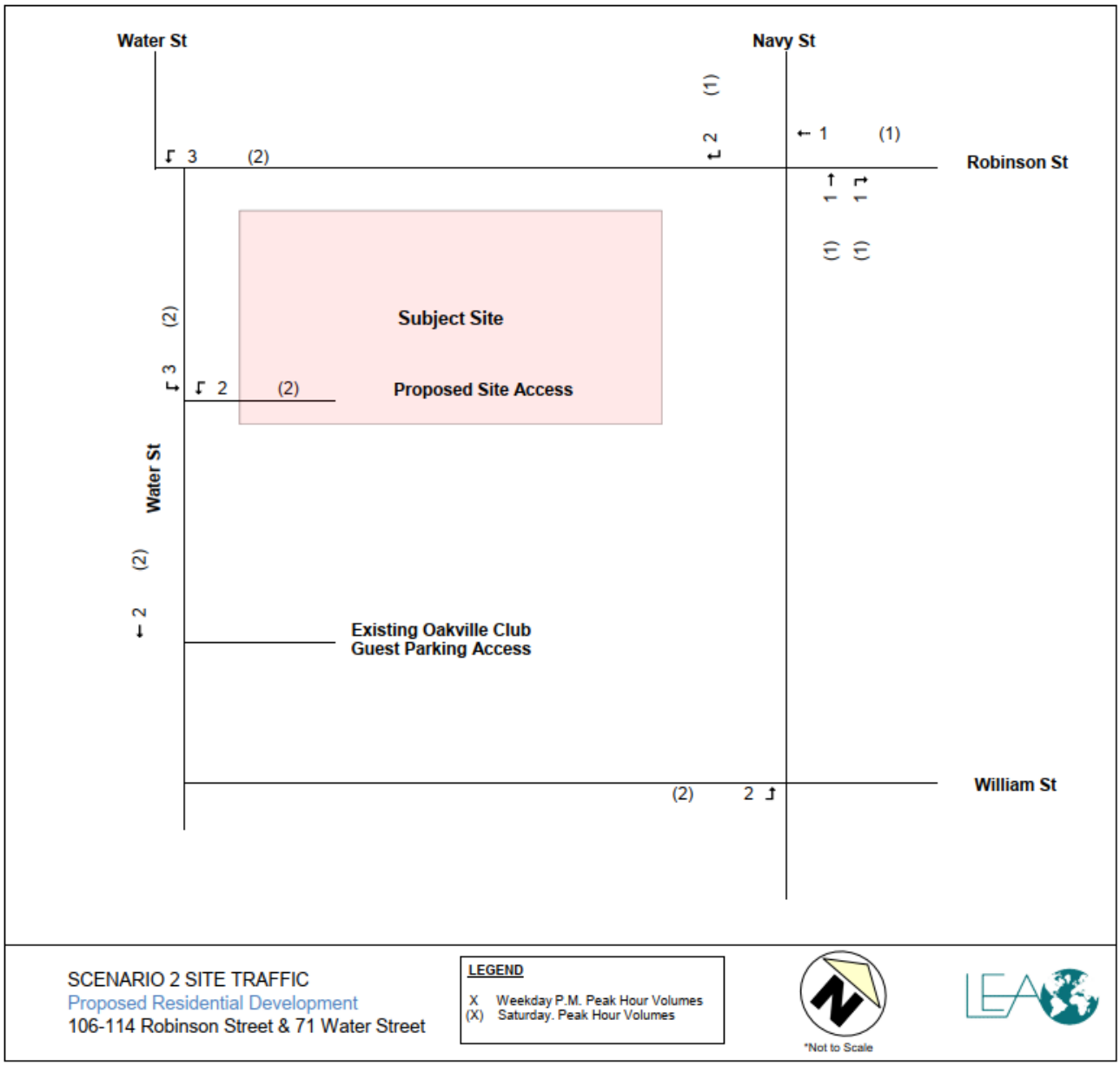
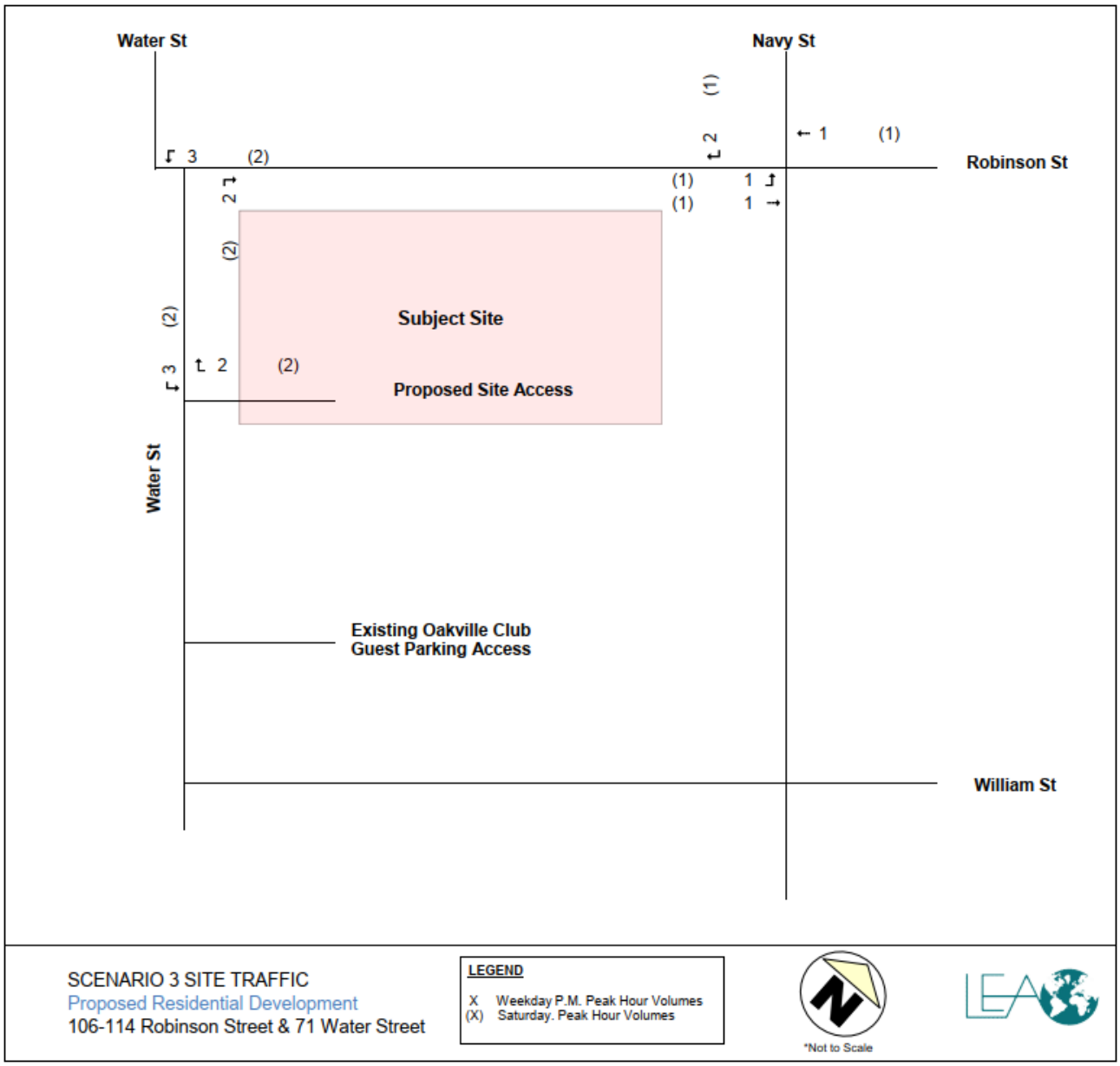


Figure 3-3: Scenario 3 Site Traffic Volumes



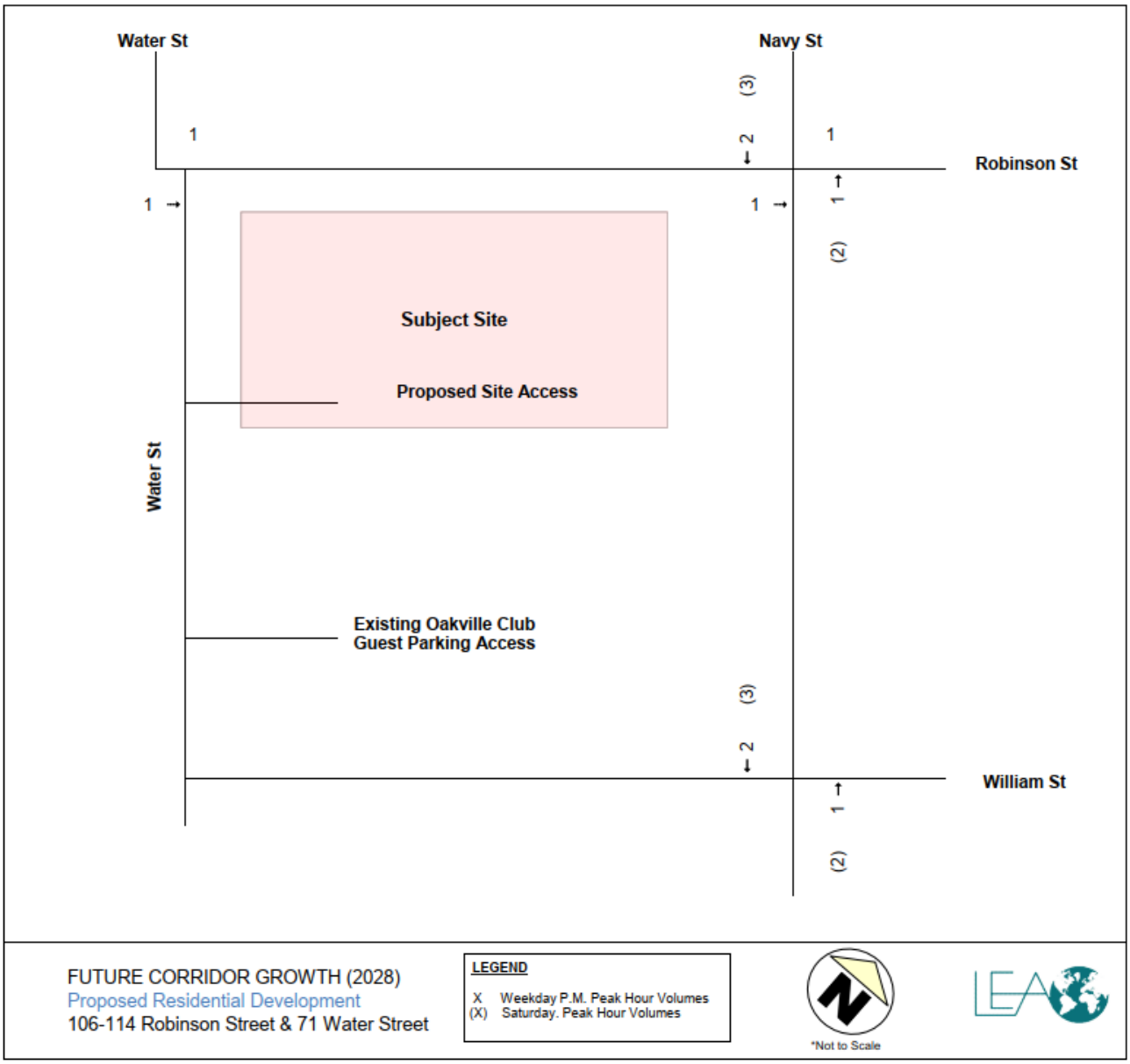
4 FUTURE TRAFFIC CONDITIONS

For the analysis of future traffic conditions, this study considers a five-year horizon to the year 2028.

As per communication with the Town of Oakville, a growth rate of 1% per annum was applied to through volumes. No background developments were considered in the analysis.

The future growth applied to existing traffic volumes is shown in **Figure 4-1**

Figure 4-1: Future Growth



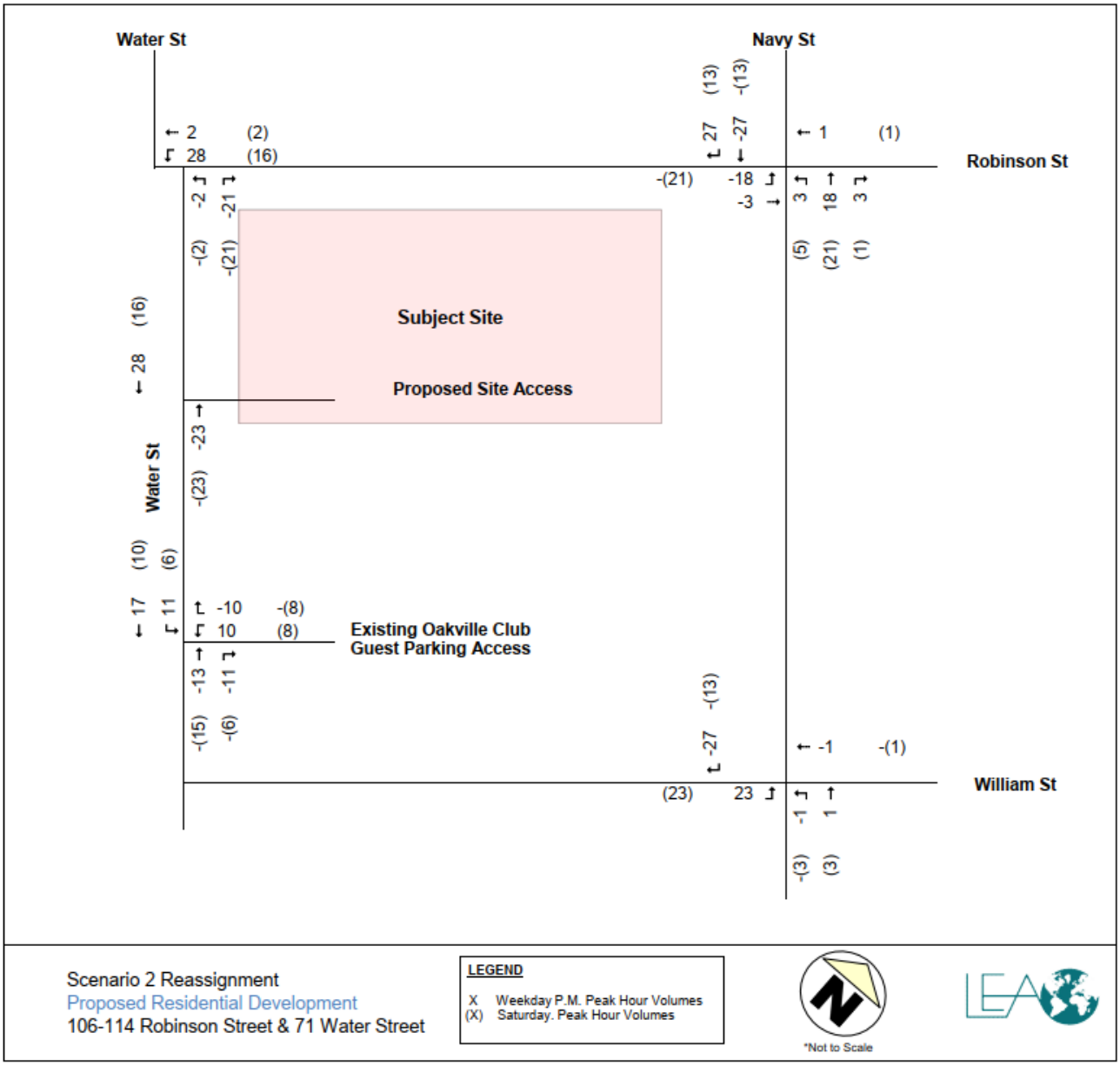
4.1 TRAFFIC REASSIGNMENT

For future scenarios 2 and 3, traffic volumes were logically reassigned.

4.1.1 Scenario 2 (Reverse One-Way Water Street) Traffic Reassignment

For Scenario 2, all vehicles entering Water Street from the Navy Street & William Street intersection were rerouted to use the Navy Street & Robinson Street intersection. All vehicles exiting Water Street from the Water Street & Robinson Street intersection were rerouted to exit via the Navy Street & William Street intersection. The reassignment of traffic volumes for Scenario 2 are shown in **Figure 4-2**

Figure 4-2: Scenario 2 Traffic Volume Reassignment



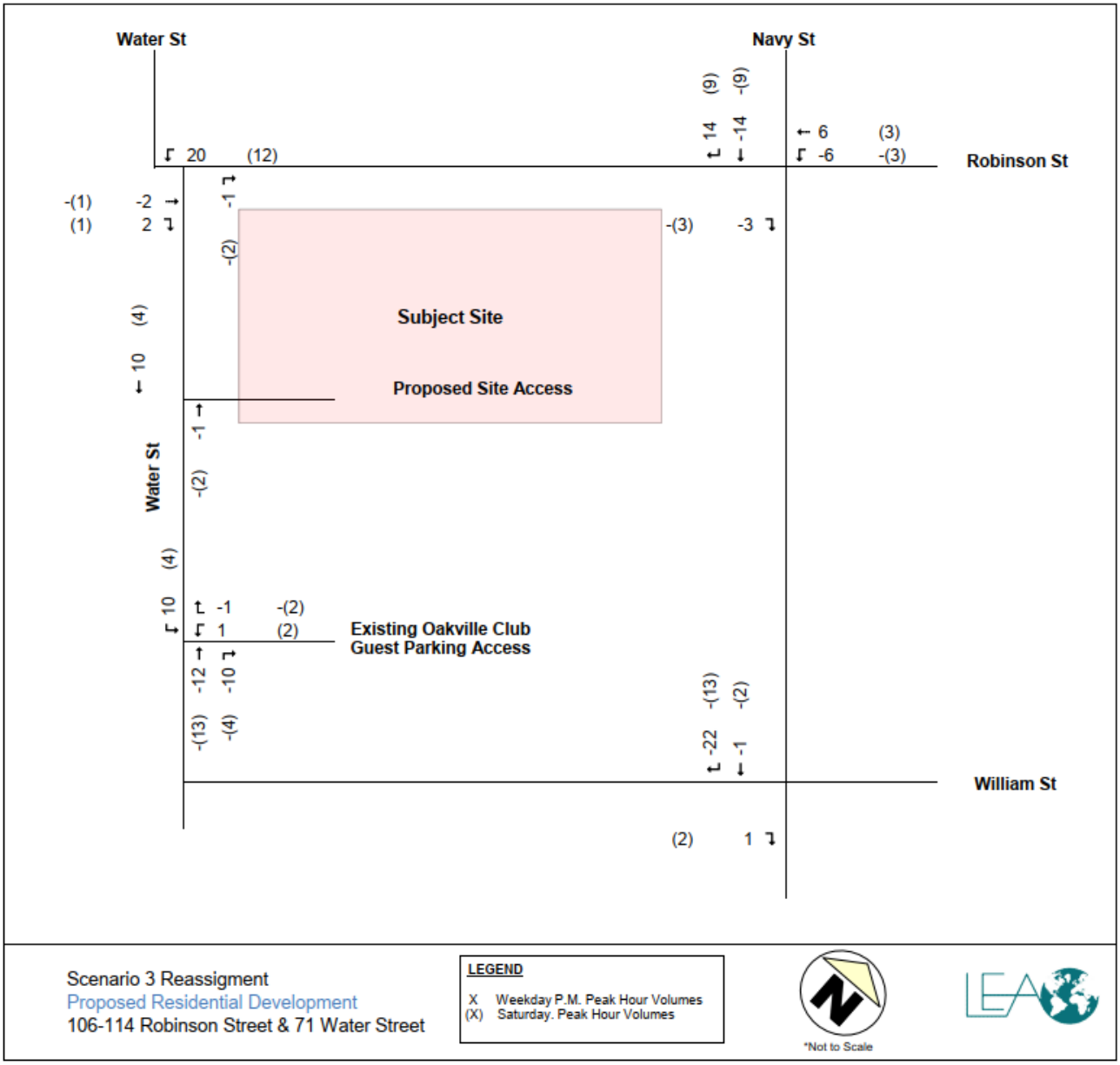
4.1.2 Scenario 3 (Two-Way Water Street) Traffic Reassignment

For Scenario 3, several reassignments were made:

- Vehicles that currently make a westbound left turn from Robinson Street onto Navy Street, then a southbound right onto William Street, were assumed to take a new route which includes travelling westbound through Robinson Street & Navy Street, then a westbound left movement onto Water Street, as this is a more direct route.
- Vehicles that currently travel southbound on Navy Street and make a southbound right movement onto William Street are assumed to reroute by making a southbound right turn movement from Navy Street to Robinson Street then make a westbound left turn onto Water Street.
- Vehicles that currently travel via a northbound right turn from Water Street to Robinson Street then make an eastbound right turn onto Navy Street were reassigned to travel south on Water Street and make an eastbound right turn onto Navy Street.

The reassignment of traffic volumes for Scenario 3 are shown in **Figure 4-3**.

Figure 4-3: Scenario 3 Traffic Volume Reassignment



4.2 FUTURE TRAFFIC VOLUMES

Future traffic volumes for the study are intersections include background growth and site-generated trips, as shown in **Figure 4-4, Figure 4-5** and **Figure 4-6**.

Figure 4-4: Scenario 1 Future Traffic Volumes

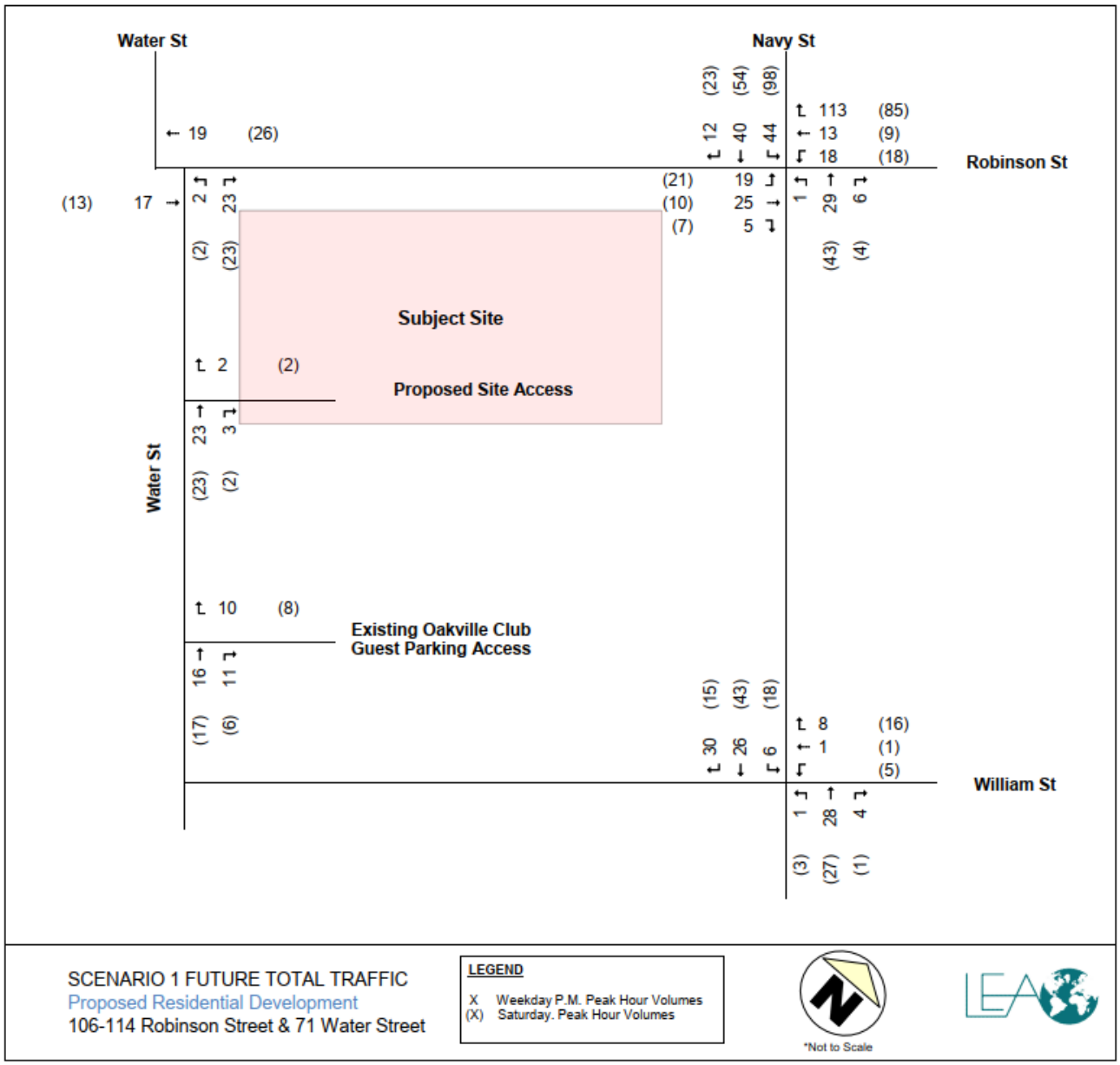


Figure 4-5: Scenario 2 Future Traffic Volumes

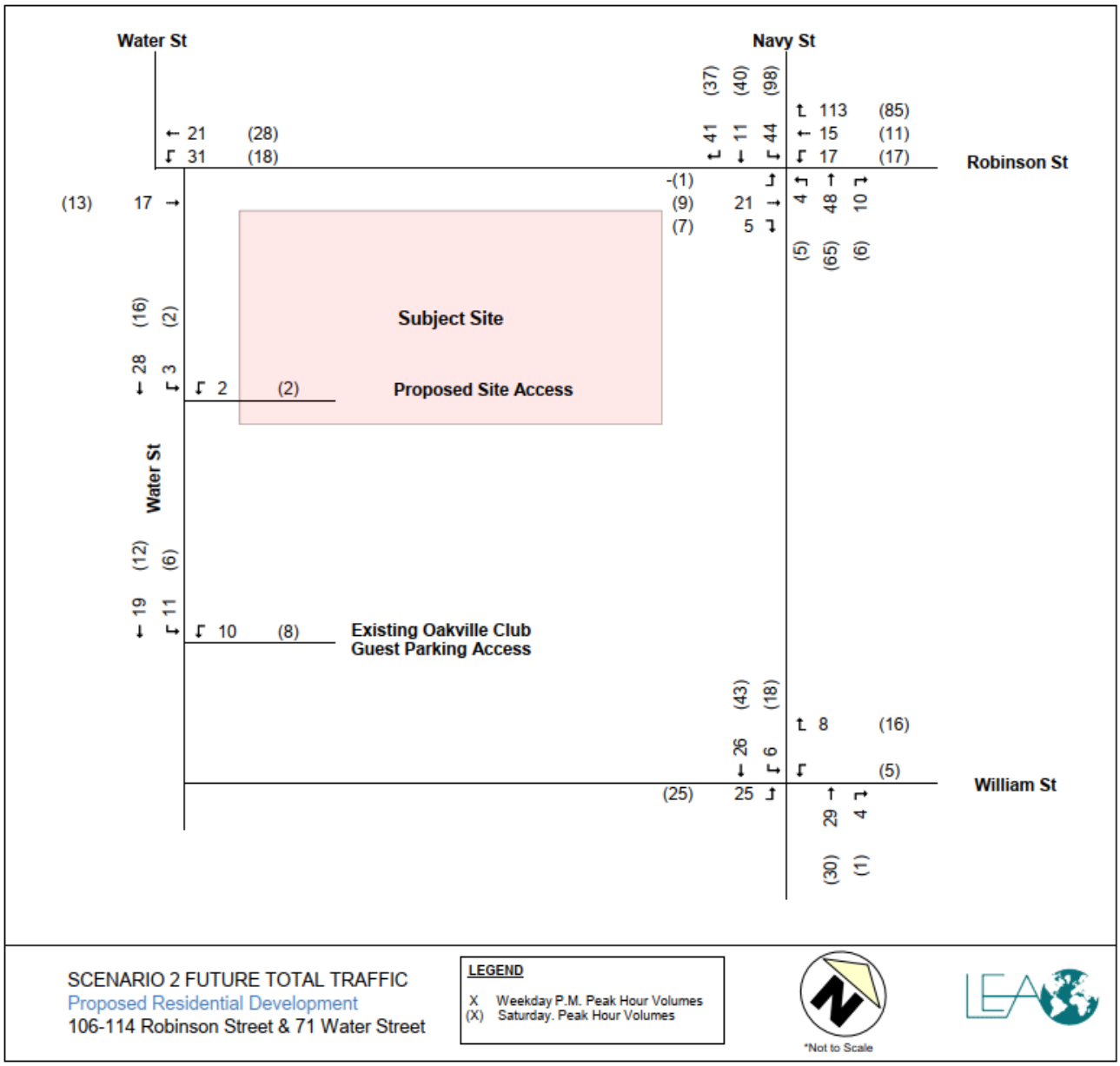
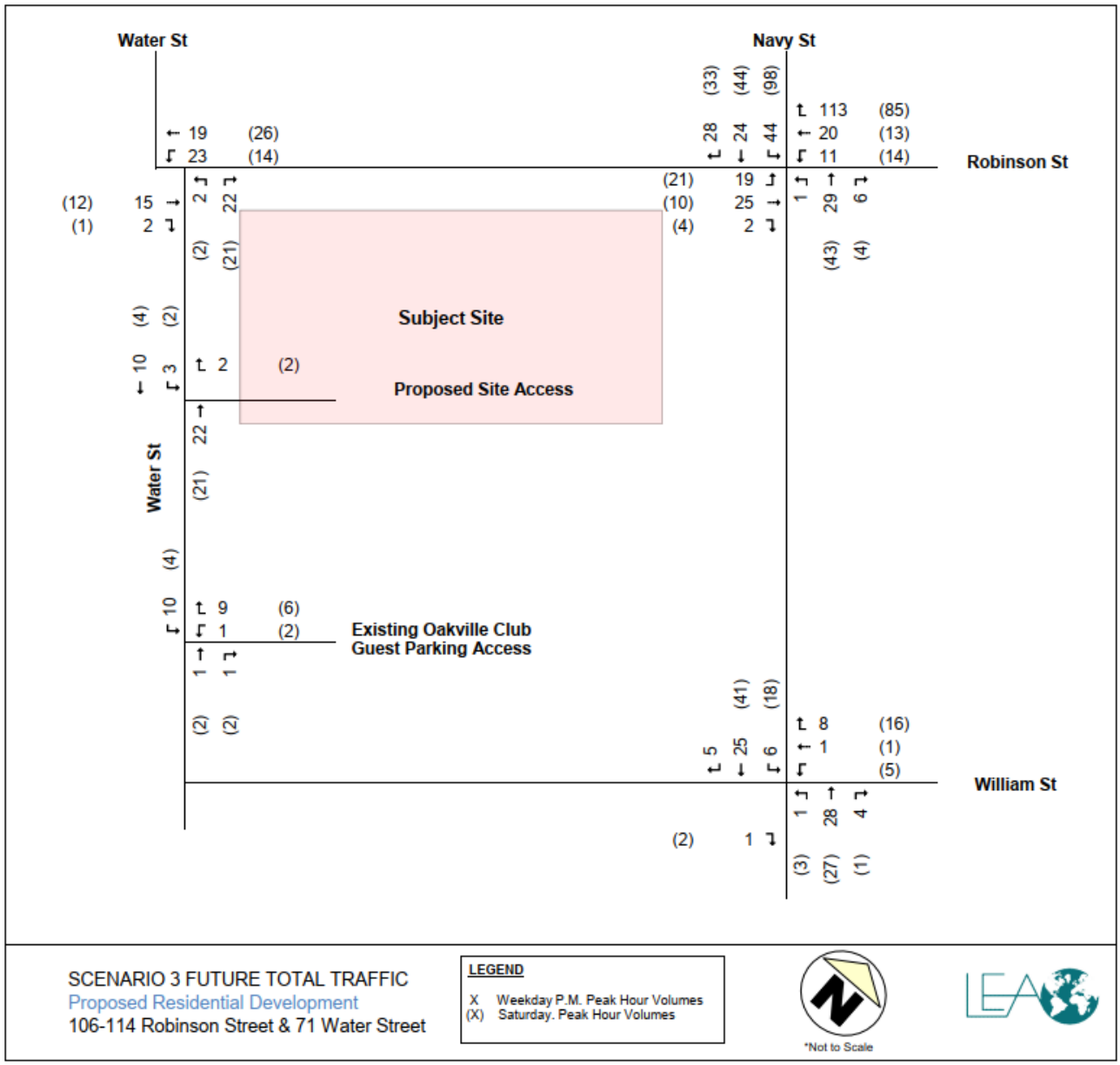


Figure 4-6: Scenario 3 Future Traffic Volumes



5 INTERSECTION CAPACITY ANALYSIS

The intersection capacity analysis for the study area was undertaken using Synchro version 11.0, which is based on the Highway Capacity Manual 2000 methodology. The results of the capacity analysis for the study area intersections under existing and future conditions are summarized in the following tables, with detailed results in **Appendix C** and **D**.

