2362 Fairview Street
City of Burlington
Transportation Impact Study and Parking Study

Paradigm Transportation Solutions Limited

2024-05
230079

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Project Summary

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2362 Fairview Street, City of Burlington Transportation Impact Study and Parking Study



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Executive Summary

Content

Lockwood Auto Group Inc. retained Paradigm Transportation Solutions Limited (Paradigm) to conduct this Transportation Impact and Parking Study for a proposed mixed-use development located at 2362 Fairview Street in the City of Burlington.

Official Plan Amendment and Zoning By-law Amendment applications are required to permit the proposed development.

This Transportation Impact Study (TIS) and Parking Study (PS) includes an analysis of existing traffic conditions, a description of the proposed development, traffic forecasts for a five-year horizon from the date of the study, and recommendations, if any, to manage future traffic conditions. The study also forecasts the site's parking demand and assesses the adequacy of the proposed parking supply in serving the proposed development.

Development Concept

The development concept includes an eleven-storey apartment building with 338 units, a 307 m^2 community space, and 247 m^2 of ground floor commercial space. Vehicle access is proposed by a private driveway to Fairview Street.

Conclusions

Based on the investigations carried out, it is concluded that:

Transportation Impact Study

- **Existing Traffic Conditions:** The study area intersections are currently operating with several critical movements during the AM and PM peak hours. The movements noted from Synchro and SimTraffic include:

  Guelph Line at Fairview Street:

  - The eastbound left-turn, eastbound right-turn, westbound left-turn, westbound right-turn, and northbound left-turn movements report 95th percentile queue lengths greater than the available storage.
  - The westbound through movement is reported to operate with a v/c ratio greater than 0.85 during the PM peak hour.

Fairview Street at Drury Lane:

- The westbound left-turn movement reports a 95th percentile queue length greater than the available storage.

- **Development Trip Generation:** The development is forecast to generate approximately 106 and 131 vehicular trips during the AM and PM peak hours, respectively.
- **Transportation Demand Management:** The site concept plan includes TDM measures intended to assist in mitigating the site's transportation and parking impacts. The provided TDM measures are aimed to further promote walking, transit, cycling, reducing parking demands, and providing education/promotion.
- **Background Traffic Conditions:** The study area intersections are forecast to operate similar to existing conditions; however, slightly exacerbated due to the inclusion of general background growth and background development site traffic contributions. The following additional critical movements are identified as a result of non-site generated traffic contributions:

  Guelph Line at Fairview Street:

  - The southbound right-turn movement is forecast to operate with a v/c ratio greater 1.00 during the PM Peak hour.

  Fairview Street at Drury Lane:

  - The westbound shared through/right-turn movement is forecast to operate with a v/c ratio greater 0.85 during the PM peak hour.
  - The southbound approach is forecast to operate with a v/c ratio greater 0.85 during the AM and PM peak hours.
- **Total Traffic Conditions:** The study area intersections are forecast to continue to operate with capacity constraints similar to background traffic conditions with no additional critical movements;
- **Traffic Control Signals:** Traffic control signal is not warranted at the intersection of Fairview Street and the Site Driveway.
- **Total Traffic Conditions with Remedial Measures:** The study area intersections are forecast to operate at acceptable levels of service with the following improvements and the forecast queuing issues generally remaining unresolved:

Fairview Street at Guelph Line:

- Optimized signal timings with a modified cycle length;
- An extension of the westbound left-turn storage length from 125 m to 180 m;
- An extension of the westbound right-turn storage length from 120 m to 190 m; and
- A conversion of the existing northbound left-turn lane shadow (i.e., pavement markings changes) to a second northbound left-turn lane and operating as a fully protected signal phase for the dual left-turn configuration.

Fairview Street at Drury Lane:

- Optimized signal timings with a modified cycle length;
- An extension of the westbound left-turn lane through repainting the existing turn lane to provide 35 m of storage (additional 15 m);
- The addition of a separate 30 m southbound left-turn lane opposite of the existing northbound left-turn lane; and
- The addition of a protected-permissive southbound left-turn advance phase at the intersection.

Parking Study

- The proposed parking supply is identified as 390 spaces and is forecast to accommodate the sites parking demand. The parking supply is allocated as:
  - Occupant parking – 348 spaces; and
  - Visitor parking (residential visitors and retail/community space visitors) – 42 spaces.
- The site's bicycle parking supply consists of 189 spaces (169 long-term spaces and 39 short-term spaces). The supply exceeds the City's zoning requirements.

Recommendations

Based on the findings of this study, it is recommended that:

- The site's TDM program be implemented and monitored over time to help manage the site's transportation and parking impacts. At the site plan approval stage, refinements to the site's TDM program can be made (for example, location of bicycle parking).

Based on existing and background traffic conditions, it is recommended that:

- The road authorities consider extending the westbound left-turn storage length at the intersection of Guelph Line and Fairview Street from 125 m to 180 m;
- The road authorities consider extending the westbound right-turn storage length at the intersection of Guelph Line and Fairview from 120 m to 190 m;
- The road authorities consider converting the existing northbound shadow lane at the intersection of Guelph Line and Fairview Street to provide a second northbound left-turn lane. The dual northbound left-turn lanes should operate with a fully protected signal phase;
- The road authorities consider repainting the westbound left-turn at the Fairview Street intersection with Drury Lane to provide a total of 35 m of storage;
- The road authorities consider the implementation of a 30 m southbound left-turn lane on Drury Lane at the Fairview Street intersection to accommodate impacts of the adjacent 2243, 2269 Fairview Street and 864 Drury Lane background developments; and
- Provision of a protected permissive southbound left-turn phase at the Fairview Street intersection with Drury Lane to accompany the aforementioned auxiliary turn lane.

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1 Introduction

1.1 Overview

Lockwood Auto Group Inc. retained Paradigm Transportation Solutions Limited (Paradigm) to conduct this Transportation Impact and Parking Study for a mixed-use development located at 2362 Fairview Street in the City of Burlington. **Figure 1.1** illustrates the site location.

Official Plan Amendment and Zoning By-law Amendment applications are required to permit the proposed development.

The scope of the study includes:

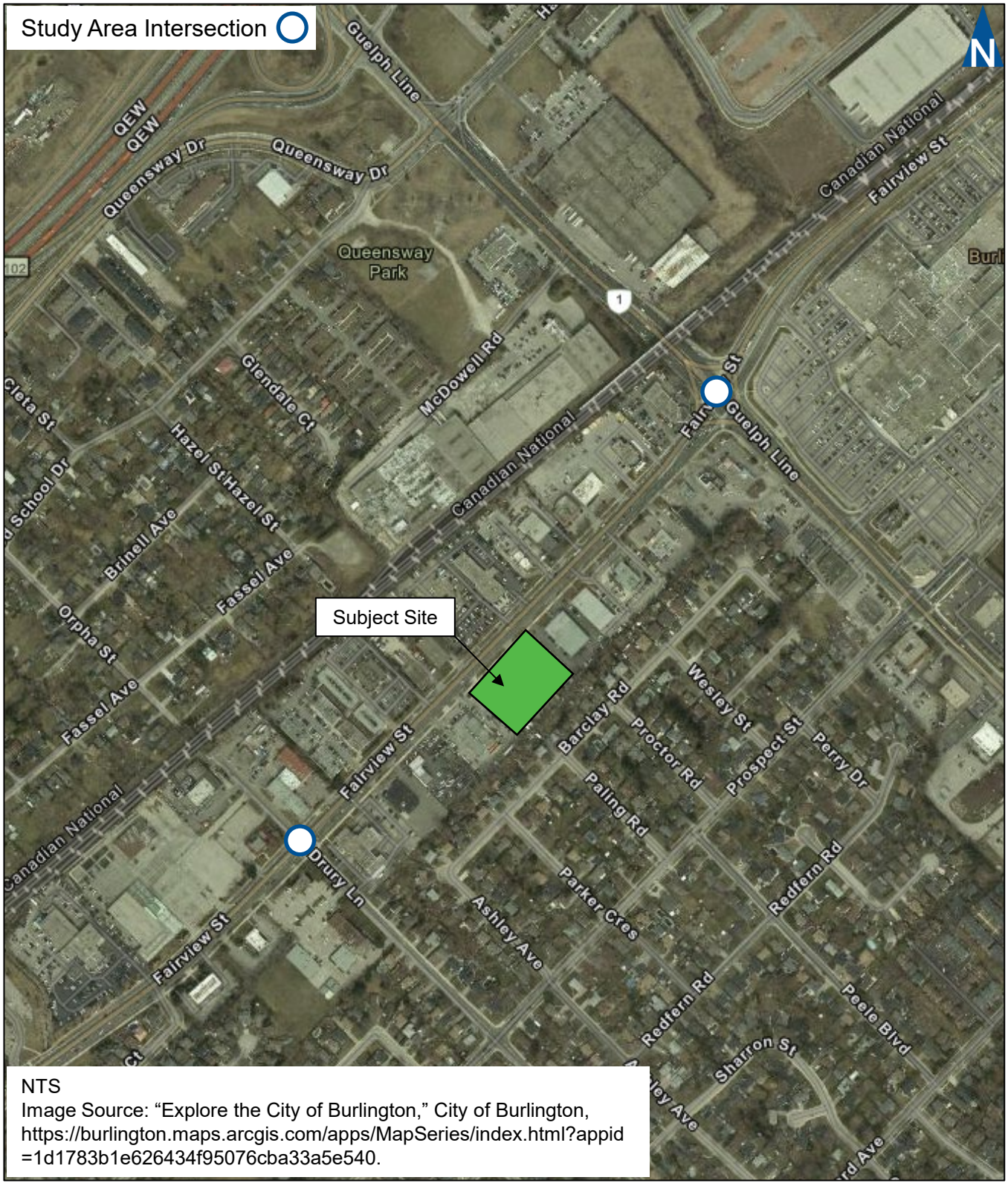
- Assessing current traffic and site conditions within the study area;
- Forecasting future background (non-development) traffic;
- Forecasting site-generated traffic;
- Analyzing future traffic impacts on the surrounding road network;
- Recommending road/intersection geometric and signal timing improvements, if necessary;
- Reviewing Zoning By-Law parking requirements;
- Estimating the site's parking demand;
- Evaluating proposed TDM measures; and
- Recommending preferred measures to support the proposed parking supply.

The study scope was developed in consultation with Halton Region and the City of Burlington in April 2023. **Appendix A** contains the pre-study consultation material and responses from the Region and the City.

1.2 Study Area

The intersections assessed in this study include:

- Fairview Street and Guelph Line (signalized);
- Fairview Street and Drury Lane (signalized); and
- Fairview Street and the Site Driveway (assumed unsignalized).



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Image Source: “Explore the City of Burlington,” City of Burlington, https://burlington.maps.arcgis.com/apps/MapSeries/index.html?appid=1d1783b1e626434f95076cba33a5e540.

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Site Location

2362 Fairview Street, Burlington TIS and PS
230079

Figure 1.1

2 Existing Conditions

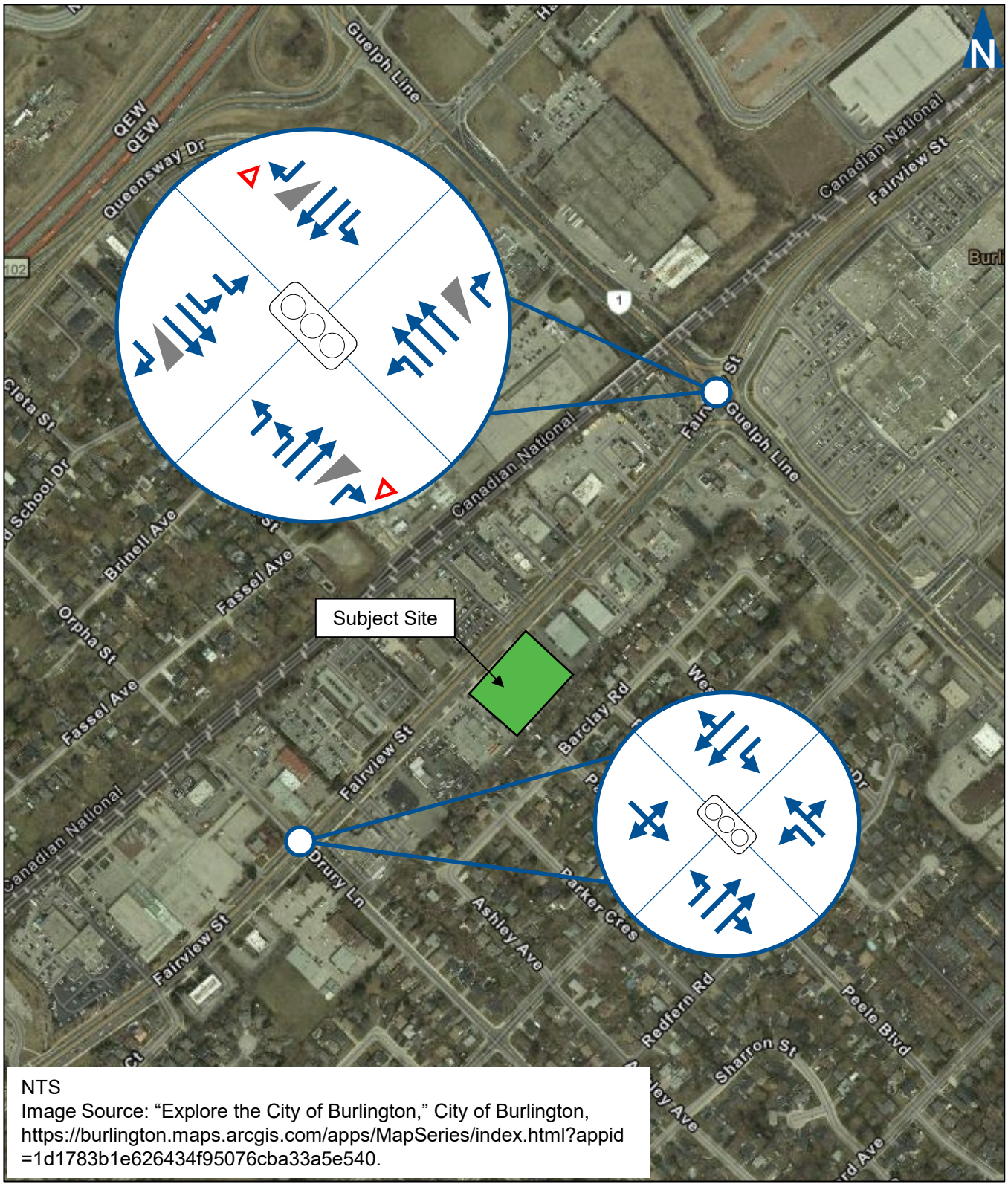
2.1 Road Characteristics

The roadways of interest within the study area include Guelph Line operating under the jurisdiction of Halton Region[1], and Drury Lane and Fairview Street both operating under the jurisdiction of the City of Burlington. The roadways are generally described as follows:

- **Guelph Line** is a six-lane roadway within the study area. Sidewalks are provided on both sides of the roadway. North of Fairview Street, the speed limit is 60 km/h, and the roadway is classified as a major arterial. South of Fairview Street, the speed limit is 50 km/h, and the roadway is classified as an Urban Avenue;
- **Fairview Street** is a four-lane, 60 km/h Multi Purpose Arterial within the study area. Sidewalks are provided on both sides of the roadway. West of Guelph Line, the roadway has a five-lane cross-section and provides a continuous center two-way left-turn lane (TWLTL); and
- **Drury lane** is a two-lane roadway within the study area. North of Fairview Street, the roadway is classified as a local street with a posted speed limit of 50 km/h with sidewalk on the west side of the roadway. South of Fairview Street, the roadway is classified as a neighbourhood connector with a posted speed limit of 40 km/h and has sidewalks on both sides.

Figure 2.1 illustrates the existing traffic control and lane configurations at the study area intersections.

[1] City of Burlington, *Official Plan: Schedule O-1 Classification of Transportation Facilities – Urban Area,* (Burlington: City of Burlington, 2020).



NTS
Image Source: "Explore the City of Burlington," City of Burlington, https://burlington.maps.arcgis.com/apps/MapSeries/index.html?appid=1d1783b1e626434f95076cba33a5e540.

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Existing Lane Configurations & Traffic Control

2.2 Active Transportation

2.2.1 Pedestrian Network

Figure 2.2 illustrates the existing sidewalks within the study area. Sidewalks are provided on at least one side of all study area roadways.

At the intersection of Guelph Line and Fairview Street, delineated pedestrian crosswalks are present along with pedestrian crossovers (PXO) at all channelized right-turns, and pedestrian pushbuttons are available.

At the intersection of Fairview Street and Drury Lane, delineated pedestrian crosswalks are present along with pedestrian pushbuttons on all approaches.

2.2.2 Cycling Network

Figure 2.3 and **Figure 2.4** illustrate the existing and future cycling network in the vicinity of the subject site.

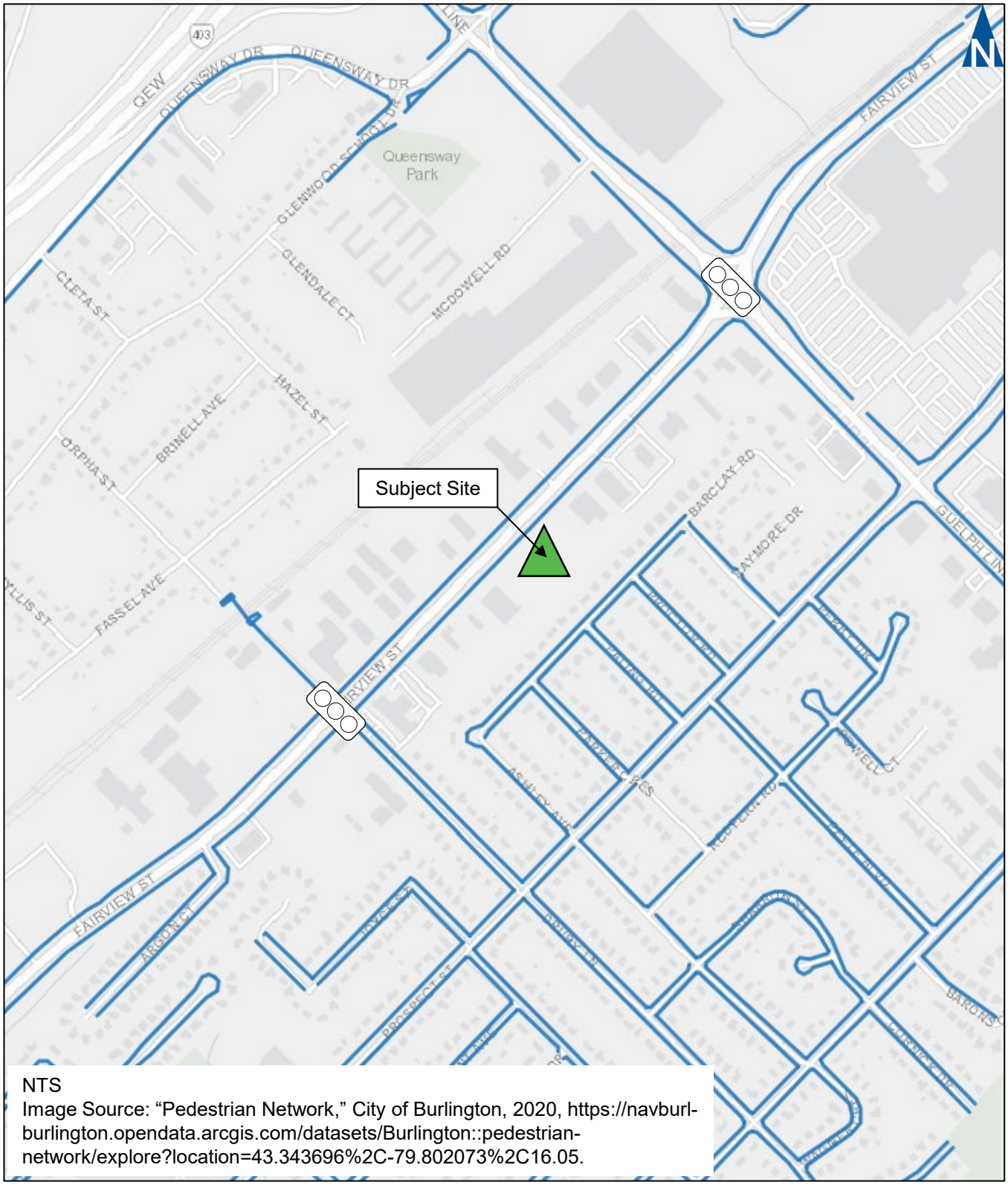
The existing cycling network infrastructure includes:

- A delineated on-street bike lane on the north side of Fairview Street;
- Sharrows on the south side of Fairview Street;
- Delineated on-street bike lanes on the east and west sides of Guelph Line south of Fairview Street; and
- Delineated on-street bike lanes on the east and west sides of Drury Lane south of Fairview Street.

The City of Burlington Cycling Plan[2] indicates future improvements to the city's cycling network. Identified improvements include:

- A protected bikeway (a barrier dividing cyclists and motorists) along Fairview Street through the study area;
- A protected bikeway running along Prospect Street and extending east of Guelph Line; and
- A local street bikeway (intended to favour cyclists) along Orpha Street connecting to the grade separator between Drury Lane and Orpha Street.

[2] City of Burlington, *Cycling Plan,* (Burlington: City of Burlington).



NTS
Image Source: “Pedestrian Network,” City of Burlington, 2020, https://navburl-burlington.opendata.arcgis.com/datasets/Burlington::pedestrian-network/explore?location=43.343696%2C-79.802073%2C16.05.

Existing Pedestrian Network

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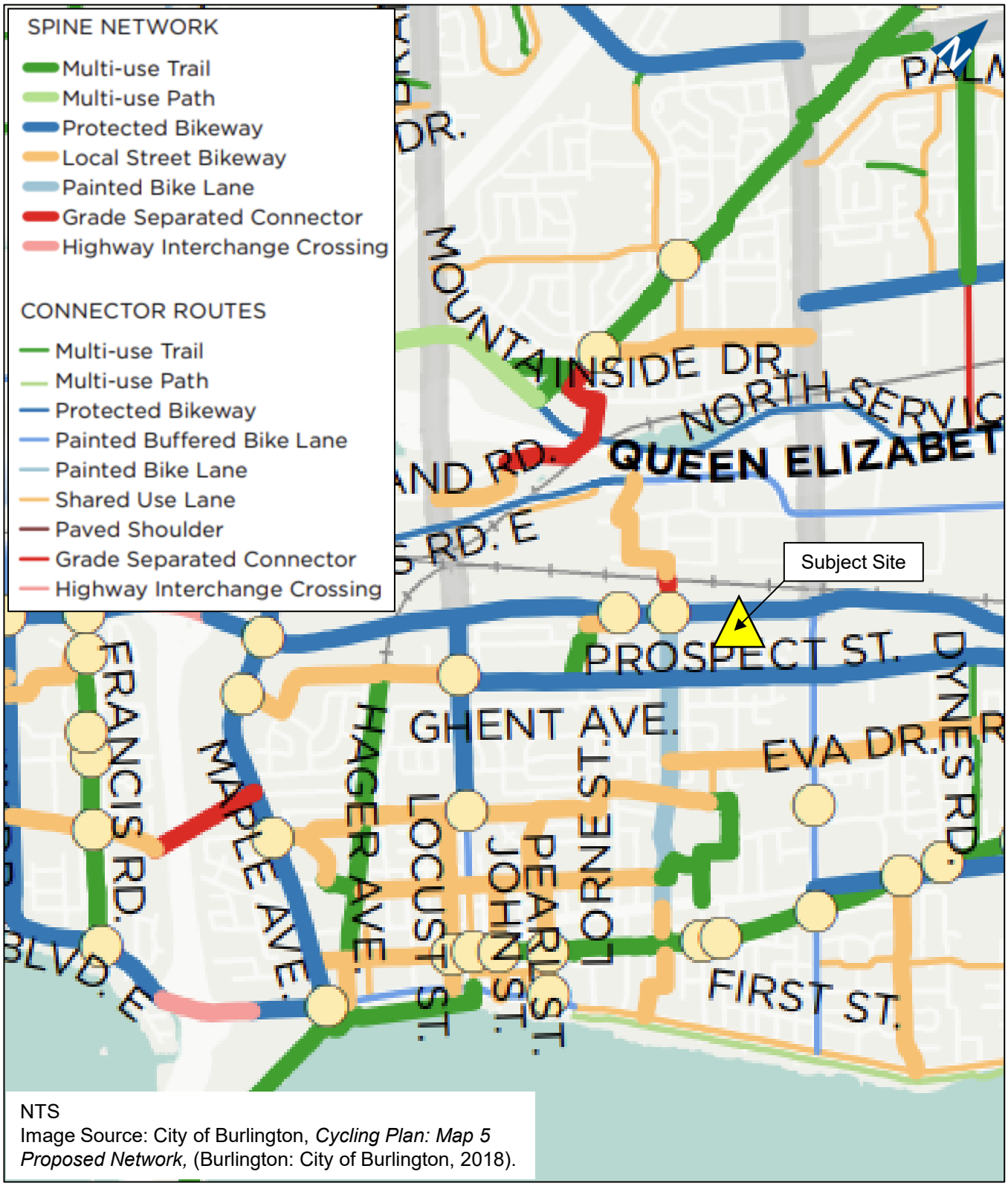
Figure 2.2



NTS
Image Source: City of Burlington, *Cycling Plan: Map 1 Existing Network,* (Burlington: City of Burlington, 2018).

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Existing Cycling Network



NTS
Image Source: City of Burlington, *Cycling Plan: Map 5 Proposed Network,* (Burlington: City of Burlington, 2018).

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Proposed Cycling Network

2.3 Transit Service

2.3.1 Transit Routes

Figure 2.5 illustrates the existing transit network. Burlington Transit[3] operates six routes near the study area:

- **Route 1 (Plains/Fairview)** travels between the Appleby GO Station and downtown Hamilton. This route operates Monday to Friday from 4:45 AM to 1:15 AM with headways between 10 to 20 minutes. On Saturday, the route operates from 6:30 AM to 12:50 AM with headways between 15 to 30 minutes. On Sunday, the route operates from 6:35 AM to 10:05 PM with headways between 15 to 40 minutes;
- **Route 3 (Guelph)** travels between the Highway 407 GO Station and the Downtown transit terminal. This route operates Monday to Friday from 4:55 AM to 11:15 PM with headways between 15 to 30 minutes. On Saturday, the route operates from 5:45 AM to 10:50 PM with headways between 30 minutes to an hour. On Sunday, the route operates from 7:15 AM to 9:05 PM with headways between 30 minutes to an hour;
- **Route 4 (Central)** travels between the Appleby and Aldershot GO Stations. This route operates Monday to Friday from 5:25 AM to 9:30 PM with headways between 30 minutes to an hour. On Saturday, the route operates from 8:30 AM to 9:00 PM with headways every hour. On Sunday, the route operates from 11:00 AM to 6:35 PM with headways every hour;
- **Route 6 (Headon)** travels between the Highway 407 and Burlington GO Stations. This route operates Monday to Friday from 5:25 AM to 10:15 PM with headways between 30 minutes to an hour. On Saturday, the route operates from 7:15 AM to 10:20 PM with one-hour headways. On Sunday, the route operates from 8:15 AM to 8:20 PM with one-hour headways;
- **Route 80 (Harvester)** travels between the Appleby and Burlington GO Stations. This route operates Monday to Friday from 5:20 AM to 7:05 PM with headways between 20 to 30 minutes; and
- **Route 81 (North Service)** operates between the Appleby and Burlington GO Stations. This route operates Monday to Friday

[3] "Schedules and Maps," City of Burlington, 2022, https://www.burlington.ca/en/transit/schedules-and-maps.aspx.

from 5:15 AM to 7:15 PM with headways generally between 20 to 35 minutes.

The connecting GO Stations provide connections with GO Transit Bus routes, other GO Transit Train routes, Hamilton Street Railway (HSR) transit and VIA rail services.

The closest GO Station (Burlington GO Station) is located approximately 900 m, equivalent to an 11-minute walk west of the subject site on the north side of Fairview Street. Pedestrian crossings of Fairview Street are facilitated by the Drury Lane signalized intersection or at the existing signalized crossing at the Burlington GO Station.

2.3.2 Transit Stop Locations and Frequent Transit Corridors

The proposed development site is served by a number of transit stops in close proximity. **Figure 2.6** illustrates the nearby transit stops.

The closest eastbound Burlington Transit stop is located approximately 120 m (about a 2-minute walk) west of the subject site on the south side of Fairview Street.

The closest westbound transit stop is located 290 m (about a 4 to 6-minute walk) west of the subject site located on the northeast corner at the intersection of Fairview Street and Drury Lane. The closest marked pedestrian crossing over Fairview Street is at the Drury Lane traffic control signal.

Frequent Transit Corridors are defined as “A priority component of the city-wide public transit network. The long-term frequent transit corridors consist of the following two components”[4]:

- “Frequent Transit Corridors have existing and/or planned land uses, and street design conditions to enable a frequent service;” and
- “Candidate Frequent Transit Corridors have some of the existing and/or planned land uses and street design conditions which may enable a frequent service in the future.”

The Frequent Transit Corridors are present along[5]:

- Fairview Street; and

[4] City of Burlington, *Official Plan: Chapter 13 – Definitions,* (Burlington: City of Burlington, 2020).
[5] City of Burlington, *Official Plan: Schedule B-2 Growth Framework and Long-Term Frequent Transit Corridors,* (Burlington: City of Burlington, 2020).

- Guelph Line (as a candidate).

2.3.3 Transit Summary

The proposed development site location is summarized to be well served by transit, offering opportunities for local travel via local transit routes, as well as providing connections to facilitate inter-regional travel.



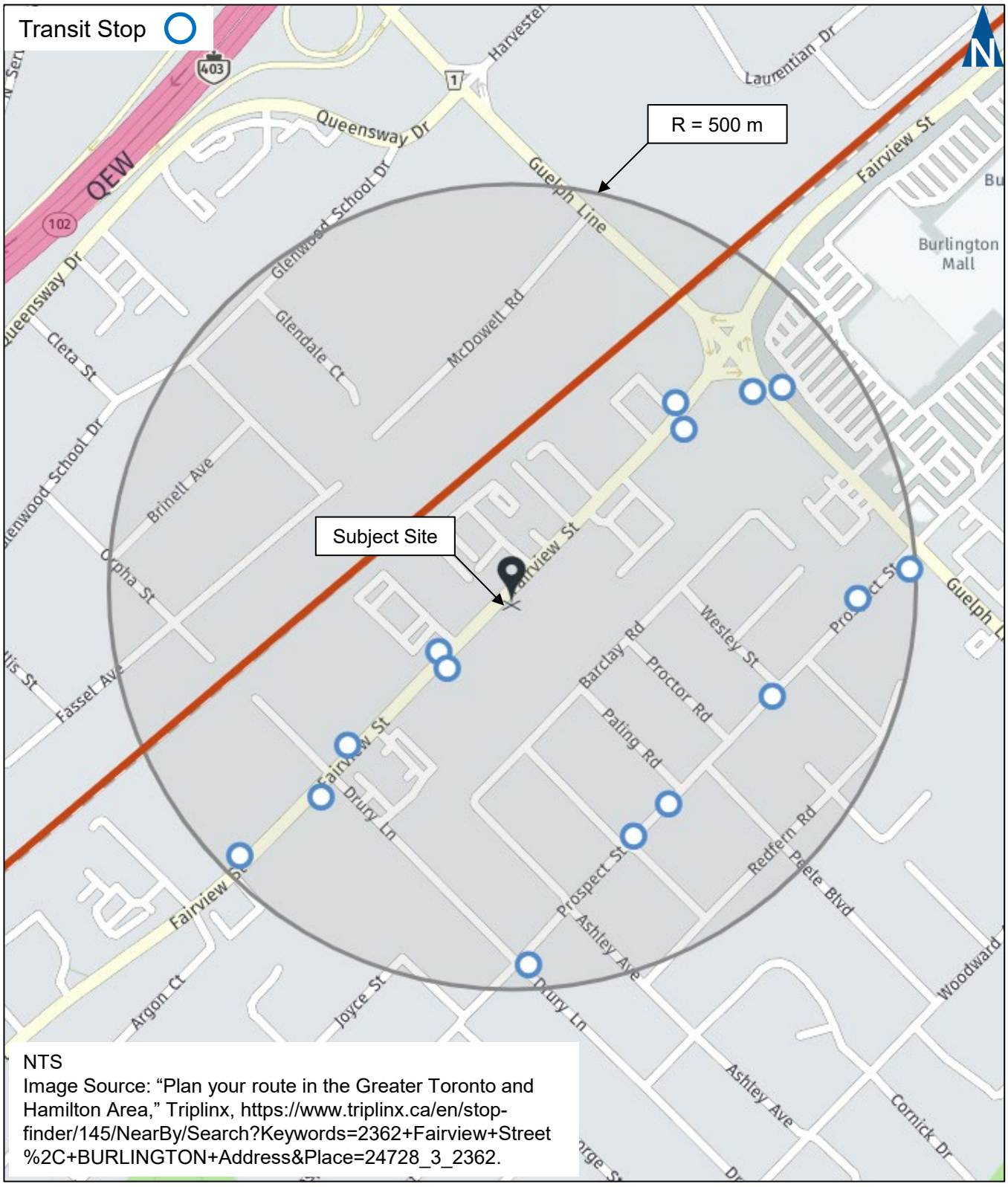
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Image Source: "2021 Route Map Burlington Transit," City of Burlington, https://www.burlington.ca/en/transit/resources/Schedules-and-Routes/Schedules-and-Maps/Route-Map.pdf.

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Existing Transit Network

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Figure 2.5



NTS
Image Source: "Plan your route in the Greater Toronto and Hamilton Area," Triplinx, https://www.triplinx.ca/en/stop-finder/145/NearBy/Search?Keywords=2362+Fairview+Street%2C+BURLINGTON+Address&Place=24728_3_2362.

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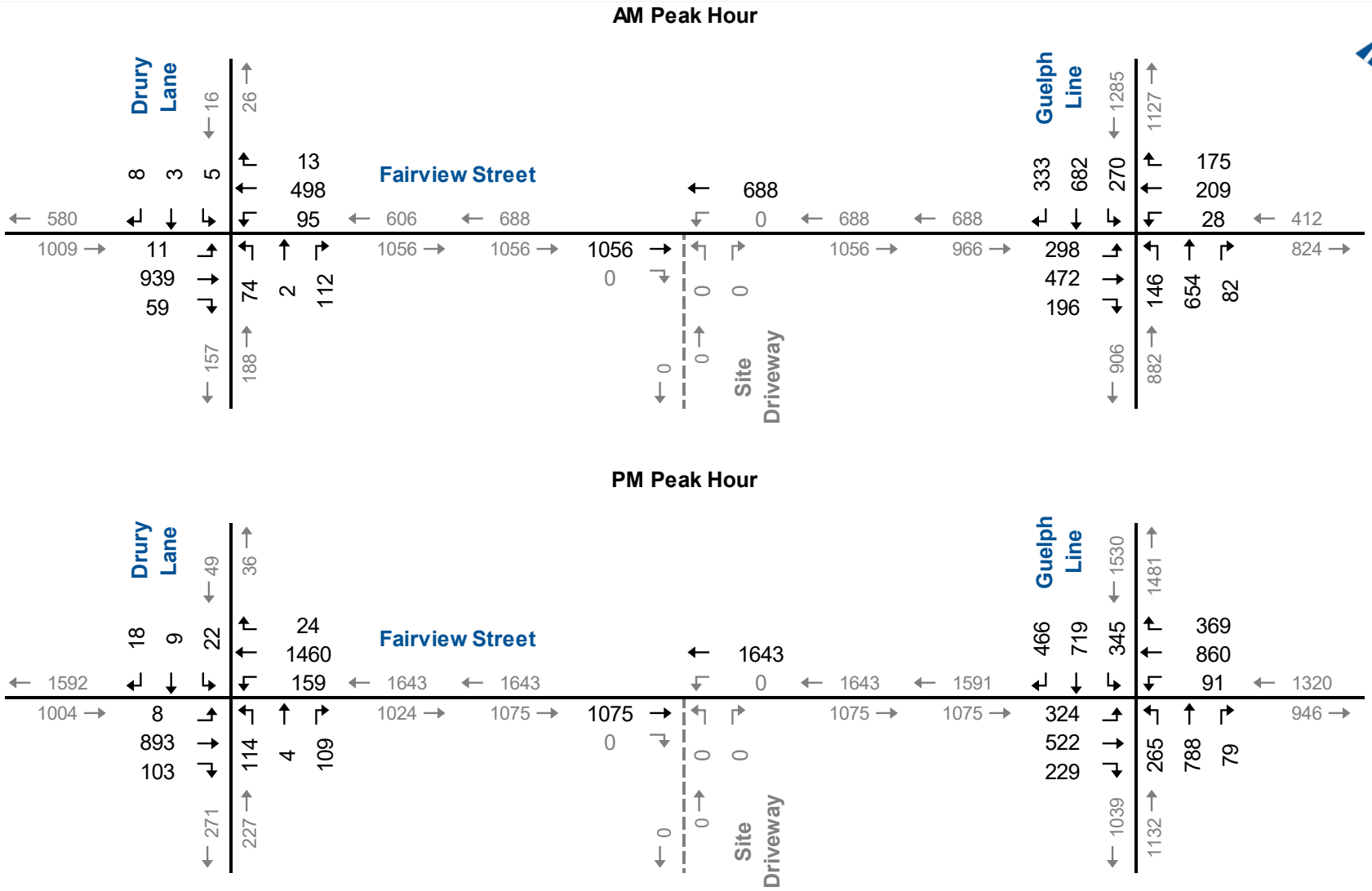
Existing Transit Stops

2.4 Traffic Volumes

Intersection Turning Movement Counts (TMCs) were collected at the study area intersections on Wednesday April 19, 2023.

Appendix B contains the TMC data and the existing signal timings for the study area intersections.

Figure 2.7 illustrates the existing weekday AM and PM peak hour traffic volumes at the study area intersections.



Base Year Traffic Volumes

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Figure 2.7

2.5 Traffic Operations

Intersection level of service (LOS) is a recognized method of quantifying the average delay experienced by drivers at intersections. It is based on the delay experienced by individual vehicles executing the various movements. The delay is related to the number of vehicles intending to make a particular movement, compared to the estimated capacity for that movement. The capacity is based on a number of criteria related to the opposing traffic flows and intersection geometry.

The highest possible rating is LOS A, under which the average total delay is equal or less than 10.0 seconds per vehicle. When the average delay exceeds 80 seconds for signalized intersections, 50 seconds for unsignalized intersections or when the volume to capacity ratio is greater than 1.00, the movement is classed as LOS F and remedial measures are usually implemented if they are feasible. LOS E is usually used as a guideline for the determination of road improvement needs on through lanes, while LOS F may be acceptable for left-turn movements at peak times, depending on delays.

The operations of the study intersections were evaluated using the existing lane configurations, traffic controls, and the base year traffic peak hour volumes.

The level of service conditions on the existing road network have been assessed using Synchro 11 and Highway Capacity Manual (HCM) 2000 procedures. The intersection analysis considered three separate measures of performance:

- The LOS for each turning movement. LOS is based on the average control delay per vehicle;
- The volume to capacity (v/c) ratio for each intersection; and
- 95th percentile queue length (metres), output via the SimTraffic module and averaged from five 60-minute simulations.

As noted in the Halton Region TIS guidelines[6], thresholds for critical are noted as follows:

- v/c for through or shared through/turning movements that exceed 0.85 at a signalized intersection;
- v/c for exclusive turning movements that exceed 0.95 at a signalized intersection;

[6] Halton Region, *Transportation Impact Study Guidelines,* (Oakville: Halton Region, 2015).

- The 95th percentile queues for an individual movement are projected to exceed available turning lane storage; and
- LOS, based on average delay per vehicle on individual movements, operate at LOS E or LOS F for unsignalized intersections.

Table 2.1 summarizes the existing intersection operations.

All study area intersections are forecast to operate at acceptable levels of service during the AM and PM peak hour with the following critical movements noted from Synchro and SimTraffic:

- Fairview Street at Guelph Line:
  - The eastbound left-turn movement reports queue length exceeding its storage length by 16 and 8 m during the AM and PM peak hours;
  - The eastbound right-turn movement reports a queue length exceeding its storage length by 17 and 31 m during the AM and PM peak hours;
  - The westbound left-turn movement reports a queue length exceeding its storage length by 13 m during the PM peak hour;
  - The westbound through movement reports a v/c ratio greater than 0.85 during the PM peak hour;
  - The westbound right-turn movement reports a queue length exceeding its storage length by 18 m during the PM peak hour; and
  - The northbound left-turn movement reports a queue length exceeding its storage length by 19 m during the PM peak hour.
- Fairview Street at Drury Lane:
  - The westbound left-turn movement reports a queue length exceeding its storage length by 2 and 10 m during the AM and PM peak hours.

Under existing traffic conditions, the reported 95th percentile queues are exceeding the available storage. It is noted the 95th percentile queue are estimates of the longest queue that could occur during the peak hour; however, this level of queuing only has a five percent probability of occurring during the analysis period. It is not typical of what a motorist would experience on average. It is noted all reported

50th percentile queue lengths are accommodated within the available storage lengths.

The channelized westbound right-turn queue length at the intersection of Guelph Line and Fairview Street reports a 95th percentile queue of zero metres during the AM peak hour. The queue length is only recorded in the defined storage area for a turn lane and not the channelized portion of the turn lane in the Synchro software.

Appendix C contains the detailed Synchro and SimTraffic reports.

TABLE 2.1: BASE YEAR OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Fairview Street at Guelph Line	TCS	LOS	D	C	C	**D**	D	D	D	**D**	C	C	C	**C**	D	C	C	**C**	**D**
			Delay	53	34	31	**39**	35	41	39	**40**	25	33	28	**31**	54	31	26	**34**	**36**
			V/C	0.69	0.45	0.20		0.12	0.32	0.12		0.48	0.43	0.06		0.66	0.56	0.24		**0.60**
			Q	76	112	47		17	65	0		31	75	0		79	69	0		
			Stor.	60	-	30		125	-	120		90	-	70		150	-	-		
			Avail.	-16	-	-17		108	-	120		59	-	70		71	-	-		
	Fairview Street at Drury Lane	TCS	LOS	A	A	>	**A**	A	A	>	**A**	C	C	>	**C**	<	C	>	**C**	**B**
			Delay	6	10	>	**9**	4	4	>	**4**	34	30	>	**32**	<	30	>	**30**	**10**
			V/C	0.02	0.50	>		0.25	0.22	>		0.50	0.08	>		<	0.05	>		**0.47**
			Q	9	65	>		22	35	>		31	26	>		<	13	>		
			Stor.	25	-	>		20	-	>		40	-	>		<	-	>		
			Avail.	16	-	>		-2	-	>		9	-	>		<	-	>		
PM Peak Hour	Fairview Street at Guelph Line	TCS	LOS	E	D	C	**D**	C	E	D	**D**	D	D	D	**D**	E	D	D	**D**	**D**
			Delay	68	36	34	**46**	33	61	44	**55**	45	43	36	**43**	65	43	44	**48**	**48**
			V/C	0.78	0.44	0.24		0.27	0.90	0.39		0.82	0.54	0.05		0.75	0.63	0.57		**0.82**
			Q	68	84	61		138	183	138		109	129	0		74	91	0		
			Stor.	60	-	30		125	-	120		90	-	70		150	-	-		
			Avail.	-8	-	-31		-13	-	-18		-19	-	70		76	-	-		
	Fairview Street at Drury Lane	TCS	LOS	A	B	>	**B**	A	A	>	**A**	D	C	>	**D**	<	C	>	**C**	**B**
			Delay	8	12	>	**12**	6	8	>	**8**	41	33	>	**37**	<	34	>	**34**	**12**
			V/C	0.05	0.51	>		0.41	0.62	>		0.60	0.09	>		<	0.16	>		**0.64**
			Q	13	74	>		30	95	>		37	27	>		<	20	>		
			Stor.	25	-	>		20	-	>		40	-	>		<	-	>		
			Avail.	12	-	>		-10	-	>		3	-	>		<	-	>		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
Stor. - Existing Storage (m)
Avail. - Available Storage (m)
TCS - Traffic Control Signal
< / > - Shared with through movement

3 Development Concept

3.1 Development Description

The subject site is located at 2362 Fairview Street in the City of Burlington.

The development concept includes an eleven-storey apartment building with 338 units, a 307 m^2 community space, and 247 m^2 of ground floor commercial space.

Vehicle access is proposed via a full-movement private driveway to Fairview Street located approximately mid-point across the site's frontage. The proposed site driveway consolidates the two existing site driveways into one connection.

The driveway approach to Fairview Street is assumed to operate under stop control with a single inbound and single outbound travel lane.

The drive aisle under the building provides a vertical clearance of 5.5 m to accommodate the movement of Regional Waste Collection vehicles.

The driveway is positioned approximately mid-point between the driveways on the north side of the street. The driveway serving 2349 Fairview Street (three-storey office building) is located approximately 36 m (CL to CL) west of the proposed site driveway. The driveway serving 2377 Fairview Street (secondary entrance to car dealership) is located approximately 39 m east of the site driveway. Left-turns from Fairview Street into the proposed site driveway and the other existing driveways is accommodated by the existing centre two-way left-turn lane on Fairview Street.

