

**TRANSPORTATION IMPACT STUDY
& PARKING JUSTIFICATION STUDY**

**109, 115 & 133 BRIDGEPORT ROAD EAST AND
30-32 WEBER STREET NORTH**

**CITY OF WATERLOO
REGION OF WATERLOO**

PREPARED FOR:

115 BRIDGEPORT INC. (SCHEMBRI GROUP)

PREPARED BY:

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JUNE 2022

UPDATED APRIL 2023

UPDATED DECEMBER 2023

CFCA FILE NO. 2217-6286

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Revision Number	Date	Comments
Rev.0	June 2022	Issued for Submission
Rev.1	April 2023	Issued for SPA Submission
Rev.2	December 2023	Issued for ZBA & OPA Submission

Executive Summary

C.F. Crozier & Associates Inc. (Crozier) has been retained by 115 Bridgeport Inc. (the Applicant) to prepare a Transportation Impact Study (TIS) in support of the Zoning By-Law Amendment (ZBA) and Official Plan Amendment (OPA) applications for the site located at 109, 115, & 133 Bridgeport Road East and 30-32 Weber Street North, in the City of Waterloo.

The subject lands, located in a mixed residential and commercial neighbourhood, cover an area of approximately 1.25 ha and currently consist of an existing car dealership, furniture store, and undeveloped areas on the 115 Bridgeport Road East property and existing residential dwellings on the 133 Bridgeport Road East property. The proposed development consists of three residential towers atop a shared 6-storey podium. There is also a separate building which has 8 floors of parking. There are 706 residential units and 644 m² gross floor area of retail. This development provides a total of 619 vehicle parking spaces and 522 bicycle parking spaces.

Under 2022 existing conditions, all study intersections operate with a Level of Service of "C" or better with no movements over capacity or queuing concerns.

Scenarios 1 and 2 were presented to consider the roadway impacts of the site with and without reconfiguration of Bridgeport Road East and Erb Street East, respectively. Scenario 2 includes the removal of one lane for both roads. The Future Background and Future Total intersection analyses have been conducted with the scenarios.

The trips expected to generate are 191 two-way (69 inbound and 122 outbound) trips during the A.M. peak hour and 253 two-way (139 inbound and 114 outbound) trips during the P.M. peak hour.

Under Future Background and Future Total conditions during the 2027 horizon year for Scenario 1 and 2, all the intersections are expected to operate with a Level of Service "C" or better. There are no queuing issues.

There is minimal change in traffic operations between the Future Background and Future Total conditions. This indicates that the site generated traffic does not materially impact the operations at the surrounding intersections.

The proposed site accesses meet the TAC GDGCR requirements for sight distance, corner clearance and access spacing.

When applying the RMU-81 rates only to the site, the proposed parking supply would only be in a deficit of 33 spaces, approximately 5% deficit of the Zoning By-Law requirement. Considering the opportunities for Transportation Demand Management measures have been provided at the site per the Checklist per Region of Waterloo guidelines. A total parking supply of 619 spaces can be justified and supported for the proposed development.

The site provides a variety of Transportation Demand Management measures such as pedestrian connectivity at the site access, proximity to public transit, reducing parking demand, and trip reduction incentives. The Checklist per Region of Waterloo guidelines was completed, which provides a list of strategies and measures for the site which would reduce the number of trips. Completing the list resulted in 43% reduced trips at the proposed development.

In conclusion, the proposed mixed-use residential and commercial development at 109, 115, & 133 Bridgeport Road East and 30-32 Weber Street North can generally be supported from a transportation perspective.

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1.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) has been retained by 115 Bridgeport Inc. to prepare a Transportation Impact Study in support of the Zoning By-Law Amendment (ZBA) and Official Plan Amendment (OPA) applications for the site located at 109, 115 & 133 Bridgeport Road East and 30-32 Weber Street North, in the City of Waterloo.

The purpose of this Transportation Impact Study (TIS) is to assess the impacts of the proposed development on the surrounding road network and to recommend any mitigation measures, if warranted. This study analyzes the existing operations of the study road network, estimates the vehicular trips from the proposed development and growth from surrounding developments, and assesses the impact of these additional vehicle trips on the future traffic operations on the road network.

The study has been completed in accordance with the agreed upon Terms of Reference (TOR) submitted to the City of Waterloo and the Region of Waterloo as well as in general conformance with the Region's TIS Guidelines. The Terms of References for the study can be found in the relevant correspondence include in Appendix A.

2.0 Development Proposal

The proposed development consists of three residential towers atop a shared 6-storey podium rising to 35 (Building A), 24 (Building B) and 19 (Building C) floors, respectively. The 6-storey podium includes residential units, commercial land uses, and landscaped rooftop amenities. There is also a separate building (Building D) which has 8 floors of parking. This development provides a total of 619 parking spaces.

The full build out is expected to occur in 2027. The Site Plan dated November 27, 2023, prepared by Bridgeport & Weber outlines the detailed site statistics of the development proposal as shown in **Figure 1. Table 1** outlines the development breakdown for each building.

Table 1: Proposed Development Breakdown

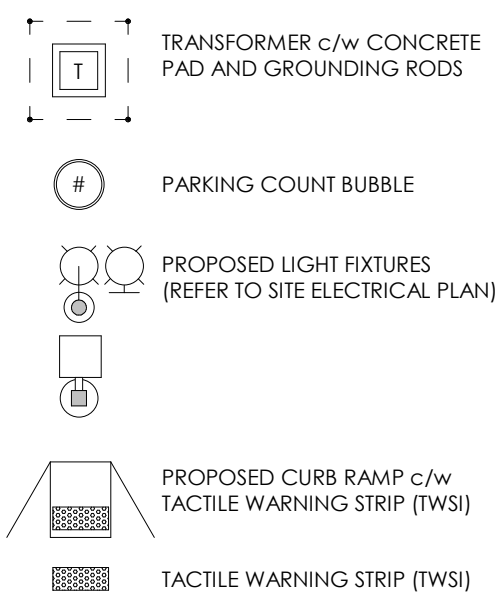
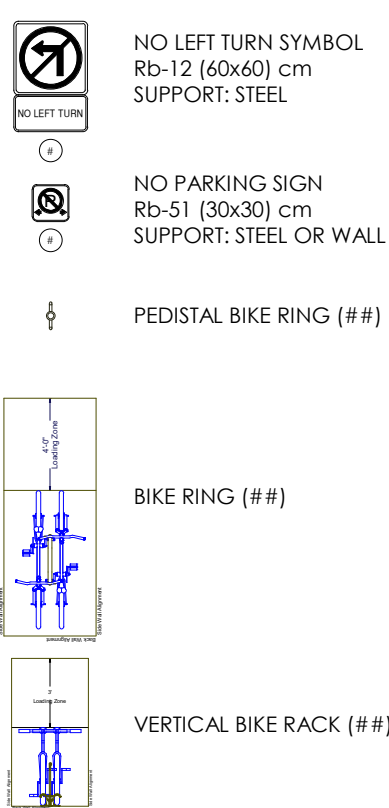
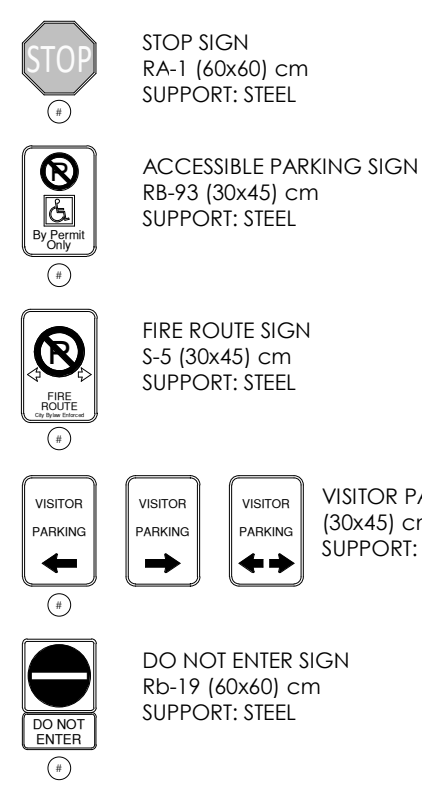
Building	Stories	GFA (ft ² / Units)
Podium	6 stories	153 units
A	29 stories ¹	274 units
B	18 stories ¹	162 units
C	13 stories ¹	117 units
Total Residential Units		706 units
First Floor Commercial		6,927 ft²

Note 1: The 6 storey Podium Building is shared between the three residential towers bringing the total storey count to 35, 24, and 19 stories in Building A, B, and C respectively.

There are three full moves site accesses proposed at this site, two would be via Bridgeport Road East and one would be via Royal Street. Both accesses via Bridgeport Road East are full-moves accesses, the Royal Street Accesses is a restricted right-in/left-in/right out access. 619 vehicle parking spaces and 522 bicycle parking spaces are proposed to facilitate the development.

The most recent Site Plan prepared by Bridgeport & Weber (dated November 27, 2023) is included in **Figure 1**.

	EXISTING HYDRO POLE
	EXISTING HYDRO POLE
	EXISTING SIGN
	EXISTING BELL BOX
	CATCHBASIN
	MANHOLE
	EXISTING STANDARD IRON BAR
	ENTRANCE ARROW
	FIRE DEPARTMENT CONNECTION
	FIRE HYDRANT
	BARRIER FREE PARKING SPACE
	FLUSH CURBING (FC)
	CONCRETE CURB
	PROPERTY LINE
	PROPOSED FENCE
	LANDSCAPED AREA
	CONCRETE AREA



1. LEGAL DESCRIPTION:
2. SITE INFORMATION TAKEN FROM ACI SURVEY
3. FOR SITE GRADING, SERVICES & STORM WATER MANAGEMENT REFER TO DRAWINGS PREPARED BY CROZIER
4. CONSULTING ENGINEERS
5. FOR LANDSCAPE WORK REFER TO DRAWINGS PREPARED BY MHBC CONSULTANTS
6. FOR SITE LIGHTING REFER TO DRAWINGS PREPARED BY MIGHTON ENGINEERING
7. ALL ROADS & ISLANDS SHALL HAVE 150mm CURBS UNLESS NOTED OTHERWISE.
8. CURB RADIUS = 120m UNLESS OTHERWISE DIMENSIONED.
9. STANDARD PARKING STALLS TO BE 2.8m x 5.5m. BARRIER FREE PARKING STALLS TO MEET CITY OF WATERLOO
10. REQUIREMENTS FOR TYPE 'A' (3.4m x 5.5m) AND TYPE 'B' (2.4m x 5.5m) INCLUDING ALL APPLICABLE ACCESS ASSES (1.5m
11. WIDE)
12. ALL OUTDOOR LIGHTING MUST BE FULL CUT-OFF AND HAVE NO GLARE.
13. TREE PROTECTION FENCING SHOULD BE ERRECTED AROUND ALL EXISTING LANDSCAPED AREAS AND SHOULD REMAIN ON
14. SITE FOR THE DURATION OF THE CONSTRUCTION
15. ALL ROOF-TOP EQUIPMENT TO BE SCREENED AND/OR LOCATED SO THAT IT CANNOT BE VIEWED FROM THE STREET.
16. SIGNAGE (BUILDING, PYLON & OTHERWISE) NOT APPROVED VIA THE SITE PLAN APPROVAL PROCESS.
17. THERE WILL BE NO OUTDOOR STORAGE OF ANY ITEMS ON SITE.
18. ALL GARBAGE TO BE STORED INTERNALLY AND ROLLED OUT FOR PICKUP.
19. LIGHT FIXTURES & BOLLARDS ARE NOT TO OBSTRUCT PEDESTRIAN MOVEMENT.
20. ALL SITES TO BE REMOVED FROM SITE.
21. LIGHTING IN PARKING GARAGE TO BE RECESSED AND MUST NOT SPILL OUT. SHOULD NOT "GLARE" OVER TO STREET OR
22. PROPERTIES NOR SHOULD THE LIGHTING BE VISIBLE FROM THE STREET.

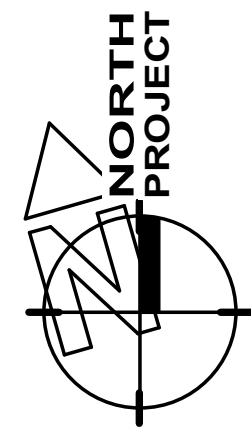
Diagram illustrating the dimensions for a single side rack and a double side rack.

Single Side Rack Dimensions:

- ACCESS AISLE WIDTH: 1750
- LENGTH (SINGLE SIDE RACK): 2000
- WIDTH: 600

Double Side Rack Dimensions:

- ACCESS AISLE WIDTH: 1750
- LENGTH (DOUBLE SIDE RACK): 3000
- WIDTH: VARIES



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CHRONOLOGY	DATE

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115 BRIDGEPORT INC.

PROJECT NAME

BRIDGEPORT & WEBER
115 & 133 BRIDGEPORT RD. E., WATERLOO

DRAWING TITLE

SITE PLAN

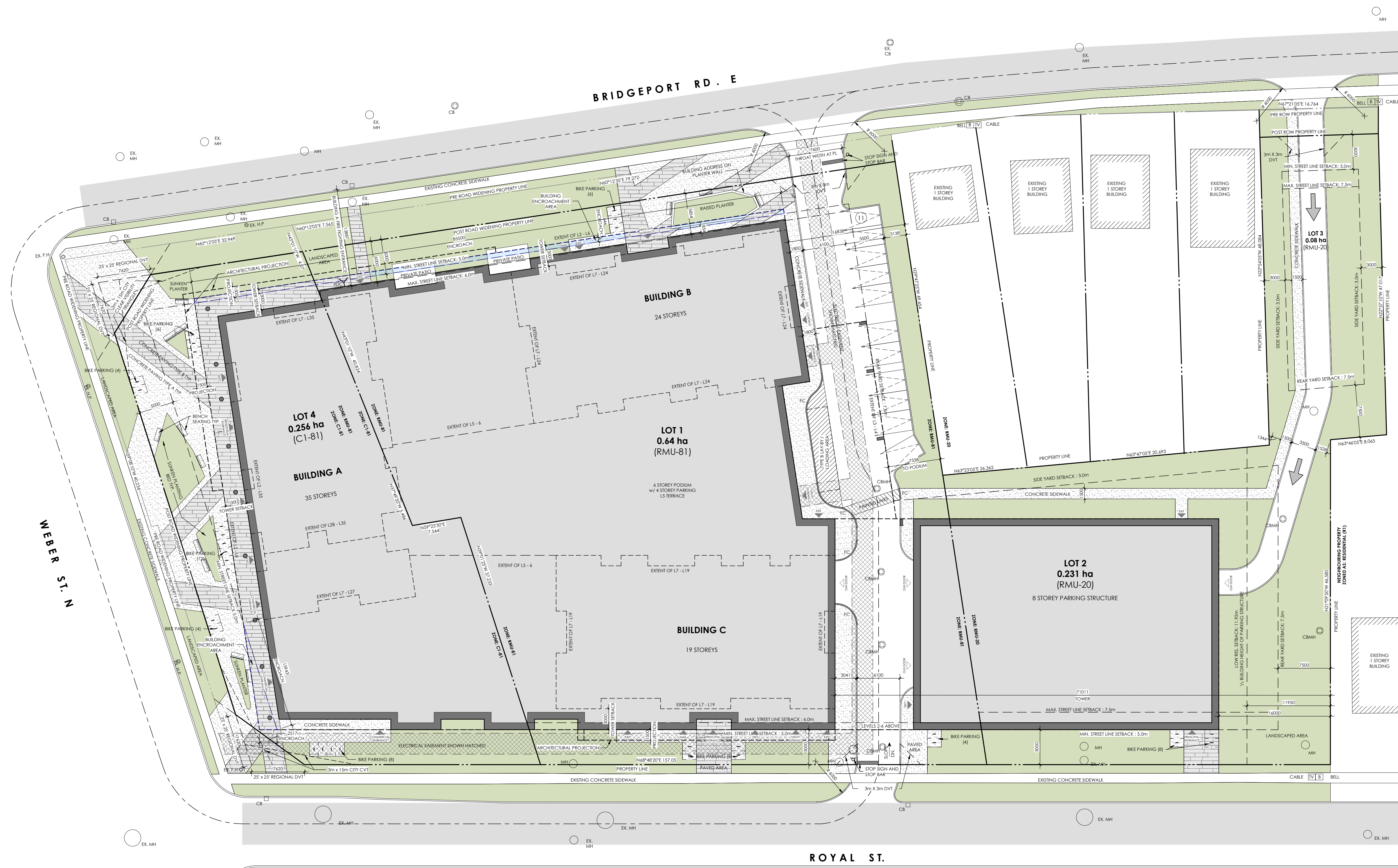
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3.0 Existing Conditions

The subject lands cover an area of approximately 1.25 ha and currently consists of an existing car dealership, furniture store, and undeveloped areas on the 115 Bridgeport Road East property and existing residential dwellings on the 133 Bridgeport Road East property. The properties, located in a mixed residential and commercial neighborhood, are bounded by Bridgeport Road East to the north, existing residential dwellings to the east, Royal Street to the south, and Weber Street North to the west.

3.1 Study Road Network

3.1.1 Study Roadways

Weber Street North (Regional Road 8) is classified as a Regional Arterial roadway in the City of Waterloo Official Plan Road Classification System Schedule 'E.' It is a four-lane roadway with pedestrian facilities on each side of the road. The posted speed limit on this roadway is 60 km/hr.

Bridgeport Road East (Regional Road 9) is classified as a Regional Arterial roadway in the City of Waterloo Official Plan Road Classification System Schedule 'E.' Bridgeport Road East is a one-way 3-lane roadway with traffic moving westbound. Bridgeport Roadway East has an assumed speed limit of 50 km/hr.

Erb Street East (Regional Road 9) is classified as a Regional Arterial roadway in the City of Waterloo Official Plan Road Classification System Schedule 'E.' Erb Street is a one-way 3-lane roadway with traffic moving eastbound towards Bridgeport Road. Erb Street has a posted speed limit of 50 km/hr.

Royal Street is classified as a local roadway in the City of Waterloo Official Plan Road Classification System Schedule 'E.' Royal Street is a 2-lane roadway with an assumed speed limit of 50 km/hr, with sidewalks on each side of the road.

Based on Region of Waterloo's Regional Roads by Road Number (November 2021), both Erb Street and Bridgeport Road East are considered Regional Road 9 in the study report.

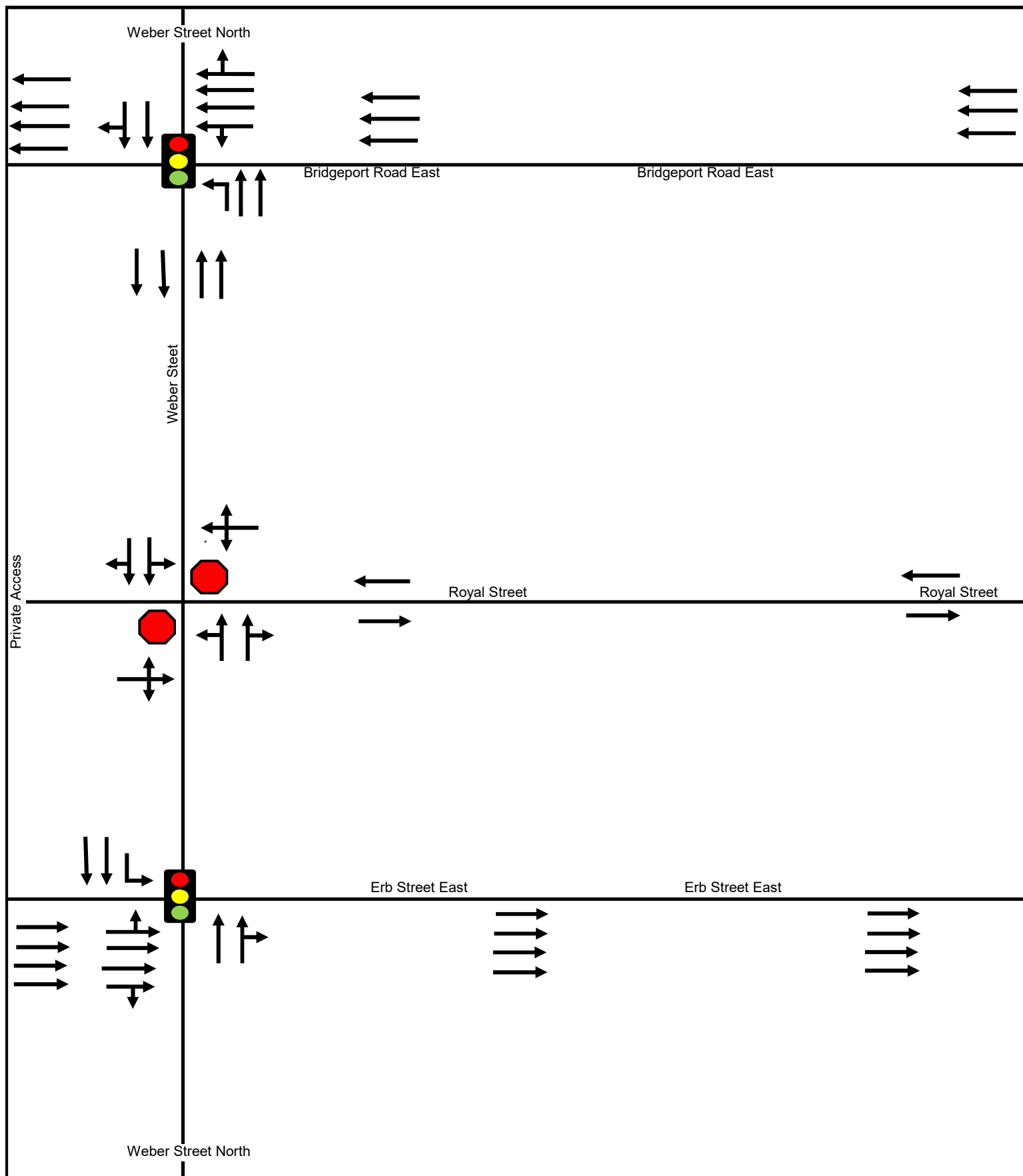
The existing 2022 lane configurations are shown in **Figure 2**.

3.1.2 Study Intersections

Bridgeport Road East and Weber Street North is a four-legged signalized intersection, however the traffic along Bridgeport Road East travels in the westbound direction only, with no eastbound approach. The westbound approach on Bridgeport Road East consists of a single through/right-turn lane, two through lanes and a single through/left-turn lane. Weber Street north has storage lanes on both the north and south approaches, with dedicated left-turns. The south approach has three lanes, and the north approach has two with an island in the middle. This intersection has pedestrian crossings on all sides.

Weber Street North and Royal Street is a three-legged intersection, with Royal Street as the minor street with an east approach and stop controlled. There is a pedestrian crossing across Royal Street.

Weber Street North and Erb Street East is a four-legged signalized intersection, however the traffic along Erb Street East travels in the eastbound direction only, with no westbound approach. The traffic along Erb Street moves eastbound and makes southbound and northbound turns. Weber Street north has storage lanes on both the north and south approaches. This intersection has pedestrian crossings on all sides.



3.2 Public Transit

The site is currently served by Grand River Transit (GRT), a public transport operator in the Region Municipality of Waterloo, Ontario. **Table 2** outlines the transit routes that are available in the study area.

Table 2: Transit Routes

Route Name	Route	Route No.	Nearest Bus Stop(s) to Site	Approximate Service Times		Headway Time (min)
				Weekdays	Weekends	
GRT- Daniel/Bloomingtondale	Begins at Boardwalk Station and ends at Daniel/Bloomingtondale	5	Weber Street North and Erb Street Weber Street North and Bridgeport Road	5:37 A.M. – 11:10 P.M.	6:05 A.M. – 10:40 P.M. (Saturday)	30 mins
GRT- Central Station	Begins at King/University and ends at Central Station	8	Weber Street North and Erb Street Weber Street North and Royal Street	5:38 A.M. – 11:44 P.M.	6:15 AM - 11:44 PM (Saturday) 7:27 AM - 11:44 PM (Sunday)	30 mins
GRT-Conestoga Station	Begins at Boardwalk Station and ends at Conestoga Station	29	Lincoln Road and Weber Street North	12:25 A.M. – 11:45 P.M. (Monday) 5:35 A.M. – 11:45 P.M. (Friday)	8:55 A.M. – 11:25 P.M. (Sunday)	30 min
GRT- ION Light Rail	Conestoga station in Waterloo and Fairway station in Kitchener	N/A	Willis Way Station	5:10 A.M. to 12:23 A.M.	5:40 to 12:14 A.M. (Saturday) 6:40 -12:40 A.M. (Sunday/Holiday)	10 min

Appendix B contains relevant transit information.

3.3 Traffic Data

According to the Terms of Reference established with the City and Region, new traffic count data was collected for the site from a specialty traffic counting firm, Spectrum Traffic Inc. Data was collected for the study intersections on April 27, 2022, during the peak hour periods of 8:00 – 9:00 A.M. (A.M. peak) and 4:30 – 5:30 P.M. (P.M. peak).

Signal Timing Plans were obtained from the Region of Waterloo. The signal timing plan for the intersection of Weber Street and Bridgeport was prepared on March 10, 2022. The signal timing plan for the intersection of Weber Street and Erb Street was prepared on March 10, 2022.

The detailed traffic movement count data and signal timing plans can be found in Appendix C.

3.4 Traffic Modelling

The assessment of intersections is based on the method outlined in the "Highway Capacity Manual, 2010" using Synchro 11 modeling software. Intersections are assessed using a Level of Service (LOS) metric, with ranges of delay assigned a letter from "A" to "F".

A Level of Service "A" or "B" would typically be measured during off-peak hours when lesser traffic volumes are on the roadways resulting in no, or minor delays for vehicles travelling through these intersections. Levels of Service "C" through "F" are often measured in the commuter peak hours when greater vehicle volumes cause longer wait times resulting in longer travel times. The Level of Service (LOS) definitions for signalized and stop control intersections is included in Appendix D.

Peak hour factors were calculated based on the provided data, and then were applied to Synchro. They ranged between 0.85 to 0.97.

The Region's TIS Guidelines provide the following criteria for identifying critical intersection operations requiring mitigation measures:

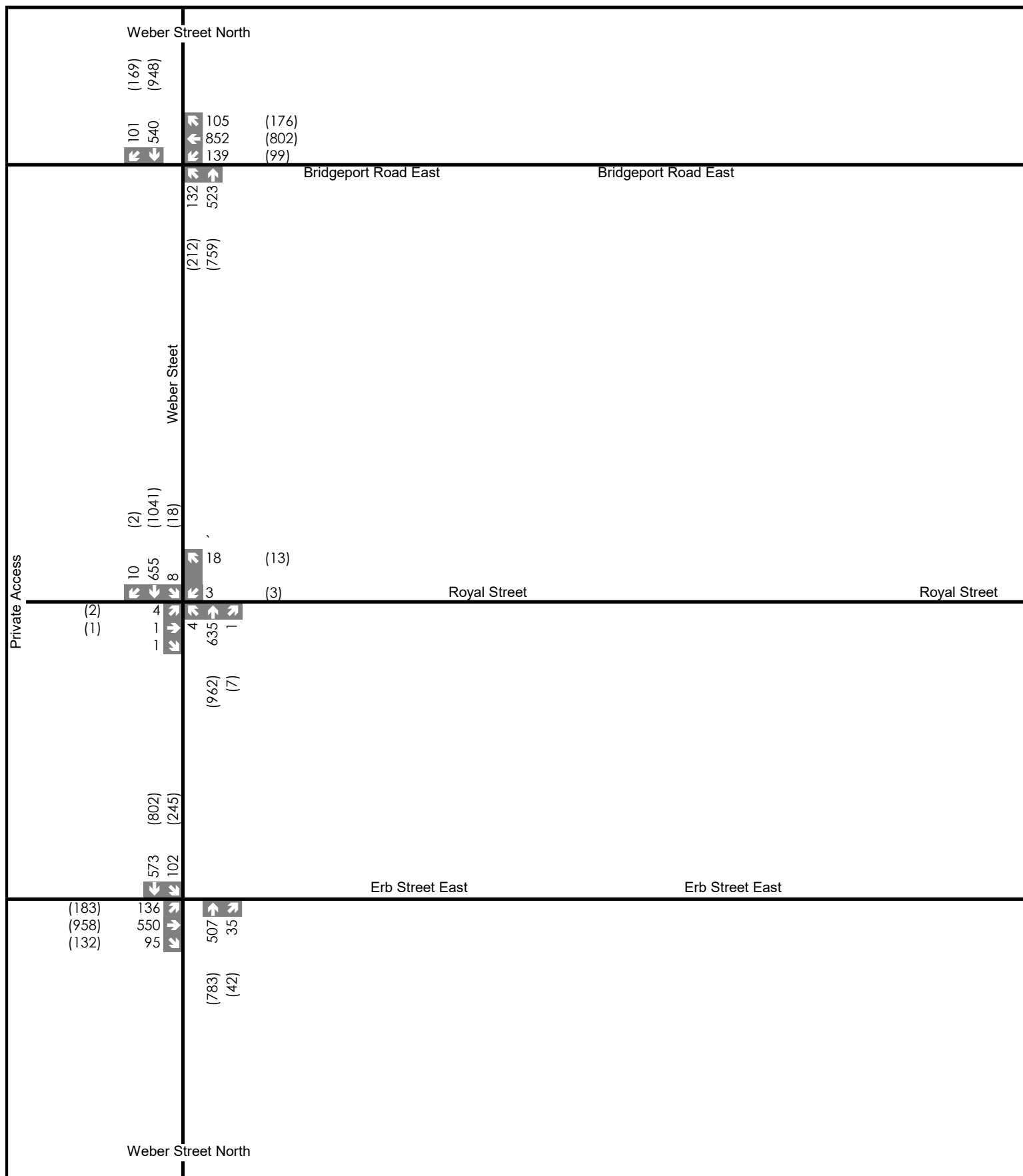
- Overall Level of Service of E or F (i.e. average control delay per vehicle greater than 55 seconds) for signalized intersections.
- Overall Level of Service E or F (i.e. average control delay per vehicle greater than 35 seconds) for unsignalized intersections.

The criteria for identifying the critical movements are:

- The average control delay for individual movements is greater than 55 seconds.
- The estimated 95th percentile queue length for an exclusive movement exceeds the available storage space.
- Estimated 95th percentile queue length for an individual movement will block an existing access.
- Exclusive turning lanes are inaccessible because of queue lengths in adjacent through lanes.
- Poor quality of service for non-auto modes.

3.5 Intersection Operations

The 2022 existing traffic volumes at the study intersections were analyzed based on observed traffic volumes during the weekday A.M. and P.M. peak hours, as illustrated in **Figure 3**. Detailed capacity analyses are included in Appendix E. **Table 3** summarizes the existing traffic operations within the study area.



Legend

xx A.M. Peak Hour Traffic Volumes
 (xx) P.M. Peak Hour Traffic Volumes

**109, 115 & 133 Bridgeport Rd. E
 & 30-32 Weber St. N**

2022 Existing Traffic Volumes



Figure 3

Project No. 2217-6286
 Date. December 15, 202
 Analyst. TDS

Table 3: Existing Level of Service

Intersection	Control	Peak Hour	Level of Service ¹	Control Delay	Critical v/c ratio ²	95 th Percentile Queue Length > Storage Lane Length
Bridgeport Road East and Weber Street North	Signal	A.M.	C	20.5 s	0.62 (WBT)	None
		P.M.	C	25.7 s	0.90 (SBT)	None
Weber Street North and Royal Street	Stop Control (Minor)	A.M.	B	13.5 s	0.20 (NBT)	None
		P.M.	B	14.9 s	0.32 (SBT)	None
Weber Street North and Erb Street East	Signal	A.M.	B	16.0 s	0.42 (EBT)	None
		P.M.	C	24.5 s	0.89 (SBL)	None

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle. Existing Signal Timings provided by the City of Waterloo were used.

Note 2: The critical movements at the intersection would be greater than 55 seconds. They are outlined and highlighted.

As indicated above, the intersection of Bridgeport Road East and Weber Street North currently operates with a Level of Service of "C" in the A.M. peak hour period and during the P.M. peak hour period. The volume to capacity ratio of 0.90 for the southbound through movement is likely a result of through traffic relying on the one through lane behind right-turning vehicles which could potentially limit movement in the through lane.

The intersection of Weber Street North and Royal Street currently operates with a Level of Service of "B" in the A.M. peak hour and with a Level of Service of "C" in the P.M. peak hour.

The intersection of Weber Street North and Erb Street East operates with a Level of Service of "B" in the A.M. peak hour and with a Level of Service of "C" during the P.M. peak hour.

All movements operate under capacity with no queueing concerns.

4.0 Future Background

Future Background conditions refer to traffic conditions incorporating expected growth, development and improvements within the surrounding intersections occurring within the study horizons, outside of the development proposal.

4.1 Study Horizons

As confirmed with the Region of Waterloo, a five-year horizon from the date of the TIS (2027) was selected to assess the impacts of the proposed development.

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.

4.2 Growth Rate & Study Scenarios

The Region of Waterloo confirmed to use a background growth rate of 1% for Royal Street, Bridgeport Road and for Erb Street. A background growth rate of 0.5% for Weber Street was also confirmed for use.

During consultation with the Region of Waterloo, it was identified that a through lane is expected to be removed along Bridgeport Road East as well as along Erb Street East (to provide space for future cycling lanes) which may impact the operations of the future study road network. As such, two scenarios have been considered to model roadway operations for the 2027 horizon.

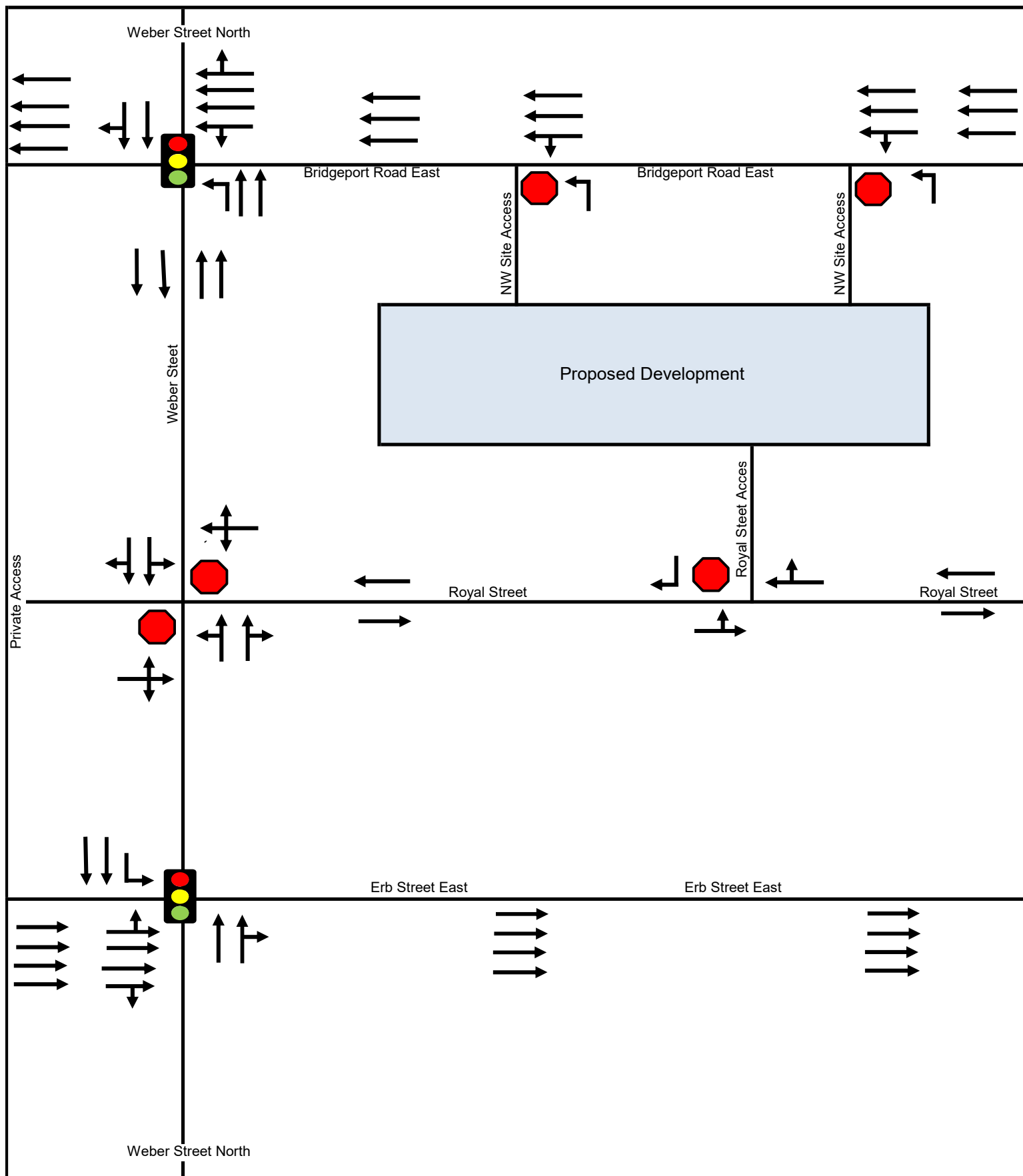
- Scenario No. 1 does not consider the reconfiguration of Bridgeport Road East and Erb Street East.
- Scenario No. 2 removes one through lane along each of Bridgeport Road East and Erb Street East and the signal timing plans have been optimized to reflect this reconfiguration.

The lane configurations in the 2027 horizon year under "Scenario No. 1 conditions" are shown in **Figure 4**, the lane configurations in the 2027 horizon year under "Scenario No. 2 conditions" are shown in **Figure 5**.

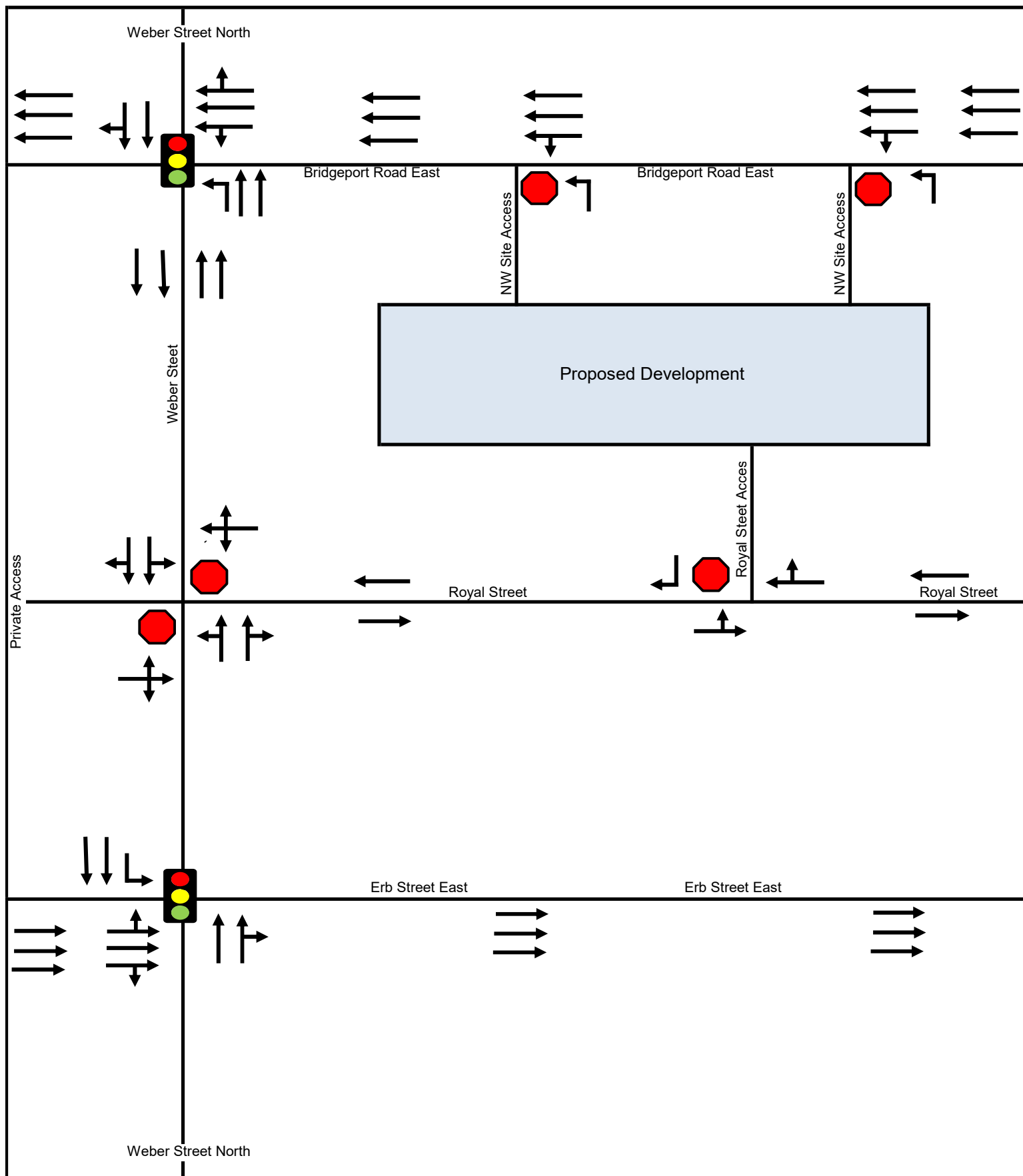
4.3 Future Changes

4.3.1 Transit Projects

According to The Region of Waterloo Central Transit Corridor (CTC) strategy, there are planned improvements to the current transit transportation network. The ION LRT project is split into two phases. The first phase was completed in 2019, and the second phase is expected to start in 2025. The second phase of the project continues building the LRT line from Kitchener to Cambridge. Through the development of the CTC, it is anticipated that there will be a parking reduction in some areas.



Legend  Signalized Intersection  Stop-Controlled Intersection	109, 115 & 133 Bridgeport Rd. E & 30-32 Weber St. N 2027 Scenario No.1 Lane Configurations	 CROZIER CONSULTING ENGINEERS	Figure 4 Project No. 2217-6286 Date. December 15, 2021 Analyst. TDS
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4.3.2 Roadway Reconfiguration

According to the Region of Waterloo Moving Forward 2018 Transportation Master Plan, there are Road Diet Projects planned for the horizons between 2019 to 2031, 2031 to 2041, and 2041 and beyond.

For the planning horizon of 2019-2031, Bridgeport Road/Caroline Street North is to undergo road diet between Highway 85 and Erb Street West. Road diets involve a reduction in travel lanes, to accommodate other transportation infrastructure such as cycling facilities, enhanced pedestrian space or dedicated transit lanes.

During consultation with the Region of Waterloo, lane reduction projects along Bridgeport Road East and Erb Street East are planned to replace vehicle lanes with bicycle lanes.

4.4 Intersection Operations

The 2027 Future Background traffic volumes are illustrated in **Figure 6**. Levels of Service (LOS) based on Future Background operations are outlined in **Table 4** and **Table 5**, respectively. Appendix E contains the capacity analysis worksheets.

Table 4: Future Background Scenario No. 1 Conditions

Intersection	Control	Peak Hour	Level of Service ¹	Control Delay	Critical v/c ratio ²	95 th Percentile Queue Length > Storage Lane Length
Bridgeport Road East and Weber Street North	Signalized	A.M.	C	20.9 s	0.65 (WBT)	None
		P.M.	C	26.8 s	0.92 (SBT)	None
Weber Street North and Royal Street	Unsignalized	A.M.	B	13.9 s	0.23 (SBT)	None
		P.M.	C	16.0 s	0.33 (SBT)	None
Weber Street North and Erb Street East	Signalized	A.M.	B	16.5 s	0.44 (EBT)	None
		P.M.	C	25.9 s	0.94 (SBL)	None

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle. Existing Signal Timings provided by the City of Waterloo were used.

Note 2: The critical movements at the intersection would be greater than 55 seconds. They are outlined and highlighted.

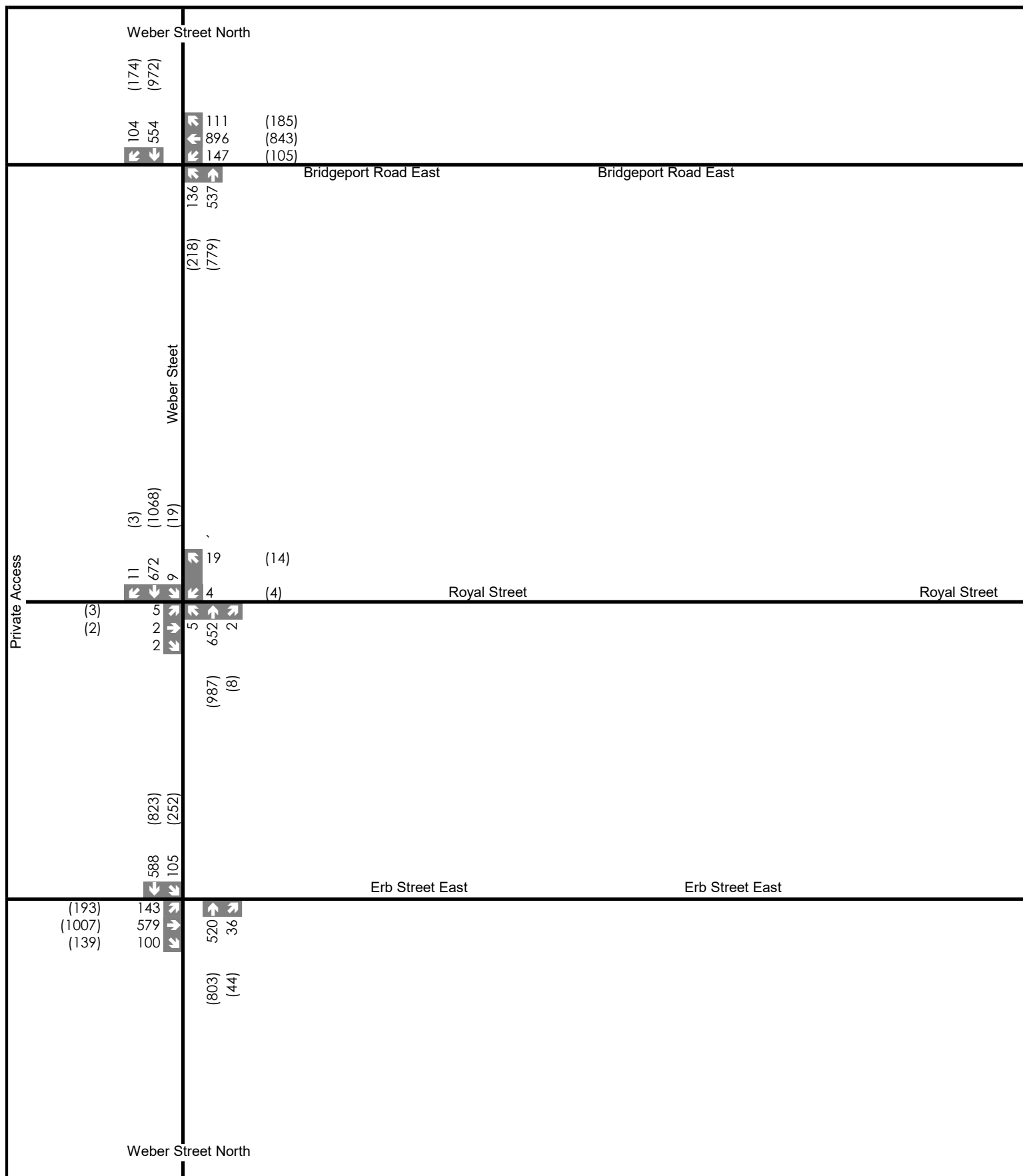


Table 5: Future Background Scenario No. 2 Conditions

Intersection	Control	Peak Hour	Level of Service ¹	Control Delay	Maximum v/c ratio ²	95 th Percentile Queue Length > Storage Lane Length
Bridgeport Road East and Weber Street North	Signalized	A.M.	C	23.4 s	0.82 (WBT)	None
		P.M.	C	29.1 s	0.94 (NBL)	None
Weber Street North and Erb Street East	Signalized	A.M.	B	17.2 s	0.56 (EBT)	None
		P.M.	C	28.8 s	0.94 (EBT)	None

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle. Existing Signal Timings provided by the City of Waterloo were used.

Note 2: The critical movements at the intersection would be greater than 55 seconds. They are outlined and highlighted.

Under Scenario No.1 conditions, the intersection of Bridgeport Road East and Weber Street North is expected to operate with a Level of Service of “C” in the A.M. peak hour period and the P.M. peak hour period for the 2027 Future Background horizon. As previously mentioned, the volume to capacity ratio of 0.92 for the southbound through lane is attributed to traffic relying on the shared through/right-turn lane along Weber Street North, where right-turning vehicles potentially limit the movement in the through lane. This intersection is expected to also be operating with a Level of Service of “C” during the A.M. and P.M. peak hour periods in Scenario No. 2. However, the volume-to-capacity ratio and control delay are expected to increase in Scenario No. 2 due to a lowered roadway capacity with less travel lanes.

The unsignalized intersection of Weber Street North and Royal Street is expected to operate with a Level of Service of “B” in the A.M. peak hour and with a Level of Service of “C” in the P.M. peak hour. This intersection is not analyzed separately for Scenario 2, as there is no expected road re-configuration relating to this intersection.

Under Scenario No. 1, the intersection of Weber Street North and Erb Street East is expected to operate with a Level of Service of “B” in the A.M. peak hour and with a Level of Service of “C” during the P.M. peak hour. In Scenario No. 2, the intersection is expected to operate with the same Level of Service as Scenario No.1 during the A.M. and P.M. peak hour periods. The volume-to-capacity ratio and control delay in Scenario are expected to increase.

5.0 Site Generated Trips

The proposed development will result in additional vehicles on the surrounding road network that would otherwise not exist. The development will also result in additional turning movements at the intersections. The following section outlines the transportation planning methodology and estimation of the trip generation, distribution, and assignment characteristics for site-generated traffic.

5.1 ITE Trip Generation

Site-generated traffic of the proposed development was calculated using the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition, using Land Use Category (LUC) 222 and 822 for the proposed Multi-family Housing High-Rise and Strip Retail Plaza respectively.

The forecasted unadjusted two-way trips are tabulated in **Table 6**. The details for each LUC including the average rate and the equation of fitted curved used are shown in Appendix F.

Table 6: ITE Trip Generation for the Proposed Development

	Parameter	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Multi-family Housing High-Rise (LUC 222) 706 Units	Equation	$T = 0.22(X) + 18.85$			$T = 0.26(X) + 23.12$		
	Net New Trips	59	115	174	116	91	207
Strip Retail Plaza (LUC 822) 6,927 ft ²	Rate (Trips/Units)	2.36			6.59		
	Net New Trips	10	7	17	23	23	46
Net New Trips		69	122	191	139	114	253

The trips expected to generate are 165 two-way (58 inbound and 107 outbound) trips during the A.M. peak hour and 209 two-way (116 inbound and 93 outbound) trips during the P.M. peak hour.

5.2 Trip Distribution and Assignment

Existing traffic data was used to estimate the peak hour trip distribution at the site, as confirmed with the Region and City of Waterloo. **Table 7** outlines the trip distribution for the proposed development divided into time and direction of travel. Existing traffic patterns from traffic movement counts were used to distribute the site generated trips to the boundary road network.

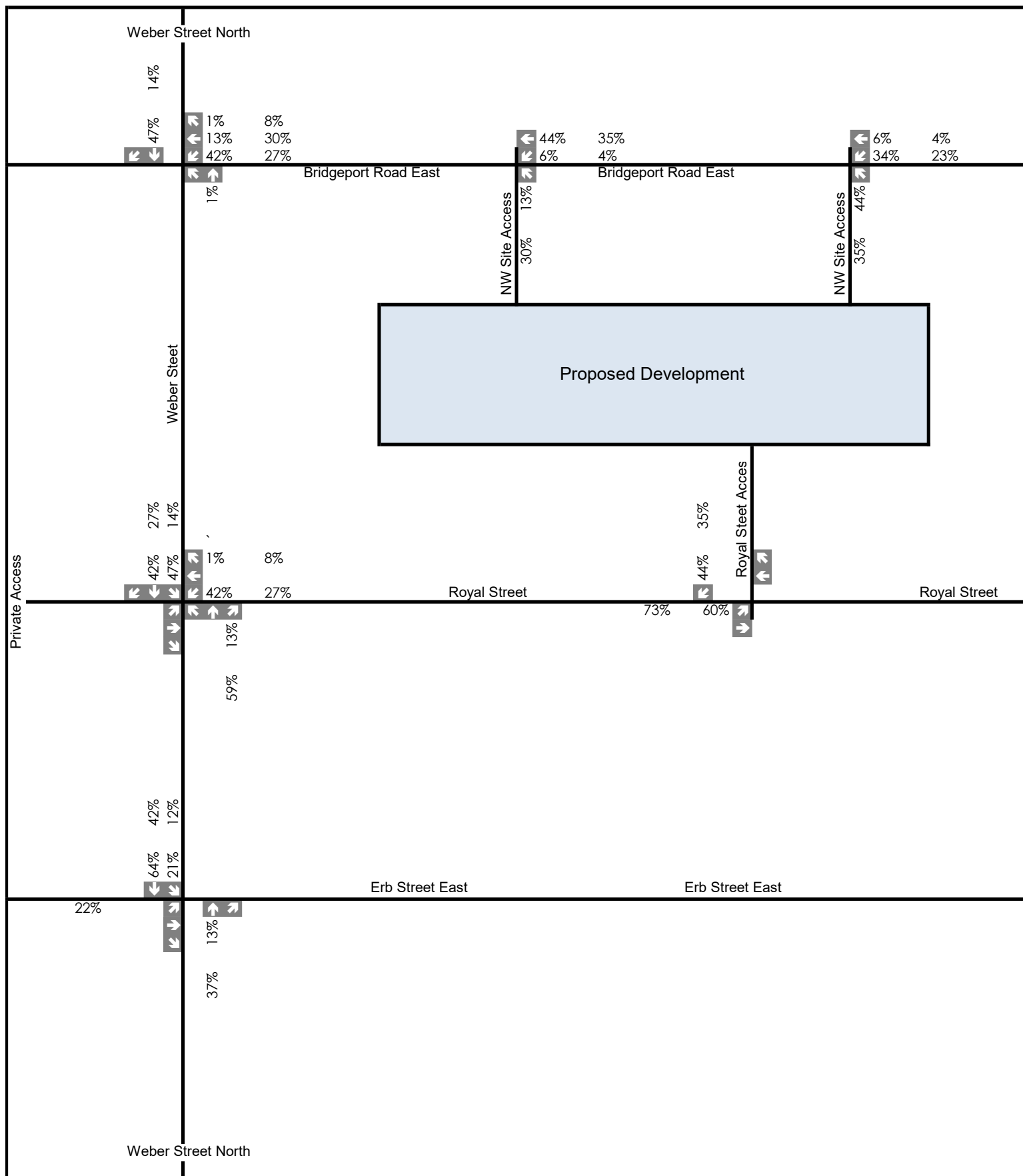
Figure 7 illustrates the assumed trip distribution for passenger vehicles. **Figure 8** shows the trip assignment for the vehicles at the proposed development.

Trips were distributed using the existing traffic data to the boundary road network based on the proposed site layout. **Table 7** provides the trip distribution for passenger vehicles.

Table 7: Trip Distribution for Passenger Vehicles

Distribution	A.M.		P.M.	
	Inbound	Outbound	Inbound	Outbound
North	47%	3%	13%	16%
South	13%	64%	37%	42%
East	40%	13%	28%	30%
West	0%	21%	22%	12%

Trip Distribution Data from Transportation Tomorrow Survey Results can be found in Appendix G.



Legend

xx A.M. Peak Hour Traffic Volumes
(xx) P.M. Peak Hour Traffic Volumes

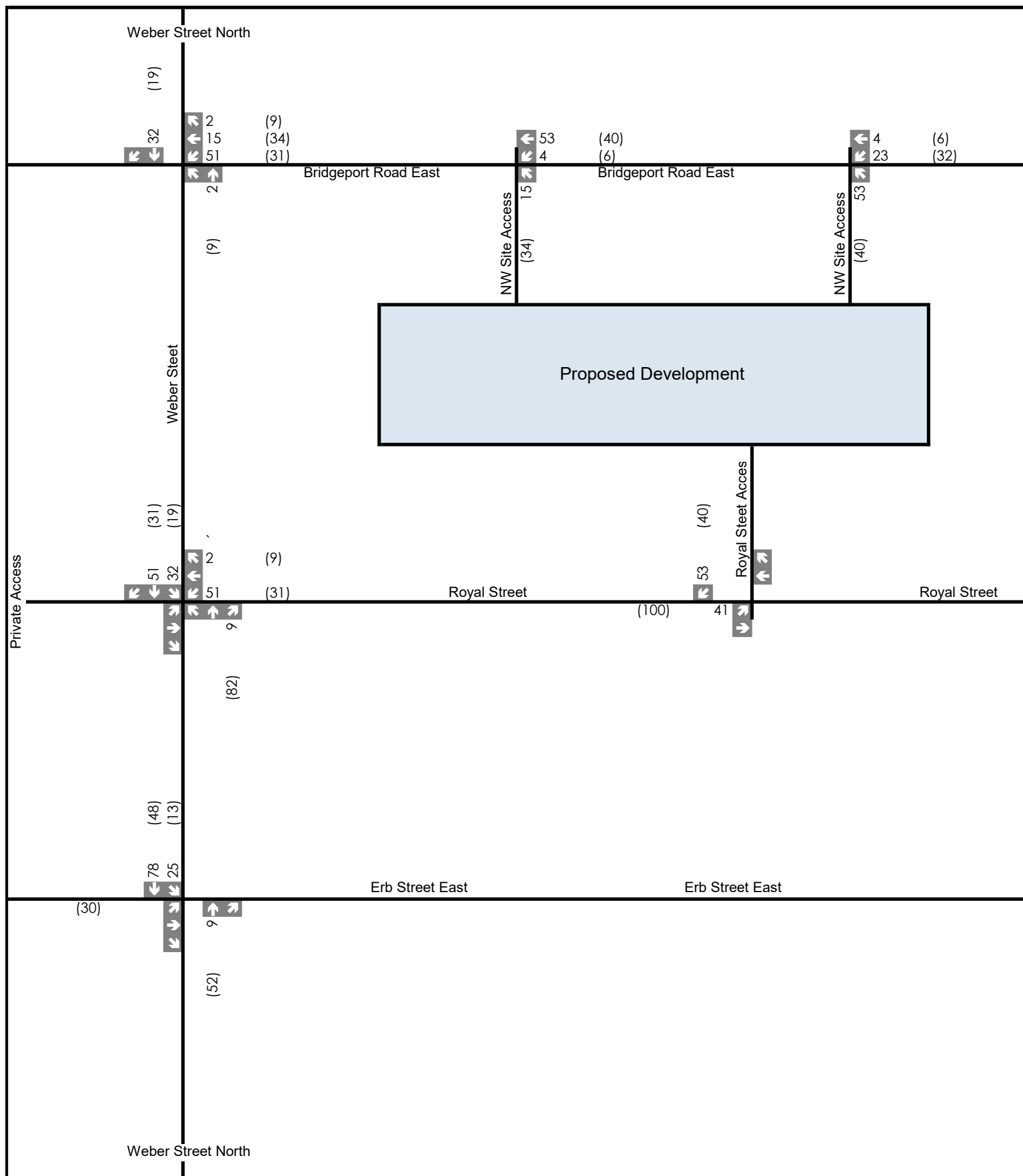
109, 115 & 133 Bridgeport Rd. E
& 30-32 Weber St. N

Site Generated Trip Distribution



Figure 7

Project No. 2217-6286
Date. December 15, 202
Analyst. TDS



Legend

xx A.M. Peak Hour Traffic Volumes
(xx) P.M. Peak Hour Traffic Volumes

109, 115 & 133 Bridgeport Rd. E
& 30-32 Weber St. N

Site Generated Trip Assignment



Figure 8

Project No. 2217-6286
Date. December 15, 202
Analyst. TDS

6.0 Future Total

6.1 Study Horizons

The horizon years remain the same as the Future Background scenario. Future Total 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.
- Site generated traffic.

The development proposed three site accesses, both accesses via Bridgeport Road East are full-moves accesses, the Royal Street Accesses is a restricted right-in/left-in/right out access.

6.2 Intersection Operations

The 2027 Future Total traffic volumes are illustrated in **Figure 9**. Levels of Service (LOS) based on Future Total traffic volumes are outlined in **Table 8** and **Table 9**. Appendix E contains the capacity analysis worksheets.

Table 8: Future Total Scenario No. 1 Conditions

Intersection	Control	Peak Hour	Level of Service ¹	Control Delay	Maximum v/c ratio ²	95 th Percentile Queue Length > Storage Lane Length
Bridgeport Road East and Weber Street North	Signalized	A.M.	C	21.6 s	0.69 (WBT)	None
		P.M.	C	27.7 s	0.93 (NBL)	None
Weber Street North and Royal Street	Unsignalized	A.M.	C	17.3 s	0.26 (WBT)	None
		P.M.	C	18.7 s	0.40 (NBT)	None
Bridgeport Road East & NE Access ³	Unsignalized	A.M.	B	12.9 s	0.11 (NBL)	None
		P.M.	B	12.7 s	0.09 (NBL)	None
Bridgeport Road East & NW Access ³	Unsignalized	A.M.	B	12.1 s	0.03 (NBL)	None
		P.M.	B	12.3 s	0.07 (NBL)	None
Royal Street & Site Access	Unsignalized	A.M.	A	8.6 s	0.06 (SBR)	None
		P.M.	A	8.5 s	0.07 (EBTL)	None
Weber Street North and Erb Street East	Signalized	A.M.	B	16.6 s	0.48 (EBT)	None
		P.M.	C	28.2 s	0.98 (SBL)	None

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle. Existing Signal Timings provided by the City of Waterloo were used.

Note 2: When the critical movements at the intersection would be greater than 55 seconds, they are outlined and highlighted.

Note 3: These intersections used HCM 6th Edition to display the results of the intersection analysis, as HCM 2000 was unable due to its limits with intersection configurations.

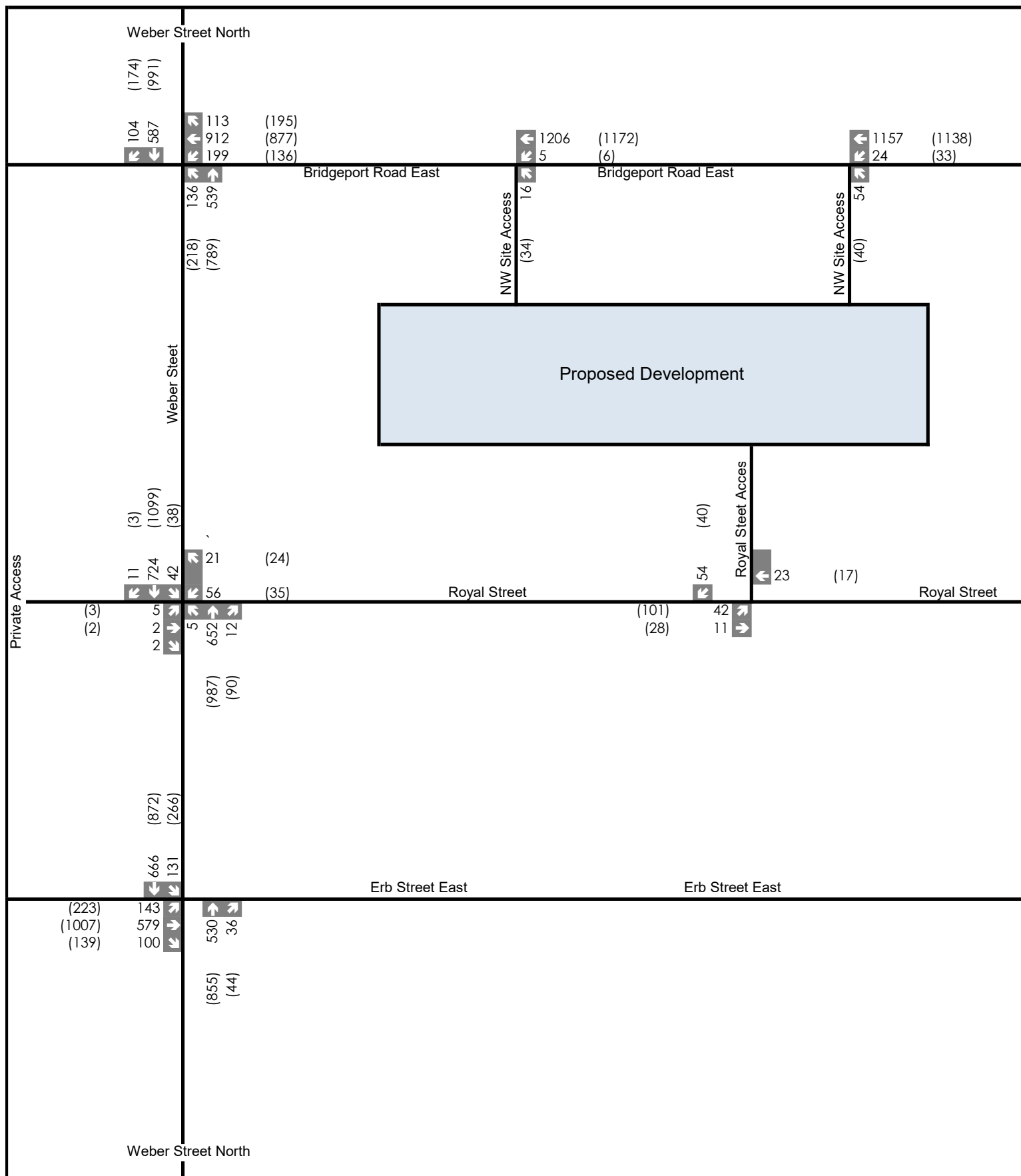


Table 9: Future Total Scenario No. 2 Conditions

Intersection	Control	Peak Hour	Level of Service ¹	Control Delay	Maximum v/c ratio ²	95 th Percentile Queue Length > Storage Lane Length
Bridgeport Road East and Weber Street North	Signalized	A.M.	C	25.0 s	0.87 (NBL)	None
		P.M.	C	30.1 s	0.94 (NBL)	None
Weber Street North and Erb Street East	Signalized	A.M.	C	30.5 s	0.95 (EBT)	None
		P.M.	C	31.5 s	0.98 (SBL)	None

Note 1: The Level of Service of a signalized intersection is based on the average control delay per vehicle. Existing Signal Timings provided by the City of Waterloo were used.

Note 2: When the critical movements at the intersection would be greater than 55 seconds, they are outlined and highlighted.

Under Future Total volumes with Scenario No.1 conditions, the intersection of Bridgeport Road East and Weber Street North is expected to operate with a Level of Service of "C" in the A.M. peak hour period and the P.M. peak hour period. This intersection is expected to also operate with a Level of Service of "C" during the A.M. and P.M. peak hour periods in Scenario No. 2. However, the volume-to-capacity ratio and control delay in Scenario No.2 are expected to increase due to vehicles relying on less lanes to travel.

The unsignalized intersection of Weber Street North and Royal Street is expected to operate with a Level of Service of "C" in the A.M. and P.M. peak hours. This intersection is not considered for Scenario 2, as there is no expected road re-configuration at this intersection.

The proposed site accesses are expected to operate with a Level of Service "B" or better during the A.M. and P.M. peak hour periods.

Under Scenario No.1, the intersection of Weber Street North and Erb Street East is expected to operate with a Level of Service of "B" in the A.M. peak hour and with a Level of Service of "C" during the P.M. peak hour. The volume-to-capacity ratio and control delay during the A.M. and P.M. peak hour periods are expected to increase under Scenario No.2 from Scenario No.1 due to reduced roadway capacity from the lane reductions. The volume-to-capacity is at 0.98 for the southbound left movement in the P.M. peak hour during Scenario 2. This is due to heavy reliance on the southbound left turn lane onto Erb Street, which has one-way movement.

7.0 Recommendations

The study intersections are expected to operate with acceptable delays and within capacity, as all the intersections are expected to operate with a Level of Service of "C" or better. As such, the proposed development can be supported from a transportation operations perspective.

It is recommended that the Region and City monitor the signal timings plans of the study intersections, given the expected re-configuration of roadways and traffic growth (external to the proposed development) which may potentially impact the operations of the surrounding road network.

8.0 Site Access Review

8.1 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 (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.
- 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 Geometric Design Guide for Canadian Roads (June 2017):

$$ISD = 0.278 * V_{major} * tg$$

Where;

ISD = Intersection Sight Distance

V_{major} = design speed of roadway (km/h)

tg = assumed time gap for vehicles to turn from stop onto roadway (s)

Table 10: Sight Distance Analysis

Feature	North-East Site Access 1 at Bridgeport Road East	North-West Site Access 2 at Bridgeport Road East	Site Access 3 at Royal Street
Access Type	Full-Movement	Full-Movement	Restricted Left-In/Right-In/Right-Out
Posted Speed Limit of Roadway	50 km/h	50 km/h	50 km/h
Assumed Design Speed	60 km/h	60 km/h	60 km/h
Base Time Gap ¹	6.5 s (right) 7.5 s (left)	6.5 s (right) 7.5 s (left)	6.5 s (right) 7.5 s (left)
Grade of Roadway	Less than 3%	Less than 3%	Less than 3%
Horizontal Alignment of Roadway	Straight	Straight	Straight
Required Sight Distance (right) ²	-	-	110 m
Available Sight Distance (right)	-	-	>110 m
Required Sight Distance (left) ²	130 m	130 m	130 m
Available Sight Distance (left)	>130 m	>130 m	>130 m
Minimum Sight Distances Satisfied?	Yes	Yes	Yes

It should be noted that traffic is permitted to move in the westbound direction only on Bridgeport Road East. As such, only the left turn sight distance was analyzed for the site accesses intersecting with Bridgeport Road East.

As outlined in **Table 10**, the minimum sight distance requirements are satisfied at the proposed site accesses at Bridgeport Road East and Royal Street. Appendix H contains all relevant TAC excerpts. See Figure 9 for an illustration of the sight lines at the proposed accesses.

8.2 Maneuvering Assessment

Truck turning analysis was conducted using AutoTurn software to analyze vehicle maneuverability of all anticipated design vehicles at the site, including RMU-20 and RMU-81 (fire trucks, and garbage trucks) as shown in **Figure 10** and **Figure 11**.

These figures illustrate the garbage vehicles and emergency design vehicles entering and exiting the site in both directions, as well as circulating the rear of the site with no expected encroachments or conflicts. The site can be supported from a maneuverability perspective.

8.3 Corner Clearance

Corner clearance is the distance between accesses and signalized intersections along the approach. The required and provided corner clearances per Figure 8.8.2 in the TAC GDGCR are summarized in **Table 11**. Per the analysis summarized within **Table 11**, the existing accesses exceed the minimum required clearance suggested in the TAC GDGCR. Appendix H contains all relevant TAC excerpts.

Table 11: Minimum Corner Clearance Requirement

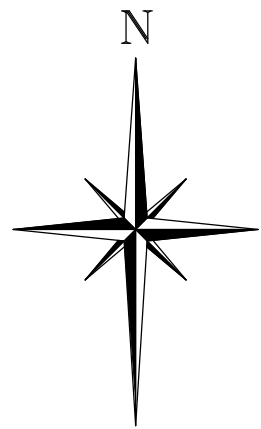
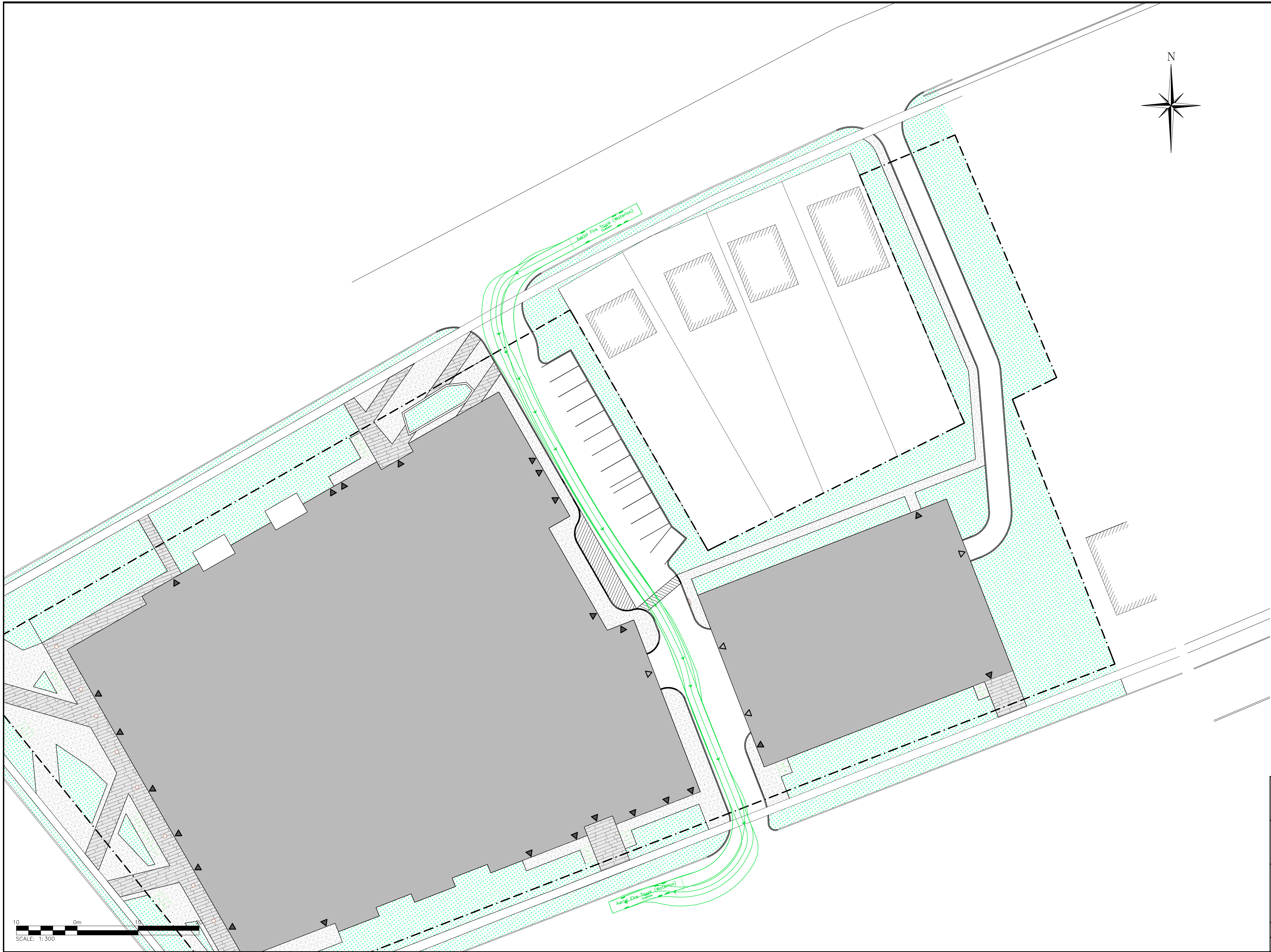
Feature	North-West Site Access at Bridgeport Road East	South-West Site Access at Royal Street
Minimum Clearance Requirement	70 m	20 m
Clearance	125 m	34 m
Minimum Clearance Requirement Satisfied?	Yes	Yes

8.4 Access Spacing

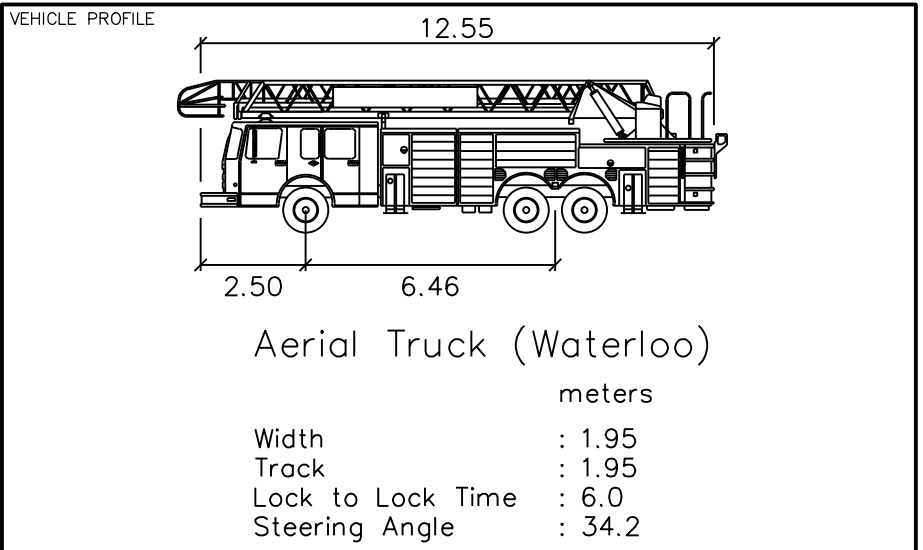
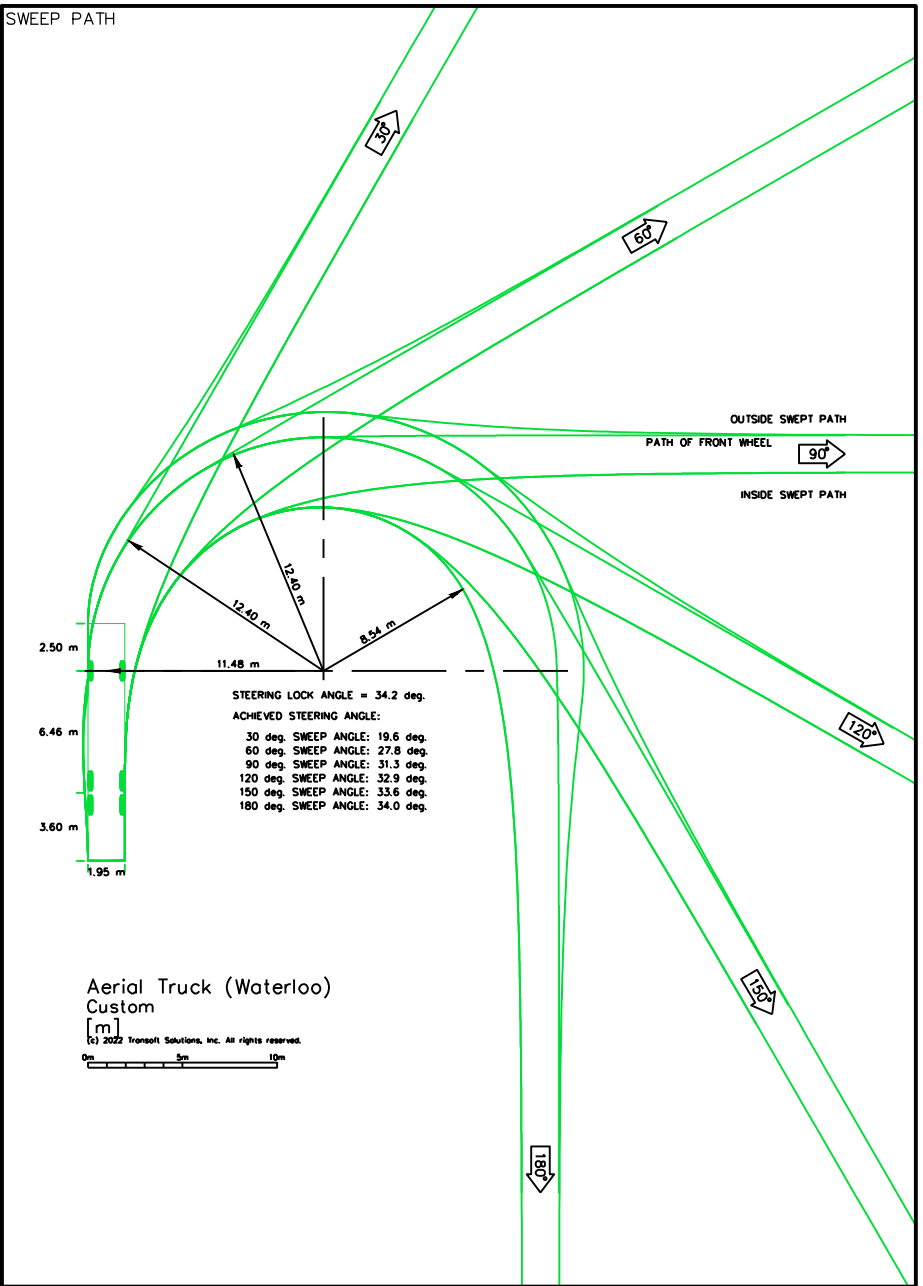
Access spacing is the distance between accesses along a roadway. The required and provided spacing per Figure 8.9.2 in TAC GDGCR are summarized in **Table 12**. Appendix H contains all relevant TAC excerpts. The spacing between the site accesses meet the TAC requirements.

Table 12: Minimum Spacing Requirement

Feature	Site Accesses along Bridgeport Road East
Minimum Spacing Requirement	25 m
Minimum Spacing Distance Satisfied?	Yes



FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION



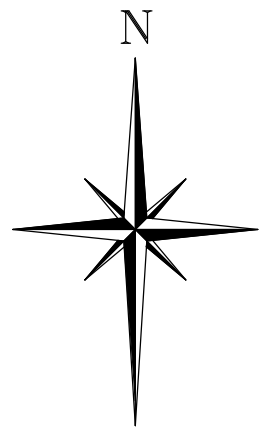
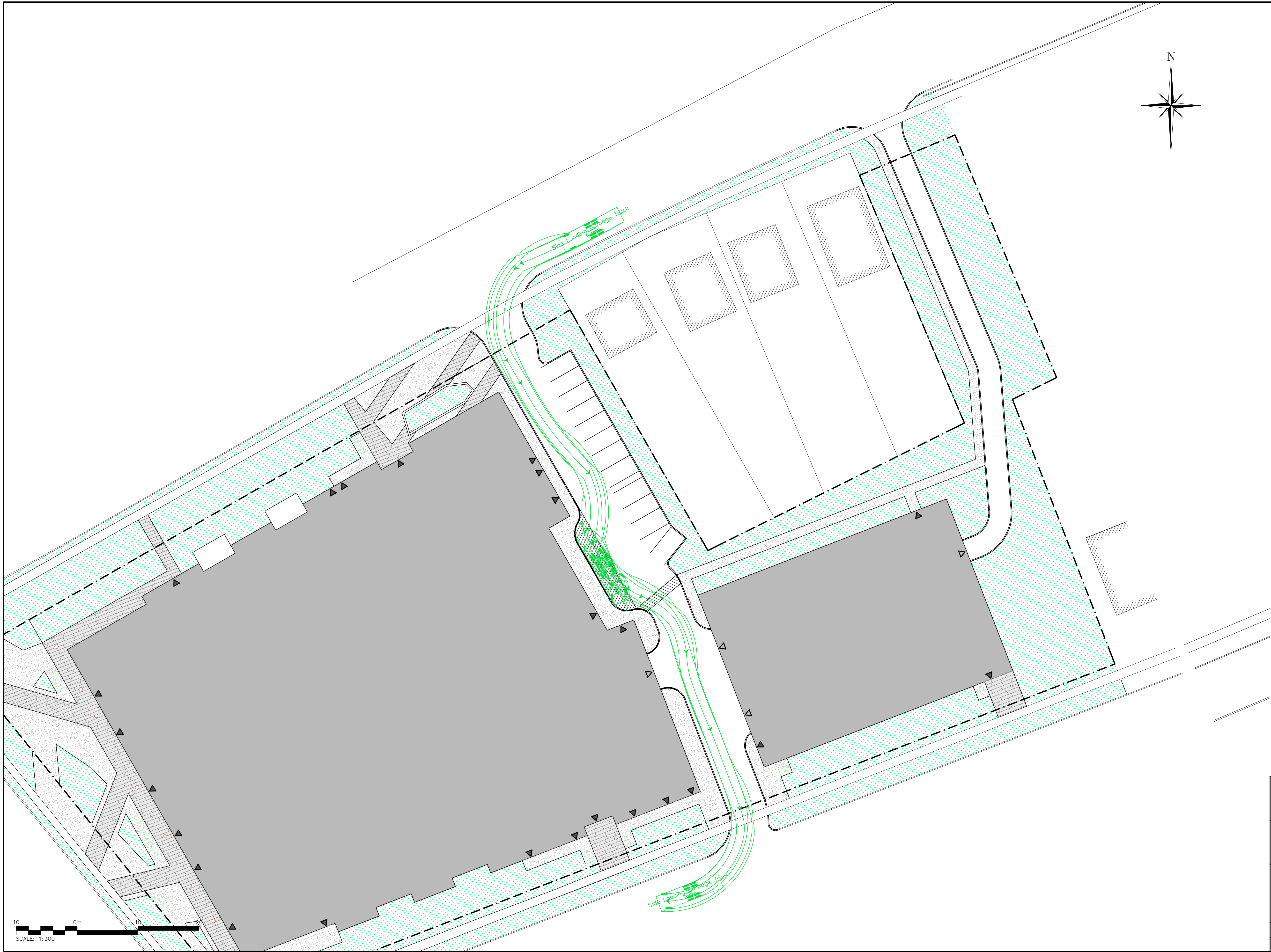
No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR SUBMISSION	03/15/2022
2	ISSUED FOR 2ND SUBMISSION	04/14/2023
3	ISSUED FOR 3RD SUBMISSION	12/15/2023

115&133 BRIDGEPORT ROAD EAST
CITY OF WATERLOO

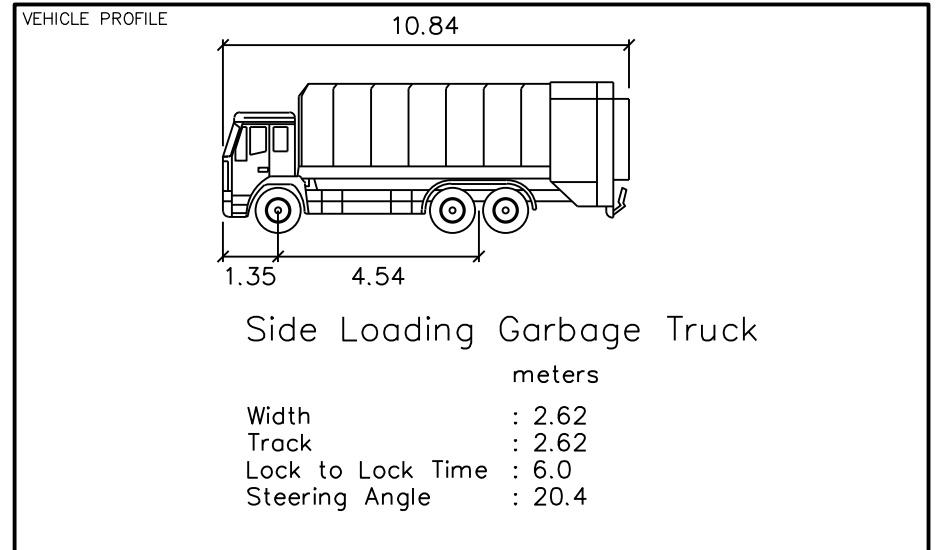
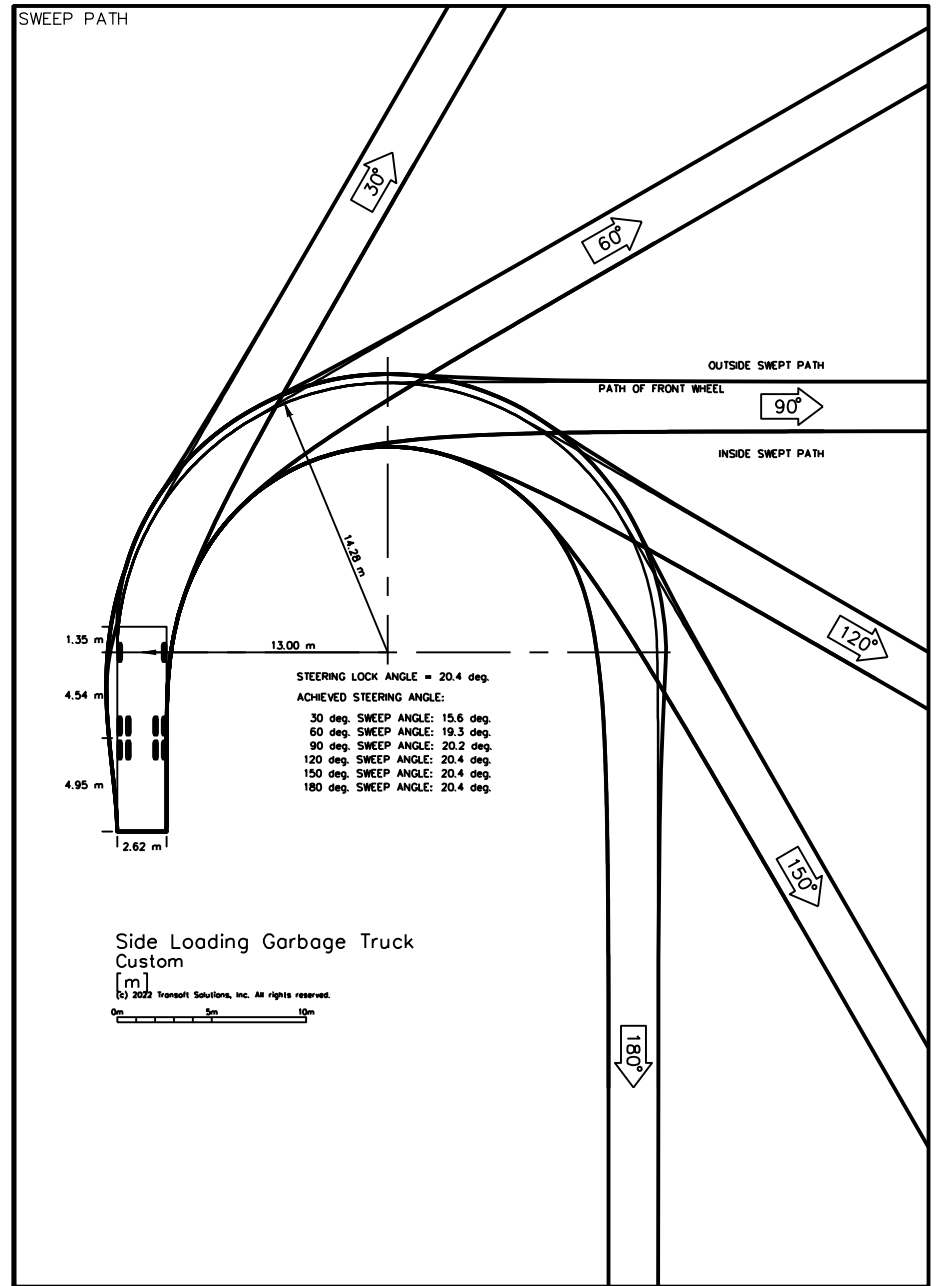
FIRE TRUCK
VEHICLE MANEUVERING ANALYSIS

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

Drawn By A.D./R.L.	Design By B.B.	Project 2217-6286
Check By T.D.S.	Scale 1:300	Drawing FIG 10



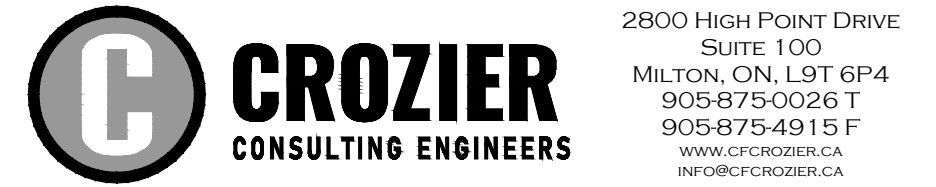
FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION



No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR SUBMISSION	03/15/2022
2	ISSUED FOR 2ND SUBMISSION	04/14/2023
3	ISSUED FOR 3RD SUBMISSION	12/15/2023

Project
115&133 BRIDGEPORT ROAD EAST
CITY OF WATERLOO

Drawing
GARBAGE TRUCK
VEHICLE MANEUVERING ANALYSIS



Drawn By A.D./R.L.	Design By B.B.	Project 2217-6286
Check By T.D.S.	Scale 1:300	Drawing FIG 11

9.0 Parking Review and Justification

9.1 Vehicle Parking

The proposed parking supply was compared to the parking requirements for the development based on the City of Waterloo Zoning By-Law 2018-50. The site is located within the zones Mixed Community Commercial C1-40, Residential Mixed-Use (RMU) 20 and RMU-40.

The parking requirements for the City of Waterloo also depend on the location of the site; it should be noted that the majority of this site is in Area E according to the City of Waterloo Zoning By-Law Parking Overlay Schedule "A1."

However, the Zoning By-Law Amendment proposes parts of the site to be rezoned for RMU-81 as well as C1-81 which would allow the usage of required rates of the RMU-81 and C1-81 zones. The portion of the site that is currently zoned as RMU-20 is not proposed to change since it does not include any of the proposed buildings.

The parking requirements have been calculated below using the existing zoning's applicable rates, as well as the proposed zoning's rates.

Appendix I contains all relevant parking excerpts.

9.1.1 Parking Rates from Zones C1-81, RMU-20 & RMU-40

The parking supply required for the site based on the City's By-Law and the existing zoning can be seen in **Table 13** below.

Table 13: C1-40, RMU-20 & RMU-40 City of Waterloo Zoning By-Law Vehicle Parking

Type of Parking	Units/GFA	Parking Rate	Required Parking Spaces	Proposed Parking Supply	Surplus/Deficit
Residential	706	1.00 spaces / Dwelling Unit	706	619	-179
Visitor	706	0.1 spaces / Dwelling Unit	71		
Commercial	644 m ²	3.2 spaces / 100 m ²	21		
Total			798	619	-179

When the existing required parking rates of zones C1-40, RMU-20 and RMU-40 are applied to the site, 652 parking spaces are required for residential, visitor and commercial use. The development proposes 619 parking spaces for residents and visitors. Therefore, the amount of parking spaces for the proposed development is deficient by 179 spaces compared to the existing zoning's By-law rates.

9.1.2 Parking Rates from Zones RMU-81, C1-81

The characteristics of the proposed development are in line with the proposed zones of RMU-81 and C1-81.

The current zone RMU-20 does not include any towers or podium as a characteristic of the zone and RMU-40 includes regulations for a podium of 4 storeys, with a maximum number of 600 bedrooms per hectare in the development. However, it is noted that the portion of the site that will mostly contain the parking structure will remain as RMU-20, but since it does not enclose any of the proposed dwelling units, the rate is not applied.

Therefore, the RMU-81 and C1-81 rates were used to calculate the number of parking spaces required for the site. Given that a portion of the west lands within the site will be zoned C1-81, it has been assumed that approximately 2/3 of Building A, and 1/4 of the Podium would fall within the C1-81 zoning and the remainder would be considered as RMU-81 zoning.

Table 14 below provides the results of required parking at the site if the rates of Zone RMU-81 and C1-81 are applied as described above.

Table 14: RMU-81 and C1-81 City of Waterloo Zoning By-Law Vehicle Parking

Type of Parking	Zone	Units/GFA	Parking Rate	Required Parking Spaces	Proposed Parking Supply	Surplus/Deficit
Residential	C1-81	221	1 spaces /Dwelling Unit	221	619	-82
Residential	RMU-81	485	0.8 spaces /Dwelling Unit	388		
Visitor	RMU-81	706	0.1 spaces /Dwelling Unit	71		
Commercial	C1-81	644 m ²	3.2 spaces /100 m ²	21		
Total				701	619	-82

When the required parking rates of zones C1-81 and RMU-81 are applied to the site, the site is in a reduced deficit of 82 parking spaces compared to the By-law requirements.

9.2 **Bicycle Parking**

According to City of Waterloo's Zoning By-Law, there are also bicycle parking requirements that apply to the site for both Type A and Type B spaces. According to the By-Law:

- Type A means secure bicycle parking located indoors or within a bike locker (long-term)
- Type B means bicycle parking other than Type A bicycle parking (short-term)

Table 15 displays the results of the calculations for the number of bicycle parking that is required.

Table 15: City of Waterloo Bicycle Parking Spaces

Type of Parking	Type of Space	Parking Rate	Required Parking Spaces
Residential (706 units)	Type A	0.3 spaces /Dwelling Unit	212
	Type B	0.3 spaces /Dwelling Unit	212
Visitor (706 unit)	Type A or Type B	25% of non-residential of vehicle parking requirement	6
Total Required Parking Supply			430 spaces
Total Proposed Parking Supply (Surplus Deficit)			522 spaces (+92) [466 Type A, 56 Type B]

There is a surplus of 921 bicycle parking space compared to the By-law requirements and therefore the proposed bicycle parking supply is considered adequate. The use of indoor Type A bicycle parking in lieu of outdoor Type B bicycle parking is preferred given the nature of the podium style development.

10.0 Parking Justification

There are other elements as a part of the development which ultimately reduce the number of trips, and vehicle ownership. Transit, active transportation, and transportation demand management measures encourage the usage of transportation modes other than motor vehicles.

As people choose these alternative modes over motor vehicles, it is expected that all the provided parking spaces would not be utilized. Therefore, the 82-parking space deficit is still considered sufficient to serve the parking needs for the site. The proposed parking supply is justified in detail in the sections below.

10.1 RMU-81 Zoning Rationale

The development is a mixed-use development that is primarily residential in nature with ground floor commercial space. Even though a portion of the proposed development will remain zoned as C1-81, it would be more appropriate to only apply the RMU-81 parking rates to this site since there is no reason to expect different travel behaviour or automobile ownership rates between the C1-81 and RMU-81 areas of the site. By applying the parking rates from zone RMU-81 to the site, there is only a deficit of 33 parking spaces, a deficit of approximately 5% in comparison to the By-law requirements. The parking supply in comparison to these Zoning By-Law rates is summarized in **Table 16** below.

Table 16: RMU-81 City of Waterloo Zoning By-Law Vehicle Parking

Type of Parking	Units/GFA	Parking Rate	Required Parking Spaces	Proposed Parking Supply	Surplus/Deficit
Residential	706	0.8 spaces /Dwelling Unit	565	619	-33
Visitor	706	0.1 spaces /Dwelling Unit	71		
Commercial	644 m ²	2.4 spaces /100 m ²	16		
Total			652	619	-33

10.2 Transit

This site is currently served by Grand River Transit (GRT). The bus stops near the site are located at walking distances and within 500 m. The ION Light Rail stops at Willis Way Station, which is located 1 km away from the site, however Route 5 (Daniel/Bloomingtondale) provides access to the Light Rail. The five routes serving this area include; Daniel/Bloomingtondale, Central Station, Conestoga Station, and ION Light Rail.

All these routes, except for the ION Light Rail have a headway time of 30 minutes. The ION Light Rail has a headway time of 10 minutes. **Table 17** below outlines the transit routes that are available in the study area.

Table 17: Transit Routes

Route Name	Route	Route No.	Nearest Bus Stop(s) to Site	Approximate Service Times		Headway Time (min)
				Weekdays	Weekends	
GRT- Daniel/Bloomingtondale	Begins at Boardwalk Station and ends at Daniel/Bloomingtondale	5	Weber Street North and Erb Street Weber Street North and Bridgeport Road	5:37 A.M. – 11:10 P.M.	6:05 A.M. – 10:40 P.M. (Saturday)	30 mins
GRT- Central Station	Begins at King/University and ends at Central Station	8	Weber Street North and Erb Street Weber Street North and Royal Street	5:38 A.M. – 11:44 P.M.	6:15 AM - 11:44 PM (Saturday) 7:27 AM - 11:44 PM (Sunday)	30 mins
GRT-Conestoga Station	Begins at Boardwalk Station and ends at Conestoga Station	29	Lincoln Road and Weber Street North	12:25 A.M. – 11:45 P.M. (Monday) 5:35 A.M. – 11:45 P.M. (Friday)	8:55 A.M. – 11:25 P.M. (Sunday)	30 min
GRT- ION Light Rail	Conestoga station in Waterloo and Fairway station in Kitchener	N/A	Willis Way Station	5:10 A.M. to 12:23 A.M.	5:40 to 12:14 A.M. (Saturday) 6:40 - 12:40 A.M. (Sunday/Holiday)	10 min

10.3 Active Transportation

The site is located within a walking distance of grocery stores, coffee shops, a Walmart, and a Sobeys as well as several existing transit routes. Additionally, there is also an elementary school within 330 metres of the site. The commercial area is surrounded by residential developments.

There are sidewalks provided on all roads in the network surrounding the site, which provides a route for pedestrians to enter and exit the site. The sidewalks also connect with commercial developments.

Bridgeport Road East and Weber Street are also expected to undergo construction with bicycle lanes implemented. Two site accesses connect the site to Bridgeport Road East, the roadway which is expected to have bicycle lanes implemented.

10.4 Transportation Demand Management

Transportation Demand Management measures are proposed to support the reduction in trips coming into and exiting the site. These measures encourage the usage of transportation modes other than motor vehicles, to reduce motor vehicle dependency. The Region of Waterloo provides a checklist by which TDM measures are evaluated to determine a reduction in parking.

The Region of Waterloo also provides a Parking Management Worksheet, which provides a percentage in parking reduction based on the provision of TDM Measures as well as other trip reduction characteristics.

The Transportation Impact Study goes into further details regarding the Transportation Demand Management measures being recommended.

Per the contents of the worksheet, as the subject development is a mixed-use development with commercial land uses, the parking management worksheet is applicable. The worksheet covers the categories below.

10.4.1 Pedestrian and Cyclist Orientation

Providing pedestrian and cyclist facilities would encourage movement on the street. This development is surrounded a road network which contains sidewalks. The development incorporates functional building entrances that are oriented to public space, with sidewalk connections. Bridgeport Road is also expected to undergo improvements to include bicycle lanes which would encourage the use of bicycles. There is also a small surplus of 92 bicycle spaces provided at the site. Sidewalk connections, bicycle spaces and bicycle lanes would encourage people to use less vehicles.

Public Transportation Access

Another mode other than motor vehicles to use would be public transportation. City of Waterloo provides bus routes using the Grand River Transit as well as the ION Light Rail. Bus stops are provided within 400 m of the site with a 30 min or less headway time. The development is planning to provide information regarding public transit routes, schedules, and fares.

10.4.2 Site Access

Creating an environment by providing accessible routes to the development encourages movement and reduces the number of vehicle trips. Movement includes cycling and walking. The site will provide sidewalks, functional building entrances, and bike storage for at least 5% of the building occupants. The proposed development intends to provide 376 bicycle spaces for the residents. This would encourage people to utilize bicycles more rather than use vehicles.

10.4.3 Trip Reduction Incentives

These items are expected to be implemented to reduce the number of vehicular trips at the proposed development. They include includes:

- The building owner/occupant agrees to charge for parking as an unbundled cost to occupants.
- The building owner/occupant agrees to provide reduced cost parking for users of moped/motorcycle spaces.
- The building is a mixed-use building, with commercial GFA and residential units.

The checklist has a point system with a certain number of points given to each feature implemented on site. The points are reflected as a percentage. The design of the proposed development scored 25 points and 63 points overall when including the trip reduction incentives. In total, 43% of vehicular trips would expected be decreased if the Travel Demand Management plan is applied. **Table 18** below summarizes the applicable TDM points. The TDM Checklist is found in Appendix J.

Table 18: Travel Demand Management Point Summary

Category	Minimum Requirement	Total Applicable	Points Scored
Pedestrian & Cyclist Orientation	24	10	8
Public Transit Access		5	1
Parking		25	25
SUB-TOTAL		40	34
Trip Reduction Incentives	N/A	25	9
OVERALL TOTAL	N/A	65	43

10.4.4 Parking

Vehicle parking facilities potentially affect the choice of travel mode at developments. It is encouraged by the Region of Waterloo to reduce parking supply to match expected demand. The expected demand would be potentially lower than the required demand due to the accessible commercial developments, the walkability of the neighbourhood, as well as public transportation. The number of parking spaces proposed is also deficient by 33 parking spaces when applying the different rates associated with the C1-81 and RMU-81 zones. Lastly, the parking is not located on a major street frontage, it is in a separate structure.

10.5 Parking Reduction Summary

Given the transportation demand management items listed above, the site would qualify for a reduction of **7%** in the required parking supply.

A 7% in parking reduction indicates that approximately 495 parking spaces are to be utilized for this site. This would indicate that 569 parking spaces is sufficient for this proposed development.

The Parking Management Checklist can be found in in the Appendix .

Parking Reduction Summary		
Category	Reduction Achieved	Maximum Achievable Reduction
		Intensification Corridor
Pedestrian & Cyclist Orientation	3%	4%
Public Transit Access	2%	5%
Parking	1%	6%
Trip Reduction Incentives	1%	7%
TOTAL	7%	22%

With the 7% reduction applied to the required number, there will be a surplus of 13 parking spaces compared to the By-law requirement for the separate RMU-81 and C1-81 zones. **Table 19** below displays the results.

Table 19: Parking Reduction Summary			
Current Parking Required	Reduction	Reduction Applied Required Parking	Parking Supply (Surplus/Deficit)
652 spaces	46 (7%)	606 spaces	619 spaces (+13)

Therefore, the site would be expected to be in a surplus of parking supply after considering the proposed Transportation Demand Management measures per the Parking Management Checklist in conjunction with the consideration that the parking rates for the proposed site would be expected to be more similar to the RMU-81 rates given the primarily residential nature of the site, the parking supply at the site would be expected to be sufficient.

Lastly due to the location of the site and the supporting transit infrastructure, not oversupplying parking at the site will encourage reduced vehicle ownership rates and will encourage future resident's non-automobile forms of transportation for a greater percentage of their trips.

11.0 Conclusion

- Under 2022 existing conditions, all the intersections operate with a Level of Service of "C" or better.
- Two scenarios were considered for the analysis due to the future reconfiguration of two roadways in the study area. Scenario No. 1 does not include the re-configuration of Bridgeport Road East and Erb Street East, while Scenario No. 2 does.
- The Future Background and Future Total intersection analyses have been categorized into two scenarios.
- In both scenarios for the 2027 Future Background and Future Total traffic conditions, all study intersections are expected to operate with a Level of Service "C" or better.
- There is no significant difference in operations between the 2027 Future Background and Future Total conditions for either scenario. This indicates that the site generated traffic does not materially impact the intersections.
- It is recommended that the Region and City monitor the signal timings at each signalized study intersection, to address future traffic growth and the lane removals along Bridgeport Road East and Erb Street East.
- The proposed site accesses are expected to provide sufficient sight distance, corner clearance and access spacing per the TAC GDGCR requirements.
- Parking Supply Review
 - When the existing required parking rates of zones C1-81 and RMU-81 rates applied to the site, the overall deficit is 82 parking spaces, which is minor relative to the total parking supply and would support the use of non-auto forms of transportation, as well as reduced vehicle ownership rates. When applying the RMU-81 rates only to the site, the proposed parking supply would only be in a deficit of 33 spaces, approximately 5% deficit of the Zoning By-Law requirement.
 - The proposed bicycle parking supply is in surplus of 92 bicycle parking spaces when compared to the Zoning By-Law requirements.
 - Several Transportation Demand Management measures have been provided at the site per the Checklist per Region of Waterloo guidelines, such as accessible site access, public transportation access, reducing parking oversupply, and implementing non-auto trip reduction incentives.
 - Using the Region of Waterloo's Parking Management Worksheet, the site would qualify for a 7% reduction in parking, which results in a parking supply of 606 and a surplus of 13 spaces as a result of the proposed TDM measures.

In conclusion, the proposed mixed-use residential and commercial development at 109, 115, & 133 Bridgeport Road East and 30-32 Weber Street North can be supported from a transportation operation, and safety perspective. We trust that this review satisfies any transportation concerns associated with the Site Plan for this development. Please feel free to contact the undersigned for any further information required.

Respectfully submitted,

C.F. CROZIER & ASSOCIATES INC.



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

C.F. CROZIER & ASSOCIATES INC



Theshantha De Silva, E.I.T.
Engineering Intern, Transportation

I:\2200\2217- Schembri Group of Companies\6286- 115 & 133 Bridgeport Rd E\Reports\Transportation\2023
Submission\2023.12.14 (2217-6286) 115 Bridgeport TIS & PJS Update.docx

APPENDIX A

Correspondence

PRE-STUDY CONFERENCE FORM

Item	Description	Details
ISSUES		
1	List any issues expected that may impact the content or recommendations of the subject Transportation Impact Study.	☒ Based on the City of Waterloo Transportation Master Plan 2020 Update, there is expected road configuration Bridgeport Road East between the years of 2019-2031
INTRODUCTION		
2	Nature of application (Attach a drawing)	☒ Official Plan Amendment ☒ Zoning Amendment ☒ Site Plan Control Application ☐ Plan of Subdivision ☐ Community Plan ☐ Other
3	TIS process, and relevant policies, procedures and approvals	☒ Guidelines for the preparation of Transportation Impact Studies in Support of Development Applications ☒ Transportation Impact Studies Requirements for Capacity Analysis, Roundabouts, Turn Lanes ☒ Safety Analysis Checklist ☒ Policy and Procedures for Access onto Regional Roads
4	Public Meeting	☐ Required ☒ Not Required
CONTEXT		
5	Study intersections (Intersections to be analyzed) Note: the consultant is responsible to identify any further intersections impacted as the study progresses.	☒ Bridgeport Road East and Weber Street North
		☒ Site Access 1 and Bridgeport Road East
		☒ Site Access 2 and Bridgeport Road East
		☒ Site Access 3 and Royal Street
		☒ Site Access 4 and Royal Street
		☒ Weber Street North and Erb Street East
		☒ Weber Street North and Royal Street
6	Size and number of phases of development	☒ Size of Development: Mixed-Use Development with shared 6-storey podium rising to 25 (Building A), 24 (Building B) and 22 (Building C) storeys, respectively. The 6-storey podium includes 4 storeys of parking, 1 storey for commercial use and 1 storey for Landscaped rooftop amenity.
7	Approved and pending approval development applications	☒ None
8	Planned transportation system improvements	☒ None

TRAVEL DEMAND		
9	Horizon years	✓ 5 years from date of TIS (2027) ✓ 5 years after full occupancy (Five years from build-out is 2032) ○ Transportation Plan horizon for large scale projects ○ Interim years
Item	Description	Details
10	Peak hour determination	✓ AM weekday peak hour of adjacent roadway ✓ PM weekday peak hour of adjacent roadway ○ Saturday peak of adjacent roadway ○ AM weekday peak hour of development ○ PM weekday peak hour of development ○ Saturday peak of development ○ Other...
11	Background	✓ Historical traffic/transit counts ✓ ROW travel demand forecasts ✓ Approved and pending approval development applications
12	Trip generation	✓ ITE average rates or fitted equation (Multifamily Housing High Rise Residential (Land Use Code 222) and Shopping Centre Retail (Land Use Code 820)) ○ Rates published elsewhere ○ Observed rates for similar areas ○ Observed rates for similar developments in the local area ○ Other...
13	Trip reductions (TDM, internal, pass-by)	✓ Transportation Demand Management Checklist ✓ Published Travel Demand Management reductions ✓ Observed Travel Demand Management reductions ✓ ITE internal capture reductions for mixed-use developments ○ Observed internal capture reductions for mixed-use developments ✓ ITE pass-by reductions ○ Observed pass-by reductions for similar developments ○ Other...
14	Trip distribution	✓ ITE trip distribution IN/OUT split ○ Regional travel demand ○ Population and employment distribution ○ Market analysis of catchment area ✓ Transportation Tomorrow Survey
15	Trip assignment	✓ Local traffic pattern ✓ Site layout and access design ✓ Existing turning movements ○ Other...

EVALUATION OF IMPACTS		
16	Traffic impact analysis (Use approved software)	✓ Conservative Growth Rate of 2% ✓ Unsignalized intersections ✓ Synchro 11.0 Software will be used ✓ left turn warrant analysis ✓ signal warrant analysis ✓ Signalized intersections ✓ LOS, v/c, delay, queuing ✓ ROW saturation flow rates ✓ Existing signal timings for existing conditions ✓ Optimize signal timings for future conditions ✓ Use existing cycle length to respect coordinated corridor ✓ Queuing analysis ○ Roundabouts ○ Other...

Item	Description	Details
17	Roundabout feasibility (Use approved software)	○ Initial screening ○ Intersection control study (10 year horizon)
18	Transit assessment	✓ Frequency and hours of service ✓ Presence of bus stops ✓ Reliability of service ✓ Passenger loads ✓ Travel time ○ Other
19	Pedestrian assessment	✓ Presence, connectivity, and width of sidewalks ✓ Barriers and buffers from traffic ✓ Crossing opportunities at intersections ○ Delay at intersections ○ Number of driveways and traffic volumes at the driveways ○ Presence of illumination ✓ Future needs (desire lines / policy / accessibility / demand) ○ Other
20	Cycling assessment	✓ Presence of a dedicated facility ✓ Network connectivity ✓ Number and width of travel lanes adjacent to the route ✓ Volume and speed of traffic ○ Percentage of trucks and buses encountered ○ Pavement condition ✓ Presence of parking /showers/change rooms ✓ Future needs (desire lines / policy / demand) ○ Other
21	Safety analysis	○ Road safety review ○ Collision risk analysis ○ Access conflict evaluation
22	Site access and circulation	✓ Review sight distances at all new access points ✓ Internal traffic controls ✓ Loading facilities and access ✓ Service/maintenance vehicle access ✓ Emergency vehicle access
23	Submission format	○ Three hard copies of main report including appendices (other than analysis results/output e.g. Synchro reports) ○ Minimum one original hard copy must be sealed by a professional engineer ✓ Electronic copy of complete report and all appendices ✓ Electronic copy of operational analysis files (e.g. Synchro, Arcady) ✓ Electronic copy of all signal warrant calculation files ○ Other

From: Hiba Naqvi
Sent: April 22, 2022 3:14 PM
To: Aaron Wignall; Ian Lindley
Subject: Waterloo Draft Form for Pre-Consultation Meeting
Attachments: Form For Waterloo.docx

Hi,

Attached is the pre-consultation form for Waterloo, for your review. I didn't include the parking section because it didn't ask anywhere for it

Regards,

Hiba

From: Aaron Wignall <awignall@cfcrozier.ca>
Sent: April 21, 2022 12:27 PM
To: Hiba Naqvi <hnaqvi@cfcrozier.ca>; Ian Lindley <ilindley@cfcrozier.ca>
Subject: RE: Terms of Reference for a Transportation Impact Study

I hate waterloo I was hoping they didn't still do this. Ok can we get the form filled out for tomorrow (while I am reviewing Aurora)?

Aaron Wignall | Associate
DID: 905.693.7834 | Cell: 289.682.7954

From: Richard Parent <RParent@regionofwaterloo.ca>
Sent: April 21, 2022 12:22 PM
To: Hiba Naqvi <hnaqvi@cfcrozier.ca>
Cc: Kornel Mucsi <KMucsi@regionofwaterloo.ca>; Aaron Wignall <awignall@cfcrozier.ca>; Hanan Wahib <HWahib@regionofwaterloo.ca>; Monirul Islam <MIslam@regionofwaterloo.ca>; Amanda Kutler <AKutler@regionofwaterloo.ca>; 'Laura Dewar' <Laura.Dewar@waterloo.ca>; Paula Sawicki <PSawicki@regionofwaterloo.ca>
Subject: RE: Terms of Reference for a Transportation Impact Study

Thanks Hanan, and good afternoon Hiba.

Thank you for your detailed email regarding the scope for a TIS in support of a proposed residential development in Waterloo. In the Region of Waterloo, in accordance with the Region's Council approved Transportation Impact Guidelines <https://www.regionofwaterloo.ca/en/living-here/resources/Design->

[Standards/Transportation-Impact-Study-Guidelines.pdf](#) , a pre-study conference for the study is required with the submitting transportation consultant, and applicable Municipal/Regional staff. In the guidelines you will find the Pre-Study Conference Form, which should be completed with the information you provided below, then submitted to Mr. Monirul Islam, the Regional Transportation Planner assigned to represent the Region in the City of Waterloo.

Once you submit the Pre-Study Conference Form, Monirul will schedule a virtual meeting with the required staff members and your team to finalize the scope of the study.

Should you have any concerns, please contact Monirul (copied above).

Regards,

Richard

Richard Parent
Manager Corridor Planning
rparent@regionofwaterloo.ca
5197495013

From: Hanan Wahib <HWahib@regionofwaterloo.ca>
Sent: April 21, 2022 9:15 AM
To: 'hnaqvi@cfcrozier.ca' <hnaqvi@cfcrozier.ca>
Cc: Kornel Mucsi <KMucsi@regionofwaterloo.ca>; 'awignall@cfcrozier.ca' <awignall@cfcrozier.ca>; Richard Parent <RParent@regionofwaterloo.ca>
Subject: FW: Terms of Reference for a Transportation Impact Study

Hi Hiba,

I copied Richard Parent, Manager, Corridor Planning on your email as his group deals with developments.

Richard would kindly direct you to the process (i.e. pre-consultation meeting) the Region follows to answer your questions.

Best Regards,

H

From: Hiba Naqvi <hnaqvi@cfcrozier.ca>
Sent: April 20, 2022 1:13 PM
To: Hanan Wahib <HWahib@regionofwaterloo.ca>
Cc: Aaron Wignall <awignall@cfcrozier.ca>
Subject: Terms of Reference for a Transportation Impact Study

Hello,

C.F. Crozier & Associates Inc. (Crozier) has been retained to prepare a Transportation Impact Study (TIS) for three residential towers atop a shared 6-storey podium rising to 25 (Building A), 24 (Building B) and 22 (Building C) storeys, respectively. The 6-storey podium includes 4 storeys of parking, 1 storey for commercial use and 1 storey for Landscaped rooftop amenity. There is also a separate building (Building D) which has 6 storeys of parking. The site is located at 115 & 133 Bridgeport Road East, in the City of Waterloo. The Conceptual Site Plan for the proposed development is attached in this email for your review.

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

Study Methodology for the Transportation Impact Study

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

- Bridgeport Road East and Weber Street North
- Site Access 1 and Bridgeport Road East
- Site Access 2 and Bridgeport Road East
- Site Access 3 and Royal Street
- Site Access 4 and Royal Street
- Weber Street North and Erb Street East
- Weber Street North and Royal Street

We kindly request that the most recent traffic counts available to the City or Region at the above noted intersections be provided for this study. Additionally, please confirm the above noted intersections are sufficient for the study.

Alternatively, we may consult specialty traffic counting firms we typically work with, in the event recent counts are not available. Due to the impact of the ongoing global COVID-19 pandemic, travel patterns are not reflective of typical commuter patterns. As such, please advise with regards to further steps should there be no applicable traffic data at the study intersections.

Analysis Periods and Scenarios

The weekday A.M. and P.M. peak hours for the 2022 existing conditions will be assessed. The build-out year (2027) and 5 years from build-out year (2032) will be considered for future background and total traffic conditions. Please advise if these horizon years are acceptable.

Background Developments

Please provide any background developments in the vicinity of the proposed development, as well as the associated transportation impact studies that should be included in our analysis, as available.

Future Background Growth Rate

An industry standard growth rate of 2% will be applied to the through movements. Please advise whether the assumed growth rate is sufficient, or alternatively please provide an appropriate growth rate(s) to reflect expected growth in the area.

Trip Generation and Distribution

Trip Generation for the proposed development will be based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition for Multifamily Housing High Rise Residential (Land Use Code 222) and Shopping Centre Retail (Land Use Code 820) will be used to estimate the site generated trips.

The site generated trips will be distributed to the boundary road network using traffic patterns from traffic movement counts.

Roadway and Transit Improvements

Based on the City of Waterloo Transportation Master Plan 2020 Update, there is expected road reconfiguration on Bridgeport Road East between the years of 2019-2031. As such, this would be utilized for the analysis. Please confirm, and if you have details regarding this change, would you be able to provide them?

Analysis Procedures

Traffic analysis will be conducted per Region of Waterloo TIS guidelines.

Weekday A.M. and P.M. peak hours will be analyzed using Synchro 11.0 analysis software, using Highway Capacity Manual (HCM) 2000 and 2010 procedures.

Peak hour will be calculated from existing traffic patterns unless otherwise specified.

Additional transportation elements, such as corner clearance and sight distance will be analysed.

Parking Justification Study

Based on the City of Waterloo Zoning By-Law 2018-050, the proposed amount of parking does not meet the required parking by 53 spaces. As such, a parking justification study is to be prepared to justify the parking spaces and will be included in the TIS.

The Region of Waterloo Guidelines state that a Parking Management Worksheet may be required.
Please confirm if this is applicable to our study.

An estimate of peak parking demand for the proposed development will be evaluated based on the Institute of Transportation Engineers (ITE) Parking Generation Manual, 5th Edition, to the compare to the proposed parking supply, as well as the City's By-law requirements.

Other parking supply rates approved elsewhere within the City in a similar transportation setting will be reviewed. These recent approval trends will be used as additional justification to support the reduced parking supply.

Please provide any sites that we would be able to survey in the area, as well as any previously collected data on parking utilization that is relevant to the site.

Available on-street parking supply as well as proximal commercial parking opportunities as a rationale to support the proposed parking supply will be reviewed. Transportation Demand Management (TDM) opportunities available to the site will be identified to assess potential site-specific measures.

Please confirm if our methodology is correct. Thank you.

Transportation Demand Management (TDM) Opportunities

Per Region of Waterloo TIS guidelines, analysis of existing and future Transportation Demand Management (TDM) opportunities will be conducted to reduce single-occupant vehicle (SOV) trips and promote alternative modes of transportation including transit and active transportation as applicable.

Summary

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

- Please provide the most recent traffic counts available for the intersections of study.
- Please provide relevant growth rate(s) applicable to the roadways of study.
- Please provide any relevant background developments and the associated traffic impact studies that are to be included our analysis.
- Please provide details of any planned roadway or transit improvements in the surrounding study area within the horizon years.
- Please provide relevant information for both the Transportation Impact Study and Parking Justification study.

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

Kind regards,

Hiba Naqvi

Hiba Naqvi | Engineering Intern
2800 High Point Drive, Suite 100 | Milton, ON L9T 6P4
T: 905.875.0026



Crozier Connections: [!\[\]\(98a0f62050c8ae5b6b5f206bfc69317a_img.jpg\)](#) [!\[\]\(fdf21e9ac78a82d793efc2dca9b630e5_img.jpg\)](#) [!\[\]\(edbf853e11110fadfb6070cc138e7bc4_img.jpg\)](#) [!\[\]\(4de201f20aabea4259dff1a9211fdde6_img.jpg\)](#)

Read our latest news and announcements [here](#).

This email was sent on behalf of C.F. Crozier & Associates Inc. and may contain confidential and/or privileged information for the sole use of the intended recipient. If you have received this email in error, please contact the sender and delete all copies. Any review or distribution by anyone other than the intended recipient is strictly prohibited.

From: Hiba Naqvi
Sent: April 26, 2022 11:55 AM
To: Ian Lindley
Subject: FW: Terms of Reference for a Transportation Impact Study

The City of Waterloo responded. See below. Should I contact any of these people below before the pre-consultation meeting?

From: Ainsley Rego <Ainsley.Rego@waterloo.ca>
Sent: April 26, 2022 10:46 AM
To: Hiba Naqvi <hnaqvi@cfcrozier.ca>
Subject: RE: Terms of Reference for a Transportation Impact Study

Good morning Hiba,

Thank you for contacting the City of Waterloo with your request. Please find my answers to your questions below in red.

- Please provide the most recent traffic counts available for the intersections of study. – **Regional staff will be able to provide this. For city roads, contact Haydn.Kocznur@waterloo.ca.**
- Please provide relevant growth rate(s) applicable to the roadways of study. – **City of Waterloo Transportation Services are satisfied with the proposed 2% growth rate.**
- Please provide any relevant background developments and the associated traffic impact studies that are to be included our analysis. – **Please contact planning@waterloo.ca**
- Please provide details of any planned roadway or transit improvements in the surrounding study area within the horizon years. – **No planned improvements from the city. Please connect with regional staff.**
- Please provide relevant information for both the Transportation Impact Study and Parking Justification study. – **To better understand the City's long term goals please review the recent Transportation Master Plan update (<https://www.waterloo.ca/en/government/plans.aspx#>)**

Please let me know if you have any additional questions or concerns.

Thank you,



Ainsley Rego, BES (she/her)

Junior Transportation Project Coordinator
Integrated Planning & Public Works, City of Waterloo
265 Lexington Court
PO Box 337 Station Waterloo
Waterloo, ON N2J 4A8
P: 1.519.886.2310 ext. 30336
F: 1.519.886.5788
TTY: 1.866.786.3941

E: ainsley.rego@waterloo.ca

From: Christine Koehler <Christine.Koehler@waterloo.ca>

Sent: April 20, 2022 12:52 PM

To: Jenny Setterfield <Jenny.Setterfield@waterloo.ca>; Ainsley Rego <Ainsley.Rego@waterloo.ca>; Chris Dedman <Chris.Dedman@waterloo.ca>; Helga Bowman <Helga.Bowman@waterloo.ca>

Subject: Fwd: Terms of Reference for a Transportation Impact Study

From: Hiba Naqvi <hnaqvi@cfcrozier.ca>

Sent: Wednesday, April 20, 2022 12:28 PM

To: gkeyworth@regionofwaterloo.ca <gkeyworth@regionofwaterloo.ca>; Christine Koehler <Christine.Koehler@waterloo.ca>

Cc: Aaron Wignall <awignall@cfcrozier.ca>

Subject: [EXTERNAL] Terms of Reference for a Transportation Impact Study

Hello,

C.F. Crozier & Associates Inc. (Crozier) has been retained to prepare a Transportation Impact Study (TIS) for three residential towers atop a shared 6-storey podium rising to 25 (Building A), 24 (Building B) and 22 (Building C) storeys, respectively. The 6-storey podium includes 4 storeys of parking, 1 storey for commercial use and 1 storey for Landscaped rooftop amenity. There is also a separate building (Building D) which has 6 storeys of parking. The site is located at 115 & 133 Bridgeport Road East, in the City of Waterloo. The Conceptual Site Plan for the proposed development is attached in this email for your review.

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- Weber Street North and Erb Street East
- Weber Street North and Royal Street

We kindly request that the most recent traffic counts available to the City or Region at the above noted intersections be provided for this study. Additionally, please confirm the above noted intersections are sufficient for the study.

Alternatively, we may consult specialty traffic counting firms we typically work with, in the event recent counts are not available. Due to the impact of the ongoing global COVID-19 pandemic, travel patterns are not reflective of typical commuter patterns. As such, please advise with regards to further steps should there be no applicable traffic data at the study intersections.

Analysis Periods and Scenarios

The weekday A.M. and P.M. peak hours for the 2022 existing conditions will be assessed. The build-out year (2027) and 5 years from build-out year (2032) will be considered for future background and total traffic conditions. Please advise if these horizon years are acceptable.

Background Developments

Please provide any background developments in the vicinity of the proposed development, as well as the associated transportation impact studies that should be included in our analysis, as available.

Future Background Growth Rate

An industry standard growth rate of 2% will be applied to the through movements. Please advise whether the assumed growth rate is sufficient, or alternatively please provide an appropriate growth rate(s) to reflect expected growth in the area.

Trip Generation and Distribution

Trip Generation for the proposed development will be based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition for Multifamily Housing High Rise Residential (Land Use Code 222) and Shopping Centre Retail (Land Use Code 820) will be used to estimate the site generated trips.

The site generated trips will be distributed to the boundary road network using traffic patterns from traffic movement counts.

Roadway and Transit Improvements

Based on the City of Waterloo Transportation Master Plan 2020 Update, there is expected road reconfiguration on Bridgeport Road East between the years of 2019-2031. As such, this would be utilized for the analysis. Please confirm, and if you have details regarding this change, would you be able to provide them?

Analysis Procedures

Traffic analysis will be conducted per Region of Waterloo TIS guidelines.

Weekday A.M. and P.M. peak hours will be analyzed using Synchro 11.0 analysis software, using Highway Capacity Manual (HCM) 2000 and 2010 procedures.

Peak hour will be calculated from existing traffic patterns unless otherwise specified.

Additional transportation elements, such as corner clearance and sight distance will be analysed.

Parking Justification Study

Based on the City of Waterloo Zoning By-Law 2018-050, the proposed amount of parking does not meet the required parking by 53 spaces. As such, a parking justification study is to be prepared to justify the parking spaces and will be included in the TIS.

The Region of Waterloo Guidelines state that a Parking Management Worksheet may be required.
Please confirm if this is applicable to our study.

An estimate of peak parking demand for the proposed development will be evaluated based on the Institute of Transportation Engineers (ITE) Parking Generation Manual, 5th Edition, to the compare to the proposed parking supply, as well as the City's By-law requirements.

Other parking supply rates approved elsewhere within the City in a similar transportation setting will be reviewed. These recent approval trends will be used as additional justification to support the reduced parking supply.

Please provide any sites that we would be able to survey in the area, as well as any previously collected data on parking utilization that is relevant to the site.

Available on-street parking supply as well as proximal commercial parking opportunities as a rationale to support the proposed parking supply will be reviewed. Transportation Demand Management (TDM) opportunities available to the site will be identified to assess potential site-specific measures.

Please confirm if our methodology is correct. Thank you.

Transportation Demand Management (TDM) Opportunities

Per Region of Waterloo TIS guidelines, analysis of existing and future Transportation Demand Management (TDM) opportunities will be conducted to reduce single-occupant vehicle (SOV) trips and promote alternative modes of transportation including transit and active transportation as applicable.

Summary

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

- Please provide the most recent traffic counts available for the intersections of study.
- Please provide relevant growth rate(s) applicable to the roadways of study.
- Please provide any relevant background developments and the associated traffic impact studies that are to be included our analysis.
- Please provide details of any planned roadway or transit improvements in the surrounding study area within the horizon years.
- Please provide relevant information for both the Transportation Impact Study and Parking Justification study.

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

Kind regards,

Hiba Naqvi

Hiba Naqvi | Engineering Intern
2800 High Point Drive, Suite 100 | Milton, ON L9T 6P4
T: 905.875.0026



Crozier Connections: [!\[\]\(9ad9446bc2b2cfb864c26975a60a8300_img.jpg\)](#) [!\[\]\(8ec96d8d793344710aab6f1732d6e9f4_img.jpg\)](#) [!\[\]\(03aebe5af4786a339e884c07cfddc2d2_img.jpg\)](#) [!\[\]\(e67448e372cbdf7dc44af6de8be1f7b9_img.jpg\)](#)

Read our latest news and announcements [here](#).

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MINUTES

NAME OF MEETING: Pre-Consultation Meeting for 115&133 Bridgeport Road East

DATE OF MINUTES: Tuesday, May 10, 2022

DATE OF MEETING: Tuesday, May 10, 2022

PROJECT NAME: 115 & 133 Bridgeport Road East

PROJECT NO.: CFCA 2217-6286

LOCATION: Online – Microsoft Teams Meeting

ATTENDEES

NAME	COMPANY	EMAIL ADDRESS
Ian Lindley	C.F. Crozier & Associates Inc.	ilindley@cfcrozier.ca
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Nicholas Guagliano	Region of Waterloo	NGuagliano@regionofwaterloo.ca
Yige Tong	Region of Waterloo	YTong@regionofwaterloo.ca
Eric Pisani	Region of Waterloo	EPisani@regionofwaterloo.ca
Ainsley Rego (Regrets)	City of Waterloo	Ainsley.Rego@waterloo.ca

ITEMS

The following minutes are a record of the above noted meeting, action items are bolded as they occur throughout the meeting and then summarized at the end for convenience. The minutes are as follows:

- Introduction between C.F Crozier & Associates Inc. (Crozier) and Region of Waterloo (Region) staff
- Crozier discussed the site plan of 115 & 133 Bridgeport Road East with all participants
- Region staff ask for Crozier walkthrough the pre-study conference form
- City of Waterloo TMP's possible impact with lane reduction along Bridgeport Road East and Erb Street East discussed. **Region Staff to confirm date of the lane reduction and construction of bike lanes Bridgeport Road East.**
- TIS process and Nature of Application per the pre-study conference form confirmed with Region staff
- Public meeting not required per the pre-study conference form
- Study intersections confirmed as the following:
 - o Bridgeport Road East and Weber Street North

- o Site Access 1 and Bridgeport Road East
 - o Site Access 2 and Bridgeport Road East
 - o Site Access 3 and Royal Street
 - o Site Access 4 and Royal Street
 - o Weber Street North and Erb Street East
 - o Weber Street North and Royal Street
- Size of the development, development applications and planned improvements discussed as outlined previously.
- Horizon years discussed. **Crozier to confirm that the 5-year horizon based on the unit count meets the TIS guidelines.**
- AM and PM weekday peak hours to be used in the study.
- No major background developments are expected to be included. **Region to confirm if any background developments are to be included in the study.**
- ITE Trip generation manual method confirmed. Land uses identified as LUC 222 and LUC 822. Exact rates or equations to be sent to Region for final confirmation. **Crozier to provide Region with rates or equations to be used, Region to confirm that the rates are acceptable.**
- TDM checklist to be conducted by Crozier as part of TIS. ITE capture and pass-by rates are acceptable if applicable to site.
- ITE and TTS trip distributions to be used for site generated traffic.
- TIS methodology agreed by Region including Synchro 11 and SimTraffic software uses. **Region to confirm growth rates.**
- Roundabout feasibility initial screening to be conducted if roadway improvements are recommended by Crozier because of the TIS.
- A transit stop is to be moved from its existing location on Weber Street to the Bridgeport Road and Weber Street Intersection. **Region to provide details of the transit service that will operate at this bus stop.**
- Any road improvements are to consider the effect that they will have on all modes on transportation including pedestrians and cyclists.
- Access conflict evaluation and road safety review to be done as part of the TIS. **Crozier to include the access conflict evaluation and road safety review as part of the TIS.**
- Site access and circulation to be done per the pre-study conference form. Crozier will be using AutoTURN software to examine the vehicles expected to be on site.
- Electronic copies of the TIS are acceptable. Copy requires the stamp of professionally licensed engineer. **Crozier to ensure TIS is properly stamped for submission.**
- Region stated that the signal timing plans will be sent per their application process. Crozier will need to make the request through the Region's application form.

These minutes are a record of the above noted meeting and are considered final. If there are any additions or revisions, please contact the undersigned prior to **May 17, 2022**, otherwise these minutes will be accepted as correct. Thank you.

Action item summary:

- **Region Staff to confirm date of the lane reduction and construction of bike lanes along Bridgeport Road East.**
- **Crozier to confirm that the 5-year horizon based on the unit count meets the TIS guidelines.**
- **Region to confirm if any background developments are to be included in the study.**
- **Crozier to provide Region with rates or equations to be used, Region to confirm that the rates are acceptable. (Included with email)**
- **Region to confirm growth rates. (Email received from Region)**
- **Region to provide details of the transit service that will operate at this bus stop.**
- **Crozier to include the access conflict evaluation and road safety review as part of the TIS.**
- **Crozier to ensure TIS is properly stamped for submission.**

Yours truly,

C.F. CROZIER & ASSOCIATES INC.



Ian Lindley, MAsC., EIT

Transportation

Distribution: Email

APPENDIX B

Existing Transit Information



Daniel/Bloomingdale

[View In Website Mode](#)

The 5 bus line (Daniel/Bloomingdale) has 3 routes. For regular weekdays, their operation hours are:
(1) Daniel/Bloomingdale: 5:37 AM - 11:10 PM (2) The Boardwalk Station: 5:48 AM - 11:46 PM (3) Waterloo Public Square Station: 11:40 PM
Use the Moovit App to find the closest 5 bus station near you and find out when is the next 5 bus arriving.

Direction: Daniel/Bloomingdale

48 stops
[VIEW LINE SCHEDULE](#)

- The Boardwalk
Station205 The Boardwalk, Waterloo
- University Ave. /
Countrystone3 Iron Gate St, Waterloo
- University Ave. / Countrystone Park
- Portsmouth /
Westvale216 Portsmouth Gate, Waterloo
- Westvale /
Bridgewater308 Westvale Drive, Waterloo
- Westvale / Thorndale550 Thorndale Dr, Waterloo
- Westvale / Edenvally244 Westvale Dr, Waterloo
- Westvale / Heather HillWestvale Drive, Waterloo
- Erb / Gateview10 Gateview Dr, Waterloo
- Erb / Fischer-HallmanErb Street West, Waterloo
- Erb / Roosevelt375 Erb Street West, Waterloo
- Erb / Culpepper359 Erb Street West, Waterloo
- Erb / Amos339 Erb Street West, Waterloo
- Erb / Mcdougall295 Erb Street West, Waterloo
- Erb / Westmount215 Erb Street West, Waterloo
- Erb / Dietz187 Erb Street West, Waterloo
- Erb / Roslin155 Erb Street West, Waterloo
- Erb / Avondale125 Erb Street West, Waterloo
- Erb / Euclid97 Erb Street West, Waterloo

5 bus Time Schedule

Daniel/Bloomingdale Route Timetable:

Sunday	Not Operational
Monday	5:37 AM - 11:10 PM
Tuesday	5:37 AM - 11:10 PM
Wednesday	5:37 AM - 11:10 PM
Thursday	5:37 AM - 11:10 PM
Friday	5:37 AM - 11:10 PM
Saturday	6:05 AM - 10:40 PM

5 bus Info

Direction: Daniel/Bloomingdale
Stops: 48
Trip Duration: 34 min
Line Summary:

Erb / Father David Bauer82 Erb St W, Waterloo

Willis Way Station

William / Caroline23 William Street West, Waterloo

Waterloo Public Square
Station22 King Street South, Waterloo

Erb / Hughes2 King St S, Waterloo

Erb / Willow7 Willow Street, Waterloo

Erb / Devitt145 Erb Street East, Waterloo

Erb / Weber54 Weber Street South, Waterloo

Erb / Ellis229 Erb Street East, Waterloo

Erb / Cardinal251 Erb St E, Waterloo

Erb / Terrystone284 Erb St E, Waterloo

Bridgeport Rd. /
Leander459 Bridgeport Road, Waterloo

Bridgeport Rd. /
Mackie495 Bridgeport Road, Waterloo

Lancaster / Bridgeport
Rd.538 Lancaster Street West, Waterloo

Lancaster /
General564 Lancaster Street West, Waterloo

Lancaster /
Bridge610 Lancaster Street West, Waterloo

Bridge / Tyson8 Bridge Street East, Waterloo

Bridge /
Bloomingdale38 Bridge Street East, Waterloo

Bridge /
Schweitzer86 Bridge Street East, Waterloo

Bridge / Tagge132 Bridge Street East, Waterloo

Hollinger / Howard15 Howard Place, Waterloo

Hollinger / Path To
DanielHollinger Crescent, Waterloo

Hollinger / Bridge170 Hollinger Crescent, Waterloo

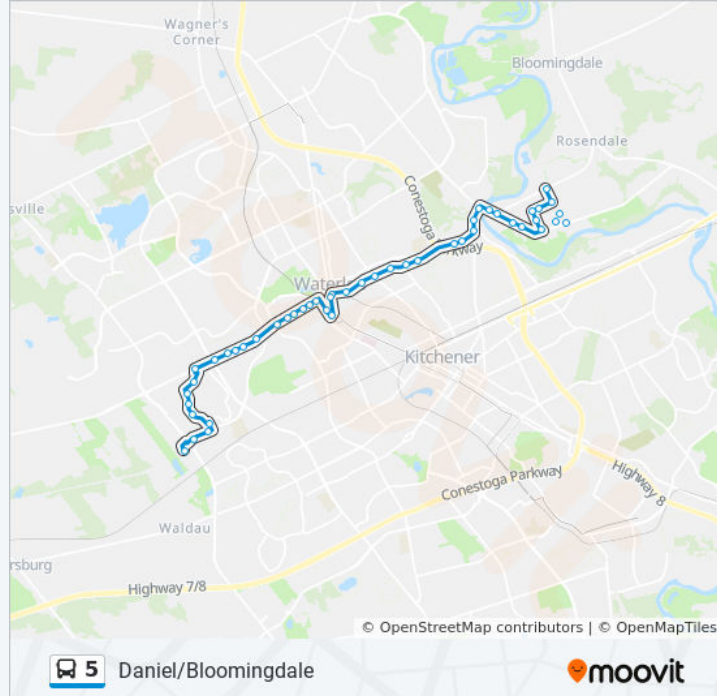
Stanley / Schueller61 Schueller Street, Waterloo

Stanley / Tagge87 Stanley Avenue, Waterloo

Stanley / Schweitzer59 Stanley Avenue, Waterloo

Schweitzer /
Nelson96 Schweitzer Street, Waterloo

Schweitzer /



Direction: Fairway Station

38 stops

[VIEW LINE SCHEDULE](#)

- King/University256 King Street North, Waterloo
- King/University256 King Street North, Waterloo
- University Ave. /
Weber65 University Avenue East, Waterloo
- Weber /
Marshall104 Marshall Street;Weber Street North, Waterloo
- Weber / Noecker153 Weber Street North, Waterloo
- Weber / Lincoln90 Weber Street North, Waterloo
- Weber / Erb21 Weber Street North, Waterloo
- Weber / Allen176 Allen Street East, Waterloo
- Weber / Union119 Weber Street South, Waterloo
- Weber / Roger153 Weber Street South, Waterloo
- Weber / Raitar378 Weber Street West, Waterloo
- Weber / Guelph341 Weber Street West, Waterloo
- Weber / Wilhelm225 Weber St W, Waterloo
- Weber /
Wellington153 Weber Street West, Waterloo
- Victoria / Kitchener Rail
Station100 Victoria St N, Waterloo
- Central Station490 King Street West, Waterloo
- Kitchener City Hall
Station58 Young Street, Waterloo
- Frederick / Weber97 Frederick Street, Waterloo
- Weber / Scott59 Weber Street East, Waterloo
- Weber / Cedar121 Weber St E, Waterloo
- Weber / Madison143 Weber St E, Waterloo
- Weber / Fairview202 Weber St E, Waterloo
- Weber / Borden311 Weber St E, Waterloo
- Weber /
Ottawa130 Ottawa Street North, Waterloo
- Weber / Sheldon621 Weber Street East, Waterloo
- Weber / Jackson721 Weber Street East, Waterloo

8 bus Time Schedule

Fairway Station Route Timetable:

Sunday	7:27 AM - 11:44 PM
Monday	5:38 AM - 11:44 PM
Tuesday	5:38 AM - 11:44 PM
Wednesday	5:38 AM - 11:44 PM
Thursday	5:38 AM - 11:44 PM
Friday	5:38 AM - 11:44 PM
Saturday	6:15 AM - 11:44 PM

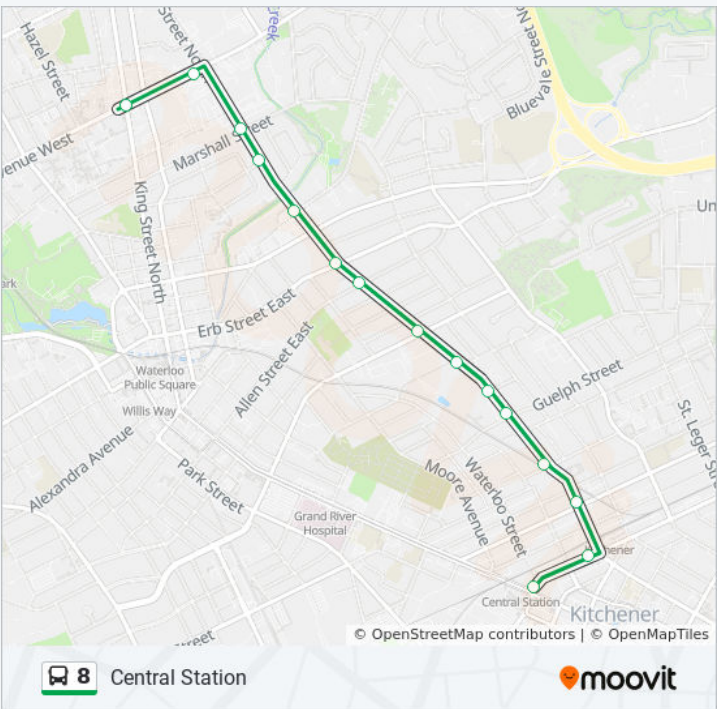
8 bus Info

Direction: Fairway Station

Stops: 38

Trip Duration: 33 min

Line Summary:



Eastwood Ci777 Weber St E, Waterloo

Weber / Wilfred42 Wilfred Avenue, Waterloo

Weber / Dellroy15 Dellroy Ave, Waterloo

Weber /
Broadview1099 Weber Street East, Waterloo

Weber / Franklin1157 Weber St E, Waterloo

Weber / Arlington

Weber / Fergus1335 Weber St E, Waterloo

Weber / Kinzie1425 Weber Street East, Waterloo

King / Kingsbury2919 King Street East, Waterloo

Fairway / King (West
Side)30 Fairway Road South, Waterloo

Fairway / Wabanaki

Fairway Station (Bus)2960 Kingsway Dr, Waterloo

The 29 bus line (Conestoga Station) has 4 routes. For regular weekdays, their operation hours are:
(1) Conestoga Station: 5:35 AM - 11:45 PM (2) Out Of Service: 12:15 AM (3) Out Of Service: 12:25 AM (4) The Boardwalk Station: 5:30 AM - 11:30 PM
Use the Moovit App to find the closest 29 bus station near you and find out when is the next 29 bus arriving.

Direction: Conestoga Station

50 stops

[VIEW LINE SCHEDULE](#)

- The Boardwalk
Station205 The Boardwalk, Waterloo
- 330 the Boardwalk330 The Boardwalk, Waterloo
- The Boardwalk / Medical
Centre430 The Boardwalk, Waterloo
- Ira Needles /
Thorndale457 Applegate Crt, Waterloo
- Ira Needles /
Erb41 Ira Needles Boulevard, Waterloo
- Erbsville / Westside Marketplace
- Erbsville / Royal
Beech610 610a Royal Beech Dr, Waterloo
- Erbsville / Path To Erbsville
Ct.91 Erbsville Court, Waterloo
- Keats Way /
Keatswood711 Keatswood Cres, Waterloo
- Keats Way / Beechwood621 Keats Way, Waterloo
- Keats Way / LeighlandKeats Way, Waterloo
- Keats Way / Beckwith543 Keats Way, Waterloo
- Keats Way / Sandford
Fleming101 Sandford Fleming Dr, Waterloo
- Keats Way / Fischer-
Hallman451 Keats Way, Waterloo
- Keats Way / Midwood397 Keats Way, Waterloo
- Keats Way / Path To
Mccarron82 Mccarron Cres, Waterloo

29 bus Time Schedule

Conestoga Station Route Timetable:

Sunday	8:55 AM - 11:25 PM
Monday	12:25 AM - 11:45 PM
Tuesday	5:35 AM - 11:45 PM
Wednesday	5:35 AM - 11:45 PM
Thursday	5:35 AM - 11:45 PM
Friday	5:35 AM - 11:45 PM
Saturday	Not Operational

29 bus Info

Direction: Conestoga Station

Stops: 50

Trip Duration: 39 min

Line Summary:

Keats Way / Amos345 Keats Way, Waterloo

Keats Way / Mcdougall257 Keats Way, Waterloo

University Ave. /
WestmountWestmount Road North, Waterloo

University Ave. / Ring Rd.

University Ave. / University Of
Waterloo163 University Avenue West, Waterloo

University Ave. /
Phillip141 University Avenue West, Waterloo

University Ave. /
Sunview208 Sunview St, Waterloo

University Ave. /
Hemlock80 University Avenue West, Waterloo

University Ave. / Wilfrid Laurier
University50 University Avenue West, Waterloo

King/University256 King Street North, Waterloo

King/University256 King Street North, Waterloo

University Ave. /
Weber65 University Avenue East, Waterloo

Weber /
Marshall104 Marshall Street;Weber Street North, Waterloo

Weber / Noecker153 Weber Street North, Waterloo

Lincoln / Weber125 Lincoln Road, Waterloo

Lincoln / Ellis155 Lincoln Road, Waterloo

Lincoln / Marshall191 Lincoln Road, Waterloo

Lincoln / Mayfield113 Mayfield Avenue, Waterloo

Lincoln / Bluevale289 Lincoln Road, Waterloo

Lincoln / University Ave.324 Lincoln Rd, Waterloo

Bridge / University
Ave.387 Strawberry Cres, Waterloo

Bridge / Crimson362 Crimson Drive, Waterloo

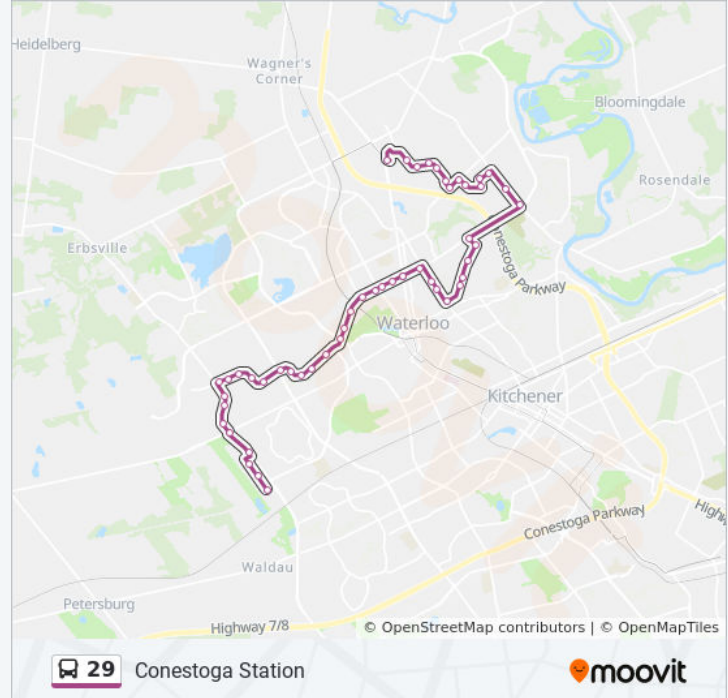
Dansbury / Eiwo451 Boettger Pl, Waterloo

Dansbury / Lee404 Lee Avenue, Waterloo

Lee / Dunvegan387 Lee Avenue, Waterloo

Dunvegan /
Bairstow420 420a Dunvegan Dr, Waterloo

Lexington /
Dunvegan266 Lexington Road, Waterloo



Lexington /
Davenport215 Lexington Road, Waterloo

Davenport / Foxhunt238 Foxhunt Rd, Waterloo

Davenport / Path To
Anndale493 Anndale Rd, Waterloo

Davenport / Kidsability
Centre498 498b Redfox Rd, Waterloo

Davenport /
Kingscourt517 Barwick Cres, Waterloo

Davenport / Conestoga
Mall543 Barwick Cres, Waterloo

Conestoga Station (Bus)

Direction: Out Of Service

51 stops

[VIEW LINE SCHEDULE](#)

- Conestoga Station (Bus)
- Davenport / Old AbbeyDavenport Road, Waterloo
- Davenport / Contestoga
Mall416 Kingscourt Drive, Waterloo
- Davenport /
Kingscourt520 520b Redfox Rd, Waterloo
- Davenport / Kidsability
Centre500 500a Redfox Rd, Waterloo
- Davenport / Path To
Redfox476 Redfox Rd, Waterloo
- Lexington /
Davenport215 Lexington Road, Waterloo
- Lexington /
Dunvegan277 Lexington Road, Waterloo
- Dunvegan /
Bairstow419 419a Dunvegan Dr, Waterloo
- Lee / Dunvegan387 Lee Avenue, Waterloo
- Lee / Dansbury398 Lee Avenue, Waterloo
- Bridge /
Dansbury373 Bridge Street West, Waterloo
- Bridge / Crimson391 Grangewood Dr, Waterloo
- University Ave. /
Bridge370 University Ave E, Waterloo
- Lincoln / Bluevale
- Lincoln / Mayfield250 Lincoln Road, Waterloo
- Lincoln / Marshall204 Lincoln Road, Waterloo
- Lincoln / Ellis168 Lincoln Road, Waterloo
- Lincoln / Weber130 Lincoln Road, Waterloo
- Weber / Mackay134 Weber Street North, Waterloo
- Weber / Noecker150 Weber Street North, Waterloo
- Weber /
Marshall113 Weber Street North;Marshall Street, Waterloo
- University Ave. /
Weber68 University Avenue East, Waterloo

29 bus Time Schedule

Out Of Service Route Timetable:

Sunday	12:15 AM
Monday	Not Operational
Tuesday	Not Operational
Wednesday	Not Operational
Thursday	Not Operational
Friday	Not Operational
Saturday	7:15 AM - 11:15 PM

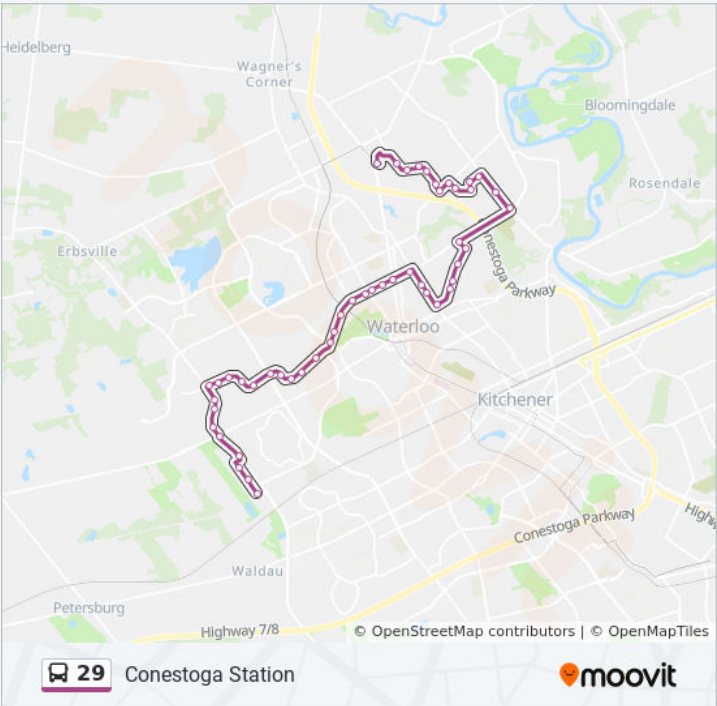
29 bus Info

Direction: Out Of Service

Stops: 51

Trip Duration: 40 min

Line Summary:



University Ave. /
Regina26 University Ave E, Waterloo

King/University256 King Street North, Waterloo

University Ave. / Wilfrid Laurier
University50 University Avenue West, Waterloo

University Ave. /
Hemlock80 University Avenue West, Waterloo

University Ave. /
Sunview108 Sunview Street, Waterloo

University Ave. /
Phillip150 University Avenue West, Waterloo

University Ave. / University Of Waterloo

University Ave. / Ring Rd.

University Ave. /
WestmountWestmount Road North, Waterloo

Keats Way /
Mcdougall76 McDougall Road, Waterloo

Keats Way / Amos80 Amos Ave, Waterloo

Keats Way / Path To
Mccarron80 Mccarron Cres, Waterloo

Keats Way /
Candlewood397 Keats Way, Waterloo

Keats Way / Fischer-
Hallman454 Keats Way, Waterloo

Keats Way / Sandford
Fleming508 Keats Way, Waterloo

Keats Way / Brynhurst540 Keats Way, Waterloo

Keats Way / Leighland525 Leighland Dr, Waterloo

Keats Way / Beechwood608 Keats Way, Waterloo

Keats Way /
Erbsville711 Keatswood Cres, Waterloo

Erbsville / Path To Erbsville
Ct.91 Erbsville Court, Waterloo

Erbsville /
Brandenburg610 Royal Beech Drive, Waterloo

Erbsville / Chablis574 Chablis Drive, Waterloo

Erbsville / Westside Marketplace

Ira Needles / Erb

Ira Needles /
Thorndale457 Applegate Crt, Waterloo

The Boardwalk / Medical Centre

330 the Boardwalk330 The Boardwalk, Waterloo

The Boardwalk

Station205 The Boardwalk, Waterloo

Direction: Out Of Service

50 stops

[VIEW LINE SCHEDULE](#)

- The Boardwalk
Station205 The Boardwalk, Waterloo
- 330 the Boardwalk330 The Boardwalk, Waterloo
- The Boardwalk / Medical
Centre430 The Boardwalk, Waterloo
- Ira Needles /
Thorndale457 Applegate Crt, Waterloo
- Ira Needles /
Erb41 Ira Needles Boulevard, Waterloo
- Erbsville / Westside Marketplace
- Erbsville / Royal
Beech610 610a Royal Beech Dr, Waterloo
- Erbsville / Path To Erbsville
Ct.91 Erbsville Court, Waterloo
- Keats Way /
Keatswood711 Keatswood Cres, Waterloo
- Keats Way / Beechwood621 Keats Way, Waterloo
- Keats Way / LeighlandKeats Way, Waterloo
- Keats Way / Beckwith543 Keats Way, Waterloo
- Keats Way / Sandford
Fleming101 Sandford Fleming Dr, Waterloo
- Keats Way / Fischer-
Hallman451 Keats Way, Waterloo
- Keats Way / Midwood397 Keats Way, Waterloo
- Keats Way / Path To
Mccarron82 Mccarron Cres, Waterloo
- Keats Way / Amos345 Keats Way, Waterloo
- Keats Way / Mcdougall257 Keats Way, Waterloo
- University Ave. /
WestmountWestmount Road North, Waterloo
- University Ave. / Ring Rd.
- University Ave. / University Of
Waterloo163 University Avenue West, Waterloo
- University Ave. /
Phillip141 University Avenue West, Waterloo

29 bus Time Schedule

Out Of Service Route Timetable:

Sunday	12:25 AM
Monday	Not Operational
Tuesday	Not Operational
Wednesday	Not Operational
Thursday	Not Operational
Friday	Not Operational
Saturday	6:55 AM - 11:25 PM

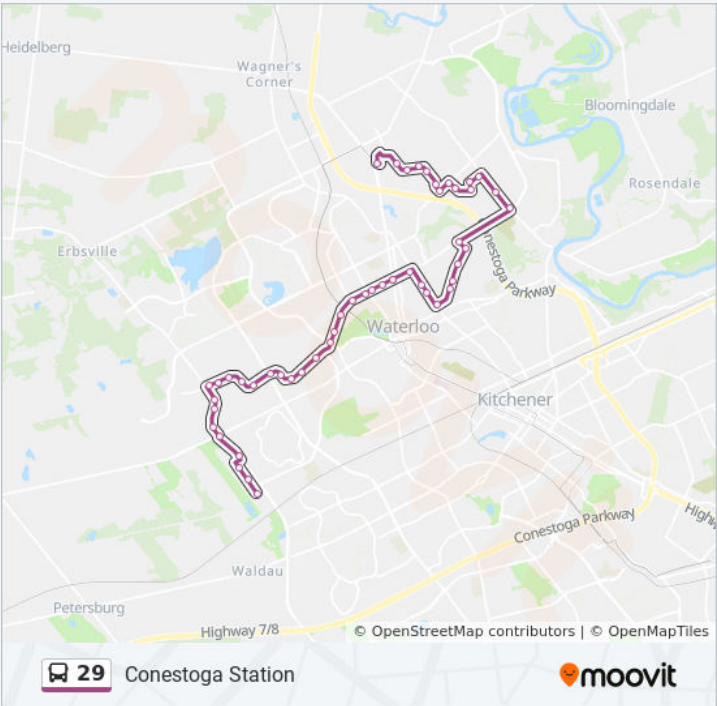
29 bus Info

Direction: Out Of Service

Stops: 50

Trip Duration: 40 min

Line Summary:



University Ave. /
Sunview208 Sunview St, Waterloo

University Ave. /
Hemlock80 University Avenue West, Waterloo

University Ave. / Wilfrid Laurier
University50 University Avenue West, Waterloo

King/University256 King Street North, Waterloo

King/University256 King Street North, Waterloo

University Ave. /
Weber65 University Avenue East, Waterloo

Weber /
Marshall104 Marshall Street;Weber Street North, Waterloo

Weber / Noecker153 Weber Street North, Waterloo

Lincoln / Weber125 Lincoln Road, Waterloo

Lincoln / Ellis155 Lincoln Road, Waterloo

Lincoln / Marshall191 Lincoln Road, Waterloo

Lincoln / Mayfield113 Mayfield Avenue, Waterloo

Lincoln / Bluevale289 Lincoln Road, Waterloo

Lincoln / University Ave.324 Lincoln Rd, Waterloo

Bridge / University
Ave.387 Strawberry Cres, Waterloo

Bridge / Crimson362 Crimson Drive, Waterloo

Dansbury / Eiwo451 Boettger Pl, Waterloo

Dansbury / Lee404 Lee Avenue, Waterloo

Lee / Dunvegan387 Lee Avenue, Waterloo

Dunvegan /
Bairstow420 420a Dunvegan Dr, Waterloo

Lexington /
Dunvegan266 Lexington Road, Waterloo

Lexington /
Davenport215 Lexington Road, Waterloo

Davenport / Foxhunt238 Foxhunt Rd, Waterloo

Davenport / Path To
Anndale493 Anndale Rd, Waterloo

Davenport / Kidsability
Centre498 498b Redfox Rd, Waterloo

Davenport /
Kingscourt517 Barwick Cres, Waterloo

Davenport / Conestoga

Mall543 Barwick Cres, Waterloo

Conestoga Station (Bus)

Direction: The Boardwalk Station

51 stops

[VIEW LINE SCHEDULE](#)

- Conestoga Station (Bus)
- Davenport / Old AbbeyDavenport Road, Waterloo
- Davenport / Contestoga
Mall416 Kingscourt Drive, Waterloo
- Davenport /
Kingscourt520 520b Redfox Rd, Waterloo
- Davenport / Kidsability
Centre500 500a Redfox Rd, Waterloo
- Davenport / Path To
Redfox476 Redfox Rd, Waterloo
- Lexington /
Davenport215 Lexington Road, Waterloo
- Lexington /
Dunvegan277 Lexington Road, Waterloo
- Dunvegan /
Bairstow419 419a Dunvegan Dr, Waterloo
- Lee / Dunvegan387 Lee Avenue, Waterloo
- Lee / Dansbury398 Lee Avenue, Waterloo
- Bridge /
Dansbury373 Bridge Street West, Waterloo
- Bridge / Crimson391 Grangewood Dr, Waterloo
- University Ave. /
Bridge370 University Ave E, Waterloo
- Lincoln / Bluevale
- Lincoln / Mayfield250 Lincoln Road, Waterloo
- Lincoln / Marshall204 Lincoln Road, Waterloo
- Lincoln / Ellis168 Lincoln Road, Waterloo
- Lincoln / Weber130 Lincoln Road, Waterloo
- Weber / Mackay134 Weber Street North, Waterloo
- Weber / Noecker150 Weber Street North, Waterloo
- Weber /
Marshall113 Weber Street North;Marshall Street, Waterloo
- University Ave. /
Weber68 University Avenue East, Waterloo

29 bus Time Schedule

The Boardwalk Station Route Timetable:

Sunday	8:10 AM - 11:10 PM
Monday	12:10 AM - 11:30 PM
Tuesday	5:30 AM - 11:30 PM
Wednesday	5:30 AM - 11:30 PM
Thursday	5:30 AM - 11:30 PM
Friday	5:30 AM - 11:30 PM
Saturday	Not Operational

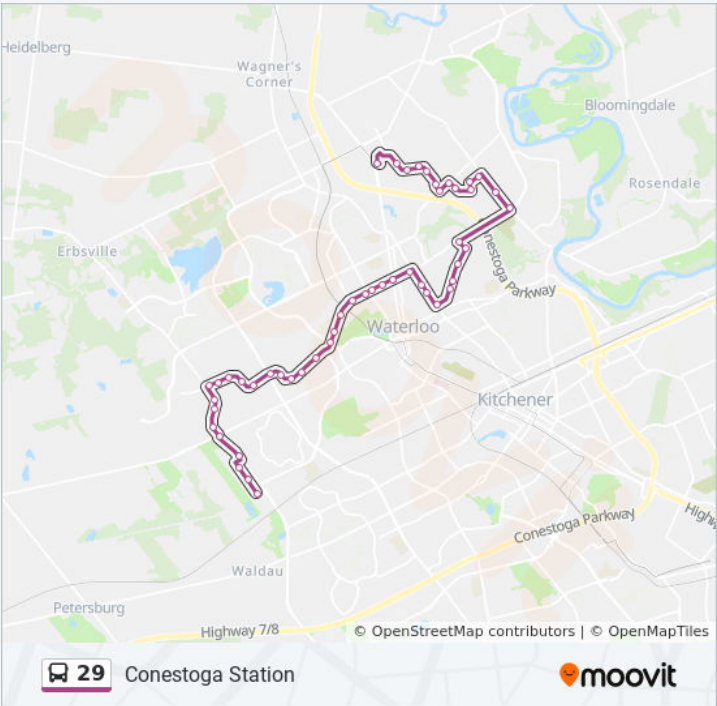
29 bus Info

Direction: The Boardwalk Station

Stops: 51

Trip Duration: 39 min

Line Summary:



University Ave. /
Regina26 University Ave E, Waterloo

King/University256 King Street North, Waterloo

University Ave. / Wilfrid Laurier
University50 University Avenue West, Waterloo

University Ave. /
Hemlock80 University Avenue West, Waterloo

University Ave. /
Sunview108 Sunview Street, Waterloo

University Ave. /
Phillip150 University Avenue West, Waterloo

University Ave. / University Of Waterloo

University Ave. / Ring Rd.

University Ave. /
WestmountWestmount Road North, Waterloo

Keats Way /
Mcdougall76 McDougall Road, Waterloo

Keats Way / Amos80 Amos Ave, Waterloo

Keats Way / Path To
Mccarron80 Mccarron Cres, Waterloo

Keats Way /
Candlewood397 Keats Way, Waterloo

Keats Way / Fischer-
Hallman454 Keats Way, Waterloo

Keats Way / Sandford
Fleming508 Keats Way, Waterloo

Keats Way / Brynhurst540 Keats Way, Waterloo

Keats Way / Leighland525 Leighland Dr, Waterloo

Keats Way / Beechwood608 Keats Way, Waterloo

Keats Way /
Erbsville711 Keatswood Cres, Waterloo

Erbsville / Path To Erbsville
Ct.91 Erbsville Court, Waterloo

Erbsville /
Brandenburg610 Royal Beech Drive, Waterloo

Erbsville / Chablis574 Chablis Drive, Waterloo

Erbsville / Westside Marketplace

Ira Needles / Erb

Ira Needles /
Thorndale457 Applegate Crt, Waterloo

The Boardwalk / Medical Centre

330 the Boardwalk330 The Boardwalk, Waterloo

The Boardwalk

Station205 The Boardwalk, Waterloo

29 bus time schedules and route maps are available in an offline PDF at moovitapp.com. Use the [Moovit App](#) to see live bus times, train schedule or subway schedule, and step-by-step directions for all public transit in Toronto.

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Check Live Arrival Times



Weekday Schedule

to Fairway

Conestoga	Northfield	Research and Technology	University of Waterloo	Laurier-Waterloo Park	Willis Way	Allen	Grand River Hospital	Central Station	Victoria Park	Queen	Kitchener Market	Borden	Mill	Block Line	Fairway
5:10	5:14	5:17	5:20	5:21	5:25	5:27	5:29	5:32	5:34	5:36	5:38	5:40	5:43	5:48	5:53
5:25	5:29	5:32	5:35	5:36	5:40	5:42	5:44	5:47	5:49	5:51	5:53	5:55	5:58	6:03	6:08
5:40	5:44	5:47	5:50	5:51	5:55	5:57	5:59	6:02	6:04	6:06	6:08	6:10	6:13	6:18	6:23
5:55	5:59	6:02	6:05	6:06	6:10	6:12	6:14	6:17	6:19	6:21	6:23	6:25	6:28	6:33	6:38
6:10	6:14	6:17	6:20	6:21	6:25	6:27	6:29	6:32	6:34	6:36	6:38	6:40	6:43	6:48	6:53
6:20	6:24	6:27	6:30	6:31	6:35	6:37	6:39	6:42	6:44	6:46	6:48	6:50	6:53	6:58	7:03
6:30	6:34	6:37	6:40	6:41	6:45	6:47	6:49	6:52	6:54	6:56	6:58	7:00	7:03	7:08	7:13
6:40	6:44	6:47	6:50	6:51	6:55	6:57	6:59	7:02	7:04	7:06	7:08	7:10	7:13	7:18	7:23
6:50	6:54	6:57	7:00	7:01	7:05	7:07	7:09	7:12	7:14	7:16	7:18	7:20	7:23	7:28	7:33
7:00	7:04	7:07	7:10	7:11	7:15	7:17	7:19	7:22	7:24	7:26	7:28	7:30	7:33	7:38	7:43
RUNS EVERY 10 MINUTES During daytime															
4:30	4:34	4:37	4:40	4:41	4:45	4:47	4:49	4:52	4:54	4:56	4:58	5:00	5:03	5:08	5:13
4:40	4:44	4:47	4:50	4:51	4:55	4:57	4:59	5:02	5:04	5:06	5:08	5:10	5:13	5:18	5:23
4:50	4:54	4:57	5:00	5:01	5:05	5:07	5:09	5:12	5:14	5:16	5:18	5:20	5:23	5:28	5:33
5:00	5:04	5:07	5:10	5:11	5:15	5:17	5:19	5:22	5:24	5:26	5:28	5:30	5:33	5:38	5:43
5:10	5:14	5:17	5:20	5:21	5:25	5:27	5:29	5:32	5:34	5:36	5:38	5:40	5:43	5:48	5:53
5:20	5:24	5:27	5:30	5:31	5:35	5:37	5:39	5:42	5:44	5:46	5:48	5:50	5:53	5:58	6:03
5:30	5:34	5:37	5:40	5:41	5:45	5:47	5:49	5:52	5:54	5:56	5:58	6:00	6:03	6:08	6:13
5:40	5:44	5:47	5:50	5:51	5:55	5:57	5:59	6:02	6:04	6:06	6:08	6:10	6:13	6:18	6:23
5:50	5:54	5:57	6:00	6:01	6:05	6:07	6:09	6:12	6:14	6:16	6:18	6:20	6:23	6:28	6:33
6:00	6:04	6:07	6:10	6:11	6:15	6:17	6:19	6:22	6:24	6:26	6:28	6:30	6:33	6:38	6:43
6:10	6:14	6:17	6:20	6:21	6:25	6:27	6:29	6:32	6:34	6:36	6:38	6:40	6:43	6:48	6:53
6:25	6:29	6:32	6:35	6:36	6:40	6:42	6:44	6:47	6:49	6:51	6:53	6:55	6:58	7:03	7:08
6:40	6:44	6:47	6:50	6:51	6:55	6:57	6:59	7:02	7:04	7:06	7:08	7:10	7:13	7:18	7:23
6:55	6:59	7:02	7:05	7:06	7:10	7:12	7:14	7:17	7:19	7:21	7:23	7:25	7:28	7:33	7:38
RUNS EVERY 15 MINUTES During evening															
10:10	10:14	10:17	10:20	10:21	10:25	10:27	10:29	10:32	10:34	10:36	10:38	10:40	10:43	10:48	10:53
10:25	10:29	10:32	10:35	10:36	10:40	10:42	10:44	10:47	10:49	10:51	10:53	10:55	10:58	11:03	11:08
10:40	10:44	10:47	10:50	10:51	10:55	10:57	10:59	11:02	11:04	11:06	11:08	11:10	11:13	11:18	11:23
11:10	11:14	11:17	11:20	11:21	11:25	11:27	11:29	11:32	11:34	11:36	11:38	11:40	11:43	11:48	11:53
11:40	11:44	11:47	11:50	11:51	11:55	11:57	11:59	12:02	12:04	12:06	12:08	12:10	12:13	12:18	12:23



Connection to 302 ION Bus

Fares and schedules are subject to change without notice.

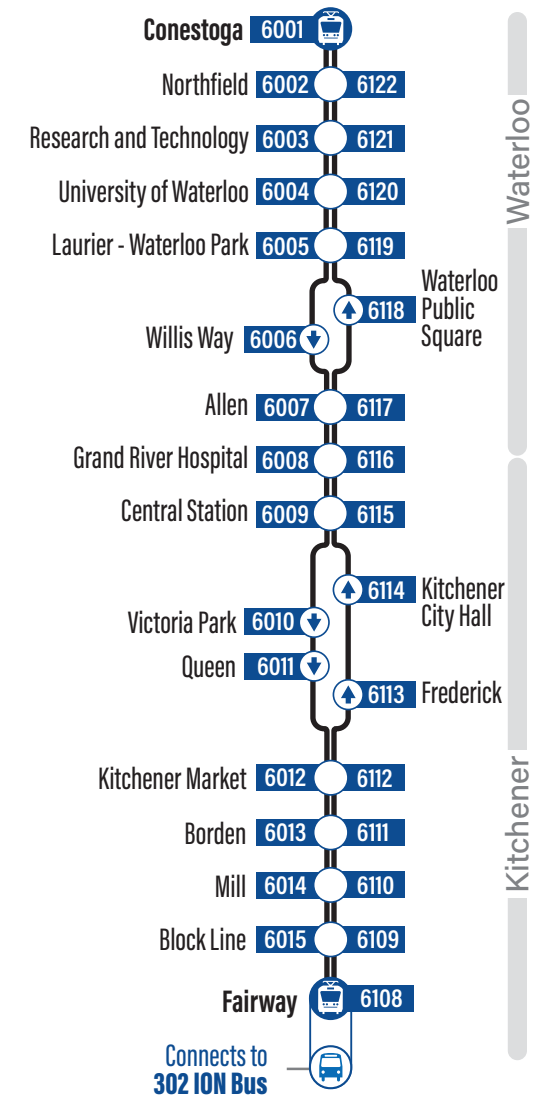
to Conestoga

Fairway	Block Line	Mill	Borden	Kitchener Market	Frederick	Kitchener City Hall	Central Station	Grand River Hospital	Allen	Waterloo Public Square	Laurier-Waterloo Park	University of Waterloo	Research and Technology	Northfield	Conestoga
5:30	5:34	5:39	5:43	5:45	5:47	5:50	5:53	5:55	5:57	6:00	6:03	6:05	6:07	6:10	6:14
6:00	6:04	6:09	6:13	6:15	6:17	6:20	6:23	6:25	6:27	6:30	6:33	6:35	6:37	6:40	6:44
6:15	6:19	6:24	6:28	6:30	6:32	6:35	6:38	6:40	6:42	6:45	6:48	6:50	6:52	6:55	6:59
6:30	6:34	6:39	6:43	6:45	6:47	6:50	6:53	6:55	6:57	7:00	7:03	7:05	7:07	7:10	7:14
6:45	6:49	6:54	6:58	7:00	7:02	7:05	7:08	7:10	7:12	7:15	7:18	7:20	7:22	7:25	7:29
7:00	7:04	7:09	7:13	7:15	7:17	7:20	7:23	7:25	7:27	7:30	7:33	7:35	7:37	7:40	7:44
7:10	7:14	7:19	7:23	7:25	7:27	7:30	7:33	7:35	7:37	7:40	7:43	7:45	7:47	7:50	7:54
7:20	7:24	7:29	7:33	7:35	7:37	7:40	7:43	7:45	7:47	7:50	7:53	7:55	7:57	8:00	8:04
7:30	7:34	7:39	7:43	7:45	7:47	7:50	7:53	7:55	7:57	8:00	8:03	8:05	8:07	8:10	8:14
RUNS EVERY 10 MINUTES During daytime															
5:20	5:24	5:29	5:33	5:35	5:37	5:40	5:43	5:45	5:47	5:50	5:53	5:55	5:57	6:00	6:04
5:30	5:34	5:39	5:43	5:45	5:47	5:50	5:53	5:55	5:57	6:00	6:03	6:05	6:07	6:10	6:14
5:40	5:44	5:49	5:53	5:55	5:57	6:00	6:03	6:05	6:07	6:10	6:13	6:15	6:17	6:20	6:24
5:50	5:54	5:59	6:03	6:05	6:07	6:10	6:13	6:15	6:17	6:20	6:23	6:25	6:27	6:30	6:34
6:00	6:04	6:09	6:13	6:15	6:17	6:20	6:23	6:25	6:27	6:30	6:33	6:35	6:37	6:40	6:44
6:10	6:14	6:19	6:23	6:25	6:27	6:30	6:33	6:35	6:37	6:40	6:43	6:45	6:47	6:50	6:54
6:20	6:24	6:29	6:33	6:35	6:37	6:40	6:43	6:45	6:47	6:50	6:53	6:55	6:57	7:00	7:04
6:30	6:34	6:39	6:43	6:45	6:47	6:50	6:53	6:55	6:57	7:00	7:03	7:05	7:07	7:10	7:14
6:40	6:44	6:49	6:53	6:55	6:57	7:00	7:03	7:05	7:07	7:10	7:13	7:15	7:17	7:20	7:24
6:50	6:54	6:59	7:03	7:05	7:07	7:10	7:13	7:15	7:17	7:20	7:23	7:25	7:27	7:30	7:34
7:00	7:04	7:09	7:13	7:15	7:17	7:20	7:23	7:25	7:27	7:30	7:33	7:35	7:37	7:40	7:44
7:15	7:19	7:24	7:28	7:30	7:32	7:35	7:38	7:40	7:42	7:45	7:48	7:50	7:52	7:55	7:59
7:30	7:34	7:39	7:43	7:45	7:47	7:50	7:53	7:55	7:57	8:00	8:03	8:05	8:07	8:10	8:14
7:45	7:49	7:54	7:58	8:00	8:02	8:05	8:08	8:10	8:12	8:15	8:18	8:20	8:22	8:25	8:29
RUNS EVERY 15 MINUTES During evening															
10:00	10:04	10:09	10:13	10:15	10:17	10:20	10:23	10:25	10:27	10:30	10:33	10:35	10:37	10:40	10:44
10:15	10:19	10:24	10:28	10:30	10:32	10:35	10:38	10:40	10:42	10:45	10:48	10:50	10:52	10:55	10:59
10:35	10:39	10:44	10:48	10:50	10:52	10:55	10:58	11:00	11:02	11:05	11:08	11:10	11:12	11:15	11:19
10:50	10:54	10:59	11:03	11:05	11:07	11:10	11:13	11:15	11:17	11:20	11:23	11:25	11:27	11:30	11:34
11:05	11:09	11:14	11:18	11:20	11:22	11:25	11:28	11:30	11:32	11:35	11:38	11:40	11:42	11:45	11:49
11:20	11:24	11:29	11:33	11:35	11:37	11:40	11:43	11:45	11:47	11:50	11:53	11:55	11:57	12:00	12:04
11:35	11:39	11:44	11:48	11:50	11:52	11:55	11:58	12:00	12:02	12:05	12:08	12:10	12:12	12:15	12:19

ION Light Rail

301

Effective: September 6, 2021



A.M.	0:00
P.M.	0:00

grt.ca

519-585-7555 Deaf and hard of hearing (TTY): 519-575-4608
Text: 57555 & key in your bus stop number

Saturday Schedule

to Fairway

Conestoga	Northfield	Research and Technology	University of Waterloo	Laurier-Waterloo Park	Willis Way	Allen	Grand River Hospital	Central Station	Victoria Park	Queen	Kitchener Market	Borden	Mill	Block Line	Fairway
5:25	5:29	5:32	5:35	5:36	5:40	5:42	5:44	5:47	5:49	5:51	5:53	5:55	5:58	6:03	6:08
5:40	5:44	5:47	5:50	5:51	5:55	5:57	5:59	6:02	6:04	6:06	6:08	6:10	6:13	6:18	6:23
5:55	5:59	6:02	6:05	6:06	6:10	6:12	6:14	6:17	6:19	6:21	6:23	6:25	6:28	6:33	6:38
6:10	6:14	6:17	6:20	6:21	6:25	6:27	6:29	6:32	6:34	6:36	6:38	6:40	6:43	6:48	6:53
6:25	6:29	6:32	6:35	6:36	6:40	6:42	6:44	6:47	6:49	6:51	6:53	6:55	6:58	7:03	7:08
6:40	6:44	6:47	6:50	6:51	6:55	6:57	6:59	7:02	7:04	7:06	7:08	7:10	7:13	7:18	7:23
6:55	6:59	7:02	7:05	7:06	7:10	7:12	7:14	7:17	7:19	7:21	7:23	7:25	7:28	7:33	7:38
7:10	7:14	7:17	7:20	7:21	7:25	7:27	7:29	7:32	7:34	7:36	7:38	7:40	7:43	7:48	7:53
7:25	7:29	7:32	7:35	7:36	7:40	7:42	7:44	7:47	7:49	7:51	7:53	7:55	7:58	8:03	8:08
7:40	7:44	7:47	7:50	7:51	7:55	7:57	7:59	8:02	8:04	8:06	8:08	8:10	8:13	8:18	8:23
7:55	7:59	8:02	8:05	8:06	8:10	8:12	8:14	8:17	8:19	8:21	8:23	8:25	8:28	8:33	8:38
8:10	8:14	8:17	8:20	8:21	8:25	8:27	8:29	8:32	8:34	8:36	8:38	8:40	8:43	8:48	8:53
8:25	8:29	8:32	8:35	8:36	8:40	8:42	8:44	8:47	8:49	8:51	8:53	8:55	8:58	9:03	9:08
8:40	8:44	8:47	8:50	8:51	8:55	8:57	8:59	9:02	9:04	9:06	9:08	9:10	9:13	9:18	9:23
RUNS EVERY 15 MINUTES During daytime and evening															
7:40	7:44	7:47	7:50	7:51	7:55	7:57	7:59	8:02	8:04	8:06	8:08	8:10	8:13	8:18	8:23
7:55	7:59	8:02	8:05	8:06	8:10	8:12	8:14	8:17	8:19	8:21	8:23	8:25	8:28	8:33	8:38
8:10	8:14	8:17	8:20	8:21	8:25	8:27	8:29	8:32	8:34	8:36	8:38	8:40	8:43	8:48	8:53
8:25	8:29	8:32	8:35	8:36	8:40	8:42	8:44	8:47	8:49	8:51	8:53	8:55	8:58	9:03	9:08
8:40	8:44	8:47	8:50	8:51	8:55	8:57	8:59	9:02	9:04	9:06	9:08	9:10	9:13	9:18	9:23
8:55	8:59	9:02	9:05	9:06	9:10	9:12	9:14	9:17	9:19	9:21	9:23	9:25	9:28	9:33	9:38
9:10	9:14	9:17	9:20	9:21	9:25	9:27	9:29	9:32	9:34	9:36	9:38	9:40	9:43	9:48	9:53
9:25	9:29	9:32	9:35	9:36	9:40	9:42	9:44	9:47	9:49	9:51	9:53	9:55	9:58	10:03	10:08
9:40	9:44	9:47	9:50	9:51	9:55	9:57	9:59	10:02	10:04	10:06	10:08	10:10	10:13	10:18	10:23
9:55	9:59	10:02	10:05	10:06	10:10	10:12	10:14	10:17	10:19	10:21	10:23	10:25	10:28	10:33	10:38
10:10	10:14	10:17	10:20	10:21	10:25	10:27	10:29	10:32	10:34	10:36	10:38	10:40	10:43	10:48	10:53
10:25	10:29	10:32	10:35	10:36	10:40	10:42	10:44	10:47	10:49	10:51	10:53	10:55	10:58	11:03	11:08
10:40	10:44	10:47	10:50	10:51	10:55	10:57	10:59	11:02	11:04	11:06	11:08	11:10	11:13	11:18	11:23
11:10	11:14	11:17	11:20	11:21	11:25	11:27	11:29	11:32	11:34	11:36	11:38	11:40	11:43	11:48	11:53
11:40	11:44	11:47	11:50	11:51	11:55	11:57	11:59	12:02	12:04	12:06	12:08	12:10	12:13	12:18	12:23

to Conestoga

Fairway	Block Line	Mill	Borden	Kitchener Market	Frederick	Kitchener City Hall	Central Station	Grand River Hospital	Allen	Waterloo Public Square	Laurier-Waterloo Park	University of Waterloo	Research and Technology	Northfield	Conestoga
6:00	6:04	6:09	6:13	6:15	6:17	6:20	6:23	6:25	6:27	6:30	6:33	6:35	6:37	6:40	6:44
6:15	6:19	6:24	6:28	6:30	6:32	6:35	6:38	6:40	6:42	6:45	6:48	6:50	6:52	6:55	6:59
6:30	6:34	6:39	6:43	6:45	6:47	6:50	6:53	6:55	6:57	7:00	7:03	7:05	7:07	7:10	7:14
6:45	6:49	6:54	6:58	7:00	7:02	7:05	7:08	7:10	7:12	7:15	7:18	7:20	7:22	7:25	7:29
7:00	7:04	7:09	7:13	7:15	7:17	7:20	7:23	7:25	7:27	7:30	7:33	7:35	7:37	7:40	7:44
7:15	7:19	7:24	7:28	7:30	7:32	7:35	7:38	7:40	7:42	7:45	7:48	7:50	7:52	7:55	7:59
7:30	7:34	7:39	7:43	7:45	7:47	7:50	7:53	7:55	7:57	8:00	8:03	8:05	8:07	8:10	8:14
7:45	7:49	7:54	7:58	8:00	8:02	8:05	8:08	8:10	8:12	8:15	8:18	8:20	8:22	8:25	8:29
8:00	8:04	8:09	8:13	8:15	8:17	8:20	8:23	8:25	8:27	8:30	8:33	8:35	8:37	8:40	8:44
8:15	8:19	8:24	8:28	8:30	8:32	8:35	8:38	8:40	8:42	8:45	8:48	8:50	8:52	8:55	8:59
8:30	8:34	8:39	8:43	8:45	8:47	8:50	8:53	8:55	8:57	9:00	9:03	9:05	9:07	9:10	9:14
8:45	8:49	8:54	8:58	9:00	9:02	9:05	9:08	9:10	9:12	9:15	9:18	9:20	9:22	9:25	9:29
9:00	9:04	9:09	9:13	9:15	9:17	9:20	9:23	9:25	9:27	9:30	9:33	9:35	9:37	9:40	9:44
9:15	9:19	9:24	9:28	9:30	9:32	9:35	9:38	9:40	9:42	9:45	9:48	9:50	9:52	9:55	9:59
RUNS EVERY 15 MINUTES During daytime and evening															
8:00	8:04	8:09	8:13	8:15	8:17	8:20	8:23	8:25	8:27	8:30	8:33	8:35	8:37	8:40	8:44
8:15	8:19	8:24	8:28	8:30	8:32	8:35	8:38	8:40	8:42	8:45	8:48	8:50	8:52	8:55	8:59
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9:30	9:34	9:39	9:43	9:45	9:47	9:50	9:53	9:55	9:57	10:00	10:03	10:05	10:07	10:10	10:14
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10:30	10:34	10:39	10:43	10:45	10:47	10:50	10:53	10:55	10:57	11:00	11:03	11:05	11:07	11:10	11:14
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11:15	11:19	11:24	11:28	11:30	11:32	11:35	11:38	11:40	11:42	11:45	11:48	11:50	11:52	11:55	11:59
11:30	11:34	11:39	11:43	11:45	11:47	11:50	11:53	11:55	11:57	12:00	12:03	12:05	12:07	12:10	12:14

Sunday/Stat Holiday Schedule

to Fairway

Conestoga	Northfield	Research and Technology	University of Waterloo	Laurier-Waterloo Park	Willis Way	Allen	Grand River Hospital	Central Station	Victoria Park	Queen	Kitchener Market	Borden	Mill	Block Line	Fairway	
6:40	6:44	6:16	6:18	6:19	6:23	6:25	6:27	6:30	6:32	6:34	6:36	6:38	6:41	6:46	6:51	
7:10	7:14	6:47	7:20	7:21	7:25	7:27	7:29	7:32	7:34	7:36	7:38	7:40	7:43	7:48	7:53	
7:40	7:44	7:47	7:50	7:51	7:55	7:57	7:59	8:02	8:04	8:06	8:08	8:10	8:13	8:18	8:23	
7:55	7:59	8:02	8:05	8:06	8:10	8:12	8:14	8:17	8:19	8:21	8:23	8:25	8:28	8:33	8:38	
8:10	8:14	8:17	8:20	8:21	8:25	8:27	8:29	8:32	8:34	8:36	8:38	8:40	8:43	8:48	8:53	
8:25	8:29	8:32	8:35	8:36	8:40	8:42	8:44	8:47	8:49	8:51	8:53	8:55	8:58	9:03	9:08	
8:40	8:44	8:47	8:50	8:51	8:55	8:57	8:59	9:02	9:04	9:06	9:08	9:10	9:13	9:18	9:23	
8:55	8:59	9:02	9:05	9:06	9:10	9:12	9:14	9:17	9:19	9:21	9:23	9:25	9:28	9:33	9:38	
9:10	9:14	9:17	9:20	9:21	9:25	9:27	9:29	9:32	9:34	9:36	9:38	9:40	9:43	9:48	9:53	
RUNS EVERY 15 MINUTES During daytime and evening																
7:55	7:59	8:02	8:05	8:06	8:10	8:12	8:14	8:17	8:19	8:21	8:23	8:25	8:28	8:33	8:38	
8:10	8:14	8:17	8:20	8:21	8:25	8:27	8:29	8:32	8:34	8:36	8:38	8:40	8:43	8:48	8:53	
8:25	8:29	8:32	8:35	8:36	8:40	8:42	8:44	8:47	8:49	8:51	8:53	8:55	8:58	9:03	9:08	
8:40	8:44	8:47	8:50	8:51	8:55	8:57	8:59	9:02	9:04	9:06	9:08	9:10	9:13	9:18	9:23	
8:55	8:59	9:02	9:05	9:06	9:10	9:12	9:14	9:17	9:19	9:21	9:23	9:25	9:28	9:33	9:38	
9:10	9:14	9:17	9:20	9:21	9:25	9:27	9:29	9:32	9:34	9:36	9:38	9:40	9:43	9:48	9:53	
9:25	9:29	9:32	9:35	9:36	9:40	9:42	9:44	9:47	9:49	9:51	9:53	9:55	9:58	10:03	10:08	
9:40	9:44	9:47	9:50	9:51	9:55	9:57	9:59	10:02	10:04	10:06	10:08	10:10	10:13	10:18	10:23	
9:55	9:59	10:02	10:05	10:06	10:10	10:12	10:14	10:17	10:19	10:21	10:23	10:25	10:28	10:33	10:38	
10:10	10:14	10:17	10:20	10:21	10:25	10:27	10:29	10:32	10:34	10:36	10:38	10:40	10:43	10:48	10:53	
10:25	10:29	10:32	10:35	10:36	10:40	10:42	10:44	10:47	10:49	10:51	10:53	10:55	10:58	11:03	11:08	
10:40	10:44	10:47	10:50	10:51	10:55	10:57	10:59	11:02	11:04	11:06	11:08	11:10	11:13	11:18	11:23	
11:10	11:14	11:17	11:20	11:21	11:25	11:27	11:29	11:32	11:34	11:36	11:38	11:40	11:43	11:48	11:53	
11:40	11:44	11:47	11:50	11:51	11:55	11:57	11:59	12:02	12:04	12:06	12:08	12:10	12:13	12:18	12:23	

APPENDIX C

Traffic Data



CURRENT TRAFFIC SIGNAL TIMING

INT #	55	WEBER STREET @ Bridgeport Road	T08-50/ 10W
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Date Prepared: March 10, 2022

Mode of Control FIXED TIME

Left Info Actuated NB LT - WEBER STREET

*Offsets are a percentage of the cycle length and refers to the beginning of Main Street green

Pattern 1 07:00-10:00 Mon to Fri OFFSET 14%

WEBER STREET

NBL	Green Arrow in	5.0	seconds			
	xt	3.0	seconds			
	ix	8.8	seconds			
NBL	Amber Arrow	3.0	seconds			
All Red		1.0	seconds			
Green		29.2	seconds			
Amber		4.0	seconds	Walk	19.2	seconds
All Red		2.0	seconds	FDW	10.0	seconds

Bridgeport Road

Green		26.0	seconds			
Amber		4.0	seconds	Walk	14.0	seconds
All Red		2.0	seconds	FDW	12.0	seconds
TOTAL		80.0	seconds			

Pattern 2 10:00-14:00 Mon to Fri OFFSET 21%

WEBER STREET

NBL	Green Arrow in	5.0	seconds			
	xt	3.0	seconds			
	ix	9.6	seconds			
NBL	Amber Arrow	3.0	seconds			
All Red		1.0	seconds			
Green		30.8	seconds			
Amber		4.0	seconds	Walk	20.8	seconds
All Red		2.0	seconds	FDW	10.0	seconds

Bridgeport Road

Green		23.6	seconds			
Amber		4.0	seconds	Walk	11.6	seconds
All Red		2.0	seconds	FDW	12.0	seconds
TOTAL		80.0	seconds			

Pattern 3

14:00-19:00 Mon to Fri, 08:30-19:00 Sat, 11:00-18:00 Sun

WEBER STREET

OFFSET

7%

NBL	Green Arrow in	5.0	seconds			
	xt	3.0	seconds			
	ix	12.2	seconds			
NBL	Amber Arrow	3.0	seconds			
All Red		1.0	seconds			
Green		34.5	seconds			
Amber		4.0	seconds	Walk	24.5	seconds
All Red		2.0	seconds	FDW	10.0	seconds

Bridgeport Road

Green		27.3	seconds			
Amber		4.0	seconds	Walk	15.3	seconds
All Red		2.0	seconds	FDW	12.0	seconds
TOTAL		90.0	seconds			

Pattern 4

All Other Times

WEBER STREET

OFFSET

19%

Green		31.8	seconds			
Amber		4.0	seconds	Walk	21.8	seconds
All Red		2.0	seconds	FDW	10.0	seconds

Bridgeport Road

Green		26.2	seconds			
Amber		4.0	seconds	Walk	14.2	seconds
All Red		2.0	seconds	FDW	12.0	seconds
TOTAL		70.0	seconds			



CURRENT TRAFFIC SIGNAL TIMING

INT # 56 **WEBER STREET @ Erb Street** T08-50/ 22W

Date Prepared: March 10, 2022

Mode of Control FIXED TIME

Left Info Actuated SB LT - WEBER STREET

*Offsets are a percentage of the cycle length and refers to the beginning of Main Street green

Pattern 1 07:00-10:00 Mon to Fri **WEBER STREET** OFFSET 96%

SBL	Green Arrow in	5.0	seconds			
	xt	3.0	seconds			
	ix	8.0	seconds			
SBL	Amber Arrow	3.0	seconds			
All Red		1.0	seconds			
Green		30.8	seconds			
Amber		4.0	seconds	Walk	20.8	seconds
All Red		2.0	seconds	FDW	10.0	seconds

Erb Street

Green	25.2	seconds			
Amber	4.0	seconds	Walk	12.2	seconds
All Red	2.0	seconds	FDW	13.0	seconds
TOTAL	80.0	seconds			

Pattern 2 10:00-14:00 Mon to Fri **WEBER STREET** OFFSET 28%

SBL	Green Arrow in	5.0	seconds			
	xt	3.0	seconds			
	ix	13.6	seconds			
SBL	Amber Arrow	3.0	seconds			
All Red		1.0	seconds			
Green		26.0	seconds			
Amber		4.0	seconds	Walk	16.0	seconds
All Red		2.0	seconds	FDW	10.0	seconds

Erb Street

Green	24.4	seconds			
Amber	4.0	seconds	Walk	11.4	seconds
All Red	2.0	seconds	FDW	13.0	seconds
TOTAL	80.0	seconds			

Pattern 3 14:00-19:00 Mon to Fri, 08:30-19:00 Sat, 11:00-18:00 Sun **WEBER STREET** OFFSET 8%

SBL	Green Arrow in	5.0	seconds		
	xt	3.0	seconds		
	ix	13.1	seconds		
SBL	Amber Arrow	3.0	seconds		
All Red		1.0	seconds		
Green		30.0	seconds		

Amber	4.0	seconds	Walk	20.0	seconds
All Red	2.0	seconds	FDW	10.0	seconds

Erb Street

Green	30.9	seconds			
Amber	4.0	seconds	Walk	17.9	seconds
All Red	2.0	seconds	FDW	13.0	seconds
TOTAL	90.0	seconds			

Pattern 4

All Other Times

WEBER STREET

OFFSET 69%

Green	33.9	seconds			
Amber	4.0	seconds	Walk	23.9	seconds
All Red	2.0	seconds	FDW	10.0	seconds

Erb Street

Green	24.1	seconds			
Amber	4.0	seconds	Walk	11.1	seconds
All Red	2.0	seconds	FDW	13.0	seconds
TOTAL	70.0	seconds			



Turning Movement Count (1 . BRIDGEPORT RD E & WEBER ST N)

Start Time	N Approach WEBER ST N						E Approach BRIDGEPORT RD E						S Approach WEBER ST N						W Approach BRIDGEPORT RD E						Int. Total (15 min)	Int. Total (1 hr)	
	Right N-W	Thru N-S	Left N-E	U-Turn N-N	Peds N:	Approach Total	Right E-N	Thru E-W	Left E-S	U-Turn E-E	Peds E:	Approach Total	Right S-E	Thru S-N	Left S-W	U-Turn S-S	Peds S:	Approach Total	Right W-S	Thru W-E	Left W-N	U-Turn W-W	Peds W:	Approach Total			
06:00:00	3	28	0	0	0	31	11	21	3	0	0	35	0	34	3	0	0	37	0	0	0	0	1	0	103		
06:15:00	3	42	0	0	1	45	2	37	11	0	0	50	0	36	7	0	0	43	0	1	0	0	0	1	139		
06:30:00	6	57	0	0	0	63	13	71	18	0	0	102	0	66	11	0	0	77	0	0	0	0	2	0	242		
06:45:00	5	55	0	0	0	60	17	75	11	0	0	103	0	75	6	0	0	81	0	0	0	0	3	0	244	728	
07:00:00	6	81	0	0	1	87	17	65	16	0	1	98	0	54	16	0	0	70	0	0	0	0	0	0	255	880	
07:15:00	9	67	0	0	0	76	13	86	20	0	2	119	0	91	22	0	0	113	0	0	0	0	0	0	308	1049	
07:30:00	13	98	0	0	0	111	16	131	28	0	0	175	0	87	23	0	1	110	0	0	0	0	1	0	396	1203	
07:45:00	12	109	0	0	2	121	31	169	33	0	0	233	0	117	43	0	0	160	0	0	0	0	2	0	514	1473	
08:00:00	21	112	0	0	3	133	28	169	34	0	0	231	0	125	29	0	1	154	0	0	0	0	1	0	518	1736	
08:15:00	20	134	0	0	1	154	24	236	33	0	0	293	0	131	43	0	0	174	0	0	0	0	0	0	621	2049	
08:30:00	27	139	0	0	2	166	29	241	36	0	1	306	0	122	27	0	1	149	0	0	0	0	1	0	621	2274	
08:45:00	33	155	0	0	0	188	24	206	36	0	1	266	0	145	33	0	1	178	0	0	0	0	1	0	632	2392	
09:00:00	31	119	0	0	2	150	28	144	29	0	2	201	0	126	20	0	0	146	0	0	0	0	1	0	497	2371	
09:15:00	18	119	0	0	8	137	24	143	25	0	3	192	0	110	40	0	1	150	0	0	0	0	2	0	479	2229	
09:30:00	30	114	0	0	1	144	34	145	31	0	1	210	0	112	35	0	0	147	0	0	0	0	0	0	501	2109	
09:45:00	27	117	0	0	3	144	30	161	21	0	1	212	0	130	35	0	1	165	0	0	0	0	2	0	521	1998	
BREAK																											
15:00:00	36	186	0	0	5	222	34	170	29	0	0	233	0	177	33	0	5	210	0	0	0	0	3	0	665		
15:15:00	55	163	0	0	4	218	32	173	30	0	2	235	0	190	51	0	2	241	0	0	0	0	3	0	694		
15:30:00	37	193	0	0	2	230	35	176	29	0	3	240	0	192	43	0	1	235	0	0	0	0	1	0	705		
15:45:00	30	188	0	0	3	218	60	173	32	0	2	265	0	171	64	0	1	235	0	0	0	0	3	0	718	2782	
16:00:00	34	181	0	0	3	215	36	183	26	0	5	245	0	190	45	0	1	235	0	0	0	0	5	0	695	2812	
16:15:00	43	196	0	0	2	239	41	197	22	0	2	260	0	178	57	0	0	235	0	0	0	0	0	0	734	2852	
16:30:00	44	230	0	0	4	274	56	190	23	0	1	269	0	172	54	0	4	226	0	0	0	0	4	0	769	2916	
16:45:00	47	236	0	0	8	283	33	227	21	0	3	281	0	175	59	0	2	234	0	0	0	0	1	0	798	2996	
17:00:00	40	232	0	0	6	272	44	200	30	0	2	274	0	196	50	0	4	246	0	0	0	0	5	0	792	3093	
17:15:00	38	250	0	0	1	288	43	185	25	0	3	253	0	216	49	0	0	265	0	0	0	0	2	0	806	3165	
17:30:00	40	194	0	0	1	234	39	215	23	0	1	277	0	154	44	0	1	198	0	0	0	0	2	0	709	3105	
17:45:00	34	158	0	0	7	192	32	186	17	0	4	235	0	134	35	0	1	169	0	0	0	0	1	0	596	2903	
18:00:00	32	160	0	0	3	192	32	158	21	0	0	211	0	148	39	0	2	187	0	0	0	0	2	0	590	2701	
18:15:00	21	142	0	0	1	163	23	132	23	0	1	178	0	134	31	0	3	165	0	0	0	0	0	0	506	2401	
18:30:00	23	130	0	0	3	153	35	136	12	0	1	183	0	138	36	0	2	174	0	0	0	0	2	0	510	2202	
18:45:00	32	131	0	0	5	163	31	131	17	0	3	179	1	130	32	0	1	163	0	0	0	0	0	0	505	2111	
Grand Total	850	4516	0	0	82	5366	947	4932	765	0	45	6644	1	4256	1115	0	36	5372	0	1	0	0	51	1	17383	-	
Approach%	15.8%	84.2%	0%	0%		-	14.3%	74.2%	11.5%	0%		-	0%	79.2%	20.8%	0%		-	0%	100%	0%	0%		-	-	-	
Totals %	4.9%	26%	0%	0%		30.9%	5.4%	28.4%	4.4%	0%		38.2%	0%	24.5%	6.4%	0%		30.9%	0%	0%	0%	0%		0%	-	-	
Heavy	16	109	0	0		-	29	131	24	0		-	0	109	12	0		-	0	0	0	0		-	-	-	
Heavy %	1.9%	2.4%	0%	0%		-	3.1%	2.7%	3.1%	0%		-	0%	2.6%	1.1%	0%		-	0%	0%	0%	0%		-	-	-	
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	



Peak Hour: 08:00 AM - 09:00 AM Weather: Overcast Clouds (-1.22 °C)

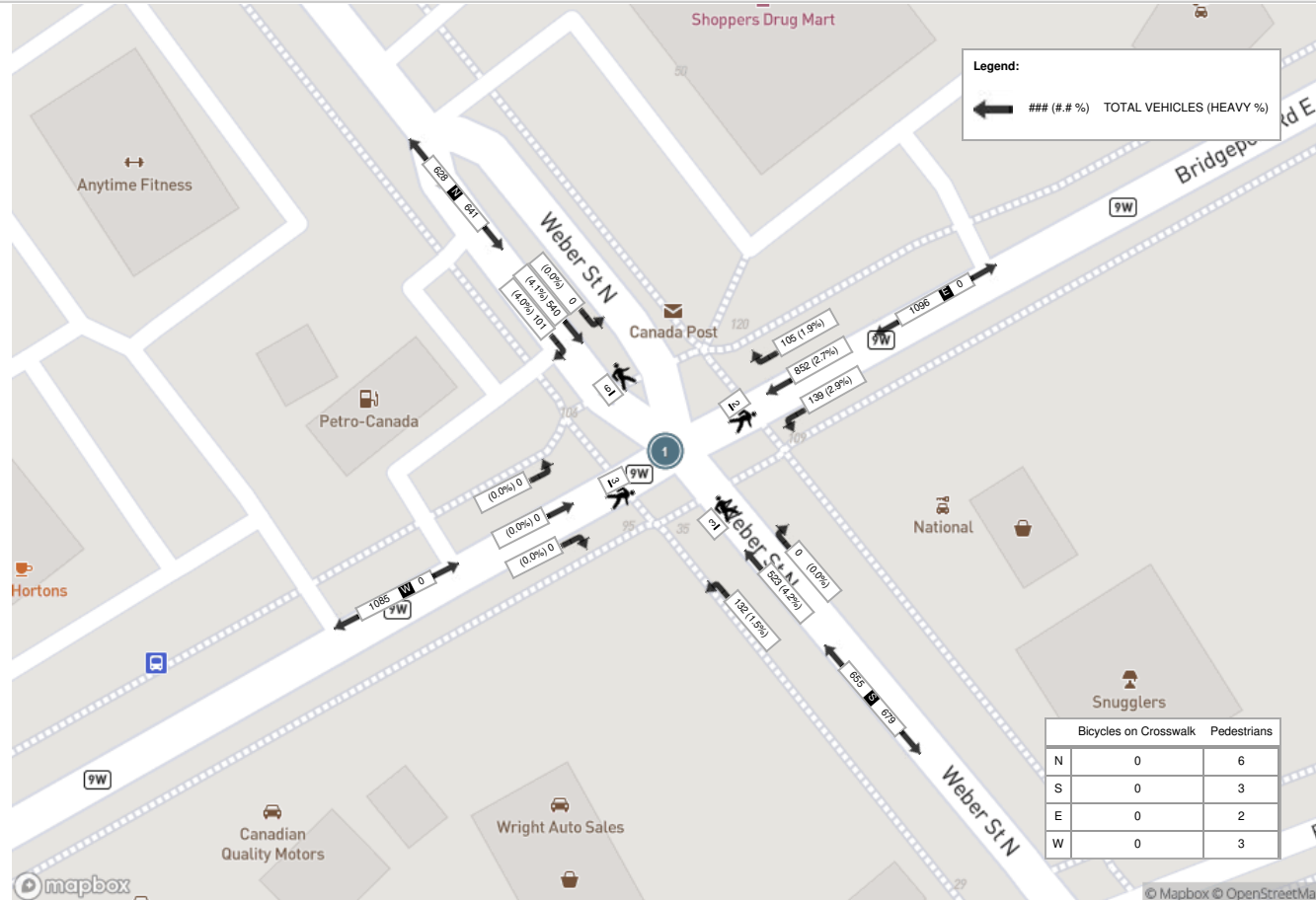
Start Time	N Approach WEBER ST N						E Approach BRIDGEPORT RD E						S Approach WEBER ST N						W Approach BRIDGEPORT RD E						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
08:00:00	21	112	0	0	3	133	28	169	34	0	0	231	0	125	29	0	1	154	0	0	0	0	1	0	518
08:15:00	20	134	0	0	1	154	24	236	33	0	0	293	0	131	43	0	0	174	0	0	0	0	0	0	621
08:30:00	27	139	0	0	2	166	29	241	36	0	1	306	0	122	27	0	1	149	0	0	0	0	1	0	621
08:45:00	33	155	0	0	0	188	24	206	36	0	1	266	0	145	33	0	1	178	0	0	0	0	1	0	632
Grand Total	101	540	0	0	6	641	105	852	139	0	2	1096	0	523	132	0	3	655	0	0	0	0	3	0	2392
Approach%	15.8%	84.2%	0%	0%		-	9.6%	77.7%	12.7%	0%		-	0%	79.8%	20.2%	0%		-	0%	0%	0%	0%		-	-
Totals %	4.2%	22.6%	0%	0%		26.8%	4.4%	35.6%	5.8%	0%		45.8%	0%	21.9%	5.5%	0%		27.4%	0%	0%	0%	0%		0%	-
PHF	0.77	0.87	0	0		0.85	0.91	0.88	0.97	0		0.9	0	0.9	0.77	0		0.92	0	0	0	0		0	-
Heavy	4	22	0	0		26	2	23	4	0		29	0	22	2	0		24	0	0	0	0		0	-
Heavy %	4%	4.1%	0%	0%		4.1%	1.9%	2.7%	2.9%	0%		2.6%	0%	4.2%	1.5%	0%		3.7%	0%	0%	0%	0%		0%	-
Lights	97	518	0	0		615	103	829	135	0		1067	0	501	130	0		631	0	0	0	0		0	-
Lights %	96%	95.9%	0%	0%		95.9%	98.1%	97.3%	97.1%	0%		97.4%	0%	95.8%	98.5%	0%		96.3%	0%	0%	0%	0%		0%	-
Single-Unit Trucks	4	11	0	0		15	0	19	1	0		20	0	11	1	0		12	0	0	0	0		0	-
Single-Unit Trucks %	4%	2%	0%	0%		2.3%	0%	2.2%	0.7%	0%		1.8%	0%	2.1%	0.8%	0%		1.8%	0%	0%	0%	0%		0%	-
Buses	0	11	0	0		11	0	2	2	0		4	0	11	1	0		12	0	0	0	0		0	-
Buses %	0%	2%	0%	0%		1.7%	0%	0.2%	1.4%	0%		0.4%	0%	2.1%	0.8%	0%		1.8%	0%	0%	0%	0%		0%	-
Articulated Trucks	0	0	0	0		0	2	2	1	0		5	0	0	0	0		0	0	0	0	0		0	-
Articulated Trucks %	0%	0%	0%	0%		0%	1.9%	0.2%	0.7%	0%		0.5%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	6	-	-	-	-	2	-	-	-	-	-	3	-	-	-	-	-	3	-	-	-
Pedestrians%	-	-	-	-	42.9%	-	-	-	-	14.3%	-	-	-	-	21.4%	-	-	-	-	-	-	21.4%	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-
Bicycles on Crosswalk%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	-	0%	-	-	-



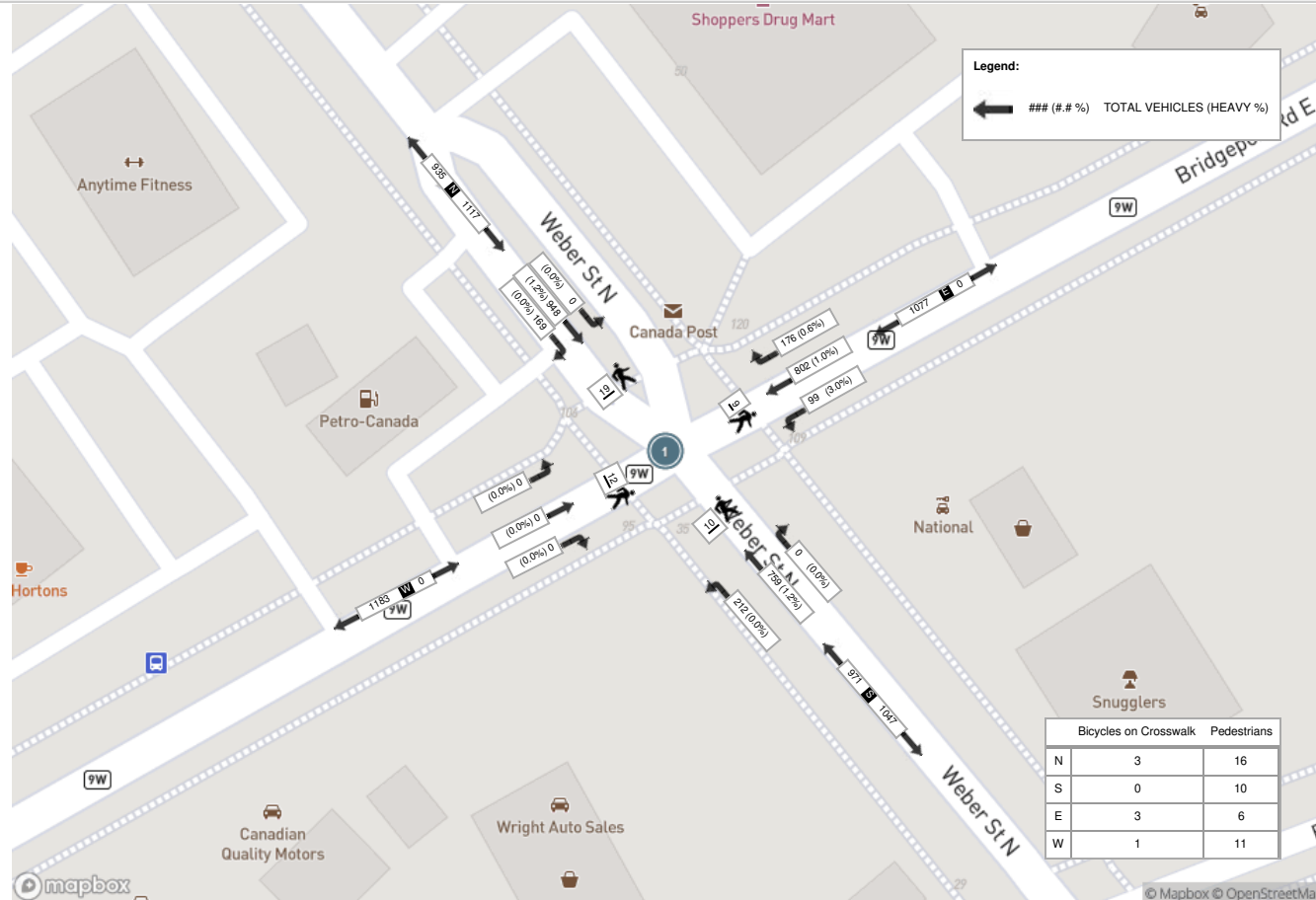
Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (-0.08 °C)

Start Time	N Approach WEBER ST N						E Approach BRIDGEPORT RD E						S Approach WEBER ST N						W Approach BRIDGEPORT RD E						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:30:00	44	230	0	0	4	274	56	190	23	0	1	269	0	172	54	0	4	226	0	0	0	0	4	0	769
16:45:00	47	236	0	0	8	283	33	227	21	0	3	281	0	175	59	0	2	234	0	0	0	0	1	0	798
17:00:00	40	232	0	0	6	272	44	200	30	0	2	274	0	196	50	0	4	246	0	0	0	0	5	0	792
17:15:00	38	250	0	0	1	288	43	185	25	0	3	253	0	216	49	0	0	265	0	0	0	0	2	0	806
Grand Total	169	948	0	0	19	1117	176	802	99	0	9	1077	0	759	212	0	10	971	0	0	0	0	12	0	3165
Approach%	15.1%	84.9%	0%	0%		-	16.3%	74.5%	9.2%	0%		-	0%	78.2%	21.8%	0%		-	0%	0%	0%	0%		-	-
Totals %	5.3%	30%	0%	0%		35.3%	5.6%	25.3%	3.1%	0%		34%	0%	24%	6.7%	0%		30.7%	0%	0%	0%	0%		0%	-
PHF	0.9	0.95	0	0		0.97	0.79	0.88	0.83	0		0.96	0	0.88	0.9	0		0.92	0	0	0	0		0	-
Heavy	0	11	0	0		11	1	8	3	0		12	0	9	0	0		9	0	0	0	0		0	-
Heavy %	0%	1.2%	0%	0%		1%	0.6%	1%	3%	0%		1.1%	0%	1.2%	0%	0%		0.9%	0%	0%	0%	0%		0%	-
Lights	168	937	0	0		1105	175	794	96	0		1065	0	750	212	0		962	0	0	0	0		0	-
Lights %	99.4%	98.8%	0%	0%		98.9%	99.4%	99%	97%	0%		98.9%	0%	98.8%	100%	0%		99.1%	0%	0%	0%	0%		0%	-
Single-Unit Trucks	0	2	0	0		2	1	4	2	0		7	0	2	0	0		2	0	0	0	0		0	-
Single-Unit Trucks %	0%	0.2%	0%	0%		0.2%	0.6%	0.5%	2%	0%		0.6%	0%	0.3%	0%	0%		0.2%	0%	0%	0%	0%		0%	-
Buses	0	9	0	0		9	0	2	1	0		3	0	7	0	0		7	0	0	0	0		0	-
Buses %	0%	0.9%	0%	0%		0.8%	0%	0.2%	1%	0%		0.3%	0%	0.9%	0%	0%		0.7%	0%	0%	0%	0%		0%	-
Articulated Trucks	0	0	0	0		0	0	2	0	0		2	0	0	0	0		0	0	0	0	0		0	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.2%	0%	0%		0.2%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Bicycles on Road	1	0	0	0		1	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0.6%	0%	0%	0%		0.1%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	16	-	-	-	-	-	6	-	-	-	-	-	10	-	-	-	-	-	11	-	-
Pedestrians%	-	-	-	-	32%	-	-	-	-	-	12%	-	-	-	-	-	20%	-	-	-	-	-	22%	-	-
Bicycles on Crosswalk	-	-	-	-	3	-	-	-	-	-	3	-	-	-	-	-	0	-	-	-	-	-	1	-	-
Bicycles on Crosswalk%	-	-	-	-	6%	-	-	-	-	-	6%	-	-	-	-	-	0%	-	-	-	-	-	2%	-	-

Peak Hour: 08:00 AM - 09:00 AM Weather: Overcast Clouds (-1.22 °C)



Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (-0.08 °C)





Turning Movement Count (3 . WEBER ST N & ERB ST E)

Start Time	N Approach WEBER ST N						E Approach ERB ST E						S Approach WEBER ST N						W Approach ERB ST E						Int. Total (15 min)	Int. Total (1 hr)	
	Right N-W	Thru N-S	Left N-E	U-Turn N-N	Peds N:	Approach Total	Right E-N	Thru E-W	Left E-S	U-Turn E-E	Peds E:	Approach Total	Right S-E	Thru S-N	Left S-W	U-Turn S-S	Peds S:	Approach Total	Right W-S	Thru W-E	Left W-N	U-Turn W-W	Peds W:	Approach Total			
06:00:00	0	20	13	0	0	33	0	0	0	0	0	0	4	36	0	0	0	40	4	41	2	0	1	47	120		
06:15:00	0	45	7	0	1	52	0	0	0	0	0	0	2	40	0	0	0	42	7	67	3	0	0	77	171		
06:30:00	0	57	16	0	0	73	0	0	0	0	0	0	5	68	0	0	0	73	5	85	12	0	2	102	248		
06:45:00	0	55	10	0	1	65	0	0	0	0	0	0	4	70	0	0	1	74	7	74	10	0	2	91	230	769	
07:00:00	0	72	19	0	0	91	0	0	0	0	0	0	4	55	0	0	0	59	15	79	14	0	0	108	258	907	
07:15:00	0	58	16	0	1	74	0	0	0	0	2	0	3	95	0	0	0	98	9	142	10	0	1	161	333	1069	
07:30:00	0	98	20	0	1	118	0	0	0	0	0	0	6	92	0	0	0	98	19	118	15	0	3	152	368	1189	
07:45:00	0	115	30	0	1	145	0	0	0	0	0	0	4	138	0	0	0	142	17	150	23	0	0	190	477	1436	
08:00:00	0	110	24	0	0	134	0	0	0	0	0	0	8	129	0	0	1	137	16	138	34	0	1	188	459	1637	
08:15:00	0	129	33	0	0	162	0	0	0	0	1	0	8	127	0	0	0	135	26	140	33	0	0	199	496	1800	
08:30:00	0	145	24	0	0	169	0	0	0	0	1	0	6	113	0	0	3	119	21	134	30	0	1	185	473	1905	
08:45:00	0	189	21	0	1	210	0	0	0	0	2	0	13	138	0	0	3	151	32	138	39	0	0	209	570	1998	
09:00:00	0	126	21	0	0	147	0	0	0	0	0	0	7	118	0	0	0	125	19	102	25	0	0	146	418	1957	
09:15:00	0	114	24	0	0	138	0	0	0	0	0	0	7	113	0	0	2	120	25	105	35	0	0	165	423	1884	
09:30:00	0	122	20	0	0	142	0	0	0	0	1	0	6	102	0	0	1	108	27	111	40	0	0	178	428	1839	
09:45:00	0	111	27	0	0	138	0	0	0	0	0	0	6	139	0	0	0	145	22	92	36	0	0	150	433	1702	
BREAK																											
15:00:00	0	165	45	0	0	210	0	0	0	0	2	0	9	153	0	0	1	162	37	164	48	0	1	249	621		
15:15:00	0	152	46	0	1	198	0	0	0	0	4	0	11	179	0	0	1	190	29	203	71	0	2	303	691		
15:30:00	0	162	55	0	3	217	0	0	0	0	1	0	6	176	0	0	3	182	31	189	57	0	2	277	676		
15:45:00	0	180	46	0	4	226	0	0	0	0	6	0	10	181	0	0	1	191	27	167	39	0	2	233	650	2638	
16:00:00	0	147	46	0	3	193	0	0	0	0	3	0	6	178	0	0	0	184	33	208	52	0	3	293	670	2687	
16:15:00	0	159	60	0	0	219	0	0	0	0	3	0	19	171	0	0	3	190	25	201	58	0	1	284	693	2689	
16:30:00	0	189	71	0	1	260	0	0	0	0	0	0	14	187	0	0	0	201	37	218	35	0	1	290	751	2764	
16:45:00	0	183	68	0	2	251	0	0	0	0	1	0	10	183	0	0	0	193	40	234	44	0	0	318	762	2876	
17:00:00	0	202	63	0	2	265	0	0	0	0	3	0	10	204	0	0	0	214	22	265	54	0	0	341	820	3026	
17:15:00	0	228	43	0	0	271	0	0	0	0	2	0	8	209	0	0	0	217	33	241	50	0	1	324	812	3145	
17:30:00	0	180	43	0	3	223	0	0	0	0	0	0	11	151	0	0	2	162	27	195	44	0	0	266	651	3045	
17:45:00	0	136	42	0	1	178	0	0	0	0	2	0	12	134	0	0	0	146	29	179	40	0	0	248	572	2855	
18:00:00	0	145	40	0	0	185	0	0	0	0	1	0	8	146	0	0	1	154	20	163	32	0	1	215	554	2589	
18:15:00	0	135	26	0	0	161	0	0	0	0	1	0	6	122	0	0	0	128	23	154	37	0	0	214	503	2280	
18:30:00	0	116	29	0	0	145	0	0	0	0	1	0	4	135	0	0	0	139	21	136	40	0	0	197	481	2110	
18:45:00	0	112	27	0	0	139	0	0	0	0	2	0	8	138	0	0	1	146	28	107	25	0	1	160	445	1983	
Grand Total	0	4157	1075	0	26	5232	0	0	0	0	39	0	245	4220	0	0	24	4465	733	4740	1087	0	26	6560	16257	-	
Approach%	0%	79.5%	20.5%	0%		-	0%	0%	0%	0%		-	5.5%	94.5%	0%	0%		-	11.2%	72.3%	16.6%	0%		-	-	-	
Totals %	0%	25.6%	6.6%	0%		32.2%	0%	0%	0%	0%		0%	1.5%	26%	0%	0%		27.5%	4.5%	29.2%	6.7%	0%		40.4%	-	-	
Heavy	0	102	33	0		-	0	0	0	0		-	13	102	0	0		-	14	116	22	0		-	-	-	
Heavy %	0%	2.5%	3.1%	0%		-	0%	0%	0%	0%		-	5.3%	2.4%	0%	0%		-	1.9%	2.4%	2%	0%		-	-	-	
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	



Peak Hour: 08:00 AM - 09:00 AM Weather: Overcast Clouds (-1.22 °C)

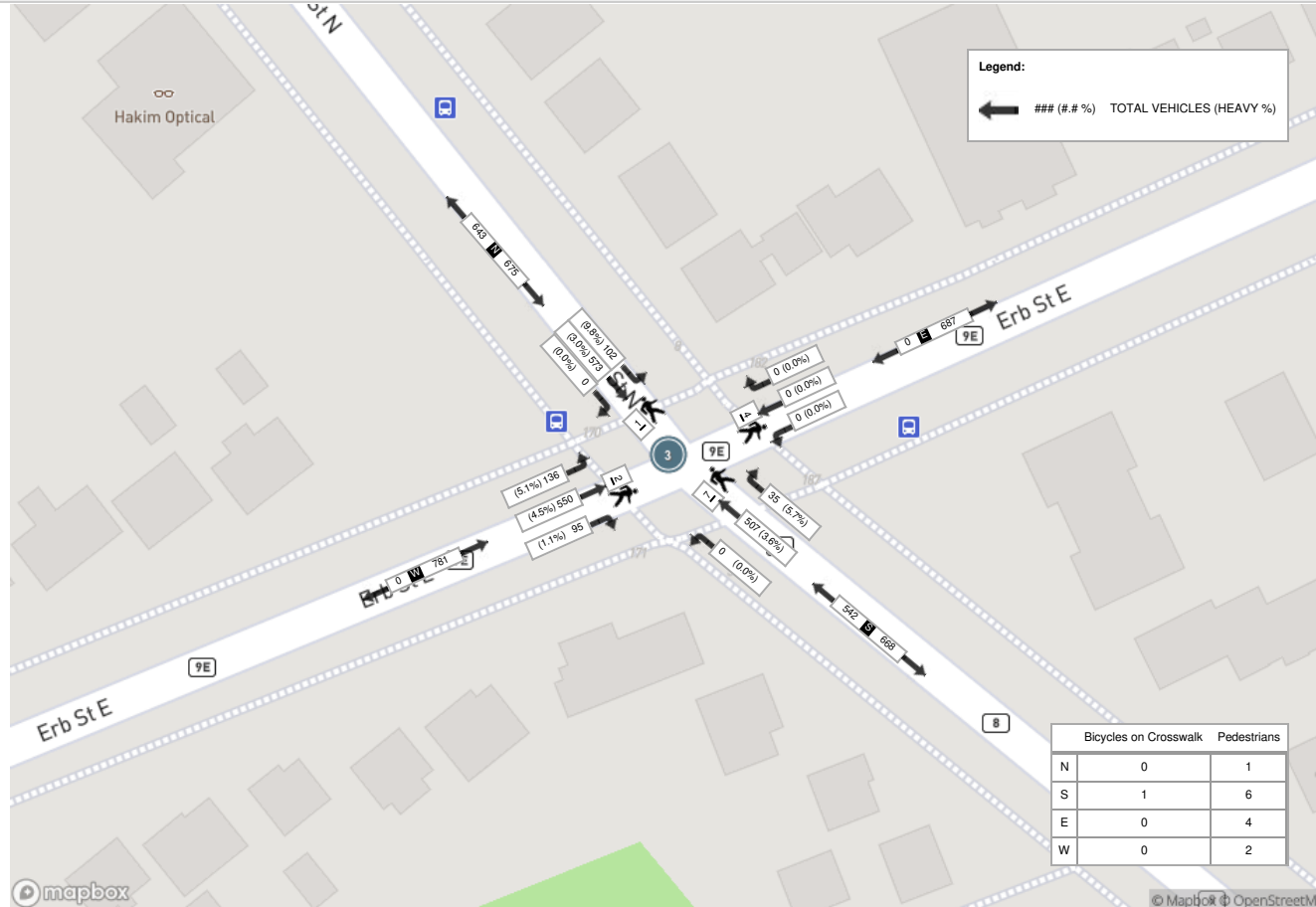
Start Time	N Approach WEBER ST N						E Approach ERB ST E						S Approach WEBER ST N						W Approach ERB ST E						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
08:00:00	0	110	24	0	0	134	0	0	0	0	0	0	8	129	0	0	1	137	16	138	34	0	1	188	459
08:15:00	0	129	33	0	0	162	0	0	0	0	1	0	8	127	0	0	0	135	26	140	33	0	0	199	496
08:30:00	0	145	24	0	0	169	0	0	0	0	1	0	6	113	0	0	3	119	21	134	30	0	1	185	473
08:45:00	0	189	21	0	1	210	0	0	0	0	2	0	13	138	0	0	3	151	32	138	39	0	0	209	570
Grand Total	0	573	102	0	1	675	0	0	0	0	4	0	35	507	0	0	7	542	95	550	136	0	2	781	1998
Approach%	0%	84.9%	15.1%	0%		-	0%	0%	0%	0%		-	6.5%	93.5%	0%	0%		-	12.2%	70.4%	17.4%	0%		-	-
Totals %	0%	28.7%	5.1%	0%		33.8%	0%	0%	0%	0%		0%	1.8%	25.4%	0%	0%		27.1%	4.8%	27.5%	6.8%	0%		39.1%	-
PHF	0	0.76	0.77	0		0.8	0	0	0	0		0	0.67	0.92	0	0		0.9	0.74	0.98	0.87	0		0.93	-
Heavy	0	17	10	0		27	0	0	0	0		0	2	18	0	0		20	1	25	7	0		33	-
Heavy %	0%	3%	9.8%	0%		4%	0%	0%	0%	0%		0%	5.7%	3.6%	0%	0%		3.7%	1.1%	4.5%	5.1%	0%		4.2%	-
Lights	0	556	92	0		648	0	0	0	0		0	33	489	0	0		522	94	525	129	0		748	-
Lights %	0%	97%	90.2%	0%		96%	0%	0%	0%	0%		0%	94.3%	96.4%	0%	0%		96.3%	98.9%	95.5%	94.9%	0%		95.8%	-
Single-Unit Trucks	0	5	7	0		12	0	0	0	0		0	2	9	0	0		11	1	14	4	0		19	-
Single-Unit Trucks %	0%	0.9%	6.9%	0%		1.8%	0%	0%	0%	0%		0%	5.7%	1.8%	0%	0%		2%	1.1%	2.5%	2.9%	0%		2.4%	-
Buses	0	10	3	0		13	0	0	0	0		0	0	9	0	0		9	0	9	3	0		12	-
Buses %	0%	1.7%	2.9%	0%		1.9%	0%	0%	0%	0%		0%	0%	1.8%	0%	0%		1.7%	0%	1.6%	2.2%	0%		1.5%	-
Articulated Trucks	0	2	0	0		2	0	0	0	0		0	0	0	0	0		0	0	2	0	0		2	-
Articulated Trucks %	0%	0.3%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0.4%	0%	0%		0.3%	-
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	1	-	-	-	-	-	4	-	-	-	-	-	6	-	-	-	-	-	2	-	-
Pedestrians%	-	-	-	-	7.1%	-	-	-	-	-	28.6%	-	-	-	-	-	42.9%	-	-	-	-	-	14.3%	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	7.1%	-	-	-	-	-	0%	-	-



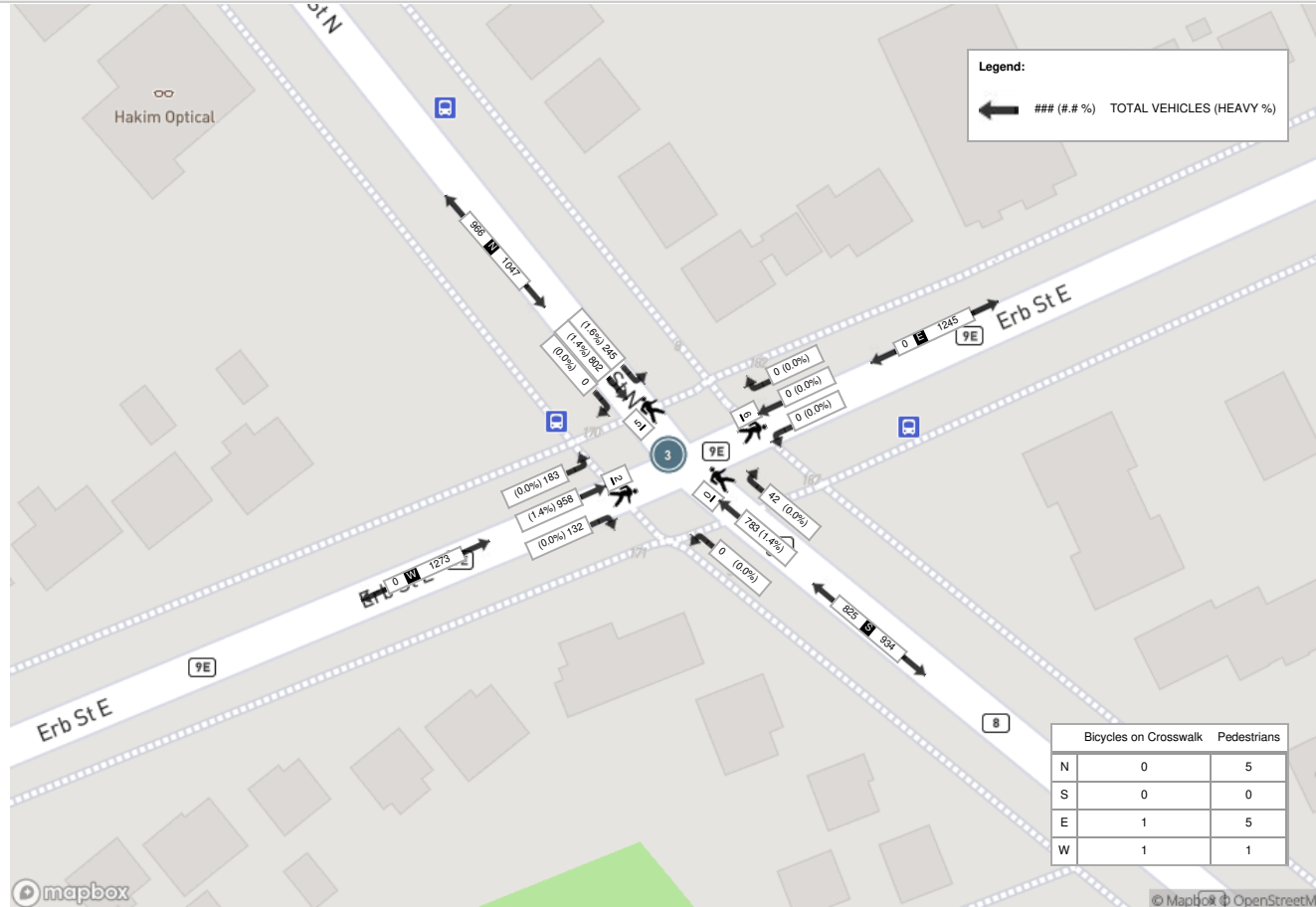
Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (-0.08 °C)

Start Time	N Approach WEBER ST N						E Approach ERB ST E						S Approach WEBER ST N						W Approach ERB ST E						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:30:00	0	189	71	0	1	260	0	0	0	0	0	0	14	187	0	0	0	201	37	218	35	0	1	290	751
16:45:00	0	183	68	0	2	251	0	0	0	0	1	0	10	183	0	0	0	193	40	234	44	0	0	318	762
17:00:00	0	202	63	0	2	265	0	0	0	0	3	0	10	204	0	0	0	214	22	265	54	0	0	341	820
17:15:00	0	228	43	0	0	271	0	0	0	0	2	0	8	209	0	0	0	217	33	241	50	0	1	324	812
Grand Total	0	802	245	0	5	1047	0	0	0	0	6	0	42	783	0	0	0	825	132	958	183	0	2	1273	3145
Approach%	0%	76.6%	23.4%	0%		-	0%	0%	0%	0%		-	5.1%	94.9%	0%	0%		-	10.4%	75.3%	14.4%	0%		-	-
Totals %	0%	25.5%	7.8%	0%		33.3%	0%	0%	0%	0%		0%	1.3%	24.9%	0%	0%		26.2%	4.2%	30.5%	5.8%	0%		40.5%	-
PHF	0	0.88	0.86	0		0.97	0	0	0	0		0	0.75	0.94	0	0		0.95	0.83	0.9	0.85	0		0.93	-
Heavy	0	11	4	0		15	0	0	0	0		0	0	11	0	0		11	0	13	0	0		13	-
Heavy %	0%	1.4%	1.6%	0%		1.4%	0%	0%	0%	0%		0%	0%	1.4%	0%	0%		1.3%	0%	1.4%	0%	0%		1%	-
Lights	0	791	241	0		1032	0	0	0	0		0	42	772	0	0		814	132	945	183	0		1260	-
Lights %	0%	98.6%	98.4%	0%		98.6%	0%	0%	0%	0%		0%	100%	98.6%	0%	0%		98.7%	100%	98.6%	100%	0%		99%	-
Single-Unit Trucks	0	2	4	0		6	0	0	0	0		0	0	3	0	0		3	0	9	0	0		9	-
Single-Unit Trucks %	0%	0.2%	1.6%	0%		0.6%	0%	0%	0%	0%		0%	0%	0.4%	0%	0%		0.4%	0%	0.9%	0%	0%		0.7%	-
Buses	0	9	0	0		9	0	0	0	0		0	0	8	0	0		8	0	3	0	0		3	-
Buses %	0%	1.1%	0%	0%		0.9%	0%	0%	0%	0%		0%	0%	1%	0%	0%		1%	0%	0.3%	0%	0%		0.2%	-
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	1	0	0		1	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0.1%	0%	0%		0.1%	-
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	5	-	-	-	-	-	5	-	-	-	-	-	0	-	-	-	-	-	1	-	-
Pedestrians%	-	-	-	-	38.5%	-	-	-	-	-	38.5%	-	-	-	-	-	0%	-	-	-	-	-	7.7%	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-
Bicycles on Crosswalk%	-	-	-	-	0%	-	-	-	-	-	7.7%	-	-	-	-	-	0%	-	-	-	-	-	7.7%	-	-

Peak Hour: 08:00 AM - 09:00 AM Weather: Overcast Clouds (-1.22 °C)



Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (-0.08 °C)





Turning Movement Count (2 . WEBER ST N & ROYAL ST)

Start Time	N Approach WEBER ST N						E Approach ROYAL ST						S Approach WEBER ST N						W Approach DRIVEWAY						Int. Total (15 min)	Int. Total (1 hr)	
	Right N-W	Thru N-S	Left N-E	U-Turn N-N	Peds N:	Approach Total	Right E-N	Thru E-W	Left E-S	U-Turn E-E	Peds E:	Approach Total	Right S-E	Thru S-N	Left S-W	U-Turn S-S	Peds S:	Approach Total	Right W-S	Thru W-E	Left W-N	U-Turn W-W	Peds W:	Approach Total			
06:00:00	0	32	0	0	0	32	1	0	0	0	0	1	1	37	0	0	0	38	0	0	0	0	0	0	71		
06:15:00	0	51	1	0	0	52	1	0	0	0	0	1	0	43	0	0	0	43	0	0	0	0	1	0	96		
06:30:00	2	74	0	0	0	76	2	0	0	0	0	2	0	77	0	0	0	77	0	0	0	0	2	0	155		
06:45:00	0	68	1	0	0	69	0	0	0	0	1	0	0	81	0	0	0	81	0	0	0	0	3	0	150	472	
07:00:00	3	90	0	1	0	94	1	0	0	0	1	1	0	68	0	0	0	68	1	0	0	0	0	1	164	565	
07:15:00	1	79	2	0	0	82	0	0	0	0	3	0	0	110	0	0	0	110	0	0	0	0	0	0	192	661	
07:30:00	2	120	0	0	0	122	4	0	1	0	0	5	1	107	0	0	0	108	0	0	1	0	0	1	236	742	
07:45:00	0	130	0	0	0	130	4	0	0	0	0	4	1	159	0	0	0	160	0	0	0	0	2	0	294	886	
08:00:00	3	132	1	0	0	136	1	0	1	0	0	2	1	156	2	0	0	159	1	0	1	0	1	2	299	1021	
08:15:00	2	170	3	0	0	175	5	0	1	0	1	6	0	164	0	0	0	164	0	1	2	0	0	3	348	1177	
08:30:00	2	170	4	0	0	176	2	0	0	0	1	2	0	146	0	0	0	146	0	0	1	0	2	1	325	1266	
08:45:00	3	183	0	0	0	186	10	0	1	0	0	11	0	169	2	0	0	171	0	0	0	0	0	0	368	1340	
09:00:00	2	141	2	0	0	145	1	0	0	0	1	1	1	145	1	0	0	147	1	0	1	0	0	2	295	1336	
09:15:00	0	135	3	0	0	138	3	0	0	0	0	3	1	143	1	0	0	145	0	0	2	0	2	2	288	1276	
09:30:00	5	136	3	0	0	144	4	0	0	0	1	4	1	147	0	0	0	148	2	0	0	0	0	2	298	1249	
09:45:00	2	128	1	0	0	131	1	0	0	0	1	1	2	166	0	0	0	168	2	0	1	0	2	3	303	1184	
BREAK																											
15:00:00	2	204	6	0	0	212	1	0	1	0	1	2	0	199	0	0	0	199	0	0	0	0	0	0	413		
15:15:00	0	195	3	0	0	198	7	0	0	0	3	7	2	240	0	0	0	242	0	0	0	0	2	0	447		
15:30:00	1	223	1	0	0	225	3	0	0	0	1	3	0	233	0	0	0	233	3	0	2	0	2	5	466		
15:45:00	3	214	2	0	0	219	2	0	1	0	3	3	0	227	0	0	0	227	1	0	1	0	1	2	451	1777	
16:00:00	1	202	6	0	0	209	5	0	0	0	2	5	1	234	1	0	0	236	0	1	0	0	6	1	451	1815	
16:15:00	1	215	4	0	3	220	3	0	1	0	3	4	3	227	2	0	0	232	2	0	0	0	1	2	458	1826	
16:30:00	0	260	3	0	0	263	6	0	2	0	3	8	1	227	0	0	0	228	0	1	2	0	1	3	502	1862	
16:45:00	1	253	4	1	0	259	4	0	0	0	3	4	1	227	0	0	1	228	0	0	0	0	1	0	491	1902	
17:00:00	0	259	4	0	0	263	2	0	1	0	0	3	3	255	0	0	0	258	0	0	0	0	2	0	524	1975	
17:15:00	1	269	6	0	0	276	1	0	0	0	2	1	2	253	0	0	0	255	0	0	0	0	1	0	532	2049	
17:30:00	1	211	2	0	0	214	2	0	1	0	1	3	1	190	0	0	0	191	0	1	0	0	0	1	409	1956	
17:45:00	0	181	1	0	0	182	5	0	0	0	2	5	0	175	1	0	0	176	1	1	0	0	0	2	365	1830	
18:00:00	0	180	1	0	0	181	2	0	0	0	4	2	0	178	1	0	0	179	2	0	0	0	1	2	364	1670	
18:15:00	0	161	2	0	0	163	4	0	0	0	4	4	0	161	0	0	0	161	0	0	0	0	0	0	328	1466	
18:30:00	0	145	2	0	1	147	3	0	1	0	2	4	1	176	0	0	0	177	1	0	0	0	1	1	329	1386	
18:45:00	0	144	4	0	0	148	1	0	1	0	2	2	1	158	0	0	0	159	0	0	0	0	0	0	309	1330	
Grand Total	38	5155	72	2	4	5267	91	0	13	0	46	104	25	5278	11	0	1	5314	17	5	14	0	34	36	10721	-	
Approach%	0.7%	97.9%	1.4%	0%		-	87.5%	0%	12.5%	0%		-	0.5%	99.3%	0.2%	0%		-	47.2%	13.9%	38.9%	0%		-	-	-	
Totals %	0.4%	48.1%	0.7%	0%		49.1%	0.8%	0%	0.1%	0%		1%	0.2%	49.2%	0.1%	0%		49.6%	0.2%	0%	0.1%	0%		0.3%	-	-	
Heavy	1	136	0	0		-	0	0	1	0		-	0	128	0	0		-	0	0	0	0		-	-	-	
Heavy %	2.6%	2.6%	0%	0%		-	0%	0%	7.7%	0%		-	0%	2.4%	0%	0%		-	0%	0%	0%	0%		-	-	-	
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	



Peak Hour: 08:00 AM - 09:00 AM Weather: Overcast Clouds (-1.22 °C)

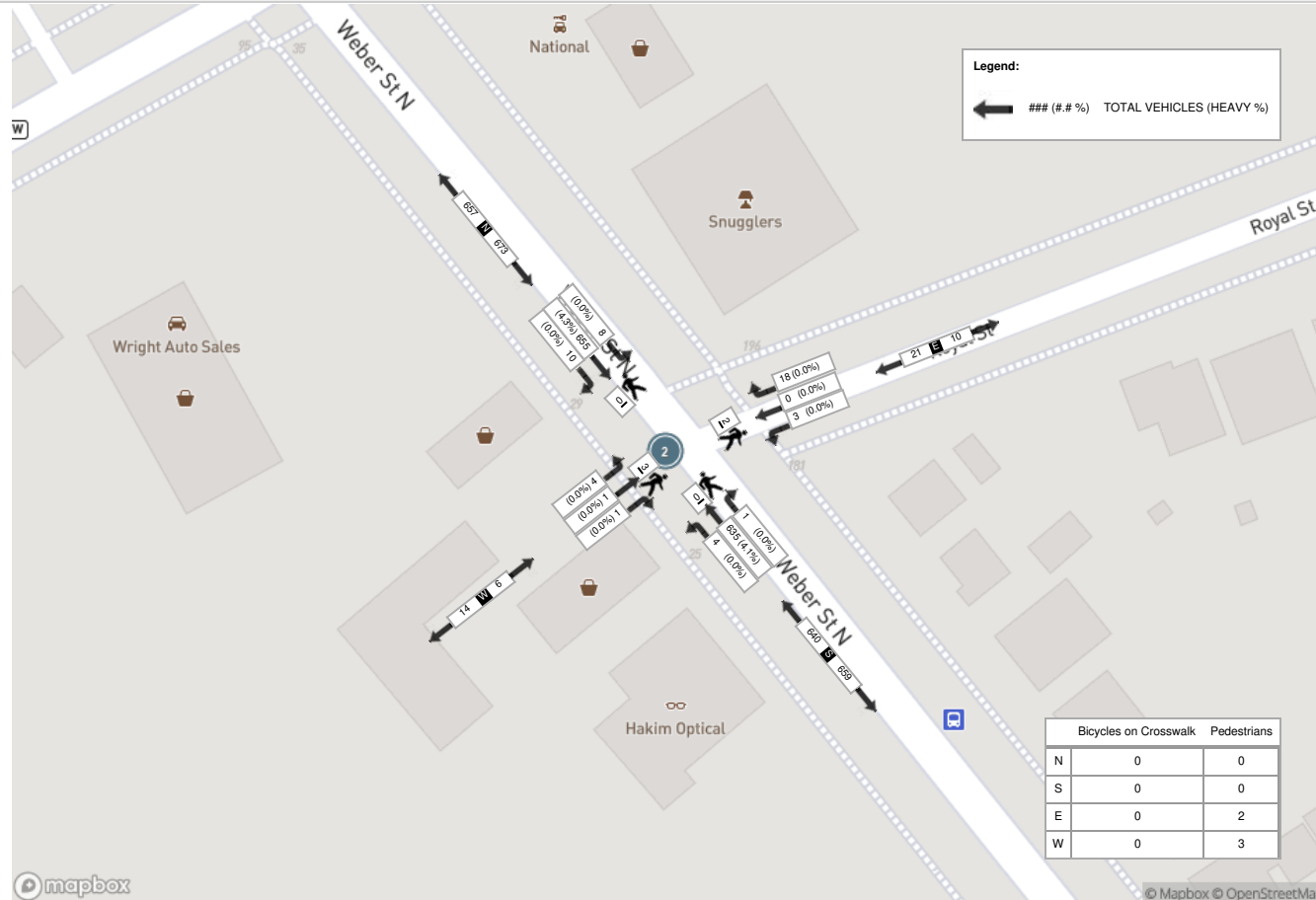
Start Time	N Approach WEBER ST N						E Approach ROYAL ST						S Approach WEBER ST N						W Approach DRIVEWAY						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
08:00:00	3	132	1	0	0	136	1	0	1	0	0	2	1	156	2	0	0	159	1	0	1	0	1	2	299
08:15:00	2	170	3	0	0	175	5	0	1	0	1	6	0	164	0	0	0	164	0	1	2	0	0	3	348
08:30:00	2	170	4	0	0	176	2	0	0	0	1	2	0	146	0	0	0	146	0	0	1	0	2	1	325
08:45:00	3	183	0	0	0	186	10	0	1	0	0	11	0	169	2	0	0	171	0	0	0	0	0	0	368
Grand Total	10	655	8	0	0	673	18	0	3	0	2	21	1	635	4	0	0	640	1	1	4	0	3	6	1340
Approach%	1.5%	97.3%	1.2%	0%		-	85.7%	0%	14.3%	0%		-	0.2%	99.2%	0.6%	0%		-	16.7%	16.7%	66.7%	0%		-	-
Totals %	0.7%	48.9%	0.6%	0%		50.2%	1.3%	0%	0.2%	0%		1.6%	0.1%	47.4%	0.3%	0%		47.8%	0.1%	0.1%	0.3%	0%		0.4%	-
PHF	0.83	0.89	0.5	0		0.9	0.45	0	0.75	0		0.48	0.25	0.94	0.5	0		0.94	0.25	0.25	0.5	0		0.5	-
Heavy	0	28	0	0		28	0	0	0	0		0	0	26	0	0		26	0	0	0	0		0	-
Heavy %	0%	4.3%	0%	0%		4.2%	0%	0%	0%	0%		0%	0%	4.1%	0%	0%		4.1%	0%	0%	0%	0%		0%	-
Lights	10	627	8	0		645	18	0	3	0		21	1	609	4	0		614	1	1	4	0		6	-
Lights %	100%	95.7%	100%	0%		95.8%	100%	0%	100%	0%		100%	100%	95.9%	100%	0%		95.9%	100%	100%	100%	0%		100%	-
Single-Unit Trucks	0	13	0	0		13	0	0	0	0		0	0	13	0	0		13	0	0	0	0		0	-
Single-Unit Trucks %	0%	2%	0%	0%		1.9%	0%	0%	0%	0%		0%	0%	2%	0%	0%		2%	0%	0%	0%	0%		0%	-
Buses	0	13	0	0		13	0	0	0	0		0	0	11	0	0		11	0	0	0	0		0	-
Buses %	0%	2%	0%	0%		1.9%	0%	0%	0%	0%		0%	0%	1.7%	0%	0%		1.7%	0%	0%	0%	0%		0%	-
Articulated Trucks	0	2	0	0		2	0	0	0	0		0	0	2	0	0		2	0	0	0	0		0	-
Articulated Trucks %	0%	0.3%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	0.3%	0%	0%		0.3%	0%	0%	0%	0%		0%	-
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	3	-	-
Pedestrians%	-	-	-	-	0%	-	-	-	-	-	40%	-	-	-	-	-	0%	-	-	-	-	-	60%	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-



Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (-0.08 °C)

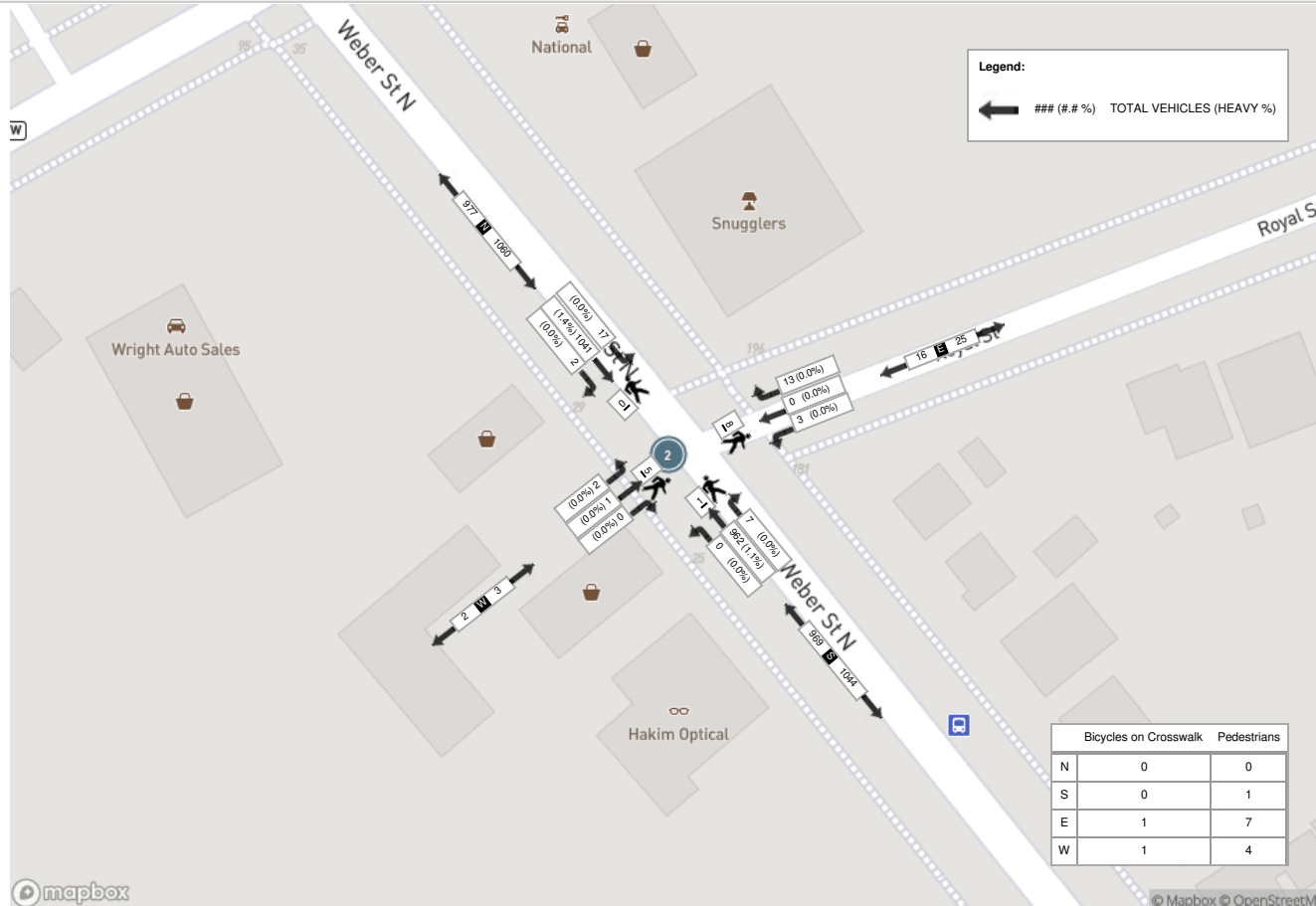
Start Time	N Approach WEBER ST N						E Approach ROYAL ST						S Approach WEBER ST N						W Approach DRIVEWAY						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:30:00	0	260	3	0	0	263	6	0	2	0	3	8	1	227	0	0	0	228	0	1	2	0	1	3	502
16:45:00	1	253	4	1	0	259	4	0	0	0	3	4	1	227	0	0	1	228	0	0	0	0	1	0	491
17:00:00	0	259	4	0	0	263	2	0	1	0	0	3	3	255	0	0	0	258	0	0	0	0	2	0	524
17:15:00	1	269	6	0	0	276	1	0	0	0	2	1	2	253	0	0	0	255	0	0	0	0	1	0	532
Grand Total	2	1041	17	1	0	1061	13	0	3	0	8	16	7	962	0	0	1	969	0	1	2	0	5	3	2049
Approach%	0.2%	98.1%	1.6%	0.1%		-	81.3%	0%	18.8%	0%		-	0.7%	99.3%	0%	0%		-	0%	33.3%	66.7%	0%		-	-
Totals %	0.1%	50.8%	0.8%	0%		51.8%	0.6%	0%	0.1%	0%		0.8%	0.3%	46.9%	0%	0%		47.3%	0%	0%	0.1%	0%		0.1%	-
PHF	0.5	0.97	0.71	0.25		0.96	0.54	0	0.38	0		0.5	0.58	0.94	0	0		0.94	0	0.25	0.25	0		0.25	-
Heavy	0	15	0	0		15	0	0	0	0		0	0	11	0	0		11	0	0	0	0		0	-
Heavy %	0%	1.4%	0%	0%		1.4%	0%	0%	0%	0%		0%	0%	1.1%	0%	0%		1.1%	0%	0%	0%	0%		0%	-
Lights	2	1026	17	1		1046	13	0	3	0		16	7	951	0	0		958	0	1	2	0		3	-
Lights %	100%	98.6%	100%	100%		98.6%	100%	0%	100%	0%		100%	100%	98.9%	0%	0%		98.9%	0%	100%	100%	0%		100%	-
Single-Unit Trucks	0	6	0	0		6	0	0	0	0		0	0	2	0	0		2	0	0	0	0		0	-
Single-Unit Trucks %	0%	0.6%	0%	0%		0.6%	0%	0%	0%	0%		0%	0%	0.2%	0%	0%		0.2%	0%	0%	0%	0%		0%	-
Buses	0	9	0	0		9	0	0	0	0		0	0	9	0	0		9	0	0	0	0		0	-
Buses %	0%	0.9%	0%	0%		0.8%	0%	0%	0%	0%		0%	0%	0.9%	0%	0%		0.9%	0%	0%	0%	0%		0%	-
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	7	-	-	-	-	-	1	-	-	-	-	-	4	-	-
Pedestrians%	-	-	-	-	0%	-	-	-	-	-	50%	-	-	-	-	-	7.1%	-	-	-	-	-	28.6%	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-
Bicycles on Crosswalk%	-	-	-	-	0%	-	-	-	-	-	7.1%	-	-	-	-	-	0%	-	-	-	-	-	7.1%	-	-

Peak Hour: 08:00 AM - 09:00 AM Weather: Overcast Clouds (-1.22 °C)



	Bicycles on Crosswalk	Pedestrians
N	0	0
S	0	0
E	0	2
W	0	3

Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (-0.08 °C)



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

APPENDIX E

Capacity Analysis

Lanes, Volumes, Timings

1: Bridgeport Road East & Weber Street North

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	139	852	105	132	523	0	0	540	101
Future Volume (vph)	0	0	0	139	852	105	132	523	0	0	540	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		37.0	52.0		0.0	0.0		0.0
Storage Lanes	0		0	0		1	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.86	0.86	0.86	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor					1.00		1.00				1.00	
Frt					0.986						0.974	
Flt Protected					0.994		0.950					
Satd. Flow (prot)	0	0	0	0	6215	0	1770	3471	0	0	3372	0
Flt Permitted					0.994		0.232					
Satd. Flow (perm)	0	0	0	0	6213	0	432	3471	0	0	3372	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					30						34	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		154.2			147.6			95.6			183.2	
Travel Time (s)		11.1			10.6			6.9			13.2	
Confl. Peds. (#/hr)	9		9	3		6	3		5	3		3
Peak Hour Factor	0.92	0.92	0.92	0.97	0.88	0.91	0.77	0.90	0.92	0.25	0.87	0.77
Heavy Vehicles (%)	2%	2%	2%	3%	3%	2%	2%	4%	0%	0%	4%	4%
Adj. Flow (vph)	0	0	0	143	968	115	171	581	0	0	621	131
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1226	0	171	581	0	0	752	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			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												
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				2
Detector Template				Left	Thru		Left	Thru				Thru
Leading Detector (m)				2.0	10.0		2.0	10.0				10.0
Trailing Detector (m)				0.0	0.0		0.0	0.0				0.0
Detector 1 Position(m)				0.0	0.0		0.0	0.0				0.0
Detector 1 Size(m)				2.0	0.6		2.0	0.6				0.6
Detector 1 Type				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
Detector 1 Queue (s)				0.0	0.0		0.0	0.0				0.0
Detector 1 Delay (s)				0.0	0.0		0.0	0.0				0.0
Detector 2 Position(m)					9.4			9.4				9.4
Detector 2 Size(m)					0.6			0.6				0.6
Detector 2 Type					Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0				0.0

Lanes, Volumes, Timings

1: Bridgeport Road East & Weber Street North

06-24-2022

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				26.0	26.0		5.0	29.2			29.2	
Minimum Split (s)				32.0	32.0		11.0	35.2			36.2	
Total Split (s)				32.0	32.0		14.8	35.2			36.2	
Total Split (%)				38.6%	38.6%		17.8%	42.4%			43.6%	
Maximum Green (s)				26.0	26.0		10.8	29.2			30.2	
Yellow Time (s)				4.0	4.0		3.0	4.0			4.0	
All-Red Time (s)				2.0	2.0		1.0	2.0			2.0	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					6.0		4.0	6.0			6.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				None	None		None	Max			Max	
Walk Time (s)				14.0	14.0			19.2			19.2	
Flash Dont Walk (s)				12.0	12.0			10.0			10.0	
Pedestrian Calls (#/hr)				0	0			0			0	
Act Effect Green (s)					26.0		46.0	44.0			30.2	
Actuated g/C Ratio					0.32		0.56	0.54			0.37	
v/c Ratio					0.62		0.43	0.31			0.59	
Control Delay					24.9		12.2	11.1			22.5	
Queue Delay					0.0		0.0	0.0			0.0	
Total Delay					24.9		12.2	11.1			22.5	
LOS					C		B	B			C	
Approach Delay					24.9			11.4			22.5	
Approach LOS					C			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 83

Actuated Cycle Length: 82

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 20.5

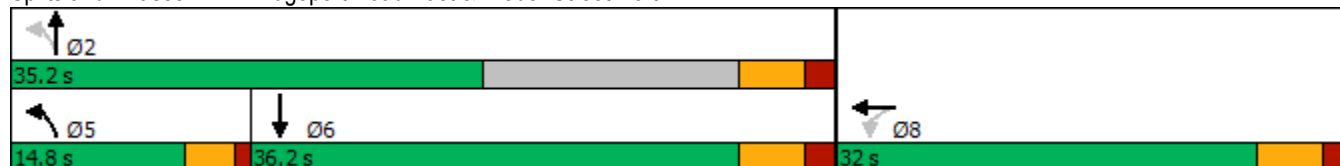
Intersection LOS: C

Intersection Capacity Utilization 66.6%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Bridgeport Road East & Weber Street North



Lanes, Volumes, Timings

2: Royal Street East

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	1	1	3	0	18	4	635	1	8	655	10
Future Volume (vph)	4	1	1	3	0	18	4	635	1	8	655	10
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	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor												
Frt		0.966			0.877			0.999			0.998	
Flt Protected		0.976			0.995			0.999			0.999	
Satd. Flow (prot)	0	1791	0	0	1658	0	0	3467	0	0	3466	0
Flt Permitted		0.976			0.995			0.999			0.999	
Satd. Flow (perm)	0	1791	0	0	1658	0	0	3467	0	0	3466	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		62.5			76.2			118.3			95.6	
Travel Time (s)		4.5			5.5			8.5			6.9	
Confl. Peds. (#/hr)							3		2	2		3
Peak Hour Factor	0.50	0.25	0.25	0.75	0.92	0.45	0.50	0.94	0.25	0.50	0.89	0.83
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	4%	0%
Adj. Flow (vph)	8	4	4	4	0	40	8	676	4	16	736	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	0	0	44	0	0	688	0	0	764	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			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												
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		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	34.1%											
Analysis Period (min)	15											
ICU Level of Service A												

HCM Unsignalized Intersection Capacity Analysis

2: Royal Street East

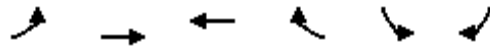
06-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1	1	3	0	18	4	635	1	8	655	10
Future Volume (Veh/h)	4	1	1	3	0	18	4	635	1	8	655	10
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.50	0.25	0.25	0.75	0.92	0.45	0.50	0.94	0.25	0.50	0.89	0.83
Hourly flow rate (vph)	8	4	4	4	0	40	8	676	4	16	736	12
Pedestrians	3			2								
Lane Width (m)	3.6			3.6								
Walking Speed (m/s)	1.2			1.2								
Percent Blockage	0			0								
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)							118			96		
pX, platoon unblocked	0.89	0.89	0.84	0.89	0.89	0.89	0.84				0.89	
vC, conflicting volume	1171	1475	377	1102	1479	342	751				682	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	422	762	0	345	766	27	327				408	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	98	99	100	99	100	96	99				98	
cM capacity (veh/h)	435	293	916	508	292	936	1044				1037	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	16	44	346	342	384	380						
Volume Left	8	4	8	0	16	0						
Volume Right	4	40	0	4	0	12						
cSH	440	869	1044	1700	1037	1700						
Volume to Capacity	0.04	0.05	0.01	0.20	0.02	0.22						
Queue Length 95th (m)	0.9	1.3	0.2	0.0	0.4	0.0						
Control Delay (s)	13.5	9.4	0.3	0.0	0.5	0.0						
Lane LOS	B	A	A		A							
Approach Delay (s)	13.5	9.4	0.1		0.3							
Approach LOS	B	A										
Intersection Summary												
Average Delay				0.6								
Intersection Capacity Utilization				34.1%	ICU Level of Service				A			
Analysis Period (min)				15								

Lanes, Volumes, Timings

3: Royal Street & Site Access

06-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	10	21	0	0	0
Future Volume (vph)	0	10	21	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frst						
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	1863	0
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	1863	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		62.6	335.6		98.4	
Travel Time (s)		4.5	24.2		7.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	11	23	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	11	23	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 6.7%	ICU Level of Service A					
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis

3: Royal Street & Site Access

06-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	10	21	0	0	0
Future Volume (Veh/h)	0	10	21	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	23	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	23				34	23
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	23				34	23
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1592				979	1054
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	11	23	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1592	1700	1700			
Volume to Capacity	0.00	0.01	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%		ICU Level of Service	
Analysis Period (min)			15		A	

Lanes, Volumes, Timings

4: Brideport Road East & NE Access

06-24-2022

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1096	0	0
Future Volume (vph)	0	0	0	1096	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	0	5085	1863	0
Flt Permitted						
Satd. Flow (perm)	0	0	0	5085	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	68.5			250.2	50.7	
Travel Time (s)	4.9			18.0	3.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	1191	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1191	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Stop			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 24.5%				ICU Level of Service A		
Analysis Period (min) 15						

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings

5: Royal Street & Site Access

06-24-2022

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↕↕↕	↖	
Traffic Volume (vph)	0	0	0	1096	0	0
Future Volume (vph)	0	0	0	1096	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	0	5085	1863	0
Flt Permitted						
Satd. Flow (perm)	0	0	0	5085	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	147.6			68.5	98.4	
Travel Time (s)	10.6			4.9	7.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	1191	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1191	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Stop			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 24.5%				ICU Level of Service A		
Analysis Period (min) 15						

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings

6: Erb Street East

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	550	95	0	0	0	0	507	35	102	573	0
Future Volume (vph)	136	550	95	0	0	0	0	507	35	102	573	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	35.0		0.0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor								1.00		1.00		
Frt		0.977						0.987				
Flt Protected		0.991								0.950		
Satd. Flow (prot)	0	6101	0	0	0	0	0	3416	0	1641	3505	0
Flt Permitted		0.991								0.333		
Satd. Flow (perm)	0	6101	0	0	0	0	0	3416	0	575	3505	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		61						15				
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		200.5			290.2			195.8			118.3	
Travel Time (s)		14.4			20.9			14.1			8.5	
Confl. Peds. (#/hr)									2	2		
Peak Hour Factor	0.87	0.98	0.74	0.92	0.92	0.92	0.92	0.92	0.67	0.77	0.76	0.25
Heavy Vehicles (%)	5%	4%	1%	2%	2%	2%	2%	4%	6%	10%	3%	2%
Adj. Flow (vph)	156	561	128	0	0	0	0	551	52	132	754	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	845	0	0	0	0	0	603	0	132	754	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			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												
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						2		1	2	
Detector Template	Left	Thru						Thru		Left	Thru	
Leading Detector (m)	2.0	10.0						10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6						0.6		2.0	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0		0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	

Lanes, Volumes, Timings

6: Erb Street East

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4									6		
Detector Phase	4	4						2		1	6	
Switch Phase												
Minimum Initial (s)	25.2	25.2						30.8		4.0	30.8	
Minimum Split (s)	31.2	31.2						37.8		8.0	37.8	
Total Split (s)	31.2	31.2						37.8		9.0	37.8	
Total Split (%)	40.0%	40.0%						48.5%		11.5%	48.5%	
Maximum Green (s)	25.2	25.2						31.8		5.0	31.8	
Yellow Time (s)	4.0	4.0						4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0						2.0		1.0	2.0	
Lost Time Adjust (s)		0.0						0.0		0.0	0.0	
Total Lost Time (s)		6.0						6.0		4.0	6.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Recall Mode	None	None						Max		None	Max	
Walk Time (s)	12.2	12.2						20.8			20.8	
Flash Dont Walk (s)	13.0	13.0						10.0			10.0	
Pedestrian Calls (#/hr)	0	0						0			0	
Act Effct Green (s)		25.3						31.9		40.9	38.9	
Actuated g/C Ratio		0.33						0.42		0.54	0.51	
v/c Ratio		0.41						0.42		0.35	0.42	
Control Delay		19.3						16.8		11.5	12.4	
Queue Delay		0.0						0.0		0.0	0.0	
Total Delay		19.3						16.8		11.5	12.4	
LOS		B						B		B	B	
Approach Delay		19.3						16.8			12.2	
Approach LOS		B						B			B	

Intersection Summary

Area Type: Other

Cycle Length: 78

Actuated Cycle Length: 76.2

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 16.0

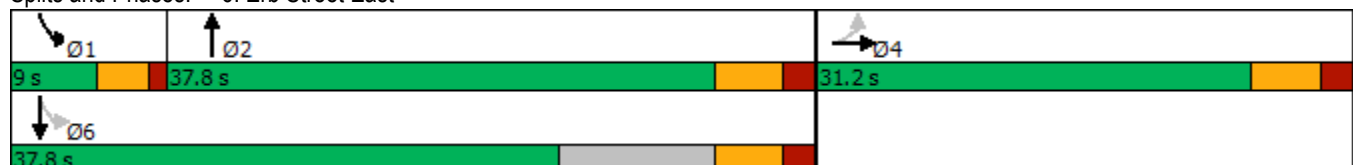
Intersection LOS: B

Intersection Capacity Utilization 65.7%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 6: Erb Street East



Lanes, Volumes, Timings

1: Bridgeport Road East & Weber Street North

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	129	857	193	218	779	0	0	988	174
Future Volume (vph)	0	0	0	129	857	193	218	779	0	0	988	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		37.0	52.0		0.0	0.0		0.0
Storage Lanes	0		0	0		1	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.86	0.86	0.86	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor					0.99		1.00				1.00	
Frt					0.973						0.977	
Flt Protected					0.994		0.950					
Satd. Flow (prot)	0	0	0	0	6211	0	1805	3574	0	0	3487	0
Flt Permitted					0.994		0.103					
Satd. Flow (perm)	0	0	0	0	6204	0	196	3574	0	0	3487	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					66						28	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		154.2			147.6			95.6			183.2	
Travel Time (s)		11.1			10.6			6.9			13.2	
Confl. Peds. (#/hr)	19		10	10		19	12					
Confl. Bikes (#/hr)									9			12
Peak Hour Factor	0.92	0.92	0.92	0.83	0.88	0.79	0.90	0.88	0.25	0.25	0.95	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	1%	1%	0%	1%	0%	0%	1%	0%
Adj. Flow (vph)	0	0	0	155	974	244	242	885	0	0	1040	193
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1373	0	242	885	0	0	1233	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			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												
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				2
Detector Template				Left	Thru		Left	Thru				Thru
Leading Detector (m)				2.0	10.0		2.0	10.0				10.0
Trailing Detector (m)				0.0	0.0		0.0	0.0				0.0
Detector 1 Position(m)				0.0	0.0		0.0	0.0				0.0
Detector 1 Size(m)				2.0	0.6		2.0	0.6				0.6
Detector 1 Type				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
Detector 1 Queue (s)				0.0	0.0		0.0	0.0				0.0
Detector 1 Delay (s)				0.0	0.0		0.0	0.0				0.0
Detector 2 Position(m)					9.4			9.4				9.4
Detector 2 Size(m)					0.6			0.6				0.6
Detector 2 Type					Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings

1: Bridgeport Road East & Weber Street North

06-24-2022

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				27.3	27.3		5.0	34.5			34.5	
Minimum Split (s)				36.9	36.9		12.2	40.5			40.5	
Total Split (s)				36.9	36.9		12.2	53.1			40.6	
Total Split (%)				41.0%	41.0%		13.6%	59.0%			45.1%	
Maximum Green (s)				30.9	30.9		8.2	47.1			34.6	
Yellow Time (s)				4.0	4.0		3.0	4.0			4.0	
All-Red Time (s)				2.0	2.0		1.0	2.0			2.0	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					6.0		4.0	6.0			6.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				None	None		None	Max			Max	
Walk Time (s)				15.3	15.3			24.5			24.5	
Flash Dont Walk (s)				12.0	12.0			10.0			10.0	
Pedestrian Calls (#/hr)				0	0			0			0	
Act Effect Green (s)					28.4		49.1	47.1			34.9	
Actuated g/C Ratio					0.32		0.56	0.54			0.40	
v/c Ratio					0.67		0.93	0.46			0.88	
Control Delay					26.0		60.3	13.5			32.6	
Queue Delay					0.0		0.0	0.0			0.0	
Total Delay					26.0		60.3	13.5			32.6	
LOS					C		E	B			C	
Approach Delay					26.0			23.6			32.6	
Approach LOS					C			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 87.5

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 27.4

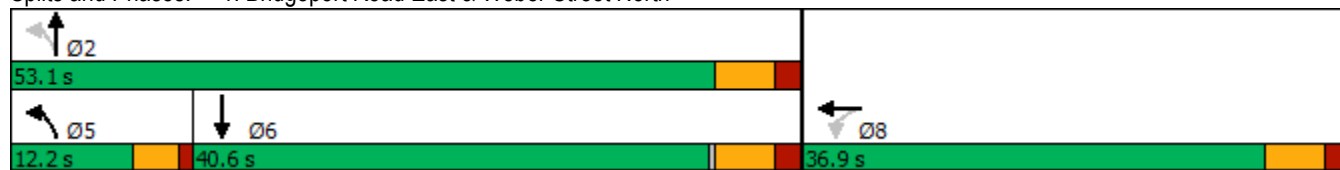
Intersection LOS: C

Intersection Capacity Utilization 81.0%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 1: Bridgeport Road East & Weber Street North



Lanes, Volumes, Timings

2: Royal Street East

06-24-2022

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	3	2	0	54	0	14	0	987	77	35	1092	3	
Future Volume (vph)	3	2	0	54	0	14	0	987	77	35	1092	3	
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	0.95	0.95	0.95	0.95	0.95	0.95	
Ped Bike Factor													
Frt					0.979					0.983			
Flt Protected	0.971				0.959						0.998		
Satd. Flow (prot)	0	1845	0	0	1784	0	0	3517	0	0	3565	0	
Flt Permitted	0.971				0.959						0.998		
Satd. Flow (perm)	0	1845	0	0	1784	0	0	3517	0	0	3565	0	
Link Speed (k/h)	50				50				50				
Link Distance (m)	62.5				76.2				118.3				
Travel Time (s)	4.5				5.5				8.5				
Confl. Peds. (#/hr)			1	1			5	8		8			
Peak Hour Factor	0.25	0.25	0.25	0.38	0.25	0.54	0.25	0.94	0.58	0.71	0.97	0.50	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	
Adj. Flow (vph)	12	8	0	142	0	26	0	1050	133	49	1126	6	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	20	0	0	168	0	0	1183	0	0	1181	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)	0.0				0.0				3.6				
Link Offset(m)	0.0				0.0				0.0				
Crosswalk Width(m)	4.8				4.8				4.8				
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (k/h)	100			100	25			15	100	15	25	100	
Sign Control	Stop			Stop			Free			Free			
Intersection Summary													
Area Type:	Other												
Control Type:	Unsignalized												
Intersection Capacity Utilization	67.5%				ICU Level of Service C								
Analysis Period (min)	15												

HCM Unsignalized Intersection Capacity Analysis

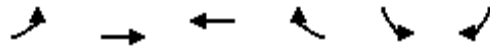
2: Royal Street East

06-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	2	0	54	0	14	0	987	77	35	1092	3
Future Volume (Veh/h)	3	2	0	54	0	14	0	987	77	35	1092	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.25	0.25	0.38	0.25	0.54	0.25	0.94	0.58	0.71	0.97	0.50
Hourly flow rate (vph)	12	8	0	142	0	26	0	1050	133	49	1126	6
Pedestrians		5			8			1				
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)								118			96	
pX, platoon unblocked	0.80	0.80	0.68	0.80	0.80	0.76	0.68			0.76		
vC, conflicting volume	1783	2423	572	1790	2360	600	1137			1191		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	162	960	0	171	881	0	277			635		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	96	100	75	100	97	100			93		
cM capacity (veh/h)	577	191	743	566	213	829	884			728		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	20	168	525	658	612	569						
Volume Left	12	142	0	0	49	0						
Volume Right	0	26	0	133	0	6						
cSH	319	596	884	1700	728	1700						
Volume to Capacity	0.06	0.28	0.00	0.39	0.07	0.33						
Queue Length 95th (m)	1.6	9.2	0.0	0.0	1.7	0.0						
Control Delay (s)	17.0	13.4	0.0	0.0	1.8	0.0						
Lane LOS	C	B			A							
Approach Delay (s)	17.0	13.4	0.0		0.9							
Approach LOS	C	B										
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			67.5%		ICU Level of Service					C		
Analysis Period (min)			15									

Lanes, Volumes, Timings
3: Royal Street & Site Access

06-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	85	28	17	0	0	50
Future Volume (vph)	85	28	17	0	0	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected	0.964					
Satd. Flow (prot)	0	1796	1863	0	1611	0
Flt Permitted	0.964					
Satd. Flow (perm)	0	1796	1863	0	1611	0
Link Speed (k/h)	50		50	50		
Link Distance (m)	62.6		335.6	98.4		
Travel Time (s)	4.5		24.2	7.1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	30	18	0	0	54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	122	18	0	54	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)	0.0		0.0	3.6		
Link Offset(m)	0.0		0.0	0.0		
Crosswalk Width(m)	4.8		4.8	4.8		
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15			25	15
Sign Control	Free		Free	Stop		
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 22.8%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis

3: Royal Street & Site Access

06-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	85	28	17	0	0	50
Future Volume (Veh/h)	85	28	17	0	0	50
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	30	18	0	0	54
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	18				232	18
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	18				232	18
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				100	95
cM capacity (veh/h)	1599				713	1061
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	122	18	54			
Volume Left	92	0	0			
Volume Right	0	0	54			
cSH	1599	1700	1061			
Volume to Capacity	0.06	0.01	0.05			
Queue Length 95th (m)	1.5	0.0	1.3			
Control Delay (s)	5.7	0.0	8.6			
Lane LOS	A		A			
Approach Delay (s)	5.7	0.0	8.6			
Approach LOS			A			
Intersection Summary						
Average Delay			6.0			
Intersection Capacity Utilization			22.8%		ICU Level of Service	
Analysis Period (min)			15		A	

Lanes, Volumes, Timings

4: Brideport Road East & NE Access

06-24-2022

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↕↕↕	↖	
Traffic Volume (vph)	0	0	26	1139	10	0
Future Volume (vph)	0	0	26	1139	10	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt						
Flt Protected				0.999	0.950	
Satd. Flow (prot)	0	0	0	5080	1770	0
Flt Permitted				0.999	0.950	
Satd. Flow (perm)	0	0	0	5080	1770	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	68.5			250.2	50.7	
Travel Time (s)	4.9			18.0	3.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	28	1238	11	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1266	11	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Stop			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	32.5%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings
5: Royal Street & Site Access

06-24-2022

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↕↕↕	↖	
Traffic Volume (vph)	0	0	7	1142	35	0
Future Volume (vph)	0	0	7	1142	35	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	0	0	5085	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	0	5085	1770	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	147.6			68.5	98.4	
Travel Time (s)	10.6			4.9	7.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	8	1241	38	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1249	38	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Stop			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 32.2%				ICU Level of Service A		
Analysis Period (min) 15						

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings
6: Erb Street East

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	1007	139	0	0	0	0	872	44	261	889	0
Future Volume (vph)	193	1007	139	0	0	0	0	872	44	261	889	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	35.0		0.0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor		1.00						1.00		1.00		
Frt		0.983						0.991				
Flt Protected		0.993								0.950		
Satd. Flow (prot)	0	6324	0	0	0	0	0	3569	0	1770	3574	0
Flt Permitted		0.993								0.132		
Satd. Flow (perm)	0	6324	0	0	0	0	0	3569	0	246	3574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		37						8				
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		200.5			290.2			195.8			118.3	
Travel Time (s)		14.4			20.9			14.1			8.5	
Confl. Peds. (#/hr)			1				5		8	8		5
Peak Hour Factor	0.85	0.90	0.83	0.92	0.92	0.92	0.25	0.94	0.75	0.86	0.88	0.25
Heavy Vehicles (%)	0%	1%	0%	2%	2%	2%	0%	0%	2%	2%	1%	2%
Adj. Flow (vph)	227	1119	167	0	0	0	0	928	59	303	1010	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1513	0	0	0	0	0	987	0	303	1010	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			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												
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						2		1	2	
Detector Template	Left	Thru						Thru		Left	Thru	
Leading Detector (m)	2.0	10.0						10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6						0.6		2.0	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0		0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	

Lanes, Volumes, Timings

6: Erb Street East

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4									6		
Detector Phase	4	4						2		1	6	
Switch Phase												
Minimum Initial (s)	30.9	30.9						30.0		5.0	30.0	
Minimum Split (s)	36.9	36.9						37.8		9.0	37.8	
Total Split (s)	36.9	36.9						38.1		13.1	53.1	
Total Split (%)	41.0%	41.0%						42.3%		14.6%	59.0%	
Maximum Green (s)	30.9	30.9						32.1		9.1	47.1	
Yellow Time (s)	4.0	4.0						4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0						2.0		1.0	2.0	
Lost Time Adjust (s)		0.0						0.0		0.0	0.0	
Total Lost Time (s)		6.0						6.0		4.0	6.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Recall Mode	None	None						Max		None	Max	
Walk Time (s)	17.9	17.9						20.0			20.0	
Flash Dont Walk (s)	13.0	13.0						10.0			10.0	
Pedestrian Calls (#/hr)	0	0						0			0	
Act Effct Green (s)		30.9						34.0		49.1	47.1	
Actuated g/C Ratio		0.34						0.38		0.55	0.52	
v/c Ratio		0.69						0.73		1.05	0.54	
Control Delay		26.7						27.7		87.7	15.6	
Queue Delay		0.0						0.0		0.0	0.0	
Total Delay		26.7						27.7		87.7	15.6	
LOS		C						C		F	B	
Approach Delay		26.7						27.7			32.2	
Approach LOS		C						C			C	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Natural Cycle: 85

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 28.9

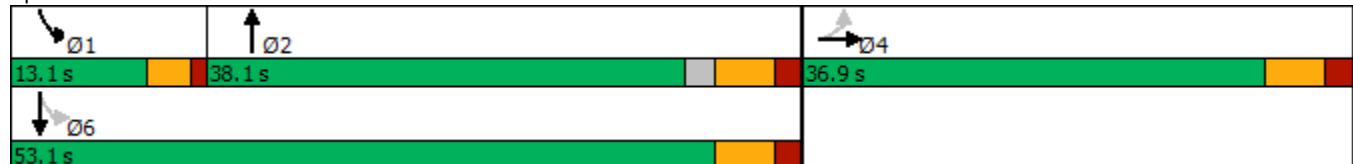
Intersection LOS: C

Intersection Capacity Utilization 79.1%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 6: Erb Street East



Lanes, Volumes, Timings

1: Bridgeport Road East & Weber Street North

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	147	896	111	136	537	0	0	554	104
Future Volume (vph)	0	0	0	147	896	111	136	537	0	0	554	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		37.0	52.0		0.0	0.0		0.0
Storage Lanes	0		0	0		1	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.86	0.86	0.86	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor					1.00		1.00				1.00	
Frt					0.986						0.974	
Flt Protected					0.994		0.950					
Satd. Flow (prot)	0	0	0	0	6215	0	1770	3471	0	0	3372	0
Flt Permitted					0.994		0.222					
Satd. Flow (perm)	0	0	0	0	6212	0	413	3471	0	0	3372	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					30						34	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		154.2			147.6			95.6			183.2	
Travel Time (s)		11.1			10.6			6.9			13.2	
Confl. Peds. (#/hr)	9		9	3		6	3		5	3		3
Peak Hour Factor	0.92	0.92	0.92	0.97	0.88	0.91	0.77	0.90	0.92	0.25	0.87	0.77
Heavy Vehicles (%)	2%	2%	2%	3%	3%	2%	2%	4%	0%	0%	4%	4%
Adj. Flow (vph)	0	0	0	152	1018	122	177	597	0	0	637	135
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1292	0	177	597	0	0	772	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			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												
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				2
Detector Template				Left	Thru		Left	Thru				Thru
Leading Detector (m)				2.0	10.0		2.0	10.0				10.0
Trailing Detector (m)				0.0	0.0		0.0	0.0				0.0
Detector 1 Position(m)				0.0	0.0		0.0	0.0				0.0
Detector 1 Size(m)				2.0	0.6		2.0	0.6				0.6
Detector 1 Type				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
Detector 1 Queue (s)				0.0	0.0		0.0	0.0				0.0
Detector 1 Delay (s)				0.0	0.0		0.0	0.0				0.0
Detector 2 Position(m)					9.4			9.4				9.4
Detector 2 Size(m)					0.6			0.6				0.6
Detector 2 Type					Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0				0.0

Lanes, Volumes, Timings

1: Bridgeport Road East & Weber Street North

06-24-2022

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				26.0	26.0		5.0	29.2			29.2	
Minimum Split (s)				32.0	32.0		11.0	35.2			36.2	
Total Split (s)				32.0	32.0		14.8	35.2			36.2	
Total Split (%)				38.6%	38.6%		17.8%	42.4%			43.6%	
Maximum Green (s)				26.0	26.0		10.8	29.2			30.2	
Yellow Time (s)				4.0	4.0		3.0	4.0			4.0	
All-Red Time (s)				2.0	2.0		1.0	2.0			2.0	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					6.0		4.0	6.0			6.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				None	None		None	Max			Max	
Walk Time (s)				14.0	14.0			19.2			19.2	
Flash Dont Walk (s)				12.0	12.0			10.0			10.0	
Pedestrian Calls (#/hr)				0	0			0			0	
Act Effect Green (s)					26.0		46.0	44.0			30.2	
Actuated g/C Ratio					0.32		0.56	0.54			0.37	
v/c Ratio					0.65		0.45	0.32			0.61	
Control Delay					25.5		12.6	11.2			22.8	
Queue Delay					0.0		0.0	0.0			0.0	
Total Delay					25.5		12.6	11.2			22.8	
LOS					C		B	B			C	
Approach Delay					25.5			11.5			22.8	
Approach LOS					C			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 83

Actuated Cycle Length: 82

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 20.9

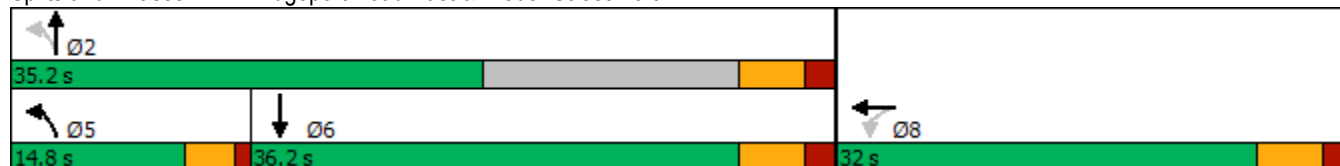
Intersection LOS: C

Intersection Capacity Utilization 66.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Bridgeport Road East & Weber Street North



Lanes, Volumes, Timings

2: Royal Street East

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	2	2	4	0	19	5	652	2	9	672	11
Future Volume (vph)	5	2	2	4	0	19	5	652	2	9	672	11
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	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor												
Frt		0.958			0.879			0.998			0.998	
Flt Protected		0.981			0.995			0.999			0.999	
Satd. Flow (prot)	0	1786	0	0	1662	0	0	3464	0	0	3466	0
Flt Permitted		0.981			0.995			0.999			0.999	
Satd. Flow (perm)	0	1786	0	0	1662	0	0	3464	0	0	3466	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		62.5			76.2			118.3			95.6	
Travel Time (s)		4.5			5.5			8.5			6.9	
Confl. Peds. (#/hr)							3		2	2		3
Peak Hour Factor	0.50	0.25	0.25	0.75	0.92	0.45	0.50	0.94	0.25	0.50	0.89	0.83
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	4%	0%
Adj. Flow (vph)	10	8	8	5	0	42	10	694	8	18	755	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	0	0	47	0	0	712	0	0	786	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			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												
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		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	35.3%											
Analysis Period (min)	15											
ICU Level of Service A												

HCM Unsignalized Intersection Capacity Analysis

2: Royal Street East

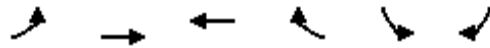
06-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	2	2	4	0	19	5	652	2	9	672	11
Future Volume (Veh/h)	5	2	2	4	0	19	5	652	2	9	672	11
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.50	0.25	0.25	0.75	0.92	0.45	0.50	0.94	0.25	0.50	0.89	0.83
Hourly flow rate (vph)	10	8	8	5	0	42	10	694	8	18	755	13
Pedestrians	3				2							
Lane Width (m)	3.6				3.6							
Walking Speed (m/s)	1.2				1.2							
Percent Blockage	0				0							
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)							118			96		
pX, platoon unblocked	0.89	0.89	0.84	0.89	0.89	0.89	0.84				0.89	
vC, conflicting volume	1210	1524	387	1146	1527	353	771				704	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	425	779	0	353	781	19	331				414	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	98	97	99	99	100	96	99				98	
cM capacity (veh/h)	429	285	909	491	284	941	1033				1024	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	26	47	357	355	396	390						
Volume Left	10	5	10	0	18	0						
Volume Right	8	42	0	8	0	13						
cSH	432	857	1033	1700	1024	1700						
Volume to Capacity	0.06	0.05	0.01	0.21	0.02	0.23						
Queue Length 95th (m)	1.5	1.4	0.2	0.0	0.4	0.0						
Control Delay (s)	13.9	9.4	0.3	0.0	0.6	0.0						
Lane LOS	B	A	A		A							
Approach Delay (s)	13.9	9.4	0.2		0.3							
Approach LOS	B	A										
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization			35.3%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings

3: Royal Street & Site Access

06-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	11	23	0	0	0
Future Volume (vph)	0	11	23	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frnt						
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	1863	0
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	1863	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		62.6	335.6		98.4	
Travel Time (s)		4.5	24.2		7.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	12	25	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	12	25	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 6.7%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis

3: Royal Street & Site Access

06-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	11	23	0	0	0
Future Volume (Veh/h)	0	11	23	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	12	25	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	25				37	25
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	25				37	25
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1589				975	1051
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	12	25	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1589	1700	1700			
Volume to Capacity	0.00	0.01	0.05			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%		ICU Level of Service	
Analysis Period (min)			15		A	

Lanes, Volumes, Timings

4: Brideport Road East & NE Access

06-24-2022

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↕↕↕	↖	
Traffic Volume (vph)	0	0	0	1152	0	0
Future Volume (vph)	0	0	0	1152	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	0	5085	1863	0
Flt Permitted						
Satd. Flow (perm)	0	0	0	5085	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	68.5			250.2	50.7	
Travel Time (s)	4.9			18.0	3.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	1252	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1252	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Stop			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 25.6%				ICU Level of Service A		
Analysis Period (min) 15						

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings

5: Royal Street & Site Access

06-24-2022

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↕↕↕	↖	
Traffic Volume (vph)	0	0	0	1152	0	0
Future Volume (vph)	0	0	0	1152	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	0	5085	1863	0
Flt Permitted						
Satd. Flow (perm)	0	0	0	5085	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	147.6			68.5	98.4	
Travel Time (s)	10.6			4.9	7.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	1252	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1252	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Stop			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 25.6%				ICU Level of Service A		
Analysis Period (min) 15						

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings

6: Erb Street East

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	579	100	0	0	0	0	520	36	105	588	0
Future Volume (vph)	143	579	100	0	0	0	0	520	36	105	588	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	35.0		0.0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor								1.00		1.00		
Frt		0.977						0.987				
Flt Protected		0.991								0.950		
Satd. Flow (prot)	0	6101	0	0	0	0	0	3416	0	1641	3505	0
Flt Permitted		0.991								0.322		
Satd. Flow (perm)	0	6101	0	0	0	0	0	3416	0	556	3505	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		61						15				
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		200.5			290.2			195.8			118.3	
Travel Time (s)		14.4			20.9			14.1			8.5	
Confl. Peds. (#/hr)									2	2		
Peak Hour Factor	0.87	0.98	0.74	0.92	0.92	0.92	0.92	0.92	0.67	0.77	0.76	0.25
Heavy Vehicles (%)	5%	4%	1%	2%	2%	2%	2%	4%	6%	10%	3%	2%
Adj. Flow (vph)	164	591	135	0	0	0	0	565	54	136	774	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	890	0	0	0	0	0	619	0	136	774	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			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												
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						2		1	2	
Detector Template	Left	Thru						Thru		Left	Thru	
Leading Detector (m)	2.0	10.0						10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6						0.6		2.0	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0		0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	

Lanes, Volumes, Timings

6: Erb Street East

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4									6		
Detector Phase	4	4						2		1	6	
Switch Phase												
Minimum Initial (s)	25.2	25.2						30.8		4.0	30.8	
Minimum Split (s)	31.2	31.2						37.8		8.0	37.8	
Total Split (s)	31.2	31.2						37.8		9.0	37.8	
Total Split (%)	40.0%	40.0%						48.5%		11.5%	48.5%	
Maximum Green (s)	25.2	25.2						31.8		5.0	31.8	
Yellow Time (s)	4.0	4.0						4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0						2.0		1.0	2.0	
Lost Time Adjust (s)		0.0						0.0		0.0	0.0	
Total Lost Time (s)		6.0						6.0		4.0	6.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Recall Mode	None	None						Max		None	Max	
Walk Time (s)	12.2	12.2						20.8			20.8	
Flash Dont Walk (s)	13.0	13.0						10.0			10.0	
Pedestrian Calls (#/hr)	0	0						0			0	
Act Effct Green (s)		25.2						31.8		42.8	40.8	
Actuated g/C Ratio		0.32						0.41		0.55	0.52	
v/c Ratio		0.44						0.44		0.36	0.42	
Control Delay		20.1						17.5		11.6	12.3	
Queue Delay		0.0						0.0		0.0	0.0	
Total Delay		20.1						17.5		11.6	12.3	
LOS		C						B		B	B	
Approach Delay		20.1						17.5			12.2	
Approach LOS		C						B			B	

Intersection Summary

Area Type: Other

Cycle Length: 78

Actuated Cycle Length: 78

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.44

Intersection Signal Delay: 16.5

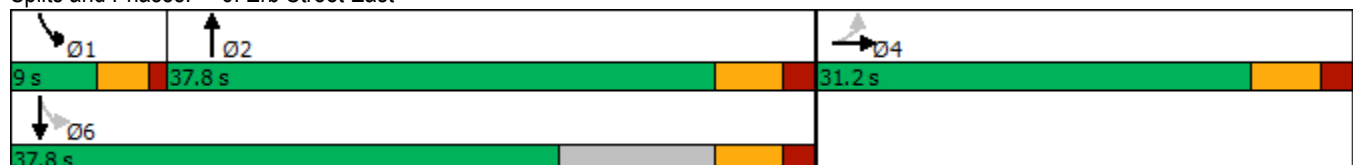
Intersection LOS: B

Intersection Capacity Utilization 65.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 6: Erb Street East



Lanes, Volumes, Timings

1: Bridgeport Road East & Weber Street North

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					←←←←		←	↑↑			↑↑	
Traffic Volume (vph)	0	0	0	105	843	185	218	779	0	0	972	174
Future Volume (vph)	0	0	0	105	843	185	218	779	0	0	972	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		37.0	52.0		0.0	0.0		0.0
Storage Lanes	0		0	0		1	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.86	0.86	0.86	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor					0.99		1.00				1.00	
Frt					0.973						0.976	
Flt Protected					0.995		0.950					
Satd. Flow (prot)	0	0	0	0	6219	0	1805	3574	0	0	3483	0
Flt Permitted					0.995		0.103					
Satd. Flow (perm)	0	0	0	0	6213	0	196	3574	0	0	3483	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					66						28	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		154.2			147.6			95.6			183.2	
Travel Time (s)		11.1			10.6			6.9			13.2	
Confl. Peds. (#/hr)	19		10	10		19	12					
Confl. Bikes (#/hr)									9			12
Peak Hour Factor	0.92	0.92	0.92	0.83	0.88	0.79	0.90	0.88	0.25	0.25	0.95	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	1%	1%	0%	1%	0%	0%	1%	0%
Adj. Flow (vph)	0	0	0	127	958	234	242	885	0	0	1023	193
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1319	0	242	885	0	0	1216	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			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												
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				2
Detector Template				Left	Thru		Left	Thru				Thru
Leading Detector (m)				2.0	10.0		2.0	10.0				10.0
Trailing Detector (m)				0.0	0.0		0.0	0.0				0.0
Detector 1 Position(m)				0.0	0.0		0.0	0.0				0.0
Detector 1 Size(m)				2.0	0.6		2.0	0.6				0.6
Detector 1 Type				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
Detector 1 Queue (s)				0.0	0.0		0.0	0.0				0.0
Detector 1 Delay (s)				0.0	0.0		0.0	0.0				0.0
Detector 2 Position(m)					9.4			9.4				9.4
Detector 2 Size(m)					0.6			0.6				0.6
Detector 2 Type					Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings

1: Bridgeport Road East & Weber Street North

06-24-2022

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				27.3	27.3		5.0	34.5			34.5	
Minimum Split (s)				36.9	36.9		12.2	40.5			40.5	
Total Split (s)				36.9	36.9		12.2	53.1			40.6	
Total Split (%)				41.0%	41.0%		13.6%	59.0%			45.1%	
Maximum Green (s)				30.9	30.9		8.2	47.1			34.6	
Yellow Time (s)				4.0	4.0		3.0	4.0			4.0	
All-Red Time (s)				2.0	2.0		1.0	2.0			2.0	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					6.0		4.0	6.0			6.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				None	None		None	Max			Max	
Walk Time (s)				15.3	15.3			24.5			24.5	
Flash Dont Walk (s)				12.0	12.0			10.0			10.0	
Pedestrian Calls (#/hr)				0	0			0			0	
Act Effect Green (s)					28.0		49.1	47.1			34.9	
Actuated g/C Ratio					0.32		0.56	0.54			0.40	
v/c Ratio					0.65		0.92	0.46			0.86	
Control Delay					25.6		59.1	13.3			31.3	
Queue Delay					0.0		0.0	0.0			0.0	
Total Delay					25.6		59.1	13.3			31.3	
LOS					C		E	B			C	
Approach Delay					25.6			23.1			31.3	
Approach LOS					C			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 87.1

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 26.8

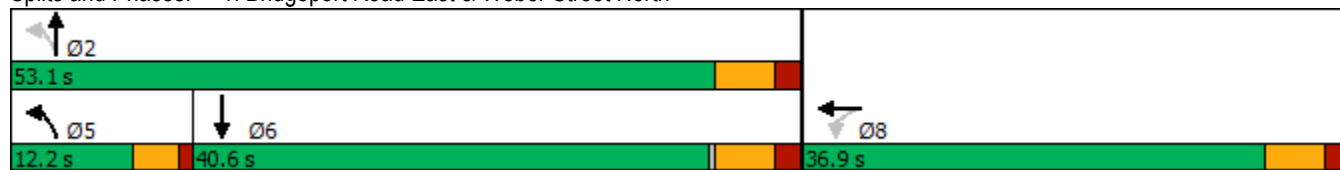
Intersection LOS: C

Intersection Capacity Utilization 80.6%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 1: Bridgeport Road East & Weber Street North



Lanes, Volumes, Timings

2: Royal Street East

06-24-2022

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	3	2	0	4	0	14	0	987	8	19	1068	3	
Future Volume (vph)	3	2	0	4	0	14	0	987	8	19	1068	3	
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	0.95	0.95	0.95	0.95	0.95	0.95	
Ped Bike Factor													
Frt					0.905					0.998			0.999
Flt Protected	0.971				0.985						0.999		
Satd. Flow (prot)	0	1845	0	0	1694	0	0	3568	0	0	3568	0	
Flt Permitted	0.971				0.985						0.999		
Satd. Flow (perm)	0	1845	0	0	1694	0	0	3568	0	0	3568	0	
Link Speed (k/h)	50				50				50				
Link Distance (m)	62.5				76.2				118.3				
Travel Time (s)	4.5				5.5				8.5				
Confl. Peds. (#/hr)			1	1			5		8	8			
Peak Hour Factor	0.25	0.25	0.25	0.38	0.25	0.54	0.25	0.94	0.58	0.71	0.97	0.50	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	
Adj. Flow (vph)	12	8	0	11	0	26	0	1050	14	27	1101	6	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	20	0	0	37	0	0	1064	0	0	1134	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)	0.0				0.0				3.6				
Link Offset(m)	0.0				0.0				0.0				
Crosswalk Width(m)	4.8				4.8				4.8				
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (k/h)	100		100	25		15	100		15	25		100	
Sign Control	Stop				Stop				Free				
Intersection Summary													
Area Type:	Other												
Control Type:	Unsignalized												
Intersection Capacity Utilization	53.4%				ICU Level of Service A								
Analysis Period (min)	15												

HCM Unsignalized Intersection Capacity Analysis

2: Royal Street East

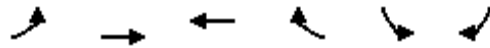
06-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	2	0	4	0	14	0	987	8	19	1068	3
Future Volume (Veh/h)	3	2	0	4	0	14	0	987	8	19	1068	3
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.25	0.25	0.25	0.38	0.25	0.54	0.25	0.94	0.58	0.71	0.97	0.50
Hourly flow rate (vph)	12	8	0	11	0	26	0	1050	14	27	1101	6
Pedestrians	5			8			1					
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)							118			96		
pX, platoon unblocked	0.80	0.80	0.69	0.80	0.80	0.79	0.69				0.79	
vC, conflicting volume	1714	2235	560	1674	2231	540	1112				1072	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	209	863	0	159	858	0	273				564	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	98	96	100	98	100	97	100				97	
cM capacity (veh/h)	547	224	752	593	226	858	897				800	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	20	37	525	539	578	556						
Volume Left	12	11	0	0	27	0						
Volume Right	0	26	0	14	0	6						
cSH	347	757	897	1700	800	1700						
Volume to Capacity	0.06	0.05	0.00	0.32	0.03	0.33						
Queue Length 95th (m)	1.5	1.2	0.0	0.0	0.8	0.0						
Control Delay (s)	16.0	10.0	0.0	0.0	0.9	0.0						
Lane LOS	C	A			A							
Approach Delay (s)	16.0	10.0	0.0		0.5							
Approach LOS	C	A										
Intersection Summary												
Average Delay				0.5								
Intersection Capacity Utilization				53.4%	ICU Level of Service				A			
Analysis Period (min)				15								

Lanes, Volumes, Timings

3: Royal Street & Site Access

06-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	28	17	0	0	0
Future Volume (vph)	0	28	17	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frnt						
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	1863	0
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	1863	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		62.6	335.6		98.4	
Travel Time (s)		4.5	24.2		7.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	30	18	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	30	18	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 6.7%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis

3: Royal Street & Site Access

06-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	28	17	0	0	0
Future Volume (Veh/h)	0	28	17	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	30	18	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	18				48	18
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	18				48	18
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1599				962	1061
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	30	18	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1599	1700	1700			
Volume to Capacity	0.00	0.01	0.05			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings

4: Brideport Road East & NE Access

06-24-2022

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↔↑↑↑	↖	
Traffic Volume (vph)	0	0	0	1132	0	0
Future Volume (vph)	0	0	0	1132	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	0	5085	1863	0
Flt Permitted						
Satd. Flow (perm)	0	0	0	5085	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	68.5			250.2	50.7	
Travel Time (s)	4.9			18.0	3.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	1230	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1230	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Stop			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	25.2%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings

5: Royal Street & Site Access

06-24-2022

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↕↕↕	↖	
Traffic Volume (vph)	0	0	0	1132	0	0
Future Volume (vph)	0	0	0	1132	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	0	5085	1863	0
Flt Permitted						
Satd. Flow (perm)	0	0	0	5085	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	147.6			68.5	98.4	
Travel Time (s)	10.6			4.9	7.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	1230	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1230	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Stop			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 25.2%				ICU Level of Service A		
Analysis Period (min) 15						

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings

6: Erb Street East

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	1007	139	0	0	0	0	803	44	252	823	0
Future Volume (vph)	193	1007	139	0	0	0	0	803	44	252	823	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	35.0		0.0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor		1.00						1.00		1.00		
Frt		0.983						0.990				
Flt Protected		0.993								0.950		
Satd. Flow (prot)	0	6324	0	0	0	0	0	3565	0	1770	3574	0
Flt Permitted		0.993								0.161		
Satd. Flow (perm)	0	6324	0	0	0	0	0	3565	0	299	3574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		37						9				
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		200.5			290.2			195.8			118.3	
Travel Time (s)		14.4			20.9			14.1			8.5	
Confl. Peds. (#/hr)			1				5		8	8		5
Peak Hour Factor	0.85	0.90	0.83	0.92	0.92	0.92	0.25	0.94	0.75	0.86	0.88	0.25
Heavy Vehicles (%)	0%	1%	0%	2%	2%	2%	0%	0%	2%	2%	1%	2%
Adj. Flow (vph)	227	1119	167	0	0	0	0	854	59	293	935	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1513	0	0	0	0	0	913	0	293	935	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			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												
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						2		1	2	
Detector Template	Left	Thru						Thru		Left	Thru	
Leading Detector (m)	2.0	10.0						10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6						0.6		2.0	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0		0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	

Lanes, Volumes, Timings

6: Erb Street East

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4									6		
Detector Phase	4	4						2		1	6	
Switch Phase												
Minimum Initial (s)	30.9	30.9						30.0		5.0	30.0	
Minimum Split (s)	36.9	36.9						37.8		9.0	37.8	
Total Split (s)	36.9	36.9						38.1		13.1	53.1	
Total Split (%)	41.0%	41.0%						42.3%		14.6%	59.0%	
Maximum Green (s)	30.9	30.9						32.1		9.1	47.1	
Yellow Time (s)	4.0	4.0						4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0						2.0		1.0	2.0	
Lost Time Adjust (s)		0.0						0.0		0.0	0.0	
Total Lost Time (s)		6.0						6.0		4.0	6.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Recall Mode	None	None						Max		None	Max	
Walk Time (s)	17.9	17.9						20.0			20.0	
Flash Dont Walk (s)	13.0	13.0						10.0			10.0	
Pedestrian Calls (#/hr)	0	0						0			0	
Act Effct Green (s)		30.9						34.0		49.1	47.1	
Actuated g/C Ratio		0.34						0.38		0.55	0.52	
v/c Ratio		0.69						0.68		0.94	0.50	
Control Delay		26.7						26.2		55.1	15.0	
Queue Delay		0.0						0.0		0.0	0.0	
Total Delay		26.7						26.2		55.1	15.0	
LOS		C						C		E	B	
Approach Delay		26.7						26.2			24.6	
Approach LOS		C						C			C	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Natural Cycle: 85

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 25.9

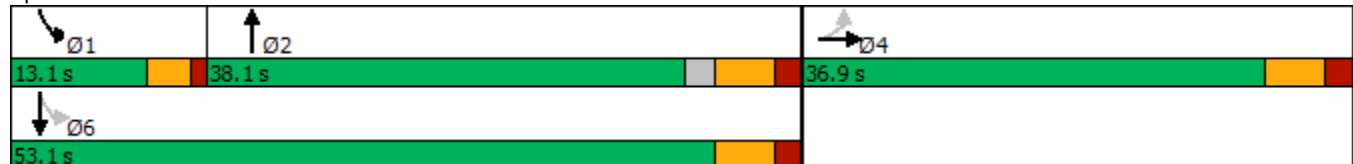
Intersection LOS: C

Intersection Capacity Utilization 78.0%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 6: Erb Street East



Lanes, Volumes, Timings

1: Bridgeport Road East & Weber Street North

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔↔↔		↔	↔↔			↔↔	
Traffic Volume (vph)	0	0	0	147	896	111	136	537	0	0	554	104
Future Volume (vph)	0	0	0	147	896	111	136	537	0	0	554	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		37.0	52.0		0.0	0.0		0.0
Storage Lanes	0		0	0		1	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor					1.00		1.00				1.00	
Frt					0.986						0.974	
Flt Protected					0.994		0.950					
Satd. Flow (prot)	0	0	0	0	4932	0	1770	3471	0	0	3372	0
Flt Permitted					0.994		0.222					
Satd. Flow (perm)	0	0	0	0	4930	0	413	3471	0	0	3372	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					22						34	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		154.2			147.6			95.6			183.2	
Travel Time (s)		11.1			10.6			6.9			13.2	
Confl. Peds. (#/hr)	9		9	3		6	3		5	3		3
Peak Hour Factor	0.92	0.92	0.92	0.97	0.88	0.91	0.77	0.90	0.92	0.25	0.87	0.77
Heavy Vehicles (%)	2%	2%	2%	3%	3%	2%	2%	4%	0%	0%	4%	4%
Adj. Flow (vph)	0	0	0	152	1018	122	177	597	0	0	637	135
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1292	0	177	597	0	0	772	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				26.0	26.0		5.0	29.2			29.2	
Minimum Split (s)				32.0	32.0		11.0	35.2			36.2	
Total Split (s)				32.0	32.0		14.8	35.2			36.2	
Total Split (%)				38.6%	38.6%		17.8%	42.4%			43.6%	
Yellow Time (s)				4.0	4.0		3.0	4.0			4.0	
All-Red Time (s)				2.0	2.0		1.0	2.0			2.0	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					6.0		4.0	6.0			6.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				None	None		None	Max			Max	
Act Effect Green (s)					26.0		46.0	44.0			30.2	
Actuated g/C Ratio					0.32		0.56	0.54			0.37	
v/c Ratio					0.82		0.45	0.32			0.61	
Control Delay					30.8		12.6	11.2			22.8	
Queue Delay					0.0		0.0	0.0			0.0	
Total Delay					30.8		12.6	11.2			22.8	
LOS					C		B	B			C	
Approach Delay					30.8			11.5			22.8	

Lanes, Volumes, Timings

1: Bridgeport Road East & Weber Street North

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	C						B			C		
Queue Length 50th (m)	71.2						13.1	27.0	52.0			
Queue Length 95th (m)	86.1						19.1	37.4	67.7			
Internal Link Dist (m)	130.2				123.6				71.6		159.2	
Turn Bay Length (m)							52.0					
Base Capacity (vph)	1578						410	1904	1263			
Starvation Cap Reductn	0						0	0	0			
Spillback Cap Reductn	0						0	0	0			
Storage Cap Reductn	0						0	0	0			
Reduced v/c Ratio	0.82						0.43	0.31	0.61			

Intersection Summary

Area Type: Other

Cycle Length: 83

Actuated Cycle Length: 82

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 23.4

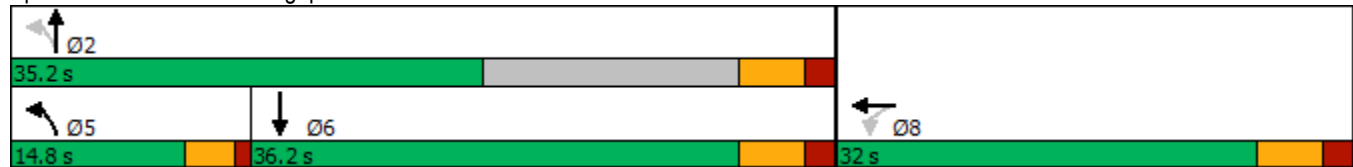
Intersection LOS: C

Intersection Capacity Utilization 70.2%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Bridgeport Road East & Weber Street North



Lanes, Volumes, Timings

2: Royal Street East

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	2	2	4	0	19	5	652	2	9	672	11
Future Volume (vph)	5	2	2	4	0	19	5	652	2	9	672	11
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	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor												
Frt		0.958			0.879			0.998			0.998	
Flt Protected		0.981			0.995			0.999			0.999	
Satd. Flow (prot)	0	1786	0	0	1662	0	0	3464	0	0	3466	0
Flt Permitted		0.981			0.995			0.999			0.999	
Satd. Flow (perm)	0	1786	0	0	1662	0	0	3464	0	0	3466	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		62.5			76.2			118.3			95.6	
Travel Time (s)		4.5			5.5			8.5			6.9	
Confl. Peds. (#/hr)							3		2	2		3
Peak Hour Factor	0.50	0.25	0.25	0.75	0.92	0.45	0.50	0.94	0.25	0.50	0.89	0.83
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	4%	0%
Adj. Flow (vph)	10	8	8	5	0	42	10	694	8	18	755	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	0	0	47	0	0	712	0	0	786	0
Sign Control		Stop			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											

HCM Unsignalized Intersection Capacity Analysis

2: Royal Street East

06-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	2	2	4	0	19	5	652	2	9	672	11
Future Volume (Veh/h)	5	2	2	4	0	19	5	652	2	9	672	11
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.50	0.25	0.25	0.75	0.92	0.45	0.50	0.94	0.25	0.50	0.89	0.83
Hourly flow rate (vph)	10	8	8	5	0	42	10	694	8	18	755	13
Pedestrians	3				2							
Lane Width (m)	3.6				3.6							
Walking Speed (m/s)	1.2				1.2							
Percent Blockage	0				0							
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)							118			96		
pX, platoon unblocked	0.89	0.89	0.84	0.89	0.89	0.89	0.84				0.89	
vC, conflicting volume	1210	1524	387	1146	1527	353	771				704	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	425	779	0	353	781	19	331				414	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	98	97	99	99	100	96	99				98	
cM capacity (veh/h)	429	285	909	491	284	941	1033				1024	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	26	47	357	355	396	390						
Volume Left	10	5	10	0	18	0						
Volume Right	8	42	0	8	0	13						
cSH	432	857	1033	1700	1024	1700						
Volume to Capacity	0.06	0.05	0.01	0.21	0.02	0.23						
Queue Length 95th (m)	1.5	1.4	0.2	0.0	0.4	0.0						
Control Delay (s)	13.9	9.4	0.3	0.0	0.6	0.0						
Lane LOS	B	A	A		A							
Approach Delay (s)	13.9	9.4	0.2		0.3							
Approach LOS	B	A										
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization			35.3%		ICU Level of Service			A				
Analysis Period (min)			15									

Lanes, Volumes, Timings

3: Royal Street & Site Access

06-24-2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	11	23	0	0	0
Future Volume (vph)	0	11	23	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	1863	0
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	1863	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		62.6	335.6		98.4	
Travel Time (s)		4.5	24.2		7.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	12	25	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	12	25	0	0	0
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 6.7%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis

3: Royal Street & Site Access

06-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	11	23	0	0	0
Future Volume (Veh/h)	0	11	23	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	12	25	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	25				37	25
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	25				37	25
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1589				975	1051
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	12	25	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1589	1700	1700			
Volume to Capacity	0.00	0.01	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%		ICU Level of Service	
Analysis Period (min)			15		A	

Lanes, Volumes, Timings

4: Brideport Road East & NE Access

06-24-2022

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↕↕↕	↖	
Traffic Volume (vph)	0	0	0	1152	0	0
Future Volume (vph)	0	0	0	1152	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	0	5085	1863	0
Flt Permitted						
Satd. Flow (perm)	0	0	0	5085	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	68.5			250.2	50.7	
Travel Time (s)	4.9			18.0	3.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	1252	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1252	0	0
Sign Control	Stop			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	25.6%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings

5: Royal Street & Site Access

06-24-2022

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↕↕↕	↖	
Traffic Volume (vph)	0	0	0	1152	0	0
Future Volume (vph)	0	0	0	1152	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	0	5085	1863	0
Flt Permitted						
Satd. Flow (perm)	0	0	0	5085	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	147.6			68.5	98.4	
Travel Time (s)	10.6			4.9	7.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	1252	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1252	0	0
Sign Control	Stop			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	25.6%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings

6: Erb Street East

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	579	100	0	0	0	0	520	36	105	588	0
Future Volume (vph)	143	579	100	0	0	0	0	520	36	105	588	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	35.0		0.0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.91	0.91	0.91	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor								1.00		1.00		
Frt		0.977						0.987				
Flt Protected		0.991								0.950		
Satd. Flow (prot)	0	4842	0	0	0	0	0	3416	0	1641	3505	0
Flt Permitted		0.991								0.322		
Satd. Flow (perm)	0	4842	0	0	0	0	0	3416	0	556	3505	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		48						15				
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		200.5			290.2			195.8			118.3	
Travel Time (s)		14.4			20.9			14.1			8.5	
Confl. Peds. (#/hr)									2	2		
Peak Hour Factor	0.87	0.98	0.74	0.92	0.92	0.92	0.92	0.92	0.67	0.77	0.76	0.25
Heavy Vehicles (%)	5%	4%	1%	2%	2%	2%	2%	4%	6%	10%	3%	2%
Adj. Flow (vph)	164	591	135	0	0	0	0	565	54	136	774	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	890	0	0	0	0	0	619	0	136	774	0
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4									6		
Detector Phase	4	4						2		1	6	
Switch Phase												
Minimum Initial (s)	25.2	25.2						30.8		4.0	30.8	
Minimum Split (s)	31.2	31.2						37.8		8.0	37.8	
Total Split (s)	31.2	31.2						37.8		9.0	37.8	
Total Split (%)	40.0%	40.0%						48.5%		11.5%	48.5%	
Yellow Time (s)	4.0	4.0						4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0						2.0		1.0	2.0	
Lost Time Adjust (s)		0.0						0.0		0.0	0.0	
Total Lost Time (s)		6.0						6.0		4.0	6.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	None	None						Max		None	Max	
Act Effct Green (s)		25.2						31.8		42.8	40.8	
Actuated g/C Ratio		0.32						0.41		0.55	0.52	
v/c Ratio		0.56						0.44		0.36	0.42	
Control Delay		22.1						17.5		11.6	12.3	
Queue Delay		0.0						0.0		0.0	0.0	
Total Delay		22.1						17.5		11.6	12.3	
LOS		C						B		B	B	
Approach Delay		22.1						17.5			12.2	

Lanes, Volumes, Timings

6: Erb Street East

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C						B			B	
Queue Length 50th (m)		39.0						34.5		9.6	36.2	
Queue Length 95th (m)		51.6						48.6		15.2	39.4	
Internal Link Dist (m)		176.5			266.2			171.8			94.3	
Turn Bay Length (m)										35.0		
Base Capacity (vph)		1596						1401		374	1833	
Starvation Cap Reductn		0						0		0	0	
Spillback Cap Reductn		0						0		0	0	
Storage Cap Reductn		0						0		0	0	
Reduced v/c Ratio		0.56						0.44		0.36	0.42	

Intersection Summary

Area Type: Other

Cycle Length: 78

Actuated Cycle Length: 78

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 17.2

Intersection LOS: B

Intersection Capacity Utilization 65.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 6: Erb Street East

 Ø1	 Ø2	 Ø4
9 s	37.8 s	31.2 s
 Ø6		
37.8 s		

Lanes, Volumes, Timings

1: Bridgeport Road East & Weber Street North

06-24-2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔↔↔		↔	↔↔			↔↔	
Traffic Volume (vph)	0	0	0	105	843	185	218	779	0	0	972	174
Future Volume (vph)	0	0	0	105	843	185	218	779	0	0	972	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		37.0	52.0		0.0	0.0		0.0
Storage Lanes	0		0	0		1	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor					0.99		1.00				1.00	
Frt					0.973						0.976	
Flt Protected					0.995		0.950					
Satd. Flow (prot)	0	0	0	0	4936	0	1805	3574	0	0	3483	0
Flt Permitted					0.995		0.103					
Satd. Flow (perm)	0	0	0	0	4931	0	196	3574	0	0	3483	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					57						28	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		154.2			147.6			95.6			183.2	
Travel Time (s)		11.1			10.6			6.9			13.2	
Confl. Peds. (#/hr)	19		10	10		19	12					
Confl. Bikes (#/hr)									9			12
Peak Hour Factor	0.92	0.92	0.92	0.83	0.88	0.79	0.90	0.88	0.25	0.25	0.95	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	1%	1%	0%	1%	0%	0%	1%	0%
Adj. Flow (vph)	0	0	0	127	958	234	242	885	0	0	1023	193
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1319	0	242	885	0	0	1216	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				27.3	27.3		5.0	34.5			34.5	
Minimum Split (s)				36.9	36.9		12.2	40.5			40.5	
Total Split (s)				36.9	36.9		12.2	53.1			40.6	
Total Split (%)				41.0%	41.0%		13.6%	59.0%			45.1%	
Yellow Time (s)				4.0	4.0		3.0	4.0			4.0	
All-Red Time (s)				2.0	2.0		1.0	2.0			2.0	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					6.0		4.0	6.0			6.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Recall Mode				None	None		None	Max			Max	
Act Effect Green (s)					29.3		49.1	47.1			34.9	
Actuated g/C Ratio					0.33		0.56	0.53			0.39	
v/c Ratio					0.79		0.94	0.46			0.87	
Control Delay					29.6		62.8	14.0			32.9	
Queue Delay					0.0		0.0	0.0			0.0	
Total Delay					29.6		62.8	14.0			32.9	
LOS					C		E	B			C	

Lanes, Volumes, Timings

1: Bridgeport Road East & Weber Street North

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay					29.6			24.5			32.9	
Approach LOS					C			C			C	
Queue Length 50th (m)					74.1		25.9	49.5			102.6	
Queue Length 95th (m)					88.6		#73.9	64.3			#146.7	
Internal Link Dist (m)		130.2			123.6			71.6			159.2	
Turn Bay Length (m)							52.0					
Base Capacity (vph)					1761		258	1905			1392	
Starvation Cap Reductn					0		0	0			0	
Spillback Cap Reductn					0		0	0			0	
Storage Cap Reductn					0		0	0			0	
Reduced v/c Ratio					0.75		0.94	0.46			0.87	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 88.4

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 29.1

Intersection LOS: C

Intersection Capacity Utilization 82.9%

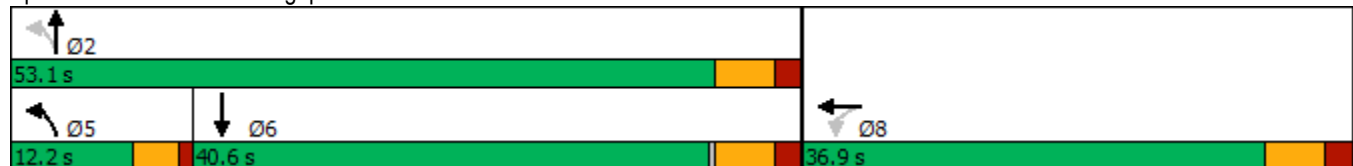
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Bridgeport Road East & Weber Street North



Lanes, Volumes, Timings

2: Royal Street East

06-24-2022

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	3	2	0	4	0	14	0	987	8	19	1068	3	
Future Volume (vph)	3	2	0	4	0	14	0	987	8	19	1068	3	
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	0.95	0.95	0.95	0.95	0.95	0.95	
Ped Bike Factor													
Frt					0.905					0.998			0.999
Flt Protected					0.971					0.985			0.999
Satd. Flow (prot)	0	1845	0	0	1694	0	0	3568	0	0	3568	0	
Flt Permitted					0.971					0.985			0.999
Satd. Flow (perm)	0	1845	0	0	1694	0	0	3568	0	0	3568	0	
Link Speed (k/h)					50					50			50
Link Distance (m)					62.5					76.2			95.6
Travel Time (s)					4.5					5.5			6.9
Confl. Peds. (#/hr)			1	1			5	8	8	5			
Peak Hour Factor	0.25	0.25	0.25	0.38	0.25	0.54	0.25	0.94	0.58	0.71	0.97	0.50	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	
Adj. Flow (vph)	12	8	0	11	0	26	0	1050	14	27	1101	6	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	20	0	0	37	0	0	1064	0	0	1134	0	
Sign Control	Stop				Stop				Free		Free		
Intersection Summary													
Area Type:	Other												
Control Type:	Unsignalized												
Intersection Capacity Utilization	53.4%				ICU Level of Service A								
Analysis Period (min)	15												

HCM Unsignalized Intersection Capacity Analysis

2: Royal Street East

06-24-2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	2	0	4	0	14	0	987	8	19	1068	3
Future Volume (Veh/h)	3	2	0	4	0	14	0	987	8	19	1068	3
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.25	0.25	0.25	0.38	0.25	0.54	0.25	0.94	0.58	0.71	0.97	0.50
Hourly flow rate (vph)	12	8	0	11	0	26	0	1050	14	27	1101	6
Pedestrians	5			8			1					
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)							118			96		
pX, platoon unblocked	0.79	0.79	0.69	0.79	0.79	0.79	0.69				0.79	
vC, conflicting volume	1714	2235	560	1674	2231	540	1112				1072	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	197	854	0	147	848	0	260				564	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	98	96	100	98	100	97	100				97	
cM capacity (veh/h)	555	226	748	602	228	858	903				800	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	20	37	525	539	578	556						
Volume Left	12	11	0	0	27	0						
Volume Right	0	26	0	14	0	6						
cSH	351	761	903	1700	800	1700						
Volume to Capacity	0.06	0.05	0.00	0.32	0.03	0.33						
Queue Length 95th (m)	1.4	1.2	0.0	0.0	0.8	0.0						
Control Delay (s)	15.9	10.0	0.0	0.0	0.9	0.0						
Lane LOS	C	A			A							
Approach Delay (s)	15.9	10.0	0.0		0.5							
Approach LOS	C	A										
Intersection Summary												
Average Delay				0.5								
Intersection Capacity Utilization				53.4%	ICU Level of Service				A			
Analysis Period (min)				15								

Lanes, Volumes, Timings

3: Royal Street & Site Access

06-24-2022

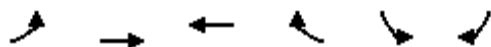


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	28	17	0	0	0
Future Volume (vph)	0	28	17	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	1863	0
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	1863	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		62.6	335.6		98.4	
Travel Time (s)		4.5	24.2		7.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	30	18	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	30	18	0	0	0
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 6.7%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis

3: Royal Street & Site Access

06-24-2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	28	17	0	0	0
Future Volume (Veh/h)	0	28	17	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	30	18	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	18				48	18
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	18				48	18
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1599				962	1061
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	30	18	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1599	1700	1700			
Volume to Capacity	0.00	0.01	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%		ICU Level of Service	
Analysis Period (min)			15		A	

Lanes, Volumes, Timings

4: Brideport Road East & NE Access

06-24-2022

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↕↕↕	↖	
Traffic Volume (vph)	0	0	0	1132	0	0
Future Volume (vph)	0	0	0	1132	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	0	5085	1863	0
Flt Permitted						
Satd. Flow (perm)	0	0	0	5085	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	68.5			250.2	50.7	
Travel Time (s)	4.9			18.0	3.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	1230	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1230	0	0
Sign Control	Stop			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	25.2%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings
5: Royal Street & Site Access

06-24-2022

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↕↕↕	↖	
Traffic Volume (vph)	0	0	0	1132	0	0
Future Volume (vph)	0	0	0	1132	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	0	0	5085	1863	0
Flt Permitted						
Satd. Flow (perm)	0	0	0	5085	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	147.6			68.5	98.4	
Travel Time (s)	10.6			4.9	7.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	1230	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1230	0	0
Sign Control	Stop			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	25.2%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings
6: Erb Street East

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	1007	139	0	0	0	0	803	44	252	823	0
Future Volume (vph)	193	1007	139	0	0	0	0	803	44	252	823	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	35.0		0.0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.91	0.91	0.91	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor		1.00						1.00		1.00		
Frt		0.983						0.990				
Flt Protected		0.993								0.950		
Satd. Flow (prot)	0	5019	0	0	0	0	0	3565	0	1770	3574	0
Flt Permitted		0.993								0.161		
Satd. Flow (perm)	0	5019	0	0	0	0	0	3565	0	299	3574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26						9				
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		200.5			290.2			195.8			118.3	
Travel Time (s)		14.4			20.9			14.1			8.5	
Confl. Peds. (#/hr)			1				5		8	8		5
Peak Hour Factor	0.85	0.90	0.83	0.92	0.92	0.92	0.25	0.94	0.75	0.86	0.88	0.25
Heavy Vehicles (%)	0%	1%	0%	2%	2%	2%	0%	0%	2%	2%	1%	2%
Adj. Flow (vph)	227	1119	167	0	0	0	0	854	59	293	935	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1513	0	0	0	0	0	913	0	293	935	0
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4									6		
Detector Phase	4	4						2		1	6	
Switch Phase												
Minimum Initial (s)	30.9	30.9						30.0		5.0	30.0	
Minimum Split (s)	36.9	36.9						37.8		9.0	37.8	
Total Split (s)	36.9	36.9						38.1		13.1	53.1	
Total Split (%)	41.0%	41.0%						42.3%		14.6%	59.0%	
Yellow Time (s)	4.0	4.0						4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0						2.0		1.0	2.0	
Lost Time Adjust (s)		0.0						0.0		0.0	0.0	
Total Lost Time (s)		6.0						6.0		4.0	6.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Recall Mode	None	None						Max		None	Max	
Act Effct Green (s)		30.9						34.0		49.1	47.1	
Actuated g/C Ratio		0.34						0.38		0.55	0.52	
v/c Ratio		0.87						0.68		0.94	0.50	
Control Delay		33.9						26.2		55.1	15.0	
Queue Delay		0.0						0.0		0.0	0.0	
Total Delay		33.9						26.2		55.1	15.0	
LOS		C						C		E	B	
Approach Delay		33.9						26.2			24.6	

Lanes, Volumes, Timings

6: Erb Street East

06-24-2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C						C			C	
Queue Length 50th (m)		91.9						71.0		27.3	54.6	
Queue Length 95th (m)		111.9						92.8		#69.5	68.9	
Internal Link Dist (m)		176.5			266.2			171.8			94.3	
Turn Bay Length (m)										35.0		
Base Capacity (vph)		1740						1352		311	1870	
Starvation Cap Reductn		0						0		0	0	
Spillback Cap Reductn		0						0		0	0	
Storage Cap Reductn		0						0		0	0	
Reduced v/c Ratio		0.87						0.68		0.94	0.50	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Natural Cycle: 85

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 28.8

Intersection LOS: C

Intersection Capacity Utilization 78.8%

ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 6: Erb Street East

		
Ø1	Ø2	Ø4
13.1 s	38.1 s	36.9 s
		
Ø6		
53.1 s		

Lanes, Volumes, Timings
1: Weber Street North & Bridgeport Road East

2027 FT AM - SN1

12/14/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					←←←←		↖	↑↑			↑↑	
Traffic Volume (vph)	0	0	0	199	912	113	136	539	0	0	587	104
Future Volume (vph)	0	0	0	199	912	113	136	539	0	0	587	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		37.0	52.0		0.0	0.0		0.0
Storage Lanes	0		0	0		1	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.86	0.86	0.86	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor					1.00		1.00				1.00	
Frt					0.986						0.975	
Flt Protected					0.993		0.950					
Satd. Flow (prot)	0	0	0	0	6209	0	1770	3471	0	0	3376	0
Flt Permitted					0.993		0.204					
Satd. Flow (perm)	0	0	0	0	6206	0	380	3471	0	0	3376	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					29						32	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		154.2			147.6			95.6			183.2	
Travel Time (s)		11.1			10.6			6.9			13.2	
Confl. Peds. (#/hr)	9		9	3		6	3		5	3		3
Peak Hour Factor	0.92	0.92	0.92	0.97	0.88	0.91	0.77	0.90	0.92	0.25	0.87	0.77
Heavy Vehicles (%)	2%	2%	2%	3%	3%	2%	2%	4%	0%	0%	4%	4%
Adj. Flow (vph)	0	0	0	205	1036	124	177	599	0	0	675	135
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1365	0	177	599	0	0	810	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			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												
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			2	
Detector Template				Left	Thru		Left	Thru			Thru	
Leading Detector (m)				2.0	10.0		2.0	10.0			10.0	
Trailing Detector (m)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Position(m)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Size(m)				2.0	0.6		2.0	0.6			0.6	
Detector 1 Type				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	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(m)					9.4			9.4			9.4	
Detector 2 Size(m)					0.6			0.6			0.6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	

Lanes, Volumes, Timings
1: Weber Street North & Bridgeport Road East

2027 FT AM - SN1
12/14/2023

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				26.0	26.0		5.0	29.2			29.2	
Minimum Split (s)				32.0	32.0		11.0	35.2			36.2	
Total Split (s)				32.0	32.0		14.8	35.2			36.2	
Total Split (%)				38.6%	38.6%		17.8%	42.4%			43.6%	
Maximum Green (s)				26.0	26.0		10.8	29.2			30.2	
Yellow Time (s)				4.0	4.0		3.0	4.0			4.0	
All-Red Time (s)				2.0	2.0		1.0	2.0			2.0	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					6.0		4.0	6.0			6.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				None	None		None	Max			Max	
Walk Time (s)				14.0	14.0			19.2			19.2	
Flash Dont Walk (s)				12.0	12.0			10.0			10.0	
Pedestrian Calls (#/hr)				0	0			0			0	
Act Effect Green (s)					26.0		46.0	44.0			30.2	
Actuated g/C Ratio					0.32		0.56	0.54			0.37	
v/c Ratio					0.69		0.47	0.32			0.64	
Control Delay					26.2		13.0	11.2			23.5	
Queue Delay					0.0		0.0	0.0			0.0	
Total Delay					26.2		13.0	11.2			23.5	
LOS					C		B	B			C	
Approach Delay					26.2			11.6			23.5	
Approach LOS					C			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 83

Actuated Cycle Length: 82

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 21.6

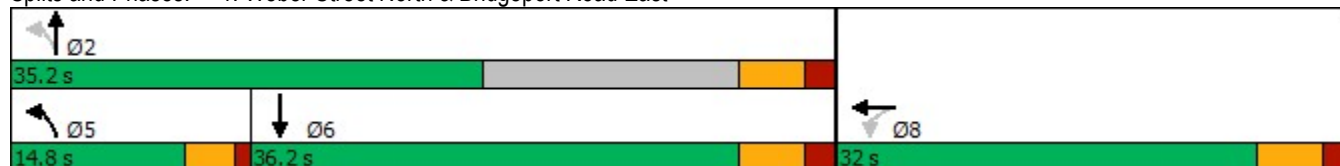
Intersection LOS: C

Intersection Capacity Utilization 66.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Weber Street North & Bridgeport Road East



HCM Unsignalized Intersection Capacity Analysis

2: Weber Street North & Royal Street

2027 FT AM - SN1

12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	2	2	56	0	21	5	652	12	42	724	11
Future Volume (Veh/h)	5	2	2	56	0	21	5	652	12	42	724	11
Sign Control	Stop				Stop				Free		Free	
Grade	0%				0%				0%		0%	
Peak Hour Factor	0.50	0.25	0.25	0.75	0.92	0.45	0.50	0.94	0.25	0.50	0.89	0.83
Hourly flow rate (vph)	10	8	8	75	0	47	10	694	48	84	813	13
Pedestrians	3				2							
Lane Width (m)	3.6				3.6							
Walking Speed (m/s)	1.2				1.2							
Percent Blockage	0				0							
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)							118			96		
pX, platoon unblocked	0.88	0.88	0.82	0.88	0.88	0.88	0.82				0.88	
vC, conflicting volume	1404	1754	416	1326	1737	373	829				744	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	585	983	0	497	963	22	357				442	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	97	96	99	79	100	95	99				92	
cM capacity (veh/h)	308	199	894	360	205	931	994				994	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	26	122	357	395	490	420						
Volume Left	10	75	10	0	84	0						
Volume Right	8	47	0	48	0	13						
cSH	319	472	994	1700	994	1700						
Volume to Capacity	0.08	0.26	0.01	0.23	0.08	0.25						
Queue Length 95th (m)	2.1	8.2	0.2	0.0	2.2	0.0						
Control Delay (s)	17.3	15.3	0.3	0.0	2.4	0.0						
Lane LOS	C	C	A		A							
Approach Delay (s)	17.3	15.3	0.2		1.3							
Approach LOS	C	C										
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			56.1%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: Royal Street & Site Access

2027 FT AM - SN1

12/14/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↩	↩			↩
Traffic Volume (veh/h)	42	11	23	0	0	54
Future Volume (Veh/h)	42	11	23	0	0	54
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	12	25	0	0	59
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	25				129	25
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	25				129	25
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				100	94
cM capacity (veh/h)	1589				840	1051
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	58	25	59			
Volume Left	46	0	0			
Volume Right	0	0	59			
cSH	1589	1700	1051			
Volume to Capacity	0.03	0.01	0.06			
Queue Length 95th (m)	0.7	0.0	1.4			
Control Delay (s)	5.9	0.0	8.6			
Lane LOS	A		A			
Approach Delay (s)	5.9	0.0	8.6			
Approach LOS			A			
Intersection Summary						
Average Delay			6.0			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑↑	↑	
Traffic Vol, veh/h	0	0	24	1157	54	0
Future Vol, veh/h	0	0	24	1157	54	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	26	1258	59	0
Major/Minor		Major2		Minor1		
Conflicting Flow All		0		555		
Stage 1		-		0		
Stage 2		-		555		
Critical Hdwy		5.34		5.74		
Critical Hdwy Stg 1		-		-		
Critical Hdwy Stg 2		-		6.04		
Follow-up Hdwy		3.12		3.82		
Pot Cap-1 Maneuver		-		515		
Stage 1		-		-		
Stage 2		-		491		
Platoon blocked, %		-		-		
Mov Cap-1 Maneuver		-		515		
Mov Cap-2 Maneuver		-		515		
Stage 1		-		-		
Stage 2		-		491		
Approach		WB		NB		
HCM Control Delay, s				12.9		
HCM LOS				B		
Minor Lane/Major Mvmt	NBLn1	WBL	WBT			
Capacity (veh/h)	515	-	-			
HCM Lane V/C Ratio	0.114	-	-			
HCM Control Delay (s)	12.9	-	-			
HCM Lane LOS	B	-	-			
HCM 95th %tile Q(veh)	0.4	-	-			

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑↑	↑	
Traffic Vol, veh/h	0	0	5	1206	16	0
Future Vol, veh/h	0	0	5	1206	16	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	5	1311	17	0
Major/Minor		Major2		Minor1		
Conflicting Flow All		0		0 534 -		
Stage 1		-		- 0 -		
Stage 2		-		- 534 -		
Critical Hdwy		5.34		- 5.74 -		
Critical Hdwy Stg 1		-		- - -		
Critical Hdwy Stg 2		-		- 6.04 -		
Follow-up Hdwy		3.12		- 3.82 -		
Pot Cap-1 Maneuver		-		- 527 0		
Stage 1		-		- - 0		
Stage 2		-		- 504 0		
Platoon blocked, %		-		-		
Mov Cap-1 Maneuver		-		- 527 -		
Mov Cap-2 Maneuver		-		- 527 -		
Stage 1		-		- - -		
Stage 2		-		- 504 -		
Approach		WB		NB		
HCM Control Delay, s				12.1		
HCM LOS				B		
Minor Lane/Major Mvmt	NBLn1	WBL	WBT			
Capacity (veh/h)	527	-	-			
HCM Lane V/C Ratio	0.033	-	-			
HCM Control Delay (s)	12.1	-	-			
HCM Lane LOS	B	-	-			
HCM 95th %tile Q(veh)	0.1	-	-			

Lanes, Volumes, Timings
6: Weber Street North & Erb Street East

2027 FT AM - SN1

12/14/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	579	100	0	0	0	0	530	36	131	666	0
Future Volume (vph)	143	579	100	0	0	0	0	530	36	131	666	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	35.0		0.0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor								1.00		1.00		
Frt		0.977						0.987				
Flt Protected		0.991								0.950		
Satd. Flow (prot)	0	6101	0	0	0	0	0	3416	0	1641	3505	0
Flt Permitted		0.991								0.316		
Satd. Flow (perm)	0	6101	0	0	0	0	0	3416	0	546	3505	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		61						15				
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		200.5			290.2			195.8			118.3	
Travel Time (s)		14.4			20.9			14.1			8.5	
Confl. Peds. (#/hr)									2	2		
Peak Hour Factor	0.87	0.98	0.74	0.92	0.92	0.92	0.92	0.92	0.67	0.77	0.76	0.25
Heavy Vehicles (%)	5%	4%	1%	2%	2%	2%	2%	4%	6%	10%	3%	2%
Adj. Flow (vph)	164	591	135	0	0	0	0	576	54	170	876	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	890	0	0	0	0	0	630	0	170	876	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			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												
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						2		1	2	
Detector Template	Left	Thru						Thru		Left	Thru	
Leading Detector (m)	2.0	10.0						10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6						0.6		2.0	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0		0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	

Lanes, Volumes, Timings
6: Weber Street North & Erb Street East

2027 FT AM - SN1

12/14/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4									6		
Detector Phase	4	4						2		1	6	
Switch Phase												
Minimum Initial (s)	25.2	25.2						30.8		4.0	30.8	
Minimum Split (s)	31.2	31.2						37.8		8.0	37.8	
Total Split (s)	31.2	31.2						37.8		9.0	37.8	
Total Split (%)	40.0%	40.0%						48.5%		11.5%	48.5%	
Maximum Green (s)	25.2	25.2						31.8		5.0	31.8	
Yellow Time (s)	4.0	4.0						4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0						2.0		1.0	2.0	
Lost Time Adjust (s)		0.0						0.0		0.0	0.0	
Total Lost Time (s)		6.0						6.0		4.0	6.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Recall Mode	None	None						Max		None	Max	
Walk Time (s)	12.2	12.2						20.8			20.8	
Flash Dont Walk (s)	13.0	13.0						10.0			10.0	
Pedestrian Calls (#/hr)	0	0						0			0	
Act Effct Green (s)		25.2						31.8		42.8	40.8	
Actuated g/C Ratio		0.32						0.41		0.55	0.52	
v/c Ratio		0.44						0.45		0.46	0.48	
Control Delay		20.1						17.6		13.4	12.9	
Queue Delay		0.0						0.0		0.0	0.0	
Total Delay		20.1						17.6		13.4	12.9	
LOS		C						B		B	B	
Approach Delay		20.1						17.6			13.0	
Approach LOS		C						B			B	

Intersection Summary

Area Type: Other

Cycle Length: 78

Actuated Cycle Length: 78

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.48

Intersection Signal Delay: 16.6

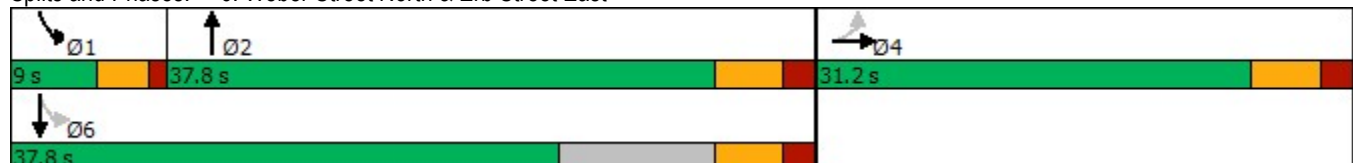
Intersection LOS: B

Intersection Capacity Utilization 67.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 6: Weber Street North & Erb Street East



Lanes, Volumes, Timings
1: Weber Street North & Bridgeport Road East

2027 FT PM - SN1

12/14/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	136	877	195	218	789	0	0	991	174
Future Volume (vph)	0	0	0	136	877	195	218	789	0	0	991	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		37.0	52.0		0.0	0.0		0.0
Storage Lanes	0		0	0		1	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.86	0.86	0.86	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor					0.99		1.00				1.00	
Frt					0.974						0.977	
Flt Protected					0.994		0.950					
Satd. Flow (prot)	0	0	0	0	6217	0	1805	3574	0	0	3487	0
Flt Permitted					0.994		0.103					
Satd. Flow (perm)	0	0	0	0	6210	0	196	3574	0	0	3487	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					65						28	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		154.2			147.6			95.6			183.2	
Travel Time (s)		11.1			10.6			6.9			13.2	
Confl. Peds. (#/hr)	19		10	10		19	12					
Confl. Bikes (#/hr)									9			12
Peak Hour Factor	0.92	0.92	0.92	0.83	0.88	0.79	0.90	0.88	0.25	0.25	0.95	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	1%	1%	0%	1%	0%	0%	1%	0%
Adj. Flow (vph)	0	0	0	164	997	247	242	897	0	0	1043	193
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1408	0	242	897	0	0	1236	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			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												
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				2
Detector Template				Left	Thru		Left	Thru				Thru
Leading Detector (m)				2.0	10.0		2.0	10.0				10.0
Trailing Detector (m)				0.0	0.0		0.0	0.0				0.0
Detector 1 Position(m)				0.0	0.0		0.0	0.0				0.0
Detector 1 Size(m)				2.0	0.6		2.0	0.6				0.6
Detector 1 Type				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
Detector 1 Queue (s)				0.0	0.0		0.0	0.0				0.0
Detector 1 Delay (s)				0.0	0.0		0.0	0.0				0.0
Detector 2 Position(m)					9.4			9.4				9.4
Detector 2 Size(m)					0.6			0.6				0.6
Detector 2 Type					Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings
1: Weber Street North & Bridgeport Road East

2027 FT PM - SN1
12/14/2023

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				27.3	27.3		5.0	34.5			34.5	
Minimum Split (s)				36.9	36.9		12.2	40.5			40.5	
Total Split (s)				36.9	36.9		12.2	53.1			40.6	
Total Split (%)				41.0%	41.0%		13.6%	59.0%			45.1%	
Maximum Green (s)				30.9	30.9		8.2	47.1			34.6	
Yellow Time (s)				4.0	4.0		3.0	4.0			4.0	
All-Red Time (s)				2.0	2.0		1.0	2.0			2.0	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					6.0		4.0	6.0			6.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				None	None		None	Max			Max	
Walk Time (s)				15.3	15.3			24.5			24.5	
Flash Dont Walk (s)				12.0	12.0			10.0			10.0	
Pedestrian Calls (#/hr)				0	0			0			0	
Act Effect Green (s)					28.5		49.1	47.1			34.9	
Actuated g/C Ratio					0.33		0.56	0.54			0.40	
v/c Ratio					0.68		0.93	0.47			0.88	
Control Delay					26.3		60.7	13.7			32.9	
Queue Delay					0.0		0.0	0.0			0.0	
Total Delay					26.3		60.7	13.7			32.9	
LOS					C		E	B			C	
Approach Delay					26.3			23.7			32.9	
Approach LOS					C			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 87.6

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 27.7

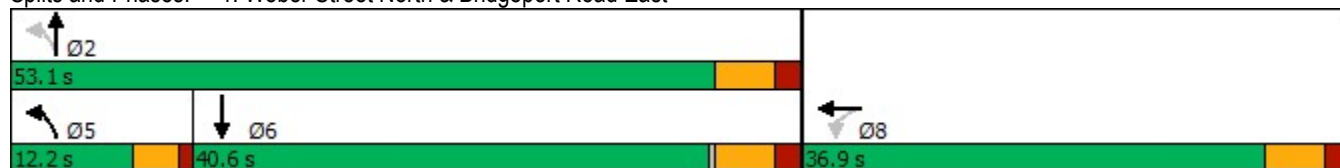
Intersection LOS: C

Intersection Capacity Utilization 81.1%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 1: Weber Street North & Bridgeport Road East



HCM Unsignalized Intersection Capacity Analysis

2: Weber Street North & Royal Street

2027 FT PM - SN1

12/14/2023

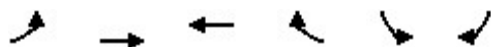
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	2	0	35	0	24	0	987	90	38	1099	3
Future Volume (Veh/h)	3	2	0	35	0	24	0	987	90	38	1099	3
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.25	0.25	0.25	0.38	0.25	0.54	0.25	0.94	0.58	0.71	0.97	0.50
Hourly flow rate (vph)	12	8	0	92	0	44	0	1050	155	54	1133	6
Pedestrians	5			8			1					
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)							118			96		
pX, platoon unblocked	0.80	0.80	0.68	0.80	0.80	0.77	0.68				0.77	
vC, conflicting volume	1818	2462	576	1815	2388	610	1144				1213	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	225	1033	0	221	939	0	281				683	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	98	95	100	82	100	95	100				92	
cM capacity (veh/h)	503	171	741	514	194	836	879				705	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	20	136	525	680	620	572						
Volume Left	12	92	0	0	54	0						
Volume Right	0	44	0	155	0	6						
cSH	283	587	879	1700	705	1700						
Volume to Capacity	0.07	0.23	0.00	0.40	0.08	0.34						
Queue Length 95th (m)	1.8	7.1	0.0	0.0	2.0	0.0						
Control Delay (s)	18.7	13.0	0.0	0.0	2.0	0.0						
Lane LOS	C	B			A							
Approach Delay (s)	18.7	13.0	0.0		1.1							
Approach LOS	C	B										
Intersection Summary												
Average Delay				1.3								
Intersection Capacity Utilization				68.8%	ICU Level of Service			C				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

3: Royal Street & Site Access

2027 FT PM - SN1

12/14/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↰			↰
Traffic Volume (veh/h)	101	28	17	0	0	40
Future Volume (Veh/h)	101	28	17	0	0	40
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	110	30	18	0	0	43
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	18				268	18
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	18				268	18
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				100	96
cM capacity (veh/h)	1599				672	1061
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	140	18	43			
Volume Left	110	0	0			
Volume Right	0	0	43			
cSH	1599	1700	1061			
Volume to Capacity	0.07	0.01	0.04			
Queue Length 95th (m)	1.8	0.0	1.0			
Control Delay (s)	5.9	0.0	8.5			
Lane LOS	A		A			
Approach Delay (s)	5.9	0.0	8.5			
Approach LOS			A			
Intersection Summary						
Average Delay			6.0			
Intersection Capacity Utilization			17.1%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection						
Int Delay, s/veh	0.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑↑↑	↑	
Traffic Vol, veh/h	0	0	33	1138	40	0
Future Vol, veh/h	0	0	33	1138	40	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	36	1237	43	0
Major/Minor		Major2		Minor1		
Conflicting Flow All		0		0	567	-
Stage 1		-		-	0	-
Stage 2		-		-	567	-
Critical Hdwy		5.34		-	5.74	-
Critical Hdwy Stg 1		-		-	-	-
Critical Hdwy Stg 2		-		-	6.04	-
Follow-up Hdwy		3.12		-	3.82	-
Pot Cap-1 Maneuver		-		-	508	0
Stage 1		-		-	-	0
Stage 2		-		-	484	0
Platoon blocked, %				-		
Mov Cap-1 Maneuver		-		-	508	-
Mov Cap-2 Maneuver		-		-	508	-
Stage 1		-		-	-	-
Stage 2		-		-	484	-
Approach		WB		NB		
HCM Control Delay, s				12.7		
HCM LOS				B		
Minor Lane/Major Mvmt	NBLn1	WBL	WBT			
Capacity (veh/h)	508	-	-			
HCM Lane V/C Ratio	0.086	-	-			
HCM Control Delay (s)	12.7	-	-			
HCM Lane LOS	B	-	-			
HCM 95th %tile Q(veh)	0.3	-	-			

HCM 6th TWSC
5: Site Access & Bridgeport Road East

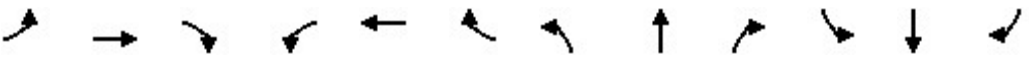
2027 FT PM - SN1
12/14/2023

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑↑	↑	
Traffic Vol, veh/h	0	0	6	1172	34	0
Future Vol, veh/h	0	0	6	1172	34	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	7	1274	37	0
Major/Minor		Major2		Minor1		
Conflicting Flow All		0		0 524 -		
Stage 1		-		- 0 -		
Stage 2		-		- 524 -		
Critical Hdwy		5.34		- 5.74 -		
Critical Hdwy Stg 1		-		- - -		
Critical Hdwy Stg 2		-		- 6.04 -		
Follow-up Hdwy		3.12		- 3.82 -		
Pot Cap-1 Maneuver		-		- 533 0		
Stage 1		-		- - 0		
Stage 2		-		- 510 0		
Platoon blocked, %		-		-		
Mov Cap-1 Maneuver		-		- 533 -		
Mov Cap-2 Maneuver		-		- 533 -		
Stage 1		-		- - -		
Stage 2		-		- 510 -		
Approach		WB		NB		
HCM Control Delay, s				12.3		
HCM LOS				B		
Minor Lane/Major Mvmt	NBLn1	WBL	WBT			
Capacity (veh/h)	533	-	-			
HCM Lane V/C Ratio	0.069	-	-			
HCM Control Delay (s)	12.3	-	-			
HCM Lane LOS	B	-	-			
HCM 95th %tile Q(veh)	0.2	-	-			

Lanes, Volumes, Timings
6: Weber Street North & Erb Street East

2027 FT PM - SN1

12/14/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑↑↑							↑↑		↘	↑↑	
Traffic Volume (vph)	223	1007	139	0	0	0	0	855	44	266	872	0
Future Volume (vph)	223	1007	139	0	0	0	0	855	44	266	872	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	35.0		0.0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor		1.00						1.00		1.00		
Frt		0.984						0.991				
Flt Protected		0.992								0.950		
Satd. Flow (prot)	0	6325	0	0	0	0	0	3569	0	1770	3574	0
Flt Permitted		0.992								0.125		
Satd. Flow (perm)	0	6325	0	0	0	0	0	3569	0	233	3574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36						8				
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		200.5			290.2			195.8			118.3	
Travel Time (s)		14.4			20.9			14.1			8.5	
Confl. Peds. (#/hr)			1				5		8	8		5
Peak Hour Factor	0.85	0.90	0.83	0.92	0.92	0.92	0.25	0.94	0.75	0.86	0.88	0.25
Heavy Vehicles (%)	0%	1%	0%	2%	2%	2%	0%	0%	2%	2%	1%	2%
Adj. Flow (vph)	262	1119	167	0	0	0	0	910	59	309	991	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1548	0	0	0	0	0	969	0	309	991	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			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												
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						2		1	2	
Detector Template	Left	Thru						Thru		Left	Thru	
Leading Detector (m)	2.0	10.0						10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6						0.6		2.0	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0		0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	

Lanes, Volumes, Timings
6: Weber Street North & Erb Street East

2027 FT PM - SN1

12/14/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4									6		
Detector Phase	4	4						2		1	6	
Switch Phase												
Minimum Initial (s)	30.9	30.9						30.0		5.0	30.0	
Minimum Split (s)	36.9	36.9						37.8		9.0	37.8	
Total Split (s)	36.9	36.9						38.1		15.0	53.1	
Total Split (%)	41.0%	41.0%						42.3%		16.7%	59.0%	
Maximum Green (s)	30.9	30.9						32.1		11.0	47.1	
Yellow Time (s)	4.0	4.0						4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0						2.0		1.0	2.0	
Lost Time Adjust (s)		0.0						0.0		0.0	0.0	
Total Lost Time (s)		6.0						6.0		4.0	6.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Recall Mode	None	None						Max		None	Max	
Walk Time (s)	17.9	17.9						20.0			20.0	
Flash Dont Walk (s)	13.0	13.0						10.0			10.0	
Pedestrian Calls (#/hr)	0	0						0			0	
Act Effct Green (s)		30.9						32.1		49.1	47.1	
Actuated g/C Ratio		0.34						0.36		0.55	0.52	
v/c Ratio		0.71						0.76		0.98	0.53	
Control Delay		27.1						29.9		68.9	15.4	
Queue Delay		0.0						0.0		0.0	0.0	
Total Delay		27.1						29.9		68.9	15.4	
LOS		C						C		E	B	
Approach Delay		27.1						29.9			28.2	
Approach LOS		C						C			C	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Natural Cycle: 85

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 28.2

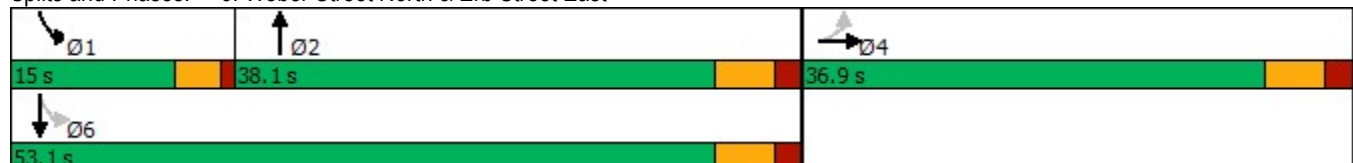
Intersection LOS: C

Intersection Capacity Utilization 78.9%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 6: Weber Street North & Erb Street East



Lanes, Volumes, Timings
1: Weber Street North & Bridgeport Road East

2027 FT AM - SN2

12/14/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					←↑↑↑		↗	↑↑			↑↑	
Traffic Volume (vph)	0	0	0	199	912	113	136	539	0	0	587	104
Future Volume (vph)	0	0	0	199	912	113	136	539	0	0	587	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		37.0	52.0		0.0	0.0		0.0
Storage Lanes	0		0	0		1	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor					1.00		1.00				1.00	
Frt					0.986						0.975	
Flt Protected					0.993		0.950					
Satd. Flow (prot)	0	0	0	0	4927	0	1770	3471	0	0	3376	0
Flt Permitted					0.993		0.204					
Satd. Flow (perm)	0	0	0	0	4925	0	380	3471	0	0	3376	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					21						32	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		154.2			147.6			95.6			183.2	
Travel Time (s)		11.1			10.6			6.9			13.2	
Confl. Peds. (#/hr)	9		9	3		6	3		5	3		3
Peak Hour Factor	0.92	0.92	0.92	0.97	0.88	0.91	0.77	0.90	0.92	0.25	0.87	0.77
Heavy Vehicles (%)	2%	2%	2%	3%	3%	2%	2%	4%	0%	0%	4%	4%
Adj. Flow (vph)	0	0	0	205	1036	124	177	599	0	0	675	135
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1365	0	177	599	0	0	810	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			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												
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			2	
Detector Template				Left	Thru		Left	Thru			Thru	
Leading Detector (m)				2.0	10.0		2.0	10.0			10.0	
Trailing Detector (m)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Position(m)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Size(m)				2.0	0.6		2.0	0.6			0.6	
Detector 1 Type				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	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(m)					9.4			9.4			9.4	
Detector 2 Size(m)					0.6			0.6			0.6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	

Lanes, Volumes, Timings
1: Weber Street North & Bridgeport Road East

2027 FT AM - SN2

12/14/2023

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				26.0	26.0		5.0	29.2			29.2	
Minimum Split (s)				32.0	32.0		11.0	35.2			36.2	
Total Split (s)				32.0	32.0		14.8	35.2			36.2	
Total Split (%)				38.6%	38.6%		17.8%	42.4%			43.6%	
Maximum Green (s)				26.0	26.0		10.8	29.2			30.2	
Yellow Time (s)				4.0	4.0		3.0	4.0			4.0	
All-Red Time (s)				2.0	2.0		1.0	2.0			2.0	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					6.0		4.0	6.0			6.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				None	None		None	Max			Max	
Walk Time (s)				14.0	14.0			19.2			19.2	
Flash Dont Walk (s)				12.0	12.0			10.0			10.0	
Pedestrian Calls (#/hr)				0	0			0			0	
Act Effect Green (s)					26.0		46.0	44.0			30.2	
Actuated g/C Ratio					0.32		0.56	0.54			0.37	
v/c Ratio					0.87		0.47	0.32			0.64	
Control Delay					33.4		13.0	11.2			23.5	
Queue Delay					0.0		0.0	0.0			0.0	
Total Delay					33.4		13.0	11.2			23.5	
LOS					C		B	B			C	
Approach Delay					33.4			11.6			23.5	
Approach LOS					C			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 83

Actuated Cycle Length: 82

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 25.0

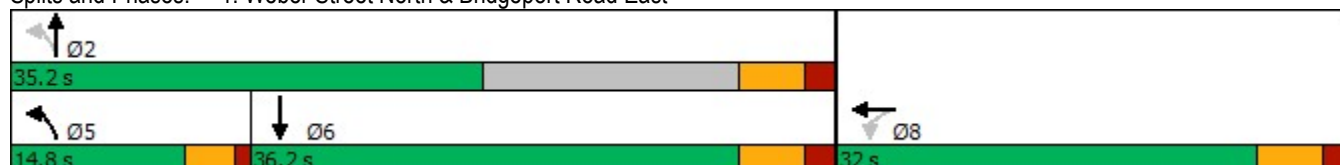
Intersection LOS: C

Intersection Capacity Utilization 71.6%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Weber Street North & Bridgeport Road East



HCM Unsignalized Intersection Capacity Analysis

2: Weber Street North & Royal Street

2027 FT AM - SN2

12/14/2023

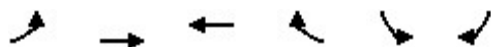
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	2	2	56	0	21	5	652	12	42	724	11
Future Volume (Veh/h)	5	2	2	56	0	21	5	652	12	42	724	11
Sign Control	Stop				Stop				Free		Free	
Grade	0%				0%				0%		0%	
Peak Hour Factor	0.50	0.25	0.25	0.75	0.92	0.45	0.50	0.94	0.25	0.50	0.89	0.83
Hourly flow rate (vph)	10	8	8	75	0	47	10	694	48	84	813	13
Pedestrians	3				2							
Lane Width (m)	3.6				3.6							
Walking Speed (m/s)	1.2				1.2							
Percent Blockage	0				0							
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)							118			96		
pX, platoon unblocked	0.88	0.88	0.82	0.88	0.88	0.88	0.82				0.88	
vC, conflicting volume	1404	1754	416	1326	1737	373	829				744	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	585	983	0	497	963	22	357				442	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	97	96	99	79	100	95	99				92	
cM capacity (veh/h)	308	199	894	360	205	931	994				994	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	26	122	357	395	490	420						
Volume Left	10	75	10	0	84	0						
Volume Right	8	47	0	48	0	13						
cSH	319	472	994	1700	994	1700						
Volume to Capacity	0.08	0.26	0.01	0.23	0.08	0.25						
Queue Length 95th (m)	2.1	8.2	0.2	0.0	2.2	0.0						
Control Delay (s)	17.3	15.3	0.3	0.0	2.4	0.0						
Lane LOS	C	C	A		A							
Approach Delay (s)	17.3	15.3	0.2		1.3							
Approach LOS	C	C										
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			56.1%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: Royal Street & Sirte Access

2027 FT AM - SN2

12/14/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↰			↰
Traffic Volume (veh/h)	42	11	23	0	0	54
Future Volume (Veh/h)	42	11	23	0	0	54
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	12	25	0	0	59
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	25				129	25
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	25				129	25
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				100	94
cM capacity (veh/h)	1589				840	1051
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	58	25	59			
Volume Left	46	0	0			
Volume Right	0	0	59			
cSH	1589	1700	1051			
Volume to Capacity	0.03	0.01	0.06			
Queue Length 95th (m)	0.7	0.0	1.4			
Control Delay (s)	5.9	0.0	8.6			
Lane LOS	A		A			
Approach Delay (s)	5.9	0.0	8.6			
Approach LOS			A			
Intersection Summary						
Average Delay			6.0			
Intersection Capacity Utilization			13.3%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑↑	↑	
Traffic Vol, veh/h	0	0	24	1157	54	0
Future Vol, veh/h	0	0	24	1157	54	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	26	1258	59	0
Major/Minor		Major2		Minor1		
Conflicting Flow All		0		555		
Stage 1		-		0		
Stage 2		-		555		
Critical Hdwy		5.34		5.74		
Critical Hdwy Stg 1		-		-		
Critical Hdwy Stg 2		-		6.04		
Follow-up Hdwy		3.12		3.82		
Pot Cap-1 Maneuver		-		515		
Stage 1		-		-		
Stage 2		-		491		
Platoon blocked, %		-		-		
Mov Cap-1 Maneuver		-		515		
Mov Cap-2 Maneuver		-		515		
Stage 1		-		-		
Stage 2		-		491		
Approach		WB		NB		
HCM Control Delay, s				12.9		
HCM LOS				B		
Minor Lane/Major Mvmt	NBLn1	WBL	WBT			
Capacity (veh/h)	515	-	-			
HCM Lane V/C Ratio	0.114	-	-			
HCM Control Delay (s)	12.9	-	-			
HCM Lane LOS	B	-	-			
HCM 95th %tile Q(veh)	0.4	-	-			

Intersection

Int Delay, s/veh 0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑↑	↑	
Traffic Vol, veh/h	0	0	5	1206	16	0
Future Vol, veh/h	0	0	5	1206	16	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	5	1311	17	0

Major/Minor	Major2	Minor1
Conflicting Flow All	0	0 534 -
Stage 1	-	- 0 -
Stage 2	-	- 534 -
Critical Hdwy	5.34	- 5.74 -
Critical Hdwy Stg 1	-	- - -
Critical Hdwy Stg 2	-	- 6.04 -
Follow-up Hdwy	3.12	- 3.82 -
Pot Cap-1 Maneuver	-	- 527 0
Stage 1	-	- - 0
Stage 2	-	- 504 0
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	- 527 -
Mov Cap-2 Maneuver	-	- 527 -
Stage 1	-	- - -
Stage 2	-	- 504 -

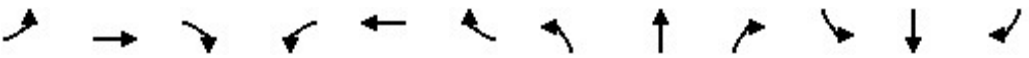
Approach	WB	NB
HCM Control Delay, s		12.1
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	WBL	WBT
Capacity (veh/h)	527	-	-
HCM Lane V/C Ratio	0.033	-	-
HCM Control Delay (s)	12.1	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-

Lanes, Volumes, Timings
6: Weber Street North & Erb Street East

2027 FT AM - SN2

12/14/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑↑		↘	↑↑	
Traffic Volume (vph)	143	579	100	0	0	0	0	530	36	131	666	0
Future Volume (vph)	143	579	100	0	0	0	0	530	36	131	666	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	35.0		0.0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.91	0.91	0.91	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor								1.00		1.00		
Frt		0.977						0.987				
Flt Protected		0.991								0.950		
Satd. Flow (prot)	0	4842	0	0	0	0	0	3416	0	1641	3505	0
Flt Permitted		0.991								0.316		
Satd. Flow (perm)	0	4842	0	0	0	0	0	3416	0	546	3505	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		48						15				
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		200.5			290.2			195.8			118.3	
Travel Time (s)		14.4			20.9			14.1			8.5	
Confl. Peds. (#/hr)									2	2		
Peak Hour Factor	0.87	0.98	0.74	0.92	0.92	0.92	0.92	0.92	0.67	0.77	0.76	0.25
Heavy Vehicles (%)	5%	4%	1%	2%	2%	2%	2%	4%	6%	10%	3%	2%
Adj. Flow (vph)	164	591	135	0	0	0	0	576	54	170	876	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	890	0	0	0	0	0	630	0	170	876	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			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												
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						2		1	2	
Detector Template	Left	Thru						Thru		Left	Thru	
Leading Detector (m)	2.0	10.0						10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6						0.6		2.0	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0		0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	

Lanes, Volumes, Timings
6: Weber Street North & Erb Street East

2027 FT AM - SN2

12/14/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4									6		
Detector Phase	4	4						2		1	6	
Switch Phase												
Minimum Initial (s)	25.2	25.2						30.8		4.0	30.8	
Minimum Split (s)	31.2	31.2						37.8		8.0	37.8	
Total Split (s)	31.2	31.2						37.8		9.0	37.8	
Total Split (%)	40.0%	40.0%						48.5%		11.5%	48.5%	
Maximum Green (s)	25.2	25.2						31.8		5.0	31.8	
Yellow Time (s)	4.0	4.0						4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0						2.0		1.0	2.0	
Lost Time Adjust (s)		0.0						0.0		0.0	0.0	
Total Lost Time (s)		6.0						6.0		4.0	6.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Recall Mode	None	None						Max		None	Max	
Walk Time (s)	12.2	12.2						20.8			20.8	
Flash Dont Walk (s)	13.0	13.0						10.0			10.0	
Pedestrian Calls (#/hr)	0	0						0			0	
Act Effct Green (s)		25.2						31.8		42.8	40.8	
Actuated g/C Ratio		0.32						0.41		0.55	0.52	
v/c Ratio		0.56						0.45		0.46	0.48	
Control Delay		22.1						17.6		13.4	12.9	
Queue Delay		0.0						0.0		0.0	0.0	
Total Delay		22.1						17.6		13.4	12.9	
LOS		C						B		B	B	
Approach Delay		22.1						17.6			13.0	
Approach LOS		C						B			B	

Intersection Summary

Area Type: Other

Cycle Length: 78

Actuated Cycle Length: 78

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 17.3

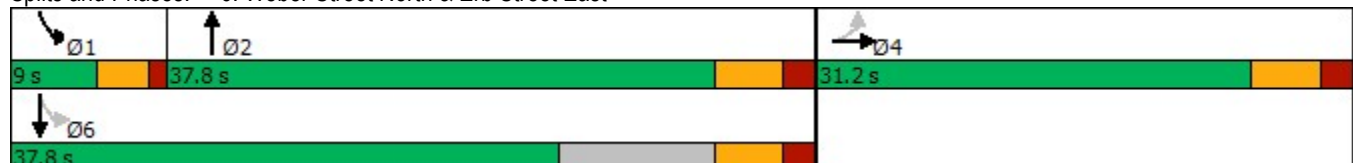
Intersection LOS: B

Intersection Capacity Utilization 67.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 6: Weber Street North & Erb Street East



Lanes, Volumes, Timings
1: Weber Street North & Bridgeport Road East

2027 FT PM - SN2

12/14/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					←↑↑↑		↗	↑↑			↑↑	
Traffic Volume (vph)	0	0	0	136	877	195	218	789	0	0	991	174
Future Volume (vph)	0	0	0	136	877	195	218	789	0	0	991	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		37.0	52.0		0.0	0.0		0.0
Storage Lanes	0		0	0		1	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor					0.99		1.00				1.00	
Frt					0.974						0.977	
Flt Protected					0.994		0.950					
Satd. Flow (prot)	0	0	0	0	4934	0	1805	3574	0	0	3487	0
Flt Permitted					0.994		0.103					
Satd. Flow (perm)	0	0	0	0	4929	0	196	3574	0	0	3487	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					56						28	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		154.2			147.6			95.6			183.2	
Travel Time (s)		11.1			10.6			6.9			13.2	
Confl. Peds. (#/hr)	19		10	10		19	12					
Confl. Bikes (#/hr)									9			12
Peak Hour Factor	0.92	0.92	0.92	0.83	0.88	0.79	0.90	0.88	0.25	0.25	0.95	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	1%	1%	0%	1%	0%	0%	1%	0%
Adj. Flow (vph)	0	0	0	164	997	247	242	897	0	0	1043	193
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1408	0	242	897	0	0	1236	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			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												
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				2
Detector Template				Left	Thru		Left	Thru				Thru
Leading Detector (m)				2.0	10.0		2.0	10.0				10.0
Trailing Detector (m)				0.0	0.0		0.0	0.0				0.0
Detector 1 Position(m)				0.0	0.0		0.0	0.0				0.0
Detector 1 Size(m)				2.0	0.6		2.0	0.6				0.6
Detector 1 Type				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
Detector 1 Queue (s)				0.0	0.0		0.0	0.0				0.0
Detector 1 Delay (s)				0.0	0.0		0.0	0.0				0.0
Detector 2 Position(m)					9.4			9.4				9.4
Detector 2 Size(m)					0.6			0.6				0.6
Detector 2 Type					Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												

Lanes, Volumes, Timings
1: Weber Street North & Bridgeport Road East

2027 FT PM - SN2

12/14/2023

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases				8	8		5	2			6	
Permitted Phases				8			2					
Detector Phase				8	8		5	2			6	
Switch Phase												
Minimum Initial (s)				27.3	27.3		5.0	34.5			34.5	
Minimum Split (s)				36.9	36.9		12.2	40.5			40.5	
Total Split (s)				36.9	36.9		12.2	53.1			40.6	
Total Split (%)				41.0%	41.0%		13.6%	59.0%			45.1%	
Maximum Green (s)				30.9	30.9		8.2	47.1			34.6	
Yellow Time (s)				4.0	4.0		3.0	4.0			4.0	
All-Red Time (s)				2.0	2.0		1.0	2.0			2.0	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					6.0		4.0	6.0			6.0	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				None	None		None	Max			Max	
Walk Time (s)				15.3	15.3			24.5			24.5	
Flash Dont Walk (s)				12.0	12.0			10.0			10.0	
Pedestrian Calls (#/hr)				0	0			0			0	
Act Effect Green (s)					29.8		49.1	47.1			34.9	
Actuated g/C Ratio					0.34		0.55	0.53			0.39	
v/c Ratio					0.83		0.95	0.47			0.89	
Control Delay					31.3		64.5	14.3			34.7	
Queue Delay					0.0		0.0	0.0			0.0	
Total Delay					31.3		64.5	14.3			34.7	
LOS					C		E	B			C	
Approach Delay					31.3			25.0			34.7	
Approach LOS					C			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 88.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 30.5

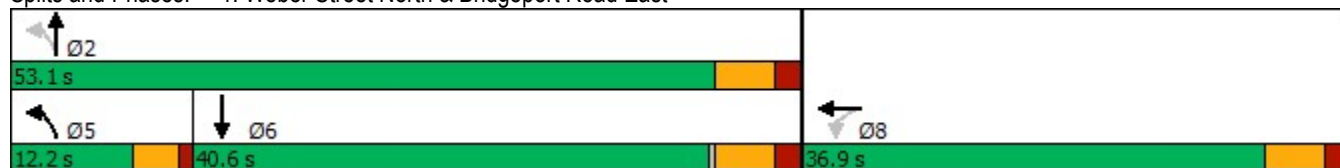
Intersection LOS: C

Intersection Capacity Utilization 84.9%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: Weber Street North & Bridgeport Road East



HCM Unsignalized Intersection Capacity Analysis

2: Weber Street North & Royal Street

2027 FT PM - SN2

12/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	2	0	35	0	24	0	987	90	38	1099	3
Future Volume (Veh/h)	3	2	0	35	0	24	0	987	90	38	1099	3
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.25	0.25	0.25	0.38	0.25	0.54	0.25	0.94	0.58	0.71	0.97	0.50
Hourly flow rate (vph)	12	8	0	92	0	44	0	1050	155	54	1133	6
Pedestrians	5			8			1					
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)							118			96		
pX, platoon unblocked	0.80	0.80	0.68	0.80	0.80	0.76	0.68				0.76	
vC, conflicting volume	1818	2462	576	1815	2388	610	1144				1213	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	182	990	0	179	896	0	267				659	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	98	96	100	83	100	95	100				92	
cM capacity (veh/h)	539	181	737	552	205	827	885				712	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	20	136	525	680	620	572						
Volume Left	12	92	0	0	54	0						
Volume Right	0	44	0	155	0	6						
cSH	301	619	885	1700	712	1700						
Volume to Capacity	0.07	0.22	0.00	0.40	0.08	0.34						
Queue Length 95th (m)	1.7	6.7	0.0	0.0	2.0	0.0						
Control Delay (s)	17.8	12.4	0.0	0.0	2.0	0.0						
Lane LOS	C	B			A							
Approach Delay (s)	17.8	12.4	0.0		1.0							
Approach LOS	C	B										
Intersection Summary												
Average Delay	1.3											
Intersection Capacity Utilization	68.8%			ICU Level of Service			C					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

3: Royal Street & Sirte Access

2027 FT PM - SN2

12/14/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↩	↩			↩
Traffic Volume (veh/h)	101	28	17	0	0	40
Future Volume (Veh/h)	101	28	17	0	0	40
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	110	30	18	0	0	43
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	18				268	18
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	18				268	18
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				100	96
cM capacity (veh/h)	1599				672	1061
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	140	18	43			
Volume Left	110	0	0			
Volume Right	0	0	43			
cSH	1599	1700	1061			
Volume to Capacity	0.07	0.01	0.04			
Queue Length 95th (m)	1.8	0.0	1.0			
Control Delay (s)	5.9	0.0	8.5			
Lane LOS	A		A			
Approach Delay (s)	5.9	0.0	8.5			
Approach LOS			A			
Intersection Summary						
Average Delay			6.0			
Intersection Capacity Utilization			17.1%	ICU Level of Service		A
Analysis Period (min)			15			

4: NE Site Access & Bridgeport Road East/Bridgeport Road East

Intersection

Int Delay, s/veh 0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑↑	↑	
Traffic Vol, veh/h	0	0	33	1138	40	0
Future Vol, veh/h	0	0	33	1138	40	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	36	1237	43	0

Major/Minor	Major2	Minor1
Conflicting Flow All	0	0 567 -
Stage 1	-	- 0 -
Stage 2	-	- 567 -
Critical Hdwy	5.34	- 5.74 -
Critical Hdwy Stg 1	-	- - -
Critical Hdwy Stg 2	-	- 6.04 -
Follow-up Hdwy	3.12	- 3.82 -
Pot Cap-1 Maneuver	-	- 508 0
Stage 1	-	- - 0
Stage 2	-	- 484 0
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	-	- 508 -
Mov Cap-2 Maneuver	-	- 508 -
Stage 1	-	- - -
Stage 2	-	- 484 -

Approach	WB	NB
HCM Control Delay, s		12.7
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	WBL	WBT
Capacity (veh/h)	508	-	-
HCM Lane V/C Ratio	0.086	-	-
HCM Control Delay (s)	12.7	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.3	-	-

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑↑↑	↑	
Traffic Vol, veh/h	0	0	6	1172	34	0
Future Vol, veh/h	0	0	6	1172	34	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	7	1274	37	0
Major/Minor		Major2		Minor1		
Conflicting Flow All		0		0	524	-
Stage 1		-		-	0	-
Stage 2		-		-	524	-
Critical Hdwy		5.34		-	5.74	-
Critical Hdwy Stg 1		-		-	-	-
Critical Hdwy Stg 2		-		-	6.04	-
Follow-up Hdwy		3.12		-	3.82	-
Pot Cap-1 Maneuver		-		-	533	0
Stage 1		-		-	-	0
Stage 2		-		-	510	0
Platoon blocked, %				-		
Mov Cap-1 Maneuver		-		-	533	-
Mov Cap-2 Maneuver		-		-	533	-
Stage 1		-		-	-	-
Stage 2		-		-	510	-
Approach		WB		NB		
HCM Control Delay, s				12.3		
HCM LOS				B		
Minor Lane/Major Mvmt	NBLn1	WBL	WBT			
Capacity (veh/h)	533	-	-			
HCM Lane V/C Ratio	0.069	-	-			
HCM Control Delay (s)	12.3	-	-			
HCM Lane LOS	B	-	-			
HCM 95th %tile Q(veh)	0.2	-	-			

Lanes, Volumes, Timings
6: Weber Street North & Erb Street East

2027 FT PM - SN2

12/14/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑						↑↑		↘	↑↑	
Traffic Volume (vph)	223	1007	139	0	0	0	0	855	44	266	872	0
Future Volume (vph)	223	1007	139	0	0	0	0	855	44	266	872	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	35.0		0.0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.91	0.91	0.91	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor		1.00						1.00		1.00		
Frt		0.984						0.991				
Flt Protected		0.992								0.950		
Satd. Flow (prot)	0	5020	0	0	0	0	0	3569	0	1770	3574	0
Flt Permitted		0.992								0.125		
Satd. Flow (perm)	0	5020	0	0	0	0	0	3569	0	233	3574	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25						8				
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		200.5			290.2			195.8			118.3	
Travel Time (s)		14.4			20.9			14.1			8.5	
Confl. Peds. (#/hr)			1				5		8	8		5
Peak Hour Factor	0.85	0.90	0.83	0.92	0.92	0.92	0.25	0.94	0.75	0.86	0.88	0.25
Heavy Vehicles (%)	0%	1%	0%	2%	2%	2%	0%	0%	2%	2%	1%	2%
Adj. Flow (vph)	262	1119	167	0	0	0	0	910	59	309	991	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1548	0	0	0	0	0	969	0	309	991	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			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												
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						2		1	2	
Detector Template	Left	Thru						Thru		Left	Thru	
Leading Detector (m)	2.0	10.0						10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6						0.6		2.0	0.6	
Detector 1 Type	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	
Detector 1 Queue (s)	0.0	0.0						0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0						0.0		0.0	0.0	
Detector 2 Position(m)		9.4						9.4			9.4	
Detector 2 Size(m)		0.6						0.6			0.6	
Detector 2 Type		Cl+Ex						Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0			0.0	

Lanes, Volumes, Timings
6: Weber Street North & Erb Street East

2027 FT PM - SN2

12/14/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA						NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4									6		
Detector Phase	4	4						2		1	6	
Switch Phase												
Minimum Initial (s)	30.9	30.9						30.0		5.0	30.0	
Minimum Split (s)	36.9	36.9						37.8		9.0	37.8	
Total Split (s)	36.9	36.9						38.1		15.0	53.1	
Total Split (%)	41.0%	41.0%						42.3%		16.7%	59.0%	
Maximum Green (s)	30.9	30.9						32.1		11.0	47.1	
Yellow Time (s)	4.0	4.0						4.0		3.0	4.0	
All-Red Time (s)	2.0	2.0						2.0		1.0	2.0	
Lost Time Adjust (s)		0.0						0.0		0.0	0.0	
Total Lost Time (s)		6.0						6.0		4.0	6.0	
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Recall Mode	None	None						Max		None	Max	
Walk Time (s)	17.9	17.9						20.0			20.0	
Flash Dont Walk (s)	13.0	13.0						10.0			10.0	
Pedestrian Calls (#/hr)	0	0						0			0	
Act Effct Green (s)		30.9						32.1		49.1	47.1	
Actuated g/C Ratio		0.34						0.36		0.55	0.52	
v/c Ratio		0.89						0.76		0.98	0.53	
Control Delay		35.3						29.9		68.9	15.4	
Queue Delay		0.0						0.0		0.0	0.0	
Total Delay		35.3						29.9		68.9	15.4	
LOS		D						C		E	B	
Approach Delay		35.3						29.9			28.2	
Approach LOS		D						C			C	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Natural Cycle: 85

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 31.5

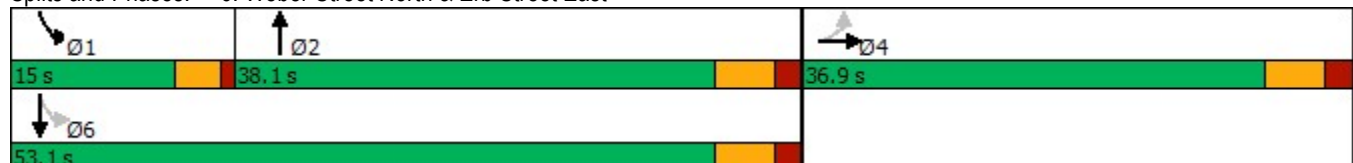
Intersection LOS: C

Intersection Capacity Utilization 80.2%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 6: Weber Street North & Erb Street East



APPENDIX F

Trip Distribution Data from ITE Trip Generation

Strip Retail Plaza (<40k) (822)

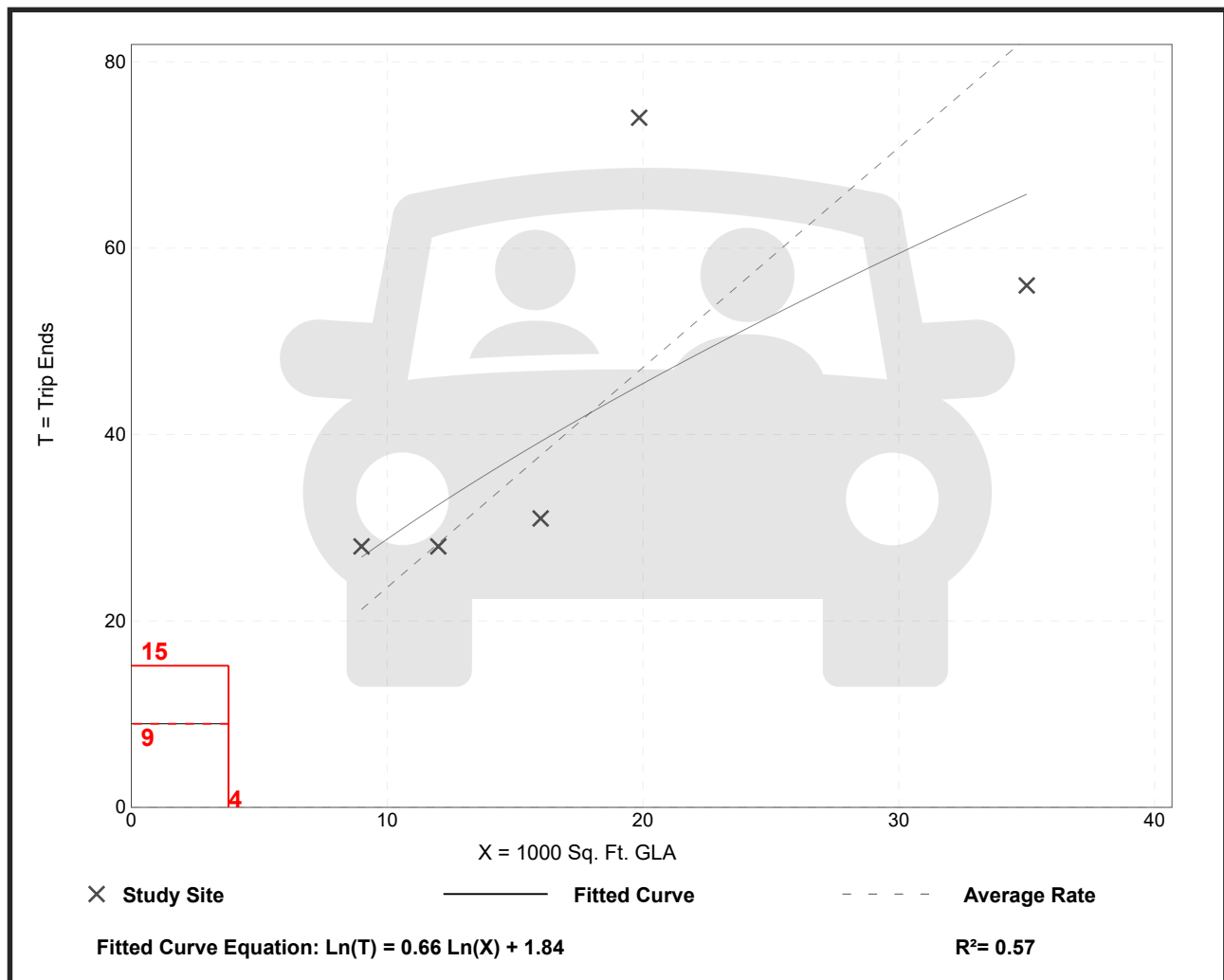
Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 5
 Avg. 1000 Sq. Ft. GLA: 18
 Directional Distribution: 60% entering, 40% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
2.36	1.60 - 3.73	0.94

Data Plot and Equation

Caution – Small Sample Size



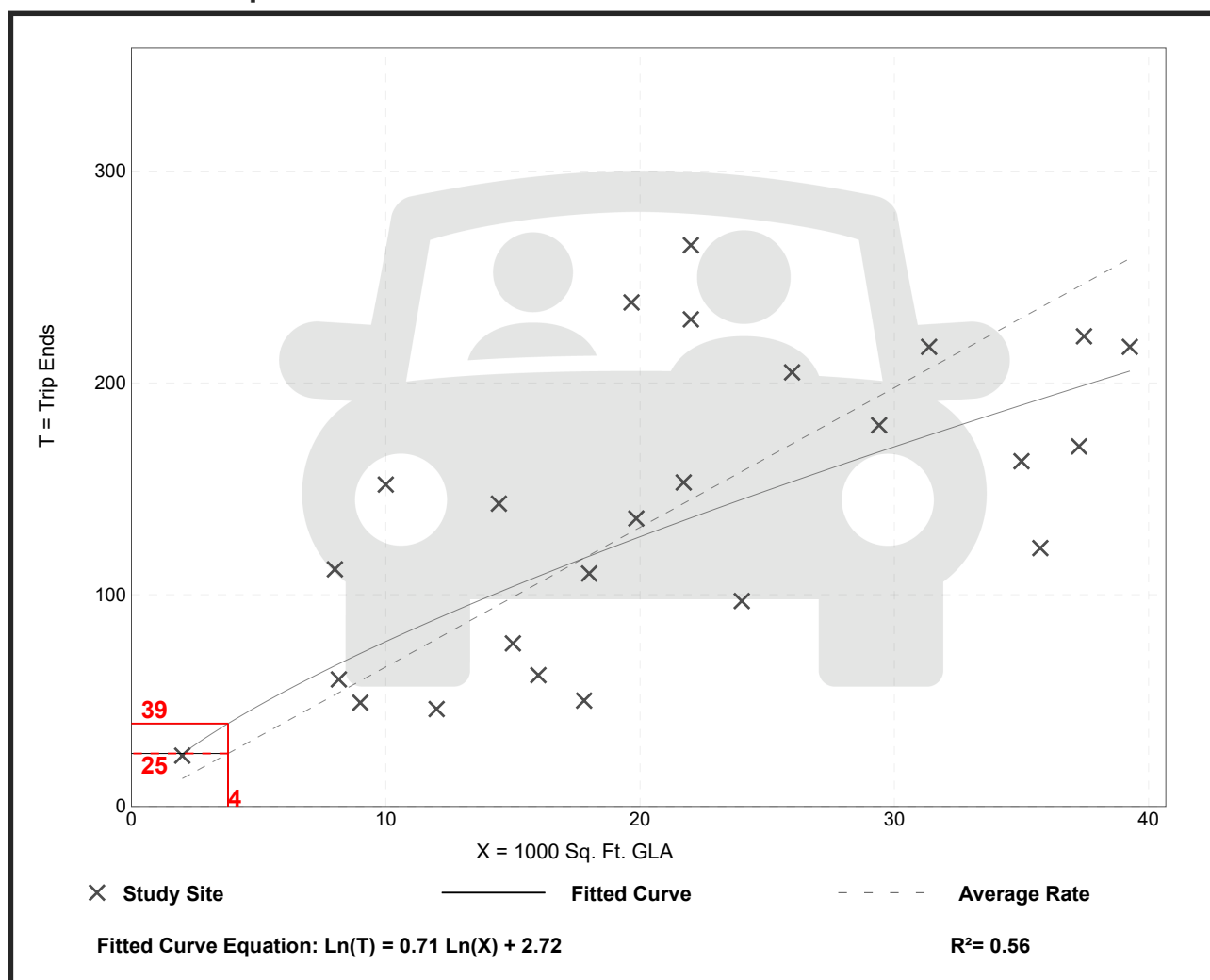
Strip Retail Plaza (<40k) (822)

Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
 Number of Studies: 25
 Avg. 1000 Sq. Ft. GLA: 21
 Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
6.59	2.81 - 15.20	2.94

Data Plot and Equation



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

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 45

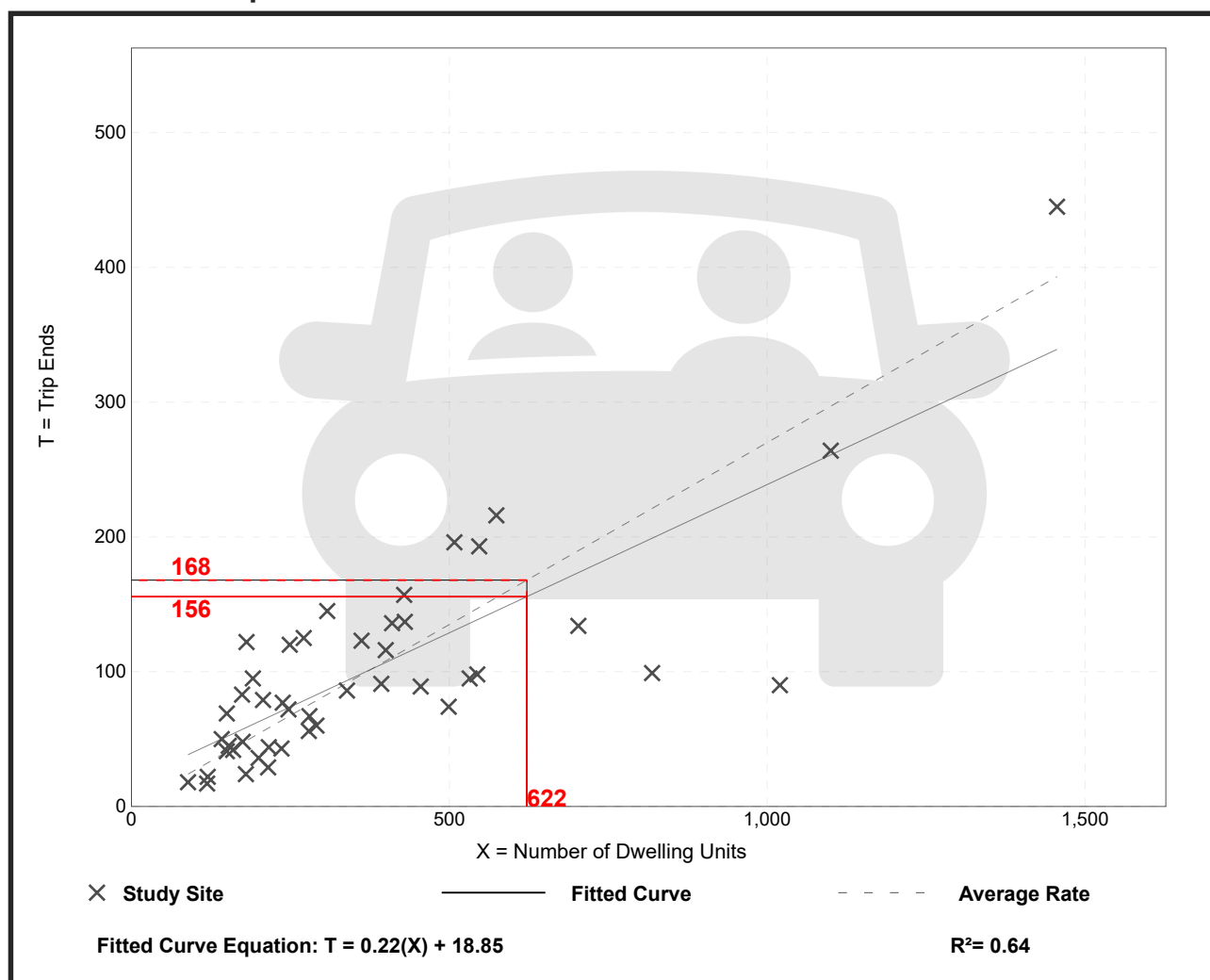
Avg. Num. of Dwelling Units: 372

Directional Distribution: 34% entering, 66% exiting

Vehicle Trip Generation per Dwelling Unit

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

Data Plot and Equation



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

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 45

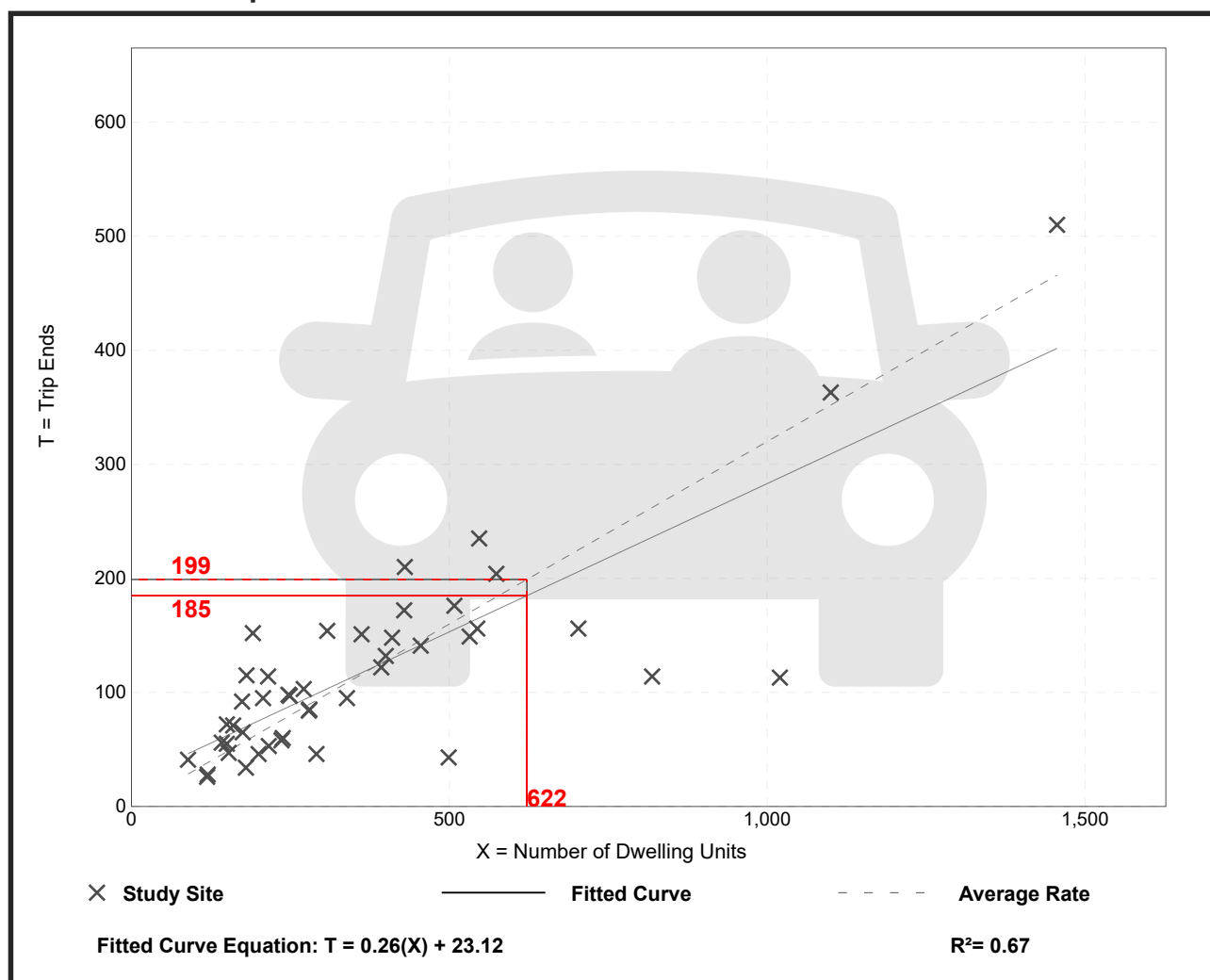
Avg. Num. of Dwelling Units: 372

Directional Distribution: 56% entering, 44% exiting

Vehicle Trip Generation per Dwelling Unit

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

Data Plot and Equation



APPENDIX G

TTS Data

Fri May 13 2022 15:03:15 GMT-0400 (Eastern Daylight Time) - Run Time: 2493ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig

Column: 2006 GTA zone of destination - gta06_dest

Filters:

(2006 GTA zone of destination - gta06_dest In 7051, 7052, 7053, 7054

and

Start time of trip - start_time In 630-930

and

Trip purpose of destination - purp_dest In H)

Trip 2016

Table:

,7051,7054

7021,42,0

7038,30,0

7098,0,20

Fri May 13 2022 15:06:48 GMT-0400 (Eastern Daylight Time) - Run Time: 2462ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06_dest

Column: 2006 GTA zone of origin - gta06_orig

Filters:

(2006 GTA zone of origin - gta06_orig In 7051, 7052, 7053, 7054

and

Start time of trip - start_time In 630-930

and

Trip purpose of destination - purp_dest In H)

Trip 2016

Table:

,7051,7052,7053,7054

7060,0,0,21,0

7097,0,0,5,0

7101,19,0,0,0

7109,0,14,0,0

7134,0,0,36,0
7214,40,0,0,0
7246,0,0,0,17
7257,0,0,13,0

Fri May 13 2022 15:04:39 GMT-0400 (Eastern Daylight Time) - Run Time: 2658ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig

Column: 2006 GTA zone of destination - gta06_dest

Filters:

(2006 GTA zone of destination - gta06_dest In 7051, 7052, 7053, 7054

and

Start time of trip - start_time In 1530-1830

and

Trip purpose of destination - purp_dest In H)

Trip 2016

Table:

,7051,7052,7054

52,15,0,0

55,31,0,0

7001,0,0,39

7007,0,0,20

7009,25,0,0

7019,28,0,0

7024,33,0,0

7042,82,0,23

7049,42,0,0

7052,27,0,0

7053,30,0,0

7056,0,0,7

7059,0,0,19

7093,0,0,17

7095,0,0,17

7104,26,0,0

7105,0,0,11

7108,0,14,10

7117,28,0,0

7143,0,0,11

7148,0,0,23

7180,0,0,11

7181,0,0,13

7190,0,0,54
7206,0,0,8
7223,28,0,0
7257,52,0,0
7264,0,0,10
7268,0,0,12
7273,0,0,8
7422,0,0,8
7442,28,0,0
7458,0,0,7
7532,0,0,32
7537,26,0,0
7558,0,0,17
7572,0,0,15
8057,0,0,19
9998,0,0,10

Fri May 13 2022 15:06:11 GMT-0400 (Eastern Daylight Time) - Run Time: 2654ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06_dest

Column: 2006 GTA zone of origin - gta06_orig

Filters:

(2006 GTA zone of origin - gta06_orig In 7051, 7052, 7053, 7054

and

Start time of trip - start_time In 1530-1830

and

Trip purpose of destination - purp_dest In H)

Trip 2016

Table:

,7051,7052,7053,7054
4018,16,0,0,0
5050,0,23,0,0
7002,22,66,33,0
7005,15,0,0,0
7010,0,22,0,0
7011,0,0,23,0
7021,0,0,22,0
7022,68,0,0,0
7024,67,0,21,0
7025,0,0,29,0
7026,28,15,0,0

7028,0,0,6,0
7038,0,0,8,0
7051,0,27,30,0
7056,0,0,0,14
7062,0,13,0,0
7066,7,9,15,0
7085,12,0,0,0
7100,0,0,8,0
7105,0,0,12,0
7107,0,0,20,0
7114,13,0,0,0
7116,0,0,0,11
7126,18,0,0,0
7129,98,0,0,0
7150,0,14,0,0
7185,17,0,0,0
7188,16,0,0,0
7195,0,0,26,0
7207,20,0,0,0
7209,23,0,0,0
7214,0,0,59,0
7225,27,0,25,0
7229,0,0,18,0
7233,8,0,0,0
7246,12,0,0,0
7253,15,0,0,0
7255,0,0,90,0
7257,0,15,27,11
7258,0,0,27,0
7259,0,0,23,0
7261,0,0,30,0
7264,0,0,12,0
7282,0,0,14,0
7297,0,0,0,39
7298,0,0,5,0
7394,0,0,16,0
7403,16,0,0,0
7415,0,0,5,0
7465,0,0,24,0
7466,23,0,0,0
7524,0,0,22,0
7534,29,0,0,0
7536,0,15,0,0
7543,0,0,29,0
7548,23,0,0,0
7549,0,21,0,0
7557,16,0,0,0

7563,0,0,38,0

8015,0,0,44,0

8069,0,0,18,0

8072,0,0,17,0

8331,24,0,0,0

8365,0,0,0,16

8960,0,0,0,17

APPENDIX H

TAC Excerpts

collector roadways, while a 3.0 m minimum is the suggested dimension for both commercial and industrial land uses. If there is a need to provide parallel parking between driveways along the roadway, a spacing of 6.0 to 7.5 m is suitable. If the spacing provided is in the range of 3.0 to 5.0 m, the space may appear inviting to a driver wishing to park, but if used, severely hampers the operation of the driveways by reducing sight lines and interfering with the turning paths of the vehicles.

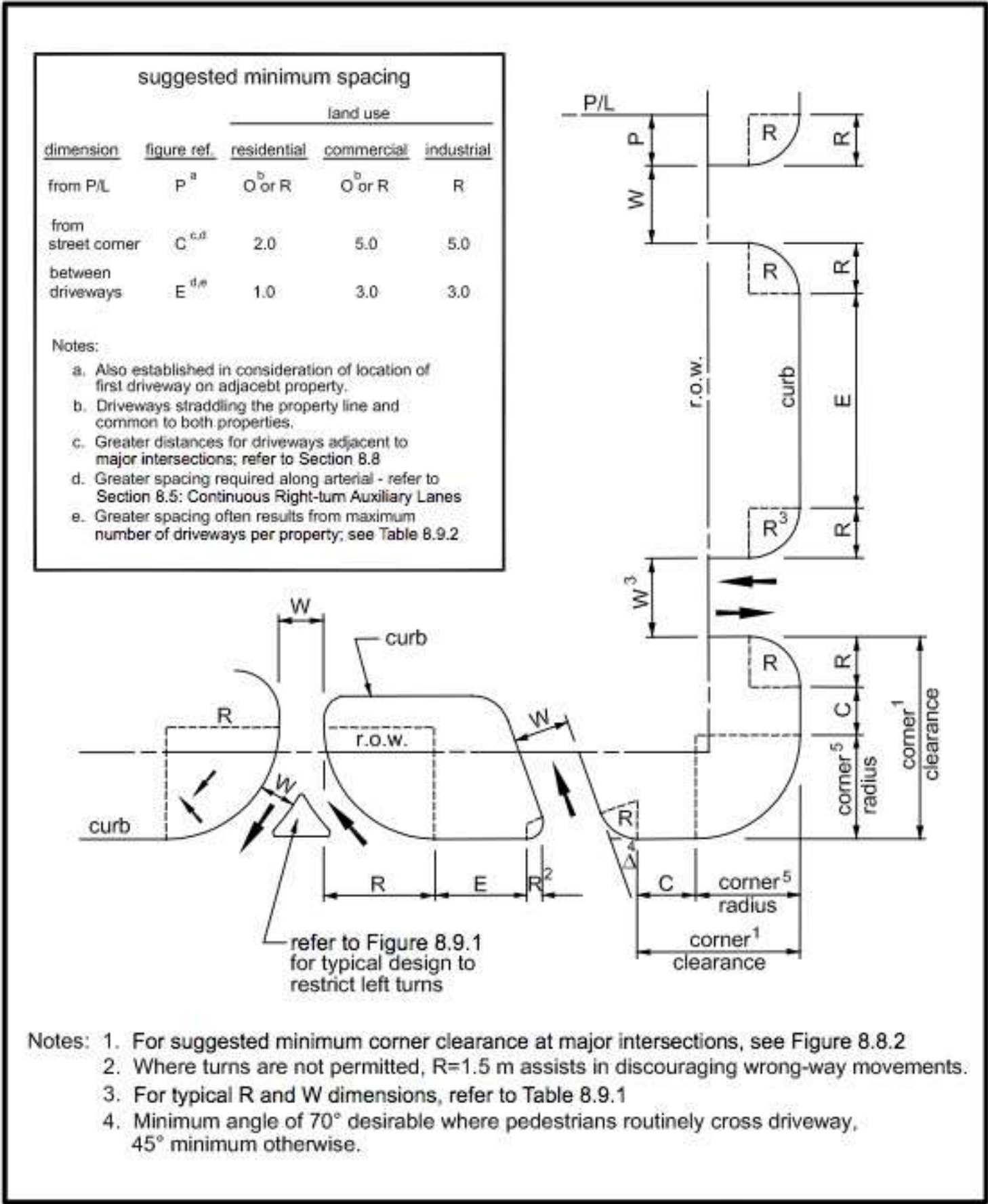


Figure 8.9.2: Driveway Spacing Guidelines – Locals and Collectors

Table 9.9.4: Design Intersection Sight Distance – Case B1, Left Turn From Stop

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	41.7	45
30	35	62.6	65
40	50	83.4	85
50	65	104.3	105
60	85	125.1	130
70	105	146.0	150
80	130	166.8	170
90	160	187.7	190
100	185	208.5	210
110	220	229.4	230
120	250	250.2	255
130	285	271.1	275

Note: Intersection sight distance shown is for a stopped passenger car to turn left onto a two-lane highway with no median and grades 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

Sight distance design for left turns at divided-highway intersections should consider multiple design vehicles and median width. If the design vehicle used to determine sight distance for a divided-highway intersection is larger than a passenger car, then sight distance for left turns will need to be checked for that selected design vehicle and for smaller design vehicles as well. If the divided-highway median is wide enough to store the design vehicle with a clearance to the through lanes of approximately 1 m at both ends of the vehicle, no separate analysis for the departure sight triangle for left turns is needed on the minor-road approach for the near roadway to the left. In most cases, the departure sight triangle for right turns (case B2) will provide sufficient sight distance for a passenger car to cross the near roadway to reach the median. Possible exceptions are addressed in the discussion of case B3.

APPENDIX I

Parking Study Correspondence

From: Brandon Bradt
Sent: June 24, 2022 12:19 PM
To: Wendy Fisher
Cc: Ainsley Rego; Aaron Wignall; Hiba Naqvi
Subject: RE: Parking Study for 115 & 188 Bridgeport Road East and 30 Weber Street
Attachments: Parking Management.pdf

Thanks for the info below and the call yesterday Wendy.

Based on our discussion yesterday, we will prepare a standalone Parking Justification Study to support the application, which we expect to have a minor deficit of approximately 20-40 spaces (depending on how you do the math to split Building A and the podium units up into the C versus RMU designations).

It's noted that the Study will generally rely on the Parking Management Worksheet (attached), which we calculate will qualify for a 7% reduction in required parking supply for the mixed-use development (~40-45 spaces). This 7% reduction to the City's required supply would be expected to put the proposed supply in surplus.

We hope you agree this will be sufficient to support the proposed parking supply at the site.

Kind Regards,
Brandon

Brandon Bradt, M.Eng. CEM, P.Eng. | Project Manager
211 Yonge Street, Suite 600 | Toronto, ON M5B 1M4
T: 416.477.3392



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From: Wendy Fisher <Wendy.Fisher@waterloo.ca>
Sent: June 23, 2022 3:01 PM
To: Hiba Naqvi <hnaqvi@cfcrozier.ca>
Cc: Ainsley Rego <Ainsley.Rego@waterloo.ca>; Brandon Bradt <bbradt@cfcrozier.ca>; Aaron Wignall <awignall@cfcrozier.ca>
Subject: RE: Parking Study for 115 & 188 Bridgeport Road East and 30 Weber Street

Hi Hiba,

My colleague in Transportation Services has forwarded your email to me.

The pre-consultation meeting that was held last fall was for a proposed development consisting of a multi-building mixed use development containing 622 units and 563 sq.m. of non-residential use. The applicant was proposing to:

- rezone a portion of the lands from (H)C1-40 to C1-81
- rezone a portion of the lands from (H)RMU-40 to RMU-81 and
- establish site specific parking regulations:
 - 0.8 spaces per residential unit
 - 0.1 spaces per residential unit for visitors
 - 2.4 spaces per 100 m² for non-residential uses.

The second data chart provided below demonstrates that the applicant would almost meet the minimum parking requirements of RMU-81. Are you suggesting that the applicant is now proposing to rezone the entire lands RMU-81? If this is the case, I would request that additional information be provided for staff to review as there may be Official Plan implications.

The minimum parking rates in the C1 zone are as follows: residential parking rate of 1.0 spaces per unit, visitor parking rate of 0.1 spaces per unit, and non-residential parking rate of 3.2 spaces per 100 sq.m. of building area. If a portion of the lands are still proposed to be rezoned C1-81, it appears that the residential and non-residential rates are proposed to be reduced. The need for a parking justification study is based on the anticipated reduction in parking spaces. If you can demonstrate that, with the C1-81 zone, there is only a deficiency of a few spaces, I would consider removing the need for a stand-alone parking justification study (provided the reduced parking has been sufficiently addressed in the Planning Justification Report). Please confirm. Ultimately, it is the responsibility of the applicant to demonstrate that parking reductions are justifiable and will not result in any negative impacts on surrounding properties or streets.

If wish to further discuss, feel free to contact me.

Wendy



WENDY FISHER MA MCIP RPP

Senior Development Planner

Planning Approvals, Integrated Planning & Public Works Department

City of Waterloo

100 Regina Street South, PO Box 337 STN Waterloo

Waterloo, ON, N2J 4A8

P: 519.747.8544 | **E:** wendy.fisher@waterloo.ca | **TTY:** 1.886.786.3941

IMPORTANT: City Hall is open, with a small complement of staff to assist you. For planning matters, appointments are strongly encouraged, and can be scheduled directly with the staff person or by emailing devservices@waterloo.ca or calling (519)747-8752. Most staff continue to work remotely, and are available virtually to assist you – please do not hesitate to reach out.

From: Hiba Naqvi <hnaqvi@cfcrozier.ca>

Sent: June 16, 2022 3:51 PM

To: Ainsley Rego <Ainsley.Rego@waterloo.ca>

Cc: Brandon Bradt <bbradt@cfcrozier.ca>; Aaron Wignall <awignall@cfcrozier.ca>

Subject: [EXTERNAL] Parking Study for 115 & 188 Bridgeport Road East and 30 Weber Street

Hello Ainsley,

C.F. Crozier was retained as the Transportation Consultant for a mixed-use development at 115 & 188 Bridgeport Road East and 30 Weber Street. Currently, the site is zoned by RMU-20, RMU-40, C1-81. The parking results using the rates provided by City of Waterloo Zoning By-Law 2018-50 are provided below.

Using the existing zoning rates for the RMU-20, RMU-40 and C1-81, the parking results would be:

Type of Parking	Units/GFA	Parking Rate	Required Parking Spaces	Proposed Parking Supply	Surplus/Deficit
Residential	622	1.00 spaces /Dwelling Unit	622	569	-128
Visitor	622	0.1 spaces /Dwelling Unit	63		
Commercial	350 m ²	3.2 spaces /100 m ²	12		
Total			697	569	-128

According to the tables above, there would be a parking deficit of 128 parking spaces if the existing zoning was used.

As part of the ZBA, we are looking to rezone parts of the site area to RMU-81, as north-east of the site is zoned as RMU-81, and the development matches the characteristics of the developments existing in Zone-81.

Using the rates of the zone of RMU-81, the parking results would be:

Type of Parking	Units/GFA	Parking Rate	Required Parking Spaces	Proposed Parking Supply	Surplus/Deficit
Residential	622	0.8 spaces /Dwelling Unit	498	569	-1
Visitor	622	0.1 spaces /Dwelling Unit	63		
Commercial	350 m ²	2.4 spaces /100 m ²	9		
Total			570	569	-1

According to the table above, the parking provided by the site meets the requirements.

Additionally, based on the Parking Management Reduction Checklist, which is based on the TDM measures being taken at the site, the site would be eligible for a 7% in parking reduction given that it is mixed-use site. The Parking Management Worksheet is attached to this email for reference.

As a result of the Parking Reduction in combination with the rezoning, we do not believe a Parking Justification Study would be necessary for the site given that the site would effectively meet the rates set out in the by-law and would be in a surplus after accounting for the parking reduction .

If you are in agreement, please confirm a parking justification study would not be required for this development from your perspective as well since we would like to remove this item from the Zoning Submission Checklist.

Regards,
Hiba

Hiba Naqvi, EIT | Engineering Intern
2800 High Point Drive, Suite 100 | Milton, ON L9T 6P4
T: 905.875.0026



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APPENDIX J

Parking Management and TDM Checklist



Parking Management Worksheet

Version 9/18/2013

Appendix I

Case Study: _____ Site Context: _____
Date: _____ Reduction Worksheet No: _____

"Urban Growth Centres" (UGC) area classification includes the Downtown / Uptown and RT Station Areas of Kitchener, Waterloo and Cambridge.

"Intensification Corridor" (IC) classification is applied to sites within 800 metres of the future CTC line

"Other" classification applies to all other sites

Please highlight the cell percentages applicable to your development under the appropriate classification. Please note that the Parking Management Worksheet and the Transportation Demand Management (TDM) Checklist are not designed for residential properties, but can be used for mixed-use developments. Local municipalities are the decision-making bodies with respect to consideration of parking reductions below Zoning By-law requirements.

TABLE A	Pedestrian and Cyclist Orientation			
In creating an environment that supports pedestrian and cycling activity, the public realm must be accessible, safe, and comfortable to encourage movement on the street and in the surrounding area(s). These facilities and features should encourage walking and cycling.				
	Features	UGC	IC	Other
A1	Development incorporates functional building entrances that are oriented to public space or to locations where pedestrians and transit users arrive from such as a street, square, park or plaza.	1%	1%	1%
A2	Continuous sidewalks (1.5m min. width) are provided along both sides of all adjacent public streets and pedestrian walkways (1.5m min width) are provided through large parking areas to link the building with the public street sidewalk system	0%	0%	1%
A3	Non-Residential: Development provides secure bike storage for 4% of the building occupants	2%	2%	1%
A4	Shower and change facilities provided on-site consistent with LEED requirements.	1%	1%	0%
A5	Provision of active uses at-grade along street frontages.	1%	1%	1%
	Category Maximum	4%	4%	3%
	Available Parking Reduction			

TABLE B	Public Transportation Access			
The availability and proximity of convenient public transit service with direct pedestrian linkages to the building will provide viable travel options for employees, visitors and residents.				
	Features	UGC	IC	Other
B1	Bus shelters with seating are provided at the transit stop immediately adjacent to the development, in consultation with Transportation Planning at the Region of Waterloo	0%	0%	0%
B2	Information regarding public transit routes, schedules and fares are provided in an accessible and visible location on site and in adjacent bus stops	0%	0%	1%
B3a	Located in an UGC or within 800 m of a future Rapid Transit Station	24%	12%	0%
B3b	Located within 600m a transit route with 15 minute headways (or less) or is located in a designated mixed use corridor or node. Note: Points are awarded for either B3a, B3b or B3c only. Please choose whichever represents the highest order of transit.	-	-	0%
B3c	Located within 400 metres of a bus service with headways of 15 min to 30 min. Note: Points are awarded for either B3a, B3b or B3c only. Please choose whichever represents the highest order of transit.	-	-	1%
	Category Maximum	24%	12%	2%
	Available Parking Reduction			

TABLE C	Parking			
Vehicle parking facilities can affect the character, travel mode and cost of a development. Reducing parking supply to match expected demand can have a positive influence on the selection of alternative travel modes.				
	Features	UGC	IC	Other
C1	Provides priority parking for carpooling/vanpooling participants equivalent to 5% of employee spaces	0%	0%	0%
C2	Commercial Uses: Provide car-share spaces equivalent to 2% of building occupants	2%	2%	0%
C3	Implements paid parking system on all or part of the site (e.g. parking permits, paid parking zones near main entrances)	2%	2%	0%
C4	Parking is not located on major street frontage.	0%	0%	1%
C5	25% to 50% of parking is located underground or in a structure	2%	1%	0%
C6	50% to 75% of parking is located underground or in a structure	4%	2%	0%

C7	75% of parking or more is located underground or in a structure	5%	3%	0%
	Category Maximum	6%	4%	1%
	Available Parking Reduction			



Case Study: 0 Site Context: 0
Date: 1900-01-00 Worksheet No: 0

TABLE D	Trip Reduction Incentives			
A formal TDM plan will identify specific initiatives that will be initiated in order to encourage reduced single occupant vehicle travel.				
	Features	UGC	IC	Other
D1	The building owner/occupant will provide a ride matching service for car/vanpooling	0%	0%	0%
D2	The building owner/occupant will provide emergency ride home options	3%	2%	0%
D3	The building owner/occupant will provide subsidized transit passes for all occupants for a period of two years	10%	4%	2%
D4	The building owner/occupant agrees to charge for parking as a separate cost to occupants	10%	5%	0%
D5	The building owner/occupant agrees to provide reduced cost for users of car/van pool, bicycle, moped/motorcycle spaces	0%	0%	1%
D6	The development agrees to join Travelwise (TMA) that provides the same services outlined under items D1 and D2	9%	6%	4%
	Category Maximum	23%	11%	1%
	Available Parking Reduction			

TABLE E	Parking Reduction Summary				
Please indicate the total reduction available based upon Tables A through D above.					
Category	Reduction Achieved	Maximum Achievable Reduction			Comments
		UGC	IC	Other	
Pedestrian & Cyclist Orientation	3%	4%	4%	4%	
Public Transit Access	2%	24%	12%	5%	
Parking	1%	6%	4%	6%	
Trip Reduction Incentives	1%	23%	11%	7%	
TOTAL	7%	57%	31%	22%	

TABLE F	TOTAL REDUCTION ACHIEVED	7%
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Comments:



Case Study: _____ Site Context: _____

TDM Checklist No: _____ ZBL Parking Requirement: _____

Date: _____ Applicable Parking Reduction: _____

The Transportation Demand Management (TDM) Checklist and Parking Management Worksheet are not designed for residential properties, but can be used to inform mixed-use developments.

TABLE A		Site Access				
In creating an environment that supports pedestrian and cycling activity, the public realm must be accessible, safe, and comfortable to encourage movement on the street and in the surrounding area(s). These facilities and features should encourage walking and cycling.						
Points		Features			Yes	N/A
A1	2	Development incorporates functional building entrances that are oriented to public space or to locations where pedestrians and transit users arrive from such as a street, square, park or plaza.			2	
A2	1	External to site: Continuous sidewalks (consistent with AODA Accessible Built Environment Standard) are provided along both sides of all adjacent public streets (over and above requirement) AND Internal to site: Pedestrian walkways (consistent with AODA Accessible Built Environment Standard e.g.1.8m min width) are provided through large parking areas to link the building with the public street sidewalk system			1	
A3	3	Non-residential: development provides secure bike storage for 5% of the building occupants. Consistent with LEED requirements.			3	
A4	4	Shower and change facilities for employees provided on-site consistent with LEED requirements.				
A5	2	Provision of active uses at-grade along street frontages (e.g. retail).			2	
Category Max =		10		Total Points Applicable =	10	Score = 8

TABLE B		Public Transportation Access				
The availability and proximity of convenient public transit service with direct pedestrian linkages to the building will provide viable travel options for employees, visitors and residents.						
Points		Features			Yes	N/A
B1	1	Bus shelters with seating are provided at the transit stop immediately adjacent to the development in consultation with Transportation Planning at the Region of Waterloo				
B2	1	Information regarding public transit routes, schedules and fares are provided in an accessible and visible location on site and in adjacent bus stops				
B3a	5	Located within 800m of a Rapid Transit Station				
B3b	3	Located within 600 m of a bus service with headways of 15 min or less or is located in a designated mixed use corridor or node. Note: Points are awarded for either B3a, B3b or B3c only. Please choose whichever represents the highest order of transit.				
B3c	1	Located within 400 m of a bus service with headways of 16 min to 30 min. Note: Points are awarded for either B3a, B3b or B3c only. Please choose whichever represents the highest order of transit.			1	
Category Max =		5	Total Points Applicable =		5	Score = 1

TABLE C		Parking		
Vehicle parking facilities can affect the character, travel mode and cost of a development. Reducing parking supply to match expected demand can have a positive influence on the selection of alternative travel modes.				
Points		Features	Yes	N/A
C1	24	Utilizes reduced parking supply consistent with the TDM Parking Management Worksheet. Contact your Area Municipal planning authority to determine whether the Worksheet is applicable to your development. Note: Points are awarded for either C1, C2, or C3 only. Please choose whichever applies with the highest value.	24	
C2	24	Includes allowances for shared parking in mixed-use zones. Note: Points are awarded for C1, C2, or C3 only. Please choose whichever applies after consulting with the Area Municipal planning authority.		
C3	15	Provides no more than the minimum number of parking spaces, as required by applicable Zoning By-Law. Note: Points are awarded for either C1, C2, or C3 only. Please choose whichever applies.		
C4	10	Implements paid parking on part or all of the site (e.g. parking permits, paid parking zones near main entrances)		
C5	3	Provides priority parking for carpooling/vanpooling participants equivalent to 5% of employee spaces		
C6	5	Commercial Uses: Provide car-share spaces equivalent to 2% of building occupants		
C7	3	Parking is not located on major street frontage or between a road right of way and the building facade.	3	
C8	5	25% to 50% of parking is located underground or in a structure		

C9	10	50% to 75% of parking is located underground or in a structure		
C10	15	75% of parking or more is located underground or in a structure	15	
C11	3	Parking spaces provided off-site on a lot within 300 metres of the lot containing such use.		
Category Max =		25	Total Points Applicable =	25
			Score =	25



Region of Waterloo TDM Checklist v2.0

FORM-1

Case Study: 0 Checklist No: 0
Date: January 0, 1900 Site Context: 0

TABLE D Trip Reduction Incentives				
A formal TDM plan will identify specific initiatives that will be initiated in order to encourage reduced single occupant vehicle travel.				
Points		Features		N/A
D1	2	The building owner/occupant will make available a ride matching service for car/vanpooling		
D2	2	The building owner/occupant will make available emergency ride home options		
D3	5	The building owner/occupant will make available subsidized transit passes for all occupants for a period of two years		
D4	5	The building owner/occupant agrees to charge for parking as an unbundled cost to occupants	5	
D5	2	The building owner/occupant agrees to provide reduced cost parking for users of car/van pool, bicycle, moped/motorcycle spaces	2	
D6	10	The building owner/occupant has prepared a TDM plan to the satisfaction of the Region of Waterloo and the Area Municipality that targets a 10% reduction in peak hour trips using forecast trip generation with status quo travel characteristics		
D7	5	The employer has provided flexible working hours, telework or shift work arrangements.		
D8	14	The development agrees to join Travelwise (TMA) that provides the same services outlined under items D1, D2, D6		
D9	5	The building owner/occupant will make available car sharing services		
D10	2	The development includes mixed uses (i.e. retail, commercial or food services, daycares, or other complementary uses) on-site or located within 400 metres.	2	
Category Max =		25	Total Points Applicable =	25
			Score =	9

TABLE E Checklist Summary				
For each item, a "Yes" answer is equivalent to the points as indicated in the section. N/A sections should be explained in an attachment to this table. The score for each section is reflected as a percentage and calculated by dividing the points by the "Total Applicable".				
Category	Minimum Requirement	Total Applicable	Points Scored	Comments
Pedestrian & Cyclist Orientation	24	10	8	
Public Transit Access		5	1	
Parking		25	25	
SUB-TOTAL		40	34	
Trip Reduction Incentives		25	9	
OVERALL TOTAL		65	43	

TABLE F Scoring Summary			
FINAL SCORE	RATING (check one)		
50 - 65	*****		TDM SUPPORTIVE DEVELOPMENT
40 - 49	****	X	
30 - 39	**		
24 - 29	*		
0 - 23			Non-TDM Supportive Development (Review and upgrade TDM elements to pass)

Comments:
