TRANSPORTATION IMPACT STUDY

1062-1074 COOKE BOULEVARD

CITY OF BURLINGTON
REGION OF HALTON

PREPARED FOR:
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SEPTEMBER 2022

CFCA FILE NO. 2321-6441

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Revision Number	Date	Comments
Rev. 0	September 1, 2022	Issued for First Submission

Executive Summary

C.F. Crozier & Associates Inc. (Crozier) was retained by Camarro Developments Inc. (the Applicant) to complete a Transportation Impact Study (TIS) and Parking Utilization Study for a proposed residential development situated at 1062-1064 Cooke Boulevard, in the City of Burlington.

The analysis undertaken herein was completed using the Draft Site Plan prepared by RAW Design dated August 30, 2022. Any minor changes to the Site Plan are not expected to materially affect the conclusions set out within this report.

The proposed development envisions the construction of two residential towers containing a total of 809 residential units, a total of 640 vehicle parking spaces, and a total of 454 bicycle parking spaces. Additionally, full-moves accesses are proposed off Masonry Court and Cooke Boulevard,

Under 2022 existing conditions, the study intersections operate with a Level of Service "B" or better, with the exception of the intersection of Plains Road East at Waterdown operating with a Level of Service "D" during both peak periods. Notably, the eastbound left-turn movement during the A.M. peak exceeds capacity, and the westbound through movement during the P.M. peak operates with a critical capacity.

Under 2026 and 2031 future background traffic, the intersection of Plains Road and Waterdown Road is anticipated to fail during the A.M. peak and operate with a LOS "E" during the P.M. peak for both horizons; notably the eastbound left continues to operate above capacity during the A.M. peak and the westbound through during the P.M. peak. The stop-controlled intersection of Masonry Court and Cooke Boulevard is anticipated to operate with LOS "F" for all horizon years and peak periods under future background traffic due to the overcapacity movement on the northbound approach. Similarly, under future background traffic, the intersection of Masonry and Waterdown Road is projected to operate with LOS "F" during the morning peak hour due to the over-capacity southbound left-turn movement at the intersection. The intersection of Plains Road East and Cooke Boulevard is anticipated to operate with LOS "C" or better under future background conditions for all peak periods and horizon years. The failure of intersections as noted is heavily due to the construction of the Aldershot GO Station.

The subject site is expected to generate 197 two-way (67 inbound and 130 outbound) trips during the weekday A.M. peak hour, and 234 (131 inbound and 103 outbound) trips during the weekday P.M. peak hour.

The future total operations at the study intersections are anticipated to be very similar to that of the future background operations forecasted for both horizon years and peak periods due to heavy volumes generated from background developments. It is noted the Cooke Boulevard site access is anticipated to operate well under capacity, however the left-turns at the Masonry Court access may face high delays due to the high volumes of through traffic generated by the Aldershot GO Station parking lot.

To mitigate the poor operations forecasted for the intersections of Cooke Boulevard at Masonry Court, Waterdown Road at Masonry Court, and the intersection of Waterdown Road at Plains Road East, measures including signal optimization and geometric improvements may be necessary, should the conservative background development volumes forecasted for the Aldershot GO Station Parking lot materialize. It is noted that with the exception of the existing overcapacity eastbound left-turn movement at Waterdown Road at Plains Road East (which is recommended to be mitigated through an extension of the eastbound left-turn lane into the existing two-way left-turn lane along the eastbound approach), all other intersections are recommended to be monitored for improvements as necessary.

Additionally, it is emphasized that all operational issues identified by the future total horizon are resultant of either existing poor capacity, or the conservative trip generation estimates for the Aldershot GO Station parking lot; the proposed site is not expected to materially impact the surrounding road network.

The sightlines at the proposed Cooke Boulevard and Masonry Court accesses were verified using the guidance provided by the Transportation Association of Canada (TAC), and sufficient visibility of oncoming vehicles are provided at either access.

Vehicle maneuvering analysis was undertaken for the site using expected design vehicles (fire, waste, medium-single unit truck and passenger vehicles). It is noted that the larger vehicles would not expect to have any encroachments, however passenger vehicles in certain spaces of the mezzanine level may face some difficulties maneuvering. As such, it is recommended the highlighted spaces in Figures T305-A/B are restricted/reserved for small vehicles.

The proposed parking supply at the site is below the City's By-Law requirements but can be supported based on the prepared Parking Justification, which included a review of the surrounding policy context, as well as recent development precedent within the Aldershot MTSA.

Per the results of the analysis contained within this report, the development applications for the proposed site may be supported from a traffic operations and safety perspective, with the above noted recommendations.

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1.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) was retained by Camarro Developments Inc. (the Applicant) to complete a Transportation Impact Study (TIS) in support of a residential development situated at 1062-1074 Cooke Boulevard in the City of Burlington, Regional Municipality of Halton.

The purpose of this study is to evaluate the impacts of the planned development on the surrounding road network and recommend traffic-related mitigation measures, if warranted. This study has been completed following the procedures set out within the Halton Region's Transportation Impact Study Guidelines, dated December 2015.

A Terms of Reference (ToR) encompassing the scope of the Transportation Impact Study was circulated to staff at the City of Burlington (the City) on June 22, 2022, and comments were received on July 18, 2022. Correspondence from the City is included in Appendix A.

1.1 Development Proposal

The proposed residential development at 1062-1074 Cooke Boulevard envisions the following elements contained in two residential towers:

- 809 residential units
- 581 m^2 of ground-floor retail space
- A total of 640 vehicle parking spaces (522 residential spaces, and 118 retail/visitor spaces)
- 454 bicycle parking spaces, including 40 short-term spaces located at grade, and 414 long-term spaces located underground (P1) and at-grade

Both residential towers are proposed to be connected via a 6-storey podium, however each would consist of separate lobbies and there are proposed to be two separate vehicular access locations:

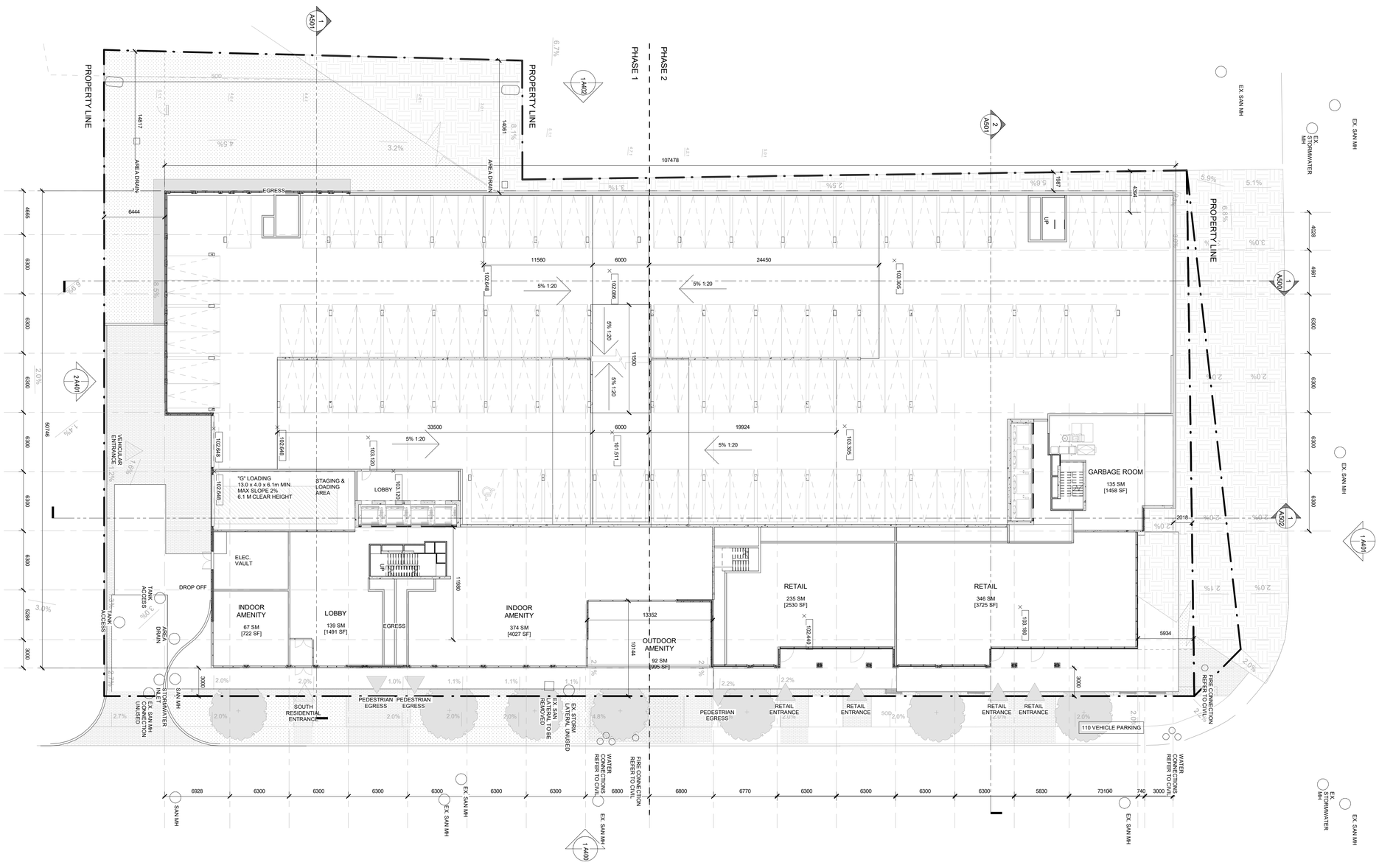
- One access via Cooke Boulevard located in the northwest corner of the site; and
- One access via Masonry Court located in the southeast corner of the site

The Site Plans dated August 30, 2022, prepared by RAW Design for the South Tower and North Tower are provided in Figure 1A and Figure 1B, respectively.

1.2 Development Lands

The subject property covers an area of approximately 0.72 ha and currently consists of two existing single storey employment buildings. The subject parcels are located within a predominately commercial neighborhood, and are bound by Cooke Boulevard to the east, commercial properties to the south and west, and Masonry Court to the north. The subject properties are currently zoned as Mixed-Use Corridor Employment (MXE) per the City of Burlington Zoning By-Law 2020.

The Site Location is included in Figure 2.



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ISSUE RECORD

REVISION RECORD

North

RAW

405-317 ADELAIDE STREET WEST
TORONTO CANADA M5V 1P9
+1 416.599.9729
WWW.RAWDESIGN.CA

18072

1074 COOKE BLVD
BURLINGTON

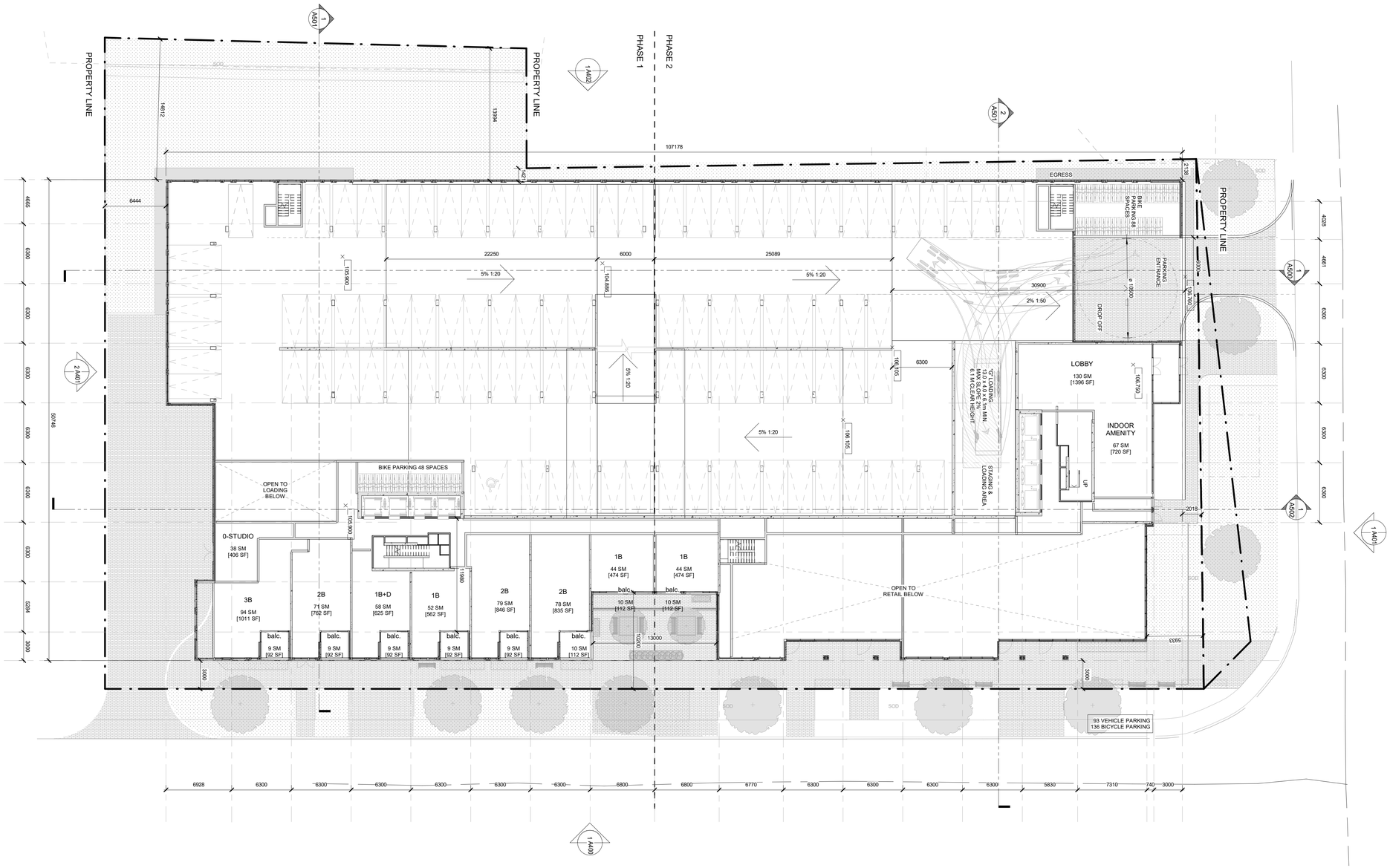
For CAMARRO GROUP

GROUND LEVEL SOUTH

1 : 200

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ISSUE RECORD

REVISION RECORD

North

RAW

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TORONTO CANADA M5V 1P9
+1 416 599 9729
WWW.RAWDESIGN.CA

18072

1074 COOKE BLV
BURLINGTON

For CAMARRO GROUP

GROUND LEVEL NORTH

1 : 200

A201B

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Legend

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

1062-1074 Cooke Blvd

Site Location

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Figure 2

Project No. 2321-6441
Date.
Analyst. FC

2.0 Existing Conditions

The following intersections were reviewed and generally form the study area transportation network as agreed upon within the ToR provided to City staff:

- Cooke Boulevard and Masonry Court
- Cooke Boulevard and Plains Road East
- Masonry Court and Waterdown Road
- Plains Road East and Waterdown Road
- Proposed Site Access via Cooke Boulevard
- Proposed Site Access via Masonry Court

The following sections provides a description of the study area from a transportation context for all modes of transportation, as well as the existing traffic operations analysis of the study road network.

2.1 Study Road Network

The following section provides a description of the existing study roadway facilities, and intersection configurations.

2.1.1 Study Roadways

Plains Road East/West is an east-west roadway and consists of two lanes in each direction, divided by a Two-Way Left-Turn Lane (TWLTL). Per the City of Burlington Official Plan Schedule J (provided in Appendix B), Plains Road is classified as a multi-purpose arterial. The roadway has a posted speed limit of 60 km/h, and sidewalks are available on both sides of the roadway, with no dedicated cyclist facilities.

Waterdown Road/Lasalle Park Road is a north-south roadway with a posted speed limit of 50 km/h. Waterdown Road, the road segment north of Plains Road, consists of two lanes in each direction with a center TWLTL, and is classified as a minor arterial roadway per the City of Burlington Official Plan. Lasalle Park Road, the segment south of Plains Road, consists of one lane in each direction. Sidewalks as well as cyclist lanes are available on both sides of the road within the study area.

Cooke Boulevard is a north-south local roadway with one lane in each direction, and an assumed speed limit of 50 km/h. Sidewalks are available on the east side of the roadway. Parking is prohibited on either side of the roadway at all times. The segment of Cooke Boulevard north of Masonry Court is a private driveway.

Masonry Court/Railway Road is an east-west local roadway, with an assumed speed limit of 50 km/h. Masonry Court, the segment east of Waterdown Road, has a multi-use path on the north side of the roadway. Furthermore, on-street parking is permitted on the south side of Masonry Court. Notably, Masonry Court terminates at the Aldershot GO parking lot to the east. The west segment of the roadway (Railway Road) leads to a private driveway.

2.1.2 Study Intersections

The intersection of **Waterdown Road and Masonry Court/Railway Road** is a four-legged signalized intersection. The southbound and northbound approaches on Waterdown Road each consist of a shared through/right-turn lane, a single through lane, and an auxiliary left-turn lane. The westbound approach on Masonry Court consists of a shared through/right-turn lane and an auxiliary left-turn lane. The eastbound approach on Railway Road consists of a single through/right/left-turn lane.

The intersection of **Waterdown Road and Plains Road East/West** is a four-legged signalized intersection. The southbound approach on Waterdown Road consists of a single through lane, a single auxiliary left-turn lane, and a single auxiliary right turn lane. The northbound approach consists of a single auxiliary left-turn lane and a shared through/right-turn lane. The eastbound and westbound approaches on Plains Road each consist of a single auxiliary left-turn lane, a single through lane, and a shared through/right-turn lane.

The intersection of **Cooke Boulevard and Masonry Court** is a four-legged intersection with two-way stop control for the approaches on Cooke Boulevard. All approaches consist of a single shared through/right/left-turn lane.

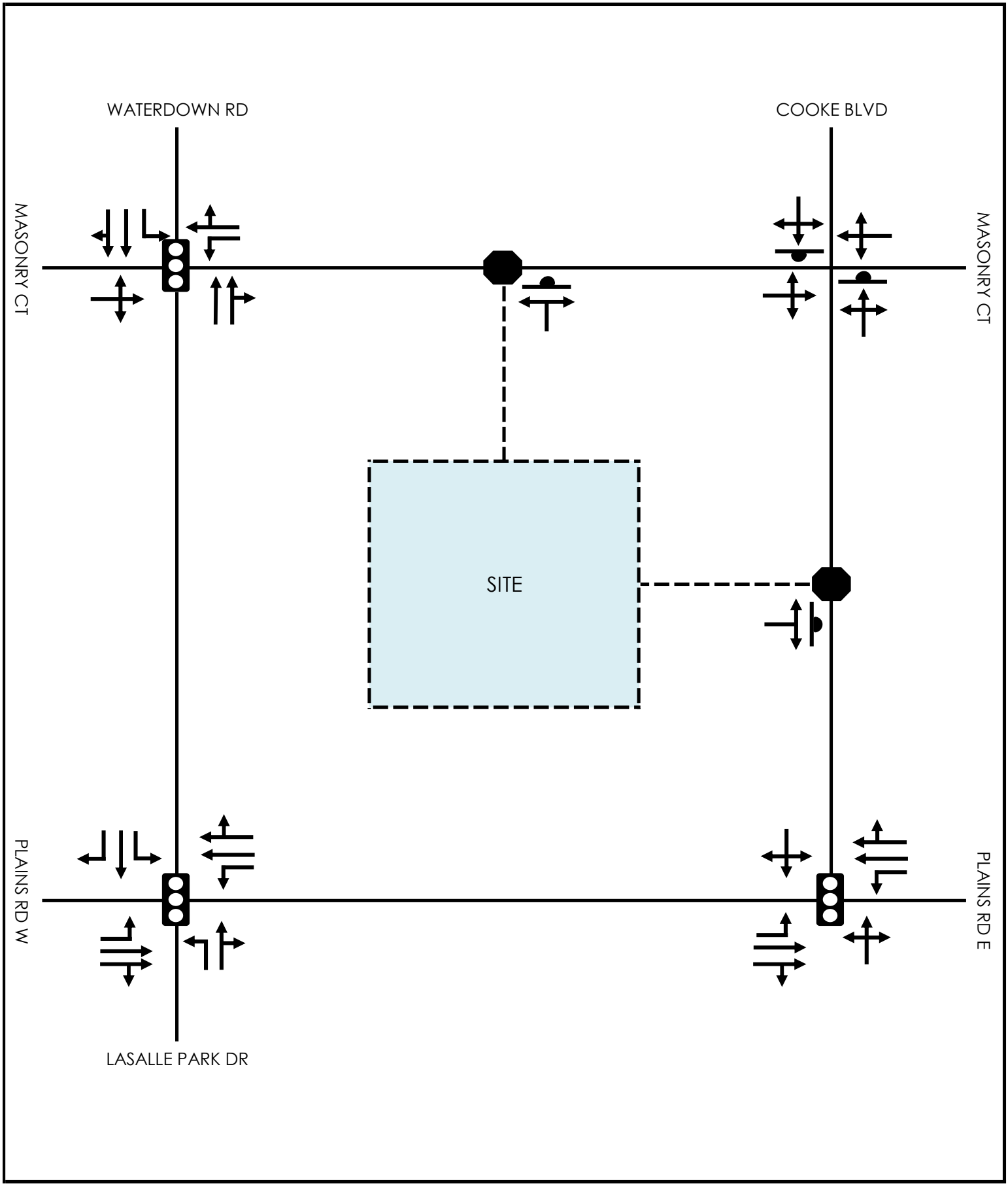
The intersection of **Plains Road East and Cooke Boulevard** is currently technically a three-legged signalized intersection, with a private residential driveway on the northbound approach. The eastbound approach consists of a single through lane, a single shared through/right-turn lane and a single auxiliary left-turn lane. The westbound approach consists of a single through lane and a single shared through/right-turn lane, along with the left-turn lane. The southbound approach consists of a shared left/right-turn lane. The northbound approach is currently a private residential driveway however it is noted that development of the lands south of the development (40-70 Plains Road East, a background development referenced later in section 3.2) proposes to have an access directly perpendicular to Cooke to create a proper four-legged intersection. This access would have a shared through/left-turn/right-turn lane.

Figure 3 illustrates the study roadways, including future roads planned for the study area.

2.2 Existing Active Transportation Network

The subject site is situated within one of the City of Burlington's three Mobility Hubs, per the City's Cycling Plan. There is a well-established cyclist network available in the vicinity of the proposed development. The multi-use path along Masonry Court connects to the bike lanes along Waterdown in the north/south direction, and Aldershot GO to the east. It is noted that while Plains Road (providing east/west connectivity) does not provide dedicated cyclist facilities, cyclists may share the road with vehicles, or travel south long Waterdown Road/Lasalle Park Road to North Shore Boulevard for connectivity to a signed route. The City's existing cycling network is included within Appendix B.

As mentioned earlier in the report, the multi-use path along Masonry Court connects to sidewalks along Waterdown Road, as well as the Aldershot GO station to the east. There are also several other transit nodes that are accessible via sidewalks as elaborated upon in Section 2.3.



Legend	1062-1074 Cooke Blvd	CROZIER CONSULTING ENGINEERS	Figure 3
Stop Controlled Intersection	Study Roadways		Project No. 2321-6441 Date. Analyst. FC

2.3 Existing Transit

A number of transit services operate within the study area, including Burlington Transit, Hamilton Street Railway (HSR), GO Transit, as well as VIA Rail.

Additionally, Aldershot GO Station's south platform is located within 450 meters (~5 minute-walk) from the subject site while the bus loop on the north platform is located within an approximate 10-minute walk. The Aldershot GO station provides the following regional connections:

- VIA Rail: Connections to the Windsor – Toronto and Toronto – New York corridor.
- GO Service: Lakeshore West corridor (Niagara Falls – Toronto)
- Burlington Transit: The following routes stop at Aldershot Station, however Routes 4 and 1 also stop at Masonry/Waterdown for closer access.
    - Route "1/101 – Plains-Fairview": This route operates along Plains Road between Appleby GO through Burlington GO to King and James Street in Hamilton. The bus operates on weekdays with headways up to 15 minutes, and on weekends with headways up to 30 minutes.
    - Burlington Transit Route "4 – Central": This route operates regularly on weekdays with a headway of 30 minutes and on weekends with a headway of approximately 60 minutes. The route operates between the Appleby GO Station and Aldershot GO station.
    - Route 87 "North Service-Aldershot": This route offers peak hour service eastbound along North Service Drive between Aldershot and the Burlington GO Station. This route operates on weekdays with headways of 10 minutes or less during the morning (5:30 A.M. to 9:15 A.M.) and in the afternoon (2:30 P.M. to 7:00 P.M.)

Figure 4 illustrates the nearby conventional transit stops and routes available in the study area. Transit maps and schedules are provided in Appendix C.

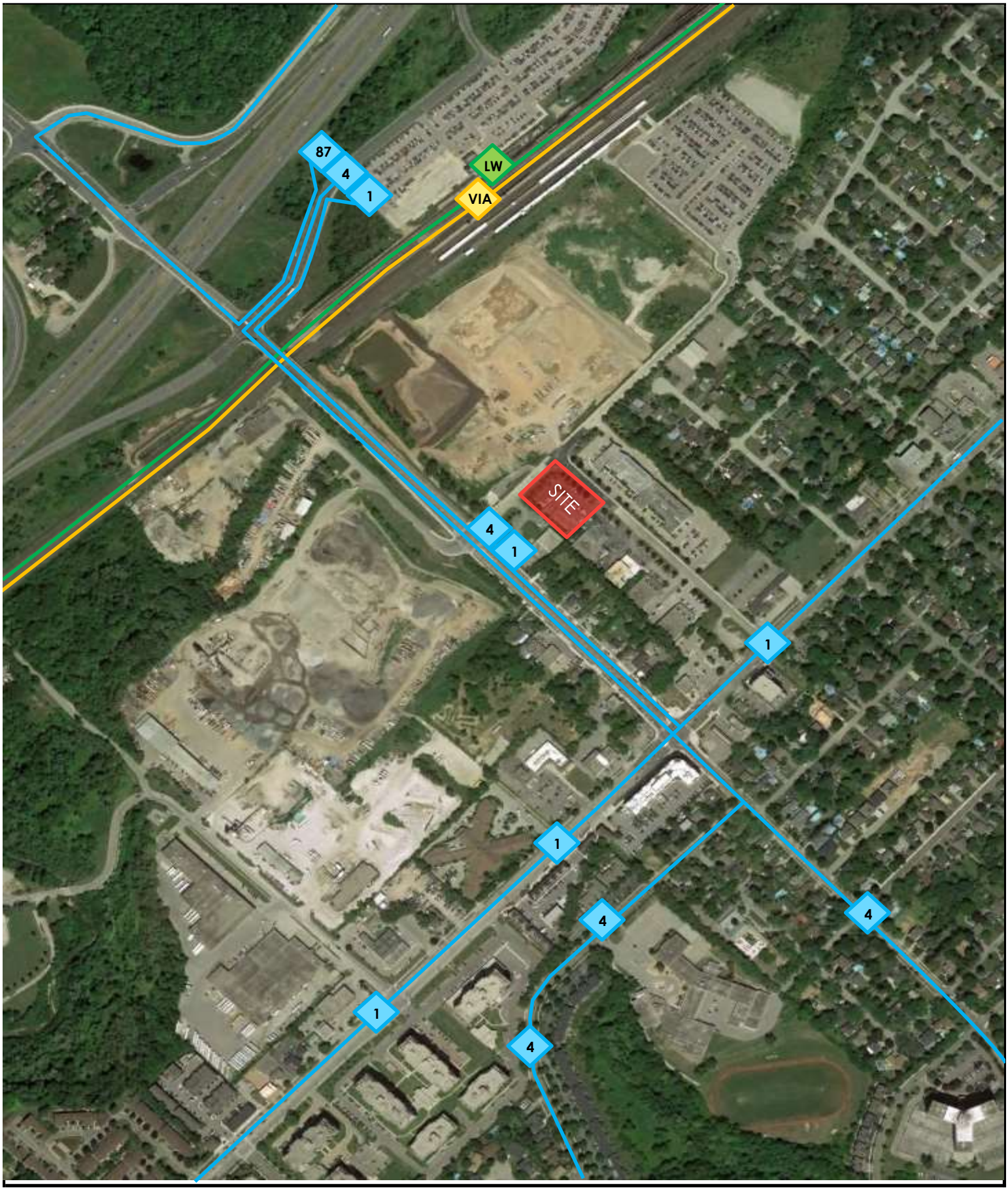
Additionally, HSR is currently testing the MyRide On-Demand service in the Waterdown Urban Transit Boundary to replace the previous HSR Route 18 operating primarily north of Plains Road along Waterdown Road. This service provides an on-demand "stop-to-stop" service that residents can use to book trips via the HSR app to be picked up from and dropped off at stops within the Waterdown service area. The closest stop to the site is Waterdown Road at Masonry Court, approximately 200 meters west of the site.

Figure 5 illustrates the stops available within the MyRide On-Demand Service in the Waterdown area, in relation to the location of the subject site.

2.4 Traffic Data

2.4.1 Turning Movement Counts

Turning movement counts conducted for a Transportation Impact Study dated December 2020 for the development situated at 40-70 Plains Road East by Paradigm Transportation Solutions Limited (Paradigm) was used in this report, following confirmation with the City during pre-consultation. Counts in the background study were conducted by Pyramid Traffic Inc. in 2018 and 2019. Similarly, peak hour factors were also assumed to be consistent with those presented in the Paradigm report.



Legend

- VIA Rail
- GO Transit
- Burlington Transit

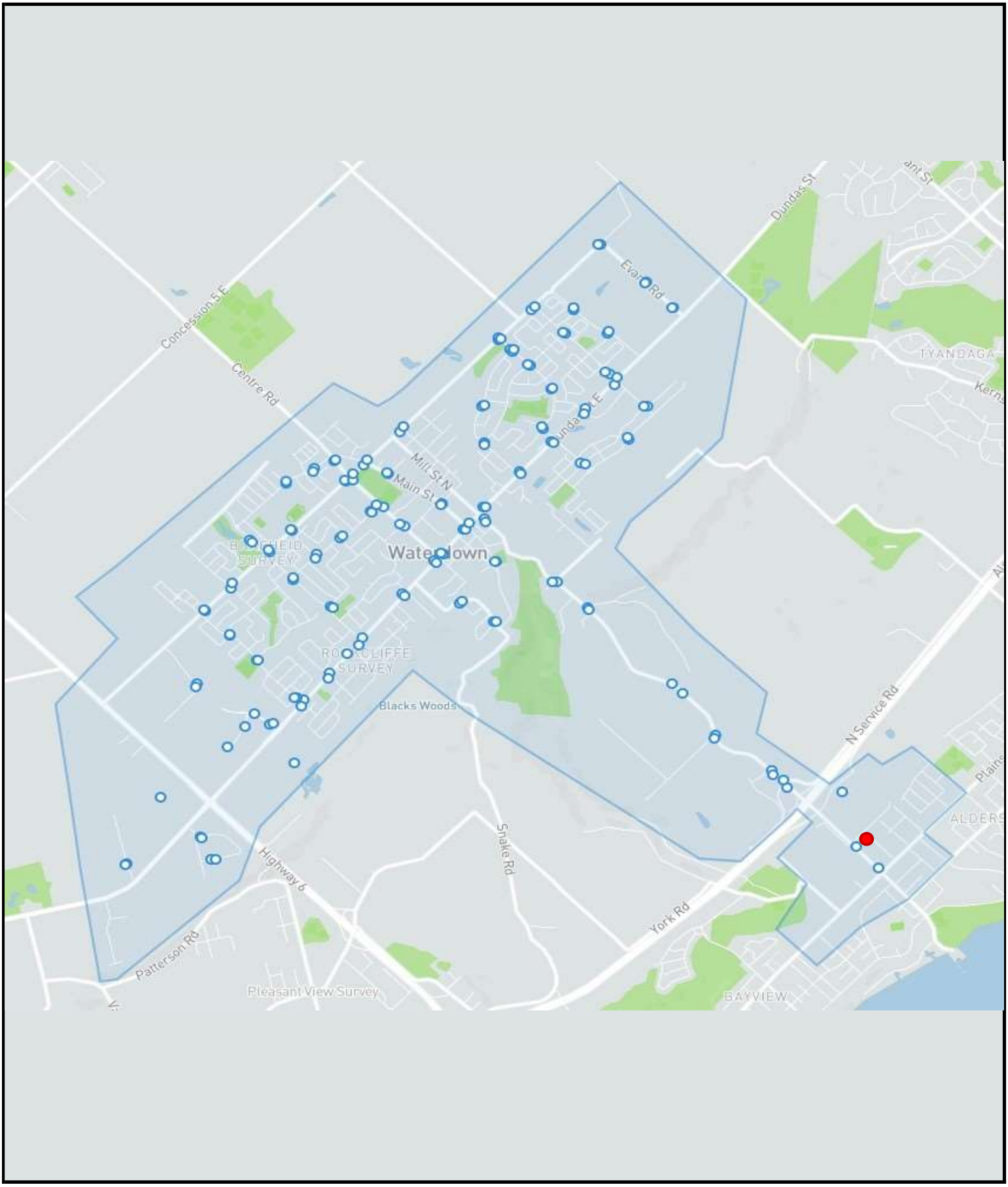
1062-1074 Cooke Blvd

Nearby Transit Routes

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Figure 4

Project No. 2321-6441
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Legend

- Waterdown Urban Transit Boundary
- On-Demand Stop
- Site Location

1062-1074 Cooke Blvd

HSR Waterdown Urban Transit Area

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Figure 5

Project No. 2321-6441
Date.
Analyst. FC

2.4.2 Growth Rates

A linear growth rate of 1.0% for traffic movements along the Waterdown Road and Plains Road corridors, as well as the intersection of Plains Road and Waterdown Road was confirmed with City staff during pre-consultation.

2.4.3 Signal Timing Plans

The most recent signal timing plans for the signalized intersections in the study area were obtained from the City, with the following dates of collection:

- Plains Road at Cooke Boulevard, 2022/06/23
- Plains Road at Waterdown Road, 2022/6/23
- Waterdown Road at Masonry Court, 2020/12/9

It is noted the signal timing plan during the P.M. peak at Waterdown Road and Plains Road East for the northbound movement (Phase 4) did not allocate sufficient green time (26.0 seconds) to satisfy the minimum split for this movement (33.3 seconds). Considering the split for this movement for all other times of day was 34.0 seconds, a maximum split of 34.0 seconds was also applied to the P.M. peak to ensure that sufficient green time was provided to meet the minimum time identified in the signal timing plan.

2.5 Traffic Modelling

The evaluation of intersections within this report is conducted based on the methodology outlined in the Highway Capacity Manual (2010), using Synchro 11 modelling software. Intersections are assessed using a Level of Service (LOS) metric, with ranges of intersection delays assigned a letter from "A" to "F". For stop-controlled intersections, a Level of Service "A" or "B" would typically be measured during off-peak hours when lesser traffic volumes are on the roadways. Levels of Service "C" through "F" would typically be observed during commuter peak hours when significant vehicle volumes would cause lengthy travel times. The Level of Service definitions for signalized and stop-controlled intersections are included in Appendix E.

Per Halton Region's Traffic Impact Study Guidelines, the following indicators were used to identify critical movements and/or intersections for signalized intersections within this study:

- Volume/capacity (V/C) ratios for overall intersection operations, through movements or shared through/turning movements increased to 0.85 or above.
- V/C ratios for exclusive movements that exceed 0.95.
- 95th percentile queue lengths for individual movements that exceed the available lane storage.

For unsignalized intersections, the following critical indicators were considered:

- A Level of Service (LOS), based on average delay per vehicle for individual movements, exceeds LOS "D".
- 95th percentile queue lengths for individual movements that exceed the available lane storage.

2.6 Intersection Operations

The traffic operations at the study intersections were analyzed based on grown volumes used to estimate 2022 traffic conditions during the weekday A.M. and P.M. peak hours, as illustrated in Figure 6. Detailed capacity analyses are included in Appendix F. Table 1 summarizes the existing traffic operations within the study area.

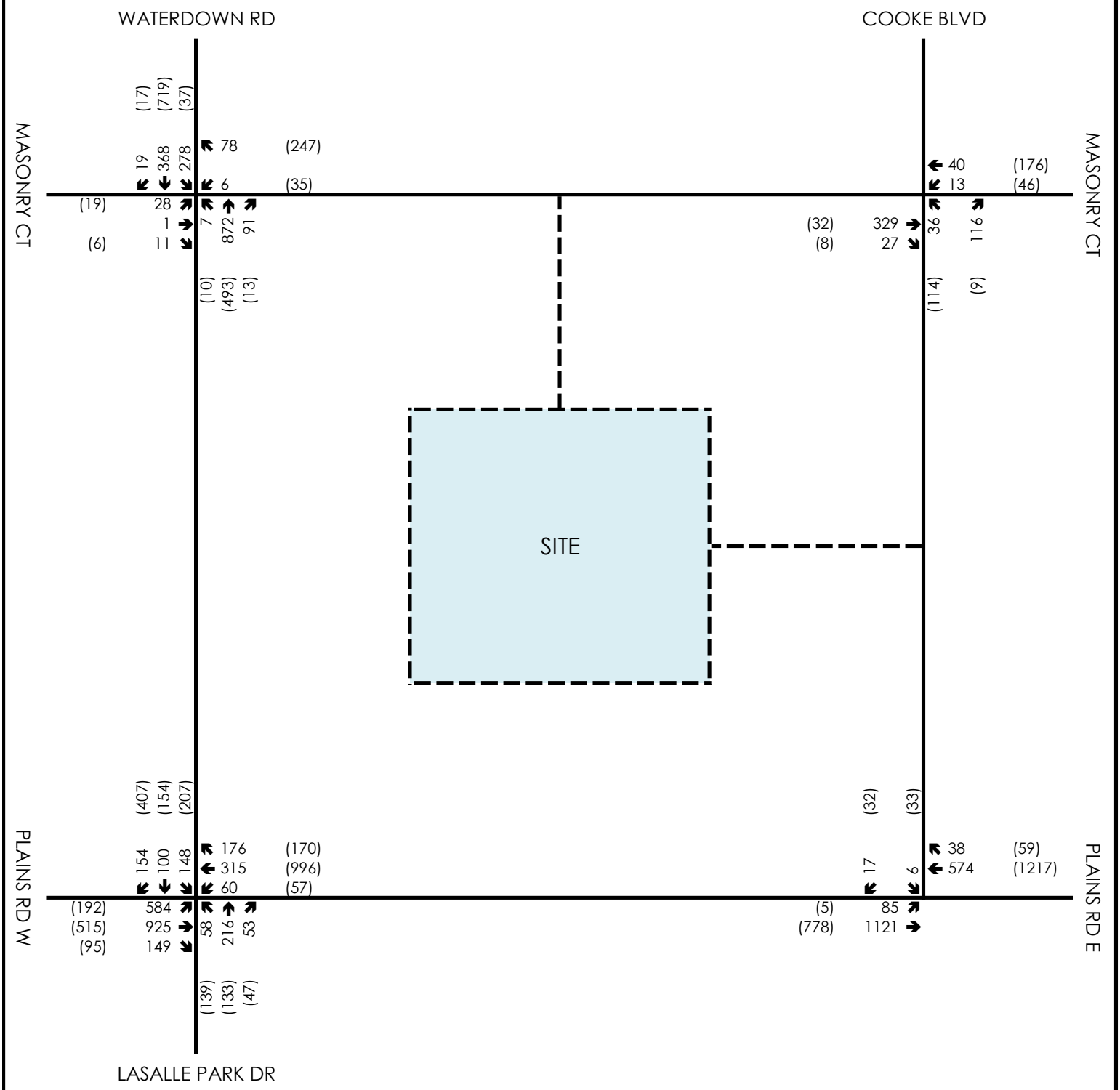
Table 1: 2022 Existing Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay (s)	Critical V/C Ratio (Approach)	95th Percentile Queue Length > Storage Length
Plains Road East at Waterdown Road	Signal	A.M.	D	38.1	**1.02 (EBL)**	EBL 220 m > 30 m
		P.M.	D	40.7	**0.87 (WBT)**	EBL 80 m > 30 m NBL 40 m > 30 m SBR 75 m > 40 m
Plains Road East at Cooke Boulevard	Signal	A.M.	A	3.4	0.38 (EBT)	None
		P.M.	A	4.5	0.48 (WBT)	None
Cooke Boulevard at Masonry Court	Stop Control (Minor)	A.M.	B	14.0 (NB)	0.45 (SB)	None
		P.M.	B	13.5 (NB)	0.45 (SB)	None
Waterdown Road at Masonry Court	Signal	A.M.	B	12.0	0.55 (SBL)	SBL 30 m > 15m
		P.M.	A	5.7	0.48 (WBT)	None

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU). The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM 2000).

Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection. In addition, all v/c ratios greater than 0.85 for through and shared through/turning movements, and 0.95 for exclusive turning lanes are highlighted.

The intersection of Plains Road East at Waterdown Road currently operates with a Level of Service "D" during both the A.M. and P.M. peaks. The eastbound left-turn during the A.M. peak operates above capacity and is also expected to significantly exceed the available storage length. The westbound through movement operates with critical (but under) capacity during the P.M. peak, with the southbound right, eastbound left, and northbound left-turn movements expected to exceed the available storage for those movements.



Legend	1062-1074 Cooke Blvd	CROZIER CONSULTING ENGINEERS	Figure 6
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	Existing Traffic Volumes		Project No. 2321-6441 Date. Analyst. FC

The remaining intersections of Plains Road East at Cooke Boulevard, Cooke Boulevard at Masonry Court, and Waterdown Road at Masonry Court are forecasted to operate with a Level of Service "B" or better and well under capacity. The 95th percentile queues at the intersection of Waterdown Road at Masonry Court are expected to exceed the available storage length for the southbound left-turn movement during the A.M. peak only.

3.0 Future Background Conditions

3.1 Study Horizons

Following consultation with the City, study horizon years of 2026 and 2031 were found appropriate for the scope of this study.

3.2 Background Developments

Background developments identified within the Transportation Impact Study dated December 2020 for the development situated at 40-70 Plains Road East by Paradigm were used as background developments within this report, including the site trips forecasted in relation to that site. It is noted that the traffic generation associated with the Aldershot GO Station Expansion is likely overstated.

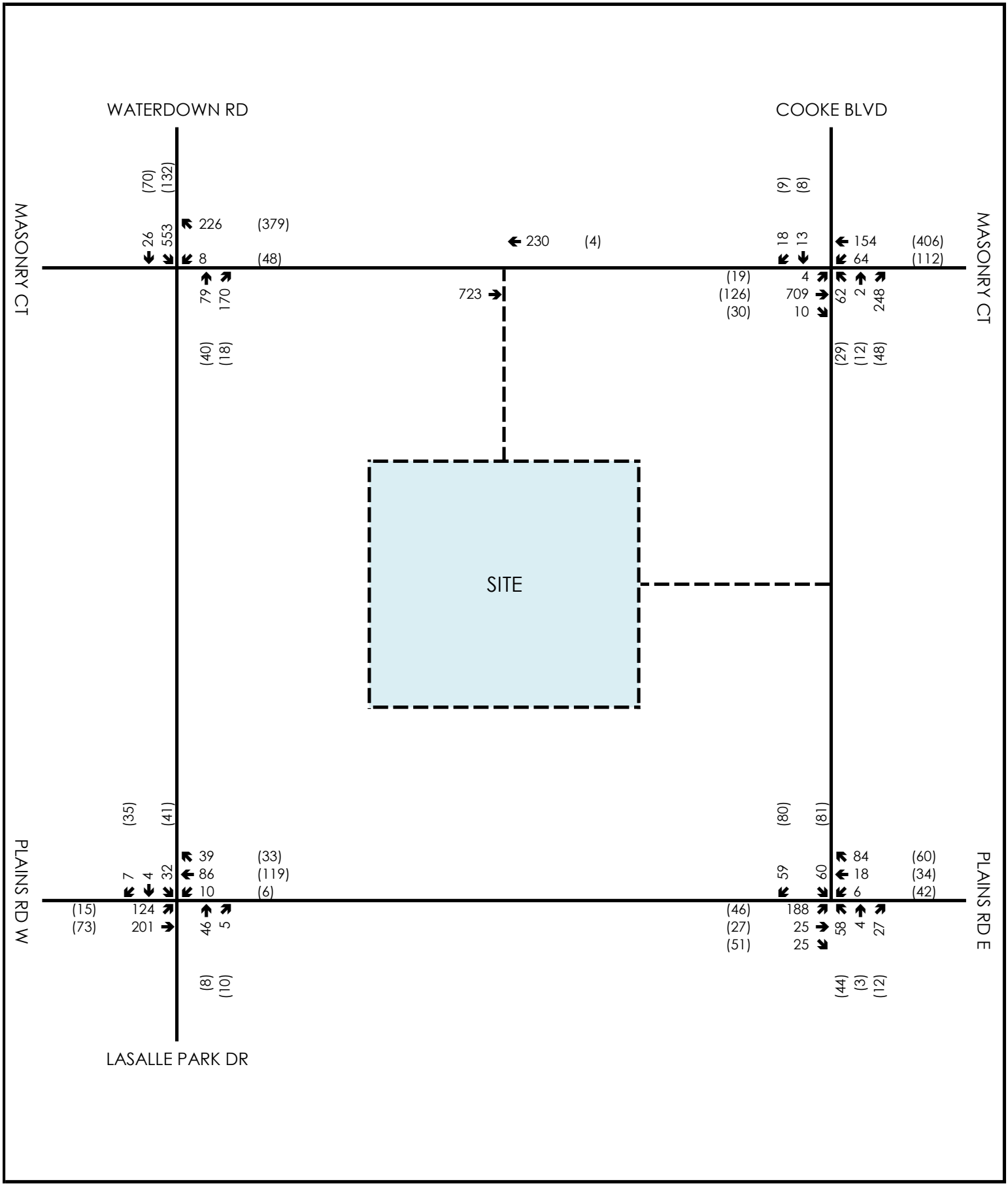
Additionally, the site trips identified within the Transportation Impact Study dated December 2021 for the development situated at 1029 Waterdown Road prepared by Crozier were considered within the background development volumes within this study.

The background developments identified within the vicinity of the proposed development are summarized in Table 2 below.

Table 2: Background Developments

Reference Number	Development Address	Type of Development
505-03/16 (OPA) 520-04/16 (Rezoning)	35 Plains Road East	Mixed-use Residential
505-11/17 (OPA) 520-22/17 (ZBA)	53-71 Plains Road East	Mixed-use Residential
505-02/16 (OPA) 520-03/16 (ZBA)	92 Plains Road East	Mixed-use Residential
505-01/19 (OPA) 520-02/19 (ZBA)	1085 Clearview Avenue, 1082, 1086 & 1090 St. Matthews Ave.	Residential
535-006/15 (SPA)	101 Masonry Court	Residential
-	Aldershot GO Station Expansion	-
505-02/21 (OPA) 520-03/21 (ZBA)	40-70 Plains Road East	Residential
505-09/21 (OPA) 520-10-21 (ZBA)	1029 Waterdown Road	Mixed-use Residential/Commercial

All trips generated by the background developments have been summarized in Figure 7. The individual background trip assignments on the study road network have been provided in Appendix G.



Legend	1062-1074 Cooke Blvd	CROZIER CONSULTING ENGINEERS	Figure 7
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	Total Background Development Trips		Project No. 2321-6441 Date. Analyst. FC

3.3 Future Transportation Network Improvements

It is noted that the background development at 40-70 Plains Road East consolidates seven existing private driveways along Plains Road East into a single driveway leading to the proposed site. The consolidated driveways would form the south leg of the existing T-intersection of Cooke Boulevard and Plains Road East.

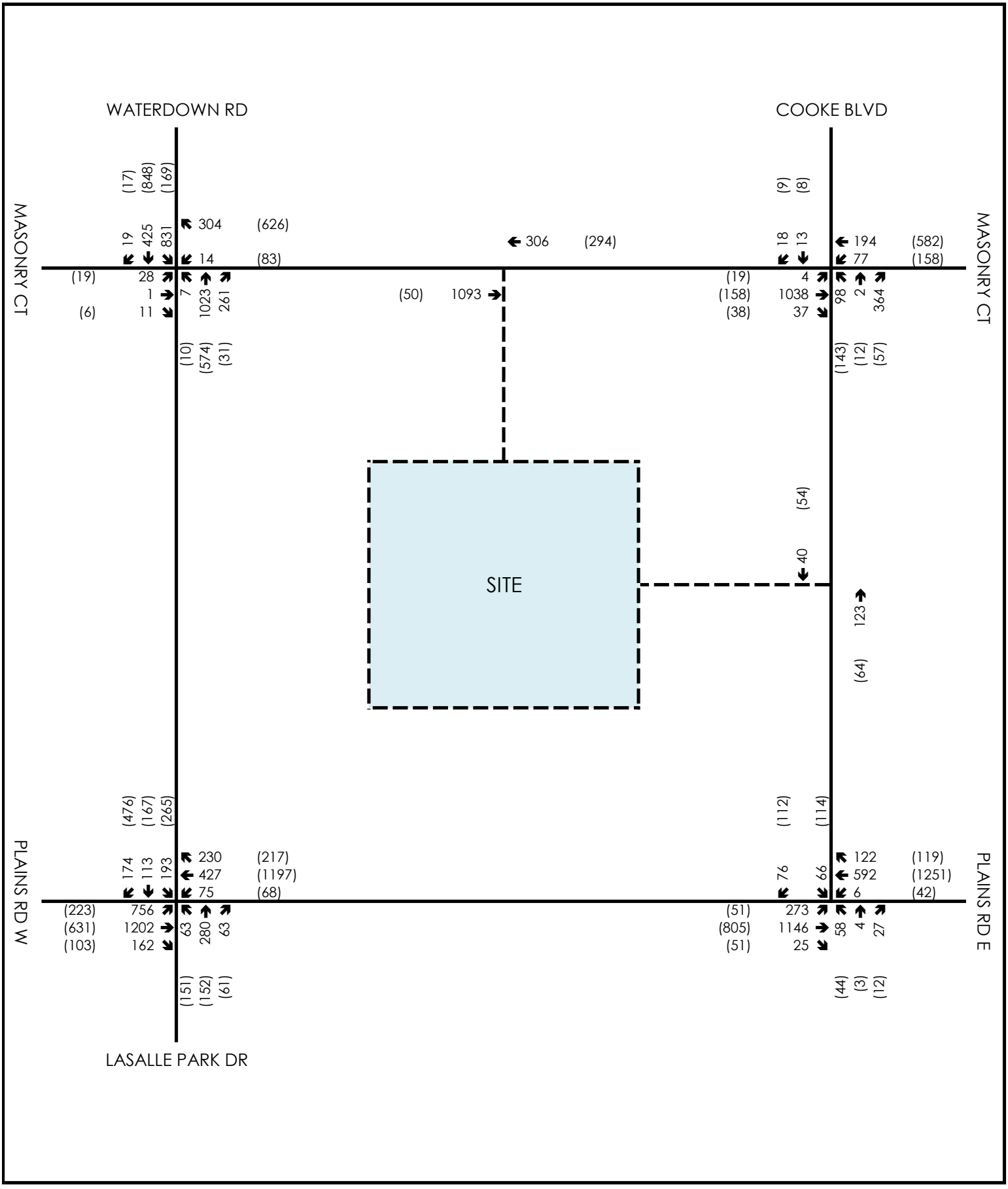
To account for this addition, the intersection was modelled with four approaches in all future traffic assessments.

3.4 Growth Rate

For consistency with the previously conducted TIS at 1029 Waterdown Road, a linear growth rate of 1.0% was used along the Waterdown Road and Plains Road corridors, as well as all movements at the intersection of Plains Road at Waterdown Road to reflect community and employment growth in the area. This approach was agreed upon during the ToR process for the subject development.

3.5 Intersection Operations

Traffic operations at the study intersections were analyzed following addition of volumes from associated growth rates and background developments in the vicinity of the subject development, as shown in Figure 8 and Figure 9 demonstrating the 2026 and 2031 future background traffic volumes, respectively. Table 3 and Table 4, respectively, summarize the 2026 and 2031 future background Levels of Service. Detailed capacity analyses are included in Appendix H.



Legend

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

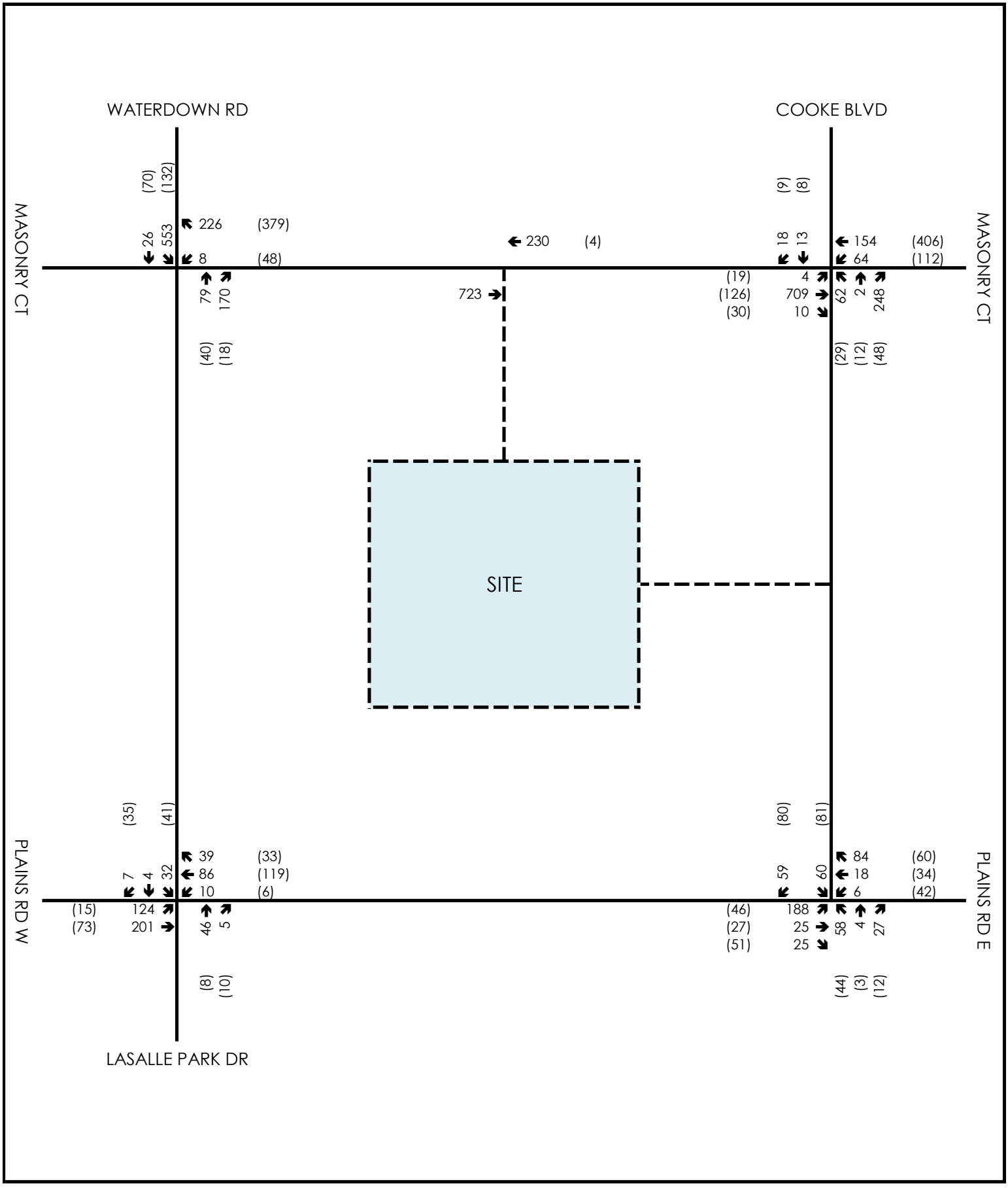
1062-1074 Cooke Blvd

2026 Future Background Traffic Volumes

CROZIER CONSULTING ENGINEERS

Figure 8

Project No. 2321-6441
Date.
Analyst. FC



Legend	1062-1074 Cooke Blvd	CROZIER CONSULTING ENGINEERS	Figure 9
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	2031 Future Background Traffic Volumes		Project No. 2321-6441 Date. Analyst. FC

Table 3: 2026 Future Background Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Critical V/C Ratio (Approach)	95th Percentile Queue Length > Storage Length
Plains Road East at Waterdown Road	Signal	A.M.	**F**	**87.1**	**1.51 (EBL)** **0.87 (NBT)**	EBL 325 m > 30m
		P.M.	E	57.5	**1.10 (WBT)**	EBL 90 m > 30 m NBL 40 m > 30 m SBR 100 m > 40 m
Plains Road East at Cooke Boulevard	Signal	A.M.	B	11.5	0.70 (SBT)	None
		P.M.	C	21.2	0.84 (SBT)	None
Cooke Boulevard at Masonry Court	Stop Control (Minor)	A.M.	**F**	**> 200 (NB)**	**9.15 (NB)**	NBTLR > 200 m
		P.M.	**F**	**> 200 (NB)**	**2.16 (NB)**	NBTLR 175 m
Waterdown Road at Masonry Court	Signal	A.M.	**F**	**88.5**	**1.13 (NBT)** **1.23 (SBL)**	SBL 305 m > 15 m
		P.M.	C	23.8	**1.00 (WBT)**	WBL 30 m > 15 m SBL 20 m > 15 m

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU). The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM 2000).

Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection. In addition, all v/c ratios greater than 0.85 for through and shared through/turning movements, and 0.95 for exclusive turning lanes are highlighted.

Table 4: 2031 Future Background Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Critical V/C Ratio (Approach)	95th Percentile Queue Length > Storage Length
Plains Road East at Waterdown Road	Signal	A.M.	**F**	**97.8**	**1.58 (EBL)** **0.98 (EBT)** **0.89 (NBT)**	EBL 335 m > 30m
		P.M.	E	72.9	**1.20 (WBT)**	EBL 95 m > 30 m NBL 40 m > 30 m SBR 125 m > 40 m
Plains Road East at Cooke Boulevard	Signal	A.M.	B	11.5	0.70 (SBT)	None
		P.M.	C	25.9	**0.89 (WBT)** **0.89 (SBT)**	None
Cooke Boulevard at Masonry Court	Stop Control (Minor)	A.M.	**F**	**> 200 (NB)**	**> 10.00 (NB)**	NBTLR > 200 m
		P.M.	**F**	**> 200 (NB)**	**2.44 (NB)**	NBTLR > 200 m
Waterdown Road at Masonry Court	Signal	A.M.	**F**	**95.2**	**1.17 (NBT)** **1.23 (SBL)**	SBL 305 m > 15 m
		P.M.	C	34.2	**1.12 (WBT)**	WBL 30 m > 15 m SBL 30 m > 15 m

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU). The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM 2000).

Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection. In addition, all v/c ratios greater than 0.85 for through and shared through/turning movements, and 0.95 for exclusive turning lanes are highlighted.

The intersection of Plains Road East at Waterdown Road is forecasted to operate with a Level of Service "F" during the A.M. peak, and a Level of Service "E" during the P.M. peak. The eastbound left-turn during the A.M. peak is forecasted to exceed capacity for both the 2026 and 2031 horizon. Additionally, the eastbound through and northbound through movements are forecasted to operate with critical volume-to-capacity ratios by the 2031 horizon. The westbound through movement is expected to still be under capacity (but critical) during the 2026 horizon but is forecasted to exceed capacity by the 2031 horizon. The queuing concerns identified during existing conditions continue into future horizons.

The intersection of Plains Road East at Cooke Boulevard is forecasted to operate with a Level of Service "C" or better under future background conditions. The intersection has no capacity concerns by the 2026 horizon, however the westbound and southbound through movements are forecasted to operate with critical operations during the P.M. peak by the 2031 horizon.

Operations at the intersection of Masonry Court and Cooke Boulevard are expected to fail during all peak periods for both horizon years due to northbound right-turn movements. The intersection operates well above capacity for the northbound movements due to a large volume of conflicting eastbound and westbound traffic producing few acceptable gaps for left and right-turns. The high

volumes of traffic at this intersection are attributed to the Aldershot GO Station background development, which are likely overstated. Notably, Synchro software showed errors during the A.M. peak hour for delay and queuing results.

Similarly, the intersection of Waterdown Road and Masonry Court is expected to operate at LOS F during the A.M. peak hour during 2029 future background traffic conditions. This is due to growth in southbound left-turning traffic associated with the Aldershot Station background development, which causes the movement to operate above capacity. The 95th percentile queues for the southbound left-turn movement during the A.M. peak period for both horizon years are expected to exceed available storage length.

4.0 Site Generated Traffic

The proposed development will result in additional vehicles on the boundary road network that previously did not exist. The proposed development will also result in additional turning movements on the boundary road intersections.

It is noted that while ground-floor retail GFA is proposed at this development, separate retail trips were not generated as these trips are expected to come from active transportation trips from residents of the building and the surrounding area.

4.1 ITE Trip Generation

The Institute of Transportation Engineers (ITE) Trip Generation Manual 11th Edition was used to forecast the number of trips generated by the proposed residential development. As the development proposes high-rise residential towers, the most appropriate land use was determined to be Land Use Code 222, Multifamily Housing (High Rise). The setting/location was set to "Not Close to Rail Transit" to provide a more diverse dataset.

Relevant excerpts from the ITE Trip Generation Manual 11th Edition are included in Appendix I.

Table 5 summarizes the number of trips forecasted to be generated by the proposed development.

Table 5: ITE Trip Generation

Land Use Building	Units	Peak Period	Equation Used	In	Out	Total
Multifamily Housing (High Rise) LUC 222	809 Units	A.M.	T = 0.22(X) + 18.85	67	130	197
		P.M.	T = 0.26(X) + 23.12	131	103	234

The subject site is expected to generate 197 two-way (67 inbound and 130 outbound) trips during the weekday A.M. peak hour, and 234 (131 inbound and 103 outbound) trips during the weekday P.M. peak hour.

4.2 Trip Distribution and Assignment

The trips generated by the residential portion of the development were distributed to the study roadways based on Transportation Tomorrow Survey (TTS) data.

TTS is a comprehensive survey of transportation characteristics of households in the Golden Horseshoe and surrounding areas. 2016 Transportation Tomorrow Survey (TTS) data, provided in Appendix G, was used to determine the trip distribution for the proposed residential development.

The subject property is situated in 2006 GTA Zone 4052, which contains a mixture of residential and commercial sites. Additionally, to determine a more accurate representation of trips entering and exiting the surrounding area, data for GTA Zones 4051 and 4050 adjacent to Zone 4052 were used in combination with the subject site zone. TTS results were filtered from the above noted three zones to reflect trip distribution patterns during the weekday peak periods.

Notably, trips were filtered for the A.M. peak period (between 6:30 A.M. and 9:30 A.M.) for trips originating and exiting the three GTA Zones analyzed, with the trip purpose in relation to leaving or entering "Home". Trips were similarly filtered during the P.M. peak period, for the timeframe between 3:30 P.M. and 6:30 P.M.

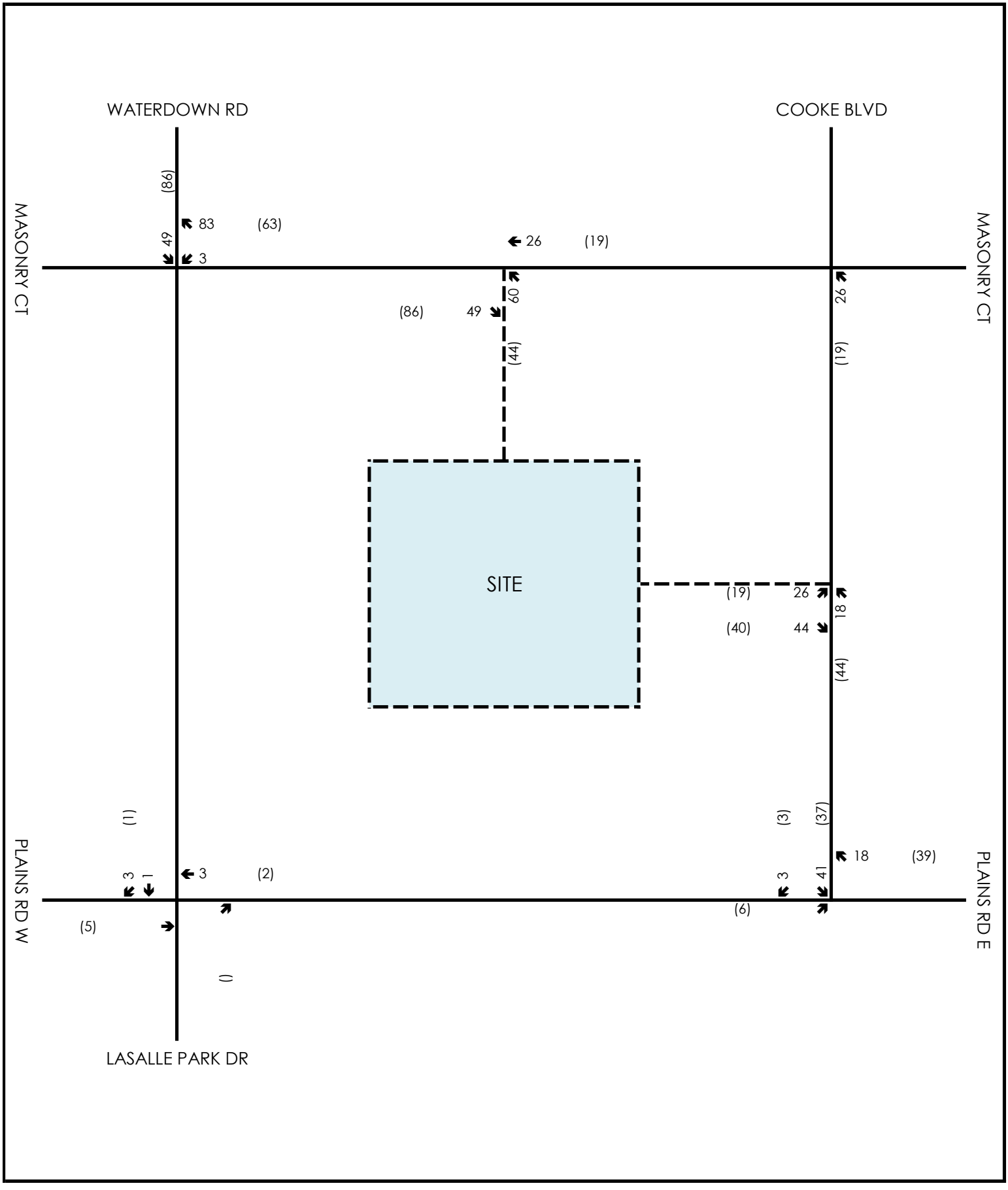
Table 6 below outlines the trip distribution for the proposed residential development, divided into time and direction of travel.

Table 6: Trip Distribution

Direction	A.M. Inbound	A.M. Outbound	P.M. Inbound	P.M. Outbound
Northwest	47%	6%	8%	2%
North	0%	2%	2%	2%
Northeast	0%	7%	10%	16%
East	53%	64%	58%	57%
Southeast	0%	3%	2%	0%
South	0%	2%	1%	0%
Southwest	0%	17%	16%	10%
West	0%	0%	3%	13%
Total	**100%**	**100%**	**100%**	**100%**

The TTS query information used to derive the above noted trip distribution has been provided in Appendix J.

The assignment of site-generated trips per the noted distribution is presented in Figure 10.



Legend	1062-1074 Cooke Blvd	CROZIER CONSULTING ENGINEERS	Figure 10
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	Site Generated Trips		Project No. 2321-6441 Date. Analyst. FC

5.0 Future Total Traffic Conditions

5.1 Intersection Operations

Traffic operations at the study intersections were analyzed with the addition of the site generated traffic to the future background traffic. The total traffic volumes forecasted for the 2026 and 2031 horizons are provided in Figure 11 and Figure 12, respectively.

Table 7 and Table 8 outlines the 2026 and 2031 future total traffic Levels of Service, respectively. Detailed capacity analysis worksheets are included in Appendix K.

The future total operations at the study intersections ate expected to operate very similarly to future background conditions, indicating that the subject development is not expected to materially impact the surrounding road network. It is noted that the operational concerns posed in the future total analysis can be largely attributed to existing capacity issues, background developments (most notably the Aldershot GO Station expansion) and other background growth.

Under future total traffic, operations at the intersection of Plains Road and Waterdown Road are expected to operate similarly to future background operations observed, with capacity concerns identified in the future background horizon persisting into the future total scenario (with no additional concerns identified as a result of site traffic).

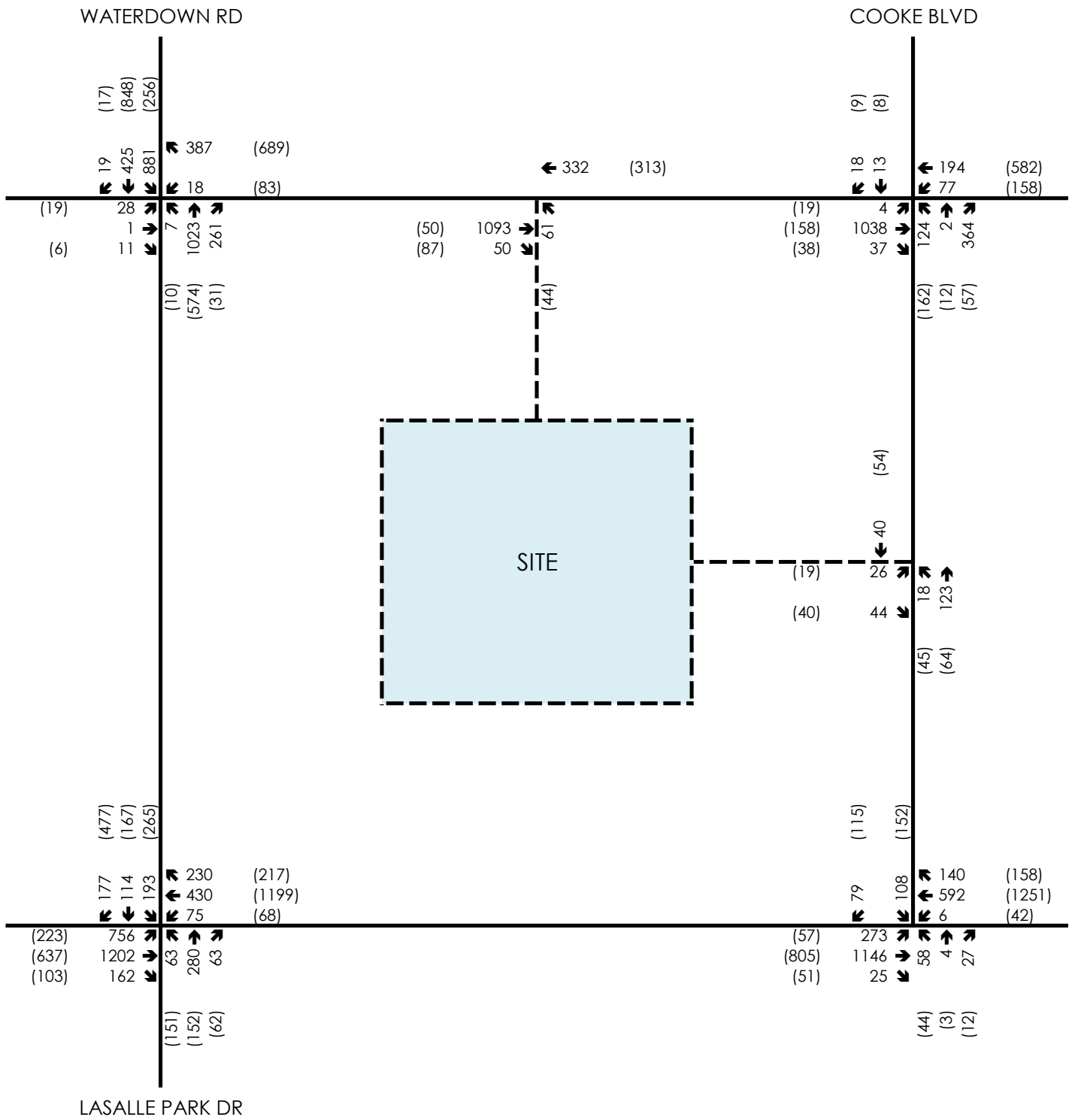
Similarly, the intersection of Plains Road East at Cooke Boulevard operates very similarly to future background conditions, with the westbound and southbound through movements operating with critical capacities during the P.M. peak only by the 2031 horizon.

The intersection of Cooke Boulevard at Masonry Court continues to fail under future total conditions due to the high volumes of traffic associated with the Aldershot Station background development.

The intersection of Waterdown and Masonry Court is expected to continue to fail as a result of the Aldershot GO development volumes and associated growth during the A.M. peak, with acceptable delays during the P.M. peak.

The proposed site access off Cooke Boulevard is forecasted to operate with acceptable delays and well under capacity, with no significant queues.

The proposed site access off Masonry Court is expected to fail during the A.M. peak as a result of the high through traffic volumes destined for Aldershot GO Station. Vehicles making a left-out of the access would face difficulty finding safe gaps to complete the left-turn exit movement against the high volume of eastbound through traffic. The access is expected to operate with acceptable operations and well under capacity during the P.M. peak and other off-peak periods.



Legend

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

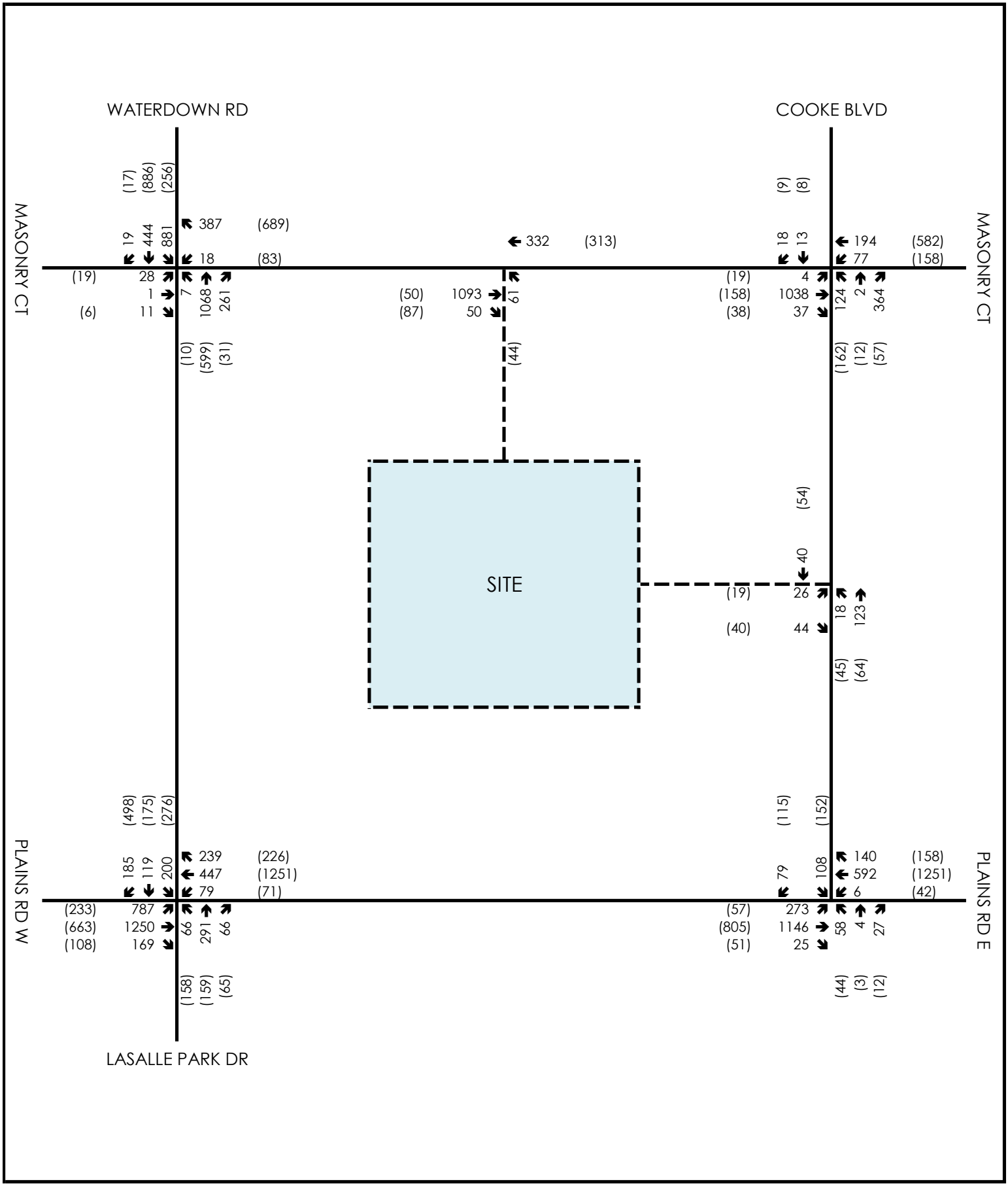
1062-1074 Cooke Blvd

2026 Future Total Traffic Volumes

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Figure 11

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Date.
Analyst. FC



Legend

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

1062-1074 Cooke Blvd

2031 Future Total Traffic Volumes

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Figure 12

Project No. 2321-6441
Date.
Analyst. FC

Table 7: 2026 Future Total Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Critical V/C Ratio (Approach)	95th Percentile Queue Length > Storage Length
Plains Road East at Waterdown Road	Signal	A.M.	**F**	**87.1**	**1.51 (EBL)** **0.87 (NBT)**	EBL 325 m > 30m
		P.M.	E	58.2	**1.11 (WBT)**	EBL 90 m > 30 m NBL 40 m > 30 m SBR 100 m > 40 m
Plains Road East at Cooke Boulevard	Signal	A.M.	B	14.2	0.79 (SBT)	None
		P.M.	C	26.2	0.89 (WBT) 0.89 (SBT)	None
Cooke Boulevard at Masonry Court	Stop Control (Minor)	A.M.	**F**	**> 200 (NB)**	**13.50 (NB)**	NBTLR > 200 m
		P.M.	**F**	**> 200 (NB)**	**2.37 (NB)**	NBTLR 200 m
Waterdown Road at Masonry Court	Signal	A.M.	**F**	**112.6**	**1.13 (NBT)** **1.42 (SBL)**	SBL 365 m > 15 m
		P.M.	C	33.4	**1.11 (WBT)**	WBL 30 m > 15 m SBL 20 m > 15 m
Site Access at Cooke Boulevard	Stop Control (Minor)	A.M.	A	9.3 (EB)	0.08 (EB)	None
		P.M.	A	9.3 (EB)	0.07 (EB)	None
Site Access at Masonry Court	Stop Control (Minor)	A.M.	**F**	**176.0 (NB)**	**0.90 (NB)**	None
		P.M.	B	11.8 (NB)	0.08 (NB)	None

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU). The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM 2000).

Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection. In addition, all v/c ratios greater than 0.85 for through and shared through/turning movements, and 0.95 for exclusive turning lanes are highlighted.

Table 8: 2031 Future Total Levels of Service

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Critical V/C Ratio (Approach)	95th Percentile Queue Length > Storage Length
Plains Road East at Waterdown Road	Signal	A.M.	**F**	**98.3**	**1.59 (EBL)** **0.88 (EBT)** **0.89 (NBT)**	EBL 335 m > 30m
		P.M.	E	72.9	**1.20 (WBT)**	EBL 95 m > 30 m NBL 40 m > 30 m SBR 125 m > 40 m
Plains Road East at Cooke Boulevard	Signal	A.M.	B	14.2	0.79 (SBT)	None
		P.M.	C	26.2	**0.89 (WBT)** **0.89 (SBT)**	None
Cooke Boulevard at Masonry Court	Stop Control (Minor)	A.M.	**F**	**> 200 (NB)**	**> 10 (NB)**	NBTLR > 200 m
		P.M.	**F**	**> 200 (NB)**	**2.37 (NB)**	NBTLR > 200 m
Waterdown Road at Masonry Court	Signal	A.M.	**F**	**118.7**	**1.17 (NBT)** **1.43 (SBL)**	SBL 365 m > 15 m
		P.M.	C	34.7	**1.12 (WBT)**	WBL 30 m > 15 m SBL 30 m > 15 m
Site Access at Cooke Boulevard	Stop Control (Minor)	A.M.	A	9.3 (EB)	0.08 (EB)	None
		P.M.	A	9.3 (EB)	0.07 (EB)	None
Site Access at Masonry Court	Stop Control (Minor)	A.M.	**F**	**176.7 (NB)**	**0.90 (NB)**	None
		P.M.	B	11.8 (NB)	0.08 (NB)	None

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle (Synchro/ICU). The Level of Service of a stop-controlled intersection is based on the delay associated with the critical minor road approach (HCM 2000).

Note 2: The critical v/c ratio is considered to be the maximum v/c ratio for movements at the intersection. In addition, all v/c ratios greater than 0.85 for through and shared through/turning movements, and 0.95 for exclusive turning lanes are highlighted.

6.0 Recommendations

There are several deficiencies noted within the future background and future total analysis that is likely to result in critical operations for future horizons. As such, the following section outlines recommendations to mitigate such critical operations in the future.

It should be emphasized that the poor operations forecasted for the following intersections are a result of existing conditions or high background development traffic forecasts (most specially the Aldershot GO Parking Lot). As such, the following recommendations are made to improve road capacity issues independent of and not resultant of site-generated traffic.

All optimization results have been provided in Appendix L.

6.1 Masonry Court Site Access

The A.M. future total operations at the proposed Masonry Court Site Access are estimated to operate at LOS "F" due to the high eastbound through volumes forecasted for the Aldershot GO Station parking lot background development. However, it is noted that Synchro uses a conservative gap acceptance and that background vehicle trips for Aldershot GO Station Expansion within the Paradigm Report, appear to be very conservative, especially when compared to Metrolinx's GO Rail Station Access Plan forecasts for the station.

It is further noted that the proposed Masonry Court access is located close to the existing signalized intersection of Waterdown Road and Masonry Court and would not meet signal warrants to justify signalization. As such, signalization of the access is not recommended as a mitigation option.

Therefore, no mitigation is proposed given that the intersection would operate under capacity and that Synchro typically uses a conservative gap acceptance. Furthermore, if delays do become excessive, it would be expected that outbound left-turning drivers during the A.M. peak would use an alternative route, likely via the Cooke Boulevard site access where no capacity issues were identified.

6.2 Cooke Boulevard and Masonry Court

Similar to above, the poor operations at the intersection of Masonry Court and Cooke Boulevard are due to the large number of forecasted trips associated with the Aldershot GO station parking lot background traffic, which are considered very conservative.

If the conservative background volume forecasts materialize, improvements would be required at the intersection to accommodate these high volumes.

6.2.1 All-Way Stop Control

To determine whether all-way stop control is suitable at this intersection, all-way stop control warrants were conducted using the methodology outlined in the OTM Book 5 using 2031 future total volumes. Although Justifications 1 and 2 (for total vehicle volumes as well as combined vehicle and pedestrian volumes, respectively) were met, the volume split warrant (Justification 3) was not met in either peak period. As such, all-way stop control is not justified at this intersection (as all justifications should be met) and is consequently not recommended. The warrant results are provided in Appendix M.

It is also noted due to the sheer volume of through east and westbound volumes forecasted for Aldershot GO station, it is expected that all-way stop control would not be sufficient to provide acceptable operations.

6.2.2 Signalization with Geometric Improvements

As all-way stop control is not recommended at the intersection, signalizing the intersection was considered as an option to improve future operations. Per the Ontario Traffic Manual (OTM) Book 12 (Signal Warrants, Justification 7), signal warrants were conducted for the intersection of Masonry Court and Cooke Boulevard for the 2031 future total conditions and are included in Appendix M.

Per the results of the signal warrants, the future total traffic volumes anticipated at this intersection do not meet the 120% justification associated with projected volumes, however the signal warrant is past the 100% justification mark suggesting the intersection could be signalized if the forecasted traffic volumes actually materialize.

Nonetheless, scenario analysis with signalization at the intersection was undertaken to explore options to improve future operations. It is noted that signalization of the intersection (with the existing roadway configuration) would still not provide sufficient capacity to the intersection, and additional geometric changes to the intersection would be required to provide additional capacity.

The following recommendations are made for the intersection; it is noted the storage lengths recommended were according to minimum lengths required to accommodate 95th percentile queues. Taper lengths were recommended based on Table 9.14.2 of the TAC GDGCR outlining recommended taper lengths for right-turn lanes and left-turn lanes, respectively.

- Signalization
    - Minimum initial, yellow, and all-red times were based on the adjacent intersection (Masonry Court and Waterdown Road)
    - Cycle length of 100 seconds also based on adjacent intersection (Masonry Court and Waterdown Road)
- Eastbound approach:
    - Addition of lane to create through/right-turn lane and through/left-turn lane; should extend to intersection of Masonry Court and Waterdown Road
- Westbound approach:
    - Addition of auxiliary left-turn lane, storage length of approximately 15 meters
    - Left-turn permissive-protected phase
- Northbound approach:
    - Addition of auxiliary right-turn lane, storage length of approximately 70 meters
- Southbound approach:
    - No recommendation.

The results of the above recommendations have been summarized in Table 9.

Table 9: Cooke Boulevard and Masonry Court Intersection Optimization Results

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Critical V/C Ratio (Approach)	95th Percentile Queue Length > Storage Length
Cooke Boulevard at Masonry Court	Stop Control (Minor)	A.M.	**F**	**> 200 (NB)**	**> 10 (NB)**	NBTLR > 200 m
		P.M.	**F**	**> 200 (NB)**	**2.35 (NB)**	NBTLR > 200 m
	Signalized	A.M.	C	23.0	0.86 (EBT)	None
		P.M.	C	23.2	0.86 (WBT)	None

As summarized above, signalization of the intersection of Masonry Court and Cooke Boulevard with the above noted geometric improvements would be expected to sufficiently improve future operations at the intersection.

It is however recommended that the City monitor the intersection in the interim and pursue intersection improvements only if the large volumes from the Aldershot GO expansion forecast actually materialize.

6.3 Masonry Court and Waterdown Road

To accommodate the significant forecasted growth in southbound left-turning traffic during the A.M. peak and westbound through traffic during the P.M. peak originating from the Aldershot GO Station, signal optimization measures as well as lane extensions are recommended.

- Signal optimization for both peak hours
- Southbound approach:
    - Addition of dual left-turn lanes
    - Addition of protected southbound left-turn phase
    - Left-turn lane extension to approximately 165 meters

Table 10 provides results from the above noted recommendations.

Table 10: Masonry Court and Waterdown Road Intersection Optimization Results

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Critical V/C Ratio (Approach)	95th Percentile Queue Length > Storage Length
Masonry Court and Waterdown Road	Signalized	A.M.	**F**	**117.3**	**1.17 (NBT)** **1.41 (SBL)**	SBL 365 m > 15 m
		P.M.	C	34.2	**1.12 (WBTR)**	WBL 30 m > 15 m SBL 30 m > 15 m
	Signalized	A.M.	D	48.6	**1.03 (NBT)** 0.99 (SBL)	None
		P.M.	C	29.5	0.90 (WBTR)	None

As noted above, the improvements recommended at the study intersections would improve the overcapacity southbound left-turn movement during the A.M. peak and the westbound through/right movement during the P.M. peak, as well as reduce total delay in both peak periods.

As previously noted, the conservative background development traffic estimates for the Aldershot GO Station are the primary source of future overcapacity movements; as such, it is recommended the City monitor this intersection to determine whether the increased traffic volumes are actually materializing before implementing any improvements.

6.4 Plains Road and Waterdown Road

In consideration of the existing overcapacity eastbound left-turn movement during the A.M. peak, as well as the overcapacity westbound through movement due to background growth during the P.M. peak, signal optimization measures as well as geometric improvements at the intersection are recommended.

The improvements recommended include:

- Signal optimization and cycle length increase for both peak hours from 110 seconds in A.M. and P.M. (originally), to 140 seconds in A.M. and 125 seconds in P.M. peaks
- Eastbound approach and westbound approach:
    - Addition of dual left-turn lanes
    - Addition of protected left-turn phase
    - Eastbound left-turn lane extension to approximately 165 meters
- Northbound approach:
    - Extension of left-turn lane to approximately 55 meters
- Southbound approach:
    - Extension of right-turn lane to approximately 210 meters

Table 11 summarized the optimized results of the intersection analysis.

Table 11: Plains Road E and Waterdown Road Intersection Optimization Results

Intersection	Control	Peak Hour	Level of Service [1]	Control Delay	Critical V/C Ratio (Approach)	95th Percentile Queue Length > Storage Length
Plains Road East at Waterdown Road	Signal	A.M.	**F**	**98.3**	**1.59 (EBL)** **0.88 (EBT)** **0.89 (NBT)**	EBL 335 m > 30m
		P.M.	E	72.9	**1.20 (WBT)**	EBL 95 m > 30 m NBL 40 m > 30 m SBR 125 m > 40 m
	Optimized	A.M.	D	52.5	0.95 (EBL) 0.89 (EBT) 0.95 (NBT) 0.89 (SBL)	None
		P.M.	E	68.7	0.96 (EBL) **1.02 (WBT)** **1.06 (SBR)**	None

The above improvements would be expected to bring all movements below capacity in the A.M. peak and would be expected to mitigate the significantly overcapacity westbound through movement during the P.M. peak. Overall delay also would be reduced significantly in the A.M. peak by approximately 46 seconds improving the LOS from 'F' to 'D'. However, it is noted that the poor operations observed are generally attributed to high background development volumes and not the proposed site. Should these volumes not materialize, such improvements may not be required; as such, it is recommended the City monitor this intersection for improvements as necessary.

To address storage issues for the existing overcapacity eastbound left-turn movement, it is noted a two-way left-turn lane is present directly west of the existing storage lane and likely acts as an informal extension of the eastbound left-turn lane given that the existing traffic volumes suggest that the existing storage length would frequently be insufficient during peak operations. As such, the City can consider formally extending the eastbound left-turn lane to provide additional capacity to this movement.

7.0 Site Access Review

The following section provides a review of geometric properties of the proposed site access(es) with reference to the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR), June 2017, as well as any municipal or regional design guidelines. This section specifically analyzes the proposed accesses from a sight distance perspective to ensure adequate visibility and sufficient spacing to avoid conflicts have been provided.

7.1 Sight Distance

The available sightlines at the proposed site access were measured and compared to the standards set out in the TAC GDGCR.

Sight distance was measured from the Site access using the following assumptions:

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

Intersection sight distance is calculated using Equation 9.9.1 from the GDGCR as outlined below:

$$ISD = 0.278 * V\ major * tg$$

Where:
ISD = Intersection Sight Distance
V major = design speed of roadway (km/h)
tg = assumed time gap for vehicles to turn from stop onto roadway (s)

Table 12 provides a summary of sightline requirements for the proposed site accesses. Figure SL-S and SL-N illustrates the sightlines for the Cooke Boulevard and Masonry Court accesses, respectively.

Table 12: Sight Distance Analysis

Feature	Site Access off Masonry Court	Site Access off Cooke Boulevard
Access Type	Full-Movement	Full-Movement
Assumed Speed Limit of Roadway	50 km/h	50 km/h
Assumed Design Speed	60 km/h	60 km/h
Base Time Gap [1]	6.5 s (right-turn) 7.5 s (left-turn)	6.5 s (right-turn) 7.5 s (left-turn)
Grade of Roadway	Less than 3%	Less than 3%
Horizontal Alignment of Roadway	Straight	Straight
Required Sight Distance (right-turn, to the left) [2]	110 m	110 m
Required Sight Distance (left-turn, to the right) [2]	130 m	130 m
Available Sight Distance (right-turn, to the left)	>110 m	>110 m
Available Sight Distance (left-turn, to the right)	>130 m	>130 m
Minimum Sight Distances Satisfied?	Yes	Yes

Note 1: Time gap for left and right-turning vehicles from a stop onto a two-lane highway with no median and with a grade less than 3%. Value from Table 9.9.3 in the TAC-GDGCR.
Note 2: Sight distance values calculated from Intersection Sight Distance equation 9.9.1 in the GDGCR.

Per the results summarized in Table 12, the proposed site accesses off Masonry Court and Cooke Boulevard would meet sight distance requirements and provide sufficient visibility to drivers on the road.





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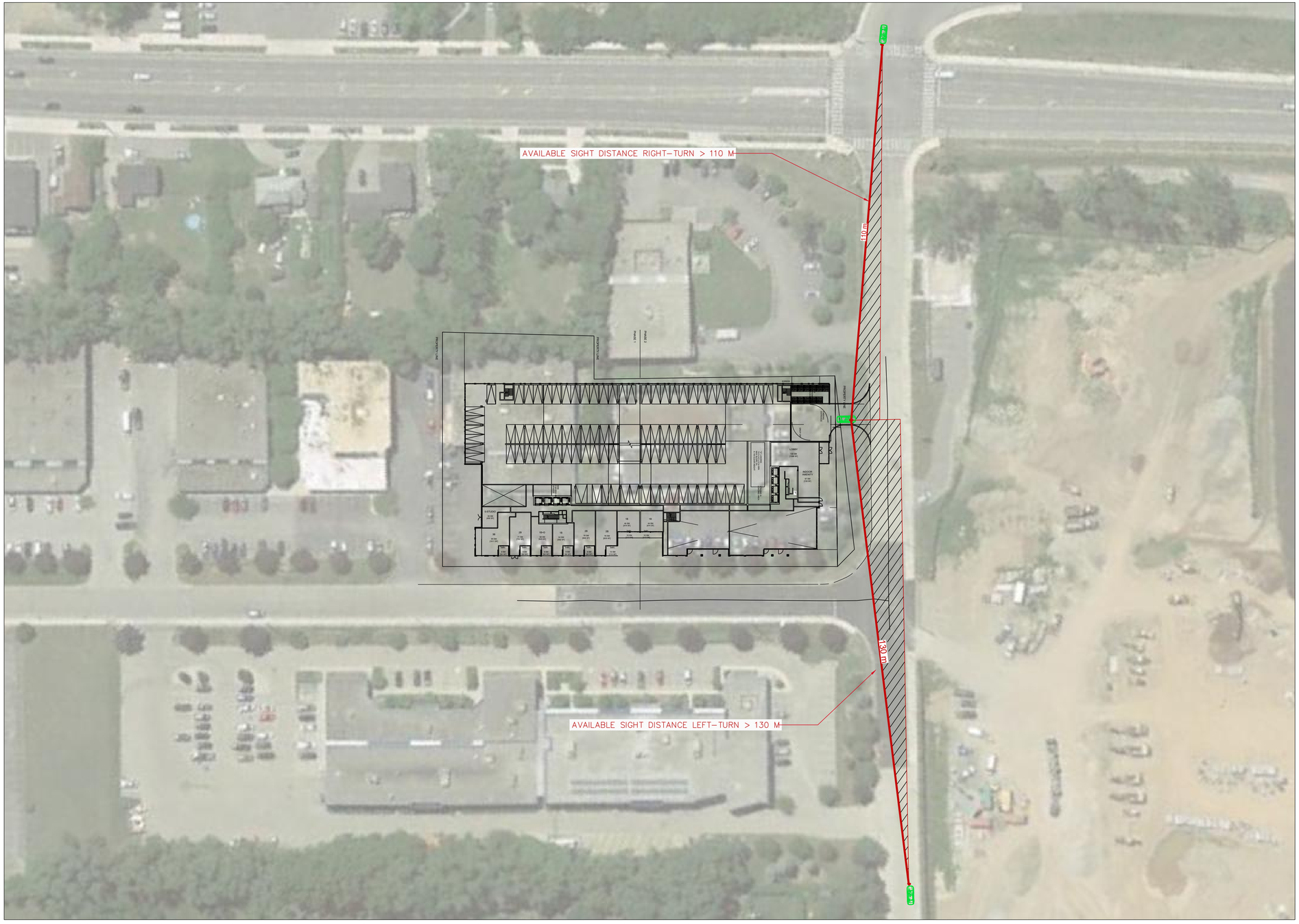
1062 – 1074 COOKE BLVD
CITY OF BURLINGTON

Drawing

SIGHT LINES
SOUTH TOWER

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

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B.B.		1:450	SL – S





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1062 – 1074 COOKE BLVD
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SIGHT LINES
NORTH TOWER

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SUITE 100
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B.B.		1:600	SL – N

8.0 Maneuvering Assessment

A maneuvering assessment was conducted to ensure the proposed site design provides adequate space for the design vehicles expected at the site. The maneuvers of these design vehicles are elaborated upon in the following section.

8.1 Emergency Vehicle

It is noted that emergency (fire) vehicles can access a site from a public road as long as the building is within 15 meters of the public roadway. As shown in Figure T301-S, the firetruck can pull up to the frontage along Cooke Boulevard within a distance of 15 meters from the building. Similarly, as shown in Figure T301-N, a firetruck can pull up to the building frontage along Masonry Court to a distance of less than 15 meters from the building.

8.2 Waste Vehicle

A maneuvering assessment was conducted for waste vehicles using a Region of Halton Front-Loading waste vehicle, as shown in Figures T302 – S and T302 – N.

As shown in Figure T302 – S, the waste vehicle should face no conflicts entering the Cooke Boulevard access and maneuvering in and out of the loading space near the access. Similarly, as shown in Figure T302 – N, the waste vehicle should face no conflicts entering the Masonry Court access and maneuvering in and out of the loading space near the access.

8.3 Medium Single Unit Truck

A maneuvering assessment was conducted for Medium Single Unit (MSU) vehicles, as shown in Figures T303 – S and T303 – N. As illustrated in Figures T303 - S and T303 – N, the MSU vehicle should face no conflicts or encroachments entering either the Masonry Court or Cooke Boulevard access and maneuvering in and out of the loading spaces near each access.

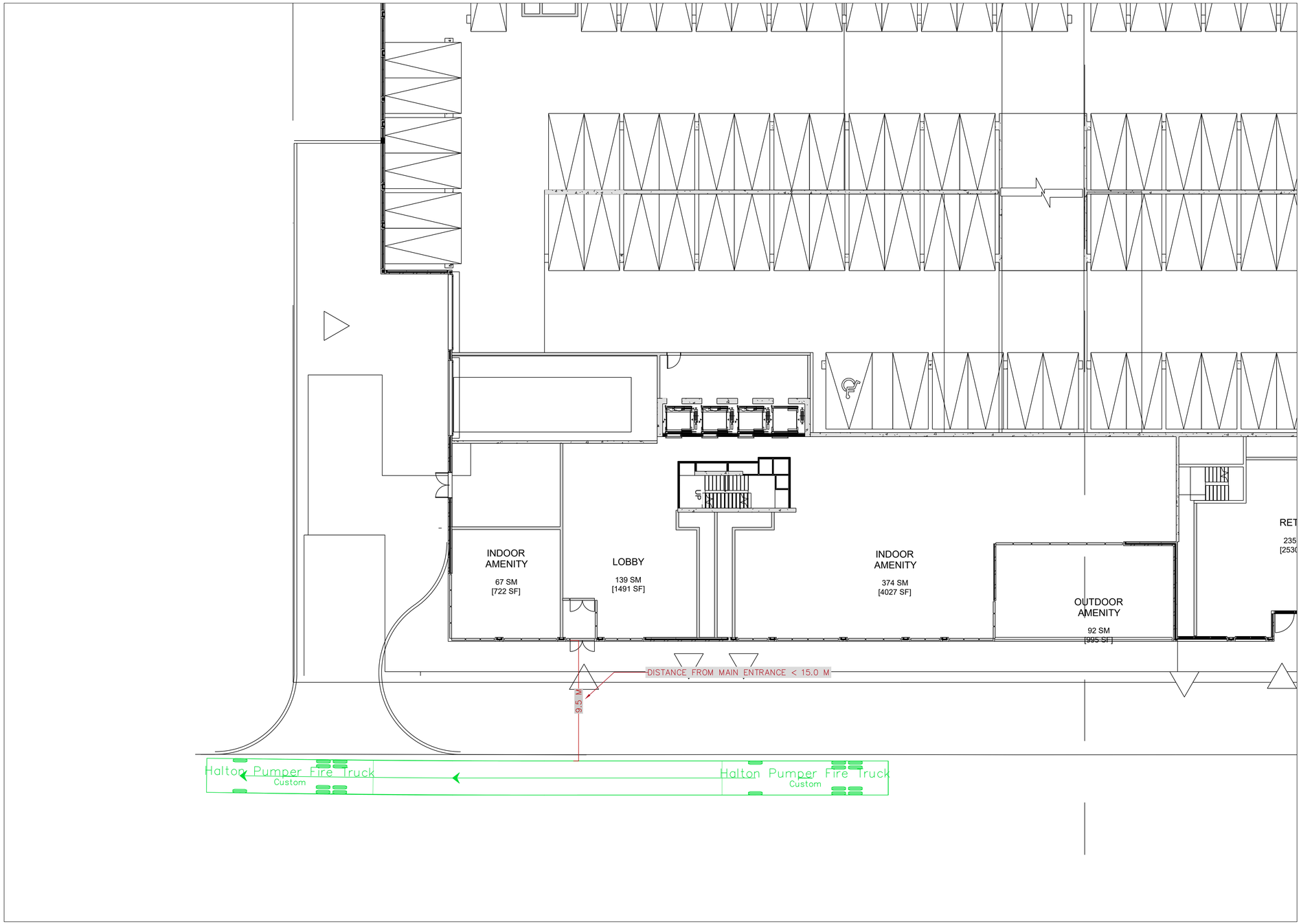
8.4 Passenger Vehicles

A maneuvering assessment was conducted using a Passenger TAC (P-TAC) vehicle to demonstrate the maneuverability of the proposed accesses and critical parking spaces. Maneuvering of the ground floor level is shown in Figures T304 – S and T304 – N, and the mezzanine level in Figures T305 – A and T305 – B.

As shown in Figures T304 - S and N, ground floor maneuvering in and out of the accesses and critical at-grade parking spaces is not expected to pose any conflicts or encroachments.

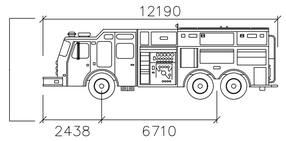
On the contrary, at the mezzanine level, maneuverability in the north parking space (shown in Figure T305 – A) is limited and would not fit a typical P-TAC vehicle. This space would fit a Mini Cooper (small car) as shown; thus, it is recommended this space be reserved for smaller vehicles.

Additionally, the maneuverability of the south parking space (shown in Figure T305 – B) is limited by the column on the right side and would also not fit a typical P-TAC vehicle. This space would fit a small car as shown in the figure; thus, it is also recommended this space be reserved for smaller vehicles.