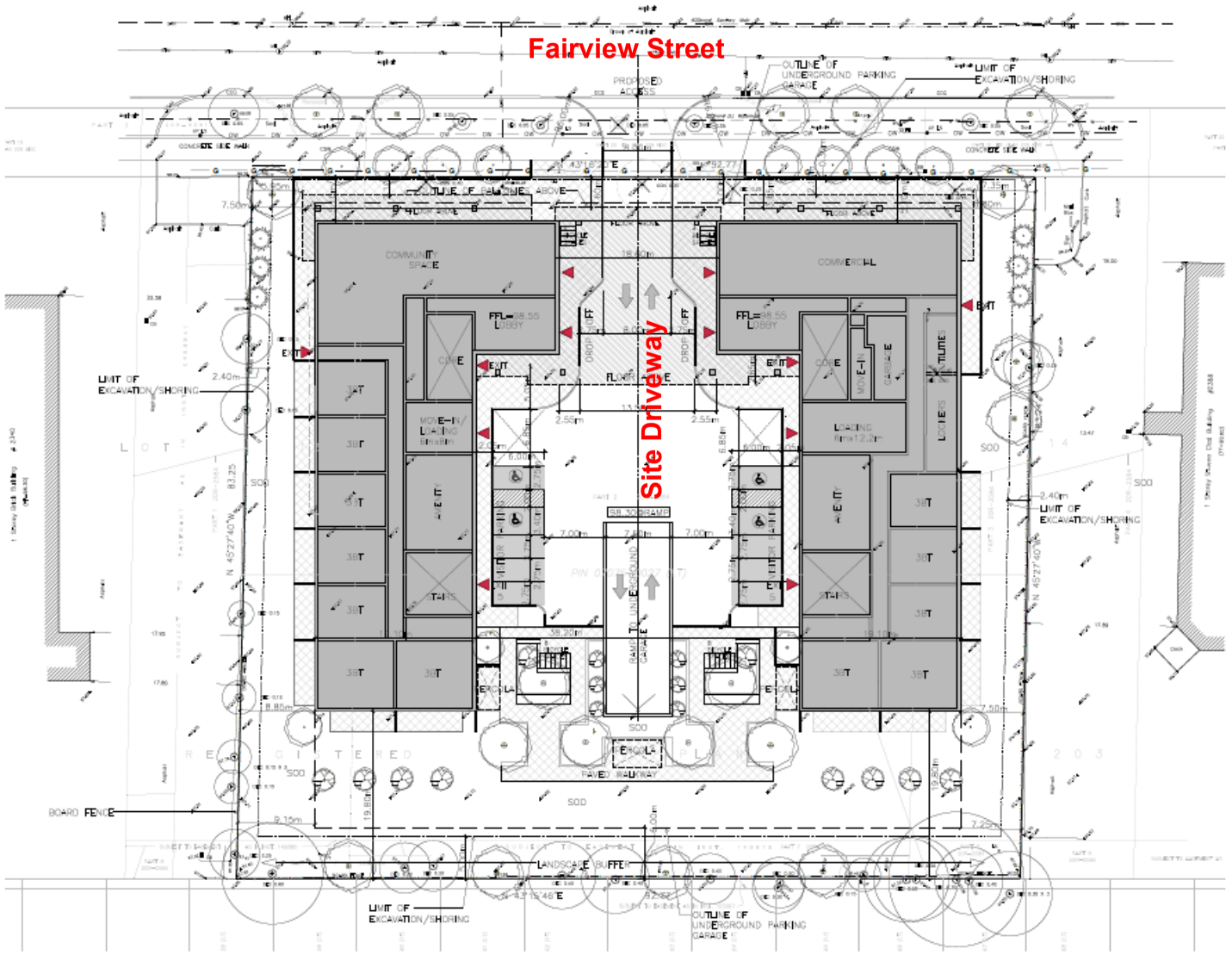
The forecast queue length for left-turns into the site driveway (refer to **Section 4.3**, Table 4.2) is approximately 17 m. The 95th percentile queue length for left-turning vehicles into the subject site is not expected to affect the operation of the upstream driveway serving 2377 Fairview Street. Moreover, the directional distribution of vehicle trips generated by the subject site (that is, a primarily residential land use) and vehicle trips generated by the car dealership are generally inverse of each other. Meaning during the AM peak hour most trips generated by the subject site are exiting the development, whereas most trips generated by the car dealership would be entering the adjacent site. During the PM peak hour, the inverse occurs.

Passenger pick-up/drop-off areas are proposed along the covered portion of the site's driveway.

The site's overall parking supply consists of 390 parking spaces. Residential parking provisions are noted as 348 spaces (1.03 spaces per unit), and the non-residential parking provision (visitors) is noted as 42 spaces (0.12 per unit).

Both short-term and long-term bicycle parking spaces are proposed on-site. The short-term supply is 24 spaces (0.07 spaces per unit), and the long-term supply is 165 spaces (0.49 spaces per unit). The site's bicycle parking supply can be adjusted at the site plan approval (SPA) stage.

Figure 3.1 illustrates the site concept plan.



NTS

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Concept Plan

2362 Fairview Street, Burlington TIS and PS
230079

Figure 3.1

3.2 Site Trip Generation

The Institute of Transportation Engineers (ITE) Trip Generation Manual[7] data was used to forecast site-generated trips. The following Land Use Codes (LUC) were used to estimate the site trip generation:

- LUC 222 (Multi-family Housing, High-Rise) – intended for multi-family residential developments with ten or more storeys;
- LUC 712 (Small Office Building) – typically houses a single tenant for a business, commercial or industrial organization, or professional firm are conducted.
- LUC 822 (Strip Retail Plaza, <40k) – intended for multiple commercial uses that take up minimal floor space.

It is noted the residential component of the development fits within the description for LUC 222 and it is assumed that residents will have travel patterns similar to other high-rise residential developments. **Appendix D** contains the trip generation data.

Table 3.1 summarizes the forecast site-generated trips indicating 106 AM peak hour and 131 PM peak hour trips would be generated by the proposed development.

An ITE pass-by trip reduction of 40% was applied during the PM peak hour for the commercial component of the development (using LUC 821 data as no pass-by data is provided for LUC 822). As indicated by the low R^2 values for the AM and PM peak hours, the average rates were utilized instead of the trip equations for LUC 822.

[7] Institute of Transportation Engineers, *Trip Generation Manual,* 11th ed., (Washington DC: ITE, 2021).

TABLE 3.1: ESTIMATED TRIP GENERATION

Land Use	Units or GFA	AM Peak Hour				PM Peak Hour			
		Rate	In	Out	Total	Rate	In	Out	Total
LUC 222	338 Units	Eq[1]	24	69	93	Eq[2]	69	42	111
LUC 712	3.30 1,000 ft^2	Avg[3]	5	1	6	Avg[4]	3	5	8
LUC 822	2.66 1,000 ft^2	Avg[5]	4	3	7	Avg[6]	10	10	20
Total Trip Generation			**33**	**73**	**106**		**82**	**57**	**139**
Pass-By Trips (LUC 822)		*0%*	*0*	*0*	*0*	*40%*	*4*	*4*	*8*
Net Trip Generation			***33***	***73***	***106***		***78***	***53***	***131***

1: T= 0.22(X) + 18.85

2: T = 0.26(X) + 23.12

3: Average Rate = 1.67

4: Average Rate = 2.16

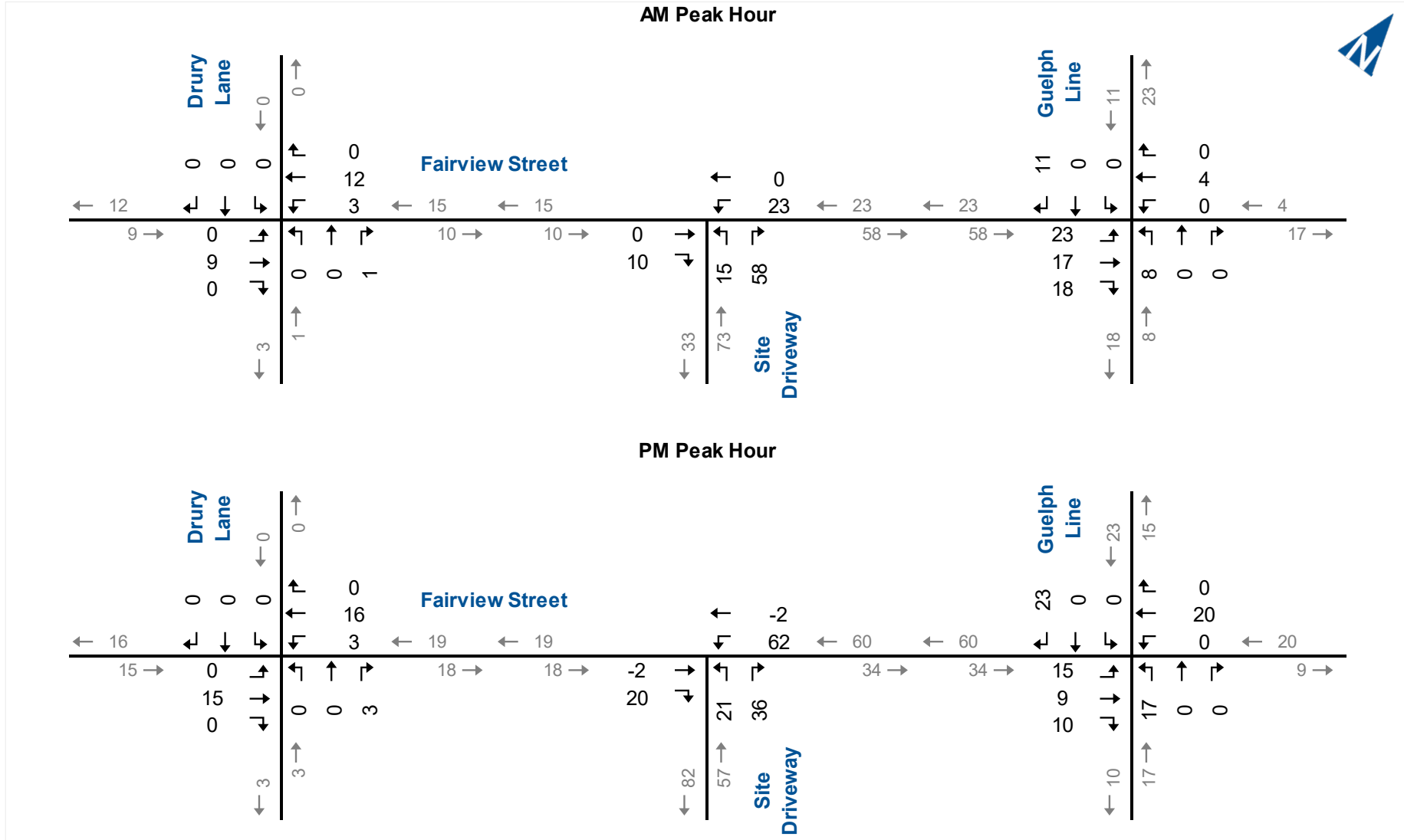
5: Average Rate = 2.36

6: Average Rate = 6.59

The site's trip distribution follows existing travel patterns observed from the collected traffic data. **Table 3.2** summarizes the estimated trip distribution. **Figure 3.2** illustrates the AM and PM peak hour trip assignment.

TABLE 3.2: ESTIMATED TRIP DISTRIBUTION

Origin/Destination	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
North via Guelph Line	34%	31%	29%	28%
South via Guelph Line	23%	25%	22%	19%
South via Drury Lane	5%	5%	5%	5%
East via Fairview Street	11%	23%	25%	18%
West via Fairview Street	27%	16%	19%	30%
Total	**100%**	**100%**	**100%**	**100%**



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Site-Generated Traffic Volumes

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230079

Figure 3.2

3.3 Transportation Demand Management (TDM)

TDM refers to ways of making the capacity of our roads more efficient by reducing vehicle demands. TDM approaches consider how people's choices of travel mode are affected by land use patterns, development design, parking availability, parking cost, and the relative cost, convenience, and availability of alternative modes of travel.

Various TDM strategies are used to influence those factors so that the alternatives are more competitive with driving alone and potentially reduce the reliance on automobiles.

To help manage the site's transportation and parking impacts, a Transportation Demand Management (TDM) program is proposed. The following TDM measures are included in the site plan (e.g., bicycle parking) or will be considered by the site operator (e.g., transit passes) as part to the development program:

- Walking
  - Safe, attractive, and direct walkways for pedestrians linking building entrances with public sidewalks;
  - All on-site sidewalks will conform to the City of Burlington's design standards and the Accessibility for Ontarians with Disabilities Act (AODA) design standards;
  - A continuous sidewalk is provided along the subject site's frontage; and
  - The outdoor space will have amenities such as benches, seating areas and/or pedestrian scale lighting.
- Cycling
  - 165 long-term bicycle parking spaces (0.49 spaces per unit);
  - 24 short-term bicycle parking spaces (0.07 spaces per unit);
  - Long-term bicycle parking will be provided in secure indoor rooms/areas with bicycle repair stations. The parking will be conveniently located in the parking structure; and
  - Short-term bicycle parking is located at grade near primary building entrances.
- Transit Infrastructure
  - A PRESTO card will be provided to occupants who do not purchase a parking space; and

- Proposed sidewalks connect directly to the adjacent Burlington Transit stops.

- Parking Infrastructure
  - Reduced parking supply due to proximity and accessibility to transit;
  - Parking is unbundled from the cost of the units;
  - The parking supply should be managed to limit the sale of spaces to buyer to be a maximum of two spaces per unit; and
  - Parking costs will reflect the full cost of building and operating the parking facility.
- Wayfinding, Travel Planning, Education/Promotion
  - Travel planning resources should be provided to residents (individualized marketing, active transportation maps, community resources, transit schedules);
  - Wayfinding signage should be provided in the Lobby or near the main entrance; and
  - Marketing material will promote a strong TDM brand.

The above TDM measures can assist in mitigating the site's transportation and parking impacts on the adjacent road network, promote a strong and vibrant economy, and create a livable community that has a balanced transportation network.

The City of Burlington's Zoning By-law prescribes the following bicycle parking requirements:

- Residential[8]: 0.05 short term bicycle parking spaces per unit and 0.50 long term bicycle parking spaces per unit.
- Retail, Retail Centre Service Commercial Office, Institutional [9]: 2 spaces plus 1 space/1,000 m^2 GFA.

The site's long-term bicycle parking supply should be increased to align with the City's zoning requirements. An additional 4 long-term bicycle parking spaces should be designed for at SPA.

To form a sustainable and balanced transportation system the city is working towards improvements to public transit and active

[8] Zoning By-Law 2020/Part 5 – Mixed-Use Corridor Zones/4.0 MXG, MXC, MXE, MXT Zone Regulations
[9] Zoning By-Law 2020/Part 1 - General Conditions and Provisions/2.0 General Provisions

transportation (AT) infrastructure to reduce the use of single-occupant vehicles and create a balanced transportation system.

TDM encourages sustainable travel choices by supporting alternative transportation options over the convention of driving alone.

By shifting travel to public transit and AT, intersection operations could be expected to maintain the status-quo (capacity constraint during peak hours) or possibly improve if fewer vehicles transverse the intersections during the peak hours of a typical weekday.

3.4 Site Circulation Review

The site circulation has been assessed using the following design vehicles:

- Transportation Association of Canada[10] (TAC) Passenger Car (P);
- TAC Light Single Unit (LSU);
- TAC Medium Single Unit (MSU);
- TAC Heavy Single Unit (HSU); and
- Halton Region Front End Loading Garbage truck.

Appendix E contains the vehicle maneuvering diagrams. No conflicts with the site's geometry are noted.

The site provides two loading zones located at grade within the courtyard area. The drive aisle under the building provides a vertical clearance of 5.5 m to accommodate the movement of Regional Waste Collection vehicles. Waste collection is proposed to occur on the site's east loading zone which is open to air.

It is recommended the drive aisles in the parking structure around the ramps operate as counterclockwise to reduce the amount of overlap between vehicles on the 90-degree corners.

[10] Transportation Association of Canada, *Geometric Design Guide for Canadian Roads,* (Ottawa: TAC, 2017).

4 Evaluation of Future Traffic Conditions

The assessment of future conditions in this section includes the following components:

- Background traffic forecast;
- Total traffic forecast;
- Level of service analysis for background traffic (pre-development); and
- Level of service analysis for total traffic (post-development).

A horizon year of a 2028 is analyzed representing a period of five years from commencement of this study.

4.1 Forecast Traffic

The future background traffic volumes near the subject site are estimated to consist of increased non-site traffic (generalized background traffic growth) and traffic generated by nearby planned developments.

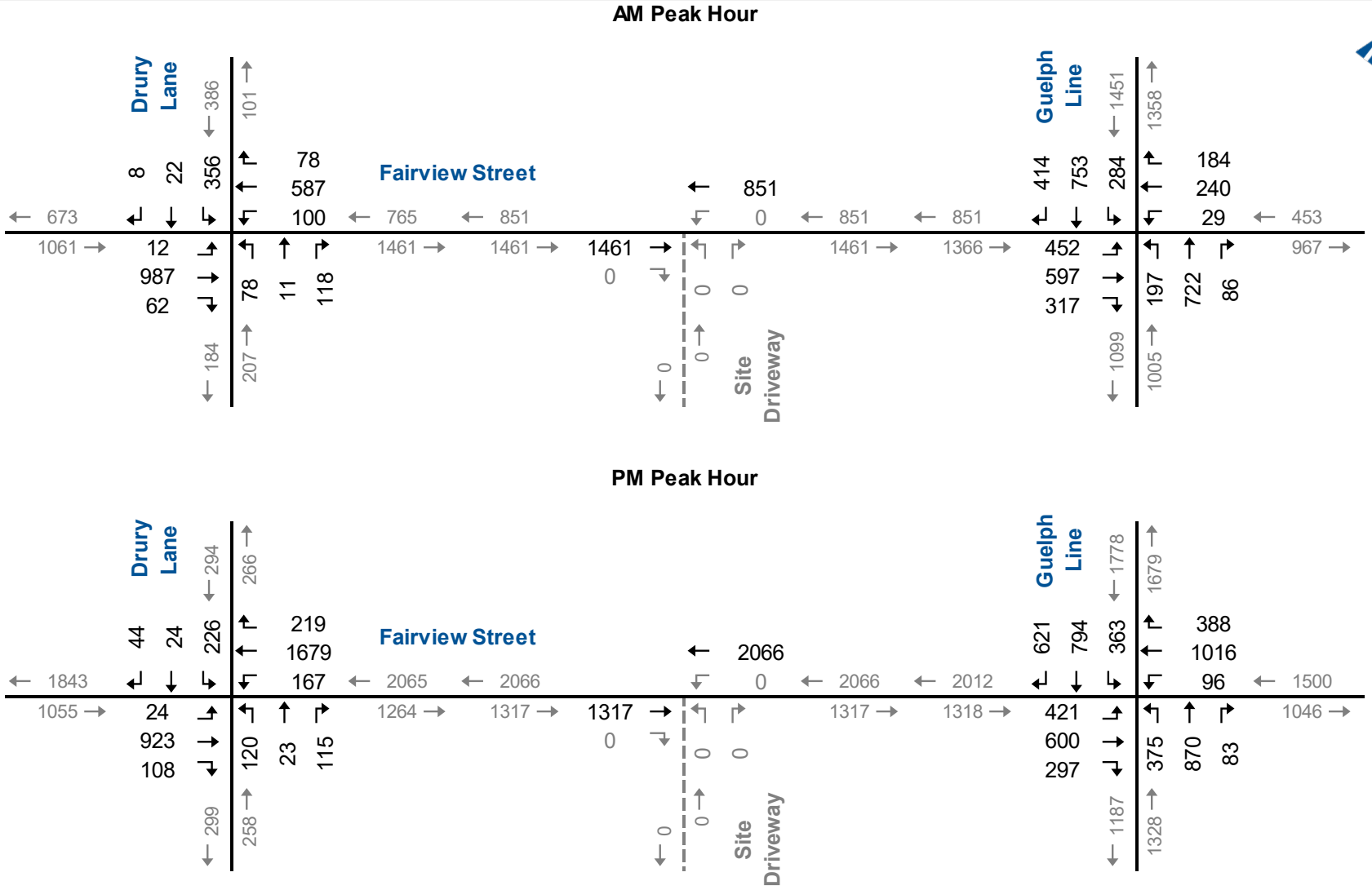
The generalized background traffic growth forecast assumes an annual growth rate of 1% per annum, with exception of the application of 2% per annum for through traffic along Guelph Line. The growth rates applied were identified by City and Region staff during pre-consultation.

Other area background traffic accounted for includes the planned development of 2243, 2269 Fairview Street, and 864 Drury Lane. The site is located on the northwest corner of the Fairview Street intersection with Drury Lane and is expected to consist of 2,494 residential units and 3,993 m^2 of commercial space. The site traffic contributions from this background development is expected to increase traffic volumes at the study area intersections.

The other area background site is forecast to generate approximately 628 and 731 trips during the AM and PM peak hours, respectively. A portion of the site generated traffic is not expected to traverse the study area intersections as some traffic will travel west outside the study area. **Appendix F** contains the background development traffic forecast and trip generation estimate for reference.

Figure 4.1 illustrates the forecast background traffic volumes.

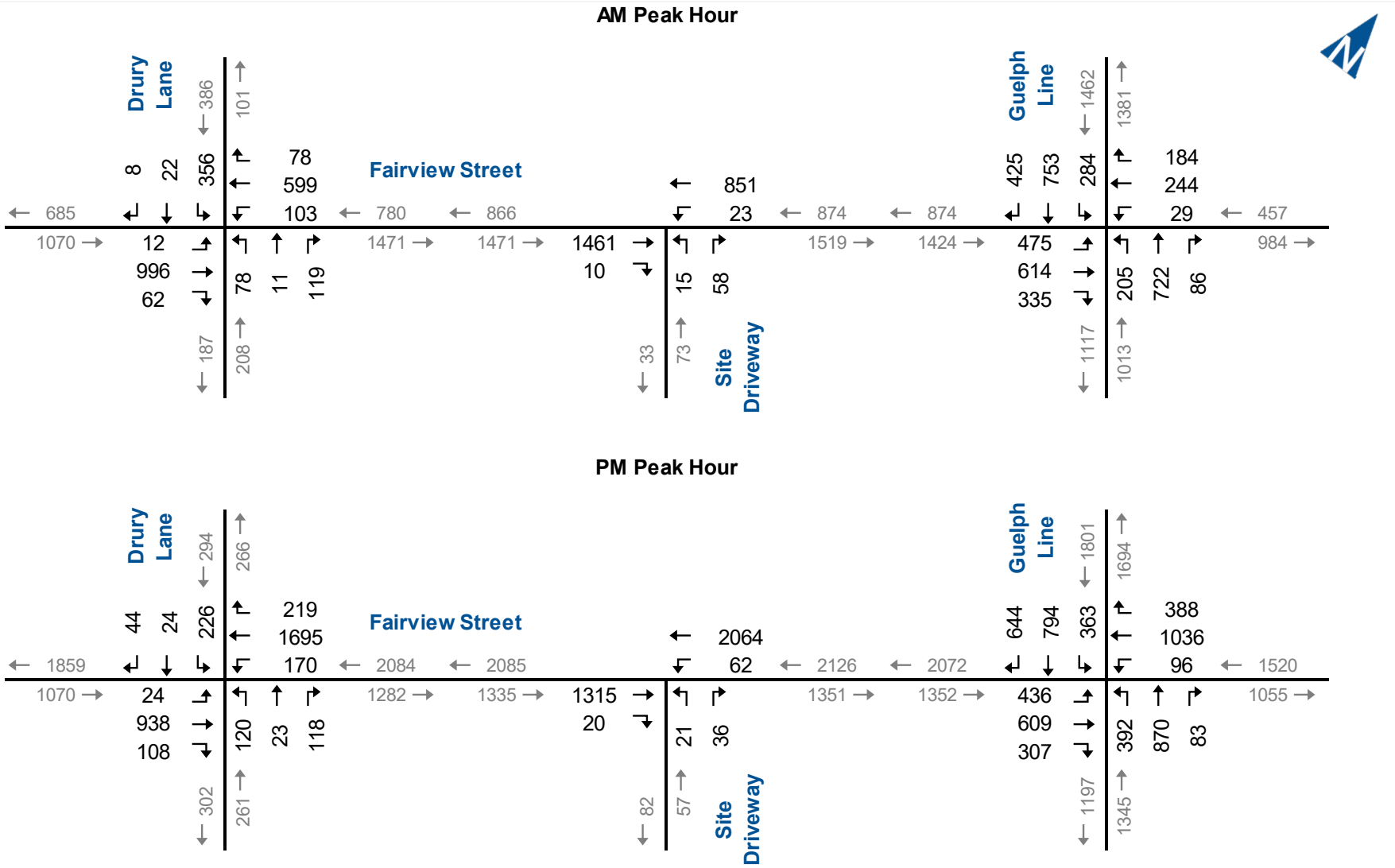
Figure 4.2 illustrates the forecast total traffic volumes.



2028 Background Traffic Volumes

2362 Fairview Street, Burlington TIS and PS
230079

Figure 4.1



2028 Total Traffic Volumes

2362 Fairview Street, Burlington TIS and PS
230079

Figure 4.2

4.2 Background Traffic Operations

The intersection operational analysis for background traffic conditions follows the same methodology used for existing traffic conditions. Signal timings including their cycle lengths are optimized at all signalized intersections. **Table 4.1** summarizes the operational results.

All study area intersections are forecast to operate at acceptable levels of service during the AM and PM peak hour. The exceptions include the following critical movements:

- Fairview Street at Guelph Line:
  - The eastbound left-turn movement is forecast to operate with a v/c ratio greater 1.00 during the PM peak hour, and a queue length exceeding its storage length by 18 and 15 m during the AM and PM peak hours, respectively;
  - The eastbound right-turn movement queue length exceeds its storage length by 33 and 35 m during the AM and PM peak hours, respectively;
  - The westbound left-turn movement queue length exceeds its storage length by 52 m during the PM peak hour;
  - The westbound through movement is forecast to operate with a v/c ratio greater than 1.00 during the PM peak hour;
  - The westbound right-turn movement queue length exceeds its storage length by 66 m during the PM peak hour;
  - The northbound left-turn movement is forecast to operates with a v/c ratio greater than 1.00, and a queue length that exceeds its storage length by 9 m during the PM peak hour; and
  - The southbound right-turn movement is forecast to operate with a v/c ratio greater than 1.00 during the PM peak hour.
- Fairview Street at Drury Lane:
  - The westbound left-turn movement queue length exceeds its storage length by 8 and 12 m during the AM and PM peak hours, respectively;
  - The westbound shared through/right-turn movement is forecast to operate with a v/c ratio greater than 0.85 during the PM peak hour; and

- The southbound approach is forecast to operates with a v/c ratio greater than 0.85 during both the AM and PM peak hours.

Under background traffic conditions, for all movements with reported 95th percentile queues exceeding their available storage, it is noted that the 50th percentile average queue lengths are also found to exceed the available storage lengths. The exception would be the westbound left-turn movement at the intersection of Guelph Line and Fairview Street where its 50th percentile average queues are accommodated by the available storage provisions.

Appendix G contains the supporting detailed Synchro 11 and SimTraffic reports for reference.

TABLE 4.1: BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Fairview Street at Guelph Line	TCS	LOS	D	B	A	**C**	C	D	C	**D**	C	C	C	**C**	D	D	C	**D**	**C**
			Delay	48	19	8	**26**	30	37	34	**36**	33	33	27	**33**	48	40	29	**38**	**33**
			V/C	0.83	0.55	0.33		0.14	0.40	0.13		0.74	0.57	0.06		0.72	0.80	0.30		**0.77**
			Q	78	119	63		15	70	0		51	76	0		113	92	0		
			Stor.	60	-	30		125	-	120		90	-	70		150	-	-		
			Avail.	-18	-	-33		110	-	120		39	-	70		37	-	-		
	Fairview Street at Drury Lane	TCS	LOS	B	C	>	**C**	B	B	>	**B**	C	C	>	**C**	<	D	>	**D**	**C**
			Delay	17	28	>	**28**	20	12	>	**13**	22	21	>	**22**	<	52	>	**52**	**26**
			V/C	0.04	0.74	>		0.49	0.40	>		0.19	0.10	>		<	0.90	>		**0.79**
			Q	11	96	>		28	52	>		29	31	>		<	97	>		
			Stor.	25	-	>		20	-	>		40	-	>		<	-	>		
			Avail.	14	-	>		-8	-	>		11	-	>		<	-	>		
PM Peak Hour	Fairview Street at Guelph Line	TCS	LOS	F	D	C	**E**	C	F	D	**E**	F	D	C	**E**	E	D	F	**E**	**E**
			Delay	127	36	34	**65**	33	95	42	**77**	121	43	34	**64**	65	50	119	**77**	**72**
			V/C	1.08	0.50	0.34		0.33	1.06	0.39		1.12	0.60	0.05		0.78	0.78	1.09		**1.11**
			Q	75	112	65		177	174	186		99	236	25		94	106	24		
			Stor.	60	-	30		125	-	120		90	-	70		150	-	-		
			Avail.	-15	-	-35		-52	-	-66		-9	-	45		56	-	-		
	Fairview Street at Drury Lane	TCS	LOS	C	B	>	**B**	B	C	>	**C**	C	C	>	**C**	<	E	>	**E**	**C**
			Delay	22	18	>	**18**	13	26	>	**24**	29	26	>	**27**	<	69	>	**69**	**26**
			V/C	0.29	0.63	>		0.57	0.94	>		0.40	0.13	>		<	0.94	>		**0.98**
			Q	24	76	>		32	100	>		37	35	>		<	92	>		
			Stor.	25	-	>		20	-	>		40	-	>		<	-	>		
			Avail.	1	-	>		-12	-	>		3	-	>		<	-	>		

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
Stor. - Existing Storage (m)
Avail. - Available Storage (m)
TCS - Traffic Control Signal
< / > - Shared with through movement

4.3 Total Traffic Operations

The intersection operational analysis for total traffic conditions follows the same methodology used for existing and background traffic conditions. Signal timings including their cycle lengths are optimized at all signalized intersections. **Table 4.2** summarizes the operational results.

All study area intersections are forecast to operate at acceptable levels of service during the AM and PM peak hour. The exceptions include the following critical movements:

- Fairview Street at Guelph Line:
  - The eastbound left-turn movement is forecast to operate with a v/c ratio greater than 1.00 during the PM peak hour, and a queue length exceeding its storage length by 18 and 9 m during the AM and PM peak hours, respectively;
  - The eastbound right-turn movement queue length exceeds its storage length by 34 and 35 m during the AM and PM peak hours, respectively;
  - The westbound left-turn movement queue length exceeds its storage length by 48 m during the PM peak hour;
  - The westbound through movement is forecast to operate with a v/c ratio greater than 1.00 during the PM peak hour;
  - The westbound right-turn movement queue length exceeds its storage length by 57 m during the PM peak hour;
  - The northbound left-turn movement is forecast to operates with a v/c ratio greater than 1.00, and a queue length that exceeds its storage length by 8 m during the PM peak hour; and
  - The southbound right-turn movement is forecast to operate with a v/c ratio greater than 1.00 during the PM peak hour.
- Fairview Street at Drury Lane:
  - The westbound left-turn movement queue length exceeds its storage length by 8 and 12 m during the AM and PM peak hours, respectively;
  - The westbound shared through/right-turn movement is forecast to operate with a v/c ratio greater than 0.85 during the PM peak hour; and

- The southbound approach is forecast to operates with a v/c ratio greater than 0.85 during the AM and PM peak hours.

Under total traffic conditions, for all movements with reported 95th percentile queues exceeding their available storage, it is noted that the 50th percentile average queue lengths are also found to exceed the available storage lengths. The only exceptions would be the westbound left-turn movements at the intersections of Guelph Line at Fairview Street and Drury Lane at Fairview Street where the 50th percentile average queues are accommodated by the available storage provisions.

With the addition of the site generated traffic volumes, the approach delays at the study area intersections are forecast to increase by about eight seconds or less during the AM and PM peak hours. Although, the southbound approach delay at the intersection of Fairview Street and Guelph Line increases by 14 seconds during the PM peak hour.

The site driveway approach to Fairview Street is forecast to operate in the LOS B to C range during the AM and PM peak hours. The 50th percentile queue length on the driveway approach is estimated to be 23 m (about three vehicles).

Appendix H contains the supporting detailed Synchro 11 and SimTraffic reports.

TABLE 4.2: TOTAL OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Fairview Street at Guelph Line	TCS	LOS	D	B	A	**C**	C	D	C	**D**	D	C	C	**C**	E	D	C	**D**	**C**
			Delay	49	19	9	**27**	30	37	34	**36**	36	32	26	**32**	56	38	29	**39**	**33**
			V/C	0.86	0.56	0.36		0.14	0.40	0.13		0.78	0.54	0.06		0.82	0.79	0.31		**0.79**
			Q	78	119	64		18	68	0		50	75	0		140	172	56		
			Stor.	60	-	30		125	-	120		90	-	70		150	-	-		
			Avail.	-18	-	-34		107	-	120		40	-	70		10	-	-		
	Fairview Street at Drury Lane	TCS	LOS	B	C	>	**C**	C	B	>	**B**	C	C	>	**C**	<	D	>	**D**	**C**
			Delay	18	29	>	**29**	21	12	>	**14**	22	22	>	**22**	<	54	>	**54**	**27**
			V/C	0.04	0.76	>		0.48	0.40	>		0.19	0.10	>		<	0.91	>		**0.80**
			Q	16	122	>		28	55	>		30	29	>		<	99	>		
			Stor.	25	-	>		20	-	>		40	-	>		<	-	>		
			Avail.	9	-	>		-8	-	>		10	-	>		<	-	>		
	Fairview Street at Site Driveway	TWSC	LOS		A	>	**A**	B	A		**A**	B		>	**B**					
			Delay		0	>	**0**	13	0		**0**	14		>	**14**					
			V/C		0.62	>		0.05	0.27			0.16		>						
			Q		205	>		12	0			49		>						
			Stor.		-	>		15	-			-		>						
			Avail.		-	>		3	-			-		>						
PM Peak Hour	Fairview Street at Guelph Line	TCS	LOS	F	D	C	**E**	C	F	D	**F**	F	D	D	**E**	E	D	F	**F**	**E**
			Delay	117	36	34	**61**	33	102	43	**82**	141	44	35	**72**	65	54	153	**91**	**78**
			V/C	1.05	0.50	0.34		0.33	1.08	0.39		1.17	0.61	0.05		0.78	0.83	1.18		**1.15**
			Q	69	108	65		173	170	177		98	234	23		81	114	36		
			Stor.	60	-	30		125	-	120		90	-	70		150	-	-		
			Avail.	-9	-	-35		-48	-	-57		-8	-	47		69	-	-		
	Fairview Street at Drury Lane	TCS	LOS	C	B	>	**B**	B	C	>	**C**	C	C	>	**C**	<	E	>	**E**	**C**
			Delay	22	19	>	**19**	14	26	>	**25**	29	26	>	**27**	<	70	>	**70**	**27**
			V/C	0.29	0.64	>		0.59	0.95	>		0.40	0.13	>		<	0.95	>		**0.99**
			Q	24	77	>		32	98	>		36	34	>		<	83	>		
			Stor.	25	-	>		20	-	>		40	-	>		<	-	>		
			Avail.	1	-	>		-12	-	>		4	-	>		<	-	>		
	Fairview Street at Site Driveway	TWSC	LOS		A	>	**A**	B	A		**A**	C		>	**C**					
			Delay		0	>	**0**	13	0		**0**	17		>	**17**					
			V/C		0.56	>		0.13	0.66			0.17		>						
			Q		37	>		17	17			32		>						
			Stor.		-	>		15	-			-		>						
			Avail.		-	>		-2	-			-		>						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
Stor. - Existing Storage (m)
Avail. - Available Storage (m)
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
< / > - Shared with through movement

5 Remedial Measures

5.1 Traffic Signal Warrant

The need for traffic control improvements is assessed using the Ontario Traffic Manual (OTM Book 12) signal warrant[11] procedures. To warrant the consideration for installation of traffic signal control with forecast traffic volumes (average hourly volumes), at least one warrant must be fulfilled by 120% for an existing intersection or 150% for a proposed intersection.

Table 5.1 summarizes the OTM signal warrants for the site driveway intersection with Fairview Street. Based on the warrant analysis, consideration of the implementation of traffic signal control is not warranted. The site driveway approach should operate as unsignalized with stop-control on the Fairview Street approach.

Appendix I contains the warrant analysis.

TABLE 5.1: OTM WARRANT SUMMARY

Horizon Year	OTM Warrant				Warranted
	1A	1B	2A	2B	
Total Traffic	165%	13%	161%	12%	**No**

5.2 Total Traffic Operations with Remedial Measures

To help manage the identified intersection capacity constraints and queue lengths at the study area intersections the following remedial measures could be considered:

- Fairview Street at Guelph Line:
  - Optimized signal timings with a modified cycle length;
  - Based on existing conditions, extend the westbound left-turn storage length from 125 m to 180 m. The widening of Fairview Street would be required;
  - Based on existing conditions, extend the westbound right-turn storage length from 120 m to 190 m. The widening of Fairview Street would be required;

[11] Ontario Ministry of Transportation, *Ontario Traffic Manual Book 12: Traffic Signals,* (Toronto: Queen's Printer for Ontario, 2012).

- Based on existing conditions, convert the existing northbound left-turn lane shadow to a second northbound left-turn lane. With the implementation of dual left-turn lanes, the northbound left-turn phase should operate as a fully protected signal phase.

- Fairview Street at Drury Lane:
  - Optimized signal timings with a modified cycle length;
  - Based on existing conditions, repaint the existing westbound left-turn lane to provide 35 m of storage (additional 15 m);
  - Based on background traffic conditions, add a separate 30 m southbound left-turn lane opposite of the existing northbound left-turn lane; and
  - Based on background traffic conditions, add a separate protected permissive southbound left-turn phase at the intersection.

Table 5.2 summarizes the level of service conditions for the weekday AM and PM peak hours with remedial measures in place. Several movements are identified to still be critical and are noted as follows:

- Guelph Line at Fairview Street:
  - The eastbound left-turn movement is forecast to have a 95th percentile queue length that exceeds the available storage by 12 and 17 m during the AM and PM peak hours. However, it is expected that the 50th percentile queue lengths will be contained by the available provisions;
  - The eastbound right-turn movement is forecast to have a queue length that exceeds its storage length by 16 and 33 m during the AM and PM peak hours. It is expected that the 50th percentile queue lengths will be contained by the available provisions;
  - The westbound left-turn movement is forecast to have a 95th percentile queue length that exceeds its storage length by 87 m during the PM peak hour. It is expected that the 50th percentile queue lengths will be contained by the proposed provision;
  - The westbound through movement is forecast to operate with a v/c ratio greater 0.85 during the PM peak hour;
  - The westbound right-turn movement 95th percentile queue length exceeds its storage length by 88 m during the PM

peak hour. It is expected that the 50th percentile queue lengths will be contained by the proposed storage length;

- The northbound left-turn movement 95th percentile queue length exceeds its storage length by 18 m during the PM peak hour. It is expected that the 50th percentile queue lengths will be contained by the available provisions;
- The southbound through movement is forecast to operate with a v/c ratio greater than 0.85 during the PM peak hour.
- The southbound right-turn movement is forecast to operate with a v/c ratio greater than 1.00 during the PM peak hour.

- Fairview Street at Drury Lane:
  - The eastbound left-turn movement 95th percentile queue length exceeds its storage length by 4 m during the PM peak hour. It is expected that the 50th percentile queue lengths will be contained by the available provisions;
  - The westbound left-turn movement 95th percentile queue length exceeds its storage length by 12 m during the PM peak hour. It is expected that the 50th percentile queue lengths will be contained by the proposed provisions;
  - The westbound shared through/right-turn movement is forecast to operate with a v/c ratio equal to 0.85 during the PM peak hour;
  - The northbound left-turn movement 95th percentile queue length exceeds its storage length by 2 m during the PM peak hour. It is expected that the 50th percentile queue lengths will be contained by the available provisions; and
  - The southbound left-turn movement queue length spills back and encroaches to the private driveway proposed for 2243, 2269 Fairview Street and 864 Drury Lane during the AM and PM peak hours.

The above noted remedial measures do not fully resolve the operational deficiencies. During peak hours, the reported 95th percentile queue lengths are forecast to be greater than the available storage. 50th percentile average queues can generally be accommodated within the existing/proposed storage lane lengths or within the taper lane. Although, the southbound left-turn movement at the intersection of Fairview Street and Drury Lane is forecast to have a 50th percentile queue length that surpasses the proposed storage length during the AM and PM peak hours.

Additionally, during peak hours select turning movements are forecast to have v/c ratios greater than 0.85. However, we do note that these movements will be within capacity except for the southbound right-turn movement at the intersection of Guelph Line and Fairview Street during the PM peak hour.

Appendix J contains the supporting detailed Synchro 11 and SimTraffic reports.

TABLE 5.2: TOTAL TRAFFIC OPERATIONS WITH REMEDIAL MEASURES

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Fairview Street at Guelph Line	TCS	LOS	D	C	B	**C**	C	D	D	**D**	E	D	D	**D**	E	D	D	**D**	**D**
			Delay	53	20	13	**30**	31	38	36	**36**	62	43	35	**46**	56	49	36	**47**	**40**
			V/C	0.84	0.47	0.35		0.12	0.31	0.13		0.73	0.63	0.06		0.71	0.84	0.31		**0.74**
			Q	72	93	46		12	51	0		55	84	0		61	95	0		
			Stor.	60	-	30		180	-	190		90	-	70		150	-	-		
			Avail.	-12	-	-16		168	-	190		35	-	70		89	-	-		
	Fairview Street at Drury Lane	TCS	LOS	B	C	>	**C**	A	A	>	**A**	E	D	>	**D**	D	C	>	**D**	**C**
			Delay	16	25	>	**25**	10	6	>	**7**	56	49	>	**52**	49	29	>	**48**	**25**
			V/C	0.03	0.65	>		0.39	0.36	>		0.57	0.14	>		0.84	0.05	>		**0.25**
			Q	13	106	>		28	43	>		35	37	>		40	113	>		
			Stor.	25	-	>		35	-	>		40	-	>		30	-	>		
			Avail.	12	-	>		7	-	>		5	-	>		-10	-	>		
	Fairview Street at Site Driveway	TWSC	LOS		A	>	**A**	B	A		**A**	B		>	**B**					
			Delay		0	>	**0**	13	0		**0**	15		>	**15**					
			V/C		0.62	>		0.06	0.27			0.18		>						
			Q		1	>		11	0			27		>						
			Stor.		-	>		15	-			-		>						
			Avail.		-	>		4	-			-		>						
PM Peak Hour	Fairview Street at Guelph Line	TCS	LOS	E	C	C	**D**	C	E	D	**E**	E	D	D	**D**	E	E	F	**F**	**E**
			Delay	66	28	29	**41**	25	66	37	**56**	77	46	35	**54**	77	71	218	**125**	**73**
			V/C	0.93	0.47	0.31		0.27	0.99	0.43		0.92	0.72	0.05		0.92	0.97	1.34		**1.07**
			Q	77	105	63		267	231	278		108	170	11		147	194	88		
			Stor.	60	-	30		180	-	190		90	-	70		150	-	-		
			Avail.	-17	-	-33		-87	-	-88		-18	-	59		3	-	-		
	Fairview Street at Drury Lane	TCS	LOS	C	B	>	**B**	B	A	>	**A**	E	D	>	**D**	F	D	>	**E**	**B**
			Delay	32	17	>	**18**	12	9	>	**9**	60	46	>	**53**	84	38	>	**73**	**20**
			V/C	0.40	0.55	>		0.51	0.85	>		0.69	0.18	>		0.93	0.15	>		**0.92**
			Q	29	97	>		47	96	>		42	46	>		44	98	>		
			Stor.	25	-	>		35	-	>		40	-	>		30	-	>		
			Avail.	-4	-	>		-12	-	>		-2	-	>		-14	-	>		
	Fairview Street at Site Driveway	TWSC	LOS		A	>	**A**	B	A		**A**	C		>	**C**					
			Delay		0	>	**0**	13	0		**0**	18		>	**18**					
			V/C		0.56	>		0.13	0.66			0.18		>						
			Q		1	>		18	12			32		>						
			Stor.		-	>		15	-			-		>						
			Avail.		-	>		-3	-			-		>						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
Stor. - Existing Storage (m)
Avail. - Available Storage (m)
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control
< / > - Shared with through movement

6 Parking

6.1 Proposed Supply

6.1.1 Vehicle Parking

The proposed parking supply is identified as 390 spaces (1.15 spaces per unit). The parking supply is allocated as:

- Occupant parking – 348 spaces (1.03 per unit); and
- Visitor parking (residential visitors and retail/community space visitors) – 42 spaces (0.12 spaces per unit).

6.1.2 Bicycle Parking

The site's short-term bicycle parking supply consists of 24 spaces (0.07 spaces per unit). The short-term spaces are located at-grade and are detailed on the site's landscaping plan.

The site's long-term bicycle parking spaces consists of 165 spaces (0.49 spaces per unit). Long-term bicycle parking spaces are provided within the site's parking structure.

6.2 Zoning By-law Requirements

The City of Burlington's Zoning By-law 2020[12] prescribes parking ratios for apartment buildings for Occupants (O) and Visitors (V). The zoning by-law mandates 1.25 spaces per unit inclusive of visitor parking for apartment buildings within a Secondary Growth Area.

The retail store and other land uses are mandated to provide 3.5 spaces and 3.0 spaces per 100 m^2, respectively.

Table 6.1 summarizes the site's Zoning By-law parking requirements. Compared to the city's zoning requirements the site's parking supply is theoretically deficient by 52 spaces.

[12] Zoning By-Law 2020/Part 1 - General Conditions and Provisions/2.0 General Provisions

TABLE 6.1: ZONING BY-LAW PARKING REQUIREMENT

Land Use	Rate	Total
Apartment Unit (338 units)	1.25 per unit inclusive of occupant and visitor	423
Retail Store (247 m^2)	3.5 per 100 m^2	9
Community Space (307 m^2)	3.0 per 100 m^2	10
Total		**442**
Supply		390
Surplus/Deficit		**-52**

6.3 City-Wide Parking Standards

The City of Burlington is updating the Zoning By-law that regulates off-street parking requirements. The City of Burlington's City-Wide Parking Standards Review[13] report includes recommended parking ratios for various land uses throughout the city and provides unique ratios for sites located within Intensification Areas such as the subject site.

The City-Wide Parking Standards Review proposes a reduced parking requirement for office and retail space. The reduced parking requirement is 2.0 spaces per 100 m^2 and 1.5 spaces per 100 m^2, respectively.

Table 6.2 and **Table 6.3** summarize the site's parking requirement using the City-Wide Parking Standards Review. Compared to the City's zoning requirements the site's parking supply is theoretically deficient by 44 spaces.

When the shared parking methodology outlined in the City-Wide Parking standards report is considered, the site's forecast parking demand is reduced to 429 spaces resulting in a theoretical deficiency of 39 spaces.

[13] IBI Group and City of Burlington, *Burlington City-Wide Parking Standards Review, Table 1: Summary of changes to the parking standards,* (Burlington: City of Burlington, 2017).

