APPENDIX 3

EXISTING TRAFFIC AND TRANSPORTATION CONDITIONS TECH MEMO

Downtown Infrastructure Revitalization Program

Part C Macdonell and Allan Structures Class EA

Existing Traffic and Transportation Conditions Memorandum

Final

Prepared for:
City of Guelph

RVA 215632

May 9, 2025

EXECUTIVE SUMMARY

As part of the Municipal Class Environmental Assessment (EA) that R. V. Anderson Associates Limited (RVA) is undertaking for the Macdonell Bridge, Allan's Bridge and Allan's Dam Sluiceway Structures, RVA has completed this Existing Traffic and Transportation Conditions Memorandum which reviewed the existing active transportation and transit facilities, collisions, and the existing and future (2051) do-nothing intersection operations along the corridor stretching from Carden Street in the west to Aurther Street North and South to the east.

Macdonell Street Bridge is one of the four main crossings over Speed River into the downtown core. Running adjacent to Macdonell Street Bridge is the Allan's Bridge and sluice gate structure.

The Macdonell Street bridge and corridor is an east-west oriented road under the jurisdiction of the City of Guelph. West of Woolwich Street/Wellington Street corridor, Macdonell Street is classified as a Downtown Main Street. East of Woolwich Street/Wellington Street East corridor, Macdonell Street is classified as a Primary Street. As outlined in the City's updated Transportation Master Plan, Macdonell Street is included within the Pedestrian Priority Network and is identified as a part of the Spine Cycling Network and Resilience Network corresponding with the City's preferred transportation direction, *Alternative #3 – Sustainability + Resilience*.

Cycling facilities in the study area include the Downtown Trail along with Macdonell Street through to Elizabeth Street designated as on-road facilities. Sidewalks are located along each segment of road with the Macdonell Street Road Bridge consisting of sidewalks and guardrails on both sides of the road. No pedestrian crosswalk is currently present at the south approach of Macdonell Street and Elizabeth Street to accommodate eastbound and westbound pedestrian movements wishing to cross Elizabeth Street.

The Guelph Central Station bus terminal is located at the western edge of the study area south of Macdonell Street and serves Guelph Transit, GO transit (bus and rail), Via Rail and Flixbus services.

Existing intersection capacity analysis completed for the study area signalized and unsignalized intersections, indicates that all intersections are currently operating satisfactorily with no critical movements during the weekday a.m., p.m., and Saturday midday peak hours. Under the future (2051) horizon year do-nothing scenario, the analysis indicates that all intersections continue to operate within the capacity of the existing roadway geometry. Of note, the intersection of Macdonell Street with Woolwich Street/Wellington Street has several movements during the a.m. and p.m. peak hours

which would be approaching capacity and require geometric enhancements beyond 2051 horizon year.

Based on historical collision data from 2016 to 2020, a total of 129 collisions occurred within the project study area. Of the 129 total collisions recorded, 72 occurred at intersections and the remaining 57 occurred within midblock sections. No fatal injury collisions were reported in the 5 years of historical data analyzed.

The majority of collisions recorded at intersections (37 or 51%) were classified as property damage only with 18 (25%) classified as non-fatal injury. Turning movement collisions were the most predominant collision impact type with 29 (40%) recorded. 28 (97%) of those occurred at the intersection of Macdonell Street with Wellington Street. The contributing reason for this could be the horizontal alignment of the north and south approaches to the intersection.

Within midblock sections, almost half 27 (47%) of collisions recorded were classified as property damage only with 3 (5%) classified as non-fatal injury. “Other” collisions were the most predominant collision impact type with 17 (30%) followed by single motor vehicle collisions with 14 (25%). The contributing factor for these collisions could potentially be attributed to the significant on-street parking available to the west of the study area corridor.

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1.0 INTRODUCTION

R.V. Anderson Associates Limited (RVA) was retained by the City of Guelph (City) to undertake an Environmental Assessment (EA) for the improvements to the Macdonell Bridge, Allan's Bridge and Allan's Dam Sluiceway Structures. The boundary limits of this study are Macdonell Street from Carden Street in the west to Arthur Street North and Arthur Street South in the east.

In support of the EA process, RVA has undertaken this Existing Traffic and Transportation Assessment. This memorandum summarizes our review of existing active transportation and transit facilities, review of collisions within the study area, and existing intersection operations along the corridor. The findings of this memorandum will assist the project team in determining the most appropriate cross-section for the future Macdonell Street corridor.

Included in this memo is an assessment of intersection operations for a future 30-year horizon (2051) with no roadway improvements, identifying any future needs of the corridor from a traffic perspective which will inform the development of alternative solutions to mitigate identified concerns.

2.0 MACDONELL STREET STUDY AREA

2.1 Study Area Description

Macdonell Street Bridge is one of the four main crossings over Speed River into the downtown core. Running adjacent to Macdonell Street Bridge is the Allan's Bridge and sluice gate structure. The at-grade Allan's bridge is currently not in use. Above the Allan's bridge is a set of elevated train tracks, which services the Via Rail and Go Trains. At grade train tracks follows the Downtown Trail and crosses at Macdonell Street just west of the bridge.

The Macdonell and Allan's Dam Structures are at the edge of the downtown core. Current land use to the north of the structures is mainly residential. Future developments on the west side of the bridge includes the third phase of the Metalworks condominium development near the intersection of Elizabeth Street and Macdonell Street. The adjacent spaces to the south of the structures include public natural spaces along the Downtown Trail, and condominium buildings along Macdonell Street. Further west along Macdonell Street is the Guelph Central Station. The Sleeman Centre and River Run Centre are located just west of the development. An aerial of the surrounding lands is shown in **Figure 1**.

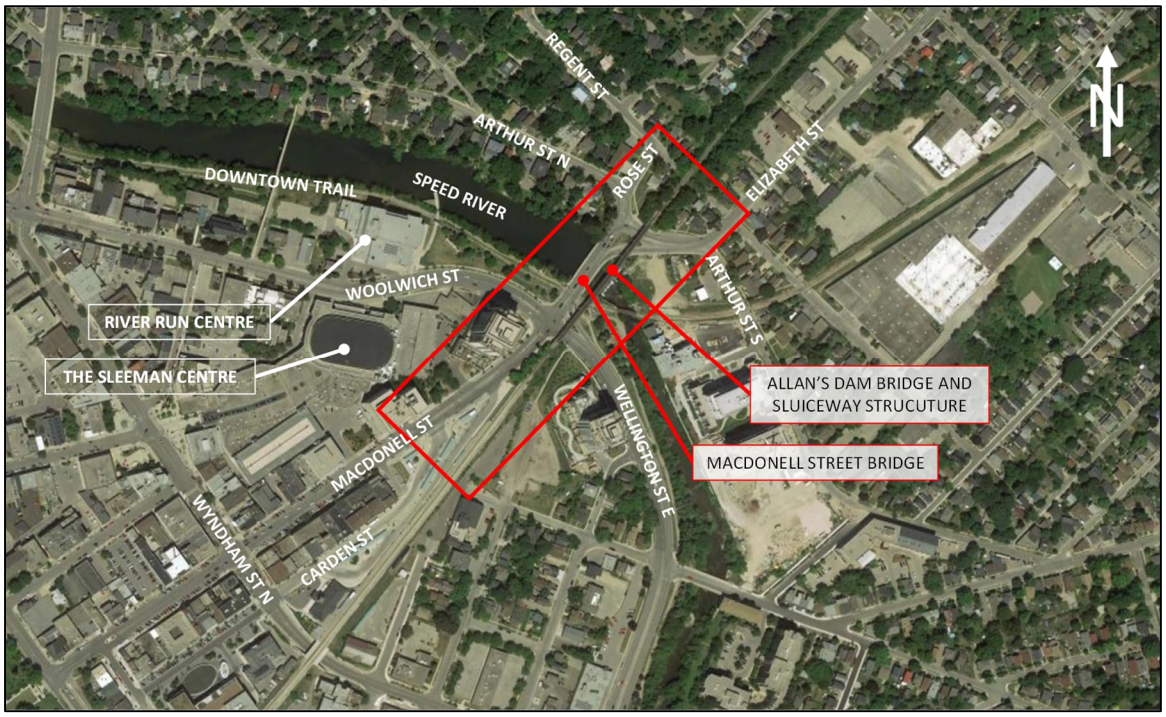

Figure 1: Aerial of Study Area

2.2 Roadway Configuration

The Macdonell Street bridge and corridor is an east-west oriented road under the jurisdiction of the City of Guelph. West of Woolwich Street/Wellington Street corridor, Macdonell Street is classified as a Downtown Main Street[1]. East of Woolwich Street/Wellington Street East corridor, Macdonell Street is classified as a Primary Street[2]. Macdonell Street has an assumed speed of 50km/h throughout. The road is generally straight, with a slight bend near the intersection of Woolwich Street and Macdonell Street. The vertical alignment is generally level. According to the City's updated Transportation Master Plan (TMP) and presented within their StoryMaps website entitled *Moving Guelph Forward*, *Alternative #3 – Sustainability + Resilience* is currently the City's preferred transportation direction. As part of this alternative, Macdonell Street is included within the

[1] Downtown Main Streets are the main commercial streets within Downtown. While accommodating cars, trucks and bicycles, Downtown Main Streets should be considered pedestrian and transit priority streets. Source: City of Guelph Official Plan, June 2021 Consolidation section 11.1.4.2.3.

[2] Primary Streets are major roads that provide access to and through Downtown for pedestrians, transit, bicycles, and auto vehicles. Source: City of Guelph Official Plan, June 2021 Consolidation section 11.1.4.2.2.

Pedestrian Priority Network and is identified as a part of the Spine Cycling Network and Resilience Network.

The segment of Macdonell Street between the west study area limit (Carden Street) to the signalized intersection of Woolwich Street/Wellington Street East has a two-lane urban cross section. This segment of road features illumination poles and trees along the boulevard on both sides of the street. The north side of the street consists of a concrete paver boulevard, and a paved shoulder. There is no street parking permitted on this segment of road. The west approach of the signalized intersection of Macdonell Street and Woolwich Street/Wellington Street East has an auxiliary left-turn lane with an approximate taper of 25 metres and storage length of 25 metres. The northbound right turn movement at the intersection is channelized and under stop control with Macdonell Street. Just east of the Woolwich Street/Wellington Street East and Macdonell Street intersection, there is an at-grade rail crossing warning signal with cantilevers and no gates. Due to the warning systems proximity to the intersection, there is approximately 15 metres of storage available between the intersection and tracks.

The segment of Macdonell Street between the intersections of Woolwich Street/Wellington Street East and Elizabeth Street is a four-lane road bridge with an urban cross section. The Macdonell Street Bridge is used as a truck route. This segment of road consists of street poles on either side of the street. There is no on-street parking permitted on this segment of road. The east approach to the signalized intersection of Macdonell Street and Woolwich Street/Wellington Street East has an auxiliary left-turn lane with an approximate storage length of 105 metres. In the eastbound direction on approach to the signalized intersection of Macdonell Street/Arthur Street North and Elizabeth Street the curb lane becomes a auxiliary right turn lane with channelization which merges with Elizabeth Street through yield traffic control.

Arthur Street North is a 2-lane road classified as a Local Street[3] with an urban cross section. The two lanes are separated by a painted median. Illumination poles are located on both side of the street. A speed hump is located near the intersection of Arthur Street North and Rose Street. Parallel parking is permitted on the west side of the street. The north approach (Arthur Street North) to the intersection of Macdonell Street/Arthur Street North and Elizabeth Street has an auxiliary left-turn lane with an approximate taper of 6 metres and storage length of 10 metres. Just beyond this storage length, Rose Street intersects with the north approach and is under stop control.

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[3] Local Streets are intended to provide access to development and facilitate circulation by all modes Downtown. City of Guelph Official Plan, June 2021 Consolidation section 11.1.4.2.5.

Rose Street is a 2-lane road classified as a Local Street connecting Arthur Street North and Regent Street. Illumination poles are located on the south side of the street. No parking is permitted on this street.

Elizabeth Street is a 2-lane road classified as a Primary Street with an urban cross section. Elizabeth Street is labeled as a truck route. Near the intersection of Arthur Street North and Elizabeth Street, the right of way consists of illumination poles on both side of the street. There is no street parking permitted on this segment of road. The west approach of the intersection of Macdonell Street, Arthur Street North and Elizabeth Street has an auxiliary left-turn lane with an approximate taper of 30 metres and storage length of 42 metres.

2.3 Active Transportation Facilities

2.3.1 Pedestrian

From Carden Street at the western edge of the study area to Woolwich Street, sidewalks are located on both sides, and a boulevard made from pavers is located on the north side of the street.

The Woolwich Street/Wellington Street East and Macdonell Street intersection provides pedestrians with crosswalks at all legs of the intersection, including across the channelized northbound right-turn lane as shown in **Figure 2**. There are no road crossings at the train track lights, however pedestrians may cross over the train tracks and continue to the crosswalks at the intersection of Woolwich Street and Macdonell Street. There are no physical barriers to stop pedestrians from crossing when a train passes through the rail crossing as shown in **Figure 3**.

Figure 2: Crosswalks at Macdonell St. and Woolwich St.

Figure 3: At-Grade Rail Crossing at Macdonell St. and Woolwich St.

The Macdonell Street Bridge consists of sidewalks and guardrails on both sides of the road. Currently, the Allan's bridge is not in use and has been blocked off.

At the intersection of Macdonell Street, Elizabeth Street and Arthur Street North, there is only one cross walk located on the north approach of Arthur Street North. Having only one crosswalk at this location limits the movement of pedestrians in this area. The next nearest crosswalks are located at the Macdonell Street and Woolwich Street intersection. This single crosswalk forces pedestrians to backtrack to the Macdonell Street and Woolwich Street intersection to cross between the north and south sides of Elizabeth Street, as shown in **Figure 4**.

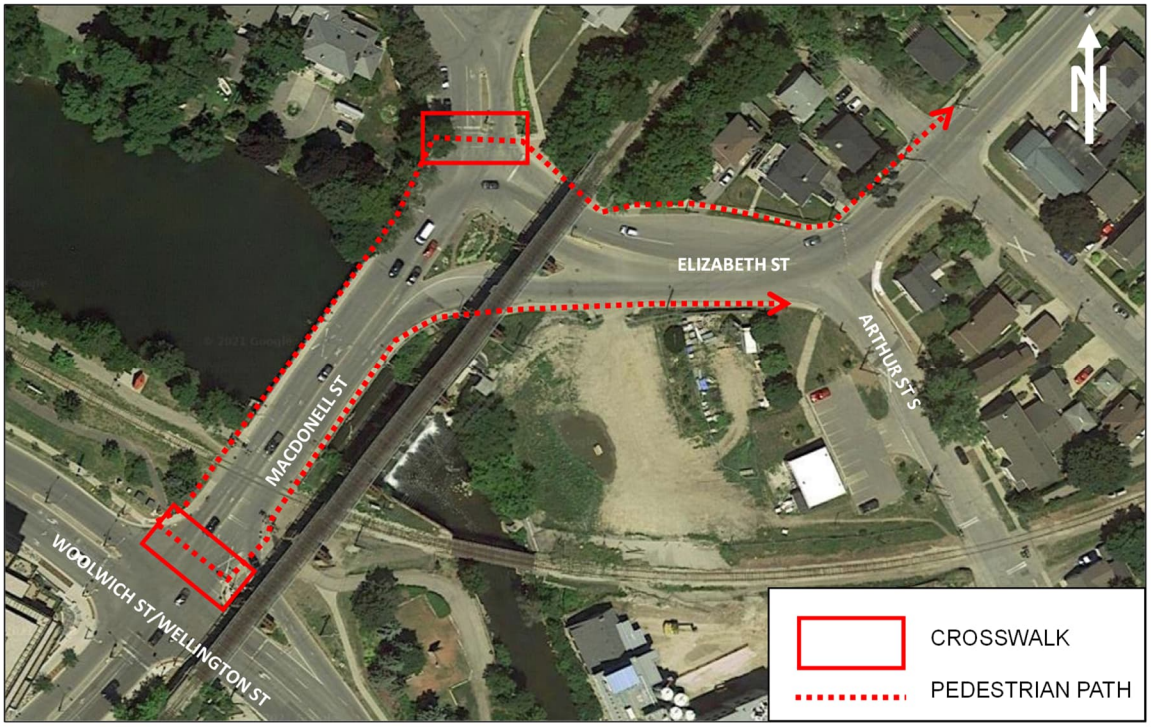


Figure 4: Macdonell Street Pedestrian Routes

Arthur Street North consists of sidewalks on both sides of the street, with a grass boulevard on the west side. Rose Street consists of sidewalks on both sides of the street, with a grass boulevard on the north side of the street. At the intersection of Rose Street and Arthur Street North, there are depressed curbs for pedestrians to cross the Rose Street approach, however there is no painted crosswalk.

Elizabeth Street consists of sidewalks on both sides of the street, with a grass boulevard on the north side. Arthur Street South consists of one sidewalk with a grass boulevard on the east side of the street. At the intersection of Elizabeth Street and Arthur Street South, there are depressed curbs for pedestrians to cross the Arthur Street South approach, however there is no painted crosswalk.

2.3.2 Cycling

Cycling facilities within the study area and Downtown Core consists mainly of the Downtown Trail however Macdonell Street and Elizabeth Street are identified as an "on-road" cycling facilities. The downtown trail allows for active transportation along the river in the downtown core. The trail starts at Wyndham Street South and Wellington Street East and continues north through the study area and then west until it transitions into the TransCanada trail. At the intersection of Macdonell Street and Elizabeth Street, there is a bike lane crossing the right turning auxiliary lane from Macdonell Street as shown in **Figure 5**. There are no additional designated bicycle facilities in the right of way.

Figure 5: Cyclist Lane at Elizabeth Street

2.4 Transit Facilities

2.4.1 Guelph Transit

Figure 6 presents the current City of Guelph transit routes within the study area as taken from the Guelph Transit Downtown Service Map and Full System Map. As presented in the figure, the Macdonell Street corridor is currently serviced by Route #99 to the west of Woolwich Street/Wellington Street East and Route #14 east of this intersection which utilizes the Macdonell Street Bridge as part of its route to and from the downtown core.

Along Woolwich Street/Wellington Street East, Routes #3, #4, #12, #20 and #40 run through the intersection with Macdonell Street.

Guelph Central Station which is located at the western edge of the study area also provides transit stops for Guelph Transit routes which utilize both Carden Street and Macdonell Street to access the station/stops. These include Routes #3, #4, #9, #10, #11, #12, #14, and #20. The locations of these stops are presented under Section 2.4.3.

2.4.2 GO Transit

Guelph Central Station also provides access to GO services including busses and trains plus services for Via Rail. GO bus routes include Route #29 which runs between Guelph and Mississauga traveling south from Guelph Central Station toward the University of Guelph before making its way east to Mississauga. GO bus Routes #30, #31, and #33 also utilize the station running from Kitchener to Toronto. These routes travel along east along Macdonell Street through the study area making their way towards Acton and then Toronto with stops in between. A snapshot of the route paths taken from their respective schedule maps are presented in **Figure 7**.

The Kitchener Line of GO Train service which runs from Kitchener to Toronto with a stop in Guelph at Guelph Central Station, utilizes the elevated train tracks above the Allan's Bridge as shown in **Figure 8**. The Kitchener Line route map is also presented in **Figure 9**.

The location of all GO Bus and Transit stops are presented under Section 2.4.3.

2.4.3 Flixbus

Along Carden Street near Guelph Central Station there is also a stop for Flixbus which has only recently begun operations within Canada. Flixbus is an alternative bus service which contains routes between Kitchener and Toronto. The location of the Flixbus stop on Carden Street is presented under Section 2.4.4.

