TRANSPORTATION IMPACT STUDY

1029 & 1033 WATERDOWN ROAD

CITY OF BURLINGTON
REGION OF HALTON

PREPARED FOR:

INFINITY DEVELOPMENT GROUP

PREPARED BY:
C.F. CROZIER & ASSOCIATES INC.
2800 HIGH POINT DRIVE, SUITE 100
MILTON, ON L9T 6P4

DECEMBER 2021

CFCA FILE NO. 2172-6124

The material in this report reflects best judgment in light of the information available at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. C.F. Crozier & Associates Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

CROZIER
CONSULTING ENGINEERS

Revision Number	Date	Comments
Rev.0	December 2021	Issued for Submission

1.0 Executive Summary

C.F. Crozier & Associates Inc. (Crozier) was retained by Infinity Development Group (the Applicant) to undertake a Transportation Impact Study (TIS) for the proposed mixed-use residential development situated at 1029 & 1033 Waterdown Road in the City of Burlington, Halton Region. This study has been prepared in accordance with requirements set out per Halton Region's Guidelines for TIS. The findings and recommendations regarding traffic-related impacts of the proposed development are presented herein.

The project proposes the construction of a 29-storey mixed-use tower with 295 residential units, 189 m^2 of ground-floor retail, and a total of 320 parking spaces. Additionally, a full-movement access is proposed to serve the site from Waterdown Road.

Under 2021 existing conditions, the intersection of Plains Road East and Waterdown Road operate with a Level of Service (LOS) "D" or better during the weekday A.M. and P.M. peak hours. All other intersections operate with a Level of Service "A" or between during the morning and afternoon peak hours under existing traffic conditions.

Under 2024 and 2029 future background traffic, the intersection of Plains Road and Waterdown Road is anticipated to operate with LOS "E" or better, with over capacity movements expected for the eastbound left-turn movement during the morning peak hour for both horizon years. 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 2029 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 mixed-use development is forecasted to generate approximately 96 two-way trips (23 inbound and 73 outbound) during the weekday A.M. peak hour, and 108 two-way trips (66 inbound and 42 outbound) during the 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. Therefore, the addition of site-generated traffic is not expected to significantly impact operations at the boundary road intersections.

The proposed site access to Waterdown Road is anticipated to operate with LOS "C" or better during the 2024 and 2029 horizon years for the morning and afternoon peak periods.

Vehicle maneuverability diagrams were prepared and indicate that waste and medium trucks may have issues circulating the proposed site. Future revisions of the site access and site plan will address these encroachments. The proposed site access is adequate with regards to sight lines and spacing per Transportation Association of Canada (TAC) requirements.

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 industry standard data, surrogate sites and development precedent in the surrounding area.

Per the results of the analysis contained within this report, the Official Plan Amendment and Zoning By-Law Amendment applications for the proposed site may be supported from a traffic operations and safety perspective.

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY III

2.0 INTRODUCTION 1

3.0 DEVELOPMENT PROPOSAL 1

4.0 EXISTING CONDITIONS 2

4.1 Development Lands 2
4.2 Boundary Road Network 2
4.2.1 Study Roadways 2
4.2.2 Study Intersections 2

4.3 Existing Transit 3
4.4 Existing Active Transportation Network 3
4.5 Traffic Data 4
4.6 Traffic Modeling 4
4.7 Intersection Operations 4

5.0 FUTURE BACKGROUND CONDITIONS 5

5.1 Study Horizons 5
5.2 Study Horizons 6
5.3 Future Transportation Network Improvements 6
5.4 Background Developments 6
5.5 Intersection Operations 6

6.0 SITE GENERATED TRAFFIC 8

6.1 ITE Trip Generation 8
6.2 Trip Distribution and Assignment 9

7.0 SITE ACCESS AND CIRCULATION REVIEW 10

7.1 Sight Distance Analysis 10
7.2 Access Spacing 11
7.3 Site Circulation 11

8.0 TOTAL TRAFFIC CONDITIONS 12

8.1 Intersection Operations 12
8.2 Comparison 13

9.0 RECOMMENDATIONS 14

9.1 Masonry Court and Cooke Boulevard 14
9.2 Masonry Court and Waterdown Road 15
9.3 Plains Road and Waterdown Road 15

10.0 PARKING JUSTIFICATION STUDY 15

10.1 Zoning By-Law Parking Requirements 15
10.2 Parking Demand Forecasting 16
10.2.1 ITE Parking Demand 17
10.2.2 Approved Development Parking Rates 17

10.2.3 Parking Utilization Data 17
10.2.4 Parking Demand Data Summary 18

10.3 Policies and Surrounding Land Use 18
10.4 Parking Supply Justification Summary 19
10.5 Parking Space Dimensional Requirements 19

11.0 TRANSPORTATION DEMAND MANAGEMENT 20

11.1 Existing Modal Split 20
11.2 Existing Transit and Active Transportation Facilities 20
11.3 TDM Opportunities 20
11.3.1 Transit 20
11.3.2 Cyclist Facilities 21
11.3.3 Pedestrian Facilities 21
11.3.4 Parking 22
11.3.5 Carshare 22
11.3.6 Wayfinding 22
11.3.7 Education and Incentives 22

12.0 CONCLUSION 23

LIST OF TABLES

Table 1: 2021 Existing Levels of Service
Table 2: Background Developments
Table 3: 2024 and 2029 Future Background Levels of Service
Table 4: 2024 and 2029 Future Background Queues
Table 5: ITE Trip Generation
Table 6: Trip Distribution
Table 7: Sight Distance Analysis
Table 8: 2024 and 2029 Future Total Levels of Service
Table 9: 2024 and 2029 Future Total Queues
Table 10: 2029 Future Background and Future Total Comparison
Table 11: Existing Parking Requirements
Table 12: Amended Parking Requirements
Table 13: Combined Visitor and Parking Rates
Table 14: Proposed Parking Supply Compared to Demand
Table 15: Parking Space Dimension Review
Table 16: Bicycle Parking Requirements

LIST OF FIGURES

Figure 1: Site Location
Figure 2: Existing Roadways
Figure 3: 2021 Existing Traffic
Figure 4: Background Development Traffic
Figure 5: 2024 Future Background Traffic
Figure 6: 2029 Future Background Traffic
Figure 7: Site Generated Traffic
Figure 8: 2024 Future Total Traffic
Figure 9: 2029 Future Total Traffic
Figure T300: Site Circulation – MSU
Figure T300: Site Circulation – Garbage Truck
Figure T300: Site Circulation – Fire Truck
Figure SL01: Sight Distance

LIST OF APPENDICES

Appendix A: City and Town Correspondence

Appendix B: Site Plan

Appendix C: City of Burlington Official Plans and Maps Excerpts

Appendix D: Level of Service Definitions

Appendix E: Detailed Capacity Analysis – 2021 Existing

Appendix F: Detailed Capacity Analysis – 2024 and 2029 Future Background

Appendix G: TTS Results and Trip Distribution

Appendix H: Detailed Capacity Analysis – 2024 and 2029 Future Total

Appendix I: Signal Warrants

Appendix J: Modal Split

2.0 Introduction

Infinity Development Group (the Applicant) retained C.F. Crozier & Associates Inc. (Crozier) to undertake a Transportation Impact Study (TIS) to support the Official Plan Amendment (OPA) and Zoning By-Law Amendment (ZBA) applications for the site at 1029 & 1033 Waterdown Road, in the City of Burlington, Halton Region.

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 encompassing the following conditions was confirmed with staff at the City of Burlington (the City) in September 2021. Correspondence between Crozier and the City are included in **Appendix A**.

The following horizon and timeframes were included in this study:

- Existing (2021) traffic conditions
- Anticipated build-out (2024) and five-years post-build out (2029) traffic conditions.
- A.M. and P.M. peak hours

The following intersections were reviewed as part of the study area:

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

3.0 Development Proposal

Per the most recent Site Plan prepared by Zedd Architecture, the elements envisioned for the proposed 29-storey mixed-use residential building include:

- 295 residential units
- 189 m^2 of ground floor retail
- 728 m^2 of amenities
- 320 parking spaces (two-storey underground)
- One (1) full-movement site access to Waterdown Road

The most recent Site Plan is included in **Appendix B**.

4.0 Existing Conditions

4.1 Development Lands

The subject lands encompass an area of approximately 0.26 ha, and currently consists of two (2) single-detached dwellings with paved driveway access to Waterdown Road. The site is zoned within a mixed-use corridor employment-oriented zone (MXE) per the City of Burlington 2020 Zoning By-Law. The study site is bounded by Waterdown Road to the west, residential lands to the north, and commercial developments to the south and east.

The location of the Site is included in **Figure 1**.

4.2 Boundary Road Network

4.2.1 Study Roadways

Plains Road East/West is an east-west roadway and consists of two lanes in each direction, with a center Two-Way Left-Turn Lane (TWLTL). Per the City of Burlington Official Plan Schedule J, 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.

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, has sidewalks available on the north side of the road, as well as cyclist sharrows on both sides 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.

Relevant Official Plan excerpts are included in **Appendix C**.

4.2.2 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.

Figure 2 illustrates the configuration of the existing boundary roadways.

4.3 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 due to the site's proximity to the Aldershot GO Station. VIA Rail connections at Aldershot GO connect to the Windsor – Toronto as well as the Toronto – New York corridors. GO service at this station connects to the Lakeshore West corridor, between Niagara Falls to Toronto. Furthermore, Burlington Transit Routes "4 – Central" as well as "87 – North Service" originate and terminate at Aldershot Station. The Aldershot GO Station is situated approximately 1.1 km (walking/cycling distance) from the subject site and is accessible using sidewalks or cyclist sharrows along Waterdown Road and Masonry Court.

Additionally, the following bus stops are available within close proximity to the subject site:

- Burlington Transit Route "4 – Central" – Stop within 50 meters south of the development. 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.

- Burlington Transit Route "1/101 – Plains-Fairview" – Stop within 150 meters south of the development. 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.

4.4 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. A painted bike lane (sharrows) is available along Waterdown Road, connecting to signed routes south along North Shore Boulevard West, as well as signed routes along Masonry Court to the north, as well as to the Aldershot GO Station to the north.

The City's existing cycling network is included within **Appendix C**.

As mentioned earlier in the report, sidewalks are available along Waterdown Road, connecting to sidewalks on Plains Road East to the south and to Masonry Court and the Aldershot GO Station to the north. There are several transit nodes that are accessible via sidewalks as elaborated upon in the previous section.

4.5 Traffic Data

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.

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.

Peak hour factors used for analysis were assumed to be consistent with those presented in the Paradigm report.

4.6 Traffic Modeling

The evaluation of intersections within this report is conducted based on the methodology outlined in the Highway Capacity Manual, 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 stop-controlled intersections is included in **Appendix D**.

All existing signal timing plans presented in the background development report prepared for 40 – 70 Plains Road by Paradigm Transportation Solutions (herein referred to as "Paradigm Report") were used for modelling existing traffic conditions.

Per notice from the City, it is noted that a small adjustment to signal timings at the intersection of Waterdown Road and Plains Road East was accounted for, to allocate 3.0 seconds for the all-red time for phases 2 and 6.

4.7 Intersection Operations

The traffic operations at the study intersections were analyzed based on grown traffic volumes to represent 2021 traffic conditions during the weekday A.M. and P.M. peak hours, as illustrated in **Figure 3**. Detailed capacity analyses are included in **Appendix E**. **Table 1** summarizes the existing traffic operations within the study area.

Table 1: 2021 Existing Levels of Service

Intersection	Level of Service (Average Delay Per Vehicle(s))		Max V/C Ratio (Approach) > 0.85		95th %ile Queue Length *50th %ile Queue Length* (Approach) > Storage Length	
	A.M. Peak	P.M. Peak	A.M. Peak	P.M. Peak	A.M. Peak	P.M. Peak
Plains Road East and Waterdown Road	D (35.7 s)	C (28.8 s)	**0.98 (EBL)**	0.82 (WBT)	210 m *120 m* (EBL)	60 m *30 m* (EBL)
Plains Road East and Cooke Boulevard	A (3.0 s)	A (5.1 s)	0.38 (EBT)	0.47 (WBT)	None	
Waterdown Road and Masonry Court	B (11.9 s)	A (6.4 s)	0.55 (SBL)	0.47 (WBTR)	None	
Masonry Court and Cooke Boulevard	B (14.0 s)	B (13.5 s)	0.32 (NB)	0.26 (NB)	None	

Note 1: The Level of Service of a Stop-Controlled intersection is based on the delay associated with the critical approach. The Level of Service of a signalized intersection is based on the average control delay per vehicle. Existing Signal Timings provided in the Paradigm Report were used.
Note 2: All v/c ratios greater than 0.85 are highlighted.

The intersection of Plains Road East and Waterdown Road currently operates with a Level of Service "D" and "C" during the weekday A.M. and P.M. peak hours, respectively. The eastbound left-turn movement is expected to near capacity during the morning peak hour, and the 95th percentile queues for this movement are also expected to exceed the available storage length during both morning and afternoon peak hours.

All other intersections operate with a Level of Service "B" or better during the weekday peak periods, and well within capacity. 95th percentile queues were observed at all intersections, and all movements are expected to have sufficient storage lengths.

5.0 Future Background Conditions

5.1 Study Horizons

Per consultation with the City of Burlington, the following horizon years were selected to assess the impacts of the proposed development on the surrounding road network:

- Anticipated Development Build Out: 2024
- Five-years from Development Build Out: 2029

Future background traffic volumes for horizon years consist of the following components:

- Background traffic growth from outside the study area.
- Traffic generated within the study area from other proposed developments.

5.2 Study Horizons

Per confirmation with the City, 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 applied.

5.3 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.

5.4 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. 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 Parking Lot	-
505-02/21 (OPA) / 520-03/21 (ZBA)	40-70 Plains Road East	Residential

All trips generated by background developments are summarized in **Figure 4**.

5.5 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. Volumes anticipated for the future background conditions for the 2024 and 2029 horizon years are included in **Figures 5** and **6**, respectively.

Table 3 summarizes the 2024 and 2029 future background Levels of Service, and **Table 4** summarizes the queuing analysis for all peak periods and horizon years. **Appendix F** includes detailed capacity analysis for the future background analysis.

Table 3: 2024 and 2029 Future Background Levels of Service

Intersection	Level of Service (Average Delay Per Vehicle(s)				Max V/C Ratio (Approach) > 0.85			
	2024 Horizon Year		2029 Horizon Year		2024 Horizon Year		2029 Horizon Year	
	A.M. Peak	P.M. Peak	A.M. Peak	P.M. Peak	A.M. Peak	P.M. Peak	A.M. Peak	P.M. Peak
Plains Road East and Waterdown Road	E (58.8 s)	C (32.7 s)	E (66.8 s)	D (36.1 s)	**1.16 (EBL) 0.99 (WBT) 0.87 (NBT) 0.90 (SBL)**	**0.89 (WBT)**	**1.22 (EBL) 1.03 (WBT) 0.89 (NBT) 0.97 (SBL)**	**0.86 (EBL) 0.95 (WBT) 0.89 (SBL)**
Plains Road East and Cooke Boulevard	B (11.7 s)	B (16.3 s)	C (11.9 s)	B (16.7 s)	0.68 (SBT)	0.78 (SBT)	0.68 (SBT)	0.78 (SBT)
Waterdown Road and Masonry Court	E (79.3 s)	C (20.6 s)	**F (>80 s)**	C (21 s)	**1.08 (NBT) 1.23 (SBL)**	**0.92 (WBTR)**	**1.08 (NBT) 1.23 (SBL)**	**0.92 (WBTR)**
Masonry Court and Cooke Boulevard	**F (>80 s)**	**F (>80 s)**	**F (>80 s)**	**F (>80 s)**	**9.13 (NB)**	**2.2 (NB)**	**9.16 (NB)**	**2.2 (NB)**

Note 1: *The Level of Service of a Stop-Controlled intersection is based on the delay associated with the critical approach.* The Level of Service of a signalized intersection is based on the average control delay per vehicle. Existing Signal Timings provided in the Paradigm Report were used.
Note 2: All v/c ratios greater than 0.85 are highlighted.

Table 4: 2024 and 2029 Future Background Queues

Intersection	95th %ile Queue Length *50th %ile Queue Length* (Approach) > Storage Length			
	2024 Horizon Year		2029 Horizon Year	
	A.M. Peak	P.M. Peak	A.M. Peak	P.M. Peak
Plains Road East and Waterdown Road	280 m *205 m* (EBL) 65 m (SBL)	60 m *35 m* (EBL)	300 m *220 m* (EBL) 70 m (SBL)	65 m *35 m* (EBL)
Plains Road East and Cooke Boulevard	None			
Waterdown Road and Masonry Court	305 m *200 m* (SBL)	None	305 m *200 m* (SBL)	None
Masonry Court and Cooke Boulevard	>600 m (NB)	>600 m (NB)	>600 m (NB)	>600 m (NB)

Under future background traffic conditions, the intersection of Plains Road and Waterdown Road is expected to operate with a LOS "E" or better for the 2024 and 2029 horizon years. The eastbound left-turn movement is expected to exceed capacity during the A.M. peak hour for both the 2024 and 2029 horizon years. Furthermore, the 95th and 50th percentile queues for the eastbound left-turn movement are expected to exceed the existing storage during the A.M. peak period similar to the existing conditions, as well as the P.M. peak period. The queues observed indicate that the eastbound queue would typically be expected to exceed storage length.

Operations at the intersection of Masonry Court and Cooke Boulevard are expected to fail during all peak periods for both horizon years due to excessive volumes for the stop controlled, northbound right-turn movements. The intersection would operate well above capacity due to a large volume of conflicting eastbound and westbound traffic producing few acceptable gaps for northbound traffic. The high volumes of traffic at this intersection are attributed to the Aldershot GO Station background development. 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 year are expected to significantly exceed available storage length.

The intersection of Plains Road East and Cooke Boulevard is expected to operate with acceptable delays and under capacity for all horizon years under future background traffic conditions. The queues at this intersection are expected to be within the available storage length.

6.0 Site Generated Traffic

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

6.1 ITE Trip Generation

Site-generated traffic for the proposed development was calculated using the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition, using Land Use Category (LUC) 222 "Multifamily Housing (High-Rise)". The fitted curve equation was used to determine a conservative estimate of the peak hour trips generated at the site. No modal split reductions were applied to site-generated trips for a more conservative representation of site-generated trips.

Notably, site generated trips for the retail portion of the development are expected to primarily from residents of the building and is not expected to generate a significant number of trips due to small area occupied by the retail space. As such, additional trip generation was not conducted for the retail portion of the development.

The site-generated trips forecasted at the proposed development are summarized in **Table 5**.

Table 5: ITE Trip Generation

ITE Category	Units	Roadway Peak Hour	Rate/Equation Used	Number of Trips		
				Inbound	Outbound	Total
Multifamily Housing (High-Rise) (LUC 221)	295 units	Weekday A.M.	T = 0.28 (X) + 12.86	23	73	96
		Weekday P.M.	T = 0.34 (X) + 8.56	66	42	108

The proposed development is expected to generate approximately 96 two-way trips (23 inbound and 73 outbound) during the weekday A.M. peak hour, and 108 two-way trips (66 inbound and 42 outbound) during the P.M. peak hour.

6.2 Trip Distribution and Assignment

The trips generated by the residential portion of the development were distributed to the boundary 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 these 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".

Additionally, trips were filtered to only include persons between the age of 18-99 and excluding uncommon or unknown modes of travel (school buses, unknown or other trips). 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 site trip distribution is included in **Appendix G**. The assignment of site-generated trips per the noted distribution is presented in **Figure 7**.

7.0 Site Access and Circulation Review

7.1 Sight Distance Analysis

The available sightlines at the proposed site access were measured and compared to the standards set out in the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR), June 2017. 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 * tag*

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 7 below summarizes the required and available sight lines at the proposed site access to Waterdown Road. **Figure SL-01** illustrates the sight lines at the site.

Table 7: Sight Distance Analysis

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

Note 1: Time gap for left-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.

As outlined above, minimum sight distance requirements are satisfied at the proposed site access on Waterdown Road. Therefore, the proposed subdivision is supportable from a sight distance perspective.

7.2 Access Spacing

Per Figure 8.8.2 in the TAC GDGCR, the minimum required corner clearances from a signalized intersection to a public driveway along an arterial road is 70.0 meters. The distance of the proposed access to the existing intersections of Waterdown and Plains Road East, as well as Waterdown and Masonry Road is within this spacing requirement. As such, the spacing of the proposed access is sufficient for corner clearance.

7.3 Site Circulation

AutoTURN analysis illustrated in **Figures T300**, **T301**, and **T302**, respectively, were undertaken to confirm the turning movements for MSU (Medium Single Unit Truck), garbage trucks, and emergency (fire) trucks that can maneuver through the site.

It is noted that as the building entrance is within 15 meters of the existing major roadway on Waterdown Road, it is assumed that emergency vehicles would not be required to circulate the site to provide services and would pull up on Waterdown Road as demonstrated in Figure **T302**.

Per the truck turning analysis, some study vehicles would have some encroachments circulating on the most recent site plan, seen in Figures **T300** and **T301**. Additional site plan submissions will include amendments to accommodate the turning movements of the circulating vehicles.

8.0 Total Traffic Conditions

The future total traffic volumes for the two (2) horizon years consist of the following components:

- Future Background traffic volumes from the corresponding year.
- Proposed development site generated traffic volumes.

The resulting total volumes in the horizon years 2024 and 2029 are presented in **Figures 8** and **9**.

8.1 Intersection Operations

The results of the 2024 and 2029 future total traffic conditions are summarized in **Table 8** and queuing analysis is summarized in **Table 9**. Detailed capacity analysis worksheets are included in **Appendix H**.

Table 8: 2024 and 2029 Future Total Levels of Service

Intersection	Level of Service (Average Delay Per Vehicle(s)				Max V/C Ratio (Approach) > 0.85			
	2024 Horizon Year		2029 Horizon Year		2024 Horizon Year		2029 Horizon Year	
	A.M. Peak	P.M. Peak	A.M. Peak	P.M. Peak	A.M. Peak	P.M. Peak	A.M. Peak	P.M. Peak
Plains Road East and Waterdown Road	E (60.4 s)	C (34.1 s)	E (69.0 s)	D (38.4 s)	**1.16 (EBL) 1.00 (WBT) 0.87 (NBT) 1.02 (SBL)**	**0.91 (WBT) 0.90 (SBL)**	**1.22 (EBL) 1.04 (WBT) 0.89 (NBT) 1.09 (SBL)**	**0.87 (EBL) 0.97 (WBT) 0.95 (SBL)**
Plains Road East and Cooke Boulevard	B (11.7 s)	B (16.4 s)	C (12.0 s)	B (16.9 s)	0.68 (SBT)	0.78 (SBT)	0.68 (SBT)	0.78 (SBT)
Waterdown Road and Masonry Court	F (85.6 s)	C (21.0 s)	**F (>80 s)**	C (21.4 s)	**1.16 (NBT) 1.23 (SBL)**	**0.92 (WBTR)**	**1.16 (NBT) 1.23 (SBL)**	**0.92 (WBTR)**
Masonry Court and Cooke Boulevard	**F (>80 s)**	**F (>80 s)**	**F (>80 s)**	**F (>80 s)**	**9.13 (NB)**	**2.2 (NB)**	**9.16 (NB)**	**2.2 (NB)**
Waterdown Road and Site Access	C (21.2 s)	B (11.7 s)	C (22.4 s)	B (11.9 s)	0.26 (WB)	0.08 (WB)	0.28 (WB)	0.08 (WB)

Note 1: The Level of Service of a Stop-Controlled intersection is based on the delay associated with the critical approach. The Level of Service of a signalized intersection is based on the average control delay per vehicle. Existing Signal Timings provided in the Paradigm Report were used.
Note 2: All v/c ratios greater than 0.85 are highlighted.

Table 9: 2024 and 2029 Future Total Queues

Intersection	95th %ile Queue Length *50th %ile Queue Length* > Storage Length			
	2024 Horizon Year		2029 Horizon Year	
	A.M. Peak	P.M. Peak	A.M. Peak	P.M. Peak
Plains Road East and Waterdown Road	280 m *205 m* (EBL)	60 m *35 m* (EBL)	300 m *220 m* (EBL)	65 m *40 m* (EBL)
Plains Road East and Cooke Boulevard	None			
Waterdown Road and Masonry Court	305 m *200 m* (SBL)	None	310 m *200 m* (SBL)	None
Masonry Court and Cooke Boulevard	>600 m (NB)	>600 m (NB)	>600 m (NB)	>600 m (NB)
Waterdown Road and Site Access	None			

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 some movements operating above capacity in the a.m. peak hour only. Notably, the eastbound left turn and southbound left turn movements are still overcapacity and the westbound through movement is expected to now exceed capacity.

Additionally, operations at the intersection of Masonry Court and Cooke Boulevard are expected to continue to fail due to large increases in traffic volumes associated with Aldershot Station.

Similarly, operations during the a.m. peak hour at the intersection of Waterdown and Masonry Court for the southbound left turn are expected to continue fail during the morning peak hour due to large increases in traffic volumes associated with Aldershot Station. The northbound through movement is also expected to continue to exceed capacity during the a.m. peak hour mostly due to background development traffic.

The intersection of Plains Road East and Cooke Boulevard is expected to operate with acceptable delays and under capacity during both peak hours.

The proposed site access is also expected to operate with acceptable delays and well under capacity, with no significant queues.

8.2 Comparison

A comparison of the results of future background and future total conditions for the 2029 horizon year are included in Table 10 below.

Table 10: 2029 Future Background and Future Total Comparison

Intersection	Level of Service (Average Delay Per Vehicle(s)				Max V/C Ratio (Approach) > 0.85			
	2029 Future Background		2029 Future Total		2029 Future Background		2029 Future Total	
	A.M. Peak	P.M. Peak	A.M. Peak	P.M. Peak	A.M. Peak	P.M. Peak	A.M. Peak	P.M. Peak
Plains Road East and Waterdown Road	E (66.8 s)	D (36.1 s)	E (69.0 s)	D (38.4 s)	**1.22 (EBL) 1.03 (WBT) 0.89 (NBT) 0.97 (SBL)**	**0.86 (EBL) 0.95 (WBT) 0.89 (SBL)**	**1.22 (EBL) 1.04 (WBT) 0.89 (NBT) 1.09 (SBL)**	**0.87 (EBL) 0.97 (WBT) 0.95 (SBL)**
Plains Road East and Cooke Boulevard	C (11.9 s)	B (16.7 s)	C (12.0 s)	B (16.9 s)	0.68 (SBT)	0.78 (SBT)	0.68 (SBT)	0.78 (SBT)
Waterdown Road and Masonry Court	**F (>80 s)**	C (21.0 s)	**F (>80 s)**	C (21.4 s)	**1.08 (NBT) 1.23 (SBL)**	**0.92 (WBTR)**	**1.16 (NBT) 1.23 (SBL)**	**0.92 (WBTR)**
Masonry Court and Cooke Boulevard	**F (>80 s)**	**F (>80 s)**	**F (>80 s)**	**F (>80 s)**	**9.16 (NB)**	**2.2 (NB)**	**9.16 (NB)**	**2.2 (NB)**

In comparing the results of the future background and total traffic volumes anticipated at the intersections of study, it is noted there are small increases with respect to delays and volume-to-capacity ratios.

Therefore, it is concluded that the proposed development does not significantly impact the operations of the surrounding road network and that the overcapacity movements expected within the network are a result of background developments, most notably Aldershot Station. However, it is noted that the volume projections used for the station in the original Paradigm report are considered very conservative.

9.0 Recommendations

9.1 Masonry Court and Cooke Boulevard

The failure of operations at the intersection of Masonry Court and Cooke Boulevard is due to the large number of forecasted trips associated with the Aldershot GO station parking lot background study. It is noted that the background volumes for this development that were used within the Paradigm Report, appear to have used a very conservative estimate of the future growth in vehicle trips generated at the station during the peak hours when comparing to the GO Rail Station Access Plan forecasts for the station.

If the conservative background volume forecasts materialize, significant improvements would be required at the intersection including auxiliary lanes and potential future signalization. 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 2029 future background conditions and are included in **Appendix I**.

Per the results of the signal warrants, the future background 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. As such, it is recommended the City continue to monitor this intersection for signalization should traffic to Aldershot Station continues to grow as forecasted.

9.2 Masonry Court and Waterdown Road

In order to accommodate the significant forecasted growth in southbound left-turn traffic at Waterdown and Masonry Court due to Aldershot Station, a southbound left-turn lane extension to at least 200 metres would be necessary. Traffic signal timing adjustments may also be necessary to provide sufficient capacity to the southbound left turns and northbound through movements.

9.3 Plains Road and Waterdown Road

The existing storage length of approximately 30 metres for the eastbound left-turn movement is insufficient to accommodate even existing traffic in both peak hours and the movement is also approaching capacity in existing conditions. However, a two-way left-turn lane is present directly west of the storage lane and likely acts as an informal extension of the left-turn lane presently given that the existing traffic volumes suggest that the existing storage length would frequently be insufficient.

As a result, the City should consider formally extending the eastbound left-turn lane and retiming the intersection with an increased cycle length. The length of the eastbound left-turn lane extension would depend on the updated signal timing.

10.0 Parking Justification Study

This section discusses the parking requirements per the City of Burlington Zoning By-Laws and compares the forecasted peak parking demand based on standard analysis criteria. The proposed parking supply does not meet the City's By-Law requirements; therefore, a parking justification study has also been completed to support the proposed parking supply at the subject site.

10.1 Zoning By-Law Parking Requirements

The existing City of Burlington Zoning By-Law parking Requirements have been reviewed for the land uses proposed at the subject site and are included in **Table 11**.

It is noted that the City of Burlington Zoning By-Law Section 2.25, Table 1.2.6 outlining Off-Street Parking Standards has been proposed to be amended per Part 1 of the City By-Law 2020; however, the amendment to the residential parking requirements has not been approved as of the date of submission of this report.

Therefore, both the existing "in-effect" apartment parking rate and pending "amended" parking rates were used to calculate the required parking for the proposed development, with the results for each rate shown in **Table 11** and **Table 12** respectively.

Table 11: Existing Parking Requirements

Land Use	Type of Unit	Number of Units/ GFA	Parking Requirements	Parking Required	Parking Provided
Residential	1-Bedroom	228 units	1.25 occupant spaces per one bedroom unit	285	295
	2-Bedroom	67 units	1.50 occupant spaces per two-bedroom unit	101	
	Visitor	295 units	0.35 visitor spaces per unit	104	25
Retail		189 m^2	3.5 spaces per 100 m^2	7	0
Total				497	320

Table 12: Amended Parking Requirements (Under LPAT Review)

Land Use	Type of Unit	Number of Units/ GFA	Parking Requirements	Parking Required	Parking Provided
Residential	1-Bedroom	228 units	1.00 occupant spaces per one bedroom unit	228	295
	2-Bedroom	67 units	1.25 occupant spaces per two-bedroom unit	84	
	Visitor	295 units	0.25 visitor spaces per unit	74	25
Retail		189 m^2	3.5 spaces per 100 m^2	7	0
Total				393	320

As outlined in **Table 11**, the proposed development provides a deficiency of 177 parking spaces per the current existing parking requirements, and per **Table 12,** a deficiency of 73 parking spaces per the "amended" residential parking rates.

It is noted that the "amended" parking requirements do not provide any specific parking reductions for intensification areas, such as Major Transit Station Areas (MTSA). The subject site falls within the existing Aldershot GO Transit Station MTSA, and as such, the parking demand for vehicles would be expected to be significantly lower due to proximity to the Aldershot GO Station. The following sections detail how the existing and "amended" parking requirements are expected to be an overestimate of the actual parking demand.