TABLE 6.2: CITY-WIDE PARKING STANDARDS

Land Use	Rate	Total
Apartment Unit (338 units)	1.25 per unit inclusive of occupant and visitor	423
Retail Store (247 m^2)	1.5 per 100 m^2	4
Community Space (307 m^2)	2.0 per 100 m^2	7
Total		**434**
Supply		390
Surplus/Deficit		**-44**

TABLE 6.3: SHARED PARKING CALCULATION

Land Use	Weekday			Weekend		
	Day	Evening	Overnight	Day	Evening	Overnight
Apartment	60%	100%	100%	80%	100%	100%
Retail	90%	80%	5%	100%	70%	5%
Community	100%	20%	5%	5%	5%	5%
Apartment	254	423	423	339	423	423
Retail	4	4	1	4	3	1
Community	7	2	1	1	1	1
Peak	**265**	**429**	**425**	**344**	**427**	**425**
Supply	**390**	**390**	**390**	**390**	**390**	**390**
Delta	**125**	**-39**	**-35**	**46**	**-37**	**-35**

6.4 Local Parking Survey Data

A proven method of estimating parking demands is to survey existing sites with the same land use. Local surveys are a real-world reflection of parking demand.

Paradigm and City of Burlington Staff previously collected parking data for apartment buildings within the City. The parking utilization surveys were undertaken at seven different sites. The sites include:

- 1284 Guelph Line – 78 units – 4 observations by Paradigm;
- 551 Maple Avenue – 186 units – 4 observations by Paradigm;
- 360 Pearl Street – 75 units – 4 observations by Paradigm and 6 observations by the City.

- 442 Maple Avenue – 135 units – 6 observations by the City;
- 505 Locust Street – 117 units – 6 observations by the City;
- 2121 Lakeshore Road – 39 units – 4 observations by the City; and
- 1477 Lakeshore Road – 60 units – 6 observations by the City.

Parking demand data collected by Paradigm was collected in 15-minute intervals from 16:00 to 22:00 on weekdays (Tuesday-Thursday) between April and November 2016. The City collected spot observations between 20:00 and 23:00 on weekdays (Tuesday or Thursdays).

The collected parking utilization data is in line with industry standard data collection methods and is representative of parking demand at local multi-family buildings.

The following parking demands were observed:

- Paradigm
  - Occupant demands range from 0.68 to 0.83 spaces per unit.
  - Visitor demands range from 0.08 to 0.24 spaces per unit.
- City
  - Occupant demands range from 0.86 to 1.25 spaces per unit.
  - Visitor demands range from 0.00 to 0.06 spaces per unit.

Figure 6.1 illustrates the data plots for the occupant and visitor parking and provides equations utilized to calculate the parking demands.

Table 6.4 summarizes the site's forecast parking demand for the apartment units using the proxy site data and the forecast parking demand for the retail land uses using the city-wide parking standards rate.

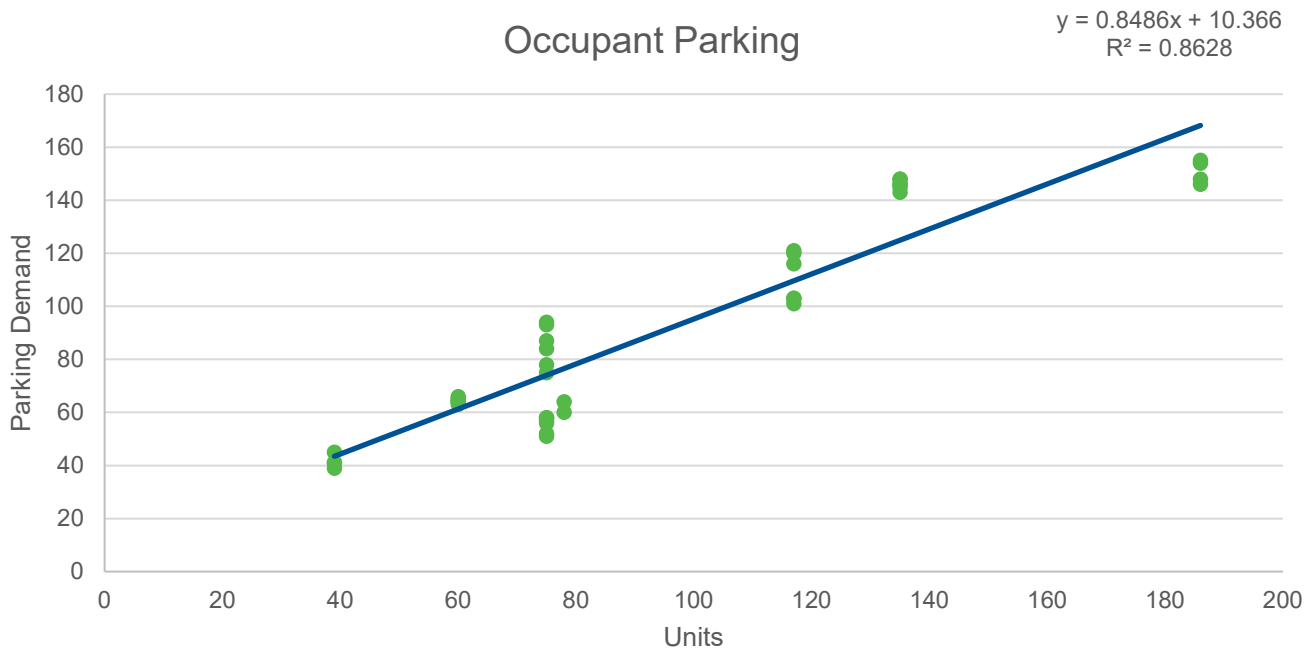
Based on the Burlington market parking utilization studies, the forecast parking demand for the subject site is estimated to be approximately 329 parking spaces for the residential land use.

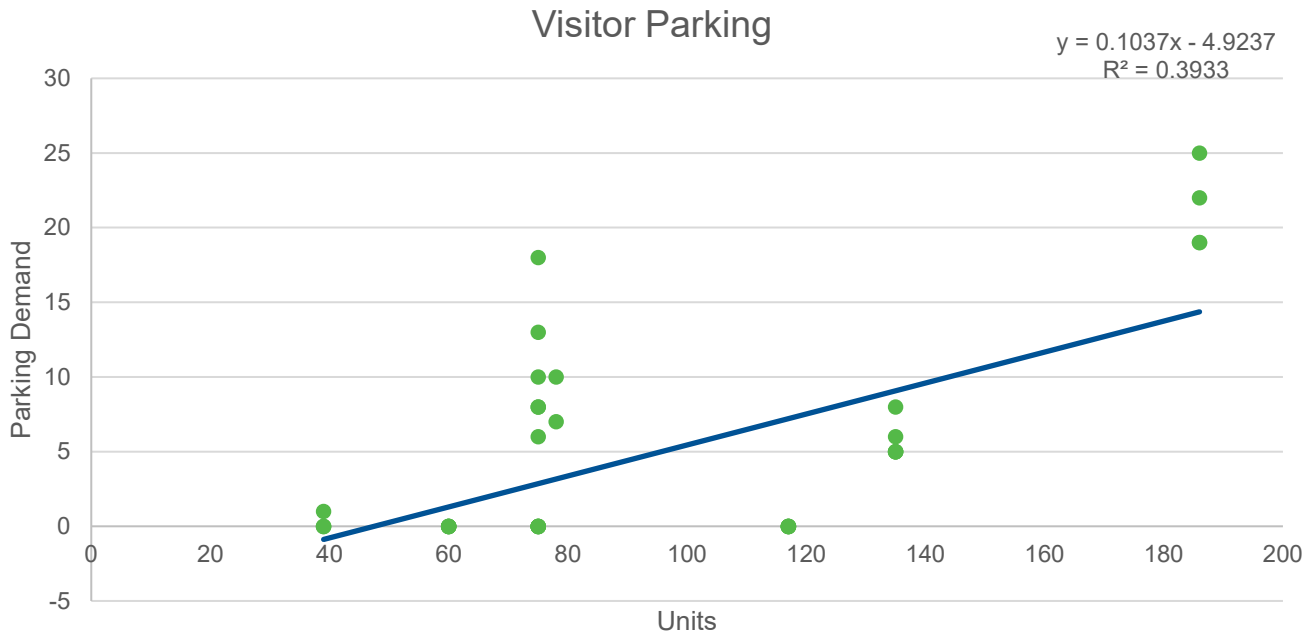
When the city-wide parking requirements for the retail and office space land uses are considered (12 spaces total) the site's overall parking demand is forecast to be 341 spaces. With a proposed parking provision of 390 spaces, the site's overall parking demand is estimated to be less than the proposed supply. The site's visitor parking supply

(residential visitors and retail patrons) should consist of at least 43 spaces.

TABLE 6.4: PROXY SITE DATA FORECAST PARKING DEMAND

Land Use	Occupant	Visitor	Total
Apartment	298	31	**329**
Retail (City-Wide)	-	4	**4**
Community Space (City-Wide)	-	7	**7**
Total	**298**	**42**	**340**
Supply	**372**	**18**	**390**
Surplus/Deficit	**74**	**-24**	**50**





paradigm TRANSPORTATION SOLUTIONS LIMITED

Occupant & Visitor Parking Data Plot

2362 Fairview Street, Burlington TIS and PS
230079

Figure 6.1

6.5 TDM Parking Reduction

The City of Burlington currently does not have a method for calculating a parking reduction based on a proposed TDM program.

The Region of Waterloo TDM Checklist[14] was reviewed to determine potential parking reductions based on the TDM plan outlined in **Section 3.3**.

With the TDM measures proposed, the site's potential parking reduction is calculated to be 12% of the parking requirement. The reduction in parking is related to:

- **Pedestrian & Cyclist Orientation – 4% reduction**
  - 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% reduction.
  - Non-Residential: Development provides secure bike storage for 4% of the building occupants – 2% reduction.
  - Provision of active uses at-grade along street frontages – 1% reduction.
- **Parking – 3 % reduction**
  - 75% of parking or more is located underground or in a structure – 3% reduction.
- **Trip Reduction Incentives – 5% reduction**
  - The building owner/occupant agrees to charge for parking as a separate cost to occupants – 5% reduction.

A 12% reduction to the staff supported Zoning By-law rates results in a parking demand of 389 spaces. With 390 spaces proposed, the site's parking supply is sufficient by 1 space.

Appendix K contains the Region of Waterloo TDM Checklist.

[14] Region of Waterloo, *Travel Demand Management (TDM) Implementation Checklist and Parking Management Worksheet,* (Kitchener: Region of Waterloo, 2013).



6.6 Summary

Using several different methodologies, the site's parking demand is forecast to be in the order of 341 to 391 spaces, depending upon the methodology used to forecast the demand. **Table 6.5** summarizes the parking demand estimates.

The transition from an automobile-dependent environment to one that is transit-supportive will require strategies to assist in shifting mode choice and enabling the emergence of a pedestrian-friendly and transit-supportive environment through TDM measures.

To support the proposed parking supply, a shift in travel modes and vehicle ownership for residents plus the integration of TDM measures will be critical to the development's success.

With a comprehensive TDM program, the site's parking supply of 390 spaces is determined to be sufficient to accommodate the site's parking demand. The site's visitor parking supply should consist of at least 43 spaces (0.13 spaces per unit).

TABLE 6.5: SUMMARY OF PARKING DEMAND ESTIMATES

Methodology	Estimated Parking Demand				Supply
	Apartment	Retail	Community	Total	
Burlington Parking Proxy Data	329	4	7	**340**	**390**
City of Burlington Zoning By-law with TDM	372	8	19	**389**	**390**

Based upon the preceding analysis it is determined the proposed overall parking supply of 390 spaces will be adequate in serving the development. It is recommended that parking be allocated as follows:

- Occupant parking = 348 spaces;
- Visitor parking – shared for all land uses = 42 spaces
  - Residential = 24 spaces;
  - Retail = 5 spaces; and
  - Community = 13 spaces.
- Bicycle parking
  - Long-term spaces (occupants) = 169 spaces
  - Short-term spaces (visitors + commercial) = 20 spaces.

7 Conclusions and Recommendations

7.1 Conclusions

Based on the investigations carried out, it is concluded that:

Transportation Impact Study

- **Existing Traffic Conditions:** The study area intersections are currently operating with several critical movements during the AM and PM peak hours. The movements noted from Synchro and SimTraffic include:

  Guelph Line at Fairview Street:

  - The eastbound left-turn, eastbound right-turn, westbound left-turn, westbound right-turn, and northbound left-turn movements report 95th percentile queue lengths greater than the available storage.
  - The westbound through movement is reported to operate with a v/c ratio greater than 0.85 during the PM peak hour.

  Fairview Street at Drury Lane:

  - The westbound left-turn movement reports a 95th percentile queue length greater than the available storage.
- **Development Trip Generation:** The development is forecast to generate approximately 106 and 131 vehicular trips during the AM and PM peak hours, respectively.
- **Transportation Demand Management:** The site concept plan includes TDM measures intended to assist in mitigating the site's transportation and parking impacts. The provided TDM measures are aimed to further promote walking, transit, cycling, reducing parking demands, and providing education/promotion.
- **Background Traffic Conditions:** The study area intersections are forecast to operate similar to existing conditions; however, slightly exacerbated due to the inclusion of general background growth and background development site traffic contributions. The following additional critical movements are identified as a result of non-site generated traffic contributions:

  Guelph Line at Fairview Street:

  - The southbound right-turn movement is forecast to operate with a v/c ratio greater 1.00 during the PM Peak hour.

Fairview Street at Drury Lane:

- The westbound shared through/right-turn movement is forecast to operate with a v/c ratio greater 0.85 during the PM peak hour.
- The southbound approach is forecast to operate with a v/c ratio greater 0.85 during the AM and PM peak hours.

- **Total Traffic Conditions:** The study area intersections are forecast to continue to operate with capacity constraints similar to background traffic conditions with no additional critical movements;
- **Traffic Control Signals:** Traffic control signal is not warranted at the intersection of Fairview Street and the Site Driveway.
- **Total Traffic Conditions with Remedial Measures:** The study area intersections are forecast to operate at acceptable levels of service with the following improvements and the forecast queuing issues generally remaining unresolved:

Fairview Street at Guelph Line:

- Optimized signal timings with a modified cycle length;
- An extension of the westbound left-turn storage length from 125 m to 180 m;
- An extension of the westbound right-turn storage length from 120 m to 190 m; and
- A conversion of the existing northbound left-turn lane shadow (i.e., pavement markings changes) to a second northbound left-turn lane and operating as a fully protected signal phase for the dual left-turn configuration.

Fairview Street at Drury Lane:

- Optimized signal timings with a modified cycle length;
- An extension of the westbound left-turn lane through repainting the existing turn lane to provide 35 m of storage (additional 15 m);
- The addition of a separate 30 m southbound left-turn lane opposite of the existing northbound left-turn lane; and
- The addition of a protected-permissive southbound left-turn advance phase at the intersection.

Parking Study

- The proposed parking supply is identified as 390 spaces and is forecast to accommodate the sites parking demand. The parking supply is allocated as:
  - Occupant parking – 348 spaces; and
  - Visitor parking (residential visitors and retail/community space visitors) – 42 spaces.
- The site's bicycle parking supply consists of 189 spaces (169 long-term spaces and 39 short-term spaces). The supply exceeds the City's zoning requirements.

7.2 Recommendations

Based on the findings of this study, it is recommended that:

- The site's TDM program be implemented and monitored over time to help manage the site's transportation and parking impacts. At the site plan approval stage, refinements to the site's TDM program can be made (for example, location of bicycle parking).

Based on existing and background traffic conditions, it is recommended that:

- The road authorities consider extending the westbound left-turn storage length at the intersection of Guelph Line and Fairview Street from 125 m to 180 m;
- The road authorities consider extending the westbound right-turn storage length at the intersection of Guelph Line and Fairview from 120 m to 190 m;
- The road authorities consider converting the existing northbound shadow lane at the intersection of Guelph Line and Fairview Street to provide a second northbound left-turn lane. The dual northbound left-turn lanes should operate with a fully protected signal phase;
- The road authorities consider repainting the westbound left-turn at the Fairview Street intersection with Drury Lane to provide a total of 35 m of storage;
- The road authorities consider the implementation of a 30 m southbound left-turn lane on Drury Lane at the Fairview Street intersection to accommodate impacts of the adjacent 2243,

2269 Fairview Street and 864 Drury Lane background developments; and

- Provision of a protected permissive southbound left-turn phase at the Fairview Street intersection with Drury Lane to accompany the aforementioned auxiliary turn lane

Appendix A

Pre-Study Material

From: Adiga, Smeeta <Smeeta.Adiga@burlington.ca>
Sent: April 18, 2023 11:14 AM
To: Andrew Orr
Cc: Lucas, Sandra; Scott Catton; Krusto, Matt
Subject: FW: (230079) 2362 Fairview Street, Burlington TIS and PS

Hi Andrew,

Please see below TIS scope of work comments (in red). If you have any questions or concerns, don't hesitate to reach out.

Thanks,

Smeeta Adiga
Transportation Planning Technologist
Transportation Services Department

P. 905 335 7600, ext 7691 | E. smeeta.adiga@burlington.ca
Address: 426 Brant Street P.O. Box 5013, Burlington, Ontario, L7R 3Z6

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Our working hours may be different. You are not obligated to reply outside of your typical working hours.

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From: Andrew Orr <aorr@ptsl.com>
Sent: April 12, 2023 9:35 AM
To: Sandra.Lucas@burlington.ca; Krusto, Matt <Matt.Krusto@halton.ca>
Cc: Scott Catton <scatton@ptsl.com>
Subject: (230079) 2362 Fairview Street, Burlington TIS and PS

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Hello Sandra and Matt,

Paradigm has been retained to conduct a Transportation Impact & Parking Study for a proposed mixed-use development located at 2362 Fairview Street in the City of Burlington. The preliminary concept plan includes 207 residential units and 994 m^2 of ground floor retail space. Vehicle access is proposed via private driveway to Fairview Street. The preliminary concept plan is attached.

We'd like to prepare our report based on the following scope, subject to your comments:

PROPOSED TERMS OF REFERENCE

Follow Halton Region's Transportation Impact Study Guidelines.

Study Area Intersections:

- Fairview Street at Guelph Line (signalized);
- Fairview Street at Drury Lane (signalized); and
- Fairview Street at the proposed site driveway (unsignalized).

Analysis Periods:

- Weekday AM peak hour; and
- Weekday PM peak hour.

Existing Data:

TMC data to be collected by Paradigm in April 2023. (Ensure the report included the existing traffic volumes and turning movements for all roadways and intersections with in the study area, including pedestrian, cyclist and heavy vehicle volumes)

Horizon Year

- Existing Conditions; and
- Five-years from the date the study is commissioned – Year 2028.

Analysis

- Synchro 11, HCM 2000 analysis
- SimTraffic queuing analysis (five 60-minute simulations with 15-minutes of seed time) (Synchro analysis file must be submitted along with the report)

Background Traffic

- Background traffic annual growth rate. **Please confirm**
  (annual growth rate of 1% per annum)
- Any additional developments identified by City. **Please confirm**

Please include:

2243,2269 Fairview Street and 864 Drury Lane: 7 residential tower on top of four mixed use podium. A total of 2494 residential units with 3993 sq. m of commercial space.

Future Road Improvements:

- **None unless identified**

Trip Generation

- ITE Trip Generation Data 11th Edition with no modal split reductions. The estimation of traffic volumes shall be based on full build-out condition and/or maximum land use intensity allowed.

Site Traffic Distribution

- Existing Traffic Patterns.

Remedial Measures

- TAC left-turn lane warrants; and
- OTM signal warrants.

Parking Study

- ITE Parking Generation Data 5th Edition
- 2016 Transportation Tomorrow Survey (TTS) Data; and
- Inhouse proxy site data.

- Require Transportation Demand Management (TDM) and mitigation measures

Site Circulation:

Auto Turn Analysis for garbage tuck and loading truck to/from any loading and waste collection area.

Best Regards,

Andrew Orr, M.A.Sc., EIT
Transportation Consultant

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road, Cambridge ON N1R 8J8
p: 519.896.3163 x210
m: 289-808-8997
e: aorr@ptsl.com
w: www.ptsl.com



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From: Huycke, Adam <Adam.Huycke@halton.ca>
Sent: April 13, 2023 8:32 AM
To: Andrew Orr
Cc: Scott Catton; Scattolon, Walter; Krusto, Matt; Dickson, Gordon
Subject: RE: (230079) 2362 Fairview Street, Burlington TIS and PS
Attachments: 3. Site Plan.pdf

Good Morning Andrew,

Further to your request, Regional Staff have now had an opportunity to consider your TIS Terms of Reference submission for the proposed development at 2362 Fairview Street in Burlington (proposed site plan application). We offer the following comments for your consideration:

PROPOSED TERMS OF REFERENCE

Study Area Intersections:
- Fairview Street at Guelph Line (signalized);
- Fairview Street at Drury Lane (signalized); and
- Fairview Street at the proposed site driveway (unsignalized).

Analysis Periods:
- Weekday AM peak hour; and
- Weekday PM peak hour.

Existing Data:
- TMC data to be collected by Paradigm in April 2023.

Horizon Year
- Existing Conditions; and
- Five-years from the date the study is commissioned – Year 2028.

Analysis
- Synchro 11, HCM 2000 analysis
- SimTraffic queuing analysis (five 60-minute simulations with 15-minutes of seed time)

Background Traffic
- Background traffic annual growth rate. **Please confirm**
- Any additional developments identified by City. **Please confirm**

Future Road Improvements:
- **None unless identified**

Trip Generation
- ITE Trip Generation Data 11th Edition with no modal split reductions.

Site Traffic Distribution
- Existing Traffic Patterns.

Remedial Measures
- TAC left-turn lane warrants; and
- OTM signal warrants.

Parking Study
- ITE Parking Generation Data 5th Edition
- 2016 Transportation Tomorrow Survey (TTS) Data; and
- Inhouse proxy site data.

The proposed Terms of Reference is generally **acceptable**, and the Region provides the following comments and notes:

Study Area Intersections:

Inclusion of the Regional Intersection at Guelph Line (Regional Road 1) and Fairview Street intersection (signalized); as proposed, is acceptable.

Background Developments:
Please contact the City of Burlington for this information.

Future Background Growth Rate:
A growth rate of 2.0% per annum may be applied to through movements along Guelph Line (Regional Road 1) to account for background growth in the area.

Future Road Improvements:
No improvements at the Guelph Line (Regional Road 1) and Fairview Street intersection are planned in the 10-year Capital plan (2023-2032).

Traffic Data:
To co-ordinate and validate the TMC data proposed to be collected by Paradigm in April 2023, please contact trafficdatarequests@halton.ca to request any traffic data or signal timing plans that may be available from Halton Region for the Guelph Line (Regional Road 1) and Fairview Street intersection.

TIS Report Requirements:
Please note, the TIS Guidelines for Halton Region can be found at the following web link:
https://www.halton.ca/Repository/Transportation-Impact-Study-Guidelines

The TIS report shall include:

- Site Plan and Map,
- Size & Number of Development Phases,
- Existing Conditions (Study Area Intersections, Road Network, Pedestrian Routes, Cycling Routes, Transit Services),
- Existing Traffic Conditions (Site Operating Characteristics, Data Collection/Traffic Counts, Analysis Periods (5 years Ahead)),
- Future Background Conditions (Horizon Years, Horizon Year Volumes)
- Background Traffic Demand (with TMC's < 2 years old),
- Background Traffic Demand Forecast (with acceptable growth rates)
- Site Generated Traffic (Transit Modal Split, Trip Generation/Distribution/Assignment)
- Future Total Traffic Demand,
- Capacity Analysis (by Intersection, with LOS, Avg. Delay, V/C ratios),
- Traffic Impacts (Tables – Total Traffic with/without Mitigation)
- Access Considerations – Existing, Proposed, Geometrics (turn lanes, sight lines),
- Recommendations - Identify required/recommended road improvements either as a result of the development impacts, or general non-development improvements.
- TDM recommendations (Transit, Pedestrian & Cycling Facilities Analysis)
- Conclusions

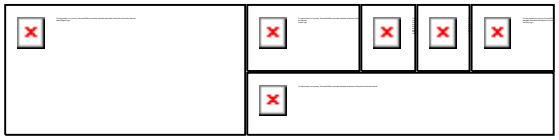
Please let me know if you have any questions or concerns on the above.

Kind regards,

Adam

Adam Huycke, MCIP, RPP, CPT
Senior Planner

Planning Services
Legislative & Planning Services
Halton Region
905-825-6000, ext. 7604 | 1-866-442-5866



From: Andrew Orr <aorr@ptsl.com>
Sent: Wednesday, April 12, 2023 12:52 PM
To: Huycke, Adam <Adam.Huycke@halton.ca>
Cc: Scott Catton <scatton@ptsl.com>
Subject: FW: (230079) 2362 Fairview Street, Burlington TIS and PS

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Hi Adam,

I was wondering if you could provide comments on the terms of reference below. The preliminary concept plan is attached.

Best Regards,

Andrew Orr, M.A.Sc., EIT
Transportation Consultant

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road, Cambridge ON N1R 8J8
p: 519.896.3163 x210
m: 289-808-8997
e: aorr@ptsl.com
w: www.ptsl.com



From: Krusto, Matt <Matt.Krusto@halton.ca>
Sent: Wednesday, April 12, 2023 9:58 AM
To: Andrew Orr <aorr@ptsl.com>; Sandra.Lucas@burlington.ca
Cc: Scott Catton <scatton@ptsl.com>
Subject: RE: (230079) 2362 Fairview Street, Burlington TIS and PS

Hi Andrew,

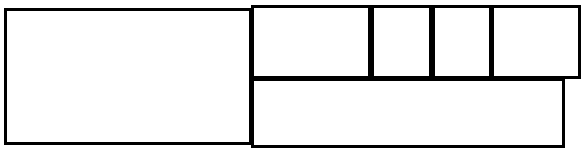
Thanks for the email.

Please send your request directly to the Senior Planner at Halton for the Burlington area (Adam Huycke Adam.Huycke@halton.ca). He will review and circulate your request internally to the appropriate staff.

Thanks,

Matt

Matt Krusto
Supervisor, Transportation Development Review
Infrastructure Planning & Policy
Public Works
Halton Region
905-825-6000, ext. 7225 | 1-866-442-5866



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From: Andrew Orr <aorr@ptsl.com>
Sent: April 12, 2023 9:35 AM
To: Sandra.Lucas@burlington.ca; Krusto, Matt <Matt.Krusto@halton.ca>
Cc: Scott Catton <scatton@ptsl.com>
Subject: (230079) 2362 Fairview Street, Burlington TIS and PS

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Analysis Periods:

- Weekday AM peak hour; and
- Weekday PM peak hour.

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- Five-years from the date the study is commissioned – Year 2028.

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Background Traffic

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- Any additional developments identified by City. **Please confirm**

Future Road Improvements:

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Site Traffic Distribution

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- 2016 Transportation Tomorrow Survey (TTS) Data; and
- Inhouse proxy site data.

Best Regards,

Andrew Orr, M.A.Sc., EIT
Transportation Consultant

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w: www.ptsl.com



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Appendix B

Traffic Data

Fairview St @ Drury Ln

Morning Peak Diagram

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

One Hour Peak
From: 8:00:00
To: 9:00:00

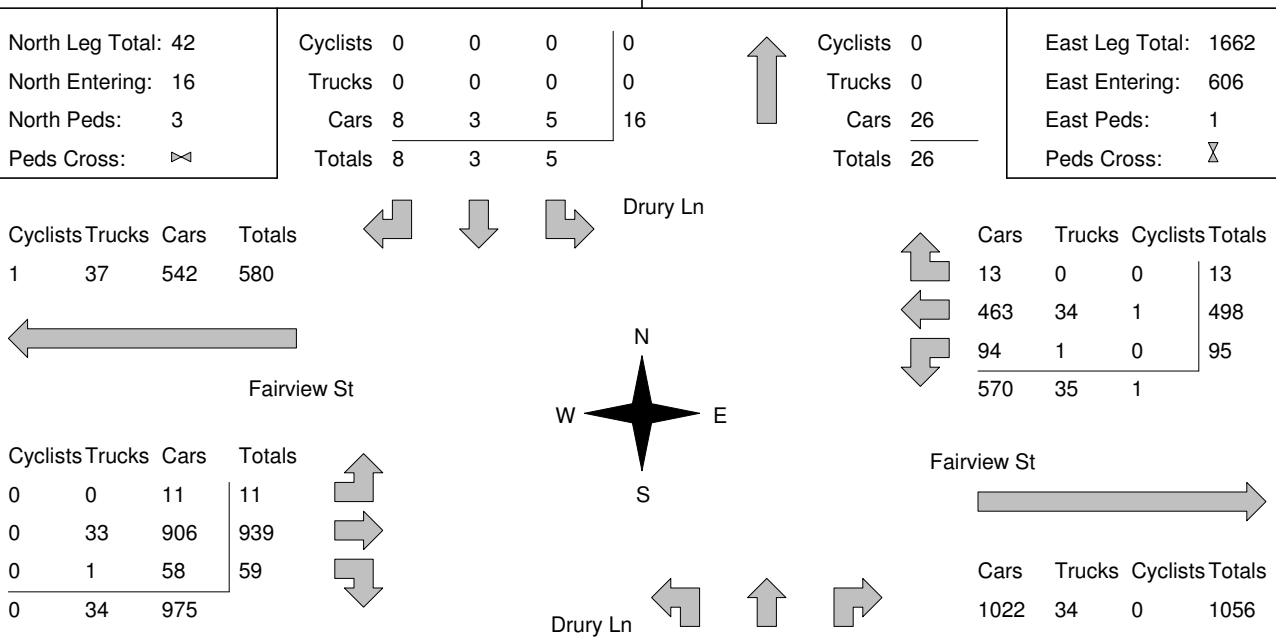
Municipality: Burlington
Site #: 0000000002
Intersection: Fairview St & Drury Ln
TFR File #: 2
Count date: 19-Apr-2023

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Fairview St runs W/E



Comments

Fairview St @ Drury Ln

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 13:00:00

One Hour Peak
From: 12:00:00
To: 13:00:00

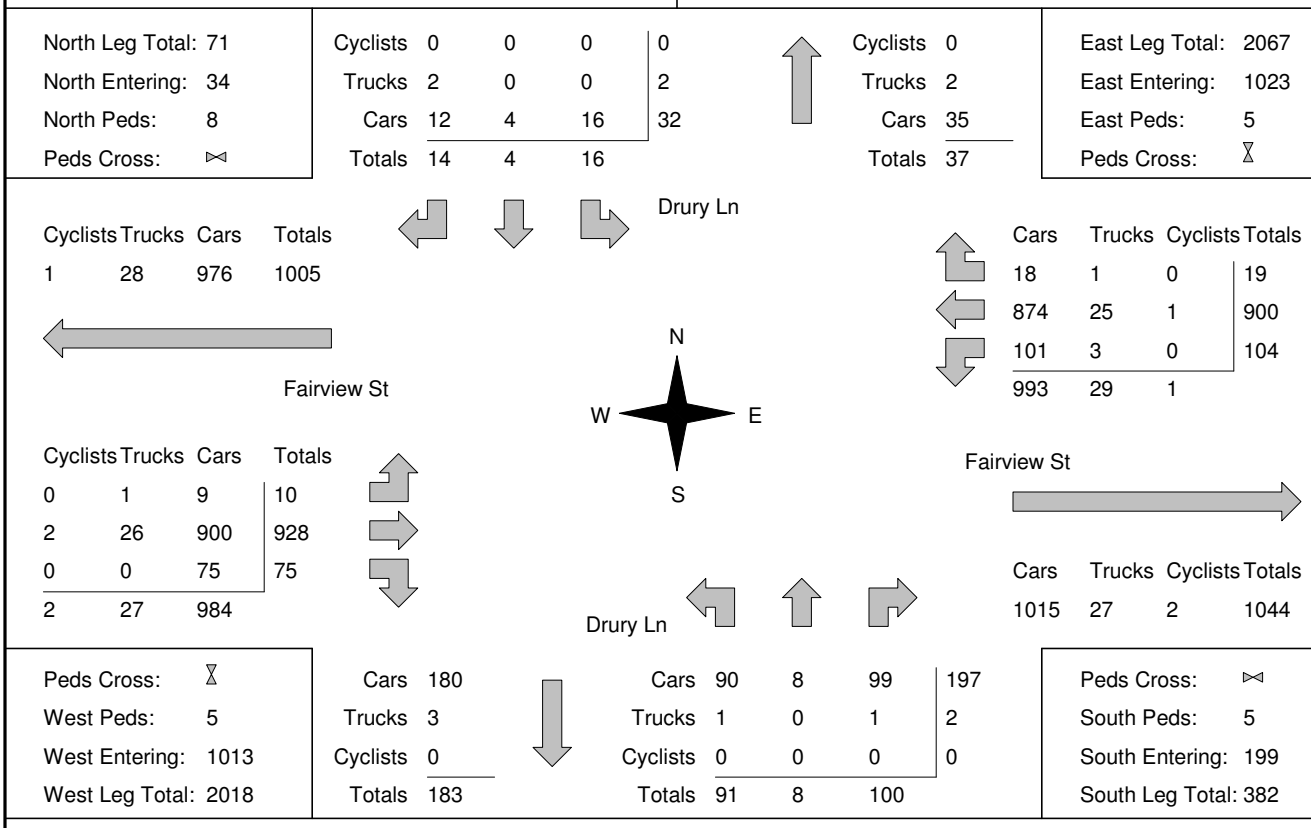
Municipality: Burlington
Site #: 0000000002
Intersection: Fairview St & Drury Ln
TFR File #: 2
Count date: 19-Apr-2023

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Fairview St runs W/E



Comments

Fairview St @ Drury Ln

Afternoon Peak Diagram

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

One Hour Peak
From: 16:45:00
To: 17:45:00

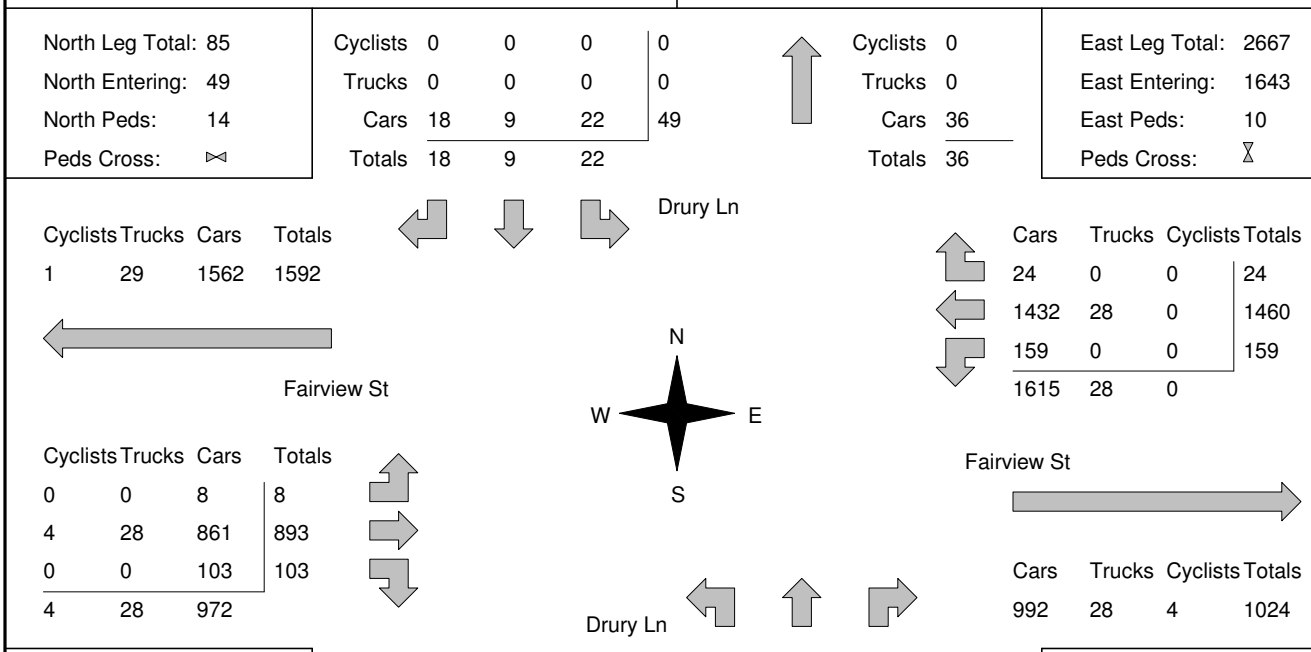
Municipality: Burlington
Site #: 0000000002
Intersection: Fairview St & Drury Ln
TFR File #: 2
Count date: 19-Apr-2023

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Fairview St runs W/E



Comments

Fairview St @ Drury Ln

Total Count Diagram

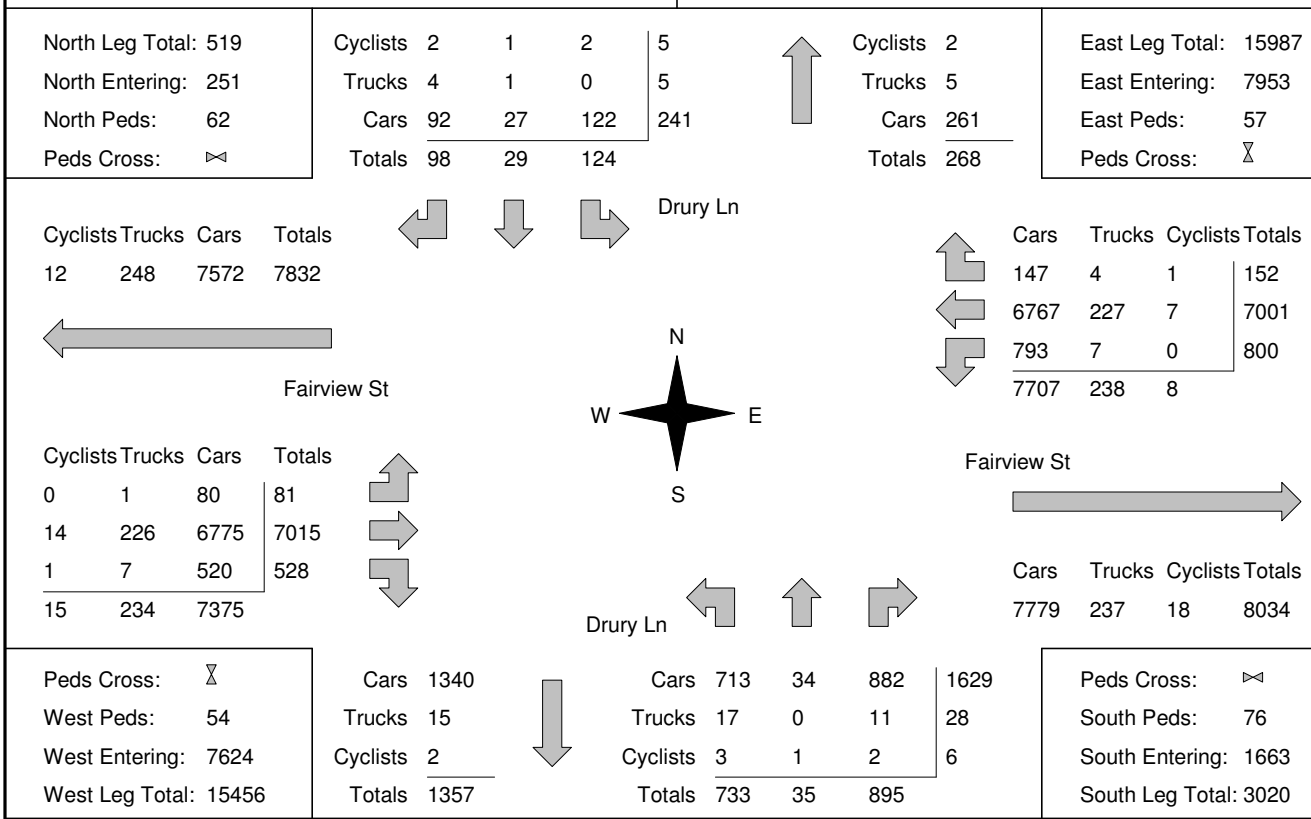
Municipality: Burlington
Site #: 0000000002
Intersection: Fairview St & Drury Ln
TFR File #: 2
Count date: 19-Apr-2023

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Fairview St runs W/E



Comments

Fairview St @ Guelph Line

Morning Peak Diagram

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

One Hour Peak
From: 8:00:00
To: 9:00:00

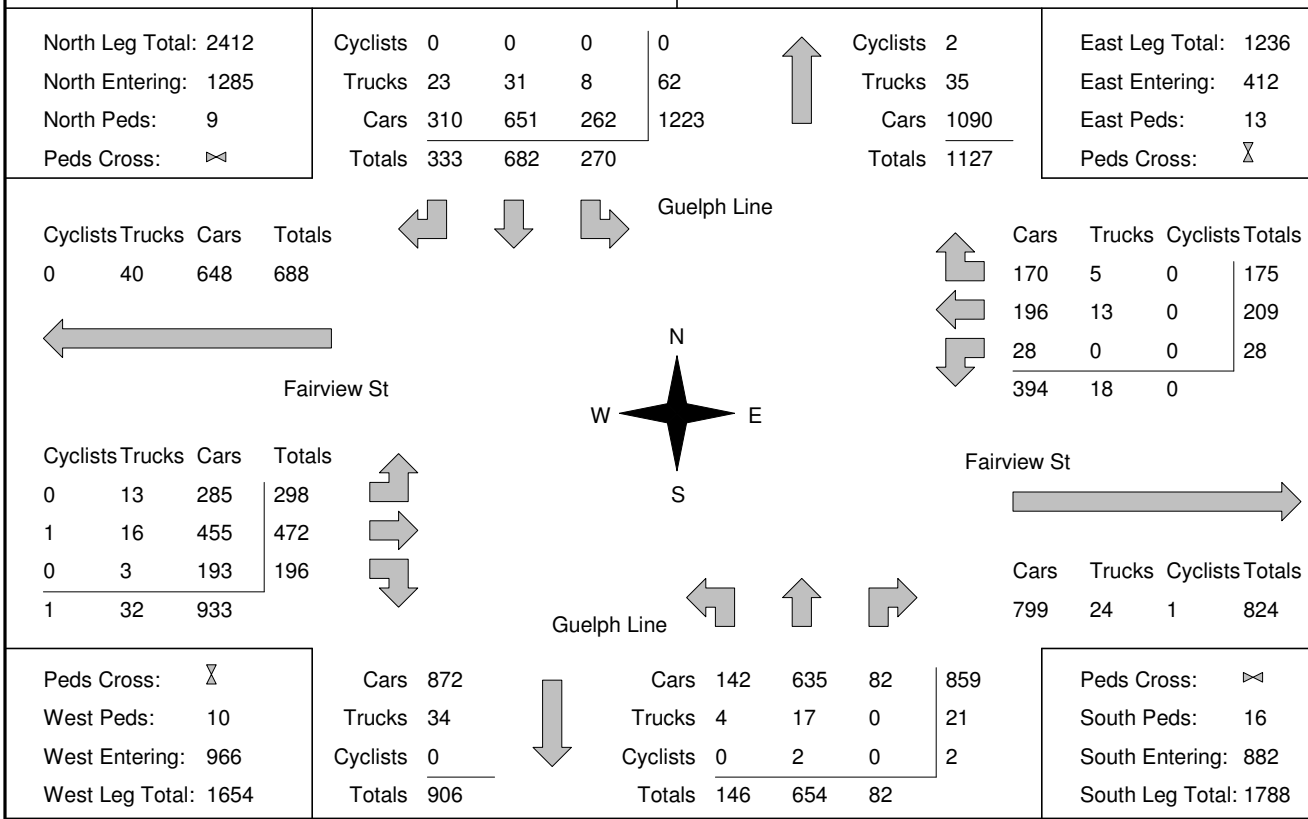
Municipality: Burlington
Site #: 0000000001
Intersection: Fairview St & Guelph Line
TFR File #: 2
Count date: 19-Apr-2023

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Fairview St runs W/E



Comments

Fairview St @ Guelph Line

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 13:00:00

One Hour Peak
From: 12:00:00
To: 13:00:00

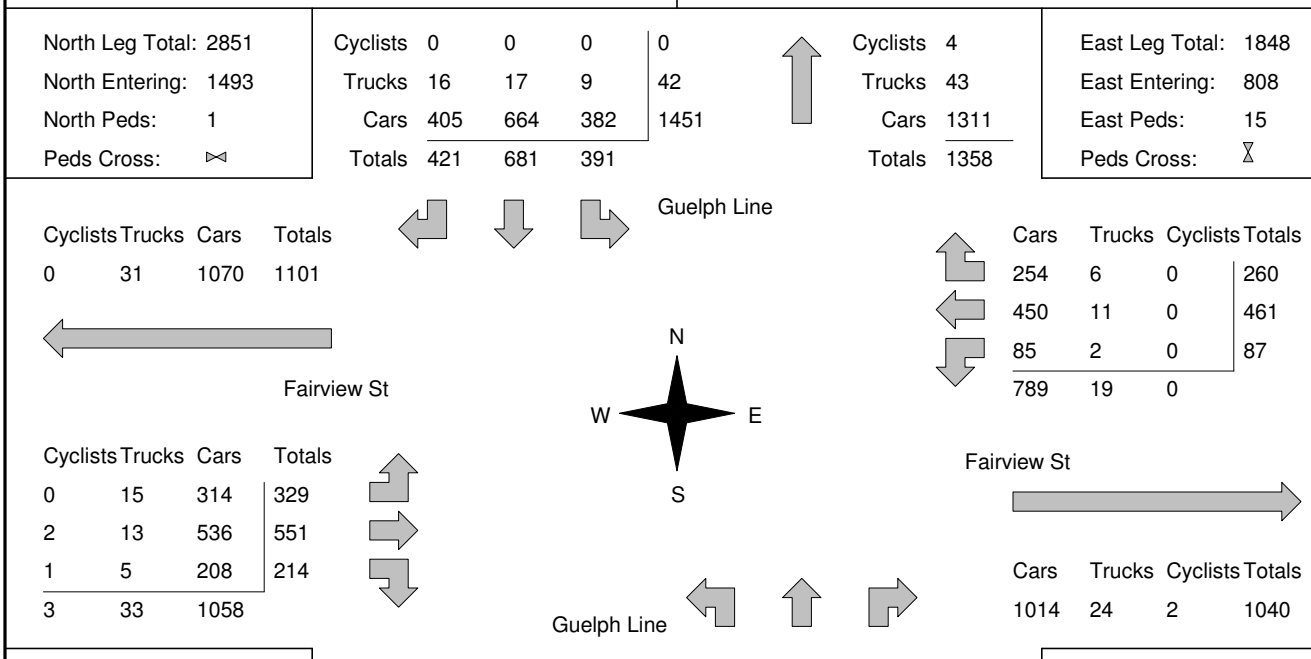
Municipality: Burlington
Site #: 0000000001
Intersection: Fairview St & Guelph Line
TFR File #: 2
Count date: 19-Apr-2023