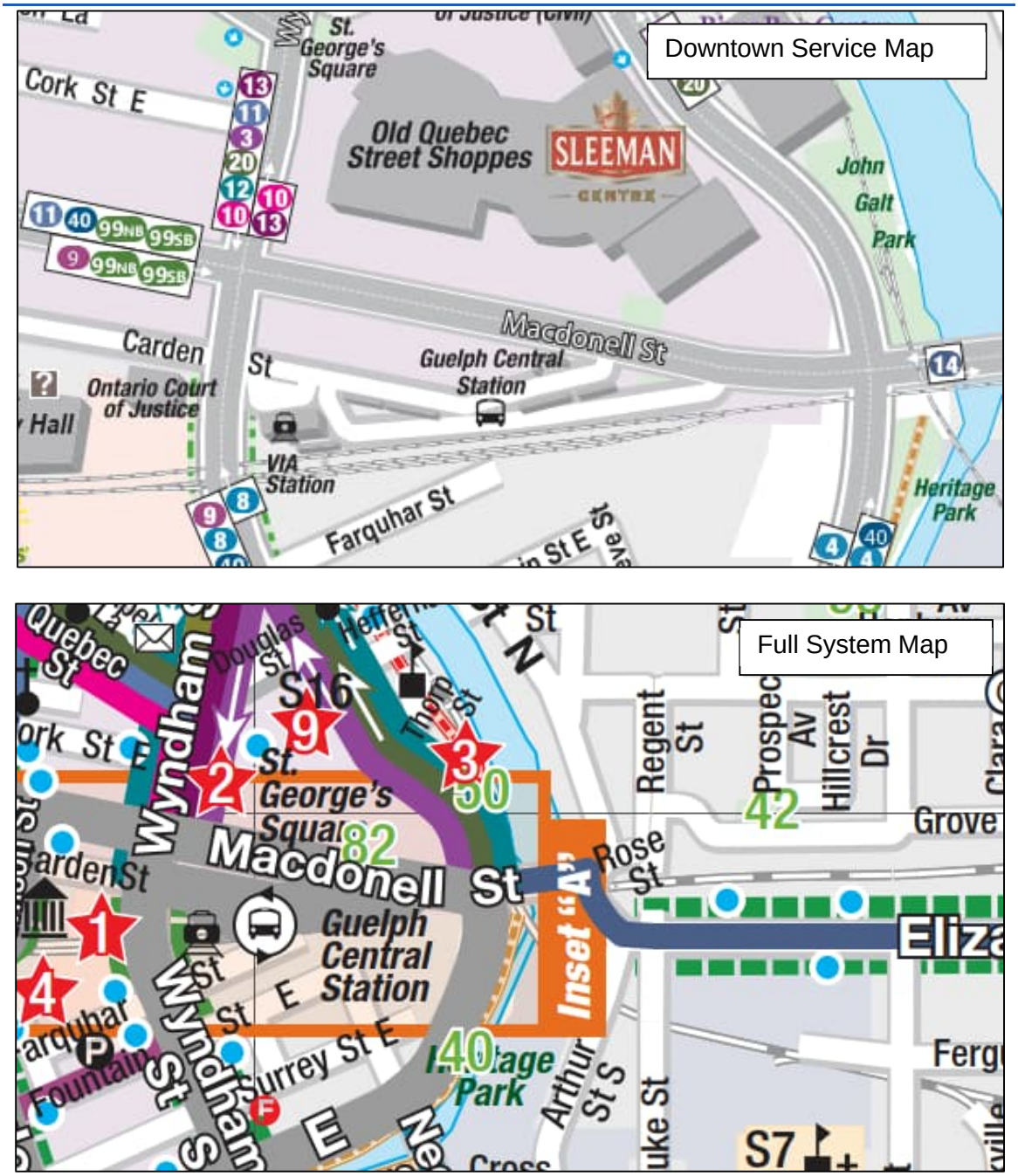


Figure 6: Guelph Transit Study Area Bus Routes

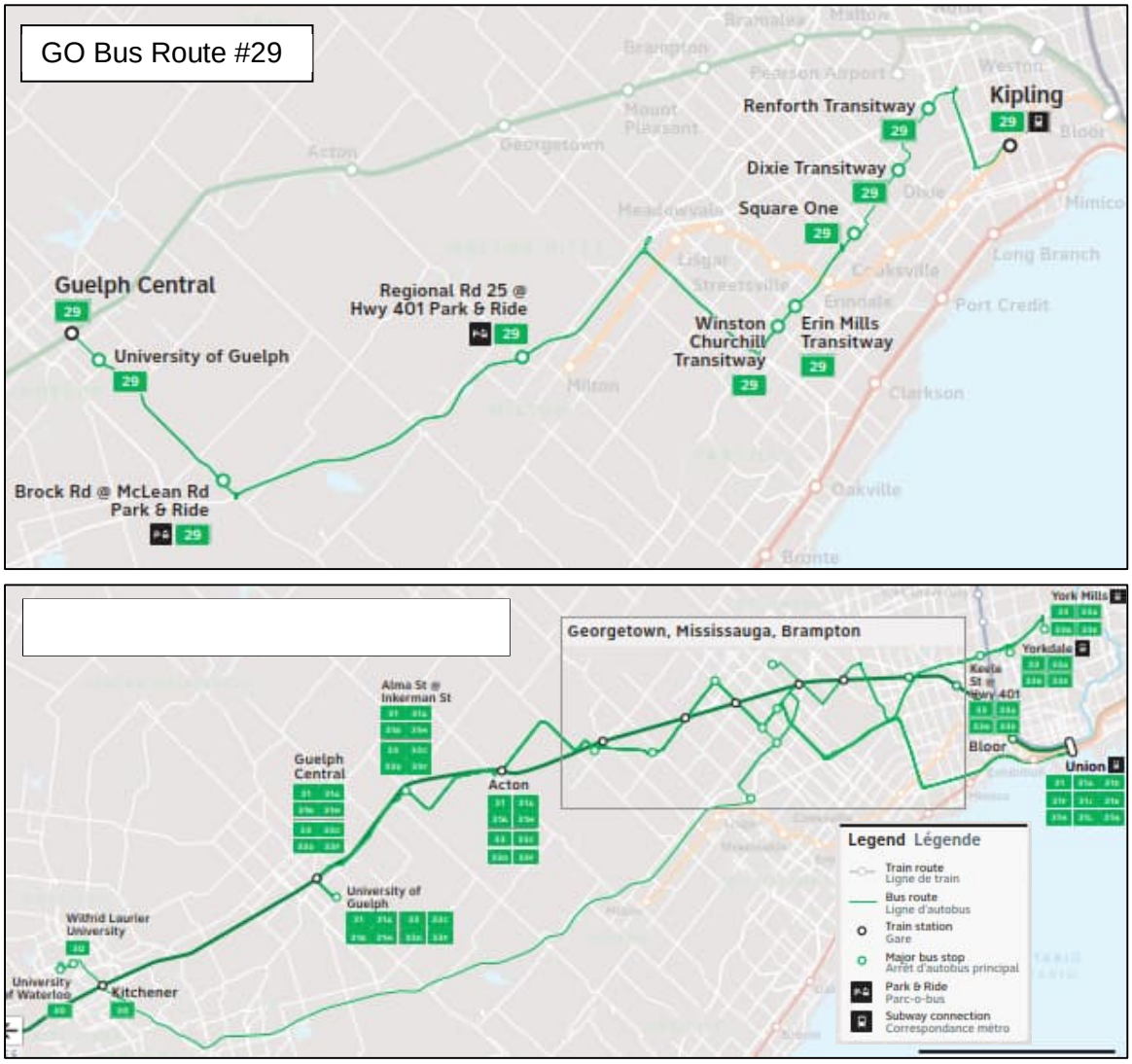


Figure 7: GO Transit Study Area Bus Routes

Figure 8: Elevated Rail Facilities Adjacent to Macdonell St. Bridge

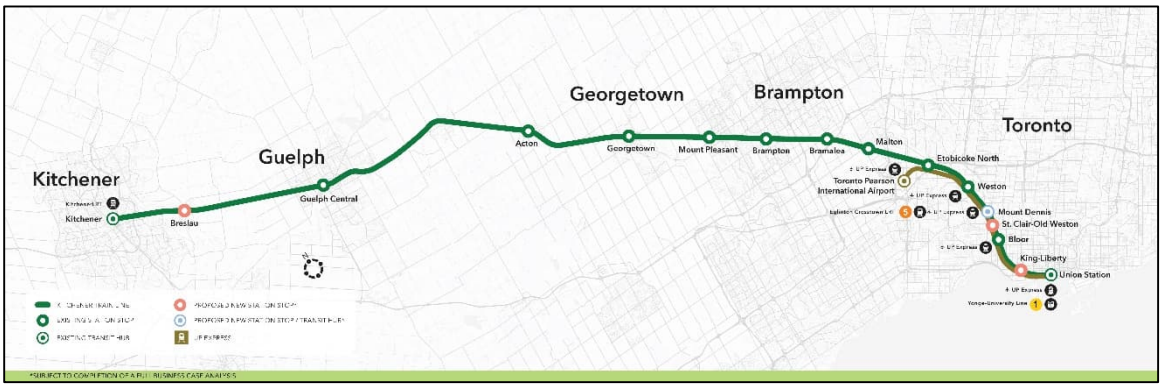


Figure 9: GO Train Kitchener Line Route

2.4.4 Transit Stop Locations

As mentioned under the previous sections there are several transit stops located at the west end of the study area coinciding with Guelph Central Station. The majority of these stops surround the intersection of Macdonell Street and Carden Street and contain by lay-bys/bus bays directly of Macdonell Street. The Macdonell Street stops, and their respective service provider are presented in **Figure 10**. There are no other transit stops located within the Macdonell Street study area.

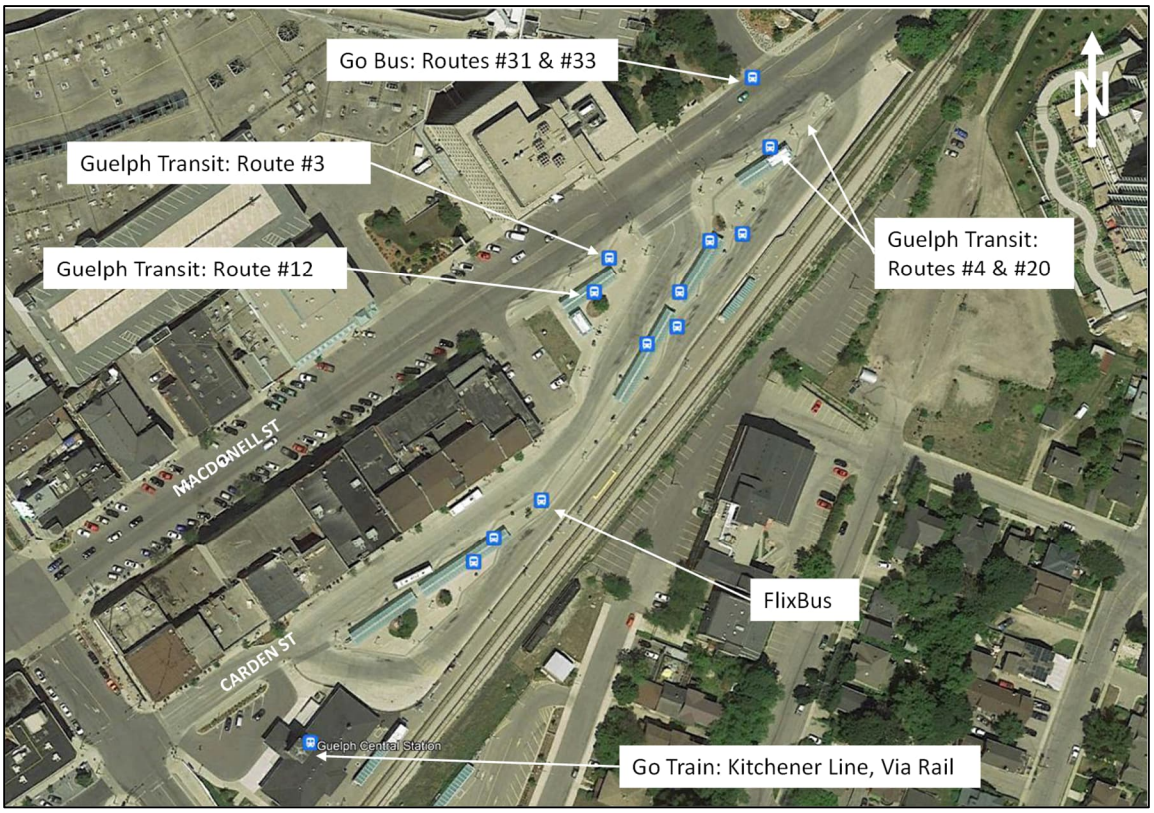


Figure 10: Macdonell St. Transit Stops

2.5 Study Area Intersections

The intersections analyzed as part of this study stretch from Carden Street in the west to Arthur Street North and Arthur Street South in the east and are presented in **Figure 11**. The following subsections provide further descriptions of the intersections including their traffic control and lane configurations.

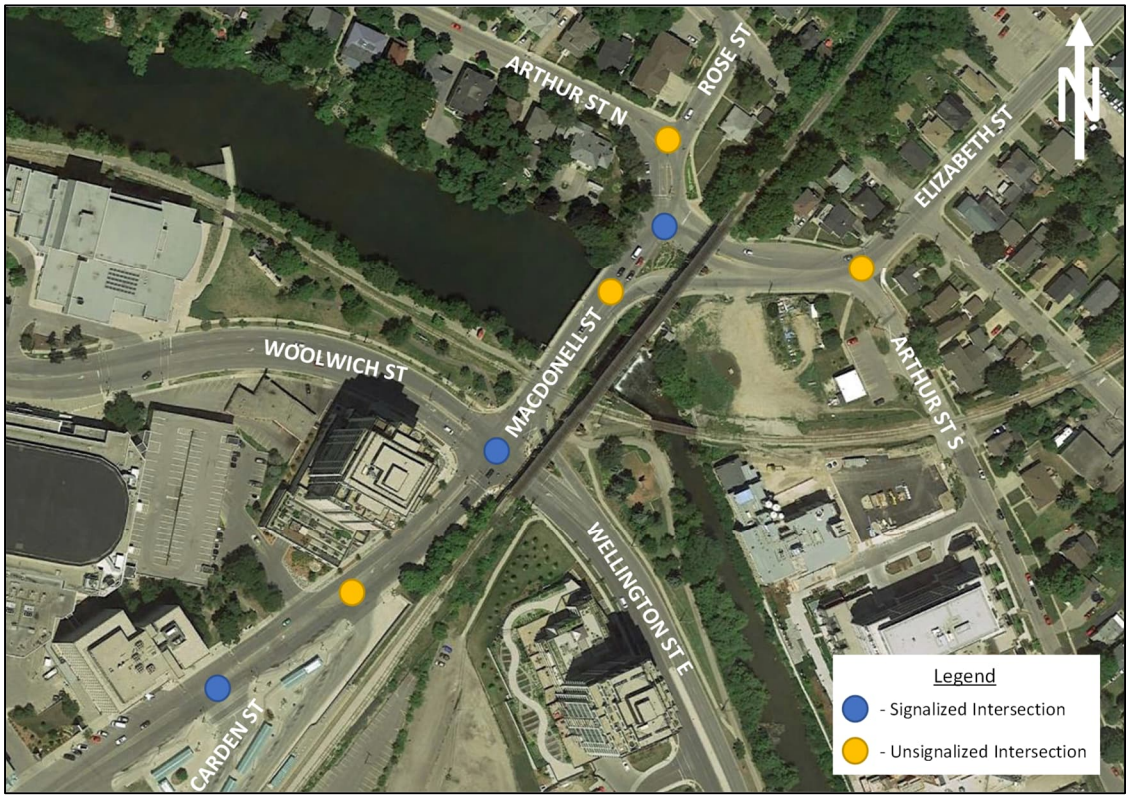


Figure 11: Study Area Intersections

2.5.1 Macdonell Street at Woolwich Street/Wellington Street East

The intersection of Woolwich Street/Wellington Street East and Macdonell Street is signalized. The west and east approaches have one shared through/right-turning lane and one left-turning lane. The north approach has one through lane, one shared through/right-turning lane, and one left turning lane. The south approach has two through lanes, one left-turning lane, and one channelized right turn lane as shown in **Figure 12**.

Figure 12: Macdonell St. at Woolwich St., Wellington Street East (South Approach)

2.5.2 Macdonell Street at Arthur Street North and Elizabeth Street

The three-way intersection of Macdonell Street at Arthur Street North and Elizabeth Street is signalized. The west approach from Macdonell Street has one through lane and one right-turning lane. The Arthur Street North approach consists of two through lanes and one left-turning lane. The Elizabeth Street (west) approach has a right-turning lane and a left-turning lane as shown in **Figure 13**.

Figure 13: Macdonell St. at Elizabeth St. and Arthur St. N, (South Approach)

2.5.3 Arthur Street North at Rose Street

The intersection at Rose Street and Arthur Street North is controlled by a single stop sign at Rose Street. All approaches at this intersection have a single lane sharing all movements.

2.5.4 Arthur Street South at Elizabeth Street

The intersection at Arthur Street South and Elizabeth Street is controlled by a single stop sign at Arthur Street South. The west approach of this intersection contains a single lane shared through and right turn movement. The east approach contains a dedicated left turn lane with approximately 50 metres. Finally, the south approach contains a single shared left and right turn lane.

3.0 EXISTING TRAFFIC CONDITIONS

3.1 Turning Movement Counts

Weekday and Saturday historical Turning Movement Counts (TMCs) from the years 2003 to 2021 were provided by the City of Guelph. At intersections where data was not available, arrangements were made for current data to be collected. This data was collected in November of 2021. All TMC data provided and collected can be found in **Appendix A**. The weekday peak hour generally ranged between 8:00 a.m. and 9:00 a.m. for morning counts, 11:30 a.m. to 1:30 p.m. for mid-day counts, and 4:00 p.m. to 5:30 p.m. for evening counts. The Saturday Midday peak hour generally ranged between 11:00 a.m. and 1:00 p.m.

Given the range of years in which traffic data was collected, all historical data was grown by 1% per annum to a current 2021 base year. The growth rate utilized was determine through a review of historical 8-hour traffic count data along the corridor. The review indicated that growth along the corridor was nominal and as a result, a 1% growth rate would be a conservative estimate. Once grown to the base year condition, balancing adjustments were applied to the volumes to mitigate any problematic imbalances in volumes between adjacent intersections, which can occur when relying on a dataset consisting of varying years of traffic data. Turning Movement Diagrams (TMDs) for the existing intersection unbalanced and balanced turning movement volumes during the weekday a.m. and p.m. and Saturday midday peak hours are provided in **Appendix B**.

3.2 Traffic Operations

3.2.1 Intersection Analysis Methodology

The industry standard Synchro macroscopic traffic analysis software was utilized to analyse the study area intersections. Key performance measures such as Level of Service (LOS), volume-to-capacity ratio (v/c ratio), and 95th percentile queuing was reported, and are defined below:

- **Average vehicle control delay** is used to characterize LOS for the entire intersection, an approach, or movement. Delay quantifies the variations in travel time and is also a surrogate measure of driver discomfort and fuel consumption.
- **V/c ratio** quantifies the degree to which the capacity of each signal phase is utilized by a defined lane group.
- **95th percentile queue** is the queue length which is expected to be exceeded only 5% of the time; it is common practice to identify preferred storage length

requirements for auxiliary turn lanes at signalized intersections based on estimated peak hour 95th percentile queueing.

Table 1 identifies the control delay thresholds (seconds of delay per vehicle) for each LOS based on Highway Capacity Manual (HCM) 2000 methodology.

Table 1: Characteristics of Level of Service at Intersections

LEVEL OF SERVICE (LOS)	CONTROL DELAY (seconds / vehicle)	
	SIGNALIZED INTERSECTION	UNSIGNALIZED INTERSECTION
A	≤ 10	≤ 10
B	> 10 to 20	> 10 to 15
C	> 20 to 35	> 15 to 25
D	> 35 to 55	> 25 to 35
E	> 55 to 80	> 35 to 50
F	> 80	> 50

Existing signal timing plans for the study area intersections were provided by the City for use in the traffic analysis; the signal timing plans are provided in **Appendix C**.

3.2.2 City of Guelph Traffic Impact Study Guidelines

The City of Guelph currently has their own Traffic Impact Study Guidelines dated April 2016. Section 3.7.1 of this document provides capacity analysis thresholds for movements at signalized and unsignalized intersections which should be documented. Those thresholds are as follows:

Signalized Intersections

- v/c ratios for overall intersection operation, through movements or shared/turning movements increased to 0.85 or above.
- v/c ratios for exclusive movements increased to 0.90 or above.
- Queues for an individual movement are projected to exceed available turning lane storage.

Unsignalized Intersections

- Level of Service (LOS) based on the average delay per vehicle, on individual movements exceeds LOS “E”
- The estimated 95th percentile queue length or an individual movement exceeds the available queue storage.

3.3 Existing (2021) Intersection Capacity Analysis

The following section presents the intersection capacity analysis results for the study area intersections during the weekday a.m., and p.m. and Saturday Midday peak hours under existing conditions. The analysis was conducted using Synchro software and utilized the signal timing plans provided by the City. The analysis results are presented in **Table 2**.

The HCM output reports from Synchro for the intersection analysis is provided in **Appendix D**.

Table 2: Existing (2021) Intersection Analysis Results

INTERSECTION *(TRAFFIC CONTROL)*	INT /MVMT	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY MIDDAY PEAK HOUR			STORAGE LENGTH
		V/C	LOS	95TH % QUEUE (M)	V/C	LOS	95TH % QUEUE (M)	V/C	LOS	95TH % QUEUE (M)	
Macdonell St. & Carden St. *(Signalized)*	**Overall**	**0.37**	**B**	**-**	**0.39**	**B**	**-**	**0.65**	**B**	**-**	-
	EBT	0.47	B	36m	0.71	C	70m	0.72	B	17m	-
	WBT	0.68	B	64m	0.57	B	52m	0.75	B	20m	-
	NBLR	0.07	B	<1 veh	0.07	B	<1 veh	0.21	B	<1 veh	-
Macdonell St. & Transit Entrance *(Unsignalized)*	**Overall**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-
	EBTR	0.14	A	<1 veh	0.22	A	<1 veh	0.13	A	<1 veh	-
	WBL	0.01	A	<1 veh	0.01	A	<1 veh	0.01	A	<1 veh	10m
	WBT	0.26	A	<1 veh	0.17	A	<1 veh	0.16	A	<1 veh	-
Macdonell St. & Woolwich St./Wellington St. *(Signalized)*	**Overall**	**0.62**	**B**	**-**	**0.62**	**C**	**-**	**0.57**	**B**	**-**	-
	EBL	0.08	B	<1 veh	0.22	B	17m	0.12	B	10m	25m
	EBTR	0.36	B	41m	0.53	C	63m	0.30	B	34m	-
	WBL	0.64	B	49m	0.58	B	36m	0.59	B	47m	105m
	WBTR	0.50	B	61m	0.39	B	44m	0.37	B	41m	-
	NBL	0.52	C	34m	0.21	C	14m	0.08	C	8m	50m
	NBTT	0.40	C	37m	0.33	C	32m	0.29	C	29m	-
	NBR	0.23	C	18m	0.35	C	24m	0.33	C	22m	40m
	SBL	0.38	C	25m	0.62	C	47m	0.48	C	36m	135m
	SBTTR	0.31	C	27m	0.43	C	39m	0.28	C	26m	-
Macdonell St. & Elizabeth St. *(Unsignalized)*	**Overall**	**-**	**-**	**-**	-	-	-	-	-	-	-
	EBT	0.15	A	<1 veh	0.19	A	<1 veh	0.11	A	<1 veh	-
	EBR	0.20	A	<1 veh	0.32	A	<1 veh	0.32	A	<1 veh	-
	WBTT	0.25	A	<1 veh	0.19	A	<1 veh	0.21	A	<1 veh	-
Macdonell St./Arthur St. N & Elizabeth St. *(Signalized)*	**Overall**	**0.50**	**C**	**-**	**0.51**	**C**	-	**0.56**	**B**	**-**	-
	EBT	0.34	C	56m	0.44	C	74m	0.68	D	47m	-
	WBL	0.09	B	11m	0.10	B	11m	0.09	C	1 veh	10m
	WTT	0.27	B	38m	0.17	B	26m	0.26	C	17m	-
	NBL	0.66	C	116m	0.58	C	97m	0.54	A	66m	70m
	NBR	0.09	B	11m	0.07	B	10m	0.02	A	<1 veh	-
Arthur St. N & Rose St. *(Unsignalized)*	**Overall**	**-**	**-**	**-**	**-**	**-**	**-**	-	-	-	-
	WBLR	0.41	C	16m	0.14	B	<1 veh	0.13	A	<1 veh	-
	NBTR	0.22	A	<1 veh	0.25	A	<1 veh	0.13	A	<1 veh	-
	SBLT	0.01	A	<1 veh	0.00	A	<1 veh	0.01	A	<1 veh	-

INTERSECTION *(TRAFFIC CONTROL)*	INT /MVMT	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY MIDDAY PEAK HOUR			STORAGE LENGTH
		V/C	LOS	95TH % QUEUE (M)	V/C	LOS	95TH % QUEUE (M)	V/C	LOS	95TH % QUEUE (M)	
	Overall	**-**	**-**	**-**	-	-	-	-	-	-	-
Arthur St. S & Elizabeth St. *(Unsignalized)*	EBTR	0.22	A	<1 veh	0.34	A	<1 veh	0.30	A	<1 veh	-
	WBL	0.01	B	<1 veh	0.02	B	<1 veh	0.05	A	<1 veh	50m
	WBR	0.28	A	<1 veh	0.25	A	<1 veh	0.34	A	<1 veh	-
	NBLR	0.43	C	17m	0.39	D	14m	0.23	C	1 veh	-

As presented in **Table 2**, all of the study area intersections are currently operating satisfactorily under existing (2021) traffic conditions with no critical movements during any of the three peak hours analyzed.