VEHICLE PROFILE



Halton Pumper Fire Truck

	mm
Width	: 2490
Track	: 2500
Lock to Lock Time	: 6.0
Steering Angle	: 45.0

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1062 – 1074 COOKE BLVD
CITY OF BURLINGTON

Drawing

SITE CIRCULATION DIAGRAM
SOUTH TOWER
FIRE TRUCK

CROZIER
CONSULTING ENGINEERS
2800 HIGH POINT DRIVE
SUITE 100
MILTON, ON, L9T 6P4
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Drawn By: A.D.	Design By:	Project: 2321–6440	
Check By: B.B.	Check By:	Scale: 1:150	Drawing: T301 – S

PHASE 1

PHASE 2

EGRESS

SOD

PROPERTY LINE

Halton Pumper Fire Truck
Custom

104.886

5% 1:20

2% 1:50

PARKING ENTRANCE

DROP OFF

106.760

106.105

5% 1:20

106.105

"C" LOADING
13.0 x 4.0 x 6.1m MIN.
MAX SLOPE 2%
6.1 M CLEAR HEIGHT

STAGING & LOADING AREA

LOBBY
130 SM
[1396 SF]

106.750

13.5 M

DISTANCE FROM MAIN ENTRANCE < 15.0 M

INDOOR AMENITY
67 SM
[720 SF]

UP

Halton Pumper Fire Truck
Custom

1B
44 SM
[474 SF]

1B
44 SM
[474 SF]

balc
10 SM
[112 SF]

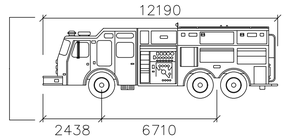
balc
10 SM
[112 SF]

OPEN TO RETAIL BELOW

SOD



VEHICLE PROFILE



Halton Pumper Fire Truck

	mm
Width	: 2490
Track	: 2500
Lock to Lock Time	: 6.0
Steering Angle	: 45.0

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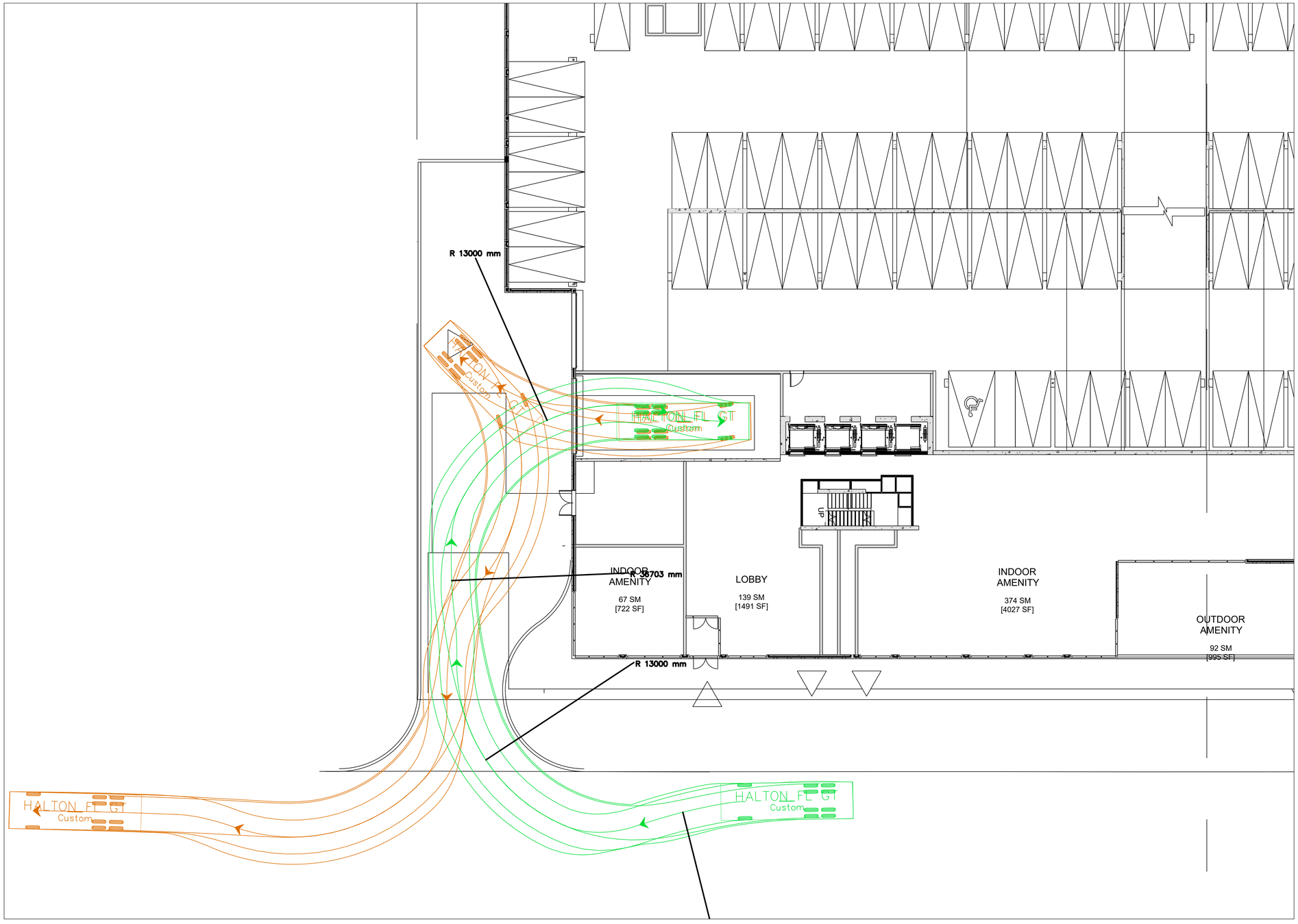
1062 – 1074 COOKE BLVD
CITY OF BURLINGTON

Drawing

SITE CIRCULATION DIAGRAM
NORTH TOWER
FIRE TRUCK

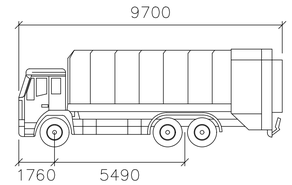
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info@cfcrozier.ca

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A.D.			2321–6440
Check By	Check By	Scale	Drawing
B.B.		1:150	T301 – N





VEHICLE PROFILE



HALTON FL GT

	mm
Width	: 2700
Track	: 2700
Lock to Lock Time	: 6.0
Steering Angle	: 35.3

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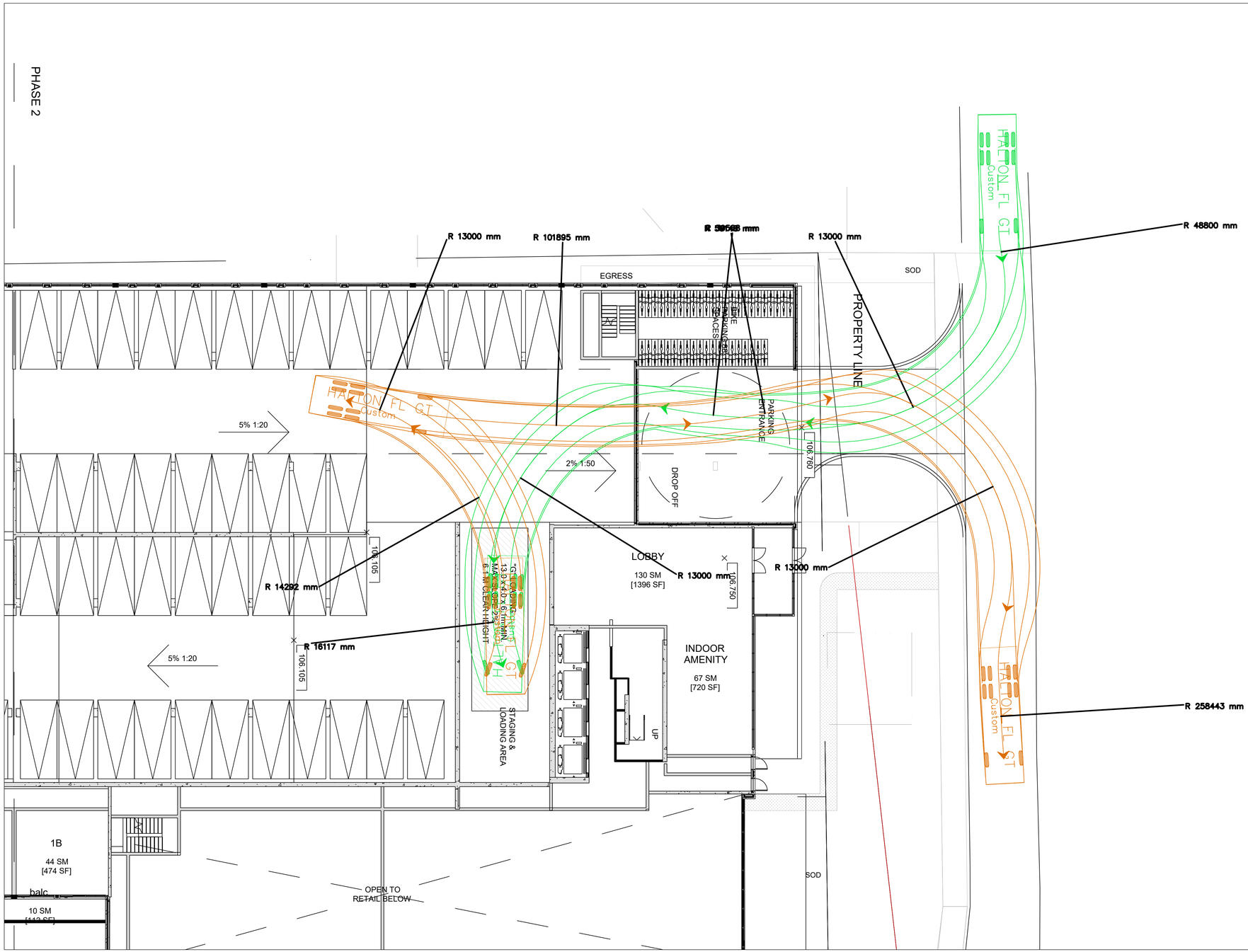
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CITY OF BURLINGTON

Drawing

SITE CIRCULATION DIAGRAM
SOUTH TOWER
GARBAGE TRUCK

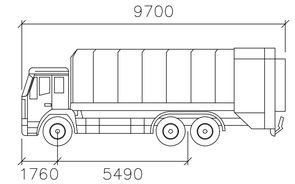
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Check By	Check By	Scale	Drawing
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VEHICLE PROFILE



HALTON FL GT

	mm
Width	: 2700
Track	: 2700
Lock to Lock Time	: 6.0
Steering Angle	: 35.3

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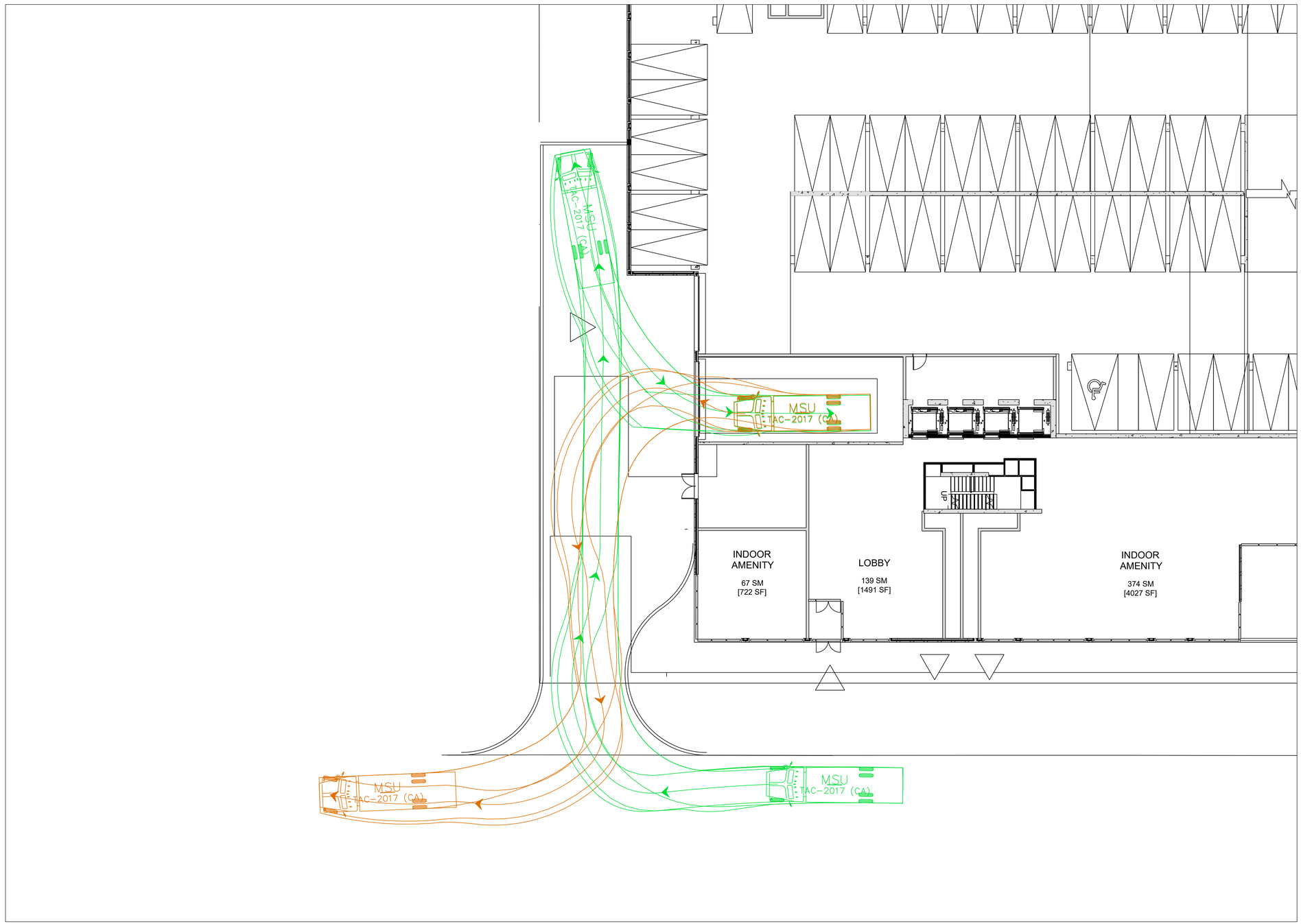
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Drawing

SITE CIRCULATION DIAGRAM
NORTH TOWER
GARBAGE TRUCK

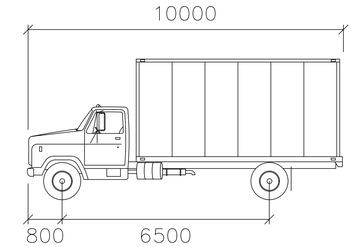
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VEHICLE PROFILE



MSU

	mm
Width	: 2600
Track	: 2600
Lock to Lock Time	: 6.0
Steering Angle	: 40.2

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CITY OF BURLINGTON

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SOUTH TOWER
MSU VEHICLE

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Check By	Check By	Scale	Drawing
B.B.		1:150	T303 – S

PROPERTY LINE

PHASE 1

PHASE 2

EGRESS

SOD

PROPERTY LINE

MSU IAC-2017 (CA)

104.886

5% 1:20

MSU IAC-2017 (CA)

2% 1:50

PARKING ENTRANCE

106.760

DROP OFF

106.105

5% 1:20

LOADING MSU IAC-2017 (CA) 13.0 x 4.0 x 6.1 MIN. MAX SLOPE 2% 60' CLEAR HEIGHT

106.105

LOBBY

130 SM
[1396 SF]

106.750

INDOOR AMENITY

67 SM
[720 SF]

UP

STAGING & LOADING AREA

MSU IAC-2017 (CA)

1B

44 SM
[474 SF]

1B

44 SM
[474 SF]

2B

78 SM
[835 SF]

balc.

balc

10 SM
[113 SF]

balc

10 SM
[113 SF]

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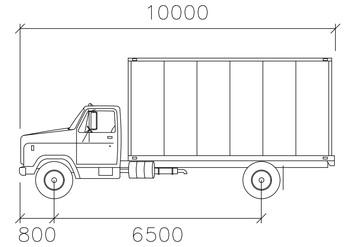
SOD

N

SUBJECT PROPERTY

KEY PLAN
SCALE: NTS

VEHICLE PROFILE



MSU

	mm
Width	: 2600
Track	: 2600
Lock to Lock Time	: 6.0
Steering Angle	: 40.2

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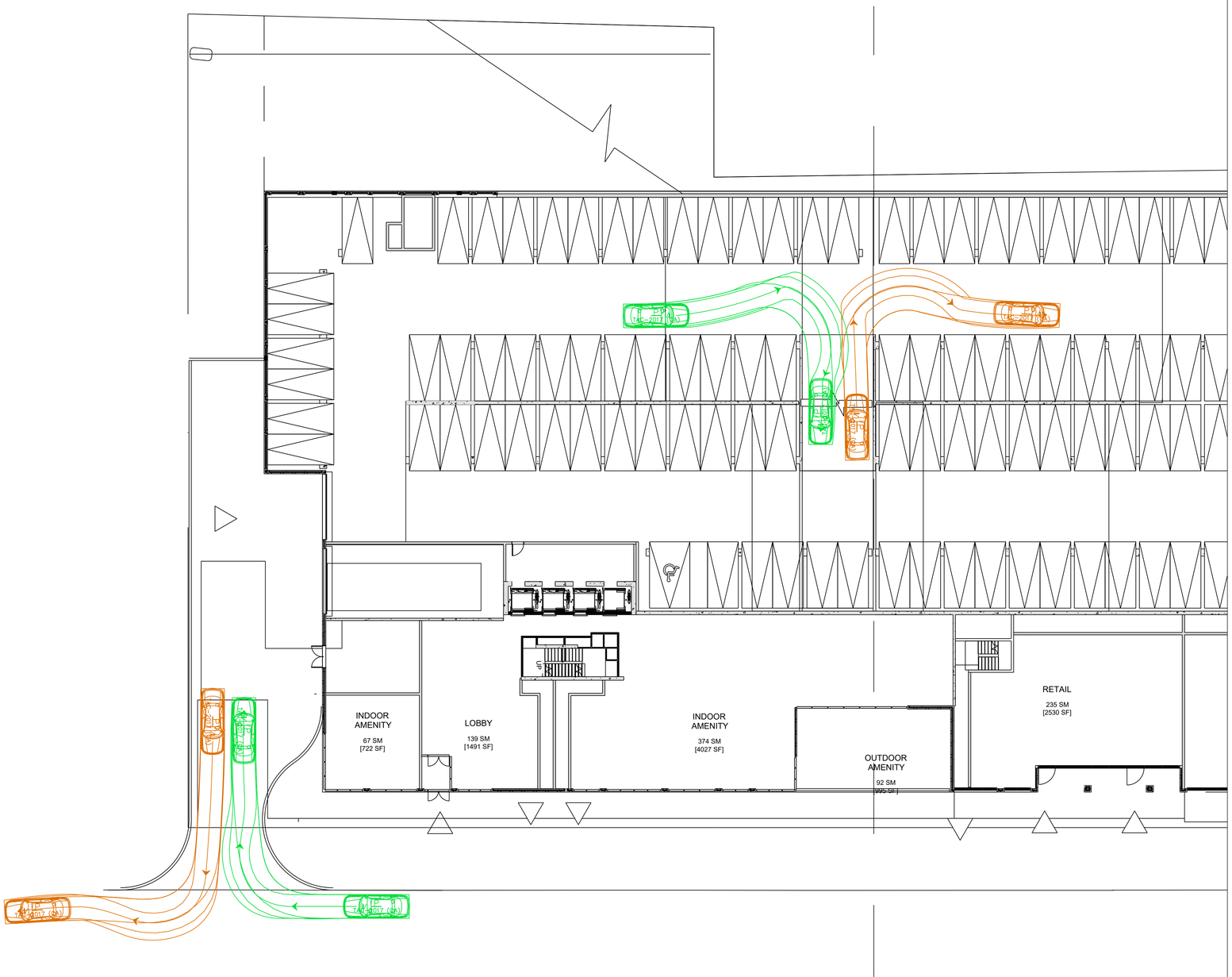
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CITY OF BURLINGTON

Drawing

SITE CIRCULATION DIAGRAM
NORTH TOWER
MSU VEHICLE

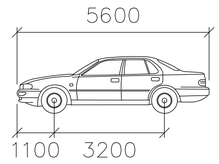
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Drawn By	Design By	Project	
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Check By	Check By	Scale	Drawing
B.B.		1:150	T303 – N





VEHICLE PROFILE



P

	mm
Width	: 2000
Track	: 2000
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

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0	ISSUED FOR REVIEW	08/23/2022
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PRELIMINARY
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Project

1062 – 1074 COOKE BLVD
CITY OF BURLINGTON

Drawing

SITE CIRCULATION DIAGRAM
SOUTH TOWER
PASSENGER CAR

CROZIER
CONSULTING ENGINEERS
2800 High Point Drive
Suite 100
Milton, ON, L9T 6P4
905-875-0026 T
905-875-4915 F
www.cfcrozier.ca
info@cfcrozier.ca

Drawn By	Design By	Project	
A.D.			2321-6440
Check By	Check By	Scale	Drawing
B.B.		1:200	T304 – S

PHASE 1

PHASE 2

EGRESS

PROPERTY LINE

PARKING ENTRANCE

DROP OFF

LOBBY

130 SM
[1396 SF]

INDOOR AMENITY

67 SM
[720 SF]

UP

"G" LOADING
13.0 x 4.0 x 6.1m MIN.
MAX SLOPE 2%
6.1 M CLEAR HEIGHT

STAGING & LOADING AREA

1B

44 SM
474 SF]

balc

10 SM
[112 SF]

1B

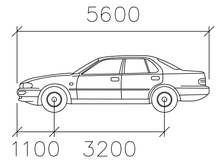
44 SM
[474 SF]

balc

10 SM
[112 SF]



VEHICLE PROFILE



P

	mm
Width	: 2000
Track	: 2000
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

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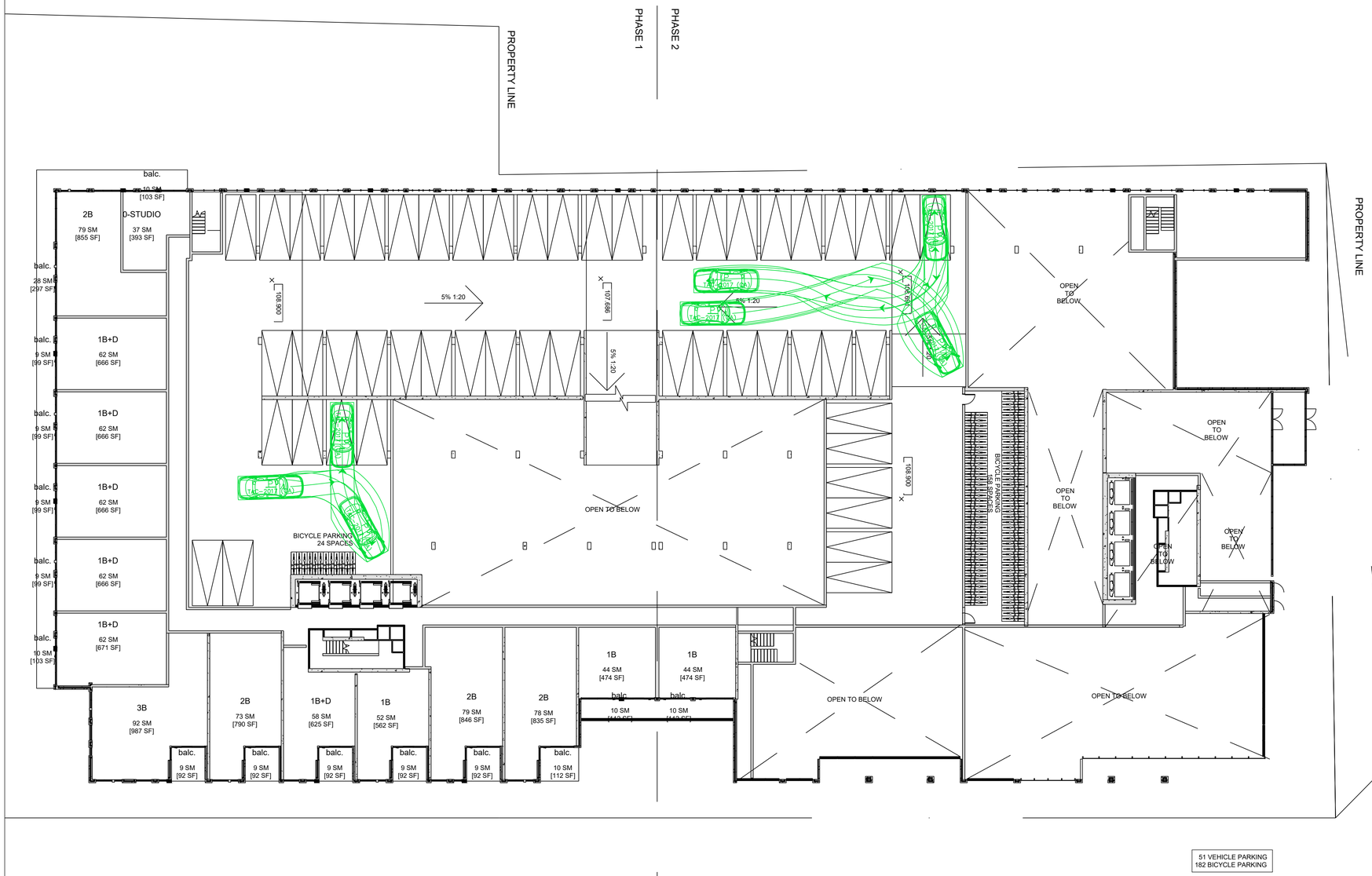
1062 – 1074 COOKE BLVD
CITY OF BURLINGTON

Drawing

SITE CIRCULATION DIAGRAM
NORTH TOWER
PASSENGER CAR

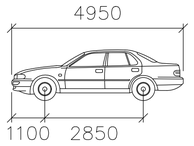
CROZIER
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A.D.		2321–6440
Check By	Check By	Scale / Drawing
B.B.		1:150 / T304 – N





VEHICLE PROFILE



Passenger CAR

	mm
Width	: 1930
Track	: 1930
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

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Project

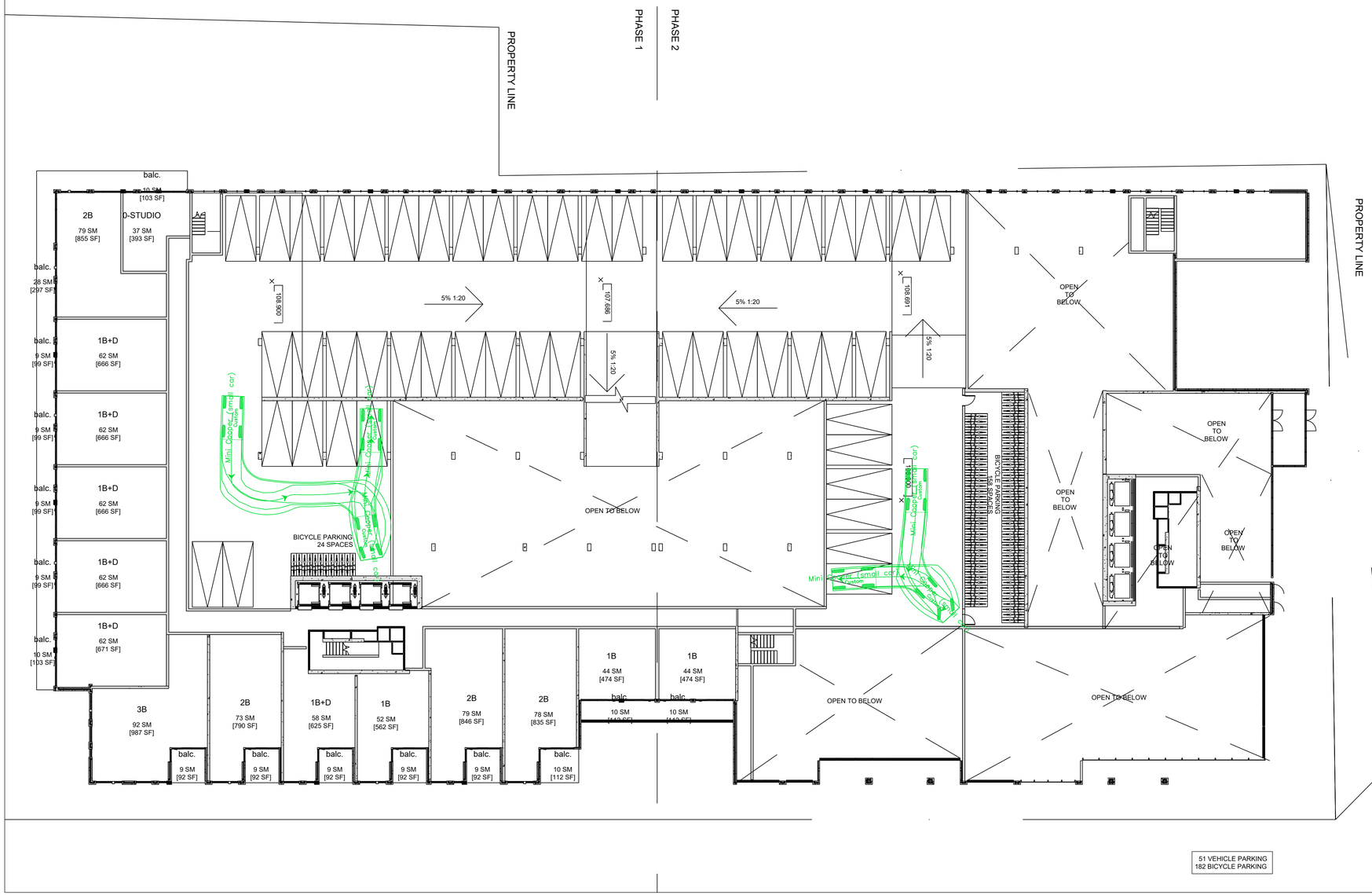
1062 – 1074 COOKE BLVD
CITY OF BURLINGTON

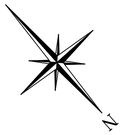
Drawing

SITE CIRCULATION DIAGRAM
MEZZANINE LEVEL
PASSENGER CAR

CROZIER
CONSULTING ENGINEERS
2800 High Point Drive
Suite 100
Milton, ON, L9T 6P4
905-875-0026 T
905-875-4915 F
www.cfcrozier.ca
info@cfcrozier.ca

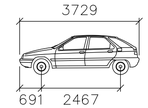
Drawn By	Design By	Project	
A.D.			2321–6440
Check By	Check By	Scale	Drawing
B.B.		1: 200	T305 – A







VEHICLE PROFILE



Mini Cooper (small car)

	mm
Width	: 1892
Track	: 1683
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

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Project

1062 – 1074 COOKE BLVD
CITY OF BURLINGTON

Drawing

SITE CIRCULATION DIAGRAM
MEZZANINE LEVEL
SMALL CAR

CROZIER
CONSULTING ENGINEERS
2800 HIGH POINT DRIVE
SUITE 100
MILTON, ON, L9T 6P4
905-875-0026 T
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WWW.CFCROZIER.CA
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A.D.			2321–6440
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B.B.		1:200	T305 – B

9.0 Parking Review

The following section reviews the required auto and bicycle parking at the proposed development per the City of Burlington's By-Law requirements.

9.1 Auto Parking Requirements

Section 2.25.4 Table 1.2.6 of the City of Burlington's Zoning By-Law was reviewed to determine the auto parking requirements at the proposed residential development.

It should be noted, that according to Schedule B-1 of the City's Official Plan, the subject site is located within a Primary Growth Area; accordingly, parking rates mandated for Primary Growth Areas were applied to the subject site.

A summary of the proposed parking and required parking at the development can be found in Table 13.

Table 13: Zoning By-Law Auto Parking Review

Land Use	Units/GFA	Zoning By-Law Rate	Spaces Required	Spaces Provided
Apartment Building	809	1.25 spaces per unit inclusive of visitor parking	1012	640
Retail Store	581 m^2	3.5 spaces per 100 m^2 GFA	21	
Total (Surplus/Deficit)			**1033**	**640 (-393)**

As noted above, the development is 393 spaces deficient compared to the City's By-Law requirements for vehicular parking spaces.

9.2 Bicycle Parking Requirements

It is noted the existing City By-Law does not require bicycle parking at residential developments, however the City has been in the process of reviewing their parking requirements, per the IBI City Wide Parking Standards Report dated July 2017. The Parking Standards Report outlines recommendations for bicycle parking requirements, including that for residential developments.

The bicycle parking requirements for the site per the proposed parking rates within the Parking Standards Report has been provided in Table 14 below.

Table 14: Bicycle Parking Requirements

Land Use	Type of Space	Units	Number of Spaces Required	Spaces Required	Spaces Provided
Residential	Long-Term	809 Units	0.5 Long-Term bicycle parking spaces per unit	405	414
	Short-Term		0.05 Short-Term bicycle parking spaces per unit	40	40
Total Long-Term (Surplus/Deficit)					**(+9)**
Total Short-Term (Surplus/Deficit)					**(0)**

As noted in Table 14, the development proposes a surplus of long-term parking bicycle spaces and meets the requirements for short-term spaces.

10.0 Parking Justification

As noted previously within Section 9.0, the proposed auto parking at the development is deficient per the City's By-Law requirements. To forecast the parking demand for the proposed mixed-use development, approved parking rates for sites with similar land use characteristics within the City of Burlington were examined along with the surrounding policy context in the following section.

10.1 Approved Development Parking Rates (53-71 Plains Road East)

The site at 53-71 Plains Road East and 1025 Cooke Boulevard is approximately 300 meters south of the subject development. The development proposes the construction of a 10 and 12-storey building with 450 residential units and 1,209 m^2 of ground-floor retail space.

The development proposed a parking rate of 0.78 parking spaces per unit for residential spaces, and a parking rate of 1 spaces for 45 m^2 of retail/commercial space which was disputed and ultimately approved per the Local Planning Appeal Tribunal (LPAT) settlement dated June 28, 2022.

Due to this developments' similarity in size, scale, and location compared to the subject site, it provides a useful comparison and precedent regarding what would be an appropriate parking supply within the Aldershot GO MTSA.

10.2 Parking Demand Data Summary

Parking demand data in the City of Burlington as well as ITE data are summarized in Table 15.

Table 15: Combined Resident and Visitor Parking Rates

Site Location/Land Use Code	Source	Parking Rate
53-71 Plains Road East & 1025 Cooke Boulevard	LPAT Settlement	0.78 spaces per unit (Approved)
Proposed Development		**0.78 spaces per unit**

Upon review of the above data, the proposed parking supply of 0.79 spaces per unit is expected to be sufficient when considering the parking rates approved at the 53-71 Plains Road East site. It can also be concluded that the City's existing and "amended" parking rates would likely be an overestimation of expected parking demand at the proposed site, especially considering the site is situated in an MTSA that provides direct access to transit.

It is also noted that the subject site is in closer proximity to the Aldershot GO station than the 53-71 Plains Road East site by approximately 270 meters. While both are in excellent proximity to the GO Station, it is expected this closer proximity of the subject site better enables residents to use transit, which further supports the application of the reduced parking rate proposed.

10.3 Policies and Surrounding Land Use

As discussed above, the subject site is within walking distance of the Aldershot GO Transit Station, which qualifies the site as part of a Major Transit Station Area (MTSA) for the station. Since MTSAs are located directly adjacent to major transit stations, the expectation is that sites located within these

areas will have significantly reduced auto parking demands given the ease of access to transit. This is further supported through the province's growth plan for the GTHA, which emphasizes policy adaptations, such as reducing parking requirements, to promote transit use in intensification areas and MTSAs.

In consideration that a large portion of residents and visitors at the site would be able to rely on transit for most trips as opposed to driving, the reduced parking at the site would prevent an oversupply of parking and support a compact built form within the MTSA.

11.0 Transportation Demand Management (TDM)

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

11.1 Existing TDM Opportunities

11.1.1 Modal Split

Transportation Tomorrow Survey (TTS) data was filtered for households situated in 2006 GTA Zones 4050, 4051, and 4052 to determine the modal split for trips expected at the subject site.

Table 16: Modal Split

Mode of Travel	Modal Split
Transit	3%
Walking	1%
Cycling	<1%
Auto	96%

As summarized above, the TTS data for the site suggests that transit, walking or cycling have not historically been popular modes of transportation. However, it is noted that based on historical Google Maps imagery, the cycling facilities in the study area were limited; bicycle lanes on Waterdown were only implemented post-2016. Additionally, it is expected that promoting TDM measures at the site will encourage residents and visitors to use the ample transit opportunities available near the site.

11.1.2 Existing Transit and Active Transportation Facilities

As discussed previously in Section 2.3, there are several transit facilities available within walking distance of the subject site. Most notably, close proximity of the subject site to the Aldershot GO station provides connections across Southern Ontario using GO service, and local trips are serviced by various Burlington Transit Routes.

Additionally, as discussed within Section 2.2, there is a well-established cyclist network in the surrounding area with north-south connectivity along Waterdown Road, and east-west connectivity along North Shore Road. Sidewalks are available throughout the study area, which also connect to the Aldershot GO Station for transit connectivity.

11.2 TDM Recommendations

11.2.1 Transit Facilities

As previously established, there are several existing transits stops in the vicinity of the subject development. To market the ease and accessibility to the Aldershot GO Station, it is recommended that the site adopts the wayfinding and educational measures elaborated later within this section.

11.2.2 Pedestrian Facilities

It is noted that there are no sidewalks available along Masonry Court or Cooke Boulevard along the site's frontage. As such, sidewalks may be beneficial to be constructed along the site frontage, but residents would eventually need to cross the road to the other sides with sidewalks beyond the site frontage, as adjacent properties do not provide sidewalks.

Additionally, adequate lighting along pedestrian paths are recommended to ensure residents feel safe and can safely navigate in low-light conditions.

Furthermore, beautification facilities such as benches, flowerpots and other fixtures should be placed near the site entrance and along pedestrian paths to provide refuge and better define a safe, walkable, and attractive pedestrian space.

11.2.3 Cyclist Facilities

Table 14 previously summarized that the proposed bicycle parking on site would provide a surplus of both long and short-term spaces for residents and visitors to cycle to and from the site.

The long-term spaces have been provided underground near the elevators, which provides easy access to residents. Additionally, the short-term spaces have been provided near the site accesses, which would be ideal for visitors to quickly lock their bicycles and enter the building.

The strategic location and surplus of the bicycle spaces on site would be beneficial in encouraging residents and visitors to cycle as a preferred method of transportation due to the ease of access.

11.2.4 Car-share Facilities

The development is providing a total of 7 car share spaces (5 in Tower 1, and 2 in Tower 2) per the most recent Site Plan.

Providing carshare facilities on site, discourages car ownership, and promotes residents to use a variety of modes of travel, using the shared vehicles only when necessary. It is expected with the ease of accessing carshare vehicles, residents would walk or cycle for shorter trips, use the easily accessible transit for commuting, and use the carshare vehicles only for necessary errands.

11.2.5 Wayfinding

Fixtures such as kiosks or displays may be provided in the building lobby to inform residents of transit information, such as routes, schedules, and stop locations of train or bus routes. Additionally, brochures outlining nearby transit nodes, bicycle routes, and pedestrian routes should be made available at the lobby.

Additional wayfinding signage to lead residents to nearby bus stops or the Aldershot GO station, may also be provided on premises to further promote the use of transit.

11.2.6 Education and Incentives

Various educational measures and incentives may be promoted at the new residential site to overall build a robust TDM brand and promote use of alternative modes of transportation available to residents.

The residential units being sold at the subject site should be promoted with a strong TDM brand, where marketing should highlight the convenience of proximity to the Aldershot GO station and nearby bus stops, as well as the accessibility to bike storage, carshare spaces, and an accessible cyclist network.

Education on available transit in the vicinity of the subject site would also be highly effective in promoting transit to new residents, who may not be aware of the variety of options available in the area. Handouts on local transit offerings and stop/schedule information, as well as nearby cyclist and pedestrian routes, may be provided to residents as part of a welcome package, and extra copies should be made available in the lobby for reference. A further step would be to include transit (PRESTO) passes to new residents as part of a welcome package to further incentivize use of transit.

12.0 Conclusion

The findings and recommendations of our analysis are summarized as the following:

- Under 2022 existing conditions, all study intersections operate with a Level of Service "B" or better, other than the intersection of Plains Road East at Waterdown Road operating with a Level of Service "D" during both peak periods. At this intersection, the eastbound left-turn movement during the A.M. peak exceeds capacity, and the westbound through movement during the P.M. peak operates with a critical capacity.

- Under future background conditions, several intersections and movements are anticipated to fail. The poor operations estimated for the study intersections, as summarized below, is largely attributed to high background volumes forecasted for the Aldershot GO Station parking lot.

    - The intersection of Plains Road and Waterdown Road is anticipated to operate with a LOS "F" and "E" during the A.M. and P.M. peak (respectively) for both horizons; notably the eastbound left continues to operate above capacity during the A.M. peak and the westbound through during the P.M. peak.

    - The intersection of Masonry Court and Cooke Boulevard is anticipated to operate with LOS "F" for all horizon years and peak periods under future background traffic due to the overcapacity movement on the northbound approach.

    - The intersection of Masonry and Waterdown Road is projected to operate with LOS "F" during the morning peak hour due to the over-capacity southbound left-turn movement at the intersection.

    - The intersection of Plains Road East and Cooke Boulevard is anticipated to operate with LOS "C" or better under future background conditions for all peak periods and horizon years.

- The proposed development is forecasted to generate 197 two-way (67 inbound and 130 outbound) trips during the weekday A.M. peak hour, and 234 (131 inbound and 103 outbound) trips during the weekday P.M. peak hour.

- The 2026 and 2031 future total operations of the study road network are expected to be similar to the future background conditions; operational concerns on the study road network all carry over from background conditions indicating the proposed site does not materially impact the surrounding road network.

- The proposed Cooke Boulevard access is expected to operate with acceptable Levels of Service. The Masonry Court accesses may face capacity issues, especially for left-turn movements exiting the site access, if the volumes forecasted for the Aldershot GO Station Expansion materialize.

- The following improvements are recommended as mitigation measures at critically operating intersections to mitigate existing and future background conditions (i.e. would be recommended with or without the proposed development):

Intersection	Recommendation	Horizon
Masonry Court at Cooke Boulevard	- Monitor intersection for signalization - Addition of eastbound lane to make through/left-turn lane and through/right-turn lane - Addition of westbound auxiliary left-turn lane and pm+pt left-turn phase - Addition of auxiliary northbound right-turn lane	If/when Aldershot GO Station volumes materialize due to Station Expansion
Masonry Court and Waterdown Road	- Addition of southbound dual left-turn lanes, protected left-turn phase, and left-turn storage extension	
Masonry Court Site Access	- Monitoring	
Plains Road and Waterdown Road	- Signal optimization - Eastbound and westbound dual left-turn lanes, protected left-turn phase - Northbound left-turn lane extension - Southbound left-turn lane extension	Monitor traffic volumes and implement when necessary
	- Eastbound left-turn lane extension	

- The sight lines for each of the proposed accesses (via Masonry Court and via Cooke Boulevard) were reviewed based on the TAC GDGCR and were found to provide sufficient visibility for exiting vehicles.

- Maneuvering at the site was verified using a variety of design vehicles expected at the site. It is noted that two parking spaces at the site may cause conflicts for typical passenger vehicles, thus it is recommended to reserve these spaces for smaller passenger vehicles.

- The proposed auto parking supply of at the site is deficient 393 spaces per the City's By-Law requirements. However, a review of approved parking rates for nearby sites with similar land use characteristics was used to determine that the proposed parking supply is expected to meet parking demand at the development.

- The proposed long term bicycle parking spaces at the site provides a surplus of nine spaces per the City's By-Law requirements and meets the City's requirements for short-term parking spaces.

In consideration that the traffic associated with the proposed site does not materially impact the surrounding road network, the site accesses are expected to provide sufficient sightlines, and maneuverability at the site is expected to operate in an acceptable manner, the proposed development can be supported.

We trust that this letter satisfies any transportation related concerns associated with the proposed development. Should you have any questions or require any further information, please do not hesitate to contact the undersigned.

Respectfully submitted,

C.F. CROZIER & ASSOCIATES INC.



Farah Tasnim, EIT
Engineering Intern, Transportation

C.F. CROZIER & ASSOCIATES INC.



Brandon Bradt, M.Eng.CEM, P.Eng
Project Manager, Transportation

BB/ft/la

J:\2300\2321- Camarro Developments Inc\6441- 1062-1074 Cooke Blvd\Reports\2022.09.01 - Transportation Impact Study - 1062-1074 Cooke Blvd (2321-6441).docx

APPENDIX A

Terms of Reference Correspondence

Farah Tasnim

From: Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
Sent: Wednesday, July 6, 2022 3:26 PM
To: Aarzoo Dhanani
Cc: Brandon Bradt; Farah Tasnim; Tessaro, Zachary
Subject: RE: Terms of Reference - 1062-1074 Cooke Blvd (CFC# 2321-6441)

Hi Aarzoo,

My coworker Zach is reviewing the TOR. He will provide you with his comments in the next few days.

Thanks,

Dan Ozimkovic, C.E.T., A.Sc.T.
Transportation Planning Technologist
Transportation Services Department
City of Burlington
Our working hours may be different. You are not obligated to reply outside of your typical working hours.

From: Aarzoo Dhanani <adhanani@cfcrozier.ca>
Sent: Wednesday, July 6, 2022 3:10 PM
To: Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
Cc: Brandon Bradt <bbradt@cfcrozier.ca>; Farah Tasnim <ftasnim@cfcrozier.ca>
Subject: RE: Terms of Reference - 1062-1074 Cooke Blvd (CFC# 2321-6441)

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

Hey Dan,

We are looking to follow up our Terms of Reference below. Please let us know if you have any questions!

Regards,

Aarzoo

Aarzoo Dhanani, EIT, M.Eng. | Engineering Intern
211 Yonge Street, Suite 600 | Toronto, ON M5B 1M4
T: 416.477.3392



Crozier Connections:

Read our latest news and announcements here.

From: Aarzoo Dhanani
Sent: Wednesday, June 22, 2022 1:56 PM
To: Danijel.Ozimkovic@burlington.ca
Cc: Brandon Bradt <bbradt@cfcrozier.ca>; Farah Choudhury <fchoudhury@cfcrozier.ca>
Subject: RE: Terms of Reference - 1062-1074 Cooke Blvd (CFC# 2321-6441)

Hello Dan,

C.F. Crozier and Consulting Engineers (Crozier) has been retained to provide Transportation Engineering services a for a Residential development located at 1062-1074 Cooke Boulevard, City of Burlington, Halton Region. It should be noted the site is located within the Aldershot MTSA. The current Site Plan and site statistics are attached to this email for your reference but please note these plans are subject to some minor changes prior to the submission.

We are kindly requesting that you review the following Terms of Reference (ToR) and provide feedback regarding our scope of work and request for data. Furthermore, should you not be the appropriate person for correspondence, it would be very appreciated to be directed to the appropriate contact.

Background

According to the site plan prepared by RAW, dated December 2020, the envisioned development consists of following elements:

Phase 1 South Tower

- An approximately thirty (30) storey residential building with a total of 369 residential units
- A total of approximately 591 vehicle parking spaces
- A total of approximately 258 bicycle parking spaces

Phase 2 South Tower

- An approximately thirty two (32) storey residential building with a total of 386 residential units
- A total of approximately 290 vehicle parking spaces
- A total of approximately 256 bicycle parking spaces

There are two full-moves site accesses proposed for the site, one via Cooke Boulevard in the southeast corner of the site, and one via Masonry Court in the northwest corner of the site. Additionally, there is currently an internal Pick-up and Drop-off (PUDO) loop that would be accessed via Cooke Boulevard at the mid-block of the site, however, it is expected that this internal PUDO loop will be removed in further iterations of the design. Instead, an on-street parking lane along the Cooke Boulevard frontage will likely be proposed to support PUDO activity at the site in order to limit the number of site accesses and allow the internal PUDO loop to be re-programmed for other uses.

Any minor changes to the development concept are not expected to affect the Terms of Reference.

Study Methodology for the Transportation Impact Study

The following intersections will be analyzed as part of the scope of study:

- Cooke Boulevard and Masonry Court
- Cooke Boulevard and Plains Road East
- Masonry Court and Waterdown Road

- Plains Road East and Waterdown Road
- Proposed Site Access via Cooke Boulevard

We kindly request recent traffic counts and signal timing plans available to the City of Burlington at the above noted intersections and confirmation that the above noted intersections are sufficient for analysis.

It is noted that Paradigm Transportation Solutions Limited (Paradigm) conducted traffic counts for the above intersections in the year of 2018, which Crozier proposes to use to perform the analysis for the TIS. However, should the collection of new counts be required, we may consult specialty traffic counting firms we typically work with.

Please advise whether the 2018 counts would be acceptable for use in the study. Further, if the collection of new counts is not be acceptable, please advise on further steps necessary to proceed with data collection to support the traffic analysis.

Analysis Periods and Scenarios

The weekday A.M. and P.M. peak hours for 2022 existing conditions, and study horizon years of 2026 and 2031 are assumed as the full buildout is expected by the year 2031.

Background Developments

The following background developments would be considered for traffic analysis:

- 35 Plains Road East (Mixed-Use Residential)
- 53-71 Plains Road East (Mixed-Use Residential)
- 92 Plains Road East (Mixed-Use Residential)
- 1085 Clearview Avenue, 1082, 1086 & 1090 St. Mathews Ave. (Residential)
- 101 Masonry Court (Residential)
- Aldershot GO Station Parking Lot
- 40 – 70 Plains Road East (Residential)
- 1029 Waterdown Road (Mixed-Use Residential)

Please provide any additional background developments in the vicinity of the proposed development and the associated transportation impact studies that should be included in our analysis if not listed above. It is noted that if new traffic counts are required instead of the 2018 counts, then not all of the above background developments may be necessary since some have been constructed since 2018.

Future Background Growth Rate

A Transportation Impact Study was previously conducted by Crozier for the site located at 1029 Waterdown Road and a linear growth rate of 1% was assumed upon consultation with City of Burlington staff.

As such, a linear growth rate of 1% for through traffic movements along the Waterdown Road and Plain Road corridors, as well as for all movements at the intersection of Plains Road and Waterdown Road will be applied to the study horizon years.

Please advise or alternatively please provide an appropriate growth rate(s) to reflect expected growth in the area.

Trip Generation and Distribution

Trip Generation for the proposed development will be based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition using Multifamily Housing (High-Rise) Residential (Land Use Code 222). Based on this land

use code, the development is forecasted to generate approximately 100 two-way trips during the A.M. peak and 119 two-way trips during the P.M. peak.

Site generated traffic to and from the study road network will be assigned using 2016 Transportation Tomorrow Survey (TTS) data.

Capacity Analysis Procedures

Weekday A.M. and P.M. peak hours will be analyzed using Synchro 11.0 analysis software, using Highway Capacity Manual (HCM) 2000 procedures.

Sight Distance Analysis

The sight lines at the proposed site access(es) will be analyzed with regards to guidance within the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR), June 2017.

Vehicle Maneuvering Analysis

A vehicle maneuvering assessment will be conducted using AutoTURN application that demonstrates the design vehicles can maneuver throughout the site. It will include circulation of passenger, emergency, loading and waste vehicles. It is noted that this will generally be done for the ground floor only to support the Official Plan and Zoning By-law Amendment applications. Additional maneuvering analysis of the underground and refinement of the ground floor maneuvering will be done at the detailed Site Plan Application stage.

Parking Analysis

The parking spaces will be assessed with respect to the City of Burlington's "Zoning By-Law Section 2.25" as well as the 2020 proposed amendment for the site and determine whether the proposed parking supply at the site is sufficient to accommodate the requirements.

Based on current site plan, Phase 1 (South Tower) proposes a parking rate of approximately 1.60 space/unit which would significantly meet the new 2020 City of Burlington parking rate requirements however Phase 2 (North Tower) proposes a parking rate of approximately 0.91 space/unit which would be significantly below the required parking rate. Besides, the site is located in very close proximity to GO Regional Transit as well as local transit routes that will support lower vehicle ownership for future residents. We also note that the proposed parking supply is in line with an OLT settlement for another site within the Aldershot MTSA.

For the Parking Study, we will complete the following:

- Review the minimum vehicle parking requirements for the proposed development per the City of Burlington Zoning By-Law Section 2.25 and compare the requirements with the proposed supply.
- Forecast the peak parking demand at the site based on parking survey data and ITE Parking Generation Manual.
- Compare to other recent development approvals such as at 35 Plains Road East, which resulted in approved parking rate of 0.93 spaces/unit for residents in 2016 that is significantly lower than the required Zoning By-Law parking requirements.
- Identify Transportation Demand Management (TDM) opportunities available at the site to assess potential site-specific measures that may be used to further support a reduced parking supply.
- Based on the findings, confirm the adequacy of the proposed parking supply to support the development.

Please confirm the above scope of work and the need for a parking justification study to support the proposed parking supply.

Transportation Demand Management (TDM) Plan

Analysis of existing and future Transportation Demand Management (TDM) opportunities will be conducted to reduce single-occupant vehicle (SOV) trips and promote alternative modes of transportation including transit and active transportation. Transit, cycling and pedestrian infrastructure in the vicinity of the site will also be assessed and recommendations related to how the site can integrate and support the existing multi-modal infrastructure will be made.

We kindly request the following information for inclusion in the study, along with any comments that arise with regards to the above Terms of Reference.

- Please confirm the use of the 2018 traffic counts conducted as part of the Paradigm TIS are acceptable for use within the TIS.
- Please provide signal timing plans available for the intersections of study identified in this Terms of Reference.
- Please confirm if the assumed growth rate is applicable or provide relevant growth rate(s) applicable to the roadways of study.
- Please confirm and provide any additional relevant background developments as well as the associated traffic impact studies that are to be included within our analysis.
- Please provide details of any planned roadway or transit improvements in the surrounding study area within the horizon years.
- Please confirm the need for a parking justification study based on the proposed parking rate at the site.

I hope the contents outlined in this email are acceptable. Should you have any questions or require any further information, please feel free to contact us.

Kind regards,

Aarzoo Dhanani

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Farah Tasnim

From: Aarzoo Dhanani
Sent: Tuesday, July 26, 2022 11:16 AM
To: Tessaro, Zachary
Cc: Brandon Bradt; Farah Tasnim
Subject: RE: 1062-1074 Cooke Blvd

Thanks Zach!

I appreciate your quick response and we will proceed with the provided information.

Have a nice day!

Regards,
Aarzoo

Aarzoo Dhanani, EIT, M.Eng. | Engineering Intern
211 Yonge Street, Suite 600 | Toronto, ON M5B 1M4
T: 416.477.3392



Crozier Connections:

Read our latest news and announcements here.

From: Tessaro, Zachary <Zachary.Tessaro@burlington.ca>
Sent: Tuesday, July 26, 2022 11:02 AM
To: Aarzoo Dhanani <adhanani@cfcrozier.ca>
Subject: RE: 1062-1074 Cooke Blvd

Hey Aarzoo,

After looking into it, MTO does not need to be contacted for this development and the intersections you have provided is acceptable. No counts are needed at the hwy 403-Waterdown interchange. In terms of transit, I have been notified that no changes are planned to be made in the coming years.

All the best,

Zachary Tessaro
Transportation Planning Technologist
Transportation

(905) 335-7600 ext. 7691
zachary.tessaro@burlington.ca

From: Aarzoo Dhanani <adhanani@cfcrozier.ca>
Sent: Tuesday, July 26, 2022 10:02 AM
To: Tessaro, Zachary <Zachary.Tessaro@burlington.ca>
Cc: Brandon Bradt <bbradt@cfcrozier.ca>; Farah Tasnim <ftasnim@cfcrozier.ca>
Subject: RE: 1062-1074 Cooke Blvd

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Thank you Zach. Looking forward for your response!

Regards,
Aarzoo

Aarzoo Dhanani, EIT, M.Eng. | Engineering Intern
211 Yonge Street, Suite 600 | Toronto, ON M5B 1M4
T: 416.477.3392



Crozier Connections:

Read our latest news and announcements here.

From: Tessaro, Zachary <Zachary.Tessaro@burlington.ca>
Sent: Monday, July 25, 2022 12:23 PM
To: Aarzoo Dhanani <adhanani@cfcrozier.ca>
Subject: RE: 1062-1074 Cooke Blvd

Hi Aarzoo,

Sorry for the late follow up. I will let you know by tomorrow for sure. In terms of the transit improvements, I am still waiting to hear back about that, but hopefully I will get you some details on that shortly.

All the best,

Zachary Tessaro
Transportation Planning Technologist
Transportation

(905) 335-7600 ext. 7691
zachary.tessaro@burlington.ca

From: Aarzoo Dhanani <adhanani@cfcrozier.ca>
Sent: Monday, July 25, 2022 12:05 PM
To: Tessaro, Zachary <Zachary.Tessaro@burlington.ca>
Cc: Brandon Bradt <bbradt@cfcrozier.ca>; Farah Tasnim <ftasnim@cfcrozier.ca>
Subject: RE: 1062-1074 Cooke Blvd

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Hey Zach,

I hope you had a nice weekend!

Just following up to check if you reviewed our findings and if you could confirm our scope at earliest. We are hoping to submit our work before the deadline.

Let me know if you have any questions of concern!

Regards,
Aarzoo

Aarzoo Dhanani, EIT, M.Eng. | Engineering Intern
211 Yonge Street, Suite 600 | Toronto, ON M5B 1M4
T: 416.477.3392



Crozier Connections:

Read our latest news and announcements here.

From: Tessaro, Zachary <Zachary.Tessaro@burlington.ca>
Sent: Monday, July 18, 2022 4:23 PM
To: Aarzoo Dhanani <adhanani@cfcrozier.ca>
Subject: RE: 1062-1074 Cooke Blvd

Hey Aarzoo,

I just have to review your findings and get back to you about the Hwy 403-Waterdown interchange.

All the best,

Zachary Tessaro
Transportation Planning Technologist
Transportation

(905) 335-7600 ext. 7691
zachary.tessaro@burlington.ca

From: Aarzoo Dhanani <adhanani@cfcrozier.ca>
Sent: Monday, July 18, 2022 3:09 PM
To: Tessaro, Zachary <Zachary.Tessaro@burlington.ca>
Subject: RE: 1062-1074 Cooke Blvd

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

Hey Zach,

Thank you for your response!

Regarding consultation with MTO for the development, it is noted that the property lies outside the MTO Controlled Permit Area and our client would not like to get MTO involved in the project considering scope of work and scale of development.

We have recently submitted a Transportation Impact Study for the development at 1029-1033 Waterdown Road in December 2021 which is adjacent to our current site and MTO was not involved considering the location outside permit area and the intersection of Hwy 403 and Waterdown Rd was also not part of the study. We would like to keep assumptions similar to previous studies conducted in vicinity to perform our traffic analysis considering the analysis of the intersection of Waterdown Road and Masonry Court would justify the traffic impact.

I hope the following information suffice our study and please confirm if the intersection of Hwy 403 and Waterdown Rd is still required to be included!

Best,
Aarzoo

Aarzoo Dhanani, EIT, M.Eng. | Engineering Intern
211 Yonge Street, Suite 600 | Toronto, ON M5B 1M4
T: 416.477.3392



Crozier Connections:

Read our latest news and announcements here.

From: Tessaro, Zachary <Zachary.Tessaro@burlington.ca>
Sent: Monday, July 18, 2022 1:37 PM
To: Aarzoo Dhanani <adhanani@cfcrozier.ca>
Cc: Dan Ozimkovic <danijel.ozimkovic@burlington.ca>
Subject: 1062-1074 Cooke Blvd

Hi Aarzoo,

Here is my comments for the Terms of Reference for 1062-1074 Cooke Blvd.

The intersections you have included are acceptable, but we would like you to include the signalized intersections for the Hwy 403-Waterdown Rd Interchange as well. Data collected in 2018 is acceptable, just a reminder that the data needs to be in line with our regulations. The background developments that have been proposed in this study is acceptable. Growth rate of 1% is acceptable as well. Please refer to this report for your parking justification City-wide Parking Standards Review - City of Burlington. For Signal Timings please email Steve Vrakela (Steve.vrakela@burlington.ca) and for TMC Data contact Patrau Florin (Patrau.florin@burlington.ca). In terms of capital projects Plains Road E will be under construction in a projected year of 2026. Here is the description "Arterial Road resurfacing typically involves removal and replacement of the wearing surface asphalt layer and other necessary minor rehabilitation of storm sewers, curb & gutter and sidewalks." This will occur from Waterdown Rd to Gallagher Rd. In 2022 Plains Road West will be under construction. The description of the construction is "Arterial Road resurfacing typically involves removal and replacement of the wearing surface asphalt layer and other necessary minor rehabilitation of storm sewers, curb & gutter and sidewalks." This will occur between Waterdown Rd and Spring Gardens Rd. Lastly, the Park Avenue Area Renewal project which is projected to occur in 2023. The description of this project is "Park Avenue East, Park Avenue West and Aldershot Place have been identified as requiring a full depth road resurfacing with improvements to road drainage. This process involves the removal and replacement of the asphalt surface."

As the development is close to the interchange of Waterdown and the 403 have you contacted the MTO about this development? Also, I am still waiting on Transit for additional information regarding your request. I will be forwarding your response as soon as I get it. If there is anything else you would like or anything I have not answered please let me know.

