

# **Transportation Study**

## **PROPOSED MIXED-USE RESIDENTIAL AND COMMERCIAL DEVELOPMENT**

Brock Street East  
Township of Uxbridge, Durham Region, ONTARIO

November 2017  
Project No: NT-17-207

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**nextrans**  
CONSULTING ENGINEERS

NextEng Consulting Group Inc.

November 29, 2017

**Re: Transportation Impact Study  
Brock Street East  
Township of Uxbridge, Durham Region  
Our Project No. NT-17-207**

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Nextrans Consulting Engineers (A Division of NextEng Consulting Group Inc.) is pleased to present the enclosed Transportation Study for the above noted site in support of an Official Plan Amendment and Zoning By-law Amendment application(s).

The subject site is located north of Brock Street East and east of Donland Lane, inclusive, in the Township of Uxbridge. The subject site is currently vacant. Based on the proposed site plan prepared by ICR Associates Incorporated, dated August 2017, the development proposal is to redevelop the existing 49, 714.57 m<sup>2</sup> site area to include 94 townhouses and 8 semi-bungalows with loft residential units, a future development block, and a commercial building with GFA of 469.45 m<sup>2</sup> and 5 apartment units above. Vehicular access to the site is proposed through a full movement driveway via an extension of Low Boulevard, a full movement driveway via an extension of Herrema Boulevard to Brock Street East, and through a right-in/right-out driveway via Brock Street East.

The study concludes that the development proposal can adequately be accommodated by the existing transportation network with manageable traffic impact to the adjacent public roadways. We trust the enclosed sufficiently addresses your needs. Should you have any questions, please do not hesitate to contact the undersigned.

Yours truly,

**Nextrans Consulting Engineers**

A Division of NextEng Consulting Group Inc.

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## EXECUTIVE SUMMARY

NexTrans Consulting Engineers was retained by David Sud (the 'Client') to undertake a Transportation Impact Study for an Official Plan Amendment and Zoning By-law Amendment applications in support of a proposed mixed-use residential and commercial development, in the Township of Uxbridge, Ontario. The subject property is located north of Brock Street East and east of Donland Lane, inclusive.

### Development Proposal

The development proposal is to redevelop the existing 49, 714.57 m<sup>2</sup> site area to include 94 townhouses and 8 semi-bungalows with loft residential units, a future development block with an approximate maximum scenario of 34 apartment units, and a commercial building with GFA of 469.45 m<sup>2</sup> and 5 apartment units above. Vehicular access to the site is proposed through a full movement driveway via an extension of Low Boulevard, a full movement driveway via an extension of Herrema Boulevard to Brock Street East, and through a right-in/right-out driveway via Brock Street East.

### Traffic Analysis

The proposed development is anticipated to generate 122 two-way trips (33 inbound and 89 outbound) during the AM peak hours and 189 two-way trips (110 inbound and 79 outbound) during the PM peak hours.

The intersection capacity analysis results (based on the methodology and procedures outlined in the Highway Capacity Manual, HCM 2000, published by the Transportation Research Board) indicate that the study area intersections and proposed access are expected to operate with acceptable levels of service.

### Access/Parking Review

It is recommended that appropriate signage consisting of STOP signs (Ra-1) and STOP bars be provided throughout the internal road network, and an appropriate barrier to ensure correct vehicle circulation at the right-in/right-out access on Brock Street East, as shown in **Figure 7-1**.

Based on Township of Uxbridge Zoning By-law 81-19, a total of 238 parking spaces will be required for the proposed mixed-use development. The preliminary site plan provides for a total of 277 parking spaces, which results in a surplus of 39 parking spaces. This surplus is due to the visitor parking provided in the townhouse block, which the zoning by-law does not currently require for townhouse dwelling units. On this basis, the future parking demand with the proposed redevelopment is completely satisfied with the proposed parking provision.

### Site Area Review

AutoTURN software was used to generate a vehicular turning template to confirm and demonstrate the accessibility of the proposed loading space and parking spaces. As illustrated in **Figure 7-2** and **Figure 7-3**, the AutoTURN analysis demonstrates that a passenger vehicle (P TAC-1999) and 12-metre Garbage/Emergency vehicle, can effectively maneuver through the parking spaces and loading area.

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## 1.0 INTRODUCTION

NexTrans Consulting Engineers was retained by David Sud (the 'Client') to undertake a Transportation Impact Study for an Official Plan Amendment and Zoning By-law Amendment applications in support of a proposed mixed-use residential and commercial development, in the Township of Uxbridge, Ontario. The subject property is located north of Brock Street East and east of Donland Lane, inclusive. This transportation impact study conforms to the Region of Durham guidelines, see **Appendix A** for the established terms of reference.

The location of the proposed development is illustrated in **Figure 1-1**.

**Figure 1-1 – Site Location**

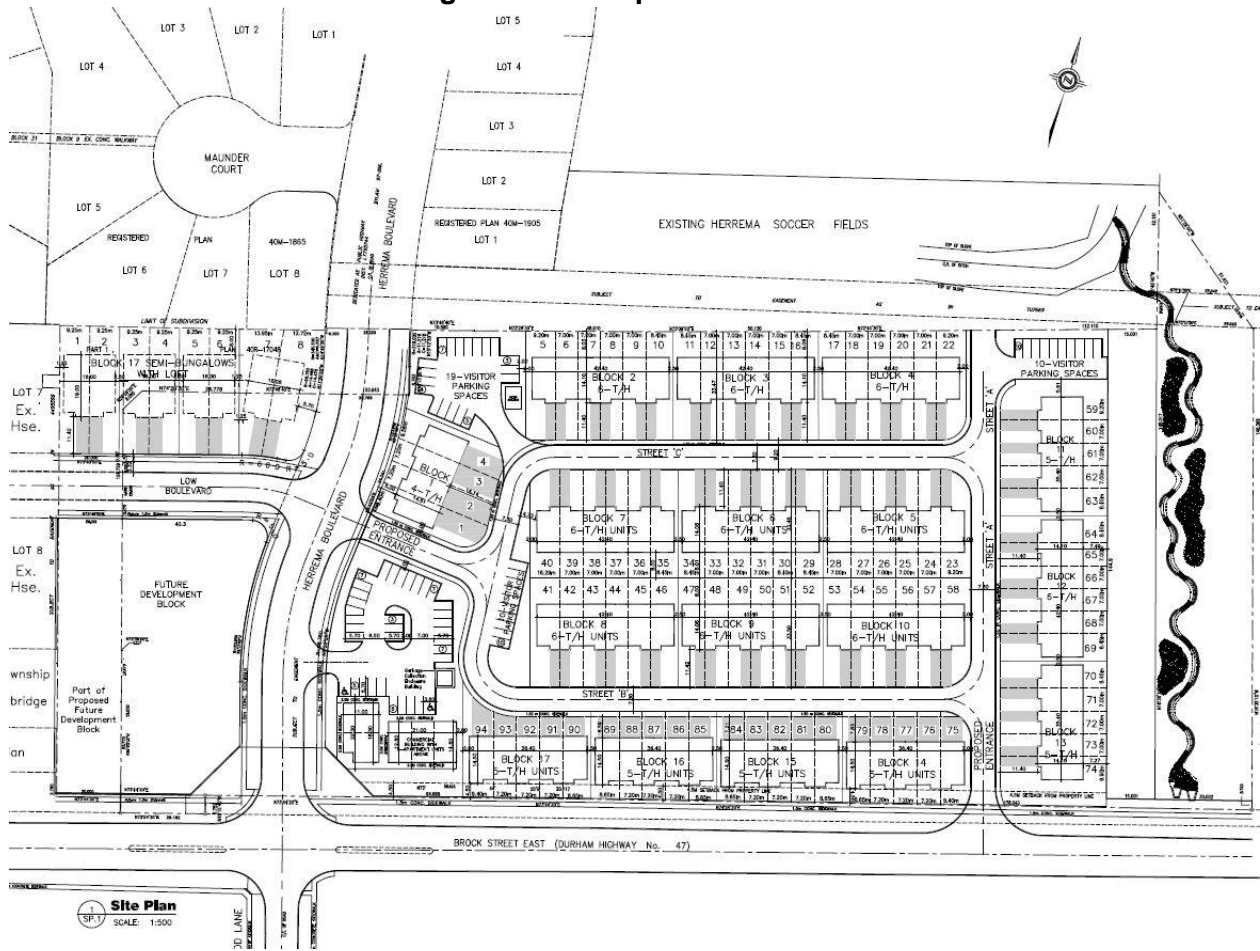


The subject property is currently vacant. Based on the proposed site plan prepared by ICR Associates Incorporated, dated August 2017, the development proposal is to redevelop the existing 49, 714.57 m<sup>2</sup> site area to include 94 townhouses and 8 semi-bungalows with loft residential units, a future development block with an approximate maximum scenario of 34 apartment units, and a commercial building with GFA of 469.45 m<sup>2</sup> and 5 apartment units above. Vehicular access to the site is proposed through a full movement driveway via an extension of Low Boulevard, a full movement driveway via an extension of Herrema Boulevard to Brock Street East, and through a right-in/right-out driveway via Brock Street East. The site plan is provided in **Figure 1-2**; **Appendix B** also provides a larger scale version of the proposed site plan.

The site plan provides for a total of 277 parking spaces.

Given the mixed-use commercial and residential nature of the development proposal, the analysis will include the weekday morning and afternoon peak periods for traffic assessment purposes.

Figure 1-2 – Proposed Site Plan



## 2.0 EXISTING TRAFFIC CONDITIONS

### 2.1. Existing Road Network

The existing subject lands are located north of Brock Street East and east of Donland Lane, inclusive, in the Town of Uxbridge. The existing road network is described as follows:

**Brock Street East:** is classified as an east-west arterial road under the jurisdiction of the Region of Durham. In the study area, it has an existing two-lane cross section and posted speed limit of 50 km/h. Brock Street East is unsignalized at Donland Lane and Nelkydd Lane with a warranted right-turn lane on approach to Nelkydd Lane.

**Herrema Boulevard:** is classified as a north-south local road under the jurisdiction of the Township of Uxbridge. In the study area, it has an existing two-lane cross section and posted speed limit of 50 km/h. Herrema Boulevard is a continuation of Donland Lane into the existing residential neighbourhood.

**Donland Lane:** is classified as a north-south local road under the jurisdiction of the Township of Uxbridge. In the study area, it has an existing two-lane cross section and posted speed limit of 50 km/h. Donland Lane is STOP controlled on approach to Brock Street East. Donland Lane also becomes Herrema Boulevard just north of Low Boulevard.

## 2.2. Existing Active Transportation Network

### Sidewalks

The area surrounding the proposed development is serviced with dedicated sidewalks on the south side of Brock Street East and on the east side of Herrema Boulevard.

### Bicycle Lanes

There are no dedicated bicycle lanes within the vicinity of the subject site.

## 2.3. Active Transportation Mode and Assessment

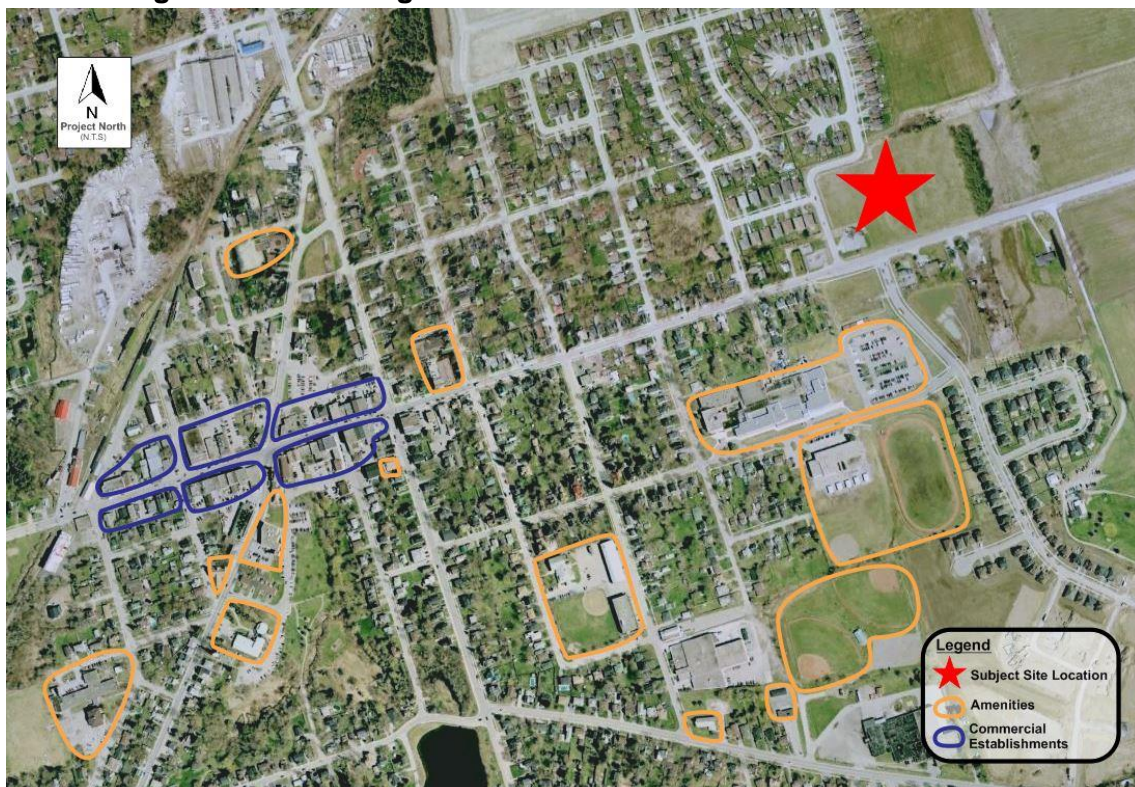
### Existing Amenities

The review of the area surrounding the proposed development indicates numerous recreational facilities, houses of worship, and schools, many of which can be easily reached by pedestrian traffic and non-auto options. **Figure 2-1** illustrates the location of the existing amenities which include Uxbridge Secondary School, Uxbridge & Area Swimming Pool, Trinity United Church etc.

### Existing Commercial Establishments

The review of the area surrounding the proposed development indicates numerous retail, food, and service establishments, many of which can be easily reached by pedestrian traffic and non-auto options. The Uxbridge Shopping Centre is located approximately 2.8 km (about an 11-minute bike ride) from the site. **Figure 2-1** illustrates the location of existing retail, food and service establishments from the proposed development. Amenities include TD Canada Trust, Pizza Pizza, Mac's, etc.

**Figure 2-1 – Existing Amenities and Commercial Establishments**





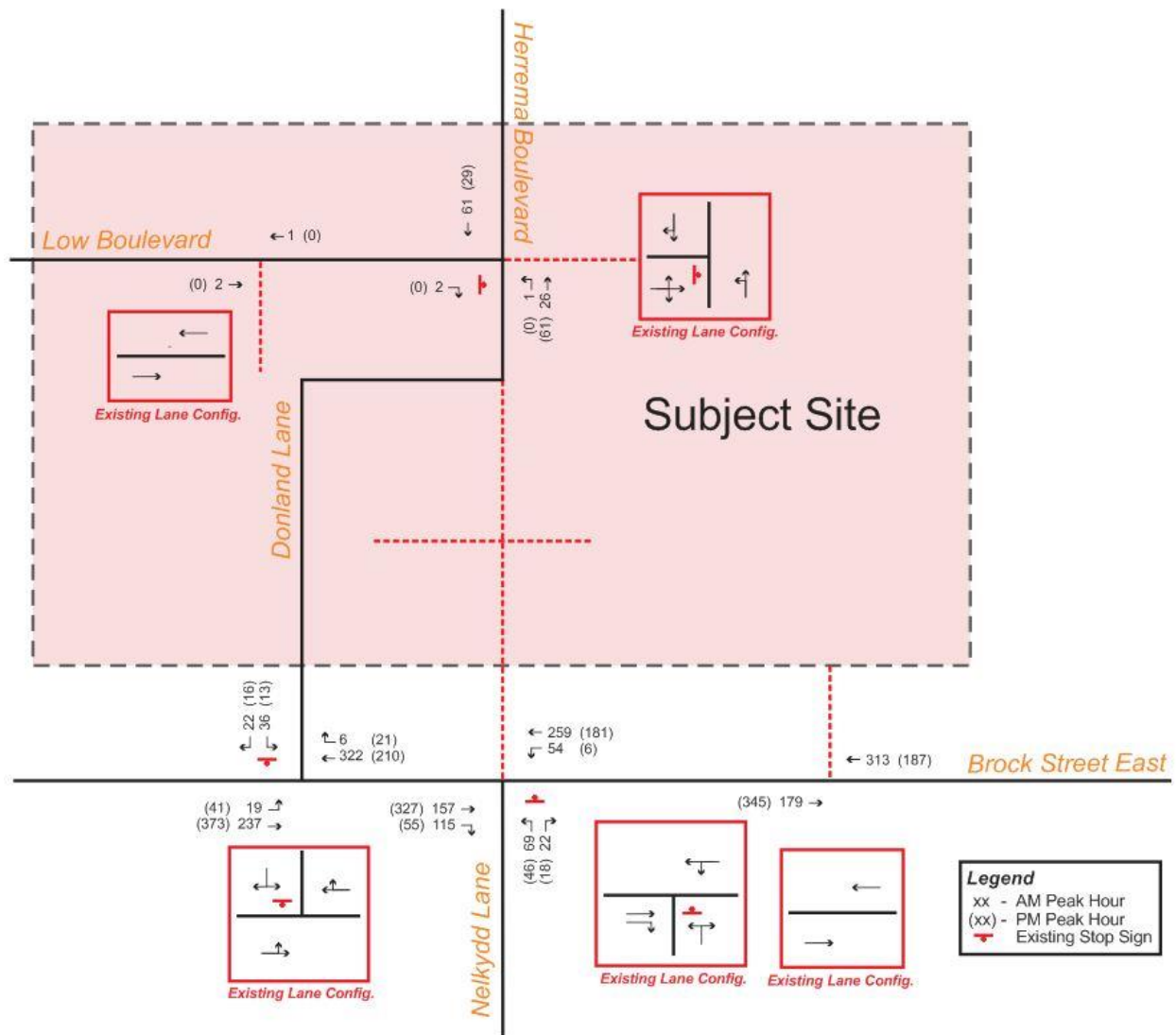
### 2.4. Existing Traffic Volumes

Existing traffic volumes at the study area intersections of Brock Street East with Donland Lane, Brock Street East with Nelkydd Lane, and Low Boulevard and Donland Lane were undertaken by Spectrum Traffic on behalf of NexTrans Consulting Engineers on Tuesday October 24<sup>th</sup>, 2017, during the morning (7:00 a.m. to 10:00 a.m.) and afternoon (4:00 p.m. to 7:00 p.m.) peak periods. Detailed traffic data sheets are provided in **Appendix C**.

### 2.5. Existing Traffic Assessment

The existing volumes are illustrated in **Figure 2-2**, and were analyzed using Synchro 10 software. The methodology of the software follows the procedures described and outlined in the Highway Capacity Manual, HCM 2000, published by the Transportation Research Board. The detailed results are provided in **Appendix D** and summarized in **Table 2.1**.

**Figure 2-2 – Existing Traffic Volumes**



**Table 2.1 – Level of Service – Existing Traffic Assessments**

Intersection	Movement	Weekday AM Peak Hour			Weekday PM Peak Hour		
		LOS (v/c)	Delay (s)	Queue (95 <sup>th</sup> m)	LOS (v/c)	Delay (s)	Queue (95 <sup>th</sup> m)
Brock Street East & Nelkydd Lane	WBLT NBLR	A (0.08)	2.5	2.0	A (0.01)	0.6	0.3
		C (0.26)	15.7	8.1	B (0.17)	13.2	4.8
Brock Street East & Donland Lane	EBLT SBLR	A (0.04)	1.3	0.9	A (0.04)	1.3	1.1
		C (0.21)	13.9	5.1	B (0.09)	13.0	2.3
Donland Lane & Low Boulevard	EBLR NBLT	A (0.01)	8.8	0.2	A (0.01)	8.5	0.2
		A (<0.01)	0.8	0.1	-	-	-

As summarized in **Table 2.1**, under existing conditions the study area intersections are operating at excellent levels of service with no critical movements identified. The intersections are operating at overall 'LOS C' or better during the peak hour time periods.

### 3.0 FUTURE BACKGROUND CONDITIONS

The future background 2021 full build out traffic volumes and the future background 2026 horizon year traffic volumes are provided in **Figure 3-1** and **Figure 3-2**, respectively. **Table 3.1** and **Table 3.2** summarize the level of service at the given intersections under future background full build out, and horizon year traffic conditions. Using the Region of Durham historic AADT statistics available between the years of 2007-2015 for ATR station 7402, a conservative background growth rate of 1% was applied to the traffic assessment. This is due to the AADT statistics fluctuating between increasing and decreasing growth, thus a 1% growth rate is representative since the traffic is relatively steady and within similar range throughout the years. Detailed output analysis can be found in **Appendix E**.

When establishing the terms of reference, the Region of Durham stated to include any future developments within the vicinity of the area. After speaking with the Township of Uxbridge, they have not received any applications for future developments at this time thus, no additional information on proposed developments was available so, if any are proposed, they were not included in our trip generation model, see **Appendix F**.

Figure 3-1 – Future Background 2021 Full Build Out Traffic Volumes

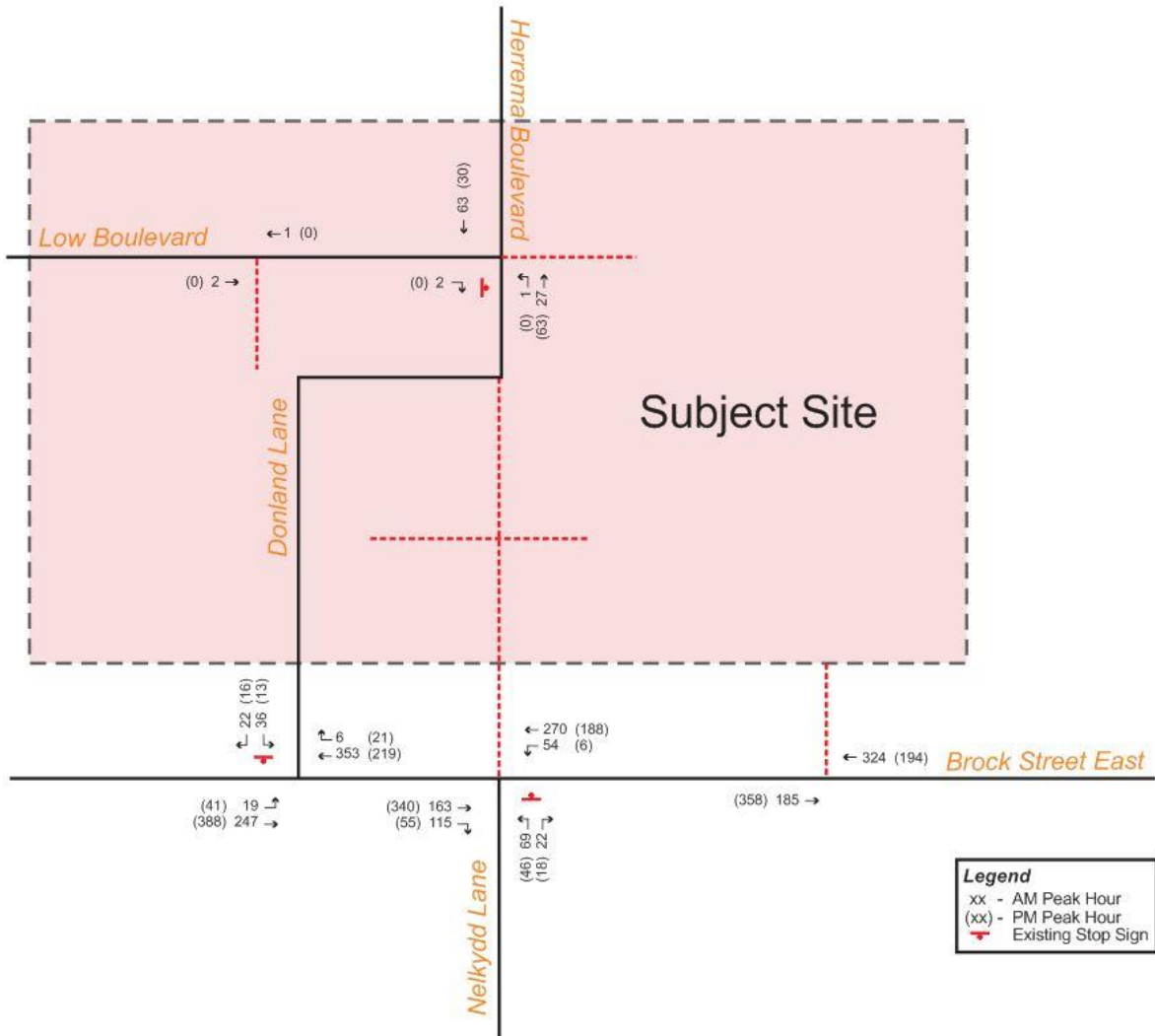


Table 3.1: Future Background 2021 Full Build Out Traffic Assessments

Intersection	Movement	Weekday AM Peak Hour			Weekday PM Peak Hour		
		LOS (v/c)	Delay (s)	Queue (95 <sup>th</sup> m)	LOS (v/c)	Delay (s)	Queue (95 <sup>th</sup> m)
Brock Street East & Nelkydd Lane	WBLT	A (0.08)	2.4	2.0	A (0.01)	0.6	0.3
	NBLR	C (0.26)	16.1	8.4	B (0.18)	13.8	5.1
Brock Street East & Donland Lane	EBLT	A (0.04)	1.2	0.9	A (0.04)	1.3	1.1
	SBLR	C (0.22)	16.2	6.5	B (0.09)	13.6	2.4
Donland Lane & Low Boulevard	EBLR	A (0.01)	8.8	0.2	A (<0.01)	0	0
	NBLT	A (<0.01)	0.7	0.1	-	-	-

Figure 3-2 – Future Background 2026 Full Build Out Traffic Volumes

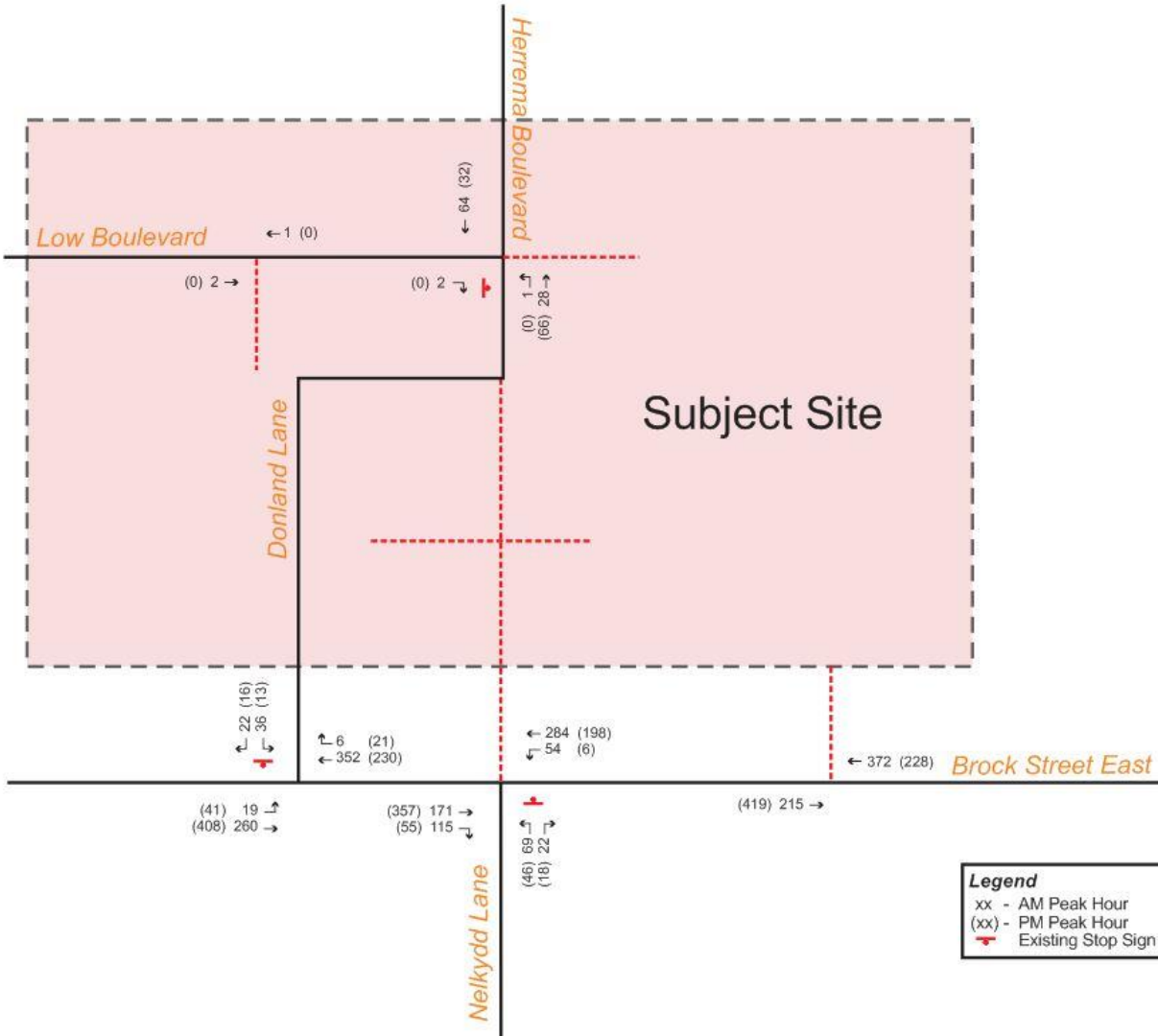


Table 3.2: Future Background 2026 Horizon Year Traffic Assessments

Intersection	Movement	Weekday AM Peak Hour			Weekday PM Peak Hour		
		LOS (v/c)	Delay (s)	Queue (95 <sup>th</sup> m)	LOS (v/c)	Delay (s)	Queue (95 <sup>th</sup> m)
Brock Street East & Nelkydd Lane	WBLT	A (0.08)	2.4	2.0	A (0.01)	0.5	0.3
	NBLR	C (0.27)	16.5	8.7	B (0.18)	14.2	5.3
Brock Street East & Donland Lane	EBLT	A (0.04)	1.2	1.0	A (0.04)	1.3	1.1
	SBLR	C (0.23)	16.9	6.2	B (0.09)	13.6	2.5
Donland Lane & Low Boulevard	EBLR	A (0.01)	8.8	0.2	A (<0.01)	0	0
	NBLT	A (<0.01)	0.7	0.1	-	-	-

As summarized in **Table 3.1** and **Table 3.2**, it is shown that during future background traffic conditions the subject study area intersections continue to operate at acceptable levels of service with no changes to expected operations. During future background traffic conditions, the intersections are operating at overall LOS 'C' during the peak hour periods.