4.0 COLLISION DATA REVIEW

Historical collision data for all study area intersections and midblock sections from 2016 to 2020, inclusively, was provided by the City and reviewed. The data includes key characteristics of the reported collisions based on information recorded in Motor Vehicle Accident Reports (MVARs), providing an opportunity to analyze the data for historical trends or patterns that could be contributing to the collision history of each intersection/midblock location.

Overall, a total of 129 collisions have been reported over the five-year period within the study area corridor. Of the 129 total collisions recorded, 72 occurred at intersections and the remaining 57 occurred midblock. The following sections provide a summary of the collision findings which occurred at intersections and midblock locations within the study area.

The raw collision data information as provided by the City is in **Appendix E**.

4.1 Collision Findings at Intersections

As mentioned previously, there were 72 total collisions which occurred at intersections within the study area. A review of the collisions based on classification indicates that 51% (37) of the collisions resulted in property damage only. Another 25% (18) resulted in non-fatal injury and 10% (7) were recorded as non-reportable. Of note is that 14% (10) of the collisions were given no classification in the data provided and no fatal injury collisions were recorded. The breakdown of collisions by classification are presented in **Figure 14**.

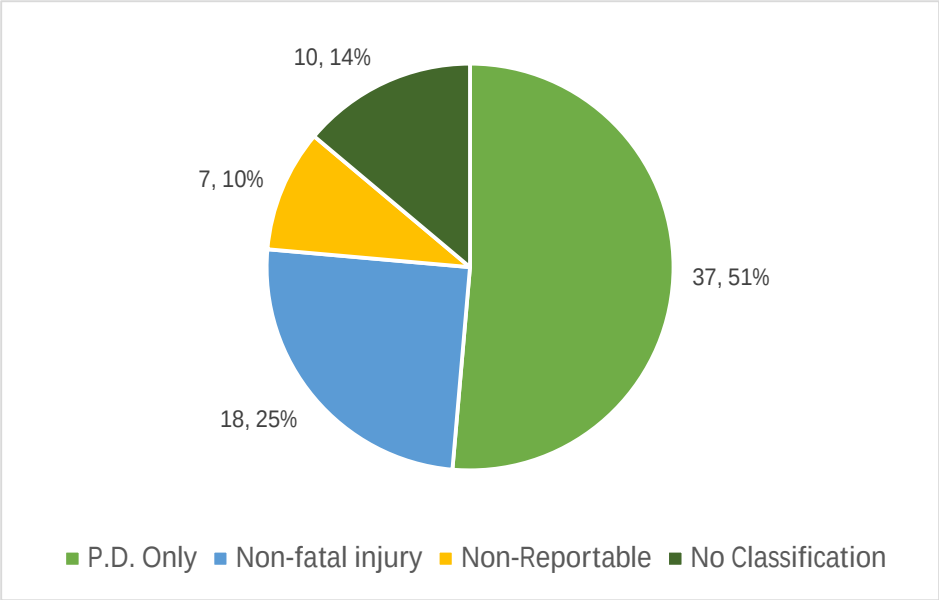


Figure 14: Breakdown of Collisions at Intersections based on Classification

Table 3 presents the breakdown of collisions by initial impact type which were recorded at each intersection.

Table 3: Breakdown of Collisions at Intersections based on Initial Impact Type

INTERSECTION	REAR ENDS	ANGLE	TURNING MOVEMENT	SIDESWIPE	SMV	APPROACHING	OTHER	TOTAL	TOTAL %
Macdonell St. & Carden St.	0	0	0	0	1	0	0	**1**	**1%**
Macdonell St. & Wellington St.	9	6	28	5	8	2	0	**58**	**81%**
Macdonell St. & Arthur St.	1	0	0	1	0	0	1	**3**	**4%**
Arthur St. & Elizabeth St.	3	0	0	3	1	1	0	**8**	**11%**
Arthur St. & Rose St.	0	1	1	0	0	0	0	**2**	**3%**
Totals	**13**	**7**	**29**	**9**	**10**	**3**	**1**	**72**	**100%**
Total %	**18%**	**10%**	**40%**	**13%**	**14%**	**4%**	**1%**	**100%**	

Based on the collision impact type results presented in **Table 3**, turning movement collisions were the predominant collision impact type for the overall study area with a total of 29 (40%) recorded over the five years of historical data. However, 48% (28) of these collisions occurred at the intersection of Macdonell Street at Wellington Street East which

was also the intersection which accounted for 81% (58) of the overall collisions at intersections within the study area.

Further investigation into turning movement collisions at the intersection of Macdonell Street and Wellington Street East found that 82% (23) of the 28 collisions involved conflicts between vehicles travelling northbound/southbound along Wellington Street/Woolwich Street East. The reasoning for this could be attributed to the horizontal alignment of the north and south approaches to the intersection. Left turning vehicles may have difficulty seeing and judging the speed of oncoming traffic due to sightline constraints on approach to the intersection caused by the horizontal curvature of the roadway.

4.2 Collision Findings at Midblock Sections

A total of 57 collisions occurred within the midblock sections between Wyndham Street and Arthur Street North and South. A review of the collisions based on classification indicates that 47% (27) of the collisions resulted in property damage only. Another 14 (25%) were classified as non-reportable and 3 (5%) resulted in non-fatal injury. Of note is that 23% (13) of the collisions were given no classification in the data provided and no fatal injury collisions were recorded. The breakdown of collisions by classification are presented in **Figure 15**.

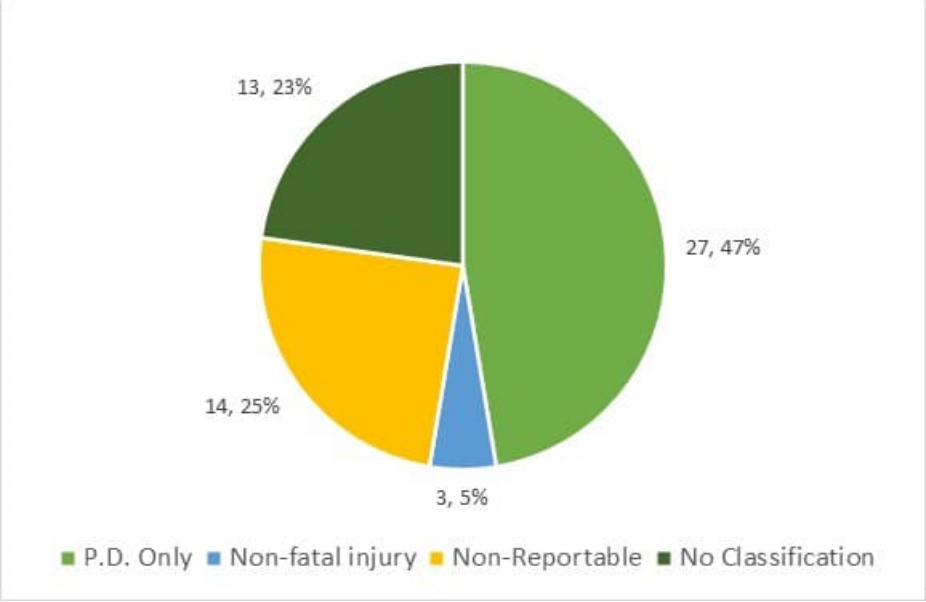


Figure 15: Breakdown of Collisions at Midblock Locations based on Classification

Table 4 presents the breakdown of collisions by initial impact type which were recorded within each midblock section.

Table 4: Breakdown of Collisions at Midblock Locations based on Initial Impact Type

MIDBLOCK	REAR ENDS	ANGLE	TURNING MOVEMENT	SIDESWIPE	SINGLE MOTOR VEHICLE	APPROACHING	OTHER	TOTAL	TOTAL %
Between Carden St. and Wyndham St.	3	2	4	4	10	0	15	38	**67%**
Between Carden St. & Wellington St.	2	1	3	4	4	0	2	16	**28%**
Arthur St. between Arthur St. S & Rose St.	1	0	0	0	0	0	0	1	**2%**
Arthur St. S	0	0	0	1	0	1	0	2	**4%**
Totals	**6**	**3**	**7**	**9**	**14**	**1**	**17**	**57**	**100%**
Total %	**11%**	**5%**	**12%**	**16%**	**25%**	**2%**	**30%**	**100%**	

The breakdown of collisions by initial impact type presented in **Table 4**, show that 'other' and single motor vehicle collisions are the most predominant collision type with the majority of these occurring within the midblock section of Macdonell Street between Carden Street and Wyndham Street which is immediately west of the study area. This midblock section also contained the most overall collisions within the study area with 38 (67%) of the total collisions recorded.

Further investigation into 'other' collisions within the midblock section between Carden Street and Wyndham Street found that 13 (86%) of the 15 recorded involved vehicles reversing. This likely corresponds with the angled on-street parking which is present throughout this midblock section.

Further investigation into single motor vehicle collisions within the midblock section of Carden Street and Wyndham Street found that all of the collisions recorded involved either a vehicle reversing, or a vehicle parked. Reversing collisions likely correspond with the angled on-street parking present throughout this midblock section. Parked incidents may potentially be attributed to vehicles striking objects (sign poles, garbage cans, planters etc.) on the side of the road while parking their vehicles as many of these objects are currently very close to the edge of the roadway as presented in **Figure 16**.

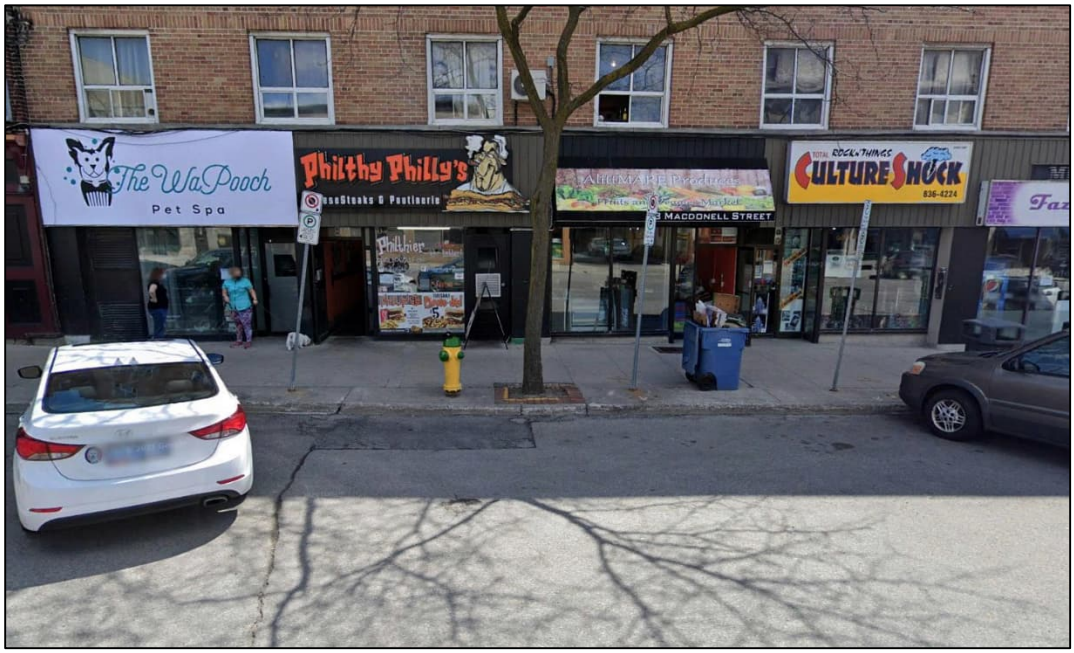


Figure 16: Objects near side of roadway adjacent on-street parking

5.0 FUTURE (2051) DO-NOTHING TRAFFIC CONDITIONS

5.1 Future Background Traffic Growth

Future background traffic growth for the corridor was established through the application of the 1% per annum growth rate to the existing traffic (2021) volumes as established under Section 3.1. The resulting background traffic volumes TMD for the 2051 horizon year during the weekday a.m., p.m. and Saturday Midday peak hours are presented in **Appendix F**.

5.2 Proposed Development Site Traffic Volumes

There is one development within the immediate study area in which estimated site trips have been included in the development of the future (2051) traffic volumes for the corridor. This development is:

- 5 Arthur Street Development – Proposed mixed-use development located on the northwest corner of Arthur Street and Cross Street

The estimated site traffic generated by the proposed development have been extracted from the Traffic Impact Study completed in January 2015 and are presented in a TMD figure found in **Appendix G**.

5.3 Future (2051) Traffic Volumes

The future (2051) traffic volumes for the study corridor were established by combining the background traffic growth volumes with the estimated site traffic volumes from the 5 Arthur Street development. The resulting future (2051) traffic volumes TMD for the weekday a.m., p.m. and Saturday Midday peak hours are presented in **Appendix H**.

5.4 Future (2051) Intersection Operations

5.4.1 Future (2051) Do-Nothing Intersection Analysis

The following section presents the intersection capacity analysis results for the study area intersections during the weekday a.m., p.m. and Saturday Midday peak hours under future (2051) Do-Nothing traffic conditions which means no changes were made to the existing intersection lane configurations. The results of the analysis are presented in **Table 5**.

The HCM output reports from Synchro for the intersection analysis are provided in **Appendix I**.

Table 5: Future (2051) Do-Nothing Intersection Analysis Results

INTERSECTION *(TRAFFIC CONTROL)*	MVMT	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY MIDDAY PEAK HOUR			STORAGE LENGTH
		V/C	LOS	95TH % QUEUE (M)	V/C	LOS	95TH % QUEUE (M)	V/C	LOS	95TH % QUEUE (M)	
Macdonell St. & Carden St. *(Signalized)*	**Overall**	**0.53**	**D**	**-**	**0.56**	**D**	**-**	**0.53**	**A**	**-**	-
	EBT	0.67	C	59m	1.01	E	114m	0.53	A	25m	-
	WBT	0.98	D	124m	0.81	C	95m	0.55	A	29m	-
	NBLR	0.09	B	<1 veh	0.10	B	1 veh	0.34	B	<1 veh	-
Macdonell St. & Transit Entrance *(Unsignalized)*	**Overall**	-	-	-	-	-	-	-	-	-	-
	EBTR	0.21	A	<1 veh	0.32	A	<1 veh	0.18	A	<1 veh	-
	WBL	0.01	A	<1 veh	0.01	A	<1 veh	0.01	A	<1 veh	10m
	WBT	0.37	A	<1 veh	0.24	A	<1 veh	0.21	A	<1 veh	-
Macdonell St. & Woolwich St./Wellington St. *(Signalized)*	**Overall**	**0.99**	**C**	**-**	**1.12**	**D**	**-**	**0.86**	**C**	**-**	-
	EBL	0.16	B	1 veh	0.34	B	23m	0.18	B	13m	25m
	EBTR	0.52	C	62m	0.80	C	118m	0.41	B	48m	-
	WBL	0.99	D	110m	1.00	E	83m	0.87	C	85m	105m
	WBTR	0.79	C	135m	0.59	B	77m	0.51	B	63m	-
	NBL	0.89	E	163m	0.42	C	20m	0.12	C	9m	50m
	NBTT	0.57	C	54m	0.47	C	45m	0.40	C	38m	-
	NBR	0.31	C	22m	0.79	D	100m	0.44	C	29m	40m
	SBL	0.81	E	54m	1.22	F	98m	0.75	D	61m	135m
	SBTTR	0.46	C	41m	0.62	C	58m	0.38	C	36m	-

INTERSECTION *(TRAFFIC CONTROL)*	MVMT	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY MIDDAY PEAK HOUR			STORAGE LENGTH
		V/C	LOS	95TH % QUEUE (M)	V/C	LOS	95TH % QUEUE (M)	V/C	LOS	95TH % QUEUE (M)	
Macdonell St. & Elizabeth St. *(Unsignalized)*	**Overall**	-	-	-	-	-	-	-	-	-	-
	EBT	0.20	A	<1 veh	0.26	A	<1 veh	0.15	A	<1 veh	-
	EBR	0.30	A	<1 veh	0.48	A	<1 veh	0.43	A	<1 veh	-
	WBTT	0.36	A	<1 veh	0.27	A	<1 veh	0.29	A	<1 veh	-
Macdonell St./Arthur St. N & Elizabeth St. *(Signalized)*	**Overall**	**0.73**	**D**	**-**	**0.71**	**C**	**-**	**0.76**	**C**	**-**	-
	EBT	0.45	C	77m	0.59	C	107m	0.85	D	75m	-
	WBL	0.18	B	17m	0.24	B	19m	0.17	C	1 veh	10m
	WTT	0.36	C	52m	0.23	B	34m	0.32	C	22m	-
	NBL	1.01	E	237m	0.83	D	177m	0.74	B	115m	70m
	NBR	0.21	B	26m	0.18	B	25m	0.02	A	<1 veh	-
Arthur St. N & Rose St. *(Unsignalized)*	**Overall**	-	-	-	-	-	-	-	-	-	-
	WBLR	0.76	E	50m	0.27	C	<1 veh	0.19	B	<1 veh	-
	NBTR	0.32	A	<1 veh	0.35	A	<1 veh	0.17	A	<1 veh	-
	SBLT	0.02	A	<1 veh	0.00	A	<1 veh	0.01	A	<1 veh	-
Arthur St. S & Elizabeth St. *(Unsignalized)*	**Overall**	-	-	-	-	-	-	-	-	-	-
	EBTR	0.33	A	<1 veh	0.51	A	<1 veh	0.45	A	<1 veh	-
	WBL	0.07	A	<1 veh	0.14	B	<1 veh	0.09	A	<1 veh	50m
	WBR	0.37	A	<1 veh	0.33	A	<1 veh	0.46	A	<1 veh	-
	NBLR	2.00	F	248m	1.99	F	170m	0.54	E	1 veh	-

Most movements are projected to operate acceptably by 2051 during peak hours, with reserve capacity, acceptable levels of delay, and no critical queueing concerns.

All four unsignalized intersections along the study corridor are projected to operate well during peak hours to 2051, except for the northbound approach on Arthur Street North at Elizabeth Street which is expected to reach capacity during the a.m. and p.m. peak hours. This is largely associated with background corridor growth on Elizabeth Street over the 30-year horizon resulting in reduced available gaps for traffic entering from Arthur Street North, combined with a notable increase in traffic on Arthur Street North largely generated from the planned mixed-use development on Arthur Street North. However, signal warrant analysis was conducted for the intersection but found that a traffic signal is not warranted in 2051 due to insufficient volumes. The signal warrant analysis sheets can be found in **Appendix J**.

All three signalized intersections along the study corridor (Macdonell Street at Carden Street, at Woolwich Street/Wellington Street East, and at Elizabeth Street) are forecasted to have one or two movements reaching capacity by 2051 during the a.m. and p.m. peak hours. A review of potential signal timing optimizations was completed, the results of which are presented in **Table 6** with HCM output reports from Synchro found in **Appendix I**.

Table 6: Future (2051) Do-Nothing Intersection Analysis Results – Optimized Timings

INTERSECTION *(TRAFFIC CONTROL)*	MVMT	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY MIDDAY PEAK HOUR			STORAGE LENGTH
		V/C	LOS	95TH % QUEUE (M)	V/C	LOS	95TH % QUEUE (M)	V/C	LOS	95TH % QUEUE (M)	
Macdonell St. & Carden St. *(Signalized)*	**Overall**	**0.51**	**C**	**-**	**0.53**	**C**	**-**	**0.81**	**C**	**-**	-
	EBT	0.58	B	55m	0.83	C	113m	0.67	A	25m	-
	WBT	0.84	C	121m	0.66	B	78m	0.68	A	30m	-
	NBLR	0.07	B	<1 veh	0.11	B	1 veh	0.30	B	<1 veh	-
Macdonell St. & Woolwich St./Wellington St. *(Signalized)*	**Overall**	**0.98**	**D**	**-**	**1.02**	**D**	**-**	**0.74**	**C**	**-**	-
	EBL	0.17	C	11m	0.36	C	32m	0.19	C	18m	25m
	EBTR	0.55	C	91m	0.85	D	168m	0.44	C	70m	-
	WBL	0.99	E	153m	0.98	E	123m	0.87	D	117m	105m
	WBTR	0.81	C	189m	0.60	C	114m	0.52	B	95m	-
	NBL	0.98	F	88m	0.39	D	27m	0.14	D	13m	50m
	NBTT	0.68	D	83m	0.57	D	70m	0.48	D	59m	-
	NBR	0.45	D	50m	0.92	E	142m	0.45	D	40m	40m
	SBL	0.62	D	41m	0.96	F	100m	0.62	D	52m	135m
	SBTTR	0.42	C	56m	0.55	C	79m	0.34	C	48m	-
Macdonell St./Arthur St. N & Elizabeth St. *(Signalized)*	**Overall**	**0.72**	**C**	**-**	**0.70**	**C**	**-**	**0.74**	**C**	**-**	-
	EBT	0.69	D	109m	0.66	C	127m	0.74	D	72m	-
	WBL	0.37	D	26m	0.30	C	23m	0.15	C	1 veh	10m
	WTT	0.55	D	75m	0.26	C	41m	0.28	C	25m	-
	NBL	0.74	C	169m	0.74	C	160m	0.73	B	169m	70m
	NBR	0.14	B	9m	0.10	B	11m	0.03	A	<1 veh	-

Through signal timing adjustments and optimization, the projected capacity constraints at the Macdonell Street at Carden Street intersection and MacDonnell Street at Arthur Street / Elizabeth Street intersection can be mitigated. However, several left-turn movements at the intersection of Macdonell Street at Woolwich Street / Wellington Street are still expected to be nearing capacity, assuming the current intersection lane configurations and geometry.

Based on the findings from the future (2051) do-nothing intersection operational analysis, and a review of the projected 2051 traffic volumes reducing the number of lanes along the Macdonell Bridge would not be feasible. A reduction in lanes would contribute to increase capacity and delay issues beyond those already identified through the operational analysis conducted in this section.

6.0 SUMMARY OF FINDINGS

The following section presents the conclusions derived from the completion of the Existing Traffic and Transportation Conditions Analysis for Macdonell Street which included a review of existing active transportation and transit facilities, review of collisions within the study area, and existing and future (2051) do-nothing intersection operations along the corridor.