Table 5-1: Intersection Capacity Analysis - Navy Street & Robinson Street (All-Way Stop Control)

PM	Existing				Future Total - Scenario 1				Future Total - Scenario 2				Future Total - Scenario 3			
Mvmt	Vol	V/C	Delay (LOS)	95th Que.	Vol	V/C	Delay (LOS)	95th Que.	Vol	V/C	Delay (LOS)	95th Que.	Vol	V/C	Delay (LOS)	95th Que.
NBLTR	35	0.05	8 (A)	0	36	0.05	8 (A)	0	62	0.08	8 (A)	0	36	0.05	8 (A)	0
EBLTR	46	0.06	8 (A)	0	49	0.07	8 (A)	0	26	0.04	8 (A)	0	46	0.07	8 (A)	0
WBLT	29	0.05	8 (A)	0	31	0.05	8 (A)	0	32	0.05	8 (A)	0	31	0.05	8 (A)	0
WBR	113	0.14	8 (A)	1	113	0.14	8 (A)	1	113	0.15	8 (A)	1	113	0.14	8 (A)	1
SBLTR	92	0.12	8 (A)	0	96	0.13	8 (A)	0	96	0.12	8 (A)	0	96	0.13	8 (A)	0
Sat	**Existing**				**Future Total - Scenario 1**				**Future Total - Scenario 2**				**Future Total - Scenario 3**			
NBLTR	45	0.07	8 (A)	0	47	0.07	8 (A)	0	76	0.11	8 (A)	0	47	0.07	8 (A)	0
EBLTR	36	0.06	8 (A)	0	38	0.06	8 (A)	0	16	0.02	8 (A)	0	38	0.06	8 (A)	0
WBLT	26	0.05	8 (A)	0	27	0.05	9 (A)	0	28	0.05	9 (A)	0	27	0.05	8 (A)	0
WBR	85	0.12	8 (A)	0	85	0.12	8 (A)	0	85	0.12	8 (A)	0	85	0.12	8 (A)	0
SBLTR	171	0.24	9 (A)	1	175	0.25	9 (A)	1	175	0.25	9 (A)	1	175	0.25	9 (A)	1

The intersection of Navy Street and Robinson Street is expected to operate well during peak hours, with V/C ratios below 0.25 and LOS A for all movements. There is no significant difference between the three scenarios in terms of traffic impacts.

Table 5-2: Intersection Capacity Analysis - Navy Street & William Street (Two-Way Stop Control)

PM	Existing				Future Total - Scenario 1				Future Total - Scenario 2				Future Total - Scenario 3			
Mvmt	Vol	V/C	Delay (LOS)	95th Que.	Vol	V/C	Delay (LOS)	95th Que.	Vol	V/C	Delay (LOS)	95th Que.	Vol	V/C	Delay (LOS)	95th Que.
NBL	1	0.00	7 (A)	0	1	0.00	7 (A)	0	-	-	-	-	1	0.00	7 (A)	0
NBT	27	0.00	0 (A)	0	28	0.00	0 (A)	0	29	0.00	0 (A)	0	28	0.00	0 (A)	0
NBR	4	0.00	0 (A)	0	4	0.00	0 (A)	0	4	0.00	0 (A)	0	4	0.00	0 (A)	0
EBLTR	-	-	-	-	-	-	-	-	25	0.04	9 (A)	0	1	0.00	9 (A)	0
WBLTR	9	0.01	9 (A)	0	9	0.01	9 (A)	0	8	0.01	9 (A)	0	9	0.01	9 (A)	0
SBL	6	0.01	7 (A)	0	6	0.01	7 (A)	0	6	0.01	7 (A)	0	6	0.01	7 (A)	0
SBT	24	0.00	0 (A)	0	26	0.00	0 (A)	0	26	0.00	0 (A)	0	25	0.00	0 (A)	0
SBR	27	0.00	0 (A)	0	30	0.00	0 (A)	0	-	-	-	-	5	0.00	0 (A)	0
Sat	**Existing**				**Future Total - Scenario 1**				**Future Total - Scenario 2**				**Future Total - Scenario 3**			
NBL	3	0.00	7 (A)	0	3	0.00	7 (A)	0	-	-	-	-	3	0.00	7 (A)	0
NBT	25	0.00	0 (A)	0	27	0.00	0 (A)	0	30	0.00	0 (A)	0	27	0.00	0 (A)	0
NBR	1	0.00	0 (A)	0	1	0.00	0 (A)	0	1	0.00	0 (A)	0	1	0.00	0 (A)	0
EBLTR	-	-	-	-	-	-	-	-	25	0.05	10 (B)	0	0	0.00	0 (A)	0
WBLTR	22	0.03	9 (A)	0	22	0.03	9 (A)	0	21	0.03	9 (A)	0	22	0.04	9 (A)	0
SBL	18	0.02	7 (A)	0	18	0.02	7 (A)	0	18	0.02	7 (A)	0	18	0.02	7 (A)	0
SBT	40	0.00	0 (A)	0	43	0.00	0 (A)	0	43	0.00	0 (A)	0	43	0.00	0 (A)	0
SBR	13	0.00	0 (A)	0	15	0.00	0 (A)	0	-	-	-	-	13	0.00	0 (A)	0

The intersection of Navy Street and William Street is expected to operate well during peak hours, with V/C ratios below 0.05 and LOS A for all movements. There is no significant difference between the three scenarios in terms of traffic impacts.

Table 5-3: Intersection Capacity Analysis - Water Street & Robinson Street (Two-Way Stop Control)

PM	Existing				Future Total - Scenario 1				Future Total - Scenario 2				Future Total - Scenario 3			
Mvmt	Vol	V/C	Delay (LOS)	95th Que.	Vol	V/C	Delay (LOS)	95th Que.	Vol	V/C	Delay (LOS)	95th Que.	Vol	V/C	Delay (LOS)	95th Que.
NBLR	23	0.03	9 (A)	0	25	0.03	9 (A)	0	-	-	-	-	24	0.03	9 (A)	0
EBT	16	0.00	0 (A)	0	17	0.00	0 (A)	0	17	0.00	0 (A)	0	15	0.00	0 (A)	0
EBR	-	-	-	-	-	-	-	-	-	-	-	-	2	0.00	0 (A)	0
WBL	-	-	-	-	-	-	-	-	31	0.00	0 (A)	0	23	0.02	7 (A)	0
WBT	18	0.00	0 (A)	0	19	0.00	0 (A)	0	21	0.00	0 (A)	0	19	0.00	0 (A)	0
Sat	**Existing**				**Future Total - Scenario 1**				**Future Total - Scenario 2**				**Future Total - Scenario 3**			
NBLR	23	0.03	9 (A)	0	25	0.03	9 (A)	0	-	-	-	-	25	0.03	9 (A)	0
EBT	13	0.00	0 (A)	0	13	0.00	0 (A)	0	13	0.00	0 (A)	0	13	0.00	0 (A)	0
EBR	-	-	-	-	-	-	-	-	-	-	-	-	0	0.00	0 (A)	0
WBL	-	-	-	-	-	-	-	-	28	0.00	0 (A)	0	2	0.00	7 (A)	0
WBT	26	0.00	0 (A)	0	26	0.00	0 (A)	0	18	0.00	0 (A)	0	26	0.00	0 (A)	0

The intersection of Water Street and Robinson Street is expected to operate well during peak hours, with V/C ratios below 0.03 and LOS A for all movements. There is no significant difference between the three scenarios in terms of traffic impacts.

Table 5-4: Intersection Capacity Analysis - Water Street & Oakville Club Guest Parking (Two-Way Stop Control)

PM	Existing				Future Total - Scenario 1				Future Total - Scenario 2				Future Total - Scenario 3			
Mvmt	Vol	V/C	Delay (LOS)	95th Que.	Vol	V/C	Delay (LOS)	95th Que.	Vol	V/C	Delay (LOS)	95th Que.	Vol	V/C	Delay (LOS)	95th Que.
NBT	13	0.00	0 (A)	0	16	0.00	0 (A)	0	-	-	-	-	1	0.00	0 (A)	0
NBR	11	0.00	0 (A)	0	11	0.00	0 (A)	0	-	-	-	-	1	0.00	0 (A)	0
WBLR	10	0.04	9 (A)	0	10	0.04	9 (A)	0	10	0.05	10 (A)	0	10	0.04	9 (A)	0
SBL	-	-	-	-	-	-	-	-	11	0.00	0 (A)	0	10	0.03	7 (A)	0
SBT	-	-	-	-	-	-	-	-	19	0.00	0 (A)	0	0	0.00	0 (A)	0
Sat	**Existing**				**Future Total - Scenario 1**				**Future Total - Scenario 2**				**Future Total - Scenario 3**			
NBT	15	0.00	0 (A)	0	17	0.00	0 (A)	0	-	-	-	-	15	0.00	0 (A)	0
NBR	6	0.00	0 (A)	0	6	0.00	0 (A)	0	-	-	-	-	6	0.00	0 (A)	0
WBLR	8	0.03	9 (A)	0	8	0.03	9 (A)	0	8	0.04	9 (A)	0	8	0.03	9 (A)	0
SBL	-	-	-	-	-	-	-	-	6	0.00	0 (A)	0	0	0.00	0 (A)	0
SBT	-	-	-	-	-	-	-	-	12	0.00	0 (A)	0	0	0.00	0 (A)	0

The intersection of Water Street and Oakville Club Guest Parking is expected to operate well during peak hours, with V/C ratios below 0.05 and LOS A for all movements. There is no significant difference between the three scenarios in terms of traffic impacts.

Table 5-5: Intersection Capacity Analysis - Water Street & Proposed Site Access (Two-Way Stop Control)

PM	Existing				Future Total - Scenario 1				Future Total - Scenario 2				Future Total - Scenario 3			
Mvmt	Vol	V/C	Delay (LOS)	95th Que.	Vol	V/C	Delay (LOS)	95th Que.	Vol	V/C	Delay (LOS)	95th Que.	Vol	V/C	Delay (LOS)	95th Que.
NBT	-	-	-	-	23	0.00	0 (A)	0	-	-	-	-	22	0.00	0 (A)	0
NBR	-	-	-	-	3	0.00	0 (A)	0	-	-	-	-	0	0.00	0 (A)	0
WBLR	-	-	-	-	2	0.01	9 (A)	0	2	0.01	9 (A)	0	2	0.01	9 (A)	0
SBL	-	-	-	-	-	-	-	-	3	0.00	0 (A)	0	3	0.01	7 (A)	0
SBT	-	-	-	-	-	-	-	-	28	0.00	0 (A)	0	10	0.00	0 (A)	0
Sat	**Existing**				**Future Total - Scenario 1**				**Future Total - Scenario 2**				**Future Total - Scenario 3**			
NBT	-	-	-	-	23	0.00	0 (A)	0	-	-	-	-	23	0.00	0 (A)	0
NBR	-	-	-	-	2	0.00	0 (A)	0	-	-	-	-	0	0.00	0 (A)	0
WBLR	-	-	-	-	2	0.01	9 (A)	0	2	0.01	9 (A)	0	2	0.01	9 (A)	0
SBL	-	-	-	-	-	-	-	-	2	0.00	0 (A)	0	2	0.01	7 (A)	0
SBT	-	-	-	-	-	-	-	-	16	0.00	0 (A)	0	0	0.00	0 (A)	0

The intersection of Water Street and the Proposed Site Access is expected to operate well during peak hours, with V/C ratios below 0.01 and LOS A for all movements. There is no significant difference between the three scenarios in terms of traffic impacts.

6 SITE ACCESS REVIEW

A review of the site access onto Water Street was completed, considering the three (3) potential future Water Street configurations (i.e. one-way southbound, one-way northbound, two-way). For each scenario, the stopping sight distance (SSD) and the intersection sight distance (ISD) were calculated based on the site plan. The sight distance requirements for the site access as per TAC Tables 9.9.4 and 9.9.6 were reviewed for all three (3) Water Street scenarios. It should be noted that intersection sight distance was calculated based on PTAC vehicles stopping at the proposed site access where the driver's eye is 4.4m from the edge of the intersecting roadway (Water Street), as per TAC Chapter 9.9.2.3. The site access review is discussed below, and drawings are attached as **Appendix E**.

6.1 SCENARIO 1 – EXISTING ONE-WAY WATER STREET (I.E. NAVY ST TO ROBINSON ST)

Stopping Sight Distance

In order for an approaching vehicle to stop in time when a vehicle is exiting the proposed access, the SSD desired is 65 m as detailed in **DWG 01A**. This is assuming a design speed of 50 km/h.

Given the curved geometry of William Street, vehicles are expected to reduce speeds as they approach the sharp bend. Based on aerial imagery, the road appears to have a horizontal radius of approximately 15 m. Per TAC Figure 3.2.4, the design speed of a road with a 15 m radius shall be less than 30 km/h. Additionally, there are existing trees along the inner curve of the bend, accessible parking spaces along the outer cure, and a driveway right at the bend which leads to The Oakville Club. All of these features will likely cause vehicles travelling along Water Street to slow down around the sharp curve. Accordingly, the assumed design speed used in the sightline analysis is 30 km/h although the actual speed is expected to be even lower. As illustrated in **DWG 01B**, the available SSD is 50 m, which exceeds the desired 31.2 m.

Intersection Sight Distance

As detailed in **DWG 01C**, the desired ISD is 95m based on a design speed of 50 km/h. However, similar to the above, vehicles are expected to reduce the speed to 30 km/h due to the geometry of the road. Therefore, with an assumed design speed of 30km/h, the available ISD of 55 m exceeds the desired 54.21 m (as per TAC Table 9.9.6).

It should be noted that any objects, if any, within the green hatch identified should allow proper sight lines between the heights of 0.3 to 1.3m (as per TAC Chapter 8.9.3).

6.2 SCENARIO 2 – REVERSE ONE-WAY WATER STREET (I.E. ROBINSON ST TO NAVY ST)

Stopping Sight Distance

In order for an approaching vehicle to stop in time when a vehicle is exiting the proposed access, the SSD desired is 65m as detailed in **DWG 02A**. This is assuming a design speed of 50 km/h.

However, vehicles are expected to reduce speeds to 15 km/h as they turn into the intersection at Robinson Street and Water Street. Based on guidelines from other municipalities, the typical turning speed for a passenger vehicle is 5 to 10 km/h. In addition, the 5m curb radius of the southwest corner further encourages vehicles to slow on turns. As a result, an assumed design speed of 15km/h was used in the sightline analysis.

As illustrated in **DWG 02A**, the available SSD for the eastbound right-turning vehicle onto Water Street is 21.8 m, whereas the available SSD for the WBL vehicle is 21 m. Both available SSDs exceed the desired 13m SSD.

Intersection Sight Distance

As detailed in **DWG 02B**, the desired ISD is 105 m based on a design speed of 50 km/h. However, similar to the above, vehicles are expected to reduce the speed to 15 km/h when turning. Therefore, with an assumed design speed of 15km/h, the available ISD for the eastbound right-turning vehicle onto Water Street of 31.4 m exceeds the desired 31.3 m.

For the westbound left-turning vehicle, the available ISD is 24.5 m. Although this distance does not satisfy the desired ISD of 31.3 m for a 15km/h design speed, the proposed access is still considered to be acceptable since the SSD is the governing factor. As justified above, the available SSD of 21 m exceeds the required 13 m (**DWG 02A**).

Since minimum SSD in the TAC table assumes a driver reaction time of 3 seconds, it is expected that a southbound vehicle will have sufficient distance in stopping as it approaches the proposed access if a vehicle exits the access.

It should be noted that any objects, if any, within the green hatch identified should allow proper sight lines between the heights of 0.3 to 1.3m (as per TAC Chapter 8.9.3).

6.3 SCENARIO 3 – TWO-WAY WATER STREET

This scenario assumes Water Street to be a two-way traffic road. The sightline analysis review is essentially a combination of the scenarios 1 and 2 described and illustrated above. To determine if the proposed access location is appropriate, ISD and SSD analyses have been conducted for both left and right turns out of the access, as discussed previously.

6.4 SIGHTLINE ANALYSIS CONCLUSION

Overall, the proposed access is deemed to be acceptable under the three (3) Water Street scenarios. To further ensure reduced vehicle speeds at the sharp bend on Water Street, advisory signage can be added per OTM Book 6. Potential signs to be added include Wa-2R with Wa-7T, Wa-8R or Wa-15A.

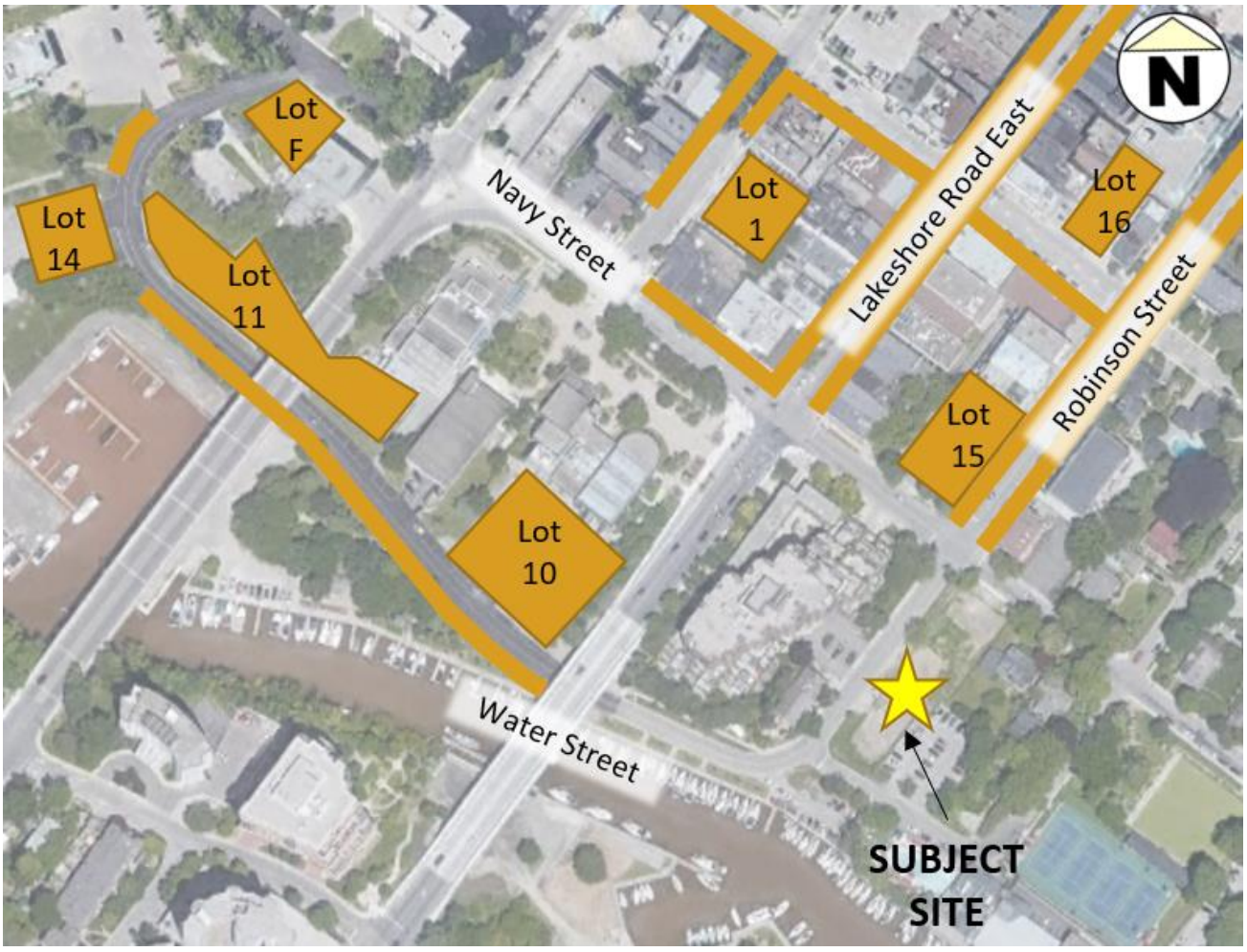
7 PARKING REVIEW

Parking regulations for the site are governed by the Town of Oakville Zoning By-Law 2014-014. The Zoning By-law requires two (2) spaces to be provided per townhouse dwelling unit. No visitor parking is required for freehold townhouse units.

As the subject development is proposing 10 townhouse units, a total of 20 parking spaces are required. This requirement will be met, with each unit having two (2) parking spaces in the underground garage.

Visitor parking is not required for the site. There is an abundance of public parking available within the vicinity, including on-street parking and public lots 1, 10, 11, 14, 15 and F.

Figure 7-1: Public Parking Near the Subject Site



Bicycle parking requirements were reviewed, and it was determined that no bicycle parking is required for townhome units.

8 CONSTRUCTION MANAGEMENT PLAN

A construction management plan has been developed for the site, and is attached as **Appendix F**. All construction activities will occur within the bounds of the property, and construction vehicle traffic will be managed through two gates onto Robinson Street. Certified Traffic Control Flagmen will be present at each gate to regulate traffic and pedestrians when trucks are entering or exiting the site.

10 CONCLUSIONS AND RECOMMENDATIONS

- The proposed development will introduce 10 townhouse units with 20 total parking spaces to a vacant lot located on Robinson Street between Water Street and Navy Street in the Town of Oakville. The subject site will be accessible via a proposed site driveway accessed from Water Street.
- The subject site is served by a single Oakville Transit bus route, which provides access to shopping, community facilities and the Oakville GO Station. There are also many active transportation facilities in the area, including trails along the waterfront and bike lanes on Robinson Street, Lakeshore Road East and Church Street.
- Under existing conditions, all intersections in the study area are operating with residual capacity and acceptable LOS during the weekday PM and Saturday midday peak hours.
- The proposed development is anticipated to generate 5 two-way trips (3 inbound and 2 outbound) during the weekday PM peak hour and 4 two-way trips (2 inbound and 2 outbound) during the Saturday peak hour.
- Under future total conditions, all studied intersections operate similarly to existing conditions with the added site traffic on the surrounding road network. As no capacity constraints are identified, no signal timing or roadway modifications are recommended. The subject development is not anticipated to have an adverse impact on the surrounding road network.
- Three potential Water Street configurations were assessed – one-way southbound, one-way northbound and two-way. All scenarios perform well and have negligible differences with the low traffic volumes present in the area.
- The subject site meets the zoning by-law requirements for parking.
- A site access review has been completed for the ZBA application. Overall, the site access provides acceptable sightline distances for intersection sight distance and stopping sight distance. Advisory signage is recommended to ensure reduced vehicle speeds at the bend on Water Street.
- A construction management plan was also prepared for the application.

APPENDIX A

Existing Traffic Data

LEA Consulting Ltd.

