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Maple Bridge Subdivision, Phase 2

TRANSPORTATION IMPACT STUDY

Mason Homes Limited

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	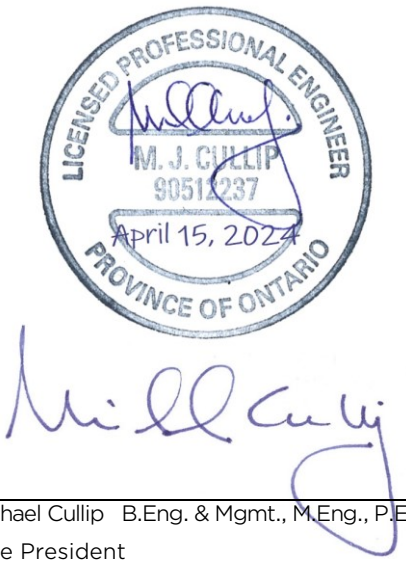
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Document Contents

Tables

Figures

Appendices

1 Introduction

Tatham Engineering Limited was retained by Mason Homes Limited to prepare a Transportation Impact Study (TIS) in support of a Draft Plan of Subdivision application for Phase 2 of the Maple Bridge Subdivision located northeast of the Centre Road and Oakside Drive intersection in the Township of Uxbridge, within the Regional Municipality of Durham. The location of the development site is illustrated in Figure 1.

1.1 REPORT OBJECTIVE

The objective of this report is to address the requirements of the Township and Region with respect to the potential transportation impacts of the development on the area road network. In particular, the following will be discussed, as agreed upon in the Terms of Reference submitted to the Township (as provided in Appendix A):

- the operations of the road system through the study area prior to the proposed development.
- the growth in the traffic volumes not otherwise attributed to the development;
- the number of new trips the proposed development is likely to generate;
- the operations of the study area road system upon completion of the development; and
- the resulting impacts and need for mitigating measures (if required) to ensure acceptable overall road operations.

1.2 REPORT STRUCTURE

The report is structured as follows:

- Chapter 1: introduction and study purpose;
- Chapter 2: existing conditions, detailing the road system and corresponding traffic operations;
- Chapter 3: future conditions, prior to the completion of the proposed development (referred to as future background conditions), the expected growth in traffic levels and the resulting operating conditions;
- Chapter 4: proposed development and associated details including land use, access, and traffic volumes;
- Chapter 5: future conditions, with completion of the proposed development (referred to as future total conditions); and
- Chapter 6: summary of the report and key findings.

2 Existing Conditions

This chapter will detail the current road network, traffic volumes, and traffic operations under existing conditions.

2.1 ROAD NETWORK

The road network to be addressed by this study consists of the following road sections and intersections:

Roads

- Centre Road
- Main Street North
- Maple Brook Drive

Intersections

- Centre Road with Bolton Drive/North Street
- Main Street North with Maple Brook Drive
- Maple Brook Drive with Oakside Drive

Aerial mapping and photographs of the road system are provided in Figure 2.

2.1.1 Roads

Brief descriptions of the study area roads are provided below. The functional classification of the study area roads reflects that provided in:

- Schedule "A" – Land Use and Transportation Plan of the Township of Uxbridge Official Plan[1] (for Township roads); and
- Schedule 'C' – Road Network of the Durham Regional Official Plan[2] (for Regional roads).

Centre Road

Centre Road is a north-south collector road with a 2-lane cross-section, providing one lane of travel per direction. The road has an urban cross-section (curb and gutter) to the south of Maple Bridge Trail and a rural cross-section (grass shoulders and open ditches) to the north. Within the study area, Centre Road has a posted speed limit of 40 km/h and 80 km/h to the south and north of Maple Bridge Trail, respectively.

[1] *Township of Uxbridge Official Plan.* Township of Uxbridge, Office Consolidation January 2014.
[2] *Durham Regional Official Plan.* Durham Region, Office Consolidation May 26, 2020.

Main Street North

Main Street North (Regional Road 1) is classified as a Type B Arterial Road. Such a road is defined in the *Durham Transportation Master Plan*[3] as being a lower-volume arterial road providing secondary connections throughout the Region. The road is oriented north-south through the study area with a 2-lane urban cross-section providing one lane of travel per direction. Main Street North has a posted speed limit of 50 km/h.

Maple Brook Drive

Maple Brook Drive is a local road which is oriented east-west through the study area, providing a 2-lane urban cross-section with one lane of travel per direction. The road has a speed limit of 40 km/h.

2.1.2 Intersections

Centre Road & Bolton Drive/North Street

The intersection of Centre Road with Bolton Drive and North Street is a 4-leg intersection operating under all-way stop control. Each approach consists of a single shared left-thru-right turn lane.

Main Street North & Maple Brook Drive

The intersection of Main Street North with Maple Brook Drive is a 3-leg intersection with Maple Brook Drive operating under stop control. The north leg (Main Street North) provides a shared thru-right turn lane with a right turn channel at the intersection (to facilitate the right turn movement given the skew of the intersection). The south leg (Main Street North) provides a shared left-thru lane, whereas the west leg (Maple Brook Drive) provides a shared left-right turn lane.

Maple Brook Drive & Oakside Drive

The intersection of Maple Brook Drive and Oakside Drive is a 3-leg T-intersection with Maple Brook Drive occupying the east and west legs and Oakside Drive occupying the south leg. The west leg is not currently open to traffic (it will serve the subject development), thus the intersection currently functions as a 90-degree street elbow (free flow in both directions through the elbow).

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[3] *Durham Transportation Master Plan*. Durham Region, December 2017.

2.2 ACTIVE TRANSPORTATION NETWORK

Active transportation infrastructure (such as sidewalks, cycling lanes and multi-use pathways) are key components of a transportation network that facilitate Transportation Demand Management objectives. An inventory of active transportation facilities within an approximately 500 metre radius of the subject site was conducted to determine the availability of said infrastructure. The existing active transportation facilities are illustrated in Figure 3.

As indicated, sidewalks are present throughout the study area road network and curbside bicycle lanes are provided along Main Street North and on Centre Road, south of Oakside Drive. The Maple Bridge Trail, an unpaved multi-use trail, runs adjacent to the subject site between Bolton Drive in the west and Main Street North in the east. All noted facilities provide connections to the wider active transportation network within Uxbridge.

2.3 TRANSIT NETWORK

Several public transit routes operate within Uxbridge, providing access to both regional and interregional transit services. It is noted that the closest transit stops are located within the downtown area of Uxbridge, an approximate 20 to 30-minute walk from the subject site.

2.3.1 Durham Regional Transit

Durham Regional Transit (DRT, the Region's transit operator) currently provides a fixed-route bus service between Whitby and Uxbridge – Route 905C. This route operates with a 90-minute headway, 7 days per week, between the hours of approximately 6:00 AM and 10:00 PM. The route provides stops at the GO Transit Uxbridge Terminal on Railway Street and at the intersections of Brock Street with Toronto Street and with Main Street. The route connects with many other routes operated by DRT in southern Durham, ultimately terminating at the Whitby GO Station.

In addition, on-demand transit services are offered within Uxbridge along most major corridors (including Centre Road and Main Street North), allowing individual riders to call for transit services (similar to a taxi service) only when needed.

2.3.2 GO Transit

GO Transit (an interregional public transit provider offering train and bus services across the GTHA) currently operates two bus routes to Uxbridge – Route 70 and Route 71. The routes operate on a 60-minute headway on weekdays and approximately 120-minute headway on weekends, between the hours of approximately 5:00 AM and 10:00 PM. Each route stops at the GO Transit Uxbridge Terminal and provides stops in Stouffville, Mount Joy, Unionville and ultimately Union Station in downtown Toronto.

Connections to GO train services are available through both the noted GO bus routes and DRT Route 905C. Routes 70 and 71 provide connections to the Stouffville Line, which provides one-way weekday service between Old Elm GO and Union Station during peak commuter hours (5:00 AM to 9:30 AM southbound and 3:00 PM to 7:00 PM northbound) every 30 to 60 minutes; 6 trains per direction are provided. Route 905C provides connections to the Lakeshore East Line at Whitby GO, which provides two-way services every 30 minutes, 7 days per week, between Oshawa GO and Union Station.

2.4 TRAFFIC VOLUMES

2.4.1 Traffic Counts

To determine existing traffic volumes within the study area, traffic counts were conducted at the intersections of Centre Road with Bolton Drive/North Street and Main Street North with Maple Brook Drive. The counts were conducted on Tuesday, September 12, 2023, from 7:00 AM to 10:00 AM and 3:00 PM to 6:00 PM. Detailed count sheets are provided in Appendix B, with the observed 2023 peak hour volumes illustrated in Figure 4.

2.4.2 Adjustments

Traffic volumes observed on Maple Brook Drive at Main Street North were carried through the Oakside Drive/Maple Brook Drive street elbow to establish the existing volumes on Oakside Drive. No intermediate development is present along Maple Brook Drive over this segment, thus volumes on the road will be consistent at both intersections.

To reflect existing condition (2024), the volumes observed during the 2023 traffic counts were adjusted by the growth rates detailed in Section 3.4.1. The resulting 2024 peak hour traffic volumes are illustrated in Figure 5.

2.5 TRAFFIC OPERATIONS

The assessment of existing conditions provides the baseline from which the future traffic operations (both without and with the subject development) can be assessed. As the capacity, and hence operations, of a road system is effectively dictated by its intersections, the analysis is focused on the intersection operations. The analysis is based on the following:

- the 2024 peak hour traffic volumes;
- the existing intersection configurations and control; and
- procedures outlined in the *2000 Highway Capacity Manual*[4] (using Synchro v.11 software).

[4] *Highway Capacity Manual.* Transportation Research Board, Washington DC, 2000.

For each intersection, the analysis considers:

- the average delay (measured in seconds);
- level of service (LOS); and
- volume to capacity (v/c) for each movement if signalized or, if unsignalized (such as those operating under stop control), for critical movements only.

With respect to the noted metrics:

- level of service 'A' corresponds to the best operating condition with minimal delays whereas level of service 'F' corresponds to poor operations resulting from high intersection delays (additional details regarding Level of Service definitions are provided in Appendix C); and
- a v/c ratio of less than 1.0 indicates the intersection movement is operating at less than capacity while v/c of 1.0 indicates capacity has been reached.

A summary of the analysis is provided in Table 1 with detailed worksheets available in Appendix D. As indicated, each intersection currently provides excellent operations (LOS B or better). Recognizing that the intersection of Maple Brook Drive with Oakside Drive is currently configured as a street elbow with no stop controlled movements, there are no operational concerns under existing conditions. Thus, it has not been included in the operational analysis.

Table 1: Intersection Operations – 2024

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Centre Road & Bolton Drive/ North Street	EB LTR	stop	8	A	0.06	8	A	0.07
	WB LTR	stop	8	A	0.03	7	A	0.01
	NB LTR	stop	8	A	0.06	8	A	0.09
	SB LTR	stop	8	A	0.09	8	A	0.07
Main Street N & Maple Brook Drive	EB LTR	stop	12	B	0.06	11	B	0.03

L – left T – through R – right LT – left-through TR – through-right LTR – left-through-right LR – left-right

2.6 ROAD NETWORK IMPROVEMENTS

Based on the results of the operational analysis under existing conditions, no improvements are required to accommodate the existing traffic volumes.

3 Future Background Conditions

This chapter will describe the road network and background traffic volumes expected for the years 2028, 2033, and 2038. The 2028 horizon has been adopted to reflect full build-out of the subject development, whereas the 2033 and 2038 horizons will address the longer-term impacts of the development (5 and 10 years beyond build-out).

3.1 ROAD NETWORK

Based on information provided in the *Durham Transportation Master Plan* (Durham TMP), no improvements to the regional road network in Uxbridge (i.e. Main Street) are currently planned. No improvements to local municipal roads were identified by Town staff, thus the road network as described in Section 2.1 has been maintained.

3.2 ACTIVE TRANSPORTATION NETWORK

As detailed in the *Uxbridge Active Transportation Plan*[5], improvements to the active transportation facilities within the study area road network are proposed. The improvements are divided into short-term (0 to 10 year) and long-term (10+ year) completion timelines and include:

Short Term

- provide signed bike route on Maple Brook Drive
- provide buffered bike lanes on Main Street North
- provide urban shoulder along Centre Road

Long Term

- addition of sidewalk on east side of Main Street North, from John Harvey Street to Fields of Uxbridge park

Based on observations made during a site visit in August 2023, none of the noted improvements have yet to be implemented.

3.3 TRANSIT NETWORK

3.3.1 Durham Regional Transit

As detailed in the *Durham TMP*, the service headway of transit routes serving Uxbridge is intended to be every 60 minutes or better by 2031. The *Durham TMP* does not state whether this is due to headway improvements on DRT Route 905 (currently every 90 minutes), headway improvements on GO Transit Route 70/Route 71 (currently 60 minutes on weekdays and 120 minutes on weekends), or a combination of both.

[5] *Uxbridge Active Transportation Plan*. WSP and Share the Road Cycling Coalition, June 2021.

3.3.2 GO Transit

As part of Metrolinx *GO Expansion* project (formerly known as *Regional Express Rail*), both the Lakeshore East Line and Stouffville Line are in the process of being upgraded to provide increased service headway and two-way, all-day train services. Upon completion, two-way, all-day train service will be provided every 15 minutes or better as follows:

- Lakeshore East Line – between Union Station and Oshawa GO; and
- Stouffville Line – between Union Station and Unionville GO (bus connections are to be available to provide services from Unionville GO to Old Elm GO).

3.4 TRAFFIC VOLUMES

Background traffic volumes for the 2028, 2033, and 2038 horizons have been determined based on the existing traffic volumes, historical and projected growth, and consideration for other development-specific traffic volumes.

3.4.1 Background Growth

Historical Population Growth

Population data from the 2016 and 2021 Canadian censuses was collected to determine recent growth rates in the area. Growth within the Township (within the Uxbridge urban area and overall) and within Durham Region is summarized in Table 2.

Table 2: Historical Population Growth

AREA	POPULATION			ANNUAL GROWTH RATE		
	2011	2016	2021	2011-16	2016-21	2011-21
Uxbridge Urban Area	11,709	11,832	11,794	0.21%	-0.06%	0.07%
Township Overall	20,623	21,176	21,556	0.53%	0.36%	0.44%
Durham Region	608,124	645,862	696,992	1.21%	1.54%	1.37%

As indicated, the Uxbridge urban area experienced negligible growth between 2011 and 2021, with less than 0.1% growth per annum realized. This can be attributed to minimal residential development activity occurring over that period. Growth within the Township overall and Durham Region has been steady, averaging approximately 0.4% per annum and 1.4% per annum, respectively, over the same period.

Projected Population Growth

Based on population projections contained in the Township's *Official Plan*, Uxbridge was anticipated to have a population of 13,715 persons in 2021 and 16,480 persons in 2031. This translates to an expected growth rate of approximately 1.8% over the 2021 to 2031 period. It is noted that due to the minimal realized growth between 2011 and 2021, a growth rate in the order of 3.4% is required to reach the 2031 population target based on the 2021 census population.

Population projections contained in the Region's *Official Plan* (which are in turn derived from the *A Place to Grow*[6] report) indicate a population of 960,000 persons within Durham by 2031. Based on the 2021 census population, this translates to annual growth of 3.2% over the 2021 to 2031 period.

Background Growth

In consideration of the historical and projected growth within the area, the following growth rates have been applied to the study area roads:

- Main Street North – 3% per annum;
- Centre Road – 1% per annum; and
- all other roads – 0% per annum.

The greatest growth was applied to Main Street North given that it functions as a regional arterial road providing key north-south connectivity throughout Durham and the Township and thus is subject to growth pressures beyond Uxbridge. Lower growth was applied to Centre Road as it functions as a collector road serving largely built-out areas and has limited connectivity to the wider area. No growth was applied to the remaining roads within the study area (Maple Brook Drive, North Street and Bolton Drive) recognizing that they are local roads serving built-out residential areas and thus are not expected to experience significant annual growth.

3.4.2 Background Development Growth

Through consultation with Township staff, one background development was identified for consideration in this study, the location of which is illustrated in Figure 6 (located immediately to the west). Development details are provided below with relevant excerpts from the corresponding traffic study provided in Appendix E.

[6] *A Place to Grow – Growth Plan for the Greater Golden Horseshoe*. Consolidation, August 2020.

Bridgebrook – 7370 Centre Road

The development at 7370 Centre Road (referred to as *Bridgebrook*) is a large residential subdivision located on the west side of Centre Road, opposite the subject site. The development will contain a total of 590 residential units with a mix of 461 single detached units, 60 semi-detached units, and 69 townhouse units. Trip estimates and distribution were obtained from the *Transportation Impact Study*[7] prepared in support of the development. Upon completion, the development is expected to generate 361 new auto trips during the weekday AM peak hour and 474 new auto trips during the weekday PM peak hour. Access to the site was to be provided in part by a new municipal road connection (identified as *Street "J"* at *Intersection #3* in the respective TIS) to Centre Road, which the study assumed to be located opposite the future extension of Maple Brook Drive. As discussed further in Section 4.3, the Maple Brook Drive extension will actually be located approximately 75 metres north of Street J. The assignment of trips to the study area road network, reflective of full build-out of the development, are also illustrated in Appendix E.

The extension of Maple Brook Drive will not occur under background conditions, recognizing that the extension will be completed in conjunction with the construction of the Maple Bridge Phase 2 development. Therefore, the Bridgebrook development trips which were assigned to Maple Brook Drive in the Bridgebrook *Transportation Impact Study* have been reassigned to other routes under background conditions. Two separate assignment figures are provided in Appendix E demonstrating the assignment employed under background and under total conditions. It is noted that despite the proposed offset between Street J (of the Bridgebrook site) and the Maple Brook Drive extension, traffic assigned to the Maple Brook Drive extension in the *Transportation Impact Study* is still assumed to do so under total conditions.

As per the Bridgebrook *Transportation Impact Study*, a 7-year build-out period was assumed for the development, with full built-out occurring by 2028. No development progress at the site was observed as of August 2023. Therefore, the noted development timeline has been adjusted by 2 years; the development is assumed to be 75% built-out by the 2028 horizon and fully built-out by the 2033 horizon.

3.4.3 Background Traffic Volumes

The resulting 2028, 2033 and 2038 background traffic volumes are illustrated in Figure 7 through Figure 9, based on the 2024 traffic volumes, the assumed background growth on each road and additional traffic generated by the noted background development.

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[7] *Transportation Impact Study – Proposed Residential Subdivision – 7370 Centre Road, Township of Uxbridge*. Nextrans Consulting Engineers. April 1, 2021.

3.5 TRAFFIC OPERATIONS

The study area intersections were analyzed again at each horizon year given the projected background volumes. The future intersection of Centre Road with Street "J" (serving the Bridgebrook development) has also been assessed.

Results of the operational assessment are summarized in Table 3 through Table 5 with detailed worksheets provided in Appendix F. As indicated, the existing intersections will continue to provide excellent operations (LOS B or better) through the 2038 horizon under background conditions. The future intersection of Centre Road with Street "J" is also expected to provide excellent operations (LOS A) through the 2038 horizon.

Table 3: Intersection Operations – 2028 Background

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Centre Road & Bolton Drive/ North Street	EB LTR	stop	8	A	0.07	8	A	0.09
	WB LTR	stop	8	A	0.04	8	A	0.03
	NB LTR	stop	8	A	0.08	8	A	0.13
	SB LTR	stop	8	A	0.16	8	A	0.12
Main Street N & Maple Brook Drive	EB LR	stop	12	B	0.06	12	B	0.03
Centre Road & Street "J"	EB LR	stop	9	A	0.08	9	A	0.06

L – left T – through R – right LT – left-through TR – through-right LTR – left-through-right LR – left-right

Table 4: Intersection Operations – 2033 Background

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Centre Road & Bolton Drive/ North Street	EB LTR	stop	8	A	0.08	8	A	0.10
	WB LTR	stop	8	A	0.05	8	A	0.03
	NB LTR	stop	8	A	0.08	8	A	0.15
	SB LTR	stop	8	A	0.19	8	A	0.14
Main Street N & Maple Brook Drive	EB LR	stop	13	B	0.07	12	B	0.04
Centre Road & Street "J"	EB LR	stop	9	A	0.11	9	A	0.08

L – left T – through R – right LT – left-through TR – through-right LTR – left-through-right LR – left-right

Table 5: Intersection Operations – 2038 Background

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Centre Road & Bolton Drive/ North Street	EB LTR	stop	8	A	0.08	8	A	0.11
	WB LTR	stop	8	A	0.05	8	A	0.03
	NB LTR	stop	8	A	0.09	8	A	0.15
	SB LTR	stop	9	A	0.20	8	A	0.14
Main Street N & Maple Brook Drive	EB LR	stop	14	B	0.07	12	B	0.04
Centre Road & Street "J"	EB LR	stop	9	A	0.11	9	A	0.08

L – left T – through R – right LT – left-through TR – through-right LTR – left-through-right LR – left-right

3.6 ROAD NETWORK IMPROVEMENTS

Based on the results of the operational analyses under future background conditions, no improvements are required to accommodate the future background traffic volumes.

4 Proposed Development

This chapter will provide additional details with respect to the Maple Bridge Phase 2 development, including its location, land-use, site access, anticipated trip generation and the assignment of such to the adjacent road network.

4.1 LOCATION

As illustrated in Figure 1, the subject site is located at the property known municipally as 7309 Centre Road, which is within the Uxbridge urban area.

4.2 LAND USE & PHASING

The subject development is a residential subdivision containing 236 residential units, a breakdown of which is as follows:

- 154 single detached dwellings; and
- 82 townhouse dwellings.

A site plan is provided in Figure 10. A single, 4-year development phase has been assumed with full build-out by 2028.

4.3 SITE ACCESS

Access to the site will be provided via the extension of Maple Brook Drive from its existing terminus at Oakside Drive westwards to Centre Road. This will provide access to the wider road network via Centre Road in the west and Main Street North in the east. As noted in Section 2.1.2, the Maple Brook Drive extension will create a 3-leg intersection with Oakside Drive, at which time it is assumed that the intersection will operate as an all-way stop, based on the configuration of similar intersections within the surrounding neighbourhoods. At the future intersection of Maple Brook Drive with Centre Road, it is assumed that Maple Brook Drive will have stop control.

The access to Centre Road will be designed according to the appropriate standards for a local urban road, allowing for safe and efficient two-way operations. It is noted that Maple Brook Drive will be offset by approximately 75 metres to the north from Street J (centreline to centreline). As per Transportation Association of Canada (TAC) guidelines, an intersection offset of greater than 40 metres (centreline to centreline) on local roads is considered acceptable as the intersections will operate as successive and separate T-intersections with independent conflict areas. TAC guidelines further recommend that adjacent intersections along a collector road have a minimum separation of 60 metres. As such, the location of the Maple Brook Drive intersection on Centre Road and the resulting offset from Street J is considered acceptable.

4.4 SITE ACCESS SIGHT LINES

A sight line assessment was conducted to establish the available sight lines at the proposed site access point on Centre Road. As requested by the Township, a review of sight lines at the intersection of Maple Brook Drive and Oakside Drive was also conducted. The assessment has considered both minimum stopping sight distance and intersection sight distance, as defined below and dictated per TAC standards:

- the minimum stopping sight distance provides sufficient distance for an approaching motorist to observe a stationary hazard in the road and bring their vehicle to a complete stop prior to the hazard; and
- the intersection sight distance allows a vehicle to enter a main road from a side street (or site access) and attain the appropriate operating speed without significantly impacting the operating speed of an approaching vehicle.

The minimum stopping and intersection sight distance requirements for a design speed of 50 km/h and 100 km/h (reflective of the current posted speed limits on Maple Brook Drive and Centre Road, respectively) are summarized in Table 6.

Table 6: Sight Distance Requirements

POSTED SPEED	DESIGN SPEED	STOPPING SIGHT DISTANCE	INTERSECTION SIGHT DISTANCE	
			Left Turn	Right Turn
40 km/h	50 km/h	65 m	105 m	95 m
80 km/h	100 km/h	185 m	210 m	185 m

The available sight distances at each location (as determined through field measurements) are summarized in Table 7 and are illustrated in Figure 11.

Table 7: Available Sight Lines

LOCATION	DESIGN SPEED	AVAILABLE SIGHT LINES TO/FROM			
		North	South	East	West
Maple Brook Drive Extension at Centre Road	100 km/h	>250 m	160 m	-	-
Oakside Drive at Maple Brook Drive	50 km/h	-	-	> 200m	80 m[1]

[1] Estimate based on conceptual future alignment of Maple Brook Drive extension

As indicated, sight lines along Centre Road to/from the south do not satisfy the TAC guidelines for minimum stopping or intersection sight distance for a design speed of 100 km/h (the sight lines are limited by a slight vertical crest curve in the road). The available stopping sight distance corresponds to the requirements for a design speed of 90 km/h whereas the intersection sight distance corresponds to 77 km/h. In light of the road's vertical geometry and corresponding limited sight lines to/from the south, and to ensure safe operations for the future road system, it is recommended that the existing 40 km/h speed zone on Centre Road to the south be extended to the north of the Maple Brook Drive extension. Alternatively, a 60 km/h speed zone could be implemented to provide a transition zone between the existing 80 km/h and 40 km/h speed zones. Given the proposed residential development along the Centre Road corridor (including both the subject development and the Bridgebrook development), a speed limit reduction through the area is considered reasonable and appropriate. Regardless, the available sight lines will comply with the associated requirements.

With respect to the available sight lines on Maple Brook Drive at Oakside Drive, such are limited to an estimated 80 metres to/from the west given the proposed horizonal alignment of the Maple Brook Drive extension. While the minimum stopping sight distance is satisfied, the intersection sight distance will not be achieved albeit this is not considered problematic. As the minimum stopping sight distance, which is considered the critical condition, is satisfied for the noted design speed, approaching vehicles will have sufficient opportunity to observe a hazard and bring their vehicle to a stop as required. The intersection sight distance is not a critical concern on low-speed residential road. Furthermore, it is recommended that the intersection of Maple Brook Drive with Oakside Drive be configured as an all-way stop, which further mitigates any potential sight line concerns (in that all vehicles approaching the intersection will be reducing their travel speed in anticipation of having to stop).

4.5 SITE CIRCULATION

4.5.1 Internal Roads

Internal circulation within the site will be provided by a new municipal local road network (including the noted Maple Brook Drive extension). This network will be designed to the appropriate standards for a local urban road, allowing for safe and efficient two-way operations. Provision for active transportation facilities along each road (e.g. sidewalks, cycling lanes, multi-use paths) will be included allowing for connections to be made to the external sidewalk and cycling network in accordance with the *Active Transportation Plan* goal of providing 'complete streets' within the Township. Additional review of internal circulation, such as a vehicle swept path assessment for critical design vehicles (i.e. fire truck, waste collection, snow plow, etc.) will

be provided with future engineering design submissions (i.e. Site Plan Application) once details of the road design and boulevard elements are confirmed.

4.5.2 Traffic Calming

The nature of most of the proposed road network (consisting of several crescents, cul-de-sacs and short road lengths as evident in the site plan of Figure 10) does not warrant traffic calming measures. However, it is acknowledged that Street A (Maple Brook Drive) has the potential to induce through traffic between Main Street and Centre Road and/or encourage higher speeds given its relatively straight alignment. Possible traffic calming measures could include on-street parking, radar speed signs or physical measures (such as speed humps or raised intersections). These options will be revisited and explored in more detail at the Site Plan Application stage.

4.6 SITE PARKING

4.6.1 Township Requirements

As per the *Township of Uxbridge Zoning By-law*[8], the following parking requirements apply:

- single detached dwelling – 2 parking spaces per unit; and
- townhouse dwelling – 2 parking spaces per unit + 0.5 visitor parking spaces per unit.

It is noted that all required parking spaces must be provided as uncovered surface parking; private garages at each dwelling unit are not counted towards the parking provision.

4.6.2 Supply

The parking supply will be discussed in further detail at the Site Plan Application stage.

4.7 SITE TRAFFIC

4.7.1 Trip Generation

The number of vehicle trips to be generated by the proposed development for the weekday AM and weekday PM peak hours has been determined based on type of use, development size and trip generation rates per the *ITE Trip Generation Manual, 11th Edition*. Based on the type of development proposed for the site, the following ITE land uses have been applied:

- single family detached (ITE land-use code 210); and
- single family attached (ITE land-use code 215).

Trip rates and trip estimates for the development are summarized in Table 8 and

[8] *Township of Uxbridge Zoning By-law Number 81-19*. Township of Uxbridge, Consolidated October 2021.