- Pedestrian facilities within the corridor consist of sidewalks on both sides of the street along the entire corridor. There are no pedestrian crosswalks presents at the intersection of Macdonell Street and Elizabeth Street to accommodate eastbound pedestrian movements wishing to cross Elizabeth Street.
- Both Macdonell Street and Elizabeth Street are currently designated as “on-road” cycling facilities with connections to the Downtown Trail. Additionally, there is a dedicated cycling lane crossing the right turning auxiliary lane within the intersection of Macdonell Street and Elizabeth Street.
- There are several Guelph Transit bus routes which run through the study area. In addition, GO Transit bus routes also utilize Macdonell Street and Elizabeth Street.
- Guelph Central Station is located at the west edge of the study area along Carden Street and in addition to providing stops for Guelph Transit bus routes, also services GO Transit (bus and rail), Via Rail and Flixbus services.
- Under existing traffic conditions, all of the study area intersections operate satisfactorily with no critical movements during any of the three peak hours analyzed.
- A review of historical collision data found a total of 129 collisions reported over the five-year period within the study area corridor. Of the 129 total collisions recorded, 72 occurred at intersections and the remaining 57 occurred within midblock sections.
- 37 (51%) of collisions at intersections within the study area were classified as property damage, 18 (25%) resulted in non-fatal injury and 7 (10%) were recorded as non-reportable. There were no fatal injuries recorded at intersections. Turning movement collisions were the most predominant collision impact type with 29 (40%) followed by rear ends with 13 (18%). Turning movement collisions were the most predominant impact type with 29 (40%) recorded. 28 (97%) of those occurring at the intersection of Macdonell Street with Wellington Street. The

contributing reason for this could be the horizontal alignment of the north and south approaches to the intersection.

- 27 (47%) of the collisions within the study area midblock sections were classified as property damage only with 14 (25%) classified as non-reportable and 3 (5%) resulted in non-fatal injury. There were no fatal injuries recorded within the study area midblock locations. “Other” collisions were the most predominant collision impact type with 17 (30%) followed by single motor vehicle collisions with 14 (25%). The contributing factor for these collisions could potentially be attributed to the significant on-street parking available to the west of the study area corridor.

- Intersection capacity analysis results for the study area intersections under the future (2051) horizon year scenario without any improvements to the existing intersection lane configurations indicate that the existing capacity of the study intersections are sufficient to accommodate the projected 2051 traffic volumes, with the exception of the unsignalized intersection of Arthur Street North at Elizabeth Street, and the signalized intersection Macdonell Street at Woolwich Street / Wellington Street East. It is to be noted that the 30-year analysis horizon is very a long period and traffic travel patterns may change by this horizon. However, it is recommended that traffic operations for both intersections be monitored beyond the 10-year horizon.

- Based on the findings from the future (2051) do-nothing intersection operational analysis, and a review of the projected 2051 traffic volumes reducing the number of lanes along the Macdonell Bridge would not be feasible. A reduction in lanes would contribute to increase capacity and delay issues beyond those already identified through the operational analysis conducted in this section.

APPENDIX E

COLLISION DATA

Accident Year	Location	Impact Location	Classification Of Accident	Initial Impact Type	Vehicle 1 Initial Direction	Vehicle 1 Manoeuver	Vehicle 2 Initial Direction	Vehicle 2 Manoeuver	Environment Condition 1	Environment Condition 2	Light	Road 1 Surface Condition	Road 2 Surface Condition
2015	MACDONELL ST @ CARDEN ST (I1492)	09 - Right shoulder	04 - Non-reportable	07 - SMV other	03 - East	05 - Turning right			01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2019	MACDONELL ST @ CARDEN ST (I1492)	01 - Within intersection	02 - Non-fatal injury	07 - SMV other	01 - North	04 - Turning left			01 - Clear		01 - Daylight	01 - Dry	01 - Dry

Accident Year	Location	Impact Location	Classification Of Accident	Initial Impact Type	Vehicle 1 Initial Direction	Vehicle 1 Manoeuver	Vehicle 2 Initial Direction	Vehicle 2 Manoeuver	Environment Condition 1	Environment Condition 2	Light	Road 1 Surface Condition	Road 2 Surface Condition
2015	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2015	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	05 - Turning movement	02 - South	04 - Turning left	03 - East	04 - Turning left	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2015	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	02 - Angle	03 - East	01 - Going ahead	01 - North	01 - Going ahead	03 - Snow		01 - Daylight	03 - Loose snow	03 - Loose snow
2015	MACDONELL ST @ WELLINGTON ST E (I1493)	99 - Other	03 - P.D. only	07 - SMV other	02 - South	05 - Turning right			01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2015	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	03 - Snow		08 - Dark, artificial	04 - Slush	04 - Slush
2015	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2015	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2015	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	02 - Angle	01 - North	01 - Going ahead	03 - East	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2015	MACDONELL ST @ WELLINGTON ST E (I1493)	03 - Left turn lane	04 - Non-reportable	03 - Rear end	04 - West	10 - Stopped	04 - West		01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2015	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	04 - Non-reportable	05 - Turning movement	01 - North	04 - Turning left	02 - South	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2015	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	02 - Angle	02 - South	01 - Going ahead	04 - West	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2016	MACDONELL ST @ WELLINGTON ST E (I1493)	03 - Left turn lane	04 - Non-reportable	03 - Rear end	01 - North	10 - Stopped	01 - North	02 - Slowing or stopping	01 - Clear		08 - Dark, artificial	01 - Dry	01 - Dry
2016	MACDONELL ST @ WELLINGTON ST E (I1493)	02 - Thru lane	04 - Non-reportable	03 - Rear end	01 - North	10 - Stopped	01 - North		01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2016	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	02 - Angle	03 - East	01 - Going ahead	01 - North	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2016	MACDONELL ST @ WELLINGTON ST E (I1493)	02 - Thru lane		01 - Approaching	03 - East	01 - Going ahead	04 - West	01 - Going ahead	03 - Snow		05 - Dusk	06 - Ice	06 - Ice
2016	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	05 - Turning movement	01 - North	01 - Going ahead	02 - South	04 - Turning left	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2016	MACDONELL ST @ WELLINGTON ST E (I1493)	02 - Thru lane	04 - Non-reportable	03 - Rear end	01 - North	10 - Stopped	01 - North		01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2016	MACDONELL ST @ WELLINGTON ST E (I1493)	02 - Thru lane	03 - P.D. only	05 - Turning movement	03 - East	05 - Turning right	03 - East	05 - Turning right	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2016	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	05 - Turning movement	04 - West	04 - Turning left	03 - East	01 - Going ahead	02 - Rain		01 - Daylight	02 - Wet	02 - Wet
2016	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	05 - Turning movement	01 - North	01 - Going ahead	02 - South	04 - Turning left	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2017	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	04 - Non-reportable	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	02 - Rain		01 - Daylight	02 - Wet	02 - Wet
2017	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection		05 - Turning movement	03 - East	04 - Turning left	04 - West	01 - Going ahead	01 - Clear		07 - Dark	01 - Dry	01 - Dry
2017	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	05 - Turning movement	01 - North	01 - Going ahead	02 - South	04 - Turning left	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2017	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	05 - Turning movement	03 - East	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		08 - Dark, artificial	01 - Dry	01 - Dry
2017	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		05 - Dusk	01 - Dry	01 - Dry
2017	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		07 - Dark	01 - Dry	01 - Dry
2017	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		08 - Dark, artificial	01 - Dry	01 - Dry
2017	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2017	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	07 - SMV other	04 - West	04 - Turning left			01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2017	MACDONELL ST @ WELLINGTON ST E (I1493)	99 - Other	02 - Non-fatal injury	07 - SMV other	03 - East	04 - Turning left			02 - Rain		08 - Dark, artificial	02 - Wet	02 - Wet
2017	MACDONELL ST @ WELLINGTON ST E (I1493)	03 - Left turn lane		04 - Sideswipe	04 - West	10 - Stopped	04 - West	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2018	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	02 - Angle	01 - North	01 - Going ahead	03 - East	01 - Going ahead	01 - Clear		08 - Dark, artificial	01 - Dry	01 - Dry
2018	MACDONELL ST @ WELLINGTON ST E (I1493)	05 - Right turn channel	04 - Non-reportable	03 - Rear end	01 - North	10 - Stopped	01 - North	01 - Going ahead	01 - Clear		01 - Daylight	04 - Slush	02 - Wet
2018	MACDONELL ST @ WELLINGTON ST E (I1493)	02 - Thru lane	03 - P.D. only	03 - Rear end	01 - North	01 - Going ahead	01 - North	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	
2018	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	07 - SMV other	03 - East	04 - Turning left			02 - Rain		08 - Dark, artificial	02 - Wet	02 - Wet
2018	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2018	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2018	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		05 - Dusk	01 - Dry	01 - Dry
2018	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2018	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	03 - Rear end	01 - North	01 - Going ahead	01 - North	10 - Stopped	01 - Clear		08 - Dark, artificial	01 - Dry	01 - Dry
2018	MACDONELL ST @ WELLINGTON ST E (I1493)	03 - Left turn lane		03 - Rear end	04 - West	10 - Stopped	04 - West	02 - Slowing or stopping	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2018	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	07 - SMV other	02 - South	05 - Turning right			01 - Clear		08 - Dark, artificial	01 - Dry	01 - Dry
2018	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	02 - Angle	02 - South	01 - Going ahead	04 - West	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2018	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	02 - Angle	04 - West	01 - Going ahead	01 - North	01 - Going ahead	02 - Rain		01 - Daylight	02 - Wet	02 - Wet
2018	MACDONELL ST @ WELLINGTON ST E (I1493)	02 - Thru lane	03 - P.D. only	03 - Rear end	02 - South	01 - Going ahead	02 - South	02 - Slowing or stopping	01 - Clear		08 - Dark, artificial	01 - Dry	01 - Dry
2019	MACDONELL ST @ WELLINGTON ST E (I1493)	02 - Thru lane		03 - Rear end	01 - North	02 - Slowing or stopping	01 - North	10 - Stopped	01 - Clear		01 - Daylight	06 - Ice	06 - Ice
2019	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection		05 - Turning movement	01 - North	01 - Going ahead	02 - South	04 - Turning left	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2019	MACDONELL ST @ WELLINGTON ST E (I1493)	02 - Thru lane		05 - Turning movement	01 - North	01 - Going ahead	01 - North	07 - Changing lanes	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2019	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		08 - Dark, artificial	04 - Slush	04 - Slush
2019	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	05 - Turning movement	01 - North	01 - Going ahead	03 - East	04 - Turning left	01 - Clear		08 - Dark, artificial	01 - Dry	01 - Dry
2019	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2019	MACDONELL ST @ WELLINGTON ST E (I1493)	02 - Thru lane	03 - P.D. only	04 - Sideswipe	02 - South	10 - Stopped	02 - South		03 - Snow		01 - Daylight	04 - Slush	04 - Slush
2019	MACDONELL ST @ WELLINGTON ST E (I1493)	02 - Thru lane	03 - P.D. only	04 - Sideswipe	01 - North	01 - Going ahead	01 - North	05 - Turning right	02 - Rain		01 - Daylight	02 - Wet	02 - Wet
2019	MACDONELL ST @ WELLINGTON ST E (I1493)	02 - Thru lane	03 - P.D. only	04 - Sideswipe	04 - West	01 - Going ahead	04 - West	06 - Making "U" turn	01 - Clear		01 - Daylight	01 - Dry	
2019	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	05 - Turning movement	01 - North	04 - Turning left	04 - West	01 - Going ahead	01 - Clear		07 - Dark	02 - Wet	02 - Wet
2019	MACDONELL ST @ WELLINGTON ST E (I1493)	11 - Not on roadway - right side	03 - P.D. only	06 - SMV unattended vehicle	03 - East	04 - Turning left		11 - Parked	01 - Clear		08 - Dark, artificial	01 - Dry	01 - Dry
2019	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	01 - Approaching	04 - West	01 - Going ahead	03 - East	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2019	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	07 - SMV other	04 - West	05 - Turning right			01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2019	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	07 - SMV other	01 - North	01 - Going ahead			07 - Fog, mist, smoke, dust		04 - Dawn, artificial	01 - Dry	01 - Dry
2019	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		07 - Dark	02 - Wet	02 - Wet
2020	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	02 - Angle	02 - South	01 - Going ahead	04 - West	03 - Overtaking	01 - Clear		08 - Dark, artificial	01 - Dry	01 - Dry
2020	MACDONELL ST @ WELLINGTON ST E (I1493)	02 - Thru lane	04 - Non-reportable	04 - Sideswipe	01 - North	10 - Stopped	01 - North	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2020	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		05 - Dusk	01 - Dry	01 - Dry
2020	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	02 - Angle	04 - West	01 - Going ahead	01 - North	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2020	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	05 - Turning movement	01 - North	01 - Going ahead	03 - East	04 - Turning left	01 - Clear		03 - Dawn	01 - Dry	01 - Dry
2020	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2020	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		08 - Dark, artificial	01 - Dry	01 - Dry
2020	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	05 - Turning movement	03 - East	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2020	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		03 - Dawn	01 - Dry	01 - Dry
2020	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	03 - P.D. only	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		08 - Dark, artificial	02 - Wet	02 - Wet
2020	MACDONELL ST @ WELLINGTON ST E (I1493)	01 - Within intersection	02 - Non-fatal injury	07 - SMV other	04 - West	04 - Turning left			01 - Clear		01 - Daylight	01 - Dry	01 - Dry

Accident Year	Location	Impact Location	Classification Of Accident	Initial Impact Type	Vehicle 1 Initial Direction	Vehicle 1 Manoeuver	Vehicle 2 Initial Direction	Vehicle 2 Manoeuver	Environment Condition 1	Environment Condition 2	Light	Road 1 Surface Condition	Road 2 Surface Condition
2015	ARTHUR ST N @ MACDONELL ST (I1498)	02 - Thru lane	04 - Non-reportable	04 - Sideswipe	01 - North	01 - Going ahead	01 - North		01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2015	ARTHUR ST N @ MACDONELL ST (I1498)	01 - Within intersection	03 - P.D. only	07 - SMV other	04 - West	05 - Turning right			02 - Rain		07 - Dark	02 - Wet	02 - Wet
2015	ARTHUR ST N @ MACDONELL ST (I1498)	01 - Within intersection	04 - Non-reportable	03 - Rear end	03 - East	10 - Stopped	03 - East		01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2015	ARTHUR ST N @ MACDONELL ST (I1498)	02 - Thru lane	04 - Non-reportable	03 - Rear end	03 - East	10 - Stopped	03 - East		01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2018	ARTHUR ST N @ MACDONELL ST (I1498)	02 - Thru lane		03 - Rear end	01 - North	10 - Stopped	01 - North		01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2020	ARTHUR ST N @ MACDONELL ST (I1498)	02 - Thru lane	03 - P.D. only	04 - Sideswipe	03 - East	01 - Going ahead	03 - East	07 - Changing lanes	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2020	ARTHUR ST N @ MACDONELL ST (I1498)	03 - Left turn lane	03 - P.D. only	99 - Other	03 - East		03 - East		01 - Clear		01 - Daylight	01 - Dry	01 - Dry

Accident Year	Location	Impact Location	Classification Of Accident	Initial Impact Type	Vehicle 1 Initial Direction	Vehicle 1 Manoeuver	Vehicle 2 Initial Direction	Vehicle 2 Manoeuver	Environment Condition 1	Environment Condition 2	Light	Road 1 Surface Condition	Road 2 Surface Condition
2016	ARTHUR ST S @ ELIZABETH ST (I1461)	02 - Thru lane	04 - Non-reportable	04 - Sideswipe	01 - North	01 - Going ahead	01 - North	08 - Merging	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2017	ARTHUR ST S @ ELIZABETH ST (I1461)	02 - Thru lane		03 - Rear end	01 - North	01 - Going ahead	01 - North		01 - Clear		01 - Daylight	06 - Ice	06 - Ice
2017	ARTHUR ST S @ ELIZABETH ST (I1461)	11 - Not on roadway - right side	03 - P.D. only	07 - SMV other	03 - East	01 - Going ahead			02 - Rain		01 - Daylight	02 - Wet	
2018	ARTHUR ST S @ ELIZABETH ST (I1461)	01 - Within intersection		03 - Rear end	01 - North	02 - Slowing or stopping	01 - North	10 - Stopped	01 - Clear		01 - Daylight	06 - Ice	06 - Ice
2018	ARTHUR ST S @ ELIZABETH ST (I1461)	02 - Thru lane	03 - P.D. only	01 - Approaching	04 - West	01 - Going ahead	03 - East	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2019	ARTHUR ST S @ ELIZABETH ST (I1461)	02 - Thru lane	03 - P.D. only	03 - Rear end	03 - East	02 - Slowing or stopping	03 - East	10 - Stopped	01 - Clear		01 - Daylight	04 - Slush	04 - Slush
2019	ARTHUR ST S @ ELIZABETH ST (I1461)	02 - Thru lane	03 - P.D. only	04 - Sideswipe	04 - West	04 - Turning left	04 - West	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2020	ARTHUR ST S @ ELIZABETH ST (I1461)	02 - Thru lane	03 - P.D. only	04 - Sideswipe	04 - West	01 - Going ahead	03 - East	01 - Going ahead	03 - Snow		07 - Dark	05 - Packed snow	

Accident Year	Location	Impact Location	Classification Of Accident	Initial Impact Type	Vehicle 1 Initial Direction	Vehicle 1 Manoeuver	Vehicle 2 Initial Direction	Vehicle 2 Manoeuver	Environment Condition 1	Environment Condition 2	Light	Road 1 Surface Condition	Road 2 Surface Condition
2019	ARTHUR ST N @ ROSE ST (I1496)	01 - Within intersection	03 - P.D. only	05 - Turning movement	02 - South	04 - Turning left	01 - North	01 - Going ahead	01 - Clear		08 - Dark, artificial	01 - Dry	01 - Dry
2019	ARTHUR ST N @ ROSE ST (I1496)	01 - Within intersection	02 - Non-fatal injury	02 - Angle	01 - North	01 - Going ahead	04 - West	01 - Going ahead	01 - Clear		08 - Dark, artificial	02 - Wet	02 - Wet

Accident Year	Location	Impact Location	Classification Of Accident	Initial Impact Type	Vehicle 1 Initial Direction	Vehicle 1 Manoeuver	Vehicle 2 Initial Direction	Vehicle 2 Manoeuver	Environment Condition 1	Environment Condition 2	Light	Road 1 Surface Condition	Road 2 Surface Condition
2015	MACDONELL ST btwn CARDEN ST & WELLINGTON ST E (S6490)	02 - Thru lane	04 - Non-reportable	05 - Turning movement	03 - East	01 - Going ahead	03 - East	06 - Making "U" turn	01 - Clear		01 - Daylight	01 - Dry	
2015	MACDONELL ST btwn CARDEN ST & WELLINGTON ST E (S6490)	02 - Thru lane	02 - Non-fatal injury	07 - SMV other	04 - West	02 - Slowing or stopping			02 - Rain		01 - Daylight	02 - Wet	
2015	MACDONELL ST btwn CARDEN ST & WELLINGTON ST E (S6490)	02 - Thru lane	03 - P.D. only	99 - Other	02 - South	09 - Reversing	04 - West	10 - Stopped	01 - Clear		01 - Daylight	02 - Wet	
2016	MACDONELL ST btwn CARDEN ST & WELLINGTON ST E (S6490)	02 - Thru lane	02 - Non-fatal injury	02 - Angle	04 - West	10 - Stopped	01 - North	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	
2016	MACDONELL ST btwn CARDEN ST & WELLINGTON ST E (S6490)	11 - Not on roadway - right side		06 - SMV unattended vehicle	02 - South	11 - Parked			03 - Snow		06 - Dusk, artificial	03 - Loose snow	
2016	MACDONELL ST btwn CARDEN ST & WELLINGTON ST E (S6490)	02 - Thru lane	02 - Non-fatal injury	04 - Sideswipe	03 - East	13 - Pulling away from shoulder or curb	03 - East	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	
2016	MACDONELL ST btwn CARDEN ST & WELLINGTON ST E (S6490)	02 - Thru lane	03 - P.D. only	06 - SMV unattended vehicle	01 - North	11 - Parked			01 - Clear		01 - Daylight	01 - Dry	
2017	MACDONELL ST btwn CARDEN ST & WELLINGTON ST E (S6490)	11 - Not on roadway - right side	04 - Non-reportable	06 - SMV unattended vehicle	01 - North	11 - Parked			02 - Rain		06 - Dusk, artificial	02 - Wet	
2017	MACDONELL ST btwn CARDEN ST & WELLINGTON ST E (S6490)	02 - Thru lane	04 - Non-reportable	03 - Rear end	03 - East	01 - Going ahead	03 - East	10 - Stopped	01 - Clear		01 - Daylight	01 - Dry	
2017	MACDONELL ST btwn CARDEN ST & WELLINGTON ST E (S6490)	02 - Thru lane	03 - P.D. only	04 - Sideswipe	04 - West	99 - Other	04 - West	10 - Stopped	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2017	MACDONELL ST btwn CARDEN ST & WELLINGTON ST E (S6490)	02 - Thru lane		99 - Other	04 - West	09 - Reversing	04 - West	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2017	MACDONELL ST btwn CARDEN ST & WELLINGTON ST E (S6490)	02 - Thru lane	03 - P.D. only	06 - SMV unattended vehicle	01 - North		02 - South	11 - Parked	01 - Clear		01 - Daylight	01 - Dry	
2017	MACDONELL ST btwn CARDEN ST & WELLINGTON ST E (S6490)	02 - Thru lane	03 - P.D. only	05 - Turning movement	04 - West	01 - Going ahead	03 - East	06 - Making "U" turn	01 - Clear		01 - Daylight	01 - Dry	
2017	MACDONELL ST btwn CARDEN ST & WELLINGTON ST E (S6490)	02 - Thru lane	04 - Non-reportable	99 - Other	04 - West	10 - Stopped	02 - South	09 - Reversing	01 - Clear		08 - Dark, artificial	01 - Dry	
2018	MACDONELL ST btwn CARDEN ST & WELLINGTON ST E (S6490)	02 - Thru lane	03 - P.D. only	04 - Sideswipe	03 - East	08 - Merging	03 - East	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	
2018	MACDONELL ST btwn CARDEN ST & WELLINGTON ST E (S6490)	02 - Thru lane		03 - Rear end	04 - West	10 - Stopped	04 - West		01 - Clear		01 - Daylight	01 - Dry	
2018	MACDONELL ST btwn CARDEN ST & WELLINGTON ST E (S6490)	02 - Thru lane	04 - Non-reportable	05 - Turning movement	04 - West	10 - Stopped	03 - East	06 - Making "U" turn	03 - Snow		01 - Daylight	03 - Loose snow	
2019	MACDONELL ST btwn CARDEN ST & WELLINGTON ST E (S6490)	02 - Thru lane	03 - P.D. only	04 - Sideswipe	03 - East	01 - Going ahead	03 - East		01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2020	MACDONELL ST btwn CARDEN ST & WELLINGTON ST E (S6490)	02 - Thru lane	03 - P.D. only	05 - Turning movement	02 - South	04 - Turning left	03 - East	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	

Accident Year	Location	Impact Location	Classification Of Accident	Initial Impact Type	Vehicle 1 Initial Direction	Vehicle 1 Manoeuver	Vehicle 2 Initial Direction	Vehicle 2 Manoeuver	Environment Condition 1	Environment Condition 2	Light	Road 1 Surface Condition	Road 2 Surface Condition
2018	ARTHUR ST N btwn ARTHUR ST S & ROSE ST (S5293)	12 - Off highway	03 - P.D. only	03 - Rear end	02 - South	99 - Other	02 - South	11 - Parked	01 - Clear		07 - Dark	01 - Dry	01 - Dry