625 Cochrane Drive, 5th Floor
Markham, ON L3R 9R9

Project No.: 24009
Intersection: Navy St & Robinson St
Weather: Light Snow
Surveyor(s): ID

File Name : Navy St & Robinson St- PM
Site Code : 00024009
Start Date : 2023-04-18
Page No : 1

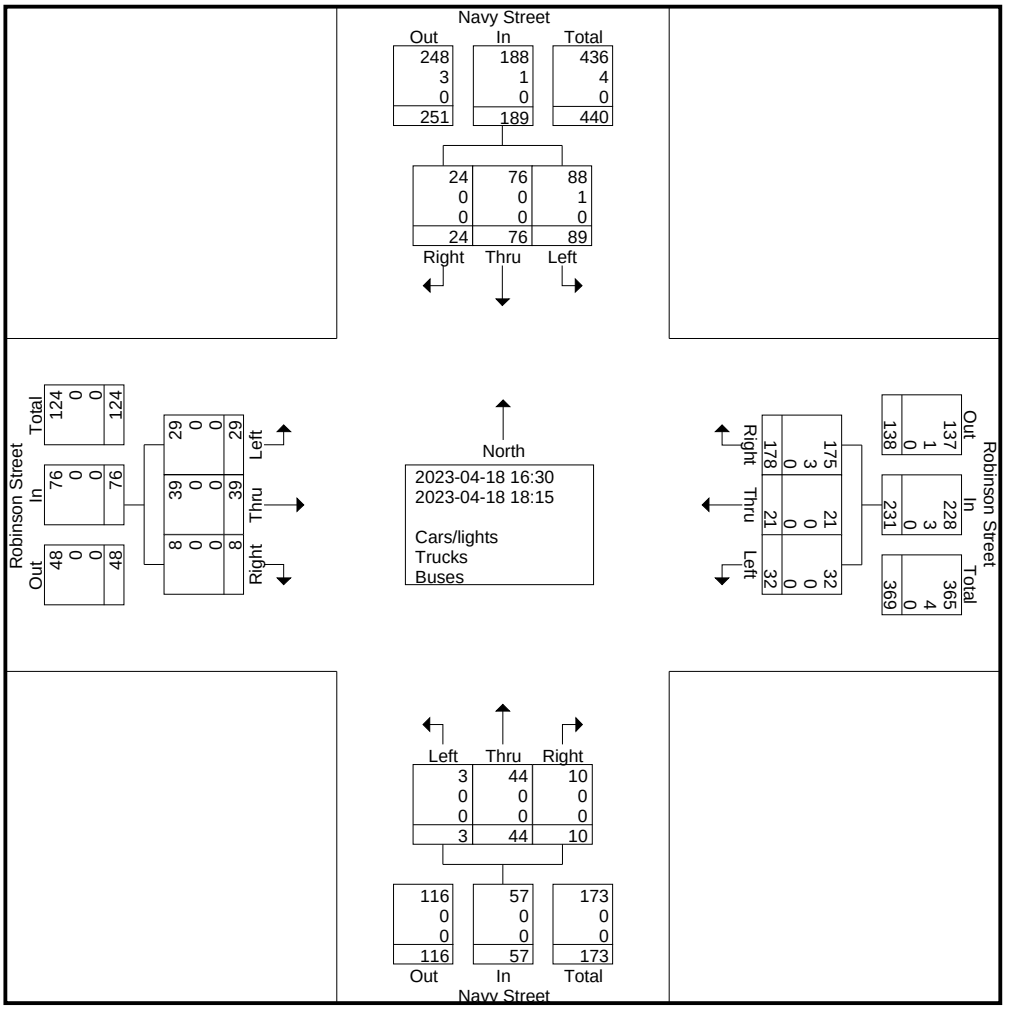
Groups Printed- Cars/lights - Trucks - Buses

	Navy Street Southbound					Robinson Street Westbound					Navy Street Northbound					Robinson Street Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
16:30	14	7	3	[3]	24	3	2	27	[10]	32	0	5	0	[0]	5	3	10	0	[2]	13	15	74	89
16:45	11	8	3	[0]	22	2	3	37	[5]	42	0	7	4	[0]	11	8	3	1	[5]	12	10	87	97
Total	25	15	6	[3]	46	5	5	64	[15]	74	0	12	4	[0]	16	11	13	1	[7]	25	25	161	186
17:00	10	9	3	[1]	22	6	2	29	[5]	37	0	8	2	[0]	10	3	4	3	[3]	10	9	79	88
17:15	9	12	3	[1]	24	6	5	22	[3]	33	1	8	0	[3]	9	4	6	1	[8]	11	15	77	92
17:30	11	8	1	[0]	20	3	3	20	[2]	26	0	2	2	[0]	4	2	6	0	[4]	8	6	58	64
17:45	14	8	3	[0]	25	2	0	12	[0]	14	0	8	1	[1]	9	3	4	1	[9]	8	10	56	66
Total	44	37	10	[2]	91	17	10	83	[10]	110	1	26	5	[4]	32	12	20	5	[24]	37	40	270	310
18:00	5	12	6	[1]	23	7	4	17	[6]	28	2	4	1	[0]	7	2	2	1	[2]	5	9	63	72
18:15	15	12	2	[4]	29	3	2	14	[2]	19	0	2	0	[1]	2	4	4	1	[5]	9	12	59	71
Grand Total	89	76	24	[10]	189	32	21	178	[33]	231	3	44	10	[5]	57	29	39	8	[38]	76	86	553	639
Apprch %	47.1	40.2	12.7			13.9	9.1	77.1			5.3	77.2	17.5			38.2	51.3	10.5					
Total %	16.1	13.7	4.3		34.2	5.8	3.8	32.2		41.8	0.5	8	1.8		10.3	5.2	7.1	1.4		13.7	13.5	86.5	
Cars/lights	88	76	24		198	32	21	175		254	3	44	10		62	29	39	8		114	0	0	628
% Cars/lights	98.9	100	100	100	99.5	100	100	98.3	78.8	96.2	100	100	100	100	100	100	100	100	100	100	0	0	98.3
Trucks	1	0	0		1	0	0	3		10	0	0	0		0	0	0	0		0	0	0	11
% Trucks	1.1	0	0	0	0.5	0	0	1.7	21.2	3.8	0	0	0	0	0	0	0	0	0	0	0	0	1.7
Buses	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

LEA Consulting Ltd.

625 Cochrane Drive, 5th Floor
Markham, ON L3R 9R9

File Name : Navy St & Robinson St- PM
Site Code : 00024009
Start Date : 2023-04-18
Page No : 2

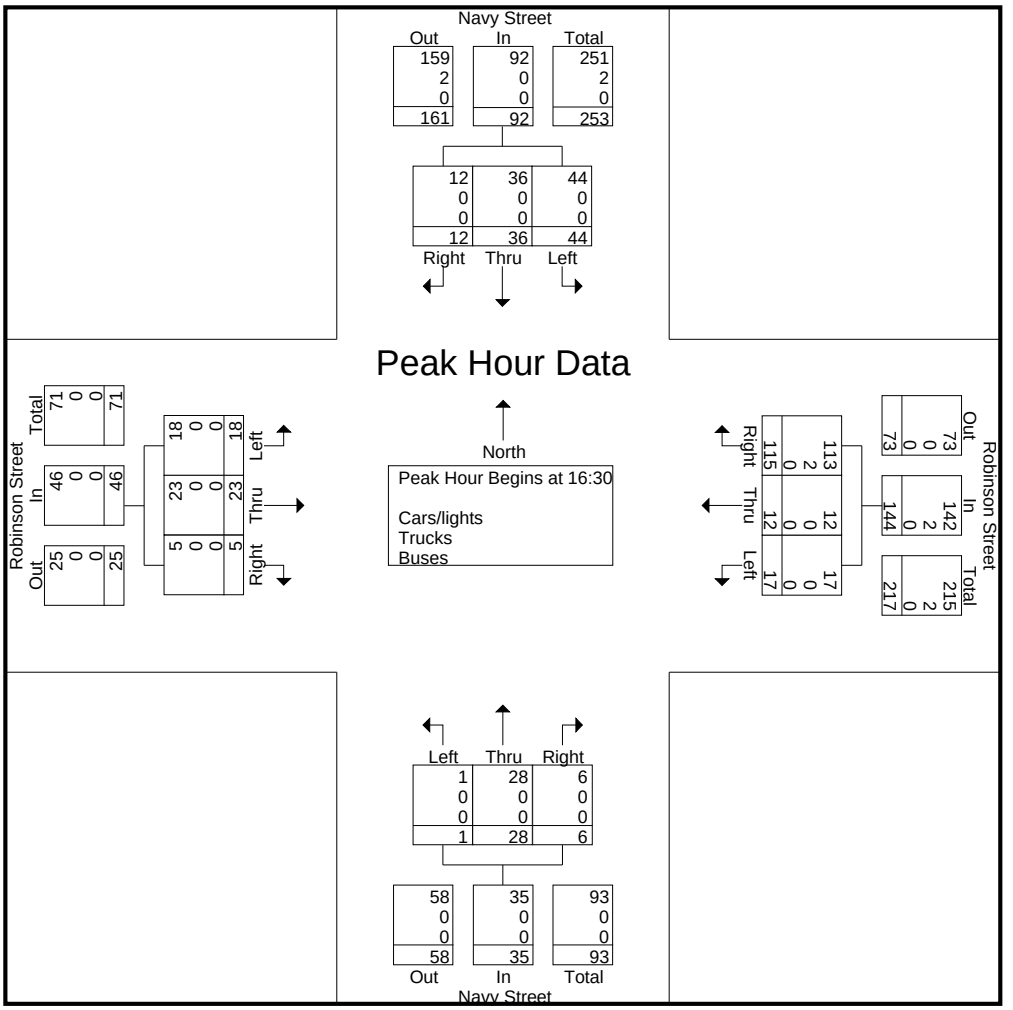


LEA Consulting Ltd.

625 Cochrane Drive, 5th Floor
Markham, ON L3R 9R9

File Name : Navy St & Robinson St- PM
Site Code : 00024009
Start Date : 2023-04-18
Page No : 3

	Navy Street Southbound				Robinson Street Westbound				Navy Street Northbound				Robinson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 16:30 to 18:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	**14**	7	**3**	**24**	3	2	27	32	0	5	0	5	3	**10**	0	**13**	74
16:45	11	8	3	22	2	3	**37**	**42**	0	7	**4**	**11**	**8**	3	1	12	**87**
17:00	10	9	3	22	**6**	2	29	37	0	**8**	2	10	3	4	**3**	10	79
17:15	9	**12**	3	24	6	**5**	22	33	**1**	8	0	9	4	6	1	11	77
Total Volume	44	36	12	92	17	12	115	144	1	28	6	35	18	23	5	46	317
% App. Total	47.8	39.1	13		11.8	8.3	79.9		2.9	80	17.1		39.1	50	10.9		
PHF	.786	.750	1.00	.958	.708	.600	.777	.857	.250	.875	.375	.795	.563	.575	.417	.885	.911
Cars/lights	44	36	12	92	17	12	113	142	1	28	6	35	18	23	5	46	315
% Cars/lights	100	100	100	100	100	100	98.3	98.6	100	100	100	100	100	100	100	100	99.4
Trucks	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	2
% Trucks	0	0	0	0	0	0	1.7	1.4	0	0	0	0	0	0	0	0	0.6
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



LEA Consulting Ltd.

625 Cochrane Drive, 5th Floor
Markham, ON L3R 9R9

Project No.: 24009
Intersection: Navy St & Robinson St
Weather: Raining
Surveyor(s): KL

File Name : Navy St & Robinson St- SAT
Site Code : 00024009
Start Date : 2023-04-22
Page No : 1

Groups Printed- Cars/lights - Trucks - Buses

	Navy Street Southbound					Robinson Street Westbound					Navy Street Northbound					Robinson Street Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
10:00	8	13	2	[0]	23	1	2	14	[6]	17	0	8	2	[0]	10	4	2	0	[5]	6	11	56	67
10:15	8	12	2	[0]	22	3	4	17	[5]	24	0	8	1	[0]	9	6	3	0	[1]	9	6	64	70
10:30	12	8	3	[0]	23	1	6	14	[0]	21	0	11	1	[0]	12	9	5	0	[4]	14	4	70	74
10:45	13	8	2	[0]	23	7	0	26	[3]	33	0	5	0	[1]	5	1	5	0	[2]	6	6	67	73
Total	41	41	9	[0]	91	12	12	71	[14]	95	0	32	4	[1]	36	20	15	0	[12]	35	27	257	284
11:00	24	7	5	[1]	36	6	2	14	[6]	22	0	8	0	[1]	8	3	6	0	[3]	9	11	75	86
11:15	11	3	3	[0]	17	4	0	21	[3]	25	1	5	0	[0]	6	3	7	0	[0]	10	3	58	61
11:30	19	15	2	[2]	36	3	1	14	[4]	18	0	4	0	[1]	4	2	5	1	[0]	8	7	66	73
11:45	15	23	3	[0]	41	3	4	19	[5]	26	0	6	0	[0]	6	4	4	1	[0]	9	5	82	87
Total	69	48	13	[3]	130	16	7	68	[18]	91	1	23	0	[2]	24	12	22	2	[3]	36	26	281	307
12:00	22	10	3	[0]	35	3	1	14	[2]	18	0	14	0	[0]	14	5	2	0	[1]	7	3	74	77
12:15	15	4	4	[0]	23	1	1	21	[1]	23	0	7	0	[0]	7	4	4	0	[1]	8	2	61	63
12:30	15	13	6	[1]	34	2	0	10	[3]	12	0	6	0	[0]	6	1	4	1	[1]	6	5	58	63
12:45	19	13	0	[3]	32	0	3	19	[2]	22	0	7	1	[1]	8	3	3	0	[0]	6	6	68	74
Total	71	40	13	[4]	124	6	5	64	[8]	75	0	34	1	[1]	35	13	13	1	[3]	27	16	261	277
13:00	13	9	8	[0]	30	5	2	14	[4]	21	0	7	1	[1]	8	5	5	0	[4]	10	9	69	78
13:15	22	11	10	[3]	43	3	5	24	[20]	32	0	2	1	[0]	3	4	7	0	[5]	11	28	89	117
13:30	25	11	12	[2]	48	1	2	12	[17]	15	0	10	0	[2]	10	6	2	1	[7]	9	28	82	110
13:45	23	17	2	[0]	42	3	2	24	[12]	29	0	7	2	[0]	9	5	1	1	[9]	7	21	87	108
Total	83	48	32	[5]	163	12	11	74	[53]	97	0	26	4	[3]	30	20	15	2	[25]	37	86	327	413
14:00	17	13	3	[1]	33	5	3	22	[14]	30	0	9	0	[0]	9	4	4	2	[4]	10	19	82	101
14:15	33	9	6	[2]	48	8	2	27	[10]	37	0	15	2	[0]	17	5	2	3	[8]	10	20	112	132
14:30	23	14	2	[0]	39	4	2	21	[11]	27	0	7	2	[1]	9	2	2	1	[3]	5	15	80	95
14:45	15	16	4	[2]	35	1	3	24	[5]	28	1	4	0	[4]	5	2	10	2	[7]	14	18	82	100
Total	88	52	15	[5]	155	18	10	94	[40]	122	1	35	4	[5]	40	13	18	8	[22]	39	72	356	428
Grand Total	352	229	82	[17]	663	64	45	371	[{\fs15133}]	480	2	150	13	[12]	165	78	83	13	[65]	174	227	1482	1709
Apprch %	53.1	34.5	12.4			13.3	9.4	77.3			1.2	90.9	7.9			44.8	47.7	7.5					
Total %	23.8	15.5	5.5		44.7	4.3	3	25		32.4	0.1	10.1	0.9		11.1	5.3	5.6	0.9		11.7	13.3	86.7	
Cars/lights	352	227	82		672	64	45	367		609	2	149	13		176	78	83	13		239	0	0	1696
% Cars/lights	100	99.1	100	64.7	98.8	100	100	98.9	100	99.3	100	99.3	100	100	99.4	100	100	100	100	100	0	0	99.2
Trucks	0	2	0		8	0	0	4		4	0	1	0		1	0	0	0		0	0	0	13
% Trucks	0	0.9	0	35.3	1.2	0	0	1.1	0	0.7	0	0.7	0	0	0.6	0	0	0	0	0	0	0	0.8
Buses	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

LEA Consulting Ltd.

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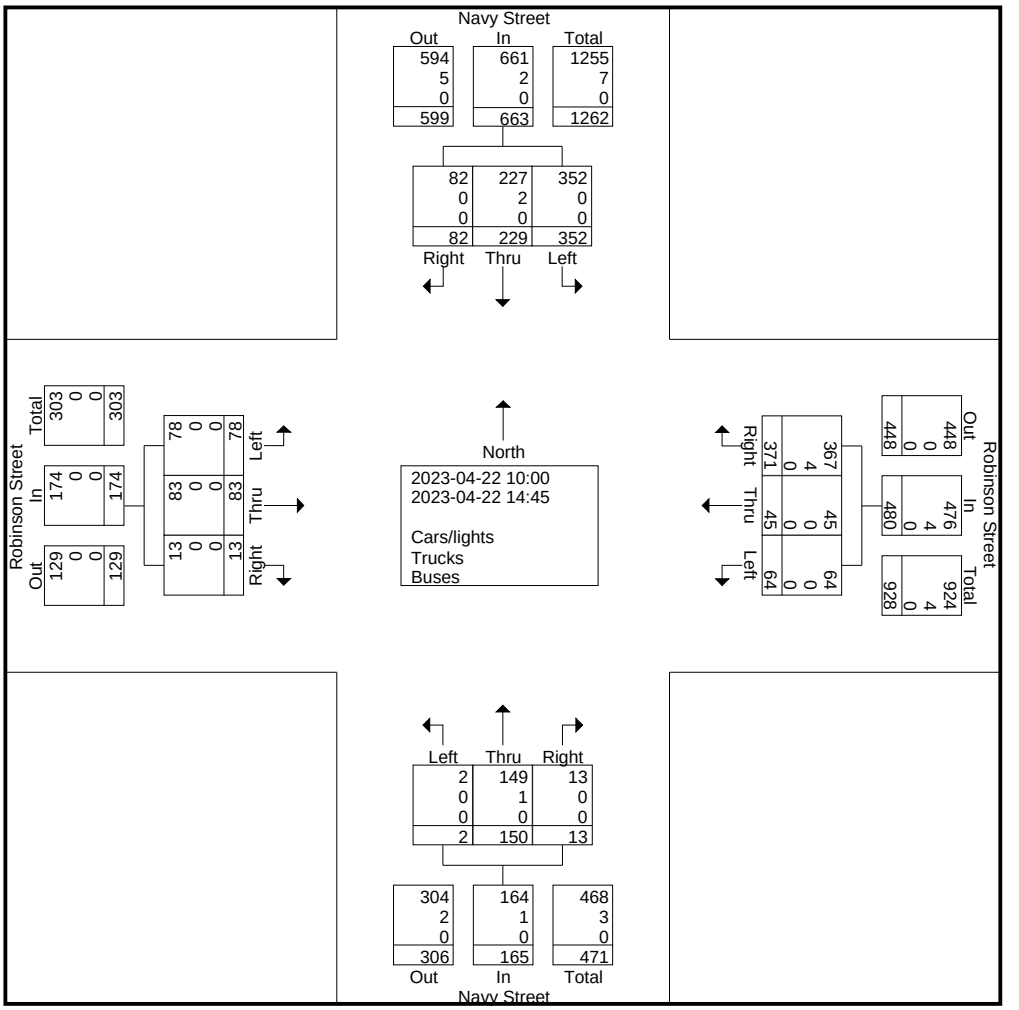

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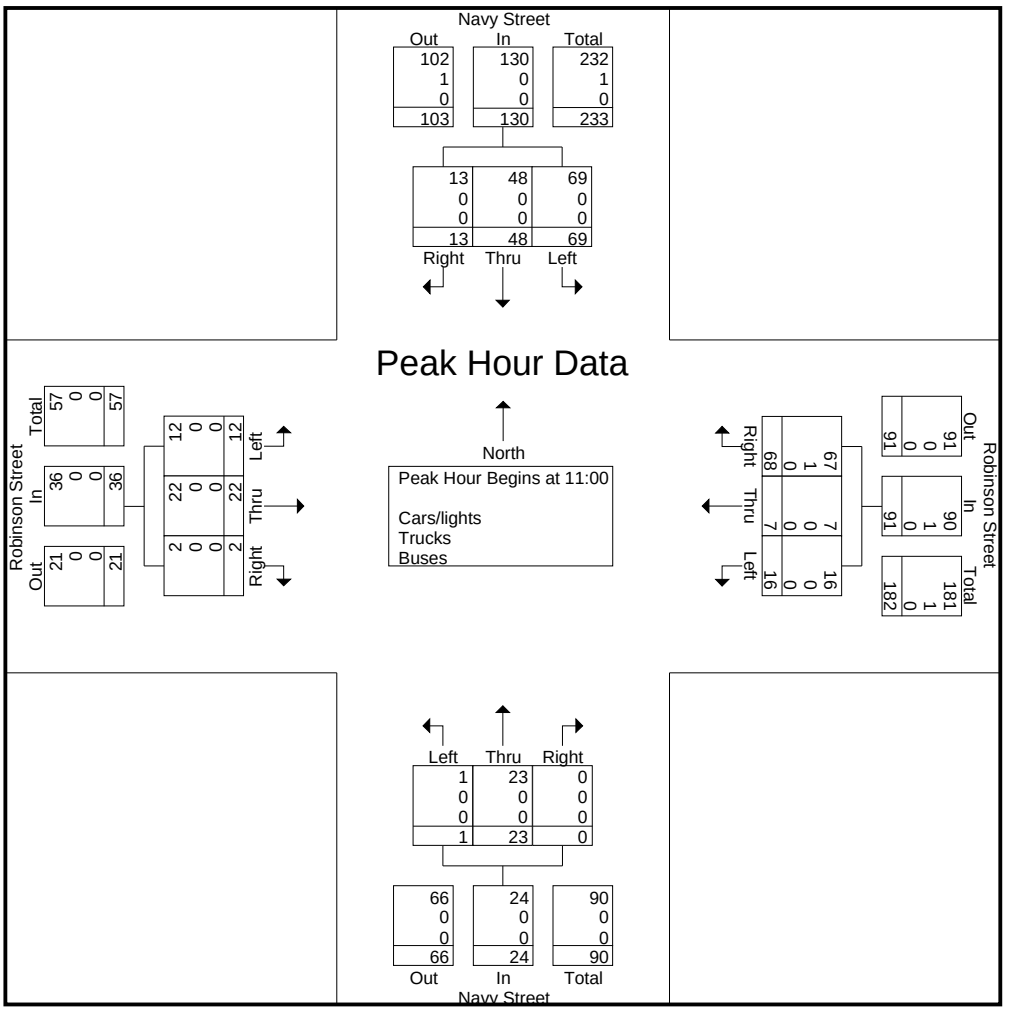
File Name : Navy St & Robinson St- SAT
Site Code : 00024009
Start Date : 2023-04-22
Page No : 3

	Navy Street Southbound				Robinson Street Westbound				Navy Street Northbound				Robinson Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 to 11:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:00																	
11:00	**24**	7	**5**	36	**6**	2	14	22	0	**8**	0	**8**	3	6	0	9	75
11:15	11	3	3	17	4	0	**21**	25	**1**	5	0	6	3	**7**	0	**10**	58
11:30	19	15	2	36	3	1	14	18	0	4	0	4	2	5	**1**	8	66
11:45	15	**23**	3	**41**	3	**4**	19	**26**	0	6	0	6	**4**	4	1	9	**82**
Total Volume	69	48	13	130	16	7	68	91	1	23	0	24	12	22	2	36	281
% App. Total	53.1	36.9	10		17.6	7.7	74.7		4.2	95.8	0		33.3	61.1	5.6		
PHF	.719	.522	.650	.793	.667	.438	.810	.875	.250	.719	.000	.750	.750	.786	.500	.900	.857
Cars/lights	69	48	13	130	16	7	67	90	1	23	0	24	12	22	2	36	280
% Cars/lights	100	100	100	100	100	100	98.5	98.9	100	100	0	100	100	100	100	100	99.6
Trucks	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
% Trucks	0	0	0	0	0	0	1.5	1.1	0	0	0	0	0	0	0	0	0.4
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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625 Cochrane Drive, 5th Floor
Markham, ON L3R 9R9

Project No.: 24009
Intersection: Navy St & William St
Weather: Light Snow
Surveyor(s): JX

File Name : Navy St & William St - PM
Site Code : 00024009
Start Date : 2023-04-18
Page No : 1

Groups Printed- Cars/lights - Trucks - Buses

	Navy Street Southbound					William Street Westbound					Navy Street Northbound					William Street Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
16:30	1	3	7	[0]	11	0	0	0	[0]	0	1	4	1	[0]	6	0	0	0	[0]	0	0	17	17
16:45	1	7	4	[0]	12	0	0	0	[0]	0	0	11	0	[0]	11	0	0	0	[0]	0	0	23	23
Total	2	10	11	[0]	23	0	0	0	[0]	0	1	15	1	[0]	17	0	0	0	[0]	0	0	40	40
17:00	3	4	7	[0]	14	0	0	1	[0]	1	0	6	1	[0]	7	0	1	0	[0]	1	0	23	23
17:15	1	10	9	[0]	20	0	1	0	[0]	1	0	6	2	[0]	8	0	0	0	[0]	0	0	29	29
17:30	2	6	6	[0]	14	0	0	0	[0]	0	0	1	0	[0]	1	1	0	0	[0]	1	0	16	16
17:45	0	5	8	[0]	13	0	0	4	[0]	4	2	5	0	[0]	7	0	0	0	[0]	0	0	24	24
Total	6	25	30	[0]	61	0	1	5	[0]	6	2	18	3	[0]	23	1	1	0	[0]	2	0	92	92
18:00	0	12	6	[0]	18	0	0	1	[0]	1	0	5	1	[0]	6	0	0	0	[0]	0	0	25	25
18:15	0	9	7	[0]	16	0	0	0	[0]	0	0	1	0	[0]	1	0	0	1	[0]	1	0	18	18
Grand Total	8	56	54	[0]	118	0	1	6	[0]	7	3	39	5	[0]	47	1	1	1	[0]	3	0	175	175
Apprch %	6.8	47.5	45.8			0	14.3	85.7			6.4	83	10.6			33.3	33.3	33.3					
Total %	4.6	32	30.9		67.4	0	0.6	3.4		4	1.7	22.3	2.9		26.9	0.6	0.6	0.6		1.7	0	100	
Cars/lights	8	56	54		118	0	1	6		7	3	39	5		47	1	1	1		3	0	0	175
% Cars/lights	100	100	100	0	100	0	100	100	0	100	100	100	100	0	100	100	100	100	0	100	0	0	100
Trucks	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0
% Trucks	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	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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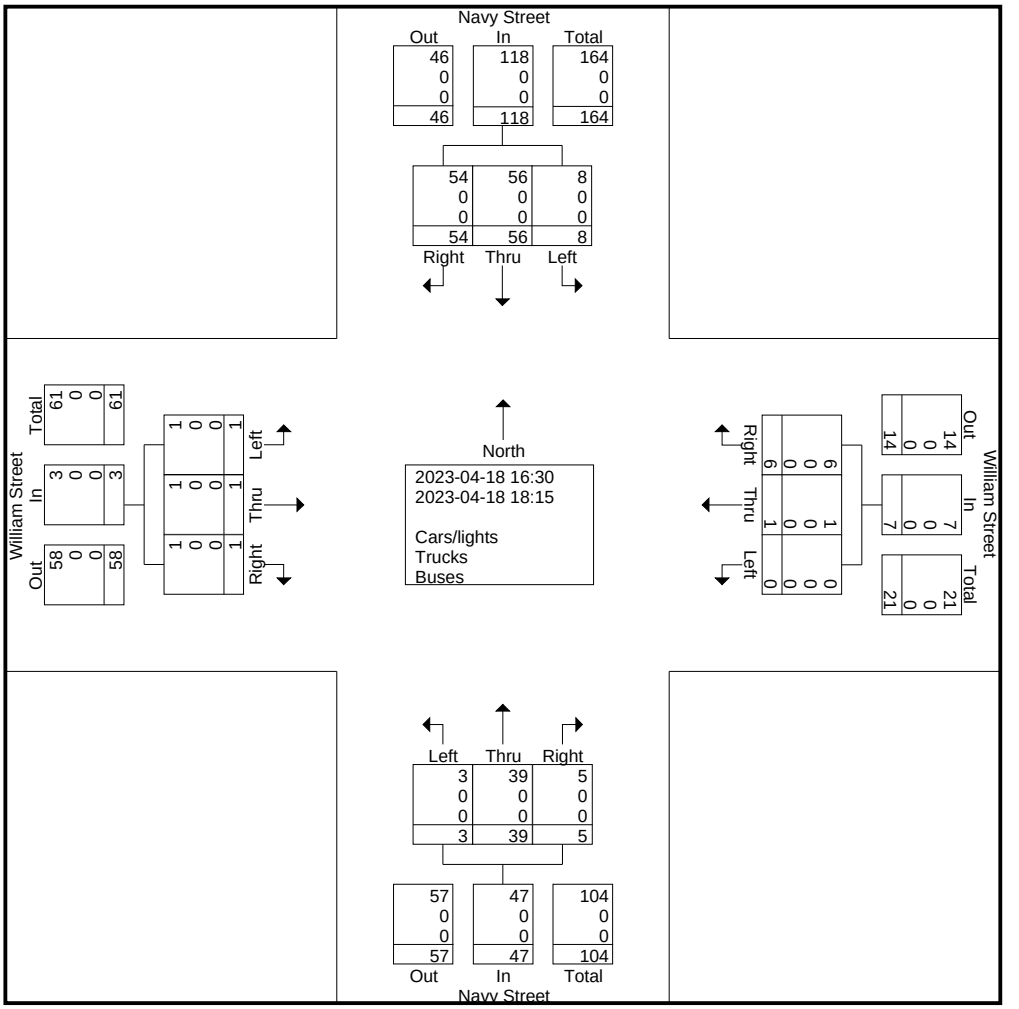
File Name : Navy St & William St - PM
Site Code : 00024009
Start Date : 2023-04-18
Page No : 2

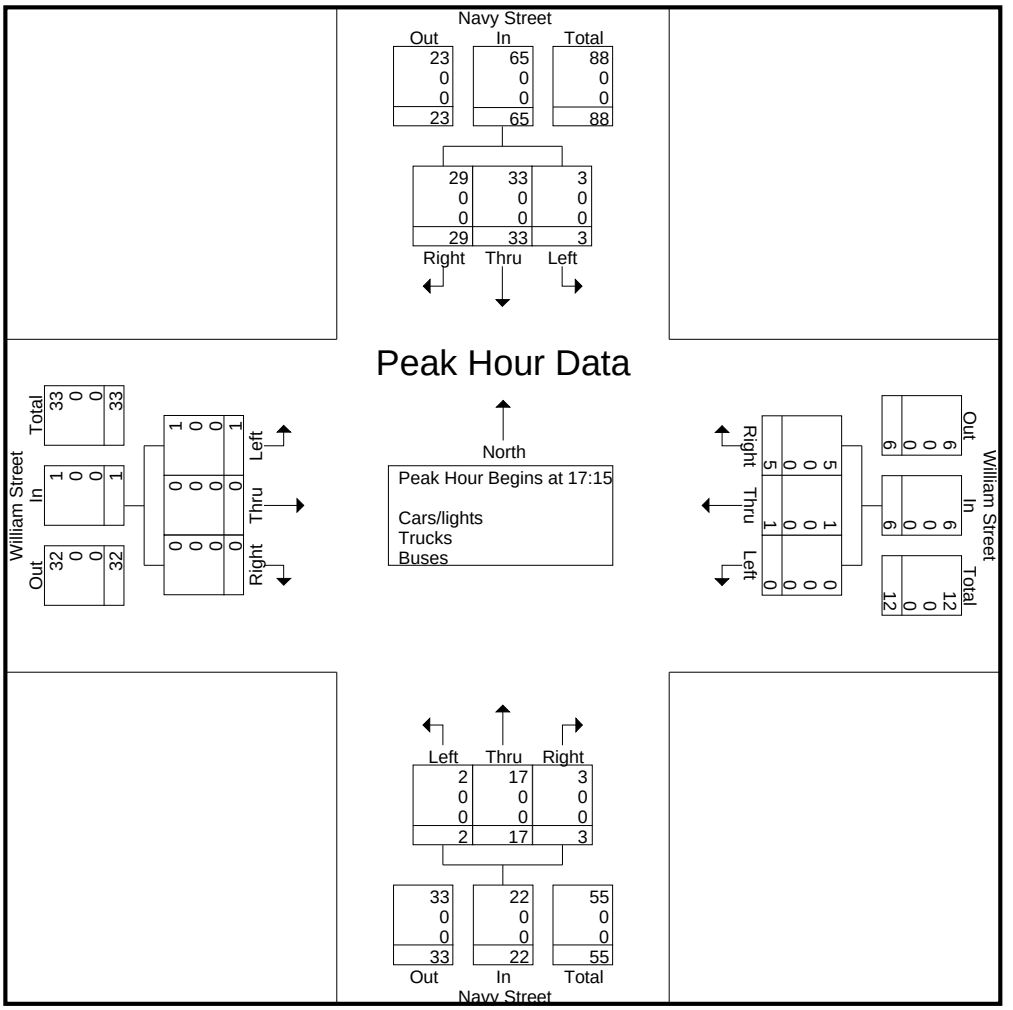


LEA Consulting Ltd.