All the best,

Zachary Tessaro
Transportation Planning Technologist
Transportation

(905) 335-7600 ext. 7691
zachary.tessaro@burlington.ca

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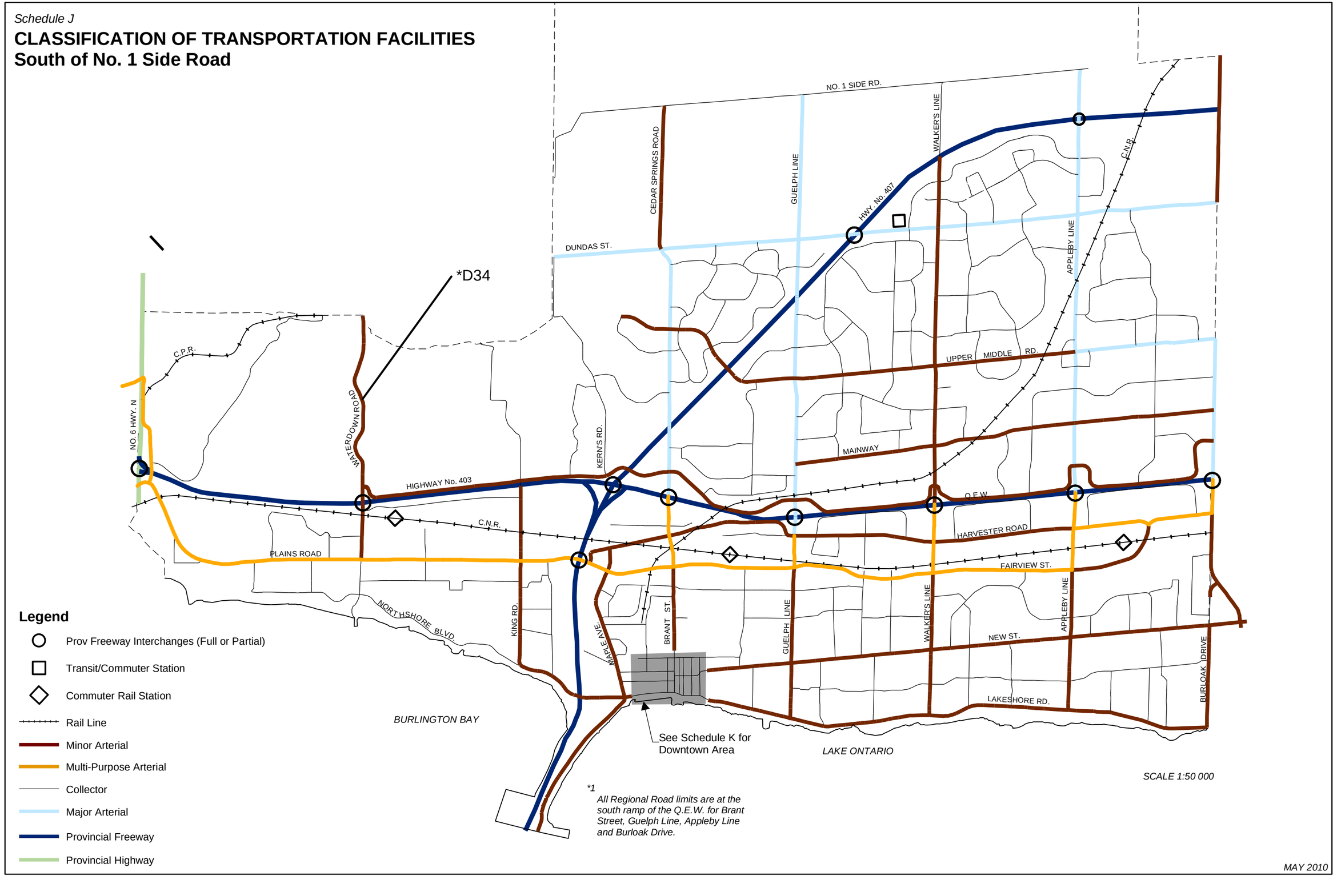
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APPENDIX B

City of Burlington Official Plan Excerpts

Schedule J

CLASSIFICATION OF TRANSPORTATION FACILITIES
South of No. 1 Side Road



Legend

- Prov Freeway Interchanges (Full or Partial)
- Transit/Commuter Station
- Commuter Rail Station
- Rail Line
- Minor Arterial
- Multi-Purpose Arterial
- Collector
- Major Arterial
- Provincial Freeway
- Provincial Highway

*1 *All Regional Road limits are at the south ramp of the Q.E.W. for Brant Street, Guelph Line, Appleby Line and Burloak Drive.*

MAY 2010

MAP 1
EXISTING NETWORK

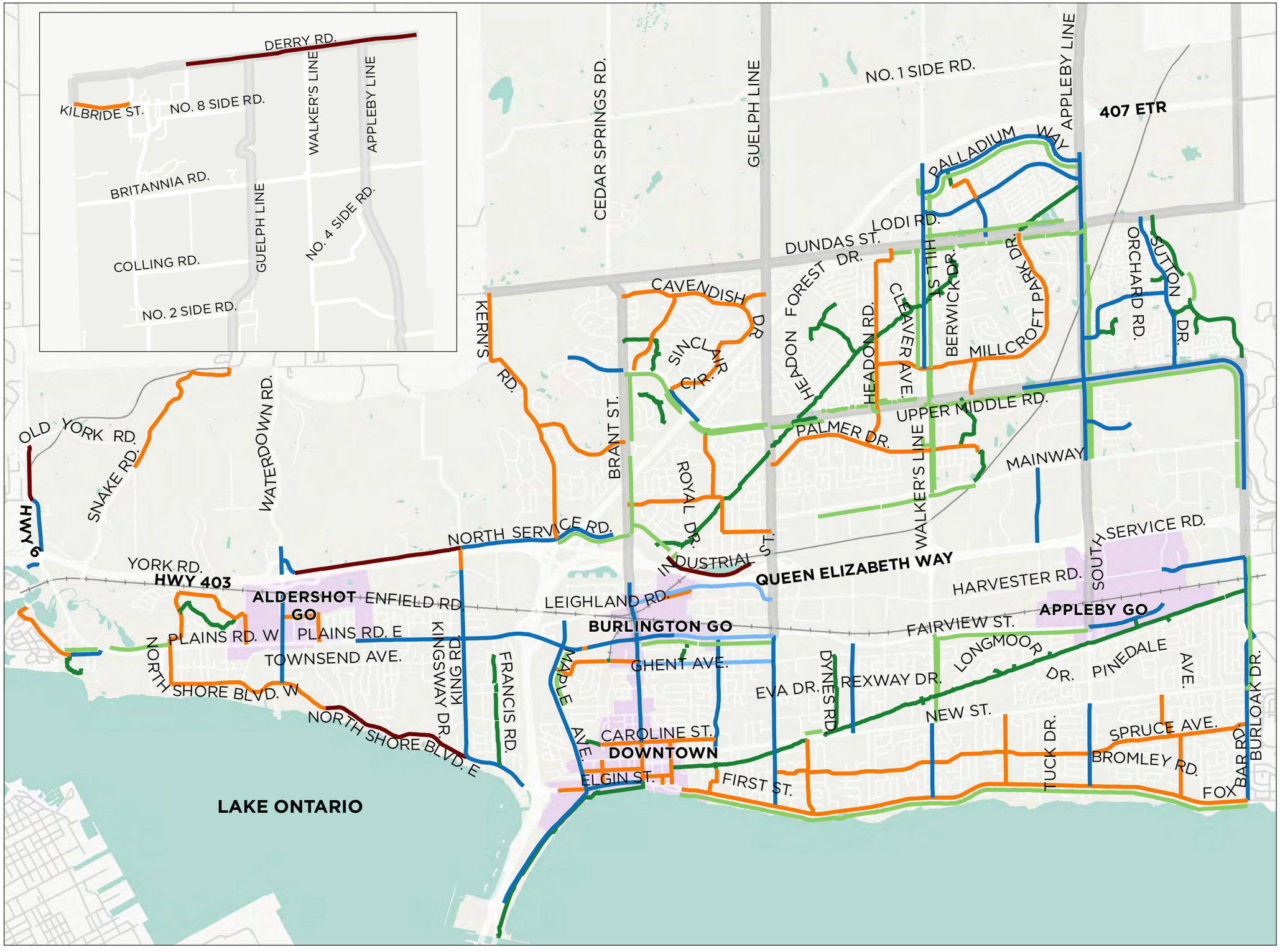
BURLINGTON CYCLING MASTER PLAN

EXISTING FACILITIES

- Multi-Use Trail
- Multi-Use Path
- Painted Bike Lane
- Painted Bike Lane / Shared
- Signed Route
- Paved Shoulder

FEATURES AND BOUNDARIES

- Regional Road
- Railway
- Mobility Hub
- Waterbody
- Burlington



CITY OF Burlington

0 0.75 1.5 KILOMETRES
5 MIN BIKE RIDE

alta PLANNING + DESIGN

Data provided by the City of Burlington, Region of Halton, and Statistics Canada.
Map produced July 2019.

DRAFT - 08/01/2019

SCHEDULE B-1
Growth Framework
City of Burlington

Legend

Growth Areas
- Primary Growth Area
- Secondary Growth Area
- Employment Growth Area
- Established Neighbourhood Area

MTSA Special Planning Areas

Designated Greenfield Area
- Developed Area Outside Delineated Built Boundary
- Undeveloped Area Outside Delineated Built Boundary (not subject to Growth Framework)

Contextual References
- Natural Heritage System and Major Parks and Open Space
- Infrastructure and Transportation Corridors
- Municipal Boundary
- Urban Boundary
- Delineated Built Boundary
- Urban Growth Centre Boundary

RURAL AREA

NORTH ALDERSHOT

HAMILTON

BURLINGTON BAY

LAKE ONTARIO

OAKVILLE

HWY 407 · HWY 403 · HWY 6 · Q.E.W. · C.N.R. · DUNDAS ST. · UPPER MIDDLE ROAD · UPPER MIDDLE RD. · PLAINS RD. W. · PLAINS RD. E · FAIRVIEW ST. · LAKESHORE RD. · NORTH SHORE BLVD. E · NORTH SERVICE RD. · SOUTH SERVICE RD. · LEIGHLAND RD. · HARVESTER RD. · MAINWAY · MOUNTAINSIDE DR. · CAVENDISH DR. · HEADON FOREST DR. · MILLCROFT PARK DR. · DRYDEN AVE · NEW ST. · SPRUCE AVE · TOWNSEND AVE. · EASTPORT DR. · PALLADIUM WAY · THOMAS ALTON BLVD. · CEDAR SPRINGS RD. · GUELPH LINE · APPLEBY LINE · TREMAINE RD. · BURLOAK DR. · WALKER'S LINE · BERWICK DR. · SUTTON RD. · HEADON RD. · KERNS RD. · BRANT ST. · FISHER AVE. · KING RD. · MAPLE AVE. · BELVENIA ROAD · HAMPTON · HEATH RD. · CORPORATE DR.

0 0.5 1 2 3 4 5 Km

The Major Transit Station Area Special Planning Area boundaries, identified on this schedule, have been identified by the City. The final boundaries of the major transit station areas will be delineated by the Region of Halton through its Municipal Comprehensive Review.

This schedule shall be used in conjunction with other applicable schedules and policies of this Plan.

NOVEMBER 2020

APPENDIX C

Transit Maps and Schedules

ROUTE SERVICE TIMES

Route		Peak Only	M-F	Sat	Sun	Hol
1	Plains		●	●	●	●
1x	Plains		●			
2	Brant		●	●	●	●
2A	Brant	●	●			
3	Guelph - Downtown		●	●	●	●
3A	Guelph - Downtown		●			
4	Central		●	●	●	
5	Francis - Downtown		●	●		
6	Headon		●	●	●	●
10	New - Maple		●	●	●	●
11	Sutton - Alton		●	●	●	●
12	Upper Middle		●	●	●	●
15A	Appleby - Walkers	AM	●			
15B	Walkers - Appleby	PM	●			
20	Burloak - Lakeshore		●	●	●	●
21	Fairview		●	●	●	●
25	Walkers		●	●	●	
40A	Pinedale - Hampton Heath	AM	●			
40B	Pinedale - Hampton Heath	PM	●			
48	Millcroft	●	●	September to June		
80	Harvester		●			
81	North Service	●	●			
83	North Service	Midday	●			
87	North Service - Aldershot	●	●			
101	Plains Express		●			
50	Burlington South	Late Night	●	●		
51	Burlington Northeast	Late Night	●	●		
52	Burlington Northwest	Late Night	●	●		
300	Aldershot		●			
301	Pinedale		●			
302	Tansley Woods		●			

MAP LEGEND

Transit

- Regular Service Bus Route
- Peak Service Bus Route[1]
- Limited Service Bus Route
- Late Night Service Bus Route
- GO Station
- HSR Transfer Point
- Oakville Transit Transfer Point
- Community Connection Route

Symbols

- Hospital
- Shopping Centre
- Arena
- City Hall
- Courthouse
- Library
- Recreation Centre
- Community Centre
- Museum / Attraction
- Outdoor Pool
- Indoor Pool
- Information
- Public Secondary School
- Public Elementary School
- Catholic Secondary School
- Catholic Elementary School

[1]Peak hours are weekdays approximately 5 to 9 a.m. and 3 to 7 p.m.

0 0.5 1 Km
0 0.5 1 Mi

No 1 Side Rd
Tremaine Rd
Alton Village
Thomas Alton Bl
Tim Dobbie Dr
Dundas-Walmart Plaza
Dr. Frank J. Hayden
Haber
John William Boich
Appleby-Dundas Plaza
Dundas St
407 ETR
Hwy 407
Headon Forest
Northampton Bl
Berton Av
Berwick Dr
Sarazen Dr
Constable Henshaw Bl
Walkers Line
Charles R. Beaudoin
St. Christopher
Sutton Dr
Orchard Park
Appleby Line
Millcroft Park Dr
Country Club Dr
Sacred Heart Of Jesus
St. Timothy's
Notre Dame
Headon Forest Dr
Cavendish Dr
Coventry Way
Bruce T. Lindley
Brant Hills
Ireland House
C.H. Norton
Florence Meares
Millcroft Centre
St. Elizabeth Seton
Alexander's
Heron Way
Upper Middle Rd
Corpus Christi
Tansley Woods
Itabashi Way
Walker Place
Upper Middle Rd
Burlington Supercentre
Angela Coughlan
M.M. Robinson
Upper Brant Plaza
Paul A. Fisher
St. Mark
Upper Middle Rd
Brant St
Tyandaga Park Dr
Kerns Rd
Rolling Meadows
Augustine Dr
St. Gabriel's
Mountainside
Fisher Av
Mount Forest Dr
Power Centre
Yorkton Plaza
Burlington Heights Centre
Canadian Martyrs
Sir E. Macmillan
Dr. Charles Best
Lester B. Pearson
Headon Rd
Guelph Line
Lansdown Dr
Mainway Plaza
Dillon Rd
Mainway
Corporate Dr
Burloak Dr
Clarksdale
Costco
Mainway Business Centre
Davidson Plaza
Heritage Rd
Queen Elizabeth Way
Bronte Creek Provincial Park
Ontario Court of Justice
Queensway Dr
North Service Rd
Harvester Rd
Wyecroft Rd
Rio-Can Burloak
Appleby Ice Centre
Sherwood Forest
Hwy 403
GO Station Access Rd
Waterdown Rd
Royal Botanical Gardens
Plains Rd W
Plains Rd E
Holy Rosary
Maplehurst
Fortinos Plaza
Glenview
Aldershot
Townsend Av
North Shore Bl W
North Shore Bl E
Lasalle Park Rd
LaSalle Park (Wading)
Shadeland Av
King Rd
King's Road
Francis Rd
Warwick Dr
Surrey La
Sainte-Philippe
Mapleview Mall
Maple Av
Maple Mews
Westgate Plaza
Brant Plaza
Burlington Square
Student Theatre
Tom Thomson
Burlington Mall
Prospect St
Woodview Place
Fairview St
Tecumseh
Assumption
Rotary Youth
Central
St. John's
Brant Plaza
Drury La
Cumberland Av
Rexway Dr
Ryerson
Longmoor Dr
Pauline Johnson
Appleby
Eastway Plaza
Nelson
Pinedale Av
Frontenac
Robert Bateman
Ascension
Appleby Mall
Centennial
New St
St. Paul's
YMCA Burlington Seniors
Music Centre
Central
Roseland Plaza
St. Raphael's
Gary Allan
John T. Tuck
Walkers Line
Guelph Line
Renaissance
Ontario St
City Hall
Burlington Art Centre
John St
Elizabeth St
James St
Pine St
Discovery Landing
The Burlington Performing Art Centre
Visitor
Joseph Brant Museum
Joseph Brant Memorial
North Shore Bl E
Lakeshore
Lakeshore Rd
Pineland
Mohawk Gardens
St. Patrick's
Skyway Arena
Lakeside Plaza
Heath Rd
Hampton
Clive Cr
Burlington Bay
Lake Ontario

Aldershot: 1x 87 VIA 87
Burlington: 1+ 2+ 3+ 5 6 10 12+ 21 25 80 81 87 101 50 51 52
Downtown: 3 4 5 10 50 52 300 11
Appleby: 4 10 11 15A 20 21 40A 80 81 83 14

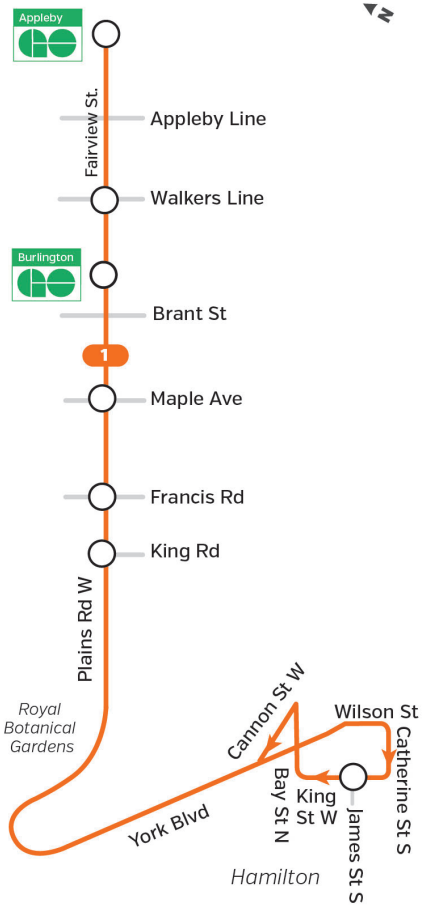
HAMILTON

Hwy 403
York Bl
Dundurn St N
Main St W
Queen St S
King St W
King St N
Bay
James St N
James St S
John St N
John St S
Catharine St N
Wilson St
Caimon St W
City Hall
Hamilton

MacLean Cartography
Cartography & Design 2017
BURLINGTON TRANSIT

Route 1 Plains/ Plains Express

Effective May 15, 2022



Burlingtontransit.ca
905-639-0550
contactbt@burlington.ca
#BurlONTransit

BURLINGTON TRANSIT

1 Plains – Fairview

Weekdays to Appleby GO

King & James (Hamilton)	Royal Botanical Gdns. (Plains Rd.)	Plains Rd. & Waterdown Rd.	Plains Rd. & Long Dr. (near King Rd.)	Fairview St. & Maple Av.	Fairview St. at Burlington GO	Fairview St. & Walkers Line	Appleby GO Station
4:45	4:55	4:59	5:02	5:06	5:09	5:14	5:19
5:00	5:10	5:14	5:17	5:21	5:24	5:29	5:34
5:15	5:25	5:29	5:32	5:36	5:39	5:44	5:49
5:30	5:40	5:44	5:47	5:51	5:54	5:59	6:04
5:40	5:50	5:54	5:57	6:01	6:04	6:09	6:14
And every 10 minutes until							
8:50	9:03	9:07	9:11	9:15	9:18	9:23	9:29
9:00	9:13	9:17	9:21	9:25	9:28	9:33	9:39
9:15	9:28	9:32	9:36	9:40	9:43	9:48	9:54
9:30	9:43	9:47	9:51	9:55	9:58	10:03	10:09
9:45	9:58	10:02	10:06	10:10	10:13	10:18	10:24
And every 15 minutes until							
3:00	**3:13**	**3:17**	**3:21**	**3:25**	**3:28**	**3:33**	**3:39**
3:10	**3:23**	**3:27**	**3:31**	**3:35**	**3:38**	**3:43**	**3:49**
3:20	**3:33**	**3:37**	**3:41**	**3:45**	**3:48**	**3:53**	**3:59**
3:30	**3:43**	**3:47**	**3:51**	**3:55**	**3:58**	**4:03**	**4:09**
3:40	**3:53**	**3:57**	**4:01**	**4:05**	**4:08**	**4:13**	**4:19**
And every 10 minutes until							
6:50	**7:03**	**7:07**	**7:11**	**7:15**	**7:18**	**7:23**	**7:29**
7:00	**7:10**	**7:14**	**7:17**	**7:21**	**7:25**	**7:30**	**7:35**
7:15	**7:25**	**7:29**	**7:32**	**7:36**	**7:40**	**7:45**	**7:50**
7:30	**7:40**	**7:44**	**7:47**	**7:51**	**7:55**	**8:00**	**8:05**
7:45	**7:55**	**7:59**	**8:02**	**8:06**	**8:10**	**8:15**	**8:20**
And every 15 minutes until							
10:15	**10:25**	**10:29**	**10:32**	**10:36**	**10:40**	**10:45**	**10:50**
10:30	**10:40**	**10:44**	**10:47**	**10:51**	**10:55**	**11:00**	**11:05**
10:45	**10:55**	**10:59**	**11:02**	**11:06**	**11:10**	**11:15**	**11:20**
11:00	**11:10**	**11:14**	**11:17**	**11:21**	**11:25**	**11:30**	**11:35**
11:15	**11:25**	**11:29**	**11:32**	**11:36**	**11:40**	**11:45**	**11:50**
11:30	**11:40**	**11:44**	**11:47**	**11:51**	**11:55**	12:00	12:05
11:45	**11:55**	**11:59**	12:02	12:06	12:10	12:15	12:20
12:00	12:10	12:14	12:17	12:21	12:25	12:30	12:35
12:25	12:35	12:39	12:42	12:46	12:50	12:55	1:00

1 Plains – Fairview

Weekdays to Hamilton

Appleby GO Station	Fairview St. & Walkers Line	Fairview St. at Burlington GO	Fairview St. & Maple Av.	Plains Rd. & Long Dr. (near King Rd.)	Plains Rd. & Waterdown Rd.	Royal Botanical Gdns. (Plains Rd.)	King & James (Hamilton)
4:52	4:57	5:02	5:05	5:08	5:11	5:16	5:26
5:07	5:12	5:17	5:20	5:23	5:26	5:31	5:41
5:22	5:27	5:32	5:35	5:38	5:41	5:46	5:56
5:37	5:42	5:47	5:50	5:53	5:56	6:01	6:11
5:52	5:57	6:02	6:05	6:08	6:11	6:16	6:26
6:07	6:12	6:17	6:20	6:23	6:26	6:31	6:41
6:17	6:22	6:27	6:30	6:33	6:36	6:41	6:51
And every 10 minutes until							
9:20	9:26	9:31	9:34	9:38	9:42	9:47	10:00
9:35	9:41	9:46	9:49	9:53	9:57	10:02	10:15
9:50	9:56	10:01	10:04	10:08	10:12	10:17	10:30
10:05	10:11	10:16	10:19	10:23	10:27	10:32	10:45
10:20	10:26	10:31	10:34	10:38	10:42	10:47	11:00
And every 15 minutes until							
2:50	**2:56**	**3:01**	**3:04**	**3:08**	**3:12**	**3:17**	**3:30**
3:05	**3:11**	**3:16**	**3:19**	**3:23**	**3:27**	**3:32**	**3:45**
3:15	**3:21**	**3:26**	**3:29**	**3:33**	**3:37**	**3:42**	**3:55**
And every 10 minutes until							
6:50	**6:56**	**7:01**	**7:04**	**7:08**	**7:12**	**7:17**	**7:30**
7:05	**7:11**	**7:16**	**7:19**	**7:23**	**7:27**	**7:32**	**7:45**
7:20	**7:26**	**7:31**	**7:34**	**7:38**	**7:42**	**7:47**	**8:00**
7:35	**7:41**	**7:46**	**7:49**	**7:53**	**7:57**	**8:02**	**8:15**
7:50	**7:56**	**8:01**	**8:04**	**8:08**	**8:12**	**8:17**	**8:30**
8:05	**8:10**	**8:16**	**8:19**	**8:22**	**8:25**	**8:30**	**8:40**
And every 15 minutes until							
10:50	**10:55**	**11:01**	**11:04**	**11:07**	**11:10**	**11:15**	**11:25**
11:05	**11:10**	**11:16**	**11:19**	**11:22**	**11:25**	**11:30**	**11:40**
11:20	**11:25**	**11:31**	**11:34**	**11:37**	**11:40**	**11:45**	**11:55**
11:35	**11:40**	**11:46**	**11:49**	**11:52**	**11:55**	12:00	12:10
11:50	**11:55**	12:01	12:04	12:07	12:10	12:15	12:25
12:05	12:10	12:16	12:19	12:22	12:25	12:30	12:40
12:20	12:25	12:31	12:34	12:37	12:40	12:45	12:55
12:35	12:40	12:46	12:49	12:52	12:55	1:00	1:10

1 Plains – Fairview

Saturday to Appleby GO

King & James (Hamilton)	Royal Botanical Gdns. (Plains Rd.)	Plains Rd. & Waterdown Rd.	Plains Rd. & Long Dr. (near King Rd.)	Fairview St. & Maple Av.	Fairview St. at Burlington GO	Fairview St. & Walkers Line	Appleby GO Station
6:30	6:40	6:44	6:47	6:51	6:54	6:59	7:04
6:45	6:55	6:59	7:02	7:06	7:09	7:14	7:19
And every 15 minutes until							
7:30	**7:40**	**7:44**	**7:47**	**7:51**	**7:55**	**8:00**	**8:05**
8:00	**8:10**	**8:14**	**8:17**	**8:21**	**8:28**	**8:32**	**8:35**
And every 30 minutes until							
11:00	**11:10**	**11:14**	**11:17**	**11:21**	**11:28**	**11:32**	**11:35**
11:30	**11:40**	**11:44**	**11:47**	**11:51**	**11:58**	12:02	12:05
12:00	12:08	12:11	12:13	12:16	12:21	12:23	12:25

1 Plains – Fairview

Saturday to Hamilton

Appleby GO Station	Fairview St. & Walkers Line	Fairview St. at Burlington GO	Fairview St. & Maple Av.	Plains Rd. & Long Dr. (near King Rd.)	Plains Rd. & Waterdown Rd.	Royal Botanical Gdns. (Plains Rd.)	King & James (Hamilton)
6:35	6:40	6:45	6:48	6:52	6:55	6:59	7:09
6:50	6:55	7:00	7:03	7:07	7:10	7:14	7:24
And every 15 minutes until							
7:15	**7:20**	**7:26**	**7:29**	**7:33**	**7:36**	**7:39**	**7:50**
7:45	**7:50**	**7:56**	**7:59**	**8:03**	**8:06**	**8:09**	**8:20**
And every 30 minutes until							
11:15	**11:20**	**11:26**	**11:29**	**11:33**	**11:36**	**11:39**	**11:50**
11:45	**11:50**	**11:56**	**11:59**	12:03	12:06	12:09	12:20
12:15	12:20	12:26	12:29	12:33	12:36	12:39	12:50

1 Plains – Fairview

Sunday/Holidays to Appleby GO

King & James (Hamilton)	Royal Botanical Gdns. (Plains Rd.)	Plains Rd. & Waterdown Rd.	Plains Rd. & Long Dr. (near King Rd.)	Fairview St. & Maple Av.	Fairview St. at Burlington GO	Fairview St. & Walkers Line	Appleby GO Station
6:45	6:55	6:59	7:02	7:06	7:09	7:14	7:19
7:00	7:10	7:14	7:17	7:21	7:24	7:29	7:34
And every 15 minutes until							
7:00	**7:10**	**7:14**	**7:17**	**7:21**	**7:25**	**7:30**	**7:35**
7:30	**7:40**	**7:44**	**7:47**	**7:51**	**7:55**	**8:00**	**8:05**
8:00	**8:10**	**8:14**	**8:17**	**8:21**	**8:25**	**8:30**	**8:35**
8:30	**8:40**	**8:44**	**8:47**	**8:51**	**8:55**	**9:00**	**9:05**
9:00	**9:08**	**9:14**	**9:17**	**9:21**	**9:25**	**9:30**	**9:35**
9:30	**9:38**	**9:44**	**9:47**	**9:51**	**9:55**	**10:00**	**10:05**

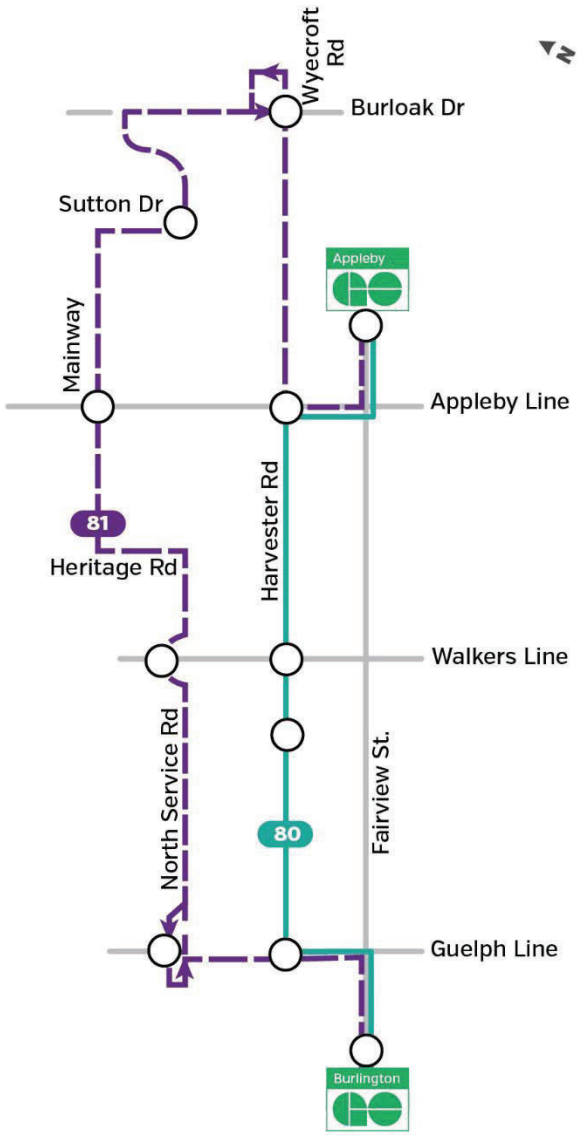
1 Plains – Fairview

Sunday/Holidays to Hamilton

Appleby GO Station	Fairview St. & Walkers Line	Fairview St. at Burlington GO	Fairview St. & Maple Av.	Plains Rd. & Long Dr. (near King Rd.)	Plains Rd. & Waterdown Rd.	Royal Botanical Gdns. (Plains Rd.)	King & James (Hamilton)
6:35	6:40	6:45	6:48	6:52	6:55	6:59	7:09
6:50	6:55	7:00	7:03	7:07	7:10	7:14	7:24
And every 15 minutes until							
7:00	**7:05**	**7:11**	**7:14**	**7:18**	**7:21**	**7:25**	**7:35**
7:15	**7:20**	**7:26**	**7:29**	**7:33**	**7:36**	**7:40**	**7:50**
7:45	**7:50**	**7:56**	**7:59**	**8:03**	**8:06**	**8:10**	**8:20**
8:15	**8:20**	**8:26**	**8:29**	**8:33**	**8:36**	**8:40**	**8:50**
8:45	**8:50**	**8:56**	**8:59**	**9:03**	**9:06**	**9:10**	**9:20**
9:15	**9:20**	**9:26**	**9:29**	**9:33**	**9:36**	**9:40**	**9:50**

Route 80/81 Harvester/ North Service

Effective May 15, 2022

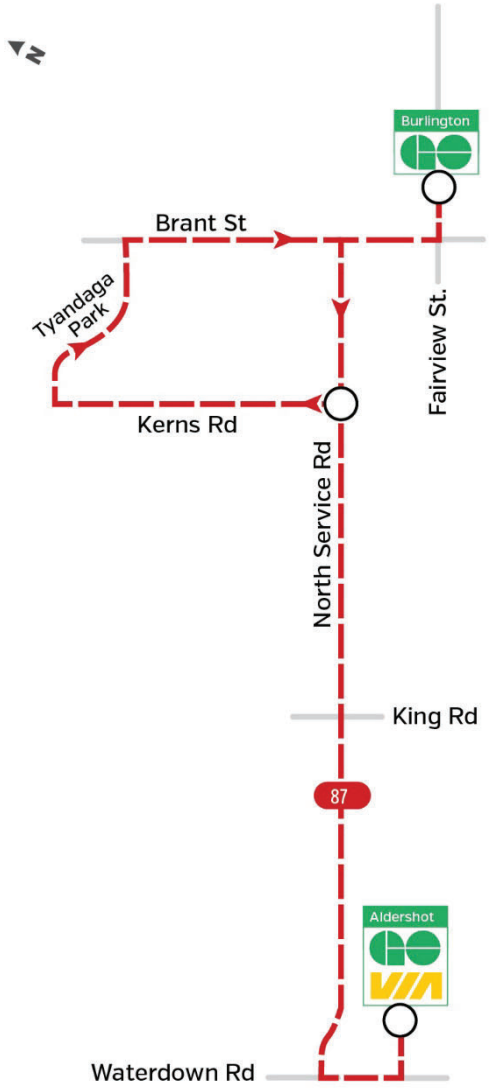


Burlingtontransit.ca
905-639-0550
contactbt@burlington.ca
#BurlONTransit

BURLINGTON TRANSIT

Route 87 North Service - Aldershot

Effective May 15, 2022



Burlingtontransit.ca
905-639-0550
contactbt@burlington.ca
#BurlONTransit

BURLINGTON TRANSIT

81 North Service

Weekdays to Burlington GO

Appleby GO Station	RioCan Centre	Sutton Dr. & North Service Rd.	Mainway & Appleby Line	North Service Rd. & Walkers Line	North Service Rd. & Guelph Line	Burlington GO Station
5:40	5:52	5:54	5:59	6:04	6:07	6:11
6:10	6:22	6:24	6:29	6:34	6:37	6:41
6:40	6:52	6:54	6:59	7:04	7:07	7:11
7:10	7:22	7:24	7:29	7:34	7:37	7:41
7:40	7:52	7:54	7:59	8:04	8:07	8:11
8:10	8:22	8:24	8:29	8:34	8:37	8:41
8:40	8:52	8:54	8:59	9:04	9:07	9:11
9:10	9:22	9:24	9:29	9:34	9:37	9:41
9:40	9:52	9:54	9:59	10:04	10:07	10:11
10:10	10:22	10:24	10:29	10:34	10:37	10:41
10:40	10:52	10:54	10:59	11:04	11:07	11:11
11:10	11:22	11:24	11:29	11:34	11:37	11:41
11:40	11:52	11:54	11:59	**12:04**	**12:07**	**12:11**
12:10	**12:22**	**12:24**	**12:29**	**12:34**	**12:37**	**12:41**
12:40	**12:52**	**12:54**	**12:59**	**1:04**	**1:07**	**1:11**
1:10	**1:22**	**1:24**	**1:29**	**1:34**	**1:37**	**1:41**
1:40	**1:52**	**1:54**	**1:59**	**2:04**	**2:07**	**2:11**
2:10	**2:22**	**2:24**	**2:29**	**2:34**	**2:37**	**2:41**
2:40	**2:52**	**2:54**	**2:59**	**3:04**	**3:07**	**3:11**
3:10	**3:22**	**3:24**	**3:29**	**3:34**	**3:37**	**3:41**
3:40	**3:52**	**3:54**	**3:59**	**4:04**	**4:07**	**4:11**
4:10	**4:22**	**4:24**	**4:29**	**4:34**	**4:37**	**4:41**
4:40	**4:52**	**4:54**	**4:59**	**5:04**	**5:07**	**5:11**
5:10	**5:22**	**5:24**	**5:29**	**5:34**	**5:37**	**5:41**
5:40	**5:52**	**5:54**	**5:59**	**6:04**	**6:07**	**6:11**
6:10	**6:22**	**6:24**	**6:29**	**6:34**	**6:37**	**6:41**
6:40	**6:52**	**6:54**	**6:59**	**7:04**	**7:07**	**7:11**

87 North Service – Aldershot

Weekdays to Aldershot GO

Burlington GO Station	North Service Rd. & Kerns Rd.	Aldershot GO Station
Morning		
5:30	5:40	5:48
6:15	6:25	6:33
7:00	7:10	7:18
7:45	7:55	8:03
8:30	8:40	8:48
Afternoon		
2:30	**2:40**	**2:48**
3:15	**3:25**	**3:33**
4:00	**4:10**	**4:18**
4:45	**4:55**	**5:03**
5:30	**5:40**	**5:48**
6:15	**6:25**	**6:33**

APPENDIX D

Traffic Data

Intersection Name:	TS ID:	Line No:	Model:	IP address:	Controller Make:
Plains Road @ Cooke Blvd	117	4	ACS/3	172.24.15.2	Econolite

Type of Operation: 8 Phase Semi-Actuated

No	Date			Description	Prepared by:
	Y	M	D		
5	2019	5	8	Plains Road Optimization	MA
6	2022	6	23	Plains Optimization	JR

*-Start from Main Menu

PHASE DESCRIPTION

Ph1		Ph5	EBLT - Plains Road
Ph2	EB - Plains Road	Ph6	WB - Plains Road
Ph3		Ph7	
Ph4	NB - Driveway	Ph8	SB - Cooke Blvd

CONFIGURATION (PHASE SEQ): PHASE IN USE/EXCLUSIVE PED (MM) *- 1 - 2

Phase:	1	2	3	4	5	6	7	8
Phase in Use		X		X	X	X		X
Exclusive PED								

CONTROLLER TIMING DATA - VEHICLE TIMING * - 2 - 1

Timing Plan: 1

	Phase: 1	2	3	4	5	6	7	8
Minimum Green		8		8	6	8		8
Walk		8		8		8		8
Ped. Clearance		11		14		11		14
Pedestrian Carry Over								
Vehicle Extension		3		3	3	3		3
MAX 1		40		30	10	40		30
MAX 2		40		30	10	40		30
Yellow Change		3.7		3.3	3	3.7		3.3
Red Clearance		2.3		2.6		2.3		2.6
Phase Minimum:	0.0	25.0	0.0	27.9	9.0	25.0	0.0	27.9

PHASE DATA - VEHICLE AND PEDESTRIAN RECALLS * - 2 - 8

Phase:	1	2	3	4	5	6	7	8
Lock Detector								
Vehicle Recall								
Pedestrian Recall		X				X		
MAX Recall		X				X		
Min Recall								

COORDINATION: COORDINATOR PATTERN, SPLIT PATTERN *** - 3 - 2, - 3 - 3**

Coordinator Pattern (CP)	Cycle Length	Offset (sec)	Timing Plan	Split Pattern	Phases (sec)							
					1	2	3	4	5	6	7	8
1	110	102	1	1		78		32	16	62		32
2	90	84	1	2		52		38	12	40		38
3	110	96	1	3		78		32	16	62		32
4	90	12	1	4		60		30	12	48		30
10	0	0	1	10		0		0	0	0		0

TIME BASE: ACTION PLAN, DAY PLAN *** - 5 - 2, - 5 - 3, -5 - 4**

Day Plan	Sched. #	Action Plan	Time Period	Pattern	Timing Plan
1	1	4	06:00	4	1
1	1	1	07:00	1	1
1	1	2	09:00	2	1
1	1	3	15:30	3	1
1	1	4	19:00	4	1
1	1	10	22:00	254	1
2	2	4	08:00	4	1
2	2	3	10:30	3	1
2	2	4	17:00	4	1
2	2	10	21:00	254	1
3	3	4	09:30	4	1
3	3	2	12:00	2	1
3	3	4	17:00	4	1
3	3	10	21:00	254	1

Schedule 1 = Day Plan 1
Schedule 2 = Day Plan 2
Schedule 3 = Day Plan 3

Day Plan 1 (Weekday)
Day Plan 2 (Saturday)
Day Plan 3 (Sunday, Holidays)

Action Plan 10 = free (254)

Special Programming:

TIME BASE DATA - TIME OF YEAR EVENTS *** - 5 - 5**

Events	Exception Day		MON/ MON	DOW/ DOW	WOM/ Year	Day Plan
New Year's Day	1	Fixed	1	1	0	3
Family Day	2	Float	2	2	3	3
Good Friday	3	Float	4	6	1	3
Victoria Day	4	Float	5	2	3	3
Canada Day	5	Fixed	7	1	0	3
Civic Day	6	Float	8	2	1	3
Labour Day	7	Float	9	2	1	3
Thanksgiving	8	Float	10	2	2	3
Christmas Day	9	Fixed	12	25	0	3

Intersection Name:	TS ID:	Line No:	Model:	IP address:	Controller Make:
Plains Road @ Waterdown Rd	100	4	ACS/3	172.24.7.2	Econolite

Type of Operation: 8 Phase Semi-Actuated

No	Date			Description	Prepared by:
	Y	M	D		
8	2019	5	15	Plains Road Optimization	MA
9	2022	5	19	Increase Main Street min green	JR
10	2022	6	23	Optimization	JR

*-Start from Main Menu

PHASE DESCRIPTION

Ph1	WBLT - Plains Road	Ph5	EBLT - Plains Road
Ph2	EB - Plains Road	Ph6	WB - Plains Road
Ph3	SBLT - Waterdown Road	Ph7	NBLT - Waterdown Road
Ph4	NB - Waterdown Road	Ph8	SB - Waterdown Road

CONFIGURATION (PHASE SEQ): PHASE IN USE/EXCLUSIVE PED (MM) *- 1 - 2

Phase:	1	2	3	4	5	6	7	8
Phase in Use	X	X	X	X	X	X	X	X
Exclusive PED								

CONTROLLER TIMING DATA - VEHICLE TIMING * - 2 - 1

Timing Plan: 1

Phase:	1	2	3	4	5	6	7	8
Minimum Green	6	20	6	8	6	20	6	8
Walk		8		10		8		10
Ped. Clearance		13		17		17		17
Pedestrian Carry Over								
Vehicle Extension	3	3	3	3	3	3	3	3
MAX 1	12	35	12	25	12	35	12	25
MAX 2	12	35	12	25	12	35	12	25
Yellow Change	3	3.7	3	3.3	3	3.7	3	3.3
Red Clearance		2.6		3		2.6		3
Phase Minimum:	9.0	27.3	9.0	33.3	9.0	31.3	9.0	33.3

PHASE DATA - VEHICLE AND PEDESTRIAN RECALLS * - 2 - 8

Phase:	1	2	3	4	5	6	7	8
Lock Detector								
Vehicle Recall								
Pedestrian Recall								
MAX Recall		X				X		
Min Recall								

COORDINATION: COORDINATOR PATTERN, SPLIT PATTERN *** - 3 - 2, - 3 - 3**

Coordinator Pattern (CP)	Cycle Length	Offset (sec)	Timing Plan	Split Pattern	Phases (sec)							
					1	2	3	4	5	6	7	8
1	110	0	1	1	12	51	13	34	31	32	10	37
2	90	84	1	2	12	34	10	34	14	32	10	34
3	110	0	1	3	15	49	20	26	18	46	10	36
4	90	2	1	4	12	34	10	34	14	32	10	34
10	0	0	1	10	0	0	0	0	0	0	0	0

TIME BASE: ACTION PLAN, DAY PLAN *** - 5 - 2, - 5 - 3, -5 - 4**

Day Plan	Sched. #	Action Plan	Time Period	Pattern	Timing Plan
1	1	4	06:00	4	1
1	1	1	07:00	1	1
1	1	2	09:00	2	1
1	1	3	15:30	3	1
1	1	4	19:00	4	1
1	1	10	22:00	254	1
2	2	4	08:00	4	1
2	2	3	10:30	3	1
2	2	4	17:00	4	1
2	2	10	21:00	254	1
3	3	4	09:30	4	1
3	3	2	12:00	2	1
3	3	4	17:00	4	1
3	3	10	21:00	254	1

Schedule 1 = Day Plan 1
Schedule 2 = Day Plan 2
Schedule 3 = Day Plan 3

Day Plan 1 (Weekday)
Day Plan 2 (Saturday)
Day Plan 3 (Sunday, Holidays)

Action Plan 10 = free (254)

Special Programming:

TIME BASE DATA - TIME OF YEAR EVENTS *** - 5 - 5**

Events	Exception Day		MON/ MON	DOW/ DOW	WOM/ Year	Day Plan
New Year's Day	1	Fixed	1	1	0	3
Family Day	2	Float	2	2	3	3
Good Friday	3	Float	4	6	1	3
Victoria Day	4	Float	5	2	3	3
Canada Day	5	Fixed	7	1	0	3
Civic Day	6	Float	8	2	1	3
Labour Day	7	Float	9	2	1	3
Thanksgiving	8	Float	10	2	2	3
Christmas Day	9	Fixed	12	25	0	3

Intersection Name:	TS ID:	Line No:	Model:	IP address:	Controller Make:
Waterdown Rd @ Masonry Crt	104	4	ACS/3	172.22.8.2	Econolite

Type of Operation: 8 Phase Semi-Actuated

*-Start from Main Menu

No	Date			Description	Prepared by
	Y	M	D		JR
8	2017	12	19	Timings reverted back to original	
9	2020	12	9	Increased phase 2 & 6 all-red	

PHASE DESCRIPTION

Ph1	SBL - Waterdown Road	Ph5	
Ph2	NB - Waterdown Road	Ph6	SB - Waterdown Road
Ph3		Ph7	
Ph4	EB - Railway Road	Ph8	WB - Masonry Court

PHASE IN USE/EXCLUSIVE PED (MM) *- 1 - 2

Phase:	1	2	3	4	5	6	7	8
Phase in Use	X	X		X		X		X
Exclusive PED								

CONTROLLER TIMING DATA - VEHICLE TIMING * - 2 - 1

Timing Plan: 1

Phase:	1	2	3	4	5	6	7	8
Minimum Green	8	8		8		8		8
Walk		15		8		15		8
Ped. Clearance		14		14		14		14
Pedestrian Carry Over								
Vehicle Extension	3	3		5		3		5
MAX 1	15	40		30		40		30
MAX 2	15	40		30		40		30
Yellow Change	3	4		4		4		4
Red Clearance	0	3		3		3		3
Phase Minimum:	12	37	1	30	1	37	1	30

PHASE DATA - VEHICLE AND PEDESTRIAN RECALLS * - 2 - 8

Phase:	1	2	3	4	5	6	7	8
Lock Detector								
Vehicle Recall								
Pedestrian Recall		X				X		
MAX Recall		X				X		
Min Recall								

COORDINATION: COORDINATOR PATTERN, SPLIT PATTERN * - 3 - 2, - 3 - 3

Coordinator Pattern (CP)	Cycle Length	Offset (sec)	Timing Plan	Split Pattern	Phases (sec)							
					1	2	3	4	5	6	7	8
1	100	22	1	1	18	42		40		60		40
2	0	0	0	0	0	0		0		0		0
3	110	72	1	3	18	60		32		78		32
10	0	0	1	10	0	0		0		0		0

TIME BASE: ACTION PLAN, DAY PLAN * - 5 - 2, - 5 - 3, -5 - 4

Day Plan	Sched. #	Action Plan	Time Period	Pattern	Timing Plan
1	1	1	06:00	1	1
1	1	10	09:00	254	1
1	1	3	15:30	3	1
1	1	10	19:00	254	1
2	2	1	09:00	1	1
2	2	10	18:00	254	1
3	3	1	9:00	1	1
3	3	10	18:00	254	1

Schedule 1 = Day Plan 1
Schedule 2 = Day Plan 2
Schedule 3 = Day Plan 3

Day Plan 1 (Weekday)
Day Plan 2 (Saturday)
Day Plan 3 (Sunday, Holidays)

Action Plan 10 = free (254)

Special Programming:

TIME BASE DATA - TIME OF YEAR EVENTS * - 5 - 5

Events	Exception Day		MON/ MON	DOW/ DOW	WOM/ Year	Day Plan
New Year's Day	1	Fixed	1	1	0	3
Family Day	2	Float	2	2	3	3
Good Friday	3	Float	4	6	1	3
Victoria Day	4	Float	5	2	3	3
Canada Day	5	Fixed	7	1	0	3
Civic Day	6	Float	8	2	1	3

Labour Day	7	Float	9	2	1	3
Thanksgiving	8	Float	10	2	2	3
Christmas Day	9	Fixed	12	25	0	3

APPENDIX E

Level of Service Definitions

Level of Service Definitions

Two-Way Stop Controlled Intersections

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

Adapted from Highway Capacity Manual 2000, Transportation Research Board

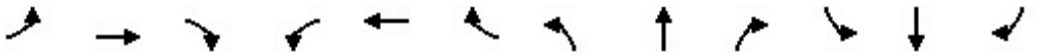
Signalized Intersections

Level of Service	Control Delay per Vehicle (seconds)	Interpretation
A	≤ 10	EXCELLENT. Extremely favourable progression with most vehicles arriving during the green phase. Most vehicles do not stop and short cycle lengths may contribute to low delay.
B	> 10 and ≤ 20	VERY GOOD. Very good progression and/or short cycle lengths with slightly more vehicles stopping than LOS "A" causing slightly higher levels of average delay.
C	> 20 and ≤ 35	GOOD. Fair progression and longer cycle lengths lead to a greater number of vehicles stopping than LOS "B".
D	> 35 and ≤ 55	FAIR. Congestion becomes noticeable with higher average delays resulting from a combination of long cycle lengths, high volume-to-capacity ratios and unfavourable progression.
E	> 55 and ≤ 80	POOR. Lengthy delays values are indicative of poor progression, long cycle lengths and high volume-to-capacity ratios. Individual cycle failures are common with individual movement failures also common.
F	> 80	UNSATISFACTORY. Indicative of oversaturated conditions with vehicular demand greater than the capacity of the intersection.

Adapted from Highway Capacity Manual 2000, Transportation Research Board

APPENDIX F

Synchro Reports – 2022 Existing



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	607	962	154	62	327	183	60	224	55	153	104	160
Future Volume (vph)	607	962	154	62	327	183	60	224	55	153	104	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	30.0		0.0	40.0		0.0	30.0		0.0	0.0		40.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	50.0			25.0			55.0			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.99		0.99	0.99		0.98	1.00		1.00		0.97
Frt		0.979			0.946			0.970				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3399	0	1662	3260	0	1711	1793	0	1662	1776	1479
Flt Permitted	0.246			0.238			0.685			0.268		
Satd. Flow (perm)	429	3399	0	413	3260	0	1211	1793	0	467	1776	1431
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			92			11				170
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		485.0			153.1			317.1			343.5	
Travel Time (s)		29.1			9.2			22.8			24.7	
Confl. Peds. (#/hr)	6		19	19		6	17		7	7		17
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	5%	3%	3%	5%	4%	4%	2%	2%	4%	5%	7%	8%
Adj. Flow (vph)	646	1023	164	66	348	195	64	238	59	163	111	170
Shared Lane Traffic (%)												
Lane Group Flow (vph)	646	1187	0	66	543	0	64	297	0	163	111	170
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			6.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes										
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		8
Detector Phase	5	2		1	6		7	4		3	8	8
Switch Phase												
Minimum Initial (s)	6.0	20.0		6.0	20.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	23.0	27.3		9.0	31.3		9.0	34.0		9.0	34.0	34.0
Total Split (s)	31.0	51.0		12.0	32.0		10.0	34.0		13.0	37.0	37.0
Total Split (%)	28.2%	46.4%		10.9%	29.1%		9.1%	30.9%		11.8%	33.6%	33.6%
Maximum Green (s)	28.0	44.7		9.0	25.7		7.0	27.7		10.0	30.7	30.7
Yellow Time (s)	3.0	3.7		3.0	3.7		3.0	3.3		3.0	3.3	3.3
All-Red Time (s)	0.0	2.6		0.0	2.6		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	3.0	6.3		3.0	6.3		3.0	6.3		3.0	6.3	6.3
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)		8.0			8.0			10.0			10.0	10.0
Flash Dont Walk (s)		13.0			17.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	65.6	53.7		36.4	25.7		32.4	22.3		38.4	27.1	27.1
Actuated g/C Ratio	0.60	0.49		0.33	0.23		0.29	0.20		0.35	0.25	0.25
v/c Ratio	1.02	0.71		0.30	0.65		0.17	0.80		0.61	0.25	0.35
Control Delay	66.2	26.5		18.1	35.6		23.7	56.0		34.9	34.6	7.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	66.2	26.5		18.1	35.6		23.7	56.0		34.9	34.6	7.0
LOS	E	C		B	D		C	E		C	C	A
Approach Delay		40.5			33.7			50.3			24.1	
Approach LOS		D			C			D			C	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 38.1 Intersection LOS: D
Intersection Capacity Utilization 96.9% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 1: Waterdown Rd & Plains Rd E



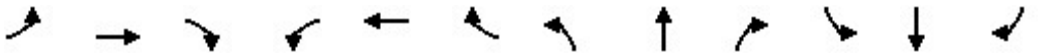


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	646	1187	66	543	64	297	163	111	170
v/c Ratio	1.02	0.71	0.30	0.65	0.17	0.80	0.61	0.25	0.35
Control Delay	66.2	26.5	18.1	35.6	23.7	56.0	34.9	34.6	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.2	26.5	18.1	35.6	23.7	56.0	34.9	34.6	7.0
Queue Length 50th (m)	~127.6	110.3	6.0	48.7	9.6	61.7	26.1	20.6	0.0
Queue Length 95th (m)	#218.2	154.8	13.6	68.1	18.0	88.3	40.2	34.5	16.4
Internal Link Dist (m)		461.0		129.1		293.1		319.5	
Turn Bay Length (m)	30.0		40.0		30.0				40.0
Base Capacity (vph)	632	1670	244	832	390	459	271	495	521
Starvation Cap Reductn	0	0	0	0	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	1.02	0.71	0.27	0.65	0.16	0.65	0.60	0.22	0.33

Intersection Summary

~ 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.