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Fairview St runs W/E



Comments

Fairview St @ Guelph Line

Afternoon Peak Diagram

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

One Hour Peak
From: 16:45:00
To: 17:45:00

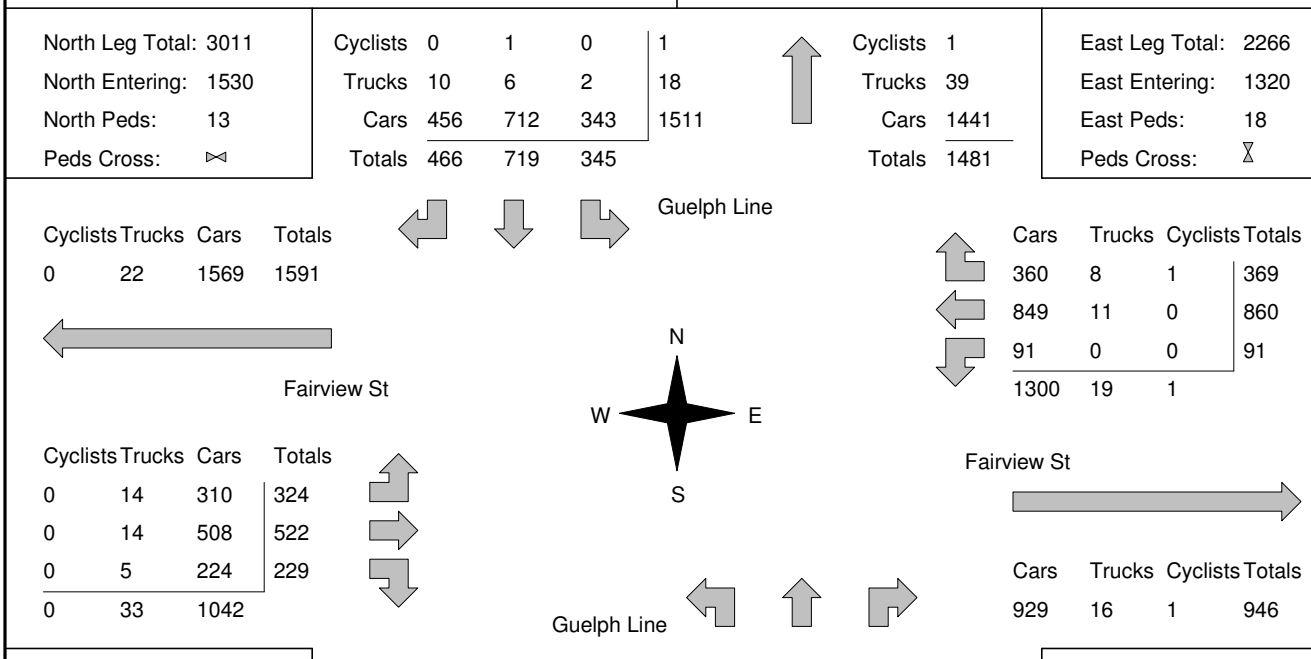
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TFR File #: 2
Count date: 19-Apr-2023

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Fairview St runs W/E



Comments

Fairview St @ Guelph Line

Total Count Diagram

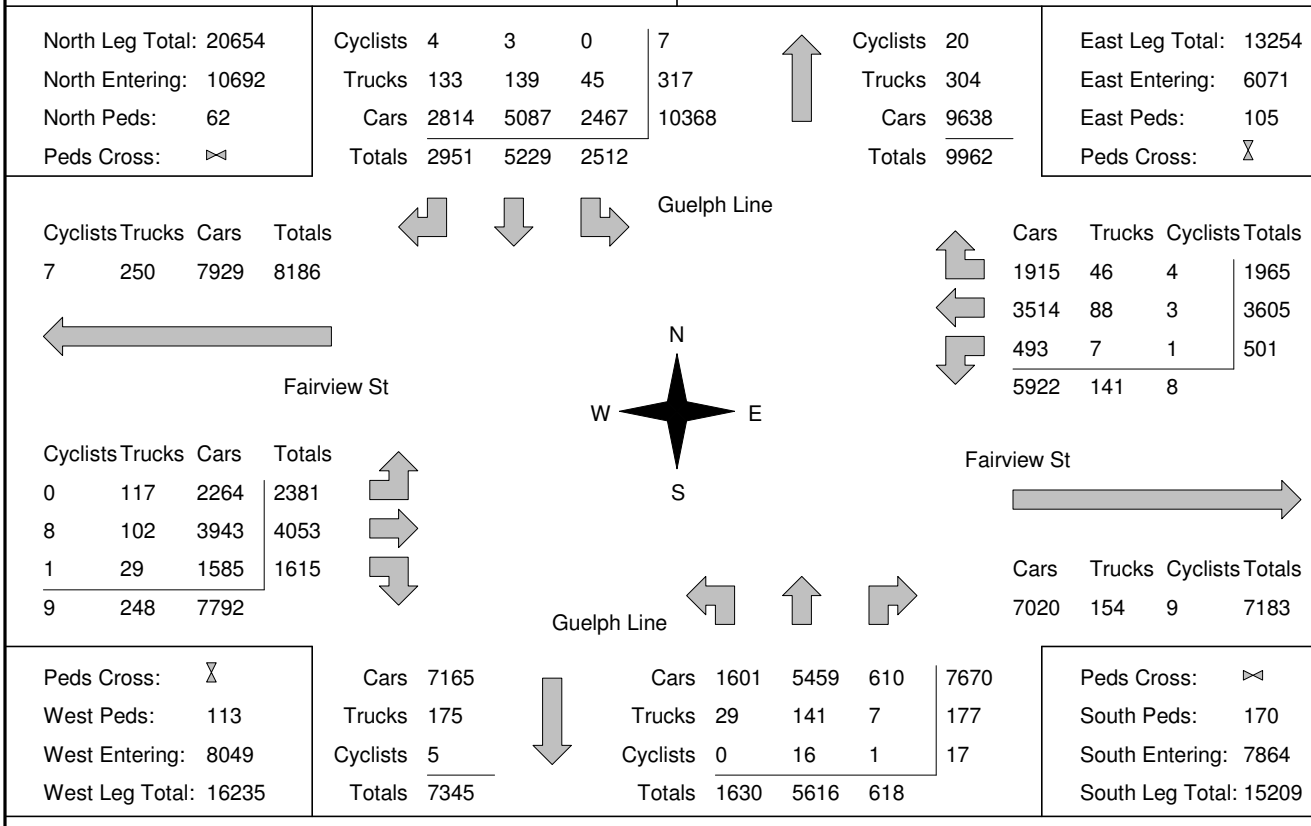
Municipality: Burlington
Site #: 0000000001
Intersection: Fairview St & Guelph Line
TFR File #: 2
Count date: 19-Apr-2023

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Fairview St runs W/E



Comments

Intersection Name:	TS ID:	Line No:	Model:	IP address:	Controller Make:
Fairview Street @ Drury Lane	155	1	ACS/3	172.22.181.2	Econolite

Type of Operation:	8 Phase Semi-Actuated

*-Start from Main Menu

No	Date			Description	Prepared by
	Y	M	D		
2	2016	9	27		BP
3	2016	12	7	Timing reverted back to original	BP
4	2020	12	10	Updated Side street FDW, Amber, All-Red	JR

PHASE DESCRIPTION

Ph1	WBLT- Fairview Street	Ph5	
Ph2	EB - Fairview Street	Ph6	WB - Fairview Street
Ph3		Ph7	
Ph4	NB - Drury Lane	Ph8	SB - Drury Lane

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

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

CONTROLLER TIMING DATA - VEHICLE TIMING * - 2 - 1

Timing Plan: 1

	Phase: 1	2	3	4	5	6	7	8
Minimum Green	6	8		8		8		8
Walk		15		8		15		8
Ped. Clearance		11		14		11		14
Pedestrian Carry Over								
Vehicle Extension	3	3		3		3		3
MAX 1	10	35		25		35		25
MAX 2	10	35		25		35		25
Yellow Change	3	4		3		4		3
Red Clearance		2		4		2		4
Phase Minimum:	**10**	**33**	**1**	**30**	**1**	**33**	**1**	**30**

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

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

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

Coordinator Pattern (CP)	Cycle Length	Offset (sec)	Timing Plan	Split Pattern	Phases (sec)							
					1	2	3	4	5	6	7	8
1	75	15	1	1	11	34		30		45		30
2	90	11	1	2	14	41		35		55		35
3	90	11	1	3	13	45		32		58		32
4	80	23	1	4	12	37		31		49		31
10	0	0	1	10	0	0		0		0		0

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

Day Plan	Sched. #	Action Plan	Time Period	Pattern	Timing Plan
1	1	1	07:00	1	1
1	1	2	09:00	2	1
1	1	3	16:30	3	1
1	1	4	18:00	4	1
1	1	10	21:30	254	1
2	2	1	07:30	1	1
2	2	2	10:00	2	1
2	2	10	20:00	254	1
3	3	2	10:00	2	1
3	3	10	20:00	254	1

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

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

Action Plan 10 = free (254)

Special Programming:

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

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

ECONOLITE

City of Burlington

MOVING TRAFFIC FORWARD

Guelph Ln @ Fairview St - TS 730 - Econolite Type - ASC/3

Configuration Controller Sequence

Phase Ring Sequence and Assignment (MM) 1-1-1

Hardware Alternate Sequence Enable: No

Phase Ring Sequence.....(Note: Sequences identical to the prior one are not printed)

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	B		B		B		B		B							
Sequence 1																
Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 2																
Ring 1	2	1	3	4	10	9	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 3																
Ring 1	1	2	4	3	9	10	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 4																
Ring 1	2	1	4	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 5																
Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	6	5	7	8	12	11	15	16	.	.	.	.	.	.	.	.
Sequence 6																
Ring 1	2	1	3	4	10	9	13	14	.	.	.	.	.	.	.	.
Ring 2	6	5	7	8	12	11	15	16	.	.	.	.	.	.	.	.
Sequence 7																
Ring 1	1	2	4	3	9	10	14	13	.	.	.	.	.	.	.	.
Ring 2	6	5	7	8	12	11	15	16	.	.	.	.	.	.	.	.
Sequence 8																
Ring 1	2	1	4	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	6	5	7	8	12	11	15	16	.	.	.	.	.	.	.	.
Sequence 9																
Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.
Sequence 10																
Ring 1	2	1	3	4	10	9	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.
Sequence 11																
Ring 1	1	2	4	3	9	10	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.
Sequence 12																
Ring 1	2	1	4	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.
Sequence 13																
Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	6	5	8	7	12	11	16	15	.	.	.	.	.	.	.	.
Sequence 14																
Ring 1	2	1	3	4	10	9	13	14	.	.	.	.	.	.	.	.
Ring 2	6	5	8	7	12	11	16	15	.	.	.	.	.	.	.	.
Sequence 15																
Ring 1	1	2	4	3	9	10	14	13	.	.	.	.	.	.	.	.
Ring 2	6	5	8	7	12	11	16	15	.	.	.	.	.	.	.	.
Sequence 16																
Ring 1	2	1	4	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	6	5	8	7	12	11	16	15	.	.	.	.	.	.	.	.

Phases In Use/Exclusive Ped (MM) 1-2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Phases In Use	X	X	X	X	X	X	X	X								
Exclusive Ped																

Phase Compatibility (MM) 1-1-2

Phase	
n/a	Barrier Mode

Phase and Overlap Descriptions

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB								
Overlap	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**
Description																

Administration (MM) 1-7-1

Enable Controller/Cabinet Interlock CRC	No
CRC (16 bit)	ED62
Enable Automatic Backup to Datakey	No

Backup Prevent (MM) 1-1-3

	Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Timing	1																
Phases	2	B			C												
	3																
	4			X													
	5																
	6					X											
	7																
	8							X									
	9																
	10																
	11																
	12																
	13																
	14																
	15																
	16																

Simultaneous Gap (MM) 1-1-4

	Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	1																
	2																
	3																
	4																
	5																
Phase	6																
Must	7																
Gap	8																
With	9																
Phase	10																
	11																
	12																
	13																
	14																
	15																
	16																
	Disable																

Load Switch Assignments (MM) 1-3

	Phase / Overlap	Type	Dimming				Power Up	Auto		Flash Together
			Red	Yellow	Green	Dark		Red	Yellow	
1	1	V				-	Auto	X		
2	2	V				-	Auto	X		X
3	3	V				-	Auto	X		
4	4	V				-	Auto	X		X
5	5	V				+	Auto	X		
6	6	V				+	Auto	X		X
7	7	V				+	Auto	X		
8	8	V				+	Auto	X		X
9	2	P				-	Auto			
10	4	P				-	Auto			
11	6	P				+	Auto			
12	8	P				+	Auto			
13	0	O				-	Auto	X		
14	0	O				+	Auto	X		X
15	0	O				-	Auto	X		
16	0	O				+	Auto	X		X

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Guelph Ln @ Fairview St - TS 730 - Econolite Type - ASC/3

Configuration Port 1 (SDLC)

Port 1 SDLC (MM) 1-4-1

BIU	1	2	3	4	5	6	7	8
Term & Facility	X	X	X					
Detector Rack	X							

Enable TS2/MMU Type Cabinet: Yes
Enable MMU Extended Status: Yes
Enable SDLC Stop Time: Yes
Enable 3 Critical RFE's Lockup: Yes

MMU Program (MM) 1-4-2

Channel Can Serve With Channel	
Channel 1	**Channel 2**
1	5
1	6
1	11
2	5
2	6
2	9
2	11
3	7
3	8
3	12
4	7
4	8
4	10
4	12
5	9
6	9
6	11
7	10
8	10
8	12
9	11
10	12

Color Check Enable (MM) 1-4-3
Enable Color Check: No

MMU/LS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Green																
Yellow																
Red																

Secondary Stations/Tests (MM) 1-4-4

ID	1	2	3	4	5	6	7	8	MMU
Term & Facility									

ID	1	2	3	4	5	6	7	8	Diag
Detector Rack									

Enable SDLC Diagnostic Test: No

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Guelph Ln @ Fairview St - TS 730 - Econolite Type - ASC/3

Configuration Communications 1 (SDLC)

Ethernet Port Configuration (MM) 1-5-1

Controller IP:	172.22.85.2
Subnet Mask:	255.255.0.0
Default Gateway IP:	172.22.0.255
Server IP:	192.168.210.120

NTCIP (MM) 1-5-5

NTCIP Backup Time (Sec):	0
NTCIP UDP Port:	501
Ethernet Priority:	1
Port 2 Priority (Port C50S for 2070):	4
Port 3A Priority (Port C21S for 2070):	2
Port 3B Priority (Port C22S for 2070):	3

Port Configuration (MM) 1-5-2 to 1-5-4

Port	2 (C50S)	3A (C21S)	3B (C22S)
Protocol	TERMINAL	NTCIP	ECPIP
Enable	No	No	No
Data Rate (BPS)	9600	19.2K	1200
Data, Parity, Stop	8 N 1	8 N 1	8 N 1
Address	0	0	0
Telemetry Response Delay	0.0	0.0	0.9
Duplex - Half or Full	Half	Full	Full
Flow Control	Yes	Yes	Yes
Group Address	0	0	0
Single Flag Enable	Yes	Yes	Yes
RTS to CTS Delay	n/a	n/a	14.0
RTS Turn Off Delay	n/a	n/a	2.0
Dropout Time	10	10	10
Early RTS	n/a	n/a	No
Telemetry Mode	n/a	n/a	FSK
ATCS Railroad	0	n/a	n/a
ATCS Railroad Line	0	n/a	n/a
ATCS Group	0	n/a	n/a
Wayside Device	0	n/a	n/a
ATC Device	0	n/a	n/a
Wayside Subnode	0	n/a	n/a
ATC Subnode	0	n/a	n/a

ECPIP (MM) 1-5-6

Controller Address:	0
Expanded System Detector Address:	0

System Detector Assignment

System Detector	Local Detector

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Guelph Ln @ Fairview St - TS 730 - Econolite Type - ASC/3

Configuration Logging / Display

Event Logging (MM) 1-6-1

Critical RFE's (MMU/TF)	Yes	3 Critical Errors Within 24 Hours	Yes
MMU Flash Faults	Yes	Local Flash Fault	Yes
Non-Critical RFE's (Det/Test)	Yes	Detector Errors	Yes
Coordination Errors	Yes	Controller Download	Yes
Preemption Events	Yes	TSP Events	Yes
Power On/Off	Yes	Low Battery	Yes
Access	Yes	Data Change	Yes
Online / Offline	Yes		

Alarm Event	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Enable Logging	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Display Options (MM) 1-7-2

Key Click Enable:	No
Backlight Enable:	Yes
LED Mode:	Auto
Display Mode:	Basic
Screen Format:	Basic
Trans Mode Pop-Up Disable:	No

Sign On (MM) 8-5

Sign On Message Line 1: City Of Burlington
Sign On Message Line 2: 8 Phase Econolite White

Software Modules (MM) 8-7

Application Version: 02.58.00
OS (Boot) Version: 01.14.03

ECONOLITE

City of Burlington

MOVING TRAFFIC FORWARD

Guelph Ln @ Fairview St - TS 730 - Econolite Type - ASC/3

Logic Processor Page 1

Logic Statement Control (MM) 1-8-1

Logic #	Statement Control
1	E
2	E

ECONOLITE

MOVING TRAFFIC FORWARD

City of Burlington

Guelph Ln @ Fairview St - TS 730 - Econolite Type - ASC/3

Logic Processor Page 2

Logic Statements (MM) 1-8-2

Logic #: 1

If:

	Assignment	#		State
IF	VEH GREEN ON PH	3	IS	On

Then:

Assignment	#	State
CTR CALL PHASE	4	On

Logic #: 2

If:

	Assignment	#		State
IF	VEH GREEN ON PH	7	IS	On

Then:

Assignment	#	State
CTR CALL PHASE	8	On

Logic #: 3

If:

	Assignment	#		State
IF	VEH GREEN ON PH	2	IS	On

Then:

Assignment	#	State
CTR OMIT PHASE	1	On

Logic #: 4

If:

	Assignment	#		State
IF	VEH GREEN ON PH	6	IS	On

Then:

Assignment	#	State
CTR OMIT PHASE	5	On

Logic #: 5

If:

	Assignment	#	State
IF	LP CIB CODE ON		169

Then:

Assignment	#	State
CTR SET TMGPLN A-C	2	On

Logic #: 6

If:

	Assignment	#	State
IF	LP CIB CODE ON		65

Then:

Assignment	#	State
LP DELAY FOR	5.5 Sec.	
LP SET LOGIC FLAG	1	On

Logic #: 7

If:

	Assignment	#		State
IF	LP LOGIC FLAG	1	IS	On
AND	VEH GREEN ON PH	2	IS	On

Then:

Assignment	#	State
DET SET VEH 1-16	4	On

Logic #: 8

If:

	Assignment	#		State
IF	LP LOGIC FLAG	1	IS	On
AND	CTR PH NEXT ON PHS	2	IS	On

Then:

Assignment	#	State
LP SET LOGIC FLAG	2	On

Logic #: 9

If:

	Assignment	#		State
IF	LP LOGIC FLAG	2	IS	On

Then:

Assignment	#	State
LP DELAY FOR	0.0 Sec.	
DET SET VEH 1-16	4	On
CTR SET FO RING	1	On
LP SET LOGIC FLAG	3	On

Logic #: 10

If:

	Assignment	#		State
IF	LP LOGIC FLAG	3	IS	On

Then:

Assignment	#	State
LP SET LOGIC FLAG	1	Off
LP SET LOGIC FLAG	2	Off
LP SET LOGIC FLAG	3	Off

Logic #: 11

If:

	Assignment	#	State
IF	LP CIB CODE ON		69

Then:

Assignment	#	State
LP DELAY FOR	5.5 Sec.	
LP SET LOGIC FLAG	4	On

Logic #: 12

If:

	Assignment	#		State
IF	LP LOGIC FLAG	4	IS	On
AND	VEH GREEN ON PH	6	IS	On

Then:

Assignment	#	State
DET SET VEH 1-16	4	On

Logic #: 13

If:

	Assignment	#	State

IF	LP LOGIC FLAG	4	IS	On
AND	CTR PH NEXT ON PHS	6	IS	On

Then:

Assignment	#	State
LP SET LOGIC FLAG	5	On

Logic #: 14

If:

	Assignment	#		State
IF	LP LOGIC FLAG	5	IS	On

Then:

Assignment	#	State
LP DELAY FOR	0.0 Sec.	
DET SET VEH 1-16	4	On
CTR SET FO RING	2	On
LP SET LOGIC FLAG	6	On

Logic #: 15

If:

	Assignment	#		State
IF	LP LOGIC FLAG	6	IS	On

Then:

Assignment	#	State
LP SET LOGIC FLAG	4	Off
LP SET LOGIC FLAG	5	Off
LP SET LOGIC FLAG	3	Off

Logic #: 16

If:

	Assignment	#		State
IF	CTR PH NEXT ON PHS	3	IS	On

Then:

Assignment	#	State
LP DELAY FOR	4.0 Sec.	
LP SET LOGIC FLAG	7	On

Logic #: 17

If:

	Assignment	#		State
IF	LP LOGIC FLAG	7	IS	On

Then:

Assignment	#	State
LP SET COB ON	513	

Logic #: 18

If:

	Assignment	#		State
IF	LP LOGIC FLAG	7	IS	On
AND	CTR PHASE TIMING	3	IS	On

Then:

Assignment	#	State
LP SET LOGIC FLAG	8	On

Logic #: 19

If:

	Assignment	#		State
IF	LP LOGIC FLAG	8	IS	On
AND	CTR PHASE TIMING	3	IS	Off

Then:

Assignment	#	State
LP SET COB OFF	513	
LP SET LOGIC FLAG	7	Off
LP SET LOGIC FLAG	8	Off

Logic #: 20

If:

	Assignment	#		State
IF	LP CIB CODE ON			0
AND	VEH GREEN ON PH	4	IS	On

Then:

Assignment	#	State
CTR CALL PHASE	1	On
CTR SET FO RING	1	On
CTR SET FO RING	2	On

Logic #: 21

If:

	Assignment	#	State
IF	LP CIB CODE ON		71

Then:

Assignment	#	State
LP SET LOGIC FLAG	9	On

Logic #: 22

If:

	Assignment	#		State
IF	LP LOGIC FLAG	9	IS	On

Then:

Assignment	#	State
CRD SET FREE		On

Logic #: 23

If:

	Assignment	#		State
IF	PED ON PH WALK	8	IS	On

Then:

Assignment	#	State
LP SET LOGIC FLAG	9	Off

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Guelph Ln @ Fairview St - TS 730 - Econolite Type - ASC/3

Controller Timing Plan (MM) 2-1

Plan 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB								
Min Green	7	8	7	8	7	8	7	8	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	12	0	8	0	12	0	8	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	14	0	19	0	14	0	19	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	15	35	12	30	15	35	20	30	35	35	35	35	35	35	35	35
Max2	15	35	12	30	15	35	20	30	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	2.0	3.0	1.0	3.0	1.0	3.0	2.0	3.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Plan 2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB								
Min Green	7	8	7	8	7	8	7	8	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	12	0	8	0	12	0	8	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	14	0	19	0	14	0	19	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	15	35	12	30	15	35	20	30	35	35	35	35	35	35	35	35
Max2	15	35	12	30	15	35	20	30	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	2.0	3.0	1.0	3.0	1.0	3.0	2.0	3.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Plan 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB								
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	0	0	0	0	0	0	0	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	0	0	0	0	0	0	0	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Plan 4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB								
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	0	0	0	0	0	0	0	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	0	0	0	0	0	0	0	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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MOVING TRAFFIC FORWARD

Guelph Ln @ Fairview St - TS 730 - Econolite Type - ASC/3

Controller Overlaps
Vehicle Overlaps (MM) 2-2

Overlap	Type	Lag Green	Yellow	Red	Adv. Green

Phases

Overlap	Phase	Included	Protect	Ped Protect	Not Overlap	Modifier	Lag X Phases	Lag 2 Phases	Flash Green

PPLT FYA

Overlap	Protected Phase (Left Turn)	Permissive Phase (Opposing Thru)	Flashing Arrow Output	Flashing Arrow Output CH	Delay Start of FYA	Delay Start of Clearance	Action Plan SF Bit Disable	Ped Protected Enable

Guaranteed Minimum Time Data (MM) 2-4

Phase	Min Green	Walk	Ped Clear	Yellow	Red Clear	Overlap Green
A01	5	0	7	3.0	0.0	5
B02	5	0	7	3.0	0.0	5
C03	5	0	7	3.0	0.0	5
D04	5	0	7	3.0	0.0	5
E05	5	0	7	3.0	0.0	5
F06	5	0	7	3.0	0.0	5
G07	5	0	7	3.0	0.0	5
H08	5	0	7	3.0	0.0	5
I09	5	0	7	3.0	0.0	5
J10	5	0	7	3.0	0.0	5
K11	5	0	7	3.0	0.0	5
L12	5	0	7	3.0	0.0	5
M13	5	0	7	3.0	0.0	5
N14	5	0	7	3.0	0.0	5
O15	5	0	7	3.0	0.0	5
P16	5	0	7	3.0	0.0	5

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Controller Pedestrian Overlaps
Vehicle / Pedestrian Overlaps (MM) 2-3

Included	Pedestrian Overlaps

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Guelph Ln @ Fairview St - TS 730 - Econolite Type - ASC/3

Controller Start / Flash Data (MM) 2-5

Start Up

Phase	Phase Setting
1	.
2	Y
3	.
4	.
5	.
6	Y
7	.
8	.
9	.
10	.
11	.
12	.
13	.
14	.
15	.
16	.

Overlap
A
B
C
D

Flash Thru Mon: No
Flash Time: 0
All Red: 0
Power Start Seq: 1
MUTCD Enabled: No
Y->G: n/a

Automatic Flash

Entry
2
6

Exit
2
6

Overlap Exit
A
B
C
D

Flash Thru Mon: No
Exit Flash: W
Minimum Flash: 8
Mimimum Recall: No
Cycle Through Phase: No

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Guelph Ln @ Fairview St - TS 730 - Econolite Type - ASC/3

Controller Options

Controller Options (MM) 2-6-1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Flashing Grn Ph	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Guar Passage																
Non-Act I		X				X										
Non-Act II																
Dual Entry		X		X		X		X								
Cond Service																
Cond Reservice																
Ped Re-Service																
Rest In Walk		X				X										
Flashing Walk																
Ped Clr-Yel																
Ped Clr-Red																
IGRN + Veh Ext																

Ped Clear Protect: Off Unit Red Revert: 2.0 MUTCD 3 Seconds Don't Walk: No

Pre-Timed Mode (MM) 2-7
Enable Pre-Timed Mode: No Free Input Disables Pre-Timed: No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Pre-Timed																

Phase Recall Options (MM) 2-8
Plan # 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Lock Detector					X				X	X	X	X	X	X	X	X
Vehicle Recall																
Ped Recall		X				X										
Max Recall		X				X										
Soft Recall																
No Rest																
Al Calc																

Plan # 2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Lock Detector									X	X	X	X	X	X	X	X
Vehicle Recall																
Ped Recall		X				X										
Max Recall		X		X		X		X								
Soft Recall																
No Rest																
Al Calc																

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Guelph Ln @ Fairview St - TS 730 - Econolite Type - ASC/3

Coordination Options

Options (MM) 3-1

Manual Pattern	Auto	ECPI Coord	Yes
System Source	SYS	System Format	PTN
Splits In	Seconds	Offsets In	Seconds
Transition	Smooth	Max Select	MAXINH
Dwell / Add Time	0		
Delay Coord Wk-LZ	No	Force Off	Float
Offset Reference	Lead	Use Ped Time	No
Ped Recall	No	Ped Reservice	No
Local Zero Override	No	FO Added Ini Green	No
Re-sync Count	0	Multisync	No

Auto Perm Minimum Green (Seconds) (MM) 3-4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Split Demand (MM) 3-5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0

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Guelph Ln @ Fairview St - TS 730 - Econolite Type - ASC/3

Coordination Pattern Data

Coordinator Pattern Data (MM) 3-2

Coordinator Pattern # 1

Split Pattern	1	TS2 (Pat-Off)	0-1	Splits In	Seconds
Cycle	120	Std (COS)	9	Offsets In	Seconds
Offset Value	30s	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	1		
Actuated Walk Rest	No	Sequence	0		
Phase Reservice	No	Action Plan	0		
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB								
Splits (Split Pat 1)	28	40	11	41	14	54	28	24	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	120s	120s	0s	0s

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Funciton Outputs																

Coordinator Pattern # 2

Split Pattern	2	TS2 (Pat-Off)	0-2	Splits In	Seconds
Cycle	120	Std (COS)	17	Offsets In	Seconds
Offset Value	70s	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	1		
Actuated Walk Rest	No	Sequence	0		
Phase Reservice	No	Action Plan	0		
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB								
Splits (Split Pat 2)	20	37	15	48	17	40	32	31	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	120s	120s	0s	0s

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Funciton Outputs																

Coordinator Pattern # 3

Split Pattern	3	TS2 (Pat-Off)	0-3	Splits In	Seconds
Cycle	140	Std (COS)	25	Offsets In	Seconds
Offset Value	29s	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	1		
Actuated Walk Rest	No	Sequence	0		
Phase Reservice	No	Action Plan	0		
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB								
Splits (Split Pat 3)	27	45	13	55	20	52	24	44	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	140s	140s	0s	0s

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Funciton Outputs																

Coordinator Pattern # 4

Split Pattern	4	TS2 (Pat-Off)	1-1	Splits In	Seconds
Cycle	90	Std (COS)	33	Offsets In	Seconds
Offset Value	57s	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	1		
Actuated Walk Rest	No	Sequence	0		
Phase Reservice	No	Action Plan	0		
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB								
Splits (Split Pat 4)	14	38	12	26	14	38	18	20	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	90s	90s	0s	0s

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Funciton Outputs																

Coordinator Pattern # 5

Split Pattern	5	TS2 (Pat-Off)	1-2	Splits In	Seconds
Cycle	120	Std (COS)	41	Offsets In	Seconds
Offset Value	30s	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	1		
Actuated Walk Rest	No	Sequence	0		
Phase Reservice	No	Action Plan	0		
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB								
Splits (Split Pat 5)	28	40	11	41	14	54	28	24	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	120s	120s	0s	0s

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Funciton Outputs																

Coordinator Pattern # 11

Split Pattern	11	TS2 (Pat-Off)	3-2	Splits In	Seconds
Cycle	120	Std (COS)	137	Offsets In	Seconds
Offset Value	70s	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	No	Sequence	0		
Phase Reservice	No	Action Plan	0		
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB								
Splits (Split Pat 11)	20	40	20	40	18	42	20	40	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	120s	120s	0s	0s

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Funciton Outputs																

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Coordination Split Pattern
Split Pattern Data (MM) 3-3

Split Pattern # 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB								
Split (seconds)	28	40	11	41	14	54	28	24	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	120s	120s	0s	0s

Split Pattern # 2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB								
Split (seconds)	20	37	15	48	17	40	32	31	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	120s	120s	0s	0s

Split Pattern # 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB								
Split (seconds)	27	45	13	55	20	52	24	44	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	140s	140s	0s	0s

Split Pattern # 4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB								
Split (seconds)	14	38	12	26	14	38	18	20	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	90s	90s	0s	0s

Split Pattern # 5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB								
Split (seconds)	28	40	11	41	14	54	28	24	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	120s	120s	0s	0s

Split Pattern # 11

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	SBLT	NB	WBLT	EB	NBLT	SB	EBLT	WB								
Split (seconds)	20	40	20	40	18	42	20	40	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	120s	120s	0s	0s

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Guelph Ln @ Fairview St - TS 730 - Econolite Type - ASC/3

Preempt Plan

Preempt Plan (MM) 4-1

Preempt Plan 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing																
Dwell Veh	X	.	.	.	.	X	.	.	.	.	.	.	.	.	.	.
Dwell Ped																
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Ped																
Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exit Phases		X				X										
Exit Calls																
Special Function																

Enable	Yes	Preempt Override	Yes	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	Yes	Duration	5	CLR > GRN	No
Term Ovlp Asap	No	PC Through Yel	No	Terminate Phase	No
Ped Dark	No	Track Clear Rsrv	No	Dwell Flash	Off
Linked Pmt	0	FL Exit Color	Red	Exit Options	Off
Exit Timing Plan	0	Reservice	0	Fault Type	Hard

Ring	1	2	3	4
Free During Pmt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	7	8	3.0	2.0
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	3.0	2.0
	Min Dwell	Pmt Ext	Max Time	Yellow	Red
Dwell / Cycle-Exit	8	0.0	45	3.0	2.0

Preemption Active Out	On	Preempt Act Dwell	No
Other - Priority Preempt	Off	Non-Priority Pmt	Off
Inhibit Extension Time	0.0	Ped Priority Return	Off
Veh Priority Return	Off	Queue Delay	Off
Conditional Delay	Off		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Preempt Plan 2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing																
Dwell Veh	.	X	.	.	X	.	.	.	.	.	.	.	.	.	.	.
Dwell Ped																
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Ped																

Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exit Phases		X				X										
Exit Calls																
Special Function																

Enable	Yes	Preempt Override	Yes	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	Yes	Duration	5	CLR > GRN	No
Term Ovlp Asap	No	PC Through Yel	No	Terminate Phase	No
Ped Dark	No	Track Clear Rsrv	No	Dwell Flash	Off
Linked Pmt	0	FL Exit Color	Grn	Exit Options	Off
Exit Timing Plan	0	Reservice	0	Fault Type	Hard

Ring	1	2	3	4
Free During Pmt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	7	8	3.0	1.0
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	3.0	1.0
	Min Dwell	Pmt Ext	Max Time	Yellow	Red
Dwell / Cycle-Exit	8	0.0	45	3.0	1.0

Preemption Active Out	On	Preempt Act Dwell	No
Other - Priority Preempt	Off	Non-Priority Pmt	Off
Inhibit Extension Time	0.0	Ped Priority Return	Off
Veh Priority Return	Off	Queue Delay	Off
Conditional Delay	Off		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Preempt Plan 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing																
Dwell Veh	.	.	X	.	.	.	.	X	.	.	.	.	.	.	.	.
Dwell Ped																
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Ped																
Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exit Phases																
Exit Calls				X				X								
Special Function																

Enable	Yes	Preempt Override	Yes	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	Yes	Duration	5	CLR > GRN	No
Term Ovlp Asap	No	PC Through Yel	No	Terminate Phase	No
Ped Dark	No	Track Clear Rsrv	No	Dwell Flash	Off
Linked Pmt	0	FL Exit Color	Grn	Exit Options	Off
Exit Timing Plan	0	Reservice	0	Fault Type	Hard

Ring	1	2	3	4
Free During Pmt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	7	8	3.0	1.0
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	3.0	1.0
	Min Dwell	Pmt Ext	Max Time	Yellow	Red
Dwell / Cycle-Exit	8	0.0	45	3.0	1.0

Preemption Active Out	On	Preempt Act Dwell	No
Other - Priority Preempt	Off	Non-Priority Pmt	Off
Inhibit Extension Time	0.0	Ped Priority Return	Off
Veh Priority Return	Off	Queue Delay	Off
Conditional Delay	Off		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Preempt Plan 4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing																
Dwell Veh	.	.	.	X	.	.	X	.	.	.	.	.	.	.	.	.
Dwell Ped																
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Ped																
Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exit Phases				X				X								
Exit Calls																
Special Function																

Enable	Yes	Preempt Override	Yes	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	Yes	Duration	5	CLR > GRN	No
Term Ovlp Asap	No	PC Through Yel	No	Terminate Phase	No
Ped Dark	No	Track Clear Rsrv	No	Dwell Flash	Off
Linked Pmt	0	FL Exit Color	Grn	Exit Options	Off
Exit Timing Plan	0	Reservice	0	Fault Type	Hard

Ring	1	2	3	4
Free During Pmt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	7	8	3.0	2.0
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	3.0	2.0
	Min Dwell	Pmt Ext	Max Time	Yellow	Red
Dwell / Cycle-Exit	8	0.0	45	3.0	2.0

Preemption Active Out	On	Preempt Act Dwell	No
Other - Priority Preempt	Off	Non-Priority Pmt	Off
Inhibit Extension Time	0.0	Ped Priority Return	Off
Veh Priority Return	Off	Queue Delay	Off
Conditional Delay	Off		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Guelph Ln @ Fairview St - TS 730 - Econolite Type - ASC/3

Preempt Preempt Filtering
Enable Preempt Filtering & TSP/SCP (MM) 4-2

Input	Solid	Pulsing
1	PREEMPTION 1	...BYPASSED...
2	PREEMPTION 2	...BYPASSED...
3	PREEMPTION 3	PREEMPTION 7
4	PREEMPTION 4	PREEMPTION 8
5	PREEMPTION 5	PREEMPTION 9
6	PREEMPTION 6	PREEMPTION 10
7	...BYPASSED...	...BYPASSED...
8	...BYPASSED...	...BYPASSED...
9	...BYPASSED...	...BYPASSED...
10	...BYPASSED...	...BYPASSED...

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Guelph Ln @ Fairview St - TS 730 - Econolite Type - ASC/3

Preempt TSP/SCP Plan and Split

TSP / SCP Plan (MM) 4-3

TSP/SCP Plan	Enable Option	Signal Type	Det Lock	Delay Time	Max Presence	PMT Enables Reservice	No Delay in TSP	Action SF Inhibit	Reservice Cycles	Bus Heading
1	No	Solid	No	0	0	No	False	0	0	NB
2	No	Solid	No	0	0	No	False	0	0	SB
3	No	Solid	No	0	0	No	False	0	0	EB
4	No	Solid	No	0	0	No	False	0	0	WB
5	No	Solid	No	0	0	No	False	0	0	.
6	No	Solid	No	0	0	No	False	0	0	.

Mode: TSP
Free Default Pattern: 120
Headway Allowance: 0

TSP/SCP Plan	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

TSP / SCP Split Pattern (MM) 4-4

TSP/SCP Split Pattern	Max Type	Phase															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
4	Max Reduction	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255

ECONOLITE

City of Burlington

MOVING TRAFFIC FORWARD

Guelph Ln @ Fairview St - TS 730 - Econolite Type - ASC/3

Time Base Clock/Calendar
Clock/Calendar Data (MM) 5-1

Manual Action Plan:	0
SYNC Reference Time:	00:00
SYNC Reference:	Reference Time
Day Light Savings:	No
Time Reset Input Set Time:	0:00:00
Standard Time From GMT:	0

ECONOLITE

City of Burlington

MOVING TRAFFIC FORWARD

Guelph Ln @ Fairview St - TS 730 - Econolite Type - ASC/3

Time Base Action Plan
Action Plan (MM) 5-2

Action Plan - 1

Pattern	1	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	0	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall		X				X										
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall				X				X								
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.					

Action Plan - 2

Pattern	2	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	0	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall		X				X										
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall				X				X								
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)								

Aux Func (1-3)			

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Action Plan - 3

Pattern	3	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	0	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall		X				X										
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall				X				X								
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)								

Aux Func (1-3)			

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Action Plan - 4

Pattern	4	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	0	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall		X				X										
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)								

Aux Func (1-3)			

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Action Plan - 5

Pattern	5	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	0	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall		X				X										
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)								

Aux Func (1-3)			

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Action Plan - 8

Pattern	Auto	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	0	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.					

Action Plan - 10

Pattern	Free	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	0	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall		X				X										
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.					