Table 9, respectively. As indicated, the site is expected to generate 147 trips during the weekday AM peak hour and 192 trips during the weekday PM peak hour.

Table 8: Trip Rates – Maple Bridge Phase 2

LAND USE	VARIABLE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		In	Out	Total	In	Out	Total
single family detached (ITE 210)	per unit	0.18	0.52	0.70	0.59	0.35	0.94
single family attached (ITE 215)	per unit	0.15	0.33	0.48	0.32	0.25	0.57

Table 9: Trip Estimates – Maple Bridge Phase 2

LAND USE	SIZE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		In	Out	Total	In	Out	Total
single detached	154 units	28	80	108	91	54	145
townhouses	82 units	12	27	39	27	20	47
Total	**236 units**	**40**	**107**	**147**	**118**	**74**	**192**

4.7.2 Trip Distribution & Assignment

The distribution of new trips generated by the subject site has been developed based on trip distribution data provided in the 2016 *Transportation Tomorrow Survey* (TTS). The TTS is a comprehensive travel survey conducted every 5 years throughout the Greater Golden Horseshoe which can be used to identify travel patterns between different *zones*. As the 2021 survey was delayed by the COVID-19 pandemic, the data is not yet available and therefore, the 2016 survey represents the most recent data available.

The subject development is located within *2006 GTA Zone 1317*, which covers the north half of Uxbridge (i.e. north of Brock Street); the south half of Uxbridge is *2006 GTA Zone 1318*. Trip details travelling to/from *Zone 1317* were obtained, with the resulting distribution of trips detailed as follows:

- to/from the north – 12% (4% internal to Uxbridge, 8% external to Uxbridge);
- to/from the south – 53% (33% internal to Uxbridge, 20% external to Uxbridge);

- to/from the east – 8% (4% internal to Uxbridge, 4% external to Uxbridge); and
- to/from the west – 27% (3% internal to Uxbridge, 24% external to Uxbridge).

As indicated, 44% of all trips made to/from *Zone 1317* remain within Uxbridge, whereas the remaining 56% of trips are to/from locations outside of Uxbridge. Based on this, and in consideration of expected travel routes to/from the site and the location of the site within *Zone 1317* (centrally, near the north limit), the following distribution was applied to the site-generated trips:

- to/from the north via Main Street North – 10%;
- to/from the south via Highway 47 via Centre Road – 20%;
- to/from the south via Regional Road 8/23 via Main Street North – 30%;
- to/from the east via Regional Highway 47 – 10%;
- to/from the west via Regional Road 8 – 30%.

Site trips were assigned to the study area road network in consideration of the above distribution. The resulting assignment is illustrated in Figure 12.

5 Future Total Conditions

This chapter will address the resulting impacts of the proposed development on the adjacent road system. The following areas will be addressed:

- operations of the key intersections; and
- potential improvements to the study area road network, if necessary.

5.1 TRAFFIC VOLUMES

To assess the impacts of the increased traffic resulting from the proposed development, the site-generated traffic volumes were added to the background traffic volumes at each horizon to yield the future total volumes. With respect to the Bridgebrook development traffic volumes, they reflect those of the corresponding *Transportation Impact Study*, with minor adjustments made to reflect the offset of Street J from the Maple Brook Drive extension.

The resulting total traffic volumes at each horizon are illustrated in Figure 13 through Figure 15. It is noted that a minimum volume of 1 vehicle has been assumed for all movements.

5.2 TRAFFIC OPERATIONS

Analysis of the key intersections was repeated for each horizon to assess the impact of the proposed development. In addition, the intersection of Maple Brook Drive with Oakside Drive was assessed, considering the configuration assumed in Section 4.5. Results of the operational assessment are summarized in Table 10 through Table 12 with detailed operations worksheets provided in Appendix G.

As indicated, the study intersections are expected to provide good operations (LOS C or better) through the 2038 horizon under total conditions.

Table 10: Intersection Operations – 2028 Total

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Centre Road & Bolton Drive/ North Street	EB LTR	stop	8	A	0.07	8	A	0.09
	WB LTR	stop	8	A	0.04	8	A	0.02
	NB LTR	stop	8	A	0.11	9	A	0.21
	SB LTR	stop	9	A	0.23	9	A	0.17
Main Street N & Maple Brook Drive	EB LR	stop	14	B	0.29	14	B	0.15
Centre Road & Street "J"	EB LR	stop	9	A	0.09	10	B	0.07
Centre Road & Maple Brook Drive	WB LR	stop	9	A	0.08	10	B	0.09
Maple Brook Drive & Oakside Drive	EB TR	stop	8	A	0.10	8	A	0.07
	WB LT	stop	8	A	0.05	8	A	0.15
	NB LR	stop	7	A	0.03	7	A	0.02

L – left T – through R – right LT – left-through TR – through-right LTR – left-through-right LR – left-right

Table 11: Intersection Operations – 2033 Total

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Centre Road & Bolton Drive/ North Street	EB LTR	stop	8	A	0.08	9	A	0.11
	WB LTR	stop	8	A	0.04	8	A	0.02
	NB LTR	stop	8	A	0.11	9	A	0.22
	SB LTR	stop	9	A	0.24	9	A	0.18
Main Street N & Maple Brook Drive	EB LR	stop	18	C	0.35	14	B	0.17
Centre Road & Street "J"	EB LTR	stop	11	B	0.13	11	B	0.09
Centre Road & Maple Brook Drive	WB LTR	stop	9	A	0.09	11	B	0.11
Maple Brook Drive & Oakside Drive	EB TR	stop	8	A	0.11	8	A	0.07
	WB LT	stop	8	A	0.05	8	A	0.16
	NB LR	stop	7	A	0.03	7	A	0.02

L – left T – through R – right LT – left-through TR – through-right LTR – left-through-right LR – left-right

Table 12: Intersection Operations – 2038 Total

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C
Centre Road & Bolton Drive/ North Street	EB LTR	stop	8	A	0.08	9	A	0.11
	WB LTR	stop	8	A	0.05	8	A	0.02
	NB LTR	stop	8	A	0.11	9	A	0.22
	SB LTR	stop	9	A	0.25	9	A	0.18
Main Street N & Maple Brook Drive	EB LR	stop	21	C	0.40	17	C	0.20
Centre Road & Street "J"	EB LTR	stop	11	B	0.13	11	B	0.09
Centre Road & Maple Brook Drive	WB LTR	stop	9	A	0.09	11	B	0.11
Maple Brook Drive & Oakside Drive	EB TR	stop	8	A	0.11	8	A	0.07
	WB LT	stop	8	A	0.05	8	A	0.16
	NB LR	stop	7	A	0.03	7	A	0.02

L – left T – through R – right LT – left-through TR – through-right LTR – left-through-right LR – left-right

5.3 ROAD NETWORK IMPROVEMENTS

5.3.1 Intersection Operations

Based on the results of the operational analyses and turn lane assessment under future total conditions, no road network improvements are required to accommodate the proposed development.

5.3.2 Turn Lane Requirements

The need for exclusive turn lanes on Centre Road and Main Street North at Maple Brook Drive have been reviewed based on MTO guidelines[9] for auxiliary turn lanes at unsignalized intersections. Warrants have been reviewed considering the 2028 and 2038 total conditions, corresponding to needs at build-out and 10 years beyond build-out of the proposed development.

[9] *MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads*. Ontario Ministry of Transportation Design Standards & Specifications Office. April 2020.

Left Turn Lanes

For two-lane, undivided highways, MTO warrants for left turn lanes at unsignalized intersections are based on design speed, advancing volume (i.e. traffic travelling in the same direction as left turning traffic), opposing volume (i.e. traffic travelling in the opposite direction that would impede left turning vehicles), and the percentage of left turns in the advancing volume.

Due to the very low southbound left turning volumes expected on Centre Road, a left turn lane will not be warranted to serve the proposed development.

A summary of the warrant analysis at the intersection of Maple Brook Drive and Main Street North is provided in Table 13 whereas the completed warrants are provided in Appendix H. As indicated, a northbound left turn lane with 15 metres of storage is warranted to serve the future volumes during the weekday PM peak hour at build-out, with an ultimate storage length of 25 metres warranted by the 2038 horizon (resulting from the increased background volumes on Main Street North). It is noted that the corresponding left turn volumes include those related to the subject development in addition to those expected under background conditions (i.e. not related to the subject development).

Table 13: Left Turn Warrants – Main Street North & Maple Brook Drive

HORIZON	WEEKDAY AM PEAK HOUR		WEEKDAY PM PEAK HOUR	
	Warranted?	Storage Required	Warranted?	Storage Required
2028	NO	-	YES	15 m
2038	NO	-	YES	25 m

Right Turn Lanes

MTO guidelines suggest that an exclusive right turn lane be considered where right turning volumes exceed 60 vehicles per hour (vph) and/or impede the operations of through traffic. Based on the total traffic volumes presented in Figure 13 and Figure 15, right turning volumes onto Maple Brook Drive from Centre Road and Main Street North are as follows:

- Centre Road (northbound) – 48 to 79 vph; and
- Main Street North (southbound) – 10 to 40 vph

As indicated, the right turn volumes on Centre Road, which includes volumes related to the subject development and the Bridgebrook development, exceed the 60 vph threshold. Notwithstanding, as per the results of the operational assessments, no operational concerns are expected and thus a right turn lane is not considered necessary at this location.

6 Summary

Proposed Development

This study has addressed the transportation impacts associated with the proposed residential development to be located at 7309 Centre Road in the Uxbridge urban area. The development will consist of 236 residential units (154 single detached units and 82 townhouse units) and upon completion is expected to generate 147 new trips during the weekday AM peak hour and 192 new trips during the weekday PM peak hour.

Transportation Impacts

In addressing the study area traffic operations, the study area intersections were analyzed under existing (2024) and future (2028, 2033 and 2038) horizon periods. The operations of the future intersection of Centre Road with Street "J" (of the Bridgebrook development) and Centre Road with Maple Brook Drive were also reviewed under future horizon periods.

Results of the operational analyses indicate that the study intersections currently provide excellent operations (LOS B or better) under existing conditions and are expected to provide good operations (LOS C or better) through the 2038 horizon. No improvements were found to be required to accommodate the proposed development.

The future intersection of Centre Road with Street "J" and with Maple Brook Drive were each found to provide excellent operations (LOS B or better) through the 2038 horizon, both with and without the subject development present.

Overall, the proposed development is not expected to have a material impact on the adjacent road network.

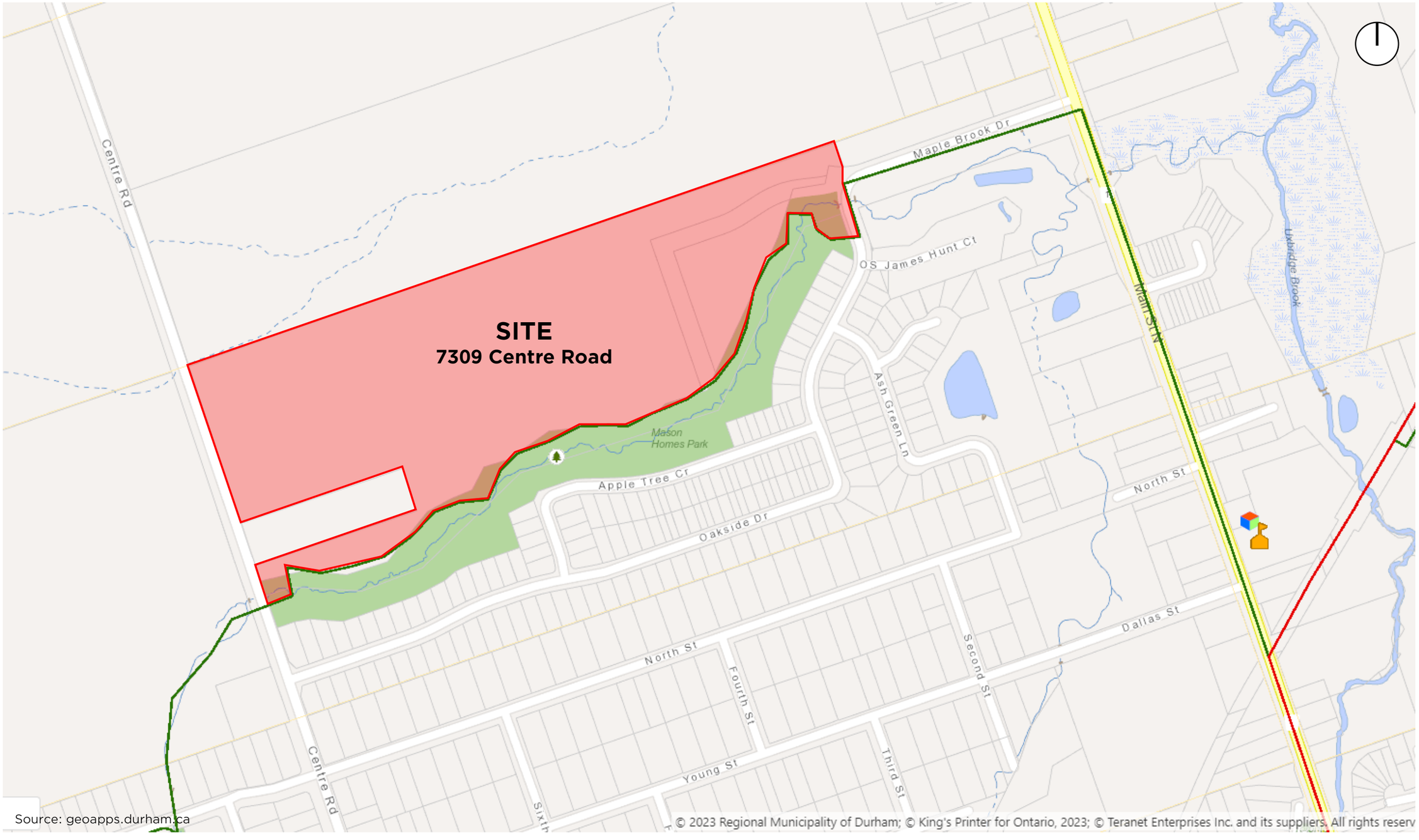
Sight Lines

Sight lines on Centre Road and Maple Brook Drive were reviewed in context of TAC requirements for minimum stopping sight and intersection sight distances. Based on the review, sight lines on Centre Road were found to be somewhat deficient to/from the south at the future intersection with Maple Brook Drive in context of the existing 80 km/ posted speed limit. It is recommended that the speed limit on that section of Centre Road be reduced to 60 km/h to ensure sufficient sight distance is provided.

Turn Lanes

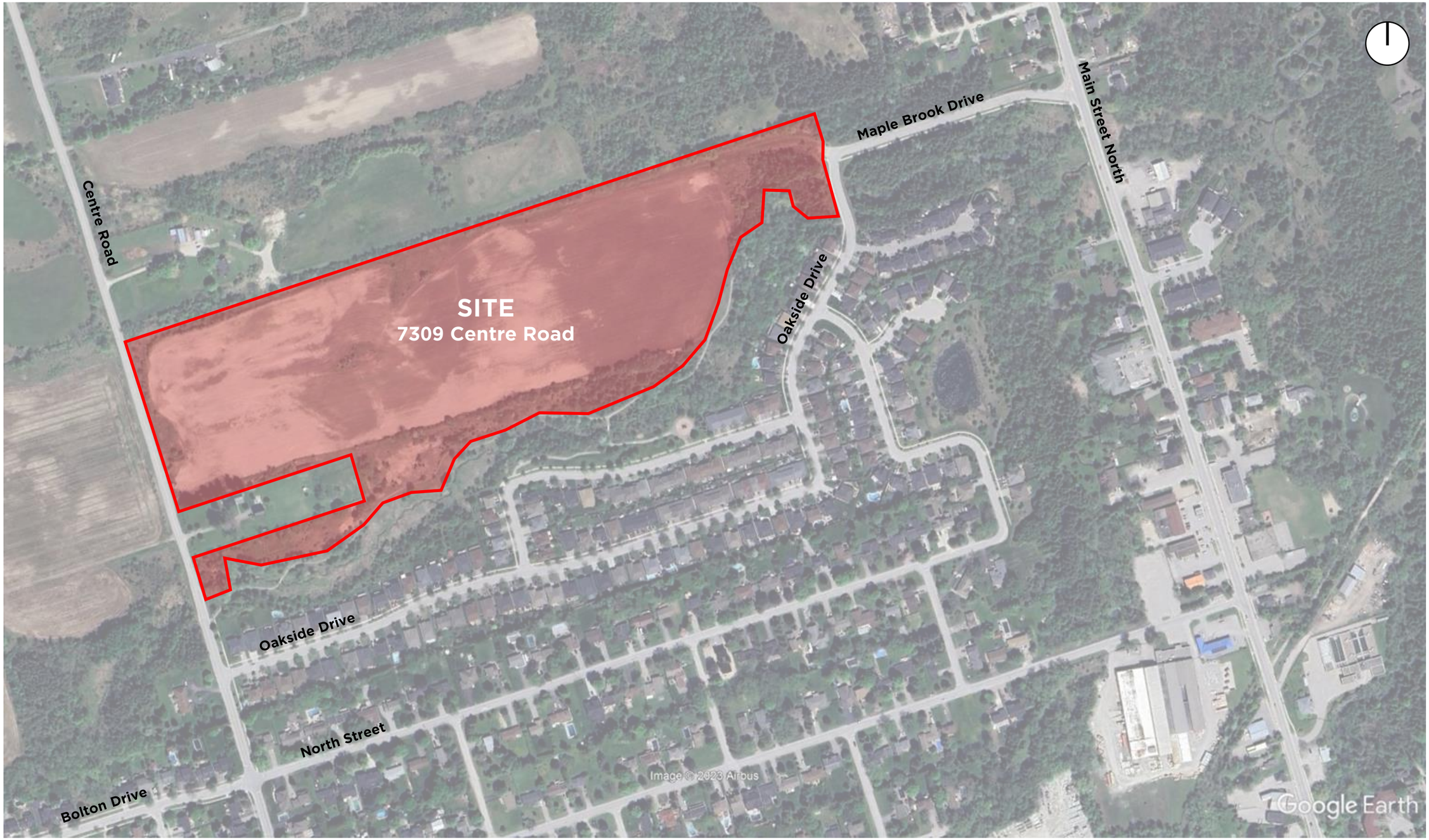
The need for exclusive turn lanes on Centre Road and Main Street North were reviewed in context of MTO requirements for auxiliary turn lanes. Based on the review, an exclusive northbound left

turn lane with 25 metres of storage is warranted on Main Street North at Maple Brook Drive to serve the projected 2038 total traffic volumes. Given that the corresponding left turn volumes include volumes that are not related to the subject development, the responsibility for the left turn lane should not lie solely with the developer. No other turn lanes were found to be necessary to accommodate the proposed development through the 2038 horizon.



MAPLE BRIDGE PHASE 2 – TRAFFIC IMPACT STUDY

Figure 1: Site Location

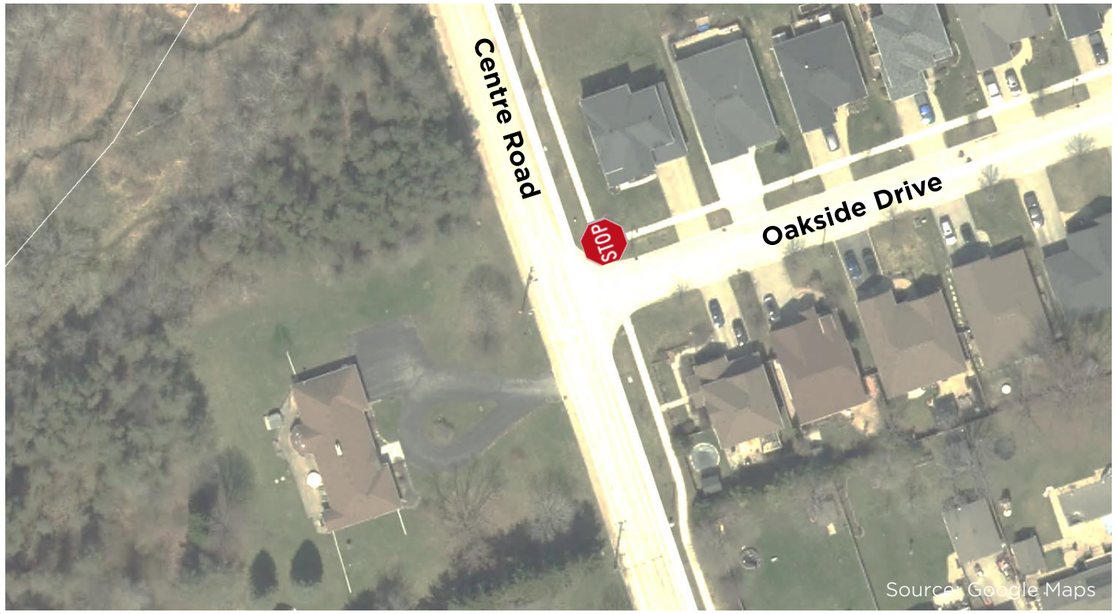


MAPLE BRIDGE PHASE 2 – TRAFFIC IMPACT STUDY

Figure 2A: Road Network

Intersection of Maple Brook Drive & Oakside Drive

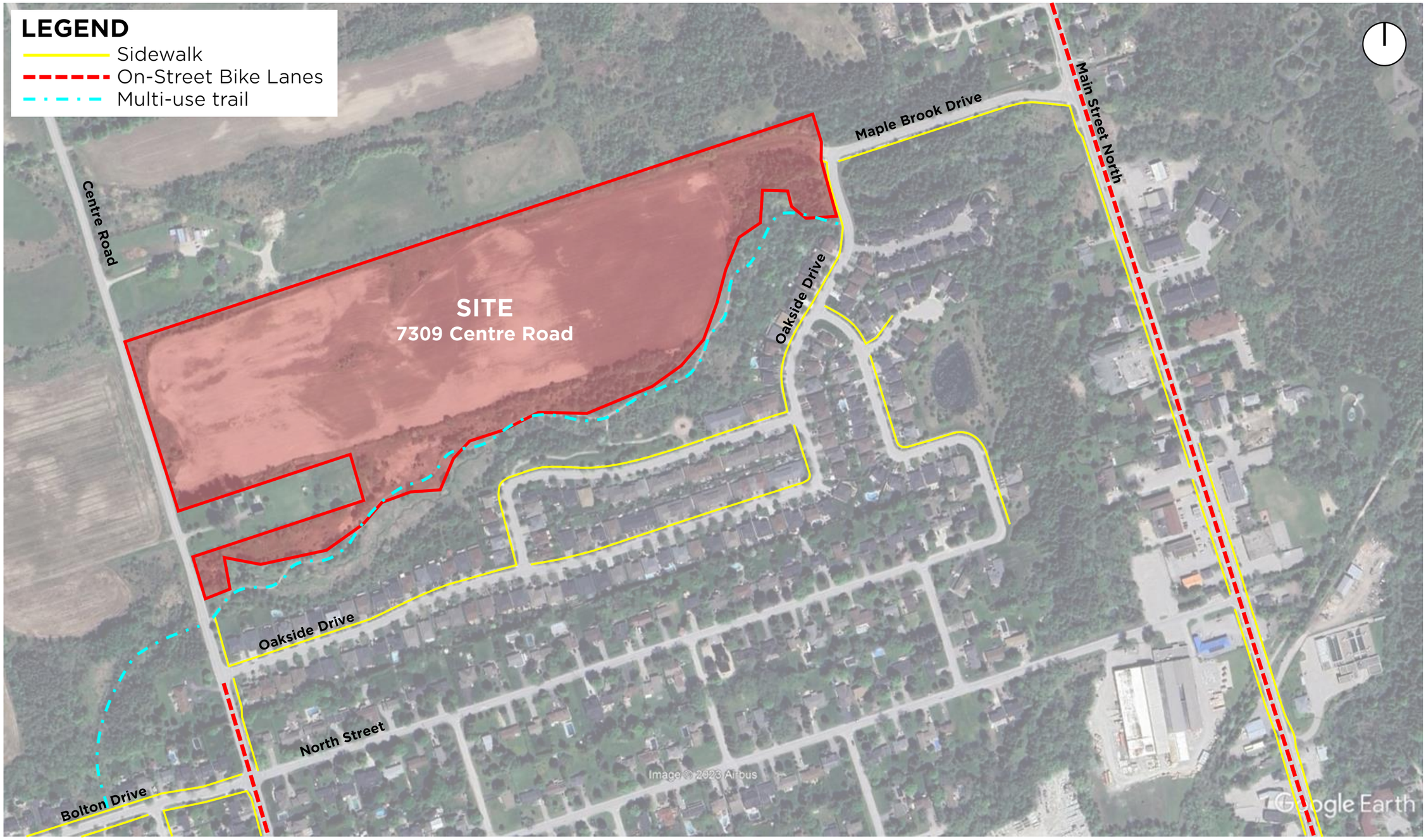
Intersection of Main Street North & Maple Brook Drive



Intersection of Centre Road & Oakside Drive

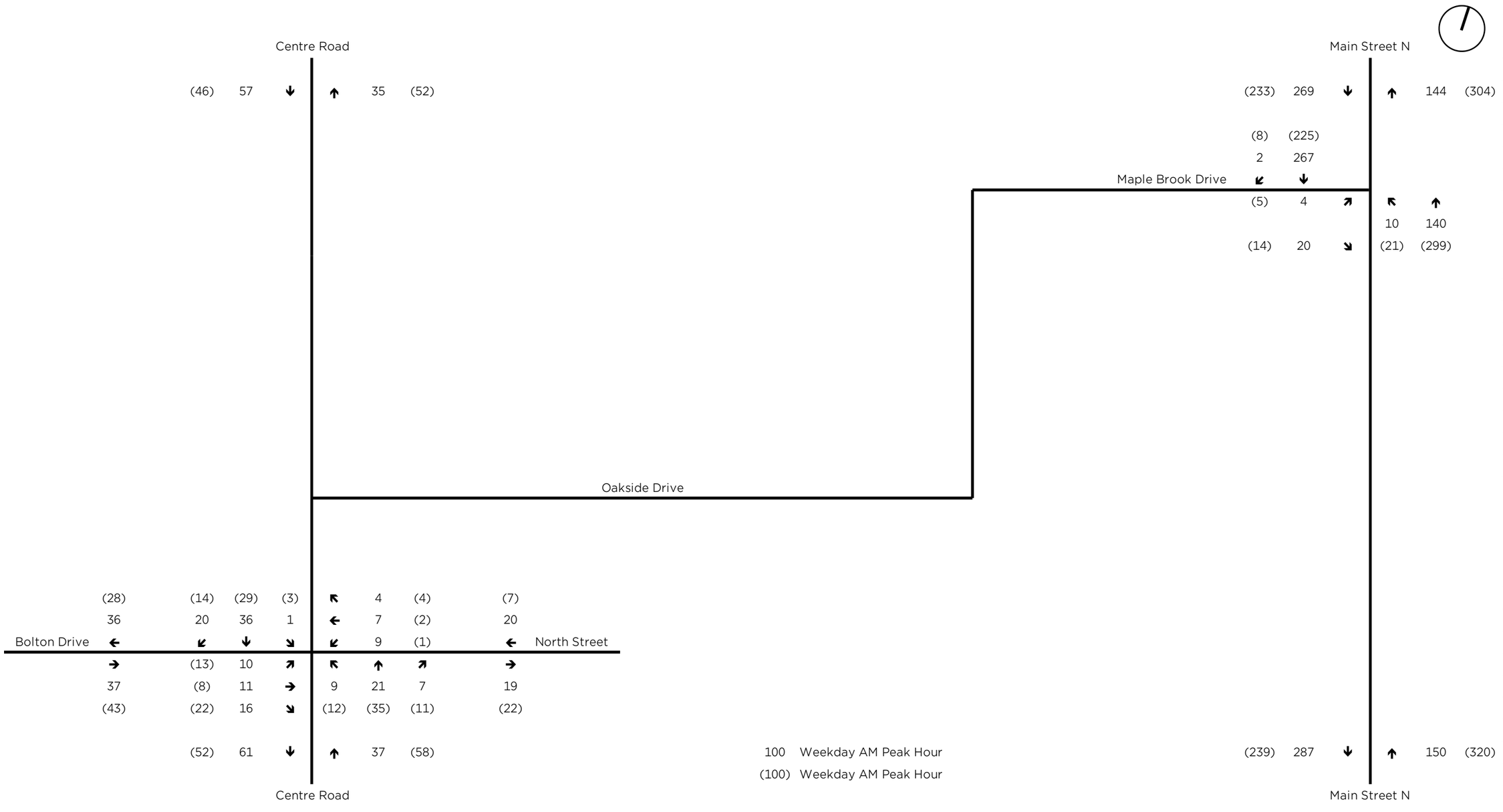
MAPLE BRIDGE PHASE 2 – TRAFFIC IMPACT STUDY