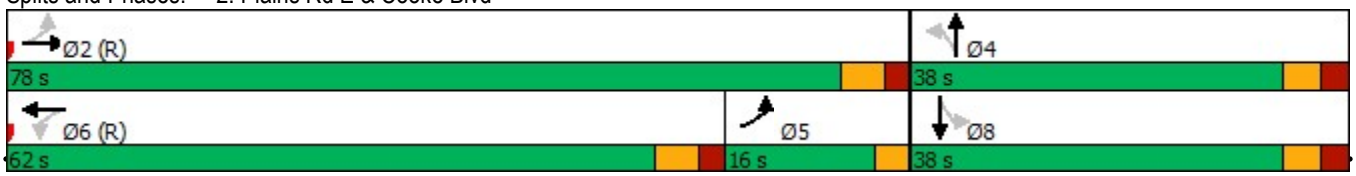


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	1121	0	0	574	38	0	0	0	6	0	17
Future Volume (vph)	85	1121	0	0	574	38	0	0	0	6	0	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.6	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	40.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (m)	25.0			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00						0.99	
Frt					0.991						0.899	
Flt Protected	0.950										0.988	
Satd. Flow (prot)	1728	3505	0	0	3394	0	0	1863	0	0	1415	0
Flt Permitted	0.403										0.914	
Satd. Flow (perm)	730	3505	0	0	3394	0	0	1863	0	0	1308	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					8						85	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		153.1			337.7			48.9			344.6	
Travel Time (s)		9.2			20.3			3.5			24.8	
Confl. Peds. (#/hr)	4					4				2		3
Peak Hour Factor	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.92	0.92	0.95	0.92	0.95
Heavy Vehicles (%)	1%	3%	2%	2%	5%	8%	2%	2%	2%	17%	2%	18%
Adj. Flow (vph)	89	1180	0	0	604	40	0	0	0	6	0	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	1180	0	0	644	0	0	0	0	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane					Yes							
Headway Factor	1.04	1.00	1.00	1.00	1.00	1.01	1.00	1.00	1.00	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA			NA					Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.7	26.0		26.0	26.0		27.9	27.9		27.9	27.9	
Total Split (s)	16.0	78.0		62.0	62.0		38.0	38.0		38.0	38.0	
Total Split (%)	13.8%	67.2%		53.4%	53.4%		32.8%	32.8%		32.8%	32.8%	
Maximum Green (s)	13.0	72.0		56.0	56.0		32.1	32.1		32.1	32.1	
Yellow Time (s)	3.0	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	0.0	2.3		2.3	2.3		2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	3.0	6.0			6.0			5.9			5.9	
Lead/Lag	Lag			Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		11.0		11.0	11.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	105.3	104.1			90.1						8.0	
Actuated g/C Ratio	0.91	0.90			0.78						0.07	
v/c Ratio	0.12	0.38			0.24						0.14	
Control Delay	1.5	2.1			5.4						1.7	
Queue Delay	0.0	0.3			0.0						0.0	
Total Delay	1.5	2.5			5.4						1.7	
LOS	A	A			A						A	
Approach Delay		2.4			5.4						1.7	
Approach LOS		A			A						A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 116			
Actuated Cycle Length: 116			
Offset: 12 (10%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.38			
Intersection Signal Delay: 3.4		Intersection LOS: A	
Intersection Capacity Utilization 70.8%		ICU Level of Service C	
Analysis Period (min) 15			

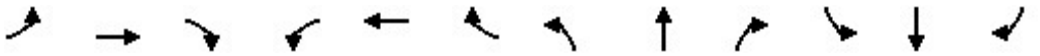
Splits and Phases: 2: Plains Rd E & Cooke Blvd





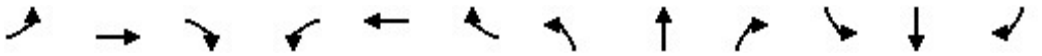
Lane Group	EBL	EBT	WBT	SBT
Lane Group Flow (vph)	89	1180	644	24
v/c Ratio	0.12	0.38	0.24	0.14
Control Delay	1.5	2.1	5.4	1.7
Queue Delay	0.0	0.3	0.0	0.0
Total Delay	1.5	2.5	5.4	1.7
Queue Length 50th (m)	2.3	28.8	27.4	0.0
Queue Length 95th (m)	4.2	35.6	35.5	0.0
Internal Link Dist (m)		129.1	313.7	320.6
Turn Bay Length (m)	40.0			
Base Capacity (vph)	770	3144	2637	423
Starvation Cap Reductn	0	1222	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.12	0.61	0.24	0.06

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	329	27	13	40	0	36	0	116	0	0	0
Future Volume (vph)	0	329	27	13	40	0	36	0	116	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.990						0.897				
Flt Protected					0.988			0.988				
Satd. Flow (prot)	0	1875	0	0	1809	0	0	1660	0	0	1900	0
Flt Permitted					0.988			0.988				
Satd. Flow (perm)	0	1875	0	0	1809	0	0	1660	0	0	1900	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		139.6			139.2			344.6			48.9	
Travel Time (s)		10.1			10.0			24.8			3.5	
Confl. Peds. (#/hr)	5					5	1		7	7		1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	0%	0%	4%	0%	5%	0%	6%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	406	33	16	49	0	44	0	143	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	439	0	0	65	0	0	187	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 36.5%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	329	27	13	40	0	36	0	116	0	0	0
Future Volume (Veh/h)	0	329	27	13	40	0	36	0	116	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	0	406	33	16	49	0	44	0	143	0	0	0
Pedestrians		1			7						5	
Lane Width (m)		3.6			3.6						3.6	
Walking Speed (m/s)		1.2			1.2						1.2	
Percent Blockage		0			1						0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		140										
pX, platoon unblocked				0.97			0.97	0.97	0.97	0.97	0.97	
vC, conflicting volume	54			439			504	508	430	658	525	55
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	54			405			473	477	395	632	494	55
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			91	100	77	100	100	100
cM capacity (veh/h)	1558			1128			473	466	634	290	456	1012

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	439	65	187	0
Volume Left	0	16	44	0
Volume Right	33	0	143	0
cSH	1558	1128	587	1700
Volume to Capacity	0.00	0.01	0.32	0.11
Queue Length 95th (m)	0.0	0.3	10.9	0.0
Control Delay (s)	0.0	2.1	14.0	0.0
Lane LOS		A	B	A
Approach Delay (s)	0.0	2.1	14.0	0.0
Approach LOS			B	A

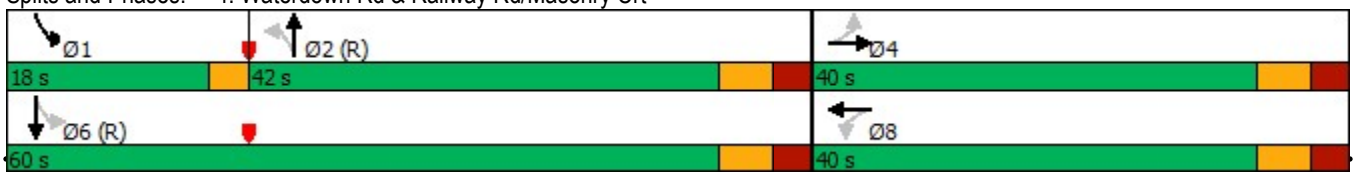
Intersection Summary				
Average Delay	4.0			
Intersection Capacity Utilization	36.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	1	11	6	0	78	7	906	91	278	382	19
Future Volume (vph)	28	1	11	6	0	78	7	906	91	278	382	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			70.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00			0.99		1.00	1.00		1.00	1.00	
Frt		0.961			0.850			0.986			0.993	
Flt Protected		0.967		0.950			0.950			0.950		
Satd. Flow (prot)	0	1158	0	1745	1518	0	1220	3395	0	1745	3280	0
Flt Permitted		0.743		0.730			0.506			0.204		
Satd. Flow (perm)	0	889	0	1341	1518	0	649	3395	0	375	3280	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			346			12			8	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		145.8			139.6			343.5			376.3	
Travel Time (s)		10.5			10.1			24.7			27.1	
Confl. Peds. (#/hr)	1					1	1		2	2		1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	54%	100%	45%	0%	0%	5%	43%	5%	1%	0%	7%	53%
Adj. Flow (vph)	29	1	12	6	0	82	7	954	96	293	402	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	6	82	0	7	1050	0	293	422	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		11.0	36.0	
Total Split (s)	40.0	40.0		40.0	40.0		42.0	42.0		18.0	60.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		42.0%	42.0%		18.0%	60.0%	
Maximum Green (s)	33.0	33.0		33.0	33.0		35.0	35.0		15.0	53.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		15.0	15.0			15.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)		11.0		11.0	11.0		58.4	58.4		82.0	79.4	
Actuated g/C Ratio		0.11		0.11	0.11		0.58	0.58		0.82	0.79	
v/c Ratio		0.39		0.04	0.17		0.02	0.53		0.55	0.16	
Control Delay		41.6		38.2	0.8		14.0	16.1		7.9	3.6	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		41.6		38.2	0.8		14.0	16.1		7.9	3.6	
LOS		D		D	A		B	B		A	A	
Approach Delay		41.6			3.3			16.0			5.4	
Approach LOS		D			A			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 22 (22%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 12.0		Intersection LOS: B	
Intersection Capacity Utilization 67.3%		ICU Level of Service C	
Analysis Period (min) 15			

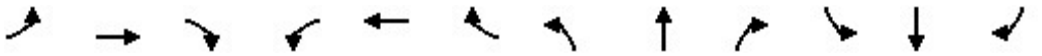
Splits and Phases: 4: Waterdown Rd & Railway Rd/Masonry Crt





Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	42	6	82	7	1050	293	422
v/c Ratio	0.39	0.04	0.17	0.02	0.53	0.55	0.16
Control Delay	41.6	38.2	0.8	14.0	16.1	7.9	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.6	38.2	0.8	14.0	16.1	7.9	3.6
Queue Length 50th (m)	5.8	1.1	0.0	0.6	67.5	11.4	10.2
Queue Length 95th (m)	16.0	4.8	0.0	3.5	110.2	29.8	18.4
Internal Link Dist (m)	121.8		115.6		319.5		352.3
Turn Bay Length (m)		15.0		20.0		15.0	
Base Capacity (vph)	301	442	732	379	1989	551	2606
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.01	0.11	0.02	0.53	0.53	0.16

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	535	98	59	1035	176	144	138	48	215	160	423
Future Volume (vph)	199	535	98	59	1035	176	144	138	48	215	160	423
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	30.0		0.0	40.0		0.0	30.0		0.0	0.0		40.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	50.0			25.0			55.0			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		0.98	1.00		0.98	0.99		0.99		0.97
Frt		0.977			0.978			0.961				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3386	0	1662	3385	0	1711	1771	0	1662	1776	1479
Flt Permitted	0.073			0.389			0.650			0.365		
Satd. Flow (perm)	128	3386	0	669	3385	0	1150	1771	0	635	1776	1429
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			18			14				287
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		485.0			153.1			317.1			343.5	
Travel Time (s)		29.1			9.2			22.8			24.7	
Confl. Peds. (#/hr)	6		19	19		6	17		7	7		17
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	5%	3%	3%	5%	4%	4%	2%	2%	4%	5%	7%	8%
Adj. Flow (vph)	212	569	104	63	1101	187	153	147	51	229	170	450
Shared Lane Traffic (%)												
Lane Group Flow (vph)	212	673	0	63	1288	0	153	198	0	229	170	450
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			6.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes										
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		8
Detector Phase	5	2		1	6		7	4		3	8	8
Switch Phase												
Minimum Initial (s)	6.0	20.0		6.0	20.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	9.0	27.3		9.0	31.3		9.0	33.3		9.0	34.0	34.0
Total Split (s)	18.0	49.0		15.0	46.0		10.0	34.0		20.0	44.0	44.0
Total Split (%)	15.3%	41.5%		12.7%	39.0%		8.5%	28.8%		16.9%	37.3%	37.3%
Maximum Green (s)	15.0	42.7		12.0	39.7		7.0	27.7		17.0	37.7	37.7
Yellow Time (s)	3.0	3.7		3.0	3.7		3.0	3.3		3.0	3.3	3.3
All-Red Time (s)	0.0	2.6		0.0	2.6		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	3.0	6.3		3.0	6.3		3.0	6.3		3.0	6.3	6.3
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)		8.0			8.0			10.0			10.0	10.0
Flash Dont Walk (s)		13.0			17.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	71.5	59.4		62.3	51.5		28.6	18.3		40.5	27.2	27.2
Actuated g/C Ratio	0.61	0.50		0.53	0.44		0.24	0.16		0.34	0.23	0.23
v/c Ratio	0.83	0.39		0.15	0.87		0.49	0.69		0.64	0.42	0.82
Control Delay	53.5	20.5		12.9	39.0		34.6	55.6		37.0	40.1	27.1
Queue Delay	0.0	0.0		0.0	15.4		0.0	0.0		0.0	0.0	0.0
Total Delay	53.5	20.5		12.9	54.5		34.6	55.6		37.0	40.1	27.1
LOS	D	C		B	D		C	E		D	D	C
Approach Delay		28.4			52.5			46.4			32.3	
Approach LOS		C			D			D			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 118			
Actuated Cycle Length: 118			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 95			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 40.7		Intersection LOS: D	
Intersection Capacity Utilization 87.3%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Waterdown Rd & Plains Rd E

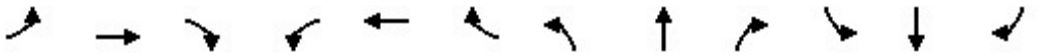




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	212	673	63	1288	153	198	229	170	450
v/c Ratio	0.83	0.39	0.15	0.87	0.49	0.69	0.64	0.42	0.82
Control Delay	53.5	20.5	12.9	39.0	34.6	55.6	37.0	40.1	27.1
Queue Delay	0.0	0.0	0.0	15.4	0.0	0.0	0.0	0.0	0.0
Total Delay	53.5	20.5	12.9	54.5	34.6	55.6	37.0	40.1	27.1
Queue Length 50th (m)	34.1	51.7	6.0	149.0	26.6	43.3	42.0	35.3	39.1
Queue Length 95th (m)	#78.3	82.4	14.9	#233.8	37.7	62.4	55.6	50.1	74.6
Internal Link Dist (m)		461.0		129.1		293.1		319.5	
Turn Bay Length (m)	30.0		40.0		30.0				40.0
Base Capacity (vph)	281	1714	479	1486	311	426	366	567	651
Starvation Cap Reductn	0	0	0	217	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	0.75	0.39	0.13	1.01	0.49	0.46	0.63	0.30	0.69

Intersection Summary

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

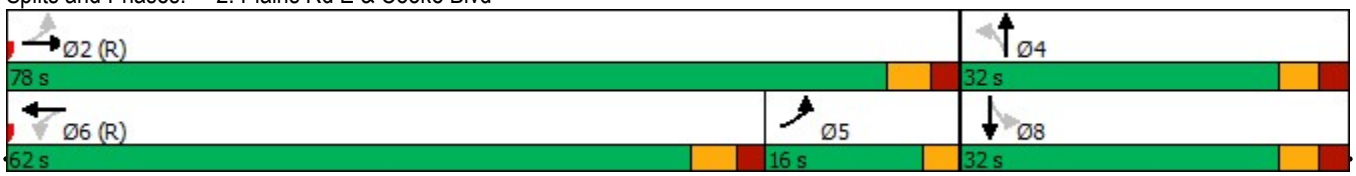


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	778	0	0	1217	59	0	0	0	33	0	32
Future Volume (vph)	5	778	0	0	1217	59	0	0	0	33	0	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.6	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	40.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (m)	25.0			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00						0.99	
Frt					0.993						0.933	
Flt Protected	0.950										0.975	
Satd. Flow (prot)	1728	3505	0	0	3405	0	0	1863	0	0	1459	0
Flt Permitted	0.182										0.840	
Satd. Flow (perm)	331	3505	0	0	3405	0	0	1863	0	0	1255	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					6						89	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		153.1			337.7			48.9			344.6	
Travel Time (s)		9.2			20.3			3.5			24.8	
Confl. Peds. (#/hr)	4					4				2		3
Peak Hour Factor	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.92	0.92	0.95	0.92	0.95
Heavy Vehicles (%)	1%	3%	2%	2%	5%	8%	2%	2%	2%	17%	2%	18%
Adj. Flow (vph)	5	819	0	0	1281	62	0	0	0	35	0	34
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	819	0	0	1343	0	0	0	0	0	69	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane					Yes							
Headway Factor	1.04	1.00	1.00	1.00	1.00	1.01	1.00	1.00	1.00	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA			NA					Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.7	26.0		26.0	26.0		27.9	27.9		27.9	27.9	
Total Split (s)	16.0	78.0		62.0	62.0		32.0	32.0		32.0	32.0	
Total Split (%)	14.5%	70.9%		56.4%	56.4%		29.1%	29.1%		29.1%	29.1%	
Maximum Green (s)	13.0	72.0		56.0	56.0		26.1	26.1		26.1	26.1	
Yellow Time (s)	3.0	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	0.0	2.3		2.3	2.3		2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	3.0	6.0			6.0			5.9			5.9	
Lead/Lag	Lag			Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		11.0		11.0	11.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	96.3	93.9			90.7						8.2	
Actuated g/C Ratio	0.88	0.85			0.82						0.07	
v/c Ratio	0.01	0.27			0.48						0.39	
Control Delay	1.6	2.3			5.2						12.7	
Queue Delay	0.0	0.3			0.0						0.0	
Total Delay	1.6	2.6			5.2						12.7	
LOS	A	A			A						B	
Approach Delay		2.6			5.2						12.7	
Approach LOS		A			A						B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 12 (11%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.48			
Intersection Signal Delay: 4.5		Intersection LOS: A	
Intersection Capacity Utilization 53.2%		ICU Level of Service A	
Analysis Period (min) 15			

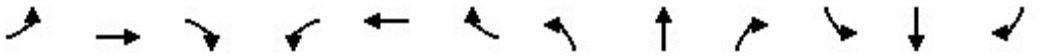
Splits and Phases: 2: Plains Rd E & Cooke Blvd





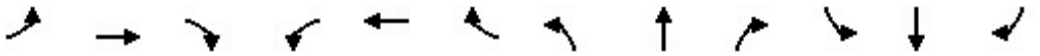
Lane Group	EBL	EBT	WBT	SBT
Lane Group Flow (vph)	5	819	1343	69
v/c Ratio	0.01	0.27	0.48	0.39
Control Delay	1.6	2.3	5.2	12.7
Queue Delay	0.0	0.3	0.0	0.0
Total Delay	1.6	2.6	5.2	12.7
Queue Length 50th (m)	0.2	17.3	35.8	0.0
Queue Length 95th (m)	0.6	23.8	99.0	9.4
Internal Link Dist (m)		129.1	313.7	320.6
Turn Bay Length (m)	40.0			
Base Capacity (vph)	453	2990	2807	365
Starvation Cap Reductn	0	1352	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.50	0.48	0.19

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	32	8	46	176	0	114	0	9	0	0	0
Future Volume (vph)	0	32	8	46	176	0	114	0	9	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.973						0.990				
Flt Protected					0.990			0.956				
Satd. Flow (prot)	0	1834	0	0	1809	0	0	1703	0	0	1900	0
Flt Permitted					0.990			0.956				
Satd. Flow (perm)	0	1834	0	0	1809	0	0	1703	0	0	1900	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		139.6			139.2			344.6			48.9	
Travel Time (s)		10.1			10.0			24.8			3.5	
Confl. Peds. (#/hr)	5					5	1		7	7		1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	0%	0%	4%	0%	5%	0%	6%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	40	10	57	217	0	141	0	11	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	50	0	0	274	0	0	152	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

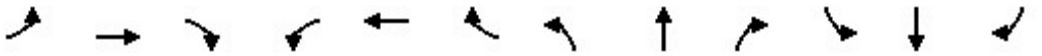
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 37.1%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	32	8	46	176	0	114	0	9	0	0	0
Future Volume (Veh/h)	0	32	8	46	176	0	114	0	9	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	0	40	10	57	217	0	141	0	11	0	0	0
Pedestrians		1			7						5	
Lane Width (m)		3.6			3.6						3.6	
Walking Speed (m/s)		1.2			1.2						1.2	
Percent Blockage		0			1						0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		140										
pX, platoon unblocked												
vC, conflicting volume	222			50			377	381	52	399	386	223
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	222			50			377	381	52	399	386	223
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			75	100	99	100	100	100
cM capacity (veh/h)	1353			1570			555	532	1015	536	529	817

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	50	274	152	0
Volume Left	0	57	141	0
Volume Right	10	0	11	0
cSH	1353	1570	574	1700
Volume to Capacity	0.00	0.04	0.26	0.45
Queue Length 95th (m)	0.0	0.9	8.5	0.0
Control Delay (s)	0.0	1.8	13.5	0.0
Lane LOS		A	B	A
Approach Delay (s)	0.0	1.8	13.5	0.0
Approach LOS			B	A

Intersection Summary				
Average Delay	5.3			
Intersection Capacity Utilization	37.1%	ICU Level of Service	A	
Analysis Period (min)	15			

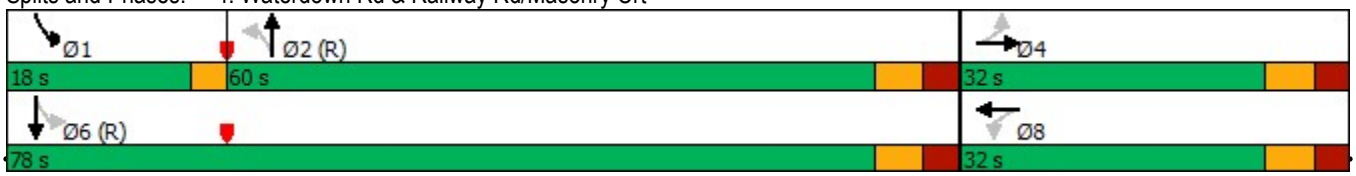


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	0	6	35	0	247	10	512	13	37	747	17
Future Volume (vph)	19	0	6	35	0	247	10	512	13	37	747	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			70.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00			0.99		1.00	1.00		1.00	1.00	
Frt		0.969			0.850			0.996			0.997	
Flt Protected		0.963		0.950			0.950			0.950		
Satd. Flow (prot)	0	1167	0	1745	1517	0	1220	3426	0	1745	3330	0
Flt Permitted		0.331		0.740			0.348			0.428		
Satd. Flow (perm)	0	401	0	1359	1517	0	447	3426	0	785	3330	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		69			436			3			4	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		145.8			139.6			343.5			376.3	
Travel Time (s)		10.5			10.1			24.7			27.1	
Confl. Peds. (#/hr)	1					1	1		2	2		1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	54%	100%	45%	0%	0%	5%	43%	5%	1%	0%	7%	53%
Adj. Flow (vph)	20	0	6	37	0	260	11	539	14	39	786	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	0	37	260	0	11	553	0	39	804	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		11.0	36.0	
Total Split (s)	32.0	32.0		32.0	32.0		60.0	60.0		18.0	78.0	
Total Split (%)	29.1%	29.1%		29.1%	29.1%		54.5%	54.5%		16.4%	70.9%	
Maximum Green (s)	25.0	25.0		25.0	25.0		53.0	53.0		15.0	71.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		15.0	15.0			15.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)		10.7		10.7	10.7		78.7	78.7		89.3	85.3	
Actuated g/C Ratio		0.10		0.10	0.10		0.72	0.72		0.81	0.78	
v/c Ratio		0.26		0.28	0.48		0.03	0.23		0.06	0.31	
Control Delay		6.1		50.4	3.0		7.2	6.4		2.5	4.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		6.1		50.4	3.0		7.2	6.4		2.5	4.2	
LOS		A		D	A		A	A		A	A	
Approach Delay		6.1			8.9			6.4			4.1	
Approach LOS		A			A			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 22 (20%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.48			
Intersection Signal Delay: 5.7		Intersection LOS: A	
Intersection Capacity Utilization 59.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: Waterdown Rd & Railway Rd/Masonry Crt



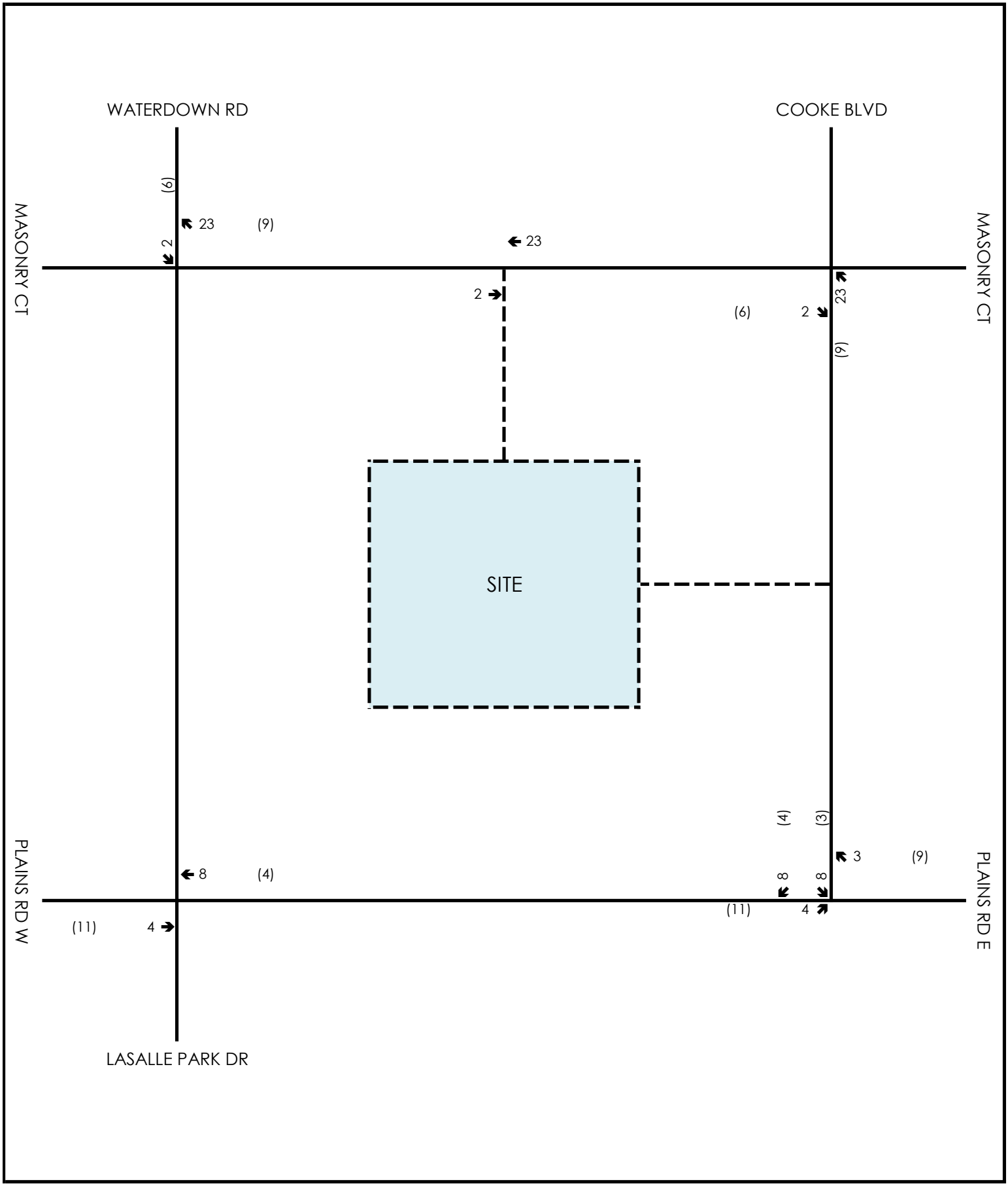


Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	26	37	260	11	553	39	804
v/c Ratio	0.26	0.28	0.48	0.03	0.23	0.06	0.31
Control Delay	6.1	50.4	3.0	7.2	6.4	2.5	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.1	50.4	3.0	7.2	6.4	2.5	4.2
Queue Length 50th (m)	0.0	7.9	0.0	0.7	22.4	1.3	22.5
Queue Length 95th (m)	0.0	18.0	0.0	3.1	34.4	3.9	36.0
Internal Link Dist (m)	121.8		115.6		319.5		352.3
Turn Bay Length (m)		15.0		20.0		15.0	
Base Capacity (vph)	144	308	681	319	2450	768	2581
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.12	0.38	0.03	0.23	0.05	0.31

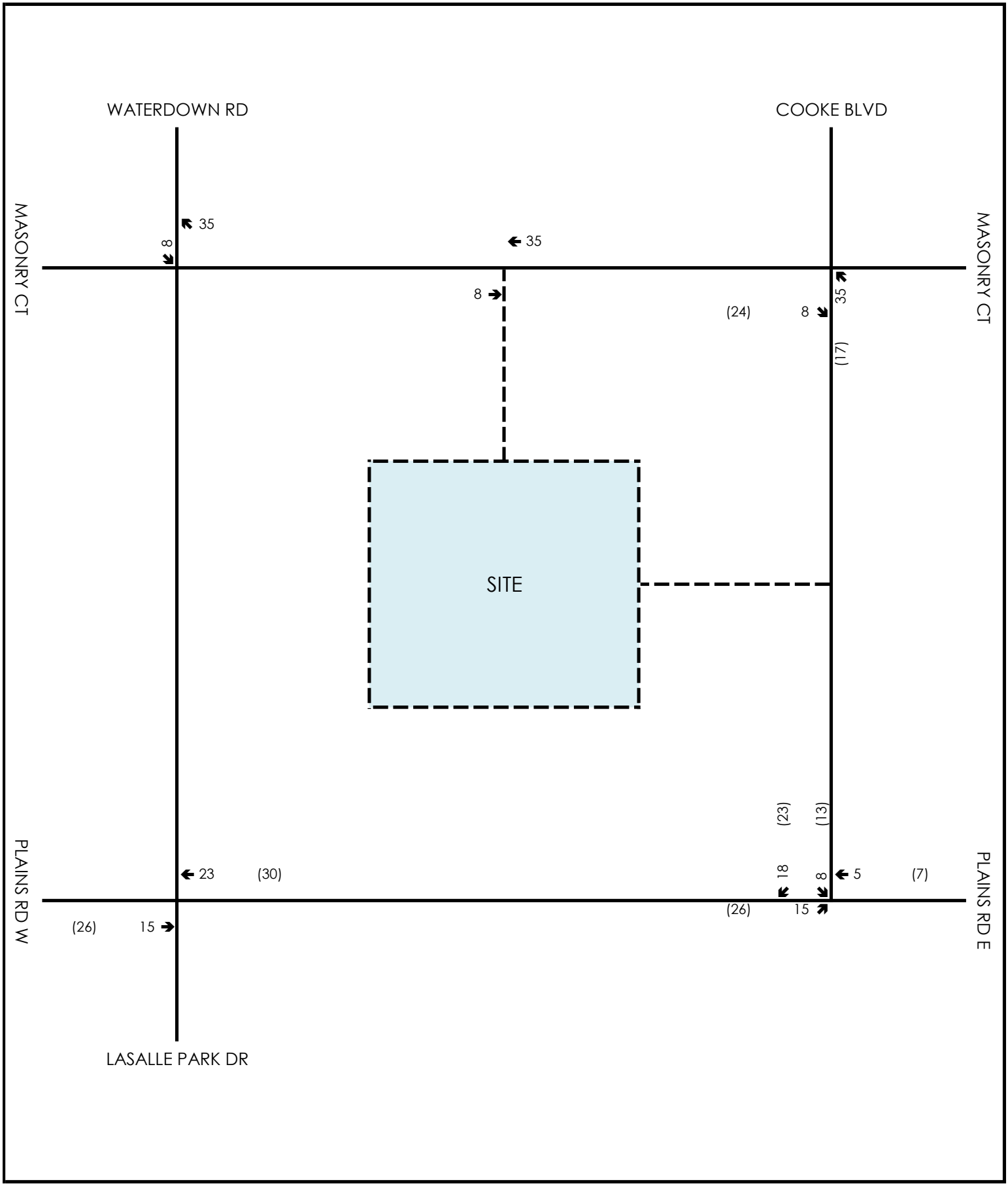
Intersection Summary

APPENDIX G

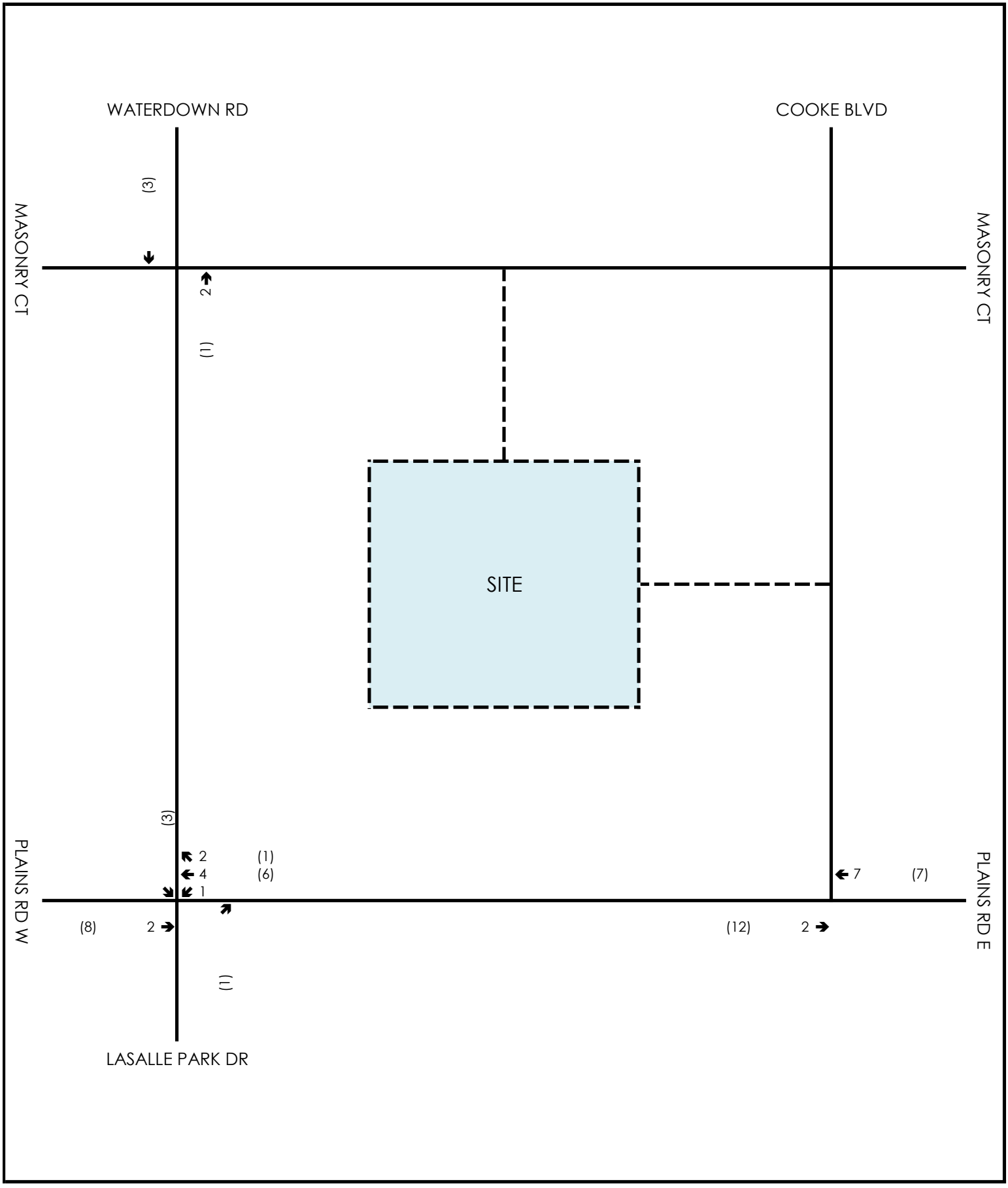
Background Development Trips and Report Excerpts



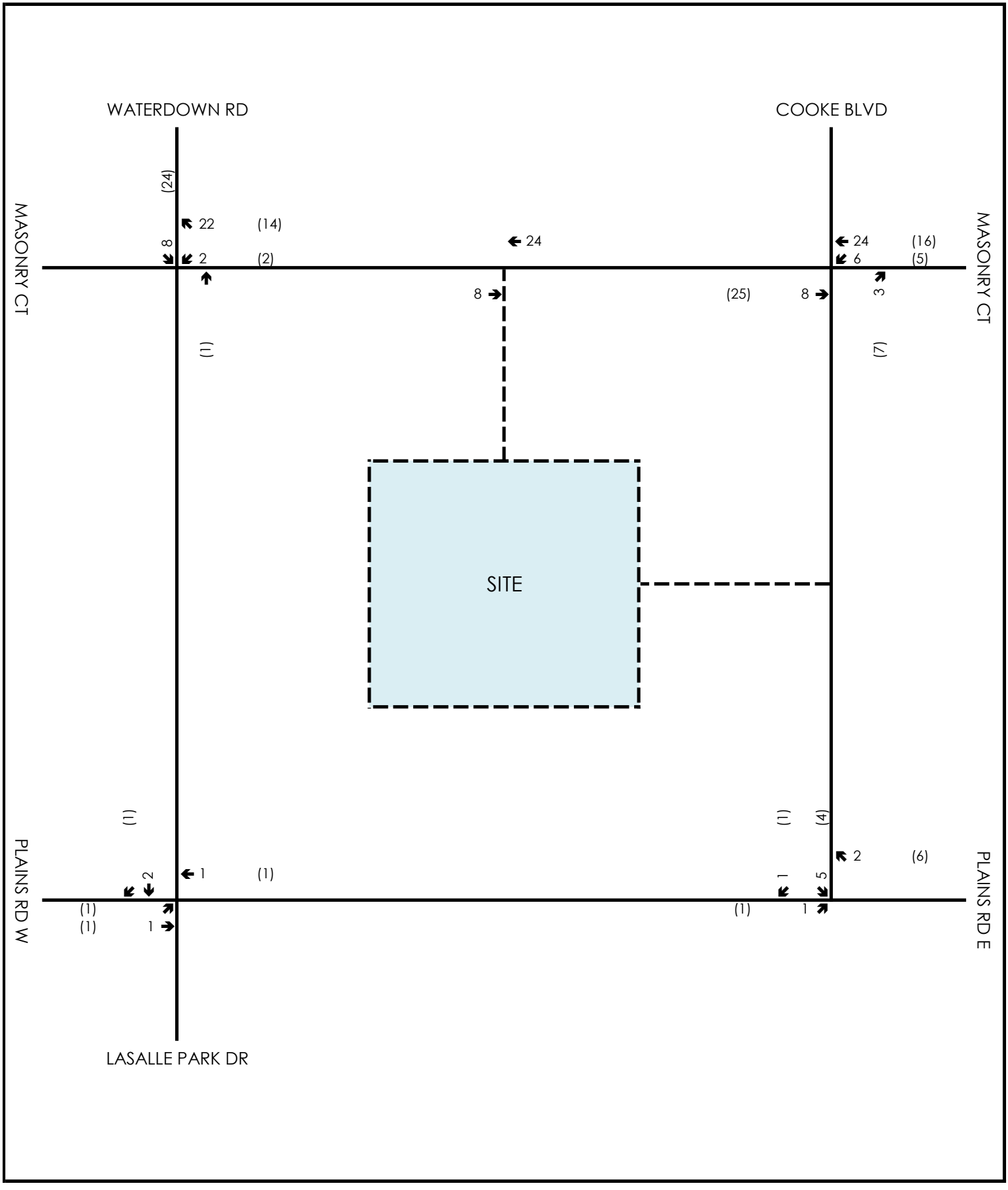
Legend	1062-1074 Cooke Blvd	CROZIER CONSULTING ENGINEERS	Appendix G-1
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	35 Plains Road East Background Volumes		Project No. 2321-6441 Date. Analyst. FC



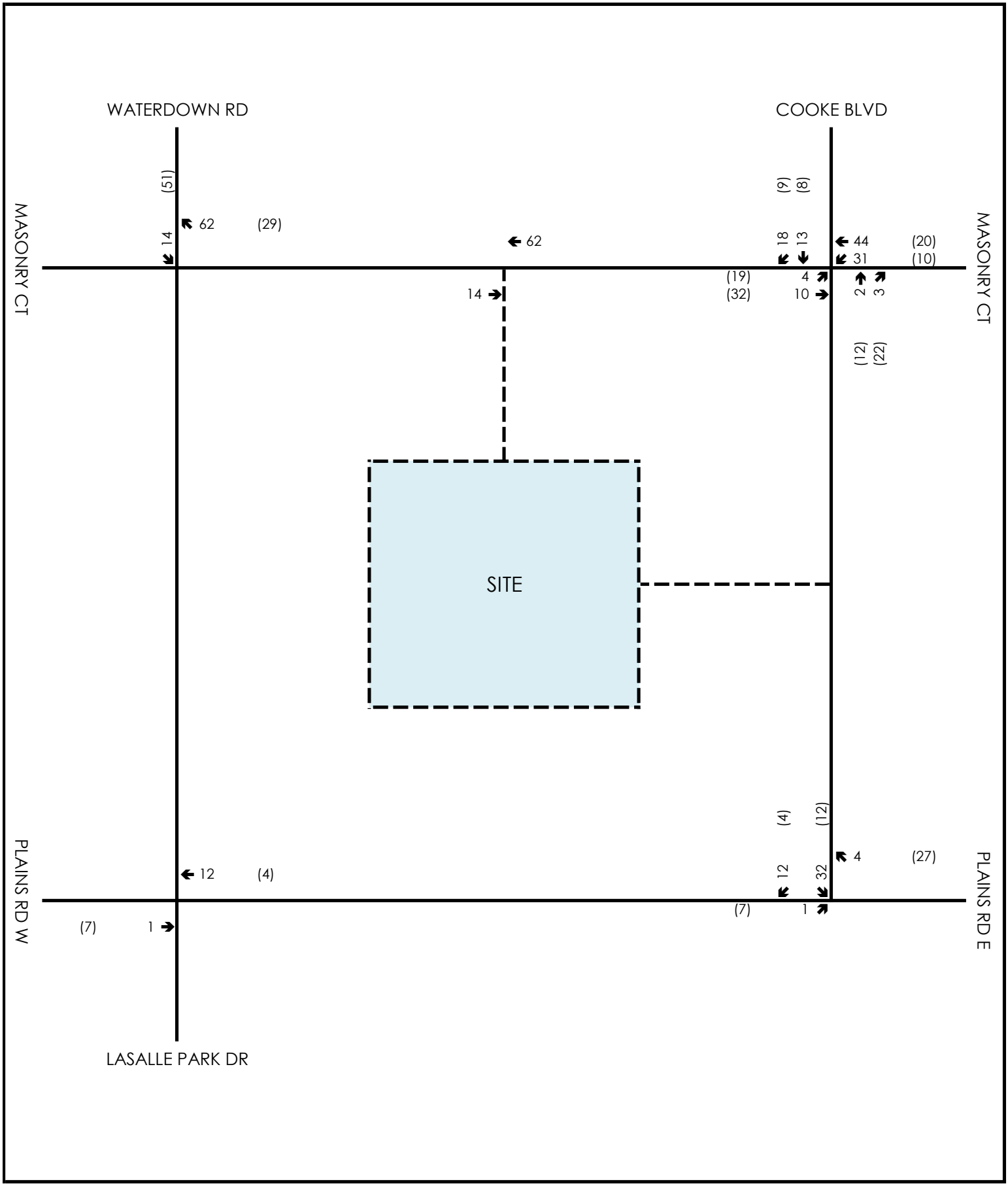
Legend	1062-1074 Cooke Blvd	CROZIER CONSULTING ENGINEERS	Appendix G-2
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	53-71 Plains Road East Background Volumes		Project No. 2321-6441 Date. Analyst. FC



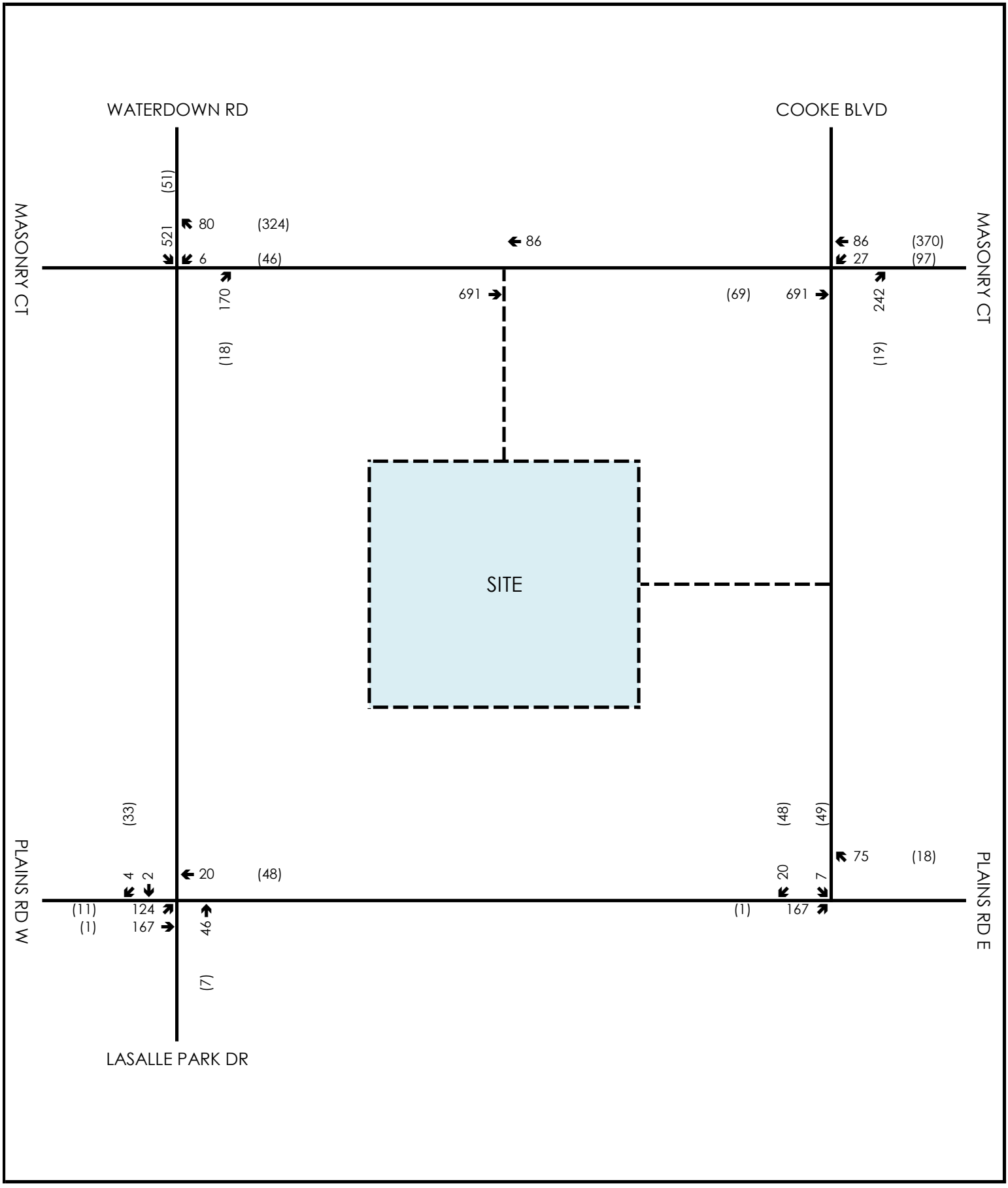
Legend	1062-1074 Cooke Blvd	CROZIER CONSULTING ENGINEERS	Appendix G-3
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	92 Plains Road East Background Volumes		Project No. 2321-6441 Date. Analyst. FC



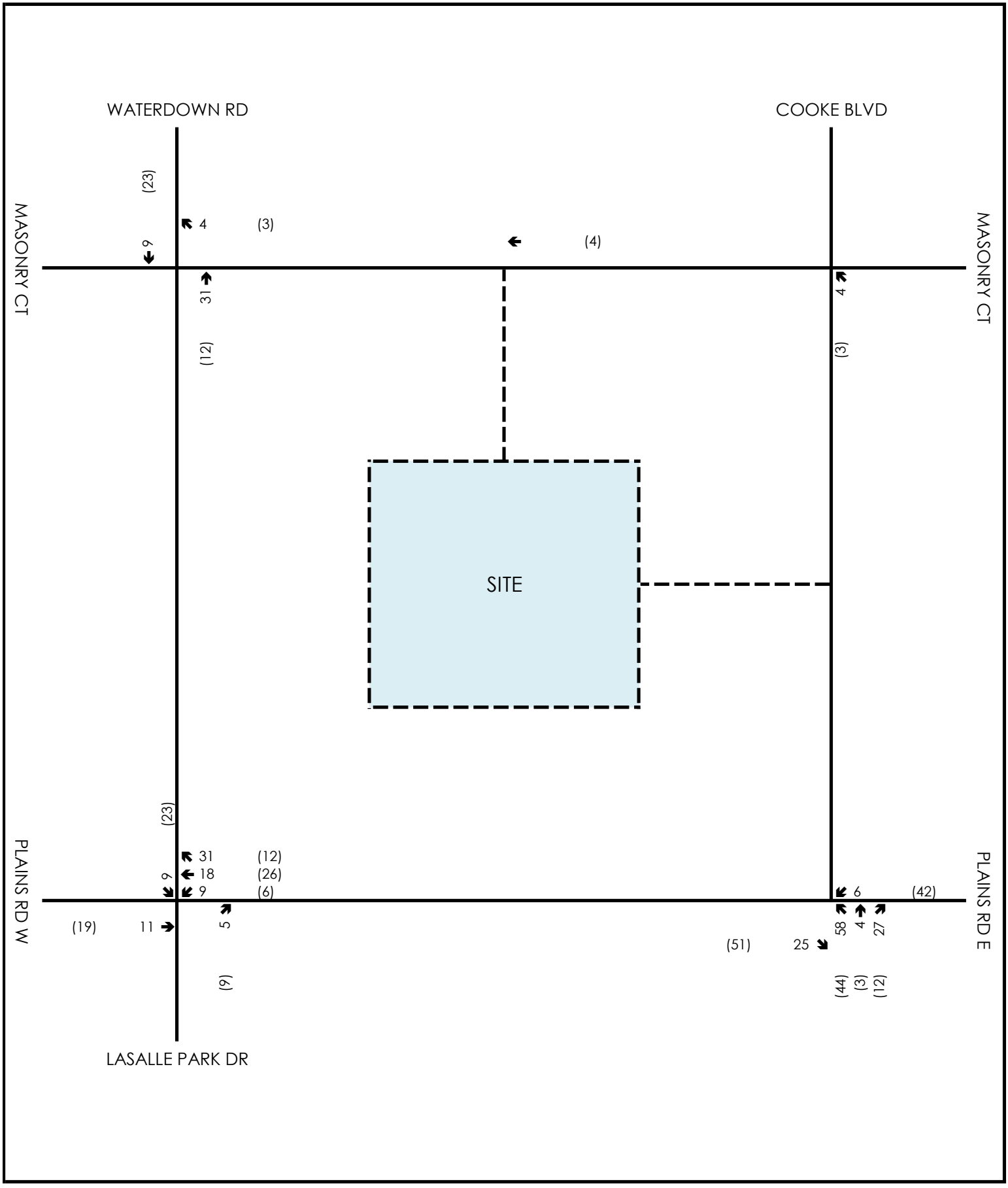
Legend	1062-1074 Cooke Blvd	CROZIER CONSULTING ENGINEERS	Appendix G-4
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	1085 Clearview Ave Background Volumes		Project No. 2321-6441 Date. Analyst. FC



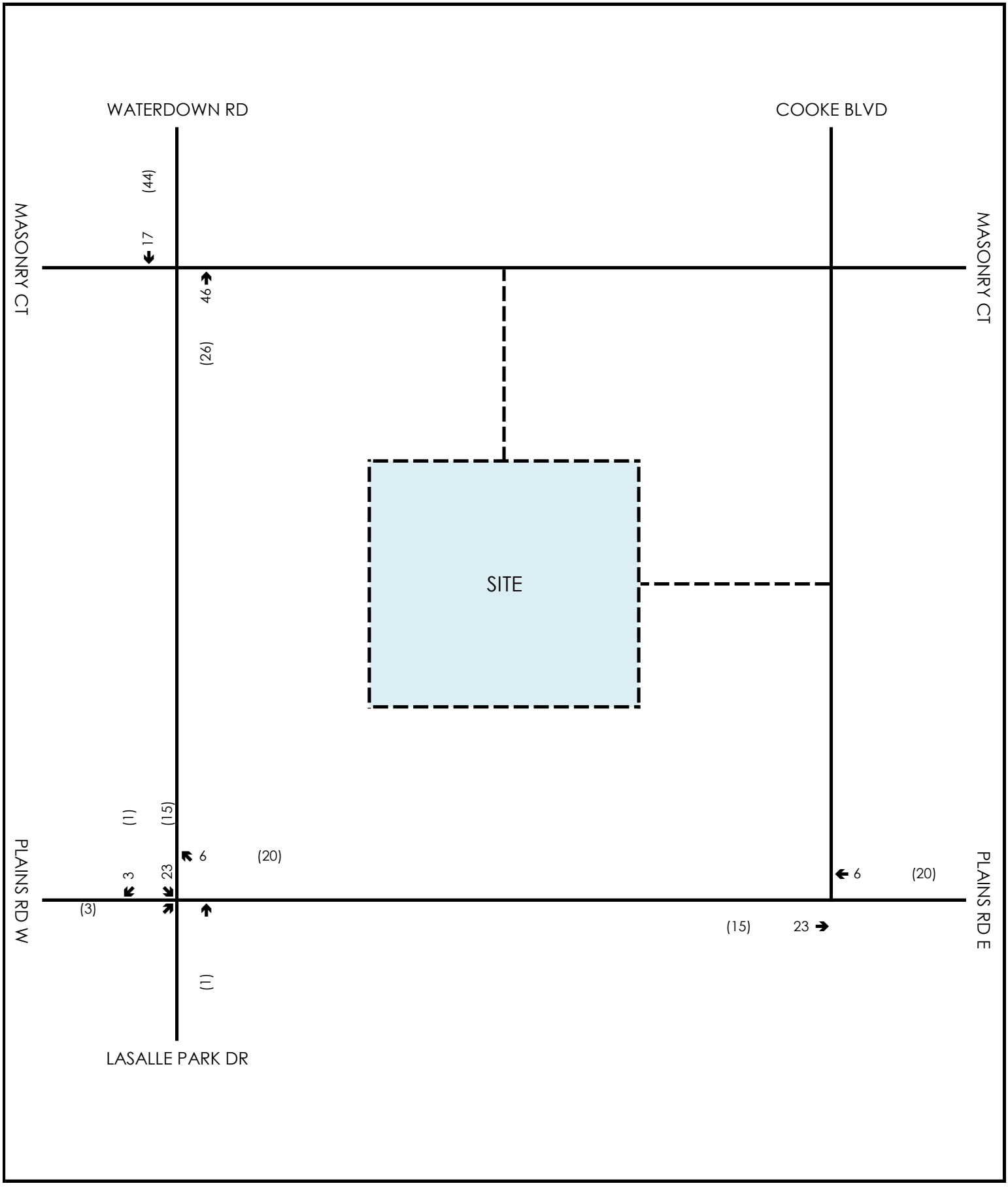
Legend	1062-1074 Cooke Blvd	CROZIER CONSULTING ENGINEERS	Appendix G-5
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	101 Masonry Court Background Volumes		Project No. 2321-6441 Date. Analyst. FC



Legend	1062-1074 Cooke Blvd	CROZIER CONSULTING ENGINEERS	Appendix G-6
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	**Aldershot GO Station Parking Background Volumes**		Project No. 2321-6441 Date. Analyst. FC



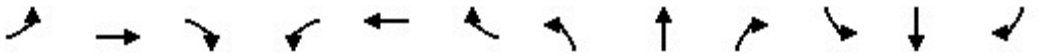
Legend	1062-1074 Cooke Blvd	CROZIER CONSULTING ENGINEERS	Appendix G-7
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	40-70 Plains Road East Background Volumes		Project No. 2321-6441 Date. Analyst. FC



Legend	1062-1074 Cooke Blvd	CROZIER CONSULTING ENGINEERS	Appendix G-8
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes	1029 Waterdown Road Background Volumes		Project No. 2321-6441 Date. Analyst. FC

APPENDIX H

Synchro Reports – Future Background



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	756	1202	162	75	427	230	63	280	63	193	113	174
Future Volume (vph)	756	1202	162	75	427	230	63	280	63	193	113	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	30.0		0.0	40.0		0.0	30.0		0.0	0.0		40.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	50.0			25.0			55.0			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.99			0.99		0.98	1.00		1.00		0.97
Frt		0.982			0.947			0.972				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3414	0	1662	3264	0	1711	1797	0	1662	1776	1479
Flt Permitted	0.142			0.159			0.680			0.202		
Satd. Flow (perm)	248	3414	0	278	3264	0	1203	1797	0	352	1776	1431
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			85			10				185
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		485.0			153.1			317.1			343.5	
Travel Time (s)		29.1			9.2			22.8			24.7	
Confl. Peds. (#/hr)	6		19	19		6	17		7	7		17
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	5%	3%	3%	5%	4%	4%	2%	2%	4%	5%	7%	8%
Adj. Flow (vph)	804	1279	172	80	454	245	67	298	67	205	120	185
Shared Lane Traffic (%)												
Lane Group Flow (vph)	804	1451	0	80	699	0	67	365	0	205	120	185
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			6.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes										
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		8
Detector Phase	5	2		1	6		7	4		3	8	8
Switch Phase												
Minimum Initial (s)	6.0	20.0		6.0	20.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	23.0	27.3		9.0	31.3		9.0	34.0		9.0	34.0	34.0
Total Split (s)	31.0	51.0		12.0	32.0		10.0	34.0		13.0	37.0	37.0
Total Split (%)	28.2%	46.4%		10.9%	29.1%		9.1%	30.9%		11.8%	33.6%	33.6%
Maximum Green (s)	28.0	44.7		9.0	25.7		7.0	27.7		10.0	30.7	30.7
Yellow Time (s)	3.0	3.7		3.0	3.7		3.0	3.3		3.0	3.3	3.3
All-Red Time (s)	0.0	2.6		0.0	2.6		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	3.0	6.3		3.0	6.3		3.0	6.3		3.0	6.3	6.3
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)		8.0			8.0			10.0			10.0	10.0
Flash Dont Walk (s)		13.0			17.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	62.5	50.2		36.8	25.7		35.3	25.2		41.5	30.2	30.2
Actuated g/C Ratio	0.57	0.46		0.33	0.23		0.32	0.23		0.38	0.27	0.27
v/c Ratio	1.51	0.93		0.42	0.85		0.16	0.87		0.82	0.25	0.35
Control Delay	265.8	40.9		22.5	46.0		22.3	60.9		50.7	32.7	6.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	265.8	40.9		22.5	46.0		22.3	60.9		50.7	32.7	6.5
LOS	F	D		C	D		C	E		D	C	A
Approach Delay		121.1			43.6			54.9			30.4	
Approach LOS		F			D			D			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.51			
Intersection Signal Delay: 87.1		Intersection LOS: F	
Intersection Capacity Utilization 110.1%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: Waterdown Rd & Plains Rd E



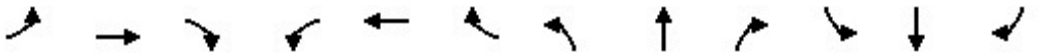


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	804	1451	80	699	67	365	205	120	185
v/c Ratio	1.51	0.93	0.42	0.85	0.16	0.87	0.82	0.25	0.35
Control Delay	265.8	40.9	22.5	46.0	22.3	60.9	50.7	32.7	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	265.8	40.9	22.5	46.0	22.3	60.9	50.7	32.7	6.5
Queue Length 50th (m)	~246.2	~172.4	8.2	70.7	9.4	75.7	31.4	21.1	0.0
Queue Length 95th (m)	#324.2	#230.4	15.9	#100.6	18.8	#121.5	#56.4	36.9	17.0
Internal Link Dist (m)		461.0		129.1		293.1		319.5	
Turn Bay Length (m)	30.0		40.0		30.0				40.0
Base Capacity (vph)	532	1565	209	827	420	459	251	500	535
Starvation Cap Reductn	0	0	0	0	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	1.51	0.93	0.38	0.85	0.16	0.80	0.82	0.24	0.35

Intersection Summary

~ 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.