10.2 Parking Demand Forecasting

To forecast the parking demand for the proposed mixed-use development, parking rates for sites with similar land use characteristics within the City of Burlington were examined along with industry standard data from the ITE Parking Generation Manual. All of the surrogate parking data referenced in this section are summarized in **Table 13**.

10.2.1 ITE Parking Demand

The Institute of Transportation Engineers (ITE) Parking Generation Manual 5th Edition contains parking demand data from surveys for a variety of sites across Canada and the United States and is well recognized in the industry for parking demand data in lieu of, or in combination with data collected from local sites.

Land Use Code 222 "Multifamily Housing (High-Rise)" for sites not located near rail transit was used to estimate the site's peak parking generation, as tabulated in **Table 13**. Additionally, Land Use Code 820 "Shopping Center" was used to forecast the parking demand expected for the retail land use proposed at the site.

10.2.2 Approved Development Parking Rates

The development located at 1085 Clearview Avenue in the City of Burlington, located 500 m northeast of the subject site, proposed a total of 164 dwelling units contained within two (2) seven-storey residential towers. A total of 152 underground resident parking spaces and 29 at-grade parking spaces were proposed for the site.

The proposed parking rate of 1.1 spaces per unit was approved for combined resident and visitor use was disputed and ultimately approved as per the Local Planning Appeal Tribunal (LPAT) decision issued January 29, 2021.

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.

10.2.3 Parking Utilization Data

Parking utilization data collected for the following sites were reviewed from the background Paradigm Report for 40-70 Plains Road East in the City of Burlington:

- 551 Maple Avenue: 186 residential units contained within a 19-storey building.
- 360 Pearl Street: 75 residential units contained within a 17-storey building.
- 1284 Guelph Line: 78 residential units contained within a 4-storey building.

Observed parking ratios at these sites were collected, and the total combined visitor plus resident parking rates are summarized in **Table 13**. The overall range of maximum observed parking rates at the three sites was found to be between 0.90 – 1.06 spaces per unit, for combined resident and visitor demand.

10.2.4 Parking Demand Data Summary

Parking demand data in the City of Burlington as well as ITE data are summarized in **Table 13**.

Table 13: Combined Resident and Visitor Parking Rates

Site Location/Land Use Code	Source	Parking Rate
1085 Clearview Avenue and 1082, 1086 & 1090 St. Matthews Avenue City of Burlington	LPAT Decision	1.10 spaces per unit (Approved)
551 Maple Avenue City of Burlington	Paradigm TIS Report	0.96 spaces per unit (Observed)
360 Pearl Street City of Burlington	Paradigm TIS Report	0.90 spaces per unit (Observed)
1284 Guelph Line City of Burlington	Paradigm TIS Report	1.06 spaces per unit (Observed)
LUC 222 Multifamily Housing (High-Rise)	ITE Parking Generation Manual	0.98 spaces per unit (Observed)
Proposed Development		**1.08 spaces per unit**

Upon review of the above data, the proposed parking supply is expected to be sufficient when considering the peak parking rates observed at surrounding residential buildings with similar land uses. 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 it is situated in an MTSA that provides direct access to transit.

10.3 Policies and Surrounding Land Use

As discussed above, the subject site is within 800 meters 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.

10.4 Parking Supply Justification Summary

In consideration of the above review of local planning policies, parking supply precedent within the MTSA, and parking data at similar sites within Burlington, it can be concluded that the proposed parking supply would be adequate for the site. **Table 14** below shows a comparison of the proposed supply versus the estimated parking demand for the site using the most conservative surrogate study and ITE rates for the residential and retail uses respectively.

Table 14: Proposed Parking Supply Compared to Demand

Land Use	GFA/Units	Parking Demand	Proposed Supply
Residential	295	313 spaces (1.06 per unit)	320
Retail	189 m^2	4 spaces	0
Total	-	317 spaces	320 spaces (+3)

It is noted that the peak retail parking demand at the site is considered conservative given that it is expected a significant proportion of retail trips will be from residents living within the tower and would therefore not generate additional auto trips. The proposed supply of 320 parking spaces also does not include the proposed 3 lay-by spaces at the site frontage along Waterdown Road that would serve short retail and visitor trips to the site.

Overall, the parking supply is expected to slightly exceed the peak parking demand at the site by 3 spaces even after considering the peak retail parking demand at the site. It can therefore be concluded that the total parking supply at the site will be sufficient for the proposed uses.

10.5 Parking Space Dimensional Requirements

It is noted that the site is also proposing parking space sizes below the existing City of Burlington By-law requirements. The proposed dimensions and By-law requirements are summarized in **Table 15** below, along with dimensional requirements from other municipalities for comparison and benchmarking. It is noted that Burlington currently has the largest parking space requirements.

Table 15: Parking Space Dimension Review

Municipality	Width (m)	Additional Width (m)	Length (m)
Burlington	3.0	0.3	6.0
Oakville	3.0	0.3	5.7
Hamilton	2.7	None	6.0
Mississauga	2.6	None	5.2
Toronto	2.6	0.3	5.6

It is noted that the width shown above is for spaces within parking garages for municipalities that make a distinction, and that the additional width is for parking spaces is the amount of additional width required for each obstruction adjacent to the parking space.

While the proposed dimensions of the parking spaces do not meet the dimensional requirements within the existing City By-law, they do meet the existing City of Toronto standard, which ensures that the spaces would function adequately. Additionally, the parking space dimensions meet the recommended minimum width and length requirements of 2.59 and 5.5 metres respectively for low turnover uses included in The Dimensions of Parking (5th Edition) prepared by the Urban Land Institute and National Parking Association.

Furthermore, the reduction is considered appropriate given that the City of Burlington currently has the largest dimension requirements for parking spaces and given the expected urbanization of the surrounding land-uses within the Major Transit Station Area (MTSA). The reduction of the parking stall sizes should be encouraged within this MTSA since it allows for a more efficient design of the parking garage that encourages a more compact development form.

Therefore, the reduced size of the spaces can be supported given that the spaces are still expected to function adequately for vehicles parking at the site, and that the area is planned for significant intensification.

11.0 Transportation Demand Management

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 Modal Split

Per analysis of 2016 Transportation Tomorrow Survey (TTS) data for households situated in 2006 GTA Zones 4050, 4051, and 4052, the modal split for all non-auto modes at the subject site is approximately 4%. As such, it can be reasonably concluded that alternative modes of transportation are not commonly used by residents within the subject site area. The TTS results are included in **Appendix J**.

11.2 Existing Transit and Active Transportation Facilities

As discussed previously in Section 3.3 Existing Transit, 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 3.4 Existing Active Transportation, there is a well-established cyclist network with sharrows or signed routes connecting to the subject site and providing connectivity both in the north/south direction via Waterdown Road (sharrows), as well as the east/west direction via North Shore (signed route).

11.3 TDM Opportunities

11.3.1 Transit

As previously established, there are several existing transits stops in the vicinity of the subject development. Consultation may be undertaken with Burlington Transit or GO Transit to enhance existing stops, such as adding shelters or benches to the existing stops.

As discussed in the following sections, various wayfinding and education measures may be undertaken to supplement the accessibility of existing transit to promote its use as a viable mode of transportation.

11.3.2 Cyclist Facilities

The most recent Site Plan provides a total of 15 short term bicycle parking spaces and a total of 60 long-term bicycle parking spaces.

Per the updated City Zoning By-Law 2020, the required bicycle parking spaces are summarized in **Table 16**.

Table 16: Bicycle Parking Requirements

Type of Space	Land Use	# of Units/GFA	Number of Spaces Required	Spaces Required	Spaces Provided
Long-Term	Residential	295 units	0.5 Long-Term bicycle parking spaces per unit	148 Long-Term	60 Long-Term
	Retail	189 m^2	2 Long-Term spaces + 1 space/1000 m^2 GFA	3 Long-Term	
Short-Term	Residential	295 units	0.05 Short-Term bicycle parking spaces per unit	15 Short-Term	15 Short-Term
	Retail	189 m^2	3 Short-Term spaces + 1 space/1000 m^2 GFA	4 Short-Term	

Per the requirements summarized in **Table 15**, the number of short-term bicycle parking spaces meets the City By-Law standards; however, the provided long-term bicycle parking spaces per the most recent Site Plan is deficient by 91 spaces.

The most recent Site Plan designates indoor spaces for bicycle parking, which would be ideal for long-term spaces. It is recommended that these spaces be near elevators or stairs to facilitate access to residents. The location of the short-term bicycle spaces would be recommended to be near the entrance of the building for visitors.

Additionally, it is recommended that sharrows or an additional bicycle lane be provided connecting the site to the existing bicycle lanes on Waterdown Road for accessibility and connectivity purposes. A well-lit path for cyclists as well as proper lighting at the bicycle parking facilities should be provided for safety and aesthetic purposes.

11.3.3 Pedestrian Facilities

Pedestrian connections on Waterdown Road should connect to the proposed site and be well-lit to be safe and appealing to residents and visitors. Furthermore, pedestrian refuges, such as benches or fixtures, may be provided for additional aesthetic value as well as refuge for walking residents. Additionally, weather protection should be provided for pedestrians near the entrances and exits of the building.

11.3.4 Parking

Through parking related TDM measures, the objective is to reduce the frequency of single occupant auto trips taken to and from the site.

The most recent Site Plan provides a deficiency of parking spaces below the By-law required rates. This reduces the number of vehicles owned by each household and encourage the use of other modes of transportation to visit the proposed site. Given the site's proximity to transit, the reduced parking rate is encouraged since visitors and residents have convenient access to the GO train network and local transit.

Additionally, parking may be unbundled with the purchase of a residential unit so that future residents have a clearer picture of the costs of automobile ownership.

11.3.5 Carshare

Although there are no dedicated carshare services offered within Burlington at this time, the Applicant may consider working with various rideshare services offered within the Greater Toronto and Hamilton Area (GTHA) to provide car-share vehicles on site to further reduce overall vehicle ownership at the proposed site.

11.3.6 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.

11.3.7 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 and a well-established 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

This study has analyzed potential traffic impacts on the boundary road network in relation to the development at 1029 and 1033 Waterdown Road. The detailed analyses contained within this report may be summarized with the following key findings:

- Under 2021 existing conditions, the intersection of Plains Road East and Waterdown Road operate with a Level of Service (LOS) "D" or better during the weekday A.M. and P.M. peak hours.

- All other intersections currently operate with minimal delays during the morning and afternoon peak hour.

- Under 2024 and 2029 future background traffic, the intersection of Plains Road and Waterdown Road is anticipated to operate with LOS "E" or better, with over capacity movements expected for the eastbound left-turn movement during the morning peak hour for both horizon years.

- 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 significant forecasted traffic growth to Aldershot Station.

- Similarly, under future background traffic, the intersection of Masonry and Waterdown Road is projected to operate with LOS "F" during the 2029 morning peak hour due to the over-capacity southbound left-turn movement associated with the growth of park and ride users of Aldershot Station.

- The intersection of Plains Road East and Cooke Boulevard is projected to operate with acceptable delays under future background conditions for all peak periods and horizon years.

- The proposed mixed-use development is forecasted to generate approximately 96 two-way trips (23 inbound and 73 outbound) during the weekday A.M. peak hour, and 108 two-way trips (66 inbound and 42 outbound) during the 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. Capacity concerns at the study intersections are mainly due to heavy volumes generated by the Aldershot Station background development.

- Signal warrants at the stop-controlled intersection of Masonry and Cooke Boulevard was conducted using the Ontario Traffic Manual (OTM) Justification 7, and signals were not found to be warranted with expected 2029 future total traffic volumes. However, it is recommended the City continue to monitor this intersection for signalization considering the forecasted growth of Aldershot Station.

- Due to capacity concerns at the intersections along Waterdown Road and limited improvements observed with signal optimization, it would be recommended for left-turn lane extensions for the southbound-left turn movement at Waterdown and Masonry, and the eastbound left-turn for Waterdown and Plains Road to address queuing concerns.

- The proposed site access to Waterdown Road is anticipated to operate with LOS "C" or better during the 2024 and 2029 horizon years for the morning and afternoon peak hours.

- Vehicle maneuverability diagrams were prepared and identified potential encroachments on the most recent site plan. Future revisions to the site plan will address deficiencies to accommodate the waste vehicle. Sight lines were observed to the site, and sufficient visibility is available.

- The proposed total parking supply at the site is expected to generate a surplus of approximately 3 parking spaces when compared to the sum of the peak parking demand of all the proposed uses. Therefore, the supply is considered sufficient.

The proposed development at 1029 and 1033 Waterdown Road is not anticipated to materially impact operations within the boundary road network. As sightlines are adequate and site circulation by design vehicles is feasible, the Official Plan Amendment and Zoning By-Law Amendment applications for the site situated at 1029 and 1023 Waterdown Road can be supported from a traffic operations and safety perspective.

We trust the assessment contained herein satisfies any transportation related concerns associated with the proposed development. Please do not hesitate to contact the undersigned to request further information.

Respectfully submitted,

C.F. CROZIER & ASSOCIATES INC.



Farah Choudhury, B. Eng.
Engineering Intern, Transportation

C.F. CROZIER & ASSOCIATES INC.

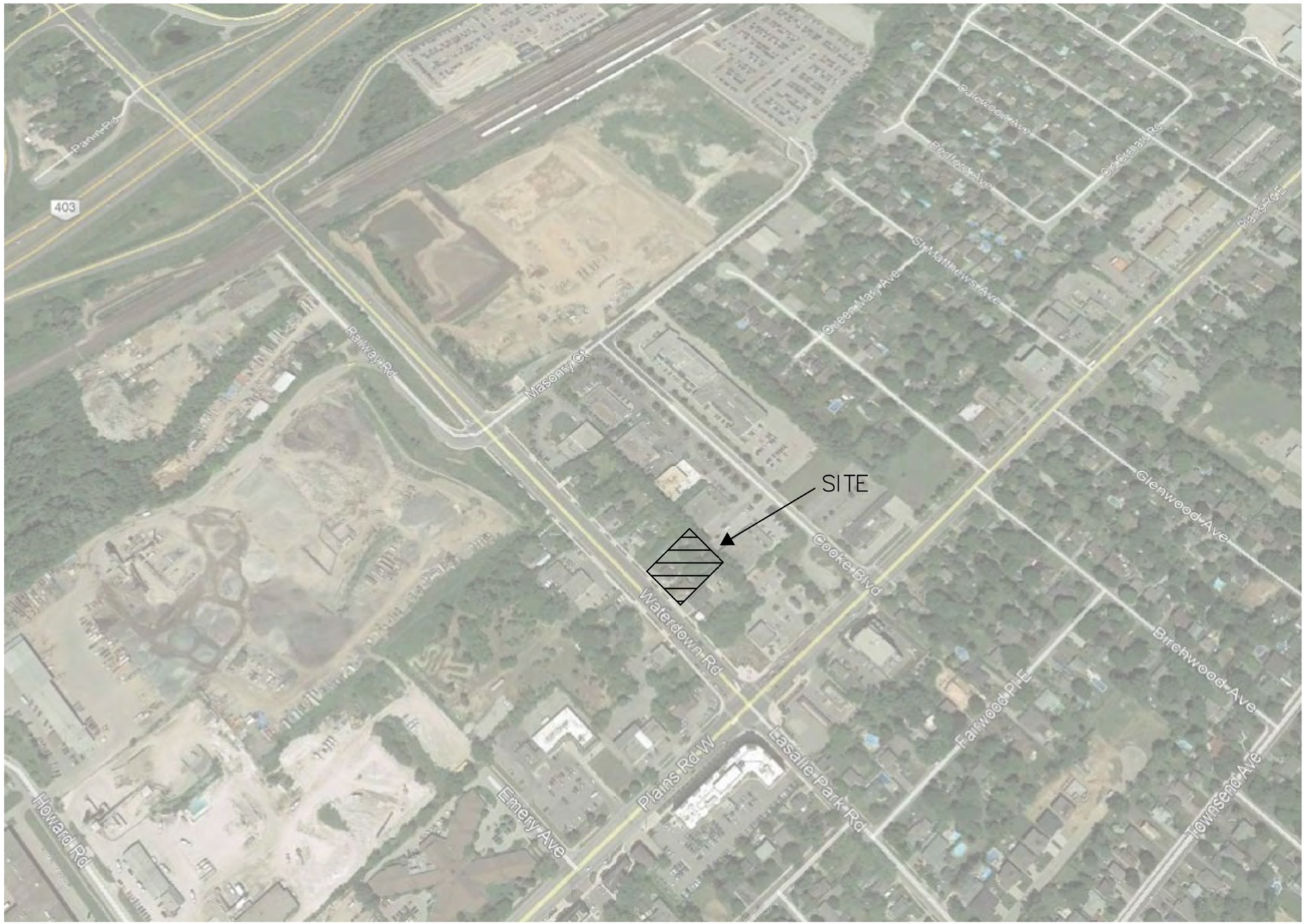


Brandon Bradt, M. Eng. CEM, P. Eng
Project Manager, Transportation

FC/cj

I:\2100\2172- Infinity Development Group\6124- Waterdown Rd\Reports\Transportation\TIS\2021.12.08_(2172-6124)_TIS FINAL.docx

FIGURES

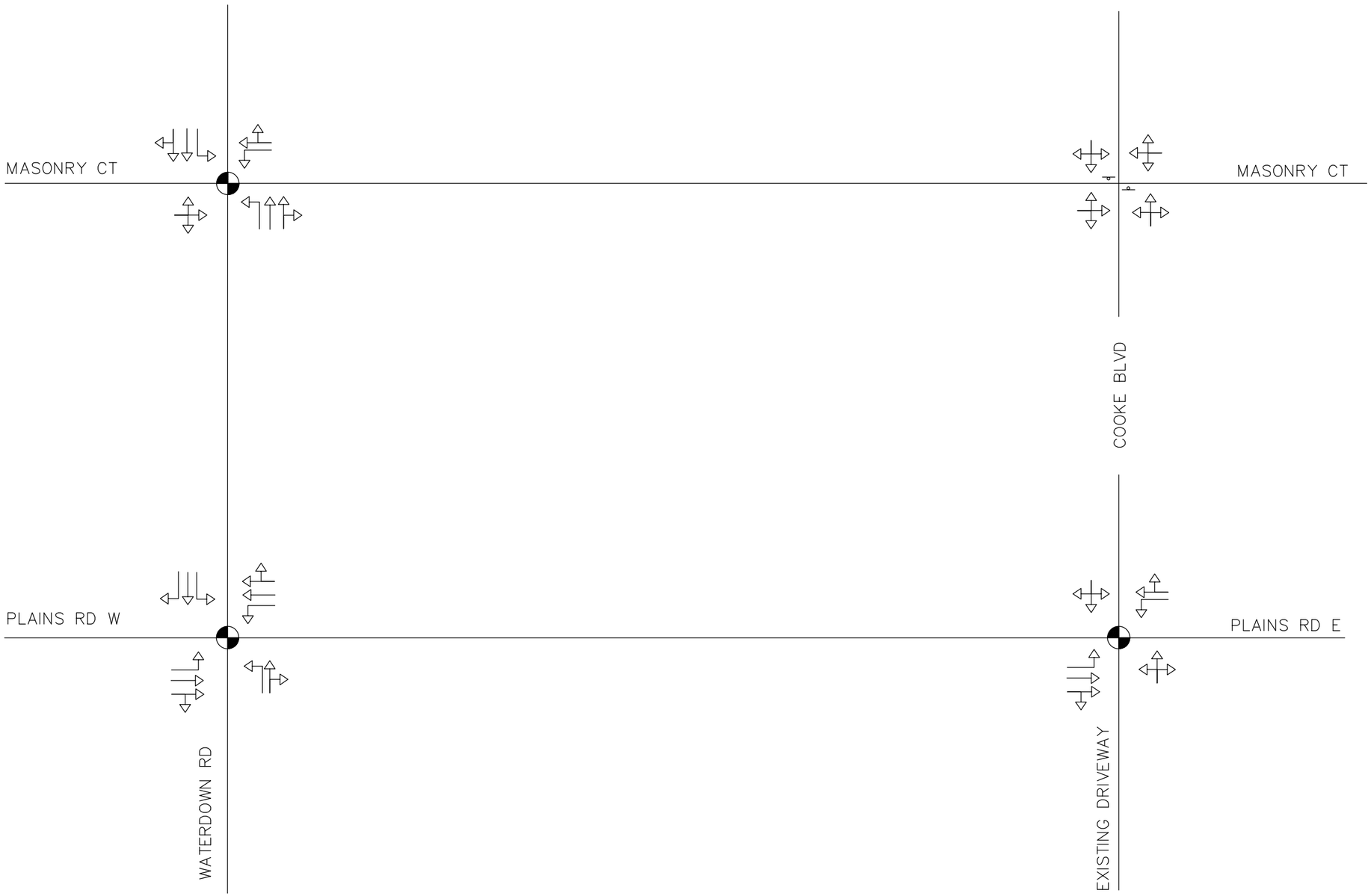


Project
1029 & 1023 WATERDOWN ROAD
CITY OF BURLINGTON

Drawing
SITE LOCATION

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

Drawn By	T.K	Design By	F.C	Project	2172-6124
Scale	N.T.S.	Date	2021/09/27	Check By	A.W	Drawing	FIG. 01



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

	SIGNAL CONTROL
	STOP CONTROL / YEILD CONTROL
XX%(YY%)	A.M. (P.M.) WEEKDAY PEAK HOUR TRAFFIC

Project

1029 & 1023 WATERDOWN ROAD
CITY OF BURLINGTON

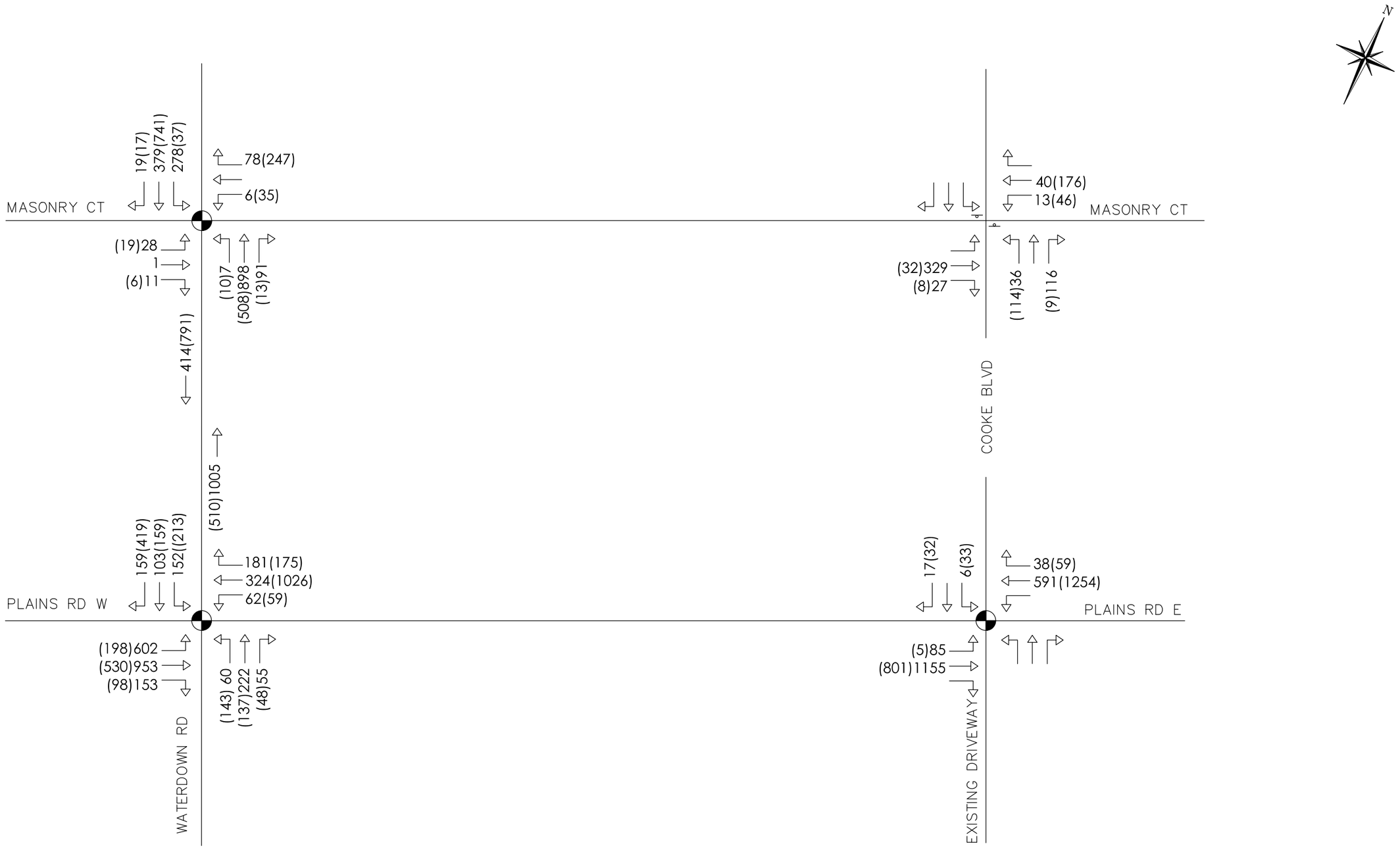
Drawing

EXISTING ROADWAYS TRAFFIC

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

Drawn By	Design By	Project
T.K	F.C	2172-6124

Scale	Date	Check By	Drawing
N.T.S.	2021/09/27	A.W	FIG. 02



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

	SIGNAL CONTROL
	STOP CONTROL / YEILD CONTROL
XX%(YY%)	A.M. (P.M.) WEEKDAY PEAK HOUR TRAFFIC

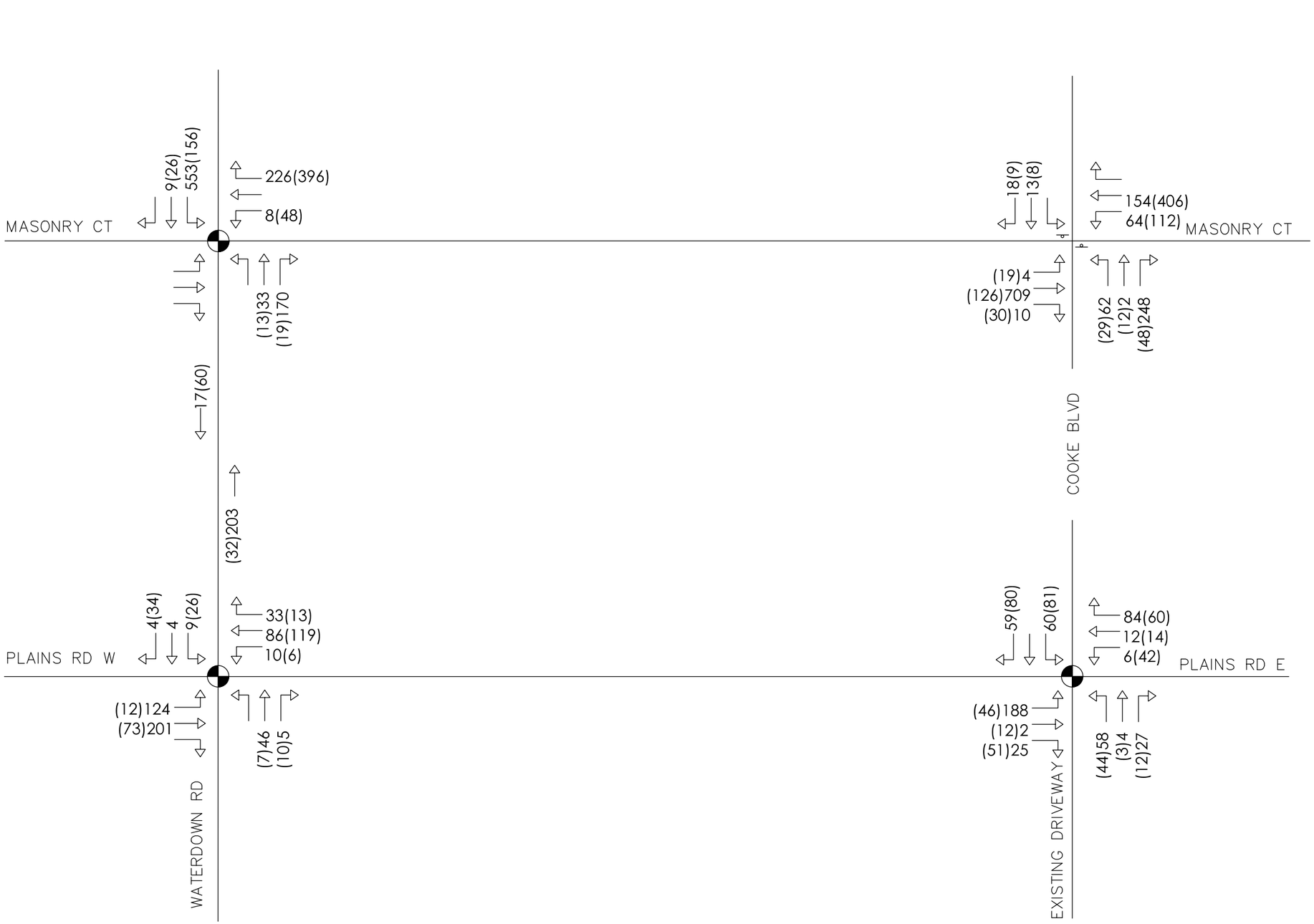
Project: 1029 & 1023 WATERDOWN ROAD
CITY OF BURLINGTON