Figure 2B: Road Network



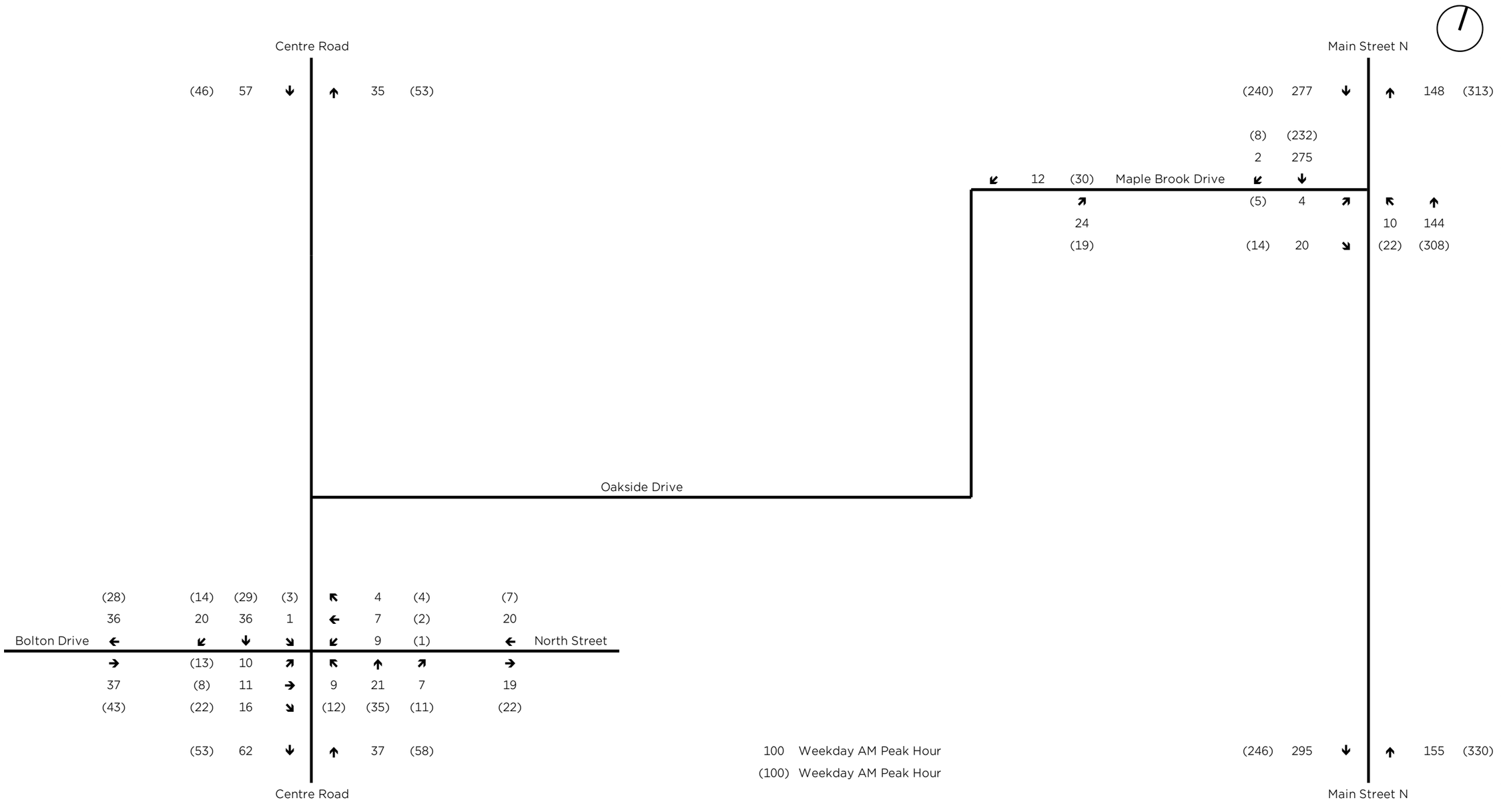
MAPLE BRIDGE PHASE 2 – TRAFFIC IMPACT STUDY

Figure 3: Active Transportation Network



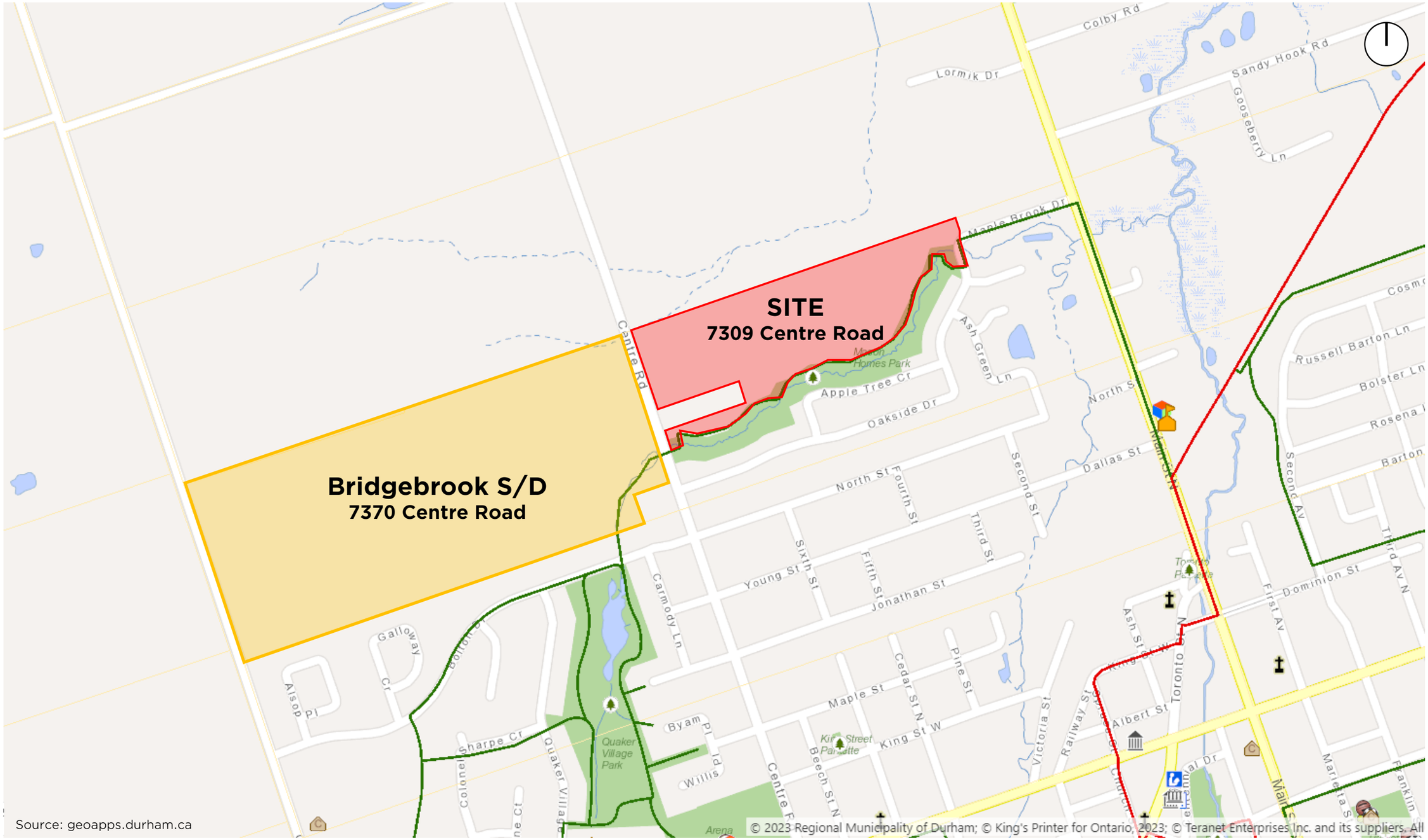
MAPLE BRIDGE PHASE 2 – TRAFFIC IMPACT STUDY

Figure 4: Traffic Volumes – 2023 (Observed)



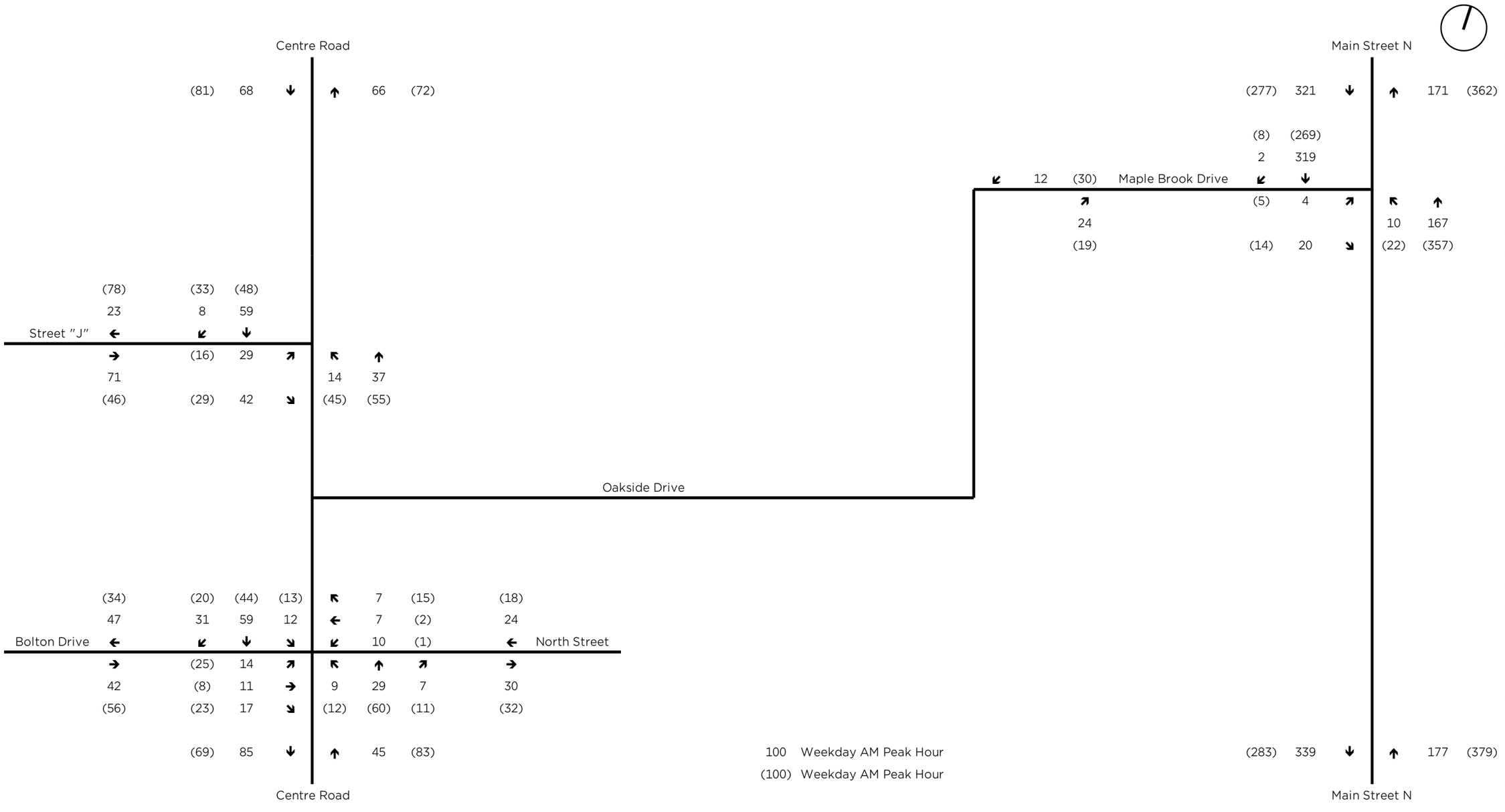
MAPLE BRIDGE PHASE 2 – TRAFFIC IMPACT STUDY

Figure 5: Traffic Volumes – 2024



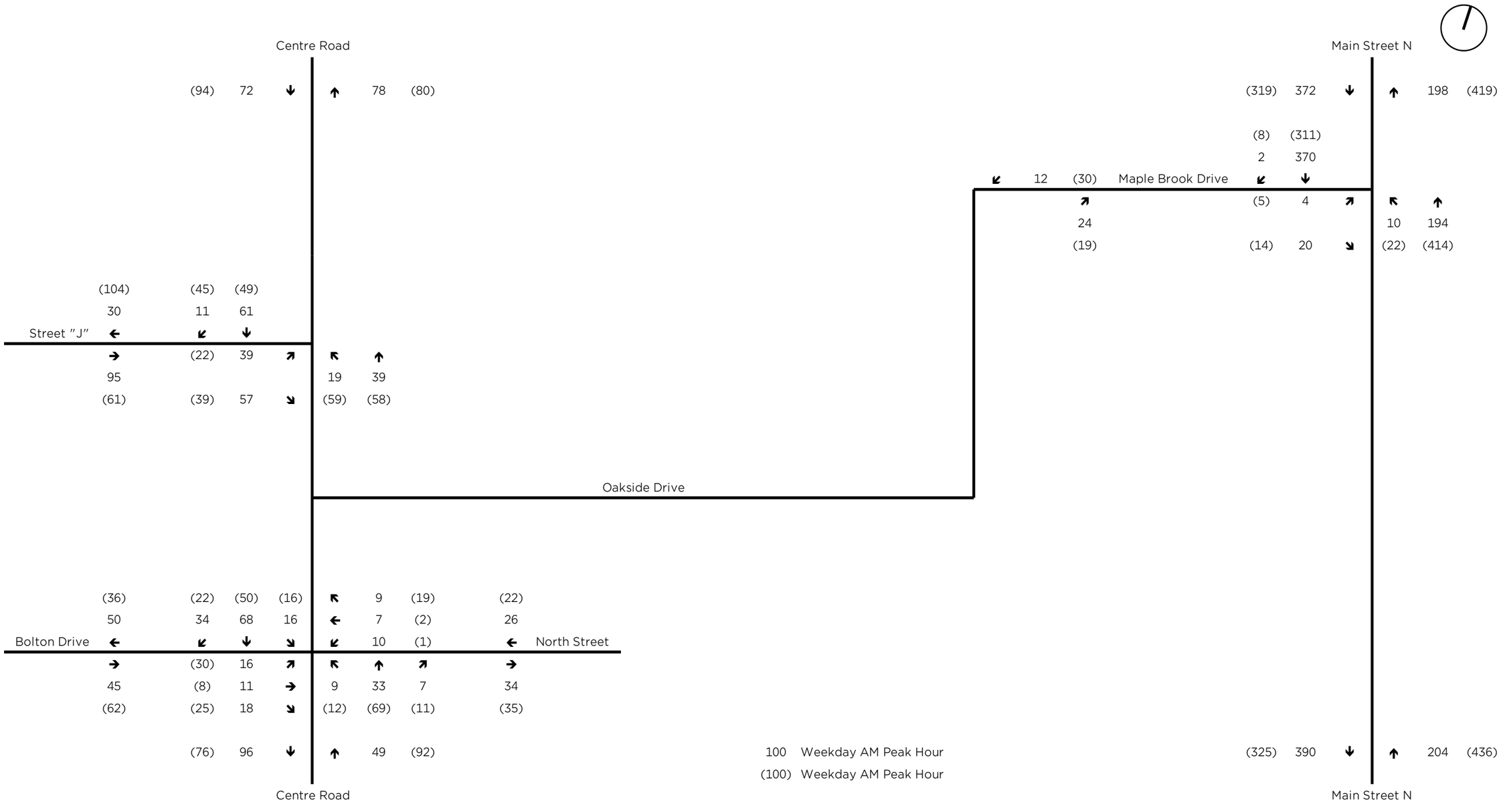
MAPLE BRIDGE PHASE 2 – TRAFFIC IMPACT STUDY

Figure 6: Background Development Location



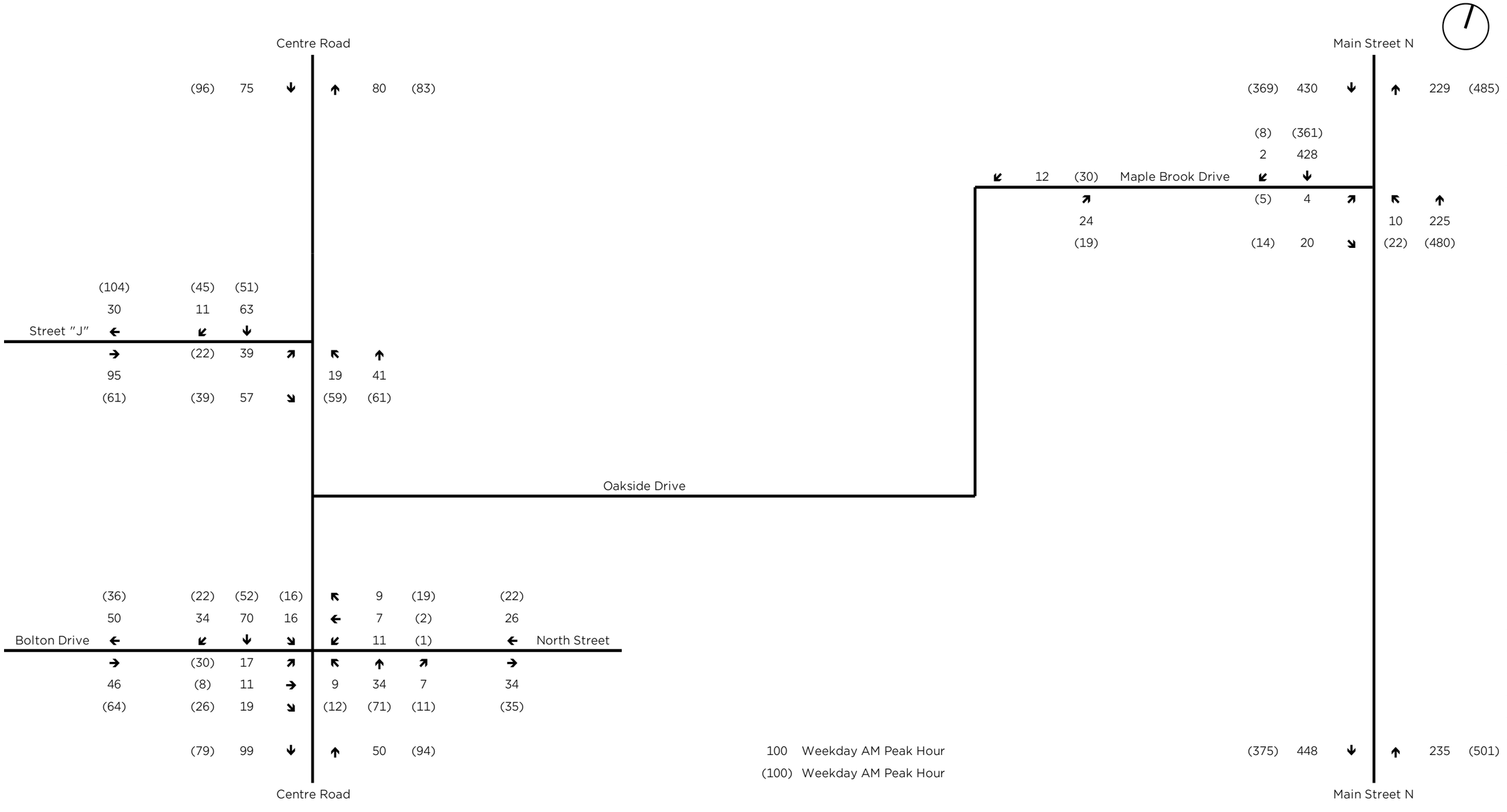
MAPLE BRIDGE PHASE 2 – TRAFFIC IMPACT STUDY

Figure 7: Traffic Volumes – 2028 Background



MAPLE BRIDGE PHASE 2 – TRAFFIC IMPACT STUDY

Figure 8: Traffic Volumes – 2033 Background

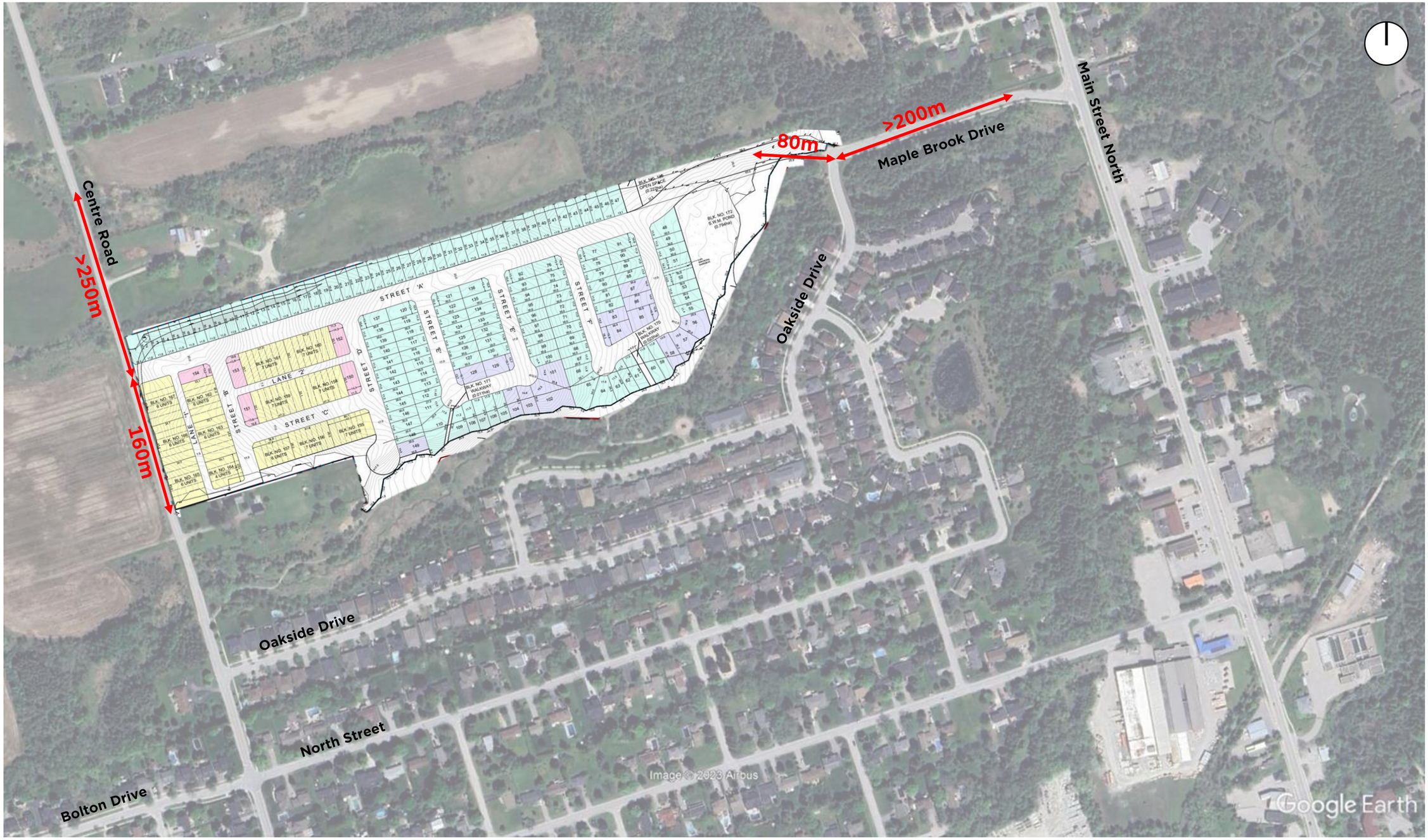


MAPLE BRIDGE PHASE 2 – TRAFFIC IMPACT STUDY

Figure 9: Traffic Volumes – 2038 Background

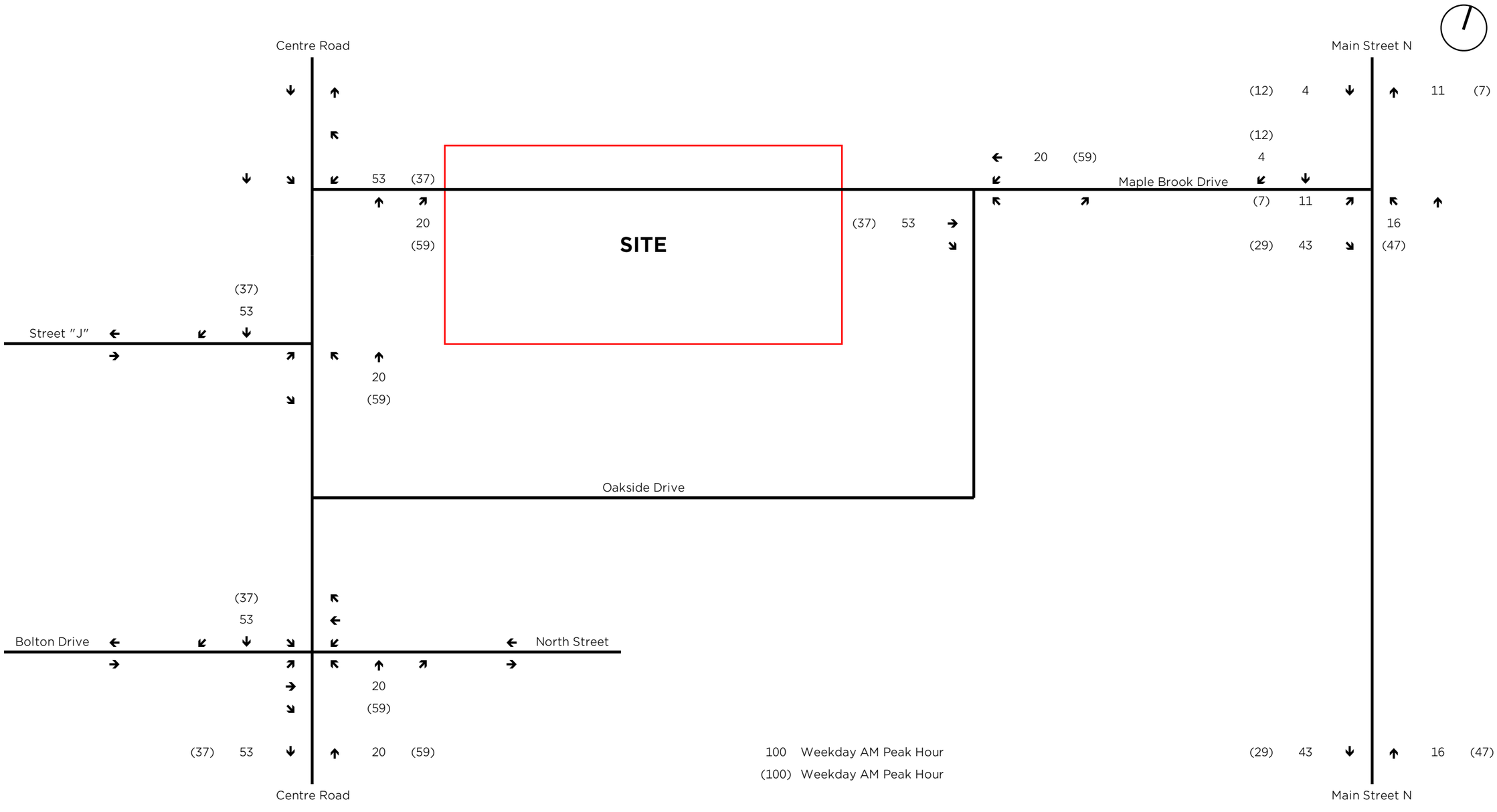
MAPLE BRIDGE PHASE 2 – TRAFFIC IMPACT STUDY