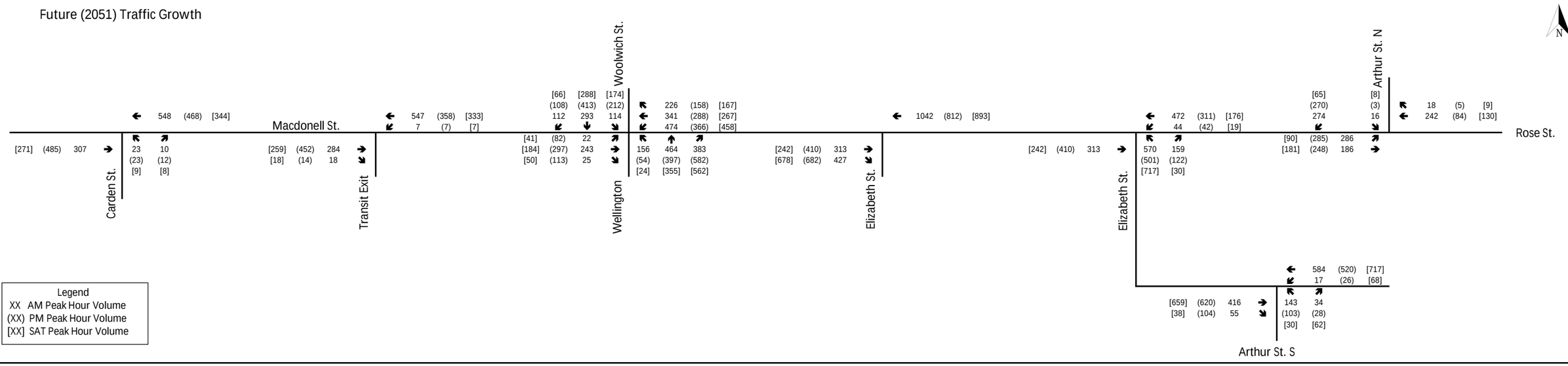
Accident Year	Location	Impact Location	Classification Of Accident	Initial Impact Type	Vehicle 1 Initial Direction	Vehicle 1 Manoeuver	Vehicle 2 Initial Direction	Vehicle 2 Manoeuver	Environment Condition 1	Environment Condition 2	Light	Road 1 Surface Condition	Road 2 Surface Condition
2017	ARTHUR ST S (S5294)	02 - Thru lane	04 - Non-reportable	04 - Sideswipe	01 - North	01 - Going ahead	01 - North	01 - Going ahead	01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2020	ARTHUR ST S (S5294)	02 - Thru lane	03 - P.D. only	01 - Approaching	04 - West	01 - Going ahead	03 - East	01 - Going ahead	01 - Clear		08 - Dark, artificial	02 - Wet	

Accident Year	Location	Impact Location	Classification Of Accident	Initial Impact Type	Vehicle 1 Initial Direction	Vehicle 1 Manoeuver	Vehicle 2 Initial Direction	Vehicle 2 Manoeuver	Environment Condition 1	Environment Condition 2	Light	Road 1 Surface Condition	Road 2 Surface Condition
2015	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	04 - Non-reportable	99 - Other	02 - South	10 - Stopped	03 - East	09 - Reversing	01 - Clear		07 - Dark	01 - Dry	
2015	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	03 - P.D. only	05 - Turning movement	03 - East	06 - Making "U" turn	04 - West	01 - Going ahead	01 - Clear		05 - Dusk	01 - Dry	
2015	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	04 - Non-reportable	06 - SMV unattended vehicle	03 - East	11 - Parked			01 - Clear		01 - Daylight	02 - Wet	04 - Slush
2015	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	03 - P.D. only	05 - Turning movement	04 - West	06 - Making "U" turn	03 - East	01 - Going ahead	02 - Rain		01 - Daylight	02 - Wet	
2015	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	04 - Non-reportable	05 - Turning movement	03 - East	04 - Turning left	03 - East	03 - Overtaking	07 - Fog, mist, smoke, dust		01 - Daylight	02 - Wet	
2015	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	04 - Non-reportable	05 - Turning movement	03 - East	03 - Overtaking	03 - East	05 - Turning right	01 - Clear		07 - Dark	01 - Dry	
2015	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	03 - P.D. only	05 - Turning movement	04 - West	01 - Going ahead	02 - South	06 - Making "U" turn	01 - Clear		01 - Daylight	01 - Dry	
2015	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	03 - P.D. only	99 - Other	01 - North	09 - Reversing	02 - South	10 - Stopped	01 - Clear		07 - Dark	01 - Dry	
2015	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	03 - P.D. only	99 - Other	02 - South	09 - Reversing	01 - North	10 - Stopped	01 - Clear		01 - Daylight	04 - Slush	
2015	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	03 - P.D. only	05 - Turning movement	04 - West	01 - Going ahead	04 - West	04 - Turning left	01 - Clear		01 - Daylight	04 - Slush	
2016	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane		04 - Sideswipe	04 - West	04 - Turning left	04 - West	03 - Overtaking	01 - Clear		01 - Daylight	01 - Dry	
2016	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	04 - Non-reportable	99 - Other	01 - North	09 - Reversing	02 - South		01 - Clear		01 - Daylight	02 - Wet	
2016	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	11 - Not on roadway - right side	04 - Non-reportable	06 - SMV unattended vehicle	01 - North	11 - Parked			01 - Clear		01 - Daylight	04 - Slush	
2016	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	04 - Non-reportable	02 - Angle	04 - West	01 - Going ahead	02 - South	09 - Reversing	01 - Clear		01 - Daylight	01 - Dry	
2016	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	03 - P.D. only	99 - Other	01 - North	09 - Reversing	03 - East	01 - Going ahead	01 - Clear		07 - Dark	01 - Dry	
2016	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	04 - Non-reportable	99 - Other	03 - East	10 - Stopped	03 - East	09 - Reversing	01 - Clear		01 - Daylight	01 - Dry	
2017	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	04 - Non-reportable	99 - Other	03 - East	10 - Stopped	04 - West	09 - Reversing	01 - Clear		05 - Dusk	02 - Wet	
2017	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane		99 - Other	04 - West	10 - Stopped			01 - Clear		01 - Daylight	01 - Dry	01 - Dry
2017	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	04 - Non-reportable	05 - Turning movement	01 - North	06 - Making "U" turn			01 - Clear		01 - Daylight	01 - Dry	
2017	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	09 - Right shoulder	04 - Non-reportable	06 - SMV unattended vehicle	02 - South	11 - Parked			01 - Clear		01 - Daylight	01 - Dry	
2017	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	12 - Off highway		06 - SMV unattended vehicle	01 - North	11 - Parked			03 - Snow		07 - Dark	03 - Loose snow	
2017	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	04 - Non-reportable	99 - Other	02 - South	09 - Reversing	03 - East	10 - Stopped	01 - Clear		01 - Daylight	01 - Dry	
2017	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	04 - Non-reportable	99 - Other	03 - East	09 - Reversing	03 - East	10 - Stopped	01 - Clear		01 - Daylight	01 - Dry	
2018	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	03 - P.D. only	02 - Angle	01 - North	10 - Stopped	03 - East	14 - Pulling onto shoulder or toward curb	01 - Clear		01 - Daylight	02 - Wet	
2018	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane		05 - Turning movement	02 - South	09 - Reversing			01 - Clear		07 - Dark	01 - Dry	
2018	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	09 - Right shoulder		06 - SMV unattended vehicle	01 - North	11 - Parked			01 - Clear		05 - Dusk	01 - Dry	
2018	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	02 - Non-fatal injury	03 - Rear end	04 - West	99 - Other	04 - West	01 - Going ahead	01 - Clear		01 - Daylight	02 - Wet	
2018	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	03 - P.D. only	06 - SMV unattended vehicle	03 - East	06 - Making "U" turn		11 - Parked	01 - Clear		08 - Dark, artificial	01 - Dry	
2018	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	03 - P.D. only	99 - Other	04 - West	01 - Going ahead	02 - South	09 - Reversing	01 - Clear		08 - Dark, artificial	01 - Dry	
2019	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane		99 - Other	04 - West	04 - Turning left	04 - West	09 - Reversing	01 - Clear		07 - Dark	01 - Dry	
2019	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane		06 - SMV unattended vehicle	03 - East	11 - Parked			06 - Strong wind		07 - Dark	02 - Wet	
2019	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane		04 - Sideswipe	03 - East	10 - Stopped	03 - East	01 - Going ahead	01 - Clear		08 - Dark, artificial	02 - Wet	
2019	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane		04 - Sideswipe	03 - East	01 - Going ahead	03 - East	10 - Stopped	02 - Rain		01 - Daylight	02 - Wet	
2019	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane		03 - Rear end	03 - East	10 - Stopped	03 - East	02 - Slowing or stopping	02 - Rain		01 - Daylight	02 - Wet	
2019	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	03 - P.D. only	05 - Turning movement	04 - West	05 - Turning right	04 - West	01 - Going ahead	01 - Clear		07 - Dark	01 - Dry	01 - Dry
2019	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	03 - P.D. only	03 - Rear end	03 - East	02 - Slowing or stopping	03 - East	10 - Stopped	01 - Clear		08 - Dark, artificial	01 - Dry	
2019	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	03 - P.D. only	06 - SMV unattended vehicle	03 - East	03 - Overtaking		11 - Parked	01 - Clear		01 - Daylight	02 - Wet	
2019	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	03 - P.D. only	99 - Other	03 - East	09 - Reversing			01 - Clear		01 - Daylight	01 - Dry	
2019	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	03 - P.D. only	99 - Other	01 - North	10 - Stopped	02 - South	10 - Stopped	01 - Clear		01 - Daylight	01 - Dry	
2019	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	03 - P.D. only	99 - Other	04 - West	09 - Reversing	03 - East	10 - Stopped	01 - Clear		01 - Daylight	01 - Dry	
2019	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	09 - Right shoulder	03 - P.D. only	06 - SMV unattended vehicle		09 - Reversing		11 - Parked	01 - Clear		01 - Daylight	01 - Dry	
2019	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	03 - P.D. only	05 - Turning movement	03 - East	04 - Turning left	02 - South	09 - Reversing	01 - Clear		01 - Daylight	01 - Dry	
2019	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	12 - Off highway	03 - P.D. only	06 - SMV unattended vehicle	03 - East	09 - Reversing	04 - West	11 - Parked	01 - Clear		01 - Daylight	01 - Dry	
2019	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	09 - Right shoulder	03 - P.D. only	06 - SMV unattended vehicle	02 - South	11 - Parked	03 - East	09 - Reversing	01 - Clear		01 - Daylight	01 - Dry	
2019	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	03 - P.D. only	99 - Other	04 - West	02 - Slowing or stopping	03 - East	09 - Reversing	01 - Clear		01 - Daylight	01 - Dry	
2019	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	03 - P.D. only	99 - Other	04 - West	10 - Stopped	03 - East	09 - Reversing	01 - Clear		08 - Dark, artificial	01 - Dry	
2020	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	03 - P.D. only	04 - Sideswipe	03 - East	01 - Going ahead	03 - East		01 - Clear		08 - Dark, artificial	02 - Wet	
2020	MACDONELL ST btwn CARDEN ST & WYNDHAM ST N (S6506)	02 - Thru lane	03 - P.D. only	99 - Other	02 - South	10 - Stopped	01 - North	09 - Reversing	01 - Clear		01 - Daylight	01 - Dry	

APPENDIX F

FUTURE 2051 TRAFFIC GROWTH

Future (2051) Traffic Growth

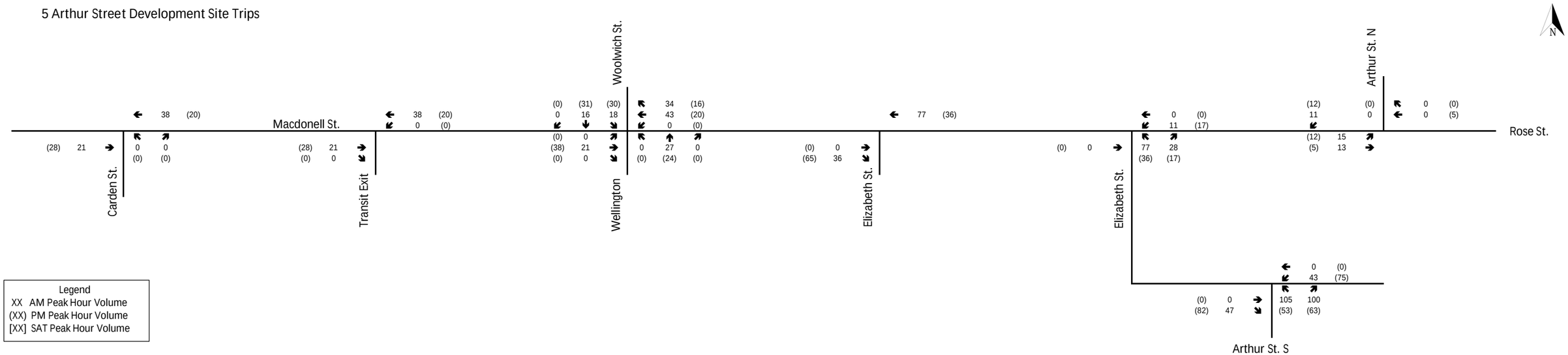


Legend
XX AM Peak Hour Volume
(XX) PM Peak Hour Volume
[XX] SAT Peak Hour Volume

APPENDIX G

DEVELOPMENT SITE TRAFFIC VOLUMES

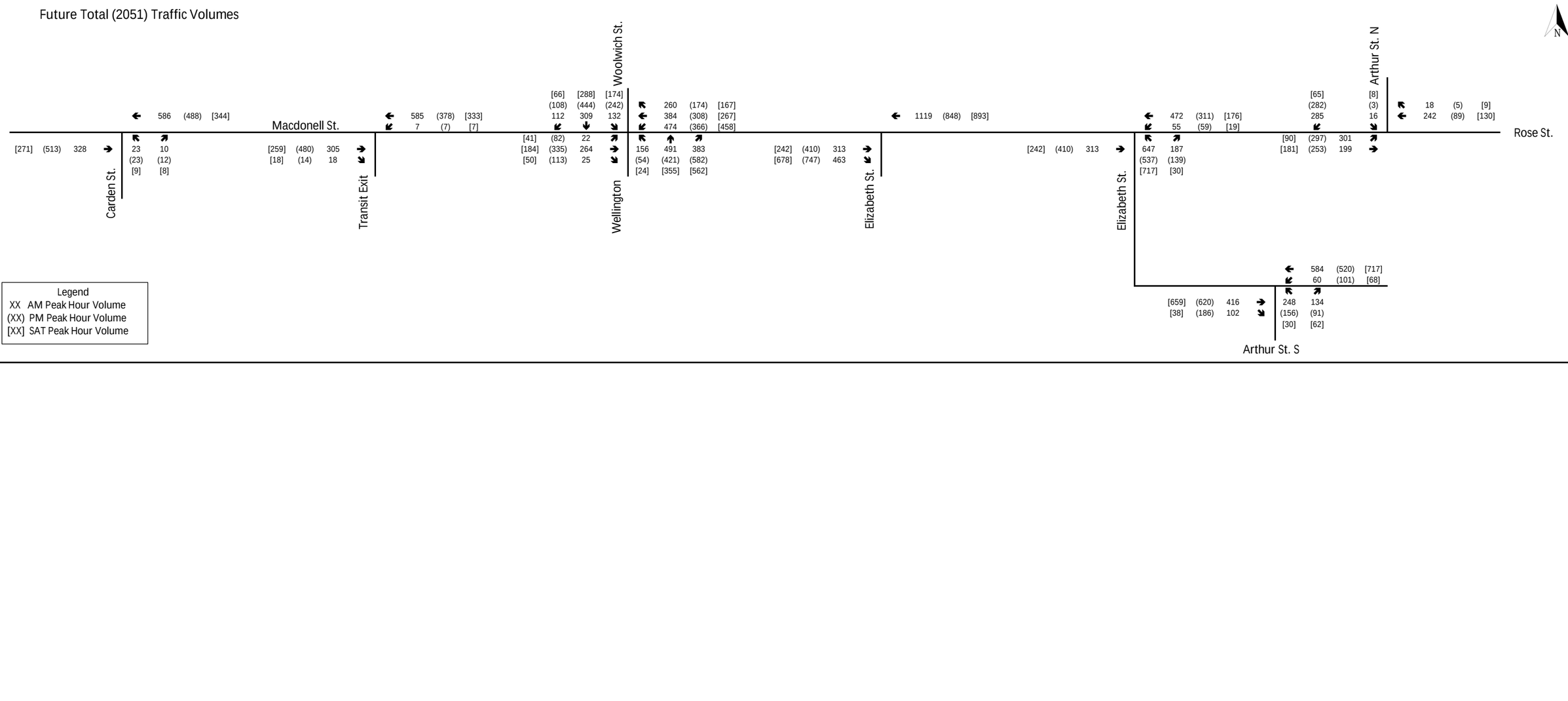
5 Arthur Street Development Site Trips



APPENDIX H

FUTURE TOTAL 2051 TRAFFIC VOLUMES

Future Total (2051) Traffic Volumes



Legend
XX AM Peak Hour Volume
(XX) PM Peak Hour Volume
[XX] SAT Peak Hour Volume

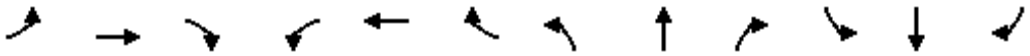
APPENDIX I

SYNCHRO HCM REPORTS – FUTURE 2051 DO-NOTHING

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	24	314	515	700	170	534	416	143	458
Act Effct Green (s)	30.0	30.0	47.0	44.0	24.0	24.0	24.0	24.0	24.0
Actuated g/C Ratio	0.38	0.38	0.59	0.55	0.30	0.30	0.30	0.30	0.30
v/c Ratio	0.16	0.52	0.94	0.80	0.89	0.57	0.60	0.81	0.49
Control Delay	20.0	22.8	42.3	21.6	71.6	26.5	6.5	61.3	21.6
Queue Delay	0.0	0.0	13.2	9.3	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	22.8	55.5	30.9	71.6	26.5	6.5	61.3	21.6
LOS	B	C	E	C	E	C	A	E	C
Approach Delay		22.6		41.3		25.9			31.1
Approach LOS		C		D		C			C
Queue Length 50th (m)	2.5	37.3	45.7	75.7	25.8	37.6	0.0	21.0	26.5
Queue Length 95th (m)	8.3	62.0	#109.8	#135.0	#63.2	53.7	21.5	#53.8	40.8
Internal Link Dist (m)		60.4		62.7		200.7			290.2
Turn Bay Length (m)	25.0				50.0		40.0	135.0	
Base Capacity (vph)	152	602	545	878	192	937	699	177	932
Starvation Cap Reductn	0	0	36	152	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.52	1.01	0.96	0.89	0.57	0.60	0.81	0.49

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 10 (13%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 32.2 Intersection LOS: C
Intersection Capacity Utilization 108.3% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	264	25	474	384	260	156	491	383	132	309	112
Future Volume (vph)	22	264	25	474	384	260	156	491	383	132	309	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		3.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.96	1.00	0.96	
Flpb, ped/bikes	0.99	1.00		0.99	1.00		0.94	1.00	1.00	0.99	1.00	
Frt	1.00	0.99		1.00	0.94		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1074	1594		1583	1542		1402	3124	1361	1517	2955	
Flt Permitted	0.36	1.00		0.44	1.00		0.43	1.00	1.00	0.37	1.00	
Satd. Flow (perm)	407	1594		731	1542		641	3124	1361	592	2955	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	287	27	515	417	283	170	534	416	143	336	122
RTOR Reduction (vph)	0	4	0	0	31	0	0	0	291	0	46	0
Lane Group Flow (vph)	24	310	0	515	669	0	170	534	125	143	412	0
Confl. Peds. (#/hr)	39		47	47		39	68		23	23		68
Heavy Vehicles (%)	50%	4%	22%	2%	4%	1%	9%	4%	3%	6%	2%	1%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		8		7	4			2			6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	30.0	30.0		44.0	44.0		24.0	24.0	24.0	24.0	24.0	
Effective Green, g (s)	30.0	30.0		44.0	44.0		24.0	24.0	24.0	24.0	24.0	
Actuated g/C Ratio	0.38	0.38		0.55	0.55		0.30	0.30	0.30	0.30	0.30	
Clearance Time (s)	6.0	6.0		3.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	152	597		519	848		192	937	408	177	886	
v/s Ratio Prot		0.19		c0.14	0.43			0.17			0.14	
v/s Ratio Perm	0.06			c0.41			c0.27		0.09	0.24		
v/c Ratio	0.16	0.52		0.99	0.79		0.89	0.57	0.31	0.81	0.46	
Uniform Delay, d1	16.6	19.4		16.3	14.3		26.7	23.6	21.6	25.9	22.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.8		37.7	7.4		40.6	2.5	1.9	31.4	1.8	
Delay (s)	17.1	20.2		53.9	21.7		67.2	26.2	23.5	57.3	24.5	
Level of Service	B	C		D	C		E	C	C	E	C	
Approach Delay (s)		19.9			35.4			31.4			32.3	
Approach LOS		B			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	108.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	313	463	0	1119	0	0
Future Volume (Veh/h)	313	463	0	1119	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	340	503	0	1216	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	87			36		
pX, platoon unblocked					0.90	
vC, conflicting volume			843		948	340
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			843		713	340
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			789		329	656

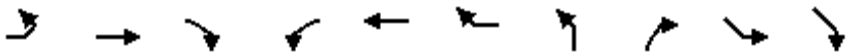
Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	340	503	608	608
Volume Left	0	0	0	0
Volume Right	0	503	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.20	0.30	0.36	0.36
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	242	18	301	199	16	285
Future Volume (Veh/h)	242	18	301	199	16	285
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)	263	20	327	216	17	310
Pedestrians	5					7
Lane Width (m)	3.6					3.6
Walking Speed (m/s)	1.2					1.2
Percent Blockage	0					1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			36			
pX, platoon unblocked	0.86	0.86			0.86	
vC, conflicting volume	784	447			548	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	670	279			396	
tC, single (s)	6.4	6.3			4.3	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.4	
p0 queue free %	27	97			98	
cM capacity (veh/h)	359	635			920	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	283	543	327
Volume Left	263	0	17
Volume Right	20	216	0
cSH	370	1700	920
Volume to Capacity	0.76	0.32	0.02
Queue Length 95th (m)	49.7	0.0	0.5
Control Delay (s)	40.2	0.0	0.7
Lane LOS	E		A
Approach Delay (s)	40.2	0.0	0.7
Approach LOS	E		