**4.0 SITE TRAFFIC**

The development proposal is to construct 94 townhouses and 8 semi-bungalows with loft residential units, a future development block with an approximate maximum scenario of 34 apartment units, and a commercial building with GFA of 469.45 m<sup>2</sup> and 5 apartment units above. Trip rates and site generated trips were derived from the information contained in the *Trip Generation Manual, 9<sup>th</sup> Edition* published by the Institute of Transportation Engineers (ITE) for “Apartment” (LUC 220), “Residential Condominium/Townhouse” (LUC 230), “High-Residential Condominium/Townhouse” (LUC 232), and “Shopping Center” (LUC 820). The trip generation summary is shown in **Table 4.1**.

**Table 4.1 – Site Traffic Trip Generation (Based on ITE)**

ITE Land Use	Parameter	Morning Peak Hour			Afternoon Peak Hour		
		In	Out	Total	In	Out	Total
Apartment (LUC 220) 5 units	Gross New Trips	1	5	6	13	7	20
	Trip Rate	0.20	1.00	1.20	2.60	1.40	4.00
Residential Condominium/Townhouse (LUC 230) 103 units	Gross New Trips	9	43	52	41	20	61
	Trip Rate	0.09	0.42	0.51	0.40	0.19	0.60
High-Rise Residential Condominium/Townhouse (LUC 232) 34 units	Gross New Trip	7	32	39	17	10	27
	Trip Rate	0.21	0.94	1.15	0.50	0.29	0.79
Shopping Center (LUC 820) 5 ft <sup>2</sup>	Gross New Trip	16	9	25	39	42	81
	Trip Rate	3.17	1.78	4.95	7.72	8.31	16.03
<b>Total</b>	<b>New Trips</b>	<b>33</b>	<b>89</b>	<b>122</b>	<b>110</b>	<b>79</b>	<b>189</b>

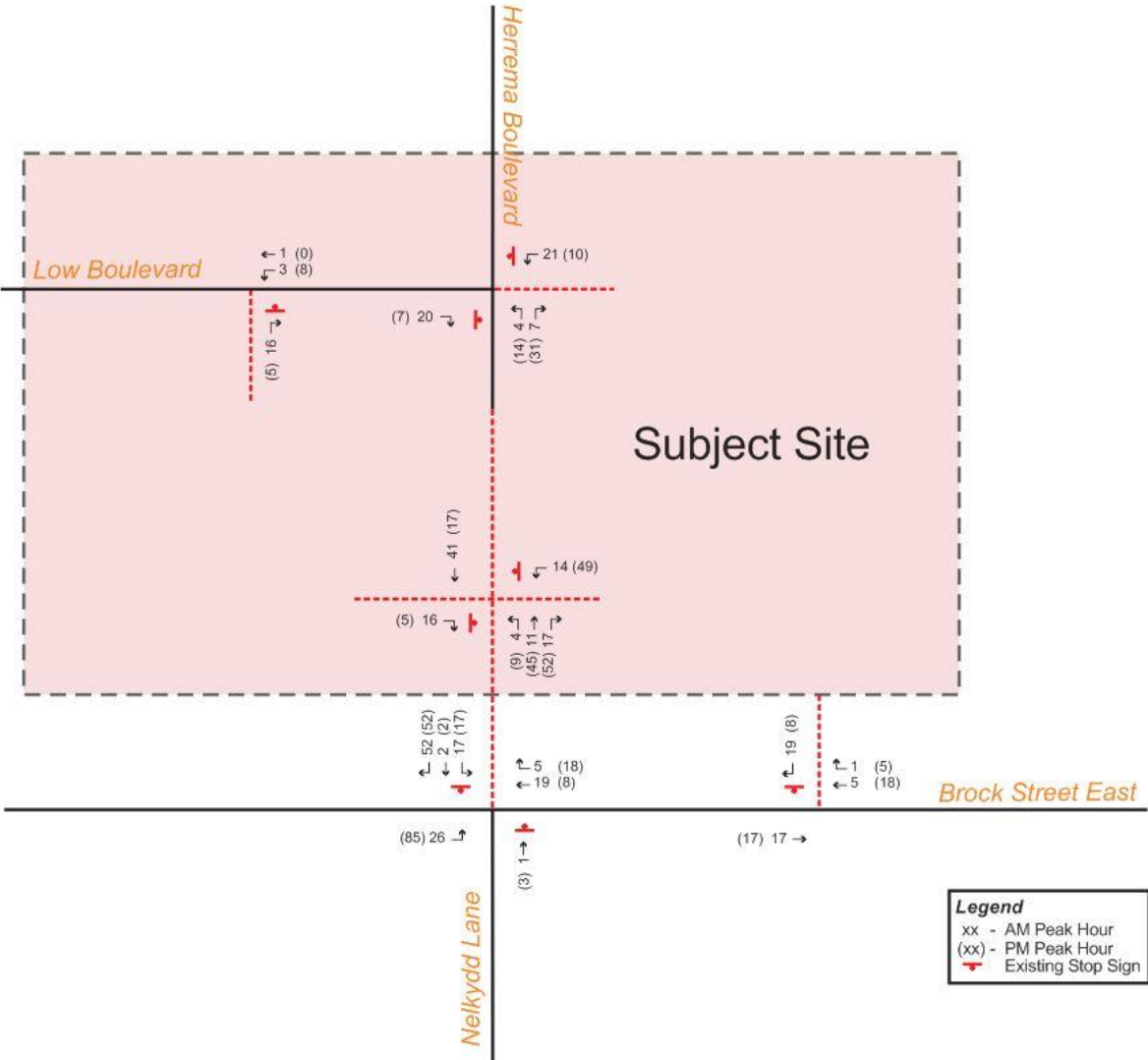
The proposed development is anticipated to generate 122 two-way trips (33 inbound and 89 outbound) during the AM peak hours and 189 two-way trips (110 inbound and 79 outbound) during the PM peak hours.

The assumptions for the trip distribution rates are based on the information extracted from the 2011 Transportation Tomorrow Survey (TTS), see **Appendix G**, existing traffic patterns and routes that drivers would likely take to access the subject site, and engineering judgement based on ease of site access. As a result, site trip distribution is summarized for the inbound and outbound site traffic movements during the morning and afternoon peak hours in **Table 4.2** with the trip assignment illustrated in **Figure 4-1**.

**Table 4.2 – Site Traffic Trip Distribution**

Direction	Via	AM Peak Hour		PM Peak Hour	
		Inbound	Outbound	Inbound	Outbound
East	Brock Street East	18%	18%	21%	21%
West	Brock Street East	79%	79%	76%	76%
South	Nelkydd Lane	3%	3%	3%	3%
<b>Total</b>		<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Figure 4-1 – Site Generated Traffic Volumes



5.0 FUTURE TOTAL TRAFFIC CONDITIONS

The forecasted 2021 and 2026 future total traffic volumes (future background traffic volumes plus site generated traffic volumes) are illustrated in Figure 5-1 and Figure 5-2, and were analyzed using Synchro 10 software. The detailed calculations are provided in Appendix H and summarized in Table 5.1 and Table 5.2.

Figure 5-1 – Future Total 2021 Traffic Volumes

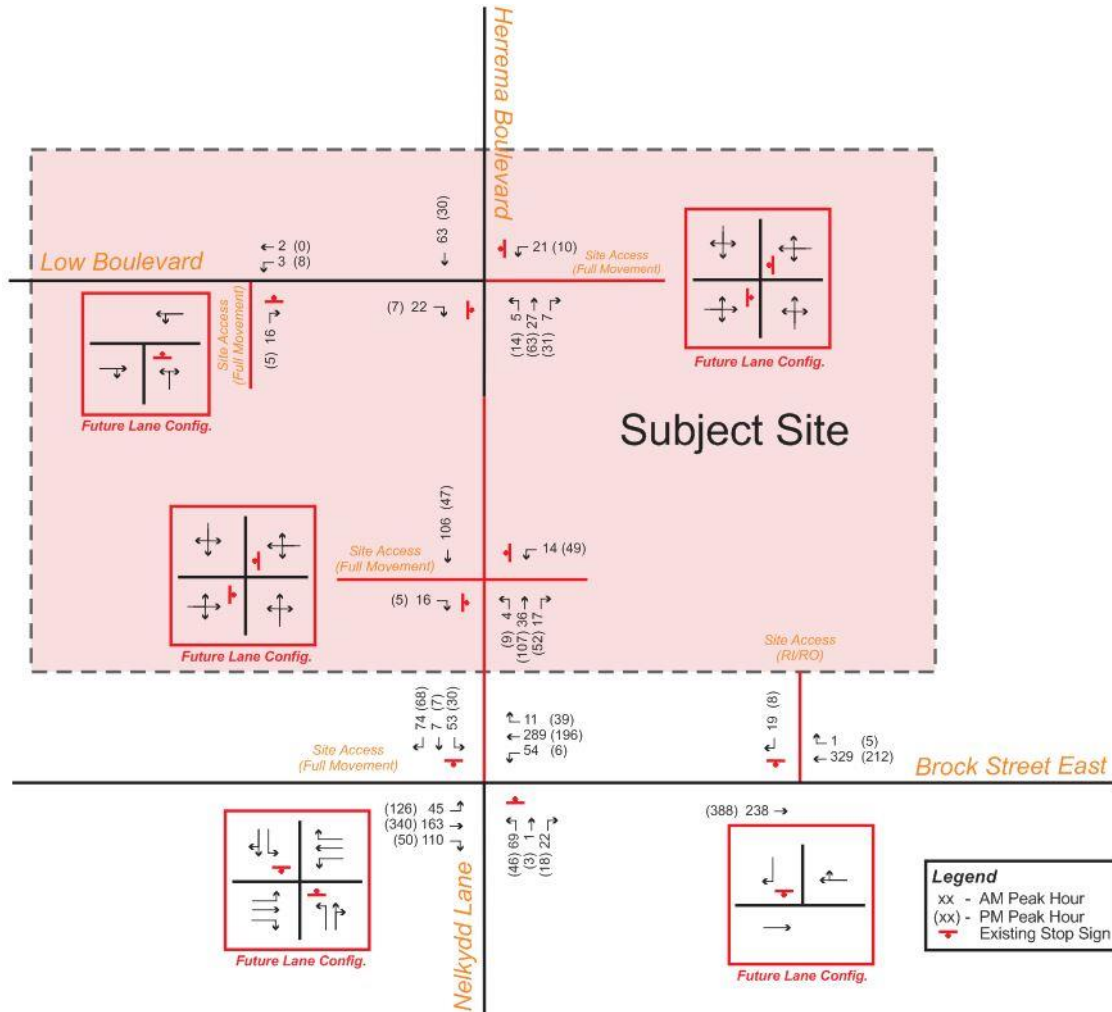


Table 5.1 – Level of Service – Future Total 2021 Traffic Assessments

Intersection	Movement	Weekday AM Peak Hour			Weekday PM Peak Hour		
		LOS (v/c)	Delay (s)	Queue (95 <sup>th</sup> m)	LOS (v/c)	Delay (s)	Queue (95 <sup>th</sup> m)
Brock Street East & Nelkydd Lane/Herrema Boulevard	EBL	A (0.04)	8.1	1.0	A (0.11)	8.1	2.8
	WBL	A (0.08)	8.3	2.0	A (0.01)	8.4	0.2
	NBL	D (0.41)	34.6	14.9	D (0.31)	34.1	10.1
	NBTR	A (0.04)	9.9	1.1	B (0.05)	12.2	1.4
	SBL	C (0.22)	23.2	6.9	C (0.15)	24.8	4.3
Brock Street East & Site Access	SBTR	B (0.15)	12.4	4.2	B (0.13)	11.4	3.5
Herrema Boulevard & Low Boulevard	SBR	B (0.03)	10.4	0.8	A (0.01)	9.5	0.3
	EBLTR	A (0.02)	8.7	0.6	A (0.01)	8.5	0.2
	WBLTR	A (0.03)	9.5	0.7	A (0.01)	9.6	0.3
Herrema Boulevard & Internal Driveway	NBLTR	A (<0.01)	0.9	0.1	A (0.01)	1.0	0.2
	EBLTR	A (0.02)	8.9	0.4	A (<0.01)	8.6	0.1
	WBLTR	A (0.02)	9.8	0.5	B (0.07)	10.3	1.9
Low Boulevard & Internal Driveway	NBLTR	A (<0.01)	0.5	0.1	A (0.01)	0.5	0.2
	WBLT	A (<0.01)	4.3	0.0	A (0.01)	7.2	0.1
	NBLR	A (0.02)	8.4	0.4	A (<0.01)	8.3	0.1

Figure 5-2 – Future Total 2026 Traffic Volumes

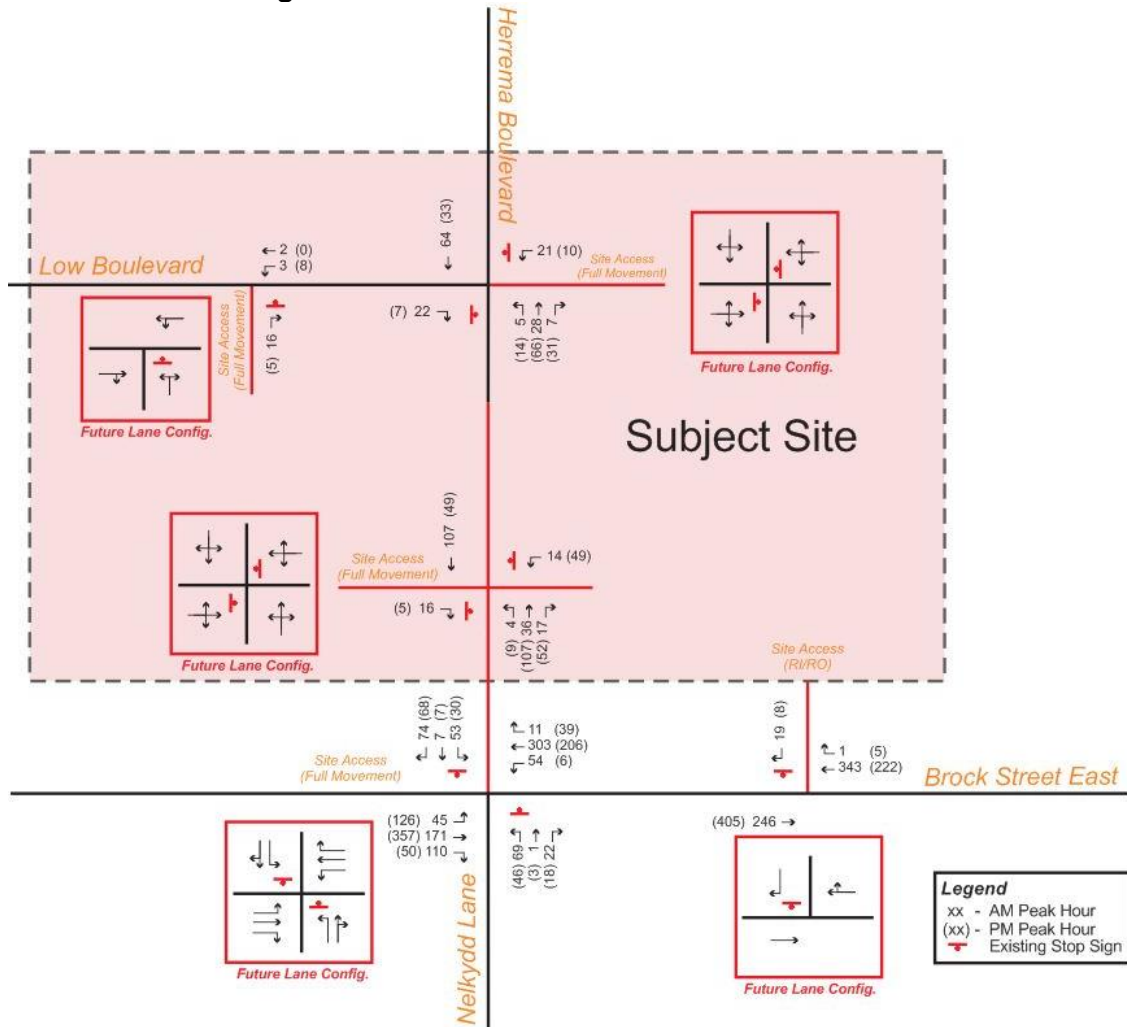


Table 5.2 – Level of Service – Future Total 2026 Traffic Assessments

Intersection	Movement	Weekday AM Peak Hour			Weekday PM Peak Hour		
		LOS (v/c)	Delay (s)	Queue (95 <sup>th</sup> m)	LOS (v/c)	Delay (s)	Queue (95 <sup>th</sup> m)
Brock Street East & Nelkydd Lane/Herrema Boulevard	EBL	A (0.04)	8.1	1.0	A (0.11)	8.1	2.8
	WBL	A (0.08)	8.4	2.0	A (0.01)	8.4	0.2
	NBL	E (0.43)	36.8	15.9	E (0.33)	36.4	10.8
	NBTR	A (0.04)	10.0	1.1	B (0.06)	12.4	1.4
	SBL	C (0.23)	24.2	7.1	D (0.16)	26.0	4.5
Brock Street East & Site Access	SBTR	B (0.16)	12.6	4.5	B (0.13)	11.6	3.6
	SBR	B (0.03)	10.5	0.8	A (0.01)	9.6	0.3
Herrema Boulevard & Low Boulevard	EBLTR	A (0.02)	8.7	0.6	A (0.01)	8.5	0.2
	WBLTR	A (0.03)	9.6	0.7	A (0.01)	9.6	0.3
	NBLTR	A (<0.01)	0.9	0.1	A (0.01)	1.0	0.2
Herrema Boulevard & Internal Driveway	EBLTR	A (0.02)	8.9	0.4	A (<0.01)	8.6	0.1
	WBLTR	A (0.02)	9.9	0.5	B (0.07)	10.3	1.9
	NBLTR	A (<0.01)	0.5	0.1	A (0.01)	0.5	0.2
Low Boulevard & Internal Driveway	WBLT	A (<0.01)	4.3	0.0	A (0.01)	7.2	0.1
	NBLR	A (0.02)	8.4	0.4	A (<0.01)	8.3	0.1



Under future total traffic conditions, the study intersections, proposed right-in/right-out access via Brock Street East, and internal road network are expected to operate at acceptable levels of service during both peak periods.

The intersection of Brock Street East and Nelkydd Lane/Herrema Boulevard was analysed as a two way stop control, during future total 2026 conditions. The lane configuration allows for future signal operations to be implemented at the intersection thus, further analysis of a possible traffic light with advanced left turn signals at the intersection was analyzed, see **Appendix I**.

**Table 5.3 – Probable Signal Timing**

Intersection	Movement	Split (s)	Yellow Time (s)	All-Red Time (s)	Cycle Length (s)
Brock Street East & Nelkydd Lane/Herrema Boulevard	EB/WB	34.5	3.5	1.0	80
	NB/SB	45.5	3.5	1.0	

**Table 5.4 – Level of Service – Future Total 2026 Traffic Assessments with Traffic Signal**

Intersection	Movement	Weekday AM Peak Hour			Weekday PM Peak Hour		
		LOS (v/c)	Delay (s)	Queue (95 <sup>th</sup> m)	LOS (v/c)	Delay (s)	Queue (95 <sup>th</sup> m)
Brock Street East & Nelkydd Lane/Herrema Boulevard (Signalized)	<b>OVERALL</b>	<b>C (0.36)</b>	<b>27.3</b>	<b>-</b>	<b>C (0.38)</b>	<b>28.3</b>	<b>-</b>
	EBL	C (0.27)	23.7	11.8	C (0.44)	20.3	27.1
	EBT	C (0.51)	28.2	45.2	D (0.82)	37.8	113.1
	EBR	C (0.13)	24.9	0.0	C (0.06)	21.3	0.0
	WBL	C (0.29)	21.1	12.4	C (0.07)	24.1	2.7
	WBT	D (0.81)	38.6	84.2	C (0.57)	29.7	53.9
	WBR	C (0.01)	22.7	0.0	C (0.03)	24.3	0.0
	NBL	A (0.12)	8.8	12.3	A (0.08)	9.4	9.0
	NBTR	B (0.03)	11.8	5.3	B (0.02)	12.1	5.2
	SBL	C (0.13)	20.1	10.0	C (0.08)	21.4	6.6
SBTR	C (0.07)	22.1	12.3	C (0.06)	23.0	11.8	
Brock Street East & Site Access	SBR	B (0.03)	10.5	0.8	A (0.01)	9.6	0.3
Herrema Boulevard & Low Boulevard	EBLTR	A (0.02)	8.7	0.6	A (0.01)	8.5	0.2
	WBLTR	A (0.03)	9.6	0.7	A (0.01)	9.6	0.3
	NBLTR	A (<0.01)	0.9	0.1	A (0.01)	1.0	0.2
Herrema Boulevard & Internal Driveway	EBLTR	A (0.02)	8.9	0.4	A (<0.01)	8.6	0.1
	WBLTR	A (0.02)	9.8	0.5	B (0.07)	10.0	1.8
	NBLTR	A (<0.01)	0.5	0.1	A (0.01)	0.5	0.2
Low Boulevard & Internal Driveway	WBLT	A (<0.01)	4.3	0.0	A (0.01)	7.2	0.1
	NBLR	A (0.02)	8.4	0.4	A (<0.01)	8.3	0.1

Under the future total 2026 conditions a signalized intersection at Brock Street East and Nelkydd Lane/Herrema Boulevard is expected to operate at acceptable levels of service.

## 6.0 PARKING ASSESSMENT

The Township of Uxbridge Zoning By-law No. 81-19 has been adopted by the Council of the Corporation of the Township of Uxbridge and has been updated in December 2016. It is a comprehensive By-law covering the entire amalgamated Township of Uxbridge. Based on the information contained in the Zoning By-law, the subject site is located in zone 'C6 – Brock Street

East Mixed Use'. The technical parking requirement for the proposed development is detailed in **Table 6.1**.

**Table 6.1 – Vehicle Parking Requirements (ZBL 81-19)**

Use	GFA / Units	Rate	Parking Requirement	Parking Provided	Difference
Commercial	469.45 m <sup>2</sup>	5.5 spaces per 100 m <sup>2</sup>	26	26	0
Apartment (above commercial)	5	1.5 spaces/unit	8	8	0
Townhouse and Semi-Bungalow	102	2 space/unit	204	243	+39
<b>Total</b>			<b>238</b>	<b>277</b>	<b>+39</b>

Based on Township of Uxbridge Zoning By-law 81-19, a total of 238 parking spaces will be required for the proposed mixed-use development. The preliminary site plan provides for a total of 277 parking spaces, which results in a surplus of 39 parking spaces. This surplus is due to the visitor parking provided in the townhouse block, which the zoning by-law does not currently require for townhouse dwelling units.

## 7.0 SITE PLAN REVIEW

### 7.1. Site Access

According to the proposed site plan, access to the site is provided through an extension of Herrema Boulevard, eliminating Donland Lane, and reaching Brock Street East. Low Boulevard will also be extended to intersect with Herrema Boulevard, this provides two full movement driveways to access the proposed future development building. The semi-bungalow units will be accessed via Low Boulevard, and both the commercial and townhouse blocks will be accessed via the extension of Herrema Boulevard. In addition, there will be a right-in/right-out site entrance at the east end of the site via Brock Street East which also provides a secondary ease of access for emergency vehicles.

In accordance with Ontario Traffic Manual (OTM) Book 5, we recommend appropriate signage consisting of STOP signs (Ra-1) and STOP bars throughout the internal road network as exhibited in **Figure 7-1**. It is recommended that the most eastern access via Brock Street East be a channelized right-in/right-out entrance/exit for vehicles through the addition of a concrete barrier. Appropriate signage will be used to control vehicles to obey the right-in/right-out movements only and prevent vehicles traveling in the westbound direction on Brock Street East from turning left into the site. A similar design to York Region's "Typical Right Turn In/Right Turn Out" design standard was utilized, see **Appendix J**.

### 7.2. Loading Requirement and Assessment

AutoTURN software was used to generate a vehicular turning template to confirm and demonstrate the accessibility of the proposed loading space and parking spaces. As illustrated in **Figure 7-2** and **Figure 7-3**, the AutoTURN analysis demonstrates that a passenger vehicle (P TAC-1999) and 12-metre Garbage/Emergency vehicle, can effectively maneuver through the parking spaces and loading area.

### 7.3. Right Lane Warrant Analysis

Abiding by the Region of Durham guidelines, the consideration for right turn lanes on Brock Street East were analysed. The proposed site plan considers the addition of a westbound right turn lane at Herrema Boulevard/Nelkydd Lane which will allow free flow of through volumes at all times on Brock Street East. Moreover, due to the low traffic volumes using the right-in/right-out access a right turn lane is not required.

### 7.4. Left Lane Warrant Analysis

Due to the volume of left turning vehicles on Brock Street East at the Herrema Boulevard/Nelkydd Lane new intersection into the site, a left-turn lane warrant analysis was made based on the review and application of the Ministry of Transportation Ontario's (MTO) Geometric Design Standards for Ontario Highways and the applicable nomographs.

The traffic volumes projected in **Figure 5-2** at the proposed vehicular entrance at Brock Street East and Herrema Boulevard/Nelkydd Lane, indicate the site access may experience high left turning traffic volumes during the weekday peak hour periods. As a result, the 2026 future total traffic volumes during the morning peak hour in the westbound left-turn lane and the afternoon peak hour in the eastbound left-turn lane will be assessed as the worst-case scenarios.

The projected traffic volumes intersect above the warrant line area of the nomograph (see **Appendix K**) and on this basis, an eastbound and westbound left turn lane are warranted thus, the proposed intersection lane configuration is acceptable.