625 Cochrane Drive, 5th Floor
Markham, ON L3R 9R9

File Name : Navy St & William St - PM
Site Code : 00024009
Start Date : 2023-04-18
Page No : 3

	Navy Street Southbound				William Street Westbound				Navy Street Northbound				William Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 16:30 to 18:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:15																	
17:15	1	10	**9**	**20**	0	**1**	0	1	0	**6**	**2**	**8**	0	0	0	0	**29**
17:30	**2**	6	6	14	0	0	0	0	0	1	0	1	**1**	0	0	**1**	16
17:45	0	5	8	13	0	0	**4**	**4**	**2**	5	0	7	0	0	0	0	24
18:00	0	**12**	6	18	0	0	1	1	0	5	1	6	0	0	0	0	25
Total Volume	3	33	29	65	0	1	5	6	2	17	3	22	1	0	0	1	94
% App. Total	4.6	50.8	44.6		0	16.7	83.3		9.1	77.3	13.6		100	0	0		
PHF	.375	.688	.806	.813	.000	.250	.313	.375	.250	.708	.375	.688	.250	.000	.000	.250	.810
Cars/lights	3	33	29	65	0	1	5	6	2	17	3	22	1	0	0	1	94
% Cars/lights	100	100	100	100	0	100	100	100	100	100	100	100	100	0	0	100	100
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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625 Cochrane Drive, 5th Floor
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Project No.: 24009
Intersection: Navy St & William St
Weather: Raining
Surveyor(s): ML

File Name : Navy St & William St - SAT
Site Code : 00024009
Start Date : 2023-04-22
Page No : 1

Groups Printed- Cars/lights - Trucks - Buses

	Navy Street Southbound					William Street Westbound					Navy Street Northbound					William Street Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
10:00	5	6	2	[1]	13	0	2	3	[6]	5	1	5	1	[1]	7	0	0	0	[0]	0	8	25	33
10:15	6	6	3	[0]	15	0	0	0	[2]	0	0	8	0	[1]	8	0	0	0	[2]	0	5	23	28
10:30	3	4	2	[0]	9	0	0	1	[0]	1	0	10	1	[0]	11	0	0	0	[4]	0	4	21	25
10:45	1	7	7	[1]	15	1	0	0	[2]	1	0	5	1	[4]	6	0	0	0	[5]	0	12	22	34
Total	15	23	14	[2]	52	1	2	4	[10]	7	1	28	3	[6]	32	0	0	0	[11]	0	29	91	120
11:00	3	3	5	[1]	11	0	0	1	[4]	1	0	8	1	[0]	9	0	0	0	[2]	0	7	21	28
11:15	2	4	3	[0]	9	1	2	2	[1]	5	0	5	0	[0]	5	0	0	0	[1]	0	2	19	21
11:30	6	9	4	[0]	19	0	0	1	[0]	1	0	3	1	[0]	4	0	0	0	[0]	0	0	24	24
11:45	2	14	10	[0]	26	1	1	0	[1]	2	0	6	4	[0]	10	0	0	0	[0]	0	1	38	39
Total	13	30	22	[1]	65	2	3	4	[6]	9	0	22	6	[0]	28	0	0	0	[3]	0	10	102	112
12:00	1	6	6	[0]	13	1	0	4	[2]	5	0	9	0	[1]	9	0	0	0	[0]	0	3	27	30
12:15	1	2	1	[0]	4	0	0	4	[1]	4	0	5	2	[0]	7	0	1	0	[0]	1	1	16	17
12:30	4	10	1	[1]	15	0	0	1	[3]	1	0	5	0	[0]	5	0	0	0	[0]	0	4	21	25
12:45	4	9	1	[0]	14	1	0	2	[0]	3	0	6	1	[0]	7	0	0	0	[0]	0	0	24	24
Total	10	27	9	[1]	46	2	0	11	[6]	13	0	25	3	[1]	28	0	1	0	[0]	1	8	88	96
13:00	2	10	2	[1]	14	0	0	2	[4]	2	0	6	0	[2]	6	0	0	0	[7]	0	14	22	36
13:15	6	5	3	[2]	14	1	1	1	[11]	3	0	1	0	[0]	1	0	0	0	[6]	0	19	18	37
13:30	6	7	1	[0]	14	0	1	4	[11]	5	1	6	1	[0]	8	0	0	0	[7]	0	18	27	45
13:45	5	8	5	[3]	18	2	0	6	[9]	8	0	3	0	[0]	3	0	0	0	[8]	0	20	29	49
Total	19	30	11	[6]	60	3	2	13	[35]	18	1	16	1	[2]	18	0	0	0	[28]	0	71	96	167
14:00	3	12	4	[0]	19	1	0	1	[6]	2	1	6	0	[2]	7	0	0	0	[1]	0	9	28	37
14:15	4	13	3	[2]	20	2	0	5	[15]	7	1	10	0	[2]	11	0	0	0	[7]	0	26	38	64
14:30	2	8	9	[2]	19	1	0	1	[5]	2	0	9	0	[4]	9	0	0	0	[5]	0	16	30	46
14:45	3	11	4	[4]	18	0	0	1	[1]	1	0	3	0	[0]	3	0	0	0	[2]	0	7	22	29
Total	12	44	20	[8]	76	4	0	8	[27]	12	2	28	0	[8]	30	0	0	0	[15]	0	58	118	176
Grand Total	69	154	76	[18]	299	12	7	40	[84]	59	4	119	13	[17]	136	0	1	0	[57]	1	176	495	671
Apprch %	23.1	51.5	25.4			20.3	11.9	67.8			2.9	87.5	9.6			0	100	0					
Total %	13.9	31.1	15.4		60.4	2.4	1.4	8.1		11.9	0.8	24	2.6		27.5	0	0.2	0		0.2	26.2	73.8	
Cars/lights	69	152	76		314	12	7	40		143	4	118	13		152	0	1	0		58	0	0	667
% Cars/lights	100	98.7	100	94.4	99.1	100	100	100	100	100	100	99.2	100	100	99.3	0	100	0	100	100	0	0	99.4
Trucks	0	2	0		3	0	0	0		0	0	1	0		1	0	0	0		0	0	0	4
% Trucks	0	1.3	0	5.6	0.9	0	0	0	0	0	0	0.8	0	0	0.7	0	0	0	0	0	0	0	0.6
Buses	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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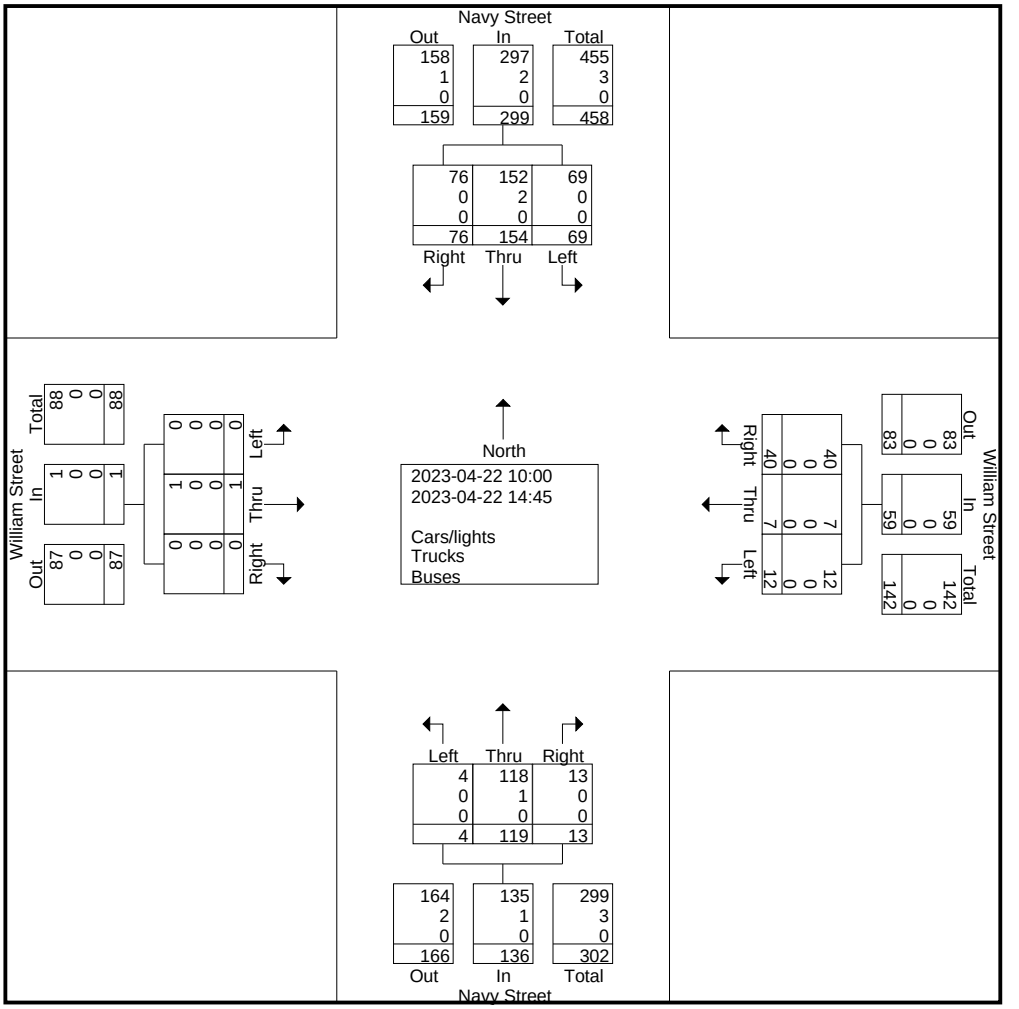
625 Cochrane Drive, 5th Floor
Markham, ON L3R 9R9

File Name : Navy St & William St - SAT
Site Code : 00024009
Start Date : 2023-04-22
Page No : 2



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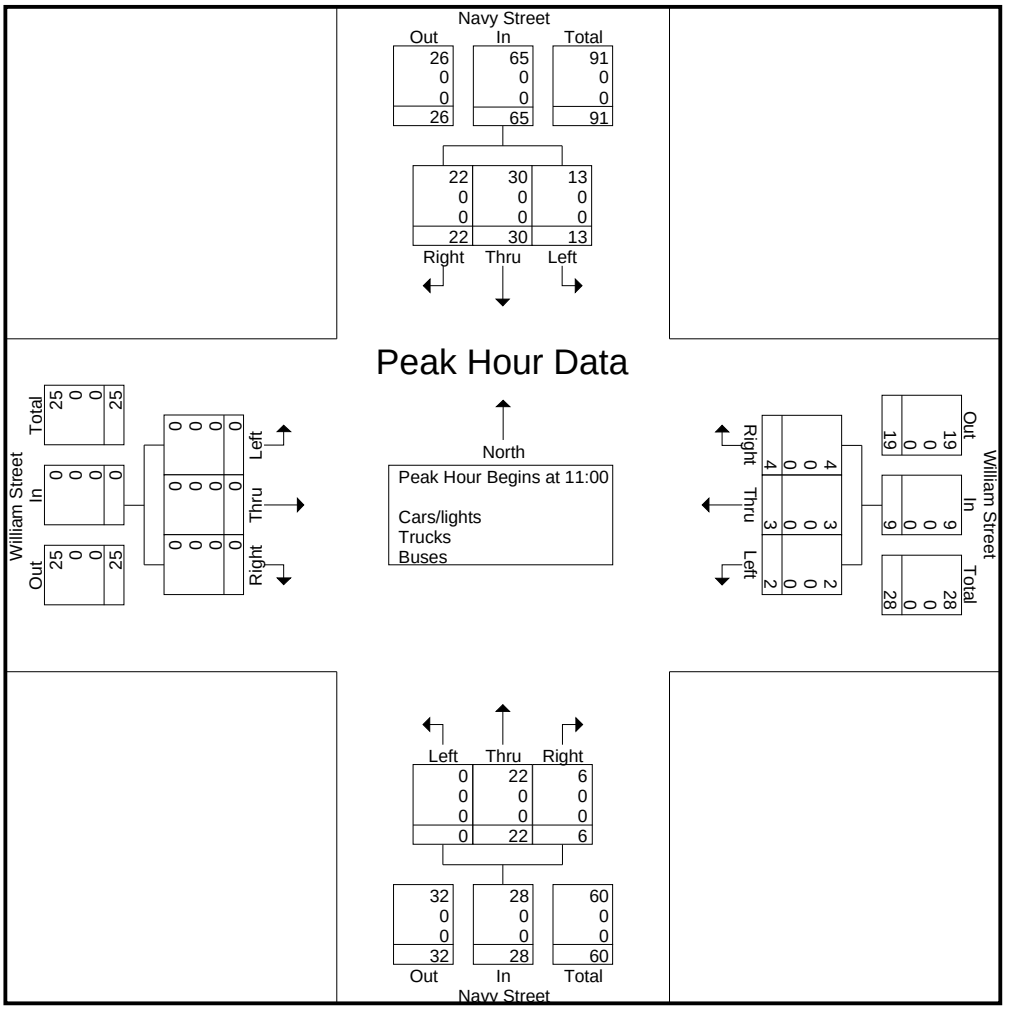
625 Cochrane Drive, 5th Floor
Markham, ON L3R 9R9

File Name : Navy St & William St - SAT
Site Code : 00024009
Start Date : 2023-04-22
Page No : 3

	Navy Street Southbound				William Street Westbound				Navy Street Northbound				William Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 to 11:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:00																	
11:00	3	3	5	11	0	0	1	1	0	**8**	1	9	0	0	0	0	21
11:15	2	4	3	9	**1**	**2**	**2**	**5**	0	5	0	5	0	0	0	0	19
11:30	**6**	9	4	19	0	0	1	1	0	3	1	4	0	0	0	0	24
11:45	2	**14**	**10**	**26**	1	1	0	2	0	6	**4**	**10**	0	0	0	0	**38**
Total Volume	13	30	22	65	2	3	4	9	0	22	6	28	0	0	0	0	102
% App. Total	20	46.2	33.8		22.2	33.3	44.4		0	78.6	21.4		0	0	0		
PHF	.542	.536	.550	.625	.500	.375	.500	.450	.000	.688	.375	.700	.000	.000	.000	.000	.671
Cars/lights	13	30	22	65	2	3	4	9	0	22	6	28	0	0	0	0	102
% Cars/lights	100	100	100	100	100	100	100	100	0	100	100	100	0	0	0	0	100
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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625 Cochrane Drive, 5th Floor
Markham, ON L3R 9R9

Project No.: 24009
Intersection: Water St & Robinson St
Weather: Light Snow
Surveyor(s): ID

File Name : Water St & Robinson St - PM
Site Code : 00024009
Start Date : 2023-04-18
Page No : 1

Groups Printed- Cars/lights - Trucks - Buses

	Robinson Street Westbound				Water Street Northbound				Water Street Eastbound						
Start Time	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
16:30	0	3	[1]	3	0	6	[0]	6	5	0	[1]	5	2	14	16
16:45	0	4	[0]	4	0	8	[0]	8	4	0	[0]	4	0	16	16
Total	0	7	[1]	7	0	14	[0]	14	9	0	[1]	9	2	30	32
17:00	0	4	[0]	4	2	1	[1]	3	3	0	[1]	3	2	10	12
17:15	0	7	[0]	7	0	6	[0]	6	4	0	[0]	4	0	17	17
17:30	0	2	[0]	2	0	6	[0]	6	1	0	[0]	1	0	9	9
17:45	0	4	[1]	4	2	6	[0]	8	3	0	[0]	3	1	15	16
Total	0	17	[1]	17	4	19	[1]	23	11	0	[1]	11	3	51	54
18:00	0	12	[0]	12	0	5	[0]	5	1	0	[0]	1	0	18	18
18:15	0	2	[0]	2	2	4	[0]	6	1	0	[0]	1	0	9	9
Grand Total	0	38	[2]	38	6	42	[1]	48	22	0	[2]	22	5	108	113
Apprch %	0	100			12.5	87.5			100	0					
Total %	0	35.2		35.2	5.6	38.9		44.4	20.4	0		20.4	4.4	95.6	
Cars/lights	0	38		40	6	42		49	22	0		24	0	0	113
% Cars/lights	0	100	100	100	100	100	100	100	100	0	100	100	0	0	100
Trucks	0	0		0	0	0		0	0	0		0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Buses	0	0		0	0	0		0	0	0		0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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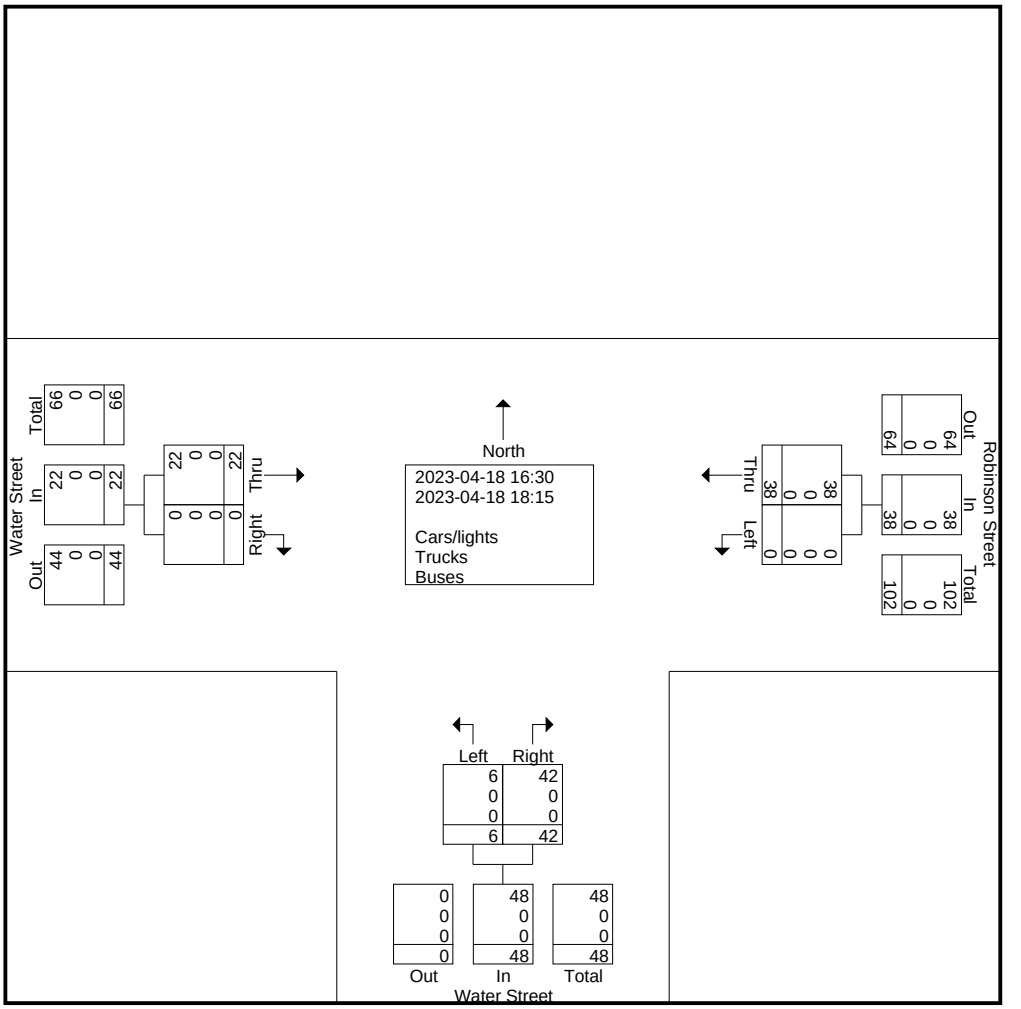
625 Cochrane Drive, 5th Floor
Markham, ON L3R 9R9

File Name : Water St & Robinson St - PM
Site Code : 00024009
Start Date : 2023-04-18
Page No : 2

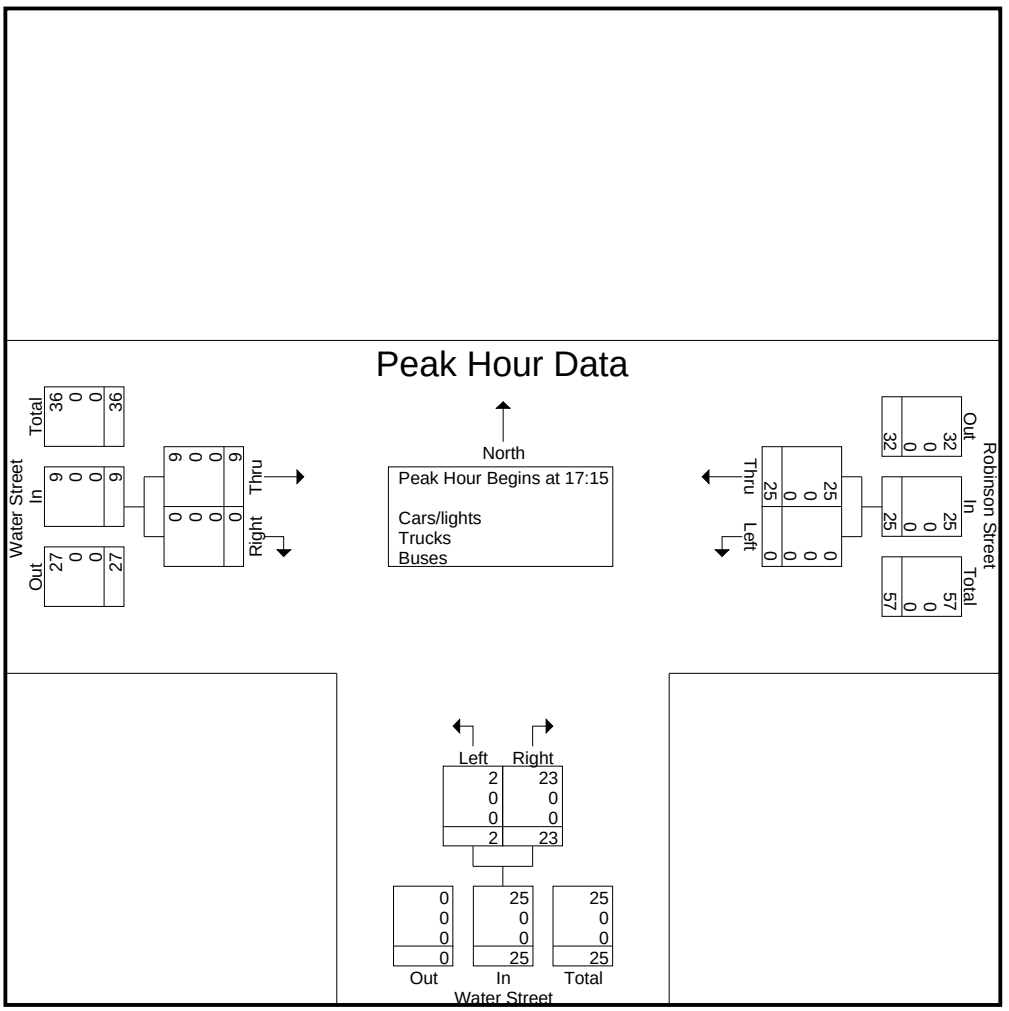


LEA Consulting Ltd.

625 Cochrane Drive, 5th Floor
Markham, ON L3R 9R9

File Name : Water St & Robinson St - PM
Site Code : 00024009
Start Date : 2023-04-18
Page No : 3

	Robinson Street Westbound			Water Street Northbound			Water Street Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 16:30 to 18:15 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 17:15										
17:15	0	7	7	0	**6**	6	**4**	0	**4**	17
17:30	0	2	2	0	6	6	1	0	1	9
17:45	0	4	4	**2**	6	**8**	3	0	3	15
18:00	0	**12**	**12**	0	5	5	1	0	1	**18**
Total Volume	0	25	25	2	23	25	9	0	9	59
% App. Total	0	100		8	92		100	0		
PHF	.000	.521	.521	.250	.958	.781	.563	.000	.563	.819
Cars/lights	0	25	25	2	23	25	9	0	9	59
% Cars/lights	0	100	100	100	100	100	100	0	100	100
Trucks	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0
Buses	0	0	0	0	0	0	0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0



LEA Consulting Ltd.