ECONOLITE

MOVING TRAFFIC FORWARD

City of Burlington

Guelph Ln @ Fairview St - TS 730 - Econolite Type - ASC/3

Time Base Day Plan/Schedule
Day Plan (MM) 5-3

Day Plan #1

Event	Action Plan	Start Time
1	5	06:00
2	1	07:00
3	2	10:00
4	3	15:15
5	2	19:00
6	10	22:00

Day Plan #2

Event	Action Plan	Start Time
1	4	07:00
2	2	09:00
3	3	12:30
4	2	17:00
5	4	20:00
6	10	22:00

Day Plan #3

Event	Action Plan	Start Time
1	4	08:30
2	2	11:30
3	4	17:00
4	10	20:30

Schedule (MM) 5-4

Schedule Number - 1

Day Plan No.: 1

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
		X	X	X	X	X	

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

Schedule Number - 2

Day Plan No.: 2

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
							X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

Schedule Number - 3

Day Plan No.: 3

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X						

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Guelph Ln @ Fairview St - TS 730 - Econolite Type - ASC/3

Time Base Exceptions
Exception Day Program (MM) 5-5

Excep Day	Float/Fixed	Mon/Mon	DOW/DOM	WOM/Year	Day Plan
1	FIXED	1	1	0	3
2	FLOAT	2	2	3	3
3	FIXED	4	19	0	3
4	FLOAT	5	2	3	3
5	FIXED	7	1	0	3
6	FLOAT	8	2	1	3
7	FLOAT	9	2	1	3
8	FLOAT	10	2	2	3
9	FIXED	12	25	0	3

ECONOLITE

City of Burlington

MOVING TRAFFIC FORWARD

Guelph Ln @ Fairview St - TS 730 - Econolite Type - ASC/3

Detectors

Detectors - Pg 1

Veh Det Phase Assignment (MM) 6-1

Vehicle Detector Plan Number - 1

Veh Detector	Assigned Phase	Called Phase	Type
1	1		S
2	2		S
3	3		S
4	4		S
5	5		S
6	6		S
7	7		S
8	8		S
9	1	1	S
10	3	3	S
11	5	5	S
12	7	7	S
13	2	2	S
14	4	4	S
15	6	6	S
16	8	8	S
17	1		S
18	2		S
19	3		S
20	4		S
21	5		S
22	6		S
23	7		S
24	8		S

Vehicle Detector Plan Number - 2

Veh Detector	Assigned Phase	Called Phase	Type

Vehicle Detector Plan Number - 3

Veh Detector	Assigned Phase	Called Phase	Type

Vehicle Detector Plan Number - 4

Veh Detector	Assigned Phase	Called Phase	Type

Vehicle Detector Setup (MM) 6-2

Veh Detector	Type	TS2 Detector	Description
1	S-STANDARD	No	
2	S-STANDARD	No	
3	S-STANDARD	No	
4	S-STANDARD	No	
5	S-STANDARD	No	
6	S-STANDARD	No	
7	S-STANDARD	No	
8	S-STANDARD	No	
9	S-STANDARD	No	
10	S-STANDARD	No	
11	S-STANDARD	No	
12	S-STANDARD	No	
13	S-STANDARD	No	
14	S-STANDARD	No	

15	S-STANDARD	No	
16	S-STANDARD	No	
17	S-STANDARD	Yes	
18	S-STANDARD	Yes	
19	S-STANDARD	Yes	
20	S-STANDARD	Yes	
21	S-STANDARD	Yes	
22	S-STANDARD	Yes	
23	S-STANDARD	Yes	
24	S-STANDARD	Yes	
25	S-STANDARD	Yes	
26	S-STANDARD	Yes	
27	S-STANDARD	Yes	
28	S-STANDARD	Yes	
29	S-STANDARD	Yes	
30	S-STANDARD	Yes	
31	S-STANDARD	Yes	
32	S-STANDARD	Yes	
33	S-STANDARD	Yes	
34	S-STANDARD	Yes	
35	S-STANDARD	Yes	
36	S-STANDARD	Yes	
37	S-STANDARD	Yes	
38	S-STANDARD	Yes	
39	S-STANDARD	Yes	
40	S-STANDARD	Yes	
41	S-STANDARD	Yes	
42	S-STANDARD	Yes	
43	S-STANDARD	Yes	
44	S-STANDARD	Yes	
45	S-STANDARD	Yes	
46	S-STANDARD	Yes	
47	S-STANDARD	Yes	
48	S-STANDARD	Yes	
49	S-STANDARD	Yes	
50	S-STANDARD	Yes	
51	S-STANDARD	Yes	
52	S-STANDARD	Yes	
53	S-STANDARD	Yes	
54	S-STANDARD	Yes	
55	S-STANDARD	Yes	
56	S-STANDARD	Yes	
57	S-STANDARD	Yes	
58	S-STANDARD	Yes	
59	S-STANDARD	Yes	
60	S-STANDARD	Yes	
61	S-STANDARD	Yes	
62	S-STANDARD	Yes	
63	S-STANDARD	Yes	
64	S-STANDARD	Yes	

Vehicle Detector Plan Number - 1

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

9	1	No	Yes	0.0	Passage	0.0	0	No	0	Red	No	No	No
10	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	7	No	Yes	0.0	Passage	0.0	0	No	0	Red	No	No	No
13	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	4	No	Yes	0.0	Passage	0.0	0	No	0	Red	No	No	No
15	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	8	No	Yes	0.0	Passage	0.0	0	No	0	Red	No	No	No
17	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
18	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
19	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
20	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
21	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
22	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
23	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
24	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
25	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
26	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
27	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
28	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
29	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
30	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
31	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
32	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
33	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
34	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
35	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
36	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
37	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
38	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
39	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
40	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
41	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
42	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
43	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
44	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
45	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
46	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
47	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
48	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
49	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
50	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
51	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
52	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
53	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
54	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
55	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
56	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
57	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
58	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
59	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
60	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
61	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
62	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
63	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
64	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 2

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay

Vehicle Detector Plan Number - 3

	Phase												

Veh Detector		ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay

Vehicle Detector Plan Number - 4

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay

Ped Detector Phase Assignment (MM) 6-3

Mode: NTCIP

Called Phase	Detector
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Guelph Ln @ Fairview St - TS 730 - Econolite Type - ASC/3

Detectors

Detectors - Pg 2

Log - Speed Detector Setup (MM) 6-4

NTCIP Log Period: 60 ECPI Log Period: 0 Length Unit: Inches

Speed Detector	Local Detector	One/Two Detector	Vehicle Length	Trap length	Enable Log
1	0	1	0	0	No
2	0	1	0	0	No
3	0	1	0	0	No
4	0	1	0	0	No
5	0	1	0	0	No
6	0	1	0	0	No
7	0	1	0	0	No
8	0	1	0	0	No
9	0	1	0	0	No
10	0	1	0	0	No
11	0	1	0	0	No
12	0	1	0	0	No
13	0	1	0	0	No
14	0	1	0	0	No
15	0	1	0	0	No
16	0	1	0	0	No

Vehicle Detector Diagnostics (MM) 6-5

Veh Diagnostic Plan Number - 1

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 2

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 3

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 4

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Pedestrian Detector Diagnostics (MM) 6-6

Ped Diagnostic Plan Number - 1

Det	Counts	Act	Pres	Multiplier

Ped Diagnostic Plan Number - 2

Det	Counts	Act	Pres	Multiplier

Ped Diagnostic Plan Number - 3

Det	Counts	Act	Pres	Multiplier

Ped Diagnostic Plan Number - 4

Det	Counts	Act	Pres	Multiplier

Appendix C

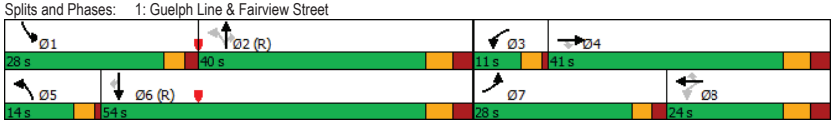
Base Year Operations

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	298	472	196	28	209	175	146	654	82	270	682	333
Future Volume (vph)	298	472	196	28	209	175	146	654	82	270	682	333
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		30.0	125.0		120.0	90.0		70.0	150.0		0.0
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.95	1.00
Ped Bike Factor	0.99		0.97	0.99		0.98	0.99		0.97	0.99		0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3367	3505	1583	1805	3406	1568	1752	5036	1615	3400	3438	1509
Flt Permitted	0.950			0.465			0.314			0.950		
Satd. Flow (perm)	3337	3505	1531	874	3406	1531	576	5036	1567	3377	3438	1471
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			165			200			200			358
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		98.6			183.4			211.2			252.5	
Travel Time (s)		5.9			11.0			15.2			15.2	
Confl. Peds. (#/hr)	9		16	16		9	10		13	13		10
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	4%	3%	2%	0%	6%	3%	3%	3%	0%	3%	5%	7%
Adj. Flow (vph)	320	508	211	30	225	188	157	703	88	290	733	358
Shared Lane Traffic (%)												
Lane Group Flow (vph)	320	508	211	30	225	188	157	703	88	290	733	358
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8	2		2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0
Minimum Split (s)	12.0	34.0	34.0	11.0	24.0	24.0	11.0	33.0	33.0	12.0	33.0	33.0
Total Split (s)	28.0	41.0	41.0	11.0	24.0	24.0	14.0	40.0	40.0	28.0	54.0	54.0
Total Split (%)	23.3%	34.2%	34.2%	9.2%	20.0%	20.0%	11.7%	33.3%	33.3%	23.3%	45.0%	45.0%
Maximum Green (s)	23.0	34.0	34.0	7.0	17.0	17.0	10.0	33.0	33.0	23.0	47.0	47.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		8.0	8.0		8.0	8.0		12.0	12.0		12.0	12.0
Flash Dont Walk (s)		19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	16.6	38.4	38.4	33.4	23.4	23.4	53.0	40.5	40.5	15.5	47.5	47.5
Actuated g/C Ratio	0.14	0.32	0.32	0.28	0.20	0.20	0.44	0.34	0.34	0.13	0.40	0.40
v/c Ratio	0.69	0.45	0.35	0.10	0.34	0.41	0.45	0.41	0.13	0.66	0.54	0.45

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	56.8	35.1	10.7	24.2	44.3	7.9	19.7	32.0	0.4	57.0	29.7	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.8	35.1	10.7	24.2	44.3	7.9	19.7	32.0	0.4	57.0	29.7	4.4
LOS	E	D	B	C	D	A	B	C	A	E	C	A
Approach Delay		36.8			27.5			27.0			28.9	
Approach LOS		D			C			C			C	
Queue Length 50th (m)	37.0	52.1	7.9	4.2	23.9	0.0	18.0	45.7	0.0	33.5	68.4	0.0
Queue Length 95th (m)	49.6	68.7	27.3	10.2	37.3	17.0	29.4	60.4	0.0	45.8	86.7	17.8
Internal Link Dist (m)		74.6			159.4			187.2			228.5	
Turn Bay Length (m)	60.0		30.0	125.0		120.0	90.0		70.0	150.0		
Base Capacity (vph)	645	1121	602	297	663	459	354	1700	661	651	1362	798
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.45	0.35	0.10	0.34	0.41	0.44	0.41	0.13	0.45	0.54	0.45

Intersection Summary		
Area Type:	Other	
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 30 (25%), Referenced to phase 2:NBTL and 6:SBT, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.69		
Intersection Signal Delay: 30.4	Intersection LOS: C	
Intersection Capacity Utilization 80.4%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 1: Guelph Line & Fairview Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	298	472	196	28	209	175	146	654	82	270	682	333
Future Volume (vph)	298	472	196	28	209	175	146	654	82	270	682	333
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3367	3505	1531	1797	3406	1531	1750	5036	1567	3400	3438	1471
Flt Permitted	0.95	1.00	1.00	0.47	1.00	1.00	0.31	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3367	3505	1531	879	3406	1531	578	5036	1567	3400	3438	1471
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	320	508	211	30	225	188	157	703	88	290	733	358
RTOR Reduction (vph)	0	0	112	0	0	149	0	0	59	0	0	221
Lane Group Flow (vph)	320	508	99	30	225	39	157	703	29	290	733	137
Confl. Peds. (#/hr)	9		16	16		9	10		13	13		10
Heavy Vehicles (%)	4%	3%	2%	0%	6%	3%	3%	3%	0%	3%	5%	7%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8	2		2			6
Actuated Green, G (s)	16.6	38.4	38.4	29.2	25.0	25.0	48.4	38.9	38.9	15.5	45.9	45.9
Effective Green, g (s)	16.6	38.4	38.4	29.2	25.0	25.0	48.4	38.9	38.9	15.5	45.9	45.9
Actuated g/C Ratio	0.14	0.32	0.32	0.24	0.21	0.21	0.40	0.32	0.32	0.13	0.38	0.38
Clearance Time (s)	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	465	1121	489	246	709	318	325	1632	507	439	1315	562
v/s Ratio Prot	c0.10	c0.14		0.00	0.07		0.04	0.14		c0.09	c0.21	
v/s Ratio Perm			0.06	0.03		0.03	0.16		0.02			0.09
v/c Ratio	0.69	0.45	0.20	0.12	0.32	0.12	0.48	0.43	0.06	0.66	0.56	0.24
Uniform Delay, d1	49.2	32.4	29.7	34.9	40.3	38.6	23.7	31.9	27.9	49.7	29.1	25.2
Progression 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
Incremental Delay, d2	4.2	1.3	0.9	0.2	1.2	0.8	1.1	0.8	0.2	3.7	1.7	1.0
Delay (s)	53.4	33.8	30.6	35.2	41.4	39.4	24.8	32.7	28.1	53.5	30.8	26.3
Level of Service	D	C	C	D	D	D	C	C	C	D	C	C
Approach Delay (s)		39.2			40.1			31.0			34.4	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	35.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0	
Intersection Capacity Utilization	80.4%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	939	59	95	498	13	74	2	112	5	3	8
Future Volume (vph)	11	939	59	95	498	13	74	2	112	5	3	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		0.0	20.0		0.0	40.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00		0.99	0.99			0.99	
Frt		0.991			0.996			0.853			0.932	
Flt Protected	0.950			0.950			0.950				0.985	
Satd. Flow (prot)	1805	3438	0	1787	3364	0	1736	1584	0	0	1726	0
Flt Permitted	0.457			0.221			0.747				0.852	
Satd. Flow (perm)	866	3438	0	415	3364	0	1352	1584	0	0	1492	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			5			115			8	
Link Speed (k/h)		60			60			40			50	
Link Distance (m)		174.2			81.3			167.3			133.3	
Travel Time (s)		10.5			4.9			15.1			9.6	
Confl. Peds. (#/hr)	3		6	6		3	9		1	1		9
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	4%	2%	1%	7%	0%	4%	0%	1%	0%	0%	0%
Adj. Flow (vph)	11	968	61	98	513	13	76	2	115	5	3	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	1029	0	98	526	0	76	117	0	0	16	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		6.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	33.0	33.0		10.0	33.0		30.0	30.0		30.0	30.0	
Total Split (s)	34.0	34.0		11.0	45.0		30.0	30.0		30.0	30.0	
Total Split (%)	45.3%	45.3%		14.7%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	28.0	28.0		8.0	39.0		23.0	23.0		23.0	23.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		0.0	2.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		3.0	6.0		7.0	7.0			7.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)	15.0	15.0			15.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	11.0	11.0			11.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	
Act Effct Green (s)	48.1	48.1		57.9	56.1		10.1	10.1			10.1	
Actuated g/C Ratio	0.64	0.64		0.77	0.75		0.13	0.13			0.13	
v/c Ratio	0.02	0.47		0.22	0.21		0.42	0.37			0.08	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	9.1	10.6		4.5	4.3		36.2	9.9			20.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	9.1	10.6		4.5	4.3		36.2	9.9			20.6	
LOS	A	B		A	A		D	A			C	
Approach Delay		10.6			4.3			20.3			20.6	
Approach LOS		B			A			C			C	
Queue Length 50th (m)	0.6	41.5		2.9	11.1		10.0	0.3			1.0	
Queue Length 95th (m)	3.1	68.7		7.9	20.2		20.6	12.4			5.7	
Internal Link Dist (m)		150.2			57.3			143.3			109.3	
Turn Bay Length (m)	25.0			20.0			40.0					
Base Capacity (vph)	555	2206		467	2516		414	565			463	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	0		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.02	0.47		0.21	0.21		0.18	0.21			0.03	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 75			
Offset: 15 (20%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.47			
Intersection Signal Delay: 9.6		Intersection LOS: A	
Intersection Capacity Utilization 58.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 2: Drury Lane & Fairview Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	939	59	95	498	13	74	2	112	5	3	8
Future Volume (vph)	11	939	59	95	498	13	74	2	112	5	3	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		3.0	6.0		7.0	7.0			7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85			0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)	1801	3438		1787	3365		1720	1584			1726	
Flt Permitted	0.46	1.00		0.22	1.00		0.75	1.00			0.85	
Satd. Flow (perm)	866	3438		415	3365		1352	1584			1493	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	11	968	61	98	513	13	76	2	115	5	3	8
RTOR Reduction (vph)	0	4	0	0	1	0	0	102	0	0	7	0
Lane Group Flow (vph)	11	1025	0	98	525	0	76	15	0	0	9	0
Confl. Peds. (#/hr)	3		6	6		3	9		1	1		9
Heavy Vehicles (%)	0%	4%	2%	1%	7%	0%	4%	0%	1%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	44.9	44.9		53.5	53.5		8.5	8.5			8.5	
Effective Green, g (s)	44.9	44.9		53.5	53.5		8.5	8.5			8.5	
Actuated g/C Ratio	0.60	0.60		0.71	0.71		0.11	0.11			0.11	
Clearance Time (s)	6.0	6.0		3.0	6.0		7.0	7.0			7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	518	2058		398	2400		153	179			169	
v/s Ratio Prot		c0.30		c0.02	0.16			0.01				
v/s Ratio Perm	0.01			0.16			c0.06				0.01	
v/c Ratio	0.02	0.50		0.25	0.22		0.50	0.08			0.05	
Uniform Delay, d1	6.1	8.6		4.1	3.7		31.2	29.8			29.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.1	0.9		0.3	0.2		2.5	0.2			0.1	
Delay (s)	6.2	9.5		4.4	3.9		33.8	30.0			29.8	
Level of Service	A	A		A	A		C	C			C	
Approach Delay (s)		9.4			3.9			31.5			29.8	
Approach LOS		A			A			C			C	

Intersection Summary					
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.47				
Actuated Cycle Length (s)	75.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	58.3%	ICU Level of Service		B	
Analysis Period (min)	15				

c Critical Lane Group

Intersection: 1: Guelph Line & Fairview Street

Movement	EB	EB	EB	EB	EB	B6	B6	B15	B15	WB	WB	WB
Directions Served	L	L	T	T	R	T	T	T	T	L	T	T
Maximum Queue (m)	63.4	67.4	99.5	100.2	45.0	70.2	66.1	88.8	87.3	25.0	74.3	66.6
Average Queue (m)	40.3	48.8	62.1	65.6	13.5	17.5	17.5	9.7	10.3	6.2	38.4	21.5
95th Queue (m)	66.5	75.6	110.1	111.8	47.2	61.0	60.9	47.6	49.4	16.5	64.9	55.3
Link Distance (m)			71.5	71.5		39.9	39.9	229.2	229.2		161.4	161.4
Upstream Blk Time (%)		2	20	23		11	11					
Queuing Penalty (veh)		0	107	123		60	60					
Storage Bay Dist (m)	60.0	60.0			30.0					125.0		
Storage Blk Time (%)	1	11	18	39	0							
Queuing Penalty (veh)	2	26	55	77	0							

Intersection: 1: Guelph Line & Fairview Street

Movement	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	T	T	L	L	T	T
Maximum Queue (m)	38.8	76.2	69.6	49.5	79.0	82.4	80.9	75.5
Average Queue (m)	17.4	48.0	37.3	13.6	38.0	52.1	43.4	38.4
95th Queue (m)	31.3	75.2	66.7	40.2	71.4	79.1	69.1	64.6
Link Distance (m)		192.4	192.4	192.4			233.4	233.4
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)	90.0				150.0	150.0		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: Drury Lane & Fairview Street

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	LTR
Maximum Queue (m)	18.2	73.8	62.6	25.6	46.9	45.7	35.3	36.3	16.9
Average Queue (m)	1.7	34.9	24.3	11.9	10.2	16.1	16.6	14.3	4.1
95th Queue (m)	9.4	64.6	50.9	21.9	28.9	34.6	30.9	26.1	12.8
Link Distance (m)		163.8	163.8		62.7	62.7		153.3	119.5
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)	25.0			20.0			40.0		
Storage Blk Time (%)		10		2	1		0	0	
Queuing Penalty (veh)		1		4	1		0	0	

Network Summary

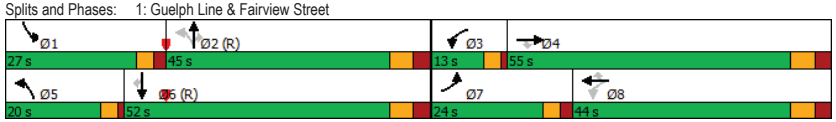
Network wide Queuing Penalty: 518

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	324	522	229	91	860	369	265	788	79	345	719	466
Future Volume (vph)	324	522	229	91	860	369	265	788	79	345	719	466
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		30.0	125.0		120.0	90.0		70.0	150.0		0.0
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.95	1.00
Ped Bike Factor	0.99		0.96	0.99		0.97	0.99		0.96	0.99		0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3367	3505	1583	1805	3574	1583	1787	5085	1615	3467	3574	1583
Flt Permitted	0.950			0.454			0.242			0.950		
Satd. Flow (perm)	3347	3505	1518	850	3574	1533	452	5085	1550	3434	3574	1524
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			163			294			171			285
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		98.6			183.4			211.2			252.5	
Travel Time (s)		5.9			11.0			15.2			15.2	
Confl. Peds. (#/hr)	13		19	19		13	16		18	18		16
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	4%	3%	2%	0%	1%	2%	1%	2%	0%	1%	1%	2%
Adj. Flow (vph)	331	533	234	93	878	377	270	804	81	352	734	476
Shared Lane Traffic (%)												
Lane Group Flow (vph)	331	533	234	93	878	377	270	804	81	352	734	476
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8	2		2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0
Minimum Split (s)	12.0	34.0	34.0	11.0	35.0	35.0	11.0	33.0	33.0	12.0	33.0	33.0
Total Split (s)	24.0	55.0	55.0	13.0	44.0	44.0	20.0	45.0	45.0	27.0	52.0	52.0
Total Split (%)	17.1%	39.3%	39.3%	9.3%	31.4%	31.4%	14.3%	32.1%	32.1%	19.3%	37.1%	37.1%
Maximum Green (s)	19.0	48.0	48.0	9.0	37.0	37.0	16.0	38.0	38.0	22.0	45.0	45.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		8.0	8.0		8.0	8.0		12.0	12.0		12.0	12.0
Flash Dont Walk (s)		19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	17.6	48.5	48.5	49.9	38.4	38.4	59.5	41.1	41.1	18.9	45.5	45.5
Actuated g/C Ratio	0.13	0.35	0.35	0.36	0.27	0.27	0.42	0.29	0.29	0.14	0.32	0.32
v/c Ratio	0.78	0.44	0.37	0.26	0.90	0.60	0.80	0.54	0.14	0.75	0.63	0.69

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	72.8	36.8	12.6	24.6	61.7	14.6	41.6	43.6	0.5	68.6	43.2	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.8	36.8	12.6	24.6	61.7	14.6	41.6	43.6	0.5	68.6	43.2	21.8
LOS	E	D	B	C	E	B	D	D	A	E	D	C
Approach Delay		42.5			46.0			40.1			42.4	
Approach LOS		D			D			D			D	
Queue Length 50th (m)	45.3	59.2	13.4	14.3	123.7	17.7	43.7	68.0	0.0	48.1	90.2	46.4
Queue Length 95th (m)	61.7	75.6	34.6	24.9	#161.3	51.2	#73.3	84.2	0.0	63.5	111.1	87.2
Internal Link Dist (m)		74.6			159.4			187.2			228.5	
Turn Bay Length (m)	60.0		30.0	125.0		120.0	90.0		70.0	150.0		
Base Capacity (vph)	456	1214	632	367	980	633	346	1491	575	544	1161	688
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.44	0.37	0.25	0.90	0.60	0.78	0.54	0.14	0.65	0.63	0.69

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 29 (21%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 95			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 42.8		Intersection LOS: D	
Intersection Capacity Utilization 88.5%		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: Guelph Line & Fairview Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	324	522	229	91	860	369	265	788	79	345	719	466
Future Volume (vph)	324	522	229	91	860	369	265	788	79	345	719	466
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	1.00	0.96	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3367	3505	1518	1794	3574	1533	1785	5085	1550	3467	3574	1524
Flt Permitted	0.95	1.00	1.00	0.45	1.00	1.00	0.24	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3367	3505	1518	857	3574	1533	455	5085	1550	3467	3574	1524
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	331	533	234	93	878	377	270	804	81	352	734	476
RTOR Reduction (vph)	0	0	107	0	0	213	0	0	57	0	0	192
Lane Group Flow (vph)	331	533	127	93	878	164	270	804	24	352	734	284
Confl. Peds. (#/hr)	13		19	19		13	16		18	18		16
Heavy Vehicles (%)	4%	3%	2%	0%	1%	2%	1%	2%	0%	1%	1%	2%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8	2		2			6
Actuated Green, G (s)	17.6	48.5	48.5	46.9	38.4	38.4	56.6	41.1	41.1	18.9	45.5	45.5
Effective Green, g (s)	17.6	48.5	48.5	46.9	38.4	38.4	56.6	41.1	41.1	18.9	45.5	45.5
Actuated g/C Ratio	0.13	0.35	0.35	0.33	0.27	0.27	0.40	0.29	0.29	0.13	0.32	0.32
Clearance Time (s)	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	423	1214	525	343	980	420	331	1492	455	468	1161	495
v/s Ratio Prot	c0.10	0.15		0.02	c0.25		0.09	0.16		c0.10	c0.21	
v/s Ratio Perm			0.08	0.07		0.11	c0.24		0.02			0.19
v/c Ratio	0.78	0.44	0.24	0.27	0.90	0.39	0.82	0.54	0.05	0.75	0.63	0.57
Uniform Delay, d1	59.3	35.3	32.6	32.6	48.9	41.3	30.5	41.5	35.5	58.3	40.1	39.2
Progression 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
Incremental Delay, d2	9.1	1.2	1.1	0.4	12.5	2.7	14.3	1.4	0.2	6.7	2.6	4.8
Delay (s)	68.5	36.4	33.7	33.1	61.4	44.0	44.8	42.9	35.7	65.0	42.8	44.0
Level of Service	E	D	C	C	E	D	D	D	D	E	D	D
Approach Delay (s)		45.5			54.6			42.8			48.1	
Approach LOS		D			D			D			D	

Intersection Summary					
HCM 2000 Control Delay	48.1	HCM 2000 Level of Service		D	
HCM 2000 Volume to Capacity ratio	0.82				
Actuated Cycle Length (s)	140.0	Sum of lost time (s)		24.0	
Intersection Capacity Utilization	88.5%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	893	103	159	1460	24	114	4	109	22	9	18
Future Volume (vph)	8	893	103	159	1460	24	114	4	109	22	9	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		0.0	20.0		0.0	40.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00		0.99	0.98			0.99	
Frt		0.985			0.998			0.855			0.950	
Flt Protected	0.950			0.950			0.950				0.978	
Satd. Flow (prot)	1805	3451	0	1805	3531	0	1787	1587	0	0	1750	0
Flt Permitted	0.151			0.210			0.724				0.802	
Satd. Flow (perm)	286	3451	0	398	3531	0	1348	1587	0	0	1429	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			3			114			19	
Link Speed (k/h)		60			60			40			50	
Link Distance (m)		174.2			81.3			167.3			133.3	
Travel Time (s)		10.5			4.9			15.1			9.6	
Confl. Peds. (#/hr)	14		7	7		14	9		10	10		9
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	3%	0%	0%	2%	0%	1%	0%	0%	0%	0%	0%
Adj. Flow (vph)	8	930	107	166	1521	25	119	4	114	23	9	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	1037	0	166	1546	0	119	118	0	0	51	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		6.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	33.0	33.0		10.0	33.0		30.0	30.0		30.0	30.0	
Total Split (s)	45.0	45.0		13.0	58.0		32.0	32.0		32.0	32.0	
Total Split (%)	50.0%	50.0%		14.4%	64.4%		35.6%	35.6%		35.6%	35.6%	
Maximum Green (s)	39.0	39.0		10.0	52.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		0.0	2.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		3.0	6.0		7.0	7.0			7.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)	15.0	15.0			15.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	11.0	11.0			11.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	
Act Effct Green (s)	52.6	52.6		66.7	63.7		13.3	13.3			13.3	
Actuated g/C Ratio	0.58	0.58		0.74	0.71		0.15	0.15			0.15	
v/c Ratio	0.05	0.51		0.40	0.62		0.60	0.36			0.22	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	11.8	13.0		6.8	8.8		47.4	10.0			24.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	11.8	13.0		6.8	8.8		47.4	10.0			24.6	
LOS	B	B		A	A		D	A			C	
Approach Delay		13.0			8.6			28.8			24.6	
Approach LOS		B			A			C			C	
Queue Length 50th (m)	0.6	49.5		6.6	60.8		19.3	0.6			4.8	
Queue Length 95th (m)	3.1	82.2		15.2	99.9		33.5	13.5			13.6	
Internal Link Dist (m)		150.2			57.3			143.3			109.3	
Turn Bay Length (m)	25.0			20.0			40.0					
Base Capacity (vph)	167	2024		452	2498		374	523			410	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	0		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.05	0.51		0.37	0.62		0.32	0.23			0.12	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 11 (12%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 12.0		Intersection LOS: B	
Intersection Capacity Utilization 77.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 2: Drury Lane & Fairview Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	893	103	159	1460	24	114	4	109	22	9	18
Future Volume (vph)	8	893	103	159	1460	24	114	4	109	22	9	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		3.0	6.0		7.0	7.0			7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00			1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.86			0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)	1800	3450		1804	3529		1769	1587			1741	
Flt Permitted	0.15	1.00		0.21	1.00		0.72	1.00			0.80	
Satd. Flow (perm)	286	3450		399	3529		1348	1587			1429	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	8	930	107	166	1521	25	119	4	114	23	9	19
RTOR Reduction (vph)	0	7	0	0	1	0	0	97	0	0	16	0
Lane Group Flow (vph)	8	1030	0	166	1545	0	119	21	0	0	35	0
Confl. Peds. (#/hr)	14		7	7		14	9		10	10		9
Heavy Vehicles (%)	0%	3%	0%	0%	2%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	52.6	52.6		63.7	63.7		13.3	13.3			13.3	
Effective Green, g (s)	52.6	52.6		63.7	63.7		13.3	13.3			13.3	
Actuated g/C Ratio	0.58	0.58		0.71	0.71		0.15	0.15			0.15	
Clearance Time (s)	6.0	6.0		3.0	6.0		7.0	7.0			7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	167	2016		408	2497		199	234			211	
v/s Ratio Prot		0.30		0.04	c0.44			0.01				
v/s Ratio Perm	0.03			0.25			c0.09				0.02	
v/c Ratio	0.05	0.51		0.41	0.62		0.60	0.09			0.16	
Uniform Delay, d1	8.0	11.1		5.7	6.8		35.9	33.1			33.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.5	0.9		0.7	1.2		4.8	0.2			0.4	
Delay (s)	8.5	12.0		6.3	8.0		40.6	33.3			33.9	
Level of Service	A	B		A	A		D	C			C	
Approach Delay (s)		12.0			7.8			37.0			33.9	
Approach LOS		B			A			D			C	

Intersection Summary				
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	77.6%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Intersection: 1: Guelph Line & Fairview Street

Movement	EB	EB	EB	EB	EB	B6	B6	B3	WB	WB	WB	WB
Directions Served	L	L	T	T	R	T	T	T	L	T	T	R
Maximum Queue (m)	63.1	67.4	93.3	90.1	45.0	19.8	23.5	1.3	132.3	166.7	157.7	116.0
Average Queue (m)	40.5	46.5	46.8	52.4	24.1	1.0	1.2	0.0	49.5	134.4	120.6	39.3
95th Queue (m)	64.1	68.1	76.9	83.6	60.5	8.3	11.0	0.9	138.1	182.6	175.2	138.4
Link Distance (m)			71.5	71.5		39.9	39.9	223.6		161.4	161.4	
Upstream Blk Time (%)		0	2	3			0			9	6	
Queuing Penalty (veh)		0	8	16			1			0	0	
Storage Bay Dist (m)	60.0	60.0			30.0				125.0			120.0
Storage Blk Time (%)	1	2	2	25	0				0	21	12	
Queuing Penalty (veh)	2	5	8	58	0				0	19	44	

Intersection: 1: Guelph Line & Fairview Street

Movement	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	T	T	L	L	T	T
Maximum Queue (m)	95.1	142.3	120.9	70.0	63.2	83.3	95.5	97.5
Average Queue (m)	64.6	76.3	63.2	40.6	41.5	54.4	65.2	61.2
95th Queue (m)	109.0	128.5	104.9	63.7	61.9	73.8	90.7	85.4
Link Distance (m)		192.4	192.4	192.4			233.4	233.4
Upstream Blk Time (%)		0	0					
Queuing Penalty (veh)		0	0					
Storage Bay Dist (m)	90.0				150.0	150.0		
Storage Blk Time (%)	12	0		0				
Queuing Penalty (veh)	32	1		0				

Intersection: 2: Drury Lane & Fairview Street

Movement	EB	EB	EB	WB	WB	WB	B11	B11	B6	B6	B6	NB
Directions Served	L	T	TR	L	T	TR	T	T	T	T		L
Maximum Queue (m)	19.2	87.1	73.2	27.3	85.0	87.3	29.3	38.1	82.2	101.0	16.9	42.2
Average Queue (m)	2.9	42.3	34.0	19.9	53.1	55.2	3.1	4.7	9.2	16.6	1.6	21.3
95th Queue (m)	12.6	73.7	63.9	30.4	92.1	95.2	17.5	22.3	50.8	73.5	19.6	36.9
Link Distance (m)		163.8	163.8		62.7	62.7	223.6	223.6	71.5	71.5	71.5	
Upstream Blk Time (%)					5	6			0	1	0	
Queuing Penalty (veh)					39	47			2	5	0	
Storage Bay Dist (m)	25.0			20.0								40.0
Storage Blk Time (%)		16		11	14							1
Queuing Penalty (veh)		1		80	22							1

Intersection: 2: Drury Lane & Fairview Street

Movement	NB	SB
Directions Served	TR	LTR
Maximum Queue (m)	36.4	25.8
Average Queue (m)	13.5	9.1
95th Queue (m)	26.5	20.3
Link Distance (m)	153.3	119.5
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 389

Appendix D

ITE Trip Generation Data

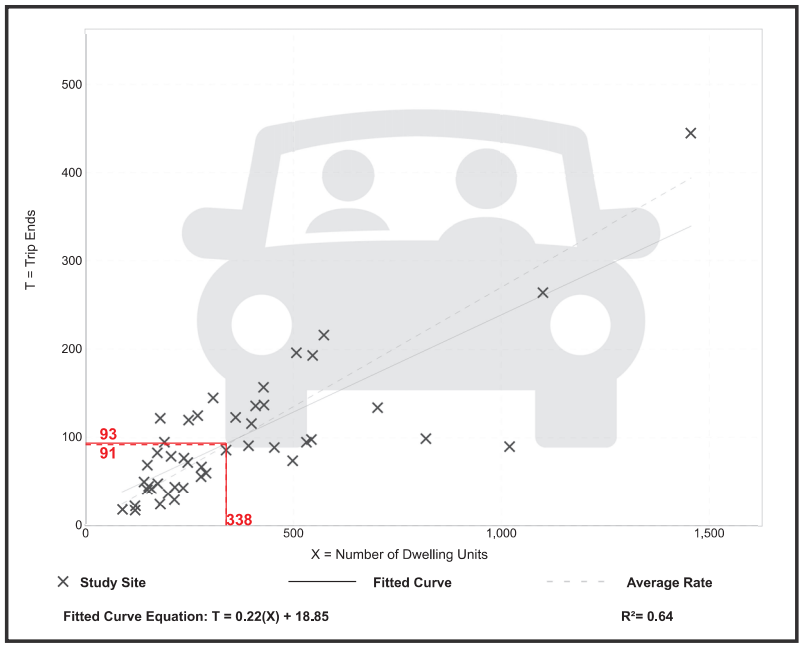
Multifamily Housing (High-Rise)
Not Close to Rail Transit (222)

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: 26% entering, 74% 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



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

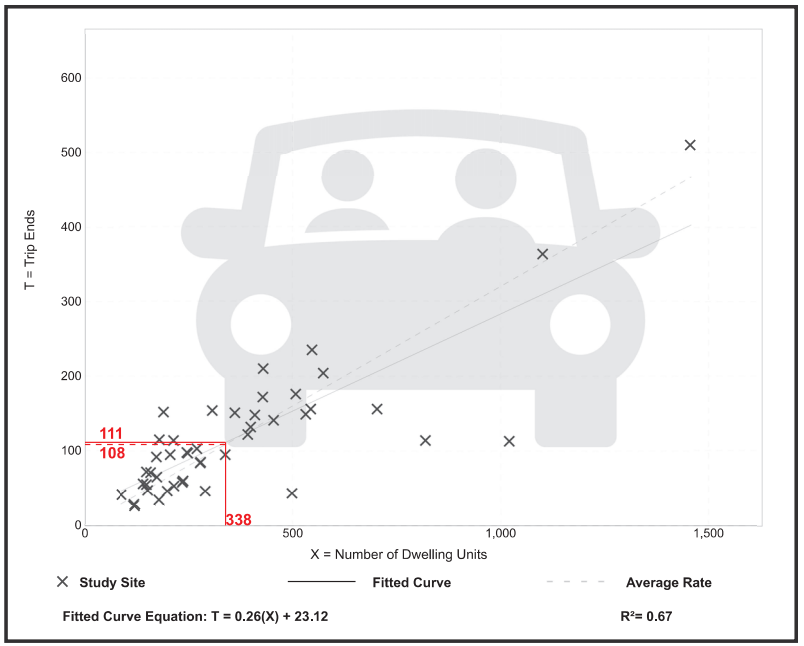
Multifamily Housing (High-Rise)
Not Close to Rail Transit (222)

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: 62% entering, 38% 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



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

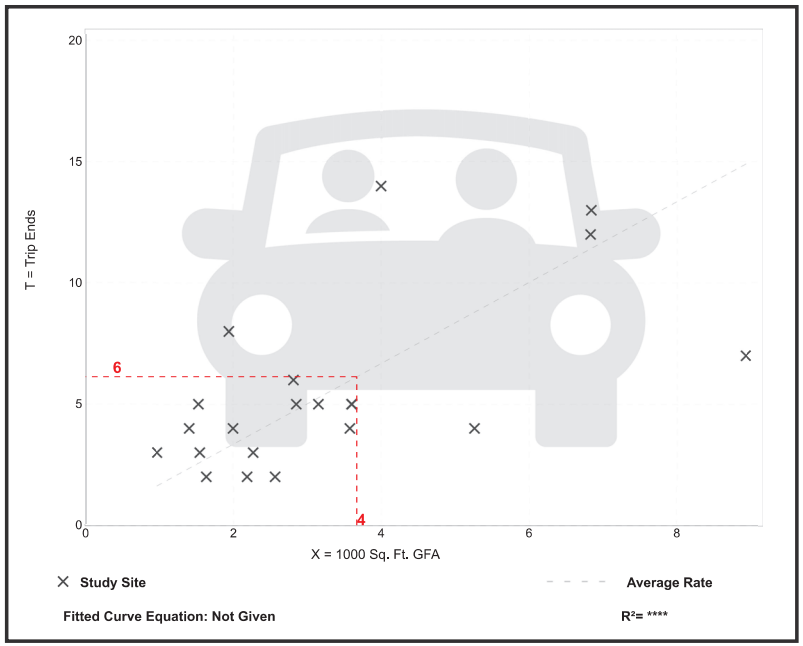
Small Office Building
(712)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
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: 21
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 82% entering, 18% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.67	0.76 - 4.12	0.88

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

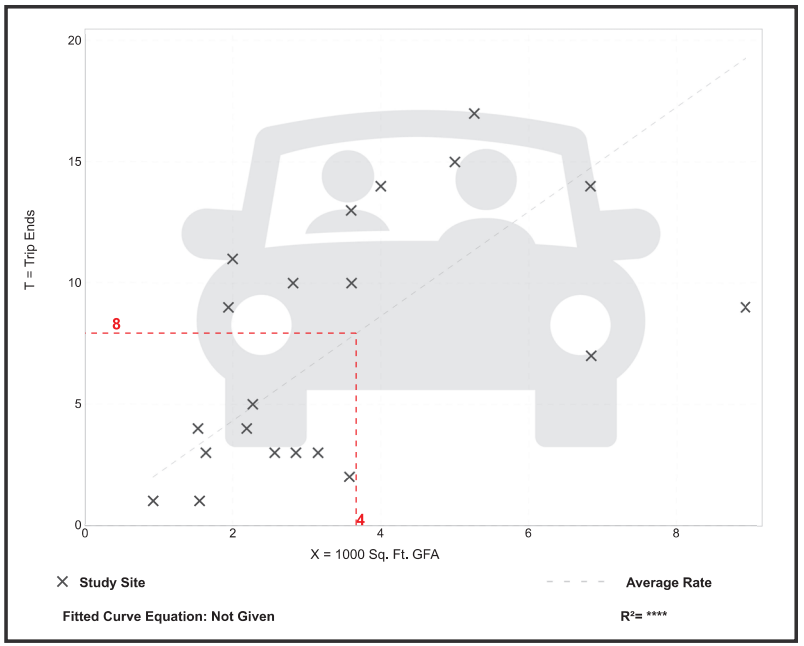
Small Office Building
(712)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
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: 21
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 34% entering, 66% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
2.16	0.56 - 5.50	1.26

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Strip Retail Plaza (<40k)
(822)

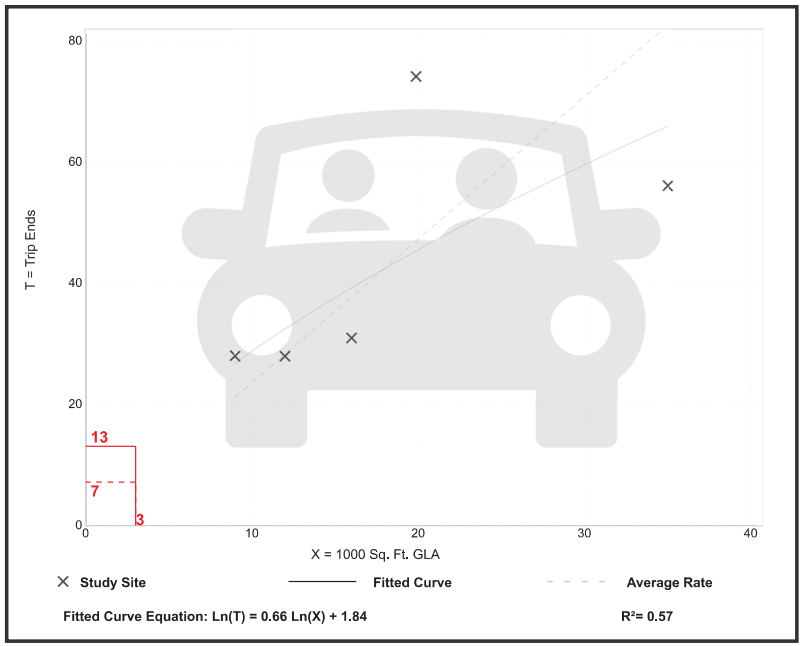
Vehicle Trip Ends vs: **1000 Sq. Ft. GLA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 5
Avg. 1000 Sq. Ft. GLA: 18
Directional Distribution: 60% entering, 40% exiting

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



Fitted Curve Equation: Ln(T) = 0.66 Ln(X) + 1.84 **R^2= 0.57**

Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

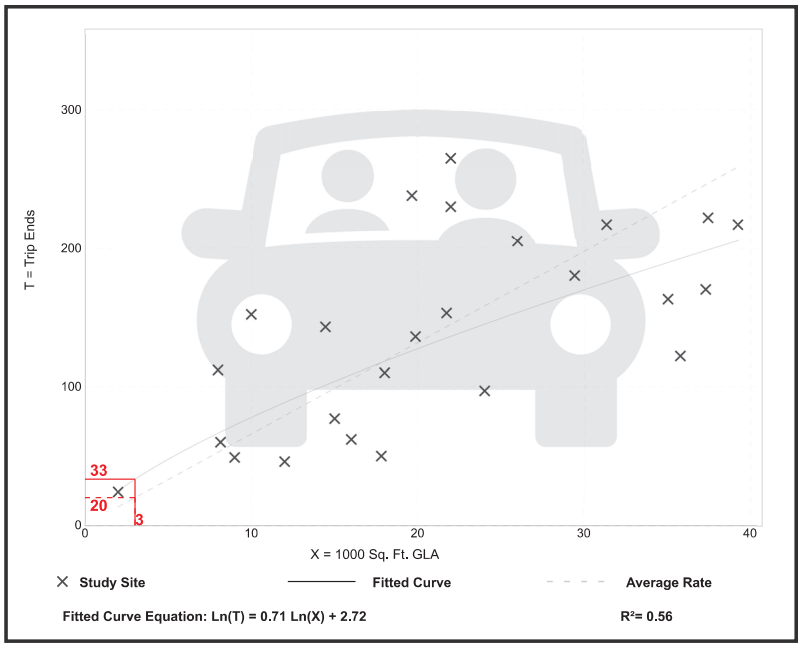
Strip Retail Plaza (<40k)
(822)

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

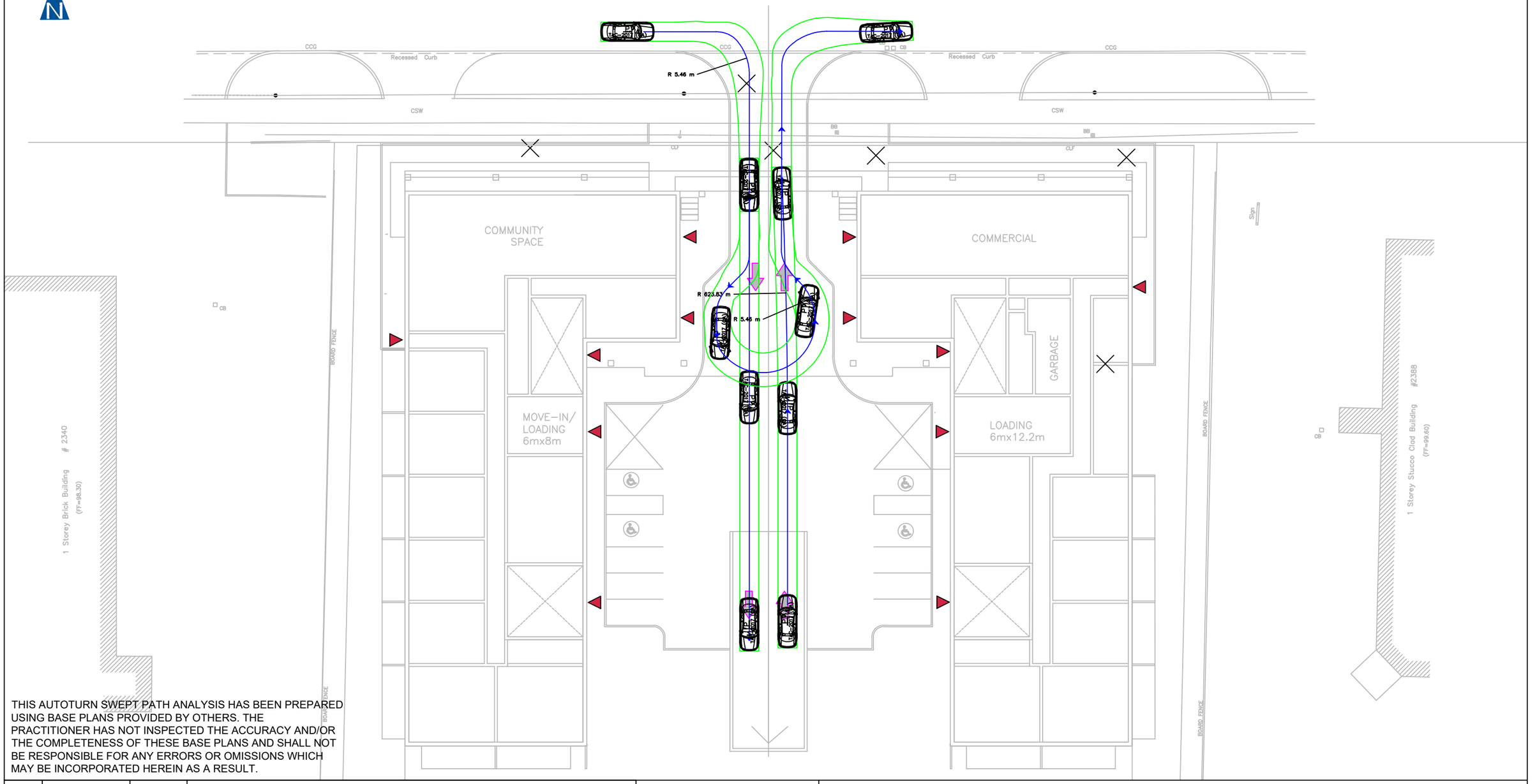


Fitted Curve Equation: Ln(T) = 0.71 Ln(X) + 2.72 **R^2= 0.56**

Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Appendix E

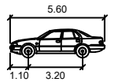
AutoTURN Analysis



THIS AUTOTURN SWEPT PATH ANALYSIS HAS BEEN PREPARED USING BASE PLANS PROVIDED BY OTHERS. THE PRACTITIONER HAS NOT INSPECTED THE ACCURACY AND/OR THE COMPLETENESS OF THESE BASE PLANS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

NO.	DATE	INITIAL	REVISION DETAIL
4	2024-03-04	SC	UPDATED SITE PLAN
3	2023-11-30	SC	UPDATED SITE PLAN
2	2023-05-02	SC	UPDATED SITE PLAN
1	2023-04-24	SC	UPDATED SITE PLAN

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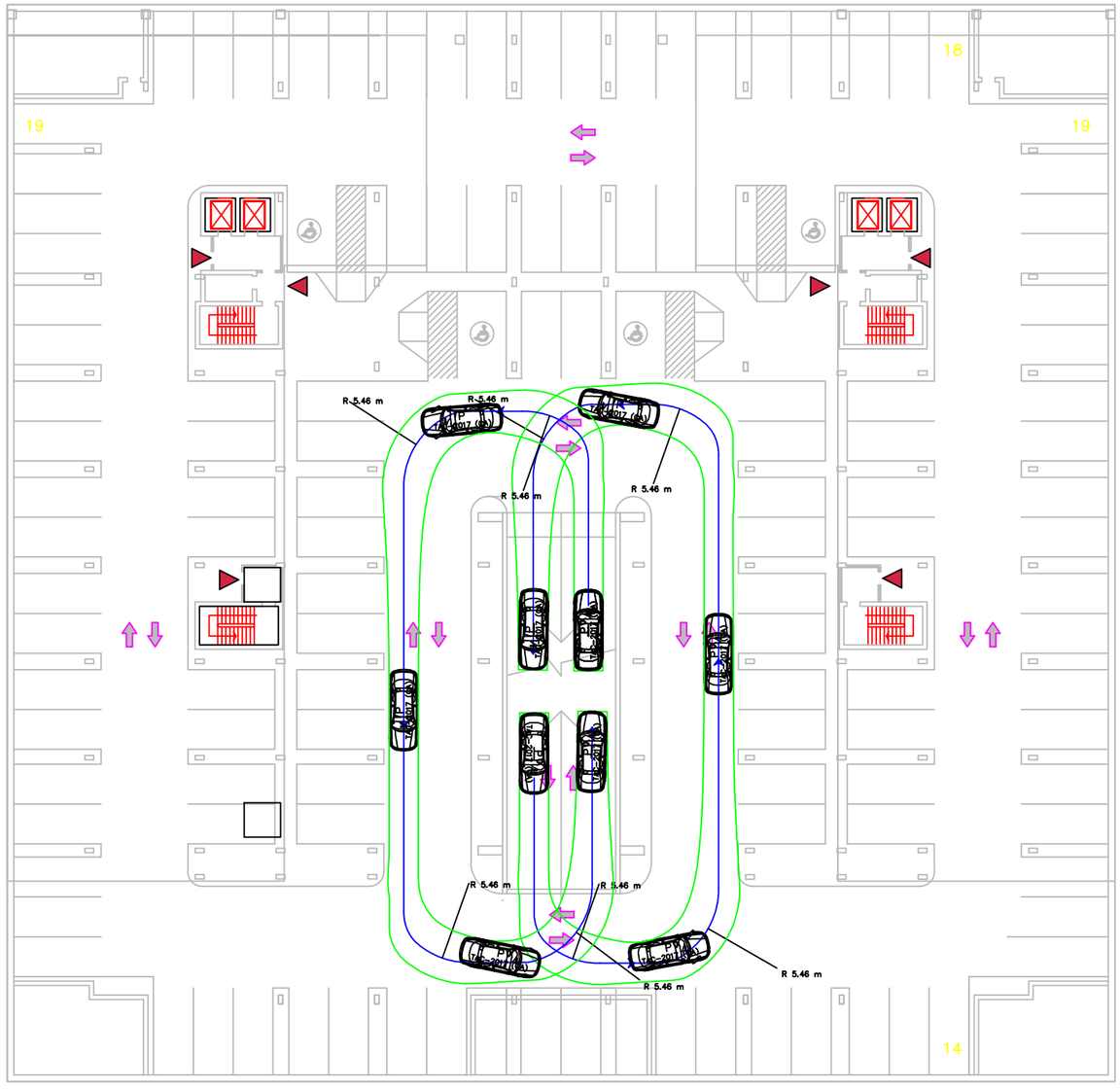
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Lock to Lock Time	: 6.0
Steering Angle	: 35.9