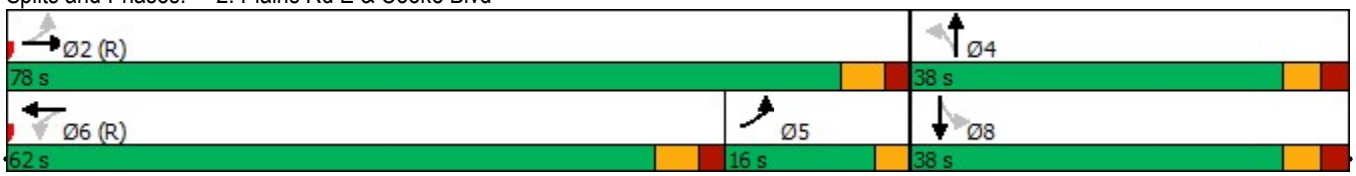


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	273	1146	25	6	592	122	58	4	27	66	0	76
Future Volume (vph)	273	1146	25	6	592	122	58	4	27	66	0	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.6	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	40.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (m)	25.0			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				0.99						0.99	
Frt		0.997			0.975			0.959			0.928	
Flt Protected	0.950							0.968			0.977	
Satd. Flow (prot)	1728	3495	0	0	3319	0	0	1729	0	0	1453	0
Flt Permitted	0.338				0.942			0.643			0.820	
Satd. Flow (perm)	613	3495	0	0	3126	0	0	1149	0	0	1218	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			28			19			85	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		153.1			337.7			48.9			344.6	
Travel Time (s)		9.2			20.3			3.5			24.8	
Confl. Peds. (#/hr)	4					4				2		3
Peak Hour Factor	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.92	0.92	0.95	0.92	0.95
Heavy Vehicles (%)	1%	3%	2%	2%	5%	8%	2%	2%	2%	17%	2%	18%
Adj. Flow (vph)	287	1206	27	7	623	128	63	4	29	69	0	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	287	1233	0	0	758	0	0	96	0	0	149	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane					Yes							
Headway Factor	1.04	1.00	1.00	1.00	1.00	1.01	1.00	1.00	1.00	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.7	26.0		26.0	26.0		27.9	27.9		27.9	27.9	
Total Split (s)	16.0	78.0		62.0	62.0		38.0	38.0		38.0	38.0	
Total Split (%)	13.8%	67.2%		53.4%	53.4%		32.8%	32.8%		32.8%	32.8%	
Maximum Green (s)	13.0	72.0		56.0	56.0		32.1	32.1		32.1	32.1	
Yellow Time (s)	3.0	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	0.0	2.3		2.3	2.3		2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	3.0	6.0			6.0			5.9			5.9	
Lead/Lag	Lag			Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		11.0		11.0	11.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	93.9	90.9			74.9			13.2			13.2	
Actuated g/C Ratio	0.81	0.78			0.65			0.11			0.11	
v/c Ratio	0.46	0.45			0.37			0.65			0.70	
Control Delay	8.3	5.3			10.4			58.7			38.9	
Queue Delay	0.0	0.7			0.0			0.0			0.0	
Total Delay	8.3	6.0			10.4			58.7			38.9	
LOS	A	A			B			E			D	
Approach Delay		6.4			10.4			58.7			38.9	
Approach LOS		A			B			E			D	

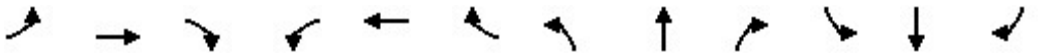
Intersection Summary			
Area Type:	Other		
Cycle Length: 116			
Actuated Cycle Length: 116			
Offset: 12 (10%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 11.5		Intersection LOS: B	
Intersection Capacity Utilization 77.9%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 2: Plains Rd E & Cooke Blvd



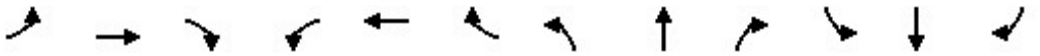
Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	287	1233	758	96	149
v/c Ratio	0.46	0.45	0.37	0.65	0.70
Control Delay	8.3	5.3	10.4	58.7	38.9
Queue Delay	0.0	0.7	0.0	0.0	0.0
Total Delay	8.3	6.0	10.4	58.7	38.9
Queue Length 50th (m)	11.6	40.2	38.1	18.0	14.7
Queue Length 95th (m)	27.1	72.6	61.7	34.1	35.5
Internal Link Dist (m)		129.1	313.7	24.9	320.6
Turn Bay Length (m)	40.0				
Base Capacity (vph)	621	2739	2028	331	398
Starvation Cap Reductn	0	1057	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.46	0.73	0.37	0.29	0.37

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	1038	37	77	194	0	98	2	364	0	13	18
Future Volume (vph)	4	1038	37	77	194	0	98	2	364	0	13	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995						0.894			0.922	
Flt Protected					0.986			0.990				
Satd. Flow (prot)	0	1888	0	0	1809	0	0	1661	0	0	1752	0
Flt Permitted					0.986			0.990				
Satd. Flow (perm)	0	1888	0	0	1809	0	0	1661	0	0	1752	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		139.6			139.2			344.6			48.9	
Travel Time (s)		10.1			10.0			24.8			3.5	
Confl. Peds. (#/hr)	5					5	1		7	7		1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	0%	0%	4%	0%	5%	0%	6%	0%	0%	0%	0%	0%
Adj. Flow (vph)	5	1281	46	95	240	0	121	2	449	0	16	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1332	0	0	335	0	0	572	0	0	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	114.4%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1038	37	77	194	0	98	2	364	0	13	18
Future Volume (Veh/h)	4	1038	37	77	194	0	98	2	364	0	13	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	5	1281	46	95	240	0	121	2	449	0	16	22
Pedestrians		1			7						5	
Lane Width (m)		3.6			3.6						3.6	
Walking Speed (m/s)		1.2			1.2						1.2	
Percent Blockage		0			1						0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		140										
pX, platoon unblocked				0.70			0.70	0.70	0.70	0.70	0.70	
vC, conflicting volume	245			1327			1775	1749	1311	2206	1772	246
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	245			1254			1891	1854	1232	2503	1886	246
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			76			0	95	0	0	58	97
cM capacity (veh/h)	1327			395			20	40	153	0	38	794

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	1332	335	572	38
Volume Left	5	95	121	0
Volume Right	46	0	449	22
cSH	1327	395	63	84
Volume to Capacity	0.00	0.24	9.15	0.45
Queue Length 95th (m)	0.1	7.4	Err	14.9
Control Delay (s)	0.2	8.2	Err	78.7
Lane LOS	A	A	F	F
Approach Delay (s)	0.2	8.2	Err	78.7
Approach LOS			F	F

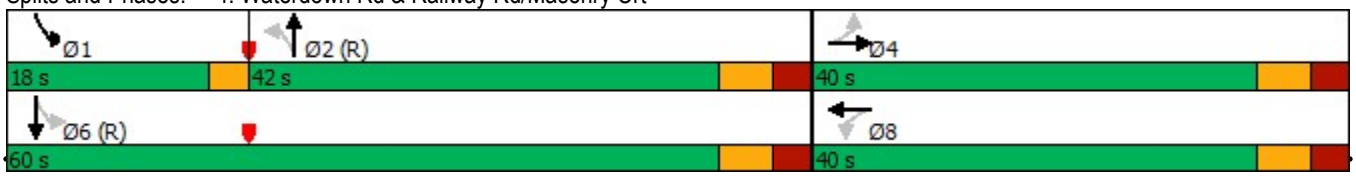
Intersection Summary			
Average Delay	2514.4		
Intersection Capacity Utilization	114.4%	ICU Level of Service	H
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	1	11	14	0	304	7	1023	261	831	425	19
Future Volume (vph)	28	1	11	14	0	304	7	1023	261	831	425	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			70.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00			0.99		1.00	1.00			1.00	
Frt		0.961			0.850			0.969			0.994	
Flt Protected		0.967		0.950			0.950			0.950		
Satd. Flow (prot)	0	1158	0	1745	1518	0	1220	3342	0	1745	3290	0
Flt Permitted		0.287		0.730			0.484			0.105		
Satd. Flow (perm)	0	343	0	1341	1518	0	621	3342	0	193	3290	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			338			35			7	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		145.8			139.6			343.5			376.3	
Travel Time (s)		10.5			10.1			24.7			27.1	
Confl. Peds. (#/hr)	1					1	1		2	2		1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	54%	100%	45%	0%	0%	5%	43%	5%	1%	0%	7%	53%
Adj. Flow (vph)	29	1	12	15	0	320	7	1077	275	875	447	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	15	320	0	7	1352	0	875	467	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		11.0	36.0	
Total Split (s)	40.0	40.0		40.0	40.0		42.0	42.0		18.0	60.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		42.0%	42.0%		18.0%	60.0%	
Maximum Green (s)	33.0	33.0		33.0	33.0		35.0	35.0		15.0	53.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		15.0	15.0			15.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)		11.8		11.8	11.8		35.0	35.0		78.2	74.2	
Actuated g/C Ratio		0.12		0.12	0.12		0.35	0.35		0.78	0.74	
v/c Ratio		0.82		0.09	0.67		0.03	1.13		1.23	0.19	
Control Delay		118.4		38.1	11.1		22.1	102.2		140.5	4.4	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		118.4		38.1	11.1		22.1	102.2		140.5	4.4	
LOS		F		D	B		C	F		F	A	
Approach Delay		118.4			12.3			101.8			93.1	
Approach LOS		F			B			F			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 22 (22%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.23			
Intersection Signal Delay: 88.5		Intersection LOS: F	
Intersection Capacity Utilization 124.0%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 4: Waterdown Rd & Railway Rd/Masonry Crt



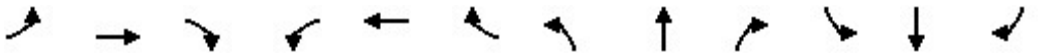


Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	42	15	320	7	1352	875	467
v/c Ratio	0.82	0.09	0.67	0.03	1.13	1.23	0.19
Control Delay	118.4	38.1	11.1	22.1	102.2	140.5	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	118.4	38.1	11.1	22.1	102.2	140.5	4.4
Queue Length 50th (m)	6.1	2.8	0.0	0.9	~167.8	~201.3	11.7
Queue Length 95th (m)	#23.2	8.4	19.8	4.1	#211.8	#305.9	22.7
Internal Link Dist (m)	121.8		115.6		319.5		352.3
Turn Bay Length (m)		15.0		20.0		15.0	
Base Capacity (vph)	121	442	727	217	1192	713	2443
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.03	0.44	0.03	1.13	1.23	0.19

Intersection Summary

~ 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.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	631	103	68	1197	217	151	152	61	265	167	476
Future Volume (vph)	223	631	103	68	1197	217	151	152	61	265	167	476
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	30.0		0.0	40.0		0.0	30.0		0.0	0.0		40.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	50.0			25.0			55.0			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		0.99	1.00		0.98	0.99		0.99		0.97
Frt		0.979			0.977			0.957				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3396	0	1662	3381	0	1711	1762	0	1662	1776	1479
Flt Permitted	0.080			0.326			0.645			0.336		
Satd. Flow (perm)	140	3396	0	563	3381	0	1141	1762	0	585	1776	1429
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			19			16				280
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		485.0			153.1			317.1			343.5	
Travel Time (s)		29.1			9.2			22.8			24.7	
Confl. Peds. (#/hr)	6		19	19		6	17		7	7		17
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	5%	3%	3%	5%	4%	4%	2%	2%	4%	5%	7%	8%
Adj. Flow (vph)	237	671	110	72	1273	231	161	162	65	282	178	506
Shared Lane Traffic (%)												
Lane Group Flow (vph)	237	781	0	72	1504	0	161	227	0	282	178	506
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			6.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes										
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		8
Detector Phase	5	2		1	6		7	4		3	8	8
Switch Phase												
Minimum Initial (s)	6.0	20.0		6.0	20.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	9.0	27.3		9.0	31.3		9.0	33.3		9.0	34.0	34.0
Total Split (s)	18.0	49.0		15.0	46.0		10.0	34.0		20.0	44.0	44.0
Total Split (%)	15.3%	41.5%		12.7%	39.0%		8.5%	28.8%		16.9%	37.3%	37.3%
Maximum Green (s)	15.0	42.7		12.0	39.7		7.0	27.7		17.0	37.7	37.7
Yellow Time (s)	3.0	3.7		3.0	3.7		3.0	3.3		3.0	3.3	3.3
All-Red Time (s)	0.0	2.6		0.0	2.6		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	3.0	6.3		3.0	6.3		3.0	6.3		3.0	6.3	6.3
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)		8.0			8.0			10.0			10.0	10.0
Flash Dont Walk (s)		13.0			17.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	68.5	56.0		58.4	47.1		30.9	20.6		43.5	30.2	30.2
Actuated g/C Ratio	0.58	0.47		0.49	0.40		0.26	0.17		0.37	0.26	0.26
v/c Ratio	0.86	0.48		0.20	1.10		0.48	0.71		0.77	0.39	0.88
Control Delay	57.6	24.0		14.7	92.5		32.5	53.9		42.2	37.5	35.5
Queue Delay	0.0	0.0		0.0	0.4		0.0	0.0		0.0	0.0	0.0
Total Delay	57.6	24.0		14.7	92.9		32.5	53.9		42.2	37.5	35.5
LOS	E	C		B	F		C	D		D	D	D
Approach Delay		31.8			89.4			45.0			37.8	
Approach LOS		C			F			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 118			
Actuated Cycle Length: 118			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.10			
Intersection Signal Delay: 57.5		Intersection LOS: E	
Intersection Capacity Utilization 98.4%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Waterdown Rd & Plains Rd E



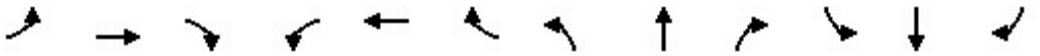


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	237	781	72	1504	161	227	282	178	506
v/c Ratio	0.86	0.48	0.20	1.10	0.48	0.71	0.77	0.39	0.88
Control Delay	57.6	24.0	14.7	92.5	32.5	53.9	42.2	37.5	35.5
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	57.6	24.0	14.7	92.9	32.5	53.9	42.2	37.5	35.5
Queue Length 50th (m)	39.3	66.4	7.3	~231.3	27.1	49.2	51.8	36.0	57.9
Queue Length 95th (m)	#90.8	99.7	16.5	#292.7	39.3	71.5	69.6	52.3	100.5
Internal Link Dist (m)		461.0		129.1		293.1		319.5	
Turn Bay Length (m)	30.0		40.0		30.0				40.0
Base Capacity (vph)	286	1620	409	1362	332	425	371	567	647
Starvation Cap Reductn	0	0	0	129	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	0.83	0.48	0.18	1.22	0.48	0.53	0.76	0.31	0.78

Intersection Summary

~ 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.

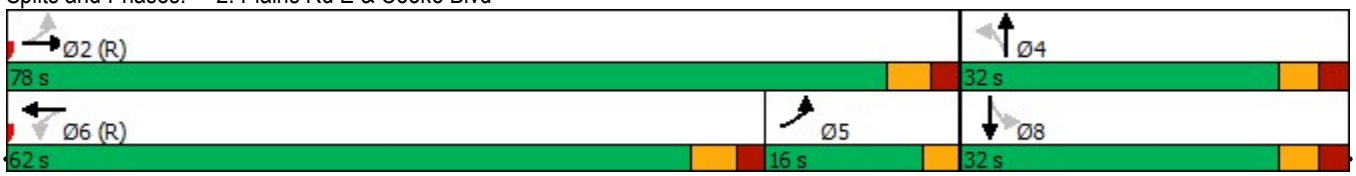


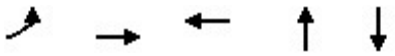
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	805	51	42	1251	119	44	3	12	114	0	112
Future Volume (vph)	51	805	51	42	1251	119	44	3	12	114	0	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.6	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	40.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (m)	25.0			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00						0.99	
Frt		0.991			0.987			0.973			0.933	
Flt Protected	0.950				0.998			0.964			0.975	
Satd. Flow (prot)	1728	3475	0	0	3373	0	0	1747	0	0	1459	0
Flt Permitted	0.107				0.883			0.609			0.828	
Satd. Flow (perm)	195	3475	0	0	2984	0	0	1104	0	0	1237	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			13			11			89	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		153.1			337.7			48.9			344.6	
Travel Time (s)		9.2			20.3			3.5			24.8	
Confl. Peds. (#/hr)	4					4				2		3
Peak Hour Factor	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.92	0.92	0.95	0.92	0.95
Heavy Vehicles (%)	1%	3%	2%	2%	5%	8%	2%	2%	2%	17%	2%	18%
Adj. Flow (vph)	54	847	55	46	1317	125	48	3	13	120	0	118
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	902	0	0	1488	0	0	64	0	0	238	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane					Yes							
Headway Factor	1.04	1.00	1.00	1.00	1.00	1.01	1.00	1.00	1.00	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.7	26.0		26.0	26.0		27.9	27.9		27.9	27.9	
Total Split (s)	16.0	78.0		62.0	62.0		32.0	32.0		32.0	32.0	
Total Split (%)	14.5%	70.9%		56.4%	56.4%		29.1%	29.1%		29.1%	29.1%	
Maximum Green (s)	13.0	72.0		56.0	56.0		26.1	26.1		26.1	26.1	
Yellow Time (s)	3.0	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	0.0	2.3		2.3	2.3		2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	3.0	6.0			6.0			5.9			5.9	
Lead/Lag	Lag			Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		11.0		11.0	11.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	82.3	79.3			66.5			18.8			18.8	
Actuated g/C Ratio	0.75	0.72			0.60			0.17			0.17	
v/c Ratio	0.18	0.36			0.82			0.32			0.84	
Control Delay	9.9	6.9			24.9			35.7			49.7	
Queue Delay	0.0	0.4			0.0			0.0			0.0	
Total Delay	9.9	7.3			24.9			35.7			49.7	
LOS	A	A			C			D			D	
Approach Delay		7.4			24.9			35.7			49.7	
Approach LOS		A			C			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 12 (11%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 21.2		Intersection LOS: C	
Intersection Capacity Utilization 92.5%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 2: Plains Rd E & Cooke Blvd

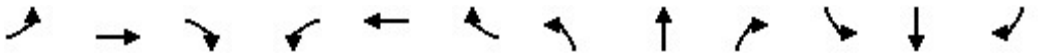




Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	54	902	1488	64	238
v/c Ratio	0.18	0.36	0.82	0.32	0.84
Control Delay	9.9	6.9	24.9	35.7	49.7
Queue Delay	0.0	0.4	0.0	0.0	0.0
Total Delay	9.9	7.3	24.9	35.7	49.7
Queue Length 50th (m)	2.8	35.8	143.1	10.4	33.3
Queue Length 95th (m)	7.7	56.9	#223.8	22.1	60.4
Internal Link Dist (m)		129.1	313.7	24.9	320.6
Turn Bay Length (m)	40.0				
Base Capacity (vph)	327	2508	1809	270	361
Starvation Cap Reductn	0	981	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.17	0.59	0.82	0.24	0.66

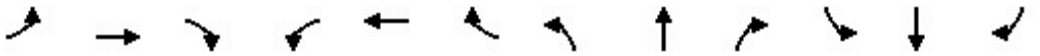
Intersection Summary

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	158	38	158	582	0	143	12	57	0	8	9
Future Volume (vph)	19	158	38	158	582	0	143	12	57	0	8	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.976						0.964			0.929	
Flt Protected		0.996			0.989			0.967				
Satd. Flow (prot)	0	1834	0	0	1808	0	0	1702	0	0	1765	0
Flt Permitted		0.996			0.989			0.967				
Satd. Flow (perm)	0	1834	0	0	1808	0	0	1702	0	0	1765	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		139.6			139.2			344.6			48.9	
Travel Time (s)		10.1			10.0			24.8			3.5	
Confl. Peds. (#/hr)	5					5	1		7	7		1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	0%	0%	4%	0%	5%	0%	6%	0%	0%	0%	0%	0%
Adj. Flow (vph)	23	195	47	195	719	0	177	15	70	0	10	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	265	0	0	914	0	0	262	0	0	21	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 79.9%		ICU Level of Service D	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	158	38	158	582	0	143	12	57	0	8	9
Future Volume (Veh/h)	19	158	38	158	582	0	143	12	57	0	8	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	23	195	47	195	719	0	177	15	70	0	10	11
Pedestrians		1			7						5	
Lane Width (m)		3.6			3.6						3.6	
Walking Speed (m/s)		1.2			1.2						1.2	
Percent Blockage		0			1						0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		140										
pX, platoon unblocked				0.98			0.98	0.98	0.98	0.98	0.98	
vC, conflicting volume	724			242			1390	1378	226	1463	1402	725
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	724			212			1388	1376	195	1462	1400	725
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			85			0	87	92	100	91	97
cM capacity (veh/h)	884			1338			91	119	827	75	115	426

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	265	914	262	21
Volume Left	23	195	177	0
Volume Right	47	0	70	11
cSH	884	1338	121	186
Volume to Capacity	0.03	0.15	2.16	0.11
Queue Length 95th (m)	0.6	4.1	176.3	3.0
Control Delay (s)	1.1	3.4	606.3	26.8
Lane LOS	A	A	F	D
Approach Delay (s)	1.1	3.4	606.3	26.8
Approach LOS			F	D

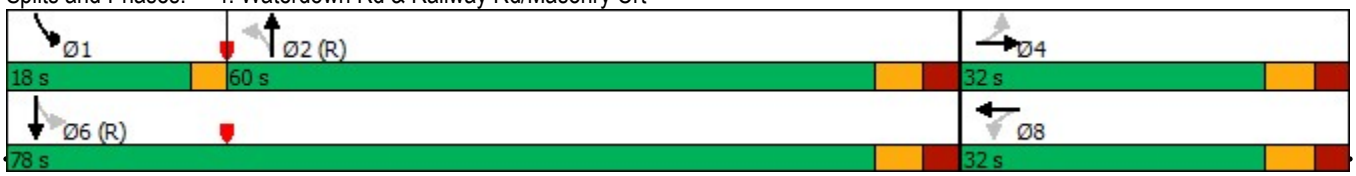
Intersection Summary				
Average Delay	111.3			
Intersection Capacity Utilization	79.9%	ICU Level of Service	D	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	0	6	83	0	626	10	574	31	169	848	17
Future Volume (vph)	19	0	6	83	0	626	10	574	31	169	848	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			70.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99		1.00	1.00		1.00	1.00	
Frt		0.969			0.850			0.992			0.997	
Flt Protected		0.963		0.950			0.950			0.950		
Satd. Flow (prot)	0	1167	0	1745	1517	0	1220	3413	0	1745	3334	0
Flt Permitted		0.252		0.740			0.313			0.358		
Satd. Flow (perm)	0	305	0	1359	1517	0	402	3413	0	657	3334	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		69			404			7			4	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		145.8			139.6			343.5			376.3	
Travel Time (s)		10.5			10.1			24.7			27.1	
Confl. Peds. (#/hr)	1					1	1		2	2		1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	54%	100%	45%	0%	0%	5%	43%	5%	1%	0%	7%	53%
Adj. Flow (vph)	20	0	6	87	0	659	11	604	33	178	893	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	0	87	659	0	11	637	0	178	911	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		11.0	36.0	
Total Split (s)	32.0	32.0		32.0	32.0		60.0	60.0		18.0	78.0	
Total Split (%)	29.1%	29.1%		29.1%	29.1%		54.5%	54.5%		16.4%	70.9%	
Maximum Green (s)	25.0	25.0		25.0	25.0		53.0	53.0		15.0	71.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		15.0	15.0			15.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)		25.0		25.0	25.0		58.3	58.3		75.0	71.0	
Actuated g/C Ratio		0.23		0.23	0.23		0.53	0.53		0.68	0.65	
v/c Ratio		0.21		0.28	1.00		0.05	0.35		0.33	0.42	
Control Delay		4.0		38.1	53.7		14.2	15.6		7.9	10.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		4.0		38.1	53.7		14.2	15.6		7.9	10.2	
LOS		A		D	D		B	B		A	B	
Approach Delay		4.0			51.9			15.6			9.8	
Approach LOS		A			D			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 22 (20%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.00			
Intersection Signal Delay: 23.8		Intersection LOS: C	
Intersection Capacity Utilization 87.4%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 4: Waterdown Rd & Railway Rd/Masonry Crt



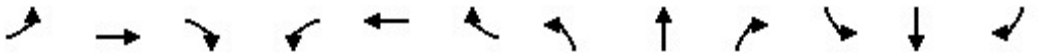


Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	26	87	659	11	637	178	911
v/c Ratio	0.21	0.28	1.00	0.05	0.35	0.33	0.42
Control Delay	4.0	38.1	53.7	14.2	15.6	7.9	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.0	38.1	53.7	14.2	15.6	7.9	10.2
Queue Length 50th (m)	0.0	16.3	~70.6	1.2	41.0	12.8	48.1
Queue Length 95th (m)	0.0	31.4	#152.5	4.5	56.9	21.0	61.1
Internal Link Dist (m)	121.8		115.6		319.5		352.3
Turn Bay Length (m)		15.0		20.0		15.0	
Base Capacity (vph)	122	308	656	213	1813	596	2153
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.28	1.00	0.05	0.35	0.30	0.42

Intersection Summary

~ 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.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	787	1250	169	79	444	239	66	291	66	200	118	182
Future Volume (vph)	787	1250	169	79	444	239	66	291	66	200	118	182
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	30.0		0.0	40.0		0.0	30.0		0.0	0.0		40.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	50.0			25.0			55.0			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.99		1.00	0.99		0.98	1.00		1.00		0.97
Frt		0.982			0.948			0.972				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3414	0	1662	3268	0	1711	1797	0	1662	1776	1479
Flt Permitted	0.274			0.205			0.676			0.187		
Satd. Flow (perm)	478	3414	0	357	3268	0	1196	1797	0	326	1776	1431
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			85			10				194
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		485.0			153.1			317.1			343.5	
Travel Time (s)		29.1			9.2			22.8			24.7	
Confl. Peds. (#/hr)	6		19	19		6	17		7	7		17
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	5%	3%	3%	5%	4%	4%	2%	2%	4%	5%	7%	8%
Adj. Flow (vph)	837	1330	180	84	472	254	70	310	70	213	126	194
Shared Lane Traffic (%)												
Lane Group Flow (vph)	837	1510	0	84	726	0	70	380	0	213	126	194
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			6.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes										
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		8
Detector Phase	5	2		1	6		7	4		3	8	8
Switch Phase												
Minimum Initial (s)	6.0	20.0		6.0	20.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	23.0	27.3		9.0	31.3		9.0	34.0		9.0	34.0	34.0
Total Split (s)	31.0	51.0		12.0	32.0		10.0	34.0		13.0	37.0	37.0
Total Split (%)	28.2%	46.4%		10.9%	29.1%		9.1%	30.9%		11.8%	33.6%	33.6%
Maximum Green (s)	28.0	44.7		9.0	25.7		7.0	27.7		10.0	30.7	30.7
Yellow Time (s)	3.0	3.7		3.0	3.7		3.0	3.3		3.0	3.3	3.3
All-Red Time (s)	0.0	2.6		0.0	2.6		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	3.0	6.3		3.0	6.3		3.0	6.3		3.0	6.3	6.3
Lead/Lag	Lag	Lag		Lead	Lead		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)		8.0			8.0			10.0			10.0	10.0
Flash Dont Walk (s)		13.0			17.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	52.6	49.3		31.0	27.7		35.8	25.7		42.0	30.7	30.7
Actuated g/C Ratio	0.48	0.45		0.28	0.25		0.33	0.23		0.38	0.28	0.28
v/c Ratio	1.58	0.98		0.42	0.82		0.17	0.89		0.87	0.25	0.36
Control Delay	299.1	50.7		38.0	43.5		22.3	63.2		58.4	32.6	6.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	299.1	50.7		38.0	43.5		22.3	63.2		58.4	32.6	6.4
LOS	F	D		D	D		C	E		E	C	A
Approach Delay		139.2			42.9			56.8			33.4	
Approach LOS		F			D			E			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.58			
Intersection Signal Delay: 97.8		Intersection LOS: F	
Intersection Capacity Utilization 112.8%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: Waterdown Rd & Plains Rd E



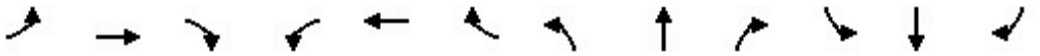


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	837	1510	84	726	70	380	213	126	194
v/c Ratio	1.58	0.98	0.42	0.82	0.17	0.89	0.87	0.25	0.36
Control Delay	299.1	50.7	38.0	43.5	22.3	63.2	58.4	32.6	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	299.1	50.7	38.0	43.5	22.3	63.2	58.4	32.6	6.4
Queue Length 50th (m)	~256.0	~200.6	14.8	74.6	9.7	79.4	32.6	22.1	0.0
Queue Length 95th (m)	#333.3	#245.6	28.1	#107.8	19.4	#129.1	#64.3	38.6	17.3
Internal Link Dist (m)		461.0		129.1		293.1		319.5	
Turn Bay Length (m)	30.0		40.0		30.0				40.0
Base Capacity (vph)	529	1537	207	886	423	459	245	503	545
Starvation Cap Reductn	0	0	0	0	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	1.58	0.98	0.41	0.82	0.17	0.83	0.87	0.25	0.36

Intersection Summary

~ 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.

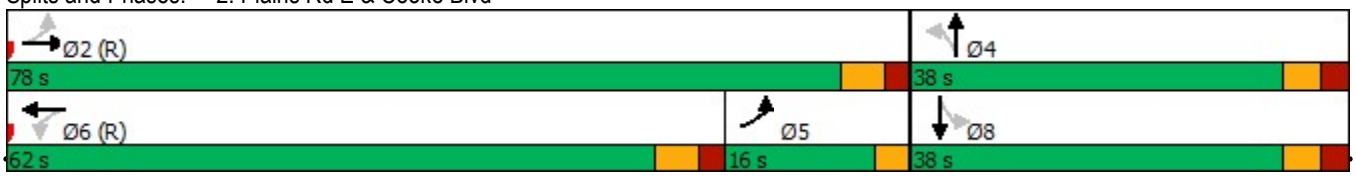


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	273	1146	25	6	592	122	58	4	27	66	0	76
Future Volume (vph)	273	1146	25	6	592	122	58	4	27	66	0	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.6	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	40.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (m)	25.0			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				0.99						0.99	
Frt		0.997			0.975			0.959			0.928	
Flt Protected	0.950							0.968			0.977	
Satd. Flow (prot)	1728	3495	0	0	3319	0	0	1729	0	0	1453	0
Flt Permitted	0.338				0.942			0.643			0.820	
Satd. Flow (perm)	613	3495	0	0	3126	0	0	1149	0	0	1218	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			28			19			85	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		153.1			337.7			48.9			344.6	
Travel Time (s)		9.2			20.3			3.5			24.8	
Confl. Peds. (#/hr)	4					4				2		3
Peak Hour Factor	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.92	0.92	0.95	0.92	0.95
Heavy Vehicles (%)	1%	3%	2%	2%	5%	8%	2%	2%	2%	17%	2%	18%
Adj. Flow (vph)	287	1206	27	7	623	128	63	4	29	69	0	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	287	1233	0	0	758	0	0	96	0	0	149	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane					Yes							
Headway Factor	1.04	1.00	1.00	1.00	1.00	1.01	1.00	1.00	1.00	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.7	26.0		26.0	26.0		27.9	27.9		27.9	27.9	
Total Split (s)	16.0	78.0		62.0	62.0		38.0	38.0		38.0	38.0	
Total Split (%)	13.8%	67.2%		53.4%	53.4%		32.8%	32.8%		32.8%	32.8%	
Maximum Green (s)	13.0	72.0		56.0	56.0		32.1	32.1		32.1	32.1	
Yellow Time (s)	3.0	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	0.0	2.3		2.3	2.3		2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	3.0	6.0			6.0			5.9			5.9	
Lead/Lag	Lag			Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		11.0		11.0	11.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	93.9	90.9			74.9			13.2			13.2	
Actuated g/C Ratio	0.81	0.78			0.65			0.11			0.11	
v/c Ratio	0.46	0.45			0.37			0.65			0.70	
Control Delay	8.3	5.3			10.4			58.7			38.9	
Queue Delay	0.0	0.7			0.0			0.0			0.0	
Total Delay	8.3	6.0			10.4			58.7			38.9	
LOS	A	A			B			E			D	
Approach Delay		6.4			10.4			58.7			38.9	
Approach LOS		A			B			E			D	

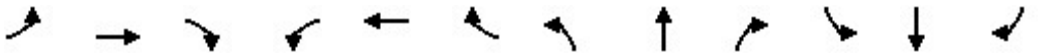
Intersection Summary			
Area Type:	Other		
Cycle Length: 116			
Actuated Cycle Length: 116			
Offset: 12 (10%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 11.5		Intersection LOS: B	
Intersection Capacity Utilization 77.9%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 2: Plains Rd E & Cooke Blvd



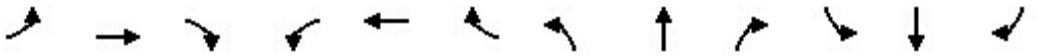
Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	287	1233	758	96	149
v/c Ratio	0.46	0.45	0.37	0.65	0.70
Control Delay	8.3	5.3	10.4	58.7	38.9
Queue Delay	0.0	0.7	0.0	0.0	0.0
Total Delay	8.3	6.0	10.4	58.7	38.9
Queue Length 50th (m)	11.6	40.2	38.1	18.0	14.7
Queue Length 95th (m)	27.1	72.6	61.7	34.1	35.5
Internal Link Dist (m)		129.1	313.7	24.9	320.6
Turn Bay Length (m)	40.0				
Base Capacity (vph)	621	2739	2028	331	398
Starvation Cap Reductn	0	1057	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.46	0.73	0.37	0.29	0.37

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	1038	37	77	194	0	98	2	364	0	13	18
Future Volume (vph)	4	1038	37	77	194	0	98	2	364	0	13	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995						0.894			0.922	
Flt Protected					0.986			0.990				
Satd. Flow (prot)	0	1888	0	0	1809	0	0	1661	0	0	1752	0
Flt Permitted					0.986			0.990				
Satd. Flow (perm)	0	1888	0	0	1809	0	0	1661	0	0	1752	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		139.6			139.2			344.6			48.9	
Travel Time (s)		10.1			10.0			24.8			3.5	
Confl. Peds. (#/hr)	5					5	1		7	7		1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	0%	0%	4%	0%	5%	0%	6%	0%	0%	0%	0%	0%
Adj. Flow (vph)	5	1281	46	95	240	0	121	2	449	0	16	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1332	0	0	335	0	0	572	0	0	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	114.4%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1038	37	77	194	0	98	2	364	0	13	18
Future Volume (Veh/h)	4	1038	37	77	194	0	98	2	364	0	13	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	5	1281	46	95	240	0	121	2	449	0	16	22
Pedestrians		1			7						5	
Lane Width (m)		3.6			3.6						3.6	
Walking Speed (m/s)		1.2			1.2						1.2	
Percent Blockage		0			1						0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		140										
pX, platoon unblocked				0.70			0.70	0.70	0.70	0.70	0.70	
vC, conflicting volume	245			1327			1775	1749	1311	2206	1772	246
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	245			1254			1891	1854	1232	2503	1886	246
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			76			0	95	0	0	58	97
cM capacity (veh/h)	1327			395			20	40	153	0	38	794

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	1332	335	572	38
Volume Left	5	95	121	0
Volume Right	46	0	449	22
cSH	1327	395	63	84
Volume to Capacity	0.00	0.24	9.15	0.45
Queue Length 95th (m)	0.1	7.4	Err	14.9
Control Delay (s)	0.2	8.2	Err	78.7
Lane LOS	A	A	F	F
Approach Delay (s)	0.2	8.2	Err	78.7
Approach LOS			F	F

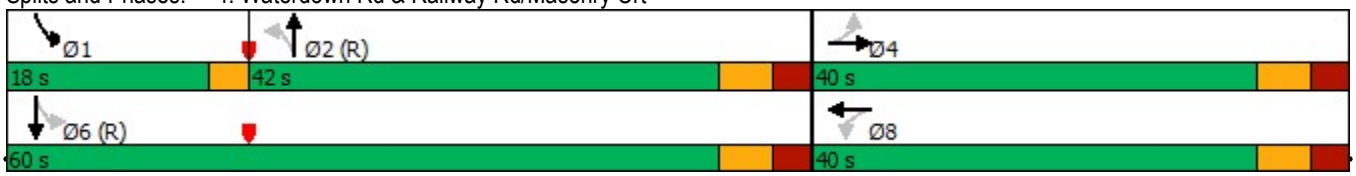
Intersection Summary			
Average Delay	2514.4		
Intersection Capacity Utilization	114.4%	ICU Level of Service	H
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	1	11	14	0	304	7	1068	261	831	444	19
Future Volume (vph)	28	1	11	14	0	304	7	1068	261	831	444	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			70.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00			0.99		1.00	1.00			1.00	
Frt		0.961			0.850			0.971			0.994	
Flt Protected		0.967		0.950			0.950			0.950		
Satd. Flow (prot)	0	1158	0	1745	1518	0	1220	3348	0	1745	3292	0
Flt Permitted		0.287		0.730			0.475			0.105		
Satd. Flow (perm)	0	343	0	1341	1518	0	610	3348	0	193	3292	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			336			33			6	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		145.8			139.6			343.5			376.3	
Travel Time (s)		10.5			10.1			24.7			27.1	
Confl. Peds. (#/hr)	1					1	1		2	2		1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	54%	100%	45%	0%	0%	5%	43%	5%	1%	0%	7%	53%
Adj. Flow (vph)	29	1	12	15	0	320	7	1124	275	875	467	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	15	320	0	7	1399	0	875	487	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		11.0	36.0	
Total Split (s)	40.0	40.0		40.0	40.0		42.0	42.0		18.0	60.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		42.0%	42.0%		18.0%	60.0%	
Maximum Green (s)	33.0	33.0		33.0	33.0		35.0	35.0		15.0	53.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		15.0	15.0			15.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)		11.8		11.8	11.8		35.0	35.0		78.2	74.2	
Actuated g/C Ratio		0.12		0.12	0.12		0.35	0.35		0.78	0.74	
v/c Ratio		0.82		0.09	0.67		0.03	1.17		1.23	0.20	
Control Delay		118.3		38.0	11.2		22.1	117.5		141.1	4.5	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		118.3		38.0	11.2		22.1	117.5		141.1	4.5	
LOS		F		D	B		C	F		F	A	
Approach Delay		118.3			12.4			117.0			92.2	
Approach LOS		F			B			F			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 22 (22%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.23			
Intersection Signal Delay: 95.2		Intersection LOS: F	
Intersection Capacity Utilization 125.3%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 4: Waterdown Rd & Railway Rd/Masonry Crt



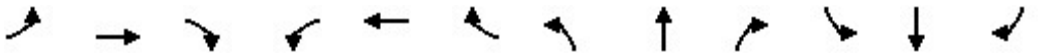


Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	42	15	320	7	1399	875	487
v/c Ratio	0.82	0.09	0.67	0.03	1.17	1.23	0.20
Control Delay	118.3	38.0	11.2	22.1	117.5	141.1	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	118.3	38.0	11.2	22.1	117.5	141.1	4.5
Queue Length 50th (m)	6.1	2.8	0.0	0.9	~178.7	~201.3	12.4
Queue Length 95th (m)	#23.0	8.4	20.1	4.2	#222.7	#306.7	24.0
Internal Link Dist (m)	121.8		115.6		319.5		352.3
Turn Bay Length (m)		15.0		20.0		15.0	
Base Capacity (vph)	121	442	726	213	1193	712	2443
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.03	0.44	0.03	1.17	1.23	0.20

Intersection Summary

~ 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.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	233	663	108	71	1251	226	158	159	65	276	175	498
Future Volume (vph)	233	663	108	71	1251	226	158	159	65	276	175	498
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	30.0		0.0	40.0		0.0	30.0		0.0	0.0		40.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	50.0			25.0			55.0			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		0.99	1.00		0.98	0.99		0.99		0.97
Frt		0.979			0.977			0.957				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3396	0	1662	3381	0	1711	1762	0	1662	1776	1479
Flt Permitted	0.083			0.303			0.640			0.331		
Satd. Flow (perm)	145	3396	0	524	3381	0	1133	1762	0	576	1776	1429
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			19			16				277
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		485.0			153.1			317.1			343.5	
Travel Time (s)		29.1			9.2			22.8			24.7	
Confl. Peds. (#/hr)	6		19	19		6	17		7	7		17
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	5%	3%	3%	5%	4%	4%	2%	2%	4%	5%	7%	8%
Adj. Flow (vph)	248	705	115	76	1331	240	168	169	69	294	186	530
Shared Lane Traffic (%)												
Lane Group Flow (vph)	248	820	0	76	1571	0	168	238	0	294	186	530
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			6.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes										
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		8
Detector Phase	5	2		1	6		7	4		3	8	8
Switch Phase												
Minimum Initial (s)	6.0	20.0		6.0	20.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	9.0	27.3		9.0	31.3		9.0	33.3		9.0	34.0	34.0
Total Split (s)	18.0	49.0		15.0	46.0		10.0	34.0		20.0	44.0	44.0
Total Split (%)	15.3%	41.5%		12.7%	39.0%		8.5%	28.8%		16.9%	37.3%	37.3%
Maximum Green (s)	15.0	42.7		12.0	39.7		7.0	27.7		17.0	37.7	37.7
Yellow Time (s)	3.0	3.7		3.0	3.7		3.0	3.3		3.0	3.3	3.3
All-Red Time (s)	0.0	2.6		0.0	2.6		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	3.0	6.3		3.0	6.3		3.0	6.3		3.0	6.3	6.3
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)		8.0			8.0			10.0			10.0	10.0
Flash Dont Walk (s)		13.0			17.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	67.2	54.5		56.7	45.3		32.1	21.8		44.8	31.5	31.5
Actuated g/C Ratio	0.57	0.46		0.48	0.38		0.27	0.18		0.38	0.27	0.27
v/c Ratio	0.88	0.52		0.23	1.20		0.49	0.70		0.79	0.39	0.91
Control Delay	60.0	25.6		15.5	130.8		31.9	52.5		43.1	36.6	39.5
Queue Delay	0.0	0.0		0.0	0.3		0.0	0.0		0.0	0.0	0.0
Total Delay	60.0	25.6		15.5	131.1		31.9	52.5		43.1	36.6	39.5
LOS	E	C		B	F		C	D		D	D	D
Approach Delay		33.5			125.7			44.0			40.0	
Approach LOS		C			F			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 118			
Actuated Cycle Length: 118			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 125			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.20			
Intersection Signal Delay: 72.9		Intersection LOS: E	
Intersection Capacity Utilization 101.9%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 1: Waterdown Rd & Plains Rd E



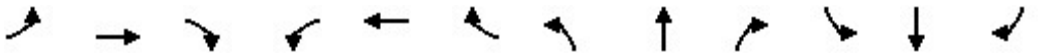


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	248	820	76	1571	168	238	294	186	530
v/c Ratio	0.88	0.52	0.23	1.20	0.49	0.70	0.79	0.39	0.91
Control Delay	60.0	25.6	15.5	130.8	31.9	52.5	43.1	36.6	39.5
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	25.6	15.5	131.1	31.9	52.5	43.1	36.6	39.5
Queue Length 50th (m)	42.7	75.5	8.3	~265.8	27.0	50.2	51.8	36.2	64.3
Queue Length 95th (m)	#96.5	106.1	17.4	#311.2	41.0	75.0	72.6	54.7	#124.4
Internal Link Dist (m)		461.0		129.1		293.1		319.5	
Turn Bay Length (m)	30.0		40.0		30.0				40.0
Base Capacity (vph)	289	1578	384	1309	343	425	375	567	645
Starvation Cap Reductn	0	0	0	81	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	0.86	0.52	0.20	1.28	0.49	0.56	0.78	0.33	0.82

Intersection Summary

~ 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.

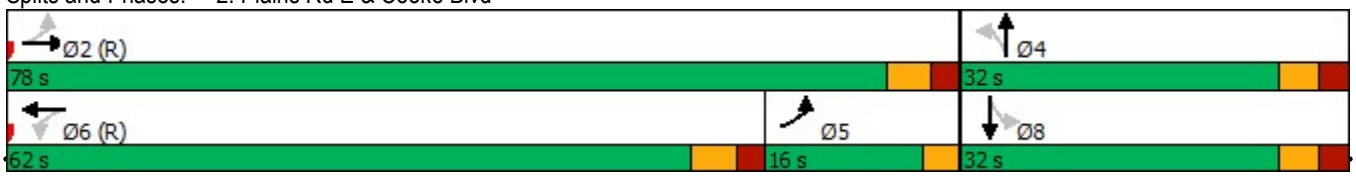


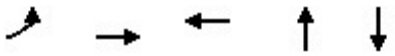
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	805	51	42	1251	156	44	3	12	150	0	115
Future Volume (vph)	57	805	51	42	1251	156	44	3	12	150	0	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.6	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	40.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (m)	25.0			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00						0.99	
Frt		0.991			0.984			0.973			0.941	
Flt Protected	0.950				0.998			0.964			0.972	
Satd. Flow (prot)	1728	3475	0	0	3358	0	0	1747	0	0	1469	0
Flt Permitted	0.089				0.884			0.653			0.807	
Satd. Flow (perm)	162	3475	0	0	2974	0	0	1184	0	0	1218	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			17			11			89	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		153.1			337.7			48.9			344.6	
Travel Time (s)		9.2			20.3			3.5			24.8	
Confl. Peds. (#/hr)	4					4				2		3
Peak Hour Factor	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.92	0.92	0.95	0.92	0.95
Heavy Vehicles (%)	1%	3%	2%	2%	5%	8%	2%	2%	2%	17%	2%	18%
Adj. Flow (vph)	60	847	55	46	1317	164	48	3	13	158	0	121
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	902	0	0	1527	0	0	64	0	0	279	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane					Yes							
Headway Factor	1.04	1.00	1.00	1.00	1.00	1.01	1.00	1.00	1.00	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.7	26.0		26.0	26.0		27.9	27.9		27.9	27.9	
Total Split (s)	16.0	78.0		62.0	62.0		32.0	32.0		32.0	32.0	
Total Split (%)	14.5%	70.9%		56.4%	56.4%		29.1%	29.1%		29.1%	29.1%	
Maximum Green (s)	13.0	72.0		56.0	56.0		26.1	26.1		26.1	26.1	
Yellow Time (s)	3.0	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	0.0	2.3		2.3	2.3		2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	3.0	6.0			6.0			5.9			5.9	
Lead/Lag	Lag			Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		11.0		11.0	11.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	79.0	76.0			63.2			22.1			22.1	
Actuated g/C Ratio	0.72	0.69			0.57			0.20			0.20	
v/c Ratio	0.21	0.38			0.89			0.26			0.89	
Control Delay	14.4	8.0			30.8			32.3			56.3	
Queue Delay	0.0	0.4			0.0			0.0			0.0	
Total Delay	14.4	8.4			30.8			32.3			56.3	
LOS	B	A			C			C			E	
Approach Delay		8.8			30.8			32.3			56.3	
Approach LOS		A			C			C			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 12 (11%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 25.9		Intersection LOS: C	
Intersection Capacity Utilization 96.0%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 2: Plains Rd E & Cooke Blvd

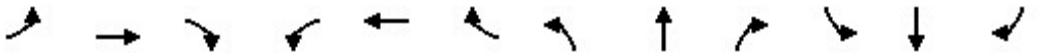




Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	60	902	1527	64	279
v/c Ratio	0.21	0.38	0.89	0.26	0.89
Control Delay	14.4	8.0	30.8	32.3	56.3
Queue Delay	0.0	0.4	0.0	0.0	0.0
Total Delay	14.4	8.4	30.8	32.3	56.3
Queue Length 50th (m)	3.9	43.2	169.7	9.8	41.9
Queue Length 95th (m)	8.3	56.9	#234.1	21.9	#84.7
Internal Link Dist (m)		129.1	313.7	24.9	320.6
Turn Bay Length (m)	40.0				
Base Capacity (vph)	301	2405	1716	289	356
Starvation Cap Reductn	0	900	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.20	0.60	0.89	0.22	0.78

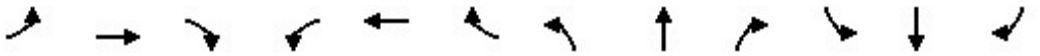
Intersection Summary

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	158	38	158	582	0	161	12	57	0	8	9
Future Volume (vph)	19	158	38	158	582	0	161	12	57	0	8	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.976						0.967			0.929	
Flt Protected		0.996			0.989			0.966				
Satd. Flow (prot)	0	1834	0	0	1808	0	0	1703	0	0	1765	0
Flt Permitted		0.996			0.989			0.966				
Satd. Flow (perm)	0	1834	0	0	1808	0	0	1703	0	0	1765	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		139.6			139.2			344.6			48.9	
Travel Time (s)		10.1			10.0			24.8			3.5	
Confl. Peds. (#/hr)	5					5	1		7	7		1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	0%	0%	4%	0%	5%	0%	6%	0%	0%	0%	0%	0%
Adj. Flow (vph)	23	195	47	195	719	0	199	15	70	0	10	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	265	0	0	914	0	0	284	0	0	21	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 80.9%		ICU Level of Service D	
Analysis Period (min) 15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	158	38	158	582	0	161	12	57	0	8	9
Future Volume (Veh/h)	19	158	38	158	582	0	161	12	57	0	8	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	23	195	47	195	719	0	199	15	70	0	10	11
Pedestrians		1			7						5	
Lane Width (m)		3.6			3.6						3.6	
Walking Speed (m/s)		1.2			1.2						1.2	
Percent Blockage		0			1						0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		140										
pX, platoon unblocked				0.96			0.96	0.96	0.96	0.96	0.96	
vC, conflicting volume	724			242			1390	1378	226	1463	1402	725
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	724			185			1386	1373	167	1461	1398	725
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			85			0	87	92	100	91	97
cM capacity (veh/h)	884			1341			89	117	839	74	113	426

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	265	914	284	21
Volume Left	23	195	199	0
Volume Right	47	0	70	11
cSH	884	1341	116	183
Volume to Capacity	0.03	0.15	2.44	0.11
Queue Length 95th (m)	0.6	4.1	201.5	3.0
Control Delay (s)	1.1	3.4	733.5	27.2
Lane LOS	A	A	F	D
Approach Delay (s)	1.1	3.4	733.5	27.2
Approach LOS			F	D

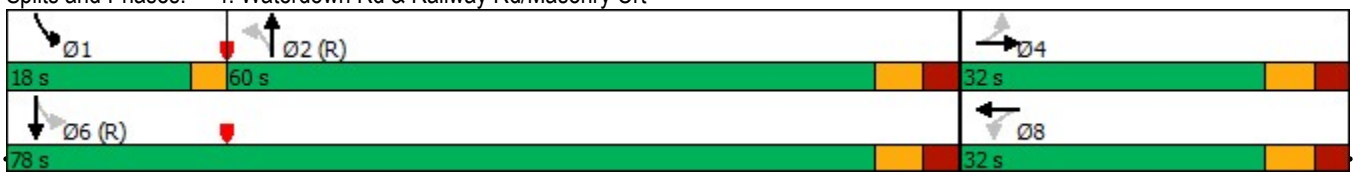
Intersection Summary				
Average Delay	143.0			
Intersection Capacity Utilization	80.9%	ICU Level of Service	D	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	0	6	83	0	686	10	599	31	252	886	17
Future Volume (vph)	19	0	6	83	0	686	10	599	31	252	886	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			70.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99		1.00	1.00		1.00	1.00	
Frt		0.969			0.850			0.993			0.997	
Flt Protected		0.963		0.950			0.950			0.950		
Satd. Flow (prot)	0	1167	0	1745	1517	0	1220	3416	0	1745	3335	0
Flt Permitted		0.252		0.740			0.301			0.339		
Satd. Flow (perm)	0	305	0	1359	1517	0	386	3416	0	622	3335	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		69			392			7			3	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		145.8			139.6			343.5			376.3	
Travel Time (s)		10.5			10.1			24.7			27.1	
Confl. Peds. (#/hr)	1					1	1		2	2		1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	54%	100%	45%	0%	0%	5%	43%	5%	1%	0%	7%	53%
Adj. Flow (vph)	20	0	6	87	0	722	11	631	33	265	933	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	0	87	722	0	11	664	0	265	951	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		11.0	36.0	
Total Split (s)	32.0	32.0		32.0	32.0		60.0	60.0		18.0	78.0	
Total Split (%)	29.1%	29.1%		29.1%	29.1%		54.5%	54.5%		16.4%	70.9%	
Maximum Green (s)	25.0	25.0		25.0	25.0		53.0	53.0		15.0	71.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		15.0	15.0			15.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)		25.0		25.0	25.0		56.2	56.2		75.0	71.0	
Actuated g/C Ratio		0.23		0.23	0.23		0.51	0.51		0.68	0.65	
v/c Ratio		0.21		0.28	1.12		0.06	0.38		0.49	0.44	
Control Delay		4.0		38.1	91.0		15.8	17.3		9.8	10.4	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		4.0		38.1	91.0		15.8	17.3		9.8	10.4	
LOS		A		D	F		B	B		A	B	
Approach Delay		4.0			85.4			17.2			10.3	
Approach LOS		A			F			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 22 (20%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.12			
Intersection Signal Delay: 34.2		Intersection LOS: C	
Intersection Capacity Utilization 95.7%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 4: Waterdown Rd & Railway Rd/Masonry Crt





Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	26	87	722	11	664	265	951
v/c Ratio	0.21	0.28	1.12	0.06	0.38	0.49	0.44
Control Delay	4.0	38.1	91.0	15.8	17.3	9.8	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.0	38.1	91.0	15.8	17.3	9.8	10.4
Queue Length 50th (m)	0.0	16.3	~114.3	1.2	45.4	20.1	51.2
Queue Length 95th (m)	0.0	31.4	#189.2	4.8	63.2	31.0	64.5
Internal Link Dist (m)	121.8		115.6		319.5		352.3
Turn Bay Length (m)		15.0		20.0		15.0	
Base Capacity (vph)	122	308	647	197	1749	577	2153
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.28	1.12	0.06	0.38	0.46	0.44

Intersection Summary

~ 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.