## 8.0 TRANSPORTATION DEMAND MANAGEMENT

Transportation demand management (TDM) refers to variety of strategies to reduce congestion, minimize the number of single-occupant vehicles, encourage non-auto modes of travel, and reduce vehicle dependency to create a sustainable transportation system. Typically, TDM strategies are for residential and office developments where large quantities of people congregate in one origin or destination.

Pedestrian sidewalks will be provided on both sides of the roadways, and sidewalk connectivity is provided throughout the proposed municipal road to ensure a complete sidewalk network.

### 8.1. Transit and Active Transportation Mode Assessment

The proposed development is situated in a transit supportive neighbourhood with bus stops located approximately 6-minutes to the subject site within comfortable walking distance. The route services are illustrated in **Appendix L**. The route services in the immediate area are described below:

- **950 Reach – Simcoe North:** The 950 Reach – Simcoe North bus route operates approximately every hour apart from only one stop between 11:00am and 3:00pm between the Welwood Plaza and UOIT/DC North Campus, generally in a north-south direction. The 950 Reach – Simcoe North bus route provides service 6 days a week. Weekend service is offered only on Saturdays and operates approximately every two (2) hours. Accessible service and bike racks are provided on the route.
- **601 Brock – Uxbridge:** The 601 Brock – Uxbridge bus route operates three to four times per day from 4:00pm to 7:00pm, between 9 Mile Road at Lakeview Mannor and the Welwood Plaza, generally in an north-south direction. The 601 Brock – Uxbridge bus route

provides service from Monday to Friday. Accessible service and bike racks are provided on this route.

## 9.0 CONCLUSION

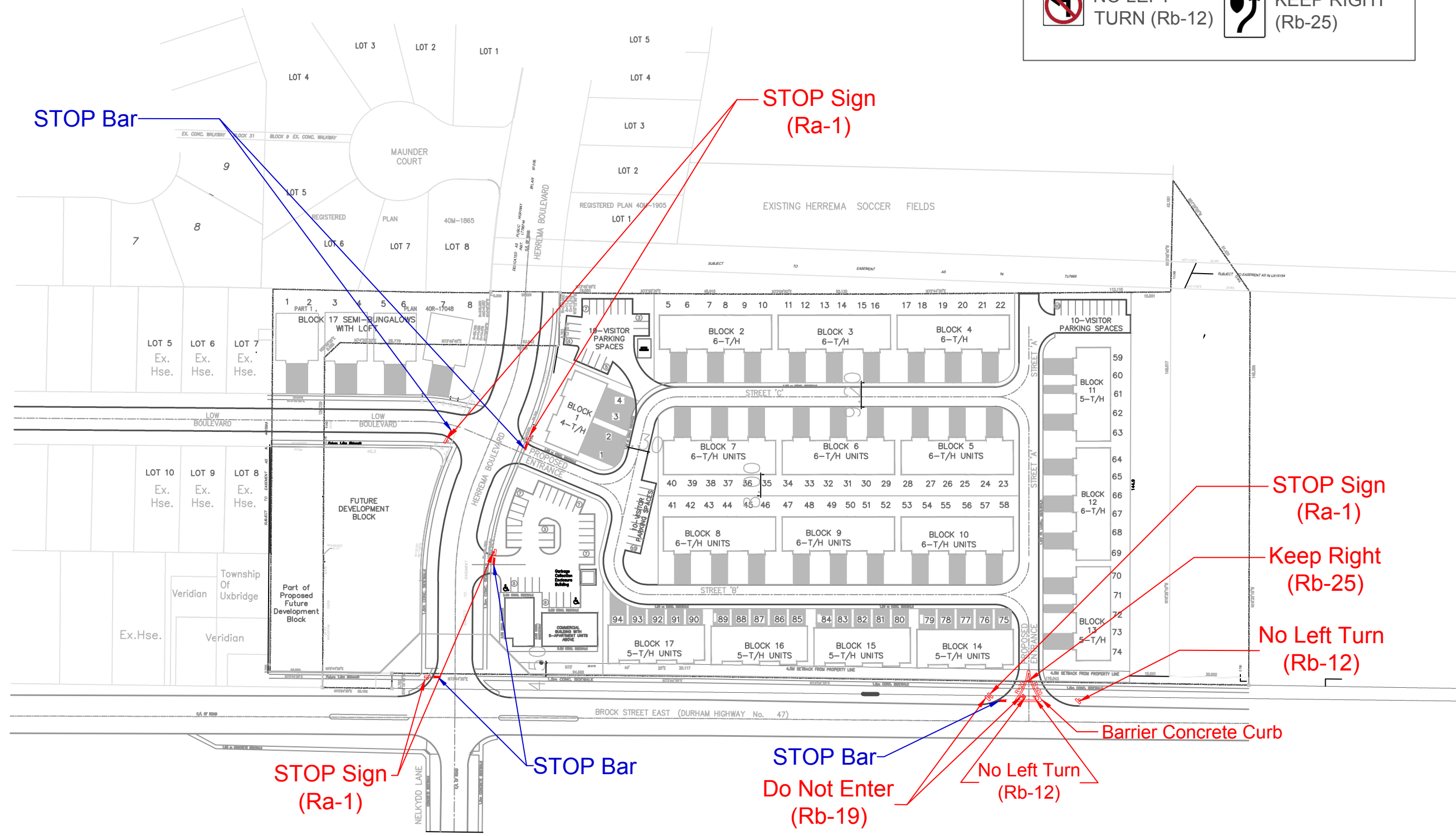
The findings and conclusions of our analysis are as follows:

- The development proposal is to redevelop the existing 49, 714.57 m<sup>2</sup> site area to include 95 townhouses and 8 semi-bungalows with loft residential units, a future development block with an approximate maximum scenario of 34 apartment units, and a commercial building with GFA of 469.45 m<sup>2</sup> and 5 apartment units above. Vehicular access to the site is proposed through a full movement driveway via and extension of Low Boulevard, a full movement driveway via an extension of Herrema Boulevard to Brock Street East, and through a right-in/right-out driveway via Brock Street East.
- The proposed development is anticipated to generate 122 two-way trips (33 inbound and 89 outbound) during the AM peak hours and 189 two-way trips (110 inbound and 79 outbound) during the PM peak hours.
- The intersection capacity analysis results (based on the methodology and procedures outlined in the Highway Capacity Manual, HCM 2000, published by the Transportation Research Board) indicate that the study intersection and access are expected to continue to operate with acceptable levels of service.
- Based on Township of Uxbridge Zoning By-law 81-19, a total of 238 parking spaces will be required for the proposed mixed-use development. The preliminary site plan provides for a total of 277 parking spaces, which results in a surplus of 39 parking spaces. This surplus is due to the visitor parking provided in the townhouse block, which the zoning by-law does not currently require for townhouse dwelling units. On this basis, the future parking demand with the proposed redevelopment is completely satisfied with the proposed parking provision.
- To ensure safe traffic operation in the area, it is recommended that appropriate internal signage consisting of STOP signs (Ra-1) and STOP bars be provided throughout the internal network, and an appropriate barrier to ensure correct vehicle circulation at the right-in/right-out access on Brock Street East, see **Figure 7-1**.
- Left and right turn lanes are warranted on Brock Street East.
- The proposed study area/loading space is accessible from a circulation perspective.



**LEGEND**

-  STOP SIGN (Ra-1)
-  DO NOT ENTER (Rb-19)
-  NO LEFT TURN (Rb-12)
-  KEEP RIGHT (Rb-25)



BENCHMARK

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NO	REVISION	DATE	BY

STAMP

CIVIL CONSULTANT:



520 Industrial Parkway South, Suite 101  
Aurora, Ontario L4G 0W8  
Tel: 905-503-2563  
Web: www.nextrans.ca

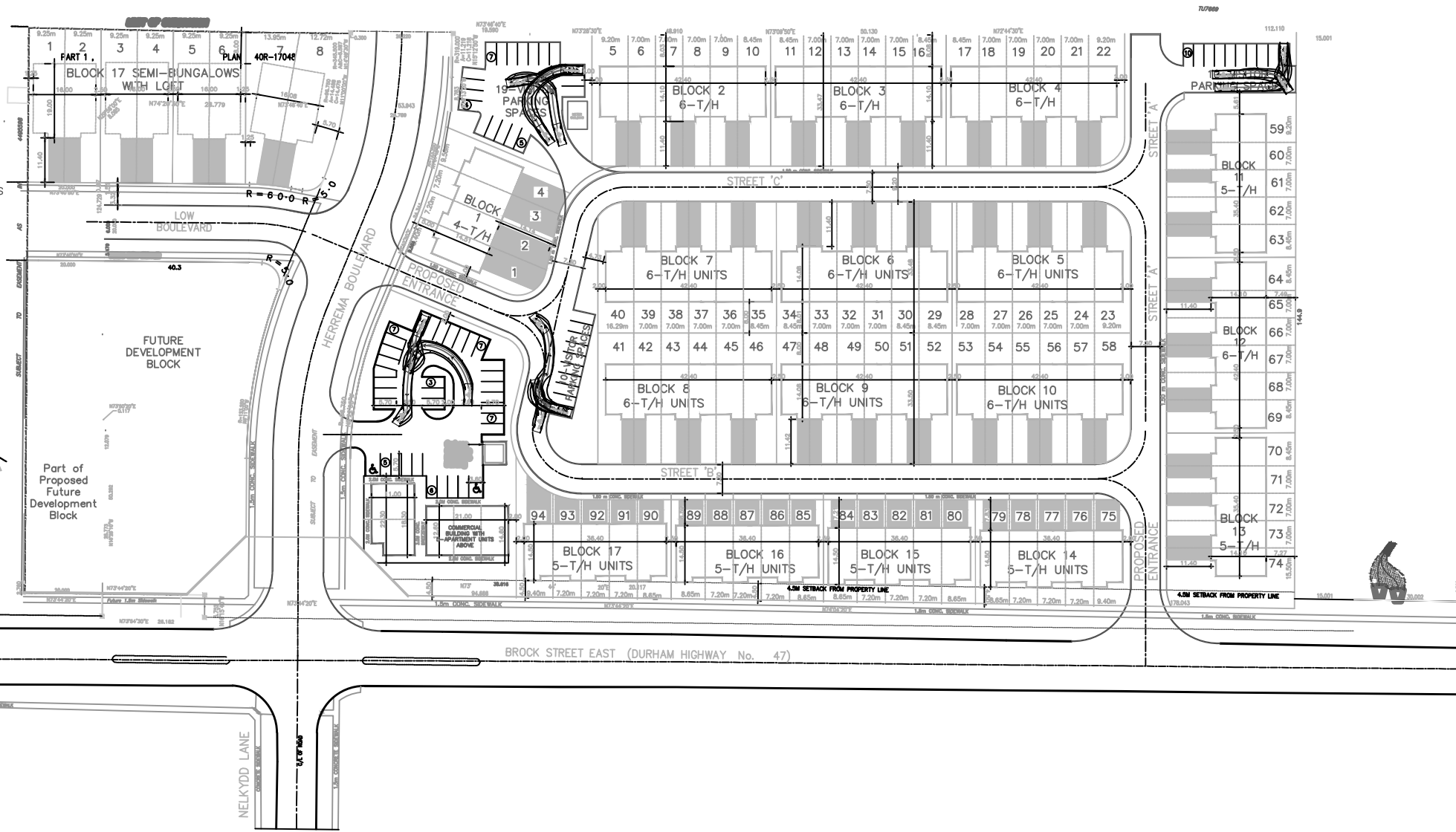
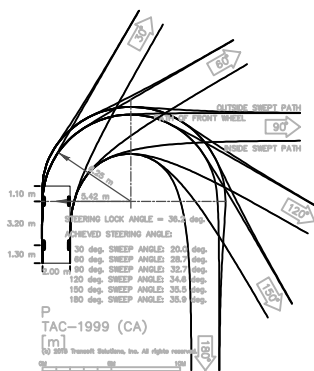
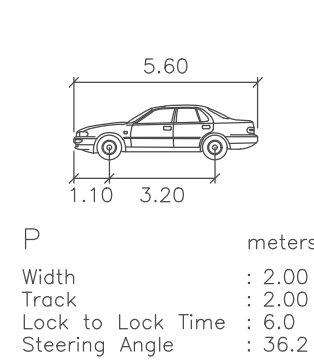
PROJECT NAME:  
**Mixed-use Residential and Commercial Development**  
 Brock Street East  
 (Township of Uxbridge)

DRAWING TITLE:  
**Signage, Pavement Markings, and Functional Plan**

DESIGN BY: M.C	DATE: November 17, 2017
CHECKED BY: R.P.	PROJECT NO. NT-17-207
DRAWN BY: M.C	DRAWING NO. Figure 7-1
SCALE: NTS	



BENCHMARK



REVISIONS

NO	REVISION	DATE	BY

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CIVIL CONSULTANT:



PROJECT NAME:

MIXED USE DEVELOPMENT  
 BROCK STREET EAST  
 (TOWNSHIP OF UXBRIDGE)

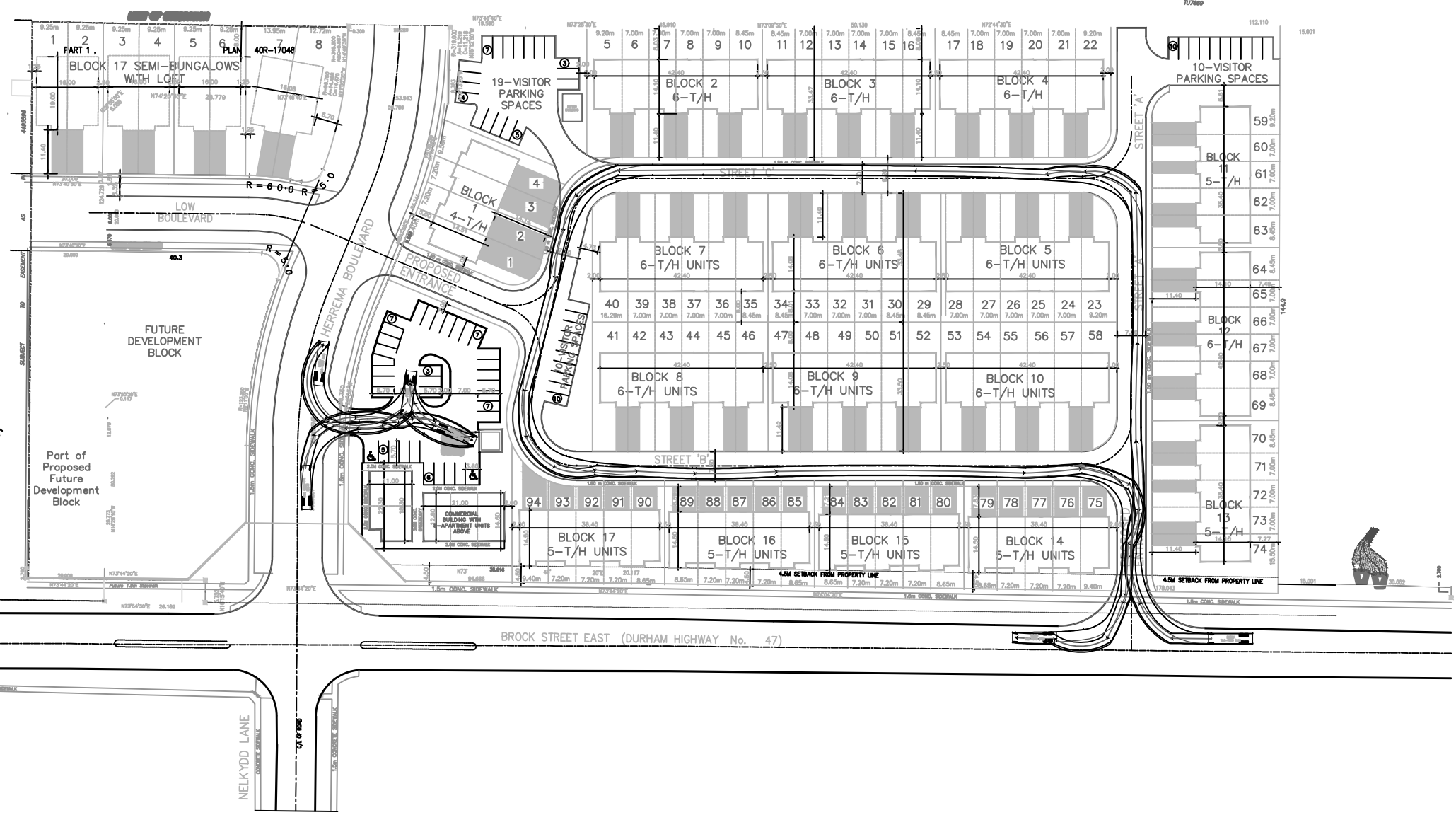
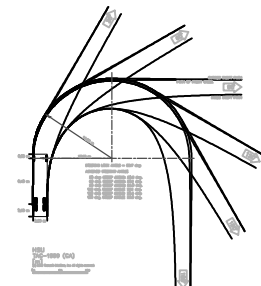
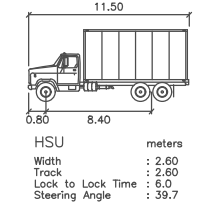
DRAWING TITLE:

AutoTURN Analysis  
 (P TAC-1999)

DESIGN BY: A.S.	DATE: November 28, 2017
CHECKED BY: R.P.	PROJECT NO.:
DRAWN BY: A.S.	NT-17-207
SCALE: NTS	DRAWING NO.:
	Figure 7-2



BENCHMARK



REVISIONS

NO	REVISION	DATE	BY

STAMP

CIVIL CONSULTANT:



PROJECT NAME:

MIXED USE DEVELOPMENT  
 BROCK STREET EAST  
 (TOWNSHIP OF UXBRIDGE)

DRAWING TITLE:

AutoTURN Analysis  
 (12m Garbage/Emergency)

DESIGN BY: A.S.	DATE: November 28, 2017
CHECKED BY: R.P.	PROJECT NO.
DRAWN BY: A.S.	NT-17-207
SCALE: NTS	DRAWING NO.
	Figure 7-3

## **Appendix A - Terms of Reference**



# Terms of Reference

**To:** Jeff Almeida, Development Approvals Division, Region of Durham  
**From:** Madeleine Catz, B.Eng., E.I.T., Transportation Analyst, Nextrans Consulting Engineers  
**cc:** David Sud  
**Date:** October 17, 2017  
**Re:** Brock Street, Proposed Mixed-use Residential and Commercial Development – TOR for Transportation Impact Study and Transportation Demand Management Options

---

This memo has been prepared to outline (for the Region's review and approval) the intended scope of work for a transportation impact study and transportation demand management (TDM) options report for the proposed mixed-use development located northeast of Brock Street East and Donland Lane in the Township of Uxbridge, Durham Region.

The following text outlines the intended scope for a transportation impact study and TDM options for the Brock Street East mixed-use development. Our transportation impact study will conform to the Regional Municipality of Durham "Traffic Impact Study Guidelines" which will include the following study parameters:

- Definition of the Study Area
- Necessary Data Requirements
- Background Traffic Forecast
- Site Trip Generation and Modal Split Assumptions
- Site Trip Distribution
- Site Trip Assignment and Total Traffic Forecasts
- Traffic Analysis
- Community Impact Analysis
- Findings and Recommendations

## Introduction

---

The report introduction will include:

1. Description of the study area
2. Description of nature of application
3. Description of proposed development and land use

Access to the site is envisioned through three locations. First, via an extension of Low Boulevard, second is through an extension of Herrema Boulevard via Brock Street East, and third is through a proposed Right-In/Right-Out driveway via Brock Street East which may act as a secondary emergency entrance.

## **Existing Traffic Assessment**

---

The existing conditions within the study area will be summarized and documented. This will include, but not limited to:

- Description of existing conditions
- A description of key roads and intersections (lanes, speed limits)
- Identifying forms of traffic control, lane configurations, turning restrictions
- Identifying pedestrian and cycling facilities
- Noting the location of adjacent driveways and access points
- Identifying other traffic generators in the vicinity of the site

Turning movement counts will be collected during weekday AM (7am-10am), weekday PM (4pm-7pm) peak periods at the following study area intersections:

- Brock Street East / Nelkydd Lane;
- Brock Street East / Donland Lane; and
- Low Boulevard / Donland Lane

Once existing traffic volumes have been collected, we will prepare a baseline model of existing traffic operations at the study area intersections using Synchro v.10 for the identified critical time periods (weekday AM and PM peak hours). The existing analysis will include levels of service, volume to capacity ratios, and queuing at the key study intersections.

## **Future Background Traffic Assessment**

---

Future Background consists of background growth and other background development traffic. We will obtain historic AADT records and estimate a background growth rate for the assumed 5-year time horizon period.

We do understand that there is and may be further redevelopment applications, as such traffic generation associated with those developments will be included in our analysis to reflect our horizon year assessment of 2022.

Operational deficiencies as a result of future forecasted traffic volumes will be identified and mitigative measures will be proposed and documented in the final report.

## **Site Traffic Assessment**

---

The weekday AM and PM peak hour traffic to be generated by the proposed development will be estimated based on information published in the *Trip Generation, 9<sup>th</sup> Edition*, by the Institute of Transportation Engineers (ITE).

The directional trip distribution and assignment for traffic approaching and departing the site will be determined based upon existing traffic patterns and Transportation Tomorrow Survey (TTS) data.

## **Future Total Traffic Assessment**

Future total traffic consists of future background plus site traffic. Operational deficiencies as a result of site traffic will be identified and mitigative measures will be proposed and documented in the final report. We will develop and recommend appropriate intersection controls and geometric improvements for all key intersections as well as determine the appropriateness of the proposed site access location(s) and the lane requirements at these new locations.

## **Transit and Transportation Demand Management (TDM) Plan**

A review of the existing and future transit availability in the area and recommendations shall be made in relation to the Region's TDM requirements to ensure acceptable walking distances are proposed to the subject lands. Additionally, a review of whether additional STOP locations would be of benefit. Also required is a transit pedestrian study to ensure sufficient capacity is available along the existing routes and that appropriate pedestrian connectivity is provided. We will obtain all necessary data from the Region's Planning Department and apply it accordingly in our analysis and final recommendation in this regard.

## **Parking Justification / On Site Circulation and Site Access Review**

- Review the available parking to determine whether the proposed parking supply is sufficient to accommodate the parking demand of the proposed site and meets current Township of Uxbridge by-law requirements.
- Provide a recommended minimum parking rate for all end uses, based on shared parking rationale (if appropriate).
- We will review and provide comment on the most recent site plan with respect to the functionality of the internal vehicular circulation to facilitate vehicle maneuvering, loading, servicing, parking and pick-up / drop-off activities.
- Using Auto TURN, we will confirm the turning radius requirements and site circulation for passenger and heavy vehicles.
- Determine the appropriateness of access location and ensure adequate connections to main corridors are provided.
- Determine if the site access locations confirm to City standards vis-a-vis spacing, clear throat, sight lines and setback minimum criteria.
- Prepare an internal signage plan depicting location of all regulatory signage as well as location of all convex mirror and pavement markings.

## Madeleine Catz

---

**From:** Jeff Almeida <Jeff.Almeida@Durham.ca>  
**Sent:** October-25-17 2:42 PM  
**To:** Madeleine Catz  
**Cc:** davidsud@rogers.com; Richard Pernicky  
**Subject:** RE: Terms of Reference - Brock Street Proposed Mixed-use Development

Hi Madeleine,

Our comments on your proposed Terms of Reference (Nexttrans October 17,2017) are as follows:

1. We agree generally with the scope and methodology being proposed. The Township of Uxbridge will advise if they have additional requirements.
2. Your study must comply with the Region's Traffic Impact Study Guidelines, including the requirements for Synchro analysis (Chapter 9 in the Design Specifications for Traffic Control Devices, Pavement Marking, Signage and Roadside Protection). The most current intersection turning movement counts available from the Region can be downloaded from our web site through the interactive traffic counts map. Historical daily traffic volumes for all Regional roads are also available through the Traffic Data page of our web site. Other traffic data, including signal timings, are available for purchase from our Traffic Engineering & Operations Division (traffic@durham.ca 905-666-8116).
3. The Horizon year needs to be 5 years after build out. 2022 is 5 years from 2017, and this is unrealistic. A reasonable assumption of full build out needs to be made, and then a 5-year horizon included.
4. Using historic AADT counts to predict background growth is acceptable. Please contact the Township of Uxbridge for any additional developments that need to be taken account of within the 5-year horizon. 226 Brock Street East (opposite the site on the south side of Brock Street (54 Units) should be included.
5. We agree with the scope and methodology for site traffic generation, distribution and assignment.
6. We agree with including transit, active transportation and TDM discussions in the TIS.as per the Region's TIS Guidelines.
7. Any proposed access to Brock St. will need to be reviewed against Regional Standards and justification provided. The TIS scoping discusses a RI/RO only entrance to Brock St and the TIS will need to include a functional design to show how this would be controlled. A median would be difficult given Brock St. is a 2-lane roadway, and a median may restrict access to future development at 226 Brock St. Any access onto Brock St. should include an assessment of the need for an auxiliary right-turn lane as per Regional guidelines.

Jeff Almeida  
Development Approvals Division  
Works Department  
Regional Municipality of Durham  
605 Rossland Road East  
Whitby, ON L1R 1W8  
Phone: (905) 668-7711 ext. 3721  
Fax: (905) 668-2051

---

**From:** Madeleine Catz [mailto:madeleine@nextrans.ca]  
**Sent:** October-17-17 4:38 PM  
**To:** Jeff Almeida  
**Cc:** davidsud@rogers.com; Richard Pernicky  
**Subject:** Terms of Reference - Brock Street Proposed Mixed-use Development

Good afternoon Mr. Almeida,

I would like to establish a terms of reference regarding a proposed mixed-use development northeast of Brock Street East and Donland Lane in Uxbridge. Please see attached terms of reference, along with the preliminary site plan.