Drawing: 2021 EXISTING TRAFFIC

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

Drawn By	Design By	Project
T.K	F.C	2172-6124

Scale	Date	Check By	Drawing
N.T.S.	2021/09/27	A.W	FIG. 03



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

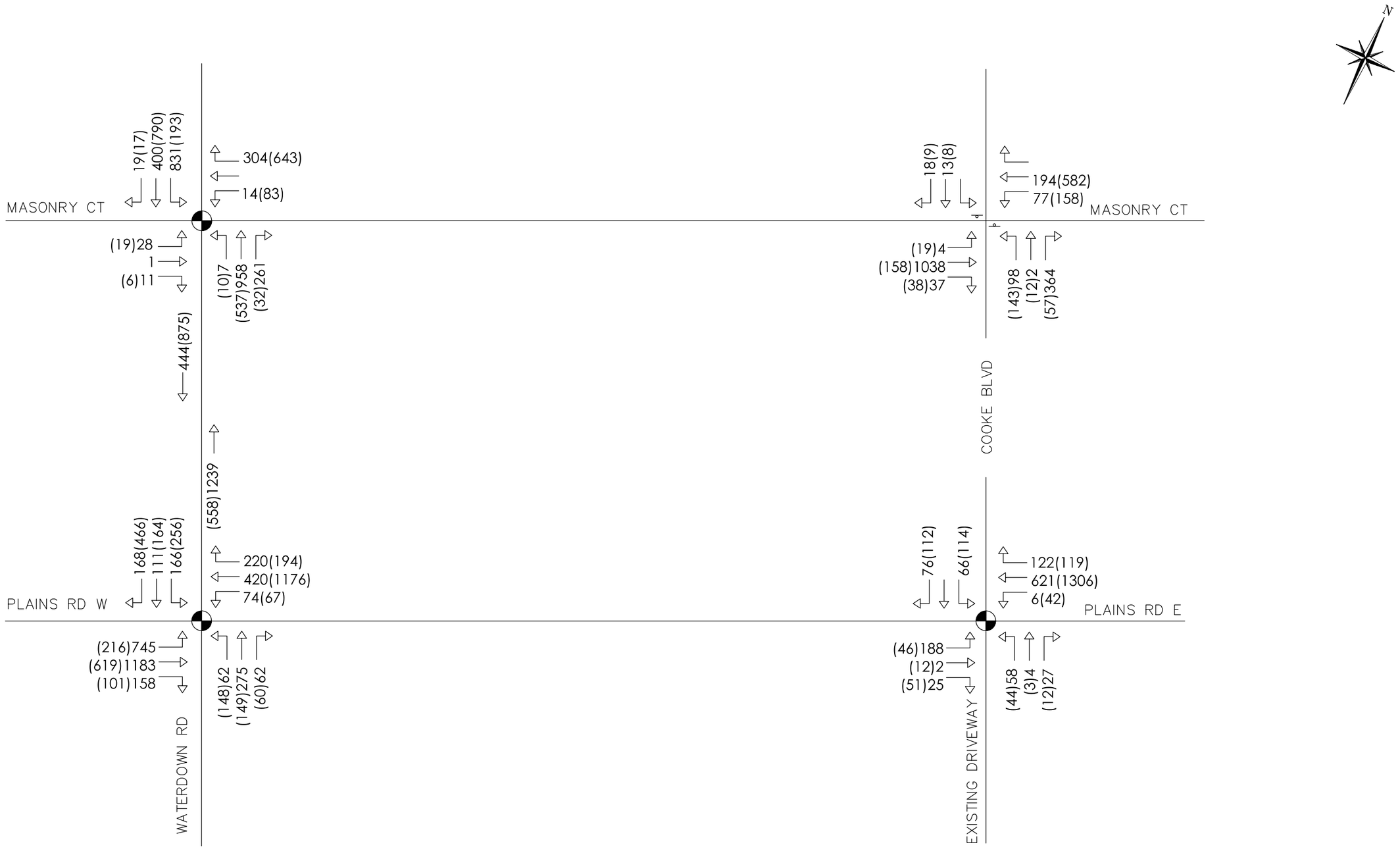
	SIGNAL CONTROL
	STOP CONTROL / YEILD CONTROL
XX%(YY%)	A.M. (P.M.) WEEKDAY PEAK HOUR TRAFFIC

Project: 1029 & 1023 WATERDOWN ROAD
CITY OF BURLINGTON

Drawing: BACKGROUND DEVELOPMENT TRAFFIC

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

Drawn By	Design By	Project
T.K	F.S	2172-6124
Scale	Date	Check By	Drawing
N.T.S.	2021/09/27	A.W	FIG. 04



Legend

- SIGNAL CONTROL
- STOP CONTROL / YEILD CONTROL
- XX%(YY%) A.M. (P.M.) WEEKDAY PEAK HOUR TRAFFIC

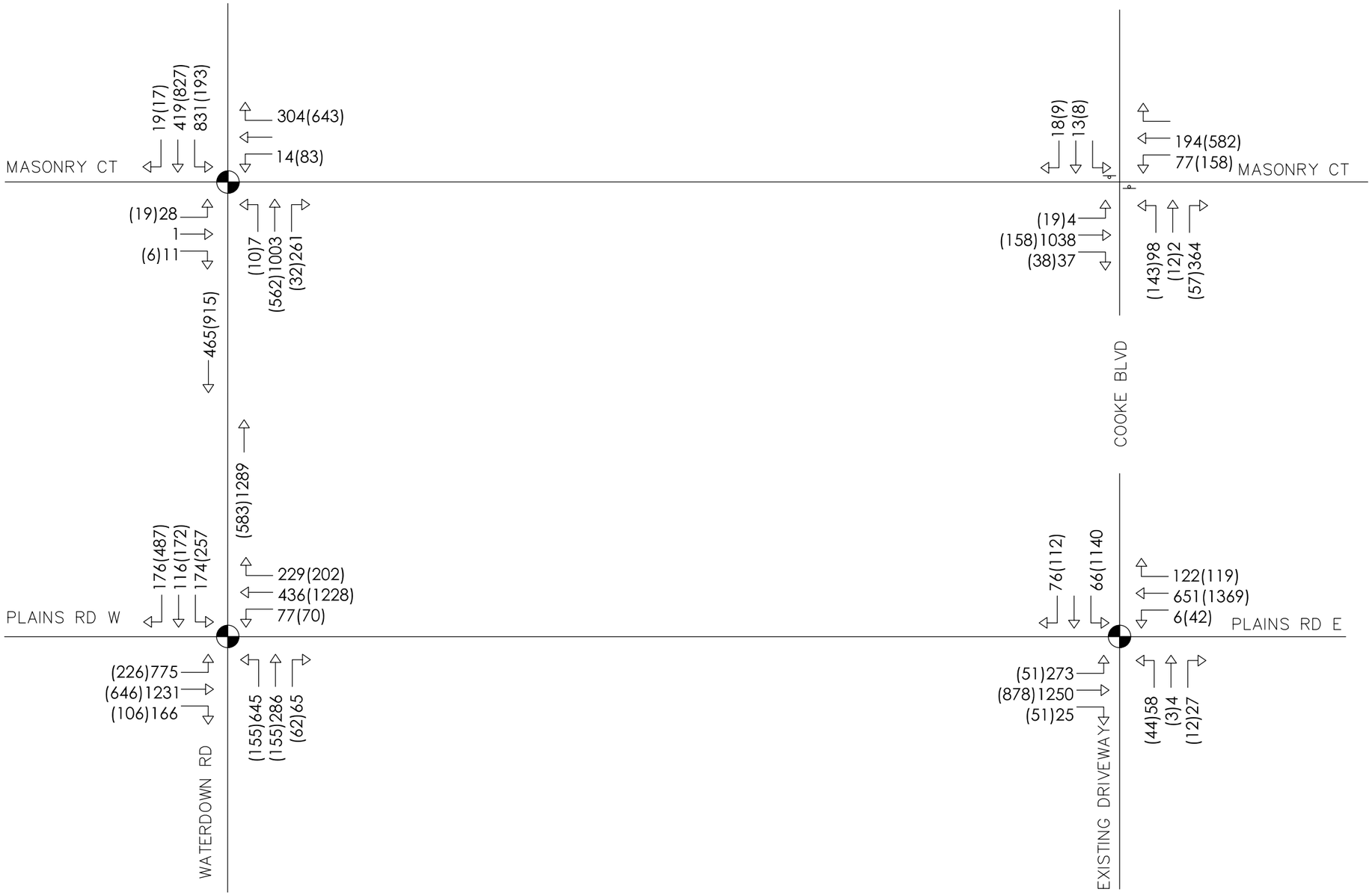
Project: 1029 & 1023 WATERDOWN ROAD
CITY OF BURLINGTON

Drawing: 2024 FUTURE BACKGROUND TRAFFIC

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

Drawn By	Design By	Project
T.K	F.S	2172-6124
Scale: N.T.S.	Date: 2021/09/27	Check By: A.W	Drawing: FIG. 05

NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL / YEILD CONTROL
- XX%(YY%) A.M. (P.M.) WEEKDAY PEAK HOUR TRAFFIC

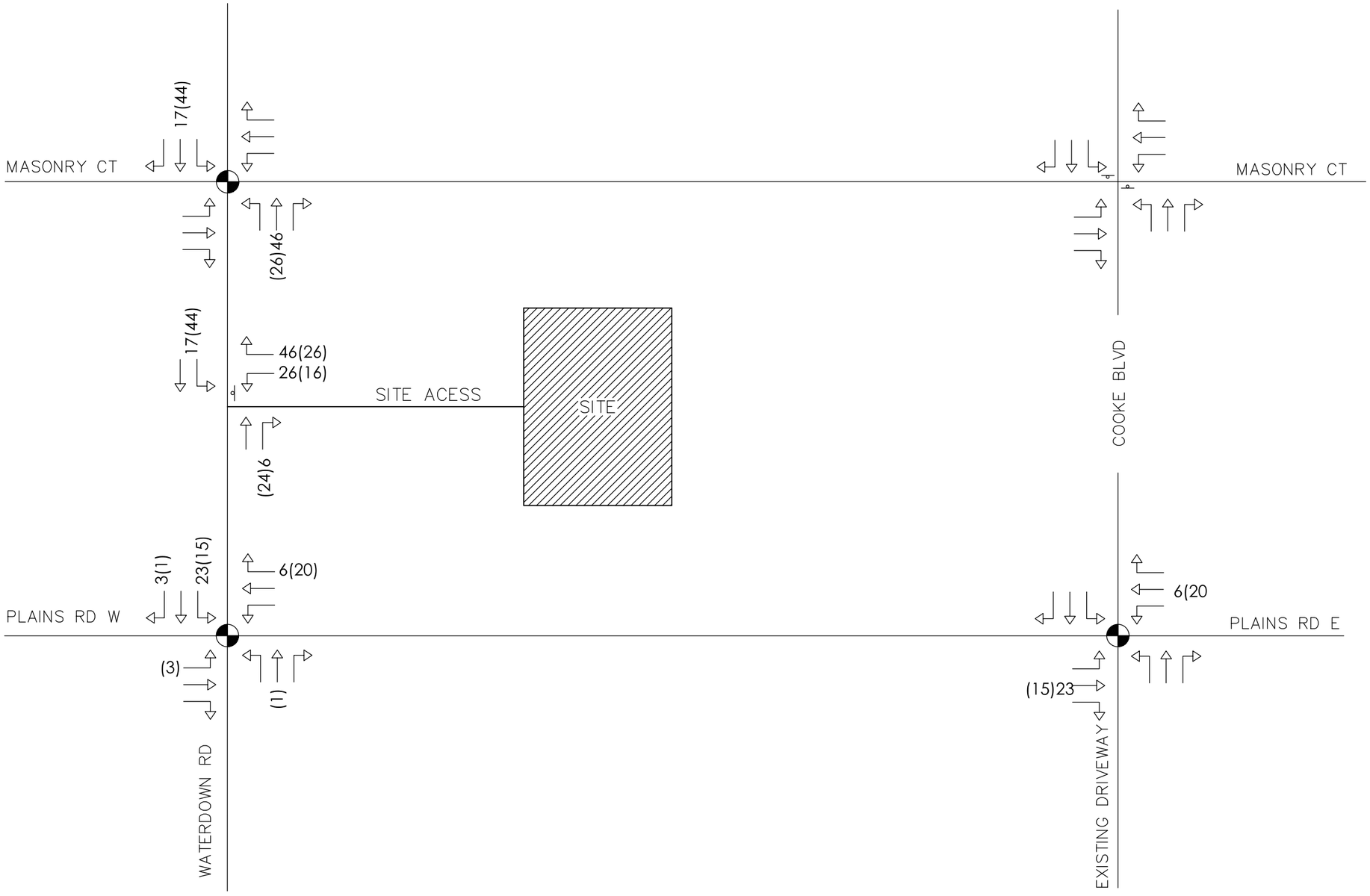
Project: 1029 & 1023 WATERDOWN ROAD
CITY OF BURLINGTON

Drawing: 2029 FUTURE BACKGROUND TRAFFIC

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

Drawn By	Design By	Project
T.K	F.S	2172-6124

Scale	Date	Check By	Drawing
N.T.S.	2021/09/27	A.W	FIG. 06



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

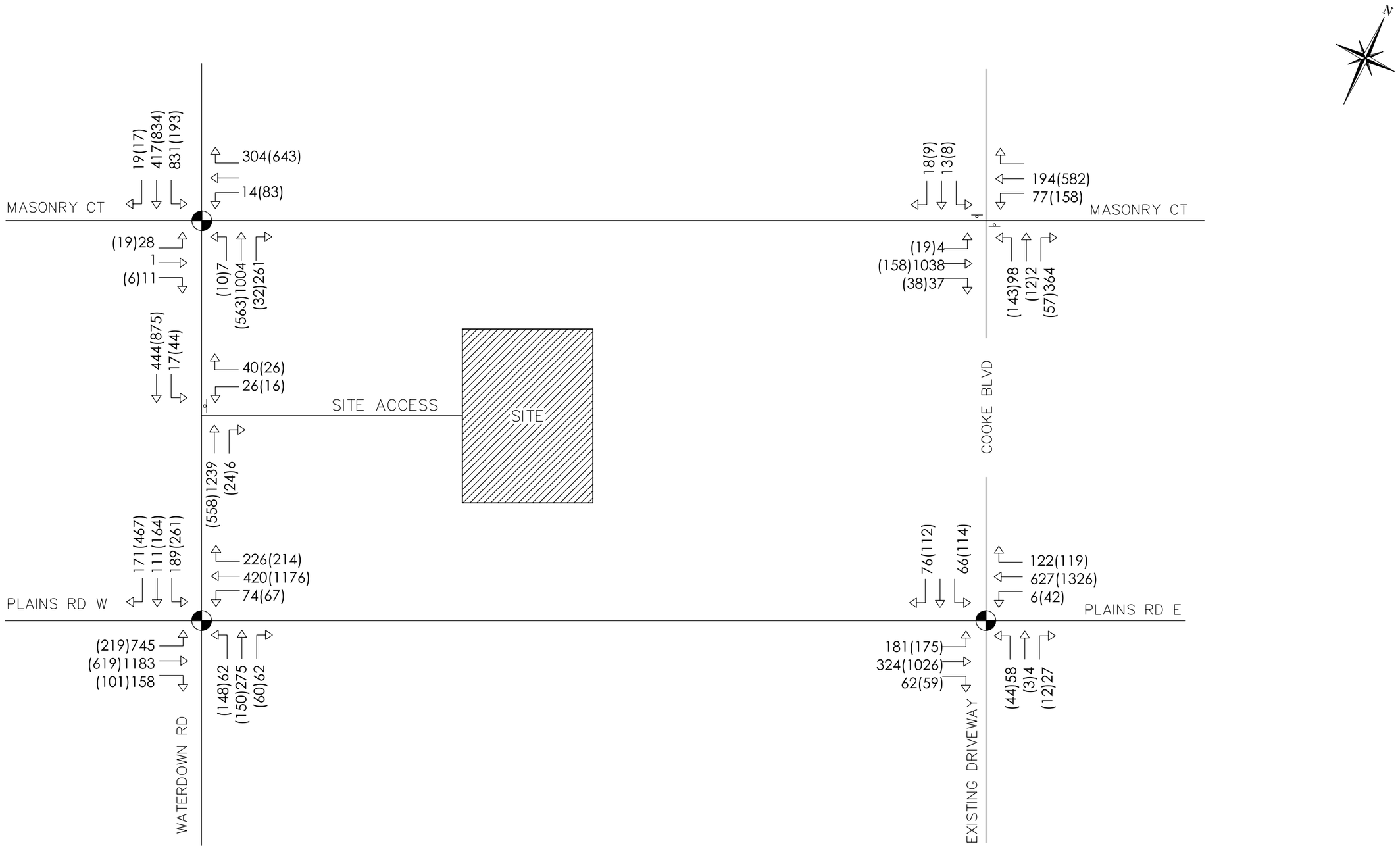
	SIGNAL CONTROL
	STOP CONTROL / YEILD CONTROL
XX%(YY%)	A.M. (P.M.) WEEKDAY PEAK HOUR TRAFFIC

Project: 1029 & 1023 WATERDOWN ROAD
CITY OF BURLINGTON

Drawing: SITE GENERATED TRAFFIC

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

Drawn By	T.K	Design By	F.S	Project	2172-6124
Scale	N.T.S.	Date	2021/09/27	Check By	A.W	Drawing	FIG. 07



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

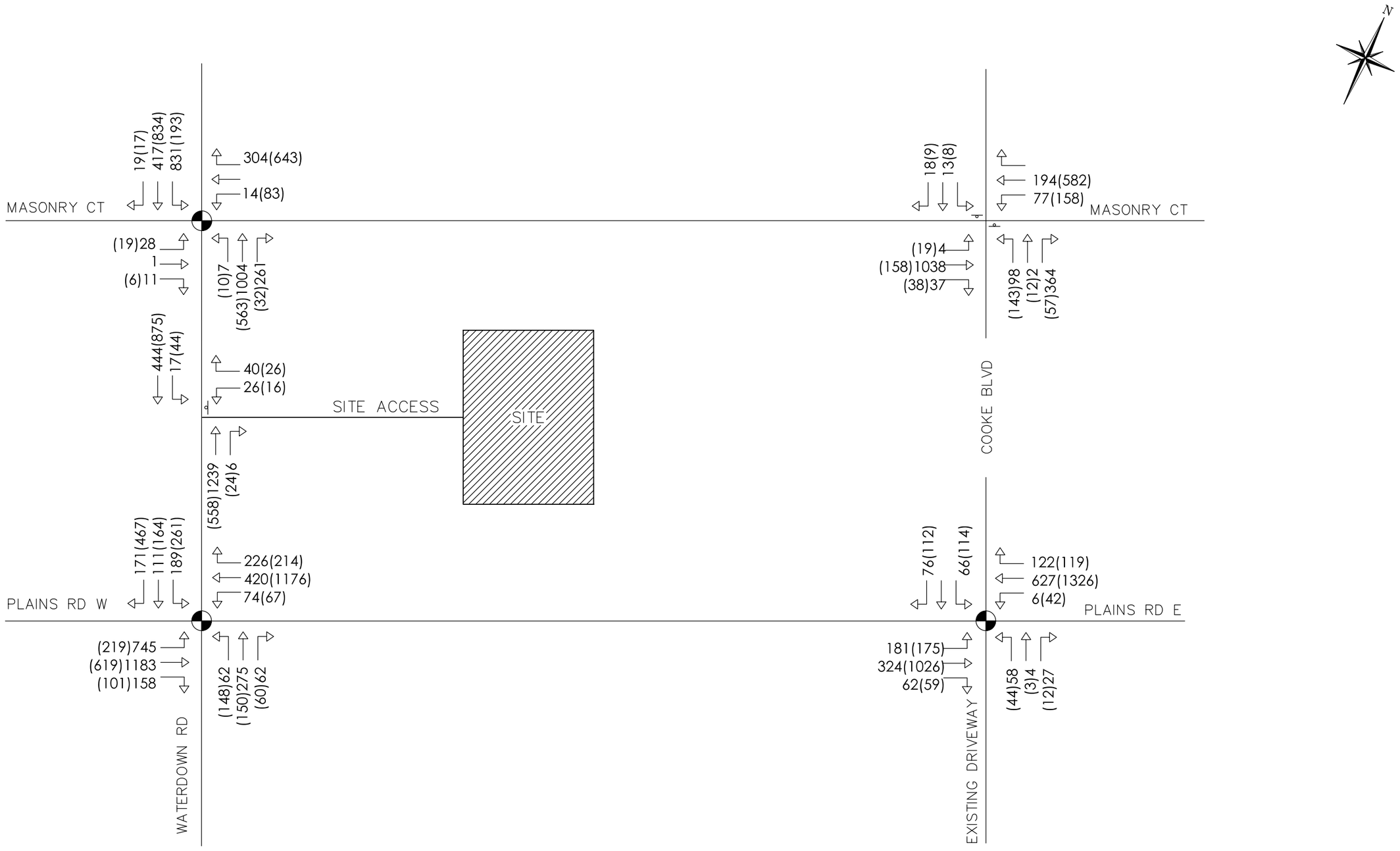
- SIGNAL CONTROL
- STOP CONTROL / YEILD CONTROL
- XX%(YY%) A.M. (P.M.) WEEKDAY PEAK HOUR TRAFFIC

Project: 1029 & 1023 WATERDOWN ROAD
CITY OF BURLINGTON

Drawing: 2024 FUTURE TOTAL TRAFFIC

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

Drawn By	T.K	Design By	F.S	Project	2172-6124
Scale	N.T.S.	Date	2021/09/27	Check By	A.W	Drawing	FIG. 08



NOTE: THIS FIGURE IS FOR SCHEMATIC PURPOSES ONLY & IS NOT TO BE SCALED.

Legend

- SIGNAL CONTROL
- STOP CONTROL / YEILD CONTROL
- XX%(YY%) A.M. (P.M.) WEEKDAY PEAK HOUR TRAFFIC

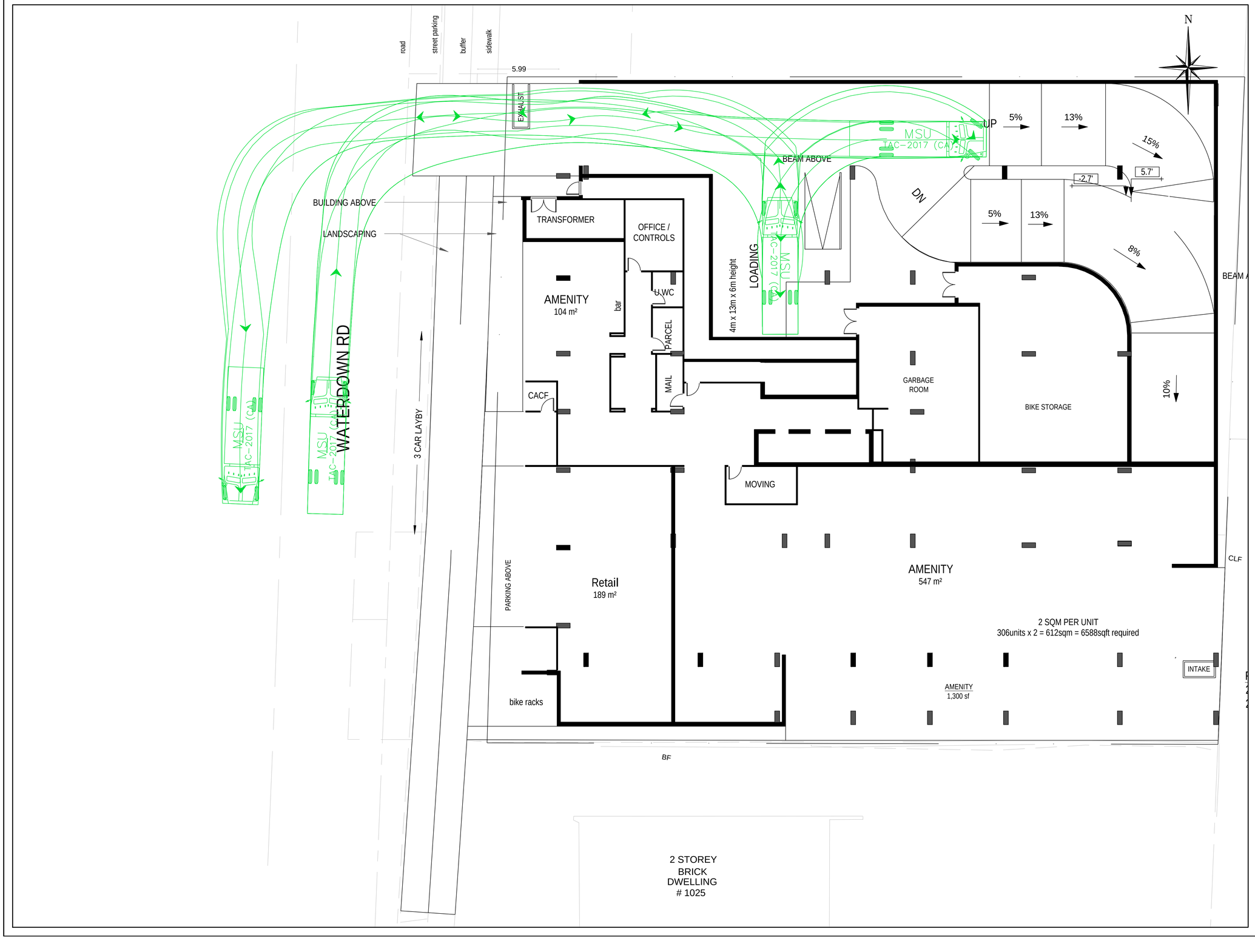
Project: 1029 & 1023 WATERDOWN ROAD
CITY OF BURLINGTON

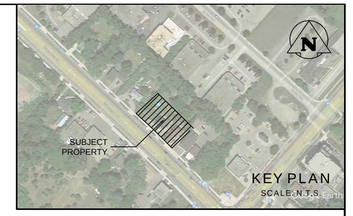
Drawing: 2029 FUTURE TOTAL TRAFFIC

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

Drawn By	Design By	Project
T.K	F.S	2172-6124

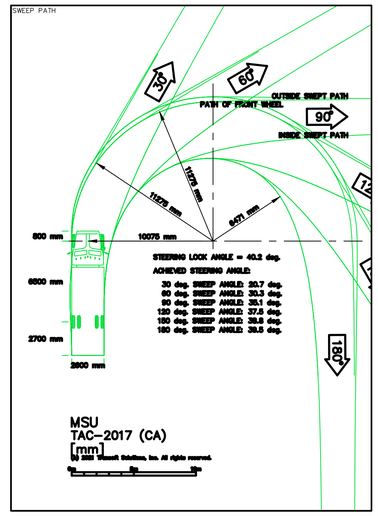
Scale	Date	Check By	Drawing
N.T.S.	2021/09/27	A.W	FIG. 09



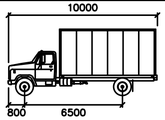


DRAFT

FOR DISCUSSION PURPOSES ONLY



VEHICLE PROFILE



MSU

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

No.	ISSUE	DATE: MM/DD/YYYY
0	ISSUED FOR 1ST SUBMISSION	10/01/2021

Project

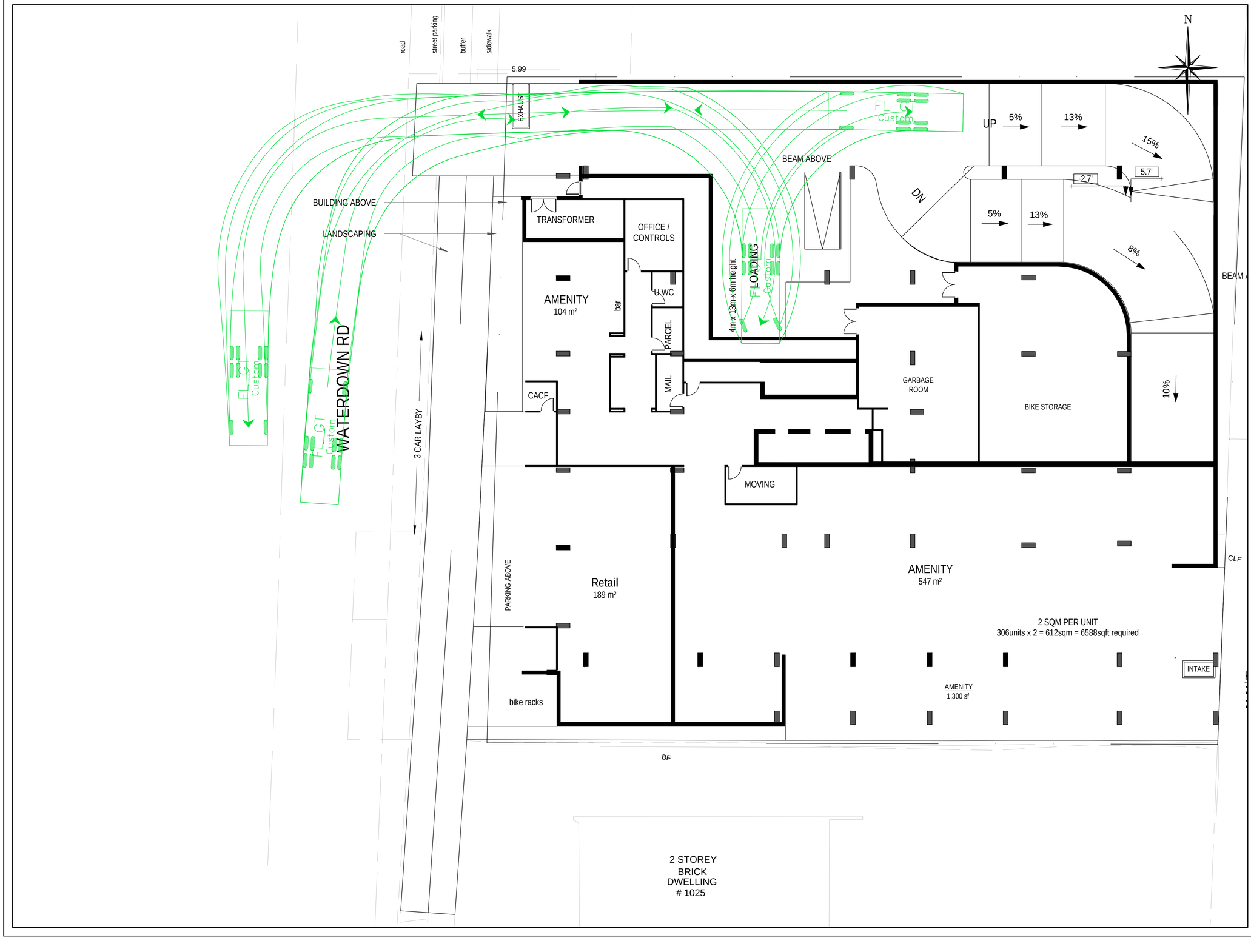
1029 & 1033 WATERDOWN ROAD
CITY OF BURLINGTON

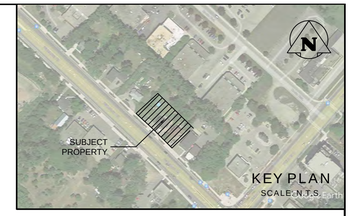
Drawing

SITE CIRCULATION – MSU

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

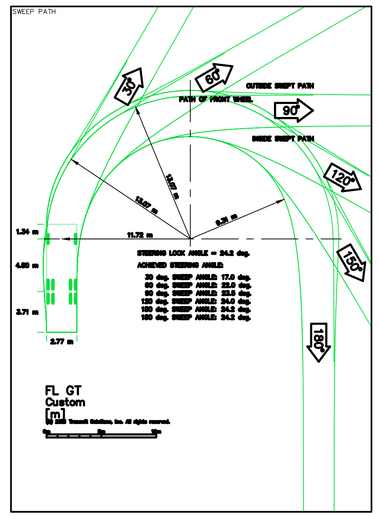
Drawn By	Design By	Project	
I.L.	I.L.		2172–6124
Check By	Check By	Scale	Drawing
F.C.	B.B.	N.T.S.	T300



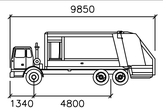


DRAFT

FOR DISCUSSION PURPOSES ONLY



VEHICLE PROFILE



FL GT

mm

Width	: 2770
Track	: 2770
Lock to Lock Time	: 6.0
Steering Angle	: 24.2

No.	ISSUE	DATE: MM/DD/YYYY
0	ISSUED FOR 1ST SUBMISSION	10/01/2021

Project

1029 & 1033 WATERDOWN ROAD
CITY OF BURLINGTON

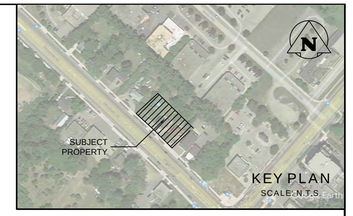
Drawing

SITE CIRCULATION – GARBAGE TRUCK

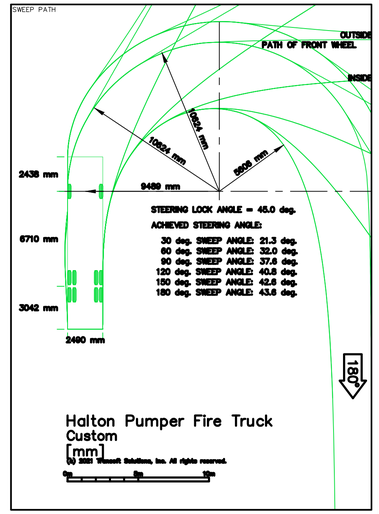
CROZIER CONSULTING ENGINEERS
2800 High Point Drive
Suite 100
Milton, ON L9T 6P4
905-875-0026 T
905-875-4915 F
www.cfcrozier.ca

Drawn By	Design By	Project	
I.L.	I.L.		2172–6124
Check By	Check By	Scale	Drawing
F.C.	B.B.	N.T.S.	T301

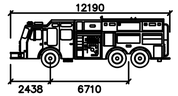
road
street parking
buffer
sidewalk
5.99
EXHAUST
BUILDING ABOVE
LANDSCAPING
TRANSFORMER
OFFICE / CONTROLS
AMENITY
104 m²
bar
U.WC
PARCEL
MAIL
CACF
4m x 13m x 6m height
LOADING
BEAM ABOVE
UP
5%
13%
15%
DN
5%
13%
8%
10%
-2.7'
5.7'
GARBAGE ROOM
BIKE STORAGE
MOVING
BEAM A
N
WATERDOWN RD
Halton Pumper Fire Truck
3 CAR LAYBY
PARKING ABOVE
Retail
189 m²
AMENITY
547 m²
2 SQM PER UNIT
306units x 2 = 612sqm = 6588sqft required
INTAKE
AMENITY
1,300 sf
bike racks
CLF
BF
Halton Pumper Fire Truck
Custom
2 STOREY
BRICK
DWELLING
1025



DRAFT
FOR DISCUSSION PURPOSES ONLY



VEHICLE PROFILE



Halton Pumper Fire Truck

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

No.	ISSUE	DATE: MM/DD/YYYY
0	ISSUED FOR 1ST SUBMISSION	10/01/2021

Project
1029 & 1033 WATERDOWN ROAD
CITY OF BURLINGTON

Drawing
SITE CIRCULATION – FIRE TRUCK

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

Drawn By	Design By	Project
I.L.	I.L.	2172–6124
Check By	Check By	Scale
F.C.	B.B.	N.T.S.
		Drawing T302



1. THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE REPRODUCTION OF ANY PART WITHOUT PRIOR WRITTEN CONSENT OF THIS OFFICE IS STRICTLY PROHIBITED.
2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, LEVELS, AND DATUMS ON SITE AND REPORT ANY DISCREPANCIES OR OMISSIONS TO THIS OFFICE PRIOR TO CONSTRUCTION.
3. THIS DRAWING IS TO BE READ AND UNDERSTOOD IN CONJUNCTION WITH ALL OTHER PLANS AND DOCUMENTS APPLICABLE TO THIS PROJECT.
4. DO NOT SCALE THE DRAWINGS.
5. ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

I.L.