APPENDIX I

ITE Trip Generation Manual Excerpts

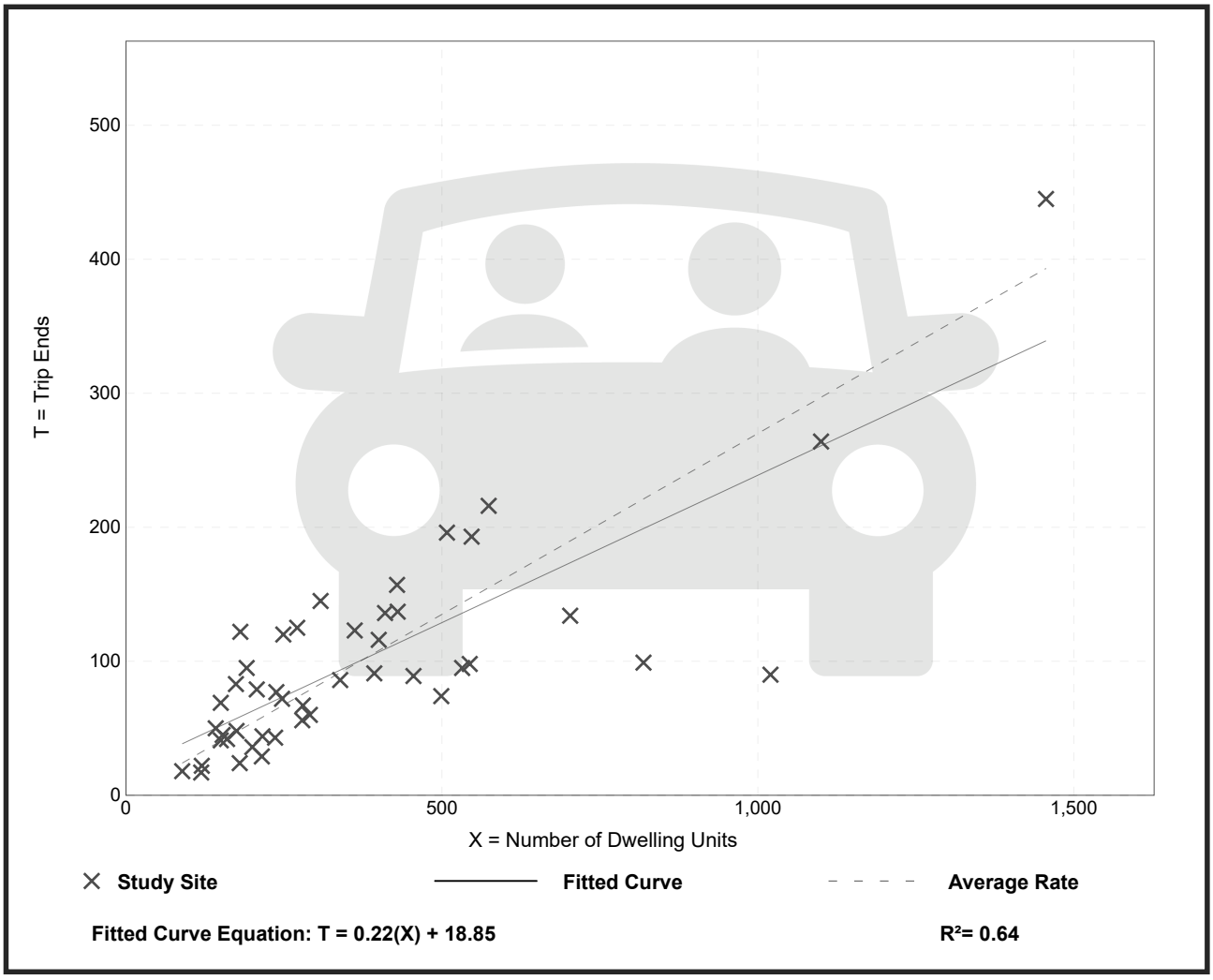
Multifamily Housing (High-Rise)
Not Close to Rail Transit (222)

Vehicle Trip Ends vs:	**Dwelling Units**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 7 and 9 a.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	45
Avg. Num. of Dwelling Units:	372
Directional Distribution:	34% entering, 66% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.27	0.09 - 0.67	0.11

Data Plot and Equation



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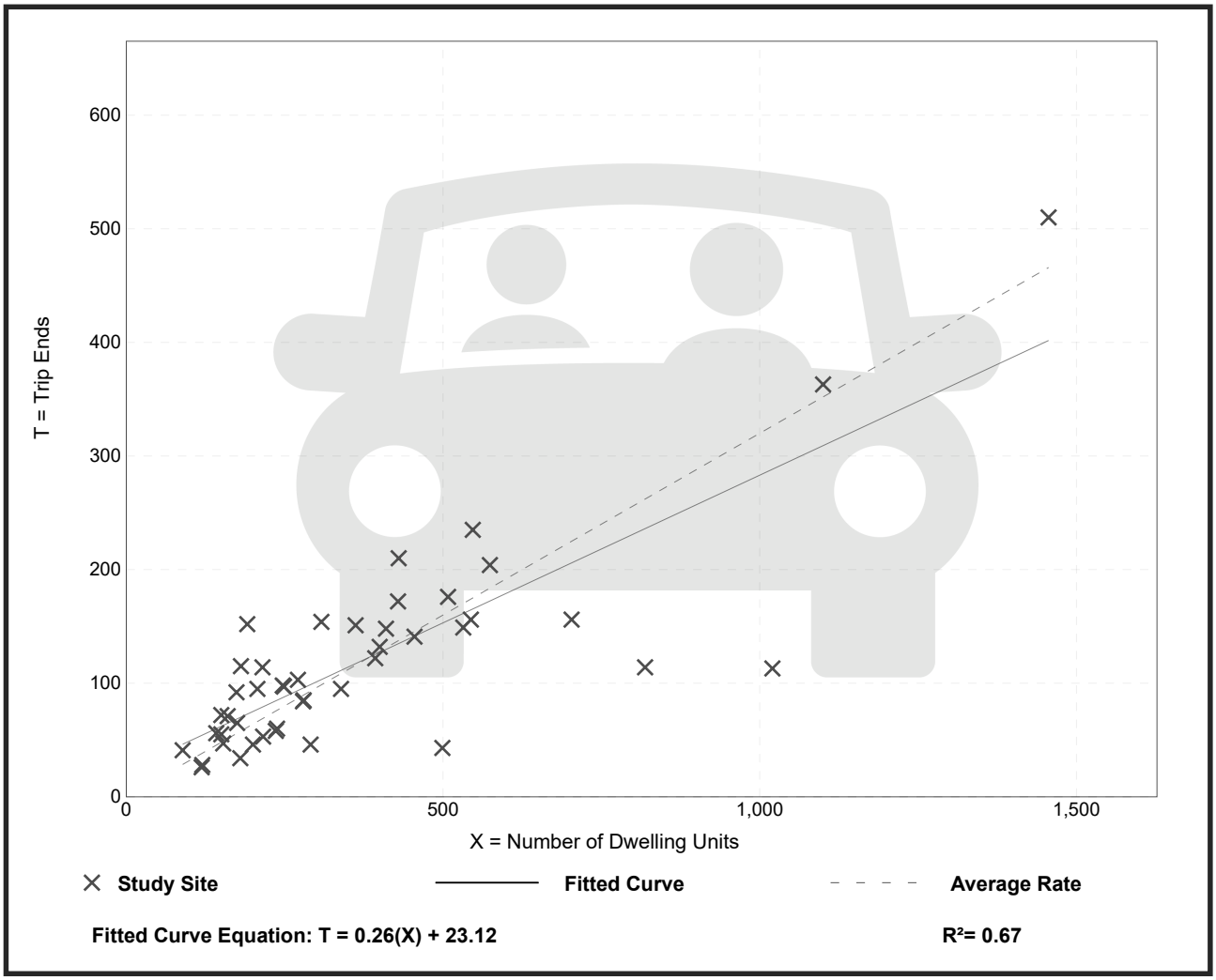
Multifamily Housing (High-Rise)
Not Close to Rail Transit (222)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 45
Avg. Num. of Dwelling Units: 372
Directional Distribution: 56% entering, 44% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.32	0.09 - 0.80	0.13

Data Plot and Equation



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APPENDIX J

TTS Query - Distribution

TTS Directional Distribution Summary

Notes:

1. Directions determined based on centroid coordinates of destination/origin planning districts.

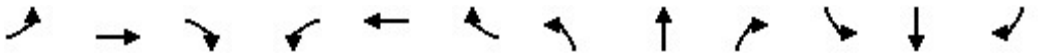
2. 'Internal' refers to local trips made within the home planning district(s), while 'External' refers to trips made to areas outside of the home planning district(s).

3. 'I' refers to local trips made within the subject TAZ that do not have a cardinal direction assigned to them. These trips are excluded from the analysis.

			Internal										External								
	Time Period	Direction	I	NW	N	NE	E	SE	S	SW	W	Total	NW	N	NE	E	SE	S	SW	W	Total
Trips	A.M.	Inbound	47	0	0	0	26	0	0	0	0	26	23	0	0	0	0	0	0	0	23
		Outbound	299	0	0	100	764	22	0	0	0	886	126	44	38	573	44	33	351	0	1209
	P.M.	Inbound	183	0	0	177	830	10	0	0	0	1017	208	44	72	603	32	23	408	84	1474
		Outbound	16	0	0	78	412	0	0	0	0	490	16	13	42	0	0	0	76	92	239
Percentage	A.M.	Inbound	49%	0%	0%	0%	27%	0%	0%	0%	0%	27%	24%	0%	0%	0%	0%	0%	0%	0%	24%
		Outbound	12%	0%	0%	4%	32%	1%	0%	0%	0%	37%	5%	2%	2%	24%	2%	1%	15%	0%	51%
	P.M.	Inbound	7%	0%	0%	7%	31%	0%	0%	0%	0%	38%	8%	2%	3%	23%	1%	1%	15%	3%	55%
		Outbound	2%	0%	0%	10%	55%	0%	0%	0%	0%	66%	2%	2%	6%	0%	0%	0%	10%	12%	32%

APPENDIX K

Synchro Reports – Future Total



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	756	1202	162	75	430	230	63	280	63	193	114	177
Future Volume (vph)	756	1202	162	75	430	230	63	280	63	193	114	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	30.0		0.0	40.0		0.0	30.0		0.0	0.0		40.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	50.0			25.0			55.0			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.99			0.99		0.98	1.00		1.00		0.97
Frt		0.982			0.948			0.972				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3414	0	1662	3268	0	1711	1797	0	1662	1776	1479
Flt Permitted	0.142			0.159			0.679			0.202		
Satd. Flow (perm)	248	3414	0	278	3268	0	1201	1797	0	352	1776	1431
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			84			10				188
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		485.0			153.1			317.1			343.5	
Travel Time (s)		29.1			9.2			22.8			24.7	
Confl. Peds. (#/hr)	6		19	19		6	17		7	7		17
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	5%	3%	3%	5%	4%	4%	2%	2%	4%	5%	7%	8%
Adj. Flow (vph)	804	1279	172	80	457	245	67	298	67	205	121	188
Shared Lane Traffic (%)												
Lane Group Flow (vph)	804	1451	0	80	702	0	67	365	0	205	121	188
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			6.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes										
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		8
Detector Phase	5	2		1	6		7	4		3	8	8
Switch Phase												
Minimum Initial (s)	6.0	20.0		6.0	20.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	23.0	27.3		9.0	31.3		9.0	34.0		9.0	34.0	34.0
Total Split (s)	31.0	51.0		12.0	32.0		10.0	34.0		13.0	37.0	37.0
Total Split (%)	28.2%	46.4%		10.9%	29.1%		9.1%	30.9%		11.8%	33.6%	33.6%
Maximum Green (s)	28.0	44.7		9.0	25.7		7.0	27.7		10.0	30.7	30.7
Yellow Time (s)	3.0	3.7		3.0	3.7		3.0	3.3		3.0	3.3	3.3
All-Red Time (s)	0.0	2.6		0.0	2.6		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	3.0	6.3		3.0	6.3		3.0	6.3		3.0	6.3	6.3
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)		8.0			8.0			10.0			10.0	10.0
Flash Dont Walk (s)		13.0			17.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	62.5	50.2		36.8	25.7		35.3	25.2		41.5	30.2	30.2
Actuated g/C Ratio	0.57	0.46		0.33	0.23		0.32	0.23		0.38	0.27	0.27
v/c Ratio	1.51	0.93		0.42	0.85		0.16	0.87		0.82	0.25	0.36
Control Delay	265.8	40.9		22.5	46.4		22.3	60.9		50.7	32.7	6.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	265.8	40.9		22.5	46.4		22.3	60.9		50.7	32.7	6.5
LOS	F	D		C	D		C	E		D	C	A
Approach Delay		121.1			44.0			54.9			30.3	
Approach LOS		F			D			D			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.51			
Intersection Signal Delay: 87.1		Intersection LOS: F	
Intersection Capacity Utilization 110.1%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: Waterdown Rd & Plains Rd E



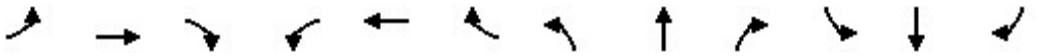


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	804	1451	80	702	67	365	205	121	188
v/c Ratio	1.51	0.93	0.42	0.85	0.16	0.87	0.82	0.25	0.36
Control Delay	265.8	40.9	22.5	46.4	22.3	60.9	50.7	32.7	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	265.8	40.9	22.5	46.4	22.3	60.9	50.7	32.7	6.5
Queue Length 50th (m)	~246.2	~172.4	8.2	71.4	9.4	75.7	31.4	21.3	0.0
Queue Length 95th (m)	#324.2	#230.4	15.9	#101.5	18.8	#121.5	#56.4	37.3	17.0
Internal Link Dist (m)		461.0		129.1		293.1		319.5	
Turn Bay Length (m)	30.0		40.0		30.0				40.0
Base Capacity (vph)	532	1565	209	827	420	459	251	500	537
Starvation Cap Reductn	0	0	0	0	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	1.51	0.93	0.38	0.85	0.16	0.80	0.82	0.24	0.35

Intersection Summary

~ 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.

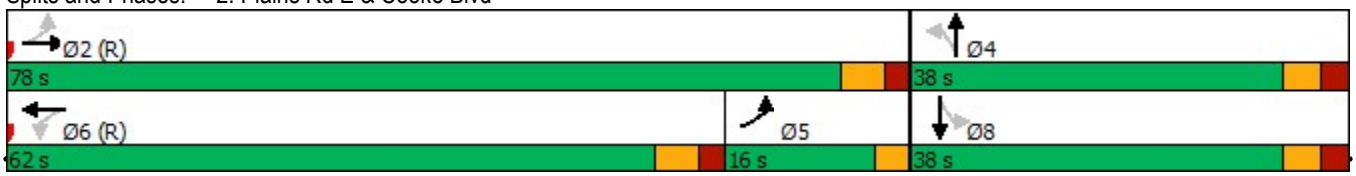


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	273	1146	25	6	592	140	58	4	27	107	0	79
Future Volume (vph)	273	1146	25	6	592	140	58	4	27	107	0	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.6	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	40.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (m)	25.0			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				0.99						0.99	
Frt		0.997			0.972			0.959			0.943	
Flt Protected	0.950							0.968			0.972	
Satd. Flow (prot)	1728	3495	0	0	3305	0	0	1729	0	0	1473	0
Flt Permitted	0.323				0.942			0.682			0.784	
Satd. Flow (perm)	586	3495	0	0	3113	0	0	1218	0	0	1186	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			34			19			85	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		153.1			337.7			48.9			268.2	
Travel Time (s)		9.2			20.3			3.5			19.3	
Confl. Peds. (#/hr)	4					4				2		3
Peak Hour Factor	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.92	0.92	0.95	0.92	0.95
Heavy Vehicles (%)	1%	3%	2%	2%	5%	8%	2%	2%	2%	17%	2%	18%
Adj. Flow (vph)	287	1206	27	7	623	147	63	4	29	113	0	83
Shared Lane Traffic (%)												
Lane Group Flow (vph)	287	1233	0	0	777	0	0	96	0	0	196	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane					Yes							
Headway Factor	1.04	1.00	1.00	1.00	1.00	1.01	1.00	1.00	1.00	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.7	26.0		26.0	26.0		27.9	27.9		27.9	27.9	
Total Split (s)	16.0	78.0		62.0	62.0		38.0	38.0		38.0	38.0	
Total Split (%)	13.8%	67.2%		53.4%	53.4%		32.8%	32.8%		32.8%	32.8%	
Maximum Green (s)	13.0	72.0		56.0	56.0		32.1	32.1		32.1	32.1	
Yellow Time (s)	3.0	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	0.0	2.3		2.3	2.3		2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	3.0	6.0			6.0			5.9			5.9	
Lead/Lag	Lag			Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		11.0		11.0	11.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	89.7	86.7			70.7			17.4			17.4	
Actuated g/C Ratio	0.77	0.75			0.61			0.15			0.15	
v/c Ratio	0.49	0.47			0.41			0.48			0.79	
Control Delay	12.3	7.3			13.0			42.1			46.9	
Queue Delay	0.0	0.7			0.0			0.0			0.0	
Total Delay	12.3	8.0			13.0			42.1			46.9	
LOS	B	A			B			D			D	
Approach Delay		8.8			13.0			42.1			46.9	
Approach LOS		A			B			D			D	

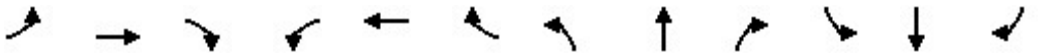
Intersection Summary			
Area Type:	Other		
Cycle Length: 116			
Actuated Cycle Length: 116			
Offset: 12 (10%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 14.2		Intersection LOS: B	
Intersection Capacity Utilization 81.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 2: Plains Rd E & Cooke Blvd



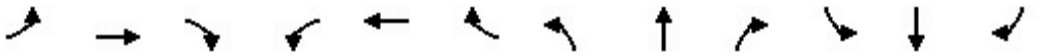
Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	287	1233	777	96	196
v/c Ratio	0.49	0.47	0.41	0.48	0.79
Control Delay	12.3	7.3	13.0	42.1	46.9
Queue Delay	0.0	0.7	0.0	0.0	0.0
Total Delay	12.3	8.0	13.0	42.1	46.9
Queue Length 50th (m)	15.3	51.0	44.8	17.0	26.1
Queue Length 95th (m)	34.9	91.1	73.4	31.2	48.9
Internal Link Dist (m)		129.1	313.7	24.9	244.2
Turn Bay Length (m)	40.0				
Base Capacity (vph)	581	2614	1911	350	389
Starvation Cap Reductn	0	953	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.49	0.74	0.41	0.27	0.50

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	1038	37	77	194	0	124	2	364	0	13	18
Future Volume (vph)	4	1038	37	77	194	0	124	2	364	0	13	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995						0.900			0.922	
Flt Protected					0.986			0.987				
Satd. Flow (prot)	0	1888	0	0	1809	0	0	1663	0	0	1752	0
Flt Permitted					0.986			0.987				
Satd. Flow (perm)	0	1888	0	0	1809	0	0	1663	0	0	1752	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		64.9			139.2			76.4			48.9	
Travel Time (s)		4.7			10.0			5.5			3.5	
Confl. Peds. (#/hr)	5					5	1		7	7		1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	0%	0%	4%	0%	5%	0%	6%	0%	0%	0%	0%	0%
Adj. Flow (vph)	5	1281	46	95	240	0	153	2	449	0	16	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1332	0	0	335	0	0	604	0	0	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

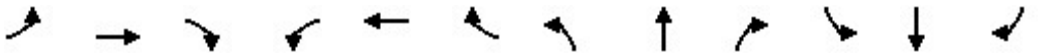
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	115.8%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1038	37	77	194	0	124	2	364	0	13	18
Future Volume (Veh/h)	4	1038	37	77	194	0	124	2	364	0	13	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	5	1281	46	95	240	0	153	2	449	0	16	22
Pedestrians		1			7						5	
Lane Width (m)		3.6			3.6						3.6	
Walking Speed (m/s)		1.2			1.2						1.2	
Percent Blockage		0			1						0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		140										
pX, platoon unblocked				0.63			0.63	0.63	0.63	0.63	0.63	
vC, conflicting volume	245			1327			1775	1749	1311	2206	1772	246
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	245			1227			1934	1893	1202	2614	1929	246
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			74			0	94	0	0	49	97
cM capacity (veh/h)	1327			364			14	33	143	0	31	794

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	1332	335	604	38
Volume Left	5	95	153	0
Volume Right	46	0	449	22
cSH	1327	364	44	70
Volume to Capacity	0.00	0.26	13.78	0.54
Queue Length 95th (m)	0.1	8.2	Err	18.1
Control Delay (s)	0.2	9.2	Err	105.0
Lane LOS	A	A	F	F
Approach Delay (s)	0.2	9.2	Err	105.0
Approach LOS			F	F

Intersection Summary			
Average Delay	2618.7		
Intersection Capacity Utilization	115.8%	ICU Level of Service	H
Analysis Period (min)	15		

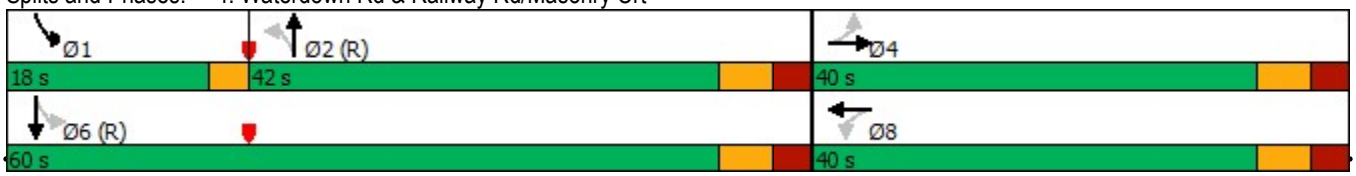


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	1	11	18	0	387	7	1023	261	881	425	19
Future Volume (vph)	28	1	11	18	0	387	7	1023	261	881	425	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			70.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00			0.99		1.00	1.00			1.00	
Frt		0.961			0.850			0.969			0.994	
Flt Protected		0.967		0.950			0.950			0.950		
Satd. Flow (prot)	0	1158	0	1745	1518	0	1220	3342	0	1745	3290	0
Flt Permitted		0.221		0.730			0.484			0.105		
Satd. Flow (perm)	0	264	0	1341	1518	0	621	3342	0	193	3290	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			338			35			7	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		145.8			74.7			343.5			376.3	
Travel Time (s)		10.5			5.4			24.7			27.1	
Confl. Peds. (#/hr)	1					1	1		2	2		1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	54%	100%	45%	0%	0%	5%	43%	5%	1%	0%	7%	53%
Adj. Flow (vph)	29	1	12	19	0	407	7	1077	275	927	447	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	19	407	0	7	1352	0	927	467	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		11.0	36.0	
Total Split (s)	40.0	40.0		40.0	40.0		42.0	42.0		18.0	60.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		42.0%	42.0%		18.0%	60.0%	
Maximum Green (s)	33.0	33.0		33.0	33.0		35.0	35.0		15.0	53.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		15.0	15.0			15.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)		15.3		15.3	15.3		35.0	35.0		74.7	70.7	
Actuated g/C Ratio		0.15		0.15	0.15		0.35	0.35		0.75	0.71	
v/c Ratio		0.84		0.09	0.79		0.03	1.13		1.42	0.20	
Control Delay		115.9		32.6	18.8		22.1	102.2		224.8	6.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		115.9		32.6	18.8		22.1	102.2		224.8	6.2	
LOS		F		C	B		C	F		F	A	
Approach Delay		115.9			19.4			101.8			151.6	
Approach LOS		F			B			F			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 22 (22%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.42			
Intersection Signal Delay: 112.6		Intersection LOS: F	
Intersection Capacity Utilization 126.8%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 4: Waterdown Rd & Railway Rd/Masonry Crt





Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	42	19	407	7	1352	927	467
v/c Ratio	0.84	0.09	0.79	0.03	1.13	1.42	0.20
Control Delay	115.9	32.6	18.8	22.1	102.2	224.8	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	115.9	32.6	18.8	22.1	102.2	224.8	6.2
Queue Length 50th (m)	6.2	3.5	13.0	0.9	~167.8	~232.5	13.2
Queue Length 95th (m)	#21.5	8.7	40.8	4.1	#211.8	#365.5	30.7
Internal Link Dist (m)	121.8		50.7		319.5		352.3
Turn Bay Length (m)		15.0		20.0		15.0	
Base Capacity (vph)	95	442	727	217	1192	651	2327
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.04	0.56	0.03	1.13	1.42	0.20

Intersection Summary

~ 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.



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	26	44	18	123	40	0
Future Volume (vph)	26	44	18	123	40	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.915					
Flt Protected	0.982			0.994		
Satd. Flow (prot)	1674	0	0	1852	1863	0
Flt Permitted	0.982			0.994		
Satd. Flow (perm)	1674	0	0	1852	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	39.4			268.2	76.4	
Travel Time (s)	2.8			19.3	5.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	48	20	134	43	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	76	0	0	154	43	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 24.9%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	44	18	123	40	0
Future Volume (Veh/h)	26	44	18	123	40	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	48	20	134	43	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)				268		
pX, platoon unblocked						
vC, conflicting volume	217	43	43			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	217	43	43			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	95	99			
cM capacity (veh/h)	761	1027	1566			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	76	154	43
Volume Left	28	20	0
Volume Right	48	0	0
cSH	910	1566	1700
Volume to Capacity	0.08	0.01	0.03
Queue Length 95th (m)	2.2	0.3	0.0
Control Delay (s)	9.3	1.0	0.0
Lane LOS	A	A	
Approach Delay (s)	9.3	1.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	24.9%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1093	50	0	332	60	0
Future Volume (vph)	1093	50	0	332	60	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.994					
Flt Protected					0.950	
Satd. Flow (prot)	1852	0	0	1863	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	1852	0	0	1863	1770	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	74.7			64.9	40.6	
Travel Time (s)	5.4			4.7	2.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1188	54	0	361	65	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1242	0	0	361	65	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.3			3.3	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

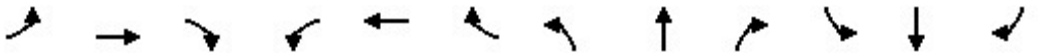
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 70.6%		ICU Level of Service C	
Analysis Period (min) 15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1093	50	0	332	60	0
Future Volume (Veh/h)	1093	50	0	332	60	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)	1188	54	0	361	65	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)	75					
pX, platoon unblocked			0.64		0.64	0.64
vC, conflicting volume			1242		1576	1215
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1095		1619	1052
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		10	100
cM capacity (veh/h)			406		72	175

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1242	361	65
Volume Left	0	0	65
Volume Right	54	0	0
cSH	1700	406	72
Volume to Capacity	0.73	0.00	0.90
Queue Length 95th (m)	0.0	0.0	36.0
Control Delay (s)	0.0	0.0	176.0
Lane LOS			F
Approach Delay (s)	0.0	0.0	176.0
Approach LOS			F

Intersection Summary			
Average Delay	6.9		
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	637	103	68	1199	217	151	152	62	265	167	477
Future Volume (vph)	223	637	103	68	1199	217	151	152	62	265	167	477
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	30.0		0.0	40.0		0.0	30.0		0.0	0.0		40.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	50.0			25.0			55.0			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		0.99	1.00		0.98	0.99		0.99		0.97
Frt		0.979			0.977			0.957				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3397	0	1662	3381	0	1711	1762	0	1662	1776	1479
Flt Permitted	0.080			0.321			0.645			0.335		
Satd. Flow (perm)	140	3397	0	555	3381	0	1141	1762	0	583	1776	1429
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			19			16				280
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		485.0			153.1			317.1			343.5	
Travel Time (s)		29.1			9.2			22.8			24.7	
Confl. Peds. (#/hr)	6		19	19		6	17		7	7		17
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	5%	3%	3%	5%	4%	4%	2%	2%	4%	5%	7%	8%
Adj. Flow (vph)	237	678	110	72	1276	231	161	162	66	282	178	507
Shared Lane Traffic (%)												
Lane Group Flow (vph)	237	788	0	72	1507	0	161	228	0	282	178	507
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			6.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes										
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		8
Detector Phase	5	2		1	6		7	4		3	8	8
Switch Phase												
Minimum Initial (s)	6.0	20.0		6.0	20.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	9.0	27.3		9.0	31.3		9.0	33.3		9.0	34.0	34.0
Total Split (s)	18.0	49.0		15.0	46.0		10.0	34.0		20.0	44.0	44.0
Total Split (%)	15.3%	41.5%		12.7%	39.0%		8.5%	28.8%		16.9%	37.3%	37.3%
Maximum Green (s)	15.0	42.7		12.0	39.7		7.0	27.7		17.0	37.7	37.7
Yellow Time (s)	3.0	3.7		3.0	3.7		3.0	3.3		3.0	3.3	3.3
All-Red Time (s)	0.0	2.6		0.0	2.6		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	3.0	6.3		3.0	6.3		3.0	6.3		3.0	6.3	6.3
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)		8.0			8.0			10.0			10.0	10.0
Flash Dont Walk (s)		13.0			17.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	68.4	55.9		58.3	47.0		31.0	20.7		43.6	30.3	30.3
Actuated g/C Ratio	0.58	0.47		0.49	0.40		0.26	0.18		0.37	0.26	0.26
v/c Ratio	0.86	0.49		0.21	1.11		0.48	0.71		0.77	0.39	0.88
Control Delay	57.5	24.1		14.7	94.2		32.4	53.8		42.1	37.4	35.6
Queue Delay	0.0	0.0		0.0	0.4		0.0	0.0		0.0	0.0	0.0
Total Delay	57.5	24.1		14.7	94.6		32.4	53.8		42.1	37.4	35.6
LOS	E	C		B	F		C	D		D	D	D
Approach Delay		31.8			90.9			44.9			37.8	
Approach LOS		C			F			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 118			
Actuated Cycle Length: 118			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.11			
Intersection Signal Delay: 58.2		Intersection LOS: E	
Intersection Capacity Utilization 98.5%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Waterdown Rd & Plains Rd E





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	237	788	72	1507	161	228	282	178	507
v/c Ratio	0.86	0.49	0.21	1.11	0.48	0.71	0.77	0.39	0.88
Control Delay	57.5	24.1	14.7	94.2	32.4	53.8	42.1	37.4	35.6
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	57.5	24.1	14.7	94.6	32.4	53.8	42.1	37.4	35.6
Queue Length 50th (m)	39.3	67.4	7.3	~233.3	27.0	49.4	51.7	35.9	58.2
Queue Length 95th (m)	#90.8	100.7	16.5	#293.8	39.3	71.9	69.6	52.3	101.4
Internal Link Dist (m)		461.0		129.1		293.1		319.5	
Turn Bay Length (m)	30.0		40.0		30.0				40.0
Base Capacity (vph)	286	1618	405	1359	333	425	370	567	647
Starvation Cap Reductn	0	0	0	126	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	0.83	0.49	0.18	1.22	0.48	0.54	0.76	0.31	0.78

Intersection Summary

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

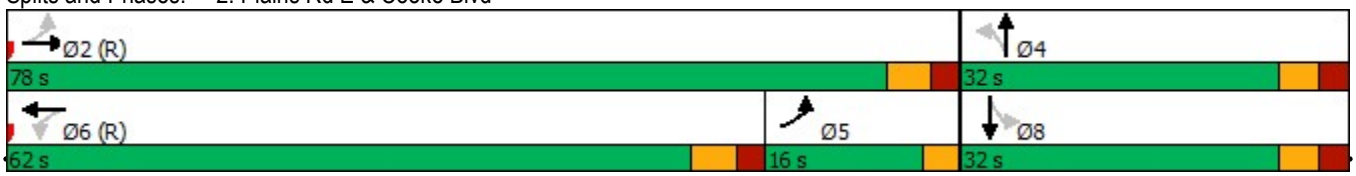
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

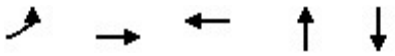
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	805	51	42	1251	158	44	3	12	152	0	115
Future Volume (vph)	57	805	51	42	1251	158	44	3	12	152	0	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.6	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	40.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (m)	25.0			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00						0.99	
Frt		0.991			0.984			0.973			0.942	
Flt Protected	0.950				0.998			0.964			0.972	
Satd. Flow (prot)	1728	3475	0	0	3357	0	0	1747	0	0	1471	0
Flt Permitted	0.089				0.884			0.655			0.806	
Satd. Flow (perm)	162	3475	0	0	2974	0	0	1187	0	0	1218	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			17			11			89	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		153.1			337.7			48.9			268.2	
Travel Time (s)		9.2			20.3			3.5			19.3	
Confl. Peds. (#/hr)	4					4				2		3
Peak Hour Factor	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.92	0.92	0.95	0.92	0.95
Heavy Vehicles (%)	1%	3%	2%	2%	5%	8%	2%	2%	2%	17%	2%	18%
Adj. Flow (vph)	60	847	55	46	1317	166	48	3	13	160	0	121
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	902	0	0	1529	0	0	64	0	0	281	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane					Yes							
Headway Factor	1.04	1.00	1.00	1.00	1.00	1.01	1.00	1.00	1.00	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.7	26.0		26.0	26.0		27.9	27.9		27.9	27.9	
Total Split (s)	16.0	78.0		62.0	62.0		32.0	32.0		32.0	32.0	
Total Split (%)	14.5%	70.9%		56.4%	56.4%		29.1%	29.1%		29.1%	29.1%	
Maximum Green (s)	13.0	72.0		56.0	56.0		26.1	26.1		26.1	26.1	
Yellow Time (s)	3.0	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	0.0	2.3		2.3	2.3		2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	3.0	6.0			6.0			5.9			5.9	
Lead/Lag	Lag			Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		11.0		11.0	11.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	78.9	75.9			63.1			22.2			22.2	
Actuated g/C Ratio	0.72	0.69			0.57			0.20			0.20	
v/c Ratio	0.21	0.38			0.89			0.26			0.89	
Control Delay	14.5	8.1			31.1			32.2			57.7	
Queue Delay	0.0	0.4			0.0			0.0			0.0	
Total Delay	14.5	8.5			31.1			32.2			57.7	
LOS	B	A			C			C			E	
Approach Delay		8.9			31.1			32.2			57.7	
Approach LOS		A			C			C			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 12 (11%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 26.2		Intersection LOS: C	
Intersection Capacity Utilization 96.1%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 2: Plains Rd E & Cooke Blvd

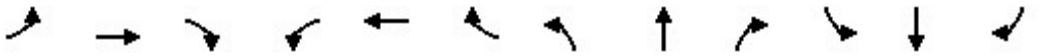




Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	60	902	1529	64	281
v/c Ratio	0.21	0.38	0.89	0.26	0.89
Control Delay	14.5	8.1	31.1	32.2	57.7
Queue Delay	0.0	0.4	0.0	0.0	0.0
Total Delay	14.5	8.5	31.1	32.2	57.7
Queue Length 50th (m)	3.9	43.4	170.8	9.7	42.2
Queue Length 95th (m)	8.3	56.9	#234.4	21.9	#85.8
Internal Link Dist (m)		129.1	313.7	24.9	244.2
Turn Bay Length (m)	40.0				
Base Capacity (vph)	301	2401	1713	290	356
Starvation Cap Reductn	0	897	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.20	0.60	0.89	0.22	0.79

Intersection Summary

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	158	38	158	582	0	162	12	57	0	8	9
Future Volume (vph)	19	158	38	158	582	0	162	12	57	0	8	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.976						0.967			0.929	
Flt Protected		0.996			0.989			0.966				
Satd. Flow (prot)	0	1834	0	0	1808	0	0	1703	0	0	1765	0
Flt Permitted		0.996			0.989			0.966				
Satd. Flow (perm)	0	1834	0	0	1808	0	0	1703	0	0	1765	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		64.9			139.2			76.4			48.9	
Travel Time (s)		4.7			10.0			5.5			3.5	
Confl. Peds. (#/hr)	5					5	1		7	7		1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	0%	0%	4%	0%	5%	0%	6%	0%	0%	0%	0%	0%
Adj. Flow (vph)	23	195	47	195	719	0	200	15	70	0	10	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	265	0	0	914	0	0	285	0	0	21	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	158	38	158	582	0	162	12	57	0	8	9
Future Volume (Veh/h)	19	158	38	158	582	0	162	12	57	0	8	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	23	195	47	195	719	0	200	15	70	0	10	11
Pedestrians		1			7						5	
Lane Width (m)		3.6			3.6						3.6	
Walking Speed (m/s)		1.2			1.2						1.2	
Percent Blockage		0			1						0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		140										
pX, platoon unblocked												
vC, conflicting volume	724			242			1390	1378	226	1463	1402	725
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	724			242			1390	1378	226	1463	1402	725
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			85			0	88	91	100	91	97
cM capacity (veh/h)	884			1336			93	121	814	77	117	426

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	265	914	285	21
Volume Left	23	195	200	0
Volume Right	47	0	70	11
cSH	884	1336	120	189
Volume to Capacity	0.03	0.15	2.37	0.11
Queue Length 95th (m)	0.6	4.1	198.9	3.0
Control Delay (s)	1.1	3.4	697.5	26.4
Lane LOS	A	A	F	D
Approach Delay (s)	1.1	3.4	697.5	26.4
Approach LOS			F	D

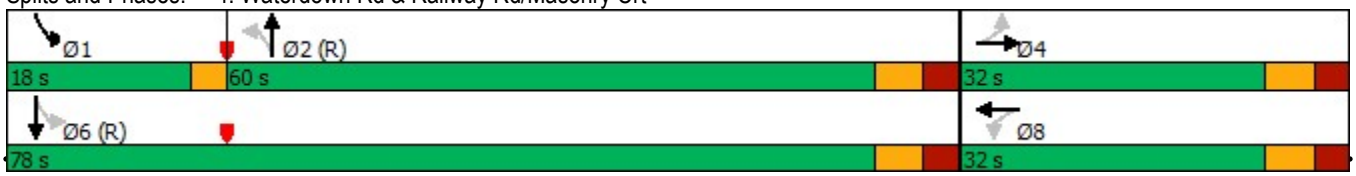
Intersection Summary				
Average Delay	136.5			
Intersection Capacity Utilization	81.0%	ICU Level of Service	D	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	0	6	83	0	689	10	574	31	255	848	17
Future Volume (vph)	19	0	6	83	0	689	10	574	31	255	848	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			70.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99		1.00	1.00		1.00	1.00	
Frt		0.969			0.850			0.992			0.997	
Flt Protected		0.963		0.950			0.950			0.950		
Satd. Flow (prot)	0	1167	0	1745	1517	0	1220	3413	0	1745	3334	0
Flt Permitted		0.252		0.740			0.313			0.352		
Satd. Flow (perm)	0	305	0	1359	1517	0	402	3413	0	646	3334	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		69			404			7			4	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		145.8			74.7			343.5			376.3	
Travel Time (s)		10.5			5.4			24.7			27.1	
Confl. Peds. (#/hr)	1					1	1		2	2		1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	54%	100%	45%	0%	0%	5%	43%	5%	1%	0%	7%	53%
Adj. Flow (vph)	20	0	6	87	0	725	11	604	33	268	893	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	0	87	725	0	11	637	0	268	911	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		11.0	36.0	
Total Split (s)	32.0	32.0		32.0	32.0		60.0	60.0		18.0	78.0	
Total Split (%)	29.1%	29.1%		29.1%	29.1%		54.5%	54.5%		16.4%	70.9%	
Maximum Green (s)	25.0	25.0		25.0	25.0		53.0	53.0		15.0	71.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		15.0	15.0			15.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)		25.0		25.0	25.0		56.2	56.2		75.0	71.0	
Actuated g/C Ratio		0.23		0.23	0.23		0.51	0.51		0.68	0.65	
v/c Ratio		0.21		0.28	1.11		0.05	0.36		0.48	0.42	
Control Delay		4.0		38.1	86.5		15.7	17.1		9.6	10.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		4.0		38.1	86.5		15.7	17.1		9.6	10.2	
LOS		A		D	F		B	B		A	B	
Approach Delay		4.0			81.3			17.1			10.1	
Approach LOS		A			F			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 22 (20%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.11			
Intersection Signal Delay: 33.4		Intersection LOS: C	
Intersection Capacity Utilization 96.1%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 4: Waterdown Rd & Railway Rd/Masonry Crt





Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	26	87	725	11	637	268	911
v/c Ratio	0.21	0.28	1.11	0.05	0.36	0.48	0.42
Control Delay	4.0	38.1	86.5	15.7	17.1	9.6	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.0	38.1	86.5	15.7	17.1	9.6	10.2
Queue Length 50th (m)	0.0	16.3	~111.2	1.2	43.2	20.4	48.1
Queue Length 95th (m)	0.0	31.4	#185.6	4.8	60.5	31.3	61.1
Internal Link Dist (m)	121.8		50.7		319.5		352.3
Turn Bay Length (m)		15.0		20.0		15.0	
Base Capacity (vph)	122	308	656	205	1746	590	2153
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.28	1.11	0.05	0.36	0.45	0.42

Intersection Summary

~ 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.



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	19	40	45	64	54	0
Future Volume (vph)	19	40	45	64	54	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.909					
Flt Protected	0.984			0.980		
Satd. Flow (prot)	1666	0	0	1825	1863	0
Flt Permitted	0.984			0.980		
Satd. Flow (perm)	1666	0	0	1825	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	39.4			268.2	76.4	
Travel Time (s)	2.8			19.3	5.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	43	49	70	59	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	64	0	0	119	59	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 22.7%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	19	40	45	64	54	0
Future Volume (Veh/h)	19	40	45	64	54	0
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)	21	43	49	70	59	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)				268		
pX, platoon unblocked						
vC, conflicting volume	227	59	59			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	227	59	59			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	96	97			
cM capacity (veh/h)	737	1007	1545			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	64	119	59
Volume Left	21	49	0
Volume Right	43	0	0
cSH	899	1545	1700
Volume to Capacity	0.07	0.03	0.03
Queue Length 95th (m)	1.8	0.8	0.0
Control Delay (s)	9.3	3.2	0.0
Lane LOS	A	A	
Approach Delay (s)	9.3	3.2	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	22.7%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	50	86	0	313	44	0
Future Volume (vph)	50	86	0	313	44	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.915					
Flt Protected					0.950	
Satd. Flow (prot)	1704	0	0	1863	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	1704	0	0	1863	1770	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	74.7			64.9	40.6	
Travel Time (s)	5.4			4.7	2.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	93	0	340	48	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	147	0	0	340	48	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.3			3.3	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

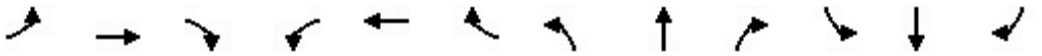
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 26.5%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	50	86	0	313	44	0
Future Volume (Veh/h)	50	86	0	313	44	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)	54	93	0	340	48	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)	75					
pX, platoon unblocked						
vC, conflicting volume			147		440	100
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			147		440	100
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		92	100
cM capacity (veh/h)			1435		574	955

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	147	340	48
Volume Left	0	0	48
Volume Right	93	0	0
cSH	1700	1435	574
Volume to Capacity	0.09	0.00	0.08
Queue Length 95th (m)	0.0	0.0	2.2
Control Delay (s)	0.0	0.0	11.8
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.8
Approach LOS			B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	26.5%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	787	1250	169	79	447	239	66	291	66	200	119	185
Future Volume (vph)	787	1250	169	79	447	239	66	291	66	200	119	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	30.0		0.0	40.0		0.0	30.0		0.0	0.0		40.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	50.0			25.0			55.0			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.99			0.99		0.98	1.00		1.00		0.97
Frt		0.982			0.948			0.972				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3414	0	1662	3268	0	1711	1797	0	1662	1776	1479
Flt Permitted	0.142			0.159			0.676			0.187		
Satd. Flow (perm)	248	3414	0	278	3268	0	1196	1797	0	326	1776	1431
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			83			10				197
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		485.0			153.1			317.1			343.5	
Travel Time (s)		29.1			9.2			22.8			24.7	
Confl. Peds. (#/hr)	6		19	19		6	17		7	7		17
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	5%	3%	3%	5%	4%	4%	2%	2%	4%	5%	7%	8%
Adj. Flow (vph)	837	1330	180	84	476	254	70	310	70	213	127	197
Shared Lane Traffic (%)												
Lane Group Flow (vph)	837	1510	0	84	730	0	70	380	0	213	127	197
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			6.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes										
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		8
Detector Phase	5	2		1	6		7	4		3	8	8
Switch Phase												
Minimum Initial (s)	6.0	20.0		6.0	20.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	23.0	27.3		9.0	31.3		9.0	34.0		9.0	34.0	34.0
Total Split (s)	31.0	51.0		12.0	32.0		10.0	34.0		13.0	37.0	37.0
Total Split (%)	28.2%	46.4%		10.9%	29.1%		9.1%	30.9%		11.8%	33.6%	33.6%
Maximum Green (s)	28.0	44.7		9.0	25.7		7.0	27.7		10.0	30.7	30.7
Yellow Time (s)	3.0	3.7		3.0	3.7		3.0	3.3		3.0	3.3	3.3
All-Red Time (s)	0.0	2.6		0.0	2.6		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	3.0	6.3		3.0	6.3		3.0	6.3		3.0	6.3	6.3
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)		8.0			8.0			10.0			10.0	10.0
Flash Dont Walk (s)		13.0			17.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	62.0	49.7		36.8	25.7		35.8	25.7		42.0	30.7	30.7
Actuated g/C Ratio	0.56	0.45		0.33	0.23		0.33	0.23		0.38	0.28	0.28
v/c Ratio	1.59	0.97		0.44	0.88		0.17	0.89		0.87	0.26	0.36
Control Delay	301.8	48.7		23.2	49.6		22.3	63.2		58.4	32.7	6.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	301.8	48.7		23.2	49.6		22.3	63.2		58.4	32.7	6.4
LOS	F	D		C	D		C	E		E	C	A
Approach Delay		139.0			46.9			56.8			33.3	
Approach LOS		F			D			E			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.59			
Intersection Signal Delay: 98.3		Intersection LOS: F	
Intersection Capacity Utilization 112.8%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: Waterdown Rd & Plains Rd E



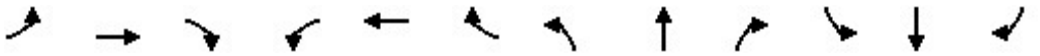


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	837	1510	84	730	70	380	213	127	197
v/c Ratio	1.59	0.97	0.44	0.88	0.17	0.89	0.87	0.26	0.36
Control Delay	301.8	48.7	23.2	49.6	22.3	63.2	58.4	32.7	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	301.8	48.7	23.2	49.6	22.3	63.2	58.4	32.7	6.4
Queue Length 50th (m)	~263.2	~197.0	8.7	75.5	9.7	79.4	32.6	22.3	0.0
Queue Length 95th (m)	#340.5	#245.6	16.5	#109.3	19.4	#129.1	#64.3	38.8	17.3
Internal Link Dist (m)		461.0		129.1		293.1		319.5	
Turn Bay Length (m)	30.0		40.0		30.0				40.0
Base Capacity (vph)	525	1549	209	827	423	459	245	503	547
Starvation Cap Reductn	0	0	0	0	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	1.59	0.97	0.40	0.88	0.17	0.83	0.87	0.25	0.36

Intersection Summary

~ 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.

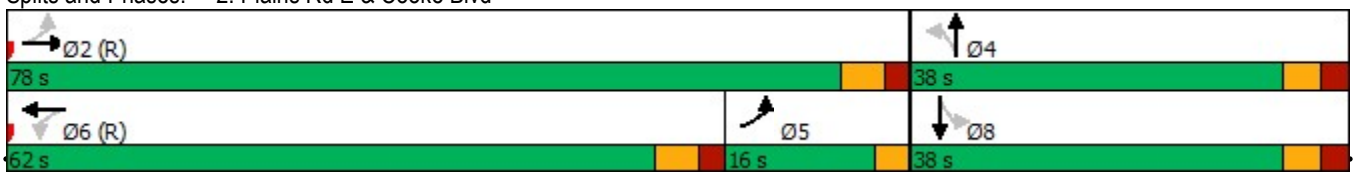


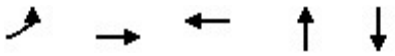
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	273	1146	25	6	592	140	58	4	27	107	0	79
Future Volume (vph)	273	1146	25	6	592	140	58	4	27	107	0	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.6	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	40.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (m)	25.0			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				0.99						0.99	
Frt		0.997			0.972			0.959			0.943	
Flt Protected	0.950							0.968			0.972	
Satd. Flow (prot)	1728	3495	0	0	3305	0	0	1729	0	0	1473	0
Flt Permitted	0.323				0.942			0.682			0.784	
Satd. Flow (perm)	586	3495	0	0	3113	0	0	1218	0	0	1186	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			34			19			85	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		153.1			337.7			48.9			268.2	
Travel Time (s)		9.2			20.3			3.5			19.3	
Confl. Peds. (#/hr)	4					4				2		3
Peak Hour Factor	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.92	0.92	0.95	0.92	0.95
Heavy Vehicles (%)	1%	3%	2%	2%	5%	8%	2%	2%	2%	17%	2%	18%
Adj. Flow (vph)	287	1206	27	7	623	147	63	4	29	113	0	83
Shared Lane Traffic (%)												
Lane Group Flow (vph)	287	1233	0	0	777	0	0	96	0	0	196	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane					Yes							
Headway Factor	1.04	1.00	1.00	1.00	1.00	1.01	1.00	1.00	1.00	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.7	26.0		26.0	26.0		27.9	27.9		27.9	27.9	
Total Split (s)	16.0	78.0		62.0	62.0		38.0	38.0		38.0	38.0	
Total Split (%)	13.8%	67.2%		53.4%	53.4%		32.8%	32.8%		32.8%	32.8%	
Maximum Green (s)	13.0	72.0		56.0	56.0		32.1	32.1		32.1	32.1	
Yellow Time (s)	3.0	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	0.0	2.3		2.3	2.3		2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	3.0	6.0			6.0			5.9			5.9	
Lead/Lag	Lag			Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		11.0		11.0	11.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	89.7	86.7			70.7			17.4			17.4	
Actuated g/C Ratio	0.77	0.75			0.61			0.15			0.15	
v/c Ratio	0.49	0.47			0.41			0.48			0.79	
Control Delay	12.3	7.3			13.0			42.1			46.9	
Queue Delay	0.0	0.7			0.0			0.0			0.0	
Total Delay	12.3	8.0			13.0			42.1			46.9	
LOS	B	A			B			D			D	
Approach Delay		8.8			13.0			42.1			46.9	
Approach LOS		A			B			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 116			
Actuated Cycle Length: 116			
Offset: 12 (10%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 14.2		Intersection LOS: B	
Intersection Capacity Utilization 81.3%		ICU Level of Service D	
Analysis Period (min) 15			

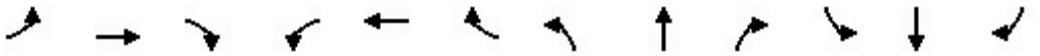
Splits and Phases: 2: Plains Rd E & Cooke Blvd





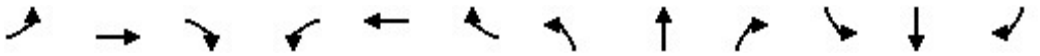
Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	287	1233	777	96	196
v/c Ratio	0.49	0.47	0.41	0.48	0.79
Control Delay	12.3	7.3	13.0	42.1	46.9
Queue Delay	0.0	0.7	0.0	0.0	0.0
Total Delay	12.3	8.0	13.0	42.1	46.9
Queue Length 50th (m)	15.3	51.0	44.8	17.0	26.1
Queue Length 95th (m)	34.9	91.1	73.4	31.2	48.9
Internal Link Dist (m)		129.1	313.7	24.9	244.2
Turn Bay Length (m)	40.0				
Base Capacity (vph)	581	2614	1911	350	389
Starvation Cap Reductn	0	953	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.49	0.74	0.41	0.27	0.50

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	1038	37	77	194	0	124	2	364	0	13	18
Future Volume (vph)	4	1038	37	77	194	0	124	2	364	0	13	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995						0.900			0.922	
Flt Protected					0.986			0.987				
Satd. Flow (prot)	0	1888	0	0	1809	0	0	1663	0	0	1752	0
Flt Permitted					0.986			0.987				
Satd. Flow (perm)	0	1888	0	0	1809	0	0	1663	0	0	1752	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		64.9			139.2			76.4			48.9	
Travel Time (s)		4.7			10.0			5.5			3.5	
Confl. Peds. (#/hr)	5					5	1		7	7		1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	0%	0%	4%	0%	5%	0%	6%	0%	0%	0%	0%	0%
Adj. Flow (vph)	5	1281	46	95	240	0	153	2	449	0	16	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1332	0	0	335	0	0	604	0	0	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

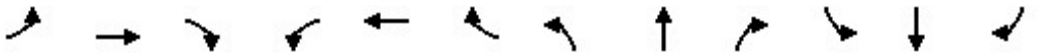
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	115.8%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1038	37	77	194	0	124	2	364	0	13	18
Future Volume (Veh/h)	4	1038	37	77	194	0	124	2	364	0	13	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	5	1281	46	95	240	0	153	2	449	0	16	22
Pedestrians		1			7						5	
Lane Width (m)		3.6			3.6						3.6	
Walking Speed (m/s)		1.2			1.2						1.2	
Percent Blockage		0			1						0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		140										
pX, platoon unblocked				0.63			0.63	0.63	0.63	0.63	0.63	
vC, conflicting volume	245			1327			1775	1749	1311	2206	1772	246
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	245			1227			1935	1894	1201	2616	1930	246
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			74			0	94	0	0	49	97
cM capacity (veh/h)	1327			364			14	33	143	0	31	794

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	1332	335	604	38
Volume Left	5	95	153	0
Volume Right	46	0	449	22
cSH	1327	364	44	70
Volume to Capacity	0.00	0.26	13.84	0.54
Queue Length 95th (m)	0.1	8.2	Err	18.2
Control Delay (s)	0.2	9.2	Err	105.6
Lane LOS	A	A	F	F
Approach Delay (s)	0.2	9.2	Err	105.6
Approach LOS			F	F

Intersection Summary			
Average Delay	2618.8		
Intersection Capacity Utilization	115.8%	ICU Level of Service	H
Analysis Period (min)	15		

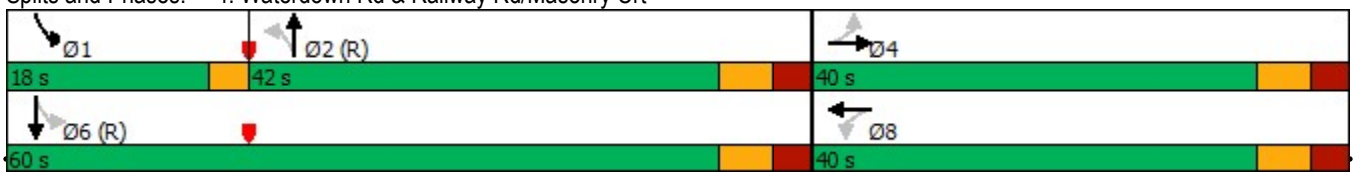


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	1	11	18	0	387	7	1068	261	881	444	19
Future Volume (vph)	28	1	11	18	0	387	7	1068	261	881	444	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			70.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor		1.00			0.99		1.00	1.00			1.00	
Frt		0.961			0.850			0.971			0.994	
Flt Protected		0.967		0.950			0.950			0.950		
Satd. Flow (prot)	0	1158	0	1745	1518	0	1220	3348	0	1745	3292	0
Flt Permitted		0.220		0.730			0.475			0.105		
Satd. Flow (perm)	0	263	0	1341	1518	0	610	3348	0	193	3292	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			336			33			6	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		145.8			74.7			343.5			376.3	
Travel Time (s)		10.5			5.4			24.7			27.1	
Confl. Peds. (#/hr)	1					1	1		2	2		1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	54%	100%	45%	0%	0%	5%	43%	5%	1%	0%	7%	53%
Adj. Flow (vph)	29	1	12	19	0	407	7	1124	275	927	467	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	19	407	0	7	1399	0	927	487	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		11.0	36.0	
Total Split (s)	40.0	40.0		40.0	40.0		42.0	42.0		18.0	60.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		42.0%	42.0%		18.0%	60.0%	
Maximum Green (s)	33.0	33.0		33.0	33.0		35.0	35.0		15.0	53.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		15.0	15.0			15.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)		15.4		15.4	15.4		35.0	35.0		74.6	70.6	
Actuated g/C Ratio		0.15		0.15	0.15		0.35	0.35		0.75	0.71	
v/c Ratio		0.84		0.09	0.79		0.03	1.17		1.43	0.21	
Control Delay		115.9		32.5	19.0		22.1	117.5		225.9	6.3	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		115.9		32.5	19.0		22.1	117.5		225.9	6.3	
LOS		F		C	B		C	F		F	A	
Approach Delay		115.9			19.6			117.0			150.3	
Approach LOS		F			B			F			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 22 (22%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.43			
Intersection Signal Delay: 118.7		Intersection LOS: F	
Intersection Capacity Utilization 128.1%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 4: Waterdown Rd & Railway Rd/Masonry Crt





Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	42	19	407	7	1399	927	487
v/c Ratio	0.84	0.09	0.79	0.03	1.17	1.43	0.21
Control Delay	115.9	32.5	19.0	22.1	117.5	225.9	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	115.9	32.5	19.0	22.1	117.5	225.9	6.3
Queue Length 50th (m)	6.2	3.5	13.4	0.9	~178.7	~232.9	14.0
Queue Length 95th (m)	#21.4	8.6	41.2	4.2	#222.7	#366.3	32.4
Internal Link Dist (m)	121.8		50.7		319.5		352.3
Turn Bay Length (m)		15.0		20.0		15.0	
Base Capacity (vph)	94	442	726	213	1193	650	2326
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.04	0.56	0.03	1.17	1.43	0.21

Intersection Summary

~ 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.