Sincerely,

**Madeleine Catz, B.Eng., EIT**  
Transportation Analyst

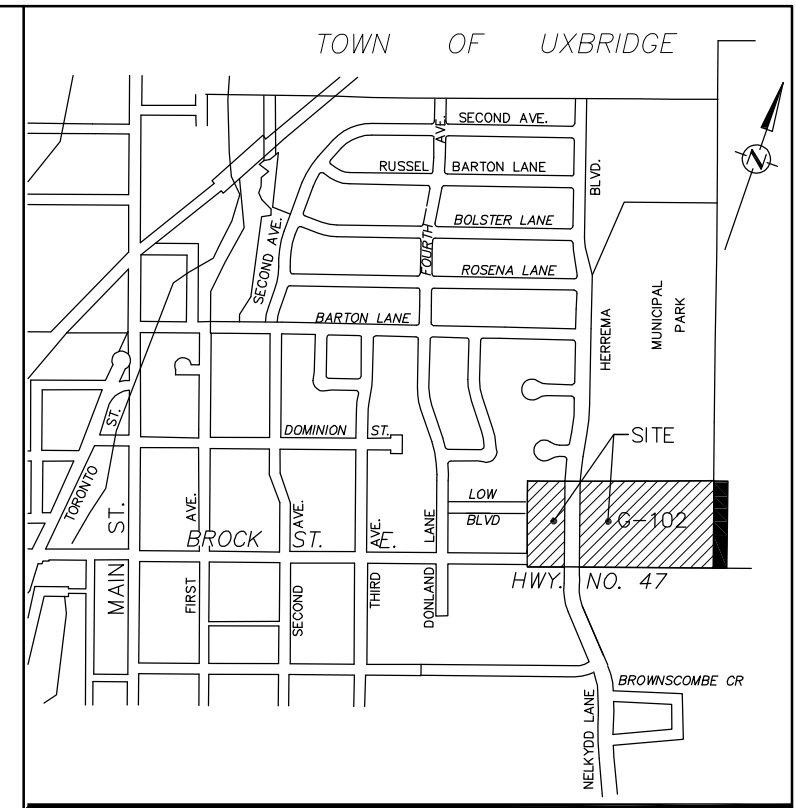
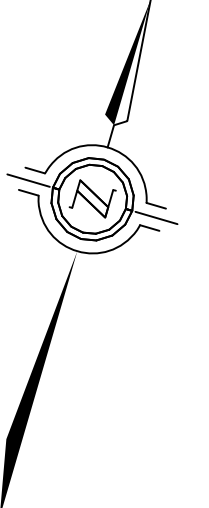
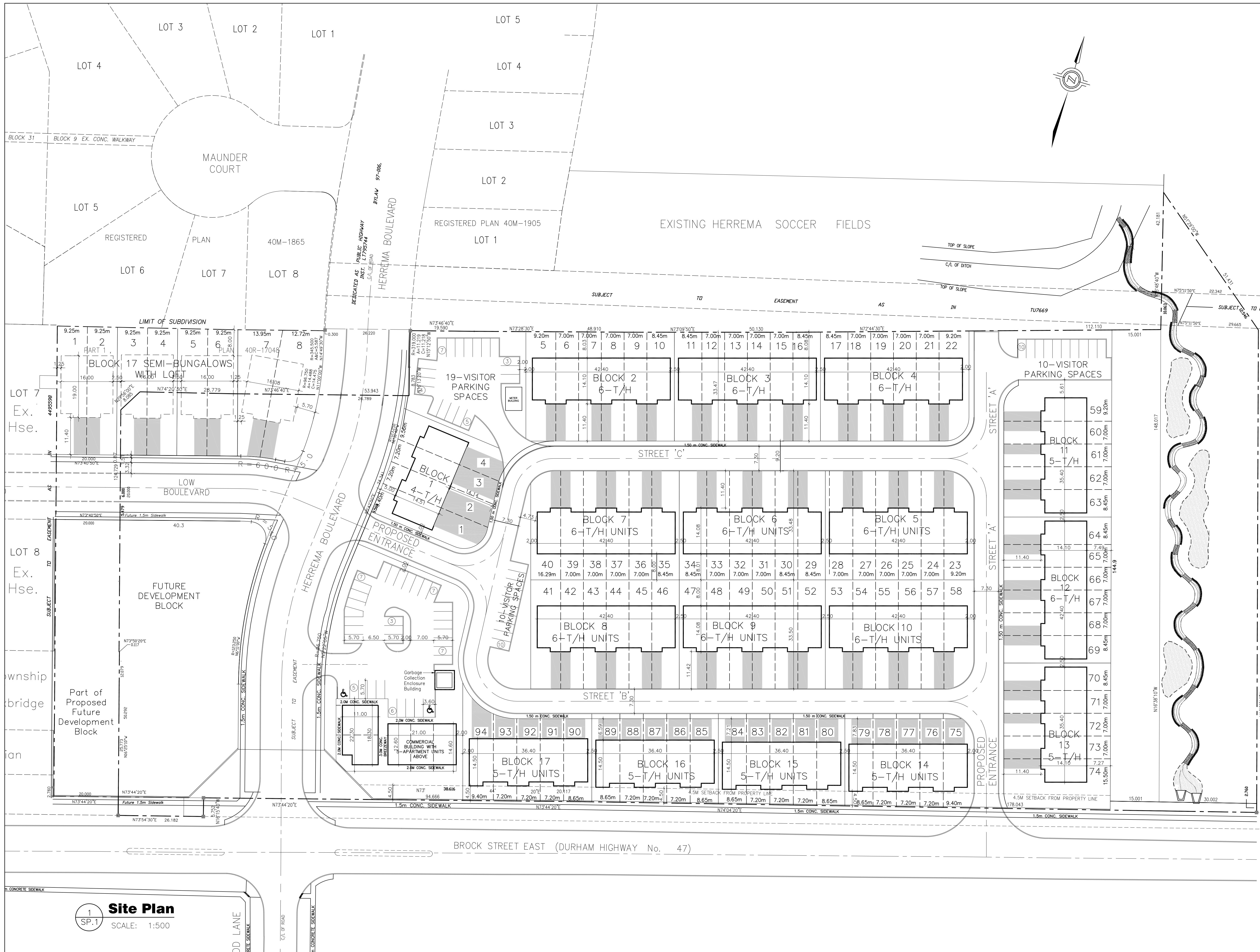
o: 905-503-2563 ext. 207  
c: 647-893-1640  
e: [madeleine@nextrans.ca](mailto:madeleine@nextrans.ca)  
w: [www.nextrans.ca](http://www.nextrans.ca)

**NOTE: NEW ADDRESS BELOW – EMAIL AND  
PHONES REMAIN SAME**

**NexTrans Consulting Engineers**  
**A Division of NextEng Consulting Group Inc.**  
520 Industrial Parkway South, Suite 201  
Aurora ON L4G 6W8

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## **Appendix B - Proposed Site Plan**



**Key Plan n.t.s.**

**AREA SUMMARY: CONDOMINIUM TOWNHOUSE BLOCK:**

LOT AREA	=	49,714.57 m <sup>2</sup>	=	12.28 ACRES (100.0 R)
EASEMENT A	=	1,361.38 m <sup>2</sup>	=	0.336 AC.
EASEMENT B	=	813.44 m <sup>2</sup>	=	0.200 AC.
EASEMENT C	=	811.40 m <sup>2</sup>	=	0.198 AC.
LOW AVENUE	=	1,420.30 m <sup>2</sup>	=	0.351 AC.
HERREMA AVE	=	3,661.77 m <sup>2</sup>	=	0.905 AC.
HERREMA AVE (ENTRY BLVD)	=	683.50 m <sup>2</sup>	=	0.170 AC.
COMMERCIAL BLOCK	=	2,921.82 m <sup>2</sup>	=	0.722 AC.
CONDOMINIUM BLOCK	=	4,753.30 m <sup>2</sup>	=	1.175 AC.
SEMI-BUNGALOW LOT AREA	=	3,152.83 m <sup>2</sup>	=	0.773 AC.
TOTAL AREA	=	19,280.10 m <sup>2</sup>	=	4.764 AC.
TOTAL RES. CONDOMINIUM TOWNHOUSE USABLE AREA:	(49,714.57 m <sup>2</sup> - 19,280.10 m <sup>2</sup> ) = 30,434.47 m <sup>2</sup> = 7.52 AC.			
UNIT DISTRIBUTION:	24 - 7.2M WIDE TOWNHOUSE UNITS			
	20 - 7.0M WIDE TOWNHOUSE UNITS			
TOTAL UNITS	44 UNITS			
DENSITY:	94 UNITS / 7.69 ACRES OR			
	94 UNITS / 3.11 Ha.			
	30.22 units / Hectares			

**COMMERCIAL BLOCK SUMMARY:**

COMMERCIAL BLOCK / WITH 5- RESIDENTIAL UNITS ABOVE

LOT AREA	=	2,861.41 m <sup>2</sup>	=	0.71 ACRES
BUILDING AREA	=	469.45 m <sup>2</sup>		
COMMERCIAL GROUND FLOOR AREA	=	469.45 m <sup>2</sup>		
PARKING PROVIDED	795 m <sup>2</sup>	=	26 PARKING SPACES	
	5.5 CARS/100 m <sup>2</sup>	=	26 PARKING SPACES	
RESIDENTIAL PARKING SPACES PROVIDED (1.5 SPACES/UNIT)	=	8 PARKING SPACES		
TOTAL PARKING SPACES PROVIDED	=	34 PARKING SPACES		

DATE	REVISIONS



**Evendales Developments Ltd.**  
BROCK STREET DEVELOPMENT  
UXBRIDGE, ONTARIO

**Proposed Brock Street Development**

DATE	AUG. 2017
SCALE	1:500
DRAWN BY	B.M.
JOB NO	217-000

**A.1**

**1 Site Plan**  
SP.1 SCALE: 1:500

## **Appendix C – Existing Traffic Data**





**Turning Movement Count (1 . BROCK ST E & DONLAND LN)**

Start Time	N Approach DONLAND LN					E Approach BROCK ST E					W Approach BROCK ST E					Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	U-Turn E:E	Peds E:	Approach Total	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
07:00:00	4	7	0	0	11	1	68	0	0	69	23	0	0	0	23	103	
07:15:00	4	4	0	0	8	0	64	0	0	64	31	3	0	0	34	106	
07:30:00	6	6	0	0	12	0	64	0	0	64	33	1	0	0	34	110	
07:45:00	9	2	0	0	11	0	83	0	0	83	34	1	0	0	35	129	448
08:00:00	4	5	0	0	9	3	74	0	0	77	54	4	0	0	58	144	489
08:15:00	8	14	0	0	22	2	82	0	0	84	79	3	0	1	82	188	571
08:30:00	6	9	0	0	15	0	75	0	0	75	59	10	0	2	69	159	620
08:45:00	4	8	0	0	12	1	91	0	0	92	45	2	0	7	47	151	642
09:00:00	5	7	0	0	12	8	74	0	2	82	45	2	0	0	47	141	639
09:15:00	2	4	0	0	6	1	60	0	0	61	27	2	0	3	29	96	547
09:30:00	4	2	0	0	6	2	48	0	0	50	29	2	0	0	31	87	475
09:45:00	4	3	0	0	7	3	61	0	0	64	31	1	0	0	32	103	427
***BREAK***																	
16:00:00	4	2	0	2	6	5	57	0	0	62	75	5	0	0	80	148	
16:15:00	3	2	0	0	5	5	59	0	0	64	94	7	0	0	101	170	
16:30:00	3	5	0	0	8	6	48	0	0	54	97	10	0	1	107	169	
16:45:00	6	1	0	2	7	7	47	0	2	54	81	6	0	0	87	148	635
17:00:00	5	4	0	0	9	2	55	0	0	57	104	11	0	0	115	181	668
17:15:00	2	3	0	0	5	6	60	0	2	66	91	14	0	0	105	176	674
17:30:00	3	3	0	0	6	3	42	0	0	45	89	7	0	0	96	147	652
17:45:00	5	2	0	0	7	4	50	0	0	54	75	4	0	2	79	140	644
18:00:00	8	4	0	0	12	5	35	0	0	40	68	9	0	0	77	129	592
18:15:00	2	2	0	0	4	3	43	0	0	46	66	5	0	0	71	121	537
18:30:00	6	4	0	0	10	3	46	0	0	49	54	6	0	0	60	119	509



18:45:00	5	1	0	0	6	5	48	0	0	53	52	7	0	0	59	118	487
<b>Grand Total</b>	112	104	0	4	216	75	1434	0	6	1509	1436	122	0	16	1558	<b>3283</b>	-
<b>Approach%</b>	51.9%	48.1%	0%	-	5%	95%	0%	-	-	92.2%	7.8%	0%	-	-	-	-	-
<b>Totals %</b>	3.4%	3.2%	0%	6.6%	2.3%	43.7%	0%	46%	43.7%	3.7%	0%	47.5%	-	-	-	-	-
<b>Heavy</b>	4	0	0	-	1	93	0	-	90	4	0	-	-	-	-	-	-
<b>Heavy %</b>	3.6%	0%	0%	-	1.3%	6.5%	0%	-	6.3%	3.3%	0%	-	-	-	-	-	-
<b>Bicycles</b>	1	0	0	-	0	0	0	-	0	0	0	-	-	-	-	-	-
<b>Bicycle %</b>	0.9%	0%	0%	-	0%	0%	0%	-	0%	0%	0%	-	-	-	-	-	-



**Peak Hour: 08:00 AM - 09:00 AM Weather: Mostly Cloudy (13.4 °C)**

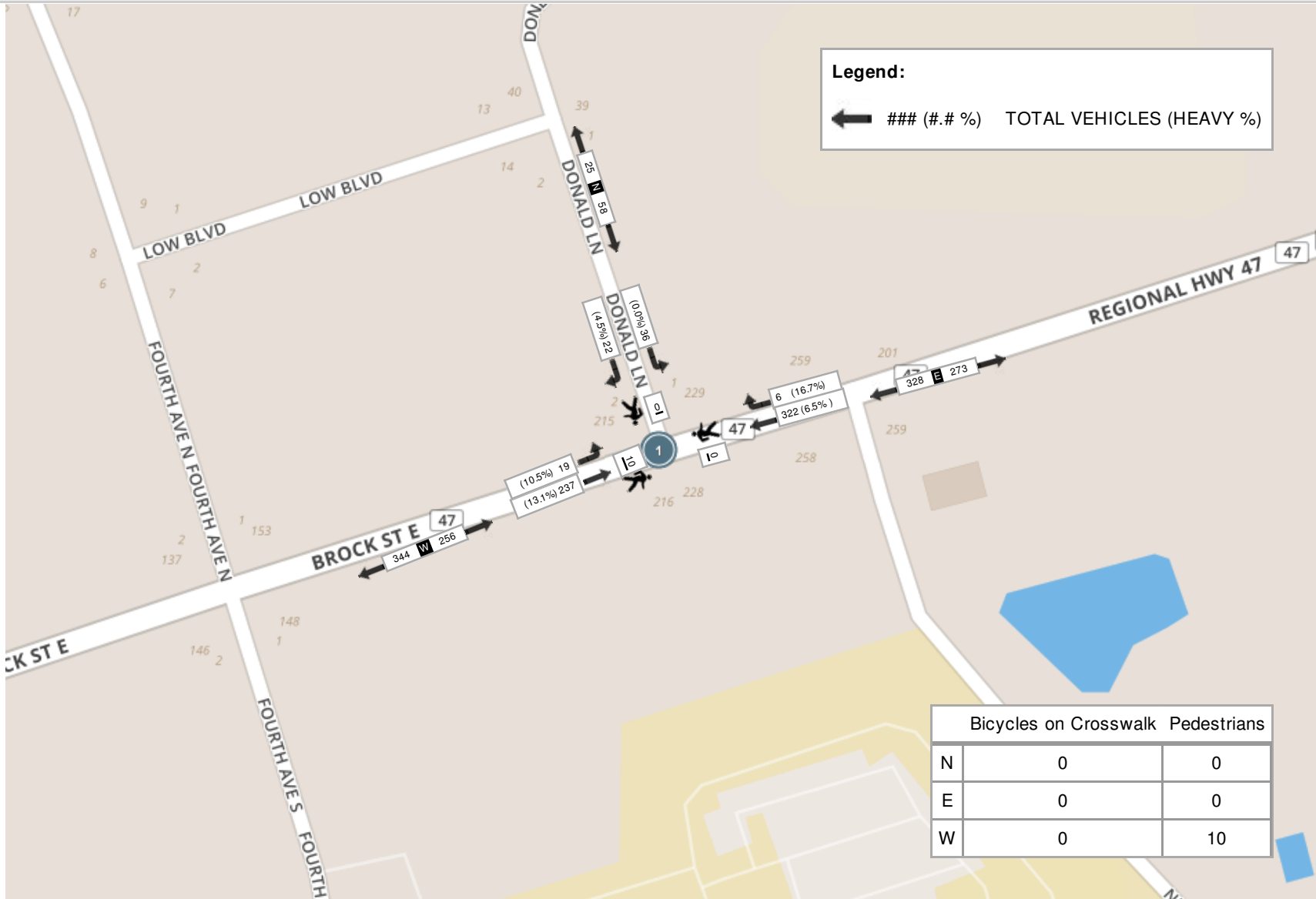
Start Time	N Approach DONLAND LN					E Approach BROCK ST E					W Approach BROCK ST E					Int. Total (15 min)
	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	Thru	Left	U-Turn	Peds	Approach Total	
08:00:00	4	5	0	0	9	3	74	0	0	77	54	4	0	0	58	144
08:15:00	8	14	0	0	22	2	82	0	0	84	79	3	0	1	82	188
08:30:00	6	9	0	0	15	0	75	0	0	75	59	10	0	2	69	159
08:45:00	4	8	0	0	12	1	91	0	0	92	45	2	0	7	47	151
<b>Grand Total</b>	<b>22</b>	<b>36</b>	<b>0</b>	<b>0</b>	<b>58</b>	<b>6</b>	<b>322</b>	<b>0</b>	<b>0</b>	<b>328</b>	<b>237</b>	<b>19</b>	<b>0</b>	<b>10</b>	<b>256</b>	<b>642</b>
<b>Approach%</b>	37.9%	62.1%	0%	-	-	1.8%	98.2%	0%	-	-	92.6%	7.4%	0%	-	-	-
<b>Totals %</b>	3.4%	5.6%	0%	9%	0.9%	50.2%	0%	51.1%	36.9%	3%	0%	39.9%	-	-	-	-
<b>PHF</b>	0.69	0.64	0	0.66	0.5	0.88	0	0.89	0.75	0.48	0	0.78	-	-	-	-
<b>Heavy</b>	1	0	0	1	1	21	0	22	31	2	0	33	-	-	-	-
<b>Heavy %</b>	4.5%	0%	0%	1.7%	16.7%	6.5%	0%	6.7%	13.1%	10.5%	0%	12.9%	-	-	-	-
<b>Lights</b>	21	36	0	57	5	301	0	306	206	17	0	223	-	-	-	-
<b>Lights %</b>	95.5%	100%	0%	98.3%	83.3%	93.5%	0%	93.3%	86.9%	89.5%	0%	87.1%	-	-	-	-
<b>Single-Unit Trucks</b>	0	0	0	0	1	6	0	7	11	1	0	12	-	-	-	-
<b>Single-Unit Trucks %</b>	0%	0%	0%	0%	16.7%	1.9%	0%	2.1%	4.6%	5.3%	0%	4.7%	-	-	-	-
<b>Buses</b>	1	0	0	1	0	9	0	9	16	1	0	17	-	-	-	-
<b>Buses %</b>	4.5%	0%	0%	1.7%	0%	2.8%	0%	2.7%	6.8%	5.3%	0%	6.6%	-	-	-	-
<b>Articulated Trucks</b>	0	0	0	0	0	6	0	6	4	0	0	4	-	-	-	-
<b>Articulated Trucks %</b>	0%	0%	0%	0%	0%	1.9%	0%	1.8%	1.7%	0%	0%	1.6%	-	-	-	-
<b>Pedestrians</b>	-	-	-	0	-	-	-	0	-	-	-	10	-	-	-	-
<b>Pedestrians%</b>	-	-	-	0%	-	-	-	0%	-	-	-	100%	-	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	-
<b>Bicycles on Crosswalk%</b>	-	-	-	0%	-	-	-	0%	-	-	-	0%	-	-	-	-
<b>Bicycles on Road</b>	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	-
<b>Bicycles on Road%</b>	-	-	-	0%	-	-	-	0%	-	-	-	0%	-	-	-	-



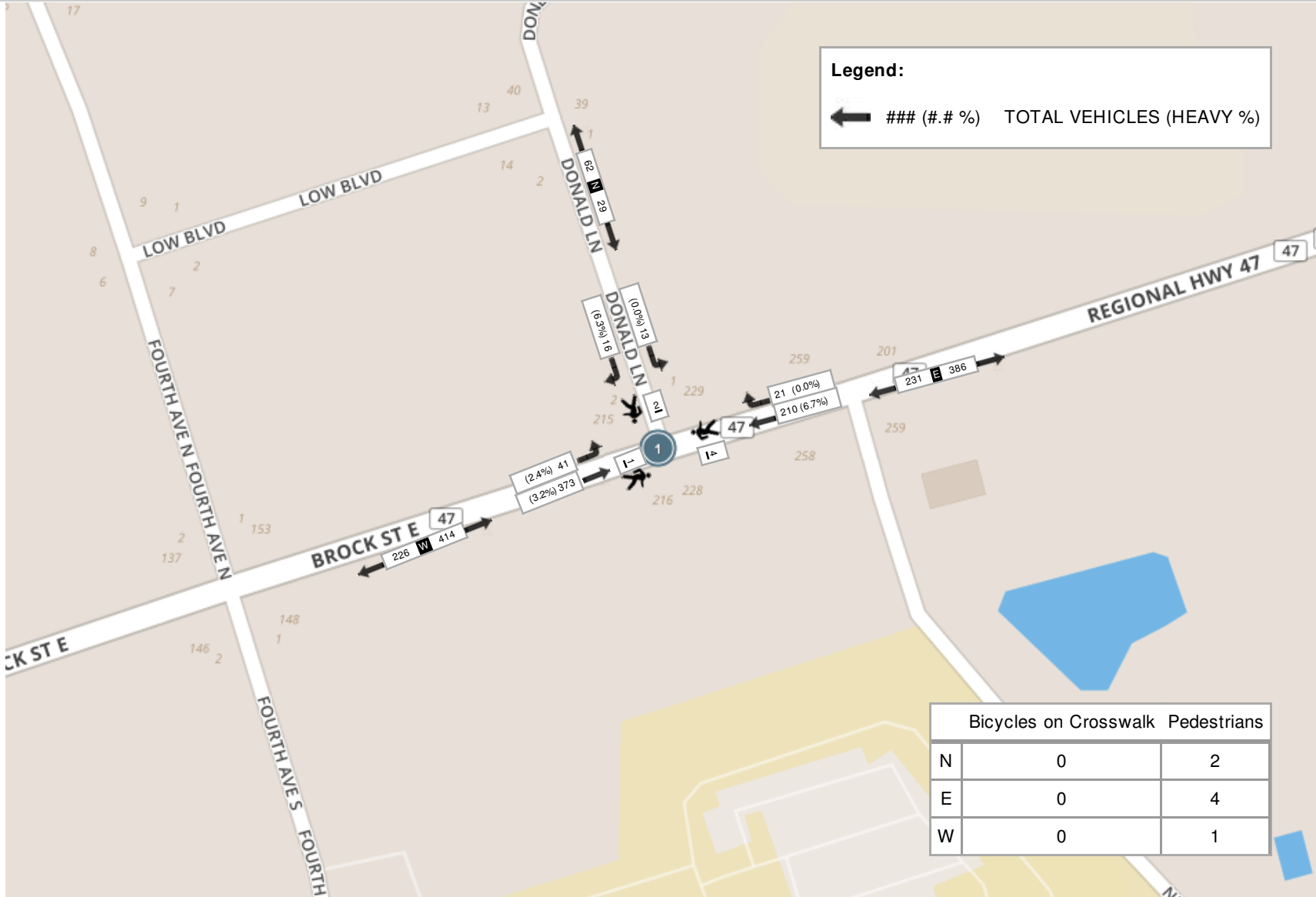
**Peak Hour: 04:30 PM - 05:30 PM Weather: Partly Cloudy (12.7 °C)**

Start Time	N Approach DONLAND LN					E Approach BROCK ST E					W Approach BROCK ST E					Int. Total (15 min)
	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	Thru	Left	U-Turn	Peds	Approach Total	
16:30:00	3	5	0	0	8	6	48	0	0	54	97	10	0	1	107	169
16:45:00	6	1	0	2	7	7	47	0	2	54	81	6	0	0	87	148
17:00:00	5	4	0	0	9	2	55	0	0	57	104	11	0	0	115	181
17:15:00	2	3	0	0	5	6	60	0	2	66	91	14	0	0	105	176
<b>Grand Total</b>	16	13	0	2	29	21	210	0	4	231	373	41	0	1	414	<b>674</b>
<b>Approach%</b>	55.2%	44.8%	0%	-	-	9.1%	90.9%	0%	-	-	90.1%	9.9%	0%	-	-	-
<b>Totals %</b>	2.4%	1.9%	0%	4.3%	3.1%	31.2%	0%	34.3%	55.3%	6.1%	0%	61.4%	-	-	-	-
<b>PHF</b>	0.67	0.65	0	0.81	0.75	0.88	0	0.88	0.9	0.73	0	0.9	-	-	-	-
<b>Heavy</b>	1	0	0	1	0	14	0	14	12	1	0	13	-	-	-	-
<b>Heavy %</b>	6.3%	0%	0%	3.4%	0%	6.7%	0%	6.1%	3.2%	2.4%	0%	3.1%	-	-	-	-
<b>Lights</b>	15	13	0	28	21	196	0	217	361	40	0	401	-	-	-	-
<b>Lights %</b>	93.8%	100%	0%	96.6%	100%	93.3%	0%	93.9%	96.8%	97.6%	0%	96.9%	-	-	-	-
<b>Single-Unit Trucks</b>	1	0	0	1	0	10	0	10	8	1	0	9	-	-	-	-
<b>Single-Unit Trucks %</b>	6.3%	0%	0%	3.4%	0%	4.8%	0%	4.3%	2.1%	2.4%	0%	2.2%	-	-	-	-
<b>Buses</b>	0	0	0	0	0	0	0	0	1	0	0	1	-	-	-	-
<b>Buses %</b>	0%	0%	0%	0%	0%	0%	0%	0%	0.3%	0%	0%	0.2%	-	-	-	-
<b>Articulated Trucks</b>	0	0	0	0	0	4	0	4	3	0	0	3	-	-	-	-
<b>Articulated Trucks %</b>	0%	0%	0%	0%	0%	1.9%	0%	1.7%	0.8%	0%	0%	0.7%	-	-	-	-
<b>Pedestrians</b>	-	-	-	2	-	-	-	4	-	-	-	1	-	-	-	-
<b>Pedestrians%</b>	-	-	-	28.6%	-	-	-	57.1%	-	-	-	14.3%	-	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	-
<b>Bicycles on Crosswalk%</b>	-	-	-	0%	-	-	-	0%	-	-	-	0%	-	-	-	-
<b>Bicycles on Road</b>	1	0	0	0	-	0	0	0	0	-	0	0	0	0	-	-
<b>Bicycles on Road%</b>	-	-	-	0%	-	-	-	0%	-	-	-	0%	-	-	-	-

Peak Hour: 08:00 AM - 09:00 AM Weather: Mostly Cloudy (13.4 °C)



Peak Hour: 04:30 PM - 05:30 PM Weather: Partly Cloudy (12.7 °C)





### Turning Movement Count (2 . BROCK ST E & NELKYDD LN)

Start Time	E Approach BROCK ST E					S Approach NELKYDD LN					W Approach BROCK ST E					Int. Total (15 min)	Int. Total (1 hr)
	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	U-Turn W:W	Peds W:	Approach Total		
07:00:00	57	4	0	0	61	2	12	0	0	14	8	22	0	0	30	105	
07:15:00	54	3	0	0	57	3	10	0	0	13	6	29	0	0	35	105	
07:30:00	57	2	0	0	59	1	7	0	0	8	8	31	0	0	39	106	
07:45:00	70	10	0	0	80	2	12	0	0	14	6	29	0	0	35	129	445
08:00:00	62	16	0	0	78	6	14	0	0	20	28	31	0	0	59	157	497
08:15:00	67	22	0	0	89	8	17	0	0	25	50	42	0	0	92	206	598
08:30:00	55	12	0	0	67	4	21	0	0	25	25	44	0	0	69	161	653
08:45:00	75	4	0	0	79	4	17	0	0	21	12	40	0	0	52	152	676
09:00:00	47	3	0	0	50	9	35	0	2	44	14	39	0	0	53	147	666
09:15:00	48	0	0	0	48	5	13	0	0	18	7	25	0	0	32	98	558
09:30:00	45	2	0	0	47	0	6	0	2	6	6	25	0	0	31	84	481
09:45:00	53	7	0	0	60	4	10	0	0	14	7	27	0	0	34	108	437
***BREAK***																	
16:00:00	46	4	0	0	50	14	15	0	0	29	6	73	0	0	79	158	
16:15:00	49	3	0	0	52	7	15	0	0	22	15	79	0	0	94	168	
16:30:00	44	0	0	0	44	6	10	0	0	16	16	84	0	0	100	160	
16:45:00	45	2	0	0	47	1	9	0	0	10	13	69	1	0	83	140	626
17:00:00	43	1	0	0	44	4	12	0	0	16	11	95	0	0	106	166	634
17:15:00	59	3	0	0	62	0	8	0	4	8	15	79	0	2	94	164	630
17:30:00	37	1	0	0	38	4	8	0	0	12	17	74	0	0	91	141	611
17:45:00	37	1	0	0	38	1	17	0	1	18	14	66	0	0	80	136	607
18:00:00	31	5	0	0	36	2	9	0	0	11	12	61	0	0	73	120	561
18:15:00	40	8	0	0	48	0	6	0	0	6	12	56	0	0	68	122	519
18:30:00	39	5	0	0	44	0	10	0	2	10	11	48	0	0	59	113	491



18:45:00	43	1	0	0	44	0	10	0	0	10	12	41	0	0	53	107	462
<b>Grand Total</b>	1203	119	0	0	1322	87	303	0	11	390	331	1209	1	2	1541	<b>3253</b>	-
<b>Approach%</b>	91%	9%	0%	-	22.3%	77.7%	0%	-	21.5%	78.5%	0.1%	-	-	-	-	-	-
<b>Totals %</b>	37%	3.7%	0%	40.6%	2.7%	9.3%	0%	12%	10.2%	37.2%	0%	47.4%	-	-	-	-	-
<b>Heavy</b>	80	4	0	-	8	13	0	-	14	79	0	-	-	-	-	-	-
<b>Heavy %</b>	6.7%	3.4%	0%	-	9.2%	4.3%	0%	-	4.2%	6.5%	0%	-	-	-	-	-	-
<b>Bicycles</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Bicycle %</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