Figure 10: Concept Plan



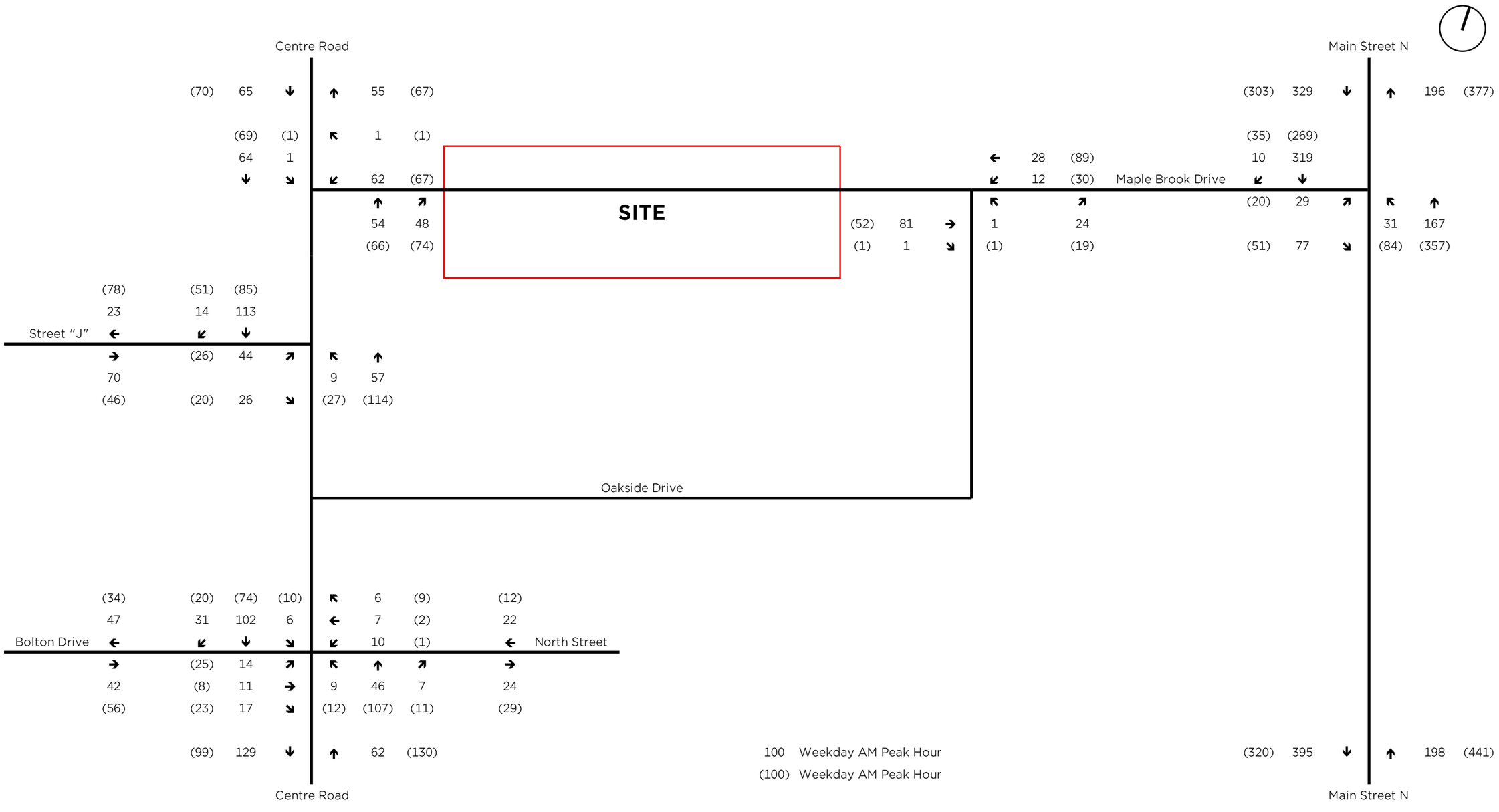
MAPLE BRIDGE PHASE 2 – TRAFFIC IMPACT STUDY

Figure 11: Available Sight Lines



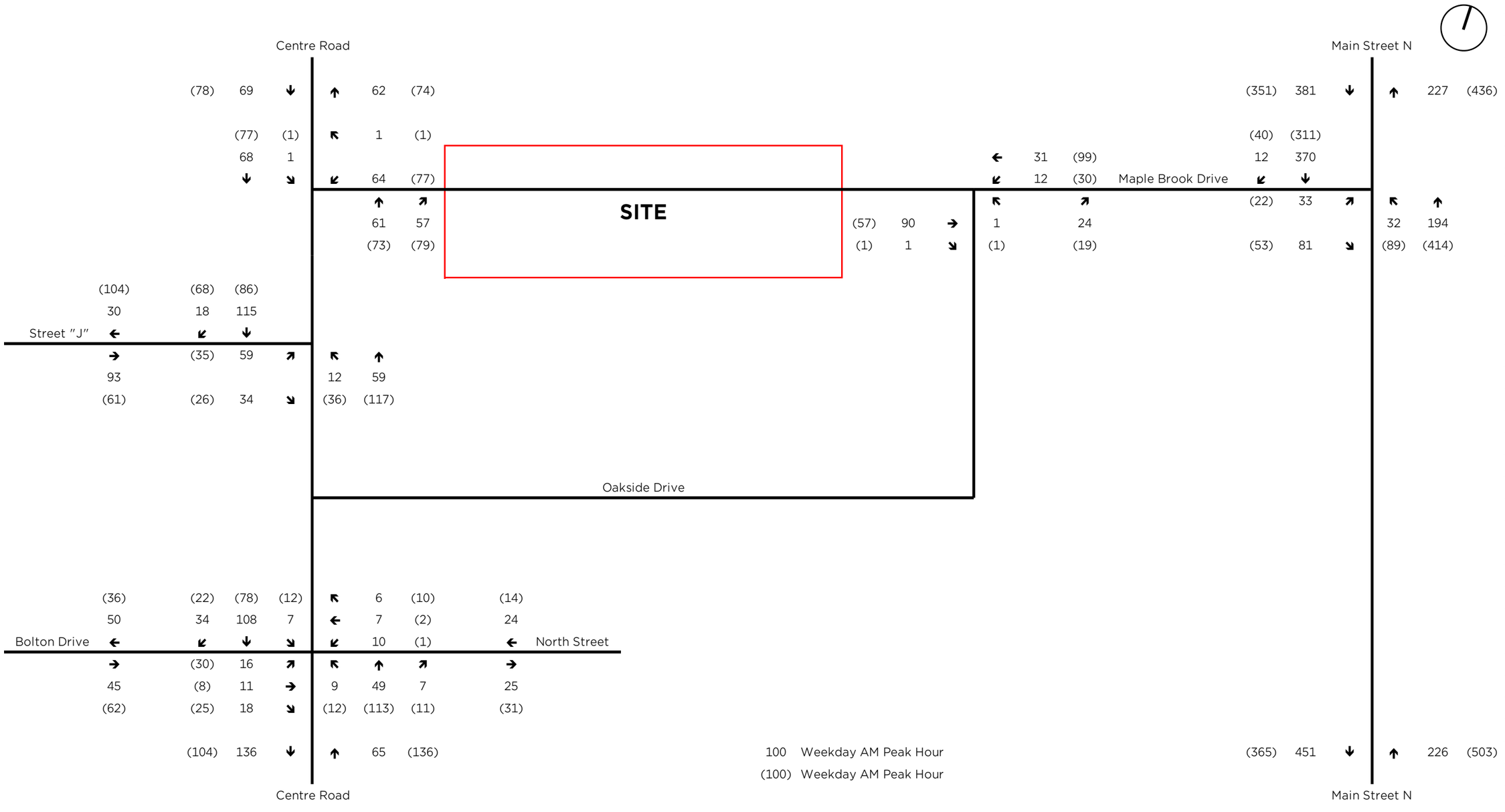
MAPLE BRIDGE PHASE 2 – TRAFFIC IMPACT STUDY

Figure 12: Site Traffic



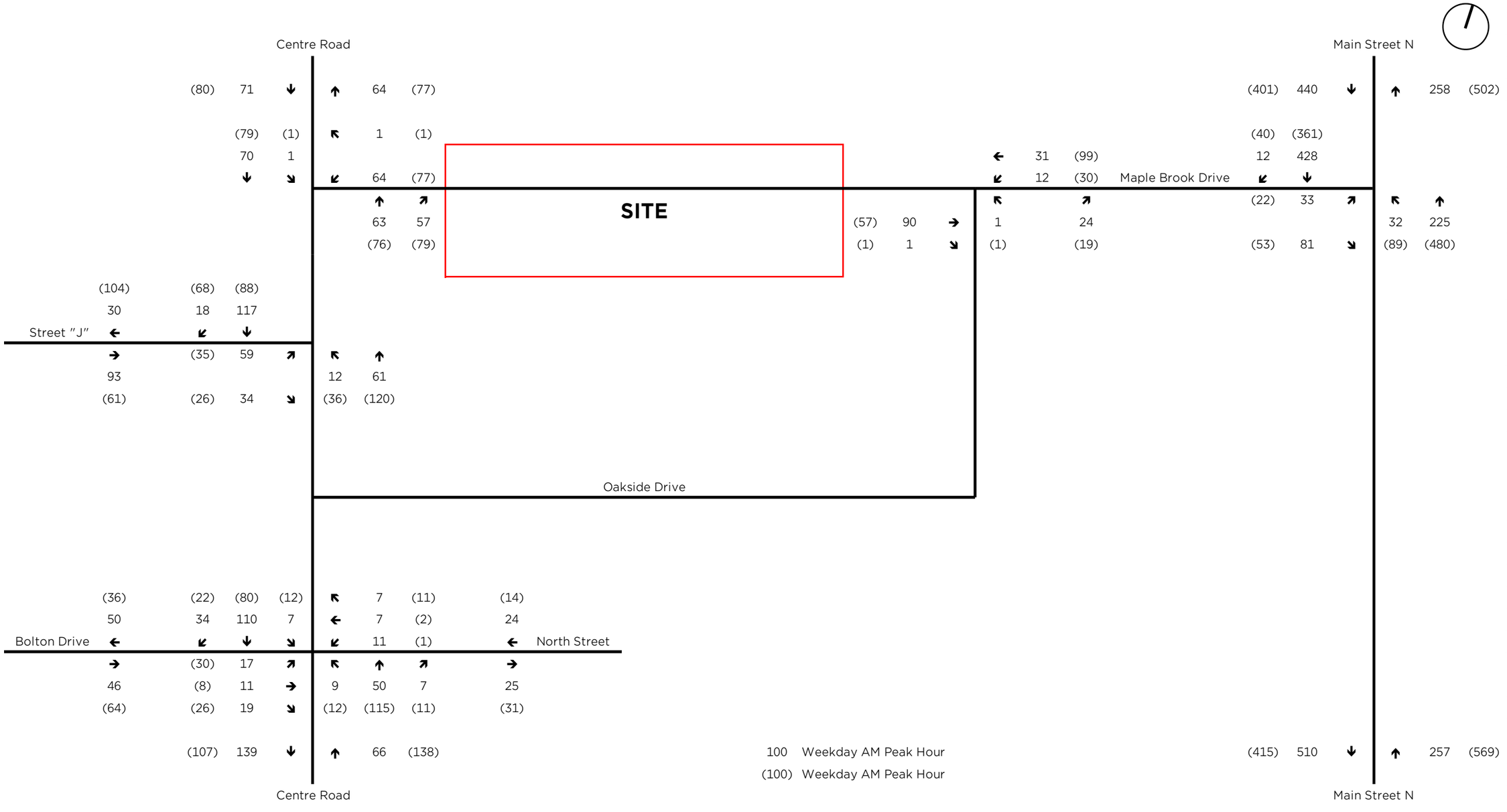
MAPLE BRIDGE PHASE 2 – TRAFFIC IMPACT STUDY

Figure 13: Traffic Volumes – 2028 Total



MAPLE BRIDGE PHASE 2 – TRAFFIC IMPACT STUDY

Figure 14: Traffic Volumes – 2033 Total



MAPLE BRIDGE PHASE 2 – TRAFFIC IMPACT STUDY

Figure 15: Traffic Volumes – 2038 Total

Appendix A:
Study Terms of Reference

From: Kyle Rainbow
Sent: Wednesday, September 13, 2023 4:28 PM
To: Matthew Buttrum
Cc: Jennifer Beer
Subject: Fw: 7309 Centre Road Development

Hi Matthew,

Please see our engineering consultant's comments on the ToR below in red.

Regards,

- Kyle

Kyle Rainbow | Director, Development Services

The Township of Uxbridge | 51 Toronto St | Uxbridge, ON L9P 1T1
647-528-3522 | krainbow@uxbridge.ca | ***http://uxbridge.ca/***

Book time to meet with me

From: Teefy, Jim <Jim.Teefy@aecom.com>
Sent: Wednesday, September 13, 2023 3:48 PM
To: Jennifer Beer <jbeer@uxbridge.ca>; Kyle Rainbow <krainbow@uxbridge.ca>
Subject: FW: 7309 Centre Road Development

Comments of terms of reference.

Jim Teefy, P.Eng
Project Engineer

Cell 905-213-4121
jim.teefy@aecom.com

AECOM
300 Water Street
Whitby
Ontario Canada L1N 9J2
www.aecom.com

From: Kyle Rainbow <krainbow@uxbridge.ca>
Sent: August-01-23 4:32 PM

To: Teefy, Jim <Jim.Teefy@aecom.com>
Subject: FW: 7309 Centre Road Development

Hi Jim – another ToR for your Transportation group to look at.

Thank you,

- Kyle

Kyle Rainbow | Director, Development Services

The Township of Uxbridge | 51 Toronto St | Uxbridge, ON L9P 1T1
647-528-3522 | krainbow@uxbridge.ca | ***http://uxbridge.ca/***

From: Matthew Buttrum <mbuttrum@tathameng.com>
Sent: Thursday, July 20, 2023 10:48 AM
To: Kyle Rainbow <krainbow@uxbridge.ca>
Subject: 7309 Centre Road Development

Hi Kyle,

Per your instructions during our phone call yesterday, I have prepared a Terms of Reference for the development proposed at 7309 Centre Road for Township review and acceptance.

Development Description

The proposed development is located at 7309 Centre Road in the Township of Uxbridge, and is generally bounded by Centre Road to the west, Maple Bridge Trail to the south and east, and the property at 7479 Centre Road to the north.
The proposed development consists of a mix of 127 single detached units and 81 townhouse units, for a total of 208 new residential units. Access to the external road network will be provided by Maple Brook Drive, which will be extended westward to Centre Road from its current terminus at Oakside Drive.

Terms of Reference

1. Study area to consist of the following intersections:
    a. Main Street North with Maple Brook Drive;
    b. Maple Brook Drive with Oakside Drive;
    c. Centre Road with Bolton Drive/North Street;
    d. Centre Road with Maple Brook Drive (future intersection) Note that there is a proposed subdivision across Centre Road from the subject development. As per the draft plan of that subdivision, there is a proposed street, called Street "A" that is proposed to intersect and provide access off Centre Road. As part of the traffic impact study (TIS), the Consultant should assess need for inclusion of that future intersection in the study area of the TIS.
2. Study Horizons – 2023 (existing), 2028 (full-build out), and 5 and 10-year horizons beyond full build-out (2033 and 2038). The Consultant should confirm that the subject development would be constructed in a single phase otherwise, additional horizons may need to be considered.
3. Traffic volumes will be established based on counts conducted at each study area intersection. New traffic counts will be conducted at each study intersection if recent count data is not available. Traffic counts that are more than three years old and / or collected between March 2020 (i.e., the start of the pandemic) through March 2022 should not be used.
4. Establish future background volumes through application of general background growth (annual growth based on historic and projected population and traffic growth) with explicit consideration given to other planned developments in the area. The Township will be contacted to supply information regarding any such developments in the area. The Consultant should also obtain

information on any planned road improvements in the vicinity of the subject development and if any, incorporate their impacts into the TIS.

5. Provide details of the proposed development and estimate trip generation based on trip rates contained within the *ITE Trip Generation Manual, 11th Edition*. Trips will be distributed based on available distribution data, the location of the site in relation to the built-up area of Uxbridge, surrounding employment centres and expected travel patterns and routes. The anticipated trip generation, distribution, and assignment is illustrated in the figure attached to this email. The Consultant should use the information from the Transportation Tomorrow Survey (TTS) to support the assumed trip distribution and assignment to the study area road network. Note that the anticipated trip generation, distribution, and assignment information presented by the Consultant along with this draft TIS Terms of Reference have not been reviewed by the Township at this time.
6. Assess operations of the study area intersections considering weekday AM and weekday PM peak periods. Operations will be assessed under existing (2023) conditions and at the future horizons noted above, both without and with the subject development. Any improvements required to support either existing, background or total conditions will be identified. The potential implications of the identified improvements should also be assessed and documented in the TIS report.
7. Review site access configuration in context of relevant design standards.
8. Conduct a sight line assessment at the future intersection on Centre Road in context of relevant standards (Township or TAC). The Consultant should also undertake sightline assessment at the intersection of Maple Brook Drive and Oakside Drive.
9. Review internal circulation. As part of this review, the Consultant should also assess need for and identify appropriate improvements (e.g., traffic calming, traffic control devices, etc.) on the internal roads and intersections of the proposed development.
10. Document the findings of the above work into a Traffic Impact Study for submission to the Township for review and approval.

The Terms of Reference should also include a task to confirm that the proposed number and type of parking spaces meet the Township's minimum parking requirements. Also, the TIS should speak to provisions for non-motorized modes of transportation: pedestrians and cyclists.

Please review the above and let me know if you have any questions or comments. I look forward to hearing back from you.

Thank you,

TATHAM ENGINEERING

Matthew Buttrum EIT
Engineering Intern

mbuttrum@tathameng.com **T** 705-733-9037 x2222
41 king Street, Unit 4, Barrie, Ontario L4N 6B5

tathameng.com

Appendix B:
Traffic Counts

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

Municipality: Uxbridge
Site #: 2320100001
Intersection: Centre Rd & Bolton Dr
TFR File #: 1
Count date: 12-Sep-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Centre Rd runs N/S

North Leg Total: 92
North Entering: 57
North Peds: 0
Peds Cross: ⋈

Buses	0	0	0	0
Trucks	0	0	0	0
Cars	20	36	1	57
Totals	20	36	1	

Buses	2
Trucks	0
Cars	33
Totals	35

East Leg Total: 39
East Entering: 20
East Peds: 0
Peds Cross: ⧖

Centre Rd

Buses	Trucks	Cars	Totals
1	0	35	36

Bolton Dr

Cars	Trucks	Buses	Totals
3	0	1	4
7	0	0	7
9	0	0	9
19	0	1	

N
W E
S

Buses	Trucks	Cars	Totals
1	0	9	10
1	0	10	11
0	0	16	16
2	0	35	

North St

Cars	Trucks	Buses	Totals
18	0	1	19

Centre Rd

Peds Cross: ⧖
West Peds: 0
West Entering: 37
West Leg Total: 73

Cars	61
Trucks	0
Buses	0
Totals	61

Cars	8	21	7	36
Trucks	0	0	0	0
Buses	1	0	0	1
Totals	9	21	7	

Peds Cross: ⋈
South Peds: 0
South Entering: 37
South Leg Total: 98

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 15:45:00
To: 16:45:00

Municipality: Uxbridge
Site #: 2320100001
Intersection: Centre Rd & Bolton Dr
TFR File #: 1
Count date: 12-Sep-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

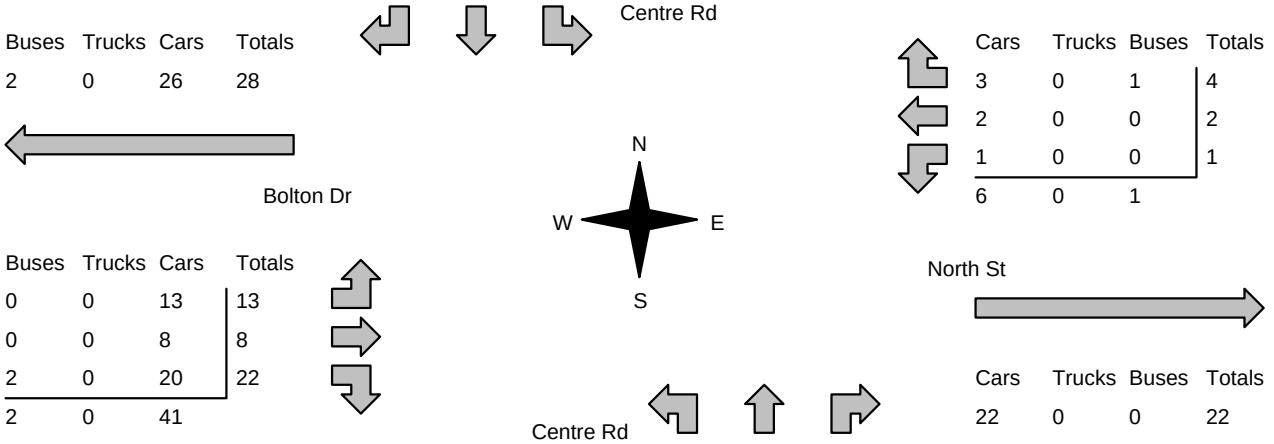
Major Road: Centre Rd runs N/S

North Leg Total: 98
North Entering: 46
North Peds: 2
Peds Cross: ⋈

Buses	1	0	0	1
Trucks	0	0	0	0
Cars	13	29	3	45
Totals	14	29	3	

Buses	1
Trucks	0
Cars	51
Totals	52

East Leg Total: 29
East Entering: 7
East Peds: 2
Peds Cross: ⧗



Buses	Trucks	Cars	Totals
2	0	26	28

Cars	Trucks	Buses	Totals
3	0	1	4
2	0	0	2
1	0	0	1
6	0	1	

Buses	Trucks	Cars	Totals
0	0	13	13
0	0	8	8
2	0	20	22
2	0	41	

Cars	Trucks	Buses	Totals
22	0	0	22

Peds Cross: ⧗
West Peds: 1
West Entering: 43
West Leg Total: 71

Cars	50			
Trucks	0			
Buses	2			
Totals	52			

Cars	11	35	11	57
Trucks	0	0	0	0
Buses	1	0	0	1
Totals	12	35	11	

Peds Cross: ⋈
South Peds: 2
South Entering: 58
South Leg Total: 110

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Total Count Diagram

Municipality: Uxbridge
Site #: 2320100001
Intersection: Centre Rd & Bolton Dr
TFR File #: 1
Count date: 12-Sep-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Centre Rd runs N/S

North Leg Total: 428
North Entering: 228
North Peds: 18
Peds Cross: ⋈

Buses	2	2	0	4
Trucks	2	2	0	4
Cars	62	151	7	220
Totals	66	155	7	

Buses	5
Trucks	0
Cars	195
Totals	200

East Leg Total: 168
East Entering: 69
East Peds: 10
Peds Cross: ⧖

Centre Rd

Buses	Trucks	Cars	Totals
4	3	145	152

Bolton Dr

Cars	Trucks	Buses	Totals
12	0	2	14
29	0	0	29
26	0	0	26
67	0	2	

N
W E
S

Buses	Trucks	Cars	Totals
3	0	57	60
1	1	43	45
4	1	91	96
8	2	191	

North St

Cars	Trucks	Buses	Totals
96	2	1	99

Centre Rd

Peds Cross: ⧖
West Peds: 13
West Entering: 201
West Leg Total: 353

Cars	268
Trucks	3
Buses	6
Totals	277

Cars	54	126	46	226
Trucks	1	0	1	2
Buses	2	0	0	2
Totals	57	126	47	

Peds Cross: ⋈
South Peds: 11
South Entering: 230
South Leg Total: 507

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Traffic Count Summary

Intersection: Centre Rd & Bolton Dr | **Count Date:** 12-Sep-23 | **Municipality:** Uxbridge

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	0	15	9	24	4
9:00:00	1	44	17	62	1
10:00:00	1	20	12	33	2
15:00:00	0	0	0	0	0
16:00:00	3	21	12	36	4
17:00:00	1	30	14	45	2
18:00:00	1	25	2	28	5
Totals:	7	155	66	228	18

North/South Total Approaches: 458

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	5	14	3	22	0
9:00:00	8	14	6	28	0
10:00:00	10	8	5	23	1
15:00:00	0	0	0	0	0
16:00:00	14	20	11	45	4
17:00:00	11	30	12	53	4
18:00:00	9	40	10	59	2
S Totals:	57	126	47	230	11

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	4	7	0	11	1
9:00:00	9	5	4	18	0
10:00:00	2	2	1	5	0
15:00:00	0	0	0	0	0
16:00:00	4	5	4	13	3
17:00:00	1	3	3	7	4
18:00:00	6	7	2	15	2
Totals:	26	29	14	69	10

East/West Total Approaches: 270

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	3	12	11	26	1
9:00:00	11	7	12	30	1
10:00:00	13	9	27	49	2
15:00:00	0	0	0	0	0
16:00:00	11	8	20	39	4
17:00:00	11	6	15	32	1
18:00:00	11	3	11	25	4
W Totals:	60	45	96	201	13

Calculated Values for Traffic Crossing Major Street

Hours Ending:	7:00	8:00	9:00	10:00	15:00	16:00	17:00	18:00
Crossing Values:	0	23	28	27	0	31	24	31

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 12-Sep-23 Site #: 2320100001

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Buses - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
7:30:00	0	0	8	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2	1
7:45:00	0	0	12	4	4	2	0	0	0	0	0	0	0	0	0	0	0	0	4	2
8:00:00	0	0	15	3	9	5	0	0	0	0	0	0	0	0	0	0	0	0	4	0
8:15:00	0	0	32	17	16	7	0	0	0	0	0	0	0	0	0	0	0	0	4	0
8:30:00	0	0	40	8	19	3	0	0	0	0	0	0	0	0	0	0	0	0	4	0
8:45:00	1	1	48	8	24	5	0	0	0	0	0	0	0	0	0	0	0	0	4	0
9:00:00	1	0	57	9	26	2	0	0	0	0	0	0	0	0	2	2	0	0	5	1
9:15:00	1	0	66	9	29	3	0	0	0	0	0	0	0	0	2	0	0	0	5	0
9:30:00	2	1	70	4	32	3	0	0	1	1	0	0	0	0	2	0	0	0	6	1
9:45:00	2	0	71	1	36	4	0	0	1	0	0	0	0	0	2	0	0	0	6	0
10:00:00	2	0	76	5	38	2	0	0	1	0	0	0	0	0	2	0	0	0	7	1
10:15:00	2	0	76	0	38	0	0	0	1	0	0	0	0	0	2	0	0	0	7	0
15:00:00	2	0	76	0	38	0	0	0	1	0	0	0	0	0	2	0	0	0	7	0
15:15:00	2	0	78	2	38	0	0	0	1	0	0	0	0	0	2	0	0	0	10	3
15:30:00	2	0	85	7	40	2	0	0	1	0	1	1	0	0	2	0	0	0	10	0
15:45:00	3	1	91	6	42	2	0	0	2	1	2	1	0	0	2	0	1	1	11	1
16:00:00	5	2	96	5	47	5	0	0	2	0	2	0	0	0	2	0	1	0	11	0
16:15:00	5	0	107	11	48	1	0	0	2	0	2	0	0	0	2	0	1	0	13	2
16:30:00	6	1	115	8	51	3	0	0	2	0	2	0	0	0	2	0	2	1	13	0
16:45:00	6	0	120	5	55	4	0	0	2	0	2	0	0	0	2	0	2	0	13	0
17:00:00	6	0	126	6	60	5	0	0	2	0	2	0	0	0	2	0	2	0	13	0
17:15:00	6	0	132	6	62	2	0	0	2	0	2	0	0	0	2	0	2	0	13	0
17:30:00	6	0	134	2	62	0	0	0	2	0	2	0	0	0	2	0	2	0	13	0
17:45:00	6	0	143	9	62	0	0	0	2	0	2	0	0	0	2	0	2	0	14	1
18:00:00	7	1	151	8	62	0	0	0	2	0	2	0	0	0	2	0	2	0	18	4
18:15:00	7	0	151	0	62	0	0	0	2	0	2	0	0	0	2	0	2	0	18	0
18:15:15	7	0	151	0	62	0	0	0	2	0	2	0	0	0	2	0	2	0	18	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 12-Sep-23 Site #: 2320100001

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Buses - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	1	1	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	1	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
8:00:00	4	3	7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8:15:00	7	3	9	2	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1	0
8:30:00	10	3	10	1	2	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0
8:45:00	10	0	11	1	3	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0
9:00:00	13	3	12	1	3	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
9:15:00	13	0	12	0	3	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
9:30:00	13	0	13	1	3	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
9:45:00	15	2	13	0	4	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0
10:00:00	15	0	14	1	4	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
10:15:00	15	0	14	0	4	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
15:00:00	15	0	14	0	4	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
15:15:00	18	3	16	2	5	1	0	0	0	0	0	0	0	0	0	0	1	0	3	2
15:30:00	18	0	18	2	6	1	0	0	0	0	0	0	0	0	0	0	1	0	3	0
15:45:00	18	0	19	1	7	1	0	0	0	0	0	0	0	0	0	0	1	0	4	1
16:00:00	19	1	19	0	8	1	0	0	0	0	0	0	0	0	0	0	1	0	4	0
16:15:00	19	0	21	2	8	0	0	0	0	0	0	0	0	0	0	0	1	0	4	0
16:30:00	19	0	21	0	9	1	0	0	0	0	0	0	0	0	0	0	2	1	4	0
16:45:00	19	0	21	0	10	1	0	0	0	0	0	0	0	0	0	0	2	0	6	2
17:00:00	20	1	22	1	10	0	0	0	0	0	0	0	0	0	0	0	2	0	8	2
17:15:00	22	2	23	1	11	1	0	0	0	0	0	0	0	0	0	0	2	0	9	1
17:30:00	25	3	25	2	11	0	0	0	0	0	0	0	0	0	0	0	2	0	9	0
17:45:00	25	0	29	4	11	0	0	0	0	0	0	0	0	0	0	0	2	0	9	0
18:00:00	26	1	29	0	12	1	0	0	0	0	0	0	0	0	0	0	2	0	10	1
18:15:00	26	0	29	0	12	0	0	0	0	0	0	0	0	0	0	0	2	0	10	0
18:15:15	26	0	29	0	12	0	0	0	0	0	0	0	0	0	0	0	2	0	10	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 12-Sep-23 Site #: 2320100001