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	26	44	18	123	40	0
Future Volume (vph)	26	44	18	123	40	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.915					
Flt Protected	0.982			0.994		
Satd. Flow (prot)	1674	0	0	1852	1863	0
Flt Permitted	0.982			0.994		
Satd. Flow (perm)	1674	0	0	1852	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	39.4			268.2	76.4	
Travel Time (s)	2.8			19.3	5.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	48	20	134	43	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	76	0	0	154	43	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 24.9%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	44	18	123	40	0
Future Volume (Veh/h)	26	44	18	123	40	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	48	20	134	43	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)				268		
pX, platoon unblocked						
vC, conflicting volume	217	43	43			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	217	43	43			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	95	99			
cM capacity (veh/h)	761	1027	1566			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	76	154	43
Volume Left	28	20	0
Volume Right	48	0	0
cSH	910	1566	1700
Volume to Capacity	0.08	0.01	0.03
Queue Length 95th (m)	2.2	0.3	0.0
Control Delay (s)	9.3	1.0	0.0
Lane LOS	A	A	
Approach Delay (s)	9.3	1.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	24.9%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1093	50	0	332	60	0
Future Volume (vph)	1093	50	0	332	60	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.994					
Flt Protected					0.950	
Satd. Flow (prot)	1852	0	0	1863	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	1852	0	0	1863	1770	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	74.7			64.9	40.6	
Travel Time (s)	5.4			4.7	2.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1188	54	0	361	65	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1242	0	0	361	65	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.3			3.3	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

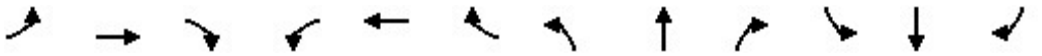
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 70.6%		ICU Level of Service C	
Analysis Period (min) 15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1093	50	0	332	60	0
Future Volume (Veh/h)	1093	50	0	332	60	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)	1188	54	0	361	65	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)	75					
pX, platoon unblocked			0.64		0.64	0.64
vC, conflicting volume			1242		1576	1215
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1094		1620	1052
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		10	100
cM capacity (veh/h)			405		72	175

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1242	361	65
Volume Left	0	0	65
Volume Right	54	0	0
cSH	1700	405	72
Volume to Capacity	0.73	0.00	0.90
Queue Length 95th (m)	0.0	0.0	36.1
Control Delay (s)	0.0	0.0	176.7
Lane LOS			F
Approach Delay (s)	0.0	0.0	176.7
Approach LOS			F

Intersection Summary			
Average Delay	6.9		
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	233	663	108	71	1251	226	158	159	65	276	175	498
Future Volume (vph)	233	663	108	71	1251	226	158	159	65	276	175	498
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	30.0		0.0	40.0		0.0	30.0		0.0	0.0		40.0
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (m)	50.0			25.0			55.0			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		0.99	1.00		0.98	0.99		0.99		0.97
Frt		0.979			0.977			0.957				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3396	0	1662	3381	0	1711	1762	0	1662	1776	1479
Flt Permitted	0.083			0.303			0.640			0.331		
Satd. Flow (perm)	145	3396	0	524	3381	0	1133	1762	0	576	1776	1429
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			19			16				277
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		485.0			153.1			317.1			343.5	
Travel Time (s)		29.1			9.2			22.8			24.7	
Confl. Peds. (#/hr)	6		19	19		6	17		7	7		17
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	5%	3%	3%	5%	4%	4%	2%	2%	4%	5%	7%	8%
Adj. Flow (vph)	248	705	115	76	1331	240	168	169	69	294	186	530
Shared Lane Traffic (%)												
Lane Group Flow (vph)	248	820	0	76	1571	0	168	238	0	294	186	530
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.6			6.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes										
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		8
Detector Phase	5	2		1	6		7	4		3	8	8
Switch Phase												
Minimum Initial (s)	6.0	20.0		6.0	20.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	9.0	27.3		9.0	31.3		9.0	33.3		9.0	34.0	34.0
Total Split (s)	18.0	49.0		15.0	46.0		10.0	34.0		20.0	44.0	44.0
Total Split (%)	15.3%	41.5%		12.7%	39.0%		8.5%	28.8%		16.9%	37.3%	37.3%
Maximum Green (s)	15.0	42.7		12.0	39.7		7.0	27.7		17.0	37.7	37.7
Yellow Time (s)	3.0	3.7		3.0	3.7		3.0	3.3		3.0	3.3	3.3
All-Red Time (s)	0.0	2.6		0.0	2.6		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	3.0	6.3		3.0	6.3		3.0	6.3		3.0	6.3	6.3
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)		8.0			8.0			10.0			10.0	10.0
Flash Dont Walk (s)		13.0			17.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	67.2	54.5		56.7	45.3		32.1	21.8		44.8	31.5	31.5
Actuated g/C Ratio	0.57	0.46		0.48	0.38		0.27	0.18		0.38	0.27	0.27
v/c Ratio	0.88	0.52		0.23	1.20		0.49	0.70		0.79	0.39	0.91
Control Delay	60.0	25.6		15.5	130.8		31.9	52.5		43.1	36.6	39.5
Queue Delay	0.0	0.0		0.0	0.3		0.0	0.0		0.0	0.0	0.0
Total Delay	60.0	25.6		15.5	131.1		31.9	52.5		43.1	36.6	39.5
LOS	E	C		B	F		C	D		D	D	D
Approach Delay		33.5			125.7			44.0			40.0	
Approach LOS		C			F			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 118			
Actuated Cycle Length: 118			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 125			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.20			
Intersection Signal Delay: 72.9		Intersection LOS: E	
Intersection Capacity Utilization 101.9%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 1: Waterdown Rd & Plains Rd E



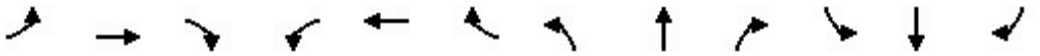


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	248	820	76	1571	168	238	294	186	530
v/c Ratio	0.88	0.52	0.23	1.20	0.49	0.70	0.79	0.39	0.91
Control Delay	60.0	25.6	15.5	130.8	31.9	52.5	43.1	36.6	39.5
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	25.6	15.5	131.1	31.9	52.5	43.1	36.6	39.5
Queue Length 50th (m)	42.7	75.5	8.3	~265.8	27.0	50.2	51.8	36.2	64.3
Queue Length 95th (m)	#96.5	106.1	17.4	#311.2	41.0	75.0	72.6	54.7	#124.4
Internal Link Dist (m)		461.0		129.1		293.1		319.5	
Turn Bay Length (m)	30.0		40.0		30.0				40.0
Base Capacity (vph)	289	1578	384	1309	343	425	375	567	645
Starvation Cap Reductn	0	0	0	81	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	0.86	0.52	0.20	1.28	0.49	0.56	0.78	0.33	0.82

Intersection Summary

~ 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.

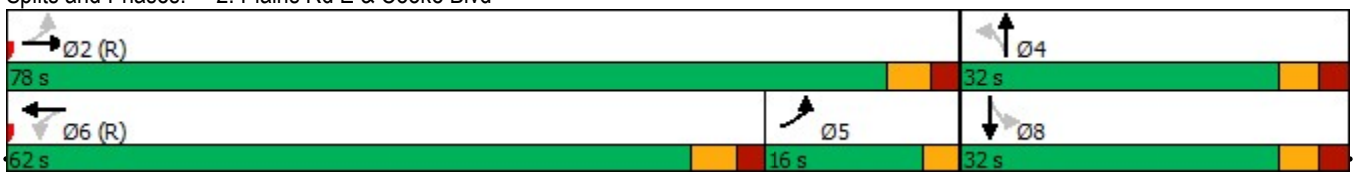


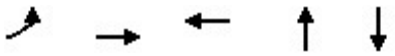
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	805	51	42	1251	158	44	3	12	152	0	115
Future Volume (vph)	57	805	51	42	1251	158	44	3	12	152	0	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.6	3.6	3.5	3.6	3.6	3.6	3.3	3.6	3.5
Storage Length (m)	40.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (m)	25.0			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00						0.99	
Frt		0.991			0.984			0.973			0.942	
Flt Protected	0.950				0.998			0.964			0.972	
Satd. Flow (prot)	1728	3475	0	0	3357	0	0	1747	0	0	1471	0
Flt Permitted	0.089				0.884			0.655			0.806	
Satd. Flow (perm)	162	3475	0	0	2974	0	0	1187	0	0	1218	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			17			11			89	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		153.1			337.7			48.9			268.2	
Travel Time (s)		9.2			20.3			3.5			19.3	
Confl. Peds. (#/hr)	4					4				2		3
Peak Hour Factor	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.92	0.92	0.95	0.92	0.95
Heavy Vehicles (%)	1%	3%	2%	2%	5%	8%	2%	2%	2%	17%	2%	18%
Adj. Flow (vph)	60	847	55	46	1317	166	48	3	13	160	0	121
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	902	0	0	1529	0	0	64	0	0	281	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane					Yes							
Headway Factor	1.04	1.00	1.00	1.00	1.00	1.01	1.00	1.00	1.00	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	9.7	26.0		26.0	26.0		27.9	27.9		27.9	27.9	
Total Split (s)	16.0	78.0		62.0	62.0		32.0	32.0		32.0	32.0	
Total Split (%)	14.5%	70.9%		56.4%	56.4%		29.1%	29.1%		29.1%	29.1%	
Maximum Green (s)	13.0	72.0		56.0	56.0		26.1	26.1		26.1	26.1	
Yellow Time (s)	3.0	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	0.0	2.3		2.3	2.3		2.6	2.6		2.6	2.6	
Lost Time Adjust (s)	0.0	0.0			0.0			0.0			0.0	
Total Lost Time (s)	3.0	6.0			6.0			5.9			5.9	
Lead/Lag	Lag			Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		11.0		11.0	11.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	78.9	75.9			63.1			22.2			22.2	
Actuated g/C Ratio	0.72	0.69			0.57			0.20			0.20	
v/c Ratio	0.21	0.38			0.89			0.26			0.89	
Control Delay	14.5	8.1			31.1			32.2			57.7	
Queue Delay	0.0	0.4			0.0			0.0			0.0	
Total Delay	14.5	8.5			31.1			32.2			57.7	
LOS	B	A			C			C			E	
Approach Delay		8.9			31.1			32.2			57.7	
Approach LOS		A			C			C			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 12 (11%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 26.2		Intersection LOS: C	
Intersection Capacity Utilization 96.1%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 2: Plains Rd E & Cooke Blvd

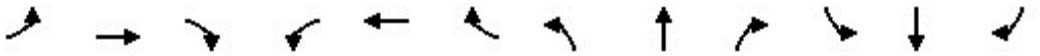




Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	60	902	1529	64	281
v/c Ratio	0.21	0.38	0.89	0.26	0.89
Control Delay	14.5	8.1	31.1	32.2	57.7
Queue Delay	0.0	0.4	0.0	0.0	0.0
Total Delay	14.5	8.5	31.1	32.2	57.7
Queue Length 50th (m)	3.9	43.4	170.8	9.7	42.2
Queue Length 95th (m)	8.3	56.9	#234.4	21.9	#85.8
Internal Link Dist (m)		129.1	313.7	24.9	244.2
Turn Bay Length (m)	40.0				
Base Capacity (vph)	301	2401	1713	290	356
Starvation Cap Reductn	0	897	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.20	0.60	0.89	0.22	0.79

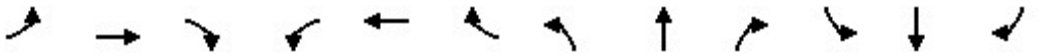
Intersection Summary

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	158	38	158	582	0	162	12	57	0	8	9
Future Volume (vph)	19	158	38	158	582	0	162	12	57	0	8	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.976						0.967			0.929	
Flt Protected		0.996			0.989			0.966				
Satd. Flow (prot)	0	1834	0	0	1808	0	0	1703	0	0	1765	0
Flt Permitted		0.996			0.989			0.966				
Satd. Flow (perm)	0	1834	0	0	1808	0	0	1703	0	0	1765	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		64.9			139.2			76.4			48.9	
Travel Time (s)		4.7			10.0			5.5			3.5	
Confl. Peds. (#/hr)	5					5	1		7	7		1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	0%	0%	4%	0%	5%	0%	6%	0%	0%	0%	0%	0%
Adj. Flow (vph)	23	195	47	195	719	0	200	15	70	0	10	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	265	0	0	914	0	0	285	0	0	21	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

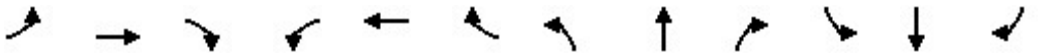
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	158	38	158	582	0	162	12	57	0	8	9
Future Volume (Veh/h)	19	158	38	158	582	0	162	12	57	0	8	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	23	195	47	195	719	0	200	15	70	0	10	11
Pedestrians		1			7						5	
Lane Width (m)		3.6			3.6						3.6	
Walking Speed (m/s)		1.2			1.2						1.2	
Percent Blockage		0			1						0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		140										
pX, platoon unblocked												
vC, conflicting volume	724			242			1390	1378	226	1463	1402	725
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	724			242			1390	1378	226	1463	1402	725
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			85			0	88	91	100	91	97
cM capacity (veh/h)	884			1336			93	121	814	77	117	426

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	265	914	285	21
Volume Left	23	195	200	0
Volume Right	47	0	70	11
cSH	884	1336	120	189
Volume to Capacity	0.03	0.15	2.37	0.11
Queue Length 95th (m)	0.6	4.1	198.9	3.0
Control Delay (s)	1.1	3.4	697.5	26.4
Lane LOS	A	A	F	D
Approach Delay (s)	1.1	3.4	697.5	26.4
Approach LOS			F	D

Intersection Summary				
Average Delay	136.5			
Intersection Capacity Utilization	81.0%	ICU Level of Service	D	
Analysis Period (min)	15			

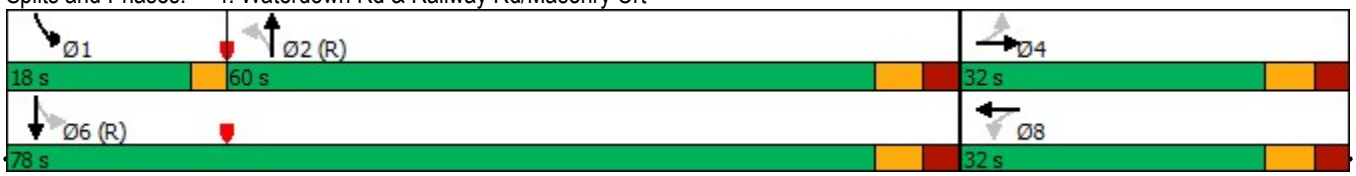


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	0	6	83	0	689	10	599	31	255	886	17
Future Volume (vph)	19	0	6	83	0	689	10	599	31	255	886	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	15.0		0.0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			70.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor					0.99		1.00	1.00		1.00	1.00	
Frt		0.969			0.850			0.993			0.997	
Flt Protected		0.963		0.950			0.950			0.950		
Satd. Flow (prot)	0	1167	0	1745	1517	0	1220	3416	0	1745	3335	0
Flt Permitted		0.252		0.740			0.301			0.339		
Satd. Flow (perm)	0	305	0	1359	1517	0	386	3416	0	622	3335	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		69			392			7			3	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		145.8			74.7			343.5			376.3	
Travel Time (s)		10.5			5.4			24.7			27.1	
Confl. Peds. (#/hr)	1					1	1		2	2		1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	54%	100%	45%	0%	0%	5%	43%	5%	1%	0%	7%	53%
Adj. Flow (vph)	20	0	6	87	0	725	11	631	33	268	933	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	0	87	725	0	11	664	0	268	951	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			3.3			3.3	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		11.0	36.0	
Total Split (s)	32.0	32.0		32.0	32.0		60.0	60.0		18.0	78.0	
Total Split (%)	29.1%	29.1%		29.1%	29.1%		54.5%	54.5%		16.4%	70.9%	
Maximum Green (s)	25.0	25.0		25.0	25.0		53.0	53.0		15.0	71.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		15.0	15.0			15.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)		25.0		25.0	25.0		56.2	56.2		75.0	71.0	
Actuated g/C Ratio		0.23		0.23	0.23		0.51	0.51		0.68	0.65	
v/c Ratio		0.21		0.28	1.12		0.06	0.38		0.49	0.44	
Control Delay		4.0		38.1	92.8		15.8	17.3		9.9	10.4	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		4.0		38.1	92.8		15.8	17.3		9.9	10.4	
LOS		A		D	F		B	B		A	B	
Approach Delay		4.0			86.9			17.3			10.3	
Approach LOS		A			F			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 22 (20%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.12			
Intersection Signal Delay: 34.7		Intersection LOS: C	
Intersection Capacity Utilization 96.1%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 4: Waterdown Rd & Railway Rd/Masonry Crt





Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	26	87	725	11	664	268	951
v/c Ratio	0.21	0.28	1.12	0.06	0.38	0.49	0.44
Control Delay	4.0	38.1	92.8	15.8	17.3	9.9	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.0	38.1	92.8	15.8	17.3	9.9	10.4
Queue Length 50th (m)	0.0	16.3	~115.7	1.2	45.5	20.4	51.2
Queue Length 95th (m)	0.0	31.4	#190.1	4.8	63.2	31.3	64.5
Internal Link Dist (m)	121.8		50.7		319.5		352.3
Turn Bay Length (m)		15.0		20.0		15.0	
Base Capacity (vph)	122	308	647	197	1747	577	2153
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.28	1.12	0.06	0.38	0.46	0.44

Intersection Summary

~ 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.



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	19	40	45	64	54	0
Future Volume (vph)	19	40	45	64	54	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.909					
Flt Protected	0.984			0.980		
Satd. Flow (prot)	1666	0	0	1825	1863	0
Flt Permitted	0.984			0.980		
Satd. Flow (perm)	1666	0	0	1825	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	39.4			268.2	76.4	
Travel Time (s)	2.8			19.3	5.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	43	49	70	59	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	64	0	0	119	59	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 22.7%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	19	40	45	64	54	0
Future Volume (Veh/h)	19	40	45	64	54	0
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)	21	43	49	70	59	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)				268		
pX, platoon unblocked						
vC, conflicting volume	227	59	59			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	227	59	59			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	96	97			
cM capacity (veh/h)	737	1007	1545			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	64	119	59
Volume Left	21	49	0
Volume Right	43	0	0
cSH	899	1545	1700
Volume to Capacity	0.07	0.03	0.03
Queue Length 95th (m)	1.8	0.8	0.0
Control Delay (s)	9.3	3.2	0.0
Lane LOS	A	A	
Approach Delay (s)	9.3	3.2	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	22.7%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	50	86	0	313	44	0
Future Volume (vph)	50	86	0	313	44	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.915					
Flt Protected					0.950	
Satd. Flow (prot)	1704	0	0	1863	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	1704	0	0	1863	1770	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	74.7			64.9	40.6	
Travel Time (s)	5.4			4.7	2.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	93	0	340	48	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	147	0	0	340	48	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.3			3.3	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 26.5%		ICU Level of Service A	
Analysis Period (min) 15			



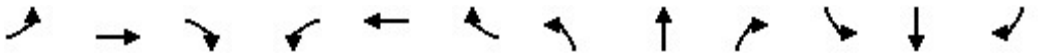
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	50	86	0	313	44	0
Future Volume (Veh/h)	50	86	0	313	44	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	93	0	340	48	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	75					
pX, platoon unblocked						
vC, conflicting volume			147		440	100
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			147		440	100
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		92	100
cM capacity (veh/h)			1435		574	955

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	147	340	48
Volume Left	0	0	48
Volume Right	93	0	0
cSH	1700	1435	574
Volume to Capacity	0.09	0.00	0.08
Queue Length 95th (m)	0.0	0.0	2.2
Control Delay (s)	0.0	0.0	11.8
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.8
Approach LOS			B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	26.5%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX L

Future Total Optimization Results

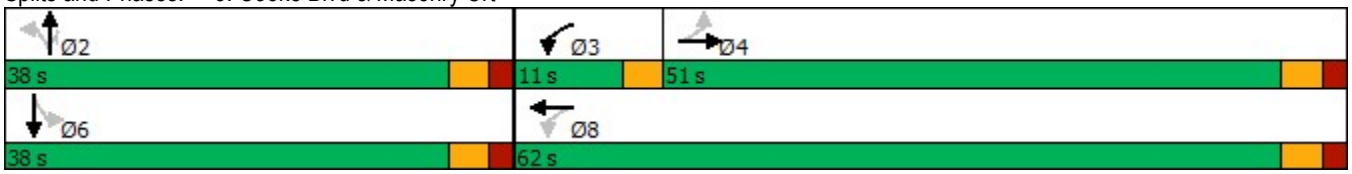


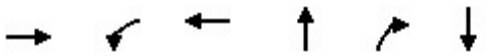
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	1038	37	77	194	0	124	2	364	0	13	18
Future Volume (vph)	4	1038	37	77	194	0	124	2	364	0	13	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		70.0	0.0		0.0
Storage Lanes	0		0	1		0	0		1	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00						1.00	0.98		0.99	
Frt		0.995							0.850		0.922	
Flt Protected				0.950				0.953				
Satd. Flow (prot)	0	3587	0	1745	1810	0	0	1709	1597	0	1728	0
Flt Permitted		0.954		0.103				0.701				
Satd. Flow (perm)	0	3422	0	189	1810	0	0	1254	1557	0	1728	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5							183		22	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		64.9			139.2			76.4			48.9	
Travel Time (s)		4.7			10.0			5.5			3.5	
Confl. Peds. (#/hr)	5					5	1		7	7		1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	0%	0%	4%	0%	5%	0%	6%	0%	0%	0%	0%	0%
Adj. Flow (vph)	5	1281	46	95	240	0	153	2	449	0	16	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1332	0	95	240	0	0	155	449	0	38	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm		NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		3	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0		8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	22.0	22.0		9.5	22.0		21.0	21.0	21.0	21.0	21.0	
Total Split (s)	51.0	51.0		11.0	62.0		38.0	38.0	38.0	38.0	38.0	
Total Split (%)	51.0%	51.0%		11.0%	62.0%		38.0%	38.0%	38.0%	38.0%	38.0%	
Maximum Green (s)	46.0	46.0		8.0	57.0		33.0	33.0	33.0	33.0	33.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0		0.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)		5.0		3.0	5.0			5.0	5.0		5.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	Min	Min		None	Min		None	None	None	None	None	
Walk Time (s)	7.0	7.0			7.0		5.0	5.0	5.0	5.0	5.0	
Flash Dont Walk (s)	10.0	10.0			10.0		11.0	11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0		0	0	0	0	0	
Act Effct Green (s)		35.9		45.7	43.4			21.0	21.0		21.0	
Actuated g/C Ratio		0.47		0.60	0.57			0.28	0.28		0.28	
v/c Ratio		0.82		0.35	0.23			0.45	0.80		0.08	
Control Delay		23.9		11.1	9.3			30.0	27.7		14.0	
Queue Delay		0.2		0.0	0.0			0.0	0.0		0.0	
Total Delay		24.1		11.1	9.3			30.0	27.7		14.0	
LOS		C		B	A			C	C		B	
Approach Delay		24.1			9.8			28.3			14.0	
Approach LOS		C			A			C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 75.8			
Natural Cycle: 65			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 23.0		Intersection LOS: C	
Intersection Capacity Utilization 72.6%		ICU Level of Service C	
Analysis Period (min) 15			

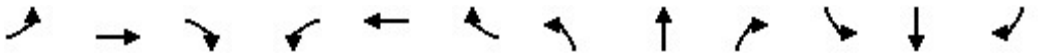
Splits and Phases: 3: Cooke Blvd & Masonry Crt





Lane Group	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	1332	95	240	155	449	38
v/c Ratio	0.82	0.35	0.23	0.45	0.80	0.08
Control Delay	23.9	11.1	9.3	30.0	27.7	14.0
Queue Delay	0.2	0.0	0.0	0.0	0.0	0.0
Total Delay	24.1	11.1	9.3	30.0	27.7	14.0
Queue Length 50th (m)	91.7	5.4	15.9	20.7	40.2	1.9
Queue Length 95th (m)	127.8	13.2	31.7	37.2	68.5	8.2
Internal Link Dist (m)	40.9		115.2	52.4		24.9
Turn Bay Length (m)					70.0	
Base Capacity (vph)	2200	300	1354	619	861	864
Starvation Cap Reductn	252	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.32	0.18	0.25	0.52	0.04

Intersection Summary

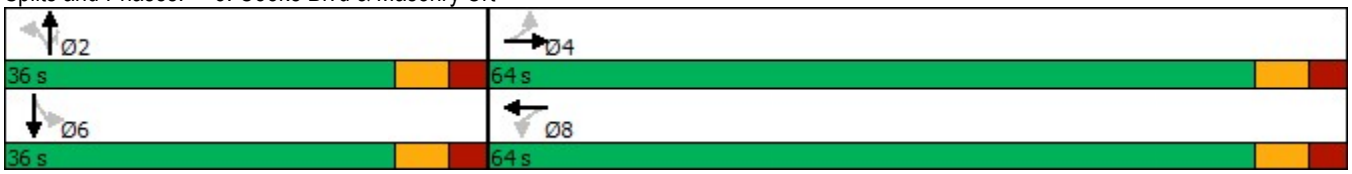


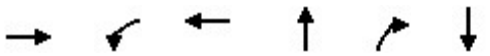
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	158	38	158	582	0	162	12	57	0	8	9
Future Volume (vph)	19	158	38	158	582	0	162	12	57	0	8	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		70.0	0.0		0.0
Storage Lanes	0		0	1		0	0		1	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor								1.00	0.98		0.99	
Frt		0.973							0.850		0.929	
Flt Protected		0.996		0.950				0.956				
Satd. Flow (prot)	0	3474	0	1745	1810	0	0	1720	1597	0	1744	0
Flt Permitted		0.796		0.588				0.726				
Satd. Flow (perm)	0	2776	0	1080	1810	0	0	1303	1560	0	1744	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		43							70		11	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		64.9			139.2			76.4			48.9	
Travel Time (s)		4.7			10.0			5.5			3.5	
Confl. Peds. (#/hr)	5					5	1		7	7		1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	0%	0%	4%	0%	5%	0%	6%	0%	0%	0%	0%	0%
Adj. Flow (vph)	23	195	47	195	719	0	200	15	70	0	10	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	265	0	195	719	0	0	215	70	0	21	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm		NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0	8.0	8.0	8.0	
Minimum Split (s)	26.0	26.0		26.0	26.0		26.0	26.0	26.0	26.0	26.0	
Total Split (s)	64.0	64.0		64.0	64.0		36.0	36.0	36.0	36.0	36.0	
Total Split (%)	64.0%	64.0%		64.0%	64.0%		36.0%	36.0%	36.0%	36.0%	36.0%	
Maximum Green (s)	57.0	57.0		57.0	57.0		29.0	29.0	29.0	29.0	29.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0	0.0		0.0	
Total Lost Time (s)		7.0		7.0	7.0			7.0	7.0		7.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	
Act Effct Green (s)		37.3		37.3	37.3			29.5	29.5		29.5	
Actuated g/C Ratio		0.46		0.46	0.46			0.36	0.36		0.36	
v/c Ratio		0.20		0.39	0.86			0.45	0.11		0.03	
Control Delay		10.4		16.1	30.7			26.7	6.9		15.4	
Queue Delay		0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay		10.4		16.1	30.7			26.7	6.9		15.4	
LOS		B		B	C			C	A		B	
Approach Delay		10.4			27.6			21.9			15.4	
Approach LOS		B			C			C			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 81.1			
Natural Cycle: 60			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 23.2		Intersection LOS: C	
Intersection Capacity Utilization 71.1%		ICU Level of Service C	
Analysis Period (min) 15			

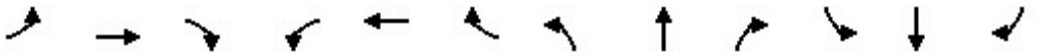
Splits and Phases: 3: Cooke Blvd & Masonry Crt





Lane Group	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	265	195	719	215	70	21
v/c Ratio	0.20	0.39	0.86	0.45	0.11	0.03
Control Delay	10.4	16.1	30.7	26.7	6.9	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	16.1	30.7	26.7	6.9	15.4
Queue Length 50th (m)	10.4	19.6	98.2	25.4	0.0	1.0
Queue Length 95th (m)	14.6	29.8	117.5	53.6	8.0	6.1
Internal Link Dist (m)	40.9		115.2	52.4		24.9
Turn Bay Length (m)					70.0	
Base Capacity (vph)	1999	773	1295	474	612	642
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.25	0.56	0.45	0.11	0.03

Intersection Summary

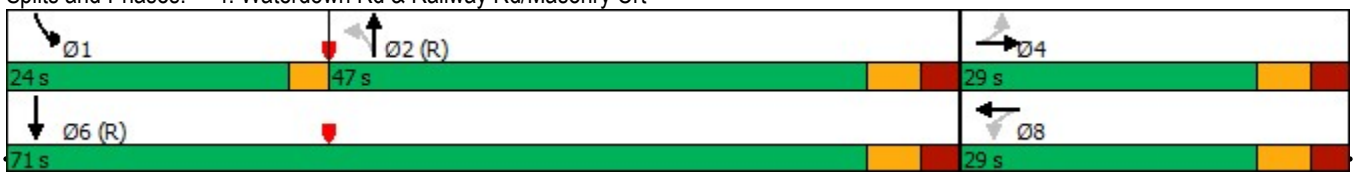


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	1	11	18	0	387	7	1068	261	881	444	19
Future Volume (vph)	28	1	11	18	0	387	7	1068	261	881	444	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	175.0		0.0
Storage Lanes	0		0	1		0	1		0	2		0
Taper Length (m)	7.5			7.5			7.5			70.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.97	0.95	0.95
Ped Bike Factor		1.00			0.99		1.00	1.00		1.00	1.00	
Frt		0.961			0.850			0.971			0.994	
Flt Protected		0.967		0.950			0.950			0.950		
Satd. Flow (prot)	0	1158	0	1745	1518	0	1220	3348	0	3385	3292	0
Flt Permitted		0.222		0.730			0.475			0.950		
Satd. Flow (perm)	0	266	0	1341	1518	0	610	3348	0	3383	3292	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			391			36			8	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		145.8			74.7			343.5			376.3	
Travel Time (s)		10.5			5.4			24.7			27.1	
Confl. Peds. (#/hr)	1					1	1		2	2		1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	54%	100%	45%	0%	0%	5%	43%	5%	1%	0%	7%	53%
Adj. Flow (vph)	29	1	12	19	0	407	7	1124	275	927	467	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	19	407	0	7	1399	0	927	487	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			6.6			6.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Prot	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2					
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		11.0	36.0	
Total Split (s)	29.0	29.0		29.0	29.0		47.0	47.0		24.0	71.0	
Total Split (%)	29.0%	29.0%		29.0%	29.0%		47.0%	47.0%		24.0%	71.0%	
Maximum Green (s)	22.0	22.0		22.0	22.0		40.0	40.0		21.0	64.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		15.0	15.0			15.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)		15.2		15.2	15.2		40.0	40.0		27.8	70.8	
Actuated g/C Ratio		0.15		0.15	0.15		0.40	0.40		0.28	0.71	
v/c Ratio		0.84		0.09	0.72		0.03	1.03		0.99	0.21	
Control Delay		119.3		34.0	12.6		18.9	61.9		64.1	5.8	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		119.3		34.0	12.6		18.9	61.9		64.1	5.8	
LOS		F		C	B		B	E		E	A	
Approach Delay		119.3			13.5			61.7			44.0	
Approach LOS		F			B			E			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.03			
Intersection Signal Delay: 48.6		Intersection LOS: D	
Intersection Capacity Utilization 104.4%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 4: Waterdown Rd & Railway Rd/Masonry Crt



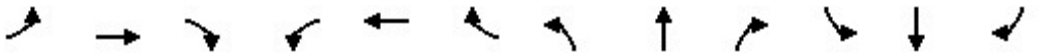


Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	42	19	407	7	1399	927	487
v/c Ratio	0.84	0.09	0.72	0.03	1.03	0.99	0.21
Control Delay	119.3	34.0	12.6	18.9	61.9	64.1	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	119.3	34.0	12.6	18.9	61.9	64.1	5.8
Queue Length 50th (m)	6.1	3.4	2.8	0.9	~159.1	97.0	15.3
Queue Length 95th (m)	#24.2	9.4	30.4	3.8	#203.1	#164.9	27.2
Internal Link Dist (m)	121.8		50.7		319.5		352.3
Turn Bay Length (m)		15.0		20.0		175.0	
Base Capacity (vph)	67	295	638	244	1360	941	2333
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.06	0.64	0.03	1.03	0.99	0.21

Intersection Summary

~ 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.

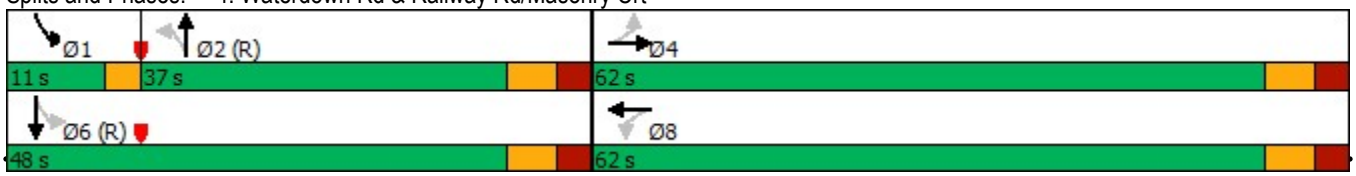


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	0	6	83	0	689	10	599	31	255	886	17
Future Volume (vph)	19	0	6	83	0	689	10	599	31	255	886	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	0.0		0.0	15.0		0.0	20.0		0.0	175.0		0.0
Storage Lanes	0		0	1		0	1		0	2		0
Taper Length (m)	7.5			7.5			7.5			70.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.97	0.95	0.95
Ped Bike Factor					0.99		1.00	1.00		1.00	1.00	
Frt		0.969			0.850			0.993			0.997	
Flt Protected		0.963		0.950			0.950			0.950		
Satd. Flow (prot)	0	1167	0	1745	1517	0	1220	3416	0	3385	3335	0
Flt Permitted		0.490		0.740			0.261			0.263		
Satd. Flow (perm)	0	594	0	1359	1517	0	335	3416	0	936	3335	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		69			267			5			2	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		145.8			74.7			343.5			376.3	
Travel Time (s)		10.5			5.4			24.7			27.1	
Confl. Peds. (#/hr)	1					1	1		2	2		1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	54%	100%	45%	0%	0%	5%	43%	5%	1%	0%	7%	53%
Adj. Flow (vph)	20	0	6	87	0	725	11	631	33	268	933	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	0	87	725	0	11	664	0	268	951	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.3			3.3			6.6			6.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		11.0	36.0	
Total Split (s)	62.0	62.0		62.0	62.0		37.0	37.0		11.0	48.0	
Total Split (%)	56.4%	56.4%		56.4%	56.4%		33.6%	33.6%		10.0%	43.6%	
Maximum Green (s)	55.0	55.0		55.0	55.0		30.0	30.0		8.0	41.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		0.0	3.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		7.0		7.0	7.0		7.0	7.0		3.0	7.0	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	8.0	8.0		8.0	8.0		15.0	15.0			15.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0			0	
Act Effct Green (s)		47.4		47.4	47.4		36.8	36.8		52.6	48.6	
Actuated g/C Ratio		0.43		0.43	0.43		0.33	0.33		0.48	0.44	
v/c Ratio		0.09		0.15	0.90		0.10	0.58		0.42	0.65	
Control Delay		0.6		17.5	32.5		33.1	34.3		20.2	28.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		0.6		17.5	32.5		33.1	34.3		20.2	28.2	
LOS		A		B	C		C	C		C	C	
Approach Delay		0.6			30.9			34.3			26.5	
Approach LOS		A			C			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 22 (20%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 29.5		Intersection LOS: C	
Intersection Capacity Utilization 92.0%		ICU Level of Service F	
Analysis Period (min) 15			

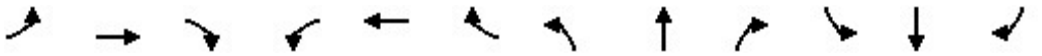
Splits and Phases: 4: Waterdown Rd & Railway Rd/Masonry Crt





Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	26	87	725	11	664	268	951
v/c Ratio	0.09	0.15	0.90	0.10	0.58	0.42	0.65
Control Delay	0.6	17.5	32.5	33.1	34.3	20.2	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.6	17.5	32.5	33.1	34.3	20.2	28.2
Queue Length 50th (m)	0.0	11.0	97.2	1.8	69.2	18.2	91.1
Queue Length 95th (m)	0.0	19.5	150.7	7.1	92.0	28.9	123.5
Internal Link Dist (m)	121.8		50.7		319.5		352.3
Turn Bay Length (m)		15.0		20.0		175.0	
Base Capacity (vph)	331	679	892	112	1146	643	1474
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.13	0.81	0.10	0.58	0.42	0.65

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	787	1250	169	79	447	239	66	291	66	200	119	185
Future Volume (vph)	787	1250	169	79	447	239	66	291	66	200	119	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	165.0		0.0	40.0		0.0	30.0		0.0	0.0		215.0
Storage Lanes	2		0	2		0	1		0	1		1
Taper Length (m)	50.0			25.0			55.0			7.5		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		0.99	0.99		0.98	1.00		1.00		0.96
Frt		0.982			0.948			0.972				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3224	3422	0	3224	3266	0	1711	1797	0	1662	1776	1479
Flt Permitted	0.950			0.950			0.676			0.135		
Satd. Flow (perm)	3204	3422	0	3199	3266	0	1190	1797	0	235	1776	1423
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			67			8				197
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		485.0			153.1			317.1			343.5	
Travel Time (s)		29.1			9.2			22.8			24.7	
Confl. Peds. (#/hr)	6		19	19		6	17		7	7		17
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	5%	3%	3%	5%	4%	4%	2%	2%	4%	5%	7%	8%
Adj. Flow (vph)	837	1330	180	84	476	254	70	310	70	213	127	197
Shared Lane Traffic (%)												
Lane Group Flow (vph)	837	1510	0	84	730	0	70	380	0	213	127	197
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6			6.6			3.6			6.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes										
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases							4			8		8
Detector Phase	5	2		1	6		7	4		3	8	8
Switch Phase												
Minimum Initial (s)	6.0	20.0		6.0	20.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	23.0	27.3		9.0	31.3		9.0	34.0		9.0	34.0	34.0
Total Split (s)	42.0	75.0		9.0	42.0		9.0	38.0		18.0	47.0	47.0
Total Split (%)	30.0%	53.6%		6.4%	30.0%		6.4%	27.1%		12.9%	33.6%	33.6%
Maximum Green (s)	39.0	68.7		6.0	35.7		6.0	31.7		15.0	40.7	40.7
Yellow Time (s)	3.0	3.7		3.0	3.7		3.0	3.3		3.0	3.3	3.3
All-Red Time (s)	0.0	2.6		0.0	2.6		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	3.0	6.3		3.0	6.3		3.0	6.3		3.0	6.3	6.3
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	None
Walk Time (s)		8.0			8.0			10.0			10.0	10.0
Flash Dont Walk (s)		13.0			17.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	38.3	69.5		6.1	37.3		40.2	30.9		52.1	41.6	41.6
Actuated g/C Ratio	0.27	0.50		0.04	0.27		0.29	0.22		0.37	0.30	0.30
v/c Ratio	0.95	0.89		0.60	0.79		0.19	0.95		0.89	0.24	0.35
Control Delay	70.1	39.2		83.6	51.1		30.7	85.3		69.3	39.2	6.6
Queue Delay	0.0	0.0		0.0	0.1		0.0	0.0		0.0	0.0	0.0
Total Delay	70.1	39.2		83.6	51.2		30.7	85.3		69.3	39.2	6.6
LOS	E	D		F	D		C	F		E	D	A
Approach Delay		50.2			54.5			76.8			39.2	
Approach LOS		D			D			E			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 52.5		Intersection LOS: D	
Intersection Capacity Utilization 93.5%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Waterdown Rd & Plains Rd E

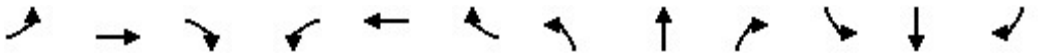




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	837	1510	84	730	70	380	213	127	197
v/c Ratio	0.95	0.89	0.60	0.79	0.19	0.95	0.89	0.24	0.35
Control Delay	70.1	39.2	83.6	51.1	30.7	85.3	69.3	39.2	6.6
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	70.1	39.2	83.6	51.2	30.7	85.3	69.3	39.2	6.6
Queue Length 50th (m)	123.0	204.2	12.6	97.5	13.2	107.2	44.0	28.4	0.0
Queue Length 95th (m)	#162.3	241.3	#23.3	123.1	24.5	#169.5	#90.2	46.5	19.0
Internal Link Dist (m)		461.0		129.1		293.1		319.5	
Turn Bay Length (m)	165.0		40.0		30.0				215.0
Base Capacity (vph)	898	1705	140	919	363	413	240	528	561
Starvation Cap Reductn	0	0	0	7	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	0.93	0.89	0.60	0.80	0.19	0.92	0.89	0.24	0.35

Intersection Summary

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	233	663	108	71	1251	226	158	159	65	276	175	498
Future Volume (vph)	233	663	108	71	1251	226	158	159	65	276	175	498
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	165.0		0.0	40.0		0.0	30.0		0.0	0.0		215.0
Storage Lanes	2		0	2		0	1		0	1		1
Taper Length (m)	50.0			25.0			55.0			7.5		
Lane Util. Factor	0.97	0.95	0.95	0.97	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.99		0.98	1.00		0.98	0.99		0.99		0.96
Frt		0.979			0.977			0.957				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3224	3409	0	3224	3381	0	1711	1762	0	1662	1776	1479
Flt Permitted	0.950			0.950			0.640			0.392		
Satd. Flow (perm)	3218	3409	0	3165	3381	0	1131	1762	0	682	1776	1427
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			22			15				160
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		485.0			153.1			317.1			343.5	
Travel Time (s)		29.1			9.2			22.8			24.7	
Confl. Peds. (#/hr)	6		19	19		6	17		7	7		17
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	5%	3%	3%	5%	4%	4%	2%	2%	4%	5%	7%	8%
Adj. Flow (vph)	248	705	115	76	1331	240	168	169	69	294	186	530
Shared Lane Traffic (%)												
Lane Group Flow (vph)	248	820	0	76	1571	0	168	238	0	294	186	530
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.6			6.6			3.6			6.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane		Yes										
Headway Factor	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01	1.04	1.00	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases							4			8		8
Detector Phase	5	2		1	6		7	4		3	8	8
Switch Phase												
Minimum Initial (s)	6.0	20.0		6.0	20.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	9.0	27.3		9.0	31.3		9.0	33.3		9.0	34.0	34.0
Total Split (s)	13.0	66.0		10.0	63.0		9.0	35.0		14.0	40.0	40.0
Total Split (%)	10.4%	52.8%		8.0%	50.4%		7.2%	28.0%		11.2%	32.0%	32.0%
Maximum Green (s)	10.0	59.7		7.0	56.7		6.0	28.7		11.0	33.7	33.7
Yellow Time (s)	3.0	3.7		3.0	3.7		3.0	3.3		3.0	3.3	3.3
All-Red Time (s)	0.0	2.6		0.0	2.6		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	3.0	6.3		3.0	6.3		3.0	6.3		3.0	6.3	6.3
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	None
Walk Time (s)		8.0			8.0			10.0			10.0	10.0
Flash Dont Walk (s)		13.0			17.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	10.0	61.7		6.8	56.7		38.0	28.7		46.0	33.7	33.7
Actuated g/C Ratio	0.08	0.49		0.05	0.45		0.30	0.23		0.37	0.27	0.27
v/c Ratio	0.96	0.48		0.43	1.02		0.45	0.57		0.87	0.39	1.06
Control Delay	105.1	22.2		65.1	60.9		35.1	46.1		59.4	40.2	87.5
Queue Delay	0.0	0.0		0.0	32.4		0.0	0.0		0.0	0.0	0.0
Total Delay	105.1	22.2		65.1	93.2		35.1	46.1		59.4	40.2	87.5
LOS	F	C		E	F		D	D		E	D	F
Approach Delay		41.4			91.9			41.6			70.6	
Approach LOS		D			F			D			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 125			
Actuated Cycle Length: 125			
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 125			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.06			
Intersection Signal Delay: 68.7		Intersection LOS: E	
Intersection Capacity Utilization 97.0%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Waterdown Rd & Plains Rd E





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	248	820	76	1571	168	238	294	186	530
v/c Ratio	0.96	0.48	0.43	1.02	0.45	0.57	0.87	0.39	1.06
Control Delay	105.1	22.2	65.1	60.9	35.1	46.1	59.4	40.2	87.5
Queue Delay	0.0	0.0	0.0	32.4	0.0	0.0	0.0	0.0	0.0
Total Delay	105.1	22.2	65.1	93.2	35.1	46.1	59.4	40.2	87.5
Queue Length 50th (m)	33.5	72.8	10.0	~217.5	30.3	51.5	57.9	39.4	~118.0
Queue Length 95th (m)	#60.7	91.4	18.5	#269.8	48.4	79.7	#107.3	61.7	#189.1
Internal Link Dist (m)		461.0		129.1		293.1		319.5	
Turn Bay Length (m)	165.0		40.0		30.0				215.0
Base Capacity (vph)	257	1692	180	1545	371	416	337	478	501
Starvation Cap Reductn	0	0	0	310	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	0.96	0.48	0.42	1.27	0.45	0.57	0.87	0.39	1.06

Intersection Summary

~ 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.

APPENDIX M

Warrants

ALL-WAY STOP CONTROL (AWSC) WARRANTS (OTM BOOK 5)

Horizon Year and Analysis Period **2031 Future Total**

PROJECT INFORMATION

Analyst	ftasnim	**Jurisdiction**	City of Burlington
Company	C.F. Crozier & Associates	**Project Name**	Cooke Blvd
Date	8.2.2022	**Project No.**	2321-6441

ROADWAY INFORMATION

East-West Street	Masonry Court	**Major Street**	East-West
North-South Street	Cooke Boulevard	**Number of legs**	4

Roadway Classification (Minor Street) Collector Roads and Rural Arterial Roads

TRAFFIC VOLUMES

Peak Hour	Major Road Approaches							Minor Road Approaches							Pedestrian Crossing Major Road	Pedestrian Crossing Minor Road
	Eastbound			Westbound			Total	Northbound			Southbound			Total		
	LT	TH	RT	LT	TH	RT		LT	TH	RT	LT	TH	RT			
AM	4	1038	37	77	194	0	**1350**	123	2	364	0	13	18	**520**	0	0
PM	19	158	38	158	582	0	**955**	161	12	57	0	8	9	**247**	0	0
AHV	**6**	**299**	**19**	**59**	**194**	**0**	**576**	**71**	**4**	**105**	**0**	**5**	**7**	**192**	**0**	**0**

Parameter	AM	PM	AHV	Threshold	
Total vehicle volume on all intersection approaches	1870	1202	769	**375**	**veh**
Combined vehicle and pedestrian volumes on minor street	520	247	192	**150**	**veh**
Combined vehicle and pedestrian volumes on minor street				**120**	**veh**
+ minor street delay*	40	30	0	**30**	**s**
Volume Split, Minor Road (vehicles only)	0.28	0.21	0.25	**0.30**	

Justification 1: Total Vehicle Volume on all Intersection Approaches **Justified? YES**
Justification 2A: Combined Vehicle and Pedestrian Volumes on minor street **Justified? YES**
Justification 2B: Combined Vehicle and Pedestrian Volumes + Delay on minor street **Justified? YES**
Justification 3: Volume Split (vehicles only) **Justified? NO**

Conclusion: The results of the calculations show that All-Way Stop Control at this intersection is not justified for the 2031 Future Total analysis period.

* Minor Approach Delay under minor stop control using the "AHV" volumes. Delay must be >30s not just for the AM/PM peak, but for the busiest 8 hours of the day to trigger the threshold for Justification 2B.
The All-Way Stop Control justification was done per criteria defined within the Ontario Traffic Manual, Book 5 (December 2021), "All-Way Stop Minimum Volume Warrants"

TRAFFIC SIGNAL WARRANTS - JUSTIFICATION 7 (PROJECTED VOLUMES)

GENERAL INFORMATION **FUTURE WEEKDAY PEAK HOUR**

Analyst	Farah Choudhury	**Jurisdiction**	City of Burlington	
Agency or Company	C.F. Crozier & Associates	**Date**	September 27, 2021	
Analysis Period	2031 Future Total	**East-West Street**	Masonry Ct	
		North-South Street	Cooke Blvd	
Flow Conditions	Restricted flow (urban)	**Major Street**	East-West	
'T' Intersection	No	**Approach lanes per direction**	1	Major Street
Existing Intersection	Yes	**Approach lanes per direction**	1	Minor Street
Additional Comments				

Justification 1: Minimum Vehicle Volumes **JUSTIFIED** **No**

Justification	Guidance Approach Lanes				Compliance			120%
	1 Lanes		2 or More Lanes		Sectional		Entire %	Satisfied
Flow Conditions	Free Flow	Restricted Flow	Free Flow	Restricted Flow	Average Hourly Volumes	%		
A. Vehicle volume, all approaches		720			**768**	107%	107%	No
B. Vehicle volume, along minor streets		170			**192**	113%	113%	No

Justification 2: Delay To Cross Traffic **JUSTIFIED** **No**

Justification	Guidance Approach Lanes				Compliance			120%
	1 Lanes		2 or More Lanes [1]		Sectional		Entire %	Satisfied
Flow Conditions	Free Flow	Restricted Flow	Free Flow	Restricted Flow	Average Hourly Volumes	%		
A. Vehicle volume, major street		720			**576**	80%	80%	No
B. Combined vehicle and pedestrian volume crossing artery from minor streets		75			**77**	103%	103%	No

CONCLUSION

The results of the calculations show that justifications are not met.
Therefore traffic control signal is not justified at this intersection for the horizon year 2031 Future Total

Note: 1. The minimum volumes were corrected from 120 vehicles and 170 vehicles in OTM, March 2012 to 50 vehicles and 70 vehicles to match Justification 2B.

APPENDIX N

TTS Query – Modal Split

Mon Sep 27 2021 09:06:36 GMT-0400 (Eastern Daylight Time) - Run Time: 2378ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of household - gta06_hhld
Column: Primary travel mode of trip - mode_prime

Filters:
(2006 GTA zone of household - gta06_hhld In 4050,4051,4052
and
Age of person - age In 18-99
and
Start time of trip - start_time In 630-930,1530-1830
and
Primary travel mode of trip - mode_prime Not In O,S,9)

Trip 2016
Table:

,Transit excluding GO rail,Cycle,Auto driver,GO rail only,Motorcycle,Auto passenger,Walk
4050,11,0,1126,11,0,157,0
4051,63,17,3133,48,56,514,65
4052,0,0,1453,44,0,76,0

Household Zone	Transit excluding GO rail	Cycle	Auto driver	GO rail only	Motorcycle	Auto passenger	Walk	Total
4050	11	0	1126	11	0	157	0	1305
4051	63	17	3133	48	56	514	65	3896
4052	0	0	1453	44	0	76	0	1573
Total	74	17	5712	103	56	747	65	6774
%	1%	0%	84%	2%	1%	11%	1%	

Mode Split	4%