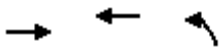
Intersection Summary			
Average Delay	10.1		
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Traffic Volume (veh/h)	0	416	102	60	0	584	248	134	0	0
Future Volume (Veh/h)	0	416	102	60	0	584	248	134	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	452	111	65	0	635	270	146	0	0
Pedestrians										
Lane Width (m)										
Walking Speed (m/s)										
Percent Blockage										
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (m)										
pX, platoon unblocked										
vC, conflicting volume	635			563			1272	508	918	693
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	635			563			1272	508	918	693
tC, single (s)	4.1			4.3			6.5	6.2	7.1	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.4			4.0	3.3	3.5	4.0
p0 queue free %	100			93			0	74	0	100
cM capacity (veh/h)	948			925			155	561	0	341

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	563	65	635	416
Volume Left	0	65	0	0
Volume Right	111	0	635	146
cSH	1700	925	1700	208
Volume to Capacity	0.33	0.07	0.37	2.00
Queue Length 95th (m)	0.0	1.8	0.0	248.4
Control Delay (s)	0.0	9.2	0.0	505.7
Lane LOS		A		F
Approach Delay (s)	0.0	0.9		505.7
Approach LOS				F

Intersection Summary			
Average Delay	125.6		
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	357	637	36
Act Effct Green (s)	21.0	21.0	21.0
Actuated g/C Ratio	0.39	0.39	0.39
v/c Ratio	0.67	0.98	0.11
Control Delay	21.8	50.8	9.4
Queue Delay	0.0	0.0	0.0
Total Delay	21.8	50.8	9.4
LOS	C	D	A
Approach Delay	21.8	50.8	9.4
Approach LOS	C	D	A
Queue Length 50th (m)	29.1	61.8	1.6
Queue Length 95th (m)	#59.0	#122.8	6.4
Internal Link Dist (m)	216.8	53.8	6.0
Turn Bay Length (m)			
Base Capacity (vph)	529	651	329
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.67	0.98	0.11

Intersection Summary	
Cycle Length: 48	
Actuated Cycle Length: 54	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 39.3	Intersection LOS: D
Intersection Capacity Utilization 61.8%	ICU Level of Service B
Analysis Period (min) 15	

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	328	0	0	586	23	10
Future Volume (vph)	328	0	0	586	23	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frpb, ped/bikes	1.00			1.00	0.98	
Flpb, ped/bikes	1.00			1.00	0.98	
Frt	1.00			1.00	0.96	
Flt Protected	1.00			1.00	0.97	
Satd. Flow (prot)	1362			1676	828	
Flt Permitted	1.00			1.00	0.97	
Satd. Flow (perm)	1362			1676	828	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	357	0	0	637	25	11
RTOR Reduction (vph)	0	0	0	0	7	0
Lane Group Flow (vph)	357	0	0	637	29	0
Confl. Peds. (#/hr)					22	34
Heavy Vehicles (%)	13%	2%	2%	2%	90%	70%
Parking (#/hr)	0					
Turn Type	NA			NA	Perm	
Protected Phases	2			6		
Permitted Phases					4	
Actuated Green, G (s)	21.0			21.0	21.0	
Effective Green, g (s)	21.0			21.0	21.0	
Actuated g/C Ratio	0.39			0.39	0.39	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	529			651	322	
v/s Ratio Prot	0.26			c0.38		
v/s Ratio Perm					c0.04	
v/c Ratio	0.67			0.98	0.09	
Uniform Delay, d1	13.7			16.3	10.5	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	6.8			29.5	0.6	
Delay (s)	20.4			45.8	11.0	
Level of Service	C			D	B	
Approach Delay (s)	20.4			45.8	11.0	
Approach LOS	C			D	B	

Intersection Summary			
HCM 2000 Control Delay	35.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	54.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	305	18	7	585	0	0
Future Volume (Veh/h)	305	18	7	585	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	332	20	8	636	0	0
Pedestrians					14	
Lane Width (m)					0.0	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	78			84		
pX, platoon unblocked			0.82		0.85	0.82
vC, conflicting volume			366		1008	356
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			124		766	112
tC, single (s)			5.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			3.1		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			846		314	776

Direction, Lane #	EB 1	WB 1	WB 2
Volume Total	352	8	636
Volume Left	0	8	0
Volume Right	20	0	0
cSH	1700	846	1700
Volume to Capacity	0.21	0.01	0.37
Queue Length 95th (m)	0.0	0.2	0.0
Control Delay (s)	0.0	9.3	0.0
Lane LOS		A	
Approach Delay (s)	0.0	0.1	
Approach LOS			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	340	60	513	703	203
Act Effct Green (s)	48.0	48.0	48.0	48.0	48.0
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.44
v/c Ratio	0.45	0.18	0.36	1.01	0.29
Control Delay	23.3	19.9	20.8	68.4	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	19.9	20.8	68.4	8.8
LOS	C	B	C	E	A
Approach Delay	23.3		20.7	55.1	
Approach LOS	C		C	E	
Queue Length 50th (m)	51.0	7.8	38.6	~157.0	10.2
Queue Length 95th (m)	76.8	17.2	52.1	#237.2	25.5
Internal Link Dist (m)	11.8		11.8	66.1	
Turn Bay Length (m)		10.0			
Base Capacity (vph)	752	342	1415	694	701
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.18	0.36	1.01	0.29

Intersection Summary	
Cycle Length: 68	
Actuated Cycle Length: 108	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 38.3	Intersection LOS: D
Intersection Capacity Utilization 81.5%	ICU Level of Service D
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	313	0	55	472	647	187
Future Volume (vph)	313	0	55	472	647	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	1.00		1.00	0.95	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1693		1577	3185	1562	1425
Flt Permitted	1.00		0.46	1.00	0.95	1.00
Satd. Flow (perm)	1693		770	3185	1562	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	340	0	60	513	703	203
RTOR Reduction (vph)	0	0	0	0	0	68
Lane Group Flow (vph)	340	0	60	513	703	135
Heavy Vehicles (%)	1%	2%	3%	2%	4%	2%
Turn Type	NA		Perm	NA	Perm	Perm
Protected Phases	8			4		
Permitted Phases			4		2	2
Actuated Green, G (s)	48.0		48.0	48.0	48.0	48.0
Effective Green, g (s)	48.0		48.0	48.0	48.0	48.0
Actuated g/C Ratio	0.44		0.44	0.44	0.44	0.44
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	752		342	1415	694	633
v/s Ratio Prot	c0.20			0.16		
v/s Ratio Perm			0.08		c0.45	0.09
v/c Ratio	0.45		0.18	0.36	1.01	0.21
Uniform Delay, d1	20.9		18.1	19.9	30.0	18.4
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0		0.2	0.2	37.4	0.8
Delay (s)	22.8		18.3	20.0	67.4	19.2
Level of Service	C		B	C	E	B
Approach Delay (s)	22.8			19.8	56.6	
Approach LOS	C			B	E	

Intersection Summary			
HCM 2000 Control Delay	38.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

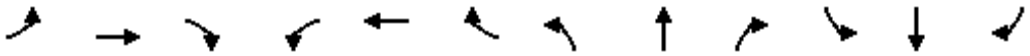
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	90	487	398	524	59	458	633	263	599
Act Effct Green (s)	30.0	30.0	47.0	44.0	24.0	24.0	24.0	24.0	24.0
Actuated g/C Ratio	0.38	0.38	0.59	0.55	0.30	0.30	0.30	0.30	0.30
v/c Ratio	0.34	0.81	0.96	0.60	0.42	0.47	0.88	1.22	0.63
Control Delay	22.7	33.7	49.9	14.1	33.6	24.8	23.7	161.7	26.2
Queue Delay	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	33.7	49.9	15.7	33.6	24.8	23.7	161.7	26.2
LOS	C	C	D	B	C	C	C	F	C
Approach Delay		32.0		30.5		24.7			67.5
Approach LOS		C		C		C			E
Queue Length 50th (m)	10.1	65.1	31.7	46.1	7.5	31.2	27.1	~52.2	40.5
Queue Length 95th (m)	23.0	#118.0	#82.5	76.8	20.0	45.4	#100.4	#97.9	58.1
Internal Link Dist (m)		60.4		62.7		200.7			290.2
Turn Bay Length (m)	25.0				50.0		40.0	135.0	
Base Capacity (vph)	262	604	414	877	140	965	720	216	948
Starvation Cap Reductn	0	0	0	192	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.81	0.96	0.76	0.42	0.47	0.88	1.22	0.63

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 10 (13%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.22
Intersection Signal Delay: 37.9 Intersection LOS: D
Intersection Capacity Utilization 109.4% ICU Level of Service H
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	335	113	366	308	174	54	421	582	242	444	107
Future Volume (vph)	83	335	113	366	308	174	54	421	582	242	444	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		3.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98		1.00	1.00	0.94	1.00	0.98	
Flpb, ped/bikes	0.98	1.00		1.00	1.00		0.96	1.00	1.00	0.97	1.00	
Frt	1.00	0.96		1.00	0.95		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1412	1573		1604	1549		1383	3217	1350	1583	3076	
Flt Permitted	0.47	1.00		0.26	1.00		0.32	1.00	1.00	0.43	1.00	
Satd. Flow (perm)	698	1573		434	1549		467	3217	1350	723	3076	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	364	123	398	335	189	59	458	633	263	483	116
RTOR Reduction (vph)	0	15	0	0	25	0	0	0	315	0	26	0
Lane Group Flow (vph)	90	472	0	398	499	0	59	458	318	263	573	0
Confl. Peds. (#/hr)	65		51	51		65	58		49	49		58
Heavy Vehicles (%)	13%	3%	5%	1%	3%	2%	13%	1%	1%	0%	0%	1%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		8		7	4			2			6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	30.0	30.0		44.0	44.0		24.0	24.0	24.0	24.0	24.0	
Effective Green, g (s)	30.0	30.0		44.0	44.0		24.0	24.0	24.0	24.0	24.0	
Actuated g/C Ratio	0.38	0.38		0.55	0.55		0.30	0.30	0.30	0.30	0.30	
Clearance Time (s)	6.0	6.0		3.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	261	589		399	851		140	965	405	216	922	
v/s Ratio Prot		0.30		c0.14	0.32			0.14			0.19	
v/s Ratio Perm	0.13			c0.41			0.13		0.24	c0.36		
v/c Ratio	0.34	0.80		1.00	0.59		0.42	0.47	0.79	1.22	0.62	
Uniform Delay, d1	17.9	22.3		14.7	12.0		22.4	22.9	25.6	28.0	24.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.8	7.7		44.4	2.9		9.1	1.7	14.2	132.4	3.1	
Delay (s)	18.7	30.1		59.2	14.9		31.5	24.5	39.8	160.4	27.2	
Level of Service	B	C		E	B		C	C	D	F	C	
Approach Delay (s)		28.3			34.0			33.3			67.9	
Approach LOS		C			C			C			E	

Intersection Summary			
HCM 2000 Control Delay	41.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	109.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	411	747	0	848	0	0
Future Volume (Veh/h)	411	747	0	848	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	447	812	0	922	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	87			36		
pX, platoon unblocked					0.94	
vC, conflicting volume			1259		908	447
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1259		773	447
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			548		315	559

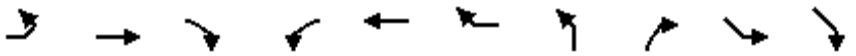
Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	447	812	461	461
Volume Left	0	0	0	0
Volume Right	0	812	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.26	0.48	0.27	0.27
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	88	5	297	253	3	281
Future Volume (Veh/h)	88	5	297	253	3	281
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)	96	5	323	275	3	305
Pedestrians	10		2			10
Lane Width (m)	3.6		3.6			3.6
Walking Speed (m/s)	1.2		1.2			1.2
Percent Blockage	1		0			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			36			
pX, platoon unblocked	0.80	0.80			0.80	
vC, conflicting volume	784	480			608	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	606	228			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 %	74	99			100	
cM capacity (veh/h)	367	643			940	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	101	598	308
Volume Left	96	0	3
Volume Right	5	275	0
cSH	375	1700	940
Volume to Capacity	0.27	0.35	0.00
Queue Length 95th (m)	8.6	0.0	0.1
Control Delay (s)	18.1	0.0	0.1
Lane LOS	C		A
Approach Delay (s)	18.1	0.0	0.1
Approach LOS	C		

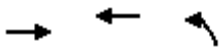
Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Traffic Volume (veh/h)	0	619	186	100	0	520	155	91	0	0
Future Volume (Veh/h)	0	619	186	100	0	520	155	91	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	673	202	109	0	565	168	99	0	0
Pedestrians										
Lane Width (m)										
Walking Speed (m/s)										
Percent Blockage										
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (m)										
pX, platoon unblocked										
vC, conflicting volume	565			875			1557	774	1175	1093
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	565			875			1557	774	1175	1093
tC, single (s)	4.1			4.1			6.5	6.2	7.1	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			86			0	75	0	100
cM capacity (veh/h)	1007			771			97	398	0	184

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	875	109	565	267
Volume Left	0	109	0	0
Volume Right	202	0	565	99
cSH	1700	771	1700	134
Volume to Capacity	0.51	0.14	0.33	1.99
Queue Length 95th (m)	0.0	3.9	0.0	170.2
Control Delay (s)	0.0	10.4	0.0	523.9
Lane LOS		B		F
Approach Delay (s)	0.0	1.7		523.9
Approach LOS				F

Intersection Summary			
Average Delay	77.7		
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	557	532	38
Act Effct Green (s)	21.0	21.0	21.0
Actuated g/C Ratio	0.39	0.39	0.39
v/c Ratio	1.01	0.81	0.12
Control Delay	63.4	27.3	9.2
Queue Delay	0.0	0.0	0.0
Total Delay	63.4	27.3	9.2
LOS	E	C	A
Approach Delay	63.4	27.3	9.2
Approach LOS	E	C	A
Queue Length 50th (m)	~56.7	46.6	1.6
Queue Length 95th (m)	#114.0	#95.4	6.5
Internal Link Dist (m)	216.8	53.8	6.0
Turn Bay Length (m)			
Base Capacity (vph)	549	658	324
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	1.01	0.81	0.12

Intersection Summary	
Cycle Length: 48	
Actuated Cycle Length: 54	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 44.5	Intersection LOS: D
Intersection Capacity Utilization 57.4%	ICU Level of Service B
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	512	0	0	489	23	12
Future Volume (vph)	512	0	0	489	23	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frpb, ped/bikes	1.00			1.00	0.96	
Flpb, ped/bikes	1.00			1.00	0.97	
Frt	1.00			1.00	0.95	
Flt Protected	1.00			1.00	0.97	
Satd. Flow (prot)	1412			1693	808	
Flt Permitted	1.00			1.00	0.97	
Satd. Flow (perm)	1412			1693	808	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	557	0	0	532	25	13
RTOR Reduction (vph)	0	0	0	0	8	0
Lane Group Flow (vph)	557	0	0	532	30	0
Confl. Peds. (#/hr)					41	71
Heavy Vehicles (%)	9%	2%	2%	1%	85%	75%
Parking (#/hr)	0					
Turn Type	NA			NA	Perm	
Protected Phases	2			6		
Permitted Phases					4	
Actuated Green, G (s)	21.0			21.0	21.0	
Effective Green, g (s)	21.0			21.0	21.0	
Actuated g/C Ratio	0.39			0.39	0.39	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	549			658	314	
v/s Ratio Prot	c0.39			0.31		
v/s Ratio Perm					c0.04	
v/c Ratio	1.01			0.81	0.10	
Uniform Delay, d1	16.5			14.7	10.5	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	42.1			7.2	0.6	
Delay (s)	58.6			22.0	11.1	
Level of Service	E			C	B	
Approach Delay (s)	58.6			22.0	11.1	
Approach LOS	E			C	B	

Intersection Summary			
HCM 2000 Control Delay	39.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	54.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	480	14	7	378	0	0
Future Volume (Veh/h)	480	14	7	378	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	522	15	8	411	0	0
Pedestrians					11	
Lane Width (m)					0.0	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	78			84		
pX, platoon unblocked			0.65		0.65	0.65
vC, conflicting volume			548		968	540
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			38		682	27
tC, single (s)			5.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			3.1		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			728		267	683

Direction, Lane #	EB 1	WB 1	WB 2
Volume Total	537	8	411
Volume Left	0	8	0
Volume Right	15	0	0
cSH	1700	728	1700
Volume to Capacity	0.32	0.01	0.24
Queue Length 95th (m)	0.0	0.3	0.0
Control Delay (s)	0.0	10.0	0.0
Lane LOS		A	
Approach Delay (s)	0.0	0.2	
Approach LOS			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	32.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	447	63	338	584	151
Act Effct Green (s)	48.0	48.0	48.0	48.0	48.0
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.44
v/c Ratio	0.59	0.24	0.23	0.83	0.22
Control Delay	26.7	21.8	19.2	38.9	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	26.7	21.8	19.2	38.9	12.0
LOS	C	C	B	D	B
Approach Delay	26.7		19.6	33.3	
Approach LOS	C		B	C	
Queue Length 50th (m)	73.0	8.5	23.8	111.3	11.8
Queue Length 95th (m)	106.8	18.8	34.0	#176.9	25.3
Internal Link Dist (m)	11.8		11.8	66.1	
Turn Bay Length (m)		10.0			
Base Capacity (vph)	752	264	1444	700	679
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.59	0.24	0.23	0.83	0.22

Intersection Summary	
Cycle Length: 68	
Actuated Cycle Length: 108	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 28.0	Intersection LOS: C
Intersection Capacity Utilization 80.4%	ICU Level of Service D
Analysis Period (min) 15	

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	411	0	58	311	537	139
Future Volume (vph)	411	0	58	311	537	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	1.00		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		0.99	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1693		1568	3249	1577	1454
Flt Permitted	1.00		0.36	1.00	0.95	1.00
Satd. Flow (perm)	1693		593	3249	1577	1454
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	447	0	63	338	584	151
RTOR Reduction (vph)	0	0	0	0	0	33
Lane Group Flow (vph)	447	0	63	338	584	118
Confl. Peds. (#/hr)			11			
Heavy Vehicles (%)	1%	2%	3%	0%	3%	0%
Turn Type	NA		Perm	NA	Perm	Perm
Protected Phases	8			4		
Permitted Phases			4		2	2
Actuated Green, G (s)	48.0		48.0	48.0	48.0	48.0
Effective Green, g (s)	48.0		48.0	48.0	48.0	48.0
Actuated g/C Ratio	0.44		0.44	0.44	0.44	0.44
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	752		263	1444	700	646
v/s Ratio Prot	c0.26			0.10		
v/s Ratio Perm			0.11		c0.37	0.08
v/c Ratio	0.59		0.24	0.23	0.83	0.18
Uniform Delay, d1	22.7		18.7	18.6	26.5	18.1
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	3.4		0.5	0.1	11.2	0.6
Delay (s)	26.1		19.1	18.7	37.7	18.8
Level of Service	C		B	B	D	B
Approach Delay (s)	26.1			18.8	33.8	
Approach LOS	C			B	C	

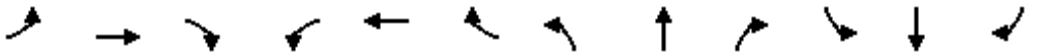
Intersection Summary			
HCM 2000 Control Delay	27.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	45	254	498	472	26	386	611	189	385
Act Effct Green (s)	30.0	30.0	47.0	44.0	24.0	24.0	24.0	24.0	24.0
Actuated g/C Ratio	0.38	0.38	0.59	0.55	0.30	0.30	0.30	0.30	0.30
v/c Ratio	0.18	0.42	0.82	0.52	0.12	0.40	0.73	0.75	0.40
Control Delay	19.3	19.8	24.8	12.2	22.2	23.7	7.9	46.0	21.6
Queue Delay	0.0	0.0	6.8	1.1	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	19.8	31.7	13.4	22.2	23.7	7.9	46.0	21.6
LOS	B	B	C	B	C	C	A	D	C
Approach Delay		19.7		22.8		14.3			29.7
Approach LOS		B		C		B			C
Queue Length 50th (m)	4.7	27.2	43.3	37.7	3.0	25.6	0.0	27.1	23.1
Queue Length 95th (m)	12.5	47.5	#85.2	63.3	9.2	38.1	29.3	#60.9	35.5
Internal Link Dist (m)		60.4		62.7		200.7			290.2
Turn Bay Length (m)	25.0				50.0		40.0	135.0	
Base Capacity (vph)	247	601	605	901	216	974	842	253	964
Starvation Cap Reductn	0	0	73	221	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.42	0.94	0.69	0.12	0.40	0.73	0.75	0.40

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 10 (13%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 20.8 Intersection LOS: C
Intersection Capacity Utilization 99.3% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	184	50	458	267	167	24	355	562	174	288	66
Future Volume (vph)	41	184	50	458	267	167	24	355	562	174	288	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		3.0	6.0		6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.97	1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		0.99	1.00	1.00	0.99	1.00	
Frt	1.00	0.97		1.00	0.94		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1272	1572		1604	1587		1369	3249	1383	1608	3132	
Flt Permitted	0.49	1.00		0.51	1.00		0.50	1.00	1.00	0.50	1.00	
Satd. Flow (perm)	660	1572		856	1587		720	3249	1383	844	3132	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	200	54	498	290	182	26	386	611	189	313	72
RTOR Reduction (vph)	0	12	0	0	28	0	0	0	428	0	25	0
Lane Group Flow (vph)	45	242	0	498	444	0	26	386	183	189	361	0
Confl. Peds. (#/hr)	20		15	15		20	14		17	17		14
Heavy Vehicles (%)	27%	4%	8%	1%	1%	0%	17%	0%	2%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		8		7	4			2			6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	30.0	30.0		44.0	44.0		24.0	24.0	24.0	24.0	24.0	
Effective Green, g (s)	30.0	30.0		44.0	44.0		24.0	24.0	24.0	24.0	24.0	
Actuated g/C Ratio	0.38	0.38		0.55	0.55		0.30	0.30	0.30	0.30	0.30	
Clearance Time (s)	6.0	6.0		3.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	247	589		573	872		216	974	414	253	939	
v/s Ratio Prot		0.15		c0.12	0.28			0.12			0.12	
v/s Ratio Perm	0.07			c0.36			0.04		0.13	c0.22		
v/c Ratio	0.18	0.41		0.87	0.51		0.12	0.40	0.44	0.75	0.38	
Uniform Delay, d1	16.8	18.5		14.0	11.2		20.3	22.2	22.6	25.3	22.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.5		16.3	2.1		1.1	1.2	3.4	18.1	1.2	
Delay (s)	17.1	18.9		30.3	13.4		21.5	23.5	26.0	43.4	23.3	
Level of Service	B	B		C	B		C	C	C	D	C	
Approach Delay (s)		18.7			22.1			24.9			29.9	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	99.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	242	678	0	893	0	0
Future Volume (Veh/h)	242	678	0	893	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	263	737	0	971	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	87			36		
pX, platoon unblocked					0.96	
vC, conflicting volume			1000		748	263
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1000		645	263
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			688		387	735

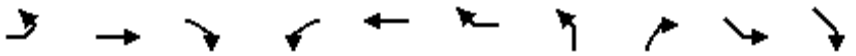
Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	263	737	486	486
Volume Left	0	0	0	0
Volume Right	0	737	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.15	0.43	0.29	0.29
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	130	9	90	181	8	65
Future Volume (Veh/h)	130	9	90	181	8	65
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)	141	10	98	197	9	71
Pedestrians			4			4
Lane Width (m)			3.6			3.6
Walking Speed (m/s)			1.2			1.2
Percent Blockage			0			0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			36			
pX, platoon unblocked	0.85	0.85			0.85	
vC, conflicting volume	290	200			295	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	84	0			90	
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	99			99	
cM capacity (veh/h)	781	929			1297	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	151	295	80
Volume Left	141	0	9
Volume Right	10	197	0
cSH	789	1700	1297
Volume to Capacity	0.19	0.17	0.01
Queue Length 95th (m)	5.6	0.0	0.2
Control Delay (s)	10.6	0.0	0.9
Lane LOS	B		A
Approach Delay (s)	10.6	0.0	0.9
Approach LOS	B		

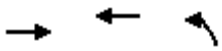
Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	33.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Traffic Volume (veh/h)	0	659	38	68	0	717	30	62	0	0
Future Volume (Veh/h)	0	659	38	68	0	717	30	62	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	716	41	74	0	779	33	67	0	0
Pedestrians							11		4	
Lane Width (m)							3.6		0.0	
Walking Speed (m/s)							1.2		1.2	
Percent Blockage							1		0	
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (m)										
pX, platoon unblocked										
vC, conflicting volume	783			768			1678	748	972	920
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	783			768			1678	748	972	920
tC, single (s)	4.1			4.1			6.5	6.2	7.1	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.2			4.0	3.3	3.5	4.0
p0 queue free %	100			91			62	84	100	100
cM capacity (veh/h)	835			847			87	412	127	245

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	757	74	779	100
Volume Left	0	74	0	0
Volume Right	41	0	779	67
cSH	1700	847	1700	184
Volume to Capacity	0.45	0.09	0.46	0.54
Queue Length 95th (m)	0.0	2.3	0.0	22.5
Control Delay (s)	0.0	9.7	0.0	45.6
Lane LOS		A		E
Approach Delay (s)	0.0	0.8		45.6
Approach LOS				E

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	295	374	19
Act Effct Green (s)	16.2	16.2	8.1
Actuated g/C Ratio	0.86	0.86	0.43
v/c Ratio	0.25	0.26	0.05
Control Delay	3.5	3.3	6.5
Queue Delay	0.0	0.0	0.0
Total Delay	3.5	3.3	6.5
LOS	A	A	A
Approach Delay	3.5	3.3	6.5
Approach LOS	A	A	A
Queue Length 50th (m)	0.0	0.0	0.1
Queue Length 95th (m)	24.5	29.0	3.5
Internal Link Dist (m)	216.8	53.8	6.0
Turn Bay Length (m)			
Base Capacity (vph)	1166	1437	759
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.25	0.26	0.03

Intersection Summary	
Cycle Length: 48	
Actuated Cycle Length: 18.9	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.26	
Intersection Signal Delay: 3.5	Intersection LOS: A
Intersection Capacity Utilization 39.8%	ICU Level of Service A
Analysis Period (min) 15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	271	0	0	344	9	8
Future Volume (vph)	271	0	0	344	9	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frpb, ped/bikes	1.00			1.00	0.99	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.94	
Flt Protected	1.00			1.00	0.97	
Satd. Flow (prot)	1374			1693	830	
Flt Permitted	1.00			1.00	0.97	
Satd. Flow (perm)	1374			1693	830	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	295	0	0	374	10	9
RTOR Reduction (vph)	0	0	0	0	9	0
Lane Group Flow (vph)	295	0	0	374	10	0
Confl. Peds. (#/hr)					12	12
Heavy Vehicles (%)	12%	2%	2%	1%	85%	85%
Parking (#/hr)	0					
Turn Type	NA			NA	Perm	
Protected Phases	2			6		
Permitted Phases					4	
Actuated Green, G (s)	8.7			8.7	0.8	
Effective Green, g (s)	8.7			8.7	0.8	
Actuated g/C Ratio	0.40			0.40	0.04	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	555			685	30	
v/s Ratio Prot	0.21			c0.22		
v/s Ratio Perm					c0.01	
v/c Ratio	0.53			0.55	0.34	
Uniform Delay, d1	4.9			4.9	10.1	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.0			0.9	6.8	
Delay (s)	5.8			5.8	16.9	
Level of Service	A			A	B	
Approach Delay (s)	5.8			5.8	16.9	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	21.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	39.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	259	18	7	333	0	0
Future Volume (Veh/h)	259	18	7	333	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	282	20	8	362	0	0
Pedestrians					18	
Lane Width (m)					0.0	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	78			84		
pX, platoon unblocked			0.95		0.95	0.95
vC, conflicting volume			320		688	310
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			257		644	246
tC, single (s)			5.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			3.1		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			854		411	752

Direction, Lane #	EB 1	WB 1	WB 2
Volume Total	302	8	362
Volume Left	0	8	0
Volume Right	20	0	0
cSH	1700	854	1700
Volume to Capacity	0.18	0.01	0.21
Queue Length 95th (m)	0.0	0.2	0.0
Control Delay (s)	0.0	9.3	0.0
Lane LOS		A	
Approach Delay (s)	0.0	0.2	
Approach LOS			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	22.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	263	21	191	779	33
Act Effct Green (s)	13.3	13.3	13.3	48.0	48.0
Actuated g/C Ratio	0.18	0.18	0.18	0.65	0.65
v/c Ratio	0.85	0.17	0.32	0.74	0.04
Control Delay	55.4	28.9	27.7	14.2	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	55.4	28.9	27.7	14.2	1.9
LOS	E	C	C	B	A
Approach Delay	55.4		27.8	13.7	
Approach LOS	E		C	B	
Queue Length 50th (m)	37.3	2.6	12.7	67.3	0.0
Queue Length 95th (m)	#75.4	8.9	22.0	114.6	2.6
Internal Link Dist (m)	11.8		11.8	66.1	
Turn Bay Length (m)		10.0			
Base Capacity (vph)	326	132	620	1053	898
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.81	0.16	0.31	0.74	0.04

Intersection Summary	
Cycle Length: 68	
Actuated Cycle Length: 73.3	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 24.5	Intersection LOS: C
Intersection Capacity Utilization 71.7%	ICU Level of Service C
Analysis Period (min) 15	

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	242	0	19	176	717	30
Future Volume (vph)	242	0	19	176	717	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	1.00		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1710		1624	3249	1608	1353
Flt Permitted	1.00		0.41	1.00	0.95	1.00
Satd. Flow (perm)	1710		693	3249	1608	1353
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	263	0	21	191	779	33
RTOR Reduction (vph)	0	0	0	0	0	11
Lane Group Flow (vph)	263	0	21	191	779	22
Confl. Peds. (#/hr)					1	16
Heavy Vehicles (%)	0%	2%	0%	0%	1%	4%
Turn Type	NA		Perm	NA	Perm	Perm
Protected Phases	8			4		
Permitted Phases			4		2	2
Actuated Green, G (s)	13.3		13.3	13.3	48.0	48.0
Effective Green, g (s)	13.3		13.3	13.3	48.0	48.0
Actuated g/C Ratio	0.18		0.18	0.18	0.65	0.65
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	310		125	589	1052	886
v/s Ratio Prot	c0.15			0.06		
v/s Ratio Perm			0.03		c0.48	0.02
v/c Ratio	0.85		0.17	0.32	0.74	0.02
Uniform Delay, d1	29.0		25.3	26.1	8.5	4.4
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	18.9		0.6	0.3	4.7	0.1
Delay (s)	47.9		26.0	26.4	13.2	4.5
Level of Service	D		C	C	B	A
Approach Delay (s)	47.9			26.4	12.8	
Approach LOS	D			C	B	

Intersection Summary			
HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	73.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

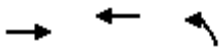
c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	340	60	513	703	203
Act Effct Green (s)	35.0	35.0	35.0	73.0	73.0
Actuated g/C Ratio	0.29	0.29	0.29	0.61	0.61
v/c Ratio	0.69	0.37	0.55	0.74	0.21
Control Delay	46.1	41.7	38.6	22.7	1.9
Queue Delay	6.0	0.0	0.0	0.0	0.0
Total Delay	52.1	41.7	38.6	22.7	1.9
LOS	D	D	D	C	A
Approach Delay	52.1		38.9	18.1	
Approach LOS	D		D	B	
Queue Length 50th (m)	74.7	11.8	56.5	116.5	0.0
Queue Length 95th (m)	109.3	26.0	74.7	169.3	9.3
Internal Link Dist (m)	11.8		11.8	66.1	
Turn Bay Length (m)		10.0			
Base Capacity (vph)	493	163	928	950	946
Starvation Cap Reductn	104	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.87	0.37	0.55	0.74	0.21

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 31.0	Intersection LOS: C
Intersection Capacity Utilization 81.5%	ICU Level of Service D
Analysis Period (min) 15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	313	0	55	472	647	187
Future Volume (vph)	313	0	55	472	647	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	1.00		1.00	0.95	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1693		1577	3185	1562	1425
Flt Permitted	1.00		0.34	1.00	0.95	1.00
Satd. Flow (perm)	1693		560	3185	1562	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	340	0	60	513	703	203
RTOR Reduction (vph)	0	0	0	0	0	80
Lane Group Flow (vph)	340	0	60	513	703	123
Heavy Vehicles (%)	1%	2%	3%	2%	4%	2%
Turn Type	NA		Perm	NA	Perm	Perm
Protected Phases	8			4		
Permitted Phases			4		2	2
Actuated Green, G (s)	35.0		35.0	35.0	73.0	73.0
Effective Green, g (s)	35.0		35.0	35.0	73.0	73.0
Actuated g/C Ratio	0.29		0.29	0.29	0.61	0.61
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	493		163	928	950	866
v/s Ratio Prot	c0.20			0.16		
v/s Ratio Perm			0.11		c0.45	0.09
v/c Ratio	0.69		0.37	0.55	0.74	0.14
Uniform Delay, d1	37.7		33.7	35.9	16.7	10.1
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	7.7		1.4	0.7	5.2	0.3
Delay (s)	45.4		35.1	36.6	21.9	10.4
Level of Service	D		D	D	C	B
Approach Delay (s)	45.4			36.5	19.3	
Approach LOS	D			D	B	

Intersection Summary			
HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	557	532	38
Act Effct Green (s)	30.0	30.0	21.0
Actuated g/C Ratio	0.48	0.48	0.33
v/c Ratio	0.83	0.66	0.14
Control Delay	27.8	17.5	12.5
Queue Delay	0.0	0.0	0.0
Total Delay	27.8	17.5	12.5
LOS	C	B	B
Approach Delay	27.8	17.5	12.5
Approach LOS	C	B	B
Queue Length 50th (m)	55.3	46.6	2.1
Queue Length 95th (m)	#112.6	78.4	8.2
Internal Link Dist (m)	216.8	53.8	6.0
Turn Bay Length (m)			
Base Capacity (vph)	672	806	276
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.83	0.66	0.14

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 63	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 22.4	Intersection LOS: C
Intersection Capacity Utilization 57.4%	ICU Level of Service B
Analysis Period (min) 15	

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

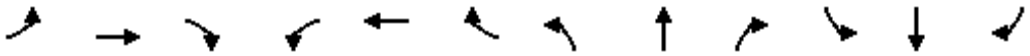
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	512	0	0	489	23	12
Future Volume (vph)	512	0	0	489	23	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frpb, ped/bikes	1.00			1.00	0.96	
Flpb, ped/bikes	1.00			1.00	0.96	
Frt	1.00			1.00	0.95	
Flt Protected	1.00			1.00	0.97	
Satd. Flow (prot)	1412			1693	799	
Flt Permitted	1.00			1.00	0.97	
Satd. Flow (perm)	1412			1693	799	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	557	0	0	532	25	13
RTOR Reduction (vph)	0	0	0	0	9	0
Lane Group Flow (vph)	557	0	0	532	29	0
Confl. Peds. (#/hr)					41	71
Heavy Vehicles (%)	9%	2%	2%	1%	85%	75%
Parking (#/hr)	0					
Turn Type	NA			NA	Perm	
Protected Phases	2			6		
Permitted Phases					4	
Actuated Green, G (s)	30.0			30.0	21.0	
Effective Green, g (s)	30.0			30.0	21.0	
Actuated g/C Ratio	0.48			0.48	0.33	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	672			806	266	
v/s Ratio Prot	c0.39			0.31		
v/s Ratio Perm					c0.04	
v/c Ratio	0.83			0.66	0.11	
Uniform Delay, d1	14.3			12.6	14.5	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	11.3			2.0	0.8	
Delay (s)	25.6			14.6	15.4	
Level of Service	C			B	B	
Approach Delay (s)	25.6			14.6	15.4	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	63.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	24	314	515	700	170	534	416	143	458
Act Effct Green (s)	43.0	43.0	69.0	66.0	30.0	30.0	30.0	45.0	42.0
Actuated g/C Ratio	0.36	0.36	0.58	0.55	0.25	0.25	0.25	0.38	0.35
v/c Ratio	0.17	0.55	0.96	0.81	0.98	0.68	0.69	0.59	0.44
Control Delay	30.4	34.7	50.2	29.6	110.0	45.9	13.9	37.2	28.2
Queue Delay	0.0	0.0	15.0	50.5	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	34.7	65.2	80.1	110.0	45.9	13.9	37.2	28.2
LOS	C	C	E	F	F	D	B	D	C
Approach Delay		34.4		73.8		43.7			30.3
Approach LOS		C		E		D			C
Queue Length 50th (m)	4.0	60.9	76.2	127.5	42.0	63.3	11.9	24.2	40.6
Queue Length 95th (m)	11.4	91.1	#152.7	188.5	#88.3	83.4	49.9	40.7	56.4
Internal Link Dist (m)		60.4		62.7		200.7			290.2
Turn Bay Length (m)	25.0				50.0		40.0	135.0	
Base Capacity (vph)	140	573	536	863	173	781	602	242	1048
Starvation Cap Reductn	0	0	34	243	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.55	1.03	1.13	0.98	0.68	0.69	0.59	0.44

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 51.5	Intersection LOS: D
Intersection Capacity Utilization 108.3%	ICU Level of Service G
Analysis Period (min) 15	

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	264	25	474	384	260	156	491	383	132	309	112
Future Volume (vph)	22	264	25	474	384	260	156	491	383	132	309	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		3.0	6.0		6.0	6.0	6.0	3.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.98		1.00	1.00	0.95	1.00	0.95	
Flpb, ped/bikes	0.99	1.00		0.99	1.00		0.91	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.94		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1070	1592		1580	1535		1350	3124	1344	1528	2908	
Flt Permitted	0.35	1.00		0.41	1.00		0.49	1.00	1.00	0.27	1.00	
Satd. Flow (perm)	393	1592		674	1535		694	3124	1344	428	2908	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	287	27	515	417	283	170	534	416	143	336	122
RTOR Reduction (vph)	0	3	0	0	20	0	0	0	266	0	31	0
Lane Group Flow (vph)	24	311	0	515	680	0	170	534	150	143	427	0
Confl. Peds. (#/hr)	39		47	47		39	68		23	23		68
Heavy Vehicles (%)	50%	4%	22%	2%	4%	1%	9%	4%	3%	6%	2%	1%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		8		7	4			2		1	6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	43.0	43.0		66.0	66.0		30.0	30.0	30.0	42.0	42.0	
Effective Green, g (s)	43.0	43.0		66.0	66.0		30.0	30.0	30.0	42.0	42.0	
Actuated g/C Ratio	0.36	0.36		0.55	0.55		0.25	0.25	0.25	0.35	0.35	
Clearance Time (s)	6.0	6.0		3.0	6.0		6.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	140	570		521	844		173	781	336	232	1017	
v/s Ratio Prot		0.20		c0.16	0.44			0.17		c0.05	0.15	
v/s Ratio Perm	0.06			c0.38			c0.24		0.11	0.17		
v/c Ratio	0.17	0.55		0.99	0.81		0.98	0.68	0.45	0.62	0.42	
Uniform Delay, d1	26.3	30.7		23.2	21.8		44.7	40.7	38.0	28.9	29.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	1.1		36.7	8.1		64.0	4.8	4.2	11.7	1.3	
Delay (s)	26.9	31.8		59.9	29.9		108.8	45.5	42.2	40.6	31.0	
Level of Service	C	C		E	C		F	D	D	D	C	
Approach Delay (s)		31.4			42.6			53.9			33.3	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	43.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	108.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	313	463	0	1119	0	0
Future Volume (Veh/h)	313	463	0	1119	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	340	503	0	1216	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	87			36		
pX, platoon unblocked					0.89	
vC, conflicting volume			843		948	340
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			843		690	340
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			789		337	656

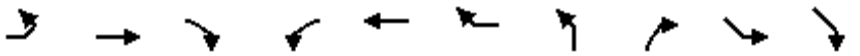
Direction, Lane #	EB 1	EB 2	WB 1	WB 2
Volume Total	340	503	608	608
Volume Left	0	0	0	0
Volume Right	0	503	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.20	0.30	0.36	0.36
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	242	18	301	199	16	285
Future Volume (Veh/h)	242	18	301	199	16	285
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)	263	20	327	216	17	310
Pedestrians	5					7
Lane Width (m)	3.6					3.6
Walking Speed (m/s)	1.2					1.2
Percent Blockage	0					1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			36			
pX, platoon unblocked	0.85	0.85			0.85	
vC, conflicting volume	784	447			548	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	659	263			381	
tC, single (s)	6.4	6.3			4.3	
tC, 2 stage (s)						
tF (s)	3.5	3.4			2.4	
p0 queue free %	27	97			98	
cM capacity (veh/h)	359	640			920	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	283	543	327
Volume Left	263	0	17
Volume Right	20	216	0
cSH	371	1700	920
Volume to Capacity	0.76	0.32	0.02
Queue Length 95th (m)	49.5	0.0	0.5
Control Delay (s)	40.0	0.0	0.7
Lane LOS	E		A
Approach Delay (s)	40.0	0.0	0.7
Approach LOS	E		

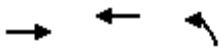
Intersection Summary			
Average Delay	10.0		
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Traffic Volume (veh/h)	0	416	102	60	0	584	248	134	0	0
Future Volume (Veh/h)	0	416	102	60	0	584	248	134	0	0
Sign Control		Free			Free		Stop		Stop	
Grade		0%			0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	452	111	65	0	635	270	146	0	0
Pedestrians										
Lane Width (m)										
Walking Speed (m/s)										
Percent Blockage										
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (m)										
pX, platoon unblocked										
vC, conflicting volume	635			563			1272	508	918	693
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	635			563			1272	508	918	693
tC, single (s)	4.1			4.3			6.5	6.2	7.1	6.5
tC, 2 stage (s)										
tF (s)	2.2			2.4			4.0	3.3	3.5	4.0
p0 queue free %	100			93			0	74	0	100
cM capacity (veh/h)	948			925			155	561	0	341

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	563	65	635	416
Volume Left	0	65	0	0
Volume Right	111	0	635	146
cSH	1700	925	1700	208
Volume to Capacity	0.33	0.07	0.37	2.00
Queue Length 95th (m)	0.0	1.8	0.0	248.4
Control Delay (s)	0.0	9.2	0.0	505.7
Lane LOS		A		F
Approach Delay (s)	0.0	0.9		505.7
Approach LOS				F

Intersection Summary			
Average Delay	125.6		
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	357	637	25
Act Effct Green (s)	27.0	27.0	21.0
Actuated g/C Ratio	0.45	0.45	0.35
v/c Ratio	0.58	0.84	0.09
Control Delay	17.1	28.0	11.5
Queue Delay	0.0	0.0	0.0
Total Delay	17.1	28.0	11.5
LOS	B	C	B
Approach Delay	17.1	28.0	11.5
Approach LOS	B	C	B
Queue Length 50th (m)	29.1	61.8	1.3
Queue Length 95th (m)	53.5	#121.1	5.8
Internal Link Dist (m)	216.8	53.8	6.0
Turn Bay Length (m)			
Base Capacity (vph)	612	754	293
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.58	0.84	0.09

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 23.8	Intersection LOS: C
Intersection Capacity Utilization 61.8%	ICU Level of Service B
Analysis Period (min) 15	

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	328	0	0	586	16	7
Future Volume (vph)	328	0	0	586	16	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frpb, ped/bikes	1.00			1.00	0.98	
Flpb, ped/bikes	1.00			1.00	0.98	
Frt	1.00			1.00	0.96	
Flt Protected	1.00			1.00	0.97	
Satd. Flow (prot)	1362			1676	825	
Flt Permitted	1.00			1.00	0.97	
Satd. Flow (perm)	1362			1676	825	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	357	0	0	637	17	8
RTOR Reduction (vph)	0	0	0	0	5	0
Lane Group Flow (vph)	357	0	0	637	20	0
Confl. Peds. (#/hr)					22	34
Heavy Vehicles (%)	13%	2%	2%	2%	90%	70%
Parking (#/hr)	0					
Turn Type	NA			NA	Perm	
Protected Phases	2			6		
Permitted Phases					4	
Actuated Green, G (s)	27.0			27.0	21.0	
Effective Green, g (s)	27.0			27.0	21.0	
Actuated g/C Ratio	0.45			0.45	0.35	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	612			754	288	
v/s Ratio Prot	0.26			c0.38		
v/s Ratio Perm					c0.02	
v/c Ratio	0.58			0.84	0.07	
Uniform Delay, d1	12.3			14.6	13.0	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	4.0			8.6	0.5	
Delay (s)	16.3			23.2	13.4	
Level of Service	B			C	B	
Approach Delay (s)	16.3			23.2	13.4	
Approach LOS	B			C	B	

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	305	18	7	585	0	0
Future Volume (Veh/h)	305	18	7	585	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	332	20	8	636	0	0
Pedestrians					14	
Lane Width (m)					0.0	
Walking Speed (m/s)					1.2	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	78			84		
pX, platoon unblocked			0.84		0.88	0.84
vC, conflicting volume			366		1008	356
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			151		743	139
tC, single (s)			5.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			3.1		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			841		333	764

Direction, Lane #	EB 1	WB 1	WB 2
Volume Total	352	8	636
Volume Left	0	8	0
Volume Right	20	0	0
cSH	1700	841	1700
Volume to Capacity	0.21	0.01	0.37
Queue Length 95th (m)	0.0	0.2	0.0
Control Delay (s)	0.0	9.3	0.0
Lane LOS		A	
Approach Delay (s)	0.0	0.1	
Approach LOS			