625 Cochrane Drive, 5th Floor
Markham, ON L3R 9R9

Project No.: 24009
Intersection: Water St & Robinson St
Weather: Raining
Surveyor(s): KL

File Name : Water St & Robinson St - SAT
Site Code : 00024009
Start Date : 2023-04-22

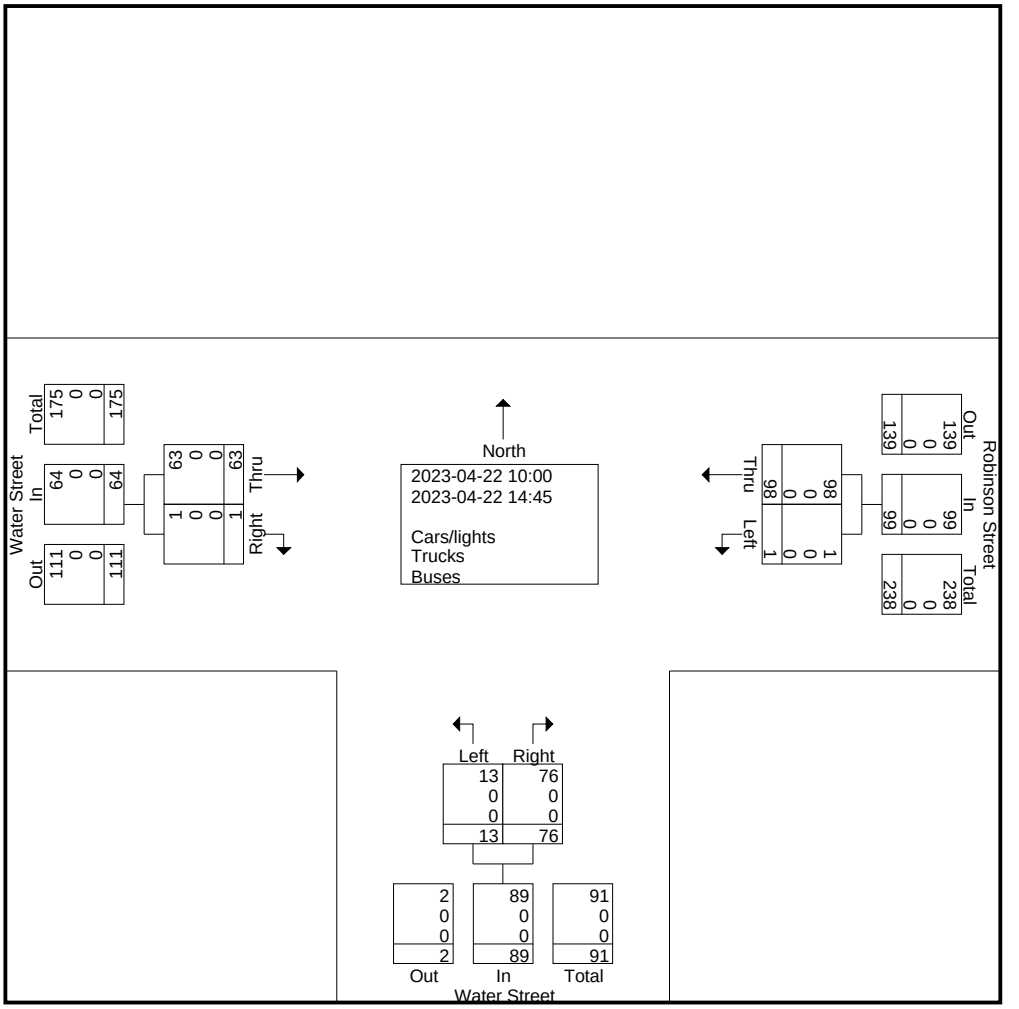
Groups Printed- Cars/lights - Trucks - Buses

	Robinson Street Westbound				Water Street Northbound				Water Street Eastbound						
Start Time	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
10:00	0	4	[0]	4	3	2	[0]	5	1	0	[0]	1	0	10	10
10:15	0	5	[0]	5	0	5	[0]	5	1	0	[0]	1	0	11	11
10:30	0	4	[0]	4	1	7	[0]	8	4	0	[0]	4	0	16	16
10:45	0	0	[0]	0	0	5	[0]	5	0	0	[0]	0	0	5	5
Total	0	13	[0]	13	4	19	[0]	23	6	0	[0]	6	0	42	42
11:00	0	5	[0]	5	0	6	[0]	6	2	0	[0]	2	0	13	13
11:15	0	3	[0]	3	0	3	[0]	3	5	0	[0]	5	0	11	11
11:30	0	2	[0]	2	0	4	[0]	4	2	0	[0]	2	0	8	8
11:45	0	5	[0]	5	1	3	[0]	4	3	0	[0]	3	0	12	12
Total	0	15	[0]	15	1	16	[0]	17	12	0	[0]	12	0	44	44
12:00	0	2	[0]	2	1	1	[0]	2	3	0	[0]	3	0	7	7
12:15	0	4	[0]	4	0	4	[0]	4	3	0	[0]	3	0	11	11
12:30	0	4	[0]	4	1	2	[0]	3	4	0	[0]	4	0	11	11
12:45	0	3	[0]	3	1	1	[0]	2	4	0	[0]	4	0	9	9
Total	0	13	[0]	13	3	8	[0]	11	14	0	[0]	14	0	38	38
13:00	1	9	[0]	10	0	4	[0]	4	5	0	[0]	5	0	19	19
13:15	0	14	[1]	14	1	5	[0]	6	6	0	[0]	6	1	26	27
13:30	0	13	[0]	13	2	6	[0]	8	3	0	[0]	3	0	24	24
13:45	0	2	[0]	2	0	4	[2]	4	2	0	[0]	2	2	8	10
Total	1	38	[1]	39	3	19	[2]	22	16	0	[0]	16	3	77	80
14:00	0	3	[0]	3	1	8	[0]	9	3	0	[0]	3	0	15	15
14:15	0	8	[2]	8	0	3	[0]	3	5	1	[0]	6	2	17	19
14:30	0	3	[0]	3	0	1	[0]	1	2	0	[0]	2	0	6	6
14:45	0	5	[0]	5	1	2	[0]	3	5	0	[0]	5	0	13	13
Total	0	19	[2]	19	2	14	[0]	16	15	1	[0]	16	2	51	53
Grand Total	1	98	[3]	99	13	76	[2]	89	63	1	[0]	64	5	252	257
Apprch %	1	99			14.6	85.4			98.4	1.6					
Total %	0.4	38.9		39.3	5.2	30.2		35.3	25	0.4		25.4	1.9	98.1	
Cars/lights	1	98		102	13	76		91	63	1		64	0	0	257
% Cars/lights	100	100	100	100	100	100	100	100	100	100	0	100	0	0	100
Trucks	0	0		0	0	0		0	0	0		0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Buses	0	0		0	0	0		0	0	0		0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

LEA Consulting Ltd.

625 Cochrane Drive, 5th Floor
Markham, ON L3R 9R9

File Name : Water St & Robinson St - SAT
Site Code : 00024009
Start Date : 2023-04-22
Page No : 2

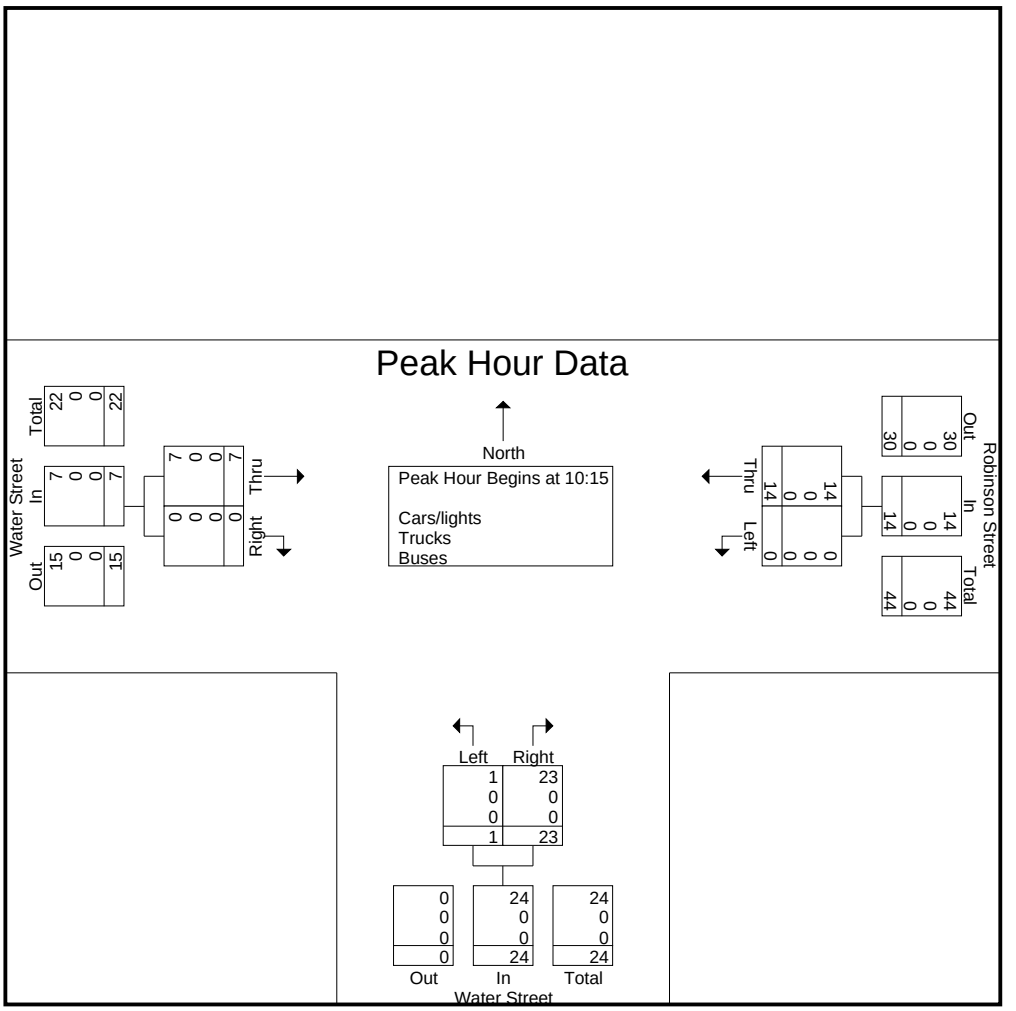


LEA Consulting Ltd.

625 Cochrane Drive, 5th Floor
Markham, ON L3R 9R9

File Name : Water St & Robinson St - SAT
Site Code : 00024009
Start Date : 2023-04-22
Page No : 3

	Robinson Street Westbound			Water Street Northbound			Water Street Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 10:00 to 11:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 10:15										
10:15	0	**5**	**5**	0	5	5	1	0	1	11
10:30	0	4	4	**1**	**7**	**8**	**4**	0	**4**	**16**
10:45	0	0	0	0	5	5	0	0	0	5
11:00	0	5	5	0	6	6	2	0	2	13
Total Volume	0	14	14	1	23	24	7	0	7	45
% App. Total	0	100		4.2	95.8		100	0		
PHF	.000	.700	.700	.250	.821	.750	.438	.000	.438	.703
Cars/lights	0	14	14	1	23	24	7	0	7	45
% Cars/lights	0	100	100	100	100	100	100	0	100	100
Trucks	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0
Buses	0	0	0	0	0	0	0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0



APPENDIX B

TTS 2016 Data

Thu Apr 13 2023 11:49:02 GMT-0400 (Eastern Daylight Time) - Run Time: 3014ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: Planning district of origin - pd_orig
Column: 2006 GTA zone of destination - gta06_dest

Filters:
(2006 GTA zone of destination - gta06_dest In 4011, 4015, 4016
and
Trip purpose of destination - purp_dest In H
and
Primary travel mode of trip - mode_prime In D, M
and
Start time of trip - start_time In 1500-1900)

Predicted Inbound Route Summary	
N Navy St	52%
E Robinson St	48%
Total	100%

Trip 2016
Table:

Origin	Destination			Total From Origin	Trip Distribution		Trip Assignment				
	4011	4015	4016		%	Direction From	From North	From South	From East	From West	Predicted Route
PD 1 of Toronto	11	0	16	27	1%	E			1%		Trafalgar Rd, Robinson St
PD 2 of Toronto	11	0	0	11	1%	E			1%		Trafalgar Rd, Robinson St
PD 4 of Toronto	0	8	0	8	0%	E			0%		Trafalgar Rd, Robinson St
PD 5 of Toronto	17	0	0	17	1%	E			1%		Trafalgar Rd, Robinson St
PD 6 of Toronto	29	0	0	29	1%	E			1%		Trafalgar Rd, Robinson St
PD 9 of Toronto	16	0	20	36	2%	E			2%		Trafalgar Rd, Robinson St
PD 10 of Toronto	0	37	0	37	2%	E			2%		Trafalgar Rd, Robinson St
Aurora	11	0	0	11	1%	E			1%		Trafalgar Rd, Robinson St
Vaughan	15	0	0	15	1%	E			1%		Trafalgar Rd, Robinson St
Brampton	26	0	4	30	1%	NE			1%		Trafalgar Rd, Robinson St
Mississauga	138	59	45	242	11%	NE			11%		Trafalgar Rd, Robinson St
Milton	7	0	17	24	1%	NW	1%				Randall St, Navy St
4005	51	0	0	51	2%	W	2%				Randall St, Navy St
4008	25	0	9	34	2%	NW	2%				Randall St, Navy St
4009	121	15	16	152	7%	NW	7%				Randall St, Navy St
4010	89	0	0	89	4%	NW	4%				Randall St, Navy St
4011	93	0	49	142	7%	W	7%				Lakeshore Rd W, Navy St
4012	47	50	21	118	6%	N	6%				Randall St, Navy St
4013	0	0	19	19	1%	N	1%				Randall St, Navy St
4014	54	32	29	115	5%	N			5%		Trafalgar Rd, Robinson St
4015	14	29	19	62	3%	N			3%		Trafalgar Rd, Robinson St
4016	66	25	0	91	4%	E			4%		Trafalgar Rd, Robinson St
4017	22	0	0	22	1%	E	1%				Lakeshore Rd E, Navy St
4019	4	0	0	4	0%	NE			0%		Trafalgar Rd, Robinson St
4020	0	37	0	37	2%	E	2%				Lakeshore Rd E, Navy St
4025	0	0	15	15	1%	NE			1%		Trafalgar Rd, Robinson St
4027	14	0	0	14	1%	NE			1%		Trafalgar Rd, Robinson St
4029	44	34	0	78	4%	N			4%		Trafalgar Rd, Robinson St
4030	44	0	0	44	2%	N			2%		Trafalgar Rd, Robinson St
4031	0	0	8	8	0%	N			0%		Trafalgar Rd, Robinson St
4040	76	0	0	76	4%	NW	4%				Randall St, Navy St
Burlington	88	42	19	149	7%	W	7%				Randall St, Navy St
Hamilton	130	37	0	167	8%	W	8%				Randall St, Navy St
Waterloo	0	0	13	13	1%	W			1%		Trafalgar Rd, Robinson St
Cambridge	99	0	0	99	5%	W			5%		Trafalgar Rd, Robinson St
Brantford	25	0	0	25	1%	W	1%				Randall St, Navy St
			TOTAL	*2111*	*100%*		*52%*	*0%*	*48%*	*0%*	*Sum Check:*

100%

Thu Apr 13 2023 13:33:54 GMT-0400 (Eastern Daylight Time) - Run Time: 2976ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: Planning district of destination - pd_dest
Column: 2006 GTA zone of origin - gta06_orig

Filters:
(2006 GTA zone of origin - gta06_orig In 4011, 4015, 4016
and
Trip purpose of origin - purp_orig In H
and
Primary travel mode of trip - mode_prime In D, M
and
Start time of trip - start_time In 600-1000)

Predicted Outbound Route Summary	
N Navy St	50%
E Robinson S	50%
Total	100%

Trip 2016
Table:

Origin	Origin			Total to Destination	Trip Distribution		Trip Assignment				
	4011	4015	4016		%	Direction To	To North	To South	To East	To West	Predicted Route
PD 1 of Toronto	18	15	31	64	2%	E			2%		Robinson St, Trafalgar Rd
PD 2 of Toronto	31	0	0	31	1%	E			1%		Robinson St, Trafalgar Rd
PD 4 of Toronto	0	8	0	8	0%	E			0%		Robinson St, Trafalgar Rd
PD 5 of Toronto	17	0	0	17	1%	E			1%		Robinson St, Trafalgar Rd
PD 6 of Toronto	29	0	0	29	1%	E			1%		Robinson St, Trafalgar Rd
PD 7 of Toronto	13	0	0	13	1%	E			1%		Robinson St, Trafalgar Rd
PD 9 of Toronto	29	0	20	49	2%	E			2%		Robinson St, Trafalgar Rd
PD 10 of Toronto	0	37	0	37	1%	E			1%		Robinson St, Trafalgar Rd
Brampton	42	0	0	42	2%	NE			2%		Robinson St, Trafalgar Rd
Mississauga	437	94	58	589	23%	NE			23%		Robinson St, Trafalgar Rd
Milton	34	14	0	48	2%	NW	2%				Navy St, Randall St
4005	0	0	13	13	1%	W	1%				Navy St, Randall St
4008	25	0	9	34	1%	NW	1%				Navy St, Randall St
4009	109	15	27	151	6%	NW	6%				Navy St, Randall St
4011	143	14	30	187	7%	W	7%				Navy St, Lakeshore Rd W
4012	18	50	16	84	3%	N	3%				Navy St, Randall St
4014	43	9	0	52	2%	N			2%		Robinson St, Trafalgar Rd
4016	67	64	0	131	5%	E			5%		Robinson St, Trafalgar Rd
4017	99	0	0	99	4%	E	4%				Navy St, Lakeshore Rd E
4018	0	0	9	9	0%	E	0%				Navy St, Lakeshore Rd E
4020	0	37	0	37	1%	E	1%				Navy St, Lakeshore Rd E
4021	0	15	19	34	1%	E	1%				Navy St, Lakeshore Rd E
4027	14	0	0	14	1%	NE			1%		Robinson St, Trafalgar Rd
4029	44	34	0	78	3%	N			3%		Robinson St, Trafalgar Rd
4030	9	0	0	9	0%	N			0%		Robinson St, Trafalgar Rd
4037	10	0	21	31	1%	NW	1%				Navy St, Randall St
4040	68	0	0	68	3%	NW	3%				Navy St, Randall St
4184	12	0	0	12	0%	NW	0%				Navy St, Randall St
4185	0	0	13	13	1%	NW	1%				Navy St, Randall St
4186	0	0	11	11	0%	NW	0%				Navy St, Randall St
Burlington	77	42	38	157	6%	W	6%				Navy St, Randall St
Hamilton	259	37	0	296	11%	W	11%				Navy St, Randall St
Lincoln	10	0	0	10	0%	W	0%				Navy St, Randall St
St. Catharines	15	0	0	15	1%	W	1%				Navy St, Randall St
Waterloo	0	0	13	13	1%	W			1%		Robinson St, Trafalgar Rd
Cambridge	99	0	0	99	4%	W			4%		Robinson St, Trafalgar Rd
Wellesley	0	15	0	15	1%	W			1%		Robinson St, Trafalgar Rd
			TOTAL	*2599*	*100%*		*50%*	*0%*	*50%*	*0%*	*Sum Check:*

100%

APPENDIX C

Intersection Capacity Analysis – Existing Conditions

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	23	5	17	12	113	1	28	6	44	36	12
Future Vol, veh/h	18	23	5	17	12	113	1	28	6	44	36	12
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	0	0	0	0	0	2	0	0	0	0	0	0
Mvmt Flow	20	25	5	19	13	124	1	31	7	48	40	13
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	7.8	7.7	7.6	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	3%	39%	59%	0%	48%
Vol Thru, %	80%	50%	41%	0%	39%
Vol Right, %	17%	11%	0%	100%	13%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	35	46	29	113	92
LT Vol	1	18	17	0	44
Through Vol	28	23	12	0	36
RT Vol	6	5	0	113	12
Lane Flow Rate	38	51	32	124	101
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.047	0.063	0.046	0.144	0.124
Departure Headway (Hd)	4.374	4.498	5.169	4.172	4.417
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	821	799	697	864	814
Service Time	2.39	2.512	2.869	1.872	2.432
HCM Lane V/C Ratio	0.046	0.064	0.046	0.144	0.124
HCM Control Delay	7.6	7.8	8.1	7.6	8.1
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0.2	0.1	0.5	0.4

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	1	8	1	27	4	6	24	27
Future Vol, veh/h	0	0	0	0	1	8	1	27	4	6	24	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	1	10	1	34	5	8	30	34

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	102	119	37	64	0	0	39	0	0
Stage 1	39	39	-	-	-	-	-	-	-
Stage 2	63	80	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	901	775	1041	1551	-	-	1584	-	-
Stage 1	989	866	-	-	-	-	-	-	-
Stage 2	965	832	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	896	0	1041	1551	-	-	1584	-	-
Mov Cap-2 Maneuver	896	0	-	-	-	-	-	-	-
Stage 1	988	0	-	-	-	-	-	-	-
Stage 2	960	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0.2	0.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1551	-	-	1041	1584	-	-
HCM Lane V/C Ratio	0.001	-	-	0.011	0.005	-	-
HCM Control Delay (s)	7.3	0	-	8.5	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	-	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	16	0	0	18	2	21
Future Vol, veh/h	16	0	0	18	2	21
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	19	0	0	21	2	25

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	40	20
Stage 1	-	-	-	-	19	-
Stage 2	-	-	-	-	21	-
Critical Hdwy	-	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	-	0	0	-	977	1064
Stage 1	-	0	0	-	1009	-
Stage 2	-	0	0	-	1007	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	977	1063
Mov Cap-2 Maneuver	-	-	-	-	977	-
Stage 1	-	-	-	-	1009	-
Stage 2	-	-	-	-	1007	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	1055	-	-
HCM Lane V/C Ratio	0.026	-	-
HCM Control Delay (s)	8.5	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	16	0	0	20	1	0
Future Vol, veh/h	16	0	0	20	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	64	0	0	80	4	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	64	0	144	64
Stage 1	-	-	-	-	64	-
Stage 2	-	-	-	-	80	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1551	-	853	1006
Stage 1	-	-	-	-	964	-
Stage 2	-	-	-	-	948	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1551	-	853	1006
Mov Cap-2 Maneuver	-	-	-	-	853	-
Stage 1	-	-	-	-	964	-
Stage 2	-	-	-	-	948	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	853	-	-	1551	-
HCM Lane V/C Ratio	0.005	-	-	-	-
HCM Control Delay (s)	9.2	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	2.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	10	13	11	0	0
Future Vol, veh/h	0	10	13	11	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	40	52	44	0	0

Major/Minor	Minor1		Major1	
Conflicting Flow All	-	74	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.2	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.3	-	-
Pot Cap-1 Maneuver	0	993	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	993	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	8.8	0
HCM LOS	A	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	993
HCM Lane V/C Ratio	-	-	0.04
HCM Control Delay (s)	-	-	8.8
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0.1

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	9	7	17	9	85	0	41	4	98	50	23
Future Vol, veh/h	20	9	7	17	9	85	0	41	4	98	50	23
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	0	0	0	0	0	1	0	0	0	0	0	0
Mvmt Flow	23	10	8	20	10	99	0	48	5	114	58	27
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	8	7.9	7.8	8.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	56%	65%	0%	57%
Vol Thru, %	91%	25%	35%	0%	29%
Vol Right, %	9%	19%	0%	100%	13%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	45	36	26	85	171
LT Vol	0	20	17	0	98
Through Vol	41	9	9	0	50
RT Vol	4	7	0	85	23
Lane Flow Rate	52	42	30	99	199
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.065	0.055	0.046	0.121	0.243
Departure Headway (Hd)	4.465	4.722	5.444	4.411	4.391
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	803	759	659	813	819
Service Time	2.488	2.749	3.167	2.134	2.408
HCM Lane V/C Ratio	0.065	0.055	0.046	0.122	0.243
HCM Control Delay	7.8	8	8.4	7.7	8.8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.2	0.2	0.1	0.4	1

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕			↕			↕	
Traffic Vol, veh/h	0	0	0	5	1	16	3	25	1	18	40	13
Future Vol, veh/h	0	0	0	5	1	16	3	25	1	18	40	13
Conflicting Peds, #/hr	0	0	0	0	0	1	3	0	6	6	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	67	67	67	67	67	67	67	67	67	67	67	67
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	7	1	24	4	37	1	27	60	19

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	176	188	45	82	0	0	44	0	0
Stage 1	52	52	-	-	-	-	-	-	-
Stage 2	124	136	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	818	710	1031	1528	-	-	1577	-	-
Stage 1	976	856	-	-	-	-	-	-	-
Stage 2	907	788	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	797	0	1025	1528	-	-	1570	-	-
Mov Cap-2 Maneuver	797	0	-	-	-	-	-	-	-
Stage 1	968	0	-	-	-	-	-	-	-
Stage 2	891	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0.8	1.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1528	-	-	960	1570	-	-
HCM Lane V/C Ratio	0.003	-	-	0.034	0.017	-	-
HCM Control Delay (s)	7.4	0	-	8.9	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	13	0	0	26	2	21
Future Vol, veh/h	13	0	0	26	2	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	19	0	0	37	3	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	56	19
Stage 1	-	-	-	-	19	-
Stage 2	-	-	-	-	37	-
Critical Hdwy	-	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	-	0	0	-	957	1065
Stage 1	-	0	0	-	1009	-
Stage 2	-	0	0	-	991	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	957	1065
Mov Cap-2 Maneuver	-	-	-	-	957	-
Stage 1	-	-	-	-	1009	-
Stage 2	-	-	-	-	991	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	1055	-	-
HCM Lane V/C Ratio	0.031	-	-
HCM Control Delay (s)	8.5	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	13	0	0	28	0	0
Future Vol, veh/h	13	0	0	28	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	52	0	0	112	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	52	0	164	52
Stage 1	-	-	-	-	52	-
Stage 2	-	-	-	-	112	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1567	-	831	1021
Stage 1	-	-	-	-	976	-
Stage 2	-	-	-	-	918	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1567	-	831	1021
Mov Cap-2 Maneuver	-	-	-	-	831	-
Stage 1	-	-	-	-	976	-
Stage 2	-	-	-	-	918	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1567	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	8	15	6	0	0
Future Vol, veh/h	0	8	15	6	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	32	60	24	0	0

Major/Minor	Minor1		Major1	
Conflicting Flow All	-	72	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.2	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.3	-	-
Pot Cap-1 Maneuver	0	996	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	996	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	8.7	0
HCM LOS	A	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	996
HCM Lane V/C Ratio	-	-	0.032
HCM Control Delay (s)	-	-	8.7
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0.1

APPENDIX D

Intersection Capacity Analysis – Future Conditions

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	19	25	5	18	13	113	1	29	6	44	40	12
Future Vol, veh/h	19	25	5	18	13	113	1	29	6	44	40	12
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	0	0	0	0	0	2	0	0	0	0	0	0
Mvmt Flow	21	27	5	20	14	124	1	32	7	48	44	13
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	7.9	7.7	7.6	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	3%	39%	58%	0%	46%
Vol Thru, %	81%	51%	42%	0%	42%
Vol Right, %	17%	10%	0%	100%	12%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	36	49	31	113	96
LT Vol	1	19	18	0	44
Through Vol	29	25	13	0	40
RT Vol	6	5	0	113	12
Lane Flow Rate	40	54	34	124	105
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.048	0.068	0.049	0.144	0.13
Departure Headway (Hd)	4.398	4.519	5.183	4.189	4.434
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	817	795	695	862	811
Service Time	2.413	2.532	2.883	1.889	2.446
HCM Lane V/C Ratio	0.049	0.068	0.049	0.144	0.129
HCM Control Delay	7.6	7.9	8.1	7.6	8.1
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.2	0.2	0.2	0.5	0.4

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	1	8	1	28	4	6	26	30
Future Vol, veh/h	0	0	0	0	1	8	1	28	4	6	26	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	1	10	1	35	5	8	33	38

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	108	127	38	71	0	0	40	0	0
Stage 1	40	40	-	-	-	-	-	-	-
Stage 2	68	87	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	894	767	1040	1542	-	-	1583	-	-
Stage 1	988	866	-	-	-	-	-	-	-
Stage 2	960	827	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	889	0	1040	1542	-	-	1583	-	-
Mov Cap-2 Maneuver	889	0	-	-	-	-	-	-	-
Stage 1	987	0	-	-	-	-	-	-	-
Stage 2	955	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0.2	0.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1542	-	-	1040	1583	-	-
HCM Lane V/C Ratio	0.001	-	-	0.011	0.005	-	-
HCM Control Delay (s)	7.3	0	-	8.5	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	17	0	0	19	2	23
Future Vol, veh/h	17	0	0	19	2	23
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	20	0	0	23	2	27

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	43	21
Stage 1	-	-	-	-	20	-
Stage 2	-	-	-	-	23	-
Critical Hdwy	-	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	-	0	0	-	973	1062
Stage 1	-	0	0	-	1008	-
Stage 2	-	0	0	-	1005	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	973	1061
Mov Cap-2 Maneuver	-	-	-	-	973	-
Stage 1	-	-	-	-	1008	-
Stage 2	-	-	-	-	1005	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	1053	-	-
HCM Lane V/C Ratio	0.028	-	-
HCM Control Delay (s)	8.5	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	17	0	0	21	1	0
Future Vol, veh/h	17	0	0	21	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	68	0	0	84	4	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	68	0	152	68
Stage 1	-	-	-	-	68	-
Stage 2	-	-	-	-	84	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1546	-	844	1001
Stage 1	-	-	-	-	960	-
Stage 2	-	-	-	-	944	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1546	-	844	1001
Mov Cap-2 Maneuver	-	-	-	-	844	-
Stage 1	-	-	-	-	960	-
Stage 2	-	-	-	-	944	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	844	-	-	1546	-
HCM Lane V/C Ratio	0.005	-	-	-	-
HCM Control Delay (s)	9.3	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	10	16	11	0	0
Future Vol, veh/h	0	10	16	11	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	40	64	44	0	0

Major/Minor	Minor1		Major1	
Conflicting Flow All	-	86	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.2	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.3	-	-
Pot Cap-1 Maneuver	0	978	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	978	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	8.8	0
HCM LOS	A	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	978
HCM Lane V/C Ratio	-	-	0.041
HCM Control Delay (s)	-	-	8.8
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0.1

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	2	23	3	0	0
Future Vol, veh/h	0	2	23	3	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	8	92	12	0	0

Major/Minor	Minor1		Major1	
Conflicting Flow All	-	98	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.2	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.3	-	-
Pot Cap-1 Maneuver	0	963	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	963	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	8.8	0
HCM LOS	A	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	963
HCM Lane V/C Ratio	-	-	0.008
HCM Control Delay (s)	-	-	8.8
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	10	7	18	9	85	0	43	4	98	54	23
Future Vol, veh/h	21	10	7	18	9	85	0	43	4	98	54	23
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	0	0	0	0	0	1	0	0	0	0	0	0
Mvmt Flow	24	12	8	21	10	99	0	50	5	114	63	27
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	8.1	8	7.8	8.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	55%	67%	0%	56%
Vol Thru, %	91%	26%	33%	0%	31%
Vol Right, %	9%	18%	0%	100%	13%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	47	38	27	85	175
LT Vol	0	21	18	0	98
Through Vol	43	10	9	0	54
RT Vol	4	7	0	85	23
Lane Flow Rate	55	44	31	99	203
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.068	0.058	0.048	0.122	0.249
Departure Headway (Hd)	4.483	4.747	5.47	4.431	4.402
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	800	755	656	809	818
Service Time	2.507	2.775	3.193	2.153	2.421
HCM Lane V/C Ratio	0.069	0.058	0.047	0.122	0.248
HCM Control Delay	7.8	8.1	8.5	7.8	8.9
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.2	0.2	0.2	0.4	1