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Buses - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	2	2	6	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	5	3	14	8	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	9	4	18	4	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	9	0	24	6	9	2	0	0	0	0	0	0	1	1	0	0	0	0	0	0
8:45:00	10	1	27	3	9	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
9:00:00	12	2	28	1	9	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
9:15:00	14	2	32	4	10	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0
9:30:00	17	3	34	2	10	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
9:45:00	19	2	34	0	12	2	0	0	0	0	0	0	1	0	0	0	0	0	1	1
10:00:00	22	3	36	2	14	2	0	0	0	0	0	0	1	0	0	0	0	0	1	0
10:15:00	22	0	36	0	14	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
15:00:00	22	0	36	0	14	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
15:15:00	27	5	39	3	15	1	0	0	0	0	0	0	1	0	0	0	0	0	3	2
15:30:00	31	4	39	0	18	3	0	0	0	0	1	1	1	0	0	0	0	0	4	1
15:45:00	31	0	45	6	20	2	1	1	0	0	1	0	1	0	0	0	0	0	5	1
16:00:00	34	3	56	11	24	4	1	0	0	0	1	0	2	1	0	0	0	0	5	0
16:15:00	38	4	61	5	26	2	1	0	0	0	1	0	2	0	0	0	0	0	5	0
16:30:00	41	3	70	9	28	2	1	0	0	0	1	0	2	0	0	0	0	0	5	0
16:45:00	42	1	80	10	31	3	1	0	0	0	1	0	2	0	0	0	0	0	7	2
17:00:00	45	3	86	6	36	5	1	0	0	0	1	0	2	0	0	0	0	0	9	2
17:15:00	49	4	102	16	41	5	1	0	0	0	1	0	2	0	0	0	0	0	10	1
17:30:00	51	2	110	8	43	2	1	0	0	0	1	0	2	0	0	0	0	0	10	0
17:45:00	52	1	117	7	44	1	1	0	0	0	1	0	2	0	0	0	0	0	10	0
18:00:00	54	2	126	9	46	2	1	0	0	0	1	0	2	0	0	0	0	0	11	1
18:15:00	54	0	126	0	46	0	1	0	0	0	1	0	2	0	0	0	0	0	11	0
18:15:15	54	0	126	0	46	0	1	0	0	0	1	0	2	0	0	0	0	0	11	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 12-Sep-23 Site #: 2320100001

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Buses - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
7:30:00	2	1	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:45:00	2	0	5	4	4	2	0	0	0	0	0	0	0	0	0	0	1	1	1	0
8:00:00	3	1	11	6	10	6	0	0	0	0	0	0	0	0	1	1	1	0	1	0
8:15:00	6	3	13	2	15	5	0	0	0	0	0	0	1	1	1	0	1	0	1	0
8:30:00	10	4	14	1	17	2	0	0	0	0	0	0	1	0	1	0	1	0	1	0
8:45:00	11	1	15	1	20	3	0	0	0	0	0	0	1	0	1	0	1	0	1	0
9:00:00	13	2	18	3	22	2	0	0	0	0	0	0	1	0	1	0	1	0	2	1
9:15:00	19	6	21	3	41	19	0	0	0	0	0	0	2	1	1	0	1	0	2	0
9:30:00	23	4	25	4	43	2	0	0	0	0	0	0	3	1	1	0	1	0	3	1
9:45:00	24	1	25	0	44	1	0	0	0	0	0	0	3	0	1	0	1	0	3	0
10:00:00	24	0	27	2	49	5	0	0	0	0	0	0	3	0	1	0	1	0	4	1
10:15:00	24	0	27	0	49	0	0	0	0	0	0	0	3	0	1	0	1	0	4	0
15:00:00	24	0	27	0	49	0	0	0	0	0	0	0	3	0	1	0	1	0	4	0
15:15:00	26	2	27	0	53	4	0	0	1	1	1	1	3	0	1	0	2	1	7	3
15:30:00	28	2	27	0	56	3	0	0	1	0	1	0	3	0	1	0	2	0	7	0
15:45:00	29	1	29	2	59	3	0	0	1	0	1	0	3	0	1	0	2	0	8	1
16:00:00	35	6	34	5	66	7	0	0	1	0	1	0	3	0	1	0	3	1	8	0
16:15:00	36	1	35	1	69	3	0	0	1	0	1	0	3	0	1	0	3	0	9	1
16:30:00	39	3	36	1	73	4	0	0	1	0	1	0	3	0	1	0	4	1	9	0
16:45:00	42	3	37	1	79	6	0	0	1	0	1	0	3	0	1	0	4	0	9	0
17:00:00	46	4	40	3	80	1	0	0	1	0	1	0	3	0	1	0	4	0	9	0
17:15:00	49	3	41	1	85	5	0	0	1	0	1	0	3	0	1	0	4	0	10	1
17:30:00	51	2	42	1	87	2	0	0	1	0	1	0	3	0	1	0	4	0	10	0
17:45:00	56	5	43	1	89	2	0	0	1	0	1	0	3	0	1	0	4	0	10	0
18:00:00	57	1	43	0	91	2	0	0	1	0	1	0	3	0	1	0	4	0	13	3
18:15:00	57	0	43	0	91	0	0	0	1	0	1	0	3	0	1	0	4	0	13	0
18:15:15	57	0	43	0	91	0	0	0	1	0	1	0	3	0	1	0	4	0	13	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

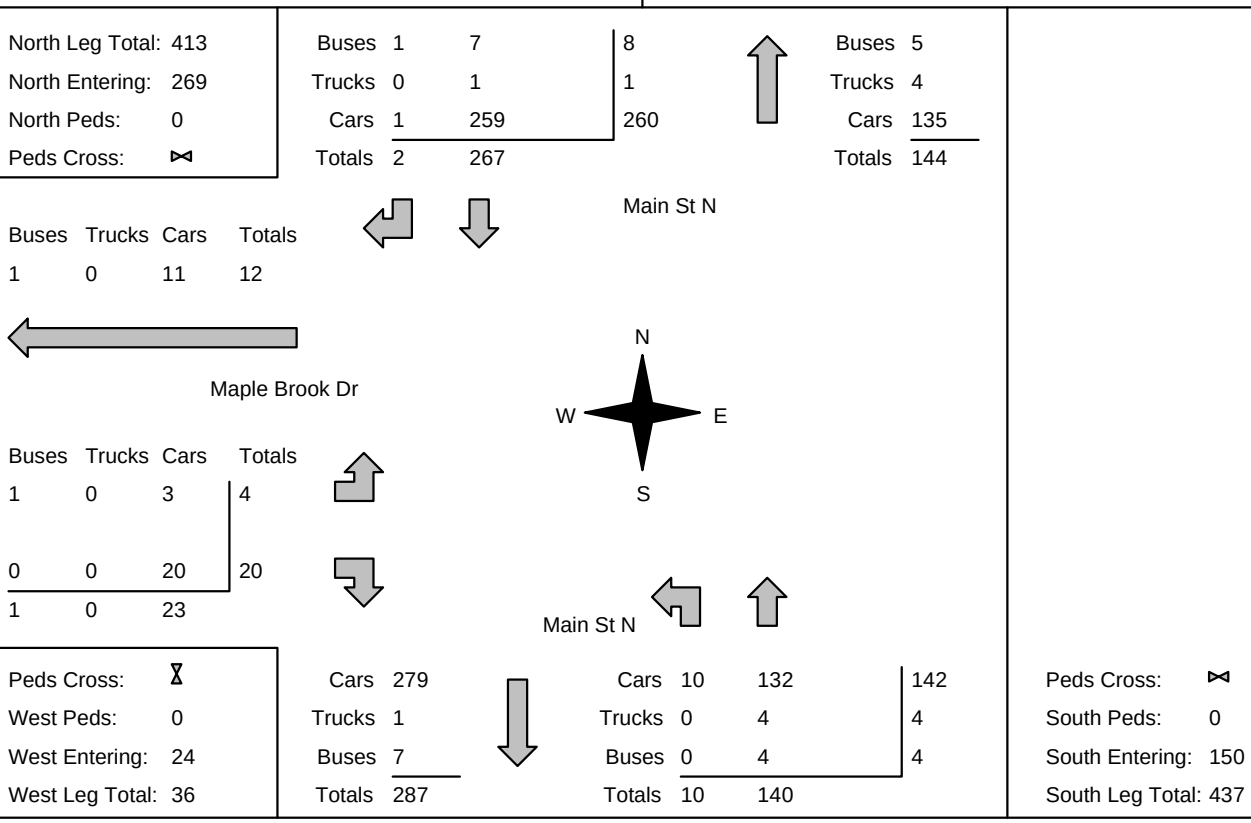
Municipality: Uxbridge
Site #: 2320100002
Intersection: Main St N & Maple Brook Dr
TFR File #: 1
Count date: 12-Sep-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Main St N runs N/S



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

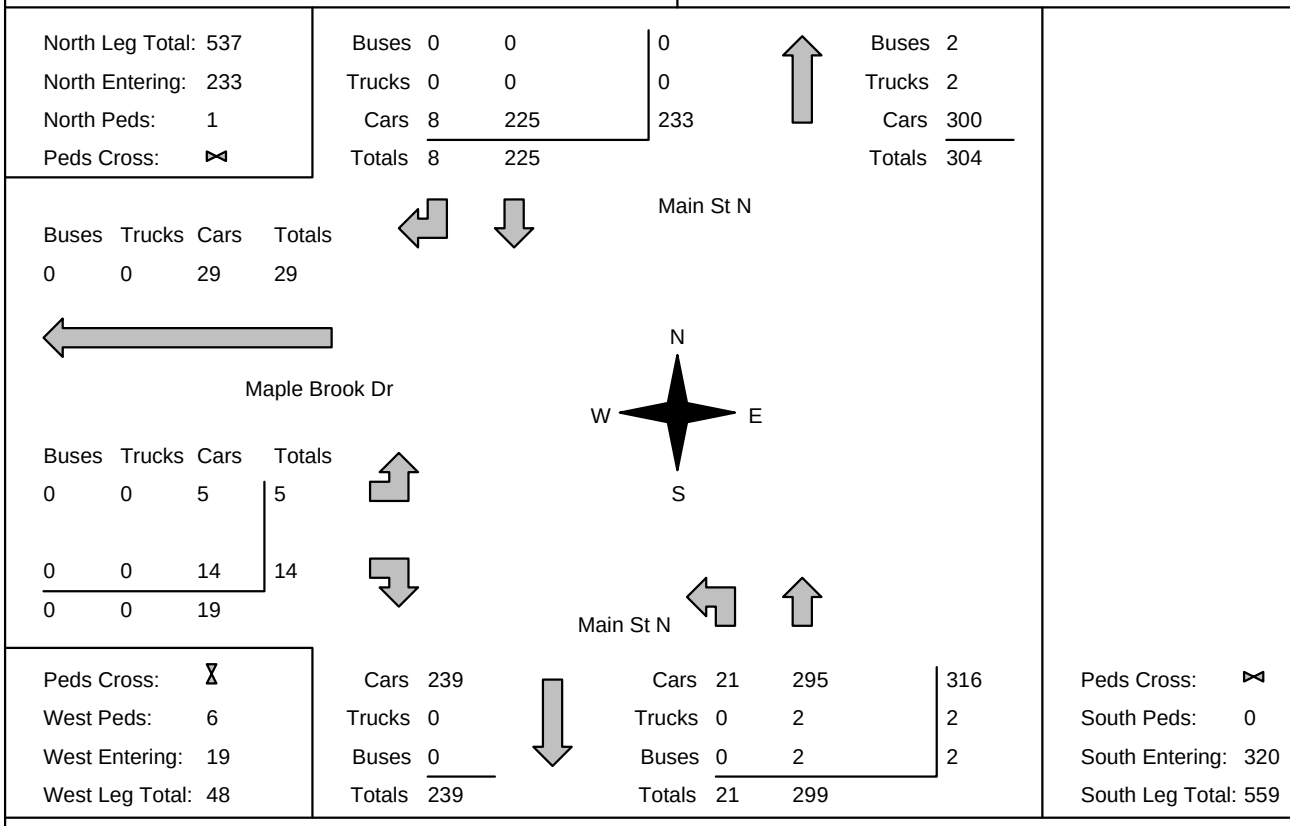
Municipality: Uxbridge
Site #: 2320100002
Intersection: Main St N & Maple Brook Dr
TFR File #: 1
Count date: 12-Sep-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Main St N runs N/S



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Total Count Diagram

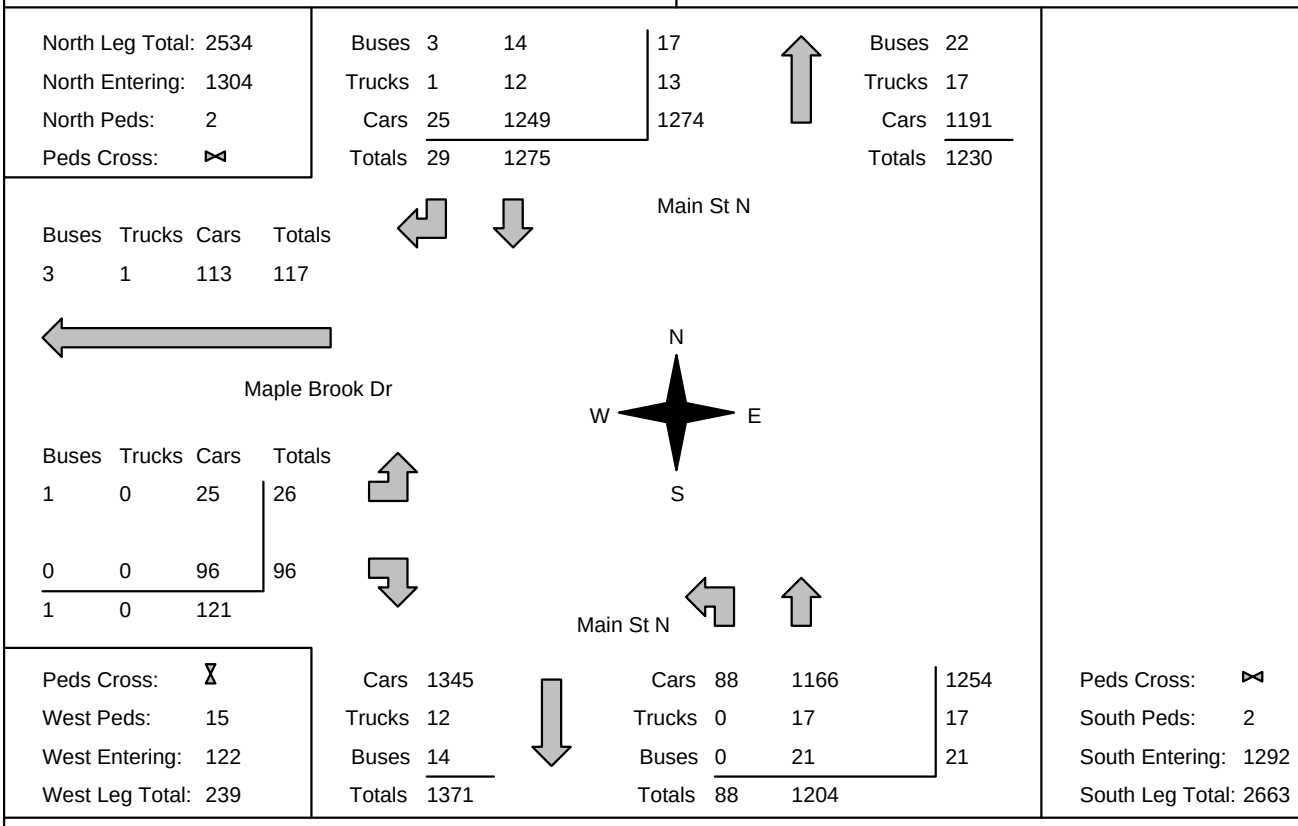
Municipality: Uxbridge
Site #: 2320100002
Intersection: Main St N & Maple Brook Dr
TFR File #: 1
Count date: 12-Sep-23

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Main St N runs N/S



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Traffic Count Summary

Intersection: Main St N & Maple Brook Dr | **Count Date:** 12-Sep-23 | **Municipality:** Uxbridge

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	0	229	3	232	0
9:00:00	0	251	4	255	0
10:00:00	0	178	1	179	0
15:00:00	0	0	0	0	0
16:00:00	0	190	7	197	0
17:00:00	0	216	9	225	2
18:00:00	0	210	5	215	0
Totals:	0	1274	29	1303	2

North/South Total Approaches: 2595

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	6	111	0	117	0
9:00:00	14	135	0	149	1
10:00:00	13	129	0	142	1
15:00:00	0	0	0	0	0
16:00:00	16	236	0	252	0
17:00:00	22	298	0	320	0
18:00:00	17	295	0	312	0
S Totals:	88	1204	0	1292	2

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	0	0	0	0	0
9:00:00	0	0	0	0	0
10:00:00	0	0	0	0	0
15:00:00	0	0	0	0	0
16:00:00	0	0	0	0	0
17:00:00	0	0	0	0	0
18:00:00	0	0	0	0	0
Totals:	0	0	0	0	0

East/West Total Approaches: 122

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0
8:00:00	4	0	25	29	0
9:00:00	3	0	17	20	0
10:00:00	2	0	10	12	1
15:00:00	0	0	0	0	0
16:00:00	4	0	17	21	2
17:00:00	9	0	14	23	9
18:00:00	4	0	13	17	3
W Totals:	26	0	96	122	15

Calculated Values for Traffic Crossing Major Street

Hours Ending:	7:00	8:00	9:00	10:00	15:00	16:00	17:00	18:00
Crossing Values:	0	4	4	3	0	4	11	4

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 12-Sep-23 Site #: 2320100002

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Buses - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	32	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	73	41	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0
7:45:00	0	0	134	61	2	1	0	0	1	0	0	0	0	0	2	2	0	0	0	0
8:00:00	0	0	222	88	2	0	0	0	1	0	0	0	0	0	6	4	1	1	0	0
8:15:00	0	0	275	53	2	0	0	0	1	0	0	0	0	0	6	0	1	0	0	0
8:30:00	0	0	332	57	2	0	0	0	2	1	0	0	0	0	7	1	1	0	0	0
8:45:00	0	0	387	55	4	2	0	0	4	2	0	0	0	0	7	0	2	1	0	0
9:00:00	0	0	463	76	5	1	0	0	6	2	0	0	0	0	11	4	2	0	0	0
9:15:00	0	0	512	49	6	1	0	0	6	0	0	0	0	0	11	0	2	0	0	0
9:30:00	0	0	556	44	6	0	0	0	8	2	0	0	0	0	11	0	2	0	0	0
9:45:00	0	0	601	45	6	0	0	0	8	0	0	0	0	0	11	0	2	0	0	0
10:00:00	0	0	639	38	6	0	0	0	8	0	0	0	0	0	11	0	2	0	0	0
10:15:00	0	0	639	0	6	0	0	0	8	0	0	0	0	0	11	0	2	0	0	0
15:00:00	0	0	639	0	6	0	0	0	8	0	0	0	0	0	11	0	2	0	0	0
15:15:00	0	0	689	50	7	1	0	0	9	1	0	0	0	0	12	1	2	0	0	0
15:30:00	0	0	730	41	10	3	0	0	10	1	1	1	0	0	14	2	2	0	0	0
15:45:00	0	0	779	49	10	0	0	0	10	0	1	0	0	0	14	0	2	0	0	0
16:00:00	0	0	824	45	12	2	0	0	10	0	1	0	0	0	14	0	2	0	0	0
16:15:00	0	0	882	58	13	1	0	0	10	0	1	0	0	0	14	0	2	0	1	1
16:30:00	0	0	925	43	15	2	0	0	10	0	1	0	0	0	14	0	3	1	1	0
16:45:00	0	0	983	58	17	2	0	0	10	0	1	0	0	0	14	0	3	0	1	0
17:00:00	0	0	1040	57	20	3	0	0	10	0	1	0	0	0	14	0	3	0	2	1
17:15:00	0	0	1095	55	21	1	0	0	10	0	1	0	0	0	14	0	3	0	2	0
17:30:00	0	0	1150	55	23	2	0	0	10	0	1	0	0	0	14	0	3	0	2	0
17:45:00	0	0	1201	51	23	0	0	0	10	0	1	0	0	0	14	0	3	0	2	0
18:00:00	0	0	1248	47	25	2	0	0	12	2	1	0	0	0	14	0	3	0	2	0
18:15:00	0	0	1249	1	25	0	0	0	12	0	1	0	0	0	14	0	3	0	2	0
18:15:15	0	0	1249	0	25	0	0	0	12	0	1	0	0	0	14	0	3	0	2	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 12-Sep-23 Site #: 2320100002

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Buses - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 12-Sep-23 Site #: 2320100002

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Buses - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	15	15	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0
7:30:00	2	2	39	24	0	0	0	0	1	0	0	0	0	0	2	1	0	0	0	0
7:45:00	3	1	64	25	0	0	0	0	2	1	0	0	0	0	2	0	0	0	0	0
8:00:00	6	3	104	40	0	0	0	0	4	2	0	0	0	0	3	1	0	0	0	0
8:15:00	12	6	147	43	0	0	0	0	4	0	0	0	0	0	6	3	0	0	0	0
8:30:00	12	0	171	24	0	0	0	0	5	1	0	0	0	0	6	0	0	0	0	0
8:45:00	16	4	193	22	0	0	0	0	5	0	0	0	0	0	7	1	0	0	1	1
9:00:00	20	4	231	38	0	0	0	0	6	1	0	0	0	0	9	2	0	0	1	0
9:15:00	25	5	267	36	0	0	0	0	6	0	0	0	0	0	10	1	0	0	1	0
9:30:00	27	2	306	39	0	0	0	0	7	1	0	0	0	0	12	2	0	0	2	1
9:45:00	31	4	331	25	0	0	0	0	7	0	0	0	0	0	12	0	0	0	2	0
10:00:00	33	2	354	23	0	0	0	0	8	1	0	0	0	0	13	1	0	0	2	0
10:15:00	33	0	354	0	0	0	0	0	8	0	0	0	0	0	13	0	0	0	2	0
15:00:00	33	0	354	0	0	0	0	0	8	0	0	0	0	0	13	0	0	0	2	0
15:15:00	37	4	391	37	0	0	0	0	9	1	0	0	0	0	13	0	0	0	2	0
15:30:00	40	3	439	48	0	0	0	0	11	2	0	0	0	0	13	0	0	0	2	0
15:45:00	43	3	509	70	0	0	0	0	12	1	0	0	0	0	14	1	0	0	2	0
16:00:00	49	6	582	73	0	0	0	0	13	1	0	0	0	0	16	2	0	0	2	0
16:15:00	53	4	659	77	0	0	0	0	13	0	0	0	0	0	18	2	0	0	2	0
16:30:00	57	4	738	79	0	0	0	0	13	0	0	0	0	0	19	1	0	0	2	0
16:45:00	63	6	803	65	0	0	0	0	14	1	0	0	0	0	20	1	0	0	2	0
17:00:00	71	8	874	71	0	0	0	0	15	1	0	0	0	0	20	0	0	0	2	0
17:15:00	74	3	952	78	0	0	0	0	15	0	0	0	0	0	20	0	0	0	2	0
17:30:00	78	4	1033	81	0	0	0	0	15	0	0	0	0	0	21	1	0	0	2	0
17:45:00	83	5	1107	74	0	0	0	0	16	1	0	0	0	0	21	0	0	0	2	0
18:00:00	88	5	1166	59	0	0	0	0	17	1	0	0	0	0	21	0	0	0	2	0
18:15:00	88	0	1166	0	0	0	0	0	17	0	0	0	0	0	21	0	0	0	2	0
18:15:15	88	0	1166	0	0	0	0	0	17	0	0	0	0	0	21	0	0	0	2	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 12-Sep-23 Site #: 2320100002

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Buses - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	1	0	0	0	8	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	2	1	0	0	12	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	4	2	0	0	25	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	4	0	0	0	27	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	4	0	0	0	28	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0
8:45:00	4	0	0	0	34	6	0	0	0	0	0	0	1	0	0	0	0	0	0	0
9:00:00	6	2	0	0	42	8	0	0	0	0	0	0	1	0	0	0	0	0	0	0
9:15:00	8	2	0	0	44	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0
9:30:00	8	0	0	0	48	4	0	0	0	0	0	0	1	0	0	0	0	0	1	1
9:45:00	8	0	0	0	51	3	0	0	0	0	0	0	1	0	0	0	0	0	1	0
10:00:00	8	0	0	0	52	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0
10:15:00	8	0	0	0	52	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
15:00:00	8	0	0	0	52	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
15:15:00	8	0	0	0	54	2	0	0	0	0	0	0	1	0	0	0	0	0	1	0
15:30:00	9	1	0	0	61	7	0	0	0	0	0	0	1	0	0	0	0	0	2	1
15:45:00	10	1	0	0	65	4	0	0	0	0	0	0	1	0	0	0	0	0	2	0
16:00:00	12	2	0	0	69	4	0	0	0	0	0	0	1	0	0	0	0	0	3	1
16:15:00	14	2	0	0	71	2	0	0	0	0	0	0	1	0	0	0	0	0	3	0
16:30:00	17	3	0	0	76	5	0	0	0	0	0	0	1	0	0	0	0	0	8	5
16:45:00	20	3	0	0	79	3	0	0	0	0	0	0	1	0	0	0	0	0	9	1
17:00:00	21	1	0	0	83	4	0	0	0	0	0	0	1	0	0	0	0	0	12	3
17:15:00	21	0	0	0	84	1	0	0	0	0	0	0	1	0	0	0	0	0	13	1
17:30:00	22	1	0	0	90	6	0	0	0	0	0	0	1	0	0	0	0	0	14	1
17:45:00	23	1	0	0	91	1	0	0	0	0	0	0	1	0	0	0	0	0	15	1
18:00:00	25	2	0	0	96	5	0	0	0	0	0	0	1	0	0	0	0	0	15	0
18:15:00	25	0	0	0	96	0	0	0	0	0	0	0	1	0	0	0	0	0	15	0
18:15:15	25	0	0	0	96	0	0	0	0	0	0	0	1	0	0	0	0	0	15	0

Appendix C:
Level of Service Definitions

TATHAM ENGINEERING

41 King Street, Unit 4
Barrie, Ontario L4N 6B5

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CAPACITY ANALYSIS AT SIGNALIZED INTERSECTIONS

Highway Capacity Manual Methodology

The capacity of signalized intersections has been determined in terms of delay taken from Chapter 9 of the Highway Capacity Manual, Special Report 209, by the Transportation Research Board, 2000.

To assist in clarifying the arithmetic analysis associated with traffic engineering, it is often useful to refer to "Level of Service". Level of Service (LOS) for signalized intersections is defined in terms of delay, which is made up of a number of factors that relate to control, geometrics, traffic, and incidents. Only the portion of total delay attributed to the control facility is quantified. This control delay includes initial deceleration, queue move-up time, stopped delay, and final acceleration delay. The following table describes in detail the characteristics of each level:

Level of Service	Expected Delay to Minor Street Traffic	Average Control Delay 'd' (sec/veh)
A	Describes operations with very low control delay, up to 10 seconds/vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all at this LOS. Short cycle lengths may also contribute to low delay.	$d \leq 10$
B	Describes operations with control delay greater than 10 seconds and up to 20 seconds/vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop at this level than at LOS A, causing longer average delays.	$10 \leq d \leq 20$
C	Describes operations with control delay greater than 20 seconds and up to 35 seconds/vehicle. These higher delays may result from fair progression, longer cycle length, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.	$20 \leq d \leq 35$
D	Describes operations with control delay greater than 35 seconds and up to 55 seconds/vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavourable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures become noticeable.	$35 \leq d \leq 55$
E	Describes operations with control delay greater than 55 seconds and up to 80 seconds/vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.	$55 \leq d \leq 80$
F	**LOS F** describes operations with control delay in excess of 80 seconds/vehicle. This *oversaturation*, considered to be unacceptable to most drivers, occurs when arrival flow rates exceed the design capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such high delay levels.	$d > 80$

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CAPACITY ANALYSIS AT UNSIGNALIZED INTERSECTIONS

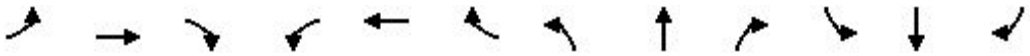
Highway Capacity Manual Methodology

The level of service at an unsignalized intersection is determined on the basis of control delay for each critical lane. This method of analysis is taken from the Highway Capacity Manual, Special Report 209, by the Transportation Research Board, 1997.