LEGEND

VEHICLE

SIGHT DISTANCE

No.	ISSUE	DATE: MM/DD/YYYY
0	ISSUED FOR 1ST SUBMISSION	10/01/2021

DRAFT
FOR DISCUSSION PURPOSES ONLY

Project: 1029 & 1033 WATERDOWN ROAD
CITY OF BURLINGTON

Drawing: SIGHTLINES

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

Drawn By	Design By	Project
I.L.	I.L.	2172-6124
Check By	Check By	Scale / Drawing
F.C.	B.B.	N.T.S. / SL01

APPENDIX A

City and Town Correspondence

Farah Choudhury

To: Brandon Bradt
Subject: RE: TIS Terms of Reference - 1029-1033 Waterdown Road

From: Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
Sent: September 15, 2021 9:53 AM
To: Brandon Bradt <bbradt@cfcrozier.ca>
Subject: RE: TIS Terms of Reference - 1029-1033 Waterdown Road

Hi Brandon,
My comments are below in red. I am also including my pre-con notes in case you didn't receive them.
Please let me know if you have any questions or comments.
Thanks,
Dan

- Please refer to our Burlington Citywide Parking Standards Review for applicable parking rates for this proposal. Lower parking rates will not be supported by Transportation Planning staff - see the following URL https://www.burlington.ca/en/services-for-you/city-wide-parking-standards-review.asp
  Note: The parking rates for residential land uses were appealed to the Local Planning Appeals Tribunal (LPAT) and are therefore not yet in force and effect. Required rates are reflected in the Zoning By-law and a variance will be required.
- Please refer to our Site Plan Guidelines for applicable design standards for structured parking and ground floor
- This site will require a Traffic Impact Study, please consult with the City of Burlington Staff to determine scope of work. Given the proximity to the 403, MTO and regional staff will need to be consulted as well on the scope of work, to determine any additional requirements.
- Please be advised, that a MTO Interchange Highway Access Plan (IHAMP) may be required above and beyond a Traffic Impact Study. Consultation with the MTO and the Region will be required to determine the scope of the transportation analysis for this proposed development. This site also falls within the QEW Prosperity Corridor study area, which is a joint project with the Region, MTO and Burlington – Further discussions with the MTO will be needed to finalize the scope of the transportation studies required for this development proposal.
- Please provide truck turning templates to demonstrate the functionality of the accesses, loading spaces and underground parking.

Dan Ozimkovic, C.E.T.
Transportation Planning Technologist
Transportation Services Department
City of Burlington

From: Brandon Bradt <bbradt@cfcrozier.ca>
Sent: Wednesday, September 15, 2021 8:51 AM
To: Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
Subject: RE: TIS Terms of Reference - 1029-1033 Waterdown Road

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.

Thanks Dan.

Brandon Bradt, M.Eng. CEM, P.Eng. | Project Manager
211 Yonge Street, Suite 301 | Toronto, ON M5B 1M4
T: 416.477.3392



Crozier Connections:

Read our latest news and announcements here.

From: Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
Sent: September 14, 2021 8:14 PM
To: Brandon Bradt <bbradt@cfcrozier.ca>
Subject: RE: TIS Terms of Reference - 1029-1033 Waterdown Road

Hi Brandon,
Sorry about the late reply. I will review the TOR and provide you with feedback by the end of this week.
Thanks,

Dan Ozimkovic, C.E.T.
Transportation Planning Technologist
Transportation Services Department
City of Burlington

From: Brandon Bradt <bbradt@cfcrozier.ca>
Sent: Tuesday, September 14, 2021 2:17 PM
To: Ozimkovic , Danijel <Danijel.Ozimkovic@burlington.ca>
Subject: RE: TIS Terms of Reference - 1029-1033 Waterdown Road

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 Danijel,

Just wanted to follow up on this. Feel free to call and discuss if needed.

Best,
Brandon

Brandon Bradt, M.Eng. CEM, P.Eng. | Project Manager
211 Yonge Street, Suite 301 | Toronto, ON M5B 1M4
T: 416.477.3392



Crozier Connections:

Read our latest news and announcements here.

From: Brandon Bradt
Sent: September 7, 2021 4:28 PM
To: danijel.ozimkovic@burlington.ca
Cc: Aaron Wignall <awignall@cfcrozier.ca>
Subject: TIS Terms of Reference - 1029-1033 Waterdown Road

Hey Danijel,

Hope you had a good long weekend.

Crozier has been retained to provide transportation consulting services to prepare a TIS for the proposed development at 1029-1033 Waterdown Road. We have prepared a terms of reference below for your review and comment based on the PAC Meeting Notes dated February 10, 2021. It is also noted that the assumptions used are generally based on the TIA prepared by Paradigm for the 40-70 Plains Road site. Can you please explain this last sentence?

- Study Area Intersections
  - Plains Road East and Waterdown Road;
  - Plains Road East and Cookes Boulevard;
  - Waterdown Road and Masonry Court; and
  - Waterdown Road and the proposed site access.
    Add Masonry Court at Cooke Blvd intersection
    Have you consulted with the MTO regarding the Waterdown Road Interchange
- A linear growth rate of 1.0% for through movements along the Waterdown Road and Plains Road corridors, as well as for turning movements at the intersection of Waterdown Road and Plains Road OK
- For traffic data, we propose using the September 2018 counts for the above intersections that are included in the Paradigm report. We will use the proposed growth rate to grow this traffic to 2021 for the existing conditions to provide a conservative assessment Have you checked with the City regarding 2019 counts. I am pretty sure counts weren't completed in 2020 due to the pandemic
- Horizon years of 2024 for full build-out and 2029 for 5 years beyond full build out using the growth rate assumptions above. AM and PM peak hours will be reviewed OK
- Future background traffic will include all developments that were included in the Paradigm report, which are listed below for reference. Please provide any additional background developments as necessary.
  - 35 Plains Road;
  - 53-71 Plains Road and 1075 Cooke Boulevard;
  - 92 Plains Road;
  - 1085 Clearview Ave;

    - 101 Masonry Court; and
    - Aldershot Go Parking Lot Expansion
      Include 40-70 Plains (Stat Public meeting for this proposed development was last night)
- Parking requirements will be assessed according to the By-law 2020 requirements (under appeal for residential uses)

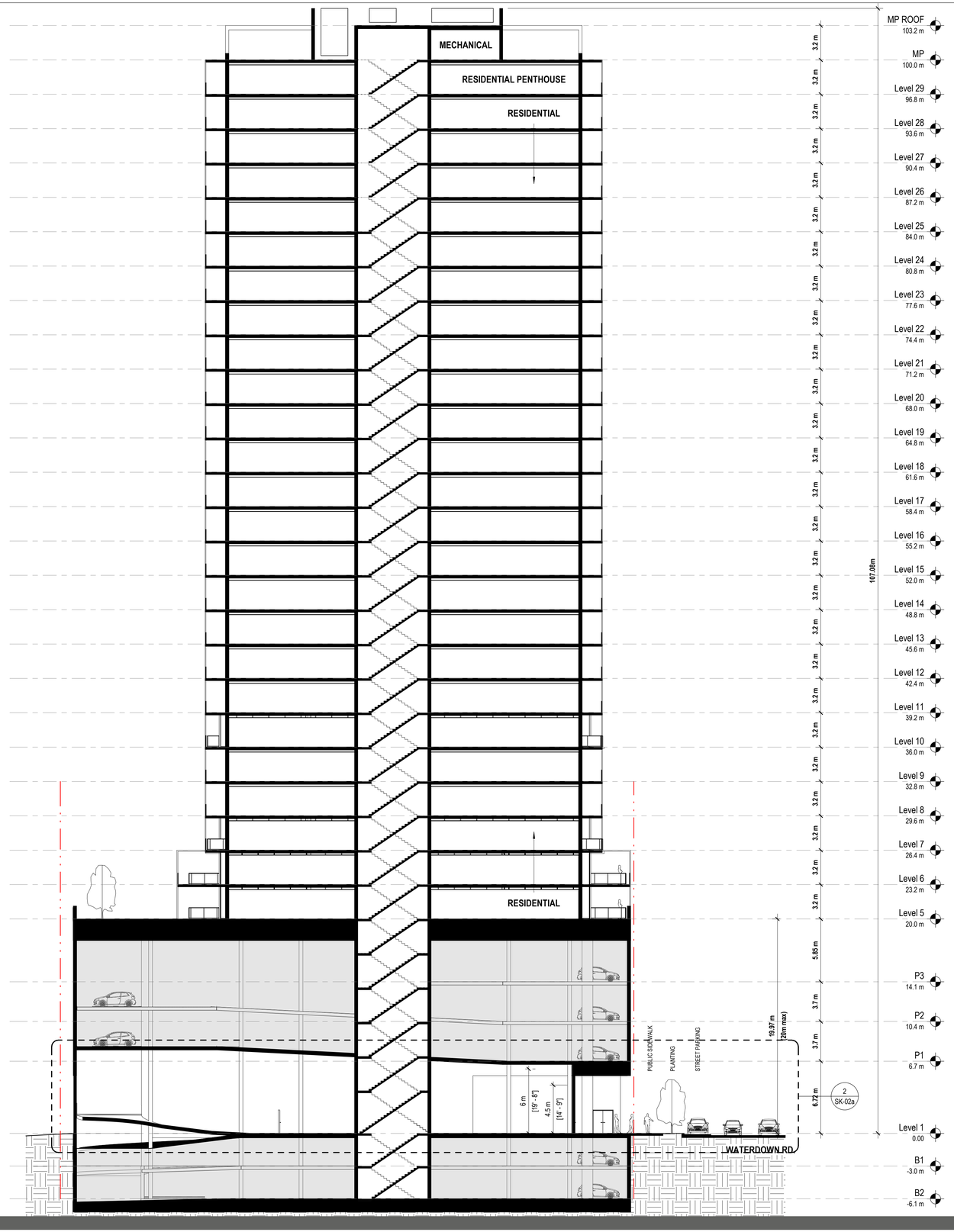
Let me know if the above terms are acceptable for the purposes of preparing the TIS and feel free to reach out with questions.

Best Wishes,
Brandon

This message, including any attachments, is privileged and intended only for the addressee(s) named above. If you are not the intended recipient, you must not read, use or disseminate the information contained in this email/fax. If you have received this email/fax transmission in error, please notify the sender immediately by telephone, fax or email and permanently delete this email from your computer/shred this fax, including any attachments, without making a copy. Access to this email/fax by anyone else is unauthorized. Thank you.

APPENDIX B

Site Plan



BUILDING STATS									
	Parking							Unit Types	
Floor Level	Count	Area BG (Sqm)	Area AG (sqm)	Retail (sqm)	Amenity (Sqm)	Floor Area (Sqm)	Total Units	1 Bed	2 Bed
29						750	6	0	6
28						750	12	10	2
27						750	12	10	2
26						750	12	10	2
25				0	0	750	12	10	2
24						750	12	10	2
23						750	12	10	2
22						750	12	10	2
21						750	12	10	2
20						750	12	10	2
19						750	12	10	2
18						750	12	10	2
17						750	12	10	2
16						750	12	10	2
15						750	12	10	2
14						750	12	10	2
13						750	12	10	2
12						750	12	10	2
11						750	12	10	2
10						750	12	10	2
9						750	12	10	2
8						750	12	10	2
7						750	12	10	2
6						1006	13	4	9
5				0	78	1006	12	4	8
4.5	41	0	1337						
4	53	0	1858			0	0	0	
3	56	0	1602			0	0	0	
2	42	0	1421			0	0	0	
1 (GRADE)	0			189	650	2177			
-2	64	2353							
-1	64	2353							
	320	4706	6218	189	728	21439	295	228	67

PARKING AREA BELOW GRADE = 4,706sqm
PARKING AREA ABOVE GRADE = 6,218sqm
BUILDING AREA ABOVE GRADE = 27,657sqm

TOTAL PARKING = 320
TOTAL UNITS = 295
TOTAL AMENITY = 728sqm

Site Development Stats

1029-1033 Waterdown Rd.

	ITEM	PROPOSED
1	ZONE - PROPOSED BUILDING PERMITTED USES	/
2	LOT AREA	2,614sqm (0.261 ha)
3	LOT FRONTAGE	48.67m
4	FRONT YARD SETBACK (podium)	0.0m
4.5	FRONT YARD SETBACK (tower)	3.77m
5	REAR YARD DEPTH (podium)	0m
5.5	REAR YARD DEPTH (tower)	13.55m
6	INTERIOR SIDEYARD DEPTH (podium)	0.25m (north) 1.21m (south)
6.5	INTERIOR SIDEYARD DEPTH (tower)	12.59m (north) 12.5 (south)
7	LANDSCAPE OPEN SPACE	6%
8	COVERAGE	94%
9	HEIGHT	107.08m
10	DENSITY	1130 uph (295 units)
11	RESIDENTIAL PARKING	320 spaces (1.08 per)
12	RESIDENTIAL BIKE PARKING	60 spaces (0.2 per)

VEHICLE PARKING:
RESIDENTIAL REQUIREMENTS
295 UNITS
RESIDENTIAL (1:1) = 295 REQUIRED **= 295 PROVIDED (1:1)**
VISITOR (1:0.25) = 75 REQUIRED **= 25 PROVIDED (1:0.08)**

BIKE PARKING:
RESIDENTIAL REQUIREMENTS
295 UNITS
SHORT TERM (0.05) = 15 REQUIRED = 15 PROVIDED
LONG TERM (0.5) = 150 REQUIRED = 60 PROVIDED

RETAIL REQUIREMENTS
189sqm
SHORT TERM (3 PLUS 1/1000sqm) = 4 REQUIRED = 4 PROVIDED
LONG TERM (2 PLUS 1/1000sqm) = 3 REQUIRED = 0 PROVIDED

zedd ARCHITECTURE
ARCHITECTURE | DESIGN | PLANNING
zedd architecture inc Z-627 maitland street london ontario
N5Y 2V7 519 518 9333 www.zeddarchitecture.com

INFINITY DEVELOPMENT GROUP

ISSUE		
NO.	DATE	DESCRIPTION
NO.	DATE	DESCRIPTION
REVISION		

THIS DRAWING, THE COPYRIGHT AND OWNERSHIP OF THE DESIGN AND ALL INSTRUMENTS OF SERVICE PREPARED BY ZEDD ARCHITECTURE INC ARE THE EXCLUSIVE PROPERTY OF ZEDD ARCHITECTURE AND MAY NOT BE USED FOR ANY OTHER PROJECT, OR SOLD, OR OFFERED FOR SALE (OR AS PART OF A SALE OF PROPERTY) UNLESS ZEDD ARCHITECTURE HAS GIVEN WRITTEN CONSENT.

NOTE: THIS DRAWING IS TO BE READ IN CONJUNCTION WITH CONSULTANT DRAWINGS AND DOCUMENTATIONS WHICH ARE APPLICABLE TO THE LISTED PROJECT.

THE CONTRACTOR SHALL THOROUGHLY CHECK AND VERIFY ALL LEVELS - DATUMS - DIMENSIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION. ANY DISCREPANCY AND/OR OMISSION SHALL BE REPORTED TO THE ARCHITECT PRIOR TO CONSTRUCTION. WRITTEN DOCUMENTATION / SPECIFICATIONS SHALL TAKE PRECEDENT OVER ARCHITECTURAL DRAWINGS.

PROJECT NAME

ZONING PACKAGE
1029-1033 Waterdown Rd.
Burlington, ON

DRAWING TITLE

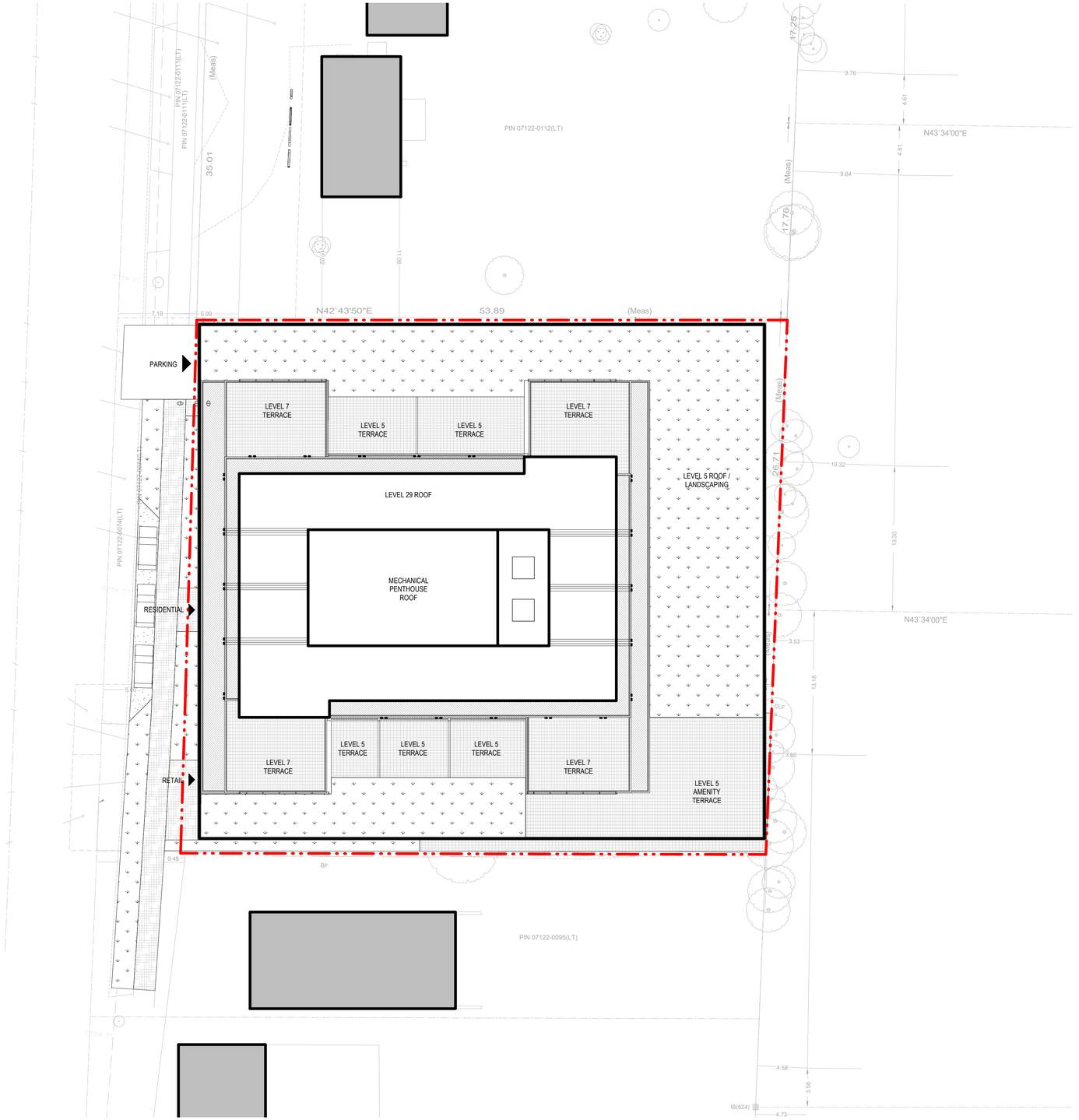
Stats

DRAWING INFO.

Project Number	20-026
Date	2021-08-24
Scale	1 : 200
Drawn by	STF
Checked by	DY

SHEET NO.

SK-01



zedd ARCHITECTURE

ARCHITECTURE | DESIGN | PLANNING

zedd architecture inc Z-627 maitland street london ontario
N5Y 2V7 519 518 9333 www.zeddarchitecture.com

INFINITY DEVELOPMENT GROUP

ISSUE NO.	DATE	DESCRIPTION

NO.	DATE	DESCRIPTION
REVISION		

THIS DRAWING, THE COPYRIGHT AND OWNERSHIP OF THE DESIGN AND ALL INSTRUMENTS OF SERVICE PREPARED BY ZEDD ARCHITECTURE INC ARE THE EXCLUSIVE PROPERTY OF ZEDD ARCHITECTURE AND MAY NOT BE USED FOR ANY OTHER PROJECT, OR SOLD, OR OFFERED FOR SALE (OR AS PART OF A SALE OF PROPERTY) UNLESS ZEDD ARCHITECTURE HAS GIVEN WRITTEN CONSENT.

NOTE: THIS DRAWING IS TO BE READ IN CONJUNCTION WITH CONSULTANT DRAWINGS AND DOCUMENTATIONS WHICH ARE APPLICABLE TO THE LISTED PROJECT.

THE CONTRACTOR SHALL THOROUGHLY CHECK AND VERIFY ALL LEVELS - DATUMS - DIMENSIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION. ANY DISCREPANCY AND/OR OMISSION SHALL BE REPORTED TO THE ARCHITECT PRIOR TO CONSTRUCTION. WRITTEN DOCUMENTATION / SPECIFICATIONS SHALL TAKE PRECEDENT OVER ARCHITECTURAL DRAWINGS.

PROJECT NAME

ZONING PACKAGE
1029-1033 Waterdown Rd.
Burlington, ON

DRAWING TITLE

Site Plan

DRAWING INFO.

Project Number	20-026
Date	2021-08-24
Scale	1 : 200
Drawn by	STF
Checked by	DY

SHEET NO.

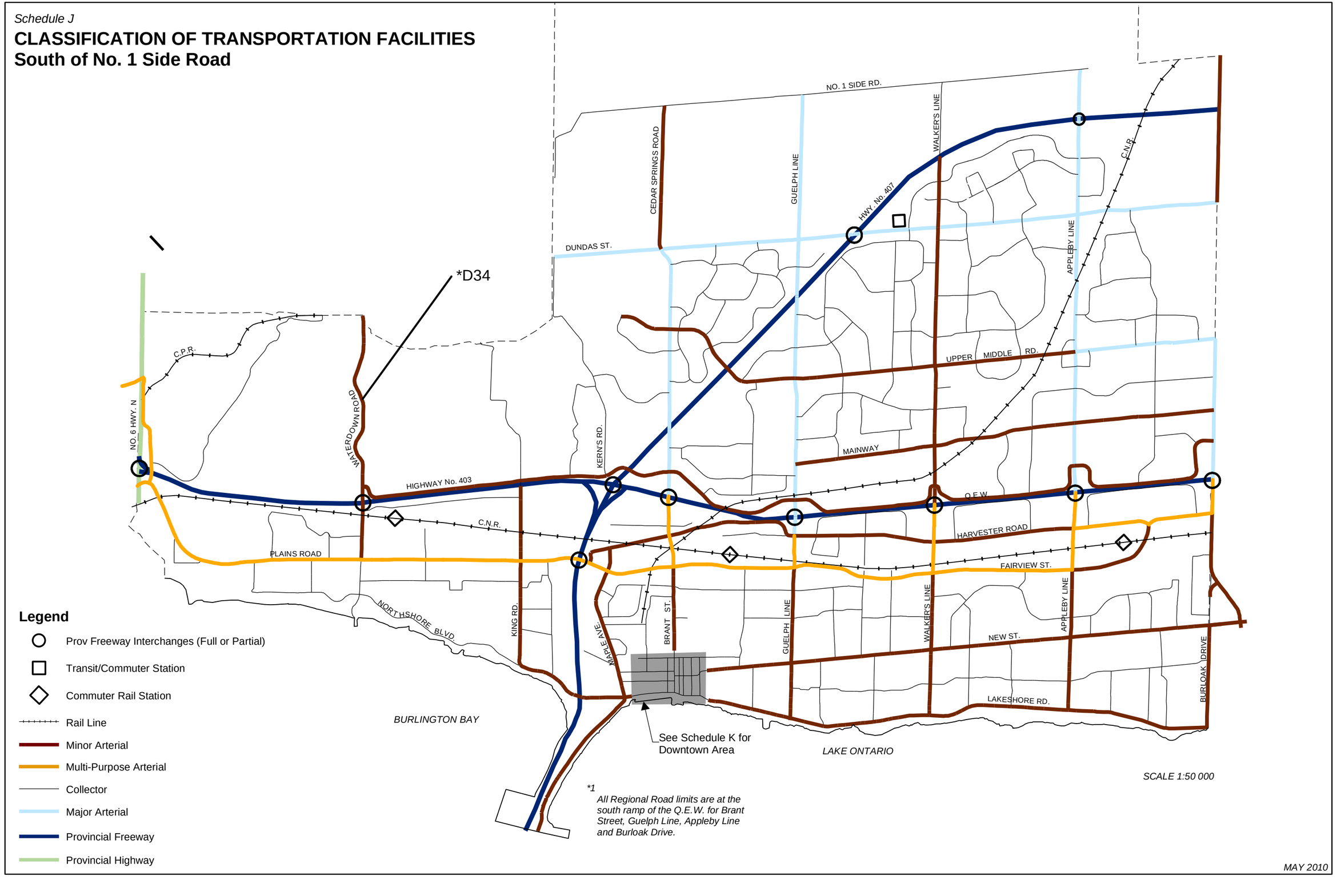
SK-02

APPENDIX C

City of Burlington Official Plans and Map 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.*

SCALE 1:50 000

MAY 2010

MAP 1
EXISTING NETWORK

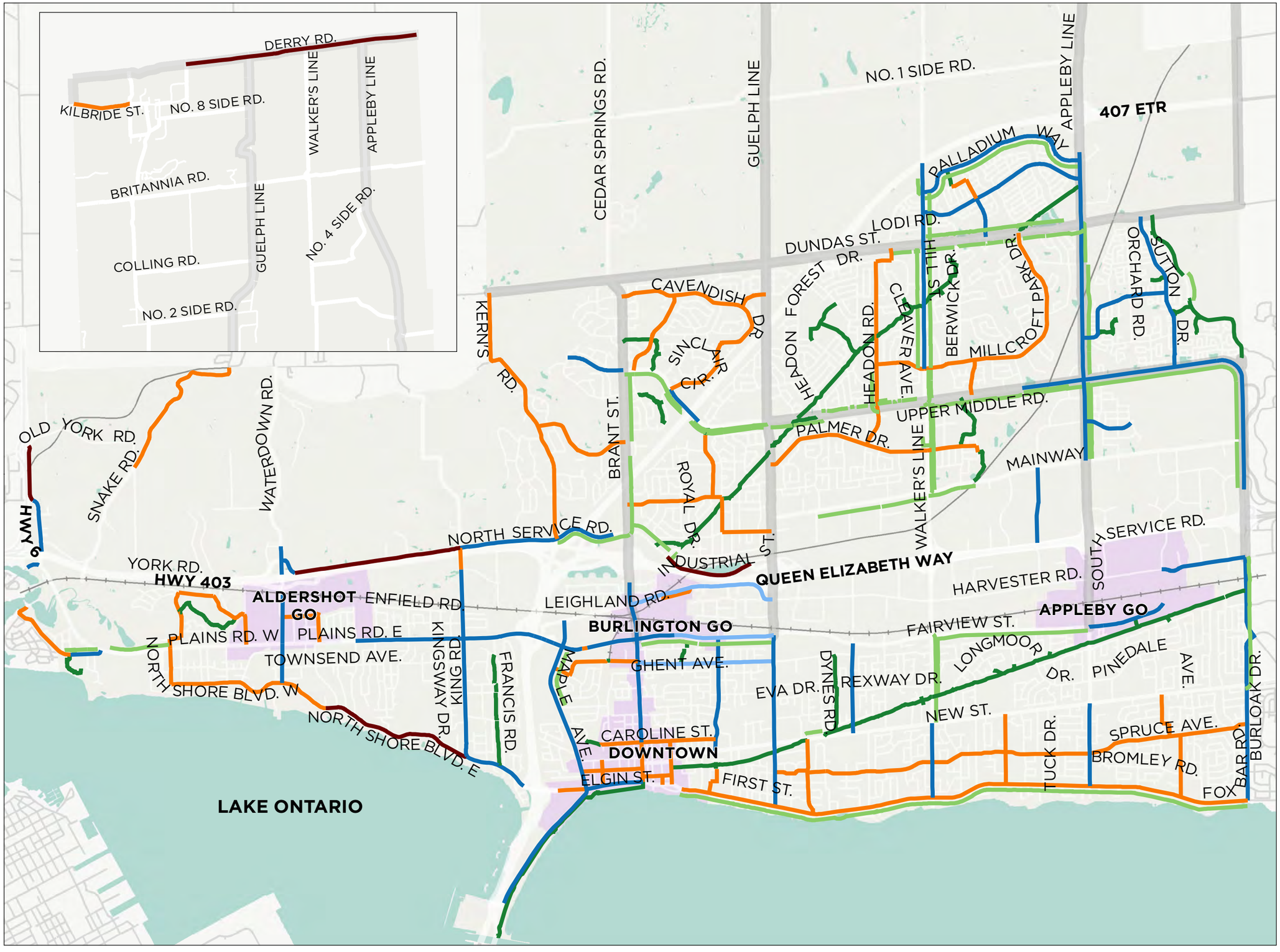
BURLINGTON CYCLING MASTER PLAN

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

APPENDIX D

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 E

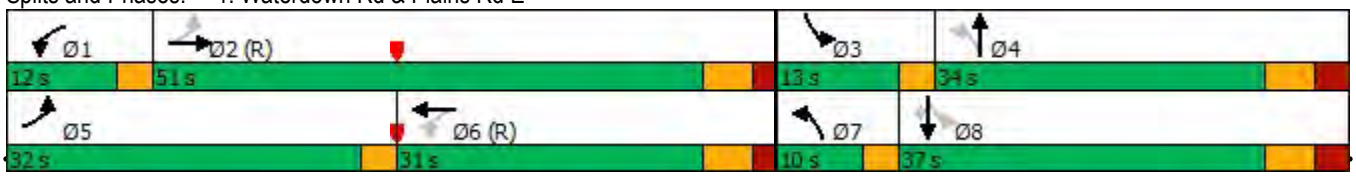
Detailed Capacity Analysis – 2021 Existing