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕			↕			↕	
Traffic Vol, veh/h	0	0	0	5	1	16	3	27	1	18	43	15
Future Vol, veh/h	0	0	0	5	1	16	3	27	1	18	43	15
Conflicting Peds, #/hr	0	0	0	0	0	1	3	0	6	6	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	67	67	67	67	67	67	67	67	67	67	67	67
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	7	1	24	4	40	1	27	64	22

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	184	198	48	89	0	0	47	0	0
Stage 1	55	55	-	-	-	-	-	-	-
Stage 2	129	143	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	810	701	1027	1519	-	-	1573	-	-
Stage 1	973	853	-	-	-	-	-	-	-
Stage 2	902	782	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	789	0	1021	1519	-	-	1566	-	-
Mov Cap-2 Maneuver	789	0	-	-	-	-	-	-	-
Stage 1	965	0	-	-	-	-	-	-	-
Stage 2	886	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0.7	1.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1519	-	-	954	1566	-	-
HCM Lane V/C Ratio	0.003	-	-	0.034	0.017	-	-
HCM Control Delay (s)	7.4	0	-	8.9	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	13	0	0	26	2	23
Future Vol, veh/h	13	0	0	26	2	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	19	0	0	37	3	33

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	-	-	-	56	19
Stage 1	-	-	-	-	19	-
Stage 2	-	-	-	-	37	-
Critical Hdwy	-	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	-	0	0	-	957	1065
Stage 1	-	0	0	-	1009	-
Stage 2	-	0	0	-	991	-
Platoon blocked, %	-			-		
Mov Cap-1 Maneuver	-	-	-	-	957	1065
Mov Cap-2 Maneuver	-	-	-	-	957	-
Stage 1	-	-	-	-	1009	-
Stage 2	-	-	-	-	991	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	1055	-	-
HCM Lane V/C Ratio	0.034	-	-
HCM Control Delay (s)	8.5	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	13	0	0	28	0	0
Future Vol, veh/h	13	0	0	28	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	52	0	0	112	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	52	0	164	52
Stage 1	-	-	-	-	52	-
Stage 2	-	-	-	-	112	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1567	-	831	1021
Stage 1	-	-	-	-	976	-
Stage 2	-	-	-	-	918	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1567	-	831	1021
Mov Cap-2 Maneuver	-	-	-	-	831	-
Stage 1	-	-	-	-	976	-
Stage 2	-	-	-	-	918	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1567	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	2.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	8	17	6	0	0
Future Vol, veh/h	0	8	17	6	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	32	68	24	0	0

Major/Minor	Minor1		Major1	
Conflicting Flow All	-	80	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.2	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.3	-	-
Pot Cap-1 Maneuver	0	986	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	986	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	8.8	0
HCM LOS	A	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	986
HCM Lane V/C Ratio	-	-	0.032
HCM Control Delay (s)	-	-	8.8
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0.1

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	2	23	2	0	0
Future Vol, veh/h	0	2	23	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	8	92	8	0	0

Major/Minor	Minor1		Major1	
Conflicting Flow All	-	96	0	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	6.2	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	3.3	-	-
Pot Cap-1 Maneuver	0	966	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	-	966	-	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	8.8	0
HCM LOS	A	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	966
HCM Lane V/C Ratio	-	-	0.008
HCM Control Delay (s)	-	-	8.8
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	21	5	17	15	113	4	48	10	44	11	41
Future Vol, veh/h	0	21	5	17	15	113	4	48	10	44	11	41
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	0	0	0	0	0	2	0	0	0	0	0	0
Mvmt Flow	0	23	5	19	16	124	4	53	11	48	12	45
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	7.6	7.7	7.8	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	6%	0%	53%	0%	46%
Vol Thru, %	77%	81%	47%	0%	11%
Vol Right, %	16%	19%	0%	100%	43%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	62	26	32	113	96
LT Vol	4	0	17	0	44
Through Vol	48	21	15	0	11
RT Vol	10	5	0	113	41
Lane Flow Rate	68	29	35	124	105
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.082	0.035	0.051	0.146	0.124
Departure Headway (Hd)	4.348	4.442	5.19	4.22	4.229
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	826	808	694	854	850
Service Time	2.363	2.459	2.89	1.92	2.242
HCM Lane V/C Ratio	0.082	0.036	0.05	0.145	0.124
HCM Control Delay	7.8	7.6	8.2	7.6	7.8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.3	0.1	0.2	0.5	0.4

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	25	0	0	0	0	8	0	29	4	6	26	0
Future Vol, veh/h	25	0	0	0	0	8	0	29	4	6	26	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	32	0	0	0	0	10	0	37	5	8	33	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	94	91	33	89	89	40	33	0	0	42	0	0
Stage 1	49	49	-	40	40	-	-	-	-	-	-	-
Stage 2	45	42	-	49	49	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	894	803	1046	901	805	1037	1592	-	-	1580	-	-
Stage 1	969	858	-	980	866	-	-	-	-	-	-	-
Stage 2	974	864	-	969	858	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	881	799	1046	897	801	1037	1592	-	-	1580	-	-
Mov Cap-2 Maneuver	881	799	-	897	801	-	-	-	-	-	-	-
Stage 1	969	854	-	980	866	-	-	-	-	-	-	-
Stage 2	964	864	-	964	854	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.2	8.5	0	1.4
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1592	-	-	881	1037	1580	-	-
HCM Lane V/C Ratio	-	-	-	0.036	0.01	0.005	-	-
HCM Control Delay (s)	0	-	-	9.2	8.5	7.3	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	17	0	0	21	1	0
Future Vol, veh/h	17	0	0	21	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	68	0	0	84	4	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	68	0	152	68
Stage 1	-	-	-	-	68	-
Stage 2	-	-	-	-	84	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1546	-	844	1001
Stage 1	-	-	-	-	960	-
Stage 2	-	-	-	-	944	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1546	-	844	1001
Mov Cap-2 Maneuver	-	-	-	-	844	-
Stage 1	-	-	-	-	960	-
Stage 2	-	-	-	-	944	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	844	-	-	1546	-
HCM Lane V/C Ratio	0.005	-	-	-	-
HCM Control Delay (s)	9.3	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	0	0	0	11	19
Future Vol, veh/h	10	0	0	0	11	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	40	0	0	0	44	76

Major/Minor	Minor1		Major2	
Conflicting Flow All	164	-	0	0
Stage 1	0	-	-	-
Stage 2	164	-	-	-
Critical Hdwy	6.4	-	4.1	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-
Follow-up Hdwy	3.5	-	2.2	-
Pot Cap-1 Maneuver	831	0	-	-
Stage 1	-	0	-	-
Stage 2	870	0	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	831	-	-	-
Mov Cap-2 Maneuver	831	-	-	-
Stage 1	-	-	-	-
Stage 2	870	-	-	-

Approach	WB	SB
HCM Control Delay, s	9.6	
HCM LOS	A	

Minor Lane/Major Mvmt	WBLn1	SBL	SBT
Capacity (veh/h)	831	-	-
HCM Lane V/C Ratio	0.048	-	-
HCM Control Delay (s)	9.6	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	0	0	0	3	28
Future Vol, veh/h	2	0	0	0	3	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	8	0	0	0	12	112

Major/Minor	Minor1		Major2	
Conflicting Flow All	136	-	0	0
Stage 1	0	-	-	-
Stage 2	136	-	-	-
Critical Hdwy	6.4	-	4.1	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-
Follow-up Hdwy	3.5	-	2.2	-
Pot Cap-1 Maneuver	862	0	-	-
Stage 1	-	0	-	-
Stage 2	895	0	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	862	-	-	-
Mov Cap-2 Maneuver	862	-	-	-
Stage 1	-	-	-	-
Stage 2	895	-	-	-

Approach	WB	SB
HCM Control Delay, s	9.2	
HCM LOS	A	

Minor Lane/Major Mvmt	WBLn1	SBL	SBT
Capacity (veh/h)	862	-	-
HCM Lane V/C Ratio	0.009	-	-
HCM Control Delay (s)	9.2	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0	-	-

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	9	7	17	11	85	5	65	6	98	40	37
Future Vol, veh/h	0	9	7	17	11	85	5	65	6	98	40	37
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	0	0	0	0	0	1	0	0	0	0	0	0
Mvmt Flow	0	10	8	20	13	99	6	76	7	114	47	43
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	7.7	8	8	8.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	7%	0%	61%	0%	56%
Vol Thru, %	86%	56%	39%	0%	23%
Vol Right, %	8%	44%	0%	100%	21%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	76	16	28	85	175
LT Vol	5	0	17	0	98
Through Vol	65	9	11	0	40
RT Vol	6	7	0	85	37
Lane Flow Rate	88	19	33	99	203
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.109	0.024	0.05	0.123	0.245
Departure Headway (Hd)	4.435	4.556	5.481	4.472	4.332
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	809	786	654	803	830
Service Time	2.459	2.584	3.204	2.194	2.352
HCM Lane V/C Ratio	0.109	0.024	0.05	0.123	0.245
HCM Control Delay	8	7.7	8.5	7.8	8.8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.4	0.1	0.2	0.4	1

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	25	0	0	5	0	16	0	30	1	18	43	0
Future Vol, veh/h	25	0	0	5	0	16	0	30	1	18	43	0
Conflicting Peds, #/hr	0	0	0	0	0	1	3	0	6	6	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	67	67	67	67	67	67	67	67	67	67	67	67
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	37	0	0	7	0	24	0	45	1	27	64	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	180	173	67	170	173	53	67	0	0	52	0	0
Stage 1	121	121	-	52	52	-	-	-	-	-	-	-
Stage 2	59	52	-	118	121	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	786	724	1002	798	724	1020	1547	-	-	1567	-	-
Stage 1	888	800	-	966	856	-	-	-	-	-	-	-
Stage 2	958	856	-	891	800	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	755	706	1000	784	706	1014	1543	-	-	1560	-	-
Mov Cap-2 Maneuver	755	706	-	784	706	-	-	-	-	-	-	-
Stage 1	886	784	-	961	852	-	-	-	-	-	-	-
Stage 2	935	852	-	875	784	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10	8.9	0	2.2
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1543	-	-	755	948	1560	-	-
HCM Lane V/C Ratio	-	-	-	0.049	0.033	0.017	-	-
HCM Control Delay (s)	0	-	-	10	8.9	7.3	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	13	0	0	28	0	0
Future Vol, veh/h	13	0	0	28	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	52	0	0	112	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	52	0	164	52
Stage 1	-	-	-	-	52	-
Stage 2	-	-	-	-	112	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1567	-	831	1021
Stage 1	-	-	-	-	976	-
Stage 2	-	-	-	-	918	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1567	-	831	1021
Mov Cap-2 Maneuver	-	-	-	-	831	-
Stage 1	-	-	-	-	976	-
Stage 2	-	-	-	-	918	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1567	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	0	0	0	6	12
Future Vol, veh/h	8	0	0	0	6	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	32	0	0	0	24	48

Major/Minor	Minor1		Major2	
Conflicting Flow All	96	-	0	0
Stage 1	0	-	-	-
Stage 2	96	-	-	-
Critical Hdwy	6.4	-	4.1	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-
Follow-up Hdwy	3.5	-	2.2	-
Pot Cap-1 Maneuver	908	0	-	-
Stage 1	-	0	-	-
Stage 2	933	0	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	908	-	-	-
Mov Cap-2 Maneuver	908	-	-	-
Stage 1	-	-	-	-
Stage 2	933	-	-	-

Approach	WB	SB
HCM Control Delay, s	9.1	
HCM LOS	A	

Minor Lane/Major Mvmt	WBLn1	SBL	SBT
Capacity (veh/h)	908	-	-
HCM Lane V/C Ratio	0.035	-	-
HCM Control Delay (s)	9.1	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	0	0	0	2	16
Future Vol, veh/h	2	0	0	0	2	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	8	0	0	0	8	64

Major/Minor	Minor1		Major2	
Conflicting Flow All	80	-	0	0
Stage 1	0	-	-	-
Stage 2	80	-	-	-
Critical Hdwy	6.4	-	4.1	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-
Follow-up Hdwy	3.5	-	2.2	-
Pot Cap-1 Maneuver	927	0	-	-
Stage 1	-	0	-	-
Stage 2	948	0	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	927	-	-	-
Mov Cap-2 Maneuver	927	-	-	-
Stage 1	-	-	-	-
Stage 2	948	-	-	-

Approach	WB	SB
HCM Control Delay, s	8.9	
HCM LOS	A	

Minor Lane/Major Mvmt	WBLn1	SBL	SBT
Capacity (veh/h)	927	-	-
HCM Lane V/C Ratio	0.009	-	-
HCM Control Delay (s)	8.9	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0	-	-

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	19	25	2	11	20	113	1	29	6	44	24	28
Future Vol, veh/h	19	25	2	11	20	113	1	29	6	44	24	28
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	0	0	0	0	0	2	0	0	0	0	0	0
Mvmt Flow	21	27	2	12	22	124	1	32	7	48	26	31
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	7.9	7.7	7.6	8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	3%	41%	35%	0%	46%
Vol Thru, %	81%	54%	65%	0%	25%
Vol Right, %	17%	4%	0%	100%	29%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	36	46	31	113	96
LT Vol	1	19	11	0	44
Through Vol	29	25	20	0	24
RT Vol	6	2	0	113	28
Lane Flow Rate	40	51	34	124	105
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.048	0.064	0.048	0.144	0.127
Departure Headway (Hd)	4.386	4.552	5.061	4.181	4.325
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	819	789	712	863	831
Service Time	2.401	2.566	2.761	1.881	2.337
HCM Lane V/C Ratio	0.049	0.065	0.048	0.144	0.126
HCM Control Delay	7.6	7.9	8	7.6	8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.2	0.2	0.2	0.5	0.4

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	1	0	1	8	1	28	4	6	25	5
Future Vol, veh/h	0	0	1	0	1	8	1	28	4	6	25	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	1	0	1	10	1	35	5	8	32	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	96	93	35	92	94	38	38	0	0	40	0	0
Stage 1	51	51	-	40	40	-	-	-	-	-	-	-
Stage 2	45	42	-	52	54	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	891	801	1044	897	800	1040	1585	-	-	1583	-	-
Stage 1	967	856	-	980	866	-	-	-	-	-	-	-
Stage 2	974	864	-	966	854	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	878	796	1044	892	795	1040	1585	-	-	1583	-	-
Mov Cap-2 Maneuver	878	796	-	892	795	-	-	-	-	-	-	-
Stage 1	966	852	-	979	865	-	-	-	-	-	-	-
Stage 2	962	863	-	960	850	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.5	8.6	0.2	1.2
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1585	-	-	1044	1006	1583	-	-
HCM Lane V/C Ratio	0.001	-	-	0.001	0.011	0.005	-	-
HCM Control Delay (s)	7.3	0	-	8.5	8.6	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	15	2	23	19	2	22
Future Vol, veh/h	15	2	23	19	2	22
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	18	2	27	23	2	26

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	20	0	96	20
Stage 1	-	-	-	-	19	-
Stage 2	-	-	-	-	77	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1609	-	908	1064
Stage 1	-	-	-	-	1009	-
Stage 2	-	-	-	-	951	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1609	-	893	1063
Mov Cap-2 Maneuver	-	-	-	-	893	-
Stage 1	-	-	-	-	1009	-
Stage 2	-	-	-	-	935	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1046	-	-	1609	-
HCM Lane V/C Ratio	0.027	-	-	0.017	-
HCM Control Delay (s)	8.5	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	17	0	0	21	1	0
Future Vol, veh/h	17	0	0	21	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	68	0	0	84	4	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	68	0	152	68
Stage 1	-	-	-	-	68	-
Stage 2	-	-	-	-	84	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1546	-	844	1001
Stage 1	-	-	-	-	960	-
Stage 2	-	-	-	-	944	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1546	-	844	1001
Mov Cap-2 Maneuver	-	-	-	-	844	-
Stage 1	-	-	-	-	960	-
Stage 2	-	-	-	-	944	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	844	-	-	1546	-
HCM Lane V/C Ratio	0.005	-	-	-	-
HCM Control Delay (s)	9.3	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	7.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	9	1	1	10	0
Future Vol, veh/h	1	9	1	1	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	36	4	4	40	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	86	6	0	0	8	0
Stage 1	6	-	-	-	-	-
Stage 2	80	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	920	1083	-	-	1625	-
Stage 1	1022	-	-	-	-	-
Stage 2	948	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	897	1083	-	-	1625	-
Mov Cap-2 Maneuver	897	-	-	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	924	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	7.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1061	1625	-
HCM Lane V/C Ratio	-	-	0.038	0.025	-
HCM Control Delay (s)	-	-	8.5	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	2	22	0	3	10
Future Vol, veh/h	0	2	22	0	3	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	8	88	0	12	40

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	152	88	0	0	88	0
Stage 1	88	-	-	-	-	-
Stage 2	64	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	844	976	-	-	1520	-
Stage 1	940	-	-	-	-	-
Stage 2	964	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	837	976	-	-	1520	-
Mov Cap-2 Maneuver	837	-	-	-	-	-
Stage 1	940	-	-	-	-	-
Stage 2	956	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	1.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	976	1520	-
HCM Lane V/C Ratio	-	-	0.008	0.008	-
HCM Control Delay (s)	-	-	8.7	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	10	3	13	14	85	0	43	4	98	41	36
Future Vol, veh/h	21	10	3	13	14	85	0	43	4	98	41	36
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	0	0	0	0	0	1	0	0	0	0	0	0
Mvmt Flow	24	12	3	15	16	99	0	50	5	114	48	42
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	8.1	7.9	7.8	8.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	62%	48%	0%	56%
Vol Thru, %	91%	29%	52%	0%	23%
Vol Right, %	9%	9%	0%	100%	21%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	47	34	27	85	175
LT Vol	0	21	13	0	98
Through Vol	43	10	14	0	41
RT Vol	4	3	0	85	36
Lane Flow Rate	55	40	31	99	203
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.068	0.053	0.047	0.121	0.246
Departure Headway (Hd)	4.468	4.811	5.367	4.421	4.346
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	802	745	668	811	828
Service Time	2.491	2.838	3.09	2.144	2.363
HCM Lane V/C Ratio	0.069	0.054	0.046	0.122	0.245
HCM Control Delay	7.8	8.1	8.4	7.8	8.8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.2	0.2	0.1	0.4	1

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	2	5	1	16	3	27	1	18	41	0
Future Vol, veh/h	0	0	2	5	1	16	3	27	1	18	41	0
Conflicting Peds, #/hr	0	0	0	0	0	1	3	0	6	6	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	67	67	67	67	67	67	67	67	67	67	67	67
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	3	7	1	24	4	40	1	27	61	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	180	173	64	172	173	48	64	0	0	47	0	0
Stage 1	118	118	-	55	55	-	-	-	-	-	-	-
Stage 2	62	55	-	117	118	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	786	724	1006	796	724	1027	1551	-	-	1573	-	-
Stage 1	891	802	-	962	853	-	-	-	-	-	-	-
Stage 2	954	853	-	892	802	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	751	704	1004	778	704	1021	1547	-	-	1566	-	-
Mov Cap-2 Maneuver	751	704	-	778	704	-	-	-	-	-	-	-
Stage 1	887	786	-	954	846	-	-	-	-	-	-	-
Stage 2	927	846	-	873	786	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.6	9	0.7	2.2
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1547	-	-	1004	935	1566	-	-
HCM Lane V/C Ratio	0.003	-	-	0.003	0.035	0.017	-	-
HCM Control Delay (s)	7.3	0	-	8.6	9	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	4.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	11	2	18	26	2	21
Future Vol, veh/h	11	2	18	26	2	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	16	3	26	37	3	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	19	0	107	18
Stage 1	-	-	-	-	18	-
Stage 2	-	-	-	-	89	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1611	-	895	1066
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	940	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1611	-	881	1066
Mov Cap-2 Maneuver	-	-	-	-	881	-
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	925	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1047	-	-	1611	-
HCM Lane V/C Ratio	0.031	-	-	0.016	-
HCM Control Delay (s)	8.6	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	13	0	0	28	0	0
Future Vol, veh/h	13	0	0	28	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	52	0	0	112	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	52	0	164	52
Stage 1	-	-	-	-	52	-
Stage 2	-	-	-	-	112	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1567	-	831	1021
Stage 1	-	-	-	-	976	-
Stage 2	-	-	-	-	918	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1567	-	831	1021
Mov Cap-2 Maneuver	-	-	-	-	831	-
Stage 1	-	-	-	-	976	-
Stage 2	-	-	-	-	918	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1567	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	6.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	6	2	2	4	0
Future Vol, veh/h	2	6	2	2	4	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	8	24	8	8	16	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	44	12	0	0	16	0
Stage 1	12	-	-	-	-	-
Stage 2	32	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	972	1074	-	-	1615	-
Stage 1	1016	-	-	-	-	-
Stage 2	996	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	962	1074	-	-	1615	-
Mov Cap-2 Maneuver	962	-	-	-	-	-
Stage 1	1016	-	-	-	-	-
Stage 2	986	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.6	0	7.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1044	1615	-
HCM Lane V/C Ratio	-	-	0.031	0.01	-
HCM Control Delay (s)	-	-	8.6	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	2	21	0	2	4
Future Vol, veh/h	0	2	21	0	2	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	25	25	25	25	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	8	84	0	8	16

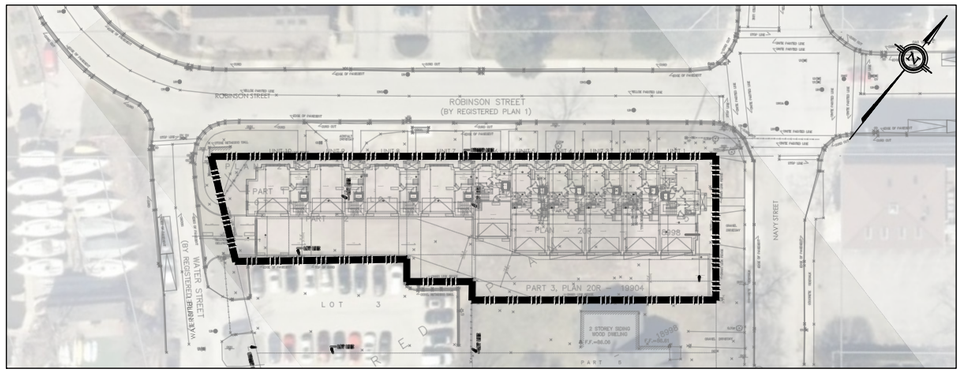
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	116	84	0	0	84	0
Stage 1	84	-	-	-	-	-
Stage 2	32	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	885	981	-	-	1526	-
Stage 1	944	-	-	-	-	-
Stage 2	996	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	881	981	-	-	1526	-
Mov Cap-2 Maneuver	881	-	-	-	-	-
Stage 1	944	-	-	-	-	-
Stage 2	991	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	2.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	981	1526	-
HCM Lane V/C Ratio	-	-	0.008	0.005	-
HCM Control Delay (s)	-	-	8.7	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

APPENDIX E

Functional Design Review



SUBJECT SITE
KEY PLAN - (N.T.S.)

VARIOUS SIGHT LINE ANALYSIS CONDUCTED FOR THE PROPOSED ACCESS LOCATED AT 106 ROBINSON STREET, OAKVILLE ON.

DRAWING #	STREET NAME / ACCESS	SCENARIO	Sightline Study (SSD or ISD)
01A	WATER ST. ACCESS	EXISTING ONE-WAY (NORTHBOUND)	STOPPING SIGHT DISTANCE
01B	WATER ST. ACCESS		STOPPING SIGHT DISTANCE
01C	WATER ST. ACCESS		INTERSECTION SIGHT DISTANCE
02A	WATER ST. ACCESS	REVERSE ONE-WAY (SOUTHBOUND)	STOPPING SIGHT DISTANCE
02B	WATER ST. ACCESS		INTERSECTION SIGHT DISTANCE
03A	WATER ST. ACCESS	TWO-WAY TRAFFIC	STOPPING SIGHT DISTANCE
03B	WATER ST. ACCESS		INTERSECTION SIGHT DISTANCE

PLOT DATE: May 11, 2023
DRAWN BY: A.E.

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Date MAY 5, 2023

106 ROBINSON ST
OAKVILLE ONTARIO

SIGHT LINE ANALYSIS
REFERENCE PAGE

Drawing No. 000

DRAWING NAME: F:\24009\Drafting\2. Working\24009-WF001.dwg

RIGHT TURN STOPPING SIGHT DISTANCE (SSD)

SEE DRAWING 002 FOR ASSUMED DESIGN SPEED 30Km/hr SSD ANALYSIS/JUSTIFICATION

AVAILABLE SSD = 65m

WATER STREET

ENSURE VISIBILITY BETWEEN VERTICAL HEIGHT OF 0.3m TO 1.3m (PER TAC CHAPTER 8.9.3)

PROPERTY LINES PER AERIAL FROM TOWN OF OAKVILLE INTERACTIVE MAP

WILLIAM STREET

ROBINSON STREET

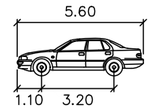
UNIT 10

UNIT 9

UNIT 8

LOT LINE

EXISTING CONDITION – SOURCE: GOOGLE STREET VIEW



P

	meters
Width	: 2.00
Track	: 2.00
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

STOPPING SIGH DISTANCE (SSD)		
SIGHTLINES PER "TAC" TABLE 9.9.4 & TABLE 9.9.6		
ASSUMED POSTED SPEED	50km/hr	
DESIGN SPEED	50km/hr	
STOPPING SIGHT DISTANCES	LEFT TURN (m)	RIGHT TURN (m)
REQUIRED SSD	-	65
AVAILABLE SSD	-	65
REQUIRED SSD SATISFIED	YES	

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LEGEND
- SIGHT LINE
- AVAILABLE SSD
- PROPERTY LINE
- RESTRICTED OBJECT HEIGHT AREA

106 ROBINSON ST
OAKVILLE ONTARIO

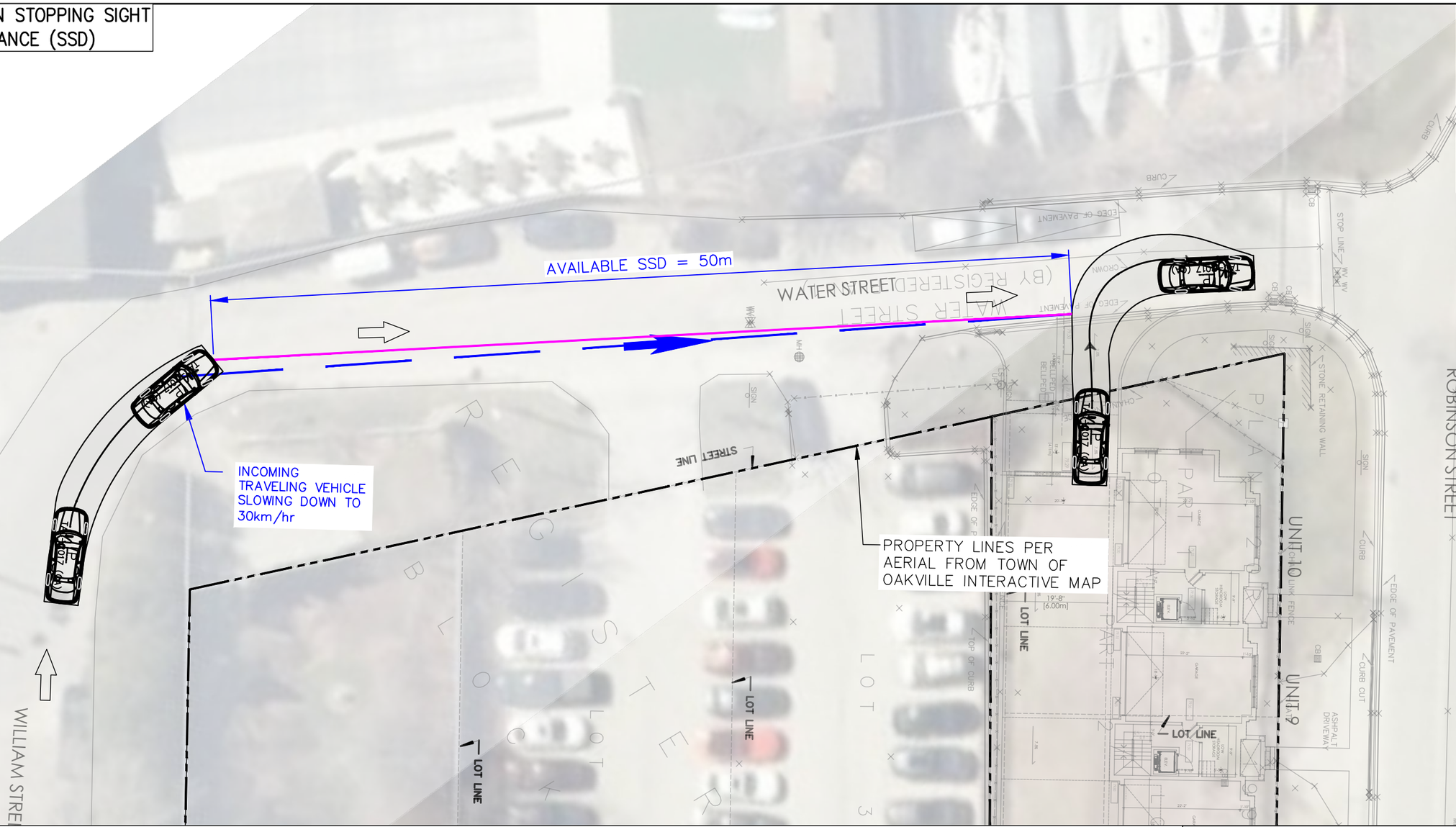
2.5 0 2.5 5 7.5m
1:250

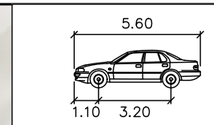
WATER ST ACCESS
STOPPING SIGHT DISTANCE
SCENARIO 1 – EXISTING ONE-WAY

Drawing No. 01A

DRAWING NAME: F:\24009\Drafting\2. Working\24009-WF001.dwg

RIGHT TURN STOPPING SIGHT DISTANCE (SSD)





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	meters
Width	: 2.00
Track	: 2.00
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

NOTES:

1. THE AVAILABLE STOPPING SIGHT DISTANCE (SSD) OF 50m (RIGHT TURN) IS LESS THAN THE REQUIRED SSD OF 65m (RIGHT TURN) FOR THE DESIGN SPEED LIMIT OF 50Km/h (PER TABLE 9.9.4 AND 9.9.6 OF TRANSPORTATION ASSOCIATION OF CANADA (TAC) GUIDELINE – CHAPTER 9). HOWEVER, GIVEN THE EXISTING CONDITIONS OF WATER ST, THE AVAILABLE SSD IS ACCEPTABLE – JUSTIFICATION IS AS FOLLOWS:
   1.1. VEHICLES ON WATER ST WILL BE SLOWING DOWN AT THE APEX OF THE CURVE AT SPEEDS BELOW THE DESIGN SPEED. ONCOMING VEHICLES ARE ASSUMED TO BE TRAVELING AT A SPEED OF 30Km/h (WORST CASE). PER TRANSPORTATION ASSOCIATION OF CANADA (TAC) GUIDELINE – CHAPTER 2 SECTION 2.5, THE SSD FOR 30Km/h DESIGN SPEED CAN BE CALCULATED AS:

- SSD = $0.278*V*t+0.039*(\frac{V^2}{a}) = 0.278*30*2.5+0.039*(\frac{30^2}{3.4}) = 31.2m$
- THEREFORE THE REQUIRED SSD IS SATISFIED AND THE AVAILABLE SSD IS MORE THAN THE REQUIRED AT A SPEED OF 30Km/h.