**Peak Hour: 08:00 AM - 09:00 AM Weather: Mostly Cloudy (13.4 °C)**

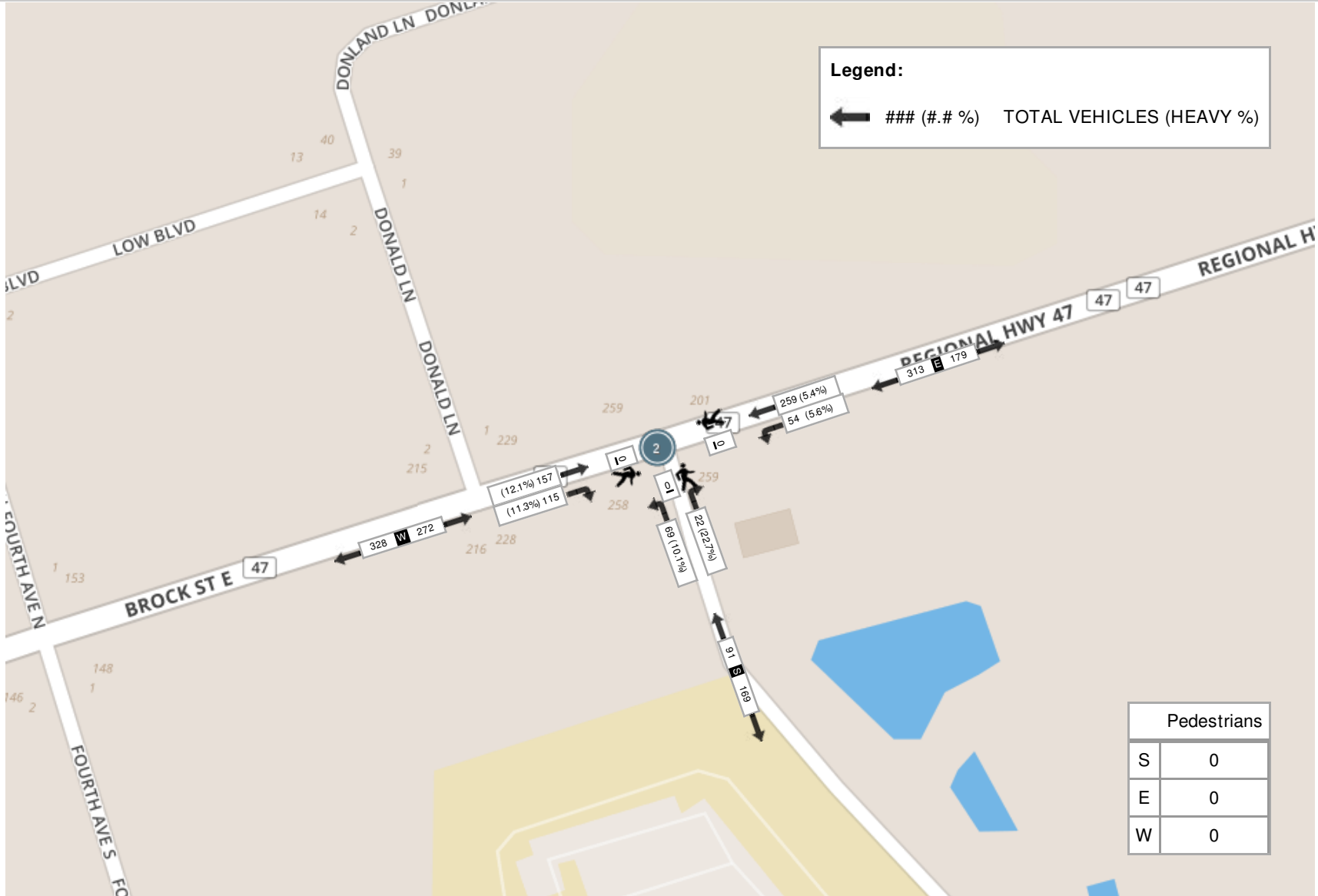
Start Time	E Approach BROCK ST E					S Approach NELKYDD LN					W Approach BROCK ST E					Int. Total (15 min)
	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	
08:00:00	62	16	0	0	78	6	14	0	0	20	28	31	0	0	59	157
08:15:00	67	22	0	0	89	8	17	0	0	25	50	42	0	0	92	206
08:30:00	55	12	0	0	67	4	21	0	0	25	25	44	0	0	69	161
08:45:00	75	4	0	0	79	4	17	0	0	21	12	40	0	0	52	152
<b>Grand Total</b>	<b>259</b>	<b>54</b>	<b>0</b>	<b>0</b>	<b>313</b>	<b>22</b>	<b>69</b>	<b>0</b>	<b>0</b>	<b>91</b>	<b>115</b>	<b>157</b>	<b>0</b>	<b>0</b>	<b>272</b>	<b>676</b>
<b>Approach%</b>	82.7%	17.3%	0%	-	-	24.2%	75.8%	0%	-	-	42.3%	57.7%	0%	-	-	-
<b>Totals %</b>	38.3%	8%	0%	46.3%	3.3%	10.2%	0%	13.5%	17%	23.2%	0%	40.2%	-	-	-	-
<b>PHF</b>	0.86	0.61	0	0.88	0.69	0.82	0	0.91	0.58	0.89	0	0.74	-	-	-	-
<b>Heavy</b>	14	3	0	17	5	7	0	12	13	19	0	32	-	-	-	-
<b>Heavy %</b>	5.4%	5.6%	0%	5.4%	22.7%	10.1%	0%	13.2%	11.3%	12.1%	0%	11.8%	-	-	-	-
<b>Lights</b>	245	51	0	296	17	62	0	79	102	138	0	240	-	-	-	-
<b>Lights %</b>	94.6%	94.4%	0%	94.6%	77.3%	89.9%	0%	86.8%	88.7%	87.9%	0%	88.2%	-	-	-	-
<b>Single-Unit Trucks</b>	6	0	0	6	0	1	0	1	0	9	0	9	-	-	-	-
<b>Single-Unit Trucks %</b>	2.3%	0%	0%	1.9%	0%	1.4%	0%	1.1%	0%	5.7%	0%	3.3%	-	-	-	-
<b>Buses</b>	2	3	0	5	5	6	0	11	13	3	0	16	-	-	-	-
<b>Buses %</b>	0.8%	5.6%	0%	1.6%	22.7%	8.7%	0%	12.1%	11.3%	1.9%	0%	5.9%	-	-	-	-
<b>Articulated Trucks</b>	6	0	0	6	0	0	0	0	0	7	0	7	-	-	-	-
<b>Articulated Trucks %</b>	2.3%	0%	0%	1.9%	0%	0%	0%	0%	0%	4.5%	0%	2.6%	-	-	-	-
<b>Pedestrians</b>	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	-
<b>Pedestrians%</b>	-	-	-	0%	-	-	-	0%	-	-	-	0%	-	-	-	-



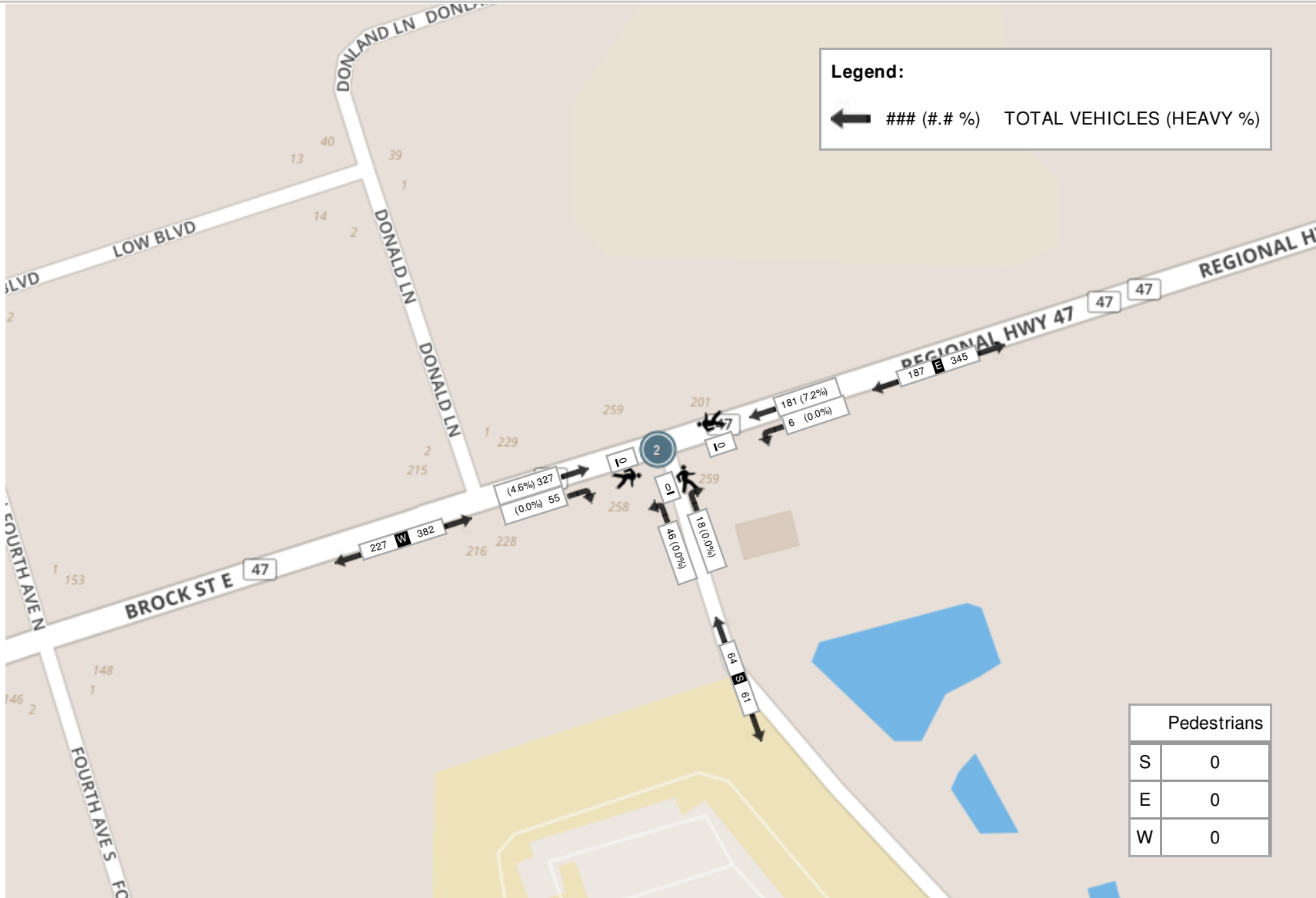
**Peak Hour: 04:15 PM - 05:15 PM Weather: Partly Cloudy (12.7 °C)**

Start Time	E Approach BROCK ST E					S Approach NELKYDD LN					W Approach BROCK ST E					Int. Total (15 min)
	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	
16:15:00	49	3	0	0	52	7	15	0	0	22	15	79	0	0	94	168
16:30:00	44	0	0	0	44	6	10	0	0	16	16	84	0	0	100	160
16:45:00	45	2	0	0	47	1	9	0	0	10	13	69	1	0	83	140
17:00:00	43	1	0	0	44	4	12	0	0	16	11	95	0	0	106	166
<b>Grand Total</b>	<b>181</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>187</b>	<b>18</b>	<b>46</b>	<b>0</b>	<b>0</b>	<b>64</b>	<b>55</b>	<b>327</b>	<b>1</b>	<b>0</b>	<b>383</b>	<b>634</b>
<b>Approach%</b>	96.8%	3.2%	0%	-	-	28.1%	71.9%	0%	-	-	14.4%	85.4%	0.3%	-	-	-
<b>Totals %</b>	28.5%	0.9%	0%	29.5%	2.8%	7.3%	0%	10.1%	8.7%	51.6%	0.2%	60.4%	-	-	-	-
<b>PHF</b>	0.92	0.5	0	0.9	0.64	0.77	0	0.73	0.86	0.86	0.25	0.9	-	-	-	-
<b>Heavy</b>	13	0	0	13	0	0	0	0	0	15	0	15	-	-	-	-
<b>Heavy %</b>	7.2%	0%	0%	7%	0%	0%	0%	0%	0%	4.6%	0%	3.9%	-	-	-	-
<b>Lights</b>	168	6	0	174	18	46	0	64	55	312	1	368	-	-	-	-
<b>Lights %</b>	92.8%	100%	0%	93%	100%	100%	0%	100%	100%	95.4%	100%	96.1%	-	-	-	-
<b>Single-Unit Trucks</b>	10	0	0	10	0	0	0	0	0	9	0	9	-	-	-	-
<b>Single-Unit Trucks %</b>	5.5%	0%	0%	5.3%	0%	0%	0%	0%	0%	2.8%	0%	2.3%	-	-	-	-
<b>Buses</b>	0	0	0	0	0	0	0	0	0	1	0	1	-	-	-	-
<b>Buses %</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.3%	0%	0.3%	-	-	-	-
<b>Articulated Trucks</b>	3	0	0	3	0	0	0	0	0	5	0	5	-	-	-	-
<b>Articulated Trucks %</b>	1.7%	0%	0%	1.6%	0%	0%	0%	0%	0%	1.5%	0%	1.3%	-	-	-	-
<b>Pedestrians</b>	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	-
<b>Pedestrians%</b>	-	-	-	0%	-	-	-	0%	-	-	-	0%	-	-	-	-

Peak Hour: 08:00 AM - 09:00 AM Weather: Mostly Cloudy (13.4 °C)



Peak Hour: 04:15 PM - 05:15 PM Weather: Partly Cloudy (12.7 °C)





### Turning Movement Count (3 . LOW BLVD & DONLAND LN)

Start Time	N Approach DONLAND LN					S Approach DONLAND LN					W Approach LOW BLVD					Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	U-Turn N:N	Peds N:	Approach Total	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Left W:N	U-Turn W:W	Peds W:	Approach Total		
07:00:00	0	11	0	0	11	1	0	0	0	1	0	0	0	0	0	12	
07:15:00	0	8	0	0	8	3	0	0	0	3	0	0	0	0	0	11	
07:30:00	0	12	0	0	12	1	0	0	0	1	0	0	0	0	0	13	
07:45:00	0	10	0	0	10	1	0	0	0	1	1	0	0	0	1	12	48
08:00:00	0	9	0	0	9	6	1	0	0	7	0	0	0	0	0	16	52
08:15:00	0	21	0	1	21	5	0	0	0	5	2	0	0	1	2	28	69
08:30:00	0	15	0	1	15	9	1	0	0	10	0	0	0	2	0	25	81
08:45:00	0	12	0	0	12	3	0	0	0	3	0	0	0	8	0	15	84
09:00:00	0	13	0	0	13	9	0	0	0	9	0	0	0	0	0	22	90
09:15:00	0	4	0	0	4	3	1	0	0	4	1	0	0	3	1	9	71
09:30:00	0	6	0	0	6	4	0	0	0	4	0	0	0	1	0	10	56
09:45:00	0	6	0	0	6	4	0	0	0	4	1	0	0	0	1	11	52
***BREAK***																	
16:00:00	0	6	0	0	6	9	0	0	0	9	0	0	0	2	0	15	
16:15:00	0	5	0	0	5	11	2	0	0	13	0	0	0	1	0	18	
16:30:00	0	8	0	0	8	16	0	0	0	16	0	0	0	2	0	24	
16:45:00	0	7	0	0	7	12	0	0	0	12	0	0	0	2	0	19	76
17:00:00	0	9	0	0	9	13	0	0	0	13	0	0	0	0	0	22	83
17:15:00	0	5	0	0	5	20	0	0	0	20	0	0	0	1	0	25	90
17:30:00	0	6	0	0	6	9	0	0	0	9	0	0	0	0	0	15	81
17:45:00	0	6	0	0	6	9	0	0	0	9	1	0	0	2	1	16	78
18:00:00	0	12	0	0	12	13	0	0	0	13	0	0	0	0	0	25	81
18:15:00	0	4	0	0	4	8	0	0	0	8	0	0	0	0	0	12	68
18:30:00	0	9	0	0	9	8	1	0	0	9	1	0	0	2	1	19	72



18:45:00	0	6	0	0	6	10	0	0	0	10	0	0	0	0	0	16	72
<b>Grand Total</b>	0	210	0	2	210	187	6	0	0	193	7	0	0	27	7	<b>410</b>	-
<b>Approach%</b>	0%	100%	0%	-	-	96.9%	3.1%	0%	-	-	100%	0%	0%	-	-	-	-
<b>Totals %</b>	0%	51.2%	0%	51.2%	45.6%	1.5%	0%	47.1%	1.7%	0%	0%	1.7%	-	-	-	-	-
<b>Heavy</b>	0	3	0	-	4	0	0	-	1	0	0	-	-	-	-	-	-
<b>Heavy %</b>	0%	1.4%	0%	-	2.1%	0%	0%	-	14.3%	0%	0%	-	-	-	-	-	-
<b>Bicycles</b>	2	2	0	-	0	0	0	-	1	2	0	-	-	-	-	-	-
<b>Bicycle %</b>	0%	1%	0%	-	0%	0%	0%	-	14.3%	0%	0%	-	-	-	-	-	-



**Peak Hour: 08:15 AM - 09:15 AM Weather: Mostly Cloudy (13.4 °C)**

Start Time	N Approach DONLAND LN					S Approach DONLAND LN					W Approach LOW BLVD					Int. Total (15 min)
	Right	Thru	U-Turn	Peds	Approach Total	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	
08:15:00	0	21	0	1	21	5	0	0	0	5	2	0	0	1	2	28
08:30:00	0	15	0	1	15	9	1	0	0	10	0	0	0	2	0	25
08:45:00	0	12	0	0	12	3	0	0	0	3	0	0	0	8	0	15
09:00:00	0	13	0	0	13	9	0	0	0	9	0	0	0	0	0	22
<b>Grand Total</b>	0	61	0	2	61	26	1	0	0	27	2	0	0	11	2	<b>90</b>
<b>Approach%</b>	0%	100%	0%	-	-	96.3%	3.7%	0%	-	-	100%	0%	0%	-	-	-
<b>Totals %</b>	0%	67.8%	0%	67.8%	67.8%	28.9%	1.1%	0%	30%	30%	2.2%	0%	0%	2.2%	2.2%	-
<b>PHF</b>	0	0.73	0	0.73	0.73	0.72	0.25	0	0.68	0.68	0.25	0	0	0.25	0.25	-
<b>Heavy</b>	0	1	0	1	1	2	0	0	2	2	0	0	0	0	0	-
<b>Heavy %</b>	0%	1.6%	0%	1.6%	1.6%	7.7%	0%	0%	7.4%	7.4%	0%	0%	0%	0%	0%	-
<b>Lights</b>	0	60	0	60	60	24	1	0	25	25	2	0	0	2	2	-
<b>Lights %</b>	0%	98.4%	0%	98.4%	98.4%	92.3%	100%	0%	92.6%	92.6%	100%	0%	0%	100%	100%	-
<b>Single-Unit Trucks</b>	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	-
<b>Single-Unit Trucks %</b>	0%	0%	0%	0%	0%	3.8%	0%	0%	3.7%	3.7%	0%	0%	0%	0%	0%	-
<b>Buses</b>	0	1	0	1	1	1	0	0	1	1	0	0	0	0	0	-
<b>Buses %</b>	0%	1.6%	0%	1.6%	1.6%	3.8%	0%	0%	3.7%	3.7%	0%	0%	0%	0%	0%	-
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
<b>Articulated Trucks %</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
<b>Pedestrians</b>	-	-	-	2	-	-	-	0	-	-	-	-	-	11	-	-
<b>Pedestrians%</b>	-	-	-	15.4%	-	-	-	0%	-	-	-	-	-	84.6%	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	0	-	-	-	0	-	-	-	-	-	0	-	-
<b>Bicycles on Crosswalk%</b>	-	-	-	0%	-	-	-	0%	-	-	-	-	-	0%	-	-
<b>Bicycles on Road</b>	0	1	0	0	-	0	0	0	0	-	0	0	0	0	-	-
<b>Bicycles on Road%</b>	-	-	-	0%	-	-	-	0%	-	-	-	-	-	0%	-	-

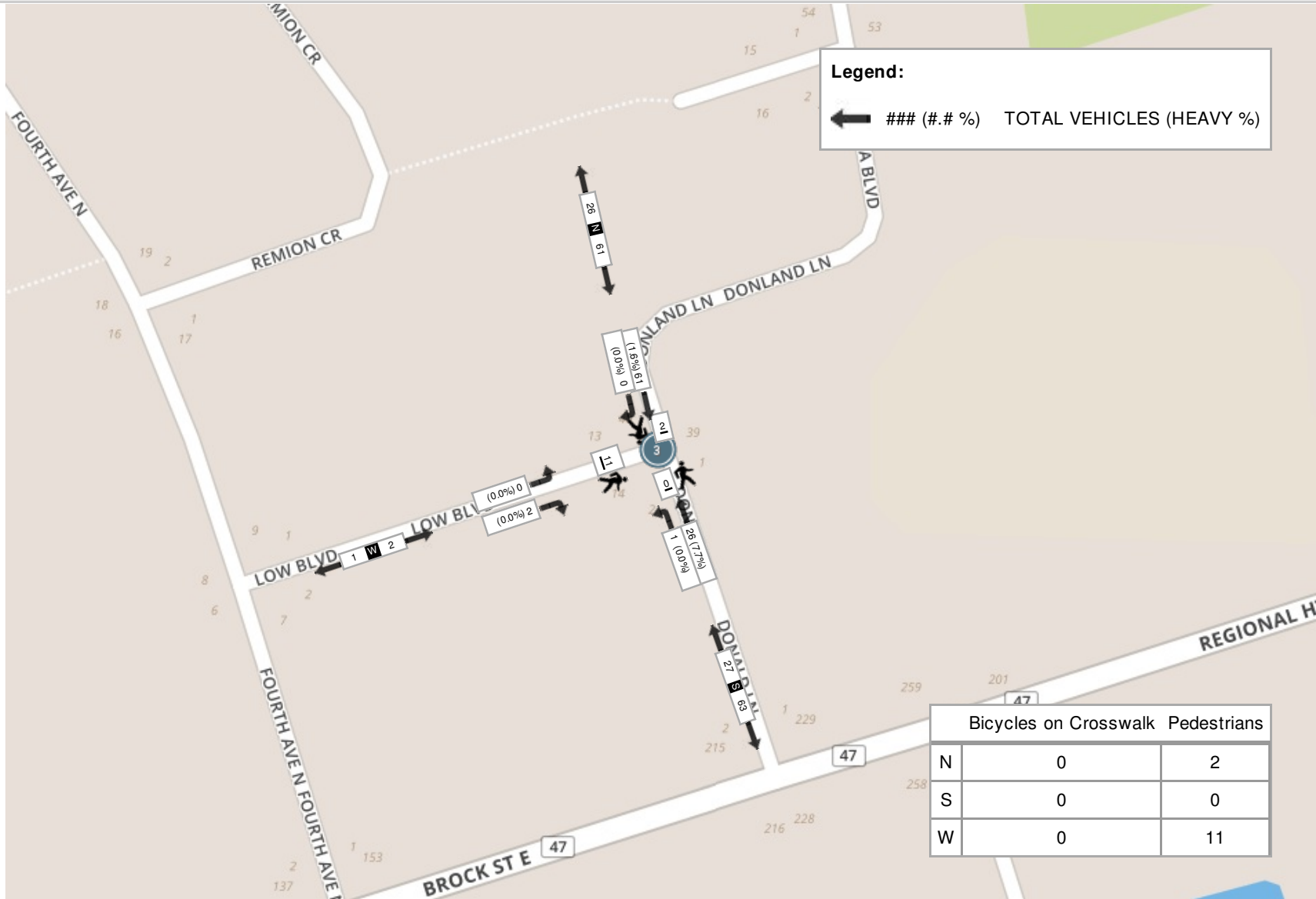


**Peak Hour: 04:30 PM - 05:30 PM Weather: Partly Cloudy (12.7 °C)**

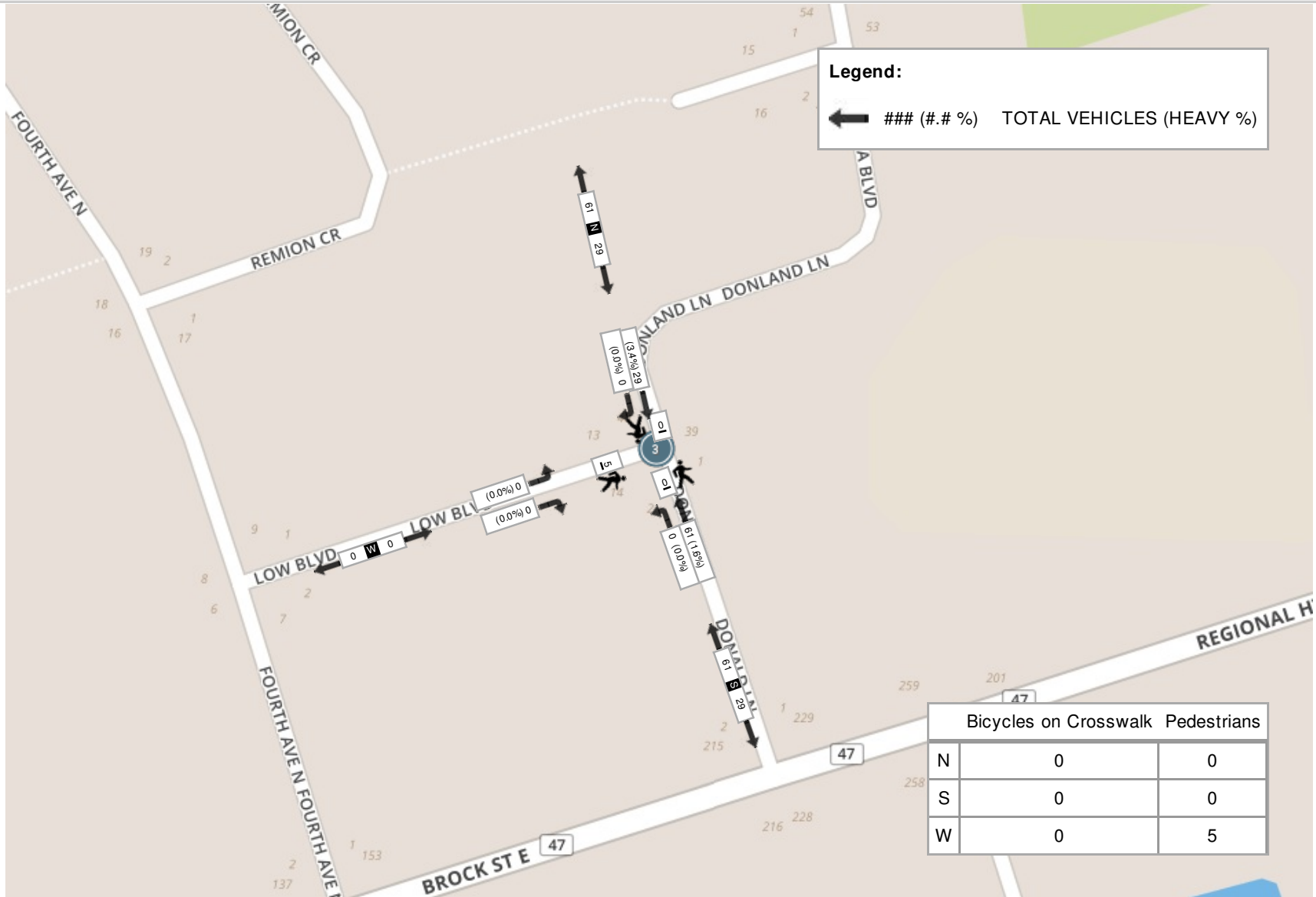
Start Time	N Approach DONLAND LN					S Approach DONLAND LN					W Approach LOW BLVD					Int. Total (15 min)
	Right	Thru	U-Turn	Peds	Approach Total	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	
16:30:00	0	8	0	0	8	16	0	0	0	16	0	0	0	2	0	24
16:45:00	0	7	0	0	7	12	0	0	0	12	0	0	0	2	0	19
17:00:00	0	9	0	0	9	13	0	0	0	13	0	0	0	0	0	22
17:15:00	0	5	0	0	5	20	0	0	0	20	0	0	0	1	0	25
<b>Grand Total</b>	0	29	0	0	29	61	0	0	0	61	0	0	0	5	0	<b>90</b>
<b>Approach%</b>	0%	100%	0%	-	-	100%	0%	0%	-	-	0%	0%	0%	-	-	-
<b>Totals %</b>	0%	32.2%	0%	32.2%	67.8%	0%	0%	67.8%	0%	0%	0%	0%	0%	0%	-	-
<b>PHF</b>	0	0.81	0	0.81	0.76	0	0	0.76	0	0	0	0	0	0	-	-
<b>Heavy</b>	0	1	0	1	1	0	0	1	0	0	0	0	0	0	-	-
<b>Heavy %</b>	0%	3.4%	0%	3.4%	1.6%	0%	0%	1.6%	0%	0%	0%	0%	0%	0%	-	-
<b>Lights</b>	0	28	0	28	60	0	0	60	0	0	0	0	0	0	-	-
<b>Lights %</b>	0%	96.6%	0%	96.6%	98.4%	0%	0%	98.4%	0%	0%	0%	0%	0%	0%	-	-
<b>Single-Unit Trucks</b>	0	1	0	1	1	0	0	1	0	0	0	0	0	0	-	-
<b>Single-Unit Trucks %</b>	0%	3.4%	0%	3.4%	1.6%	0%	0%	1.6%	0%	0%	0%	0%	0%	0%	-	-
<b>Buses</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
<b>Buses %</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-
<b>Articulated Trucks</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
<b>Articulated Trucks %</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-
<b>Pedestrians</b>	-	-	-	0	-	-	-	0	-	-	-	-	5	-	-	-
<b>Pedestrians%</b>	-	-	-	0%	-	-	-	0%	-	-	-	-	100%	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	0	-	-	-	0	-	-	-	-	0	-	-	-
<b>Bicycles on Crosswalk%</b>	-	-	-	0%	-	-	-	0%	-	-	-	-	0%	-	-	-
<b>Bicycles on Road</b>	0	0	0	0	-	0	0	0	0	-	1	0	0	0	-	-
<b>Bicycles on Road%</b>	-	-	-	0%	-	-	-	0%	-	-	-	-	0%	-	-	-