The average control delay for any particular critical movement (control delay includes initial deceleration, queue move-up time, stopped delay, and final acceleration delay) is a function of the service rate or capacity of the approach and degree of saturation. The level of service criteria for unsignalized intersections is outlined below and is related to ranges in vehicle delay.

Level of Service	Expected Delay to Minor Street Traffic	Average Control Delay 'd' (sec/veh)
A	Little or no delays	$0 < d \leq 10$
B	Short traffic delays	$10 \leq d \leq 15$
C	Average traffic delays	$15 \leq d \leq 25$
D	Long traffic delays	$25 \leq d \leq 35$
E	Very long traffic delays	$35 \leq d \leq 50$
F	Extreme delays with queuing which may cause congestion affecting other traffic movements in the intersection	$d > 50$

Appendix D:
Existing Operations



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	11	16	9	7	4	9	21	7	1	36	20
Future Volume (vph)	10	11	16	9	7	4	9	21	7	1	36	20
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	14	16	23	13	10	6	13	30	10	1	51	29

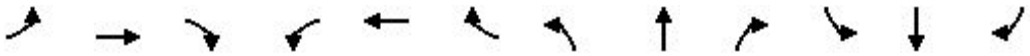
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	53	29	53	81
Volume Left (vph)	14	13	13	1
Volume Right (vph)	23	6	10	29
Hadj (s)	-0.17	0.00	-0.03	-0.18
Departure Headway (s)	4.0	4.2	4.1	4.0
Degree Utilization, x	0.06	0.03	0.06	0.09
Capacity (veh/h)	858	818	843	887
Control Delay (s)	7.3	7.4	7.4	7.3
Approach Delay (s)	7.3	7.4	7.4	7.3
Approach LOS	A	A	A	A

Intersection Summary				
Delay	7.3			
Level of Service	A			
Intersection Capacity Utilization	17.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	20	10	144	275	2
Future Volume (Veh/h)	4	20	10	144	275	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	6	28	14	200	382	3
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	612	384	382			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	612	384	382			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	96	99			
cM capacity (veh/h)	451	664	1176			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	34	214	385
Volume Left	6	14	0
Volume Right	28	0	3
cSH	613	1176	1700
Volume to Capacity	0.06	0.01	0.23
Queue Length 95th (m)	1.3	0.3	0.0
Control Delay (s)	11.2	0.6	0.0
Lane LOS	B	A	
Approach Delay (s)	11.2	0.6	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	25.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	13	8	22	1	2	4	12	35	11	3	29	14
Future Volume (vph)	13	8	22	1	2	4	12	35	11	3	29	14
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	18	11	30	1	3	5	16	47	15	4	39	19

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	59	9	78	62
Volume Left (vph)	18	1	16	4
Volume Right (vph)	30	5	15	19
Hadj (s)	-0.21	-0.28	-0.04	-0.14
Departure Headway (s)	4.0	4.0	4.1	4.0
Degree Utilization, x	0.07	0.01	0.09	0.07
Capacity (veh/h)	867	866	860	882
Control Delay (s)	7.3	7.0	7.5	7.3
Approach Delay (s)	7.3	7.0	7.5	7.3
Approach LOS	A	A	A	A

Intersection Summary				
Delay	7.3			
Level of Service	A			
Intersection Capacity Utilization	19.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	14	22	308	232	8
Future Volume (Veh/h)	5	14	22	308	232	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	15	23	324	244	8
Pedestrians	7			6	7	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	632	261	251			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	632	261	251			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	98	98			
cM capacity (veh/h)	431	768	1306			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	20	347	252
Volume Left	5	23	0
Volume Right	15	0	8
cSH	642	1306	1700
Volume to Capacity	0.03	0.02	0.15
Queue Length 95th (m)	0.7	0.4	0.0
Control Delay (s)	10.8	0.7	0.0
Lane LOS	B	A	
Approach Delay (s)	10.8	0.7	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	45.4%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix E:
Background Development Details

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Transportation Impact Study

PROPOSED RESIDENTIAL SUBDIVISION

7370 Centre Road
UXBRIDGE, ONTARIO

April 2021
Project No: NT-20-058

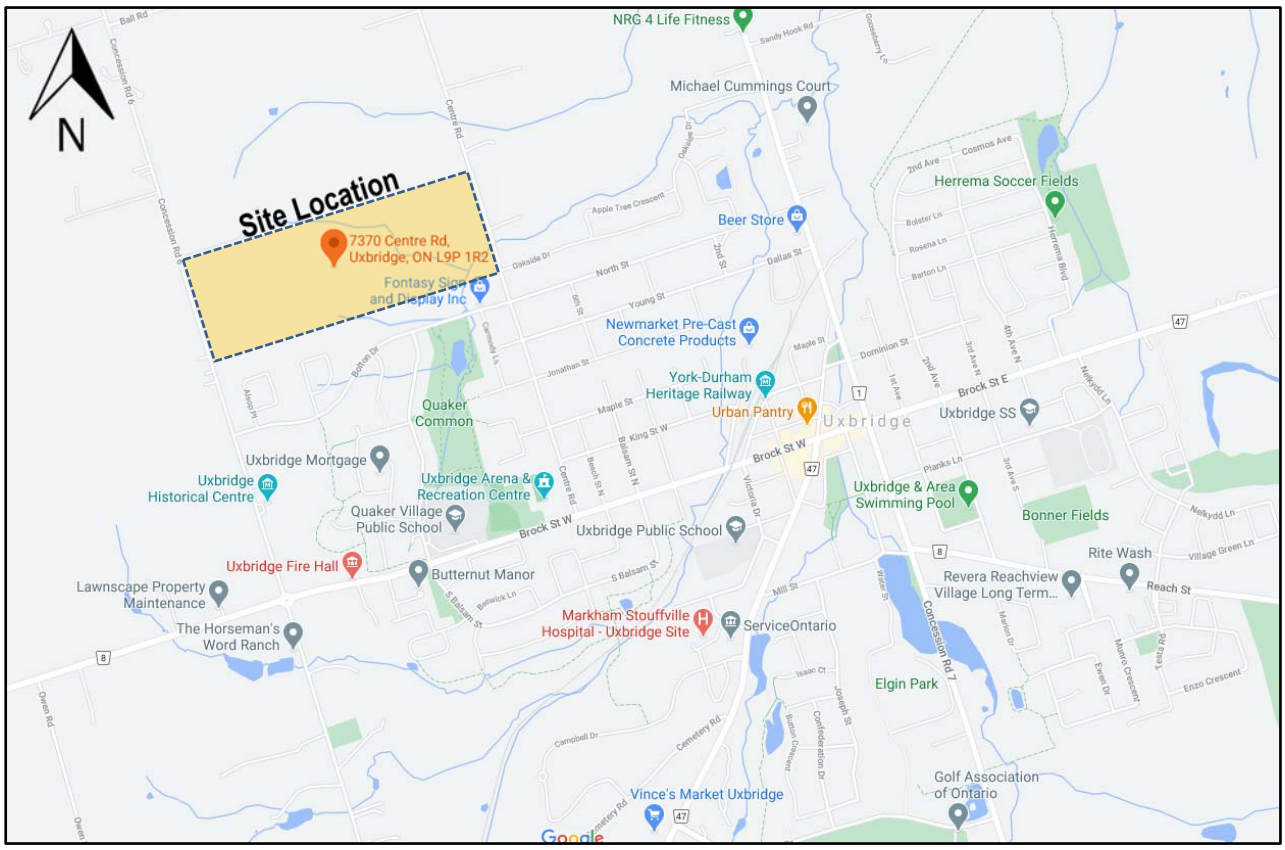
1.0 INTRODUCTION

Nextrans Consulting Engineers (A Division of NextEng Consulting Group Inc.) was retained by Bridgebrook Corp. (the 'Client') to undertake a Transportation Impact Study in support of a proposed draft plan of subdivision for a residential development. The subject site is located at 7370 Centre Road, north of Bolton Drive, between Centre Road and Concession Road 6, in the Town of Uxbridge.

This Transportation Impact Study has been prepared in accordance with the Region of Durham Traffic Impact Study Guidelines, as well as the requirements outlined in the proposed terms of reference submitted to the Township of Uxbridge and Durham Region. The relevant correspondence is included in Appendix A.

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

Figure 1 – Proposed Development Location



Source: Google Map

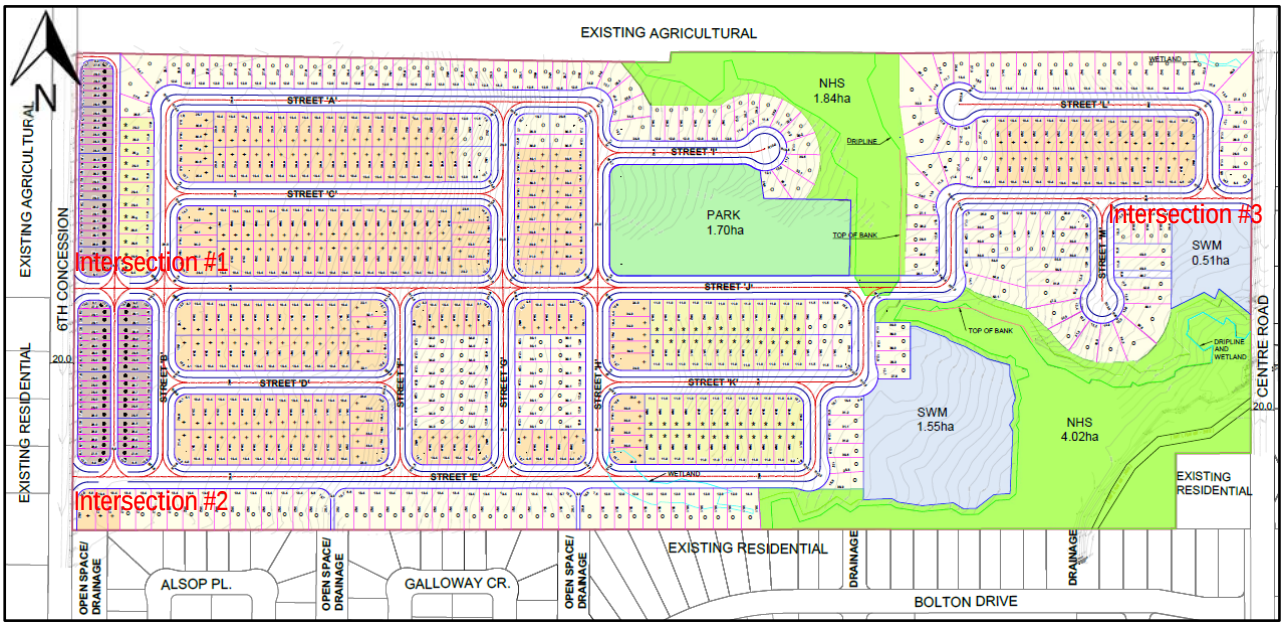
The subject site is current vacant. The proposed development consists of 590 residential dwelling units (including 461 single-detached, 69 townhouse and 60 semi/linked units). For the purposes of this assessment, the proposed 60 linked residential dwelling unit will be treated at townhouse units, which is consistent with the definition of the Institute of Transportation Engineers (ITE) Trip Generation Manual 10th Edition.

Two full moves intersections are proposed onto Concession 6, with the most southerly intersection is located approximately 225 m north of the Bolton Drive/Concession 6, with the northerly intersection is located approximately 150 m north of the southerly intersection.

A full moves intersection is also proposed onto Centre Road, which is located approximately 400 m north of the Bolton Drive/Centre Road intersection and will be aligned with the future Maplebrook Drive extension on the east side of Centre Road.

Figure 2 illustrates the proposed development conceptual plan.

Figure 2 – Conceptual Plan



2.0 EXISTING TRAFFIC CONDITIONS

2.1. Existing Road Network

The existing road network, lane configuration and existing traffic control for the study area are shown in Figure 3 (Existing Lane Configurations). The details area described below:

- Centre Road: is a north-south collector road as identified in Schedule 'A' of the Township of Uxbridge Official Plan (Consolidated January 2014). Centre Road generally has a two-lane urban cross-section south of Oakside Drive with sidewalk on one side of the road, and rural cross-section north of Oakside Drive with no sidewalk. It generally maintains a posted speed limit of 50 km/h.
- Bolton Drive/North Street: is an east-west local road as identified in Schedule 'A' of the Township of Uxbridge Official Plan (Consolidated January 2014). It generally has two-lane urban cross-section west of North Street with sidewalks on both sides of the street, and rural cross-section east of North Street with no sidewalk. It generally maintains a posted speed limit of 50 km/h.
- Quaker Village Drive: is a north-south collector road as identified in Schedule 'A' of the Township of Uxbridge Official Plan (Consolidated January 2014). It generally has two-lane urban cross-section with sidewalks on both sides of the street. It maintains a posted speed limit of 40 km/h.
- Oakside Drive: is an east-west local road as identified in Schedule 'A' of the Township of Uxbridge Official Plan (Consolidated January 2014). It has two-lane urban cross-section with sidewalk located on the north side of the street. It generally maintains a posted speed limit of 50 km/h.
- Concession Road 6: is a north-south collector road as identified in Schedule 'A' of the Township of Uxbridge Official Plan (Consolidated January 2014). It generally has two-lane rural cross-section with no sidewalk. It maintains a posted speed limit of 60 km/h near the subject site.
- Brock Street W/Regional Road 8: is an east-west arterial road as identified in Schedule 'A' Map 'A2' of the Regional of Durham Official Plan (Consolidated May 2020). It generally has two lane rural cross-section with no sidewalk west of Concession Road 6, and has a two-lane urban cross-section east of Concession Road 6 with sidewalk located on the south side east of Norm Goodspeed Drive and both sides east of Quaker Village

Table 3 – 2028 Future Background Levels of Service

Intersection	Movement	Weekday AM Peak Hour			Weekday PM Peak Hour			Available Storage (m)
		LOS (v/c)	Delay (s)	95th Queue (m)	LOS (v/c)	Delay (s)	95th Queue (m)	
Regional Road 8/ Brock Street W/ Concession 6 (Roundabout)	EB – LTR	A (0.28)	8	1	A (0.38)	8	2	300+
	WB – LTR	A (0.41)	8	2	A (0.34)	9	1	250+
	NB – LTR	A (0.18)	6	1	D (0.82)	26	9	300+
	SB – LTR	A (0.24)	8	1	A (0.17)	6	1	580
Brock Street W/ Centre Road (Unsignalized)	EB – L	A (0.04)	9	1	A (0.09)	9	2	95
	EB – T	A (0.28)	0	0	A (0.31)	0	0	95
	WB – TR	A (0.32)	0	0	A (0.29)	0	0	95
	SB – TR	C (0.66)	32	37	D (0.47)	31	19	185
Concession 6/ Bolton Drive (Unsignalized)	WB – LR	A (0.08)	10	2	B (0.10)	12	3	75
	NB – TR	A (0.06)	0	0	A (0.22)	0	0	580
	SB – TL	A (0.00)	0	0	A (0.01)	1	0	300+
Bolton Drive/ Centre Road/ North Street (Unsignalized)	EB – LTR	A (0.25)	9	--	A (0.13)	8	--	100
	WB – LTR	A (0.08)	9	--	A (0.07)	8	--	200
	NB – LTR	A (0.13)	9	--	A (0.26)	9	--	135
	SB – LTR	A (0.28)	9	--	A (0.18)	8	--	105
Bolton Drive/ Quaker Village Dr (Unsignalized)	EB – TR	A (0.11)	8	--	A (0.11)	8	--	150
	WB – TL	A (0.12)	8	--	A (0.14)	8	--	240
	NB – LR	A (0.22)	8	--	A (0.11)	8	--	300
Centre Road/ Oakside Drive (Unsignalized)	WB – LR	A (0.10)	10	3	A (0.06)	10	2	300+
	NB – TR	A (0.06)	0	0	A (0.10)	0	0	105
	SB – TL	A (0.00)	1	0	A (0.00)	1	0	300+
Centre Road/ Maplebrook Dr (Unsignalized)	WB – LR	A (0.05)	9	1	A (0.03)	10	1	300+
	NB – TR	A (0.03)	0	0	A (0.06)	0	0	280
	SB – TL	A (0.00)	1	0	A (0.01)	1	0	300+

Based on the intersection capacity analysis, under the 2028 future background traffic conditions, all the intersections considered are expected to operate at acceptable levels of service. Forecasted queues can be accommodated with the current available storage, v/c ratios are under 1.0 and the highest approach delays are expected to be approximately 32 seconds. Therefore, no improvements are required under this horizon year.

5.0 SITE TRAFFIC

5.1. Proposed Development

As indicated, the proposed development consists of 590 residential dwelling units (including 461 single-detached, 69 townhouse and 60 semi/linked units). The 2016 Transportation Tomorrow Survey (TTS), the catchment area and *Trip Generation Manual, 10th Edition* published by the Institute of Transportation Engineers (ITE) were reviewed to estimate the modal split, trip distribution and trip generation for the proposed development.

5.2. Modes of Travel Assessment in the Area

Since the subject site is currently vacant, the surrounding traffic zones have been utilized to analyze the existing modal split. For the purposes of this assessment, the inclusion of Traffic Zones 1313, 1316, 1317, 1318 is appropriate and reasonable. Table 4 summarizes the travel modal split information. The detailed 2016 TTS data analysis is included in Appendix E.

Table 4 – Modes of Travel based on 2016 TTS Data

Time	Trips Made to the Township of Uxbridge				
	Auto Driver (including motorcycle)	Auto Passenger (including paid rideshare and taxi)	Transit/ GO	Cycle	Walk
AM Peak Period (6:00 – 9:00)	69%	11%	4%	0%	16%
PM Peak Period (4:00 – 7:00)	77%	15%	3%	1%	4%

Based on the information provided above, currently the majority mode of transportation in the area is private automobile, which accounts for 69% during the morning and 77% during the afternoon peak periods. The none single-occupant-vehicle modal split (transit, walking and cycling) is 20% during the morning and only 8% during the afternoon peak period. It is Nextrans' opinion that, although the proposed development is not located as close to the downtown area as some of the traffic zones considered in the analysis above and therefore the walking mode will not be as high as 16%, however, it is anticipated that other none single-occupant-vehicle modes such as carpooling, paid rideshare (i.e. uber and taxi) and transit mode will be close to the percentage indicated above.

For the purposes of this assessment and to be conservative, an 8% modal split for all none single-occupant-vehicle modes such as walking, cycling, transit and carpooling/shared-ride will be applied to the proposed development and background developments in the area. Given that Nextrans will provide a comprehensive assessment and recommendations for the active transportation network within the proposed development, it is Nextrans' opinion that the proposed 8% modal split for all none single-occupant-vehicle mode can be achieved and justified.

5.3. Site Trip Generation

Based on Nextrans' review of the *Trip Generation Manual, 10th Edition* published by the Institute of Transportation Engineers (ITE), the Land Use Codes (LUC) 210 "Single-Family Detached Housing General Urban/Suburban" and (LUC) 220 "Multifamily Housing Low-Rise General Urban/Suburban" fitted curve equations and average have been utilized for the proposed development. The site trip generation is summarized in Table 5.

Table 5 – Site Trip Generation

ITE Land Use	Magnitude (units)	Parameters	Morning Peak Hour			Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
Multifamily Housing (Low-Rise) LUC 220 General Urban/Suburban	129	Trip Rates AM - Ln(T) = 0.95Ln(X) - 0.51 PM - Ln(T) = 0.89Ln(X) - 0.02	0.11	0.36	0.47	0.36	0.21	0.57
		Total Trips	14	47	61	47	27	74
Single-Family Detached Housing LUC 210 General Urban/Suburban	461	Trip Rates AM - T = 0.71(X) + 4.80 PM - Ln(T) = 0.96Ln(X) + 0.20	0.18	0.54	0.72	0.6	0.36	0.96
		Total Trips	83	249	332	278	163	441
Total Trips			*97*	*296*	*393*	*325*	*190*	*515*
None Single-Occupant-Vehicle Modal Split (8%)			*8*	*24*	*32*	*26*	*15*	*41*
New Auto Trips			*89*	*272*	*361*	*299*	*175*	*474*

Based on the analysis noted above, the proposed development is expected to generate:

- 393 total two-way trips (97 inbound and 296 outbound) and 515 total two-way trips (325 inbound and 190 outbound) during the AM and PM peak hours, respectively;
- 361 two-way auto trips (89 inbound and 272 outbound) and 474 two-way auto trips (299 inbound and 175 outbound) during the AM and PM peak hours, respectively; and
- 32 two-way none single-occupant-vehicle trips (8 inbound and 24 outbound) and 41 two-way single-occupant-vehicle trips (26 inbound and 15 outbound) during the AM and PM peak hours, respectively.

5.4. Site Trip Distribution and Assignment

The 2016 Transportation Tomorrow Survey (TTS) data was reviewed for Traffic Zones 1313, 1316, 1317, 1318 in order to estimate the general trip distribution for the proposed development. Table 6 summarizes general distribution based on the 2016 TTS data for the proposed development, with Table 7 summarizing the site traffic assignment. It should be noted that the auto site trip distribution and assignment have been taken into consideration the 2016 TTS information and existing intersection turning movements, where appropriate.

Table 6 – Trip Distribution for Auto Mode

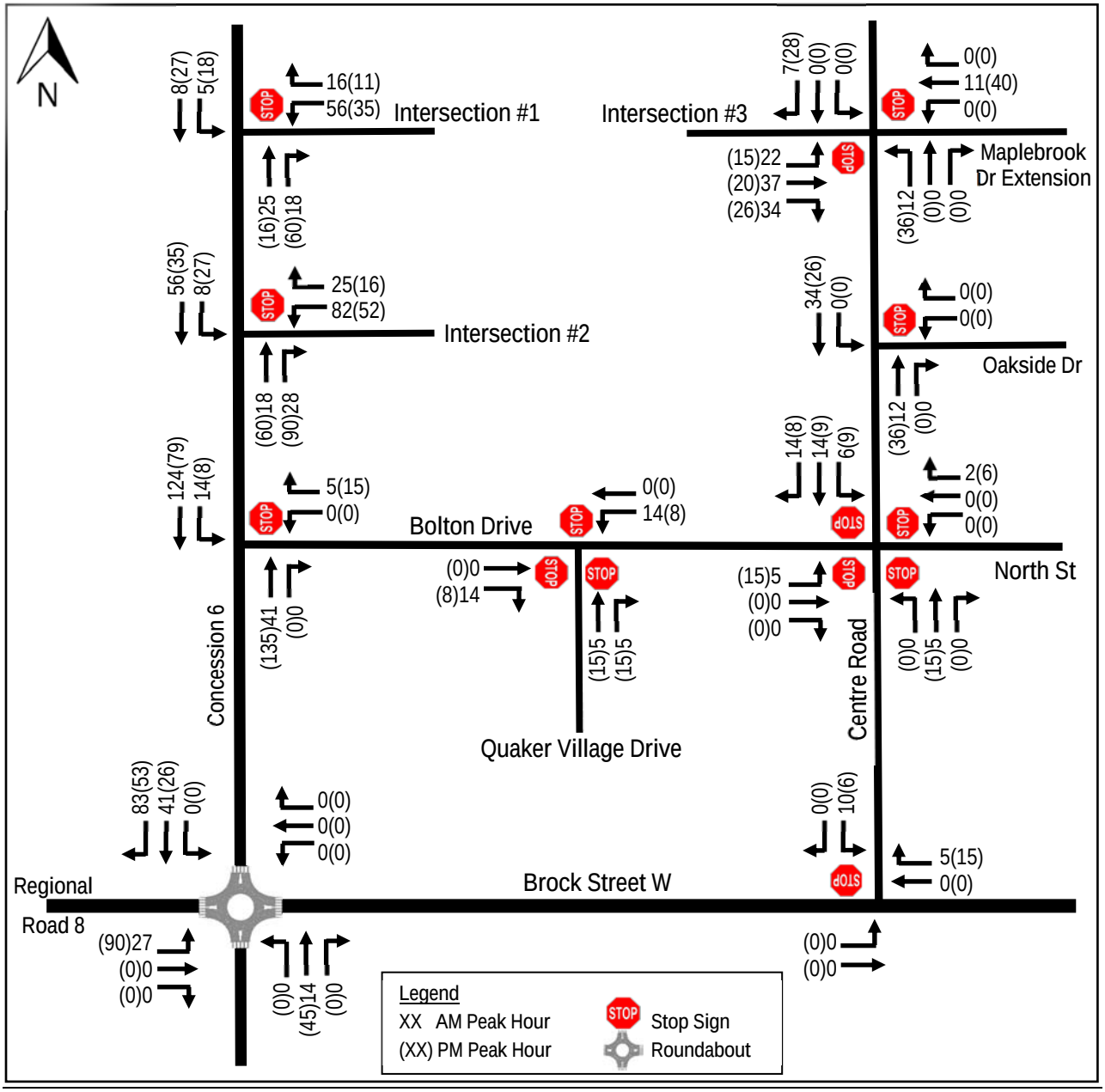
Toronto	Uxbridge	Durham Region	York Region	Peel Region	Others
10%	38%	17%	31%	1%	3%

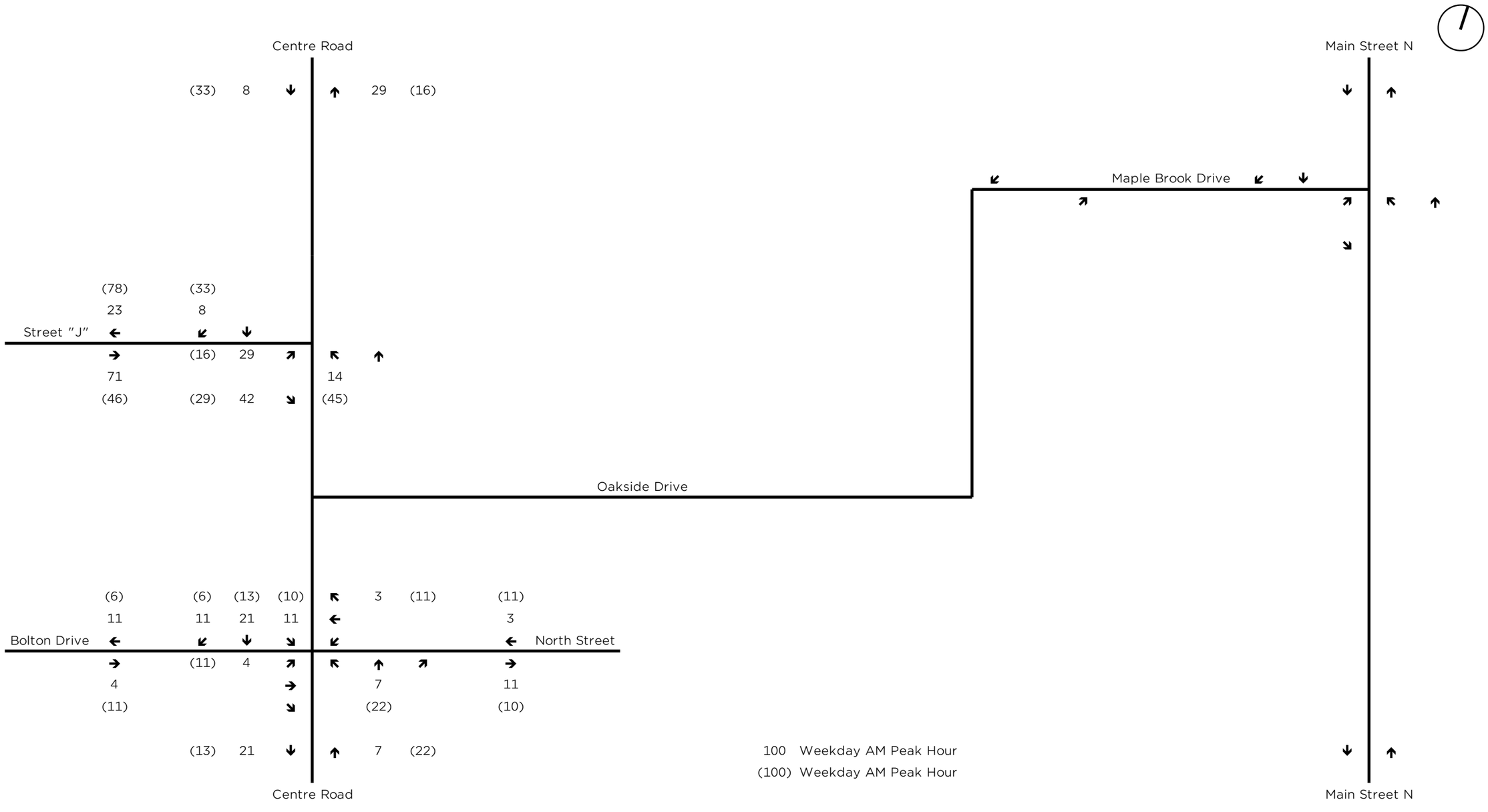
Table 7 – Site Trip Distribution

General Direction (To/From)	Inbound	Outbound
North (via Concession 6, Centre Road and Concession 7)	5%	5%
South (via Concession 6, Centre Road and Concession 7/Main Street S)	25%	25%
East (Brock Street W/Regional Road 8, Davis Drive)	25%	25%
West (Brock Street W/Regional Road 8, Davis Drive and Toronto Street)	45%	45%
Total	*100%*	*100%*