STOPPING SIGH DISTANCE (SSD)		
SIGHTLINES PER "TAC" TABLE 9.9.4 & TABLE 9.9.6		
ASSUMED POSTED SPEED	50km/hr	
DESIGN SPEED	50km/hr	
STOPPING SIGHT DISTANCES	LEFT TURN (m)	RIGHT TURN (m)
REQUIRED SSD	-	65
AVAILABLE SSD	-	50
REQUIRED SSD SATISFIED	YES (SEE NOTE 1)	

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LEGEND
- SIGHT LINE
- AVAILABLE SSD/ISD
- PROPERTY LINE

106 ROBINSON ST
OAKVILLE ONTARIO

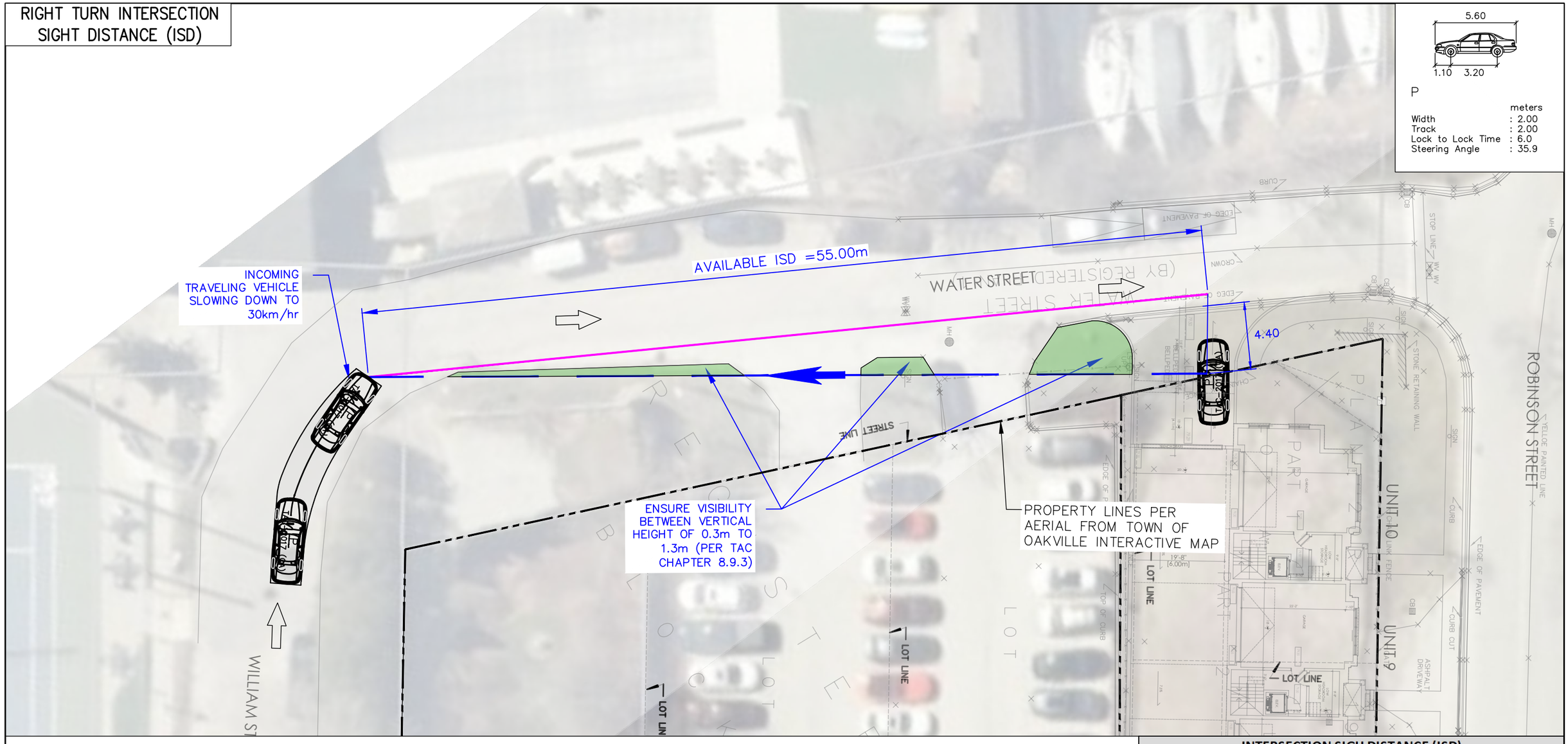
2.5 0 2.5 5 7.5m
1:250

WATER ST ACCESS
STOPPING SIGHT DISTANCE
SCENARIO 1 – EXISTING ONE–WAY
(ASSUMED 30km/hr)

Drawing No. 01B

DRAWING NAME: F:\24009\Drafting\2. Working\24009–WF001.dwg

RIGHT TURN INTERSECTION SIGHT DISTANCE (ISD)



NOTES:

1. THE AVAILABLE INTERSECTION SIGHT DISTANCE (ISD) OF 55m (RIGHT TURN) IS LESS THAN THE DESIRED ISD OF 95m (RIGHT TURN) FOR THE DESIGN SPEED LIMIT OF 50Km/h (PER TABLE 9.9.6 OF TRANSPORTATION ASSOCIATION OF CANADA (TAC) GUIDELINE – CHAPTER 9). HOWEVER, GIVEN THE EXISTING CONDITIONS OF WATER ST, THE AVAILABLE ISD IS ACCEPTABLE – JUSTIFICATION IS AS FOLLOWS:
   1.1. VEHICLES ON WATER ST WILL BE SLOWING DOWN AT THE APEX OF THE CURVE AT SPEEDS BELOW THE DESIGN SPEED. ONCOMING VEHICLES ARE ASSUMED TO BE TRAVELING AT A SPEED OF 30Km/h (WORST CASE SCENARIO). PER TRANSPORTATION ASSOCIATION OF CANADA (TAC) GUIDELINE – CHAPTER 9 SECTION 9.9.2.3 THE ISD FOR 30Km/h CAN BE CALCULATED AS SHOWN BELOW:

- RIGHT TURN: ISD = $0.278*V_{MAJOR}*T_g$ = 0.278*30*6.5 = 54.21m
- THEREFORE THERE IS ENOUGH AVAILABLE ISD BETWEEN THE PROPOSED ACCESS AND THE ONCOMING VEHICLES AT THE APEX OF THE CURVE ON THE WEST SIDE OF WATER ST.

INTERSECTION SIGH DISTANCE (ISD)		
SIGHTLINES PER "TAC" TABLE 9.9.4 & TABLE 9.9.6		
ASSUMED POSTED SPEED	50km/hr	
DESIGN SPEED	50km/hr	
INTERSECTION SIGHT DISTANCES	LEFT TURN (m)	RIGHT TURN (m)
DESIRED ISD	-	95
AVAILABLE ISD	-	55
DESIRED ISD SATISFIED	YES (SEE NOTE 1)	

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Date MAY 5, 2023

LEGEND
- SIGHT LINE
- AVAILABLE SSD/ISD
- PROPERTY LINE
- RESTRICTED OBJECT HEIGHT AREA

106 ROBINSON ST
OAKVILLE ONTARIO

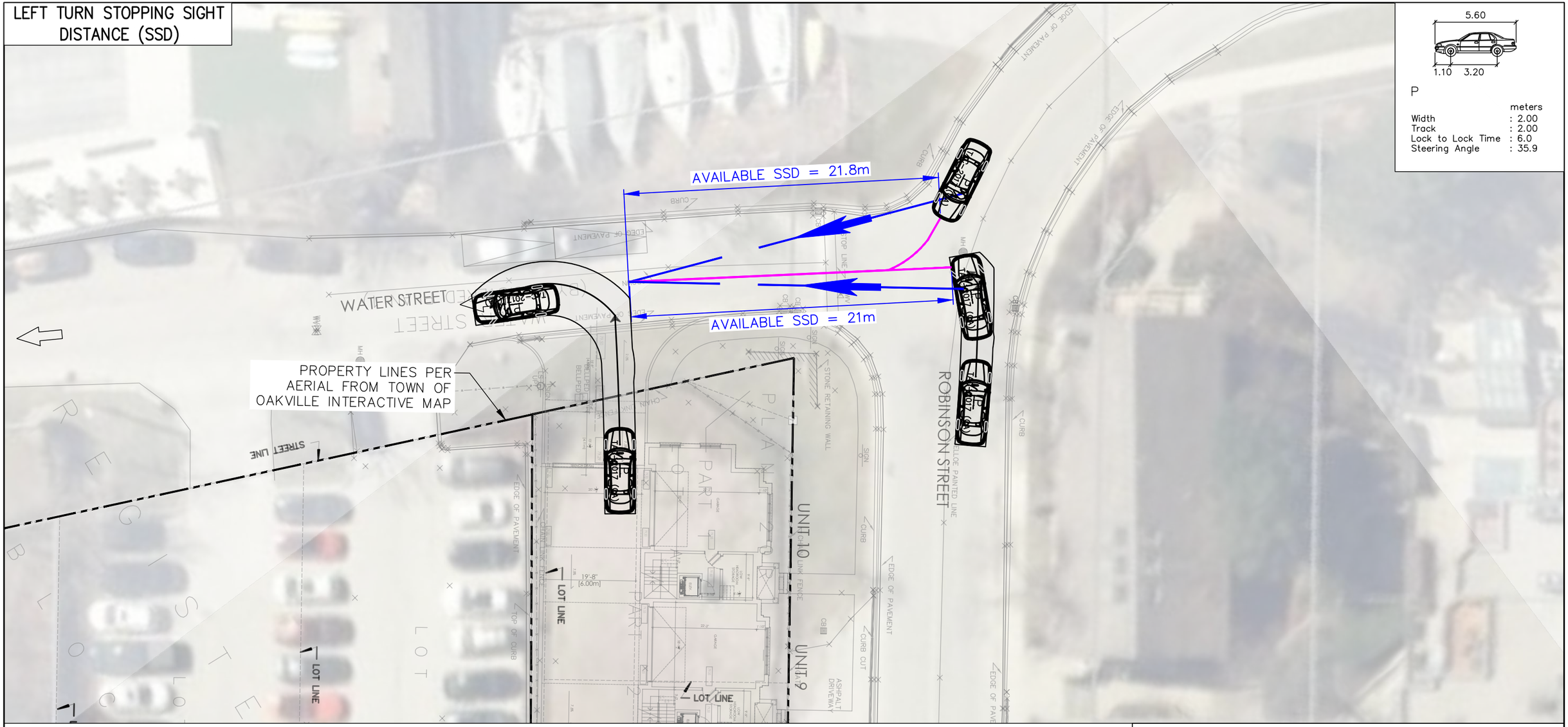
2.5 0 2.5 5 7.5m
1:250

WATER ST ACCESS
INTERSECTION SIGHT DISTANCE
SCENARIO 1 – EXISTING ONE-WAY
(ASSUMED 30km/hr)

Drawing No. 01C

DRAWING NAME: F:\24009\Drafting\2. Working\24009-WF001.dwg

LEFT TURN STOPPING SIGHT DISTANCE (SSD)



NOTES:

1. THE AVAILABLE STOPPING SIGHT DISTANCE (SSD) OF 21.8m (LEFT TURN) IS LESS THAN THE REQUIRED SSD OF 65m (LEFT TURN) FOR THE DESIGN SPEED LIMIT OF 50Km/h (PER TABLE 9.9.4 AND 9.9.6 OF TRANSPORTATION ASSOCIATION OF CANADA (TAC) GUIDELINE – CHAPTER 9). HOWEVER, GIVEN THE EXISTING CONDITIONS OF WATER ST, THE AVAILABLE SSD IS ACCEPTABLE – JUSTIFICATION IS AS FOLLOWS:
   1.1. VEHICLES ON ROBINSON ST WILL BE SLOWING DOWN AT SPEEDS BELOW THE DESIGN SPEED WHEN MAKING A LEFT OR RIGHT TURN ONTO WATER ST. ONCOMING VEHICLES ARE ASSUMED TO BE TRAVELING AT A SPEED OF 15Km/h. PER TRANSPORTATION ASSOCIATION OF CANADA (TAC) GUIDELINE – CHAPTER 2 SECTION 2.5, THE SSD FOR 15Km/h DESIGN SPEED CAN BE CALCULATED AS:

- SSD = $0.278*V*t+0.039*(\frac{V^2}{a})$ = $0.278*15*2.5+0.039*(\frac{15^2}{3.4})$ = 13m
- THEREFORE THE REQUIRED SSD IS SATISFIED AND THE AVAILABLE SSD IS MORE THAN THE REQUIRED AT A SPEED OF 15Km/h.

STOPPING SIGH DISTANCE (SSD)		
SIGHTLINES PER "TAC" TABLE 9.9.4 & TABLE 9.9.6		
ASSUMED POSTED SPEED	50km/hr	
DESIGN SPEED	50km/hr	
STOPPING SIGHT DISTANCES	LEFT TURN (m)	RIGHT TURN (m)
REQUIRED SSD	65	-
AVAILABLE SSD	21.8/21	-
REQUIRED SSD SATISFIED	YES (SEE NOTE 1)	

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Date MAY 5, 2023

LEGEND
- SIGHT LINE
- AVAILABLE SSD/ISD
- PROPERTY LINE

106 ROBINSON ST
OAKVILLE ONTARIO

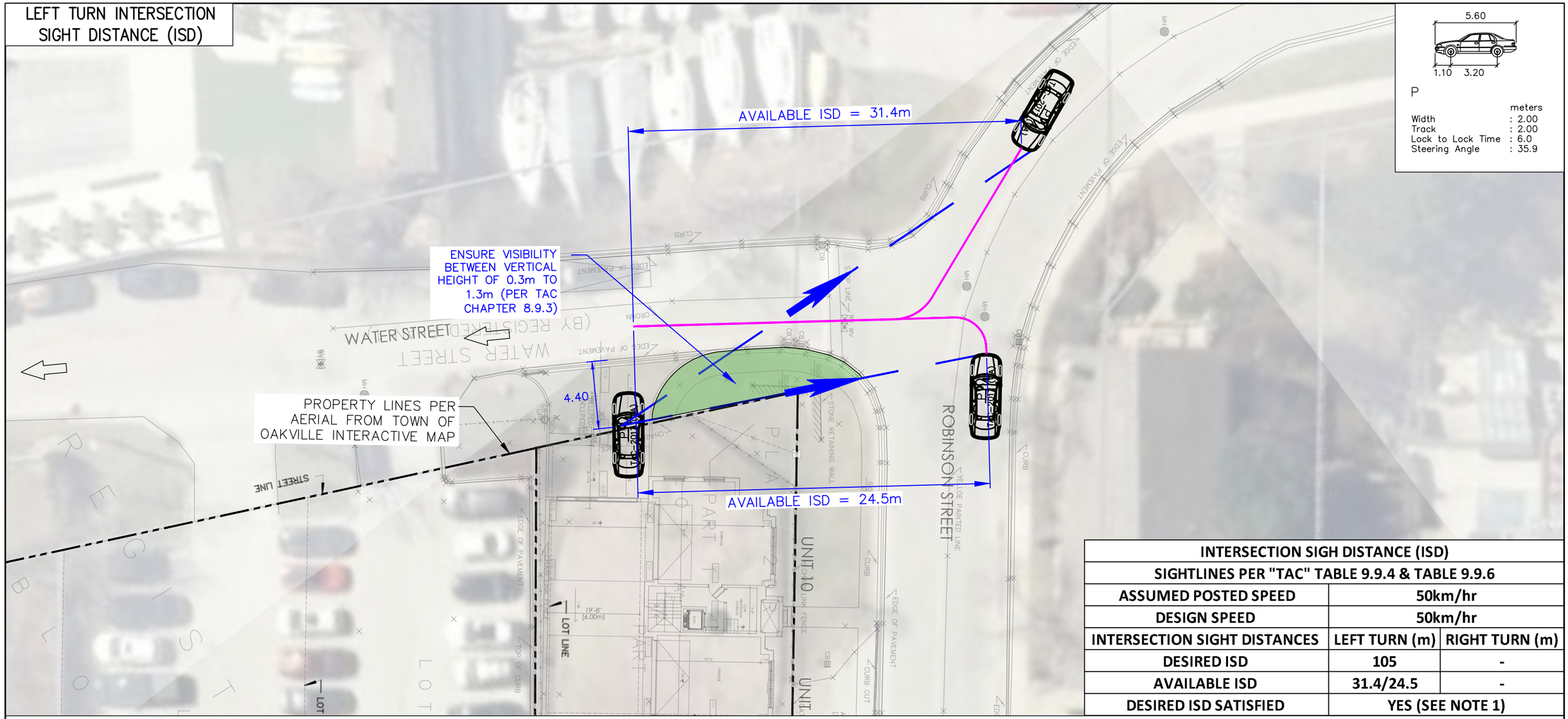
2.5 0 2.5 5 7.5m
1:250

WATER ST ACCESS
STOPPING SIGHT DISTANCE
SCENARIO 2 – REVERSE ONE-WAY
(ASSUMED 15km/hr)

Drawing No. 02A

DRAWING NAME: F:\24009\Drafting\2. Working\24009-WF001.dwg

LEFT TURN INTERSECTION SIGHT DISTANCE (ISD)



INTERSECTION SIGH DISTANCE (ISD)		
SIGHTLINES PER "TAC" TABLE 9.9.4 & TABLE 9.9.6		
ASSUMED POSTED SPEED	50km/hr	
DESIGN SPEED	50km/hr	
INTERSECTION SIGHT DISTANCES	LEFT TURN (m)	RIGHT TURN (m)
DESIRED ISD	105	-
AVAILABLE ISD	31.4/24.5	-
DESIRED ISD SATISFIED	YES (SEE NOTE 1)	

NOTES:

1. THE AVAILABLE INTERSECTION SIGHT DISTANCE (ISD) OF 31.4m (LEFT TURN) IS LESS THAN THE DESIRED ISD OF 105m (LEFT TURN) FOR THE DESIGN SPEED LIMIT OF 50Km/h (PER TABLE 9.9.6 OF TRANSPORTATION ASSOCIATION OF CANADA (TAC) GUIDELINE – CHAPTER 9). HOWEVER, GIVEN THE EXISTING CONDITIONS OF WATER ST, THE AVAILABLE ISD IS ACCEPTABLE – JUSTIFICATION IS AS FOLLOWS:
   1.1. VEHICLES ON ROBINSON ST WILL BE SLOWING DOWN AT SPEEDS BELOW THE DESIGN SPEED WHEN MAKING A LEFT OR RIGHT TURN ONTO WATER ST. ONCOMING VEHICLES ARE ASSUMED TO BE TRAVELING AT A SPEED OF 15Km/h. PER TRANSPORTATION ASSOCIATION OF CANADA (TAC) GUIDELINE – CHAPTER 9 SECTION 9.9.2.3 THE ISD FOR 15Km/h CAN BE CALCULATED AS SHOWN BELOW:

- LEFT TURN: ISD = $0.278*V_{MAJOR}*T_g$ = 0.278*15*7.5 = 31.3m
- THE AVAILABLE SSD OF 21.8m FOR VEHICLE TRAVELING SOUTHBOUND ALONG WATER ST IS GREATER THAN 13m, WHICH EXCEEDS THE MINIMUM REQUIREMENTS. IT SHOULD BE NOTED THAT THE MINIMUM SSD SPECIFIED IN THE TAC GUIDE CONSERVATIVELY ASSUMES THAT THE DRIVER OF THE MOVING VEHICLE REQUIRES 3.0– SECONDS TO PERCEIVE AN OBSTACLE AND ACT ACCORDINGLY. THEREFORE, AN INCOMING SOUTHBOUND VEHICLE ALONG WATER ST WILL HAVE MORE THAN SUFFICIENT DISTANCE TO BRING THE VEHICLE TO A COMPLETE STOP AND AVOID POTENTIAL COLLISION, SHOULD AN OBSTACLE BE PRESENT AS THE INCOMING SOUTHBOUND VEHICLE APPROACHES THE DRIVEWAY ACCESS (i.e. WHEN THEY SEE A VEHICLE MAKING A LEFT TURN FROM THE DRIVEWAY ACCESS).
- EVEN THOUGH THE AVAILABLE ISD OF 24.5m IN THE WESTBOUND LEFT DIRECTION DOES NOT MEET THE DESIRED ISD, THE AVAILABLE DISTANCE EXCEEDS THE MINIMUM SSD OF 13m WHICH MAKES THE LOCATION OF THE PROPOSED ACCESS ACCEPTABLE. THOUGH, TO ACHIEVE THE MAXIMUM AVAILABLE ISD, IT IS RECOMMENDED TO DEDICATE THE HATCHED AREA AS INDICATED AS A LOW PLANTING AREA WITH THIS RESTRICTION, THE VEHICULAR TRAFFIC WILL HAVE ENHANCED VISIBILITY AND WILL BE ABLE TO MANEUVER THE ACCESS SAFELY.

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Date MAY 5, 2023

LEGEND
- SIGHT LINE
- AVAILABLE SSD/ISD
- PROPERTY LINE
- RESTRICTED OBJECT HEIGHT AREA

106 ROBINSON ST
OAKVILLE ONTARIO

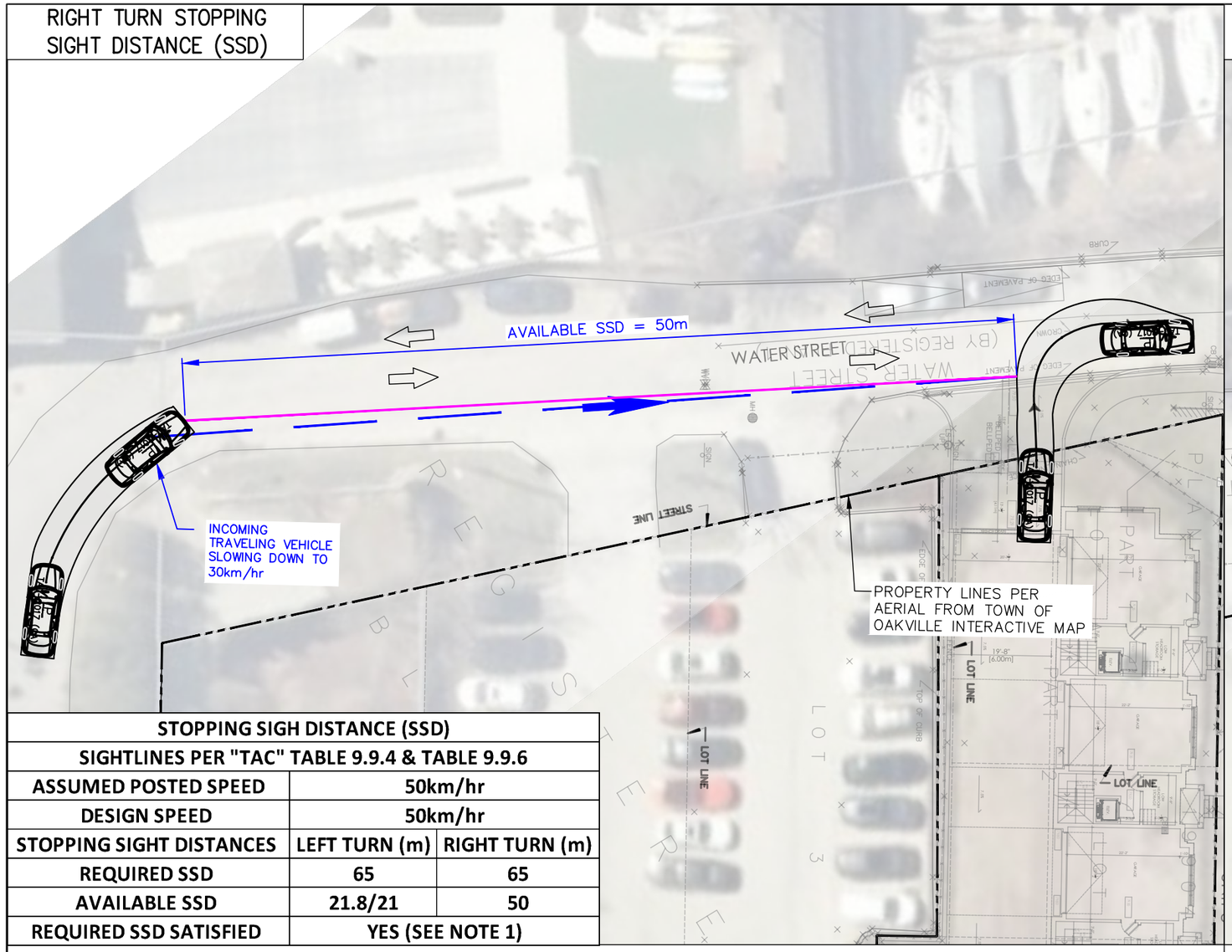
2.5 0 2.5 5 7.5m
1:250

WATER ST ACCESS
INTERSECTION SIGHT DISTANCE
SCENARIO 2 – REVERSE ONE–WAY
(ASSUMED 15km/hr)

Drawing No. 02B

DRAWING NAME: F:\24009\Drafting\2. Working\24009–WF001.dwg

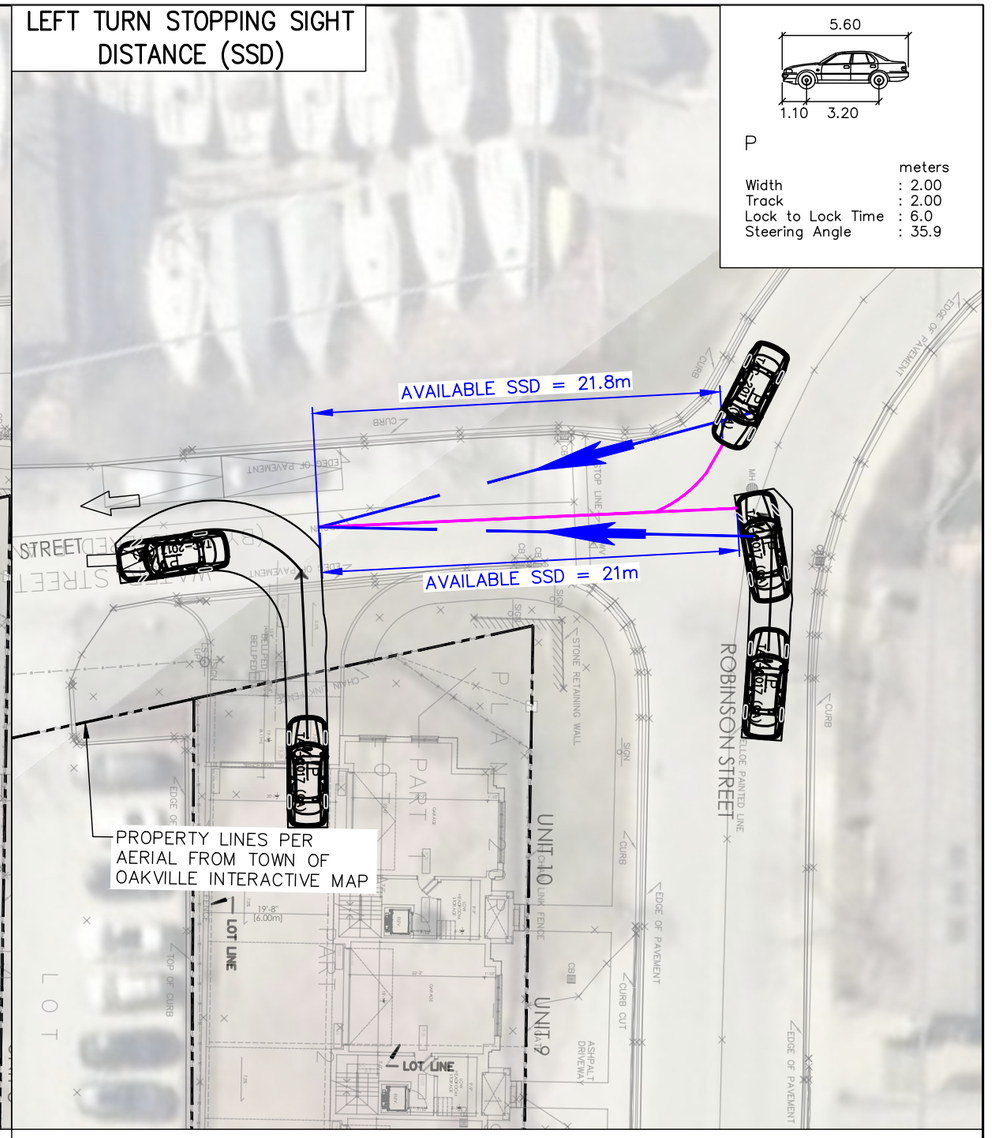
RIGHT TURN STOPPING SIGHT DISTANCE (SSD)



STOPPING SIGH DISTANCE (SSD)		
SIGHTLINES PER "TAC" TABLE 9.9.4 & TABLE 9.9.6		
ASSUMED POSTED SPEED	50km/hr	
DESIGN SPEED	50km/hr	
STOPPING SIGHT DISTANCES	LEFT TURN (m)	RIGHT TURN (m)
REQUIRED SSD	65	65
AVAILABLE SSD	21.8/21	50
REQUIRED SSD SATISFIED	YES (SEE NOTE 1)	

NOTES:
1. THE AVAILABLE STOPPING SIGHT DISTANCE (SSD) OF 50m (RIGHT TURN) IS LESS THAN THE REQUIRED SSD OF 65m (RIGHT TURN) FOR THE DESIGN SPEED LIMIT OF 50Km/h (PER TABLE 9.9.4 AND 9.9.6 OF TRANSPORTATION ASSOCIATION OF CANADA (TAC) GUIDELINE – CHAPTER 9). HOWEVER, GIVEN THE EXISTING CONDITIONS OF WATER ST, THE AVAILABLE SSD IS ACCEPTABLE – JUSTIFICATION IS AS FOLLOWS:
   1.1. VEHICLES ON WATER ST WILL BE SLOWING DOWN AT THE APEX OF THE CURVE AT SPEEDS BELOW THE DESIGN SPEED. ONCOMING VEHICLES ARE ASSUMED TO BE TRAVELING AT A SPEED OF 30Km/h (WORST CASE). PER TRANSPORTATION ASSOCIATION OF CANADA (TAC) GUIDELINE – CHAPTER 2 SECTION 2.5, THE SSD FOR 30Km/h DESIGN SPEED CAN BE CALCULATED AS:
- SSD = $0.278*V*t+0.039*(\frac{V^2}{a})$ = $0.278*30*2.5+0.039*(\frac{30^2}{3.4})$ = 31.2m
- THEREFORE THE REQUIRED SSD IS SATISFIED AND THE AVAILABLE SSD IS MORE THAN THE REQUIRED AT A SPEED OF 30Km/h.