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	602	953	153	62	324	181	60	222	55	152	103	159
Future Volume (vph)	602	953	153	62	324	181	60	222	55	152	103	159
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	3259	0	1711	1792	0	1662	1776	1479
Flt Permitted	0.254			0.240			0.686			0.282		
Satd. Flow (perm)	443	3399	0	417	3259	0	1213	1792	0	491	1776	1431
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			91			11				169
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		193.9			153.1			162.9			345.6	
Travel Time (s)		11.6			9.2			11.7			24.9	
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)	640	1014	163	66	345	193	64	236	59	162	110	169
Shared Lane Traffic (%)												
Lane Group Flow (vph)	640	1177	0	66	538	0	64	295	0	162	110	169
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									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	8.0		6.0	8.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	9.0	27.0		9.0	27.0		9.0	34.0		9.0	34.0	34.0
Total Split (s)	32.0	51.0		12.0	31.0		10.0	34.0		13.0	37.0	37.0
Total Split (%)	29.1%	46.4%		10.9%	28.2%		9.1%	30.9%		11.8%	33.6%	33.6%
Maximum Green (s)	29.0	45.0		9.0	25.0		7.0	27.0		10.0	30.0	30.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	-1.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	2.0	6.0		3.0	6.0		3.0	7.0		3.0	7.0	7.0
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			13.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	66.2	53.6		35.4	25.0		32.8	22.0		38.8	26.8	26.8
Actuated g/C Ratio	0.60	0.49		0.32	0.23		0.30	0.20		0.35	0.24	0.24
v/c Ratio	0.98	0.71		0.30	0.66		0.16	0.80		0.58	0.25	0.36
Control Delay	53.6	26.5		18.5	36.4		23.5	56.7		33.6	34.8	7.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	53.6	26.5		18.5	36.4		23.5	56.7		33.6	34.8	7.0
LOS	D	C		B	D		C	E		C	C	A
Approach Delay		36.0			34.5			50.7			23.7	
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: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 35.7		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

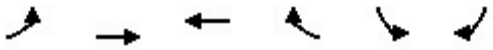




Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	640	1177	66	538	64	295	162	110	169
v/c Ratio	0.98	0.71	0.30	0.66	0.16	0.80	0.58	0.25	0.36
Control Delay	53.6	26.5	18.5	36.4	23.5	56.7	33.6	34.8	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.6	26.5	18.5	36.4	23.5	56.7	33.6	34.8	7.0
Queue Length 50th (m)	111.6	109.6	6.1	48.6	9.5	61.2	25.7	20.4	0.0
Queue Length 95th (m)	#207.5	152.0	13.6	68.0	18.0	88.6	40.0	34.6	16.4
Internal Link Dist (m)		169.9		129.1		138.9		321.6	
Turn Bay Length (m)	30.0		40.0		30.0				40.0
Base Capacity (vph)	656	1665	242	811	395	448	279	484	513
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	0.98	0.71	0.27	0.66	0.16	0.66	0.58	0.23	0.33

Intersection Summary

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

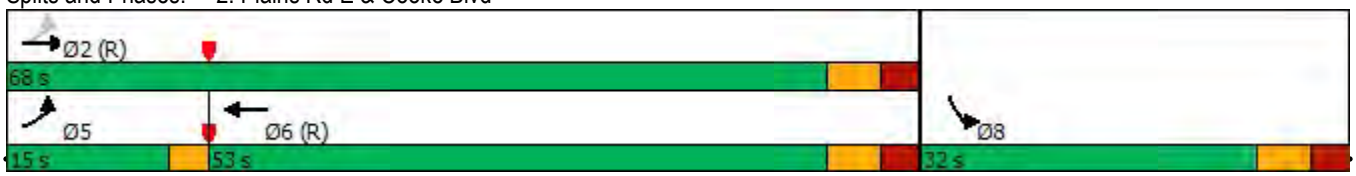


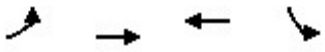
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	85	1155	591	38	6	17
Future Volume (vph)	85	1155	591	38	6	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.5	3.3	3.5
Storage Length (m)	40.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	25.0				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor	1.00		1.00		0.98	
Frt			0.991		0.899	
Flt Protected	0.950				0.988	
Satd. Flow (prot)	1728	3505	3395	0	1365	0
Flt Permitted	0.385				0.988	
Satd. Flow (perm)	698	3505	3395	0	1364	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			9		18	
Link Speed (k/h)		60	60		50	
Link Distance (m)		153.1	69.6		344.6	
Travel Time (s)		9.2	4.2		24.8	
Confl. Peds. (#/hr)	4			4	2	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	3%	5%	8%	17%	18%
Adj. Flow (vph)	89	1216	622	40	6	18
Shared Lane Traffic (%)						
Lane Group Flow (vph)	89	1216	662	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.3	3.3		3.3	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane			Yes			
Headway Factor	1.04	1.00	1.00	1.01	1.04	1.01
Turning Speed (k/h)	25			15	25	15
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (m)	2.0	10.0	10.0		2.0	
Trailing Detector (m)	0.0	0.0	0.0		0.0	
Detector 1 Position(m)	0.0	0.0	0.0		0.0	
Detector 1 Size(m)	2.0	0.6	0.6		2.0	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA		Prot	
Protected Phases	5	2	6		8	
Permitted Phases	2					
Detector Phase	5	2	6		8	
Switch Phase						
Minimum Initial (s)	6.0	8.0	8.0		6.0	
Minimum Split (s)	9.0	26.0	26.0		19.0	
Total Split (s)	15.0	68.0	53.0		32.0	
Total Split (%)	15.0%	68.0%	53.0%		32.0%	
Maximum Green (s)	12.0	61.0	46.0		25.0	
Yellow Time (s)	3.0	4.0	4.0		4.0	
All-Red Time (s)	0.0	3.0	3.0		3.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	3.0	7.0	7.0		7.0	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	C-Max	C-Max		None	
Walk Time (s)		8.0	8.0		8.0	
Flash Dont Walk (s)		11.0	11.0		4.0	
Pedestrian Calls (#/hr)		0	0		0	
Act Effct Green (s)	91.1	91.3	80.9		6.7	
Actuated g/C Ratio	0.91	0.91	0.81		0.07	
v/c Ratio	0.13	0.38	0.24		0.22	
Control Delay	1.5	2.2	4.0		24.3	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	1.5	2.2	4.0		24.3	
LOS	A	A	A		C	
Approach Delay		2.2	4.0		24.3	
Approach LOS		A	A		C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.38			
Intersection Signal Delay: 3.0		Intersection LOS: A	
Intersection Capacity Utilization 49.1%		ICU Level of Service A	
Analysis Period (min) 15			

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





Lane Group	EBL	EBT	WBT	SBL
Lane Group Flow (vph)	89	1216	662	24
v/c Ratio	0.13	0.38	0.24	0.22
Control Delay	1.5	2.2	4.0	24.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	1.5	2.2	4.0	24.3
Queue Length 50th (m)	0.0	0.0	9.5	1.5
Queue Length 95th (m)	5.1	45.5	33.9	m6.5
Internal Link Dist (m)		129.1	45.6	320.6
Turn Bay Length (m)	40.0			
Base Capacity (vph)	759	3199	2747	354
Starvation Cap Reductn	0	299	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.12	0.42	0.24	0.07

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

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	898	91	278	379	19
Future Volume (vph)	28	1	11	6	0	78	7	898	91	278	379	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	3279	0
Flt Permitted		0.743		0.730			0.507			0.207		
Satd. Flow (perm)	0	889	0	1341	1518	0	651	3395	0	380	3279	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			347			12			8	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		42.4			141.2			345.6			127.1	
Travel Time (s)		3.1			10.2			24.9			9.2	
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	945	96	293	399	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	6	82	0	7	1041	0	293	419	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								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	
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		6.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		10.5	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	0.52		0.55	0.16	
Control Delay		41.6		38.2	0.8		14.0	16.0		7.7	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	16.0		7.7	3.6	
LOS		D		D	A		B	B		A	A	
Approach Delay		41.6			3.3			16.0			5.3	
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: 11.9		Intersection LOS: B	
Intersection Capacity Utilization 67.1%		ICU Level of Service C	
Analysis Period (min) 15			

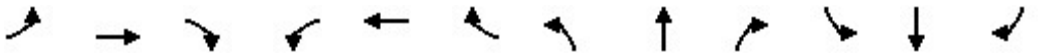
Splits and Phases: 3: Waterdown Rd & Masonry Crt





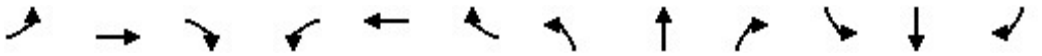
Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	42	6	82	7	1041	293	419
v/c Ratio	0.39	0.04	0.17	0.02	0.52	0.55	0.16
Control Delay	41.6	38.2	0.8	14.0	16.0	7.7	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.6	38.2	0.8	14.0	16.0	7.7	3.6
Queue Length 50th (m)	5.8	1.1	0.0	0.6	66.7	11.4	10.1
Queue Length 95th (m)	16.0	4.8	0.0	3.5	108.7	29.2	18.2
Internal Link Dist (m)	18.4		117.2		321.6		103.1
Turn Bay Length (m)		15.0		20.0		15.0	
Base Capacity (vph)	301	442	733	380	1989	554	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	0.52	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)	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)		141.2			139.2			344.6			48.9	
Travel Time (s)		10.2			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	

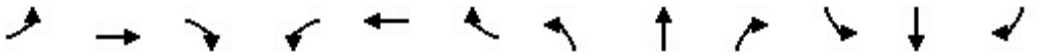
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 36.5%		ICU Level of Service A	
Analysis Period (min) 15			



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)		141										
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	396	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			1129			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	1129	587	1700
Volume to Capacity	0.00	0.01	0.32	0.00
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)	198	530	98	59	1026	175	143	137	48	213	159	419
Future Volume (vph)	198	530	98	59	1026	175	143	137	48	213	159	419
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		0.99	1.00		1.00		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	3388	0	1662	3387	0	1711	1774	0	1662	1776	1479
Flt Permitted	0.087			0.402			0.654			0.394		
Satd. Flow (perm)	152	3388	0	692	3387	0	1164	1774	0	688	1776	1440
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			20			14				327
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		193.9			153.1			162.9			345.6	
Travel Time (s)		11.6			9.2			11.7			24.9	
Confl. Peds. (#/hr)	3		19	19		3	12		2	2		12
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	5%	3%	3%	5%	4%	4%	2%	2%	4%	5%	7%	8%
Adj. Flow (vph)	202	541	100	60	1047	179	146	140	49	217	162	428
Shared Lane Traffic (%)												
Lane Group Flow (vph)	202	641	0	60	1226	0	146	189	0	217	162	428
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			6.9	
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									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	8.0		6.0	8.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	9.0	27.0		9.0	27.0		9.0	34.0		9.0	34.0	34.0
Total Split (s)	18.0	46.0		18.0	46.0		10.0	26.0		20.0	36.0	36.0
Total Split (%)	16.4%	41.8%		16.4%	41.8%		9.1%	23.6%		18.2%	32.7%	32.7%
Maximum Green (s)	15.0	40.0		15.0	40.0		7.0	19.0		17.0	29.0	29.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0		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	6.0		3.0	6.0		3.0	7.0		3.0	7.0	7.0
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			13.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	66.4	54.8		58.5	48.2		26.5	15.5		37.6	23.6	23.6
Actuated g/C Ratio	0.60	0.50		0.53	0.44		0.24	0.14		0.34	0.21	0.21
v/c Ratio	0.78	0.38		0.14	0.82		0.46	0.72		0.59	0.43	0.76
Control Delay	42.3	18.9		7.1	30.1		32.0	57.4		29.9	36.3	18.2
Queue Delay	0.0	0.0		0.0	0.3		0.0	0.0		0.0	0.0	0.0
Total Delay	42.3	18.9		7.1	30.4		32.0	57.4		29.9	36.3	18.2
LOS	D	B		A	C		C	E		C	D	B
Approach Delay		24.5			29.3			46.3			25.0	
Approach LOS		C			C			D			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 37 (34%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 28.8		Intersection LOS: C	
Intersection Capacity Utilization 85.2%		ICU Level of Service E	
Analysis Period (min) 15			

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

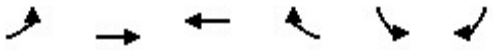




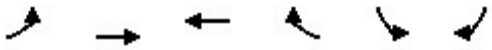
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	202	641	60	1226	146	189	217	162	428
v/c Ratio	0.78	0.38	0.14	0.82	0.46	0.72	0.59	0.43	0.76
Control Delay	42.3	18.9	7.1	30.1	32.0	57.4	29.9	36.3	18.2
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Total Delay	42.3	18.9	7.1	30.4	32.0	57.4	29.9	36.3	18.2
Queue Length 50th (m)	26.7	46.5	5.2	129.1	23.0	38.1	36.9	31.5	30.3
Queue Length 95th (m)	#58.5	68.1	3.7	#192.3	36.8	61.1	54.8	50.1	61.4
Internal Link Dist (m)		169.9		129.1		138.9		321.6	
Turn Bay Length (m)	30.0		40.0		30.0				40.0
Base Capacity (vph)	298	1700	540	1494	315	318	385	468	620
Starvation Cap Reductn	0	0	0	34	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	0.68	0.38	0.11	0.84	0.46	0.59	0.56	0.35	0.69

Intersection Summary

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



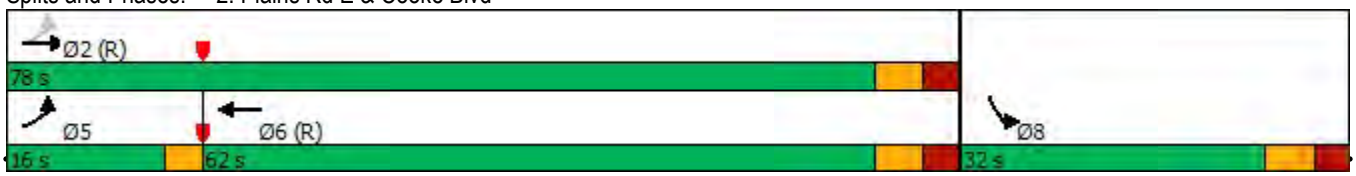
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	801	1254	59	33	32
Future Volume (vph)	5	801	1254	59	33	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.6	3.5	3.3	3.5
Storage Length (m)	40.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	25.0				7.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor			1.00		0.99	
Frt			0.993		0.934	
Flt Protected	0.950				0.975	
Satd. Flow (prot)	1745	3574	3500	0	1631	0
Flt Permitted	0.172				0.975	
Satd. Flow (perm)	316	3574	3500	0	1627	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			6		33	
Link Speed (k/h)		60	60		50	
Link Distance (m)		153.1	69.6		344.6	
Travel Time (s)		9.2	4.2		24.8	
Confl. Peds. (#/hr)	4			4	2	3
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	1%	2%	8%	3%	0%
Adj. Flow (vph)	5	826	1293	61	34	33
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	826	1354	0	67	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.3	3.3		3.3	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane			Yes			
Headway Factor	1.04	1.00	1.00	1.01	1.04	1.01
Turning Speed (k/h)	25			15	25	15
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (m)	2.0	10.0	10.0		2.0	
Trailing Detector (m)	0.0	0.0	0.0		0.0	
Detector 1 Position(m)	0.0	0.0	0.0		0.0	
Detector 1 Size(m)	2.0	0.6	0.6		2.0	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						

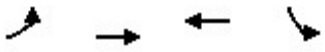


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA		Prot	
Protected Phases	5	2	6		8	
Permitted Phases	2					
Detector Phase	5	2	6		8	
Switch Phase						
Minimum Initial (s)	6.0	8.0	8.0		6.0	
Minimum Split (s)	9.0	26.0	26.0		19.0	
Total Split (s)	16.0	78.0	62.0		32.0	
Total Split (%)	14.5%	70.9%	56.4%		29.1%	
Maximum Green (s)	13.0	71.0	55.0		25.0	
Yellow Time (s)	3.0	4.0	4.0		4.0	
All-Red Time (s)	0.0	3.0	3.0		3.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	3.0	7.0	7.0		7.0	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	C-Max	C-Max		None	
Walk Time (s)		8.0	8.0		8.0	
Flash Dont Walk (s)		11.0	11.0		4.0	
Pedestrian Calls (#/hr)		0	0		0	
Act Effct Green (s)	94.4	91.8	90.0		8.2	
Actuated g/C Ratio	0.86	0.83	0.82		0.07	
v/c Ratio	0.01	0.28	0.47		0.44	
Control Delay	1.4	2.3	5.1		36.7	
Queue Delay	0.0	0.1	0.1		0.0	
Total Delay	1.4	2.4	5.2		36.7	
LOS	A	A	A		D	
Approach Delay		2.4	5.2		36.7	
Approach LOS		A	A		D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 23 (21%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.47			
Intersection Signal Delay: 5.1		Intersection LOS: A	
Intersection Capacity Utilization 53.7%		ICU Level of Service A	
Analysis Period (min) 15			

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

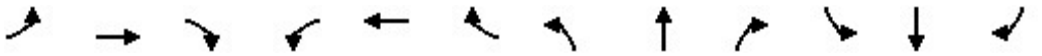




Lane Group	EBL	EBT	WBT	SBL
Lane Group Flow (vph)	5	826	1354	67
v/c Ratio	0.01	0.28	0.47	0.44
Control Delay	1.4	2.3	5.1	36.7
Queue Delay	0.0	0.1	0.1	0.0
Total Delay	1.4	2.4	5.2	36.7
Queue Length 50th (m)	0.2	16.7	40.3	7.2
Queue Length 95th (m)	m0.3	25.5	91.2	20.9
Internal Link Dist (m)		129.1	45.6	320.6
Turn Bay Length (m)	40.0			
Base Capacity (vph)	440	2982	2864	396
Starvation Cap Reductn	0	878	0	0
Spillback Cap Reductn	0	0	347	3
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.01	0.39	0.54	0.17

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



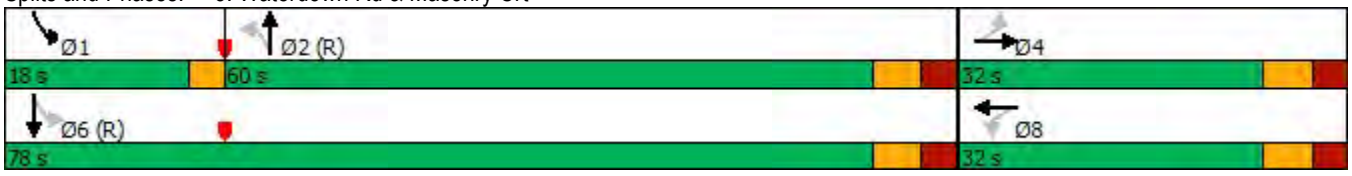
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	0	6	35	0	247	10	508	13	37	741	17
Future Volume (vph)	19	0	6	35	0	247	10	508	13	37	741	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	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	0.98		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	1426	0	1543	1540	0	1289	3471	0	1719	3482	0
Flt Permitted		0.322		0.740			0.353			0.433		
Satd. Flow (perm)	0	476	0	1200	1540	0	479	3471	0	782	3482	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		69			441			3			4	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		42.4			141.2			345.6			127.1	
Travel Time (s)		3.1			10.2			24.9			9.2	
Confl. Peds. (#/hr)	4		1	1		4	1		3	3		1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	26%	0%	17%	17%	0%	3%	40%	3%	23%	5%	2%	59%
Adj. Flow (vph)	20	0	6	36	0	257	10	529	14	39	772	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	0	36	257	0	10	543	0	39	790	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)		3.6			3.6			3.6			3.6	
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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		6.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		10.5	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)		11.0		11.0	11.0		79.4	79.4		89.0	85.0	
Actuated g/C Ratio		0.10		0.10	0.10		0.72	0.72		0.81	0.77	
v/c Ratio		0.24		0.30	0.47		0.03	0.22		0.06	0.29	
Control Delay		5.0		51.3	2.8		8.8	8.7		2.7	4.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		5.0		51.3	2.8		8.8	8.7		2.7	4.2	
LOS		A		D	A		A	A		A	A	
Approach Delay		5.0			8.8			8.7			4.1	
Approach LOS		A			A			A			A	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 72 (65%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.47
Intersection Signal Delay: 6.4 Intersection LOS: A
Intersection Capacity Utilization 60.0% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: Waterdown Rd & Masonry Crt

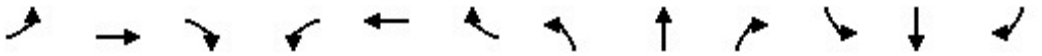




Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	26	36	257	10	543	39	790
v/c Ratio	0.24	0.30	0.47	0.03	0.22	0.06	0.29
Control Delay	5.0	51.3	2.8	8.8	8.7	2.7	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.0	51.3	2.8	8.8	8.7	2.7	4.2
Queue Length 50th (m)	0.0	7.7	0.0	0.9	34.1	1.3	22.1
Queue Length 95th (m)	0.0	17.6	0.0	m1.4	m48.8	4.0	35.5
Internal Link Dist (m)	18.4		117.2		321.6		103.1
Turn Bay Length (m)		15.0		20.0		15.0	
Base Capacity (vph)	161	272	690	345	2504	760	2690
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	0.16	0.13	0.37	0.03	0.22	0.05	0.29

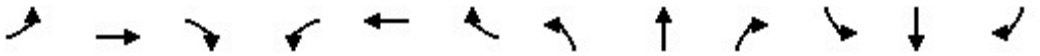
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



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 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	1761	0	0	1852	0	0	1734	0	0	1900	0
Flt Permitted					0.990			0.956				
Satd. Flow (perm)	0	1761	0	0	1852	0	0	1734	0	0	1900	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		141.2			139.2			344.6			48.9	
Travel Time (s)		10.2			10.0			24.8			3.5	
Confl. Peds. (#/hr)	3		2	2		3			3	3		
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 (%)	50%	3%	13%	0%	2%	0%	4%	0%	0%	0%	0%	57%
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)		3.6			3.6			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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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 32.6%		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					3			2			3	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.2			1.2			1.2	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		141										
pX, platoon unblocked												
vC, conflicting volume	220			52			378	381	50	393	386	220
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	220			52			378	381	50	393	386	220
tC, single (s)	4.6			4.1			7.1	6.5	6.2	7.1	6.5	6.8
tC, 2 stage (s)												
tF (s)	2.7			2.2			3.5	4.0	3.3	3.5	4.0	3.8
p0 queue free %	100			96			75	100	99	100	100	100
cM capacity (veh/h)	1108			1564			557	532	1020	544	529	698

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	1108	1564	576	1700
Volume to Capacity	0.00	0.04	0.26	0.00
Queue Length 95th (m)	0.0	0.9	8.4	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	32.6%	ICU Level of Service	A	
Analysis Period (min)	15			

APPENDIX F

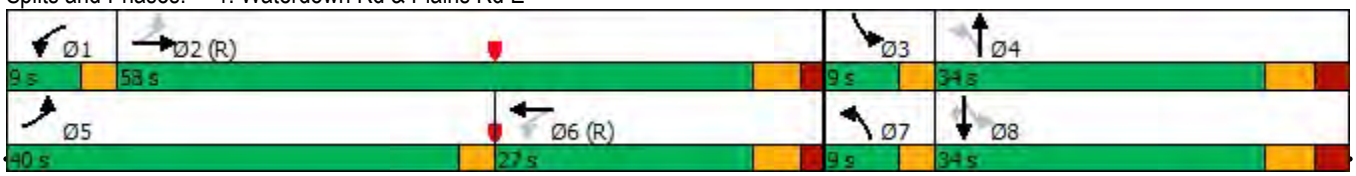
Detailed Capacity Analysis - 2024 and 2029 Future Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	745	1183	158	74	420	220	62	275	62	166	111	168
Future Volume (vph)	745	1183	158	74	420	220	62	275	62	166	111	168
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		0.982			0.948			0.972				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3414	0	1662	3267	0	1711	1797	0	1662	1776	1479
Flt Permitted	0.171			0.196			0.681			0.231		
Satd. Flow (perm)	298	3414	0	341	3267	0	1205	1797	0	402	1776	1431
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			76			10				179
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		191.0			153.1			162.9			345.6	
Travel Time (s)		11.5			9.2			11.7			24.9	
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)	793	1259	168	79	447	234	66	293	66	177	118	179
Shared Lane Traffic (%)												
Lane Group Flow (vph)	793	1427	0	79	681	0	66	359	0	177	118	179
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									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	8.0		6.0	8.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	9.0	27.0		9.0	27.0		9.0	34.0		9.0	34.0	34.0
Total Split (s)	40.0	58.0		9.0	27.0		9.0	34.0		9.0	34.0	34.0
Total Split (%)	36.4%	52.7%		8.2%	24.5%		8.2%	30.9%		8.2%	30.9%	30.9%
Maximum Green (s)	37.0	52.0		6.0	21.0		6.0	27.0		6.0	27.0	27.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	-1.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	2.0	6.0		3.0	6.0		3.0	7.0		3.0	7.0	7.0
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			13.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	67.3	55.9		30.2	21.0		34.7	24.7		35.3	26.5	26.5
Actuated g/C Ratio	0.61	0.51		0.27	0.19		0.32	0.22		0.32	0.24	0.24
v/c Ratio	1.16	0.82		0.47	0.99		0.16	0.87		0.90	0.28	0.37
Control Delay	116.9	28.6		27.4	73.1		24.8	61.8		73.6	36.0	7.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	116.9	28.6		27.4	73.1		24.8	61.8		73.6	36.0	7.4
LOS	F	C		C	E		C	E		E	D	A
Approach Delay		60.2			68.3			56.1			39.2	
Approach LOS		E			E			E			D	

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: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.16			
Intersection Signal Delay: 58.8		Intersection LOS: E	
Intersection Capacity Utilization 106.1%		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)	793	1427	79	681	66	359	177	118	179
v/c Ratio	1.16	0.82	0.47	0.99	0.16	0.87	0.90	0.28	0.37
Control Delay	116.9	28.6	27.4	73.1	24.8	61.8	73.6	36.0	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	116.9	28.6	27.4	73.1	24.8	61.8	73.6	36.0	7.4
Queue Length 50th (m)	~204.6	147.0	7.4	73.5	9.8	74.5	28.2	21.7	0.0
Queue Length 95th (m)	#281.0	181.7	15.1	#114.6	19.7	#120.4	#64.5	38.2	17.6
Internal Link Dist (m)		167.0		129.1		138.9		321.6	
Turn Bay Length (m)	30.0		40.0		30.0				40.0
Base Capacity (vph)	681	1743	167	685	407	448	197	438	488
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	1.16	0.82	0.47	0.99	0.16	0.80	0.90	0.27	0.37

Intersection Summary

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

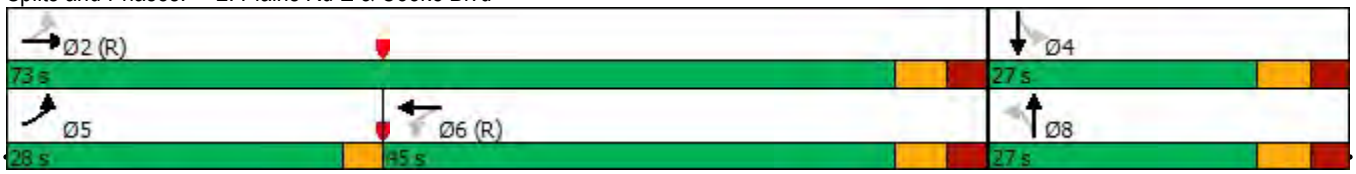
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	273	1192	25	6	621	122	58	4	27	66	0	76
Future Volume (vph)	273	1192	25	6	621	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	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	40.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		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	1.00	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		0.997			0.975			0.959			0.928	
Flt Protected	0.950			0.950				0.968			0.977	
Satd. Flow (prot)	1728	3495	0	1711	3320	0	0	1729	0	0	1452	0
Flt Permitted	0.312			0.216				0.688			0.836	
Satd. Flow (perm)	566	3495	0	389	3320	0	0	1229	0	0	1240	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			26			19			76	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		153.1			159.5			52.9			344.6	
Travel Time (s)		9.2			9.6			3.8			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	1255	27	7	654	128	63	4	29	69	0	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	287	1282	0	7	782	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	1.01	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	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		6.0	6.0		5.0	5.0	
Minimum Split (s)	9.0	26.0		26.0	26.0		19.0	19.0		25.0	25.0	
Total Split (s)	28.0	73.0		45.0	45.0		27.0	27.0		27.0	27.0	
Total Split (%)	28.0%	73.0%		45.0%	45.0%		27.0%	27.0%		27.0%	27.0%	
Maximum Green (s)	25.0	66.0		38.0	38.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	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)	3.0	7.0		7.0	7.0			7.0			7.0	
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	
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		7.0	7.0	
Flash Dont Walk (s)		11.0		11.0	11.0		4.0	4.0		11.0	11.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	77.8	73.8		60.4	60.4			12.2			12.2	
Actuated g/C Ratio	0.78	0.74		0.60	0.60			0.12			0.12	
v/c Ratio	0.51	0.50		0.03	0.39			0.57			0.68	
Control Delay	7.0	6.9		12.2	11.8			45.3			34.3	
Queue Delay	0.0	0.6		0.0	0.0			0.0			0.0	
Total Delay	7.0	7.5		12.2	11.8			45.3			34.3	
LOS	A	A		B	B			D			C	
Approach Delay		7.4			11.8			45.3			34.3	
Approach LOS		A			B			D			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 11.7		Intersection LOS: B	
Intersection Capacity Utilization 67.6%		ICU Level of Service C	
Analysis Period (min) 15			

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

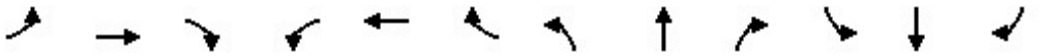




Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	287	1282	7	782	96	149
v/c Ratio	0.51	0.50	0.03	0.39	0.57	0.68
Control Delay	7.0	6.9	12.2	11.8	45.3	34.3
Queue Delay	0.0	0.6	0.0	0.0	0.0	0.0
Total Delay	7.0	7.5	12.2	11.8	45.3	34.3
Queue Length 50th (m)	12.0	46.5	0.5	37.3	15.0	14.3
Queue Length 95th (m)	28.1	81.8	3.3	68.8	29.6	m26.0
Internal Link Dist (m)		129.1		135.5	28.9	320.6
Turn Bay Length (m)	40.0		15.0			
Base Capacity (vph)	730	2579	235	2016	261	308
Starvation Cap Reductn	0	825	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	0.39	0.73	0.03	0.39	0.37	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