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	340	60	513	703	203
Act Effct Green (s)	48.0	48.0	48.0	60.0	60.0
Actuated g/C Ratio	0.40	0.40	0.40	0.50	0.50
v/c Ratio	0.50	0.21	0.40	0.90	0.25
Control Delay	30.2	26.1	26.9	43.8	3.6
Queue Delay	3.7	0.0	0.0	0.0	0.0
Total Delay	33.9	26.1	26.9	43.8	3.6
LOS	C	C	C	D	A
Approach Delay	33.9		26.9	34.8	
Approach LOS	C		C	C	
Queue Length 50th (m)	62.4	9.6	47.2	153.5	1.5
Queue Length 95th (m)	91.3	20.5	62.4	#236.0	13.9
Internal Link Dist (m)	11.8		11.8	66.1	
Turn Bay Length (m)		10.0			
Base Capacity (vph)	677	286	1274	781	808
Starvation Cap Reductn	246	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.79	0.21	0.40	0.90	0.25

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 32.1	Intersection LOS: C
Intersection Capacity Utilization 81.5%	ICU Level of Service D
Analysis Period (min) 15	

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

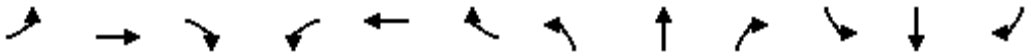
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	313	0	55	472	647	187
Future Volume (vph)	313	0	55	472	647	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	1.00		1.00	0.95	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1693		1577	3185	1562	1425
Flt Permitted	1.00		0.43	1.00	0.95	1.00
Satd. Flow (perm)	1693		716	3185	1562	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	340	0	60	513	703	203
RTOR Reduction (vph)	0	0	0	0	0	96
Lane Group Flow (vph)	340	0	60	513	703	108
Heavy Vehicles (%)	1%	2%	3%	2%	4%	2%
Turn Type	NA		Perm	NA	Perm	Perm
Protected Phases	8			4		
Permitted Phases			4		2	2
Actuated Green, G (s)	48.0		48.0	48.0	60.0	60.0
Effective Green, g (s)	48.0		48.0	48.0	60.0	60.0
Actuated g/C Ratio	0.40		0.40	0.40	0.50	0.50
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	677		286	1274	781	712
v/s Ratio Prot	c0.20			0.16		
v/s Ratio Perm			0.08		c0.45	0.08
v/c Ratio	0.50		0.21	0.40	0.90	0.15
Uniform Delay, d1	27.0		23.6	25.7	27.3	16.2
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7		0.4	0.2	15.5	0.4
Delay (s)	29.7		23.9	26.0	42.7	16.7
Level of Service	C		C	C	D	B
Approach Delay (s)	29.7			25.7	36.9	
Approach LOS	C			C	D	

Intersection Summary			
HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	90	487	398	524	59	458	633	263	599
Act Effct Green (s)	43.0	43.0	69.0	66.0	30.0	30.0	30.0	45.0	42.0
Actuated g/C Ratio	0.36	0.36	0.58	0.55	0.25	0.25	0.25	0.38	0.35
v/c Ratio	0.36	0.85	0.96	0.61	0.39	0.57	0.96	0.93	0.55
Control Delay	33.7	50.0	55.8	20.4	46.7	42.6	40.8	70.3	32.3
Queue Delay	0.0	3.0	0.0	9.6	0.0	0.0	0.0	0.0	0.0
Total Delay	33.7	53.1	55.8	30.0	46.7	42.6	40.8	70.3	32.3
LOS	C	D	E	C	D	D	D	E	C
Approach Delay		50.0		41.1		41.8			43.9
Approach LOS		D		D		D			D
Queue Length 50th (m)	16.3	107.5	58.4	78.0	12.2	52.4	57.9	48.1	59.7
Queue Length 95th (m)	32.3	#168.4	#122.9	114.4	26.6	70.4	#142.0	#99.5	78.7
Internal Link Dist (m)		60.4		62.7		200.7			290.2
Turn Bay Length (m)	25.0				50.0		40.0	135.0	
Base Capacity (vph)	248	572	415	863	150	804	659	284	1083
Starvation Cap Reductn	0	34	0	304	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.91	0.96	0.94	0.39	0.57	0.96	0.93	0.55

Intersection Summary

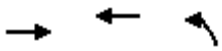
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 43.5 Intersection LOS: D
Intersection Capacity Utilization 107.7% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	335	113	366	308	174	54	421	582	242	444	107
Future Volume (vph)	83	335	113	366	308	174	54	421	582	242	444	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		3.0	6.0		6.0	6.0	6.0	3.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98		1.00	1.00	0.91	1.00	0.97	
Flpb, ped/bikes	0.97	1.00		1.00	1.00		0.93	1.00	1.00	0.99	1.00	
Frt	1.00	0.96		1.00	0.95		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1400	1568		1604	1539		1343	3217	1314	1610	3046	
Flt Permitted	0.47	1.00		0.22	1.00		0.43	1.00	1.00	0.33	1.00	
Satd. Flow (perm)	692	1568		365	1539		602	3217	1314	554	3046	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	364	123	398	335	189	59	458	633	263	483	116
RTOR Reduction (vph)	0	10	0	0	17	0	0	0	331	0	18	0
Lane Group Flow (vph)	90	477	0	398	507	0	59	458	302	263	581	0
Confl. Peds. (#/hr)	65		51	51		65	58		49	49		58
Heavy Vehicles (%)	13%	3%	5%	1%	3%	2%	13%	1%	1%	0%	0%	1%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		8		7	4			2		1	6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	43.0	43.0		66.0	66.0		30.0	30.0	30.0	42.0	42.0	
Effective Green, g (s)	43.0	43.0		66.0	66.0		30.0	30.0	30.0	42.0	42.0	
Actuated g/C Ratio	0.36	0.36		0.55	0.55		0.25	0.25	0.25	0.35	0.35	
Clearance Time (s)	6.0	6.0		3.0	6.0		6.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	247	561		407	846		150	804	328	273	1066	
v/s Ratio Prot		0.30		c0.16	0.33			0.14		c0.07	0.19	
v/s Ratio Perm	0.13			c0.38			0.10		0.23	c0.27		
v/c Ratio	0.36	0.85		0.98	0.60		0.39	0.57	0.92	0.96	0.55	
Uniform Delay, d1	28.4	35.5		23.7	18.1		37.4	39.4	43.9	36.4	31.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	11.5		39.4	3.1		7.6	2.9	33.2	45.9	2.0	
Delay (s)	29.3	47.1		63.1	21.2		45.0	42.3	77.1	82.3	33.3	
Level of Service	C	D		E	C		D	D	E	F	C	
Approach Delay (s)		44.3			39.3			61.6			48.3	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	49.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	107.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	557	532	38
Act Effct Green (s)	27.0	27.0	21.0
Actuated g/C Ratio	0.45	0.45	0.35
v/c Ratio	0.88	0.70	0.13
Control Delay	33.6	19.3	11.4
Queue Delay	0.0	0.0	0.0
Total Delay	33.6	19.3	11.4
LOS	C	B	B
Approach Delay	33.6	19.3	11.4
Approach LOS	C	B	B
Queue Length 50th (m)	55.3	46.6	1.9
Queue Length 95th (m)	#113.2	79.7	7.6
Internal Link Dist (m)	216.8	53.8	6.0
Turn Bay Length (m)			
Base Capacity (vph)	635	761	289
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.88	0.70	0.13

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 26.1	Intersection LOS: C
Intersection Capacity Utilization 57.4%	ICU Level of Service B
Analysis Period (min) 15	

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	512	0	0	489	23	12
Future Volume (vph)	512	0	0	489	23	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frpb, ped/bikes	1.00			1.00	0.96	
Flpb, ped/bikes	1.00			1.00	0.96	
Frt	1.00			1.00	0.95	
Flt Protected	1.00			1.00	0.97	
Satd. Flow (prot)	1412			1693	802	
Flt Permitted	1.00			1.00	0.97	
Satd. Flow (perm)	1412			1693	802	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	557	0	0	532	25	13
RTOR Reduction (vph)	0	0	0	0	8	0
Lane Group Flow (vph)	557	0	0	532	30	0
Confl. Peds. (#/hr)					41	71
Heavy Vehicles (%)	9%	2%	2%	1%	85%	75%
Parking (#/hr)	0					
Turn Type	NA			NA	Perm	
Protected Phases	2			6		
Permitted Phases					4	
Actuated Green, G (s)	27.0			27.0	21.0	
Effective Green, g (s)	27.0			27.0	21.0	
Actuated g/C Ratio	0.45			0.45	0.35	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	635			761	280	
v/s Ratio Prot	c0.39			0.31		
v/s Ratio Perm					c0.04	
v/c Ratio	0.88			0.70	0.11	
Uniform Delay, d1	15.0			13.2	13.2	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	15.8			2.8	0.8	
Delay (s)	30.7			16.1	13.9	
Level of Service	C			B	B	
Approach Delay (s)	30.7			16.1	13.9	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	447	63	338	584	151
Act Effct Green (s)	48.0	48.0	48.0	60.0	60.0
Actuated g/C Ratio	0.40	0.40	0.40	0.50	0.50
v/c Ratio	0.66	0.30	0.26	0.74	0.19
Control Delay	35.1	29.7	24.8	30.9	3.1
Queue Delay	18.7	0.0	0.0	0.0	0.0
Total Delay	53.8	29.7	24.8	30.9	3.1
LOS	D	C	C	C	A
Approach Delay	53.8		25.6	25.2	
Approach LOS	D		C	C	
Queue Length 50th (m)	89.2	10.5	29.1	111.3	0.0
Queue Length 95th (m)	127.2	23.4	40.6	159.9	10.8
Internal Link Dist (m)	11.8		11.8	66.1	
Turn Bay Length (m)		10.0			
Base Capacity (vph)	677	209	1299	788	802
Starvation Cap Reductn	224	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.99	0.30	0.26	0.74	0.19

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 33.4		Intersection LOS: C	
Intersection Capacity Utilization 80.4%		ICU Level of Service D	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	411	0	58	311	537	139
Future Volume (vph)	411	0	58	311	537	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	1.00		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		0.99	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1693		1568	3249	1577	1454
Flt Permitted	1.00		0.32	1.00	0.95	1.00
Satd. Flow (perm)	1693		524	3249	1577	1454
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	447	0	63	338	584	151
RTOR Reduction (vph)	0	0	0	0	0	76
Lane Group Flow (vph)	447	0	63	338	584	76
Confl. Peds. (#/hr)			11			
Heavy Vehicles (%)	1%	2%	3%	0%	3%	0%
Turn Type	NA		Perm	NA	Perm	Perm
Protected Phases	8			4		
Permitted Phases			4		2	2
Actuated Green, G (s)	48.0		48.0	48.0	60.0	60.0
Effective Green, g (s)	48.0		48.0	48.0	60.0	60.0
Actuated g/C Ratio	0.40		0.40	0.40	0.50	0.50
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	677		209	1299	788	727
v/s Ratio Prot	c0.26			0.10		
v/s Ratio Perm			0.12		c0.37	0.05
v/c Ratio	0.66		0.30	0.26	0.74	0.10
Uniform Delay, d1	29.4		24.6	24.1	23.8	15.8
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	5.0		0.8	0.1	6.2	0.3
Delay (s)	34.4		25.4	24.2	30.0	16.1
Level of Service	C		C	C	C	B
Approach Delay (s)	34.4			24.4	27.2	
Approach LOS	C			C	C	

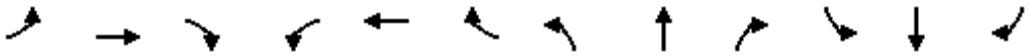
Intersection Summary			
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	45	254	498	472	26	386	611	189	385
Act Effct Green (s)	43.0	43.0	69.0	66.0	30.0	30.0	30.0	45.0	42.0
Actuated g/C Ratio	0.36	0.36	0.58	0.55	0.25	0.25	0.25	0.38	0.35
v/c Ratio	0.19	0.44	0.84	0.53	0.14	0.48	0.76	0.59	0.35
Control Delay	29.3	30.8	31.2	18.1	37.5	40.6	10.2	35.9	27.9
Queue Delay	0.0	0.0	13.6	4.9	0.0	0.0	0.0	0.0	0.0
Total Delay	29.3	30.8	44.9	23.0	37.5	40.6	10.2	35.9	27.9
LOS	C	C	D	C	D	D	B	D	C
Approach Delay		30.6		34.2		22.3			30.5
Approach LOS		C		C		C			C
Queue Length 50th (m)	7.6	45.2	72.2	64.7	5.1	43.0	0.0	32.8	34.4
Queue Length 95th (m)	17.5	70.3	#116.6	95.3	13.3	59.0	39.9	52.4	48.1
Internal Link Dist (m)		60.4		62.7		200.7			290.2
Turn Bay Length (m)	25.0				50.0		40.0	135.0	
Base Capacity (vph)	235	571	594	889	187	812	801	318	1110
Starvation Cap Reductn	0	0	87	341	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.44	0.98	0.86	0.14	0.48	0.76	0.59	0.35

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.84		
Intersection Signal Delay: 28.9	Intersection LOS: C	
Intersection Capacity Utilization 97.6%	ICU Level of Service F	
Analysis Period (min) 15		

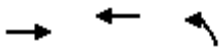
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	184	50	458	267	167	24	355	562	174	288	66
Future Volume (vph)	41	184	50	458	267	167	24	355	562	174	288	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		3.0	6.0		6.0	6.0	6.0	3.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.96	1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00		0.98	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.94		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1268	1571		1603	1584		1359	3249	1371	1617	3125	
Flt Permitted	0.49	1.00		0.48	1.00		0.52	1.00	1.00	0.39	1.00	
Satd. Flow (perm)	658	1571		802	1584		749	3249	1371	663	3125	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	200	54	498	290	182	26	386	611	189	313	72
RTOR Reduction (vph)	0	8	0	0	19	0	0	0	458	0	16	0
Lane Group Flow (vph)	45	246	0	498	453	0	26	386	153	189	369	0
Confl. Peds. (#/hr)	20		15	15		20	14		17	17		14
Heavy Vehicles (%)	27%	4%	8%	1%	1%	0%	17%	0%	2%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		8		7	4			2		1	6	
Permitted Phases	8			4			2		2	6		
Actuated Green, G (s)	43.0	43.0		66.0	66.0		30.0	30.0	30.0	42.0	42.0	
Effective Green, g (s)	43.0	43.0		66.0	66.0		30.0	30.0	30.0	42.0	42.0	
Actuated g/C Ratio	0.36	0.36		0.55	0.55		0.25	0.25	0.25	0.35	0.35	
Clearance Time (s)	6.0	6.0		3.0	6.0		6.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	235	562		574	871		187	812	342	303	1093	
v/s Ratio Prot		0.16		c0.14	0.29			0.12		c0.05	0.12	
v/s Ratio Perm	0.07			c0.33			0.03		0.11	c0.17		
v/c Ratio	0.19	0.44		0.87	0.52		0.14	0.48	0.45	0.62	0.34	
Uniform Delay, d1	26.5	29.3		20.1	17.0		35.0	38.3	38.0	30.0	28.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.5		16.2	2.2		1.5	2.0	4.2	9.3	0.8	
Delay (s)	26.9	29.8		36.3	19.2		36.5	40.3	42.2	39.4	29.6	
Level of Service	C	C		D	B		D	D	D	D	C	
Approach Delay (s)		29.4			28.0			41.3			32.8	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	97.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	295	374	19
Act Effct Green (s)	15.8	15.8	8.8
Actuated g/C Ratio	0.88	0.88	0.49
v/c Ratio	0.24	0.25	0.05
Control Delay	3.4	3.1	6.9
Queue Delay	0.0	0.0	0.0
Total Delay	3.4	3.1	6.9
LOS	A	A	A
Approach Delay	3.4	3.1	6.9
Approach LOS	A	A	A
Queue Length 50th (m)	0.0	0.0	0.1
Queue Length 95th (m)	25.3	29.8	3.9
Internal Link Dist (m)	216.8	53.8	6.0
Turn Bay Length (m)			
Base Capacity (vph)	1298	1599	750
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.23	0.23	0.03

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 17.9	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.25	
Intersection Signal Delay: 3.4	Intersection LOS: A
Intersection Capacity Utilization 39.8%	ICU Level of Service A
Analysis Period (min) 15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	271	0	0	344	9	8
Future Volume (vph)	271	0	0	344	9	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frpb, ped/bikes	1.00			1.00	0.99	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.94	
Flt Protected	1.00			1.00	0.97	
Satd. Flow (prot)	1374			1693	831	
Flt Permitted	1.00			1.00	0.97	
Satd. Flow (perm)	1374			1693	831	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	295	0	0	374	10	9
RTOR Reduction (vph)	0	0	0	0	9	0
Lane Group Flow (vph)	295	0	0	374	10	0
Confl. Peds. (#/hr)					12	12
Heavy Vehicles (%)	12%	2%	2%	1%	85%	85%
Parking (#/hr)	0					
Turn Type	NA			NA	Perm	
Protected Phases	2			6		
Permitted Phases					4	
Actuated Green, G (s)	6.1			6.1	0.8	
Effective Green, g (s)	6.1			6.1	0.8	
Actuated g/C Ratio	0.32			0.32	0.04	
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	443			546	35	
v/s Ratio Prot	0.21			c0.22		
v/s Ratio Perm					c0.01	
v/c Ratio	0.67			0.68	0.30	
Uniform Delay, d1	5.5			5.6	8.8	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	3.8			3.6	4.7	
Delay (s)	9.3			9.1	13.5	
Level of Service	A			A	B	
Approach Delay (s)	9.3			9.1	13.5	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	18.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	39.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	263	21	191	779	33
Act Effct Green (s)	19.0	19.0	19.0	60.1	60.1
Actuated g/C Ratio	0.21	0.21	0.21	0.66	0.66
v/c Ratio	0.74	0.15	0.28	0.74	0.04
Control Delay	46.5	31.2	30.9	16.9	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	46.5	31.2	30.9	16.9	3.3
LOS	D	C	C	B	A
Approach Delay	46.5		30.9	16.3	
Approach LOS	D		C	B	
Queue Length 50th (m)	45.6	3.2	15.6	84.1	0.3
Queue Length 95th (m)	72.2	9.7	25.0	168.6	4.0
Internal Link Dist (m)	11.8		11.8	66.1	
Turn Bay Length (m)		10.0			
Base Capacity (vph)	902	358	1713	1059	894
Starvation Cap Reductn	5	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.29	0.06	0.11	0.74	0.04

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 91.2			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 24.9		Intersection LOS: C	
Intersection Capacity Utilization 71.7%		ICU Level of Service C	
Analysis Period (min) 15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	242	0	19	176	717	30
Future Volume (vph)	242	0	19	176	717	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		6.0	6.0	6.0	6.0
Lane Util. Factor	1.00		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1710		1624	3249	1607	1349
Flt Permitted	1.00		0.40	1.00	0.95	1.00
Satd. Flow (perm)	1710		679	3249	1607	1349
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	263	0	21	191	779	33
RTOR Reduction (vph)	0	0	0	0	0	10
Lane Group Flow (vph)	263	0	21	191	779	23
Confl. Peds. (#/hr)					1	16
Heavy Vehicles (%)	0%	2%	0%	0%	1%	4%
Turn Type	NA		Perm	NA	Perm	Perm
Protected Phases	8			4		
Permitted Phases			4		2	2
Actuated Green, G (s)	19.0		19.0	19.0	60.2	60.2
Effective Green, g (s)	19.0		19.0	19.0	60.2	60.2
Actuated g/C Ratio	0.21		0.21	0.21	0.66	0.66
Clearance Time (s)	6.0		6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	356		141	676	1060	890
v/s Ratio Prot	c0.15			0.06		
v/s Ratio Perm			0.03		c0.48	0.02
v/c Ratio	0.74		0.15	0.28	0.73	0.03
Uniform Delay, d1	33.8		29.5	30.4	10.2	5.4
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	7.8		0.5	0.2	4.5	0.1
Delay (s)	41.6		30.0	30.6	14.8	5.4
Level of Service	D		C	C	B	A
Approach Delay (s)	41.6			30.5	14.4	
Approach LOS	D			C	B	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	91.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX J

TRAFFIC SIGNAL WARRANTS

OTM Book 12 - Signal Warrant Analysis - Justification 7 - Projected Volumes

Intersection:	Elizabeth St. & Arthur St.		
Major Roadway:	Elizabeth St.	Orientation: East-West	No. of Lanes: 1
Minor Roadway	Arthur St.	Orientation: North-South	No. of Lanes: 1
Analysis Scenario:	Future Total (2051) Traffic Conditions		
Peak Hour[1]:	AM & PM Average Hour Volumes		
Existing Intersection[1]:	Yes		
T-Intersection[2]:	Yes	Signal Warrant 150% Satisfied:	No
Flow Conditions[3]:	Restricted Flow	Signal Warrant 120% Satisfied:	No

Traffic & Pedestrian Volumes

Peak Hour	Major Roadway									Minor Roadway								
	Northbound				Southbound					Eastbound				Westbound				
	Left	Thru	Right	Total	Left	Thru	Right	Total	Peds	Left	Thru	Right	Total	Left	Thru	Right	Total	Peds
AM	248		134	**382**				**0**			416	102	**517**	60	584		**644**	
PM	155		91	**247**				**0**			619	186	**805**	100	520		**620**	
Totals	**403.7**	**0**	**225**	**628**	**0**	**0**	**0**	**0**	**0**	**0**	**1035**	**288**	**1323**	**160**	**1105**	**0**	**1265**	**0**

Table 21 – Justification 7 – Projected Volumes

Justification	Description	Minimim Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance		
						Sectional		Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	804	93%	234%
	B. Vehicle volume, along minor streets * (average hour)	120	170	120	170	647	234%	
2. Delay to Cross Traffic	A. Vehicle volume, major street (average hour)	480	720	600	900	157	18%	44%
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	120	170	40	44%	

Notes:

1. If using Average Hour Volumes, Justifications 1 and 2 should be met to 120% for an existing intersection or 150% for a new intersection.

2. For "T" intersections, these values should be increased by 50%

3. Restricted flow: Operating or posted speed less than 70km/hr. Normally urban areas.
Free flow: Operating or posted speeds equal to or greater than 70km/hr. Normally rural areas.

- Application of Justification 2b:

- *The number of pedestrians crossing the main road.*
- *Total left turns from both the side road approaches.*
- *The highest through volumes from one of the side road approaches.*
- *Fifty percent of the heavier left-turn traffic movement from the main road when both of the following criteria are met:*
  - *The left turn volume is greater than 120 vehicles per hour.*
  - *The total of the heavier left-turn volume plus its opposing volume is greater than 720 vph*