Figure 11 illustrates the proposed development generated traffic volumes

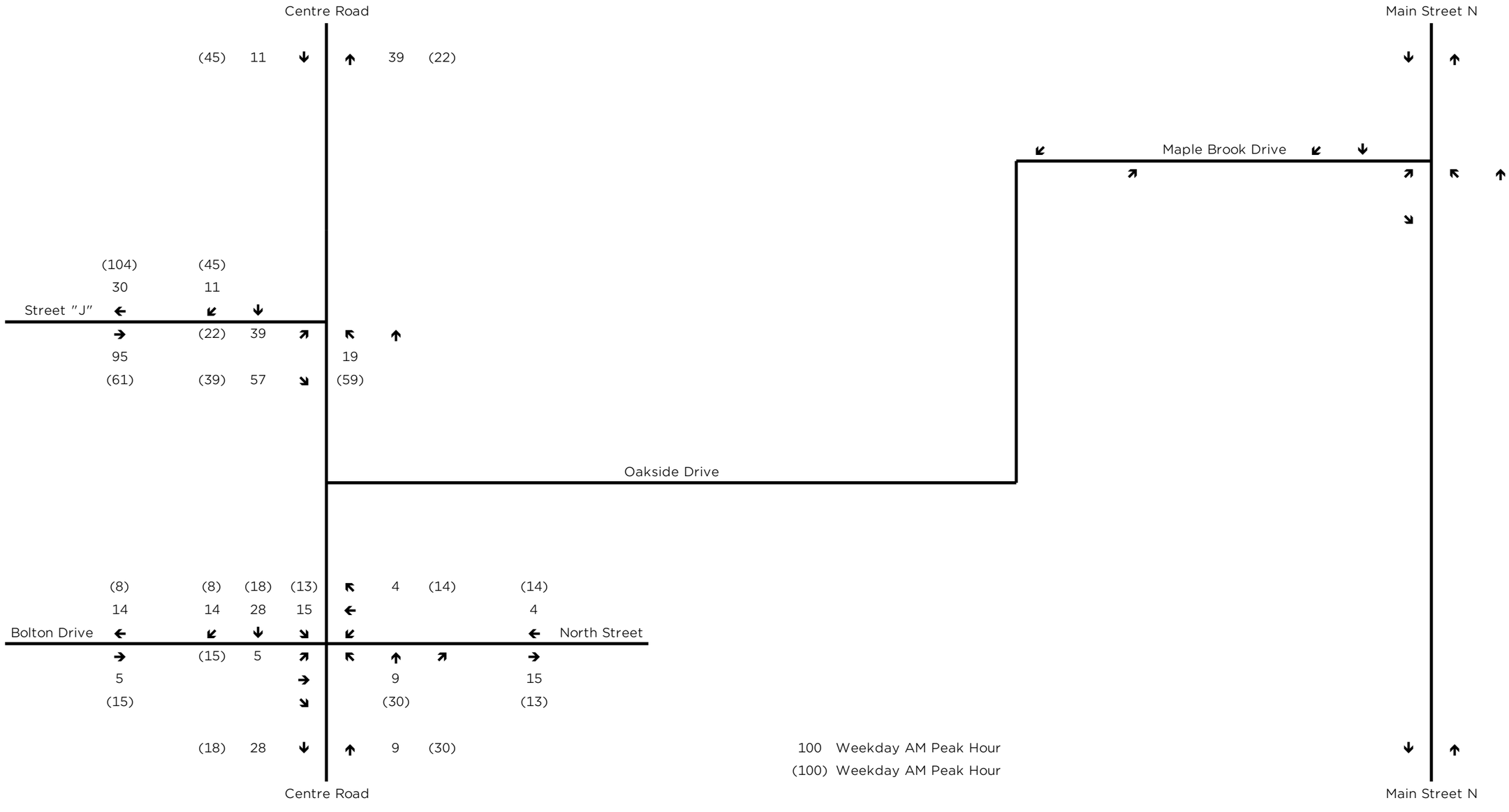
Figure 11 – Site Traffic Volumes





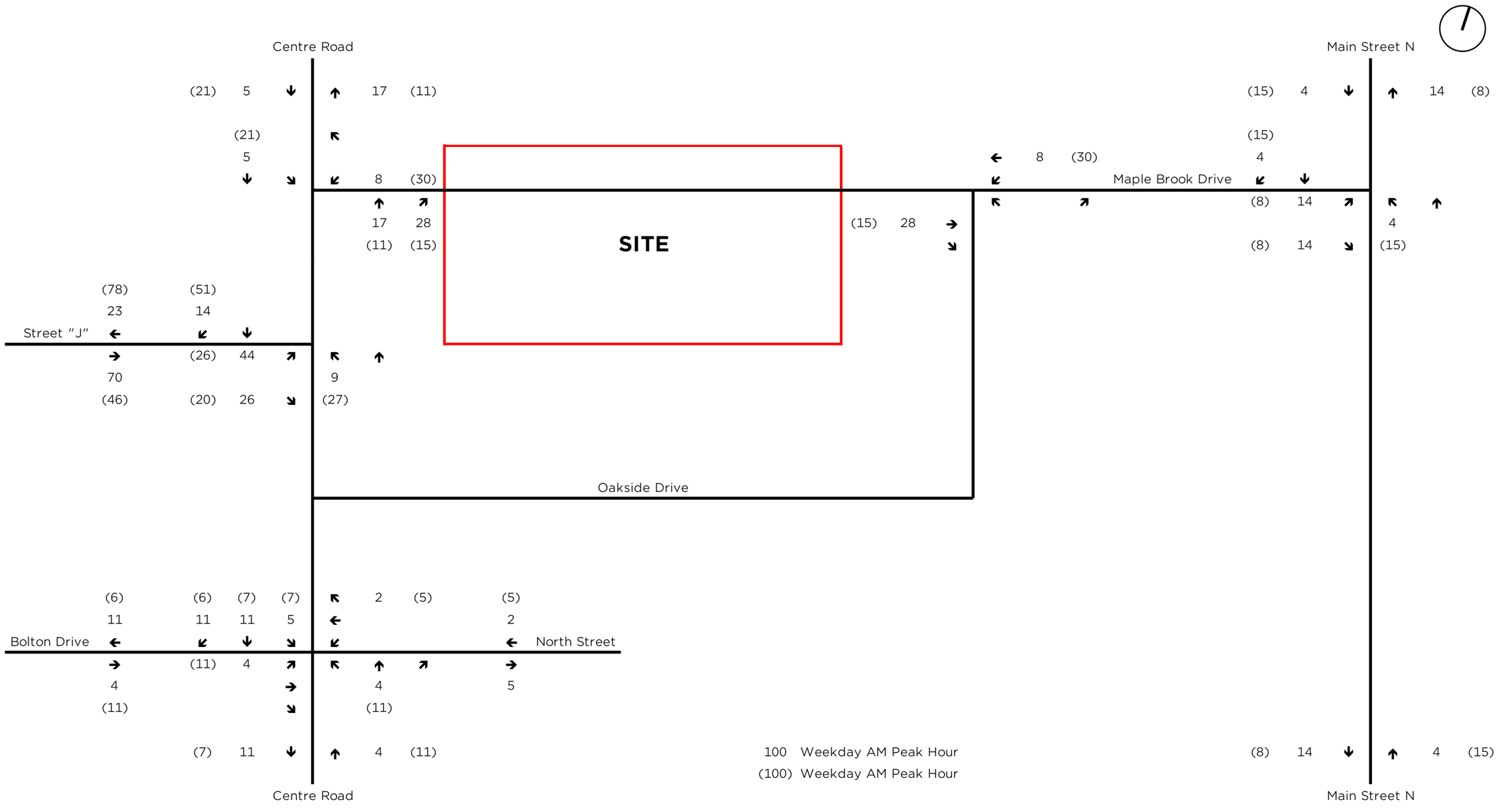
MAPLE BROOK PHASE 2 – TRAFFIC IMPACT STUDY – APPENDIX E

Figure E1: Bridgebrook Trip Assignment – 2028 Background Conditions



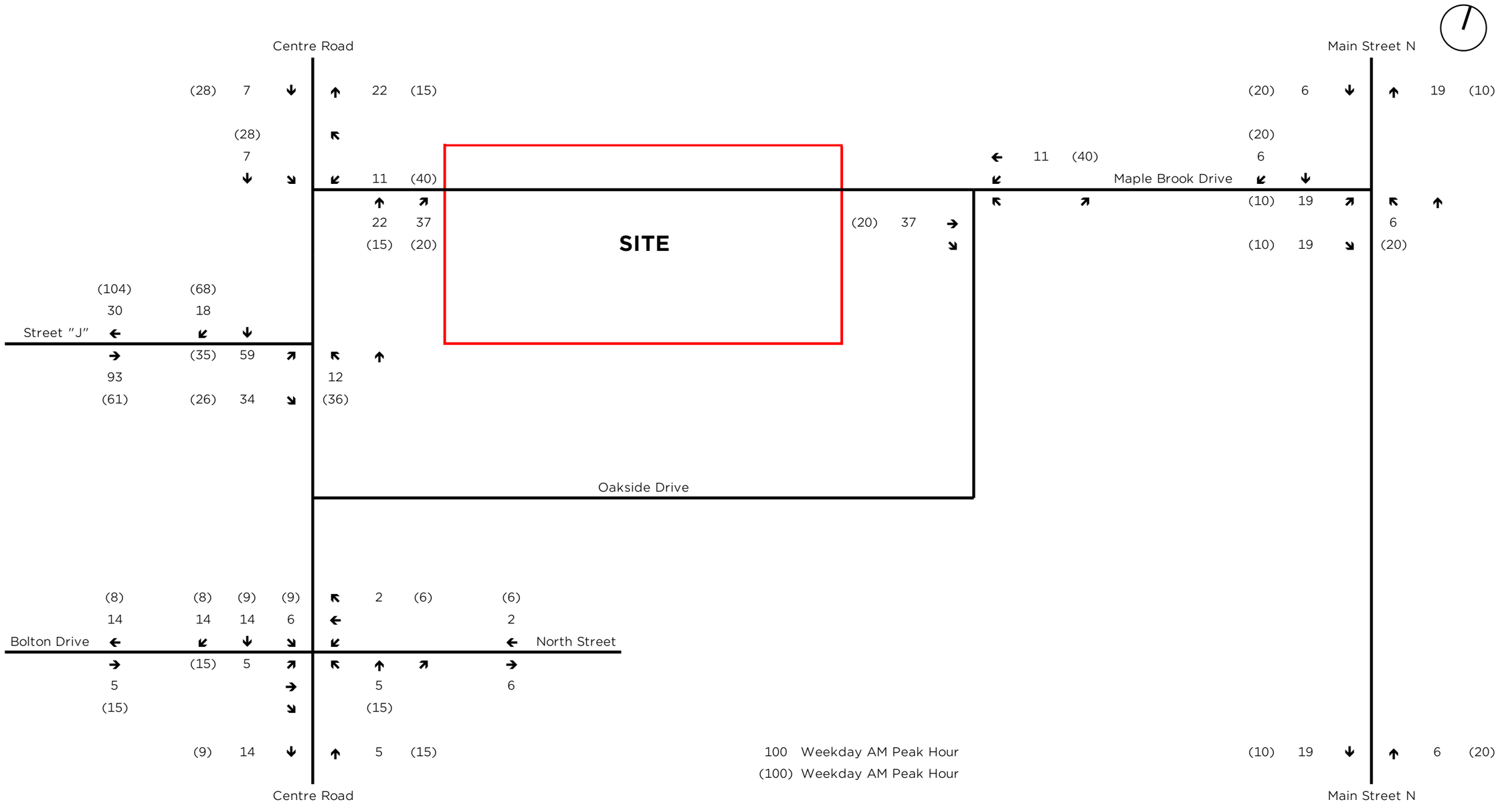
MAPLE BROOK PHASE 2 – TRAFFIC IMPACT STUDY – APPENDIX E

Figure E2: Bridgebrook Trip Assignment – 2033 Background Conditions



MAPLE BROOK PHASE 2 – TRAFFIC IMPACT STUDY – APPENDIX E

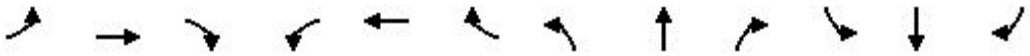
Figure E3: Bridgebrook Trip Assignment – 2028 Total Conditions



MAPLE BROOK PHASE 2 – TRAFFIC IMPACT STUDY – APPENDIX E

Figure E4: Bridgebrook Trip Assignment – 2033 Total Conditions

Appendix F:
Background Operations



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	14	11	17	10	7	7	9	29	7	12	59	31
Future Volume (vph)	14	11	17	10	7	7	9	29	7	12	59	31
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	20	16	24	14	10	10	13	41	10	17	84	44

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	60	34	64	145
Volume Left (vph)	20	14	13	17
Volume Right (vph)	24	10	10	44
Hadj (s)	-0.14	-0.06	-0.02	-0.12
Departure Headway (s)	4.3	4.4	4.2	4.1
Degree Utilization, x	0.07	0.04	0.08	0.16
Capacity (veh/h)	803	772	817	865
Control Delay (s)	7.6	7.5	7.6	7.8
Approach Delay (s)	7.6	7.5	7.6	7.8
Approach LOS	A	A	A	A

Intersection Summary				
Delay	7.7			
Level of Service	A			
Intersection Capacity Utilization	16.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	20	10	167	319	2
Future Volume (Veh/h)	4	20	10	167	319	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	6	28	14	232	443	3
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	704	444	443			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	704	444	443			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	95	99			
cM capacity (veh/h)	398	614	1117			

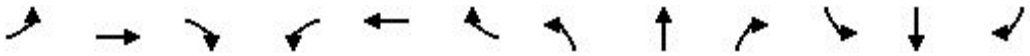
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	34	246	446
Volume Left	6	14	0
Volume Right	28	0	3
cSH	560	1117	1700
Volume to Capacity	0.06	0.01	0.26
Queue Length 95th (m)	1.5	0.3	0.0
Control Delay (s)	11.8	0.6	0.0
Lane LOS	B	A	
Approach Delay (s)	11.8	0.6	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	27.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	29	42	14	37	59	8
Future Volume (Veh/h)	29	42	14	37	59	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	46	15	40	64	9
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	138	68	73			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	138	68	73			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	95	99			
cM capacity (veh/h)	846	995	1527			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	78	55	73
Volume Left	32	15	0
Volume Right	46	0	9
cSH	928	1527	1700
Volume to Capacity	0.08	0.01	0.04
Queue Length 95th (m)	2.1	0.2	0.0
Control Delay (s)	9.2	2.1	0.0
Lane LOS	A	A	
Approach Delay (s)	9.2	2.1	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	20.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	25	8	23	1	2	15	12	60	11	13	44	20
Future Volume (vph)	25	8	23	1	2	15	12	60	11	13	44	20
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	34	11	31	1	3	20	16	81	15	18	59	27

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	76	24	112	104
Volume Left (vph)	34	1	16	18
Volume Right (vph)	31	20	15	27
Hadj (s)	-0.12	-0.46	-0.02	-0.09
Departure Headway (s)	4.3	4.0	4.2	4.2
Degree Utilization, x	0.09	0.03	0.13	0.12
Capacity (veh/h)	799	835	825	841
Control Delay (s)	7.7	7.1	7.8	7.7
Approach Delay (s)	7.7	7.1	7.8	7.7
Approach LOS	A	A	A	A

Intersection Summary				
Delay		7.7		
Level of Service		A		
Intersection Capacity Utilization		23.8%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	14	22	357	269	8
Future Volume (Veh/h)	5	14	22	357	269	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	15	23	376	283	8
Pedestrians	7			6	7	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	723	300	290			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	723	300	290			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	98	98			
cM capacity (veh/h)	381	731	1263			

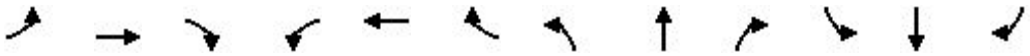
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	20	399	291
Volume Left	5	23	0
Volume Right	15	0	8
cSH	594	1263	1700
Volume to Capacity	0.03	0.02	0.17
Queue Length 95th (m)	0.8	0.4	0.0
Control Delay (s)	11.3	0.6	0.0
Lane LOS	B	A	
Approach Delay (s)	11.3	0.6	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	29	45	55	48	33
Future Volume (Veh/h)	16	29	45	55	48	33
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	32	49	60	52	36
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	228	70	88			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	228	70	88			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	97	97			
cM capacity (veh/h)	735	993	1508			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	49	109	88
Volume Left	17	49	0
Volume Right	32	0	36
cSH	885	1508	1700
Volume to Capacity	0.06	0.03	0.05
Queue Length 95th (m)	1.3	0.8	0.0
Control Delay (s)	9.3	3.5	0.0
Lane LOS	A	A	
Approach Delay (s)	9.3	3.5	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	22.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	16	11	18	10	7	9	9	33	7	16	68	34
Future Volume (vph)	16	11	18	10	7	9	9	33	7	16	68	34
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	23	16	26	14	10	13	13	47	10	23	97	49

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	65	37	70	169
Volume Left (vph)	23	14	13	23
Volume Right (vph)	26	13	10	49
Hadj (s)	-0.14	-0.10	-0.01	-0.11
Departure Headway (s)	4.3	4.4	4.3	4.1
Degree Utilization, x	0.08	0.05	0.08	0.19
Capacity (veh/h)	785	761	805	855
Control Delay (s)	7.7	7.6	7.7	8.1
Approach Delay (s)	7.7	7.6	7.7	8.1
Approach LOS	A	A	A	A

Intersection Summary				
Delay			7.9	
Level of Service			A	
Intersection Capacity Utilization			18.1%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	20	10	194	370	2
Future Volume (Veh/h)	4	20	10	194	370	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	6	28	14	269	514	3
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	812	516	514			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	812	516	514			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	95	99			
cM capacity (veh/h)	344	559	1052			

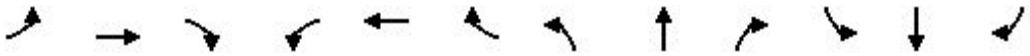
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	34	283	517
Volume Left	6	14	0
Volume Right	28	0	3
cSH	504	1052	1700
Volume to Capacity	0.07	0.01	0.30
Queue Length 95th (m)	1.6	0.3	0.0
Control Delay (s)	12.7	0.5	0.0
Lane LOS	B	A	
Approach Delay (s)	12.7	0.5	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	29.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	39	57	19	39	61	11
Future Volume (Veh/h)	39	57	19	39	61	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	62	21	42	66	12
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	156	72	78			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	156	72	78			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	94	99			
cM capacity (veh/h)	824	990	1520			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	104	63	78
Volume Left	42	21	0
Volume Right	62	0	12
cSH	916	1520	1700
Volume to Capacity	0.11	0.01	0.05
Queue Length 95th (m)	2.9	0.3	0.0
Control Delay (s)	9.4	2.5	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	2.5	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	22.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	30	8	25	1	2	19	12	69	11	16	50	22
Future Volume (vph)	30	8	25	1	2	19	12	69	11	16	50	22
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	41	11	34	1	3	26	16	93	15	22	68	30

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	86	30	124	120
Volume Left (vph)	41	1	16	22
Volume Right (vph)	34	26	15	30
Hadj (s)	-0.11	-0.48	-0.01	-0.08
Departure Headway (s)	4.4	4.1	4.3	4.2
Degree Utilization, x	0.10	0.03	0.15	0.14
Capacity (veh/h)	779	817	809	825
Control Delay (s)	7.9	7.2	8.0	7.9
Approach Delay (s)	7.9	7.2	8.0	7.9
Approach LOS	A	A	A	A

Intersection Summary				
Delay		7.9		
Level of Service		A		
Intersection Capacity Utilization		25.3%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	14	22	414	311	8
Future Volume (Veh/h)	5	14	22	414	311	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	15	23	436	327	8
Pedestrians	7			6	7	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	827	344	334			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	827	344	334			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	98	98			
cM capacity (veh/h)	331	690	1217			

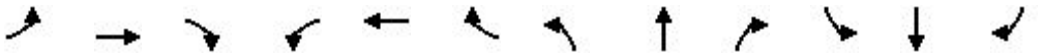
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	20	459	335
Volume Left	5	23	0
Volume Right	15	0	8
cSH	543	1217	1700
Volume to Capacity	0.04	0.02	0.20
Queue Length 95th (m)	0.9	0.4	0.0
Control Delay (s)	11.9	0.6	0.0
Lane LOS	B	A	
Approach Delay (s)	11.9	0.6	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	22	39	59	58	49	45
Future Volume (Veh/h)	22	39	59	58	49	45
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	42	64	63	53	49
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	268	78	102			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	268	78	102			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	96	96			
cM capacity (veh/h)	690	983	1490			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	66	127	102
Volume Left	24	64	0
Volume Right	42	0	49
cSH	852	1490	1700
Volume to Capacity	0.08	0.04	0.06
Queue Length 95th (m)	1.9	1.0	0.0
Control Delay (s)	9.6	4.0	0.0
Lane LOS	A	A	
Approach Delay (s)	9.6	4.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	23.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	11	19	11	7	9	9	34	7	16	70	34
Future Volume (vph)	17	11	19	11	7	9	9	34	7	16	70	34
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	24	16	27	16	10	13	13	49	10	23	100	49

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	67	39	72	172
Volume Left (vph)	24	16	13	23
Volume Right (vph)	27	13	10	49
Hadj (s)	-0.14	-0.08	-0.01	-0.11
Departure Headway (s)	4.3	4.4	4.3	4.1
Degree Utilization, x	0.08	0.05	0.09	0.20
Capacity (veh/h)	781	755	801	852
Control Delay (s)	7.7	7.7	7.7	8.1
Approach Delay (s)	7.7	7.7	7.7	8.1
Approach LOS	A	A	A	A

Intersection Summary				
Delay	7.9			
Level of Service	A			
Intersection Capacity Utilization	18.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	20	10	225	428	2
Future Volume (Veh/h)	4	20	10	225	428	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	6	28	14	312	594	3
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	936	596	594			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	936	596	594			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	94	99			
cM capacity (veh/h)	290	504	982			

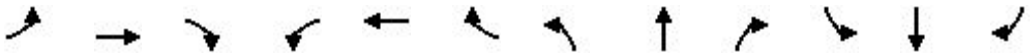
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	34	326	597
Volume Left	6	14	0
Volume Right	28	0	3
cSH	446	982	1700
Volume to Capacity	0.08	0.01	0.35
Queue Length 95th (m)	1.9	0.3	0.0
Control Delay (s)	13.7	0.5	0.0
Lane LOS	B	A	
Approach Delay (s)	13.7	0.5	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	32.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	39	57	19	41	63	11
Future Volume (Veh/h)	39	57	19	41	63	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	62	21	45	68	12
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	161	74	80			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	161	74	80			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	94	99			
cM capacity (veh/h)	818	988	1518			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	104	66	80
Volume Left	42	21	0
Volume Right	62	0	12
cSH	912	1518	1700
Volume to Capacity	0.11	0.01	0.05
Queue Length 95th (m)	2.9	0.3	0.0
Control Delay (s)	9.5	2.4	0.0
Lane LOS	A	A	
Approach Delay (s)	9.5	2.4	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	22.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	30	8	26	1	2	19	12	71	11	16	52	22
Future Volume (vph)	30	8	26	1	2	19	12	71	11	16	52	22
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	41	11	35	1	3	26	16	96	15	22	70	30

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	87	30	127	122
Volume Left (vph)	41	1	16	22
Volume Right (vph)	35	26	15	30
Hadj (s)	-0.11	-0.48	-0.01	-0.08
Departure Headway (s)	4.4	4.1	4.3	4.2
Degree Utilization, x	0.11	0.03	0.15	0.14
Capacity (veh/h)	767	814	808	823
Control Delay (s)	7.9	7.2	8.0	7.9
Approach Delay (s)	7.9	7.2	8.0	7.9
Approach LOS	A	A	A	A

Intersection Summary				
Delay	7.9			
Level of Service	A			
Intersection Capacity Utilization	25.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	14	22	480	361	8
Future Volume (Veh/h)	5	14	22	480	361	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	15	23	505	380	8
Pedestrians	7			6	7	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	949	397	387			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	949	397	387			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	98	98			
cM capacity (veh/h)	280	645	1164			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	20	528	388
Volume Left	5	23	0
Volume Right	15	0	8
cSH	486	1164	1700
Volume to Capacity	0.04	0.02	0.23
Queue Length 95th (m)	1.0	0.5	0.0
Control Delay (s)	12.7	0.6	0.0
Lane LOS	B	A	
Approach Delay (s)	12.7	0.6	0.0
Approach LOS	B		

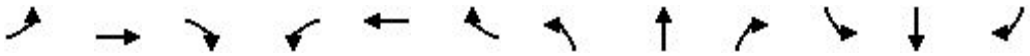
Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	55.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	22	39	59	61	51	45
Future Volume (Veh/h)	22	39	59	61	51	45
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	42	64	66	55	49
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	274	80	104			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	274	80	104			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	96	96			
cM capacity (veh/h)	685	981	1488			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	66	130	104
Volume Left	24	64	0
Volume Right	42	0	49
cSH	848	1488	1700
Volume to Capacity	0.08	0.04	0.06
Queue Length 95th (m)	1.9	1.0	0.0
Control Delay (s)	9.6	3.9	0.0
Lane LOS	A	A	
Approach Delay (s)	9.6	3.9	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	23.4%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix G:
Total Operations



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	14	11	17	10	7	6	9	46	7	6	102	31
Future Volume (vph)	14	11	17	10	7	6	9	46	7	6	102	31
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	20	16	24	14	10	9	13	66	10	9	146	44

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	60	33	89	199
Volume Left (vph)	20	14	13	9
Volume Right (vph)	24	9	10	44
Hadj (s)	-0.14	-0.04	0.00	-0.09
Departure Headway (s)	4.4	4.6	4.3	4.1
Degree Utilization, x	0.07	0.04	0.11	0.23
Capacity (veh/h)	751	728	801	851
Control Delay (s)	7.8	7.8	7.8	8.3
Approach Delay (s)	7.8	7.8	7.8	8.3
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.1			
Level of Service	A			
Intersection Capacity Utilization	18.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	29	77	31	167	319	10
Future Volume (Veh/h)	29	77	31	167	319	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	40	107	43	232	443	14
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	768	450	443			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	768	450	443			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	82	96			
cM capacity (veh/h)	356	609	1117			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	147	275	457
Volume Left	40	43	0
Volume Right	107	0	14
cSH	510	1117	1700
Volume to Capacity	0.29	0.04	0.27
Queue Length 95th (m)	9.0	0.9	0.0
Control Delay (s)	14.9	1.6	0.0
Lane LOS	B	A	
Approach Delay (s)	14.9	1.6	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	44	26	9	57	113	14
Future Volume (Veh/h)	44	26	9	57	113	14
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	28	10	62	123	15
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	212	130	138			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	212	130	138			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	97	99			
cM capacity (veh/h)	770	919	1446			