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	958	261	831	400	19
Future Volume (vph)	28	1	11	14	0	304	7	958	261	831	400	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	0.99			1.00	
Frt		0.961			0.850			0.968			0.993	
Flt Protected		0.967		0.950			0.950			0.950		
Satd. Flow (prot)	0	1158	0	1745	1518	0	1220	3339	0	1745	3283	0
Flt Permitted		0.289		0.730			0.496			0.105		
Satd. Flow (perm)	0	346	0	1341	1518	0	636	3339	0	193	3283	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			342			38			7	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		42.4			141.2			345.6			127.1	
Travel Time (s)		3.1			10.2			24.9			9.2	
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	1008	275	875	421	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	15	320	0	7	1283	0	875	441	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								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	
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		6.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		10.5	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)		11.7		11.7	11.7		35.0	35.0		78.3	74.3	
Actuated g/C Ratio		0.12		0.12	0.12		0.35	0.35		0.78	0.74	
v/c Ratio		0.82		0.10	0.67		0.03	1.08		1.23	0.18	
Control Delay		118.4		38.2	10.7		22.0	80.4		139.7	4.3	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		118.4		38.2	10.7		22.0	80.4		139.7	4.3	
LOS		F		D	B		C	F		F	A	
Approach Delay		118.4			11.9			80.1			94.4	
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: 79.3		Intersection LOS: E	
Intersection Capacity Utilization 122.2%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 3: Waterdown Rd & Masonry Crt



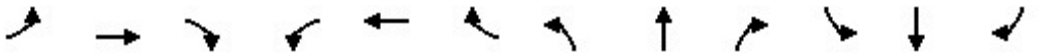


Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	42	15	320	7	1283	875	441
v/c Ratio	0.82	0.10	0.67	0.03	1.08	1.23	0.18
Control Delay	118.4	38.2	10.7	22.0	80.4	139.7	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	118.4	38.2	10.7	22.0	80.4	139.7	4.3
Queue Length 50th (m)	6.1	2.8	0.0	0.9	~151.7	~201.3	11.1
Queue Length 95th (m)	#23.3	8.4	19.1	4.1	#195.3	#304.7	21.2
Internal Link Dist (m)	18.4		117.2		321.6		103.1
Turn Bay Length (m)		15.0		20.0		15.0	
Base Capacity (vph)	122	442	730	222	1193	714	2440
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	0.34	0.03	0.44	0.03	1.08	1.23	0.18

Intersection Summary

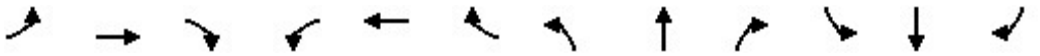
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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)	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)		141.2			139.2			344.6			48.9	
Travel Time (s)		10.2			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)		141										
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			1890	1853	1232	2502	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			396			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	396	63	85
Volume to Capacity	0.00	0.24	9.13	0.45
Queue Length 95th (m)	0.1	7.4	Err	14.9
Control Delay (s)	0.2	8.2	Err	78.5
Lane LOS	A	A	F	F
Approach Delay (s)	0.2	8.2	Err	78.5
Approach LOS			F	F

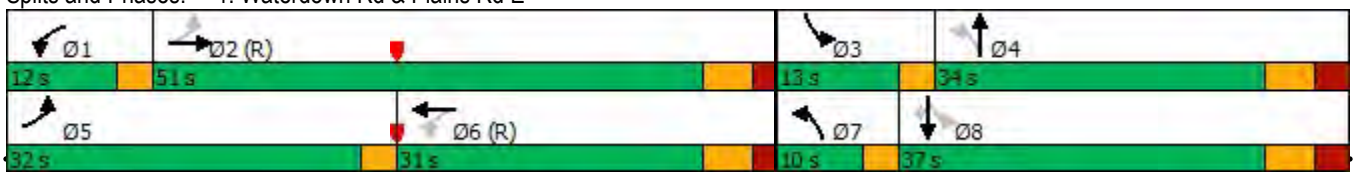
Intersection Summary			
Average Delay	2514.4		
Intersection Capacity Utilization	114.4%	ICU Level of Service	H
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	216	619	101	67	1176	194	148	149	60	246	164	466
Future Volume (vph)	216	619	101	67	1176	194	148	149	60	246	164	466
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		0.99	1.00		1.00		0.97
Frt		0.979			0.979			0.957				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3398	0	1662	3390	0	1711	1765	0	1662	1776	1479
Flt Permitted	0.074			0.358			0.651			0.370		
Satd. Flow (perm)	129	3398	0	615	3390	0	1159	1765	0	646	1776	1440
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			16			17				476
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		284.3			153.1			162.9			345.6	
Travel Time (s)		17.1			9.2			11.7			24.9	
Confl. Peds. (#/hr)	3		19	19		3	12		2	2		12
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	5%	3%	3%	5%	4%	4%	2%	2%	4%	5%	7%	8%
Adj. Flow (vph)	220	632	103	68	1200	198	151	152	61	251	167	476
Shared Lane Traffic (%)												
Lane Group Flow (vph)	220	735	0	68	1398	0	151	213	0	251	167	476
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									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	8.0		6.0	8.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	9.0	27.0		9.0	27.0		9.0	34.0		9.0	34.0	34.0
Total Split (s)	32.0	51.0		12.0	31.0		10.0	34.0		13.0	37.0	37.0
Total Split (%)	29.1%	46.4%		10.9%	28.2%		9.1%	30.9%		11.8%	33.6%	33.6%
Maximum Green (s)	29.0	45.0		9.0	25.0		7.0	27.0		10.0	30.0	30.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0		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	6.0		3.0	6.0		3.0	7.0		3.0	7.0	7.0
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			13.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	69.4	57.8		61.2	50.7		28.6	17.6		34.6	20.6	20.6
Actuated g/C Ratio	0.63	0.53		0.56	0.46		0.26	0.16		0.31	0.19	0.19
v/c Ratio	0.85	0.41		0.17	0.89		0.45	0.72		0.85	0.50	0.73
Control Delay	53.8	17.7		10.6	36.8		33.0	53.6		57.4	44.5	10.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	53.8	17.7		10.6	36.8		33.0	53.6		57.4	44.5	10.4
LOS	D	B		B	D		C	D		E	D	B
Approach Delay		26.0			35.6			45.1			30.0	
Approach LOS		C			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: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 32.7		Intersection LOS: C	
Intersection Capacity Utilization 94.1%		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)	220	735	68	1398	151	213	251	167	476
v/c Ratio	0.85	0.41	0.17	0.89	0.45	0.72	0.85	0.50	0.73
Control Delay	53.8	17.7	10.6	36.8	33.0	53.6	57.4	44.5	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	17.7	10.6	36.8	33.0	53.6	57.4	44.5	10.4
Queue Length 50th (m)	33.0	50.8	5.5	143.5	25.6	42.6	45.7	34.2	0.0
Queue Length 95th (m)	60.0	77.8	13.0	#248.1	39.0	64.1	#71.8	52.1	29.8
Internal Link Dist (m)		260.3		129.1		138.9		321.6	
Turn Bay Length (m)	30.0		40.0		30.0				40.0
Base Capacity (vph)	485	1795	437	1572	335	446	295	484	738
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	0.45	0.41	0.16	0.89	0.45	0.48	0.85	0.35	0.64

Intersection Summary

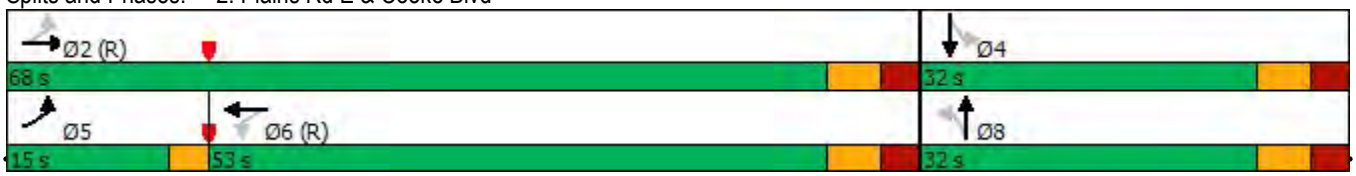
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	838	51	42	1306	119	44	3	12	114	0	112
Future Volume (vph)	51	838	51	42	1306	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	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	40.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		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	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	
Frt		0.991			0.987			0.973			0.933	
Flt Protected	0.950			0.950				0.964			0.975	
Satd. Flow (prot)	1745	3540	0	1711	3467	0	0	1747	0	0	1688	0
Flt Permitted	0.107			0.311				0.612			0.807	
Satd. Flow (perm)	197	3540	0	560	3467	0	0	1109	0	0	1394	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			13			12			76	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		153.1			163.6			52.9			344.6	
Travel Time (s)		9.2			9.8			3.8			24.8	
Confl. Peds. (#/hr)	4					4				2		3
Peak Hour Factor	0.97	0.97	0.92	0.92	0.97	0.97	0.92	0.94	0.92	0.97	0.95	0.97
Heavy Vehicles (%)	0%	1%	2%	2%	2%	8%	2%	2%	2%	3%	2%	0%
Adj. Flow (vph)	53	864	55	46	1346	123	48	3	13	118	0	115
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	919	0	46	1469	0	0	64	0	0	233	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	1.01	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	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		6.0	6.0		5.0	5.0	
Minimum Split (s)	9.0	26.0		26.0	26.0		19.0	19.0		25.0	25.0	
Total Split (s)	15.0	68.0		53.0	53.0		32.0	32.0		32.0	32.0	
Total Split (%)	15.0%	68.0%		53.0%	53.0%		32.0%	32.0%		32.0%	32.0%	
Maximum Green (s)	12.0	61.0		46.0	46.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	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)	3.0	7.0		7.0	7.0			7.0			7.0	
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	
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		7.0	7.0	
Flash Dont Walk (s)		11.0		11.0	11.0		4.0	4.0		11.0	11.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	73.0	69.0		61.2	61.2			17.0			17.0	
Actuated g/C Ratio	0.73	0.69		0.61	0.61			0.17			0.17	
v/c Ratio	0.22	0.38		0.13	0.69			0.32			0.78	
Control Delay	7.1	7.7		12.7	17.2			32.6			41.7	
Queue Delay	0.0	0.3		0.0	0.0			0.0			0.0	
Total Delay	7.1	8.0		12.7	17.2			32.6			41.7	
LOS	A	A		B	B			C			D	
Approach Delay		8.0			17.0			32.6			41.7	
Approach LOS		A			B			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 16.3		Intersection LOS: B	
Intersection Capacity Utilization 67.8%		ICU Level of Service C	
Analysis Period (min) 15			

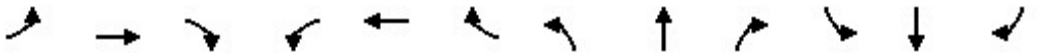
Splits and Phases: 2: Plains Rd E & Cooke Blvd





Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	53	919	46	1469	64	233
v/c Ratio	0.22	0.38	0.13	0.69	0.32	0.78
Control Delay	7.1	7.7	12.7	17.2	32.6	41.7
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	7.1	8.0	12.7	17.2	32.6	41.7
Queue Length 50th (m)	2.6	35.9	3.9	101.8	9.3	31.1
Queue Length 95th (m)	7.8	60.5	12.2	162.0	20.1	54.2
Internal Link Dist (m)		129.1		139.6	28.9	320.6
Turn Bay Length (m)	40.0		15.0			
Base Capacity (vph)	329	2447	343	2128	286	405
Starvation Cap Reductn	0	860	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	0.16	0.58	0.13	0.69	0.22	0.58

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	0	6	83	0	643	10	537	32	193	790	17
Future Volume (vph)	19	0	6	83	0	643	10	537	32	193	790	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		1.00	0.98		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	1426	0	1491	1541	0	1246	3435	0	1662	3485	0
Flt Permitted		0.300		0.740			0.336			0.358		
Satd. Flow (perm)	0	444	0	1160	1541	0	441	3435	0	625	3485	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		76			418			7			3	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		42.4			141.2			345.6			127.1	
Travel Time (s)		3.1			10.2			24.9			9.2	
Confl. Peds. (#/hr)	4		1	1		4	1		3	3		1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	26%	0%	17%	17%	0%	3%	40%	3%	23%	5%	2%	59%
Adj. Flow (vph)	20	0	6	86	0	670	10	559	33	201	823	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	0	86	670	0	10	592	0	201	841	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								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	
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		6.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		10.5	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)		27.8		27.8	27.8		44.1	44.1		62.2	58.2	
Actuated g/C Ratio		0.28		0.28	0.28		0.44	0.44		0.62	0.58	
v/c Ratio		0.15		0.27	0.92		0.05	0.39		0.40	0.41	
Control Delay		1.7		28.1	31.1		22.1	21.6		12.0	13.3	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		1.7		28.1	31.1		22.1	21.6		12.0	13.3	
LOS		A		C	C		C	C		B	B	
Approach Delay		1.7			30.8			21.6			13.1	
Approach LOS		A			C			C			B	

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: 0.92			
Intersection Signal Delay: 20.6		Intersection LOS: C	
Intersection Capacity Utilization 90.1%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: Waterdown Rd & Masonry Crt

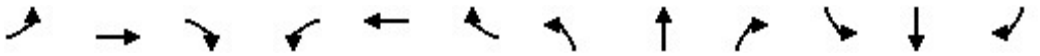




Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	26	86	670	10	592	201	841
v/c Ratio	0.15	0.27	0.92	0.05	0.39	0.40	0.41
Control Delay	1.7	28.1	31.1	22.1	21.6	12.0	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.7	28.1	31.1	22.1	21.6	12.0	13.3
Queue Length 50th (m)	0.0	12.6	50.8	1.3	45.7	18.8	52.7
Queue Length 95th (m)	0.0	25.2	#125.4	5.3	65.4	31.0	68.4
Internal Link Dist (m)	18.4		117.2		321.6		103.1
Turn Bay Length (m)		15.0		20.0		15.0	
Base Capacity (vph)	197	382	788	194	1518	544	2028
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	0.13	0.23	0.85	0.05	0.39	0.37	0.41

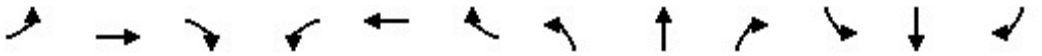
Intersection Summary

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	1697	0	0	1850	0	0	1725	0	0	1359	0
Flt Permitted		0.996			0.989			0.967				
Satd. Flow (perm)	0	1697	0	0	1850	0	0	1725	0	0	1359	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		141.2			139.2			344.6			48.9	
Travel Time (s)		10.2			10.0			24.8			3.5	
Confl. Peds. (#/hr)	3		2	2		3			3	3		
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 (%)	50%	3%	13%	0%	2%	0%	4%	0%	0%	0%	0%	57%
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 80.0%		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	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					3			2			3	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.2			1.2			1.2	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		141										
pX, platoon unblocked				0.96			0.96	0.96	0.96	0.96	0.96	
vC, conflicting volume	722			244			1392	1378	224	1457	1402	722
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	722			193			1387	1374	172	1455	1398	722
tC, single (s)	4.6			4.1			7.1	6.5	6.2	7.1	6.5	6.8
tC, 2 stage (s)												
tF (s)	2.7			2.2			3.5	4.0	3.3	3.5	4.0	3.8
p0 queue free %	97			85			0	87	92	100	91	97
cM capacity (veh/h)	694			1336			89	116	839	75	112	347

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	694	1336	119	174
Volume to Capacity	0.03	0.15	2.20	0.12
Queue Length 95th (m)	0.8	4.1	178.1	3.2
Control Delay (s)	1.3	3.4	624.4	28.5
Lane LOS	A	A	F	D
Approach Delay (s)	1.3	3.4	624.4	28.5
Approach LOS			F	D

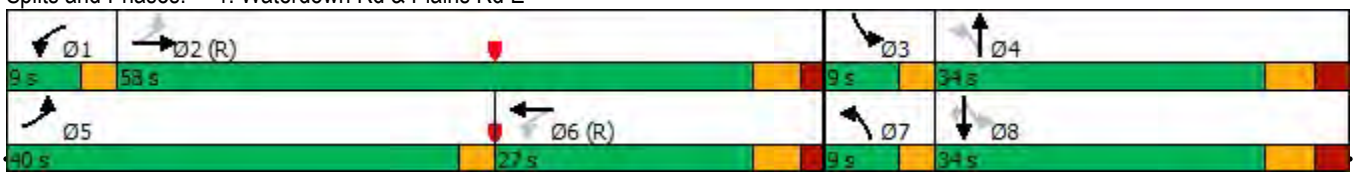
Intersection Summary				
Average Delay	114.6			
Intersection Capacity Utilization	80.0%	ICU Level of Service	D	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	775	1231	166	77	436	229	65	286	65	174	116	176
Future Volume (vph)	775	1231	166	77	436	229	65	286	65	174	116	176
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		0.982			0.948			0.972				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3414	0	1662	3267	0	1711	1797	0	1662	1776	1479
Flt Permitted	0.171			0.196			0.678			0.214		
Satd. Flow (perm)	299	3414	0	341	3267	0	1199	1797	0	373	1776	1431
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			77			10				187
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		191.0			153.1			162.9			345.6	
Travel Time (s)		11.5			9.2			11.7			24.9	
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)	824	1310	177	82	464	244	69	304	69	185	123	187
Shared Lane Traffic (%)												
Lane Group Flow (vph)	824	1487	0	82	708	0	69	373	0	185	123	187
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									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	8.0		6.0	8.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	9.0	27.0		9.0	27.0		9.0	34.0		9.0	34.0	34.0
Total Split (s)	40.0	58.0		9.0	27.0		9.0	34.0		9.0	34.0	34.0
Total Split (%)	36.4%	52.7%		8.2%	24.5%		8.2%	30.9%		8.2%	30.9%	30.9%
Maximum Green (s)	37.0	52.0		6.0	21.0		6.0	27.0		6.0	27.0	27.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	-1.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	2.0	6.0		3.0	6.0		3.0	7.0		3.0	7.0	7.0
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			13.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	66.9	55.5		30.2	21.0		35.1	25.1		35.7	26.9	26.9
Actuated g/C Ratio	0.61	0.50		0.27	0.19		0.32	0.23		0.32	0.24	0.24
v/c Ratio	1.22	0.86		0.49	1.03		0.17	0.89		0.97	0.28	0.38
Control Delay	139.5	31.1		28.4	82.2		24.8	64.2		90.3	35.9	7.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	139.5	31.1		28.4	82.2		24.8	64.2		90.3	35.9	7.3
LOS	F	C		C	F		C	E		F	D	A
Approach Delay		69.7			76.7			58.1			45.5	
Approach LOS		E			E			E			D	

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: 130			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.22			
Intersection Signal Delay: 66.8		Intersection LOS: E	
Intersection Capacity Utilization 109.5%		ICU Level of Service H	
Analysis Period (min) 15			

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



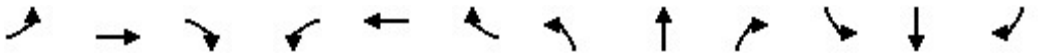


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	824	1487	82	708	69	373	185	123	187
v/c Ratio	1.22	0.86	0.49	1.03	0.17	0.89	0.97	0.28	0.38
Control Delay	139.5	31.1	28.4	82.2	24.8	64.2	90.3	35.9	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	139.5	31.1	28.4	82.2	24.8	64.2	90.3	35.9	7.3
Queue Length 50th (m)	~219.4	158.1	7.7	~82.6	10.2	78.2	29.6	22.6	0.0
Queue Length 95th (m)	#296.7	#210.6	15.8	#121.5	20.3	#128.6	#71.5	39.4	17.8
Internal Link Dist (m)		167.0		129.1		138.9		321.6	
Turn Bay Length (m)	30.0		40.0		30.0				40.0
Base Capacity (vph)	675	1730	168	686	411	448	191	441	496
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	1.22	0.86	0.49	1.03	0.17	0.83	0.97	0.28	0.38

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.

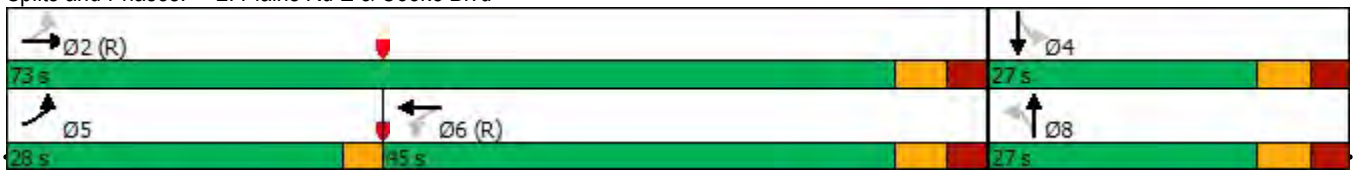


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	273	1250	25	6	651	122	58	4	27	66	0	76
Future Volume (vph)	273	1250	25	6	651	122	58	4	27	66	0	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	40.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		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	1.00	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		0.997			0.976			0.959			0.928	
Flt Protected	0.950			0.950				0.968			0.977	
Satd. Flow (prot)	1728	3495	0	1711	3325	0	0	1729	0	0	1452	0
Flt Permitted	0.299			0.203				0.688			0.836	
Satd. Flow (perm)	543	3495	0	366	3325	0	0	1229	0	0	1240	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			25			19			76	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		153.1			159.5			52.9			344.6	
Travel Time (s)		9.2			9.6			3.8			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	1316	27	7	685	128	63	4	29	69	0	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	287	1343	0	7	813	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	1.01	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	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		6.0	6.0		5.0	5.0	
Minimum Split (s)	9.0	26.0		26.0	26.0		19.0	19.0		25.0	25.0	
Total Split (s)	28.0	73.0		45.0	45.0		27.0	27.0		27.0	27.0	
Total Split (%)	28.0%	73.0%		45.0%	45.0%		27.0%	27.0%		27.0%	27.0%	
Maximum Green (s)	25.0	66.0		38.0	38.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	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)	3.0	7.0		7.0	7.0			7.0			7.0	
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	
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		7.0	7.0	
Flash Dont Walk (s)		11.0		11.0	11.0		4.0	4.0		11.0	11.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	77.8	73.8		60.2	60.2			12.2			12.2	
Actuated g/C Ratio	0.78	0.74		0.60	0.60			0.12			0.12	
v/c Ratio	0.52	0.52		0.03	0.40			0.57			0.68	
Control Delay	7.2	7.1		12.5	12.2			45.3			34.3	
Queue Delay	0.0	0.7		0.0	0.0			0.0			0.0	
Total Delay	7.2	7.8		12.5	12.2			45.3			34.3	
LOS	A	A		B	B			D			C	
Approach Delay		7.7			12.2			45.3			34.3	
Approach LOS		A			B			D			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 11.9		Intersection LOS: B	
Intersection Capacity Utilization 69.2%		ICU Level of Service C	
Analysis Period (min) 15			

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

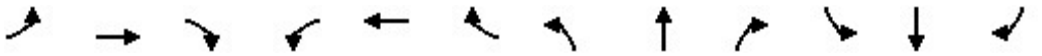




Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	287	1343	7	813	96	149
v/c Ratio	0.52	0.52	0.03	0.40	0.57	0.68
Control Delay	7.2	7.1	12.5	12.2	45.3	34.3
Queue Delay	0.0	0.7	0.0	0.0	0.0	0.0
Total Delay	7.2	7.8	12.5	12.2	45.3	34.3
Queue Length 50th (m)	12.0	50.0	0.5	39.4	15.0	14.3
Queue Length 95th (m)	28.1	88.2	3.4	74.1	29.6	m26.0
Internal Link Dist (m)		129.1		135.5	28.9	320.6
Turn Bay Length (m)	40.0		15.0			
Base Capacity (vph)	718	2579	220	2012	261	308
Starvation Cap Reductn	0	800	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	0.40	0.75	0.03	0.40	0.37	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



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	1003	261	831	419	19
Future Volume (vph)	28	1	11	14	0	304	7	1003	261	831	419	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			0.993	
Flt Protected		0.967		0.950			0.950			0.950		
Satd. Flow (prot)	0	1158	0	1745	1518	0	1220	3342	0	1745	3286	0
Flt Permitted		0.287		0.730			0.487			0.105		
Satd. Flow (perm)	0	343	0	1341	1518	0	625	3342	0	193	3286	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			340			36			7	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		42.4			141.2			345.6			127.1	
Travel Time (s)		3.1			10.2			24.9			9.2	
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	1056	275	875	441	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	15	320	0	7	1331	0	875	461	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								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	
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		6.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		10.5	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		0.84		0.10	0.67		0.03	1.12		1.23	0.19	
Control Delay		119.4		38.1	10.9		22.1	95.0		140.3	4.4	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		119.4		38.1	10.9		22.1	95.0		140.3	4.4	
LOS		F		D	B		C	F		F	A	
Approach Delay		119.4			12.1			94.7			93.4	
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: 85.4		Intersection LOS: F	
Intersection Capacity Utilization 123.5%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 3: Waterdown Rd & Masonry Crt



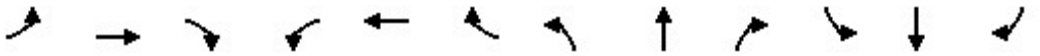


Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	42	15	320	7	1331	875	461
v/c Ratio	0.84	0.10	0.67	0.03	1.12	1.23	0.19
Control Delay	119.4	38.1	10.9	22.1	95.0	140.3	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	119.4	38.1	10.9	22.1	95.0	140.3	4.4
Queue Length 50th (m)	6.1	2.8	0.0	0.9	~162.9	~201.3	11.6
Queue Length 95th (m)	#23.2	8.4	19.4	4.1	#206.7	#305.5	22.3
Internal Link Dist (m)	18.4		117.2		321.6		103.1
Turn Bay Length (m)		15.0		20.0		15.0	
Base Capacity (vph)	121	442	728	218	1193	713	2441
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	1.12	1.23	0.19

Intersection Summary

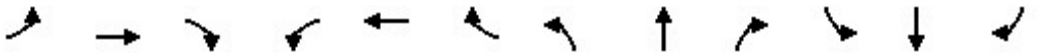
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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)	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)		141.2			139.2			344.6			48.9	
Travel Time (s)		10.2			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)		141										
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	1231	2503	1887	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	62	84
Volume to Capacity	0.00	0.24	9.16	0.45
Queue Length 95th (m)	0.1	7.4	Err	14.9
Control Delay (s)	0.2	8.2	Err	78.8
Lane LOS	A	A	F	F
Approach Delay (s)	0.2	8.2	Err	78.8
Approach LOS			F	F

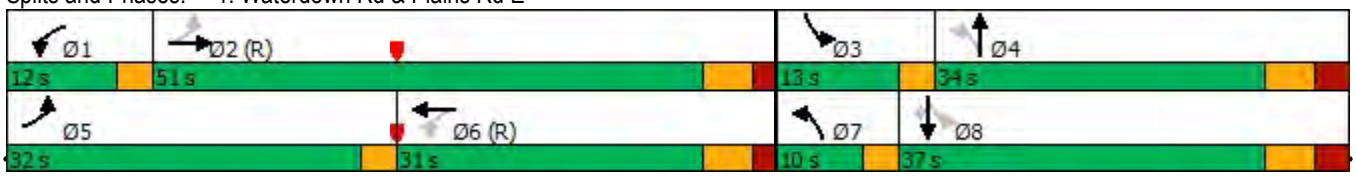
Intersection Summary			
Average Delay	2514.4		
Intersection Capacity Utilization	114.4%	ICU Level of Service	H
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	226	646	106	70	1228	202	155	155	62	257	172	487
Future Volume (vph)	226	646	106	70	1228	202	155	155	62	257	172	487
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		0.99	1.00		1.00		0.97
Frt		0.979			0.979			0.957				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3398	0	1662	3390	0	1711	1765	0	1662	1776	1479
Flt Permitted	0.076			0.343			0.646			0.360		
Satd. Flow (perm)	133	3398	0	590	3390	0	1150	1765	0	629	1776	1440
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			16			17				497
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		284.3			153.1			162.9			345.6	
Travel Time (s)		17.1			9.2			11.7			24.9	
Confl. Peds. (#/hr)	3		19	19		3	12		2	2		12
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	5%	3%	3%	5%	4%	4%	2%	2%	4%	5%	7%	8%
Adj. Flow (vph)	231	659	108	71	1253	206	158	158	63	262	176	497
Shared Lane Traffic (%)												
Lane Group Flow (vph)	231	767	0	71	1459	0	158	221	0	262	176	497
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									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	8.0		6.0	8.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	9.0	27.0		9.0	27.0		9.0	34.0		9.0	34.0	34.0
Total Split (s)	32.0	51.0		12.0	31.0		10.0	34.0		13.0	37.0	37.0
Total Split (%)	29.1%	46.4%		10.9%	28.2%		9.1%	30.9%		11.8%	33.6%	33.6%
Maximum Green (s)	29.0	45.0		9.0	25.0		7.0	27.0		10.0	30.0	30.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0		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	6.0		3.0	6.0		3.0	7.0		3.0	7.0	7.0
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			13.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	68.9	57.2		60.1	49.6		29.1	18.1		35.1	21.1	21.1
Actuated g/C Ratio	0.63	0.52		0.55	0.45		0.26	0.16		0.32	0.19	0.19
v/c Ratio	0.86	0.43		0.18	0.95		0.47	0.73		0.89	0.52	0.73
Control Delay	54.3	18.4		11.0	44.2		33.1	53.6		63.2	44.5	10.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	54.3	18.4		11.0	44.2		33.1	53.6		63.2	44.5	10.4
LOS	D	B		B	D		C	D		E	D	B
Approach Delay		26.7			42.7			45.0			31.6	
Approach LOS		C			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: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 36.1		Intersection LOS: D	
Intersection Capacity Utilization 97.4%		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)	231	767	71	1459	158	221	262	176	497
v/c Ratio	0.86	0.43	0.18	0.95	0.47	0.73	0.89	0.52	0.73
Control Delay	54.3	18.4	11.0	44.2	33.1	53.6	63.2	44.5	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.3	18.4	11.0	44.2	33.1	53.6	63.2	44.5	10.4
Queue Length 50th (m)	35.3	54.4	5.8	157.5	26.7	44.3	47.7	36.0	0.0
Queue Length 95th (m)	62.8	83.2	13.6	#270.2	40.2	66.3	#78.3	54.2	30.4
Internal Link Dist (m)		260.3		129.1		138.9		321.6	
Turn Bay Length (m)	30.0		40.0		30.0				40.0
Base Capacity (vph)	486	1777	420	1538	339	446	294	484	754
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	0.48	0.43	0.17	0.95	0.47	0.50	0.89	0.36	0.66

Intersection Summary

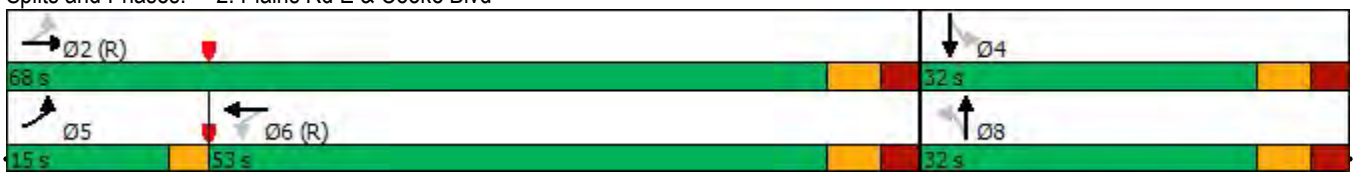
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	878	51	42	1369	119	44	3	12	114	0	112
Future Volume (vph)	51	878	51	42	1369	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	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	40.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		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	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	
Frt		0.991			0.988			0.973			0.933	
Flt Protected	0.950			0.950				0.964			0.975	
Satd. Flow (prot)	1745	3540	0	1711	3472	0	0	1747	0	0	1688	0
Flt Permitted	0.094			0.298				0.612			0.807	
Satd. Flow (perm)	173	3540	0	537	3472	0	0	1109	0	0	1394	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			12			12			76	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		153.1			163.6			52.9			344.6	
Travel Time (s)		9.2			9.8			3.8			24.8	
Confl. Peds. (#/hr)	4					4				2		3
Peak Hour Factor	0.97	0.97	0.92	0.92	0.97	0.97	0.92	0.94	0.92	0.97	0.95	0.97
Heavy Vehicles (%)	0%	1%	2%	2%	2%	8%	2%	2%	2%	3%	2%	0%
Adj. Flow (vph)	53	905	55	46	1411	123	48	3	13	118	0	115
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	960	0	46	1534	0	0	64	0	0	233	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	1.01	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	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		6.0	6.0		5.0	5.0	
Minimum Split (s)	9.0	26.0		26.0	26.0		19.0	19.0		25.0	25.0	
Total Split (s)	15.0	68.0		53.0	53.0		32.0	32.0		32.0	32.0	
Total Split (%)	15.0%	68.0%		53.0%	53.0%		32.0%	32.0%		32.0%	32.0%	
Maximum Green (s)	12.0	61.0		46.0	46.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	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)	3.0	7.0		7.0	7.0			7.0			7.0	
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	
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		7.0	7.0	
Flash Dont Walk (s)		11.0		11.0	11.0		4.0	4.0		11.0	11.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	73.0	69.0		61.2	61.2			17.0			17.0	
Actuated g/C Ratio	0.73	0.69		0.61	0.61			0.17			0.17	
v/c Ratio	0.23	0.39		0.14	0.72			0.32			0.78	
Control Delay	7.5	7.8		12.9	18.1			32.6			41.7	
Queue Delay	0.0	0.4		0.0	0.0			0.0			0.0	
Total Delay	7.5	8.2		12.9	18.1			32.6			41.7	
LOS	A	A		B	B			C			D	
Approach Delay		8.2			17.9			32.6			41.7	
Approach LOS		A			B			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 16.7		Intersection LOS: B	
Intersection Capacity Utilization 67.8%		ICU Level of Service C	
Analysis Period (min) 15			

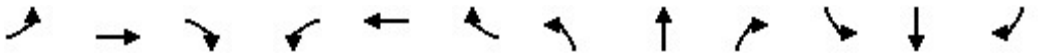
Splits and Phases: 2: Plains Rd E & Cooke Blvd





Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	53	960	46	1534	64	233
v/c Ratio	0.23	0.39	0.14	0.72	0.32	0.78
Control Delay	7.5	7.8	12.9	18.1	32.6	41.7
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0
Total Delay	7.5	8.2	12.9	18.1	32.6	41.7
Queue Length 50th (m)	2.6	38.2	3.9	110.0	9.3	31.1
Queue Length 95th (m)	7.8	64.1	12.3	175.1	20.1	54.2
Internal Link Dist (m)		129.1		139.6	28.9	320.6
Turn Bay Length (m)	40.0		15.0			
Base Capacity (vph)	314	2446	328	2130	286	405
Starvation Cap Reductn	0	847	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	0.17	0.60	0.14	0.72	0.22	0.58

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	0	6	83	0	643	10	562	32	193	827	17
Future Volume (vph)	19	0	6	83	0	643	10	562	32	193	827	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		1.00	0.98		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	1426	0	1491	1541	0	1246	3437	0	1662	3487	0
Flt Permitted		0.304		0.740			0.323			0.342		
Satd. Flow (perm)	0	450	0	1160	1541	0	424	3437	0	597	3487	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		76			409			6			3	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		42.4			141.2			345.6			127.1	
Travel Time (s)		3.1			10.2			24.9			9.2	
Confl. Peds. (#/hr)	4		1	1		4	1		3	3		1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	26%	0%	17%	17%	0%	3%	40%	3%	23%	5%	2%	59%
Adj. Flow (vph)	20	0	6	86	0	670	10	585	33	201	861	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	0	86	670	0	10	618	0	201	879	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								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	
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		6.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		10.5	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)		28.2		28.2	28.2		43.7	43.7		61.8	57.8	
Actuated g/C Ratio		0.28		0.28	0.28		0.44	0.44		0.62	0.58	
v/c Ratio		0.14		0.26	0.92		0.05	0.41		0.41	0.44	
Control Delay		1.7		28.0	32.1		22.2	22.1		12.3	13.7	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		1.7		28.0	32.1		22.2	22.1		12.3	13.7	
LOS		A		C	C		C	C		B	B	
Approach Delay		1.7			31.7			22.1			13.4	
Approach LOS		A			C			C			B	

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: 0.92			
Intersection Signal Delay: 21.0		Intersection LOS: C	
Intersection Capacity Utilization 90.1%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: Waterdown Rd & Masonry Crt

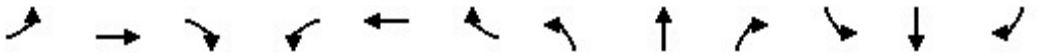




Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	26	86	670	10	618	201	879
v/c Ratio	0.14	0.26	0.92	0.05	0.41	0.41	0.44
Control Delay	1.7	28.0	32.1	22.2	22.1	12.3	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.7	28.0	32.1	22.2	22.1	12.3	13.7
Queue Length 50th (m)	0.0	12.6	52.9	1.3	48.3	18.8	56.1
Queue Length 95th (m)	0.0	25.2	#128.1	5.3	68.7	31.0	72.3
Internal Link Dist (m)	18.4		117.2		321.6		103.1
Turn Bay Length (m)		15.0		20.0		15.0	
Base Capacity (vph)	199	382	782	185	1505	529	2017
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	0.13	0.23	0.86	0.05	0.41	0.38	0.44

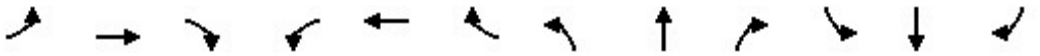
Intersection Summary

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	1697	0	0	1850	0	0	1725	0	0	1359	0
Flt Permitted		0.996			0.989			0.967				
Satd. Flow (perm)	0	1697	0	0	1850	0	0	1725	0	0	1359	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		141.2			139.2			344.6			48.9	
Travel Time (s)		10.2			10.0			24.8			3.5	
Confl. Peds. (#/hr)	3		2	2		3			3	3		
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 (%)	50%	3%	13%	0%	2%	0%	4%	0%	0%	0%	0%	57%
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 80.0%		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	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					3			2			3	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.2			1.2			1.2	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		141										
pX, platoon unblocked				0.96			0.96	0.96	0.96	0.96	0.96	
vC, conflicting volume	722			244			1392	1378	224	1457	1402	722
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	722			192			1387	1373	171	1455	1398	722
tC, single (s)	4.6			4.1			7.1	6.5	6.2	7.1	6.5	6.8
tC, 2 stage (s)												
tF (s)	2.7			2.2			3.5	4.0	3.3	3.5	4.0	3.8
p0 queue free %	97			85			0	87	92	100	91	97
cM capacity (veh/h)	694			1336			89	116	840	75	112	347

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	694	1336	119	174
Volume to Capacity	0.03	0.15	2.20	0.12
Queue Length 95th (m)	0.8	4.1	178.1	3.2
Control Delay (s)	1.3	3.4	625.0	28.5
Lane LOS	A	A	F	D
Approach Delay (s)	1.3	3.4	625.0	28.5
Approach LOS			F	D

Intersection Summary				
Average Delay	114.7			
Intersection Capacity Utilization	80.0%	ICU Level of Service	D	
Analysis Period (min)	15			

APPENDIX G

TTS Results and Trip Distribution

TTS Directional Distribution Summary

Notes:

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

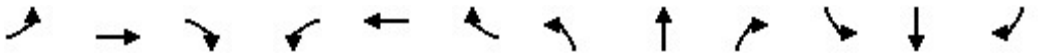
2. 'Internal' refers to local trips made within the home planning district(s), while 'External' refers to trips made to areas outside of the home planning district(s).

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 H

Detailed Capacity Analysis – 2024 and 2029 Future Total

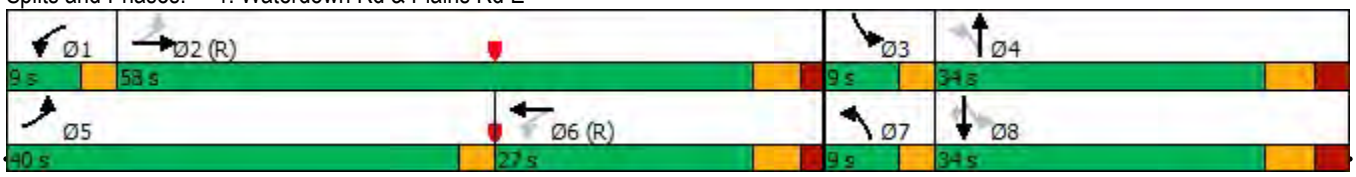


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	745	1183	158	74	420	226	62	275	62	189	111	171
Future Volume (vph)	745	1183	158	74	420	226	62	275	62	189	111	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		0.982			0.948			0.972				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3414	0	1662	3266	0	1711	1797	0	1662	1776	1479
Flt Permitted	0.171			0.196			0.681			0.231		
Satd. Flow (perm)	299	3414	0	341	3266	0	1205	1797	0	402	1776	1431
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			80			10				182
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		191.0			153.1			162.9			116.4	
Travel Time (s)		11.5			9.2			11.7			8.4	
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)	793	1259	168	79	447	240	66	293	66	201	118	182
Shared Lane Traffic (%)												
Lane Group Flow (vph)	793	1427	0	79	687	0	66	359	0	201	118	182
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			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		Yes									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	8.0		6.0	8.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	9.0	27.0		9.0	27.0		9.0	34.0		9.0	34.0	34.0
Total Split (s)	40.0	58.0		9.0	27.0		9.0	34.0		9.0	34.0	34.0
Total Split (%)	36.4%	52.7%		8.2%	24.5%		8.2%	30.9%		8.2%	30.9%	30.9%
Maximum Green (s)	37.0	52.0		6.0	21.0		6.0	27.0		6.0	27.0	27.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	-1.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	2.0	6.0		3.0	6.0		3.0	7.0		3.0	7.0	7.0
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			13.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	67.3	55.9		30.2	21.0		34.7	24.7		35.3	26.5	26.5
Actuated g/C Ratio	0.61	0.51		0.27	0.19		0.32	0.22		0.32	0.24	0.24
v/c Ratio	1.16	0.82		0.47	1.00		0.16	0.87		1.02	0.28	0.38
Control Delay	116.9	28.6		27.4	73.9		24.8	61.8		102.3	36.0	7.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	116.9	28.6		27.4	73.9		24.8	61.8		102.3	36.0	7.4
LOS	F	C		C	E		C	E		F	D	A
Approach Delay		60.1			69.1			56.1			52.2	
Approach LOS		E			E			E			D	

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: 130			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.16			
Intersection Signal Delay: 60.4		Intersection LOS: E	
Intersection Capacity Utilization 107.5%		ICU Level of Service G	
Analysis Period (min) 15			

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



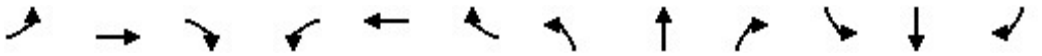


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	793	1427	79	687	66	359	201	118	182
v/c Ratio	1.16	0.82	0.47	1.00	0.16	0.87	1.02	0.28	0.38
Control Delay	116.9	28.6	27.4	73.9	24.8	61.8	102.3	36.0	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	116.9	28.6	27.4	73.9	24.8	61.8	102.3	36.0	7.4
Queue Length 50th (m)	~204.5	147.0	7.4	73.8	9.8	74.5	32.6	21.7	0.0
Queue Length 95th (m)	#280.8	181.7	15.1	#115.6	19.7	#120.4	#78.8	38.2	17.6
Internal Link Dist (m)		167.0		129.1		138.9		92.4	
Turn Bay Length (m)	30.0		40.0		30.0				40.0
Base Capacity (vph)	681	1743	167	688	407	448	197	438	490
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	1.16	0.82	0.47	1.00	0.16	0.80	1.02	0.27	0.37

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.

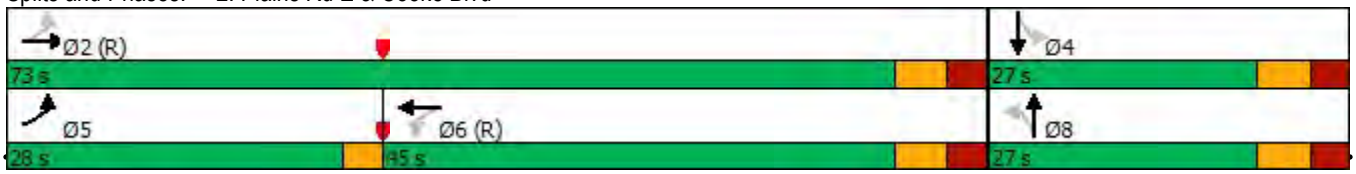


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	273	1215	25	6	627	122	58	4	27	66	0	76
Future Volume (vph)	273	1215	25	6	627	122	58	4	27	66	0	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	40.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		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	1.00	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		0.997			0.976			0.959			0.928	
Flt Protected	0.950			0.950				0.968			0.977	
Satd. Flow (prot)	1728	3495	0	1711	3324	0	0	1729	0	0	1452	0
Flt Permitted	0.310			0.211				0.688			0.836	
Satd. Flow (perm)	563	3495	0	380	3324	0	0	1229	0	0	1240	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			26			19			76	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		153.1			159.5			52.9			344.6	
Travel Time (s)		9.2			9.6			3.8			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	1279	27	7	660	128	63	4	29	69	0	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	287	1306	0	7	788	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	1.01	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	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		6.0	6.0		5.0	5.0	
Minimum Split (s)	9.0	26.0		26.0	26.0		19.0	19.0		25.0	25.0	
Total Split (s)	28.0	73.0		45.0	45.0		27.0	27.0		27.0	27.0	
Total Split (%)	28.0%	73.0%		45.0%	45.0%		27.0%	27.0%		27.0%	27.0%	
Maximum Green (s)	25.0	66.0		38.0	38.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	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)	3.0	7.0		7.0	7.0			7.0			7.0	
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	
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		7.0	7.0	
Flash Dont Walk (s)		11.0		11.0	11.0		4.0	4.0		11.0	11.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	77.8	73.8		60.4	60.4			12.2			12.2	
Actuated g/C Ratio	0.78	0.74		0.60	0.60			0.12			0.12	
v/c Ratio	0.51	0.51		0.03	0.39			0.57			0.68	
Control Delay	7.0	6.9		12.2	11.9			45.3			34.3	
Queue Delay	0.0	0.7		0.0	0.0			0.0			0.0	
Total Delay	7.0	7.6		12.2	11.9			45.3			34.3	
LOS	A	A		B	B			D			C	
Approach Delay		7.5			11.9			45.3			34.3	
Approach LOS		A			B			D			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 11.7		Intersection LOS: B	
Intersection Capacity Utilization 68.2%		ICU Level of Service C	
Analysis Period (min) 15			

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





Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	287	1306	7	788	96	149
v/c Ratio	0.51	0.51	0.03	0.39	0.57	0.68
Control Delay	7.0	6.9	12.2	11.9	45.3	34.3
Queue Delay	0.0	0.7	0.0	0.0	0.0	0.0
Total Delay	7.0	7.6	12.2	11.9	45.3	34.3
Queue Length 50th (m)	12.0	47.8	0.5	37.7	15.0	14.3
Queue Length 95th (m)	28.1	84.3	3.3	69.7	29.6	m26.0
Internal Link Dist (m)		129.1		135.5	28.9	320.6
Turn Bay Length (m)	40.0		15.0			
Base Capacity (vph)	729	2579	229	2018	261	308
Starvation Cap Reductn	0	815	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	0.39	0.74	0.03	0.39	0.37	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

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	1004	261	831	417	19
Future Volume (vph)	28	1	11	14	0	304	7	1004	261	831	417	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			0.993	
Flt Protected		0.967		0.950			0.950			0.950		
Satd. Flow (prot)	0	1158	0	1745	1518	0	1220	3342	0	1745	3286	0
Flt Permitted		0.287		0.730			0.488			0.105		
Satd. Flow (perm)	0	343	0	1341	1518	0	626	3342	0	193	3286	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			339			36			7	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		42.4			141.2			229.3			127.1	
Travel Time (s)		3.1			10.2			16.5			9.2	
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	1057	275	875	439	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	15	320	0	7	1332	0	875	459	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			3.6			3.6	
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	
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		6.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		10.5	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		0.84		0.10	0.67		0.03	1.12		1.23	0.19	
Control Delay		119.4		38.1	11.0		22.1	95.4		140.3	4.4	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		119.4		38.1	11.0		22.1	95.4		140.3	4.4	
LOS		F		D	B		C	F		F	A	
Approach Delay		119.4			12.2			95.0			93.6	
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: 1.23			
Intersection Signal Delay: 85.6		Intersection LOS: F	
Intersection Capacity Utilization 123.5%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 3: Waterdown Rd & Masonry Crt



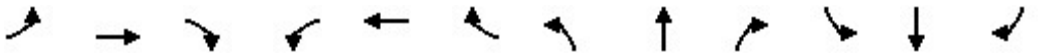


Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	42	15	320	7	1332	875	459
v/c Ratio	0.84	0.10	0.67	0.03	1.12	1.23	0.19
Control Delay	119.4	38.1	11.0	22.1	95.4	140.3	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	119.4	38.1	11.0	22.1	95.4	140.3	4.4
Queue Length 50th (m)	6.1	2.8	0.0	0.9	~163.1	~201.3	11.6
Queue Length 95th (m)	#23.2	8.4	19.6	4.1	#206.9	#305.5	22.2
Internal Link Dist (m)	18.4		117.2		205.3		103.1
Turn Bay Length (m)		15.0		20.0		15.0	
Base Capacity (vph)	121	442	728	219	1193	713	2441
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	1.12	1.23	0.19

Intersection Summary

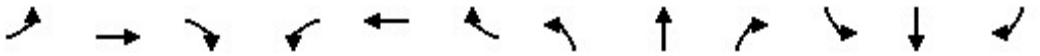
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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)	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)		141.2			139.2			344.6			48.9	
Travel Time (s)		10.2			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)		141										
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	1231	2503	1887	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	62	84
Volume to Capacity	0.00	0.24	9.16	0.45
Queue Length 95th (m)	0.1	7.4	Err	14.9
Control Delay (s)	0.2	8.2	Err	78.8
Lane LOS	A	A	F	F
Approach Delay (s)	0.2	8.2	Err	78.8
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	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	26	46	1239	6	17	444
Future Volume (vph)	26	46	1239	6	17	444
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.913		0.999			
Flt Protected	0.982				0.950	
Satd. Flow (prot)	1670	0	3536	0	1770	3539
Flt Permitted	0.982				0.950	
Satd. Flow (perm)	1670	0	3536	0	1770	3539
Link Speed (k/h)	50		50			50
Link Distance (m)	49.4		116.4			229.3
Travel Time (s)	3.6		8.4			16.5
Peak Hour Factor	0.92	0.92	0.94	0.92	0.92	0.95
Adj. Flow (vph)	28	50	1318	7	18	467
Shared Lane Traffic (%)						
Lane Group Flow (vph)	78	0	1325	0	18	467
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			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			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

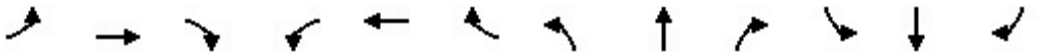
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	45.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	26	46	1239	6	17	444
Future Volume (Veh/h)	26	46	1239	6	17	444
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.94	0.92	0.92	0.95
Hourly flow rate (vph)	28	50	1318	7	18	467
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			116			229
pX, platoon unblocked						
vC, conflicting volume	1591	662			1325	
vC1, stage 1 conf vol	1322					
vC2, stage 2 conf vol	270					
vCu, unblocked vol	1591	662			1325	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	88			97	
cM capacity (veh/h)	205	404			517	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	78	879	446	18	234	234
Volume Left	28	0	0	18	0	0
Volume Right	50	0	7	0	0	0
cSH	300	1700	1700	517	1700	1700
Volume to Capacity	0.26	0.52	0.26	0.03	0.14	0.14
Queue Length 95th (m)	8.1	0.0	0.0	0.9	0.0	0.0
Control Delay (s)	21.2	0.0	0.0	12.2	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	21.2	0.0		0.5		
Approach LOS	C					

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	45.4%	ICU Level of Service	A
Analysis Period (min)	15		

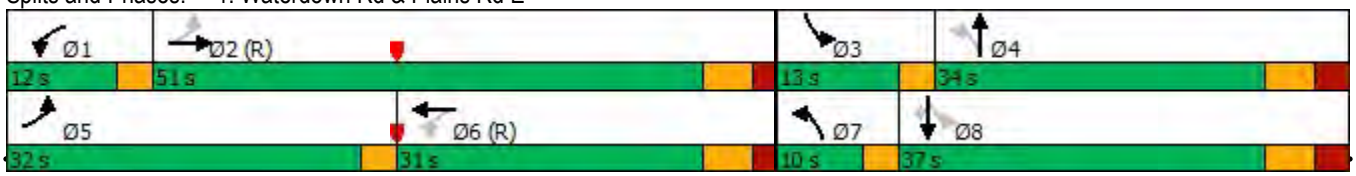


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	619	101	67	1176	214	148	150	60	261	164	467
Future Volume (vph)	219	619	101	67	1176	214	148	150	60	261	164	467
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		0.99	1.00		1.00		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	3398	0	1662	3383	0	1711	1765	0	1662	1776	1479
Flt Permitted	0.075			0.360			0.651			0.368		
Satd. Flow (perm)	131	3398	0	618	3383	0	1159	1765	0	643	1776	1440
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			17			17				477
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		284.3			153.1			162.9			108.9	
Travel Time (s)		17.1			9.2			11.7			7.8	
Confl. Peds. (#/hr)	3		19	19		3	12		2	2		12
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	5%	3%	3%	5%	4%	4%	2%	2%	4%	5%	7%	8%
Adj. Flow (vph)	223	632	103	68	1200	218	151	153	61	266	167	477
Shared Lane Traffic (%)												
Lane Group Flow (vph)	223	735	0	68	1418	0	151	214	0	266	167	477
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			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		Yes									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	8.0		6.0	8.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	9.0	27.0		9.0	27.0		9.0	34.0		9.0	34.0	34.0
Total Split (s)	32.0	51.0		12.0	31.0		10.0	34.0		13.0	37.0	37.0
Total Split (%)	29.1%	46.4%		10.9%	28.2%		9.1%	30.9%		11.8%	33.6%	33.6%
Maximum Green (s)	29.0	45.0		9.0	25.0		7.0	27.0		10.0	30.0	30.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0		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	6.0		3.0	6.0		3.0	7.0		3.0	7.0	7.0
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			13.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	69.4	57.7		60.9	50.5		28.6	17.6		34.6	20.6	20.6
Actuated g/C Ratio	0.63	0.52		0.55	0.46		0.26	0.16		0.31	0.19	0.19
v/c Ratio	0.85	0.41		0.17	0.91		0.45	0.72		0.90	0.50	0.73
Control Delay	53.5	17.7		10.6	38.6		32.9	53.5		65.4	44.4	10.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	53.5	17.7		10.6	38.6		32.9	53.5		65.4	44.4	10.4
LOS	D	B		B	D		C	D		E	D	B
Approach Delay		26.1			37.4			45.0			32.7	
Approach LOS		C			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: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 34.1		Intersection LOS: C	
Intersection Capacity Utilization 95.8%		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)	223	735	68	1418	151	214	266	167	477
v/c Ratio	0.85	0.41	0.17	0.91	0.45	0.72	0.90	0.50	0.73
Control Delay	53.5	17.7	10.6	38.6	32.9	53.5	65.4	44.4	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.5	17.7	10.6	38.6	32.9	53.5	65.4	44.4	10.4
Queue Length 50th (m)	33.5	50.9	5.5	148.0	25.5	42.8	48.8	34.1	0.0
Queue Length 95th (m)	60.7	78.0	13.0	#254.8	39.0	64.6	#80.6	52.0	30.1
Internal Link Dist (m)		260.3		129.1		138.9		84.9	
Turn Bay Length (m)	30.0		40.0		30.0				40.0
Base Capacity (vph)	486	1793	437	1562	336	446	295	484	739
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	0.46	0.41	0.16	0.91	0.45	0.48	0.90	0.35	0.65

Intersection Summary

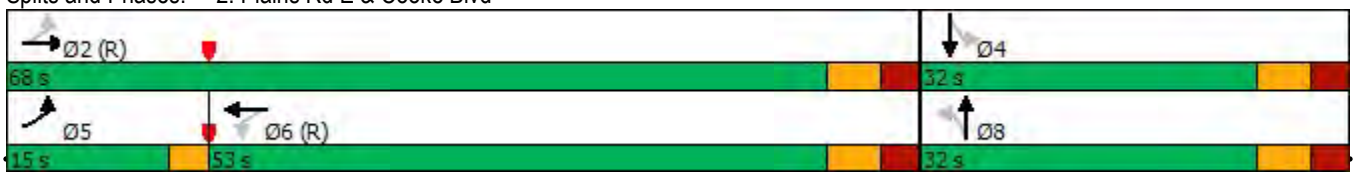
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	853	51	42	1326	119	44	3	12	114	0	112
Future Volume (vph)	51	853	51	42	1326	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	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	40.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		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	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	
Frt		0.991			0.988			0.973			0.933	
Flt Protected	0.950			0.950				0.964			0.975	
Satd. Flow (prot)	1745	3540	0	1711	3471	0	0	1747	0	0	1688	0
Flt Permitted	0.102			0.306				0.612			0.807	
Satd. Flow (perm)	187	3540	0	551	3471	0	0	1109	0	0	1394	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			12			12			76	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		153.1			163.6			52.9			344.6	
Travel Time (s)		9.2			9.8			3.8			24.8	
Confl. Peds. (#/hr)	4					4				2		3
Peak Hour Factor	0.97	0.97	0.92	0.92	0.97	0.97	0.92	0.94	0.92	0.97	0.95	0.97
Heavy Vehicles (%)	0%	1%	2%	2%	2%	8%	2%	2%	2%	3%	2%	0%
Adj. Flow (vph)	53	879	55	46	1367	123	48	3	13	118	0	115
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	934	0	46	1490	0	0	64	0	0	233	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	1.01	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	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		6.0	6.0		5.0	5.0	
Minimum Split (s)	9.0	26.0		26.0	26.0		19.0	19.0		25.0	25.0	
Total Split (s)	15.0	68.0		53.0	53.0		32.0	32.0		32.0	32.0	
Total Split (%)	15.0%	68.0%		53.0%	53.0%		32.0%	32.0%		32.0%	32.0%	
Maximum Green (s)	12.0	61.0		46.0	46.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	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)	3.0	7.0		7.0	7.0			7.0			7.0	
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	
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		7.0	7.0	
Flash Dont Walk (s)		11.0		11.0	11.0		4.0	4.0		11.0	11.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	73.0	69.0		61.2	61.2			17.0			17.0	
Actuated g/C Ratio	0.73	0.69		0.61	0.61			0.17			0.17	
v/c Ratio	0.22	0.38		0.14	0.70			0.32			0.78	
Control Delay	7.3	7.7		12.8	17.5			32.6			41.7	
Queue Delay	0.0	0.3		0.0	0.0			0.0			0.0	
Total Delay	7.3	8.1		12.8	17.5			32.6			41.7	
LOS	A	A		B	B			C			D	
Approach Delay		8.0			17.3			32.6			41.7	
Approach LOS		A			B			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 16.4		Intersection LOS: B	
Intersection Capacity Utilization 67.8%		ICU Level of Service C	
Analysis Period (min) 15			

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





Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	53	934	46	1490	64	233
v/c Ratio	0.22	0.38	0.14	0.70	0.32	0.78
Control Delay	7.3	7.7	12.8	17.5	32.6	41.7
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	7.3	8.1	12.8	17.5	32.6	41.7
Queue Length 50th (m)	2.6	36.8	3.9	104.5	9.3	31.1
Queue Length 95th (m)	7.8	61.8	12.2	166.2	20.1	54.2
Internal Link Dist (m)		129.1		139.6	28.9	320.6
Turn Bay Length (m)	40.0		15.0			
Base Capacity (vph)	323	2447	337	2130	286	405
Starvation Cap Reductn	0	856	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	0.16	0.59	0.14	0.70	0.22	0.58

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	0	6	83	0	643	10	563	32	193	834	17
Future Volume (vph)	19	0	6	83	0	643	10	563	32	193	834	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		1.00	0.98		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	1426	0	1491	1541	0	1246	3437	0	1662	3487	0
Flt Permitted		0.304		0.740			0.321			0.342		
Satd. Flow (perm)	0	450	0	1160	1541	0	421	3437	0	597	3487	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		76			409			6			3	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		42.4			141.2			236.7			127.1	
Travel Time (s)		3.1			10.2			17.0			9.2	
Confl. Peds. (#/hr)	4		1	1		4	1		3	3		1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	26%	0%	17%	17%	0%	3%	40%	3%	23%	5%	2%	59%
Adj. Flow (vph)	20	0	6	86	0	670	10	586	33	201	869	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	0	86	670	0	10	619	0	201	887	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			3.6			3.6	
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	
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		6.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		10.5	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)		28.2		28.2	28.2		43.7	43.7		61.8	57.8	
Actuated g/C Ratio		0.28		0.28	0.28		0.44	0.44		0.62	0.58	
v/c Ratio		0.14		0.26	0.92		0.05	0.41		0.41	0.44	
Control Delay		1.7		28.0	32.1		22.3	22.1		12.3	13.8	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		1.7		28.0	32.1		22.3	22.1		12.3	13.8	
LOS		A		C	C		C	C		B	B	
Approach Delay		1.7			31.7			22.1			13.5	
Approach LOS		A			C			C			B	

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: 0.92			
Intersection Signal Delay: 21.0		Intersection LOS: C	
Intersection Capacity Utilization 90.1%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: Waterdown Rd & Masonry Crt

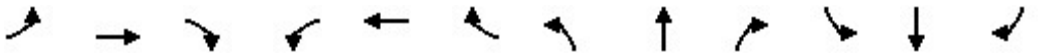




Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	26	86	670	10	619	201	887
v/c Ratio	0.14	0.26	0.92	0.05	0.41	0.41	0.44
Control Delay	1.7	28.0	32.1	22.3	22.1	12.3	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.7	28.0	32.1	22.3	22.1	12.3	13.8
Queue Length 50th (m)	0.0	12.6	52.9	1.3	48.4	18.8	56.8
Queue Length 95th (m)	0.0	25.2	#128.1	5.3	69.0	31.0	73.1
Internal Link Dist (m)	18.4		117.2		212.7		103.1
Turn Bay Length (m)		15.0		20.0		15.0	
Base Capacity (vph)	199	382	782	184	1505	529	2017
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	0.13	0.23	0.86	0.05	0.41	0.38	0.44