LEFT TURN STOPPING SIGHT DISTANCE (SSD)



P

	meters
Width	: 2.00
Track	: 2.00
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

NOTES:
1. THE AVAILABLE STOPPING SIGHT DISTANCE (SSD) OF 21.8m (LEFT TURN) IS LESS THAN THE REQUIRED SSD OF 65m (LEFT TURN) FOR THE DESIGN SPEED LIMIT OF 50Km/h (PER TABLE 9.9.4 AND 9.9.6 OF TRANSPORTATION ASSOCIATION OF CANADA (TAC) GUIDELINE – CHAPTER 9). HOWEVER, GIVEN THE EXISTING CONDITIONS OF WATER ST, THE AVAILABLE SSD IS ACCEPTABLE – JUSTIFICATION IS AS FOLLOWS:
   1.1. VEHICLES ON ROBINSON ST WILL BE SLOWING DOWN AT SPEEDS BELOW THE DESIGN SPEED WHEN MAKING A LEFT OR RIGHT TURN ONTO WATER ST. ONCOMING VEHICLES ARE ASSUMED TO BE TRAVELING AT A SPEED OF 15Km/h. PER TRANSPORTATION ASSOCIATION OF CANADA (TAC) GUIDELINE – CHAPTER 2 SECTION 2.5, THE SSD FOR 15Km/h DESIGN SPEED CAN BE CALCULATED AS:
- SSD = $0.278*V*t+0.039*(\frac{V^2}{a})$ = $0.278*15*2.5+0.039*(\frac{15^2}{3.4})$ = 13m
- THEREFORE THE REQUIRED SSD IS SATISFIED AND THE AVAILABLE SSD IS MORE THAN THE REQUIRED AT A SPEED OF 15Km/h.

PLOT DATE: May 11, 2023

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Date MAY 5, 2023

LEGEND
- SIGHT LINE
- AVAILABLE SSD/ISD
- PROPERTY LINE

106 ROBINSON ST
OAKVILLE ONTARIO

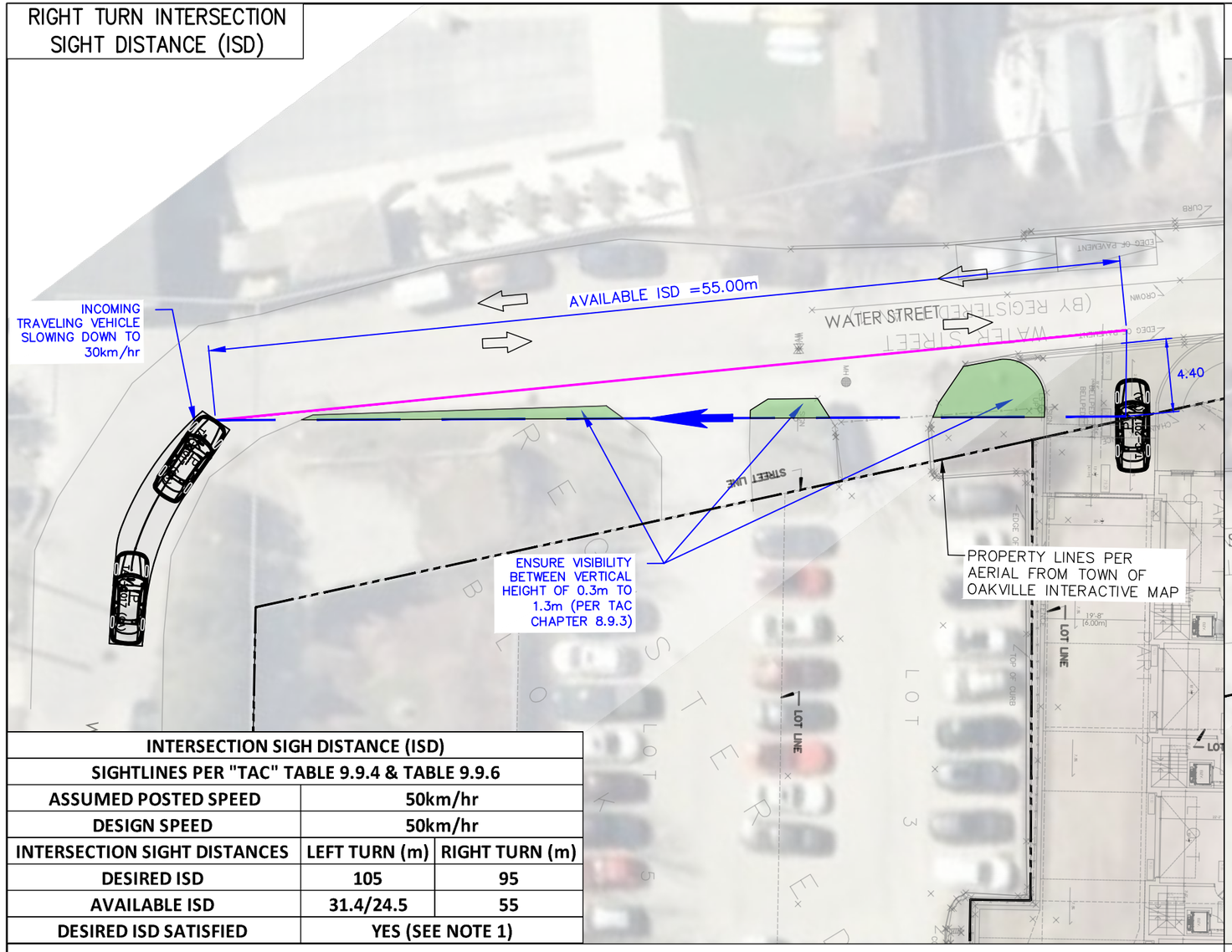
3 0 3 6 9m
1:300

WATER ST ACCESS
STOPPING SIGHT DISTANCE
SCENARIO 3 – TWO-WAY WATER ST
(ASSUMED 30 km/hr & 15km/hr)

Drawing No. 03A

DRAWING NAME: F:\24009\Drafting\2. Working\24009-WF001.dwg

RIGHT TURN INTERSECTION SIGHT DISTANCE (ISD)



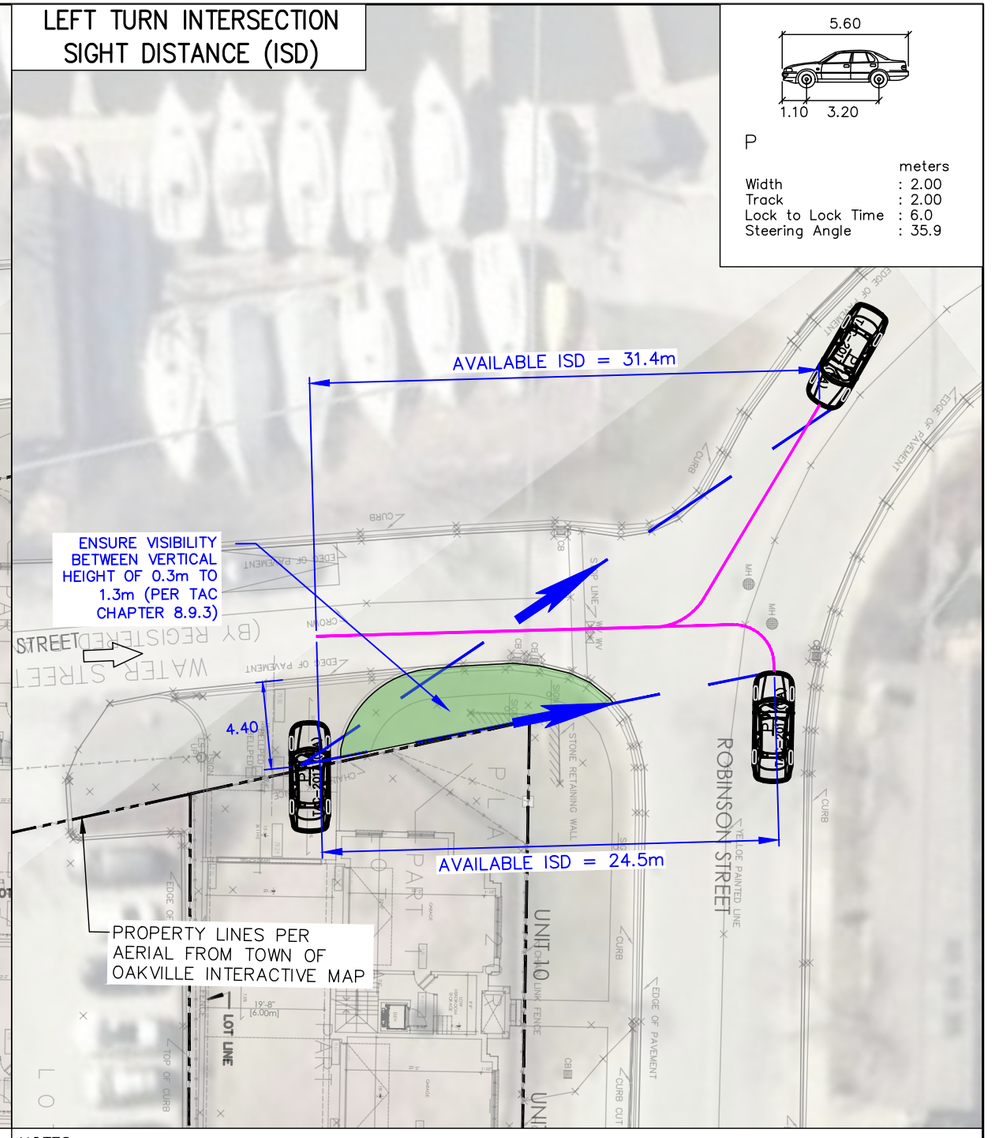
INTERSECTION SIGH DISTANCE (ISD)		
SIGHTLINES PER "TAC" TABLE 9.9.4 & TABLE 9.9.6		
ASSUMED POSTED SPEED	50km/hr	
DESIGN SPEED	50km/hr	
INTERSECTION SIGHT DISTANCES	LEFT TURN (m)	RIGHT TURN (m)
DESIRED ISD	105	95
AVAILABLE ISD	31.4/24.5	55
DESIRED ISD SATISFIED	YES (SEE NOTE 1)	

NOTES:

1. THE AVAILABLE INTERSECTION SIGHT DISTANCE (ISD) OF 55m (RIGHT TURN) IS LESS THAN THE DESIRED ISD OF 95m (RIGHT TURN) FOR THE DESIGN SPEED LIMIT OF 50Km/h (PER TABLE 9.9.6 OF TRANSPORTATION ASSOCIATION OF CANADA (TAC) GUIDELINE – CHAPTER 9). HOWEVER, GIVEN THE EXISTING CONDITIONS OF WATER ST, THE AVAILABLE ISD IS ACCEPTABLE – JUSTIFICATION IS AS FOLLOWS:
   1.1. VEHICLES ON WATER ST WILL BE SLOWING DOWN AT THE APEX OF THE CURVE AT SPEEDS BELOW THE DESIGN SPEED. ONCOMING VEHICLES ARE ASSUMED TO BE TRAVELING AT A SPEED OF 30Km/h (WORST CASE SCENARIO). PER TRANSPORTATION ASSOCIATION OF CANADA (TAC) GUIDELINE – CHAPTER 9 SECTION 9.9.2.3 THE ISD FOR 30Km/h CAN BE CALCULATED AS SHOWN BELOW:

- RIGHT TURN: ISD = $0.278*V_{MAJOR}*T_g$ = 0.278*30*6.5 = 54.21m
- THEREFORE THERE IS ENOUGH AVAILABLE ISD BETWEEN THE PROPOSED ACCESS AND THE ONCOMING VEHICLES AT THE APEX OF THE CURVE ON THE WEST SIDE OF WATER ST.

LEFT TURN INTERSECTION SIGHT DISTANCE (ISD)



NOTES:

1. THE AVAILABLE INTERSECTION SIGHT DISTANCE (ISD) OF 31.4m (LEFT TURN) IS LESS THAN THE DESIRED ISD OF 105m (LEFT TURN) FOR THE DESIGN SPEED LIMIT OF 50Km/h (PER TABLE 9.9.6 OF TRANSPORTATION ASSOCIATION OF CANADA (TAC) GUIDELINE – CHAPTER 9). HOWEVER, GIVEN THE EXISTING CONDITIONS OF WATER ST, THE AVAILABLE ISD IS ACCEPTABLE – JUSTIFICATION IS AS FOLLOWS:
   1.1. VEHICLES ON ROBINSON ST WILL BE SLOWING DOWN AT SPEEDS BELOW THE DESIGN SPEED WHEN MAKING A LEFT OR RIGHT TURN ONTO WATER ST. ONCOMING VEHICLES ARE ASSUMED TO BE TRAVELING AT A SPEED OF 15Km/h. PER TRANSPORTATION ASSOCIATION OF CANADA (TAC) GUIDELINE – CHAPTER 9 SECTION 9.9.2.3 THE ISD FOR 15Km/h CAN BE CALCULATED AS SHOWN BELOW:

- LEFT TURN: ISD = $0.278*V_{MAJOR}*T_g$ = 0.278*15*7.5 = 31.3m
- THEREFORE THERE IS ENOUGH AVAILABLE ISD BETWEEN THE PROPOSED ACCESS AND THE ONCOMING VEHICLES FROM ROBINSON ST.

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LEGEND
- SIGHT LINE
- AVAILABLE SSD/ISD
- PROPERTY LINE
- RESTRICTED OBJECT HEIGHT AREA

106 ROBINSON ST
OAKVILLE ONTARIO
3 0 3 6 9m
1:300

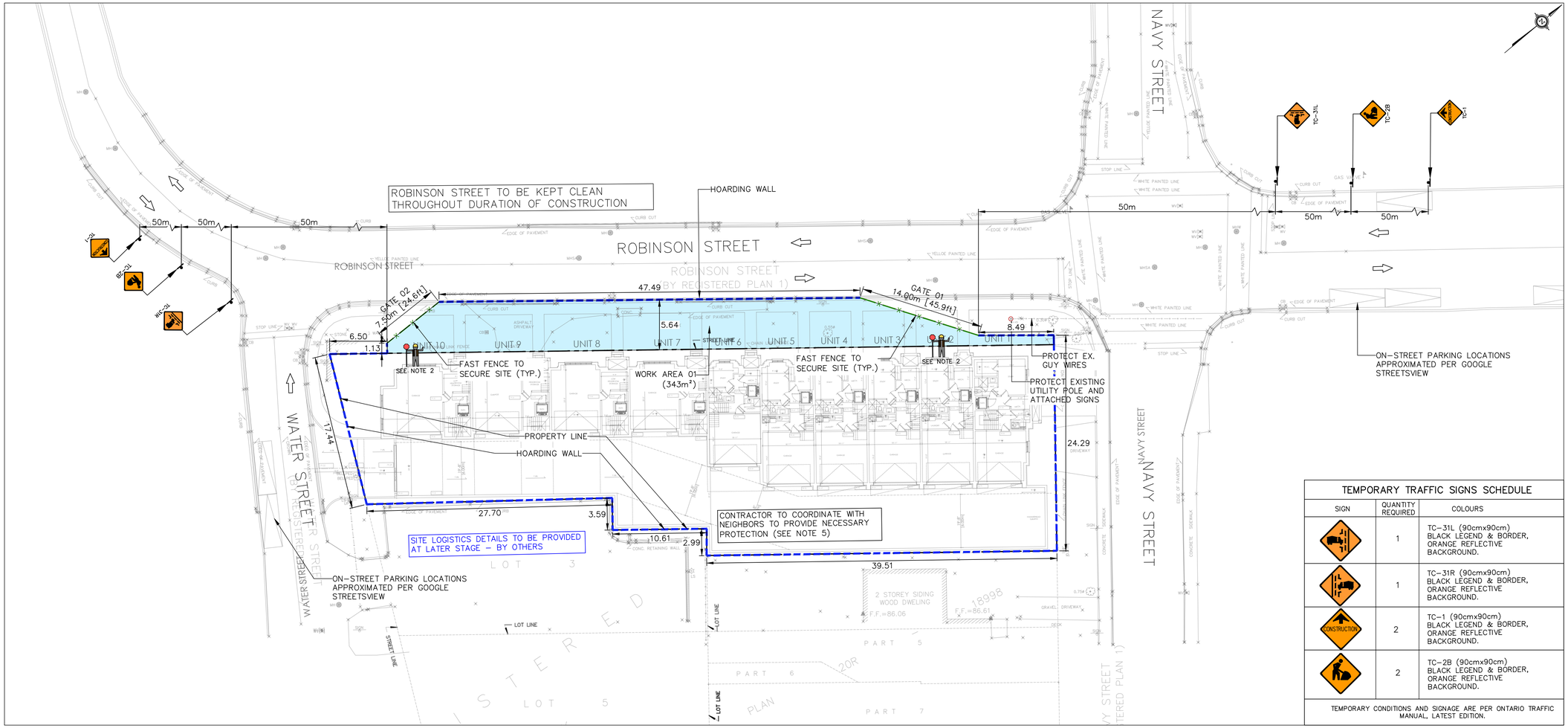
WATER ST ACCESS INTERSECTION SIGHT DISTANCE SCENARIO 3 – TWO-WAY WATER ST (ASSUMED 30 km/hr & 15km/hr)

Drawing No. 03B

DRAWING NAME: F:\24009\Drafting\2. Working\24009-WF001.dwg

APPENDIX F

Construction Management Plan



PROPOSED HOARDING AND SIGNAGE PLAN
SCALE – 1:250

NOTES:

1. THE TAC DESIGN VEHICLE HSU REPRESENTS THE LONGER SINGLE UNIT VEHICLE LIKE THE "DUMP" AND "CONCRETE" TRUCKS, ETC.
2. TWO (2) CERTIFIED TRAFFIC CONTROL FLAGMAN TO BE PRESENT TO REGULATE THE TRAFFIC AND PEDESTRIANS WHEN THE TRUCKS ARE ENTERING OR EXITING THE SITE.

2.1. ADDITIONAL TCPs ARE REQUIRED TO REGULATE THE TRAFFIC AND PEDESTRIANS WHEN THE WB20 VEHICLE/HSU TRUCKS ARE REVERSING INTO THE CONSTRUCTION AREA. EXACT NUMBER TO DETERMINED AND APPROVED BY COUNCIL)

3. HYDRO POLE CLEARANCE AND RELOCATION TO BE VERIFIED BY OTHERS DURING ALL STAGE.
4. ALL CONSTRUCTION ACCESS GATES TO OPEN INWARDS OR SLIDING GATES TO BE PROVIDED AND MUST HAVE MIN. 4.5m VERTICAL CLEARANCE.
5. PER MINISTRY OF LABOR (MOL), NO WORK SHALL BE CARRIED OUT ON A BUILDING OR STRUCTURE LOCATED 4.5M OR LESS FROM A PUBLIC WAY UNLESS A COVERED WAY IS CONSTRUCTED OVER THE PART OF THE PUBLIC WAY THAT IS ADJACENT TO THE PROJECT.
6. THIS PLAN IS INTENDED FOR ZBA APPLICATION ONLY AND NOT FOR CONSTRUCTION.
7. CONSTRUCTION HOURS SET OUT BY TOWN OF OAKVILLE NOISE BYLAW 2008-098 WILL BE RESPECTED. CONTRACTORS ARE RESTRICTED TO WORK FROM 7PM TO 7AM THE NEXT DAY AND ALL DAY ON SUNDAYS AND STATUTORY HOLIDAYS.
8. ALL FIRE HYDRANTS SHOULD BE CLEAR VISIBLE, ARE FREE OF ANY OBSTRUCTIONS WITHIN A ONE METRE RADIUS, INCLUDING SNOW AND ICE AND HAVE AN UNOBSTRUCTED PATH FROM THE ROADWAY.
9. CONTRACTOR TO MANAGE CONSTRUCTION AND DEMOLITION WASTE IN ACCORDANCE WITH O.REG.103/94.

LEGEND:

- PROPERTY LINE
- HOARDING WALL
- FAST FENCE (GATE)
- WORK AREA 01 (ROBINSON STREET – BOULEVARD)
- SEE NOTE 2 — TRAFFIC CONTROL PERSON
- TRAFFIC FLOW DIRECTION
- SIGN LOCATION – POST MOUNTED
- EX. POLE

TEMPORARY TRAFFIC SIGNS SCHEDULE

SIGN	QUANTITY REQUIRED	COLOURS
	1	TC-31L (90cmx90cm) BLACK LEGEND & BORDER, ORANGE REFLECTIVE BACKGROUND.
	1	TC-31R (90cmx90cm) BLACK LEGEND & BORDER, ORANGE REFLECTIVE BACKGROUND.
CONSTRUCTION	2	TC-1 (90cmx90cm) BLACK LEGEND & BORDER, ORANGE REFLECTIVE BACKGROUND.
	2	TC-2B (90cmx90cm) BLACK LEGEND & BORDER, ORANGE REFLECTIVE BACKGROUND.

TEMPORARY CONDITIONS AND SIGNAGE ARE PER ONTARIO TRAFFIC MANUAL, LATEST EDITION.

REV.	Drawn	Date	Description
10			
9			
8			
7			
6			
5			
4			
3			
2			
1	A.E.	2023-04-26	ZBA SUBMISSION

5 0 5 10 15m
1:250

12 0 12 24 36m
1:600

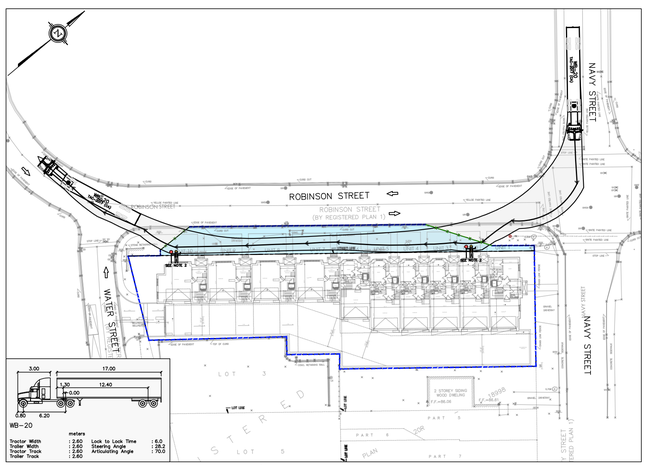
LEA Consulting Ltd.
Consulting Engineers and Planners
www.LEA.ca

NOT FOR CONSTRUCTION

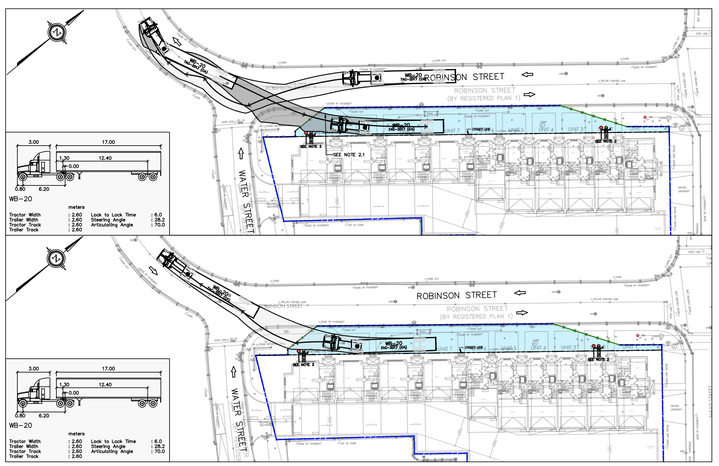
106 ROBINSON STREET OAKVILLE ONTARIO

CONSTRUCTION MANAGEMENT PLAN
SHORING, EXCAVATION, BELOW AND ABOVE GRADE HOARDING PLAN AND SIGNAGE PLAN

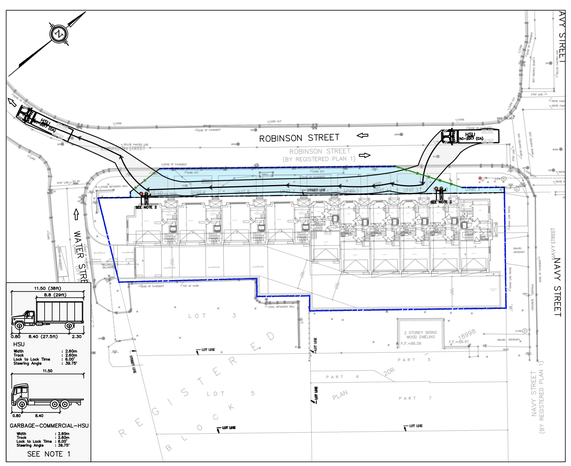
Design By	Date
S.T.	MAY 30, 2023
Drawn By	Checked By
A.E.	S.T.
Project No.	Drawing No.
24009	C001



WB-20 TRUCK – FORWARD IN/FORWARD OUT
SCALE – 1:600



WB-20 TRUCK – REVERSE IN/FORWARD OUT
SCALE – 1:600



HSU TRUCK – FORWARD IN/FORWARD OUT
SCALE – 1:600

DRAWING NAME: F:\24009\Drafting\CMP\24009-CMP-WF001.dwg