AUTOTURN ASSESSMENT
2362 FAIRVIEW ST
CITY OF BURLINGTON

paradigm TRANSPORTATION SOLUTIONS LIMITED

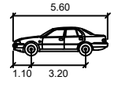
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DRAWN: SC	DESIGN: SC	CHECK: EB	



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2	2023-05-02	SC	UPDATED SITE PLAN
1	2023-04-24	SC	UPDATED SITE PLAN

DESIGN VEHICLE:



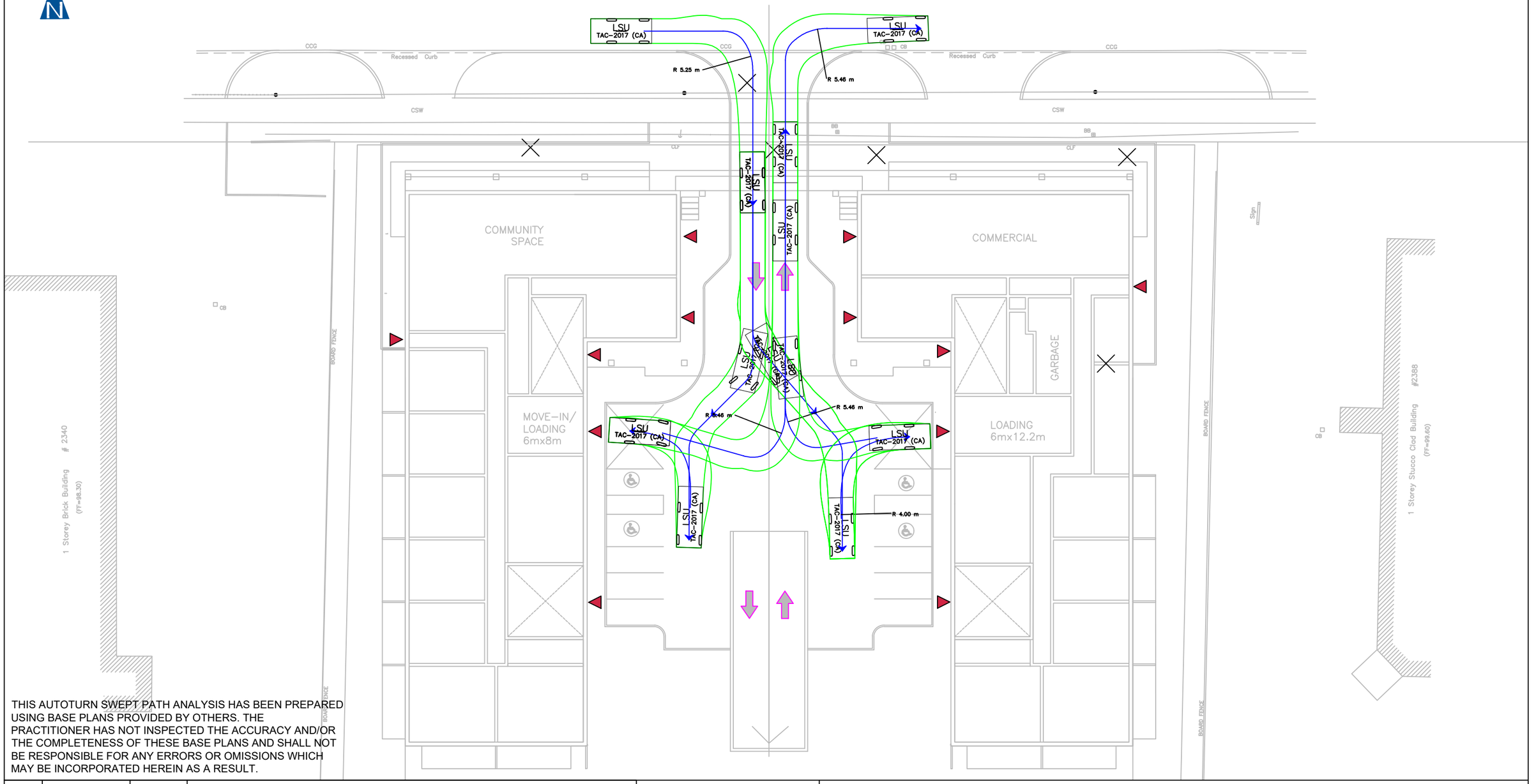
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Lock to Lock Time	: 6.0
Steering Angle	: 35.9

AUTOTURN ASSESSMENT
2362 FAIRVIEW ST
CITY OF BURLINGTON

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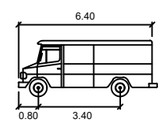
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NO.	DATE	INITIAL	REVISION DETAIL
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3	2023-11-30	SC	UPDATED SITE PLAN
2	2023-05-02	SC	UPDATED SITE PLAN
1	2023-04-24	SC	UPDATED SITE PLAN

DESIGN VEHICLE:



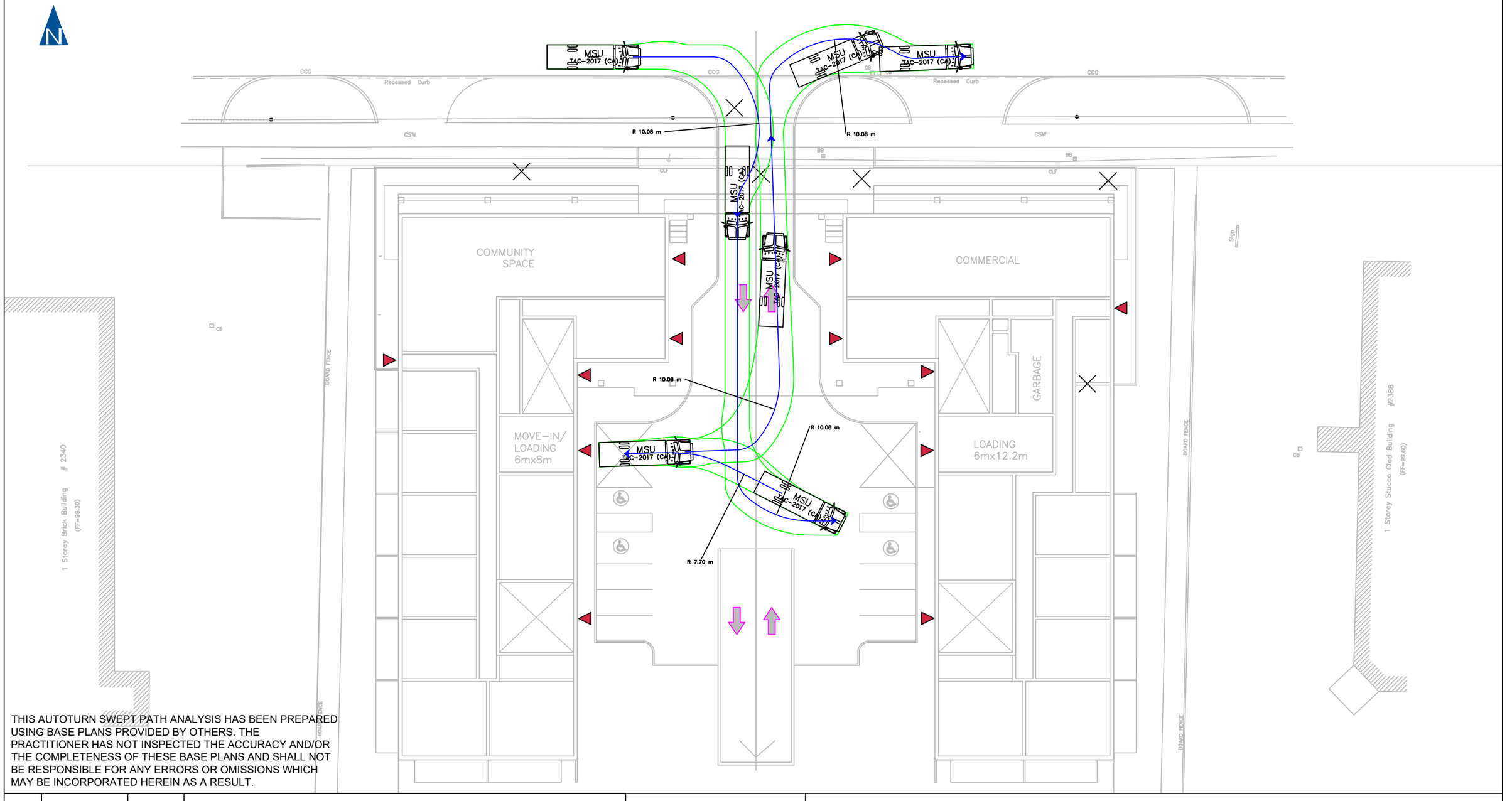
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AUTOTURN ASSESSMENT
2362 FAIRVIEW ST
CITY OF BURLINGTON

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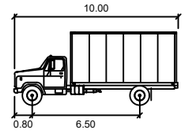
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NO.	DATE	INITIAL	REVISION DETAIL
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3	2023-11-30	SC	UPDATED SITE PLAN
2	2023-05-02	SC	UPDATED SITE PLAN
1	2023-04-24	SC	UPDATED SITE PLAN

DESIGN VEHICLE:



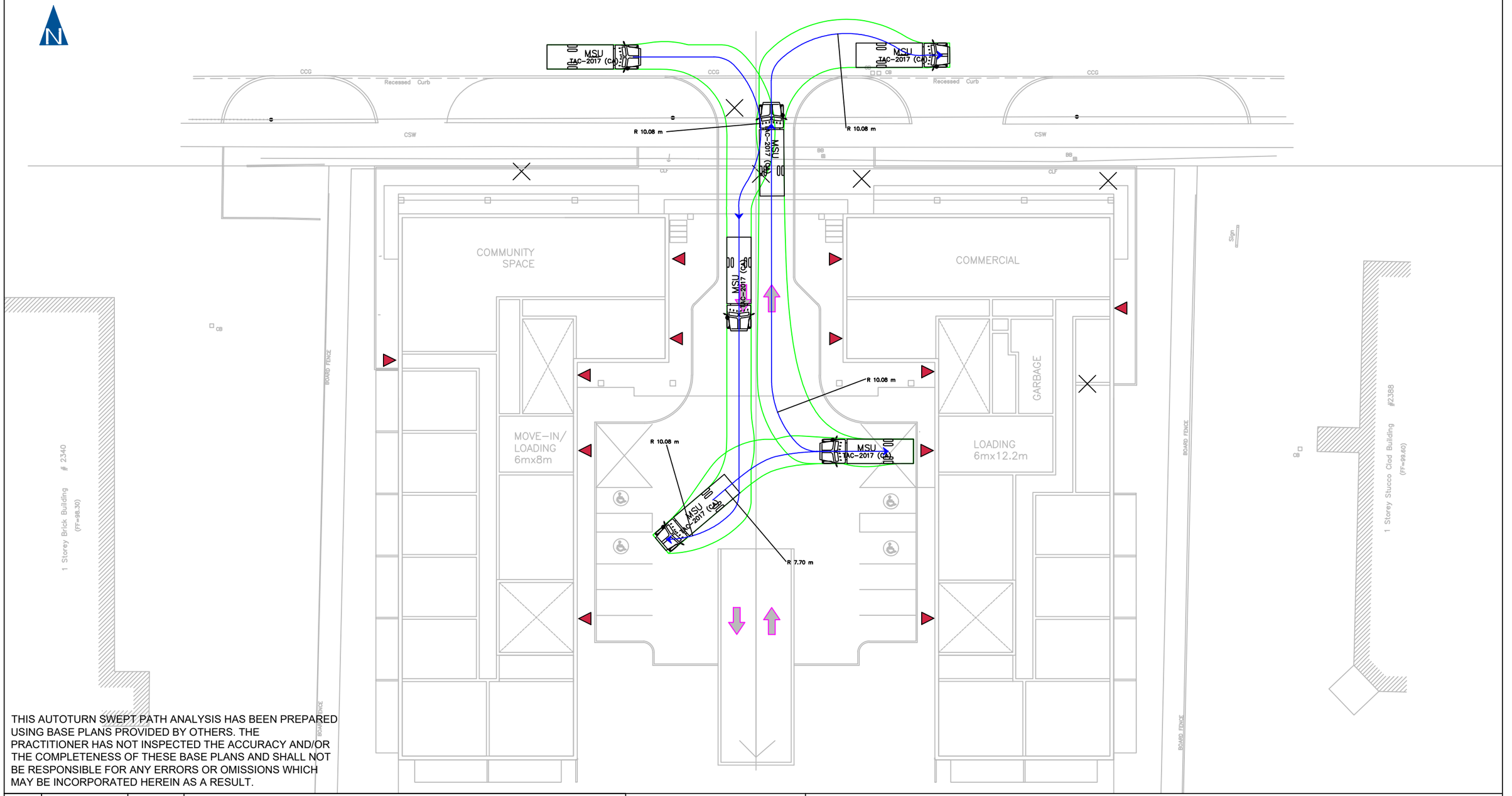
MSU

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Lock to Lock Time	: 6.0
Steering Angle	: 40.2

AUTOTURN ASSESSMENT
2362 FAIRVIEW ST
CITY OF BURLINGTON

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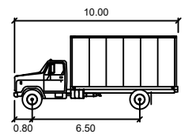
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NO.	DATE	INITIAL	REVISION DETAIL
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3	2023-11-30	SC	UPDATED SITE PLAN
2	2023-05-02	SC	UPDATED SITE PLAN
1	2023-04-24	SC	UPDATED SITE PLAN

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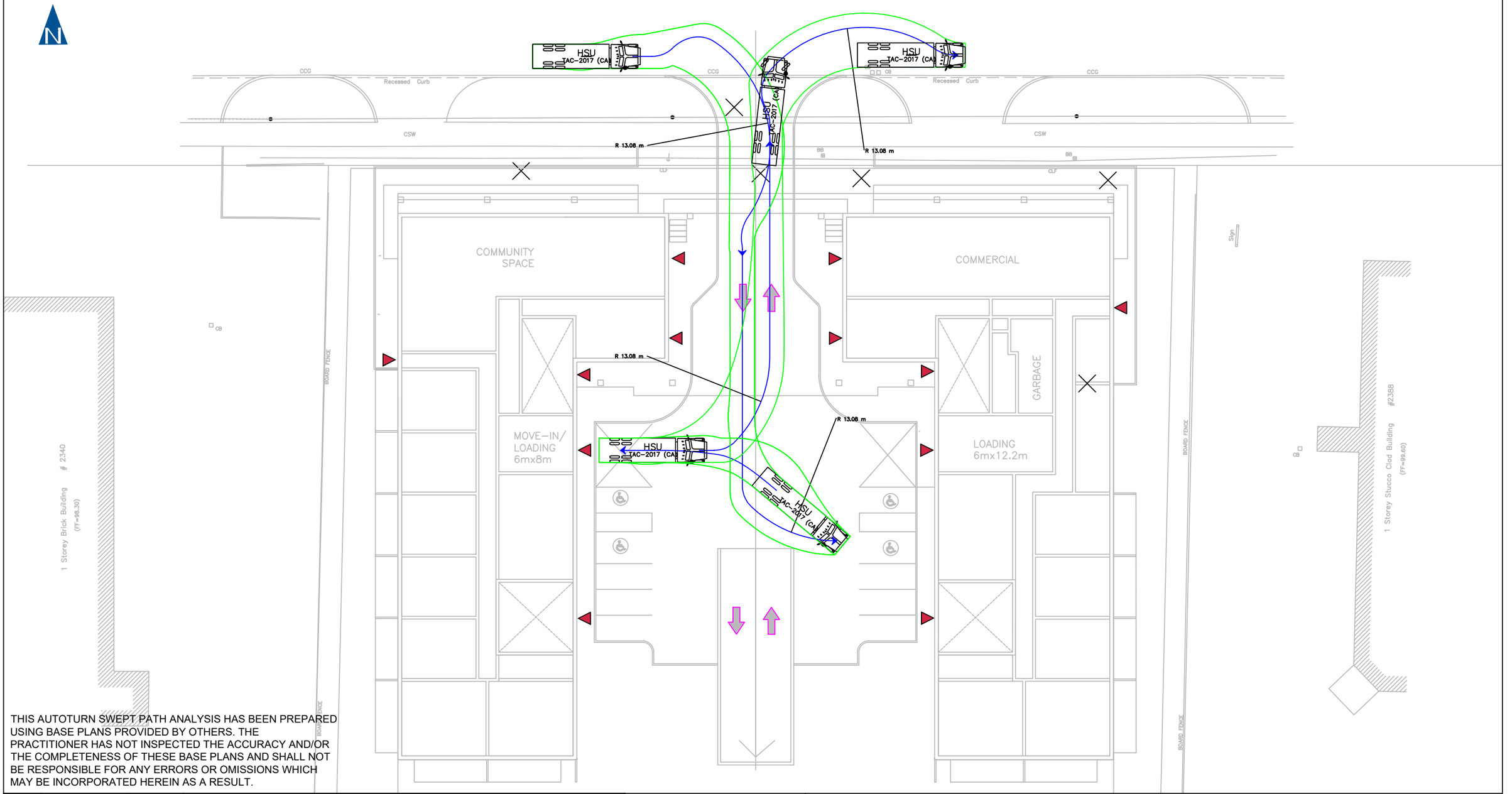
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Steering Angle	: 40.2

AUTOTURN ASSESSMENT
2362 FAIRVIEW ST
CITY OF BURLINGTON

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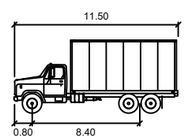
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3	2023-11-30	SC	UPDATED SITE PLAN
2	2023-05-02	SC	UPDATED SITE PLAN
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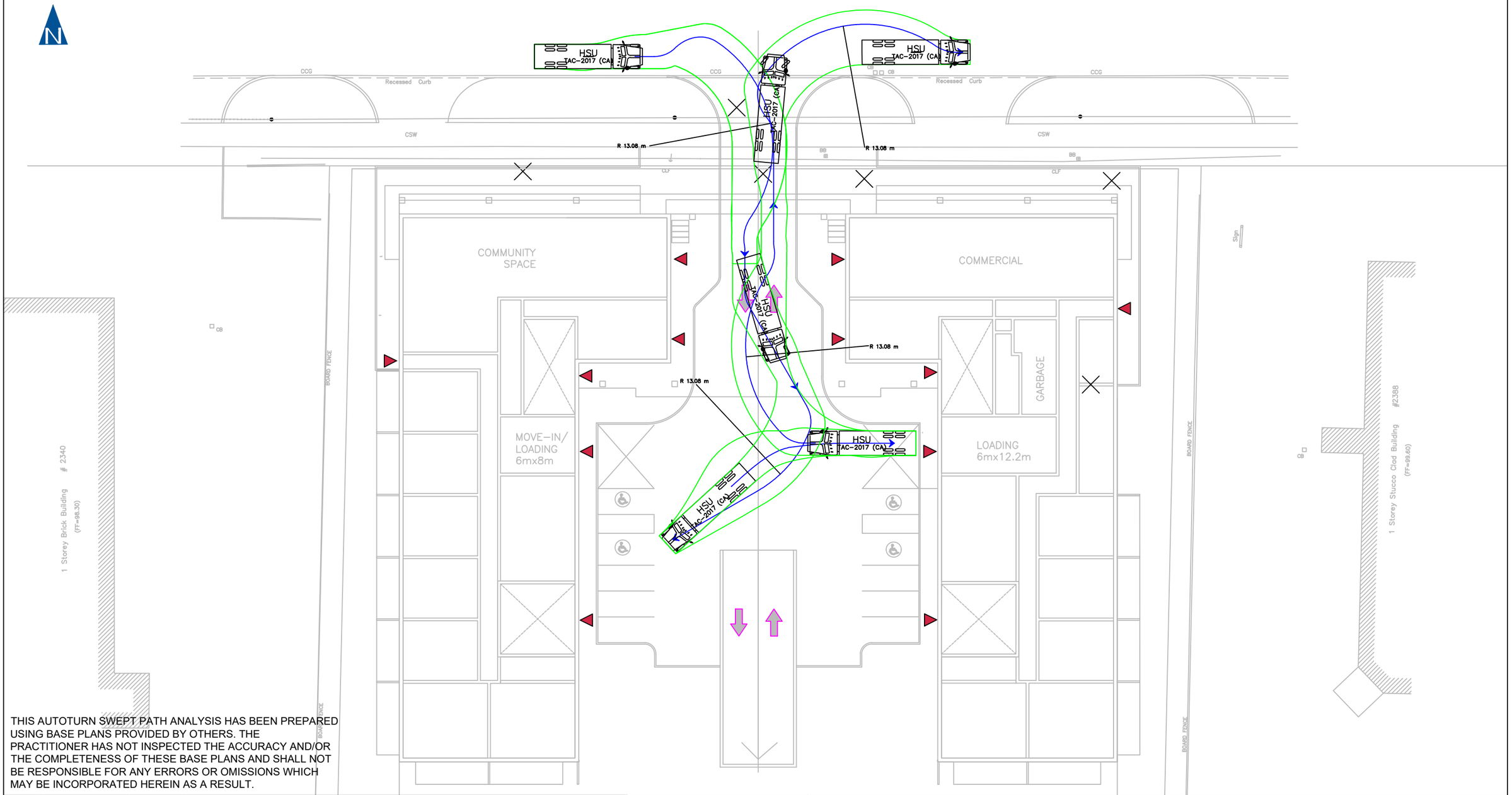
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AUTOTURN ASSESSMENT
2362 FAIRVIEW ST
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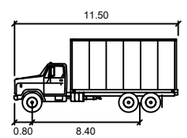
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THIS AUTOTURN SWEPT PATH ANALYSIS HAS BEEN PREPARED USING BASE PLANS PROVIDED BY OTHERS. THE PRACTITIONER HAS NOT INSPECTED THE ACCURACY AND/OR THE COMPLETENESS OF THESE BASE PLANS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.

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2	2023-05-02	SC	UPDATED SITE PLAN
1	2023-04-24	SC	UPDATED SITE PLAN

DESIGN VEHICLE:



HSU

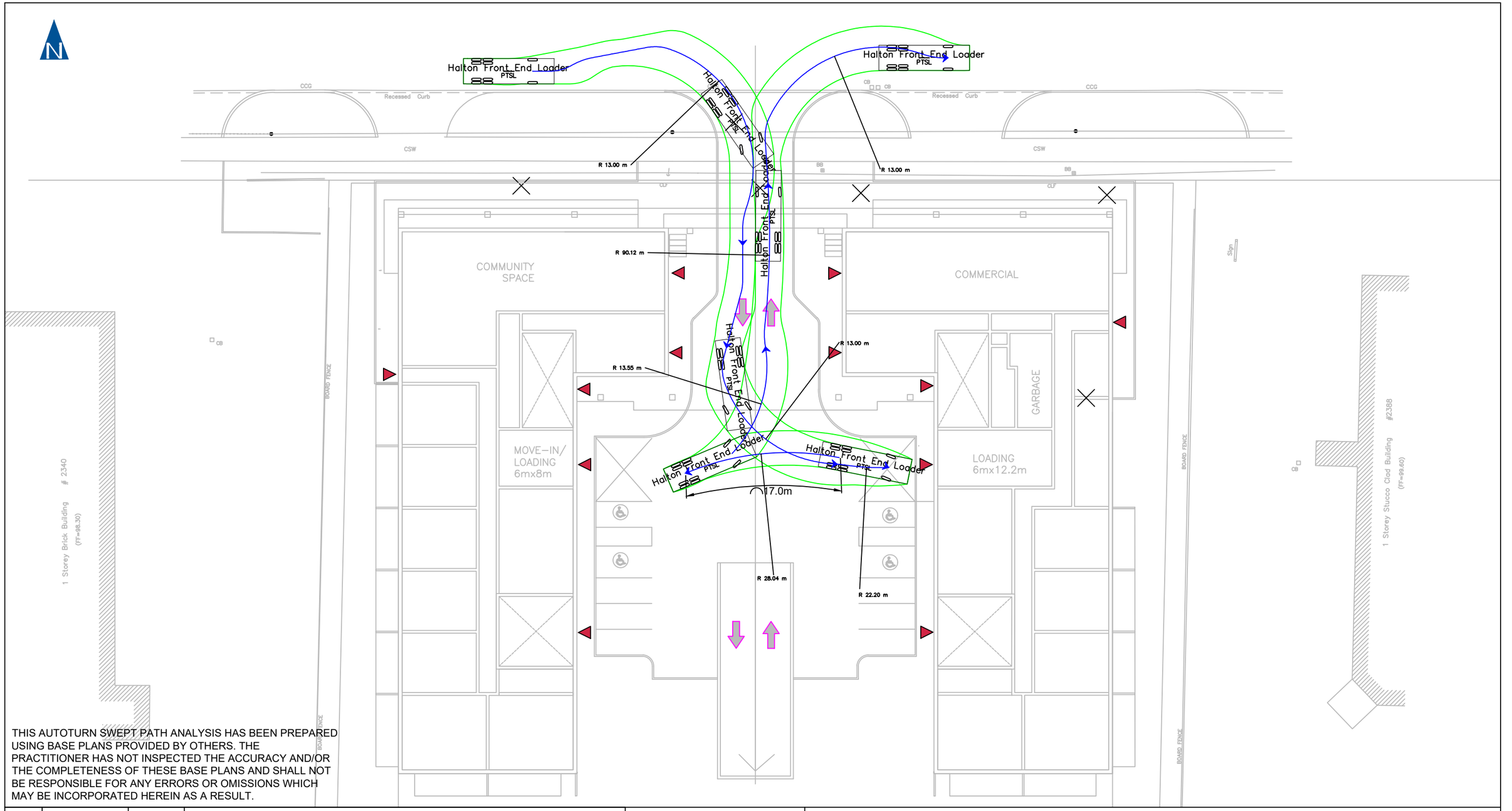
meters

Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

AUTOTURN ASSESSMENT
2362 FAIRVIEW ST
CITY OF BURLINGTON

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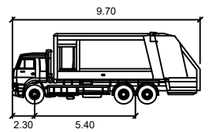
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NO.	DATE	INITIAL	REVISION DETAIL
4	2024-03-04	SC	UPDATED SITE PLAN
3	2023-11-30	SC	UPDATED SITE PLAN
2	2023-05-02	SC	UPDATED SITE PLAN
1	2023-04-24	SC	UPDATED SITE PLAN

DESIGN VEHICLE:



Halton Front End Loader

meters

Width	: 2.70
Track	: 2.70
Lock to Lock Time	: 6.0
Steering Angle	: 24.5

AUTOTURN ASSESSMENT
2362 FAIRVIEW ST
CITY OF BURLINGTON

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PROJECT NO.: 230079	DATE: APR 2023	SCALE: 1:400	DRAWING NO.: 08
DRAWN: SC	DESIGN: SC	CHECK: EB	

Appendix F

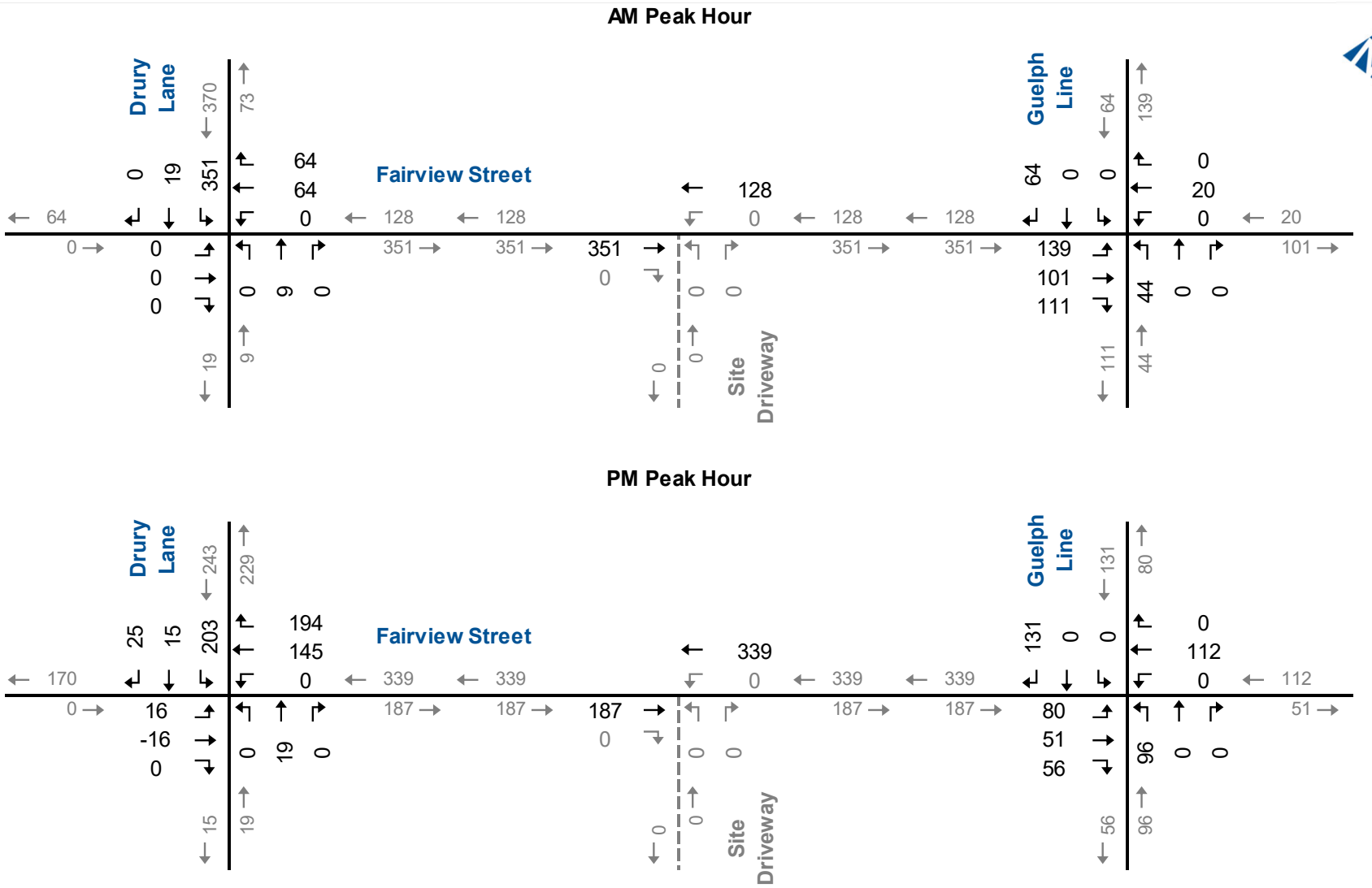
Background Development Material

Background Development

Land Use	Units/GFA	AM Peak Hour				PM Peak Hour			
		Rate	In	Out	Total	Rate	In	Out	Total
LUC 221 - Multi-Family Housing (Mid-Rise)	2494 Units	Eq	148	420	568	Eq	416	256	672
LUC 821 - Strip Retail Plaza (40-150k)	42.98 ft^2/1000	Avg	46	28	74	Avg	109	114	223
Total Trip Generation			**194**	**448**	**642**		**525**	**370**	**895**
Internal Capture			*7*	*7*	*14*		*41*	*41*	*82*
Pass-By Trips (LUC 821)		*0%*	*0*	*0*	*0*	*40%*	*41*	*41*	*82*
Net Trip Generation			***187***	***441***	***628***		***443***	***288***	***731***

LUC 222 - AM: T = 0.22(X) + 18.85 | PM: T = 0.26(X) + 23.12

LUC 821 - AM: Average Rate = 1.73 | PM: Average Rate = 5.19



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Background Development Traffic Volumes

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	2362 Fairview Street	**Organization:**	
Project Location:	Burlington	**Performed By:**	
Scenario Description:		**Date:**	
Analysis Year:		**Checked By:**	
Analysis Period:	**AM Street Peak Hour**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	821	42,980		74	46	28
Restaurant				0		
Cinema/Entertainment				0		
Residential	222		2494	568	148	420
Hotel				0		
All Other Land Uses[2]				0		
Total				642	194	448

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail	1.00			1.00		
Restaurant						
Cinema/Entertainment						
Residential	1.00			1.00		
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	3	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	4	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	642	194	448
Internal Capture Percentage	2%	4%	2%
External Vehicle-Trips[3]	628	187	441
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	9%	11%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	2%	1%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	2362 Fairview Street
Analysis Period:	**AM Street Peak Hour**

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	46	46	1.00	28	28
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	148	148	1.00	420	420
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	8		4	0	4	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	8	4	84	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		15	0	0	0	0
Retail	0		0	0	3	0
Restaurant	0	4		0	7	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	8	0	0		0
Hotel	0	2	0	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	4	42	46	42	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	3	145	148	145	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	3	25	28	25	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	4	416	420	416	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	2362 Fairview Street	**Organization:**	
Project Location:	Burlington	**Performed By:**	
Scenario Description:		**Date:**	
Analysis Year:		**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	821	42,980		223	109	114
Restaurant				0		
Cinema/Entertainment				0		
Residential	222		2494	672	416	256
Hotel				0		
All Other Land Uses[2]				0		
Total				895	525	370

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail	1.00			1.00		
Restaurant						
Cinema/Entertainment						
Residential	1.00			1.00		
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail					0	
Restaurant						
Cinema/Entertainment						
Residential		0				
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	30	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	11	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	895	525	370
Internal Capture Percentage	9%	8%	11%
External Vehicle-Trips[3]	813	484	329
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	10%	26%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	7%	4%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	2362 Fairview Street
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	109	109	1.00	114	114
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	416	416	1.00	256	256
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	2		33	5	30	6
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	10	108	54	0		8
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		9	0	0	17	0
Retail	0		0	0	191	0
Restaurant	0	55		0	67	0
Cinema/Entertainment	0	4	0		17	0
Residential	0	11	0	0		0
Hotel	0	2	0	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	11	98	109	98	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	30	386	416	386	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	30	84	114	84	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	11	245	256	245	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

Appendix G

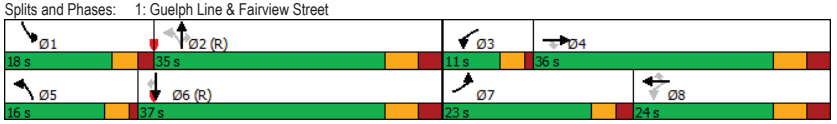
Background Traffic Operations

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	452	597	317	29	240	184	197	722	86	284	753	414
Future Volume (vph)	452	597	317	29	240	184	197	722	86	284	753	414
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		30.0	125.0		120.0	90.0		70.0	150.0		0.0
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.95	1.00
Ped Bike Factor	0.99		0.97	0.99		0.98	1.00		0.97	0.99		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3367	3505	1583	1805	3406	1568	1752	5036	1615	3400	3438	1509
Flt Permitted	0.950			0.408			0.184			0.950		
Satd. Flow (perm)	3343	3505	1537	770	3406	1534	338	5036	1572	3382	3438	1474
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			256			198			185			445
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		98.6			183.4			211.2			252.5	
Travel Time (s)		5.9			11.0			15.2			15.2	
Confl. Peds. (#/hr)	9		16	16		9	10		13	13		10
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	4%	3%	2%	0%	6%	3%	3%	3%	0%	3%	5%	7%
Adj. Flow (vph)	486	642	341	31	258	198	212	776	92	305	810	445
Shared Lane Traffic (%)												
Lane Group Flow (vph)	486	642	341	31	258	198	212	776	92	305	810	445
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8	2		2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0
Minimum Split (s)	12.0	34.0	34.0	11.0	24.0	24.0	11.0	33.0	33.0	12.0	33.0	33.0
Total Split (s)	23.0	36.0	36.0	11.0	24.0	24.0	16.0	35.0	35.0	18.0	37.0	37.0
Total Split (%)	23.0%	36.0%	36.0%	11.0%	24.0%	24.0%	16.0%	35.0%	35.0%	18.0%	37.0%	37.0%
Maximum Green (s)	18.0	29.0	29.0	7.0	17.0	17.0	12.0	28.0	28.0	13.0	30.0	30.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		8.0	8.0		8.0	8.0		12.0	12.0		12.0	12.0
Flash Dont Walk (s)		19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	17.4	33.4	33.4	27.6	17.6	17.6	42.7	28.6	28.6	12.4	30.9	30.9
Actuated g/C Ratio	0.17	0.33	0.33	0.28	0.18	0.18	0.43	0.29	0.29	0.12	0.31	0.31
v/c Ratio	0.83	0.55	0.50	0.11	0.43	0.46	0.70	0.54	0.16	0.72	0.76	0.58

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	51.3	19.5	3.9	18.9	39.5	9.1	30.0	31.9	0.6	52.7	37.1	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.3	19.5	3.9	18.9	39.5	9.1	30.0	31.9	0.6	52.7	37.1	6.1
LOS	D	B	A	B	D	A	C	C	A	D	D	A
Approach Delay		26.4			25.9			28.9			31.3	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	36.2	38.7	1.7	3.4	23.5	0.0	22.6	46.2	0.0	29.1	74.3	0.0
Queue Length 95th (m)	m#60.0	m53.1	m6.6	8.5	35.5	18.1	#41.0	58.6	0.0	42.7	96.4	22.5
Internal Link Dist (m)		74.6			159.4			187.2			228.5	
Turn Bay Length (m)	60.0		30.0	125.0		120.0	90.0		70.0	150.0		
Base Capacity (vph)	606	1170	683	285	601	433	317	1441	581	442	1062	762
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.55	0.50	0.11	0.43	0.46	0.67	0.54	0.16	0.69	0.76	0.58

Intersection Summary		
Area Type:	Other	
Cycle Length: 100		
Actuated Cycle Length: 100		
Offset: 4 (4%), Referenced to phase 2:NBTL and 6:SBT, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.83		
Intersection Signal Delay: 28.6	Intersection LOS: C	
Intersection Capacity Utilization 87.1%	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.		
m Volume for 95th percentile queue is metered by upstream signal.		