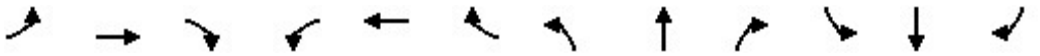
Intersection Summary

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	1697	0	0	1850	0	0	1725	0	0	1359	0
Flt Permitted		0.996			0.989			0.967				
Satd. Flow (perm)	0	1697	0	0	1850	0	0	1725	0	0	1359	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		141.2			139.2			344.6			48.9	
Travel Time (s)		10.2			10.0			24.8			3.5	
Confl. Peds. (#/hr)	3		2	2		3			3	3		
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 (%)	50%	3%	13%	0%	2%	0%	4%	0%	0%	0%	0%	57%
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 80.0%		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	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					3			2			3	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.2			1.2			1.2	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		141										
pX, platoon unblocked				0.96			0.96	0.96	0.96	0.96	0.96	
vC, conflicting volume	722			244			1392	1378	224	1457	1402	722
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	722			192			1387	1373	171	1455	1398	722
tC, single (s)	4.6			4.1			7.1	6.5	6.2	7.1	6.5	6.8
tC, 2 stage (s)												
tF (s)	2.7			2.2			3.5	4.0	3.3	3.5	4.0	3.8
p0 queue free %	97			85			0	87	92	100	91	97
cM capacity (veh/h)	694			1336			89	116	840	75	112	347

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	694	1336	119	174
Volume to Capacity	0.03	0.15	2.20	0.12
Queue Length 95th (m)	0.8	4.1	178.1	3.2
Control Delay (s)	1.3	3.4	625.0	28.5
Lane LOS	A	A	F	D
Approach Delay (s)	1.3	3.4	625.0	28.5
Approach LOS			F	D

Intersection Summary				
Average Delay	114.7			
Intersection Capacity Utilization	80.0%	ICU Level of Service	D	
Analysis Period (min)	15			



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	16	26	558	24	44	875
Future Volume (vph)	16	26	558	24	44	875
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.916		0.993			
Flt Protected	0.981				0.950	
Satd. Flow (prot)	1674	0	3514	0	1770	3539
Flt Permitted	0.981				0.950	
Satd. Flow (perm)	1674	0	3514	0	1770	3539
Link Speed (k/h)	50		50			50
Link Distance (m)	57.1		108.9			236.7
Travel Time (s)	4.1		7.8			17.0
Peak Hour Factor	0.92	0.92	0.98	0.92	0.92	0.96
Adj. Flow (vph)	17	28	569	26	48	911
Shared Lane Traffic (%)						
Lane Group Flow (vph)	45	0	595	0	48	911
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			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			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 34.2%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	16	26	558	24	44	875
Future Volume (Veh/h)	16	26	558	24	44	875
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.98	0.92	0.92	0.96
Hourly flow rate (vph)	17	28	569	26	48	911
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			109			237
pX, platoon unblocked	0.87					
vC, conflicting volume	1134	298			595	
vC1, stage 1 conf vol	582					
vC2, stage 2 conf vol	552					
vCu, unblocked vol	858	298			595	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	96			95	
cM capacity (veh/h)	456	699			977	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	45	379	216	48	456	456
Volume Left	17	0	0	48	0	0
Volume Right	28	0	26	0	0	0
cSH	582	1700	1700	977	1700	1700
Volume to Capacity	0.08	0.22	0.13	0.05	0.27	0.27
Queue Length 95th (m)	2.0	0.0	0.0	1.2	0.0	0.0
Control Delay (s)	11.7	0.0	0.0	8.9	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	11.7	0.0		0.4		
Approach LOS	B					

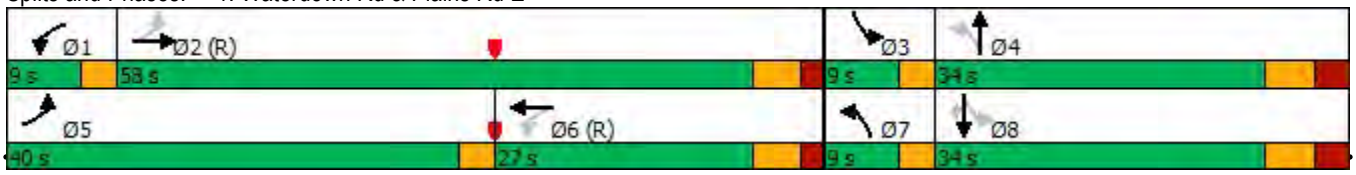
Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	775	1231	166	77	436	235	65	286	65	196	116	180
Future Volume (vph)	775	1231	166	77	436	235	65	286	65	196	116	180
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		0.982			0.947			0.972				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	3414	0	1662	3263	0	1711	1797	0	1662	1776	1479
Flt Permitted	0.171			0.196			0.678			0.214		
Satd. Flow (perm)	299	3414	0	341	3263	0	1199	1797	0	373	1776	1431
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			80			10				191
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		191.0			153.1			162.9			116.4	
Travel Time (s)		11.5			9.2			11.7			8.4	
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)	824	1310	177	82	464	250	69	304	69	209	123	191
Shared Lane Traffic (%)												
Lane Group Flow (vph)	824	1487	0	82	714	0	69	373	0	209	123	191
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			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		Yes									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	8.0		6.0	8.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	9.0	27.0		9.0	27.0		9.0	34.0		9.0	34.0	34.0
Total Split (s)	40.0	58.0		9.0	27.0		9.0	34.0		9.0	34.0	34.0
Total Split (%)	36.4%	52.7%		8.2%	24.5%		8.2%	30.9%		8.2%	30.9%	30.9%
Maximum Green (s)	37.0	52.0		6.0	21.0		6.0	27.0		6.0	27.0	27.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	3.0		0.0	3.0	3.0
Lost Time Adjust (s)	-1.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	2.0	6.0		3.0	6.0		3.0	7.0		3.0	7.0	7.0
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			13.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	66.9	55.5		30.2	21.0		35.1	25.1		35.7	26.9	26.9
Actuated g/C Ratio	0.61	0.50		0.27	0.19		0.32	0.23		0.32	0.24	0.24
v/c Ratio	1.22	0.86		0.49	1.04		0.17	0.89		1.09	0.28	0.39
Control Delay	139.5	31.1		28.4	84.0		24.8	64.2		124.7	35.9	7.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	139.5	31.1		28.4	84.0		24.8	64.2		124.7	35.9	7.3
LOS	F	C		C	F		C	E		F	D	A
Approach Delay		69.7			78.2			58.1			61.0	
Approach LOS		E			E			E			E	

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: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.22			
Intersection Signal Delay: 69.0		Intersection LOS: E	
Intersection Capacity Utilization 110.9%		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)	824	1487	82	714	69	373	209	123	191
v/c Ratio	1.22	0.86	0.49	1.04	0.17	0.89	1.09	0.28	0.39
Control Delay	139.5	31.1	28.4	84.0	24.8	64.2	124.7	35.9	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	139.5	31.1	28.4	84.0	24.8	64.2	124.7	35.9	7.3
Queue Length 50th (m)	~219.4	158.1	7.7	~83.6	10.2	78.2	~37.4	22.6	0.0
Queue Length 95th (m)	#296.7	#210.6	15.8	#122.7	20.3	#128.6	#86.1	39.4	18.0
Internal Link Dist (m)		167.0		129.1		138.9		92.4	
Turn Bay Length (m)	30.0		40.0		30.0				40.0
Base Capacity (vph)	675	1730	168	687	411	448	191	441	499
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	1.22	0.86	0.49	1.04	0.17	0.83	1.09	0.28	0.38

Intersection Summary

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

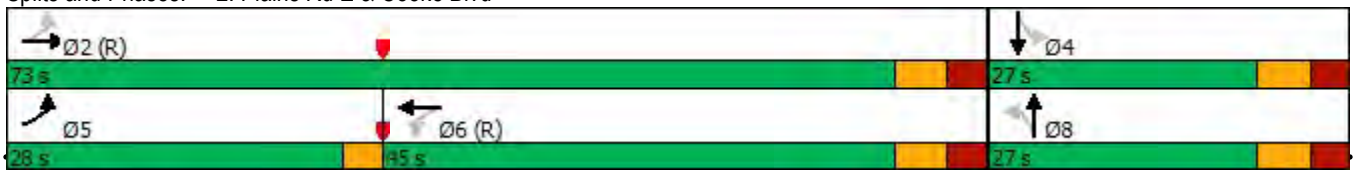
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	273	1272	25	6	657	122	58	4	27	66	0	76
Future Volume (vph)	273	1272	25	6	657	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	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	40.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		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	1.00	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		0.997			0.977			0.959			0.928	
Flt Protected	0.950			0.950				0.968			0.977	
Satd. Flow (prot)	1728	3495	0	1711	3328	0	0	1729	0	0	1452	0
Flt Permitted	0.296			0.199				0.688			0.836	
Satd. Flow (perm)	537	3495	0	358	3328	0	0	1229	0	0	1240	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			24			19			76	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		153.1			159.5			52.9			344.6	
Travel Time (s)		9.2			9.6			3.8			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	1339	27	7	692	128	63	4	29	69	0	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	287	1366	0	7	820	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	1.01	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	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		6.0	6.0		5.0	5.0	
Minimum Split (s)	9.0	26.0		26.0	26.0		19.0	19.0		25.0	25.0	
Total Split (s)	28.0	73.0		45.0	45.0		27.0	27.0		27.0	27.0	
Total Split (%)	28.0%	73.0%		45.0%	45.0%		27.0%	27.0%		27.0%	27.0%	
Maximum Green (s)	25.0	66.0		38.0	38.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	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)	3.0	7.0		7.0	7.0			7.0			7.0	
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	
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		7.0	7.0	
Flash Dont Walk (s)		11.0		11.0	11.0		4.0	4.0		11.0	11.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	77.8	73.8		60.2	60.2			12.2			12.2	
Actuated g/C Ratio	0.78	0.74		0.60	0.60			0.12			0.12	
v/c Ratio	0.53	0.53		0.03	0.41			0.57			0.68	
Control Delay	7.3	7.2		12.7	12.3			45.3			34.3	
Queue Delay	0.0	0.7		0.0	0.0			0.0			0.0	
Total Delay	7.3	7.9		12.7	12.3			45.3			34.3	
LOS	A	A		B	B			D			C	
Approach Delay		7.8			12.3			45.3			34.3	
Approach LOS		A			B			D			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 12.0		Intersection LOS: B	
Intersection Capacity Utilization 69.8%		ICU Level of Service C	
Analysis Period (min) 15			

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





Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	287	1366	7	820	96	149
v/c Ratio	0.53	0.53	0.03	0.41	0.57	0.68
Control Delay	7.3	7.2	12.7	12.3	45.3	34.3
Queue Delay	0.0	0.7	0.0	0.0	0.0	0.0
Total Delay	7.3	7.9	12.7	12.3	45.3	34.3
Queue Length 50th (m)	12.0	51.5	0.5	40.0	15.0	14.3
Queue Length 95th (m)	28.1	90.6	3.4	75.4	29.6	m26.0
Internal Link Dist (m)		129.1		135.5	28.9	320.6
Turn Bay Length (m)	40.0		15.0			
Base Capacity (vph)	715	2579	215	2012	261	308
Starvation Cap Reductn	0	791	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	0.40	0.76	0.03	0.41	0.37	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

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	1050	261	831	436	19
Future Volume (vph)	28	1	11	14	0	304	7	1050	261	831	436	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			0.970			0.994	
Flt Protected		0.967		0.950			0.950			0.950		
Satd. Flow (prot)	0	1158	0	1745	1518	0	1220	3345	0	1745	3291	0
Flt Permitted		0.287		0.730			0.478			0.105		
Satd. Flow (perm)	0	343	0	1341	1518	0	613	3345	0	193	3291	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			337			34			7	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		42.4			141.2			229.3			127.1	
Travel Time (s)		3.1			10.2			16.5			9.2	
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	1105	275	875	459	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	15	320	0	7	1380	0	875	479	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			3.6			3.6	
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	
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		6.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		10.5	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	1.16		1.23	0.20	
Control Delay		118.3		38.1	11.2		22.1	111.5		140.8	4.4	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		118.3		38.1	11.2		22.1	111.5		140.8	4.4	
LOS		F		D	B		C	F		F	A	
Approach Delay		118.3			12.4			111.0			92.5	
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: 92.5		Intersection LOS: F	
Intersection Capacity Utilization 124.8%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 3: Waterdown Rd & Masonry Crt



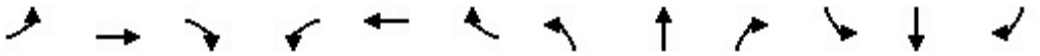


Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	42	15	320	7	1380	875	479
v/c Ratio	0.82	0.09	0.67	0.03	1.16	1.23	0.20
Control Delay	118.3	38.1	11.2	22.1	111.5	140.8	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	118.3	38.1	11.2	22.1	111.5	140.8	4.4
Queue Length 50th (m)	6.1	2.8	0.0	0.9	~174.3	~201.3	12.1
Queue Length 95th (m)	#23.1	8.4	20.0	4.2	#218.3	#306.3	23.4
Internal Link Dist (m)	18.4		117.2		205.3		103.1
Turn Bay Length (m)		15.0		20.0		15.0	
Base Capacity (vph)	121	442	726	214	1192	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	1.16	1.23	0.20

Intersection Summary

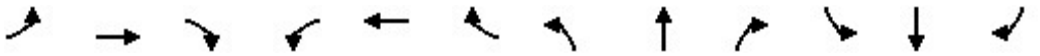
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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)	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)		141.2			139.2			344.6			48.9	
Travel Time (s)		10.2			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)		141										
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	1231	2503	1887	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	62	84
Volume to Capacity	0.00	0.24	9.16	0.45
Queue Length 95th (m)	0.1	7.4	Err	14.9
Control Delay (s)	0.2	8.2	Err	78.8
Lane LOS	A	A	F	F
Approach Delay (s)	0.2	8.2	Err	78.8
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	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	26	47	1289	6	17	465
Future Volume (vph)	26	47	1289	6	17	465
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.913		0.999			
Flt Protected	0.983				0.950	
Satd. Flow (prot)	1672	0	3536	0	1770	3539
Flt Permitted	0.983				0.950	
Satd. Flow (perm)	1672	0	3536	0	1770	3539
Link Speed (k/h)	50		50			50
Link Distance (m)	49.4		116.4			229.3
Travel Time (s)	3.6		8.4			16.5
Peak Hour Factor	0.92	0.92	0.94	0.92	0.92	0.95
Adj. Flow (vph)	28	51	1371	7	18	489
Shared Lane Traffic (%)						
Lane Group Flow (vph)	79	0	1378	0	18	489
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			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			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	26	47	1289	6	17	465
Future Volume (Veh/h)	26	47	1289	6	17	465
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.94	0.92	0.92	0.95
Hourly flow rate (vph)	28	51	1371	7	18	489
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			116			229
pX, platoon unblocked						
vC, conflicting volume	1655	689			1378	
vC1, stage 1 conf vol	1374					
vC2, stage 2 conf vol	280					
vCu, unblocked vol	1655	689			1378	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	87			96	
cM capacity (veh/h)	192	388			493	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	79	914	464	18	244	244
Volume Left	28	0	0	18	0	0
Volume Right	51	0	7	0	0	0
cSH	285	1700	1700	493	1700	1700
Volume to Capacity	0.28	0.54	0.27	0.04	0.14	0.14
Queue Length 95th (m)	8.8	0.0	0.0	0.9	0.0	0.0
Control Delay (s)	22.4	0.0	0.0	12.6	0.0	0.0
Lane LOS	C			B		
Approach Delay (s)	22.4	0.0		0.4		
Approach LOS	C					

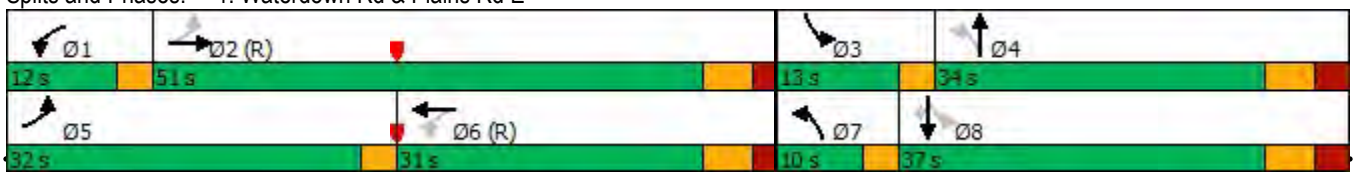
Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	229	646	106	70	1228	222	155	156	62	272	172	488
Future Volume (vph)	229	646	106	70	1228	222	155	156	62	272	172	488
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		0.99	1.00		1.00		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	3398	0	1662	3383	0	1711	1766	0	1662	1776	1479
Flt Permitted	0.076			0.345			0.646			0.357		
Satd. Flow (perm)	133	3398	0	593	3383	0	1150	1766	0	624	1776	1440
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			17			17				498
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		284.3			153.1			162.9			108.9	
Travel Time (s)		17.1			9.2			11.7			7.8	
Confl. Peds. (#/hr)	3		19	19		3	12		2	2		12
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	5%	3%	3%	5%	4%	4%	2%	2%	4%	5%	7%	8%
Adj. Flow (vph)	234	659	108	71	1253	227	158	159	63	278	176	498
Shared Lane Traffic (%)												
Lane Group Flow (vph)	234	767	0	71	1480	0	158	222	0	278	176	498
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			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		Yes									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	8.0		6.0	8.0		6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	9.0	27.0		9.0	27.0		9.0	34.0		9.0	34.0	34.0
Total Split (s)	32.0	51.0		12.0	31.0		10.0	34.0		13.0	37.0	37.0
Total Split (%)	29.1%	46.4%		10.9%	28.2%		9.1%	30.9%		11.8%	33.6%	33.6%
Maximum Green (s)	29.0	45.0		9.0	25.0		7.0	27.0		10.0	30.0	30.0
Yellow Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0		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	6.0		3.0	6.0		3.0	7.0		3.0	7.0	7.0
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			13.0			17.0			17.0	17.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effct Green (s)	68.9	57.2		59.9	49.4		29.1	18.1		35.1	21.1	21.1
Actuated g/C Ratio	0.63	0.52		0.54	0.45		0.26	0.16		0.32	0.19	0.19
v/c Ratio	0.87	0.43		0.18	0.97		0.46	0.73		0.95	0.52	0.73
Control Delay	55.0	18.4		11.1	47.7		33.0	53.5		74.0	44.4	10.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	55.0	18.4		11.1	47.7		33.0	53.5		74.0	44.4	10.3
LOS	D	B		B	D		C	D		E	D	B
Approach Delay		27.0			46.1			45.0			35.2	
Approach LOS		C			D			D			D	

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: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 38.4		Intersection LOS: D	
Intersection Capacity Utilization 99.1%		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)	234	767	71	1480	158	222	278	176	498
v/c Ratio	0.87	0.43	0.18	0.97	0.46	0.73	0.95	0.52	0.73
Control Delay	55.0	18.4	11.1	47.7	33.0	53.5	74.0	44.4	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.0	18.4	11.1	47.7	33.0	53.5	74.0	44.4	10.3
Queue Length 50th (m)	36.1	54.5	5.8	162.3	26.6	44.5	51.1	36.0	0.0
Queue Length 95th (m)	63.5	83.4	13.7	#277.5	40.1	66.4	#88.6	54.2	30.4
Internal Link Dist (m)		260.3		129.1		138.9		84.9	
Turn Bay Length (m)	30.0		40.0		30.0				40.0
Base Capacity (vph)	486	1775	420	1528	340	446	293	484	754
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	0.48	0.43	0.17	0.97	0.46	0.50	0.95	0.36	0.66

Intersection Summary

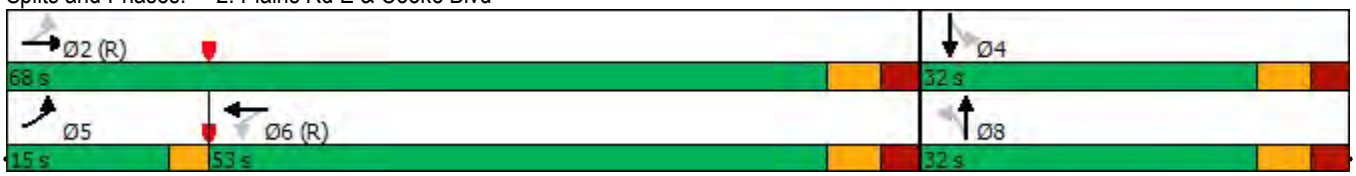
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	893	51	42	1389	119	44	3	12	114	0	112
Future Volume (vph)	51	893	51	42	1389	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	3.5	3.3	3.6	3.5	3.3	3.6	3.5	3.3	3.6	3.5
Storage Length (m)	40.0		0.0	15.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	1		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	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	
Frt		0.992			0.988			0.973			0.933	
Flt Protected	0.950			0.950				0.964			0.975	
Satd. Flow (prot)	1745	3544	0	1711	3472	0	0	1747	0	0	1688	0
Flt Permitted	0.090			0.294				0.612			0.807	
Satd. Flow (perm)	165	3544	0	529	3472	0	0	1109	0	0	1394	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			12			12			76	
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		153.1			163.6			52.9			344.6	
Travel Time (s)		9.2			9.8			3.8			24.8	
Confl. Peds. (#/hr)	4					4				2		3
Peak Hour Factor	0.97	0.97	0.92	0.92	0.97	0.97	0.92	0.94	0.92	0.97	0.95	0.97
Heavy Vehicles (%)	0%	1%	2%	2%	2%	8%	2%	2%	2%	3%	2%	0%
Adj. Flow (vph)	53	921	55	46	1432	123	48	3	13	118	0	115
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	976	0	46	1555	0	0	64	0	0	233	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	1.01	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	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	5	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	6.0	8.0		8.0	8.0		6.0	6.0		5.0	5.0	
Minimum Split (s)	9.0	26.0		26.0	26.0		19.0	19.0		25.0	25.0	
Total Split (s)	15.0	68.0		53.0	53.0		32.0	32.0		32.0	32.0	
Total Split (%)	15.0%	68.0%		53.0%	53.0%		32.0%	32.0%		32.0%	32.0%	
Maximum Green (s)	12.0	61.0		46.0	46.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	0.0	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)	3.0	7.0		7.0	7.0			7.0			7.0	
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	
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		7.0	7.0	
Flash Dont Walk (s)		11.0		11.0	11.0		4.0	4.0		11.0	11.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	73.0	69.0		61.2	61.2			17.0			17.0	
Actuated g/C Ratio	0.73	0.69		0.61	0.61			0.17			0.17	
v/c Ratio	0.24	0.40		0.14	0.73			0.32			0.78	
Control Delay	7.6	7.9		13.0	18.4			32.6			41.7	
Queue Delay	0.0	0.4		0.0	0.0			0.0			0.0	
Total Delay	7.6	8.3		13.0	18.4			32.6			41.7	
LOS	A	A		B	B			C			D	
Approach Delay		8.2			18.2			32.6			41.7	
Approach LOS		A			B			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 20 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 16.9		Intersection LOS: B	
Intersection Capacity Utilization 67.8%		ICU Level of Service C	
Analysis Period (min) 15			

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





Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	53	976	46	1555	64	233
v/c Ratio	0.24	0.40	0.14	0.73	0.32	0.78
Control Delay	7.6	7.9	13.0	18.4	32.6	41.7
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0
Total Delay	7.6	8.3	13.0	18.4	32.6	41.7
Queue Length 50th (m)	2.6	39.1	3.9	112.6	9.3	31.1
Queue Length 95th (m)	7.8	65.4	12.3	#179.8	20.1	54.2
Internal Link Dist (m)		129.1		139.6	28.9	320.6
Turn Bay Length (m)	40.0		15.0			
Base Capacity (vph)	309	2449	323	2130	286	405
Starvation Cap Reductn	0	842	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	0.17	0.61	0.14	0.73	0.22	0.58

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	0	6	83	0	643	10	588	32	193	871	17
Future Volume (vph)	19	0	6	83	0	643	10	588	32	193	871	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		1.00	0.98		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	1426	0	1491	1541	0	1246	3438	0	1662	3489	0
Flt Permitted		0.306		0.740			0.309			0.326		
Satd. Flow (perm)	0	453	0	1160	1541	0	405	3438	0	569	3489	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		76			401			6			3	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		42.4			141.2			236.7			127.1	
Travel Time (s)		3.1			10.2			17.0			9.2	
Confl. Peds. (#/hr)	4		1	1		4	1		3	3		1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	26%	0%	17%	17%	0%	3%	40%	3%	23%	5%	2%	59%
Adj. Flow (vph)	20	0	6	86	0	670	10	613	33	201	907	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	0	86	670	0	10	646	0	201	925	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			3.6			3.6	
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	
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		6.0	8.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		36.0	36.0		10.5	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)		28.5		28.5	28.5		43.4	43.4		61.5	57.5	
Actuated g/C Ratio		0.28		0.28	0.28		0.43	0.43		0.62	0.58	
v/c Ratio		0.14		0.26	0.92		0.06	0.43		0.43	0.46	
Control Delay		1.6		27.8	33.0		22.4	22.5		12.6	14.1	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		1.6		27.8	33.0		22.4	22.5		12.6	14.1	
LOS		A		C	C		C	C		B	B	
Approach Delay		1.6			32.4			22.5			13.9	
Approach LOS		A			C			C			B	

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: 0.92			
Intersection Signal Delay: 21.4		Intersection LOS: C	
Intersection Capacity Utilization 90.1%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: Waterdown Rd & Masonry Crt

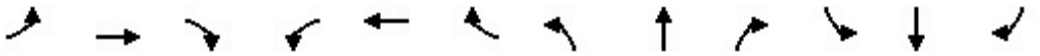




Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	26	86	670	10	646	201	925
v/c Ratio	0.14	0.26	0.92	0.06	0.43	0.43	0.46
Control Delay	1.6	27.8	33.0	22.4	22.5	12.6	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.6	27.8	33.0	22.4	22.5	12.6	14.1
Queue Length 50th (m)	0.0	12.6	55.0	1.3	51.0	18.8	60.2
Queue Length 95th (m)	0.0	25.2	#130.5	5.3	72.1	31.0	77.1
Internal Link Dist (m)	18.4		117.2		212.7		103.1
Turn Bay Length (m)		15.0		20.0		15.0	
Base Capacity (vph)	200	382	777	175	1496	514	2008
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	0.13	0.23	0.86	0.06	0.43	0.39	0.46

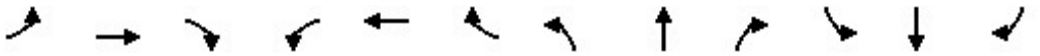
Intersection Summary

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	1697	0	0	1850	0	0	1725	0	0	1359	0
Flt Permitted		0.996			0.989			0.967				
Satd. Flow (perm)	0	1697	0	0	1850	0	0	1725	0	0	1359	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		141.2			139.2			344.6			48.9	
Travel Time (s)		10.2			10.0			24.8			3.5	
Confl. Peds. (#/hr)	3		2	2		3			3	3		
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 (%)	50%	3%	13%	0%	2%	0%	4%	0%	0%	0%	0%	57%
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 80.0%		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	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					3			2			3	
Lane Width (m)					3.6			3.6			3.6	
Walking Speed (m/s)					1.2			1.2			1.2	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		141										
pX, platoon unblocked				0.96			0.96	0.96	0.96	0.96	0.96	
vC, conflicting volume	722			244			1392	1378	224	1457	1402	722
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	722			192			1387	1373	170	1455	1398	722
tC, single (s)	4.6			4.1			7.1	6.5	6.2	7.1	6.5	6.8
tC, 2 stage (s)												
tF (s)	2.7			2.2			3.5	4.0	3.3	3.5	4.0	3.8
p0 queue free %	97			85			0	87	92	100	91	97
cM capacity (veh/h)	694			1336			89	116	840	74	112	347

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	694	1336	119	174
Volume to Capacity	0.03	0.15	2.20	0.12
Queue Length 95th (m)	0.8	4.1	178.2	3.2
Control Delay (s)	1.3	3.4	625.4	28.6
Lane LOS	A	A	F	D
Approach Delay (s)	1.3	3.4	625.4	28.6
Approach LOS			F	D

Intersection Summary				
Average Delay	114.8			
Intersection Capacity Utilization	80.0%	ICU Level of Service	D	
Analysis Period (min)	15			



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	16	26	583	24	44	915
Future Volume (vph)	16	26	583	24	44	915
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0		0.0	20.0	
Storage Lanes	1	0		0	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt	0.916		0.994			
Flt Protected	0.981				0.950	
Satd. Flow (prot)	1674	0	3518	0	1770	3539
Flt Permitted	0.981				0.950	
Satd. Flow (perm)	1674	0	3518	0	1770	3539
Link Speed (k/h)	50		50			50
Link Distance (m)	57.1		108.9			236.7
Travel Time (s)	4.1		7.8			17.0
Peak Hour Factor	0.92	0.92	0.98	0.92	0.92	0.96
Adj. Flow (vph)	17	28	595	26	48	953
Shared Lane Traffic (%)						
Lane Group Flow (vph)	45	0	621	0	48	953
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			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			Yes			Yes
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 35.3%		ICU Level of Service A	
Analysis Period (min) 15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	16	26	583	24	44	915
Future Volume (Veh/h)	16	26	583	24	44	915
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.98	0.92	0.92	0.96
Hourly flow rate (vph)	17	28	595	26	48	953
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			109			237
pX, platoon unblocked	0.86					
vC, conflicting volume	1180	310			621	
vC1, stage 1 conf vol	608					
vC2, stage 2 conf vol	572					
vCu, unblocked vol	884	310			621	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	96			95	
cM capacity (veh/h)	444	685			956	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	45	397	224	48	476	476
Volume Left	17	0	0	48	0	0
Volume Right	28	0	26	0	0	0
cSH	569	1700	1700	956	1700	1700
Volume to Capacity	0.08	0.23	0.13	0.05	0.28	0.28
Queue Length 95th (m)	2.1	0.0	0.0	1.3	0.0	0.0
Control Delay (s)	11.9	0.0	0.0	9.0	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	11.9	0.0		0.4		
Approach LOS	B					

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX I

Signal 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	2029 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

TRAFFIC & PEDESTRIAN VOLUMES

Hour Ending	Main 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 Peak Hour	4	1038	37	77	194	0	**1350**	98	2	364	0	13	18	**495**		
PM Peak Hour	19	158	38	158	582	0	**955**	143	12	57	0	8	9	**229**		
Total	**23**	**1196**	**75**	**235**	**776**	**0**	**2305**	**241**	**14**	**421**	**0**	**21**	**27**	**724**	**0**	**0**

Parameter	AM	PM	Average Hourly Volume (AHV)
Vehicle volume, all approaches	1845	1184	757
Vehicle volume, along minor street	495	229	181
Vehicle volume, along major street	1350	955	576
Combined vehicle and pedestrian volume crossing from minor streets	111	155	67

NOTES

1. The traffic control signal justification was done as per criteria defined in Ontario Traffic Manual, Book: 12 (March 2012) Justification 7 - Projected Volumes.

	AM	PM
2. Traffic crossing MAJOR street defined as:		
a. Left turns from both minor street approaches	98	143
b. The heaviest through volume from the minor street	13	12
c. 50% of the heavier left turn movement from the major street when both of the following are met:	0	0
1. the left turn volume > 120	No	Yes
2. the left turn volume + opposing volume > 720	Yes	No
d. Pedestrians crossing the major street	0	0

3. Justifications 1 and 2 are required to be met to 120% in the case of an existing intersection and 150% in the case of a new intersection
4. For 'T' intersection, the threshold values to be increased by 50%

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	2029 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			**757**	105%	105%	No
B. Vehicle volume, along minor streets		170			**181**	106%	106%	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			**67**	89%	89%	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 2029 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 J

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%