Peak Hour: 08:15 AM - 09:15 AM Weather: Mostly Cloudy (13.4 °C)



Peak Hour: 04:30 PM - 05:30 PM Weather: Partly Cloudy (12.7 °C)

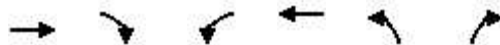


## **Appendix D – Existing Traffic Level of Service Calculations**

# HCM Unsignalized Intersection Capacity Analysis

## 3: Nelkydd Lane & Brock Street East

11/16/2017

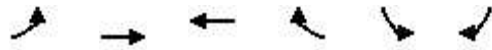


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑		↑	↑	
Traffic Volume (veh/h)	157	115	54	259	69	22
Future Volume (Veh/h)	157	115	54	259	69	22
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.89	0.58	0.61	0.86	0.82	0.69
Hourly flow rate (vph)	176	198	89	301	84	32
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			374		655	176
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			374		655	176
tC, single (s)			4.2		6.5	6.4
tC, 2 stage (s)						
tF (s)			2.3		3.6	3.5
p0 queue free %			92		78	96
cM capacity (veh/h)			1163		387	816
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>NB 1</b>		
Volume Total	176	198	390	116		
Volume Left	0	0	89	84		
Volume Right	0	198	0	32		
cSH	1700	1700	1163	452		
Volume to Capacity	0.10	0.12	0.08	0.26		
Queue Length 95th (m)	0.0	0.0	2.0	8.1		
Control Delay (s)	0.0	0.0	2.5	15.7		
Lane LOS			A	C		
Approach Delay (s)	0.0		2.5	15.7		
Approach LOS				C		
<b>Intersection Summary</b>						
Average Delay			3.2			
Intersection Capacity Utilization			40.0%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 6: Brock Street East & Donland Lane

11/16/2017



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	19	237	322	6	36	22
Future Volume (Veh/h)	19	237	322	6	36	22
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.48	0.75	0.88	0.50	0.64	0.69
Hourly flow rate (vph)	40	316	366	12	56	32
Pedestrians					10	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	388				778	382
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	388				778	382
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	96				84	95
cM capacity (veh/h)	1119				352	655
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	356	378	88			
Volume Left	40	0	56			
Volume Right	0	12	32			
cSH	1119	1700	423			
Volume to Capacity	0.04	0.22	0.21			
Queue Length 95th (m)	0.9	0.0	6.2			
Control Delay (s)	1.3	0.0	15.7			
Lane LOS	A		C			
Approach Delay (s)	1.3	0.0	15.7			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			2.2			
Intersection Capacity Utilization			38.2%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 8: Donland Lane & Low Boulevard

11/16/2017



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	2	1	26	61	0
Future Volume (Veh/h)	0	2	1	26	61	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.25	0.25	0.25	0.72	0.73	0.25
Hourly flow rate (vph)	0	8	4	36	84	0
Pedestrians	11				2	
Lane Width (m)	3.6				3.6	
Walking Speed (m/s)	1.2				1.2	
Percent Blockage	1				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	141	95	95			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	141	95	95			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	845	958	1498			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	8	40	84			
Volume Left	0	4	0			
Volume Right	8	0	0			
cSH	958	1498	1700			
Volume to Capacity	0.01	0.00	0.05			
Queue Length 95th (m)	0.2	0.1	0.0			
Control Delay (s)	8.8	0.8	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.8	0.8	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.8			
Intersection Capacity Utilization			16.4%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 3: Nelkydd Lane & Brock Street East

11/06/2017



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑		↑	↑	
Traffic Volume (veh/h)	327	55	6	161	46	18
Future Volume (Veh/h)	327	55	6	161	46	18
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.50	0.92	0.77	0.64
Hourly flow rate (vph)	380	64	12	175	60	28
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	65					
pX, platoon unblocked						
vC, conflicting volume			444		579	380
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			444		579	380
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		87	96
cM capacity (veh/h)			1127		475	671
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>NB 1</b>		
Volume Total	380	64	187	88		
Volume Left	0	0	12	60		
Volume Right	0	64	0	28		
cSH	1700	1700	1127	524		
Volume to Capacity	0.22	0.04	0.01	0.17		
Queue Length 95th (m)	0.0	0.0	0.3	4.8		
Control Delay (s)	0.0	0.0	0.6	13.2		
Lane LOS			A	B		
Approach Delay (s)	0.0		0.6	13.2		
Approach LOS				B		
<b>Intersection Summary</b>						
Average Delay			1.8			
Intersection Capacity Utilization			27.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 6: Brock Street East & Donland Lane

11/06/2017



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	41	373	210	21	13	16
Future Volume (Veh/h)	41	373	210	21	13	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.73	0.90	0.88	0.75	0.65	0.67
Hourly flow rate (vph)	56	414	239	28	20	24
Pedestrians		1	4		2	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	269				785	256
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	269				785	256
tC, single (s)	4.1				6.4	6.3
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.4
p0 queue free %	96				94	97
cM capacity (veh/h)	1292				347	771
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	470	267	44			
Volume Left	56	0	20			
Volume Right	0	28	24			
cSH	1292	1700	495			
Volume to Capacity	0.04	0.16	0.09			
Queue Length 95th (m)	1.1	0.0	2.3			
Control Delay (s)	1.3	0.0	13.0			
Lane LOS	A		B			
Approach Delay (s)	1.3	0.0	13.0			
Approach LOS			B			
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization		48.0%		ICU Level of Service		A
Analysis Period (min)			15			



# HCM Unsignalized Intersection Capacity Analysis

## 8: Donland Lane & Low Boulevard

11/06/2017



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	2	0	61	29	0
Future Volume (Veh/h)	0	2	0	61	29	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.25	0.25	0.25	0.76	0.81	0.25
Hourly flow rate (vph)	0	8	0	80	36	0
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	121	41	41			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	121	41	41			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	876	1031	1575			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	8	80	36			
Volume Left	0	0	0			
Volume Right	8	0	0			
cSH	1031	1575	1700			
Volume to Capacity	0.01	0.00	0.02			
Queue Length 95th (m)	0.2	0.0	0.0			
Control Delay (s)	8.5	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	8.5	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay	0.5					
Intersection Capacity Utilization	14.9%			ICU Level of Service	A	
Analysis Period (min)	15					

## **Appendix E – Future Background Level of Service Calculations**

# HCM Unsignalized Intersection Capacity Analysis

## 3: Nelkydd Lane & Brock Street East

11/16/2017



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑		↑	↑	
Traffic Volume (veh/h)	163	115	54	270	69	22
Future Volume (Veh/h)	163	115	54	270	69	22
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.89	0.58	0.61	0.86	0.82	0.69
Hourly flow rate (vph)	183	198	89	314	84	32
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			381		675	183
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			381		675	183
tC, single (s)			4.2		6.5	6.4
tC, 2 stage (s)						
tF (s)			2.3		3.6	3.5
p0 queue free %			92		78	96
cM capacity (veh/h)			1156		376	808
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>NB 1</b>		
Volume Total	183	198	403	116		
Volume Left	0	0	89	84		
Volume Right	0	198	0	32		
cSH	1700	1700	1156	441		
Volume to Capacity	0.11	0.12	0.08	0.26		
Queue Length 95th (m)	0.0	0.0	2.0	8.4		
Control Delay (s)	0.0	0.0	2.5	16.1		
Lane LOS			A	C		
Approach Delay (s)	0.0		2.5	16.1		
Approach LOS				C		
<b>Intersection Summary</b>						
Average Delay			3.2			
Intersection Capacity Utilization			40.9%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 6: Brock Street East & Donland Lane

11/16/2017



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↔		↕	
Traffic Volume (veh/h)	19	247	335	6	36	22
Future Volume (Veh/h)	19	247	335	6	36	22
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.48	0.75	0.88	0.50	0.64	0.69
Hourly flow rate (vph)	40	329	381	12	56	32
Pedestrians					10	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	403				806	397
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	403				806	397
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	96				83	95
cM capacity (veh/h)	1104				338	643
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	369	393	88			
Volume Left	40	0	56			
Volume Right	0	12	32			
cSH	1104	1700	409			
Volume to Capacity	0.04	0.23	0.22			
Queue Length 95th (m)	0.9	0.0	6.5			
Control Delay (s)	1.2	0.0	16.2			
Lane LOS	A		C			
Approach Delay (s)	1.2	0.0	16.2			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			2.2			
Intersection Capacity Utilization			38.7%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 8: Donland Lane & Low Boulevard

11/16/2017



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	2	1	27	63	0
Future Volume (Veh/h)	0	2	1	27	63	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.25	0.25	0.25	0.72	0.73	0.25
Hourly flow rate (vph)	0	8	4	38	86	0
Pedestrians	11			2		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.2			1.2		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	145	97	97			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	145	97	97			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	841	956	1495			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	8	42	86			
Volume Left	0	4	0			
Volume Right	8	0	0			
cSH	956	1495	1700			
Volume to Capacity	0.01	0.00	0.05			
Queue Length 95th (m)	0.2	0.1	0.0			
Control Delay (s)	8.8	0.7	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.8	0.7	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay	0.7					
Intersection Capacity Utilization	16.4%			ICU Level of Service	A	
Analysis Period (min)	15					

# HCM Unsignalized Intersection Capacity Analysis

## 3: Nelkydd Lane & Brock Street East

11/16/2017



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑		↑	↑	
Traffic Volume (veh/h)	340	55	6	188	46	18
Future Volume (Veh/h)	340	55	6	188	46	18
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.50	0.92	0.77	0.64
Hourly flow rate (vph)	395	64	12	204	60	28
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			459		623	395
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			459		623	395
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		87	96
cM capacity (veh/h)			1113		448	659
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>NB 1</b>		
Volume Total	395	64	216	88		
Volume Left	0	0	12	60		
Volume Right	0	64	0	28		
cSH	1700	1700	1113	499		
Volume to Capacity	0.23	0.04	0.01	0.18		
Queue Length 95th (m)	0.0	0.0	0.3	5.1		
Control Delay (s)	0.0	0.0	0.6	13.8		
Lane LOS			A	B		
Approach Delay (s)	0.0		0.6	13.8		
Approach LOS				B		
<b>Intersection Summary</b>						
Average Delay			1.7			
Intersection Capacity Utilization			28.2%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 6: Brock Street East & Donland Lane

11/16/2017



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (veh/h)	41	388	219	21	13	16
Future Volume (Veh/h)	41	388	219	21	13	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.73	0.90	0.88	0.75	0.65	0.67
Hourly flow rate (vph)	56	431	249	28	20	24
Pedestrians		1	4		2	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	279				812	266
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	279				812	266
tC, single (s)	4.1				6.4	6.3
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.4
p0 queue free %	96				94	97
cM capacity (veh/h)	1282				334	761
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	487	277	44			
Volume Left	56	0	20			
Volume Right	0	28	24			
cSH	1282	1700	481			
Volume to Capacity	0.04	0.16	0.09			
Queue Length 95th (m)	1.1	0.0	2.4			
Control Delay (s)	1.3	0.0	13.2			
Lane LOS	A		B			
Approach Delay (s)	1.3	0.0	13.2			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			1.5			
Intersection Capacity Utilization			49.2%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 8: Donland Lane & Low Boulevard

11/16/2017



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	63	30	0
Future Volume (Veh/h)	0	0	0	63	30	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.25	0.25	0.25	0.76	0.81	0.25
Hourly flow rate (vph)	0	0	0	83	37	0
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	125	42	42			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	125	42	42			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	871	1030	1573			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	83	37			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1573	1700			
Volume to Capacity	0.00	0.00	0.02			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay	0.0					
Intersection Capacity Utilization	8.2%			ICU Level of Service	A	
Analysis Period (min)	15					



# HCM Unsignalized Intersection Capacity Analysis

## 3: Nelkydd Lane & Brock Street East

11/16/2017



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑		↑	↑	
Traffic Volume (veh/h)	171	115	54	284	69	22
Future Volume (Veh/h)	171	115	54	284	69	22
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.58	0.61	0.86	0.82	0.69
Hourly flow rate (vph)	192	198	89	330	84	32
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			390		700	192
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			390		700	192
tC, single (s)			4.2		6.5	6.4
tC, 2 stage (s)						
tF (s)			2.3		3.6	3.5
p0 queue free %			92		77	96
cM capacity (veh/h)			1147		363	799
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>NB 1</b>		
Volume Total	192	198	419	116		
Volume Left	0	0	89	84		
Volume Right	0	198	0	32		
cSH	1700	1700	1147	427		
Volume to Capacity	0.11	0.12	0.08	0.27		
Queue Length 95th (m)	0.0	0.0	2.0	8.7		
Control Delay (s)	0.0	0.0	2.4	16.5		
Lane LOS			A	C		
Approach Delay (s)	0.0		2.4	16.5		
Approach LOS				C		
<b>Intersection Summary</b>						
Average Delay			3.2			
Intersection Capacity Utilization			42.1%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 6: Brock Street East & Donland Lane

11/16/2017



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (veh/h)	19	260	352	6	36	22
Future Volume (Veh/h)	19	260	352	6	36	22
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.48	0.75	0.88	0.50	0.64	0.69
Hourly flow rate (vph)	40	347	400	12	56	32
Pedestrians					10	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	422				843	416
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	422				843	416
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	96				83	95
cM capacity (veh/h)	1086				322	627
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	387	412	88			
Volume Left	40	0	56			
Volume Right	0	12	32			
cSH	1086	1700	391			
Volume to Capacity	0.04	0.24	0.23			
Queue Length 95th (m)	0.9	0.0	6.8			
Control Delay (s)	1.2	0.0	16.9			
Lane LOS	A		C			
Approach Delay (s)	1.2	0.0	16.9			
Approach LOS			C			
<b>Intersection Summary</b>						
Average Delay			2.2			
Intersection Capacity Utilization			39.3%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 8: Donland Lane & Low Boulevard

11/16/2017

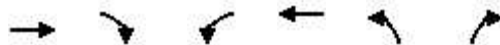


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	2	1	28	64	0
Future Volume (Veh/h)	0	2	1	28	64	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.25	0.25	0.25	0.72	0.73	0.25
Hourly flow rate (vph)	0	8	4	39	88	0
Pedestrians	11			2		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.2			1.2		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	148	99	99			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	148	99	99			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	837	953	1493			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	8	43	88			
Volume Left	0	4	0			
Volume Right	8	0	0			
cSH	953	1493	1700			
Volume to Capacity	0.01	0.00	0.05			
Queue Length 95th (m)	0.2	0.1	0.0			
Control Delay (s)	8.8	0.7	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.8	0.7	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay	0.7					
Intersection Capacity Utilization	16.4%			ICU Level of Service	A	
Analysis Period (min)	15					

# HCM Unsignalized Intersection Capacity Analysis

## 3: Nelkydd Lane & Brock Street East

11/16/2017



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑		↑	↑	
Traffic Volume (veh/h)	357	55	6	198	46	18
Future Volume (Veh/h)	357	55	6	198	46	18
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.50	0.92	0.77	0.64
Hourly flow rate (vph)	415	64	12	215	60	28
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			479		654	415
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			479		654	415
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		86	96
cM capacity (veh/h)			1094		430	642
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>NB 1</b>		
Volume Total	415	64	227	88		
Volume Left	0	0	12	60		
Volume Right	0	64	0	28		
cSH	1700	1700	1094	480		
Volume to Capacity	0.24	0.04	0.01	0.18		
Queue Length 95th (m)	0.0	0.0	0.3	5.3		
Control Delay (s)	0.0	0.0	0.5	14.2		
Lane LOS			A	B		
Approach Delay (s)	0.0		0.5	14.2		
Approach LOS				B		
<b>Intersection Summary</b>						
Average Delay			1.7			
Intersection Capacity Utilization			29.1%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 6: Brock Street East & Donland Lane

11/16/2017



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (veh/h)	41	408	230	21	13	16
Future Volume (Veh/h)	41	408	230	21	13	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.73	0.90	0.88	0.75	0.65	0.67
Hourly flow rate (vph)	56	453	261	28	20	24
Pedestrians		1	4		2	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.2	1.2		1.2	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	291				846	278
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	291				846	278
tC, single (s)	4.1				6.4	6.3
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.4
p0 queue free %	96				94	97
cM capacity (veh/h)	1269				319	749
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	509	289	44			
Volume Left	56	0	20			
Volume Right	0	28	24			
cSH	1269	1700	464			
Volume to Capacity	0.04	0.17	0.09			
Queue Length 95th (m)	1.1	0.0	2.5			
Control Delay (s)	1.3	0.0	13.6			
Lane LOS	A		B			
Approach Delay (s)	1.3	0.0	13.6			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			1.5			
Intersection Capacity Utilization			50.8%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 8: Donland Lane & Low Boulevard

11/16/2017



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	66	32	0
Future Volume (Veh/h)	0	0	0	66	32	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.25	0.25	0.25	0.76	0.81	0.25
Hourly flow rate (vph)	0	0	0	87	40	0
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	132	45	45			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	132	45	45			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	863	1026	1570			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	0	87	40			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1570	1700			
Volume to Capacity	0.00	0.00	0.02			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay	0.0					
Intersection Capacity Utilization	8.2%		ICU Level of Service	A		
Analysis Period (min)	15					

**Appendix F – Email Response from the  
Township of Uxbridge**

## Madeleine Catz

---

**From:** Jo Ann. Merrick <jmerrick@town.uxbridge.on.ca>  
**Sent:** November-03-17 1:04 PM  
**To:** Madeleine Catz  
**Subject:** RE: Brock Street East Proposed Development

There is nothing at this time. We have had people inquiring about different properties in that area, but until we get an application, we don't really know.

### ***Jo Ann Merrick***

Administrative Assistant  
Public Works & Operations/  
Development Services  
Township of Uxbridge  
51 Toronto St. S.  
Uxbridge, ON L9P 1T1

(t)905-852-9181 ext 202  
(f) 905-852-9674

---

**From:** Madeleine Catz [mailto:madeleine@nextrans.ca]  
**Sent:** Friday, November 03, 2017 12:57 PM  
**To:** Jo Ann. Merrick <jmerrick@town.uxbridge.on.ca>  
**Subject:** RE: Brock Street East Proposed Development

Hi Jo Ann,

Thank you for getting back to me. Would you know of any future developments in the area that I would be able consider in my transportation study?

Sincerely,

**Madeleine Catz, B.Eng., EIT**  
Transportation Analyst

o: 905-503-2563 ext. 207  
c: 647-893-1640  
e: [madeleine@nextrans.ca](mailto:madeleine@nextrans.ca)  
w: [www.nextrans.ca](http://www.nextrans.ca)

**NexTrans Consulting Engineers**  
**A Division of NextEng Consulting Group Inc.**  
520 Industrial Parkway South, Suite 201  
Aurora ON L4G 6W8

---

**From:** Jo Ann. Merrick [mailto:jmerrick@town.uxbridge.on.ca]  
**Sent:** November-03-17 11:39 AM  
**To:** Madeleine Catz <[madeleine@nextrans.ca](mailto:madeleine@nextrans.ca)>  
**Subject:** RE: Brock Street East Proposed Development



Madeleine

We do not have any applications for 226 Brock St. at this time.

***Jo Ann Merrick***

Administrative Assistant  
Public Works & Operations/  
Development Services  
Township of Uxbridge  
51 Toronto St. S.  
Uxbridge, ON L9P 1T1

(t)905-852-9181 ext 202  
(f) 905-852-9674

---

**From:** Madeleine Catz [<mailto:madeleine@nextrans.ca>]

**Sent:** Thursday, November 02, 2017 4:30 PM

**To:** Jo Ann. Merrick <[jmerrick@town.uxbridge.on.ca](mailto:jmerrick@town.uxbridge.on.ca)>

**Subject:** Brock Street East Proposed Development

Good afternoon Jo Ann,

I am working on the Transportation Study for a proposed mixed-use development at the northeast corner of Brock Street East and Donland Lane. Would you be able to provide me with any future developments that would need to be taken into account during our horizon period, 2021-2026? The Region of Durham mentioned how 54 units are being built just south of the proposed site at 226 Brock Street East, would you have more information on this?

Sincerely,

**Madeleine Catz, B.Eng., EIT**

Transportation Analyst

o: 905-503-2563 ext. 207

c: 647-893-1640

e: [madeleine@nextrans.ca](mailto:madeleine@nextrans.ca)

w: [www.nextrans.ca](http://www.nextrans.ca)

**NexTrans Consulting Engineers**

**A Division of NextEng Consulting Group Inc.**

520 Industrial Parkway South, Suite 201

Aurora ON L4G 6W8

## **Appendix G – TTS Data**

# TTS AM Data

Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8	Column9	Column10	Column11	Column12	Column13	Column14	Column15	Column16	Column17	Column18	Column19	Column20	Column21
Fri Nov 03 2017 16:07:58 GMT-0400 (Eastern Daylight Time) - Run Time: 2920ms																				
Cross Tabulation Query Form - Trip - 2011																				
Row: 2006 GTA zone of origin - gta06_orig																				
Column: Planning district of destination - pd_dest																				
Table: Primary travel mode of trip - mode_prime																				
Filters:																				
(2006 GTA zone of origin - gta06_orig In 1317																				
and																				
Start time of trip - start_time In 600-900)																				
Trip 2011																				
Table: Transit excluding GO rail																				
Oshawa																				
1317	31																			
Trip 2011																				
Table: Auto driver																				
	PD 1 of Toronto	PD 5 of Toronto	PD 11 of Toronto	PD 13 of Toronto	PD 16 of Toronto	Uxbridge	Scugog	Ajax	Clarington	Georgina	Newmarket	Aurora	Richmond Hill	Whitchurch-Stouffville	Markham	King	Vaughan	Mississauga	Kawartha Lakes	Peterborough
1317	57	40	24	40	40	696	135	17	17	31	105	48	17	111	231	31	50	22	24	24
Trip 2011																				
Table: Auto passenger																				
	Uxbridge	Aurora	Markham																	
1317	259	62	24																	
Trip 2011																				
Table: School bus																				
	Uxbridge																			
1317	53																			
Trip 2011																				
Table: Walk																				
	Uxbridge																			
1317	374																			

## TTS PM Data

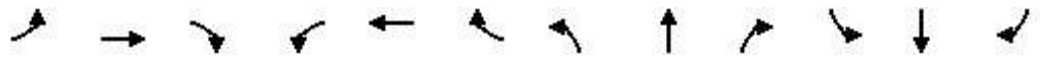
Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8	Column9	Column10	Column11	Column12	Column13	Column14	Column15	Column16	Column17	
Fri Nov 03 2017 16:08:41 GMT-0400 (Eastern Daylight Time) - Run Time: 2959ms																	
Cross Tabulation Query Form - Trip - 2011																	
Row: 2006 GTA zone of origin - gta06_orig																	
Column: Planning district of destination - pd_dest																	
Table: Primary travel mode of trip - mode_prime																	
Filters:																	
(2006 GTA zone of origin - gta06_orig In 1317																	
and																	
Start time of trip - start_time In 1600-1900)																	
Trip 2011																	
Table: Auto driver																	
		PD 4 of Toronto	PD 11 of Toronto	PD 13 of Toronto	Brock	Uxbridge	Scugog	Pickering	Ajax	Whitby	Oshawa	Georgina	Newmarket	Richmond Hill	Whitchurch-Stouffville	Markham	Kawartha Lakes
1317		15	24	15	19	639	119	18	22	64	39	38	33	45	61	50	32
Trip 2011																	
Table: Auto passenger																	
		PD 13 of Toronto	Uxbridge	Scugog	Whitby	East Gwillimbury	Richmond Hill	Markham									
1317		15	189	15	44	13	53	37									
Trip 2011																	
Table: Walk																	
		Uxbridge															
1317		62															

## **Appendix H – Future Total Traffic Level of Service Calculations**

# HCM Unsignalized Intersection Capacity Analysis

## 3: Nelkydd Lane/Herrema Boulevard & Brock Street East

11/23/2017

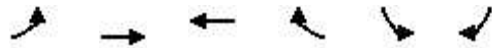


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
Lane Configurations																
Traffic Volume (veh/h)	45	163	110	54	289	11	69	1	22	52	8	74				
Future Volume (Veh/h)	45	163	110	54	289	11	69	1	22	52	8	74				
Sign Control	Free			Free			Stop			Stop						
Grade	0%			0%			0%			0%						
Peak Hour Factor	0.92	0.89	0.58	0.61	0.86	0.92	0.82	0.92	0.69	0.92	0.92	0.92				
Hourly flow rate (vph)	49	183	190	89	336	12	84	1	32	57	9	80				
Pedestrians																
Lane Width (m)																
Walking Speed (m/s)																
Percent Blockage																
Right turn flare (veh)																
Median type	None			None												
Median storage (veh)																
Upstream signal (m)																
pX, platoon unblocked																
vC, conflicting volume	348		373		880		807		183		828		985		336	
vC1, stage 1 conf vol																
vC2, stage 2 conf vol																
vCu, unblocked vol	348		373		880		807		183		828		985		336	
tC, single (s)	4.1		4.2		7.2		6.5		6.4		7.1		6.5		6.2	
tC, 2 stage (s)																
tF (s)	2.2		2.3		3.6		4.0		3.5		3.5		4.0		3.3	
p0 queue free %	96		92		59		100		96		78		96		89	
cM capacity (veh/h)	1211		1164		203		279		808		254		220		706	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2						
Volume Total	49	183	190	89	336	12	84	33	57	89						
Volume Left	49	0	0	89	0	0	84	0	57	0						
Volume Right	0	0	190	0	0	12	0	32	0	80						
cSH	1211	1700	1700	1164	1700	1700	203	764	254	577						
Volume to Capacity	0.04	0.11	0.11	0.08	0.20	0.01	0.41	0.04	0.22	0.15						
Queue Length 95th (m)	1.0	0.0	0.0	2.0	0.0	0.0	15.0	1.1	6.7	4.3						
Control Delay (s)	8.1	0.0	0.0	8.3	0.0	0.0	34.6	9.9	23.2	12.4						
Lane LOS	A		A		D		A		C		B					
Approach Delay (s)	0.9		1.7		27.6		16.6									
Approach LOS	D		C													
Intersection Summary																
Average Delay	6.1															
Intersection Capacity Utilization	39.0%		ICU Level of Service		A											
Analysis Period (min)	15															