Splits and Phases: 1: Guelph Line & Fairview Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	452	597	317	29	240	184	197	722	86	284	753	414
Future Volume (vph)	452	597	317	29	240	184	197	722	86	284	753	414
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3367	3505	1537	1800	3406	1534	1752	5036	1572	3400	3438	1474
Flt Permitted	0.95	1.00	1.00	0.41	1.00	1.00	0.18	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3367	3505	1537	773	3406	1534	339	5036	1572	3400	3438	1474
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	486	642	341	31	258	198	212	776	92	305	810	445
RTOR Reduction (vph)	0	0	170	0	0	160	0	0	67	0	0	315
Lane Group Flow (vph)	486	642	171	31	258	38	212	776	25	305	810	130
Confl. Peds. (#/hr)	9		16	16		9	10		13	13		10
Heavy Vehicles (%)	4%	3%	2%	0%	6%	3%	3%	3%	0%	3%	5%	7%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8	2		2			6
Actuated Green, G (s)	17.4	33.4	33.4	23.4	19.2	19.2	38.1	27.0	27.0	12.4	29.3	29.3
Effective Green, g (s)	17.4	33.4	33.4	23.4	19.2	19.2	38.1	27.0	27.0	12.4	29.3	29.3
Actuated g/C Ratio	0.17	0.33	0.33	0.23	0.19	0.19	0.38	0.27	0.27	0.12	0.29	0.29
Clearance Time (s)	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	585	1170	513	224	653	294	286	1359	424	421	1007	431
v/s Ratio Prot	c0.14	c0.18		0.01	0.08		0.08	0.15		c0.09	c0.24	
v/s Ratio Perm			0.11	0.03		0.02	0.20		0.02			0.09
v/c Ratio	0.83	0.55	0.33	0.14	0.40	0.13	0.74	0.57	0.06	0.72	0.80	0.30
Uniform Delay, d1	39.9	27.2	24.9	29.9	35.3	33.5	23.0	31.5	27.1	42.2	32.7	27.4
Progression Factor	1.04	0.64	0.25	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.0	1.3	1.2	0.3	1.8	0.9	9.9	1.7	0.3	6.1	6.8	1.8
Delay (s)	48.5	18.6	7.5	30.1	37.1	34.4	32.9	33.2	27.3	48.2	39.5	29.2
Level of Service	D	B	A	C	D	C	C	C	C	D	D	C
Approach Delay (s)		25.9			35.6			32.7			38.3	
Approach LOS		C			D			C			D	

Intersection Summary				
HCM 2000 Control Delay	32.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0	
Intersection Capacity Utilization	87.1%	ICU Level of Service	E	
Analysis Period (min)	15			

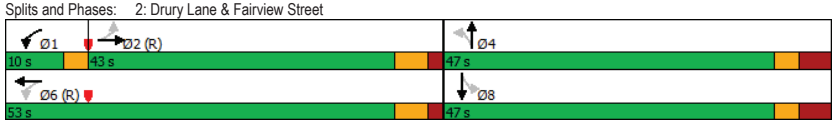
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	987	62	100	587	78	78	11	118	356	22	8
Future Volume (vph)	12	987	62	100	587	78	78	11	118	356	22	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		0.0	20.0		0.0	40.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00		0.99	0.99			1.00	
Frt		0.991			0.982			0.862			0.997	
Flt Protected	0.950			0.950			0.950				0.956	
Satd. Flow (prot)	1805	3437	0	1787	3329	0	1736	1603	0	0	1810	0
Flt Permitted	0.391			0.125			0.662				0.650	
Satd. Flow (perm)	741	3437	0	235	3329	0	1203	1603	0	0	1229	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			19			122			1	
Link Speed (k/h)		60			60			40			50	
Link Distance (m)		174.2			81.3			167.3			133.3	
Travel Time (s)		10.5			4.9			15.1			9.6	
Confl. Peds. (#/hr)	3		6	6		3	9		1	1		9
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	4%	2%	1%	7%	0%	4%	0%	1%	0%	0%	0%
Adj. Flow (vph)	12	1018	64	103	605	80	80	11	122	367	23	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	1082	0	103	685	0	80	133	0	0	398	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		6.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	33.0	33.0		10.0	33.0		30.0	30.0		30.0	30.0	
Total Split (s)	43.0	43.0		10.0	53.0		47.0	47.0		47.0	47.0	
Total Split (%)	43.0%	43.0%		10.0%	53.0%		47.0%	47.0%		47.0%	47.0%	
Maximum Green (s)	37.0	37.0		7.0	47.0		40.0	40.0		40.0	40.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		0.0	2.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		3.0	6.0		7.0	7.0			7.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)	15.0	15.0			15.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	11.0	11.0			11.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	
Act Effct Green (s)	42.8	42.8		54.1	51.1		35.9	35.9			35.9	
Actuated g/C Ratio	0.43	0.43		0.54	0.51		0.36	0.36			0.36	
v/c Ratio	0.04	0.73		0.43	0.40		0.19	0.20			0.90	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	20.8	29.3		18.8	12.4		21.7	5.2			54.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	20.8	29.3		18.8	12.4		21.7	5.2			54.8	
LOS	C	C		B	B		C	A			D	
Approach Delay		29.2			13.3			11.4			54.8	
Approach LOS		C			B			B			D	
Queue Length 50th (m)	1.4	97.9		6.5	25.2		9.9	1.3			67.9	
Queue Length 95th (m)	5.2	124.6		m17.2	42.8		19.5	12.0			#116.3	
Internal Link Dist (m)		150.2			57.3			143.3			109.3	
Turn Bay Length (m)	25.0			20.0			40.0					
Base Capacity (vph)	317	1475		241	1711		481	714			492	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	0		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.04	0.73		0.43	0.40		0.17	0.19			0.81	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 26.7		Intersection LOS: C	
Intersection Capacity Utilization 84.5%		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.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 2: Drury Lane & Fairview Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	987	62	100	587	78	78	11	118	356	22	8
Future Volume (vph)	12	987	62	100	587	78	78	11	118	356	22	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		3.0	6.0		7.0	7.0			7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00			1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.86			1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	
Satd. Flow (prot)	1801	3438		1787	3330		1727	1604			1809	
Flt Permitted	0.39	1.00		0.13	1.00		0.66	1.00			0.65	
Satd. Flow (perm)	742	3438		236	3330		1203	1604			1230	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	12	1018	64	103	605	80	80	11	122	367	23	8
RTOR Reduction (vph)	0	4	0	0	9	0	0	78	0	0	1	0
Lane Group Flow (vph)	12	1078	0	103	676	0	80	55	0	0	397	0
Confl. Peds. (#/hr)	3		6	6		3	9		1	1		9
Heavy Vehicles (%)	0%	4%	2%	1%	7%	0%	4%	0%	1%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	42.2	42.2		51.1	51.1		35.9	35.9			35.9	
Effective Green, g (s)	42.2	42.2		51.1	51.1		35.9	35.9			35.9	
Actuated g/C Ratio	0.42	0.42		0.51	0.51		0.36	0.36			0.36	
Clearance Time (s)	6.0	6.0		3.0	6.0		7.0	7.0			7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	313	1450		212	1701		431	575			441	
v/s Ratio Prot		c0.31		c0.03	0.20			0.03				
v/s Ratio Perm	0.02			0.22			0.07				c0.32	
v/c Ratio	0.04	0.74		0.49	0.40		0.19	0.10			0.90	
Uniform Delay, d1	17.0	24.3		16.2	15.0		22.0	21.3			30.4	
Progression Factor	1.00	1.00		1.11	0.76		1.00	1.00			1.00	
Incremental Delay, d2	0.2	3.5		1.5	0.6		0.2	0.1			21.2	
Delay (s)	17.2	27.8		19.5	12.0		22.2	21.3			51.5	
Level of Service	B	C		B	B		C	C			D	
Approach Delay (s)		27.7			13.0			21.7			51.5	
Approach LOS		C			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: Guelph Line & Fairview Street

Movement	EB	EB	EB	EB	EB	B6	B6	B15	B15	B3	B3	WB
Directions Served	L	L	T	T	R	T	T	T	T	T	T	L
Maximum Queue (m)	63.6	67.4	103.3	100.8	45.0	69.9	67.6	221.4	221.3	102.9	98.7	19.6
Average Queue (m)	56.9	62.0	81.1	78.9	26.9	39.9	35.0	78.7	75.5	14.3	13.5	6.2
95th Queue (m)	74.5	78.1	119.2	118.4	62.8	86.3	81.7	237.9	234.0	81.2	76.7	15.0
Link Distance (m)			71.5	71.5		39.9	39.9	229.2	229.2	223.6	223.6	
Upstream Blk Time (%)		14	40	30		32	24	11	9	0		
Queuing Penalty (veh)		0	295	221		237	176	78	67	0		
Storage Bay Dist (m)	60.0	60.0			30.0							125.0
Storage Blk Time (%)	8	40	16	44	0							
Queuing Penalty (veh)	23	119	71	138	0							

Intersection: 1: Guelph Line & Fairview Street

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	L	T	T	T	L	L	T	T
Maximum Queue (m)	85.0	70.9	66.3	78.7	67.8	51.9	89.4	100.2	103.1	99.0
Average Queue (m)	40.9	26.6	27.5	47.7	37.7	15.0	50.1	61.8	51.1	44.6
95th Queue (m)	69.7	58.2	51.3	76.1	65.2	41.7	102.5	112.8	92.1	80.2
Link Distance (m)	161.4	161.4		192.4	192.4	192.4			233.4	233.4
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)			90.0				150.0	150.0		
Storage Blk Time (%)	0		0				0	0	0	
Queuing Penalty (veh)	0		0				0	2	0	

Intersection: 2: Drury Lane & Fairview Street

Movement	EB	EB	EB	WB	WB	WB	B11	NB	NB	SB
Directions Served	L	T	TR	L	T	TR	T	L	TR	LTR
Maximum Queue (m)	19.5	103.9	97.8	27.2	59.0	64.9	2.3	38.6	42.3	110.3
Average Queue (m)	2.7	62.1	51.4	16.1	24.0	31.2	0.1	14.5	15.5	62.6
95th Queue (m)	11.0	95.8	85.2	28.1	45.9	51.8	1.6	29.0	30.6	97.2
Link Distance (m)		163.8	163.8		62.7	62.7	223.6		153.3	119.5
Upstream Blk Time (%)					0	0				0
Queuing Penalty (veh)					1	1				0
Storage Bay Dist (m)	25.0			20.0				40.0		
Storage Blk Time (%)		28		5	10			0	1	
Queuing Penalty (veh)		3		15	10			0	1	

Network Summary

Network wide Queuing Penalty: 1457

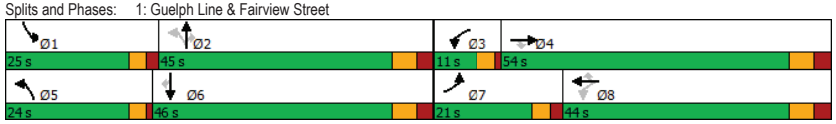
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	421	600	297	96	1016	388	375	870	83	363	794	621
Future Volume (vph)	421	600	297	96	1016	388	375	870	83	363	794	621
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		30.0	125.0		120.0	90.0		70.0	150.0		0.0
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.95	1.00
Ped Bike Factor	1.00		0.96	0.99		0.97	1.00		0.96	0.99		0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3367	3505	1583	1805	3574	1583	1787	5085	1615	3467	3574	1583
Flt Permitted	0.950			0.395			0.142			0.950		
Satd. Flow (perm)	3351	3505	1520	742	3574	1534	266	5085	1551	3439	3574	1526
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			192			320			137			215
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		98.6			183.4			211.2			252.5	
Travel Time (s)		5.9			11.0			15.2			15.2	
Confl. Peds. (#/hr)	13		19	19		13	16		18	18		16
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	4%	3%	2%	0%	1%	2%	1%	2%	0%	1%	1%	2%
Adj. Flow (vph)	430	612	303	98	1037	396	383	888	85	370	810	634
Shared Lane Traffic (%)												
Lane Group Flow (vph)	430	612	303	98	1037	396	383	888	85	370	810	634
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8	2		2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0
Minimum Split (s)	12.0	34.0	34.0	11.0	35.0	35.0	11.0	33.0	33.0	12.0	33.0	33.0
Total Split (s)	21.0	54.0	54.0	11.0	44.0	44.0	24.0	45.0	45.0	25.0	46.0	46.0
Total Split (%)	15.6%	40.0%	40.0%	8.1%	32.6%	32.6%	17.8%	33.3%	33.3%	18.5%	34.1%	34.1%
Maximum Green (s)	16.0	47.0	47.0	7.0	37.0	37.0	20.0	38.0	38.0	20.0	39.0	39.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	Max	Max	None	Max	Max
Walk Time (s)		8.0	8.0		8.0	8.0		12.0	12.0		12.0	12.0
Flash Dont Walk (s)		19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	16.0	47.0	47.0	47.0	37.0	37.0	62.6	39.6	39.6	18.4	39.0	39.0
Actuated g/C Ratio	0.12	0.35	0.35	0.35	0.27	0.27	0.46	0.29	0.29	0.14	0.29	0.29
v/c Ratio	1.08	0.50	0.46	0.31	1.06	0.61	1.10	0.59	0.15	0.79	0.78	1.07

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	122.3	36.5	14.5	25.4	92.5	13.2	110.3	43.1	1.3	68.8	50.5	87.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	122.3	36.5	14.5	25.4	92.5	13.2	110.3	43.1	1.3	68.8	50.5	87.2
LOS	F	D	B	C	F	B	F	D	A	E	D	F
Approach Delay		59.0			67.7			59.5			67.1	
Approach LOS		E			E			E			E	
Queue Length 50th (m)	~64.8	66.6	20.7	14.7	~157.2	15.3	~91.8	74.3	0.0	48.7	103.4	~141.4
Queue Length 95th (m)	#97.2	84.3	46.7	25.6	#198.3	48.2	#153.9	89.3	1.9	65.2	127.2	#212.9
Internal Link Dist (m)		74.6			159.4			187.2			228.5	
Turn Bay Length (m)	60.0		30.0	125.0		120.0	90.0		70.0	150.0		
Base Capacity (vph)	399	1220	654	313	979	652	348	1493	552	513	1032	593
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.50	0.46	0.31	1.06	0.61	1.10	0.59	0.15	0.72	0.78	1.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 135			
Actuated Cycle Length: 135			
Natural Cycle: 135			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.10			
Intersection Signal Delay: 63.7		Intersection LOS: E	
Intersection Capacity Utilization 103.9%		ICU Level of Service G	
Analysis Period (min) 15			

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

Splits and Phases: 1: Guelph Line & Fairview Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	421	600	297	96	1016	388	375	870	83	363	794	621
Future Volume (vph)	421	600	297	96	1016	388	375	870	83	363	794	621
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	1.00	0.96	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3367	3505	1520	1797	3574	1534	1786	5085	1551	3467	3574	1526
Flt Permitted	0.95	1.00	1.00	0.40	1.00	1.00	0.14	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3367	3505	1520	748	3574	1534	266	5085	1551	3467	3574	1526
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	430	612	303	98	1037	396	383	888	85	370	810	634
RTOR Reduction (vph)	0	0	125	0	0	232	0	0	60	0	0	153
Lane Group Flow (vph)	430	612	178	98	1037	164	383	888	25	370	810	481
Confl. Peds. (#/hr)	13		19	19		13	16		18	18		16
Heavy Vehicles (%)	4%	3%	2%	0%	1%	2%	1%	2%	0%	1%	1%	2%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8	2		2			6
Actuated Green, G (s)	16.0	47.0	47.0	44.0	37.0	37.0	59.6	39.6	39.6	18.4	39.0	39.0
Effective Green, g (s)	16.0	47.0	47.0	44.0	37.0	37.0	59.6	39.6	39.6	18.4	39.0	39.0
Actuated g/C Ratio	0.12	0.35	0.35	0.33	0.27	0.27	0.44	0.29	0.29	0.14	0.29	0.29
Clearance Time (s)	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	399	1220	529	298	979	420	342	1491	454	472	1032	440
v/s Ratio Prot	c0.13	0.17		0.02	c0.29		c0.17	0.17		0.11	0.23	
v/s Ratio Perm			0.12	0.09		0.11	c0.33		0.02			0.32
v/c Ratio	1.08	0.50	0.34	0.33	1.06	0.39	1.12	0.60	0.05	0.78	0.78	1.09
Uniform Delay, d1	59.5	34.8	32.5	32.5	49.0	39.8	36.1	40.8	34.3	56.4	44.1	48.0
Progression 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
Incremental Delay, d2	67.4	1.5	1.7	0.6	45.8	2.7	85.1	1.8	0.2	8.3	6.0	70.6
Delay (s)	126.9	36.2	34.2	33.1	94.8	42.5	121.2	42.6	34.5	64.7	50.1	118.6
Level of Service	F	D	C	C	F	D	F	D	C	E	D	F
Approach Delay (s)		64.8			77.3			64.3			77.0	
Approach LOS		E			E			E			E	

Intersection Summary					
HCM 2000 Control Delay	71.5	HCM 2000 Level of Service		E	
HCM 2000 Volume to Capacity ratio	1.11				
Actuated Cycle Length (s)	135.0	Sum of lost time (s)		24.0	
Intersection Capacity Utilization	103.9%	ICU Level of Service		G	
Analysis Period (min)	15				

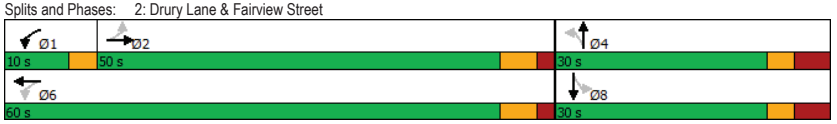
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	923	108	167	1679	219	120	23	115	226	24	44
Future Volume (vph)	24	923	108	167	1679	219	120	23	115	226	24	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		0.0	20.0		0.0	40.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	0.99		0.99	0.98			0.99	
Frt		0.984			0.983			0.875			0.980	
Flt Protected	0.950			0.950			0.950				0.963	
Satd. Flow (prot)	1805	3448	0	1805	3469	0	1787	1629	0	0	1787	0
Flt Permitted	0.091			0.165			0.661				0.684	
Satd. Flow (perm)	173	3448	0	313	3469	0	1237	1629	0	0	1259	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			28			120			10	
Link Speed (k/h)		60			60			40			50	
Link Distance (m)		174.2			81.3			167.3			133.3	
Travel Time (s)		10.5			4.9			15.1			9.6	
Confl. Peds. (#/hr)	14		7	7		14	9		10	10		9
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	3%	0%	0%	2%	0%	1%	0%	0%	0%	0%	0%
Adj. Flow (vph)	25	961	113	174	1749	228	125	24	120	235	25	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	1074	0	174	1977	0	125	144	0	0	306	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		6.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	33.0	33.0		10.0	33.0		30.0	30.0		30.0	30.0	
Total Split (s)	50.0	50.0		10.0	60.0		30.0	30.0		30.0	30.0	
Total Split (%)	55.6%	55.6%		11.1%	66.7%		33.3%	33.3%		33.3%	33.3%	
Maximum Green (s)	44.0	44.0		7.0	54.0		23.0	23.0		23.0	23.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		0.0	2.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		3.0	6.0		7.0	7.0			7.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		None	None		None	None		None	None	
Walk Time (s)	15.0	15.0			15.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	11.0	11.0			11.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	
Act Effct Green (s)	44.0	44.0		56.9	53.9		22.5	22.5			22.5	
Actuated g/C Ratio	0.49	0.49		0.64	0.60		0.25	0.25			0.25	
v/c Ratio	0.29	0.63		0.55	0.94		0.40	0.29			0.94	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	25.3	18.5		13.6	27.0		32.4	9.2			71.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	25.3	18.5		13.6	27.0		32.4	9.2			71.6	
LOS	C	B		B	C		C	A			E	
Approach Delay		18.7			25.9			20.0			71.6	
Approach LOS		B			C			B			E	
Queue Length 50th (m)	2.4	67.0		10.9	149.0		17.7	3.1			49.6	
Queue Length 95th (m)	9.6	87.0		18.6	#216.3		33.4	16.8			#97.9	
Internal Link Dist (m)		150.2			57.3			143.3			109.3	
Turn Bay Length (m)	25.0			20.0			40.0					
Base Capacity (vph)	85	1706		316	2105		318	508			331	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	0		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.29	0.63		0.55	0.94		0.39	0.28			0.92	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 89.4			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 27.1		Intersection LOS: C	
Intersection Capacity Utilization 110.7%		ICU Level of Service H	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 2: Drury Lane & Fairview Street





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	923	108	167	1679	219	120	23	115	226	24	44
Future Volume (vph)	24	923	108	167	1679	219	120	23	115	226	24	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		3.0	6.0		7.0	7.0			7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00			0.99	
Frt	1.00	0.98		1.00	0.98		1.00	0.88			0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	
Satd. Flow (prot)	1805	3449		1805	3468		1777	1629			1773	
Flt Permitted	0.09	1.00		0.17	1.00		0.66	1.00			0.68	
Satd. Flow (perm)	173	3449		314	3468		1236	1629			1259	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	25	961	112	174	1749	228	125	24	120	235	25	46
RTOR Reduction (vph)	0	10	0	0	11	0	0	90	0	0	7	0
Lane Group Flow (vph)	25	1064	0	174	1966	0	125	54	0	0	299	0
Confl. Peds. (#/hr)	14		7	7		14	9		10	10		9
Heavy Vehicles (%)	0%	3%	0%	0%	2%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	44.0	44.0		53.9	53.9		22.5	22.5			22.5	
Effective Green, g (s)	44.0	44.0		53.9	53.9		22.5	22.5			22.5	
Actuated g/C Ratio	0.49	0.49		0.60	0.60		0.25	0.25			0.25	
Clearance Time (s)	6.0	6.0		3.0	6.0		7.0	7.0			7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	85	1697		304	2090		311	409			316	
v/s Ratio Prot		0.31		0.04	c0.57			0.03				
v/s Ratio Perm	0.14			0.30			0.10				c0.24	
v/c Ratio	0.29	0.63		0.57	0.94		0.40	0.13			0.94	
Uniform Delay, d1	13.5	16.7		10.5	16.3		27.8	25.9			32.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	8.6	1.8		2.6	9.2		0.9	0.1			36.0	
Delay (s)	22.1	18.4		13.1	25.5		28.7	26.0			68.8	
Level of Service	C	B		B	C		C	C			E	
Approach Delay (s)		18.5			24.5			27.3			68.8	
Approach LOS		B			C			C			E	

Intersection Summary				
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.98			
Actuated Cycle Length (s)	89.4	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	110.7%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Intersection: 1: Guelph Line & Fairview Street

Movement	EB	EB	EB	EB	EB	B6	B6	B15	B15	B3	B3	WB
Directions Served	L	L	T	T	R	T	T	T	T	T	T	L
Maximum Queue (m)	63.7	67.5	100.2	97.2	45.0	62.2	53.6	177.0	161.6	8.4	3.0	132.4
Average Queue (m)	60.9	65.5	89.7	68.6	32.3	49.1	12.5	88.8	56.3	0.5	0.1	82.1
95th Queue (m)	71.2	75.3	112.0	103.7	65.0	88.2	44.9	214.6	174.3	6.9	2.1	177.2
Link Distance (m)			71.5	71.5		39.9	39.9	229.2	229.2	223.6	223.6	
Upstream Blk Time (%)		29	64	8		59	2	2	0			
Queuing Penalty (veh)		0	404	51		372	15	10	1			
Storage Bay Dist (m)	60.0	60.0			30.0							125.0
Storage Blk Time (%)	12	66	6	33	0							0
Queuing Penalty (veh)	35	198	24	97	0							0

Intersection: 1: Guelph Line & Fairview Street

Movement	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	T	T	R	L	L	T	T
Maximum Queue (m)	172.4	173.1	135.0	97.5	206.0	196.0	101.7	46.5	87.2	99.0	115.0	110.3
Average Queue (m)	166.3	165.6	121.6	97.3	192.5	148.6	38.0	2.6	51.2	62.7	76.5	73.7
95th Queue (m)	169.5	173.7	185.9	99.0	221.1	236.4	75.6	25.3	83.0	94.0	105.6	101.9
Link Distance (m)	161.4	161.4			192.4	192.4	192.4				233.4	233.4
Upstream Blk Time (%)	56	47			74	0						
Queuing Penalty (veh)	0	0			0	0						
Storage Bay Dist (m)			120.0	90.0				70.0	150.0	150.0		
Storage Blk Time (%)	66	59	0	88	0		3	0				
Queuing Penalty (veh)	64	228	0	256	1		2	0				

Intersection: 1: Guelph Line & Fairview Street

Movement	SB
Directions Served	R
Maximum Queue (m)	25.4
Average Queue (m)	1.6
95th Queue (m)	24.4
Link Distance (m)	233.4
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Drury Lane & Fairview Street

Movement	EB	EB	EB	WB	WB	WB	B11	B11	B6	B6	B6	NB
Directions Served	L	T	TR	L	T	TR	T	T	T	T		L
Maximum Queue (m)	32.2	84.0	81.8	27.3	88.4	88.3	83.1	94.8	91.6	116.1	68.9	41.9
Average Queue (m)	8.9	47.5	41.4	21.3	75.3	78.1	19.8	26.0	33.2	38.7	5.8	20.2
95th Queue (m)	23.8	76.1	70.9	32.2	99.7	98.9	58.4	68.9	98.4	116.5	39.6	36.6
Link Distance (m)		163.8	163.8		62.7	62.7	223.6	223.6	71.5	71.5	71.5	
Upstream Blk Time (%)					16	20			1	3	0	
Queuing Penalty (veh)					164	205			7	23	3	
Storage Bay Dist (m)	25.0			20.0								40.0
Storage Blk Time (%)	1	21		12	28							1
Queuing Penalty (veh)	3	5		97	47							1

Intersection: 2: Drury Lane & Fairview Street

Movement	NB	SB
Directions Served	TR	LTR
Maximum Queue (m)	46.9	104.1
Average Queue (m)	17.5	54.1
95th Queue (m)	35.3	91.9
Link Distance (m)	153.3	119.5
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (m)		
Storage Blk Time (%)	1	
Queuing Penalty (veh)	1	

Network Summary

Network wide Queuing Penalty: 2313

Appendix H

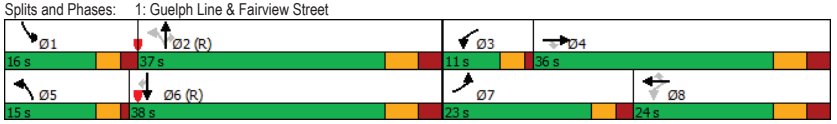
Total Traffic Operations

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	475	614	335	29	244	184	205	722	86	284	753	425
Future Volume (vph)	475	614	335	29	244	184	205	722	86	284	753	425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		30.0	125.0		120.0	90.0		70.0	150.0		0.0
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.95	1.00
Ped Bike Factor	0.99		0.97	0.99		0.98	1.00		0.97	0.99		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3367	3505	1583	1805	3406	1568	1752	5036	1615	3400	3438	1509
Flt Permitted	0.950			0.401			0.183			0.950		
Satd. Flow (perm)	3344	3505	1537	756	3406	1534	337	5036	1572	3382	3438	1474
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			263			198			185			457
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		98.6			183.4			211.2			252.5	
Travel Time (s)		5.9			11.0			15.2			15.2	
Confl. Peds. (#/hr)	9		16	16		9	10		13	13		10
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	4%	3%	2%	0%	6%	3%	3%	3%	0%	3%	5%	7%
Adj. Flow (vph)	511	660	360	31	262	198	220	776	92	305	810	457
Shared Lane Traffic (%)												
Lane Group Flow (vph)	511	660	360	31	262	198	220	776	92	305	810	457
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8	2		2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0
Minimum Split (s)	12.0	34.0	34.0	11.0	24.0	24.0	11.0	33.0	33.0	12.0	33.0	33.0
Total Split (s)	23.0	36.0	36.0	11.0	24.0	24.0	15.0	37.0	37.0	16.0	38.0	38.0
Total Split (%)	23.0%	36.0%	36.0%	11.0%	24.0%	24.0%	15.0%	37.0%	37.0%	16.0%	38.0%	38.0%
Maximum Green (s)	18.0	29.0	29.0	7.0	17.0	17.0	11.0	30.0	30.0	11.0	31.0	31.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		8.0	8.0		8.0	8.0		12.0	12.0		12.0	12.0
Flash Dont Walk (s)		19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	17.6	33.4	33.4	27.4	17.4	17.4	43.7	30.0	30.0	11.0	31.4	31.4
Actuated g/C Ratio	0.18	0.33	0.33	0.27	0.17	0.17	0.44	0.30	0.30	0.11	0.31	0.31
v/c Ratio	0.86	0.56	0.52	0.11	0.44	0.46	0.74	0.51	0.15	0.82	0.75	0.59

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	52.2	20.4	4.7	18.9	39.8	9.2	32.5	30.4	0.5	62.2	36.2	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.2	20.4	4.7	18.9	39.8	9.2	32.5	30.4	0.5	62.2	36.2	6.0
LOS	D	C	A	B	D	A	C	C	A	E	D	A
Approach Delay		27.3			26.1			28.3			32.5	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	39.9	46.1	4.0	3.4	24.0	0.0	23.6	44.7	0.0	29.8	73.2	0.0
Queue Length 95th (m)	m#70.0	m58.5	m7.8	8.5	36.1	18.1	#47.4	56.8	0.0	#49.9	94.9	22.3
Internal Link Dist (m)		74.6			159.4			187.2			228.5	
Turn Bay Length (m)	60.0		30.0	125.0		120.0	90.0		70.0	150.0		
Base Capacity (vph)	606	1170	688	280	594	431	303	1512	601	374	1078	776
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.56	0.52	0.11	0.44	0.46	0.73	0.51	0.15	0.82	0.75	0.59

Intersection Summary		
Area Type:	Other	
Cycle Length: 100		
Actuated Cycle Length: 100		
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.86		
Intersection Signal Delay: 29.1	Intersection LOS: C	
Intersection Capacity Utilization 88.2%	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.		
m Volume for 95th percentile queue is metered by upstream signal.		

Splits and Phases: 1: Guelph Line & Fairview Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	475	614	335	29	244	184	205	722	86	284	753	425
Future Volume (vph)	475	614	335	29	244	184	205	722	86	284	753	425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3367	3505	1537	1800	3406	1534	1752	5036	1572	3400	3438	1474
Flt Permitted	0.95	1.00	1.00	0.40	1.00	1.00	0.18	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3367	3505	1537	760	3406	1534	337	5036	1572	3400	3438	1474
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	511	660	360	31	262	198	220	776	92	305	810	457
RTOR Reduction (vph)	0	0	175	0	0	160	0	0	66	0	0	321
Lane Group Flow (vph)	511	660	185	31	262	38	220	776	26	305	810	136
Confl. Peds. (#/hr)	9		16	16		9	10		13	13		10
Heavy Vehicles (%)	4%	3%	2%	0%	6%	3%	3%	3%	0%	3%	5%	7%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8	2		2			6
Actuated Green, G (s)	17.6	33.4	33.4	23.2	19.0	19.0	39.0	28.4	28.4	11.0	29.8	29.8
Effective Green, g (s)	17.6	33.4	33.4	23.2	19.0	19.0	39.0	28.4	28.4	11.0	29.8	29.8
Actuated g/C Ratio	0.18	0.33	0.33	0.23	0.19	0.19	0.39	0.28	0.28	0.11	0.30	0.30
Clearance Time (s)	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	592	1170	513	220	647	291	281	1430	446	374	1024	439
v/s Ratio Prot	c0.15	c0.19		0.01	0.08		0.08	0.15		c0.09	c0.24	
v/s Ratio Perm			0.12	0.03		0.02	0.22		0.02			0.09
v/c Ratio	0.86	0.56	0.36	0.14	0.40	0.13	0.78	0.54	0.06	0.82	0.79	0.31
Uniform Delay, d1	40.0	27.3	25.2	30.0	35.5	33.6	22.6	30.3	26.1	43.5	32.2	27.2
Progression Factor	0.99	0.66	0.30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.5	1.5	1.4	0.3	1.9	0.9	13.3	1.5	0.3	12.8	6.2	1.8
Delay (s)	49.1	19.4	9.0	30.3	37.4	34.5	35.9	31.8	26.3	56.3	38.5	29.0
Level of Service	D	B	A	C	D	C	D	C	C	E	D	C
Approach Delay (s)		26.9			35.8			32.2			39.2	
Approach LOS		C			D			C			D	

Intersection Summary				
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	24.0	
Intersection Capacity Utilization	88.2%	ICU Level of Service	E	
Analysis Period (min)	15			

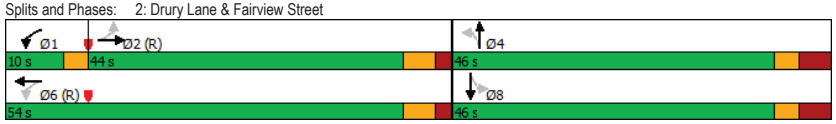
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	996	62	103	599	78	78	11	119	356	22	8
Future Volume (vph)	12	996	62	103	599	78	78	11	119	356	22	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		0.0	20.0		0.0	40.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00		0.99	0.99			1.00	
Frt		0.991			0.983			0.862			0.997	
Flt Protected	0.950			0.950			0.950				0.956	
Satd. Flow (prot)	1805	3437	0	1787	3332	0	1736	1603	0	0	1810	0
Flt Permitted	0.386			0.118			0.665				0.649	
Satd. Flow (perm)	732	3437	0	222	3332	0	1209	1603	0	0	1228	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			19			123			1	
Link Speed (k/h)		60			60			40			50	
Link Distance (m)		174.2			81.3			167.3			133.3	
Travel Time (s)		10.5			4.9			15.1			9.6	
Confl. Peds. (#/hr)	3		6	6		3	9		1	1		9
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	4%	2%	1%	7%	0%	4%	0%	1%	0%	0%	0%
Adj. Flow (vph)	12	1027	64	106	618	80	80	11	123	367	23	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	1091	0	106	698	0	80	134	0	0	398	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		6.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	33.0	33.0		10.0	33.0		30.0	30.0		30.0	30.0	
Total Split (s)	44.0	44.0		10.0	54.0		46.0	46.0		46.0	46.0	
Total Split (%)	44.0%	44.0%		10.0%	54.0%		46.0%	46.0%		46.0%	46.0%	
Maximum Green (s)	38.0	38.0		7.0	48.0		39.0	39.0		39.0	39.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		0.0	2.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		3.0	6.0		7.0	7.0			7.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)	15.0	15.0			15.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	11.0	11.0			11.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	
Act Effct Green (s)	41.5	41.5		54.5	51.5		35.5	35.5			35.5	
Actuated g/C Ratio	0.42	0.42		0.54	0.52		0.36	0.36			0.36	
v/c Ratio	0.04	0.76		0.46	0.40		0.19	0.21			0.91	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	20.2	30.2		20.5	12.9		22.1	5.4			56.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	20.2	30.2		20.5	12.9		22.1	5.4			56.9	
LOS	C	C		C	B		C	A			E	
Approach Delay		30.1			13.9			11.6			56.9	
Approach LOS		C			B			B			E	
Queue Length 50th (m)	1.4	97.5		6.9	27.5		9.9	1.3			68.0	
Queue Length 95th (m)	5.1	123.7		m18.3	44.9		19.8	12.2			#118.9	
Internal Link Dist (m)		150.2			57.3			143.3			109.3	
Turn Bay Length (m)	25.0			20.0			40.0					
Base Capacity (vph)	304	1430		233	1724		471	700			479	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	0		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.04	0.76		0.45	0.40		0.17	0.19			0.83	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 96 (96%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 27.6		Intersection LOS: C	
Intersection Capacity Utilization 85.0%		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.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 2: Drury Lane & Fairview Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	996	62	103	599	78	78	11	119	356	22	8
Future Volume (vph)	12	996	62	103	599	78	78	11	119	356	22	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		3.0	6.0		7.0	7.0			7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00			1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.86			1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	
Satd. Flow (prot)	1801	3438		1787	3331		1727	1604			1809	
Flt Permitted	0.39	1.00		0.12	1.00		0.66	1.00			0.65	
Satd. Flow (perm)	732	3438		222	3331		1209	1604			1229	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	12	1027	64	106	618	80	80	11	123	367	23	8
RTOR Reduction (vph)	0	4	0	0	9	0	0	79	0	0	1	0
Lane Group Flow (vph)	12	1087	0	106	689	0	80	55	0	0	397	0
Confl. Peds. (#/hr)	3		6	6		3	9		1	1		9
Heavy Vehicles (%)	0%	4%	2%	1%	7%	0%	4%	0%	1%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	41.5	41.5		51.5	51.5		35.5	35.5			35.5	
Effective Green, g (s)	41.5	41.5		51.5	51.5		35.5	35.5			35.5	
Actuated g/C Ratio	0.42	0.42		0.52	0.52		0.36	0.36			0.36	
Clearance Time (s)	6.0	6.0		3.0	6.0		7.0	7.0			7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	303	1426		223	1715		429	569			436	
v/s Ratio Prot		c0.32		c0.03	0.21			0.03				
v/s Ratio Perm	0.02			0.21			0.07				c0.32	
v/c Ratio	0.04	0.76		0.48	0.40		0.19	0.10			0.91	
Uniform Delay, d1	17.4	25.0		16.3	14.8		22.3	21.5			30.7	
Progression Factor	1.00	1.00		1.21	0.80		1.00	1.00			1.00	
Incremental Delay, d2	0.2	3.9		1.3	0.6		0.2	0.1			23.0	
Delay (s)	17.6	28.9		21.1	12.5		22.5	21.6			53.8	
Level of Service	B	C		C	B		C	C			D	
Approach Delay (s)		28.8			13.6			21.9			53.8	
Approach LOS		C			B			C			D	

Intersection Summary				
HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	85.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1461	10	23	851	15	58
Future Volume (vph)	1461	10	23	851	15	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	15.0		0.0	0.0
Storage Lanes		0	1		1	0
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.999				0.892	
Flt Protected			0.950		0.990	
Satd. Flow (prot)	3502	0	1770	3406	1645	0
Flt Permitted			0.950		0.990	
Satd. Flow (perm)	3502	0	1770	3406	1645	0
Link Speed (k/h)	60			60	50	
Link Distance (m)	240.4			246.0	62.1	
Travel Time (s)	14.4			14.8	4.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	2%	6%	2%	2%
Adj. Flow (vph)	1588	11	25	925	16	63
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1599	0	25	925	79	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1461	10	23	851	15	58
Future Volume (Veh/h)	1461	10	23	851	15	58
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)	1588	11	25	925	16	63
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	322			401		
pX, platoon unblocked			0.74		0.74	0.74
vC, conflicting volume			1599		2106	800
vC1, stage 1 conf vol					1594	
vC2, stage 2 conf vol					512	
vCu, unblocked vol			1097		1739	12
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			95		92	92
cM capacity (veh/h)			465		193	785

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	1059	540	25	462	462	79
Volume Left	0	0	25	0	0	16
Volume Right	0	11	0	0	0	63
cSH	1700	1700	465	1700	1700	485
Volume to Capacity	0.62	0.32	0.05	0.27	0.27	0.16
Queue Length 95th (m)	0.0	0.0	1.3	0.0	0.0	4.3
Control Delay (s)	0.0	0.0	13.2	0.0	0.0	13.9
Lane LOS			B			B
Approach Delay (s)	0.0		0.3			13.9
Approach LOS						B

Intersection Summary				
Average Delay		0.5		
Intersection Capacity Utilization		51.8%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection: 1: Guelph Line & Fairview Street

Movement	EB	EB	EB	EB	EB	B6	B6	B15	B15	WB	WB	WB
Directions Served	L	L	T	T	R	T	T	T	T	L	T	T
Maximum Queue (m)	63.7	67.4	103.1	98.2	45.0	73.1	69.0	238.3	240.9	25.7	77.0	69.1
Average Queue (m)	58.7	64.0	87.2	83.4	28.4	49.7	44.7	139.5	131.7	6.6	42.8	28.8
95th Queue (m)	74.0	77.9	119.1	118.4	63.6	90.4	88.2	304.3	297.1	17.5	68.2	60.6
Link Distance (m)			71.5	71.5		39.9	39.9	231.1	231.1		161.4	161.4
Upstream Blk Time (%)		18	52	33		51	31	11	6			
Queuing Penalty (veh)		0	396	252		386	233	84	44			
Storage Bay Dist (m)	60.0	60.0			30.0					125.0		
Storage Blk Time (%)	11	52	11	47	0							
Queuing Penalty (veh)	33	159	50	157	0							

Intersection: 1: Guelph Line & Fairview Street

Movement	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	L	T	T	T	L	L	T	T	R
Maximum Queue (m)	61.3	77.5	63.8	48.0	103.7	113.1	123.5	126.3	47.6
Average Queue (m)	27.0	45.9	36.6	14.6	66.0	75.5	74.1	62.3	4.4
95th Queue (m)	49.8	75.1	63.9	40.2	132.7	139.6	172.4	147.6	55.8
Link Distance (m)		192.4	192.4	192.4			233.4	233.4	233.4
Upstream Blk Time (%)							3	0	0
Queuing Penalty (veh)							0	0	0
Storage Bay Dist (m)	90.0				150.0	150.0			
Storage Blk Time (%)		0			1	8	1		
Queuing Penalty (veh)		0			2	30	2		

Intersection: 2: Drury Lane & Fairview Street

Movement	EB	EB	EB	WB	WB	WB	B11	NB	NB	SB
Directions Served	L	T	TR	L	T	TR	T	L	TR	LTR
Maximum Queue (m)	27.5	123.2	115.4	27.3	58.8	62.5	3.7	36.6	34.2	113.8
Average Queue (m)	3.6	69.7	60.6	16.5	28.4	33.9	0.1	14.8	15.2	61.8
95th Queue (m)	15.6	121.9	113.7	28.3	52.5	55.2	2.6	30.2	28.7	98.6
Link Distance (m)		163.8	163.8		62.7	62.7	221.5		153.3	119.5
Upstream Blk Time (%)		2	2		0	0				1
Queuing Penalty (veh)		0	0		0	1				0
Storage Bay Dist (m)	25.0			20.0				40.0		
Storage Blk Time (%)	0	32		7	11			0	0	
Queuing Penalty (veh)	0	4		21	11			0	0	

Intersection: 3: Site Driveway & Fairview Street

Movement	EB	EB	B11	B11	WB	B6	NB
Directions Served	T	TR	T	T	L	T	LR
Maximum Queue (m)	173.7	167.3	14.5	16.4	13.6	3.4	41.6
Average Queue (m)	57.5	54.5	6.1	5.8	4.1	0.2	22.6
95th Queue (m)	205.4	201.0	36.3	35.7	11.6	3.0	49.4
Link Distance (m)	221.5	221.5	62.7	62.7		71.5	48.1
Upstream Blk Time (%)	8	6	1	1			20
Queuing Penalty (veh)	58	45	8	7			0
Storage Bay Dist (m)					15.0		
Storage Blk Time (%)					1		
Queuing Penalty (veh)					3		

Network Summary

Network wide Queuing Penalty: 1988

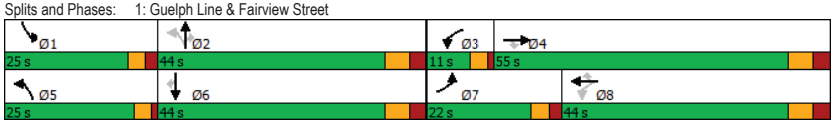
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	436	609	307	96	1036	388	392	870	83	363	794	644
Future Volume (vph)	436	609	307	96	1036	388	392	870	83	363	794	644
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		30.0	125.0		120.0	90.0		70.0	150.0		0.0
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.95	1.00
Ped Bike Factor	1.00		0.96	0.99		0.97	1.00		0.96	0.99		0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3367	3505	1583	1805	3574	1583	1787	5085	1615	3467	3574	1583
Flt Permitted	0.950			0.402			0.122			0.950		
Satd. Flow (perm)	3352	3505	1520	755	3574	1534	228	5085	1551	3439	3574	1526
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			198			319			145			225
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		98.6			183.4			211.2			252.5	
Travel Time (s)		5.9			11.0			15.2			15.2	
Confl. Peds. (#/hr)	13		19	19		13	16		18	18		16
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	4%	3%	2%	0%	1%	2%	1%	2%	0%	1%	1%	2%
Adj. Flow (vph)	445	621	313	98	1057	396	400	888	85	370	810	657
Shared Lane Traffic (%)												
Lane Group Flow (vph)	445	621	313	98	1057	396	400	888	85	370	810	657
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8	2		2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0
Minimum Split (s)	12.0	34.0	34.0	11.0	35.0	35.0	11.0	33.0	33.0	12.0	33.0	33.0
Total Split (s)	22.0	55.0	55.0	11.0	44.0	44.0	25.0	44.0	44.0	25.0	44.0	44.0
Total Split (%)	16.3%	40.7%	40.7%	8.1%	32.6%	32.6%	18.5%	32.6%	32.6%	18.5%	32.6%	32.6%
Maximum Green (s)	17.0	48.0	48.0	7.0	37.0	37.0	21.0	37.0	37.0	20.0	37.0	37.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	3.0	3.0	1.0	3.0	3.0	1.0	3.0	3.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	Max	Max	None	Max	Max
Walk Time (s)		8.0	8.0		8.0	8.0		12.0	12.0		12.0	12.0
Flash Dont Walk (s)		19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	17.0	48.0	48.0	47.0	37.0	37.0	62.4	38.6	38.6	18.4	37.0	37.0
Actuated g/C Ratio	0.13	0.36	0.36	0.35	0.27	0.27	0.46	0.29	0.29	0.14	0.27	0.27
v/c Ratio	1.05	0.50	0.47	0.31	1.08	0.61	1.15	0.61	0.16	0.79	0.83	1.13

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	113.8	35.8	14.2	24.8	98.8	13.2	130.4	44.1	0.7	68.8	54.4	108.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	113.8	35.8	14.2	24.8	98.8	13.2	130.4	44.1	0.7	68.8	54.4	108.4
LOS	F	D	B	C	F	B	F	D	A	E	D	F
Approach Delay		56.1			72.3			66.6			76.6	
Approach LOS		E			E			E			E	
Queue Length 50th (m)	~65.5	67.0	21.3	14.5	~163.0	15.5	~105.1	75.1	0.0	48.7	105.7	~154.7
Queue Length 95th (m)	#98.5	84.7	47.6	25.2	#204.1	48.5	#168.2	90.4	0.4	65.2	130.0	#227.3
Internal Link Dist (m)		74.6			159.4			187.2			228.5	
Turn Bay Length (m)	60.0		30.0	125.0		120.0	90.0		70.0	150.0		
Base Capacity (vph)	423	1246	668	317	979	652	347	1455	547	513	979	581
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.50	0.47	0.31	1.08	0.61	1.15	0.61	0.16	0.72	0.83	1.13

Intersection Summary		
Area Type:	Other	
Cycle Length: 135		
Actuated Cycle Length: 135		
Natural Cycle: 135		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 1.15		
Intersection Signal Delay: 68.7		Intersection LOS: E
Intersection Capacity Utilization 106.8%		ICU Level of Service G
Analysis Period (min) 15		

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

Splits and Phases: 1: Guelph Line & Fairview Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	436	609	307	96	1036	388	392	870	83	363	794	644
Future Volume (vph)	436	609	307	96	1036	388	392	870	83	363	794	644
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	1.00	0.96	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3367	3505	1520	1797	3574	1534	1787	5085	1551	3467	3574	1526
Flt Permitted	0.95	1.00	1.00	0.40	1.00	1.00	0.12	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3367	3505	1520	760	3574	1534	229	5085	1551	3467	3574	1526
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	445	621	313	98	1057	396	400	888	85	370	810	657
RTOR Reduction (vph)	0	0	128	0	0	232	0	0	61	0	0	163
Lane Group Flow (vph)	445	621	185	98	1057	164	400	888	24	370	810	494
Confl. Peds. (#/hr)	13		19	19		13	16		18	18		16
Heavy Vehicles (%)	4%	3%	2%	0%	1%	2%	1%	2%	0%	1%	1%	2%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8	2		2			6
Actuated Green, G (s)	17.0	48.0	48.0	44.0	37.0	37.0	59.6	38.6	38.6	18.4	37.0	37.0
Effective Green, g (s)	17.0	48.0	48.0	44.0	37.0	37.0	59.6	38.6	38.6	18.4	37.0	37.0
Actuated g/C Ratio	0.13	0.36	0.36	0.33	0.27	0.27	0.44	0.29	0.29	0.14	0.27	0.27
Clearance Time (s)	5.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	423	1246	540	301	979	420	343	1453	443	472	979	418
v/s Ratio Prot	c0.13	0.18		0.02	c0.30		c0.18	0.17		0.11	0.23	
v/s Ratio Perm			0.12	0.09		0.11	c0.33		0.02			0.32
v/c Ratio	1.05	0.50	0.34	0.33	1.08	0.39	1.17	0.61	0.05	0.78	0.83	1.18
Uniform Delay, d1	59.0	34.1	31.9	32.4	49.0	39.8	39.3	41.7	35.0	56.4	46.0	49.0
Progression 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
Incremental Delay, d2	58.1	1.4	1.7	0.6	52.8	2.7	101.8	1.9	0.2	8.3	8.0	103.6
Delay (s)	117.1	35.5	33.7	33.1	101.8	42.6	141.1	43.6	35.2	64.7	54.0	152.6
Level of Service	F	D	C	C	F	D	F	D	D	E	D	F
Approach Delay (s)		61.4			82.3			71.5			91.4	
Approach LOS		E			F			E			F	

Intersection Summary				
HCM 2000 Control Delay	77.9	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.15			
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	24.0	
Intersection Capacity Utilization	106.8%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

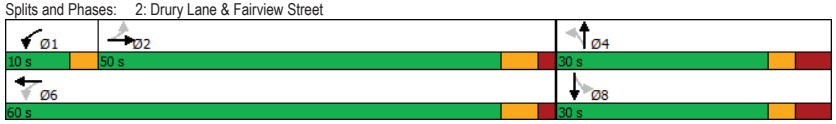
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	938	108	170	1695	219	120	23	118	226	24	44
Future Volume (vph)	24	938	108	170	1695	219	120	23	118	226	24	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		0.0	20.0		0.0	40.0		0.0	0.0		0.0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	0.99		0.99	0.98			0.99	
Frt		0.984			0.983			0.874			0.980	
Flt Protected	0.950			0.950			0.950				0.963	
Satd. Flow (prot)	1805	3448	0	1805	3469	0	1787	1627	0	0	1787	0
Flt Permitted	0.091			0.160			0.661				0.682	
Satd. Flow (perm)	173	3448	0	303	3469	0	1237	1627	0	0	1256	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			28			123			10	
Link Speed (k/h)		60			60			40			50	
Link Distance (m)		174.2			81.3			167.3			133.3	
Travel Time (s)		10.5			4.9			15.1			9.6	
Confl. Peds. (#/hr)	14		7	7		14	9		10	10		9
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	3%	0%	0%	2%	0%	1%	0%	0%	0%	0%	0%
Adj. Flow (vph)	25	977	113	177	1766	228	125	24	123	235	25	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	1090	0	177	1994	0	125	147	0	0	306	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		6.0	8.0		8.0	8.0		8.0	8.0	
Minimum Split (s)	33.0	33.0		10.0	33.0		30.0	30.0		30.0	30.0	
Total Split (s)	50.0	50.0		10.0	60.0		30.0	30.0		30.0	30.0	
Total Split (%)	55.6%	55.6%		11.1%	66.7%		33.3%	33.3%		33.3%	33.3%	
Maximum Green (s)	44.0	44.0		7.0	54.0		23.0	23.0		23.0	23.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		0.0	2.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		3.0	6.0		7.0	7.0			7.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		None	None		None	None		None	None	
Walk Time (s)	15.0	15.0			15.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)	11.0	11.0			11.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	0	0			0		0	0		0	0	
Act Effct Green (s)	44.0	44.0		57.0	54.0		22.5	22.5			22.5	
Actuated g/C Ratio	0.49	0.49		0.64	0.60		0.25	0.25			0.25	
v/c Ratio	0.29	0.64		0.57	0.95		0.40	0.29			0.95	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	25.3	18.8		14.3	28.2		32.4	9.1			72.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	25.3	18.8		14.3	28.2		32.4	9.1			72.1	
LOS	C	B		B	C		C	A			E	
Approach Delay		18.9			27.0			19.8			72.1	
Approach LOS		B			C			B			E	
Queue Length 50th (m)	2.4	68.5		11.1	151.6		17.7	3.1			49.6	
Queue Length 95th (m)	9.6	88.9		19.0	#219.5		33.4	16.9			#98.0	
Internal Link Dist (m)		150.2			57.3			143.3			109.3	
Turn Bay Length (m)	25.0			20.0			40.0					
Base Capacity (vph)	85	1705		310	2104		318	509			330	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	0		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.29	0.64		0.57	0.95		0.39	0.29			0.93	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 89.5			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 27.8		Intersection LOS: C	
Intersection Capacity Utilization 111.3%		ICU Level of Service H	
Analysis Period (min) 15			