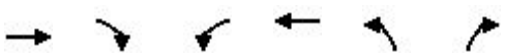
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	76	72	138
Volume Left	48	10	0
Volume Right	28	0	15
cSH	819	1446	1700
Volume to Capacity	0.09	0.01	0.08
Queue Length 95th (m)	2.3	0.2	0.0
Control Delay (s)	9.8	1.1	0.0
Lane LOS	A	A	
Approach Delay (s)	9.8	1.1	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	21.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	62	1	54	48	1	64
Future Volume (Veh/h)	62	1	54	48	1	64
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	67	1	59	52	1	70
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	157	85			111	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	157	85			111	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	100			100	
cM capacity (veh/h)	834	974			1479	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	68	111	71
Volume Left	67	0	1
Volume Right	1	52	0
cSH	835	1700	1479
Volume to Capacity	0.08	0.07	0.00
Queue Length 95th (m)	2.0	0.0	0.0
Control Delay (s)	9.7	0.0	0.1
Lane LOS	A		A
Approach Delay (s)	9.7	0.0	0.1
Approach LOS	A		

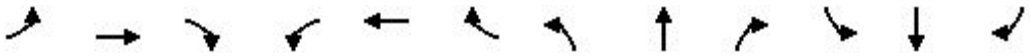
Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	81	1	12	28	1	24
Future Volume (vph)	81	1	12	28	1	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	88	1	13	30	1	26

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	89	43	27
Volume Left (vph)	0	13	1
Volume Right (vph)	1	0	26
Hadj (s)	0.03	0.09	-0.54
Departure Headway (s)	4.0	4.1	3.6
Degree Utilization, x	0.10	0.05	0.03
Capacity (veh/h)	882	858	944
Control Delay (s)	7.5	7.3	6.7
Approach Delay (s)	7.5	7.3	6.7
Approach LOS	A	A	A

Intersection Summary			
Delay	7.3		
Level of Service	A		
Intersection Capacity Utilization	18.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	25	8	23	1	2	9	12	107	11	10	74	20
Future Volume (vph)	25	8	23	1	2	9	12	107	11	10	74	20
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	34	11	31	1	3	12	16	145	15	14	100	27

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	76	16	176	141
Volume Left (vph)	34	1	16	14
Volume Right (vph)	31	12	15	27
Hadj (s)	-0.12	-0.40	0.00	-0.06
Departure Headway (s)	4.5	4.3	4.3	4.2
Degree Utilization, x	0.09	0.02	0.21	0.17
Capacity (veh/h)	739	763	817	813
Control Delay (s)	8.0	7.4	8.4	8.1
Approach Delay (s)	8.0	7.4	8.4	8.1
Approach LOS	A	A	A	A

Intersection Summary				
Delay		8.2		
Level of Service		A		
Intersection Capacity Utilization		26.6%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	51	84	357	269	35
Future Volume (Veh/h)	20	51	84	357	269	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	54	88	376	283	37
Pedestrians	7			6	7	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	868	314	290			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	868	314	290			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	92	93			
cM capacity (veh/h)	297	717	1263			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	75	464	320
Volume Left	21	88	0
Volume Right	54	0	37
cSH	513	1263	1700
Volume to Capacity	0.15	0.07	0.19
Queue Length 95th (m)	3.9	1.7	0.0
Control Delay (s)	13.2	2.1	0.0
Lane LOS	B	A	
Approach Delay (s)	13.2	2.1	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	20	27	114	85	51
Future Volume (Veh/h)	26	20	27	114	85	51
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	22	29	124	92	55
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	302	120	147			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	302	120	147			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	98	98			
cM capacity (veh/h)	676	932	1435			

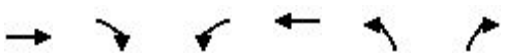
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	50	153	147
Volume Left	28	29	0
Volume Right	22	0	55
cSH	769	1435	1700
Volume to Capacity	0.07	0.02	0.09
Queue Length 95th (m)	1.6	0.5	0.0
Control Delay (s)	10.0	1.6	0.0
Lane LOS	B	A	
Approach Delay (s)	10.0	1.6	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	28.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	67	1	66	74	1	69
Future Volume (Veh/h)	67	1	66	74	1	69
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	73	1	72	80	1	75
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	189	112			152	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	189	112			152	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	100			100	
cM capacity (veh/h)	799	941			1429	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	74	152	76
Volume Left	73	0	1
Volume Right	1	80	0
cSH	801	1700	1429
Volume to Capacity	0.09	0.09	0.00
Queue Length 95th (m)	2.3	0.0	0.0
Control Delay (s)	10.0	0.0	0.1
Lane LOS	A		A
Approach Delay (s)	10.0	0.0	0.1
Approach LOS	A		

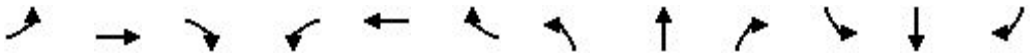
Intersection Summary			
Average Delay		2.5	
Intersection Capacity Utilization		18.4%	ICU Level of Service
Analysis Period (min)		15	



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	52	1	30	89	1	19
Future Volume (vph)	52	1	30	89	1	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	57	1	33	97	1	21

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	58	130	22
Volume Left (vph)	0	33	1
Volume Right (vph)	1	0	21
Hadj (s)	0.02	0.08	-0.53
Departure Headway (s)	4.1	4.1	3.8
Degree Utilization, x	0.07	0.15	0.02
Capacity (veh/h)	864	871	900
Control Delay (s)	7.4	7.8	6.9
Approach Delay (s)	7.4	7.8	6.9
Approach LOS	A	A	A

Intersection Summary			
Delay	7.6		
Level of Service	A		
Intersection Capacity Utilization	23.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	16	11	18	10	7	6	9	49	7	7	108	34
Future Volume (vph)	16	11	18	10	7	6	9	49	7	7	108	34
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	23	16	26	14	10	9	13	70	10	10	154	49

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	65	33	93	213
Volume Left (vph)	23	14	13	10
Volume Right (vph)	26	9	10	49
Hadj (s)	-0.14	-0.04	0.00	-0.09
Departure Headway (s)	4.5	4.6	4.3	4.1
Degree Utilization, x	0.08	0.04	0.11	0.24
Capacity (veh/h)	742	718	794	848
Control Delay (s)	7.9	7.8	7.9	8.5
Approach Delay (s)	7.9	7.8	7.9	8.5
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.2			
Level of Service	A			
Intersection Capacity Utilization	18.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	33	81	32	194	370	12
Future Volume (Veh/h)	33	81	32	194	370	12
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	46	112	44	269	514	17
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	880	522	514			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	880	522	514			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	85	80	96			
cM capacity (veh/h)	305	554	1052			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	158	313	531
Volume Left	46	44	0
Volume Right	112	0	17
cSH	447	1052	1700
Volume to Capacity	0.35	0.04	0.31
Queue Length 95th (m)	11.9	1.0	0.0
Control Delay (s)	17.4	1.6	0.0
Lane LOS	C	A	
Approach Delay (s)	17.4	1.6	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	59	34	12	59	115	18
Future Volume (Veh/h)	59	34	12	59	115	18
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	64	37	13	64	125	20
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	225	135	145			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	225	135	145			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	96	99			
cM capacity (veh/h)	756	914	1437			

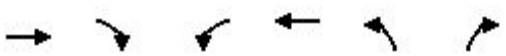
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	101	77	145
Volume Left	64	13	0
Volume Right	37	0	20
cSH	807	1437	1700
Volume to Capacity	0.13	0.01	0.09
Queue Length 95th (m)	3.2	0.2	0.0
Control Delay (s)	10.1	1.3	0.0
Lane LOS	B	A	
Approach Delay (s)	10.1	1.3	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	25.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	64	1	61	57	1	68
Future Volume (Veh/h)	64	1	61	57	1	68
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	70	1	66	62	1	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	173	97			128	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	173	97			128	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	100			100	
cM capacity (veh/h)	816	959			1458	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	71	128	75
Volume Left	70	0	1
Volume Right	1	62	0
cSH	818	1700	1458
Volume to Capacity	0.09	0.08	0.00
Queue Length 95th (m)	2.2	0.0	0.0
Control Delay (s)	9.8	0.0	0.1
Lane LOS	A		A
Approach Delay (s)	9.8	0.0	0.1
Approach LOS	A		

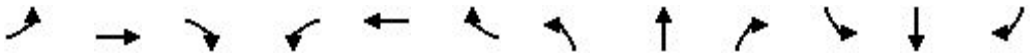
Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	17.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	90	1	12	31	1	24
Future Volume (vph)	90	1	12	31	1	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	1	13	34	1	26

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	99	47	27
Volume Left (vph)	0	13	1
Volume Right (vph)	1	0	26
Hadj (s)	0.03	0.09	-0.54
Departure Headway (s)	4.0	4.1	3.7
Degree Utilization, x	0.11	0.05	0.03
Capacity (veh/h)	881	857	932
Control Delay (s)	7.5	7.4	6.8
Approach Delay (s)	7.5	7.4	6.8
Approach LOS	A	A	A

Intersection Summary			
Delay	7.4		
Level of Service	A		
Intersection Capacity Utilization	19.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	30	8	25	1	2	10	12	113	11	12	78	22
Future Volume (vph)	30	8	25	1	2	10	12	113	11	12	78	22
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	41	11	34	1	3	14	16	153	15	16	105	30

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	86	18	184	151
Volume Left (vph)	41	1	16	16
Volume Right (vph)	34	14	15	30
Hadj (s)	-0.11	-0.42	0.00	-0.06
Departure Headway (s)	4.6	4.3	4.3	4.3
Degree Utilization, x	0.11	0.02	0.22	0.18
Capacity (veh/h)	728	753	806	804
Control Delay (s)	8.1	7.4	8.5	8.2
Approach Delay (s)	8.1	7.4	8.5	8.2
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.3			
Level of Service	A			
Intersection Capacity Utilization	27.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	22	53	89	414	311	40
Future Volume (Veh/h)	22	53	89	414	311	40
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	56	94	436	327	42
Pedestrians	7			6	7	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	986	361	334			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	986	361	334			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	92	92			
cM capacity (veh/h)	250	675	1217			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	79	530	369
Volume Left	23	94	0
Volume Right	56	0	42
cSH	452	1217	1700
Volume to Capacity	0.17	0.08	0.22
Queue Length 95th (m)	4.8	1.9	0.0
Control Delay (s)	14.6	2.2	0.0
Lane LOS	B	A	
Approach Delay (s)	14.6	2.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	26	36	117	86	68
Future Volume (Veh/h)	35	26	36	117	86	68
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	28	39	127	93	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	335	130	167			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	335	130	167			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	97	97			
cM capacity (veh/h)	642	920	1411			

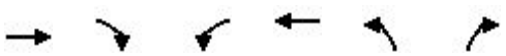
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	66	166	167
Volume Left	38	39	0
Volume Right	28	0	74
cSH	736	1411	1700
Volume to Capacity	0.09	0.03	0.10
Queue Length 95th (m)	2.2	0.6	0.0
Control Delay (s)	10.4	2.0	0.0
Lane LOS	B	A	
Approach Delay (s)	10.4	2.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	30.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	77	1	73	79	1	77
Future Volume (Veh/h)	77	1	73	79	1	77
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	84	1	79	86	1	84
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	208	122			165	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	208	122			165	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	100			100	
cM capacity (veh/h)	780	929			1413	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	85	165	85
Volume Left	84	0	1
Volume Right	1	86	0
cSH	781	1700	1413
Volume to Capacity	0.11	0.10	0.00
Queue Length 95th (m)	2.8	0.0	0.0
Control Delay (s)	10.2	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	10.2	0.0	0.1
Approach LOS	B		

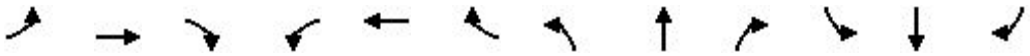
Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	19.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	57	1	30	99	1	19
Future Volume (vph)	57	1	30	99	1	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	62	1	33	108	1	21

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	63	141	22
Volume Left (vph)	0	33	1
Volume Right (vph)	1	0	21
Hadj (s)	0.02	0.08	-0.53
Departure Headway (s)	4.1	4.1	3.8
Degree Utilization, x	0.07	0.16	0.02
Capacity (veh/h)	862	871	889
Control Delay (s)	7.4	7.9	6.9
Approach Delay (s)	7.4	7.9	6.9
Approach LOS	A	A	A

Intersection Summary			
Delay	7.6		
Level of Service	A		
Intersection Capacity Utilization	23.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	11	19	11	7	7	9	50	7	7	110	34
Future Volume (vph)	17	11	19	11	7	7	9	50	7	7	110	34
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	24	16	27	16	10	10	13	71	10	10	157	49

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	67	36	94	216
Volume Left (vph)	24	16	13	10
Volume Right (vph)	27	10	10	49
Hadj (s)	-0.14	-0.04	0.00	-0.09
Departure Headway (s)	4.5	4.6	4.4	4.2
Degree Utilization, x	0.08	0.05	0.11	0.25
Capacity (veh/h)	739	716	790	844
Control Delay (s)	7.9	7.8	7.9	8.5
Approach Delay (s)	7.9	7.8	7.9	8.5
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.2			
Level of Service	A			
Intersection Capacity Utilization	19.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	33	81	32	225	428	12
Future Volume (Veh/h)	33	81	32	225	428	12
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	46	112	44	312	594	17
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	1002	602	594			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1002	602	594			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	82	78	96			
cM capacity (veh/h)	257	499	982			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	158	356	611
Volume Left	46	44	0
Volume Right	112	0	17
cSH	391	982	1700
Volume to Capacity	0.40	0.04	0.36
Queue Length 95th (m)	14.5	1.1	0.0
Control Delay (s)	20.3	1.5	0.0
Lane LOS	C	A	
Approach Delay (s)	20.3	1.5	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	52.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	59	34	12	61	117	18
Future Volume (Veh/h)	59	34	12	61	117	18
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	64	37	13	66	127	20
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	229	137	147			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	229	137	147			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	96	99			
cM capacity (veh/h)	752	911	1435			

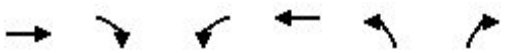
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	101	79	147
Volume Left	64	13	0
Volume Right	37	0	20
cSH	804	1435	1700
Volume to Capacity	0.13	0.01	0.09
Queue Length 95th (m)	3.3	0.2	0.0
Control Delay (s)	10.1	1.3	0.0
Lane LOS	B	A	
Approach Delay (s)	10.1	1.3	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	25.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	64	1	63	57	1	70
Future Volume (Veh/h)	64	1	63	57	1	70
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	70	1	68	62	1	76
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	177	99			130	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	177	99			130	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	100			100	
cM capacity (veh/h)	812	957			1455	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	71	130	77
Volume Left	70	0	1
Volume Right	1	62	0
cSH	814	1700	1455
Volume to Capacity	0.09	0.08	0.00
Queue Length 95th (m)	2.2	0.0	0.0
Control Delay (s)	9.8	0.0	0.1
Lane LOS	A		A
Approach Delay (s)	9.8	0.0	0.1
Approach LOS	A		

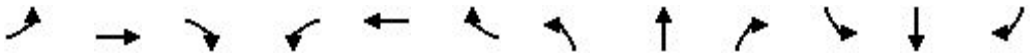
Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	17.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	90	1	12	31	1	24
Future Volume (vph)	90	1	12	31	1	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	1	13	34	1	26

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	99	47	27
Volume Left (vph)	0	13	1
Volume Right (vph)	1	0	26
Hadj (s)	0.03	0.09	-0.54
Departure Headway (s)	4.0	4.1	3.7
Degree Utilization, x	0.11	0.05	0.03
Capacity (veh/h)	881	857	932
Control Delay (s)	7.5	7.4	6.8
Approach Delay (s)	7.5	7.4	6.8
Approach LOS	A	A	A

Intersection Summary			
Delay	7.4		
Level of Service	A		
Intersection Capacity Utilization	19.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	30	8	26	1	2	11	12	115	11	12	80	22
Future Volume (vph)	30	8	26	1	2	11	12	115	11	12	80	22
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	41	11	35	1	3	15	16	155	15	16	108	30

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	87	19	186	154
Volume Left (vph)	41	1	16	16
Volume Right (vph)	35	15	15	30
Hadj (s)	-0.11	-0.43	0.00	-0.06
Departure Headway (s)	4.6	4.3	4.3	4.3
Degree Utilization, x	0.11	0.02	0.22	0.18
Capacity (veh/h)	726	751	804	802
Control Delay (s)	8.1	7.4	8.6	8.3
Approach Delay (s)	8.1	7.4	8.6	8.3
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.3			
Level of Service	A			
Intersection Capacity Utilization	27.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	22	53	89	480	361	40
Future Volume (Veh/h)	22	53	89	480	361	40
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	56	94	505	380	42
Pedestrians	7			6	7	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.1			1.1	1.1	
Percent Blockage	1			1	1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1108	414	387			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1108	414	387			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	91	92			
cM capacity (veh/h)	211	631	1164			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	79	599	422
Volume Left	23	94	0
Volume Right	56	0	42
cSH	399	1164	1700
Volume to Capacity	0.20	0.08	0.25
Queue Length 95th (m)	5.5	2.0	0.0
Control Delay (s)	16.2	2.1	0.0
Lane LOS	C	A	
Approach Delay (s)	16.2	2.1	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	26	36	120	88	68
Future Volume (Veh/h)	35	26	36	120	88	68
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	28	39	130	96	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	341	133	170			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	341	133	170			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	97	97			
cM capacity (veh/h)	637	916	1407			

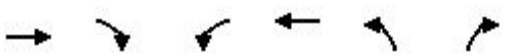
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	66	169	170
Volume Left	38	39	0
Volume Right	28	0	74
cSH	731	1407	1700
Volume to Capacity	0.09	0.03	0.10
Queue Length 95th (m)	2.3	0.6	0.0
Control Delay (s)	10.4	1.9	0.0
Lane LOS	B	A	
Approach Delay (s)	10.4	1.9	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	30.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	77	1	76	79	1	79
Future Volume (Veh/h)	77	1	76	79	1	79
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	84	1	83	86	1	86
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	126			169	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	214	126			169	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	100			100	
cM capacity (veh/h)	774	924			1409	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	85	169	87
Volume Left	84	0	1
Volume Right	1	86	0
cSH	775	1700	1409
Volume to Capacity	0.11	0.10	0.00
Queue Length 95th (m)	2.8	0.0	0.0
Control Delay (s)	10.2	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	10.2	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay		2.6	
Intersection Capacity Utilization		19.8%	ICU Level of Service A
Analysis Period (min)		15	

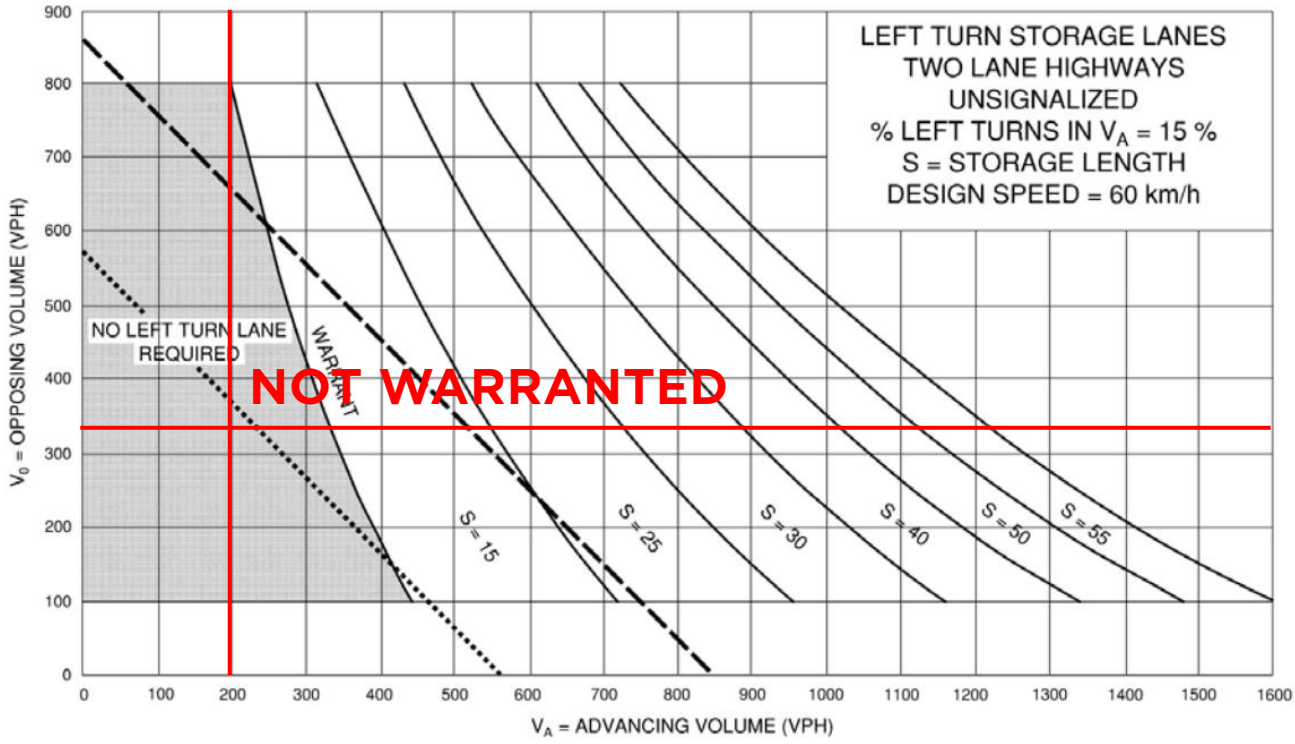


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	57	1	30	99	1	19
Future Volume (vph)	57	1	30	99	1	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	62	1	33	108	1	21

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	63	141	22
Volume Left (vph)	0	33	1
Volume Right (vph)	1	0	21
Hadj (s)	0.02	0.08	-0.53
Departure Headway (s)	4.1	4.1	3.8
Degree Utilization, x	0.07	0.16	0.02
Capacity (veh/h)	862	871	889
Control Delay (s)	7.4	7.9	6.9
Approach Delay (s)	7.4	7.9	6.9
Approach LOS	A	A	A

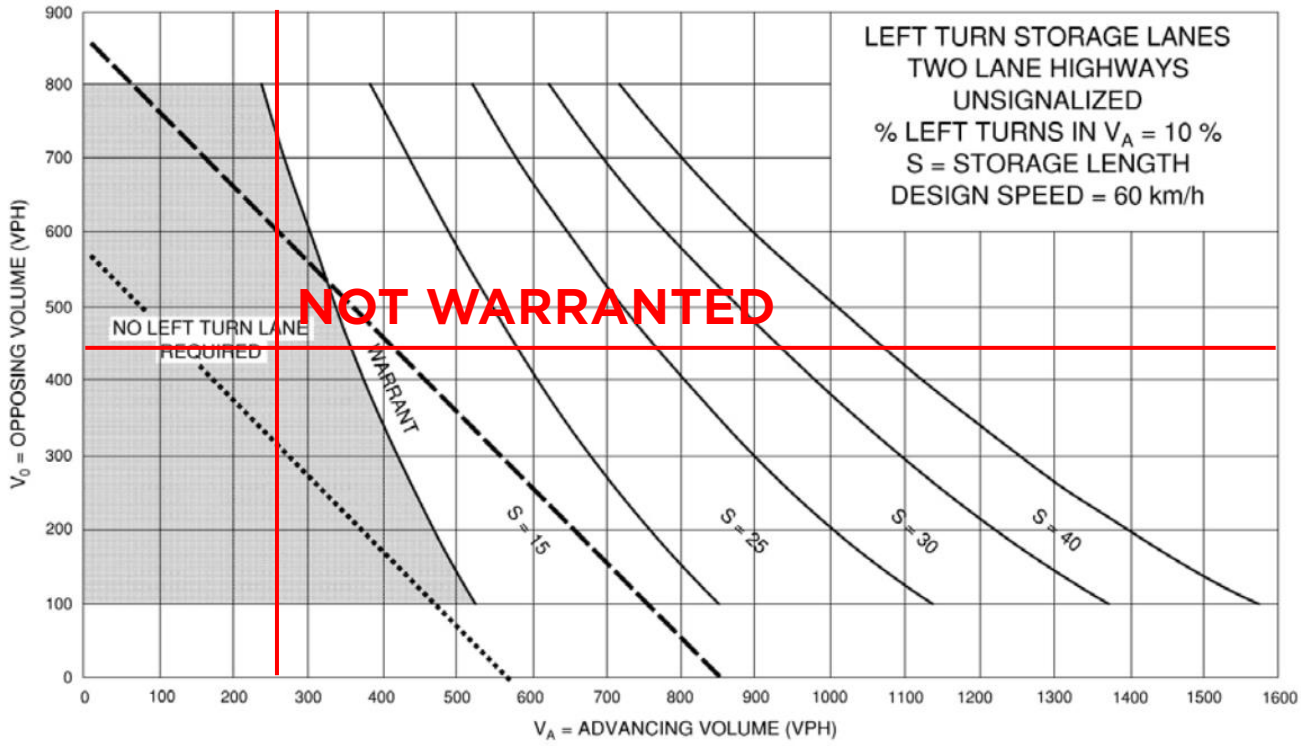
Intersection Summary			
Delay	7.6		
Level of Service	A		
Intersection Capacity Utilization	23.5%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix H:
Left Turn Warrants

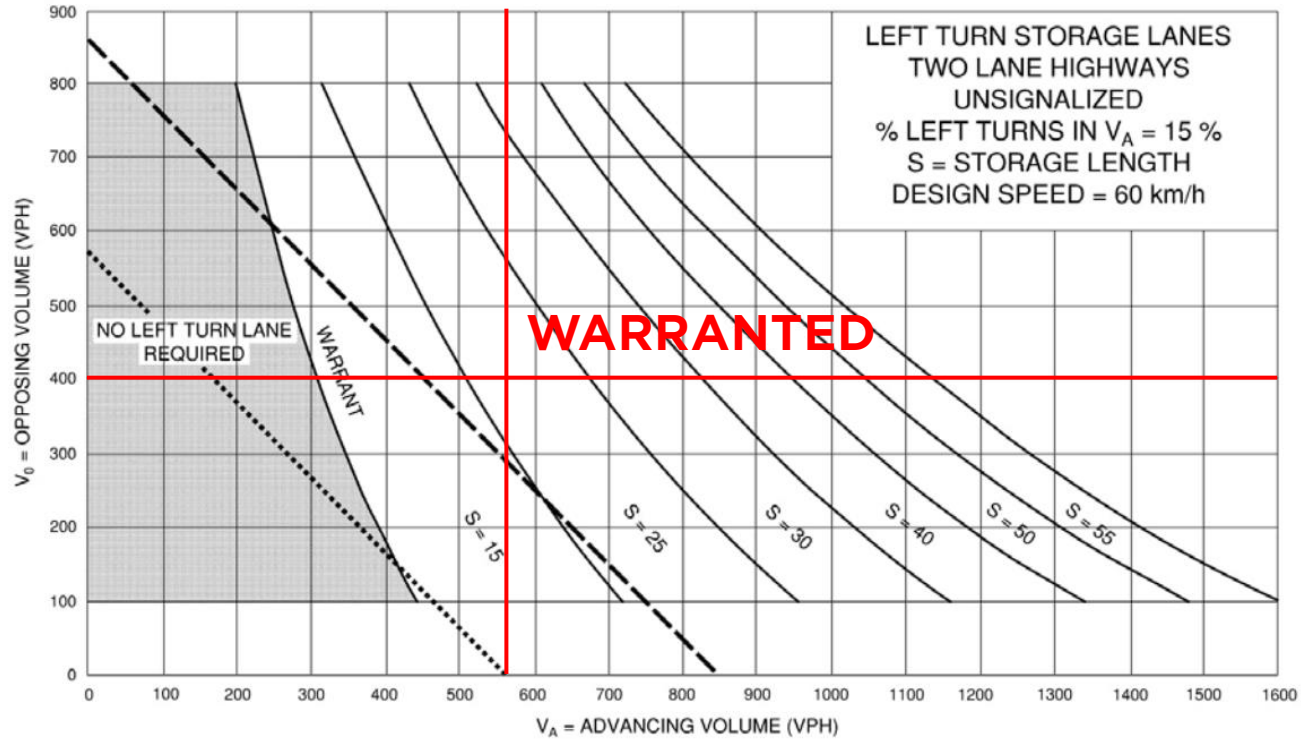


Weekday AM Peak Hour

Weekday PM Peak Hour



Weekday AM Peak Hour



Weekday PM Peak Hour