# HCM Unsignalized Intersection Capacity Analysis

## 6: Brock Street East & Site Access

11/23/2017



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Volume (veh/h)	0	237	329	1	0	19
Future Volume (Veh/h)	0	237	329	1	0	19
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	258	358	1	0	21
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	359				616	358
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	359				616	358
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	97
cM capacity (veh/h)	1200				454	686
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	258	359	21			
Volume Left	0	0	0			
Volume Right	0	1	21			
cSH	1700	1700	686			
Volume to Capacity	0.15	0.21	0.03			
Queue Length 95th (m)	0.0	0.0	0.8			
Control Delay (s)	0.0	0.0	10.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.4			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization			27.4%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 8: Herrema Boulevard /Herrema Boulevard & Low Boulevard

11/23/2017



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	0	0	22	20	0	0	5	27	7	0	63	0
Future Volume (Veh/h)	0	0	22	20	0	0	5	27	7	0	63	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	24	22	0	0	5	29	8	0	68	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	111	115	68	135	111	33	68			37		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	111	115	68	135	111	33	68			37		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	98	97	100	100	100			100		
cM capacity (veh/h)	865	773	995	814	777	1041	1533			1574		
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	24	22	42	68								
Volume Left	0	22	5	0								
Volume Right	24	0	8	0								
cSH	995	814	1533	1574								
Volume to Capacity	0.02	0.03	0.00	0.00								
Queue Length 95th (m)	0.6	0.7	0.1	0.0								
Control Delay (s)	8.7	9.5	0.9	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	8.7	9.5	0.9	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			2.9									
Intersection Capacity Utilization			20.6%	ICU Level of Service	A							
Analysis Period (min)			15									



# HCM Unsignalized Intersection Capacity Analysis

## 11: Herrema Boulevard/Herrema Boulevard & Internal Driveway 1

11/23/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	16	14	0	0	4	36	17	0	105	0
Future Volume (Veh/h)	0	0	16	14	0	0	4	36	17	0	105	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	17	15	0	0	4	39	18	0	114	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	170	179	114	187	170	48	114			57		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	170	179	114	187	170	48	114			57		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	98	98	100	100	100			100		
cM capacity (veh/h)	792	713	939	758	721	1021	1475			1547		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	17	15	61	114								
Volume Left	0	15	4	0								
Volume Right	17	0	18	0								
cSH	939	758	1475	1547								
Volume to Capacity	0.02	0.02	0.00	0.00								
Queue Length 95th (m)	0.4	0.5	0.1	0.0								
Control Delay (s)	8.9	9.8	0.5	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	8.9	9.8	0.5	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			20.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 14: Internal Driveway 2 & Low Boulevard

11/23/2017

























Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	0	0	3	2	0	16
Future Volume (Veh/h)	0	0	3	2	0	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	3	2	0	17
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			0		8	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		8	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			1623		1011	1085
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	0	5	17			
Volume Left	0	3	0			
Volume Right	0	0	17			
cSH	1700	1623	1085			
Volume to Capacity	0.00	0.00	0.02			
Queue Length 95th (m)	0.0	0.0	0.4			
Control Delay (s)	0.0	4.3	8.4			
Lane LOS		A	A			
Approach Delay (s)	0.0	4.3	8.4			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			7.5			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 3: Nelkydd Lane/Herrema Boulevard & Brock Street East

11/23/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	340	50	6	196	39	46	3	18	30	7	68
Future Volume (Veh/h)	125	340	50	6	196	39	46	3	18	30	7	68
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.89	0.58	0.61	0.86	0.92	0.82	0.92	0.69	0.92	0.92	0.92
Hourly flow rate (vph)	136	382	86	10	228	42	56	3	26	33	8	74
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	270			468			980	944	382	930	988	228
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	270			468			980	944	382	930	988	228
tC, single (s)	4.1			4.2			7.2	6.5	6.4	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.5	3.5	4.0	3.3
p0 queue free %	89			99			69	99	96	85	96	91
cM capacity (veh/h)	1293			1073			179	232	621	215	219	811
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2		
Volume Total	136	382	86	10	228	42	56	29	33	82		
Volume Left	136	0	0	10	0	0	56	0	33	0		
Volume Right	0	0	86	0	0	42	0	26	0	74		
cSH	1293	1700	1700	1073	1700	1700	179	530	215	642		
Volume to Capacity	0.11	0.22	0.05	0.01	0.13	0.02	0.31	0.05	0.15	0.13		
Queue Length 95th (m)	2.8	0.0	0.0	0.2	0.0	0.0	10.1	1.4	4.3	3.5		
Control Delay (s)	8.1	0.0	0.0	8.4	0.0	0.0	34.1	12.2	24.8	11.4		
Lane LOS	A			A			D	B	C	B		
Approach Delay (s)	1.8			0.3			26.6		15.3			
Approach LOS							D		C			
Intersection Summary												
Average Delay			4.8									
Intersection Capacity Utilization			40.4%			ICU Level of Service			A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 6: Brock Street East & Site Access

11/23/2017



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↔			↗
Traffic Volume (veh/h)	0	388	212	5	0	8
Future Volume (Veh/h)	0	388	212	5	0	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	422	230	5	0	9
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	235				654	232
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	235				654	232
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1332				431	807
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	422	235	9			
Volume Left	0	0	0			
Volume Right	0	5	9			
cSH	1700	1700	807			
Volume to Capacity	0.25	0.14	0.01			
Queue Length 95th (m)	0.0	0.0	0.3			
Control Delay (s)	0.0	0.0	9.5			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.5			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization			23.8%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 8: Herrema Boulevard & Low Boulevard

















11/23/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	7	10	0	0	14	63	30	0	30	0
Future Volume (Veh/h)	0	0	7	10	0	0	14	63	30	0	30	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	8	11	0	0	15	68	33	0	33	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	148	164	33	156	148	84	33			101		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	148	164	33	156	148	84	33			101		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	99	100	100	99			100		
cM capacity (veh/h)	815	722	1041	799	737	975	1579			1491		
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	8	11	116	33								
Volume Left	0	11	15	0								
Volume Right	8	0	33	0								
cSH	1041	799	1579	1491								
Volume to Capacity	0.01	0.01	0.01	0.00								
Queue Length 95th (m)	0.2	0.3	0.2	0.0								
Control Delay (s)	8.5	9.6	1.0	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	8.5	9.6	1.0	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			26.5%	ICU Level of Service						A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 11: Herrema Boulevard /Herrema Boulevard & Internal Driveway 1

11/23/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	5	49	0	0	9	106	52	0	47	0
Future Volume (Veh/h)	0	0	5	49	0	0	9	106	52	0	47	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	5	53	0	0	10	115	57	0	51	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	214	243	51	220	214	144	51			172		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	214	243	51	220	214	144	51			172		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	93	100	100	99			100		
cM capacity (veh/h)	739	655	1017	729	679	904	1555			1405		
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	5	53	182	51								
Volume Left	0	53	10	0								
Volume Right	5	0	57	0								
cSH	1017	729	1555	1405								
Volume to Capacity	0.00	0.07	0.01	0.00								
Queue Length 95th (m)	0.1	1.9	0.2	0.0								
Control Delay (s)	8.6	10.3	0.5	0.0								
Lane LOS	A	B	A									
Approach Delay (s)	8.6	10.3	0.5	0.0								
Approach LOS	A	B										
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			32.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 14: Internal Driveway 2 & Low Boulevard

11/23/2017

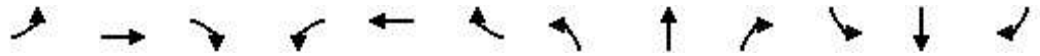


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	0	0	8	0	0	5
Future Volume (Veh/h)	0	0	8	0	0	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	9	0	0	5
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			0	18	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0	18	0	
tC, single (s)			4.1	6.4	6.2	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
p0 queue free %			99	100	100	
cM capacity (veh/h)			1623	994	1085	
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	0	9	5			
Volume Left	0	9	0			
Volume Right	0	0	5			
cSH	1700	1623	1085			
Volume to Capacity	0.00	0.01	0.00			
Queue Length 95th (m)	0.0	0.1	0.1			
Control Delay (s)	0.0	7.2	8.3			
Lane LOS			A			
Approach Delay (s)	0.0	7.2	8.3			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			7.6			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 3: Nelkydd Lane/Herrema Boulevard & Brock Street East

11/23/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	171	110	54	303	11	69	1	22	52	8	74
Future Volume (Veh/h)	45	171	110	54	303	11	69	1	22	52	8	74
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.89	0.58	0.61	0.86	0.92	0.82	0.92	0.69	0.92	0.92	0.92
Hourly flow rate (vph)	49	192	190	89	352	12	84	1	32	57	9	80
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	364		382		904		832		192		852	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	364		382		904		832		192		852	
tC, single (s)	4.1		4.2		7.2		6.5		6.4		7.1	
tC, 2 stage (s)												
tF (s)	2.2		2.3		3.6		4.0		3.5		3.5	
p0 queue free %	96		92		57		100		96		77	
cM capacity (veh/h)	1195		1155		195		270		799		244	
Direction, Lane #												
	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2		
Volume Total	49	192	190	89	352	12	84	33	57	89		
Volume Left	49	0	0	89	0	0	84	0	57	0		
Volume Right	0	0	190	0	0	12	0	32	0	80		
cSH	1195	1700	1700	1155	1700	1700	195	754	244	563		
Volume to Capacity	0.04	0.11	0.11	0.08	0.21	0.01	0.43	0.04	0.23	0.16		
Queue Length 95th (m)	1.0	0.0	0.0	2.0	0.0	0.0	15.9	1.1	7.1	4.5		
Control Delay (s)	8.1	0.0	0.0	8.4	0.0	0.0	36.8	10.0	24.2	12.6		
Lane LOS	A		A		E		A		C		B	
Approach Delay (s)	0.9		1.6		29.3		17.1					
Approach LOS					D		C					
Intersection Summary												
Average Delay			6.2									
Intersection Capacity Utilization			39.8%		ICU Level of Service				A			
Analysis Period (min)			15									



# HCM Unsignalized Intersection Capacity Analysis

## 6: Brock Street East & Site Access

















11/23/2017



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Volume (veh/h)	0	245	343	1	0	19
Future Volume (Veh/h)	0	245	343	1	0	19
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	266	373	1	0	21
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	374				640	374
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	374				640	374
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	97
cM capacity (veh/h)	1184				440	673
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	266	374	21			
Volume Left	0	0	0			
Volume Right	0	1	21			
cSH	1700	1700	673			
Volume to Capacity	0.16	0.22	0.03			
Queue Length 95th (m)	0.0	0.0	0.8			
Control Delay (s)	0.0	0.0	10.5			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.5			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization			28.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 8: Herrema Boulevard /Herrema Boulevard & Low Boulevard

















11/23/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	22	20	0	0	5	28	7	0	64	0
Future Volume (Veh/h)	0	0	22	20	0	0	5	28	7	0	64	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	24	22	0	0	5	30	8	0	70	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	114	118	70	138	114	34	70			38		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	114	118	70	138	114	34	70			38		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	98	97	100	100	100			100		
cM capacity (veh/h)	861	770	993	810	774	1039	1531			1572		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	24	22	43	70								
Volume Left	0	22	5	0								
Volume Right	24	0	8	0								
cSH	993	810	1531	1572								
Volume to Capacity	0.02	0.03	0.00	0.00								
Queue Length 95th (m)	0.6	0.7	0.1	0.0								
Control Delay (s)	8.7	9.6	0.9	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	8.7	9.6	0.9	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			2.9									
Intersection Capacity Utilization			20.7%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 11: Herrema Boulevard/Herrema Boulevard & Internal Driveway 1

11/23/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	16	14	0	0	4	36	17	0	106	0
Future Volume (Veh/h)	0	0	16	14	0	0	4	36	17	0	106	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	17	15	0	0	4	39	18	0	115	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	171	180	115	188	171	48	115			57		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	171	180	115	188	171	48	115			57		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	98	98	100	100	100			100		
cM capacity (veh/h)	791	712	937	757	720	1021	1474			1547		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	17	15	61	115								
Volume Left	0	15	4	0								
Volume Right	17	0	18	0								
cSH	937	757	1474	1547								
Volume to Capacity	0.02	0.02	0.00	0.00								
Queue Length 95th (m)	0.4	0.5	0.1	0.0								
Control Delay (s)	8.9	9.9	0.5	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	8.9	9.9	0.5	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			20.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 14: Internal Driveway 2 & Low Boulevard

11/23/2017



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Traffic Volume (veh/h)	0	0	3	2	0	16
Future Volume (Veh/h)	0	0	3	2	0	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	3	2	0	17
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			0		8	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		8	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			1623		1011	1085
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	0	5	17			
Volume Left	0	3	0			
Volume Right	0	0	17			
cSH	1700	1623	1085			
Volume to Capacity	0.00	0.00	0.02			
Queue Length 95th (m)	0.0	0.0	0.4			
Control Delay (s)	0.0	4.3	8.4			
Lane LOS		A	A			
Approach Delay (s)	0.0	4.3	8.4			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			7.5			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 3: Nelkydd Lane/Herrema Boulevard & Brock Street East

11/23/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	357	50	6	206	39	46	3	18	30	7	68
Future Volume (Veh/h)	125	357	50	6	206	39	46	3	18	30	7	68
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.89	0.58	0.61	0.86	0.92	0.82	0.92	0.69	0.92	0.92	0.92
Hourly flow rate (vph)	136	401	86	10	240	42	56	3	26	33	8	74
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	282		487		1011		975		401		960	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	282		487		1011		975		401		960	
tC, single (s)	4.1		4.2		7.2		6.5		6.4		7.1	
tC, 2 stage (s)												
tF (s)	2.2		2.3		3.6		4.0		3.5		3.5	
p0 queue free %	89		99		67		99		96		84	
cM capacity (veh/h)	1280		1056		169		223		606		210	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2		
Volume Total	136	401	86	10	240	42	56	29	33	82		
Volume Left	136	0	0	10	0	0	56	0	33	0		
Volume Right	0	0	86	0	0	42	0	26	0	74		
cSH	1280	1700	1700	1056	1700	1700	169	514	204	627		
Volume to Capacity	0.11	0.24	0.05	0.01	0.14	0.02	0.33	0.06	0.16	0.13		
Queue Length 95th (m)	2.8	0.0	0.0	0.2	0.0	0.0	10.8	1.4	4.5	3.6		
Control Delay (s)	8.1	0.0	0.0	8.4	0.0	0.0	36.4	12.4	26.0	11.6		
Lane LOS	A		A		E		B		D		B	
Approach Delay (s)	1.8		0.3		28.2		15.7					
Approach LOS	D		C									
Intersection Summary												
Average Delay	4.8											
Intersection Capacity Utilization	41.3%		ICU Level of Service		A							
Analysis Period (min)	15											

# HCM Unsignalized Intersection Capacity Analysis

## 6: Brock Street East & Site Access

11/23/2017



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	←			↘
Traffic Volume (veh/h)	0	405	222	5	0	8
Future Volume (Veh/h)	0	405	222	5	0	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	440	241	5	0	9
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	246				684	244
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	246				684	244
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1320				415	795
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	440	246	9			
Volume Left	0	0	0			
Volume Right	0	5	9			
cSH	1700	1700	795			
Volume to Capacity	0.26	0.14	0.01			
Queue Length 95th (m)	0.0	0.0	0.3			
Control Delay (s)	0.0	0.0	9.6			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.6			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization			24.6%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 8: Herrema Boulevard & Low Boulevard

















11/23/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	7	10	0	0	14	66	30	0	32	0
Future Volume (Veh/h)	0	0	7	10	0	0	14	66	30	0	32	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	8	11	0	0	15	72	33	0	35	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	154	170	35	162	154	88	35			105		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	154	170	35	162	154	88	35			105		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	99	100	100	99			100		
cM capacity (veh/h)	808	716	1038	792	731	970	1576			1486		
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	8	11	120	35								
Volume Left	0	11	15	0								
Volume Right	8	0	33	0								
cSH	1038	792	1576	1486								
Volume to Capacity	0.01	0.01	0.01	0.00								
Queue Length 95th (m)	0.2	0.3	0.2	0.0								
Control Delay (s)	8.5	9.6	1.0	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	8.5	9.6	1.0	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			26.6%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 11: Herrema Boulevard /Herrema Boulevard & Internal Driveway 1

11/23/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	5	49	0	0	9	106	52	0	49	0
Future Volume (Veh/h)	0	0	5	49	0	0	9	106	52	0	49	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	5	53	0	0	10	115	57	0	53	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	216	245	53	222	216	144	53			172		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	216	245	53	222	216	144	53			172		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	93	100	100	99			100		
cM capacity (veh/h)	736	653	1014	727	677	904	1553			1405		
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	5	53	182	53								
Volume Left	0	53	10	0								
Volume Right	5	0	57	0								
cSH	1014	727	1553	1405								
Volume to Capacity	0.00	0.07	0.01	0.00								
Queue Length 95th (m)	0.1	1.9	0.2	0.0								
Control Delay (s)	8.6	10.3	0.5	0.0								
Lane LOS	A	B	A									
Approach Delay (s)	8.6	10.3	0.5	0.0								
Approach LOS	A	B										
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			32.0%	ICU Level of Service						A		
Analysis Period (min)			15									



# HCM Unsignalized Intersection Capacity Analysis

## 14: Internal Driveway 2 & Low Boulevard

11/23/2017



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	0	0	8	0	0	5
Future Volume (Veh/h)	0	0	8	0	0	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	9	0	0	5
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			0		18	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		18	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			1623		994	1085
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	0	9	5			
Volume Left	0	9	0			
Volume Right	0	0	5			
cSH	1700	1623	1085			
Volume to Capacity	0.00	0.01	0.00			
Queue Length 95th (m)	0.0	0.1	0.1			
Control Delay (s)	0.0	7.2	8.3			
Lane LOS		A	A			
Approach Delay (s)	0.0	7.2	8.3			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			7.6			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

**Appendix I – Future Total 2026 with  
Traffic Signal Level of Service  
Calculations**

# HCM Signalized Intersection Capacity Analysis

## 3: Nelkydd Lane/Herrema Boulevard & Brock Street East

11/23/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	171	110	54	303	11	69	1	22	52	8	74
Future Volume (vph)	45	171	110	54	303	11	69	1	22	52	8	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1712	1442	1703	1810	1583	1641	1327		1770	1612	
Flt Permitted	0.29	1.00	1.00	0.48	1.00	1.00	0.57	1.00		0.74	1.00	
Satd. Flow (perm)	532	1712	1442	869	1810	1583	992	1327		1370	1612	
Peak-hour factor, PHF	0.92	0.89	0.58	0.61	0.86	0.92	0.82	0.92	0.69	0.92	0.92	0.92
Adj. Flow (vph)	49	192	190	89	352	12	84	1	32	57	9	80
RTOR Reduction (vph)	0	0	148	0	0	9	0	17	0	0	59	0
Lane Group Flow (vph)	49	192	42	89	352	3	84	16	0	57	30	0
Heavy Vehicles (%)	2%	11%	12%	6%	5%	2%	10%	2%	23%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	20.1	17.3	17.3	23.5	19.0	19.0	43.4	36.0		23.6	20.7	
Effective Green, g (s)	20.1	17.3	17.3	23.5	19.0	19.0	43.4	36.0		23.6	20.7	
Actuated g/C Ratio	0.26	0.22	0.22	0.30	0.24	0.24	0.55	0.46		0.30	0.26	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	179	376	316	307	436	382	697	607		425	423	
v/s Ratio Prot	0.01	0.11		c0.02	c0.19		c0.03	0.01		0.00	0.02	
v/s Ratio Perm	0.06		0.03	0.07		0.00	c0.04			0.04		
v/c Ratio	0.27	0.51	0.13	0.29	0.81	0.01	0.12	0.03		0.13	0.07	
Uniform Delay, d1	22.9	27.0	24.7	20.6	28.1	22.7	8.5	11.7		19.9	21.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	1.2	0.2	0.5	10.5	0.0	0.4	0.1		0.1	0.3	
Delay (s)	23.7	28.2	24.9	21.1	38.6	22.7	8.8	11.8		20.1	22.1	
Level of Service	C	C	C	C	D	C	A	B		C	C	
Approach Delay (s)		26.2			34.8			9.7			21.3	
Approach LOS		C			C			A			C	

### Intersection Summary

HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	78.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Queues

3: Nelkydd Lane/Herrema Boulevard & Brock Street East

11/23/2017



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	49	192	190	89	352	12	84	33	57	89
v/c Ratio	0.22	0.52	0.40	0.27	0.77	0.02	0.12	0.05	0.12	0.19
Control Delay	18.9	31.6	6.1	19.3	39.4	0.1	10.2	6.3	12.3	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	31.6	6.1	19.3	39.4	0.1	10.2	6.3	12.3	9.0
Queue Length 50th (m)	4.9	26.2	0.0	9.2	52.0	0.0	6.5	0.1	4.3	1.1
Queue Length 95th (m)	11.8	45.2	0.0	12.4	#84.2	0.0	12.3	5.3	10.0	12.3
Internal Link Dist (m)		153.2			201.7			64.4		34.7
Turn Bay Length (m)										
Base Capacity (vph)	227	453	532	325	506	590	706	656	464	462
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.42	0.36	0.27	0.70	0.02	0.12	0.05	0.12	0.19

Intersection Summary

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

# HCM Unsignalized Intersection Capacity Analysis

## 6: Brock Street East & Site Access

















11/23/2017



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↔			↗
Traffic Volume (veh/h)	0	245	343	1	0	19
Future Volume (Veh/h)	0	245	343	1	0	19
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	266	373	1	0	21
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		226				
pX, platoon unblocked					0.95	
vC, conflicting volume	374				640	374
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	374				590	374
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	97
cM capacity (veh/h)	1184				445	673
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	266	374	21			
Volume Left	0	0	0			
Volume Right	0	1	21			
cSH	1700	1700	673			
Volume to Capacity	0.16	0.22	0.03			
Queue Length 95th (m)	0.0	0.0	0.8			
Control Delay (s)	0.0	0.0	10.5			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.5			
Approach LOS			B			
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization			28.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 8: Herrema Boulevard /Herrema Boulevard & Low Boulevard

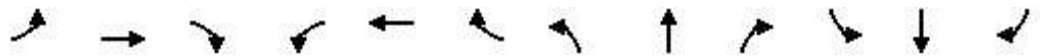
11/23/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	22	20	0	0	5	28	7	0	64	0
Future Volume (Veh/h)	0	0	22	20	0	0	5	28	7	0	64	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	24	22	0	0	5	30	8	0	70	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)								117				
pX, platoon unblocked												
vC, conflicting volume	114	118	70	138	114	34	70			38		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	114	118	70	138	114	34	70			38		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	98	97	100	100	100			100		
cM capacity (veh/h)	861	770	993	810	774	1039	1531			1572		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	24	22	43	70								
Volume Left	0	22	5	0								
Volume Right	24	0	8	0								
cSH	993	810	1531	1572								
Volume to Capacity	0.02	0.03	0.00	0.00								
Queue Length 95th (m)	0.6	0.7	0.1	0.0								
Control Delay (s)	8.7	9.6	0.9	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	8.7	9.6	0.9	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			2.9									
Intersection Capacity Utilization			20.7%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 11: Herrema Boulevard/Herrema Boulevard & Internal Driveway 1

11/23/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	0	0	16	14	0	0	4	36	17	0	106	0
Future Volume (Veh/h)	0	0	16	14	0	0	4	36	17	0	106	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	17	15	0	0	4	39	18	0	115	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
								None			None	
Median storage veh												
Upstream signal (m)												
								59				
pX, platoon unblocked	0.99	0.99		0.99	0.99	0.99					0.99	
vC, conflicting volume	171	180	115	188	171	48	115				57	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	161	170	115	179	161	38	115				47	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	98	98	100	100	100				100	
cM capacity (veh/h)	796	715	937	762	724	1027	1474				1550	
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	17	15	61	115								
Volume Left	0	15	4	0								
Volume Right	17	0	18	0								
cSH	937	762	1474	1550								
Volume to Capacity	0.02	0.02	0.00	0.00								
Queue Length 95th (m)	0.4	0.5	0.1	0.0								
Control Delay (s)	8.9	9.8	0.5	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	8.9	9.8	0.5	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			20.5%	ICU Level of Service							A	
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 14: Internal Driveway 2 & Low Boulevard

11/23/2017



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	0	0	3	2	0	16
Future Volume (Veh/h)	0	0	3	2	0	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	3	2	0	17
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			0		8	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		8	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			1623		1011	1085
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	0	5	17			
Volume Left	0	3	0			
Volume Right	0	0	17			
cSH	1700	1623	1085			
Volume to Capacity	0.00	0.00	0.02			
Queue Length 95th (m)	0.0	0.0	0.4			
Control Delay (s)	0.0	4.3	8.4			
Lane LOS		A	A			
Approach Delay (s)	0.0	4.3	8.4			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			7.5			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			



# HCM Signalized Intersection Capacity Analysis

## 3: Nelkydd Lane/Herrema Boulevard & Brock Street East

11/23/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	125	357	50	6	206	39	46	3	18	30	7	68	
Future Volume (vph)	125	357	50	6	206	39	46	3	18	30	7	68	
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.86		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1770	1712	1442	1703	1810	1583	1641	1361		1770	1611		
Flt Permitted	0.36	1.00	1.00	0.31	1.00	1.00	0.58	1.00		0.74	1.00		
Satd. Flow (perm)	671	1712	1442	554	1810	1583	1004	1361		1375	1611		
Peak-hour factor, PHF	0.92	0.89	0.58	0.61	0.86	0.92	0.82	0.92	0.69	0.92	0.92	0.92	
Adj. Flow (vph)	136	401	86	10	240	42	56	3	26	33	8	74	
RTOR Reduction (vph)	0	0	61	0	0	32	0	14	0	0	55	0	
Lane Group Flow (vph)	136	401	25	10	240	10	56	15	0	33	27	0	
Heavy Vehicles (%)	2%	11%	12%	6%	5%	2%	10%	2%	23%	2%	2%	2%	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases	4		4	8		8	2			6			
Actuated Green, G (s)	28.7	23.4	23.4	19.9	19.0	19.0	44.0	37.6		23.3	21.4		
Effective Green, g (s)	28.7	23.4	23.4	19.9	19.0	19.0	44.0	37.6		23.3	21.4		
Actuated g/C Ratio	0.35	0.29	0.29	0.24	0.23	0.23	0.54	0.46		0.28	0.26		
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	306	489	412	147	420	367	680	625		400	421		
v/s Ratio Prot	c0.03	c0.23		0.00	0.13		c0.02	0.01		0.00	0.02		
v/s Ratio Perm	0.13		0.02	0.02		0.01	c0.03			0.02			
v/c Ratio	0.44	0.82	0.06	0.07	0.57	0.03	0.08	0.02		0.08	0.06		
Uniform Delay, d1	19.3	27.2	21.2	23.9	27.8	24.3	9.2	12.1		21.3	22.7		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		
Incremental Delay, d2	1.0	10.6	0.1	0.2	1.9	0.0	0.2	0.1		0.1	0.3		
Delay (s)	20.3	37.8	21.3	24.1	29.7	24.3	9.4	12.1		21.4	23.0		
Level of Service	C	D	C	C	C	C	A	B		C	C		
Approach Delay (s)		31.7			28.7			10.3			22.5		
Approach LOS		C			C			B			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			28.3	HCM 2000 Level of Service				C					
HCM 2000 Volume to Capacity ratio			0.38										
Actuated Cycle Length (s)			81.8	Sum of lost time (s)					18.0				
Intersection Capacity Utilization			43.4%	ICU Level of Service				A					
Analysis Period (min)			15										
c Critical Lane Group													

# Queues

## 3: Nelkydd Lane/Herrema Boulevard & Brock Street East

11/23/2017



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	136	401	86	10	240	42	56	29	33	82
v/c Ratio	0.43	0.76	0.15	0.04	0.61	0.08	0.08	0.04	0.07	0.18
Control Delay	22.1	35.5	0.5	16.7	34.9	0.3	9.7	6.9	11.7	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.1	35.5	0.5	16.7	34.9	0.3	9.7	6.9	11.7	9.0
Queue Length 50th (m)	14.4	51.2	0.0	1.0	34.0	0.0	3.8	0.2	2.2	1.0
Queue Length 95th (m)	27.1	#113.1	0.0	2.7	53.9	0.0	9.0	5.2	6.6	11.8
Internal Link Dist (m)		153.2			201.7			64.4		38.0
Turn Bay Length (m)										
Base Capacity (vph)	319	548	601	225	451	548	701	692	456	452
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.73	0.14	0.04	0.53	0.08	0.08	0.04	0.07	0.18

### Intersection Summary

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

# HCM Unsignalized Intersection Capacity Analysis

## 6: Brock Street East & Site Access

11/23/2017



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	←	↖	↘	↙
Traffic Volume (veh/h)	0	405	222	5	0	8
Future Volume (Veh/h)	0	405	222	5	0	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	440	241	5	0	9
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)		226				
pX, platoon unblocked					0.80	
vC, conflicting volume	246				684	244
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	246				478	244
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1320				436	795
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>SB 1</b>			
Volume Total	440	246	9			
Volume Left	0	0	0			
Volume Right	0	5	9			
cSH	1700	1700	795			
Volume to Capacity	0.26	0.14	0.01			
Queue Length 95th (m)	0.0	0.0	0.3			
Control Delay (s)	0.0	0.0	9.6			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.6			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization			24.6%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 8: Herrema Boulevard & Low Boulevard

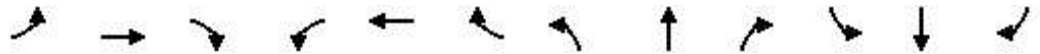
11/23/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	7	10	0	0	14	66	30	0	32	0
Future Volume (Veh/h)	0	0	7	10	0	0	14	66	30	0	32	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	8	11	0	0	15	72	33	0	35	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	154	170	35	162	154	88	35			105		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	154	170	35	162	154	88	35			105		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	99	100	100	99			100		
cM capacity (veh/h)	808	716	1038	792	731	970	1576			1486		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	8	11	120	35								
Volume Left	0	11	15	0								
Volume Right	8	0	33	0								
cSH	1038	792	1576	1486								
Volume to Capacity	0.01	0.01	0.01	0.00								
Queue Length 95th (m)	0.2	0.3	0.2	0.0								
Control Delay (s)	8.5	9.6	1.0	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	8.5	9.6	1.0	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			26.6%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 11: Herrema Boulevard /Herrema Boulevard & Internal Driveway 1

11/23/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	0	0	5	49	0	0	9	106	52	0	49	0
Future Volume (Veh/h)	0	0	5	49	0	0	9	106	52	0	49	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	5	53	0	0	10	115	57	0	53	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
								None			None	
Median storage veh												
Upstream signal (m)												
								62				
pX, platoon unblocked	0.95	0.95		0.95	0.95	0.95					0.95	
vC, conflicting volume	216	245	53	222	216	144	53				172	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	143	174	53	149	143	66	53				96	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	100	93	100	100	99				100	
cM capacity (veh/h)	777	677	1014	768	703	944	1553				1416	
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	5	53	182	53								
Volume Left	0	53	10	0								
Volume Right	5	0	57	0								
cSH	1014	768	1553	1416								
Volume to Capacity	0.00	0.07	0.01	0.00								
Queue Length 95th (m)	0.1	1.8	0.2	0.0								
Control Delay (s)	8.6	10.0	0.5	0.0								
Lane LOS	A	B	A									
Approach Delay (s)	8.6	10.0	0.5	0.0								
Approach LOS	A	B										
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			32.0%	ICU Level of Service							A	
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

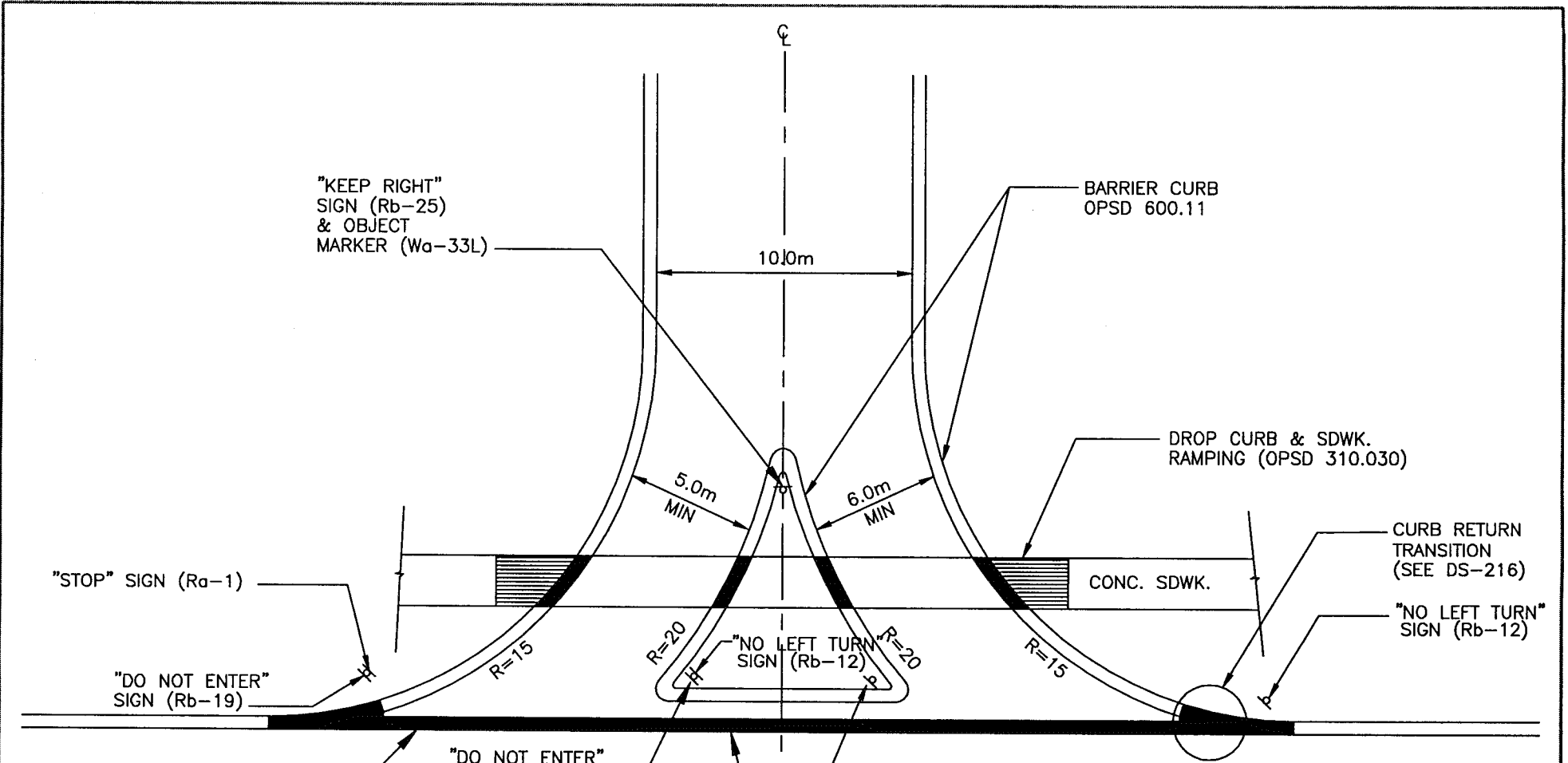
## 14: Internal Driveway 2 & Low Boulevard

11/23/2017



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	0	0	8	0	0	5
Future Volume (Veh/h)	0	0	8	0	0	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	9	0	0	5
<b>Pedestrians</b>						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			0	18	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0	18	0	
tC, single (s)			4.1	6.4	6.2	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
p0 queue free %			99	100	100	
cM capacity (veh/h)			1623	994	1085	
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>			
Volume Total	0	9	5			
Volume Left	0	9	0			
Volume Right	0	0	5			
cSH	1700	1623	1085			
Volume to Capacity	0.00	0.01	0.00			
Queue Length 95th (m)	0.0	0.1	0.1			
Control Delay (s)	0.0	7.2	8.3			
Lane LOS			A			
Approach Delay (s)	0.0	7.2	8.3			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			7.6			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

**Appendix J – York Region Typical Right Turn  
In/Right Turn Out Design  
Standard**



- NOTES
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
  2. CURB TYPE, CATCH BASINS, ETC. SHALL CONFORM TO ONTARIO PROVINCIAL STANDARDS. (INDICATE O.P.S.D. REFERENCE ON PLANS)
  3. SIGNS TO BE MOUNTED ON 4x4 PRESSURE TREATED WOOD POSTS.

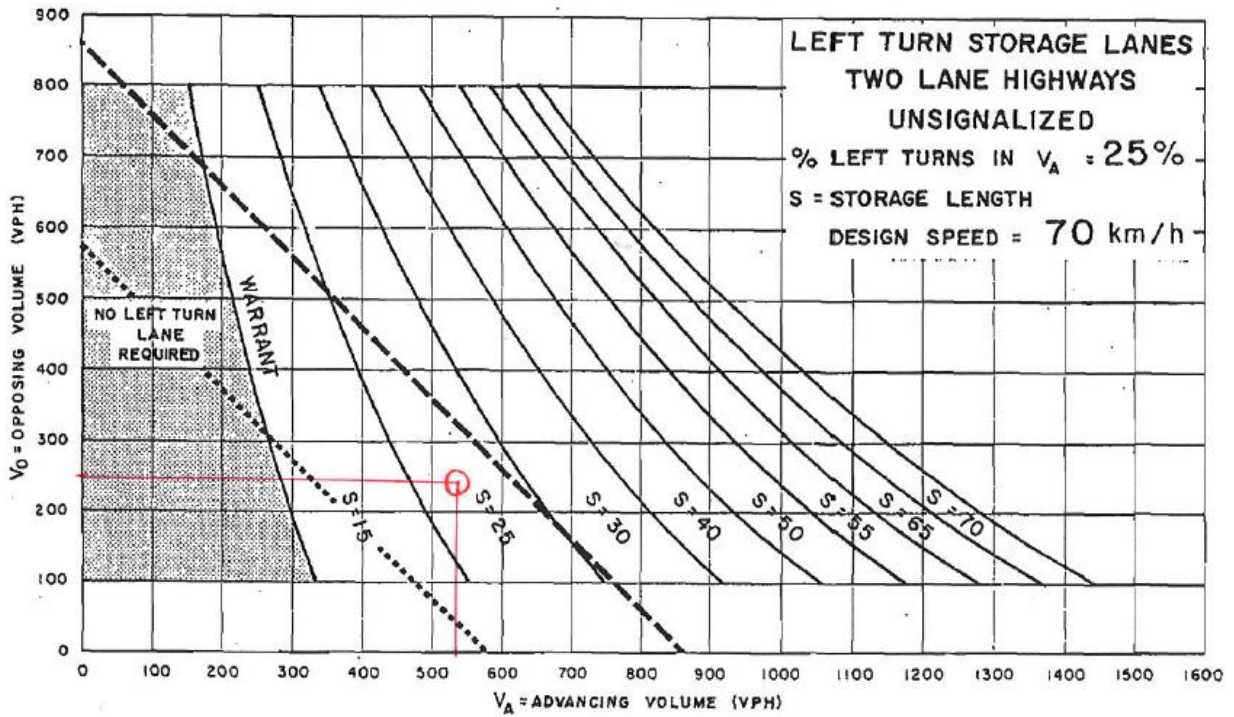
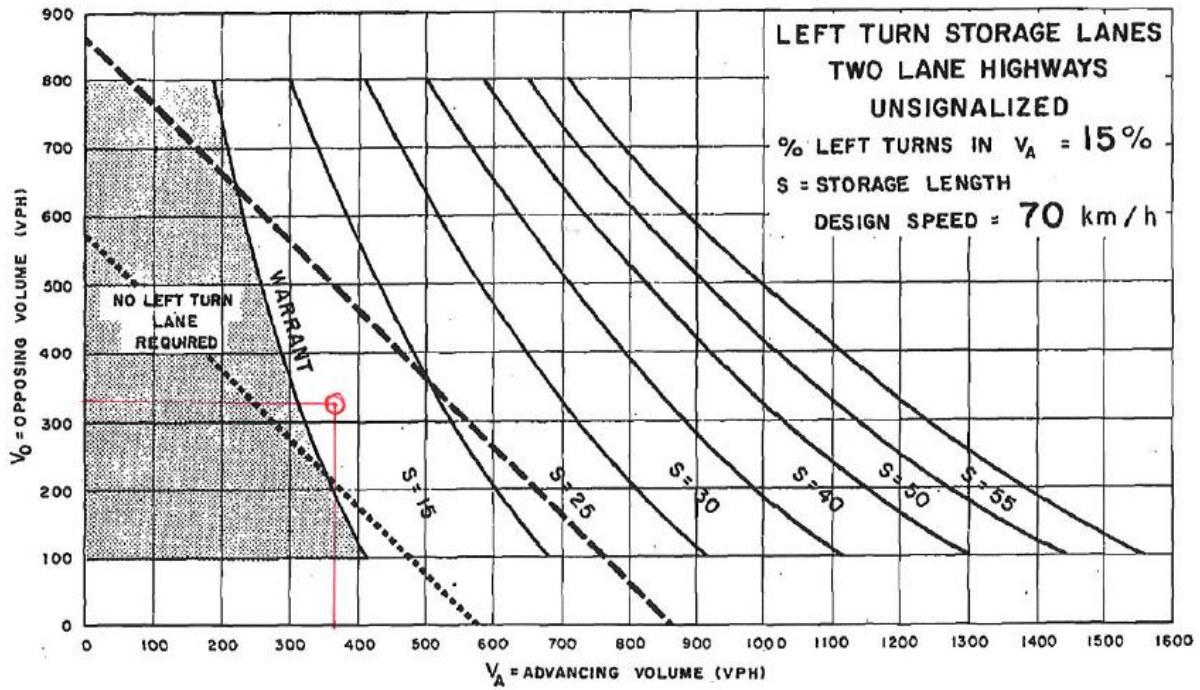
**YorkRegion** Transportation and Works

COMMERCIAL-  
TYPICAL RIGHT TURN IN/  
RIGHT TURN OUT  
-URBAN

DATE:	MARCH 2004	SCALE	N.T.S.
REV.	X	X	DS-207



## **Appendix K – Left Turn Lane Warrant Nomograph**



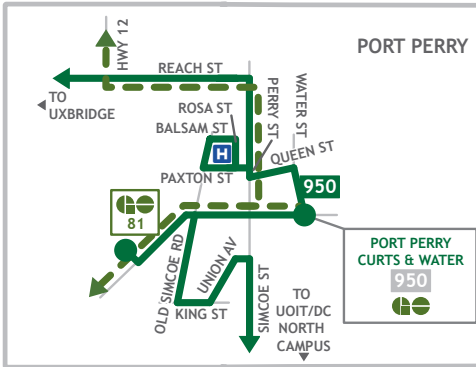
## **Appendix L – Transit Route Services**

# ROUTE 601-603-950-960

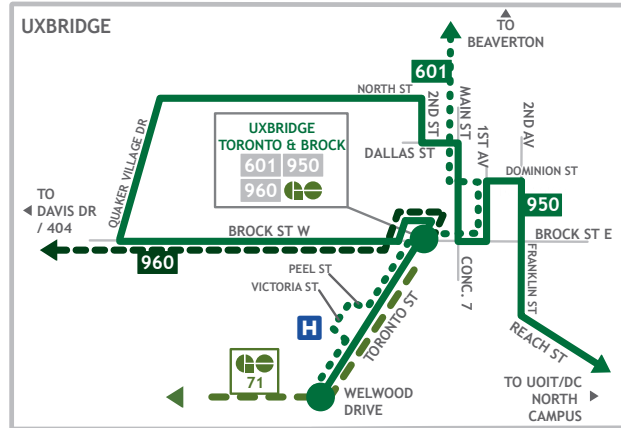
**BROCK - UXBRIDGE**  
**PICKERING - UXBRIDGE**  
**REACH - SIMCOE NORTH**  
**NEWMARKET - UXBRIDGE**

Monday - Friday				
South to Pickering			North to Uxbridge	
Toronto & Brock   Uxbridge   Depart   Stop # 2424	Welwood & Toronto   Uxbridge   Stop # 2416	Old Brock & Central   Acorn   Uxbridge   Stop # 3386	407 / Brock Park & Ride   Pickering   Stop # 3377	Pickering Parkway Terminal   Arrive
<b>603</b>			<b>603</b>	
06:30	06:35	06:50	06:58	07:15
07:55	08:00	08:15	08:23	08:40
-	11:15	11:30	11:38	11:53
-	13:15	13:30	13:38	13:53
Pickering Parkway Terminal   Depart   Stop # 93112			407 / Brock Park & Ride   Pickering   Stop # 3376	Old Brock & Central   Acorn   Uxbridge   Stop # 3385
06:30			06:30	
10:32			10:47	
12:32			12:47	
15:40			15:55	
17:45			18:00	
18:08			18:08	
18:23			18:23	

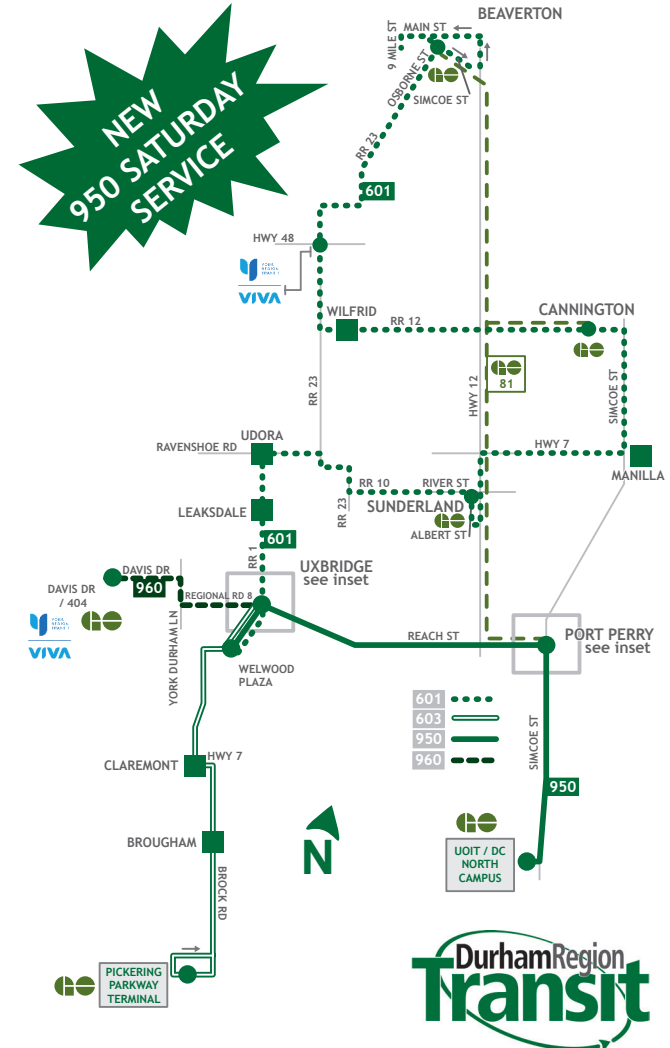
**Legend**  
→ Stop not serviced by this trip



Monday - Friday			
West to Newmarket		East to Uxbridge	
T	T	T	T
Toronto & Brock   North Side   Depart   Stop # 2424	Brock & Quaker Village   Stop # 93547	Regional Road 8 & Mill Run   Siloam   Stop # 3237	Davis - 404 Park & Ride   Arrive
<b>960</b>		<b>960</b>	
07:20	07:23	07:28	07:44
08:40	08:43	08:48	09:04
13:40	13:43	13:48	14:04
17:00	17:03	17:08	17:24
18:05	18:08	18:13	18:29
Davis - 404 Park & Ride   Depart   Stop # 3241	Regional Road 8 & Mill Run   Siloam   Stop # 3238	Brock & South Balsam   Stop # 3210	Toronto & Albert   Arrive
<b>960</b>		<b>960</b>	
07:50	08:06	08:11	08:15
09:20	09:36	09:41	09:45
14:10	14:26	14:31	14:35
17:35	17:51	17:56	18:00
18:35	18:51	18:56	19:00



**NEW  
950 SATURDAY  
SERVICE**



## Mobile Apps

DRT provides its service schedules to The Regional Municipality of Durham's Open Data Program. Various third-party transit apps using this data are available on the App Store and Google Play.



## CONTACT US

- [durhamregiontransit.com](http://durhamregiontransit.com)
- [DRTHelps@durham.ca](mailto:DRTHelps@durham.ca)
- Customer Service Centre  
1-866-247-0055
- @durham\_transit
- /durhamregiontransit

# ROUTE 601 - 603 - 950 - 960

**BROCK - UXBRIDGE**  
**REACH - SIMCOE NORTH**

**PICKERING - UXBRIDGE**  
**NEWMARKET - UXBRIDGE**



Monday - Saturday																											
South to UOIT / DC North Campus Terminal						North to Uxbridge																					
Branch	Wellwood & Toronto   Depart Stop # 2416	T Toronto & Albert Stop # 2422	Brock & Quaker Village Stop # 93547	First & Brock Stop # 3333	Reach & East Stop # 2428	Reach & Simcoe Stop # 2453	Paxton & Rosa   Port Perry Hospital   Stop # 2498	Curts & Water   Port Perry Terminal   Stop # 2491	Smart Centre Port Perry Stop # 3300	Simcoe & Green Way Stop # 2745	Simcoe & Raglan Stop # 2465	Simcoe & Columbus Stop # 2458	UOIT / DC North Campus   Arrive	Branch	UOIT / DC North Campus   Depart Stop # 698	Simcoe & Columbus Stop # 2457	Simcoe & Raglan Stop # 2462	Simcoe & Greenway Stop # 2733	Smart Centre Port Perry Stop # 3300	Curts & Water   Port Perry Terminal   Stop # 2491	Paxton & Rosa   Port Perry Hospital   Stop # 2498	Reach & Simcoe Stop # 2454	Franklin & Reach Stop # 3224	First & Brock Stop # 2435	Brock & South Balsam Stop # 3210	T Toronto & Brock   North Side   Stop # 2424	Wellwood & Toronto   Arrive
Monday - Friday													Saturday														
950													950														
950C	-	06:20	06:23	06:30	06:33	06:45	06:49	06:54	→	07:05	07:12	07:15	07:23	950B	-	-	-	-	-	06:44	06:49	06:53	07:05	07:08	07:16	07:20	-
950C	-	07:20	07:23	07:30	07:33	07:45	07:49	07:54	→	08:05	08:12	08:15	08:23	950B	07:25	07:32	07:35	07:42	07:50	07:57	08:02	08:06	08:18	08:21	08:29	08:33	-
950	-	08:20	08:23	08:30	08:33	08:45	08:49	08:54	09:00	09:08	09:15	09:18	09:26	950	08:25	08:32	08:35	08:42	08:50	08:57	09:02	09:06	09:18	09:21	09:29	09:33	09:38
950	-	09:50	09:53	10:00	10:03	10:15	10:19	10:24	10:30	10:38	10:45	10:48	10:56	950	09:55	10:02	10:05	10:12	10:20	10:27	10:32	10:36	10:48	10:51	10:59	11:03	11:08
950	11:15	11:20	11:23	11:30	11:33	11:45	11:49	11:54	12:00	12:08	12:15	12:18	12:26	950B	12:30	12:37	12:40	12:47	12:55	13:02	13:07	13:11	13:23	13:26	13:34	13:38	-
950	13:15	13:20	13:23	13:30	13:33	13:45	13:49	13:54	14:00	14:08	14:15	14:18	14:26	950	14:30	14:37	14:40	14:47	14:55	15:02	15:07	15:11	15:23	15:26	15:34	15:38	15:43
950	-	14:40	14:43	14:50	14:53	15:05	15:09	15:14	15:20	15:28	15:35	15:38	15:46	950B	15:50	15:57	16:00	16:07	16:15	16:22	16:27	16:31	16:43	16:46	16:54	16:58	-
950	16:25	16:30	16:33	16:40	16:43	16:55	16:59	17:04	17:10	17:18	17:25	17:28	17:36	950B	16:50	16:57	17:00	17:07	17:15	17:22	17:27	17:31	17:43	17:46	17:54	17:58	-
950	-	18:05	18:08	18:15	18:18	18:30	18:34	18:39	18:45	18:53	19:00	19:03	19:11	950	17:45	17:52	17:55	18:02	18:10	18:17	18:22	18:26	18:38	18:41	18:49	18:53	18:58
950	-	19:05	19:08	19:15	19:18	19:30	19:34	19:39	19:45	19:53	20:00	20:03	20:11	950	19:15	19:22	19:25	19:32	19:40	19:47	19:52	19:56	20:08	20:11	20:19	20:23	20:28
950	21:00	21:05	21:08	21:15	21:18	21:30	21:34	21:39	21:45	21:53	22:00	22:03	22:11	950	20:15	20:22	20:25	20:32	20:40	20:47	20:52	20:56	21:08	21:11	21:19	21:23	21:28
														950	22:15	22:22	22:25	22:32	22:40	22:47	22:52	22:56	23:08	23:11	23:19	23:23	23:28

If this information is required in an accessible format, please call 1-866-247-0055

Monday - Friday																													
North to Beaverton						South to Uxbridge																							
Branch	Wellwood & Toronto   Uxbridge   Depart Stop # 2416	T Toronto & Brock   South Side   Uxbridge   Stop # 93018	First & Brock   Uxbridge   Stop # 3333	R.R. 1 & Harrison   Leaskdale   Stop # 3198	R.R. 1 & Ravenshoe   Udora   Stop # 3194	Albert & River   Sunderland   Stop # 2530	Simcoe & Hwy. 7   Manilla   Stop # 3192	Cameron & Ann   Cannington   Stop # 93549	Hwy. 12 & Brock Road   Wilfrid   Stop # 3234	R.R. 23 & Hwy. 48   Stop # 3180	R.R. 23 & Concession 2   Stop # 3182	Hwy. 12 & Beaver   Beaverton   Stop # 93528	Main & Franklin   Beaverton   Stop # 93529	9 Mile at Lakeview Manor   Beaverton   Arrive	Branch	9 Mile at Lakeview Manor   Beaverton   Depart Stop # 3190	R.R. 23 & Concession 2   Stop # 3183	R.R. 23 & Hwy. 48   Stop # 3181	Hwy. 12 & Brock Road   Wilfrid   Stop # 3235	Cameron & Ann   Cannington   Stop # 2533	Simcoe & Hwy. 7   Manilla   Stop # 3191	Albert & Jones   Sunderland   Stop # 3193	R.R. 1 & Ravenshoe   Udora   Stop # 3195	R.R. 1 & Harrison   Leaskdale   Stop # 3199	First & Brock   Uxbridge   Stop # 2435	T Toronto & Brock   South Side   Uxbridge   Stop # 2438	T Toronto & Albert   Uxbridge   Stop # 2422	Victoria at Uxbridge Hospital Entrance   Stop # 3301	Wellwood & Toronto   Uxbridge   Arrive
601													601																
601	-	-	-	-	-	-	-	-	-	-	-	05:51	05:55	06:00	601B	-	-	-	-	-	-	05:53	06:03	06:08	06:17	→	06:19	-	-
601	10:15	10:20	10:22	10:31	10:36	10:47	10:59	11:08	11:20	11:22	11:26	11:36	11:40	11:45	601B	06:00	06:09	06:13	06:15	06:27	06:36	06:48	06:59	07:04	07:13	07:15	-	-	-
601	15:55	16:00	16:02	16:11	16:16	16:27	16:39	16:48	17:00	17:02	17:06	17:16	17:20	17:25	601	11:50	11:59	12:03	12:05	12:17	12:26	12:38	12:49	12:54	13:03	13:05	→	13:06	13:10
601B	18:30	18:35	18:37	18:46	18:51	19:02	-	-	-	-	-	-	-	-	601	17:30	17:39	17:43	17:45	17:57	18:06	18:18	18:29	18:34	18:43	18:45	→	18:46	18:50

**Legend**

→ Stop not serviced by this trip

**T** Connect between Routes 601 / 950 / 960