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

Splits and Phases: 2: Drury Lane & Fairview Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	938	108	170	1695	219	120	23	118	226	24	44
Future Volume (vph)	24	938	108	170	1695	219	120	23	118	226	24	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		3.0	6.0		7.0	7.0			7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00			0.99	
Frt	1.00	0.98		1.00	0.98		1.00	0.87			0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	
Satd. Flow (prot)	1805	3449		1805	3469		1777	1628			1773	
Flt Permitted	0.09	1.00		0.16	1.00		0.66	1.00			0.68	
Satd. Flow (perm)	173	3449		305	3469		1236	1628			1255	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	25	977	112	177	1766	228	125	24	123	235	25	46
RTOR Reduction (vph)	0	10	0	0	11	0	0	92	0	0	7	0
Lane Group Flow (vph)	25	1080	0	177	1983	0	125	55	0	0	299	0
Confl. Peds. (#/hr)	14		7	7		14	9		10	10		9
Heavy Vehicles (%)	0%	3%	0%	0%	2%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	44.0	44.0		53.9	53.9		22.5	22.5			22.5	
Effective Green, g (s)	44.0	44.0		53.9	53.9		22.5	22.5			22.5	
Actuated g/C Ratio	0.49	0.49		0.60	0.60		0.25	0.25			0.25	
Clearance Time (s)	6.0	6.0		3.0	6.0		7.0	7.0			7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	85	1697		299	2091		311	409			315	
v/s Ratio Prot		0.31		0.05	c0.57			0.03				
v/s Ratio Perm	0.14			0.31			0.10				c0.24	
v/c Ratio	0.29	0.64		0.59	0.95		0.40	0.13			0.95	
Uniform Delay, d1	13.5	16.8		10.7	16.5		27.8	25.9			32.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	8.6	1.8		3.1	10.0		0.9	0.2			36.6	
Delay (s)	22.1	18.6		13.8	26.4		28.7	26.1			69.5	
Level of Service	C	B		B	C		C	C			E	
Approach Delay (s)		18.7			25.4			27.3			69.5	
Approach LOS		B			C			C			E	

Intersection Summary					
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.99				
Actuated Cycle Length (s)	89.4	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	111.3%	ICU Level of Service		H	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1315	20	62	2064	21	36
Future Volume (vph)	1315	20	62	2064	21	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	15.0		0.0	0.0
Storage Lanes		0	1		1	0
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.998				0.915	
Flt Protected			0.950		0.982	
Satd. Flow (prot)	3498	0	1770	3539	1674	0
Flt Permitted			0.950		0.982	
Satd. Flow (perm)	3498	0	1770	3539	1674	0
Link Speed (k/h)	60			60	50	
Link Distance (m)	240.4			246.0	62.1	
Travel Time (s)	14.4			14.8	4.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	2%	2%	2%	2%
Adj. Flow (vph)	1429	22	67	2243	23	39
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1451	0	67	2243	62	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1315	20	62	2064	21	36
Future Volume (Veh/h)	1315	20	62	2064	21	36
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)	1429	22	67	2243	23	39
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	322			401		
pX, platoon unblocked			0.79		0.84	0.79
vC, conflicting volume			1451		2696	726
vC1, stage 1 conf vol					1440	
vC2, stage 2 conf vol					1256	
vCu, unblocked vol			1031		1503	109
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			87		89	95
cM capacity (veh/h)			527		203	727

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	953	498	67	1122	1122	62
Volume Left	0	0	67	0	0	23
Volume Right	0	22	0	0	0	39
cSH	1700	1700	527	1700	1700	372
Volume to Capacity	0.56	0.29	0.13	0.66	0.66	0.17
Queue Length 95th (m)	0.0	0.0	3.3	0.0	0.0	4.4
Control Delay (s)	0.0	0.0	12.8	0.0	0.0	16.6
Lane LOS			B			C
Approach Delay (s)	0.0		0.4			16.6
Approach LOS						C

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	67.1%	ICU Level of Service		C
Analysis Period (min)	15			

Intersection: 1: Guelph Line & Fairview Street

Movement	EB	EB	EB	EB	EB	B6	B6	B15	B15	WB	WB	WB
Directions Served	L	L	T	T	R	T	T	T	T	L	T	T
Maximum Queue (m)	63.7	67.5	102.8	99.8	45.0	71.6	55.1	201.6	192.9	132.4	168.3	175.3
Average Queue (m)	62.1	66.9	92.1	73.8	33.6	52.2	15.1	108.6	77.8	77.9	165.6	166.6
95th Queue (m)	66.8	68.5	106.6	108.4	65.4	86.4	48.9	260.2	226.3	172.6	169.9	170.4
Link Distance (m)			71.5	71.5		39.9	39.9	231.1	231.1		161.4	161.4
Upstream Blk Time (%)		28	64	10		58	3	5	0		64	62
Queuing Penalty (veh)		0	434	70		391	18	33	1		0	0
Storage Bay Dist (m)	60.0	60.0			30.0					125.0		
Storage Blk Time (%)	15	66	6	35						0	73	69
Queuing Penalty (veh)	44	199	27	107						0	70	267

Intersection: 1: Guelph Line & Fairview Street

Movement	WB	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	R	L	T	T	T	R	L	L	T	T	R
Maximum Queue (m)	135.0	97.5	203.4	190.5	82.6	46.4	75.0	90.5	123.2	119.1	73.8
Average Queue (m)	127.1	97.3	193.3	137.0	32.8	2.1	46.1	57.7	81.7	77.6	3.7
95th Queue (m)	176.5	98.4	228.8	233.8	67.9	22.6	70.9	81.1	113.9	111.6	36.0
Link Distance (m)			192.4	192.4	192.4				233.4	233.4	233.4
Upstream Blk Time (%)			87	0							
Queuing Penalty (veh)			0	0							
Storage Bay Dist (m)	120.0	90.0				70.0	150.0	150.0			
Storage Blk Time (%)	0	88	0		2						
Queuing Penalty (veh)	0	256	0		2						

Intersection: 2: Drury Lane & Fairview Street

Movement	EB	EB	EB	WB	WB	WB	B11	B11	NB	NB	SB
Directions Served	L	T	TR	L	T	TR	T	T	L	TR	LTR
Maximum Queue (m)	28.7	87.9	89.4	27.3	90.0	87.7	56.0	60.6	41.3	40.4	90.4
Average Queue (m)	9.1	47.8	41.1	20.2	71.5	75.5	10.8	15.3	19.6	17.8	51.9
95th Queue (m)	23.7	77.4	73.5	31.7	96.7	98.3	37.4	43.7	36.0	33.6	82.9
Link Distance (m)		163.8	163.8		62.7	62.7	221.5	221.5		153.3	119.5
Upstream Blk Time (%)					12	16					0
Queuing Penalty (veh)					121	163					0
Storage Bay Dist (m)	25.0			20.0					40.0		
Storage Blk Time (%)	1	20		11	26				1	0	
Queuing Penalty (veh)	3	5		92	45				1	0	

Intersection: 3: Site Driveway & Fairview Street

Movement	EB	EB	WB	WB	WB	B6	B6	B6	NB
Directions Served	T	TR	L	T	T	T	T		LR
Maximum Queue (m)	39.5	39.0	19.0	32.8	20.5	73.8	80.6	92.3	39.7
Average Queue (m)	7.6	3.0	8.3	1.8	1.0	20.2	28.7	13.1	14.9
95th Queue (m)	36.8	24.2	17.1	17.3	12.4	67.9	81.3	63.0	31.5
Link Distance (m)	221.5	221.5		231.1	231.1	71.5	71.5	71.5	48.1
Upstream Blk Time (%)						0	1	1	1
Queuing Penalty (veh)						1	5	7	0
Storage Bay Dist (m)			15.0						
Storage Blk Time (%)			4	0					
Queuing Penalty (veh)			36	0					

Network Summary

Network wide Queuing Penalty: 2396

Appendix I

Traffic Control Warrant

Signal Justification Calculation for Forecasted Volumes
(OTM Book 12 - Justification 7)

Horizon Year: 2028 Total
Region/City/Township: Burlington

Major Street: Fairview Street
Minor Street: Site Driveway

North/South?: N

Number of Approach Lanes: 2 or more
Tee Intersection? Y
Flow Conditions: Restricted

PM Forecast Only? N

Warrant Results		
150% Satisfied	No	Justification for new intersections with forecast traffic
120% Satisfied	No	Justification for existing intersections with forecast traffic

Time Period	Major Street: Fairview Street						Minor Street: Site Driveway						
	Eastbound			Westbound			Northbound			Southbound			Peds
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	Crossing
AM Peak Hour	0	1461	10	23	851	0	15	0	58	0	0	0	0
PM Peak Hour	0	1315	20	62	2064	0	21	0	36	0	0	0	0
Avg. Hourly Volume	0	694	8	21	729	0	9	0	24	0	0	0	0

Warrant	AHV
1A - All	1484
1B - Minor	33
2A - Major	1452
2B - Cross	9

Warrant 1 - Minimum Vehicular Volume

	Approach Lanes	1		2 or more		Average Hourly Volume
1A	Flow Conditions	Free	Restricted	Free	Restricted	
					X	
	All Approaches	480	720	600	900	1484
					% Fulfilled	165%

	Approach Lanes	1		2 or more		Average Hourly Volume
1B	Flow Conditions	Free	Restricted	Free	Restricted	
					X	
	Minor Street Approaches	180	255	180	255	33
					% Fulfilled	13%

Warrant 2 - Delay To Cross Traffic

	Approach Lanes	1		2 or more		Average Hourly Volume
2A	Flow Conditions	Free	Restricted	Free	Restricted	
					X	
	Major Street Approaches	480	720	600	900	1452
					% Fulfilled	161%

	Approach Lanes	1		2 or more		Average Hourly Volume
2B	Flow Conditions	Free	Restricted	Free	Restricted	
					X	
	Traffic Crossing Major Street	50	75	50	75	9
					% Fulfilled	12%

Appendix J

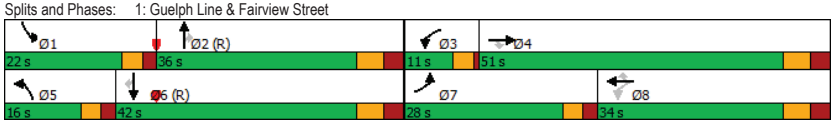
Total Traffic Operations with Remedial Measures

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	475	614	335	29	244	184	205	722	86	284	753	425
Future Volume (vph)	475	614	335	29	244	184	205	722	86	284	753	425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		30.0	180.0		190.0	90.0		70.0	150.0		0.0
Storage Lanes	2		1	1		1	2		1	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.95	1.00
Ped Bike Factor	0.99		0.97	0.99		0.98	1.00		0.97	0.99		0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3367	3505	1583	1805	3406	1568	3400	5036	1615	3400	3438	1509
Flt Permitted	0.950			0.401			0.950			0.950		
Satd. Flow (perm)	3339	3505	1531	755	3406	1531	3384	5036	1567	3379	3438	1471
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			246			209			209			457
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		98.6			234.7			211.2			252.5	
Travel Time (s)		5.9			14.1			15.2			15.2	
Confl. Peds. (#/hr)	9		16	16		9	10		13	13		10
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	4%	3%	2%	0%	6%	3%	3%	3%	0%	3%	5%	7%
Adj. Flow (vph)	511	660	360	31	262	198	220	776	92	305	810	457
Shared Lane Traffic (%)												
Lane Group Flow (vph)	511	660	360	31	262	198	220	776	92	305	810	457
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0
Minimum Split (s)	12.0	34.0	34.0	11.0	34.0	34.0	12.0	33.0	33.0	12.0	33.0	33.0
Total Split (s)	28.0	51.0	51.0	11.0	34.0	34.0	16.0	36.0	36.0	22.0	42.0	42.0
Total Split (%)	23.3%	42.5%	42.5%	9.2%	28.3%	28.3%	13.3%	30.0%	30.0%	18.3%	35.0%	35.0%
Maximum Green (s)	23.0	44.0	44.0	7.0	27.0	27.0	11.0	29.0	29.0	17.0	35.0	35.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	3.0	3.0	1.0	3.0	3.0	2.0	3.0	3.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		8.0	8.0		8.0	8.0		12.0	12.0		12.0	12.0
Flash Dont Walk (s)		19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	21.6	48.4	48.4	38.4	28.4	28.4	10.7	30.8	30.8	15.2	35.3	35.3
Actuated g/C Ratio	0.18	0.40	0.40	0.32	0.24	0.24	0.09	0.26	0.26	0.13	0.29	0.29
v/c Ratio	0.84	0.47	0.47	0.10	0.33	0.38	0.73	0.60	0.17	0.71	0.80	0.61

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	55.4	21.4	6.1	19.1	39.7	6.6	67.5	41.8	0.6	59.7	46.3	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.4	21.4	6.1	19.1	39.7	6.6	67.5	41.8	0.6	59.7	46.3	6.8
LOS	E	C	A	B	D	A	E	D	A	E	D	A
Approach Delay		29.1			25.1			43.5			37.4	
Approach LOS		C			C			D			D	
Queue Length 50th (m)	47.7	63.8	12.1	3.7	27.1	0.0	26.0	58.7	0.0	35.2	91.7	0.0
Queue Length 95th (m)	72.1	56.2	m12.8	8.9	39.2	16.1	#40.6	73.4	0.0	49.3	115.2	25.5
Internal Link Dist (m)		74.6			210.7			187.2			228.5	
Turn Bay Length (m)	60.0		30.0	180.0		190.0	90.0		70.0	150.0		
Base Capacity (vph)	645	1413	764	302	805	521	311	1293	557	481	1010	754
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.47	0.47	0.10	0.33	0.38	0.71	0.60	0.17	0.63	0.80	0.61

Intersection Summary		
Area Type:	Other	
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 7 (6%), Referenced to phase 2:NBT and 6:SBT, Start of Green		
Natural Cycle: 95		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.84		
Intersection Signal Delay: 34.8	Intersection LOS: C	
Intersection Capacity Utilization 85.8%	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.		
m Volume for 95th percentile queue is metered by upstream signal.		

Splits and Phases: 1: Guelph Line & Fairview Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	475	614	335	29	244	184	205	722	86	284	753	425
Future Volume (vph)	475	614	335	29	244	184	205	722	86	284	753	425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3367	3505	1531	1799	3406	1531	3400	5036	1567	3400	3438	1471
Flt Permitted	0.95	1.00	1.00	0.40	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3367	3505	1531	759	3406	1531	3400	5036	1567	3400	3438	1471
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	511	660	360	31	262	198	220	776	92	305	810	457
RTOR Reduction (vph)	0	0	147	0	0	149	0	0	70	0	0	329
Lane Group Flow (vph)	511	660	213	31	262	50	220	776	22	305	810	128
Confl. Peds. (#/hr)	9		16	16		9	10		13	13		10
Heavy Vehicles (%)	4%	3%	2%	0%	6%	3%	3%	3%	0%	3%	5%	7%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8			2			6
Actuated Green, G (s)	21.6	48.4	48.4	34.2	30.0	30.0	10.7	29.2	29.2	15.2	33.7	33.7
Effective Green, g (s)	21.6	48.4	48.4	34.2	30.0	30.0	10.7	29.2	29.2	15.2	33.7	33.7
Actuated g/C Ratio	0.18	0.40	0.40	0.29	0.25	0.25	0.09	0.24	0.24	0.13	0.28	0.28
Clearance Time (s)	5.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	606	1413	617	252	851	382	303	1225	381	430	965	413
v/s Ratio Prot	c0.15	c0.19		0.00	0.08		0.06	0.15		c0.09	c0.24	
v/s Ratio Perm			0.14	0.03		0.03			0.01			0.09
v/c Ratio	0.84	0.47	0.35	0.12	0.31	0.13	0.73	0.63	0.06	0.71	0.84	0.31
Uniform Delay, d1	47.6	26.3	24.8	31.2	36.6	34.9	53.2	40.6	34.9	50.3	40.6	34.0
Progression Factor	0.93	0.75	0.49	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.5	0.9	1.2	0.2	0.9	0.7	8.4	2.5	0.3	5.3	8.7	2.0
Delay (s)	52.9	20.5	13.4	31.4	37.5	35.6	61.6	43.1	35.1	55.6	49.3	36.0
Level of Service	D	C	B	C	D	D	E	D	D	E	D	D
Approach Delay (s)		29.6			36.3			46.2			46.6	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	39.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0	
Intersection Capacity Utilization	85.8%	ICU Level of Service	E	
Analysis Period (min)	15			

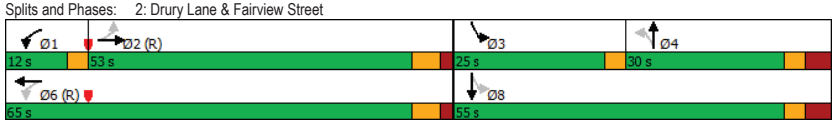
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	996	62	103	599	78	78	11	119	356	22	8
Future Volume (vph)	12	996	62	103	599	78	78	11	119	356	22	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		0.0	35.0		0.0	40.0		0.0	30.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00		0.99	0.99		1.00	0.99	
Frt		0.991			0.983			0.862			0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3437	0	1787	3331	0	1736	1603	0	1805	1813	0
Flt Permitted	0.386			0.151			0.737			0.475		
Satd. Flow (perm)	731	3437	0	284	3331	0	1327	1603	0	901	1813	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			16			123			8	
Link Speed (k/h)		60			60			40			50	
Link Distance (m)		174.2			81.3			167.3			133.3	
Travel Time (s)		10.5			4.9			15.1			9.6	
Confl. Peds. (#/hr)	3		6	6		3	9		1	1		9
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	4%	2%	1%	7%	0%	4%	0%	1%	0%	0%	0%
Adj. Flow (vph)	12	1027	64	106	618	80	80	11	123	367	23	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	1091	0	106	698	0	80	134	0	367	31	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		1	6		4	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		6.0	8.0		8.0	8.0		6.0	8.0	
Minimum Split (s)	33.0	33.0		10.0	33.0		30.0	30.0		10.0	30.0	
Total Split (s)	53.0	53.0		12.0	65.0		30.0	30.0		25.0	55.0	
Total Split (%)	44.2%	44.2%		10.0%	54.2%		25.0%	25.0%		20.8%	45.8%	
Maximum Green (s)	47.0	47.0		9.0	59.0		23.0	23.0		22.0	48.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		0.0	2.0		4.0	4.0		0.0	4.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		3.0	6.0		7.0	7.0		3.0	7.0	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)	15.0	15.0			15.0		8.0	8.0			8.0	
Flash Dont Walk (s)	11.0	11.0			11.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0			0		0	0			0	
Act Effct Green (s)	58.3	58.3		72.9	69.9		12.8	12.8		41.1	37.1	
Actuated g/C Ratio	0.49	0.49		0.61	0.58		0.11	0.11		0.34	0.31	
v/c Ratio	0.03	0.65		0.38	0.36		0.57	0.48		0.78	0.05	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	19.8	26.6		10.1	6.6		65.8	16.0		44.7	21.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.8	26.6		10.1	6.6		65.8	16.0		44.7	21.7	
LOS	B	C		B	A		E	B		D	C	
Approach Delay		26.6			7.0			34.6			42.9	
Approach LOS		C			A			C			D	
Queue Length 50th (m)	1.4	97.8		4.7	18.1		18.0	2.4		69.5	3.7	
Queue Length 95th (m)	5.5	138.0		m8.1	24.4		32.6	19.3		92.7	10.0	
Internal Link Dist (m)		150.2			57.3			143.3			109.3	
Turn Bay Length (m)	25.0			35.0			40.0			30.0		
Base Capacity (vph)	354	1672		292	1947		254	406		474	730	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.03	0.65		0.36	0.36		0.31	0.33		0.77	0.04	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 8 (7%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 23.6		Intersection LOS: C	
Intersection Capacity Utilization 80.8%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 2: Drury Lane & Fairview Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	996	62	103	599	78	78	11	119	356	22	8
Future Volume (vph)	12	996	62	103	599	78	78	11	119	356	22	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		3.0	6.0		7.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.86		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1800	3438		1787	3331		1711	1603		1804	1814	
Flt Permitted	0.39	1.00		0.15	1.00		0.74	1.00		0.47	1.00	
Satd. Flow (perm)	732	3438		284	3331		1327	1603		902	1814	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	12	1027	64	106	618	80	80	11	123	367	23	8
RTOR Reduction (vph)	0	3	0	0	7	0	0	110	0	0	6	0
Lane Group Flow (vph)	12	1088	0	106	691	0	80	24	0	367	25	0
Confl. Peds. (#/hr)	3		6	6		3	9		1	1		9
Heavy Vehicles (%)	0%	4%	2%	1%	7%	0%	4%	0%	1%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	58.3	58.3		69.9	69.9		12.8	12.8		37.1	37.1	
Effective Green, g (s)	58.3	58.3		69.9	69.9		12.8	12.8		37.1	37.1	
Actuated g/C Ratio	0.49	0.49		0.58	0.58		0.11	0.11		0.31	0.31	
Clearance Time (s)	6.0	6.0		3.0	6.0		7.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	355	1670		273	1940		141	170		438	560	
v/s Ratio Prot		c0.32		c0.03	0.21			0.02		c0.15	0.01	
v/s Ratio Perm	0.02			0.20			0.06			c0.11		
v/c Ratio	0.03	0.65		0.39	0.36		0.57	0.14		0.84	0.05	
Uniform Delay, d1	16.1	23.2		14.7	13.2		51.0	48.6		36.1	29.0	
Progression Factor	1.00	1.00		0.62	0.45		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	2.0		0.8	0.4		5.2	0.4		13.1	0.0	
Delay (s)	16.3	25.2		9.8	6.4		56.1	49.0		49.2	29.1	
Level of Service	B	C		A	A		E	D		D	C	
Approach Delay (s)		25.1			6.8			51.7			47.6	
Approach LOS		C			A			D			D	

Intersection Summary					
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.71				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		19.0	
Intersection Capacity Utilization	80.8%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1461	10	23	851	15	58
Future Volume (vph)	1461	10	23	851	15	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	15.0		0.0	0.0
Storage Lanes		0	1		1	0
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.999				0.892	
Flt Protected			0.950		0.990	
Satd. Flow (prot)	3502	0	1770	3406	1645	0
Flt Permitted			0.950		0.990	
Satd. Flow (perm)	3502	0	1770	3406	1645	0
Link Speed (k/h)	60			60	50	
Link Distance (m)	240.4			246.0	62.1	
Travel Time (s)	14.4			14.8	4.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	2%	6%	2%	2%
Adj. Flow (vph)	1588	11	25	925	16	63
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1599	0	25	925	79	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1461	10	23	851	15	58
Future Volume (Veh/h)	1461	10	23	851	15	58
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)	1588	11	25	925	16	63
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	322			401		
pX, platoon unblocked			0.77		0.78	0.77
vC, conflicting volume			1599		2106	800
vC1, stage 1 conf vol					1594	
vC2, stage 2 conf vol					512	
vCu, unblocked vol			1175		1747	134
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			94		91	91
cM capacity (veh/h)			453		185	684

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	1059	540	25	462	462	79
Volume Left	0	0	25	0	0	16
Volume Right	0	11	0	0	0	63
cSH	1700	1700	453	1700	1700	442
Volume to Capacity	0.62	0.32	0.06	0.27	0.27	0.18
Queue Length 95th (m)	0.0	0.0	1.3	0.0	0.0	4.8
Control Delay (s)	0.0	0.0	13.4	0.0	0.0	14.9
Lane LOS			B			B
Approach Delay (s)	0.0		0.4			14.9
Approach LOS						B

Intersection Summary				
Average Delay		0.6		
Intersection Capacity Utilization		51.8%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection: 1: Guelph Line & Fairview Street

Movement	EB	EB	EB	EB	EB	B6	B6	B15	WB	WB	WB	NB
Directions Served	L	L	T	T	R	T	T	T	L	T	T	L
Maximum Queue (m)	63.4	67.3	94.2	91.1	45.0	36.4	20.4	19.5	15.3	55.8	50.6	53.7
Average Queue (m)	46.5	51.9	50.4	42.0	12.9	4.4	1.0	1.0	4.4	29.6	14.1	17.4
95th Queue (m)	68.6	72.3	93.4	74.2	45.8	27.8	9.7	12.2	12.0	50.9	36.7	44.1
Link Distance (m)			71.3	71.3		39.9	39.9	231.1		211.7	211.7	
Upstream Blk Time (%)		1	6	1		1	0					
Queuing Penalty (veh)		0	46	7		10	0					
Storage Bay Dist (m)	60.0	60.0			30.0				180.0			90.0
Storage Blk Time (%)	2	8	3	13								
Queuing Penalty (veh)	5	25	12	44								

Intersection: 1: Guelph Line & Fairview Street

Movement	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	T	T	L	L	T	T
Maximum Queue (m)	66.9	91.8	79.6	58.2	54.7	63.5	101.8	94.4
Average Queue (m)	32.4	62.9	52.2	29.9	24.7	40.0	68.9	63.2
95th Queue (m)	55.3	83.8	72.2	56.5	53.7	61.0	94.6	88.8
Link Distance (m)		192.3	192.3	192.3			232.2	232.2
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)	90.0				150.0	150.0		
Storage Blk Time (%)		0		0				
Queuing Penalty (veh)		1		0				

Intersection: 2: Drury Lane & Fairview Street

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (m)	17.5	106.8	98.8	39.4	47.9	50.0	43.6	58.4	37.3	111.8
Average Queue (m)	2.9	71.0	60.2	14.3	15.1	24.5	17.2	18.1	35.9	55.0
95th Queue (m)	12.7	106.0	94.4	28.1	36.5	42.8	34.8	37.2	39.8	113.0
Link Distance (m)		163.8	163.8		62.5	62.5		153.3		119.4
Upstream Blk Time (%)						0				2
Queuing Penalty (veh)						0				0
Storage Bay Dist (m)	25.0			35.0			40.0		30.0	
Storage Blk Time (%)		28		0	1		1	1	44	
Queuing Penalty (veh)		3		1	1		1	1	13	

Intersection: 3: Site Driveway & Fairview Street

Movement	EB	WB	B6	B6	NB
Directions Served	TR	L	T	T	LR
Maximum Queue (m)	1.3	12.7	11.4	16.0	40.1
Average Queue (m)	0.0	3.3	0.4	0.8	12.0
95th Queue (m)	0.9	10.8	8.1	9.6	27.0
Link Distance (m)	221.5		71.3	71.3	48.1
Upstream Blk Time (%)					1
Queuing Penalty (veh)					0
Storage Bay Dist (m)		15.0			
Storage Blk Time (%)		1			
Queuing Penalty (veh)		2			

Network Summary

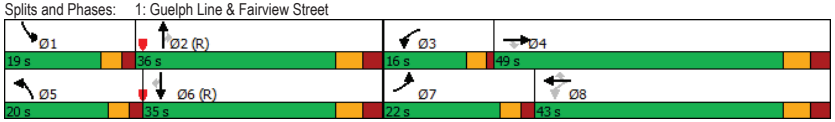
Network wide Queuing Penalty: 173

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	436	609	307	96	1036	388	392	870	83	363	794	644
Future Volume (vph)	436	609	307	96	1036	388	392	870	83	363	794	644
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		30.0	180.0		190.0	90.0		70.0	150.0		0.0
Storage Lanes	2		1	1		1	2		1	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.95	1.00
Ped Bike Factor	1.00		0.96	0.99		0.97	0.99		0.96	0.99		0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3367	3505	1583	1805	3574	1583	3467	5085	1615	3467	3574	1583
Flt Permitted	0.950			0.409			0.950			0.950		
Satd. Flow (perm)	3354	3505	1525	769	3574	1537	3442	5085	1556	3442	3574	1530
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			221			284			164			232
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		98.6			234.7			211.2			252.5	
Travel Time (s)		5.9			14.1			15.2			15.2	
Confl. Peds. (#/hr)	13		19	19		13	16		18	18		16
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	4%	3%	2%	0%	1%	2%	1%	2%	0%	1%	1%	2%
Adj. Flow (vph)	445	621	313	98	1057	396	400	888	85	370	810	657
Shared Lane Traffic (%)												
Lane Group Flow (vph)	445	621	313	98	1057	396	400	888	85	370	810	657
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0	7.0	8.0	8.0
Minimum Split (s)	12.0	34.0	34.0	11.0	35.0	35.0	12.0	33.0	33.0	12.0	33.0	33.0
Total Split (s)	22.0	49.0	49.0	16.0	43.0	43.0	20.0	36.0	36.0	19.0	35.0	35.0
Total Split (%)	18.3%	40.8%	40.8%	13.3%	35.8%	35.8%	16.7%	30.0%	30.0%	15.8%	29.2%	29.2%
Maximum Green (s)	17.0	42.0	42.0	12.0	36.0	36.0	15.0	29.0	29.0	14.0	28.0	28.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	3.0	3.0	1.0	3.0	3.0	2.0	3.0	3.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Max	Max	None	Max	Max	None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)		8.0	8.0		8.0	8.0		12.0	12.0		12.0	12.0
Flash Dont Walk (s)		19.0	19.0		19.0	19.0		14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	17.0	45.0	45.0	48.0	36.0	36.0	15.0	29.0	29.0	14.0	28.0	28.0
Actuated g/C Ratio	0.14	0.38	0.38	0.40	0.30	0.30	0.12	0.24	0.24	0.12	0.23	0.23
v/c Ratio	0.93	0.47	0.44	0.25	0.99	0.60	0.92	0.72	0.17	0.92	0.97	1.23

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	69.3	28.4	10.9	17.9	66.3	14.3	80.0	45.8	0.7	80.6	71.0	145.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.3	28.4	10.9	17.9	66.3	14.3	80.0	45.8	0.7	80.6	71.0	145.6
LOS	E	C	B	B	E	B	F	D	A	F	E	F
Approach Delay		37.6			50.0			53.0			99.6	
Approach LOS		D			D			D			F	
Queue Length 50th (m)	54.1	62.5	25.9	11.4	128.3	19.8	48.0	69.7	0.0	44.4	98.7	~144.9
Queue Length 95th (m)	m#80.2	m84.4	m47.7	20.5	#172.7	52.0	#76.0	84.7	0.0	#71.4	#137.9	#214.8
Internal Link Dist (m)		74.6			210.7			187.2			228.5	
Turn Bay Length (m)	60.0		30.0	180.0		190.0	90.0		70.0	150.0		
Base Capacity (vph)	476	1314	710	430	1072	659	433	1228	500	404	833	534
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.47	0.44	0.23	0.99	0.60	0.92	0.72	0.17	0.92	0.97	1.23

Intersection Summary		
Area Type:	Other	
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 23 (19%), Referenced to phase 2:NBT and 6:SBT, Start of Green		
Natural Cycle: 125		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.23		
Intersection Signal Delay: 62.7	Intersection LOS: E	
Intersection Capacity Utilization 97.1%	ICU Level of Service F	
Analysis Period (min) 15		
~ Volume exceeds capacity, queue is theoretically infinite.		
Queue shown is maximum after two cycles.		
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		
m Volume for 95th percentile queue is metered by upstream signal.		

Splits and Phases: 1: Guelph Line & Fairview Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	436	609	307	96	1036	388	392	870	83	363	794	644
Future Volume (vph)	436	609	307	96	1036	388	392	870	83	363	794	644
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	1.00	0.96	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3367	3505	1525	1798	3574	1537	3467	5085	1556	3467	3574	1530
Flt Permitted	0.95	1.00	1.00	0.41	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3367	3505	1525	774	3574	1537	3467	5085	1556	3467	3574	1530
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	445	621	313	98	1057	396	400	888	85	370	810	657
RTOR Reduction (vph)	0	0	138	0	0	199	0	0	64	0	0	178
Lane Group Flow (vph)	445	621	175	98	1057	197	400	888	21	370	810	479
Confl. Peds. (#/hr)	13		19	19		13	16		18	18		16
Heavy Vehicles (%)	4%	3%	2%	0%	1%	2%	1%	2%	0%	1%	1%	2%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4	8		8			2			6
Actuated Green, G (s)	17.0	45.0	45.0	45.0	36.0	36.0	15.0	29.0	29.0	14.0	28.0	28.0
Effective Green, g (s)	17.0	45.0	45.0	45.0	36.0	36.0	15.0	29.0	29.0	14.0	28.0	28.0
Actuated g/C Ratio	0.14	0.38	0.38	0.38	0.30	0.30	0.12	0.24	0.24	0.12	0.23	0.23
Clearance Time (s)	5.0	7.0	7.0	4.0	7.0	7.0	5.0	7.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	476	1314	571	367	1072	461	433	1228	376	404	833	357
v/s Ratio Prot	c0.13	0.18		0.02	c0.30		c0.12	0.17		0.11	0.23	
v/s Ratio Perm			0.11	0.08		0.13			0.01			c0.31
v/c Ratio	0.93	0.47	0.31	0.27	0.99	0.43	0.92	0.72	0.05	0.92	0.97	1.34
Uniform Delay, d1	51.0	28.5	26.5	24.8	41.7	33.7	51.9	41.8	35.0	52.4	45.6	46.0
Progression Factor	0.85	0.94	1.05	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	23.2	1.1	1.2	0.4	24.3	2.9	25.3	3.7	0.3	25.0	25.2	171.7
Delay (s)	66.4	27.8	29.1	25.2	66.1	36.6	77.2	45.5	35.2	77.4	70.8	217.7
Level of Service	E	C	C	C	E	D	E	D	D	E	E	F
Approach Delay (s)		40.6			56.0			54.1			124.7	
Approach LOS		D			E			D			F	

Intersection Summary				
HCM 2000 Control Delay	72.7	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.07			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0	
Intersection Capacity Utilization	97.1%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

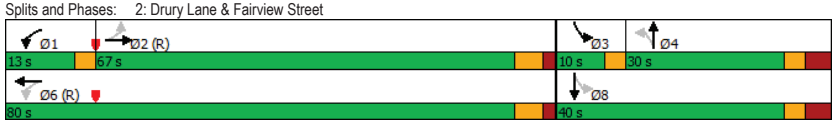
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	938	108	170	1695	219	120	23	118	226	24	44
Future Volume (vph)	24	938	108	170	1695	219	120	23	118	226	24	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	25.0		0.0	35.0		0.0	40.0		0.0	30.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	0.99		0.99	0.98		0.99	0.98	
Frt		0.984			0.983			0.874			0.903	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3446	0	1805	3466	0	1787	1622	0	1805	1686	0
Flt Permitted	0.058			0.185			0.711			0.485		
Satd. Flow (perm)	110	3446	0	351	3466	0	1320	1622	0	910	1686	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			22			123			21	
Link Speed (k/h)		60			60			40			50	
Link Distance (m)		174.2			81.3			167.3			133.3	
Travel Time (s)		10.5			4.9			15.1			9.6	
Confl. Peds. (#/hr)	14		7	7		14	9		10	10		9
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	3%	0%	0%	2%	0%	1%	0%	0%	0%	0%	0%
Adj. Flow (vph)	25	977	113	177	1766	228	125	24	123	235	25	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	1090	0	177	1994	0	125	147	0	235	71	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		1	6		4	4		3	8	
Switch Phase												
Minimum Initial (s)	8.0	8.0		6.0	8.0		8.0	8.0		6.0	8.0	
Minimum Split (s)	33.0	33.0		10.0	33.0		30.0	30.0		10.0	30.0	
Total Split (s)	67.0	67.0		13.0	80.0		30.0	30.0		10.0	40.0	
Total Split (%)	55.8%	55.8%		10.8%	66.7%		25.0%	25.0%		8.3%	33.3%	
Maximum Green (s)	61.0	61.0		10.0	74.0		23.0	23.0		7.0	33.0	
Yellow Time (s)	4.0	4.0		3.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		0.0	2.0		4.0	4.0		0.0	4.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		3.0	6.0		7.0	7.0		3.0	7.0	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)	15.0	15.0			15.0		8.0	8.0			8.0	
Flash Dont Walk (s)	11.0	11.0			11.0		14.0	14.0			14.0	
Pedestrian Calls (#/hr)	0	0			0		0	0			0	
Act Effct Green (s)	68.5	68.5		83.6	80.6		16.4	16.4		30.4	26.4	
Actuated g/C Ratio	0.57	0.57		0.70	0.67		0.14	0.14		0.25	0.22	
v/c Ratio	0.40	0.55		0.50	0.85		0.69	0.45		0.83	0.18	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	41.5	18.2		9.4	9.9		68.1	15.7		63.9	27.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	41.5	18.2		9.4	9.9		68.1	15.7		63.9	27.0	
LOS	D	B		A	A		E	B		E	C	
Approach Delay		18.7			9.9			39.8			55.4	
Approach LOS		B			A			D			E	
Queue Length 50th (m)	3.1	79.3		9.8	65.1		28.1	5.0		46.9	9.4	
Queue Length 95th (m)	#17.0	112.1		m10.4	m67.3		45.5	21.9		#67.2	20.1	
Internal Link Dist (m)		150.2			57.3			143.3			109.3	
Turn Bay Length (m)	25.0			35.0			40.0			30.0		
Base Capacity (vph)	62	1973		367	2334		253	410		283	478	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.40	0.55		0.48	0.85		0.49	0.36		0.83	0.15	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 18.1		Intersection LOS: B	
Intersection Capacity Utilization 104.2%		ICU Level of Service G	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Drury Lane & Fairview Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	938	108	170	1695	219	120	23	118	226	24	44
Future Volume (vph)	24	938	108	170	1695	219	120	23	118	226	24	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		3.0	6.0		7.0	7.0		3.0	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.87		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3448		1804	3466		1763	1623		1795	1686	
Flt Permitted	0.06	1.00		0.18	1.00		0.71	1.00		0.49	1.00	
Satd. Flow (perm)	111	3448		351	3466		1319	1623		917	1686	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	25	977	112	177	1766	228	125	24	123	235	25	46
RTOR Reduction (vph)	0	6	0	0	7	0	0	106	0	0	16	0
Lane Group Flow (vph)	25	1084	0	177	1987	0	125	41	0	235	55	0
Confl. Peds. (#/hr)	14		7	7		14	9		10	10		9
Heavy Vehicles (%)	0%	3%	0%	0%	2%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases		2		1	6			4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	68.5	68.5		80.6	80.6		16.4	16.4		26.4	26.4	
Effective Green, g (s)	68.5	68.5		80.6	80.6		16.4	16.4		26.4	26.4	
Actuated g/C Ratio	0.57	0.57		0.67	0.67		0.14	0.14		0.22	0.22	
Clearance Time (s)	6.0	6.0		3.0	6.0		7.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	63	1968		345	2327		180	221		252	370	
v/s Ratio Prot		0.31		0.04	c0.57			0.03		c0.05	0.03	
v/s Ratio Perm	0.23			0.30			0.09			c0.15		
v/c Ratio	0.40	0.55		0.51	0.85		0.69	0.18		0.93	0.15	
Uniform Delay, d1	14.3	16.1		10.0	15.2		49.4	45.9		45.4	37.7	
Progression Factor	1.00	1.00		1.12	0.48		1.00	1.00		1.00	1.00	
Incremental Delay, d2	17.6	1.1		0.4	1.4		11.0	0.4		38.6	0.2	
Delay (s)	31.9	17.2		11.7	8.7		60.4	46.3		84.0	37.9	
Level of Service	C	B		B	A		E	D		F	D	
Approach Delay (s)		17.6			9.0			52.8			73.3	
Approach LOS		B			A			D			E	

Intersection Summary				
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	104.2%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1315	20	62	2064	21	36
Future Volume (vph)	1315	20	62	2064	21	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	15.0		0.0	0.0
Storage Lanes		0	1		1	0
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.998				0.915	
Flt Protected			0.950		0.982	
Satd. Flow (prot)	3498	0	1770	3539	1674	0
Flt Permitted			0.950		0.982	
Satd. Flow (perm)	3498	0	1770	3539	1674	0
Link Speed (k/h)	60			60	50	
Link Distance (m)	240.4			246.0	62.1	
Travel Time (s)	14.4			14.8	4.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	2%	2%	2%	2%
Adj. Flow (vph)	1429	22	67	2243	23	39
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1451	0	67	2243	62	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1315	20	62	2064	21	36
Future Volume (Veh/h)	1315	20	62	2064	21	36
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)	1429	22	67	2243	23	39
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	322			401		
pX, platoon unblocked			0.82		0.81	0.82
vC, conflicting volume			1451		2696	726
vC1, stage 1 conf vol					1440	
vC2, stage 2 conf vol					1256	
vCu, unblocked vol			1104		1612	216
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			87		88	94
cM capacity (veh/h)			513		195	645

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	953	498	67	1122	1122	62
Volume Left	0	0	67	0	0	23
Volume Right	0	22	0	0	0	39
cSH	1700	1700	513	1700	1700	347
Volume to Capacity	0.56	0.29	0.13	0.66	0.66	0.18
Queue Length 95th (m)	0.0	0.0	3.4	0.0	0.0	4.8
Control Delay (s)	0.0	0.0	13.1	0.0	0.0	17.6
Lane LOS			B			C
Approach Delay (s)	0.0		0.4			17.6
Approach LOS						C

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	67.1%	ICU Level of Service		C
Analysis Period (min)	15			

Intersection: 1: Guelph Line & Fairview Street

Movement	EB	EB	EB	EB	EB	B6	B6	B15	B15	WB	WB	WB
Directions Served	L	L	T	T	R	T	T	T	T	L	T	T
Maximum Queue (m)	63.5	67.4	97.7	94.0	45.0	51.1	30.9	23.9	12.8	187.5	218.6	225.4
Average Queue (m)	48.7	56.1	64.1	55.1	26.9	9.6	2.6	3.1	0.5	138.9	215.7	215.6
95th Queue (m)	71.4	77.2	104.9	89.2	62.8	41.9	17.2	22.6	7.8	267.0	225.2	231.2
Link Distance (m)			71.3	71.3		39.9	39.9	231.1	231.1		211.7	211.7
Upstream Blk Time (%)		3	12	3		4	0				64	49
Queuing Penalty (veh)		0	84	21		30	1				0	0
Storage Bay Dist (m)	60.0	60.0			30.0					180.0		
Storage Blk Time (%)	2	14	5	18						0	73	61
Queuing Penalty (veh)	7	43	24	57						0	70	236

Intersection: 1: Guelph Line & Fairview Street

Movement	WB	NB	NB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	T	R	L	L	T	T	R
Maximum Queue (m)	205.0	91.8	97.3	179.4	149.4	76.7	15.4	93.4	151.1	202.3	194.3	129.3
Average Queue (m)	189.1	71.6	82.2	92.8	75.4	43.2	0.5	54.2	84.1	117.2	113.6	14.6
95th Queue (m)	277.5	101.5	108.1	170.2	135.5	69.9	10.9	86.5	147.0	193.5	183.3	88.1
Link Distance (m)				192.3	192.3	192.3				232.2	232.2	232.2
Upstream Blk Time (%)				7	0					0	0	0
Queuing Penalty (veh)				0	0					0	0	0
Storage Bay Dist (m)	190.0	90.0	90.0				70.0	150.0	150.0			
Storage Blk Time (%)	0	1	14	2		1			0	7		
Queuing Penalty (veh)	0	4	42	6		1			0	25		

Intersection: 2: Drury Lane & Fairview Street

Movement	EB	EB	EB	WB	WB	WB	B11	B11	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	T	T	L	TR	L	TR
Maximum Queue (m)	32.0	109.2	94.3	42.4	87.8	92.5	49.6	53.1	46.8	65.9	37.4	111.9
Average Queue (m)	11.4	63.9	53.8	26.6	77.7	80.8	12.8	17.8	23.6	22.2	33.1	43.4
95th Queue (m)	28.8	97.3	85.7	47.1	95.7	95.8	38.9	44.1	41.8	45.7	44.3	98.4
Link Distance (m)		163.8	163.8		62.5	62.5	221.5	221.5		153.3		119.4
Upstream Blk Time (%)					18	24						1
Queuing Penalty (veh)					191	245						0
Storage Bay Dist (m)	25.0			35.0					40.0		30.0	
Storage Blk Time (%)	8	24		2	25				3	2	43	0
Queuing Penalty (veh)	35	6		18	42				4	2	29	0

Intersection: 3: Site Driveway & Fairview Street

Movement	EB	WB	WB	WB	B6	B6	B6	NB
Directions Served	TR	L	T	T	T	T		LR
Maximum Queue (m)	1.3	19.6	26.7	8.8	80.8	86.4	97.0	40.6
Average Queue (m)	0.0	8.4	1.1	0.3	32.3	40.6	18.1	14.2
95th Queue (m)	0.9	17.9	12.1	5.3	85.4	95.3	74.7	31.6
Link Distance (m)	221.5		231.1	231.1	71.3	71.3	71.3	48.1
Upstream Blk Time (%)					1	2	2	0
Queuing Penalty (veh)					3	11	11	0
Storage Bay Dist (m)		15.0						
Storage Blk Time (%)		3						
Queuing Penalty (veh)		34						

Network Summary

Network wide Queuing Penalty: 1281

Appendix K

Region of Waterloo TDM Checklist

Region of Waterloo

Parking Management Worksheet

Version 9/18/2013

Appendix I

Case Study: 230079 **Site Context:** 2362 Fairview Street

Date: November 2023 **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%	1%
A5	Provision of active uses at-grade along street frontages.	1%	1%	1%
	Category Maximum	**4%**	**4%**	**4%**
	Available Parking Reduction		**4%**	

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%	1%
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.**	-	-	3%
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%**	**5%**
	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%	5%
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%	1%
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%**	**6%**
	Available Parking Reduction		**3%**	

Sample Parking Reduction Worksheet **FORM-2**

Case Study:	230079	**Site Context:**	2362 Fairview Street
Date:	November 2023	**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%	1%
D2	The building owner/occupant will provide emergency ride home options	3%	2%	1%
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%	2%
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%**	**7%**
	Available Parking Reduction		**5%**	

TABLE E	**Parking Reduction Summary**				
Please indicate the total reduction available based upon Tables A through D above.					
		Maximum Achievable Reduction			
Category	**Reduction Achieved**	**UGC**	**IC**	**Other**	**Comments**
Pedestrian & Cyclist Orientation	**4%**	4%	4%	4%	
Public Transit Access	**0%**	24%	12%	5%	
Parking	**3%**	6%	4%	6%	
Trip Reduction Incentives	**5%**	23%	11%	7%	
TOTAL	**12%**	**57%**	**31%**	**22%**	

TABLE F	**TOTAL REDUCTION ACHIEVED**	**12%**

Comments: