1134 & 1167 Plains Road East Mixed-Use Development, Burlington ON Transportation Impact Study

Paradigm Transportation Solutions Limited

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Project Summary

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1134-1167 Plains Road East Mixed-Use Development, Burlington ON Transportation Impact Study



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Executive Summary

Content

Paradigm Transportation Solutions Limited (Paradigm) was retained to conduct this Transportation Impact Study (TIS) for a proposed mixed-use development located at 1134-1167 Plains Road East in the City of Burlington.

This study determines the impacts of the development traffic on the surrounding road network and identifies the recommended improvements to accommodate the site generated traffic.

Development Concept

The subject site is located at 1134-1167 Plains Road East in the City of Burlington. The development concept includes four residential high-rise buildings containing approximately 1,046 units with ground floor commercial space. The existing heritage building will be relocated on-site and will operate as office space. Vehicle access to the site is proposed by three private driveways to Plains Road East.

Conclusions

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

- **Existing Traffic Operations:** Capacity issues are identified at the following intersections:
  - Plains Road East/Fairview Street at the QEW East Ramp;
  - Plains Road East at Brant Street; and
  - Brant Street at Fairview Street.
- **Estimated Site Generated Traffic:** Phase 1 (Year 2027) of the subject site is estimated to generate approximately 161 AM peak hour trips and 186 PM peak hour trips. Phase 2 (Year 2029) of the subject site is estimated to generate approximately 103 AM peak hour trips and 118 PM peak hour trips. Full build-out of the subject site is estimated to generate approximately 339 AM peak hour trips and 434 PM peak hour trips.
- **Background Traffic Operations:** The capacity deficiencies identified under existing conditions will continue to occur with the forecast increase in non-site related traffic. Under background traffic conditions capacity issues are identified at the following intersections:

- QEW West Ramp at Plains Road East/Fairview Street;
- Plains Road East/Fairview Street at the QEW East Ramp;
- Plains Road East at Maple Avenue;
- Plains Road East at Brant Street; and
- Brant Street at Fairview Street.

- **Total Traffic Operations**: The capacity deficiencies identified under background conditions will continue to occur with the addition of site generated traffic. Site generated traffic results in new capacity deficiencies at the following intersections:
  - Plains Road East/Fairview Street at the QEW East Ramp;
    - Eastbound left-turn;
  - Plains Road East at Maple Avenue;
    - Eastbound through/right-turn.
- The site driveways to Plains Road East are forecast to operate with acceptable levels of services with exception to the Phase 1 driveway under the forecast Ten-Year Horizon.

  The site driveway is forecast to operate with low levels of delay and v/c ratios during the AM peak hour. During the PM peak hour, the southbound left/right-turn movement is forecast to operate at LOS E and v/c ratio of 0.55.
- **Remedial Measures**: Left-Turn lane are warranted at the Phase 1 and Phase 2 (north) site access. To accommodate left-turn movements into the site the existing two-way centre left-turn lane on Plains Road East should be extended to the Phase 1 site access.

  Right-turn lanes on Plains Road East at the three site accesses are not warranted.

Recommendations

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

- The City of Burlington should extend the municipal sidewalk along Plains Road East from Maple Avenue to Fairview Street.
- The existing two-way centre left-turn lane on Plains Road East be extended to the Phase 1 site access.
- The Halton Region and the City of Burlington monitor the future traffic volumes at the study area intersections and optimize the signal timings accordingly. The need for signal timing

improvements at these intersections are noted to occur with or without the development of the subject sites.

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1 Introduction

1.1 Overview

Molinaro Group has retained Paradigm Transportation Solutions Limited (Paradigm) to conduct this Transportation Impact Study (TIS) for a proposed mixed-use development located at 1134-1167 Plains Road East in the City of Burlington.

Figure 1.1 illustrates the location of the subject site.

The scope of the study includes:

- Determine and assess the current study area traffic conditions;
- Forecast the additional traffic generated by the proposed development;
- Analyze the impacts of this additional traffic on the study area street network for four horizon years:
  - Build-out of Phase 1 (Year 2027);
  - Full build-out (Year 2029);
  - Five-years from full build-out (Year 2034) and
  - Ten-years from full build-out (Year 2039).
- Recommend any necessary remedial measures required to mitigate these impacts.
- Identification of any operational or safety concerns and any mitigation measures that may be required to improve operations; and
- Review of the site circulation.

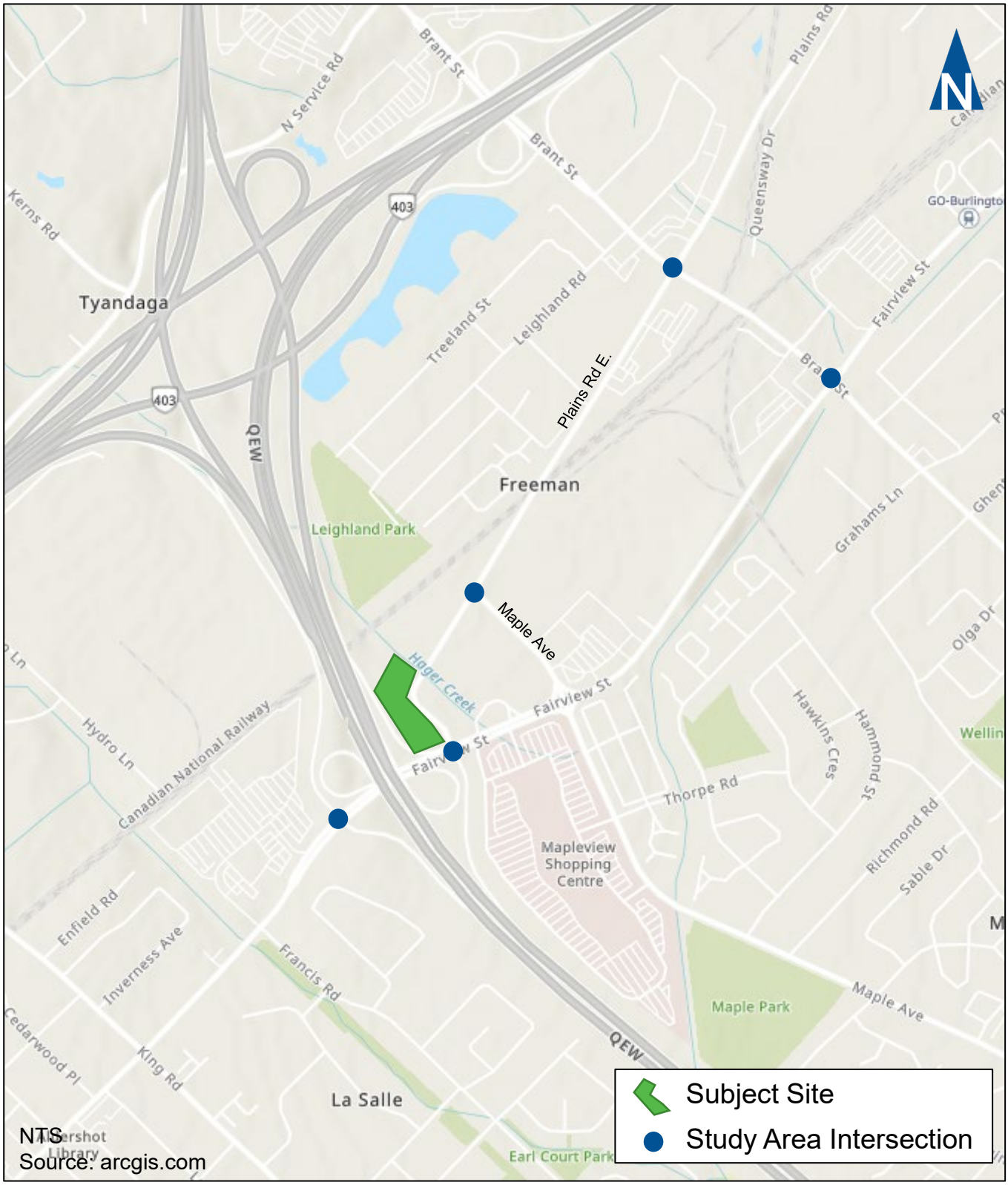
Appendix A contains the pre-study consultation material and responses from the City of Burlington, Halton Region and Ministry of Transportation (MTO). The study follows the Halton Region TIS Guidelines [1] and MTO TIS Guidelines[2].

[1] Halton Region. 2015. Transportation Impact Study Guidelines, January 2015.
[2] General Guidelines for the Preparation of Traffic Impact Studies, Ministry of Transportation, Highway Operations Management – Traffic Office, February 2021

1.2 Study Area

The study area intersections assessed in this study include:

- Plains Road East at Queen Elizabeth Way (QEW) West Ramp (signalized);
- Plains Road East/Fairview Street at the QEW East Ramp (signalized);
- Plains Road East at Maple Avenue (signalized);
- Plains Road East at Brant Street (signalized); and
- Brant Street at Fairview Street (signalized).



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Location of Subject Site

1134 & 1167 Plains Road East TIS
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Figure 1.1

2 Existing Conditions

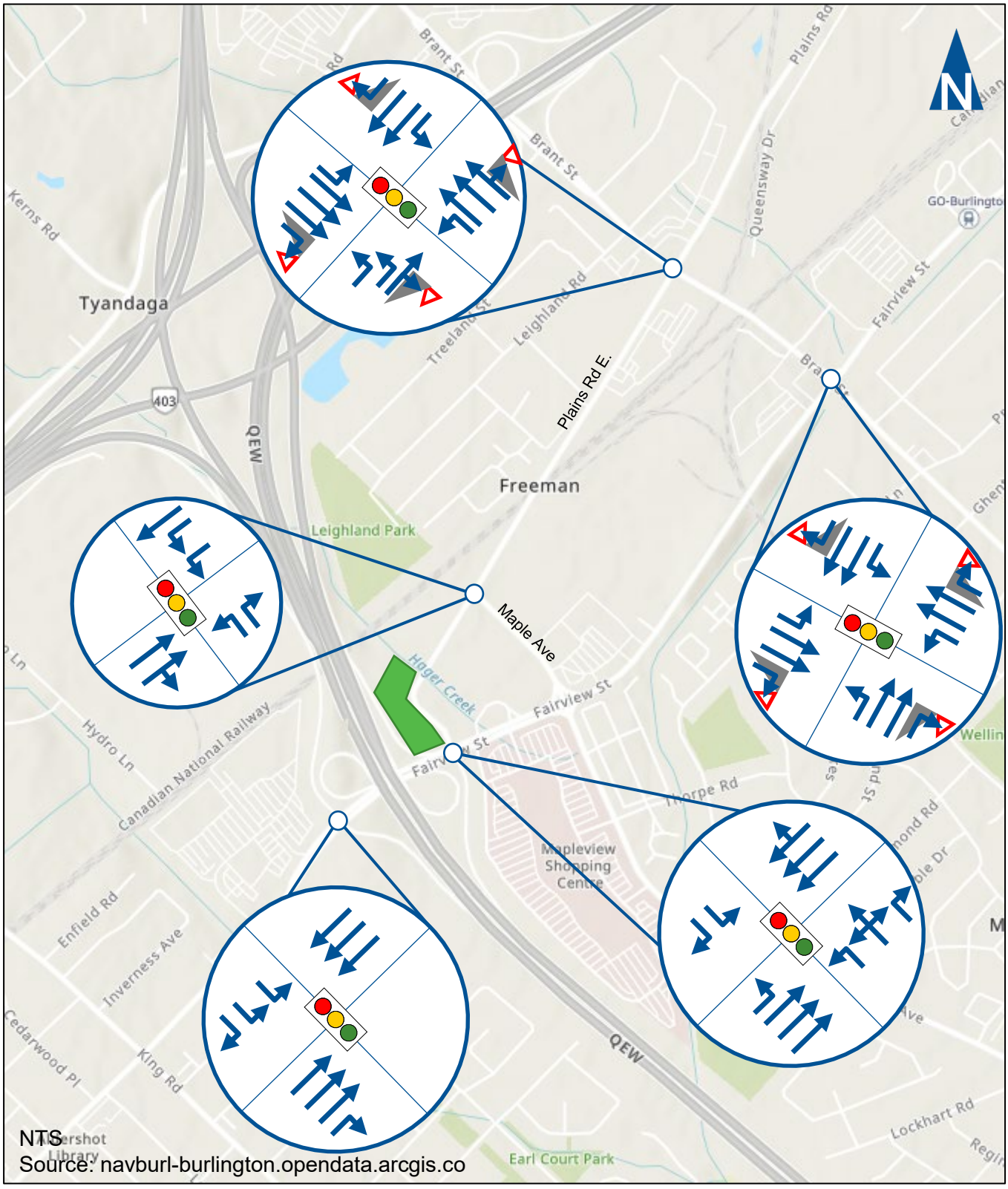
2.1 Road Network

The roadways of interest within the study area include:

- **Queen Elizabeth Way** (QEW) is an east-west provincial 400-Series Highway. The highway runs north-south in the study area. The highway has a posted speed limit of 100 km/h. The East and West Ramp Terminals with Plains Road East are signalized.
- **Plains Road East** is an east-west minor arterial[3] roadway with an urban cross-section. West of the QEW, the roadway has a 4-lane cross-section and a posted speed limit of 50 km/h. At the intersection with Fairview Street the cross-section is reduced to 3-lanes and the classification changes to minor arterial with a posted speed limit of 60 km/h. The curve on this roadway where the alignment changes from north-south to east west has an advisory speed of 20 km/h. Rumble strips alert eastbound drivers approaching the curve. Chevron alignment signs and checkerboard signs are also present through the curve. The intersections with Fairview Street, Maple Avenue and Brant Street are signalized.
- **Fairview Street** is an east-west multi-purpose arterial roadway with a 6-lane cross-section. The posted speed limit is 50 km/h between the QEW and Maple Avenue. East of Maple Avenue the speed limit is 60 km/h. The intersection with Brant Street is signalized.
- **Brant Street** is a north-south multi-purpose arterial roadway with an urban cross-section. North of Fairview Street the roadway has a 6-lane cross-section and a posted speed limit of 60 km/h. South of Fairview Street the roadway has a 4-lane cross-section and a posted speed limit of 50 km/h and is classified as a minor arterial.
- **Maple Avenue** is a north-south 4-lane minor arterial roadway with an urban cross-section. The posted speed limit is 50 km/h.

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

[3] City of Burlington Official Plan, Schedule J – Classification of Transportation Facilities



NTS
Source: navburl-burlington.opendata.arcgis.co

Existing Lane Configuration and Traffic Control

2.2 Walking

Sidewalks are provided on both sides of all study area roadways expect along Plains Road East between Fairview Street and Maple Avenue. Crosswalks and pedestrian signals with pushbuttons are provided at all study area intersections. **Figure 2.2** illustrates the existing sidewalks within the study area.

To support the development of the subject site and to complete the pedestrian network, the City of Burlington should extend the municipal sidewalk along Plains Road East from Maple Avenue to Fairview Street.

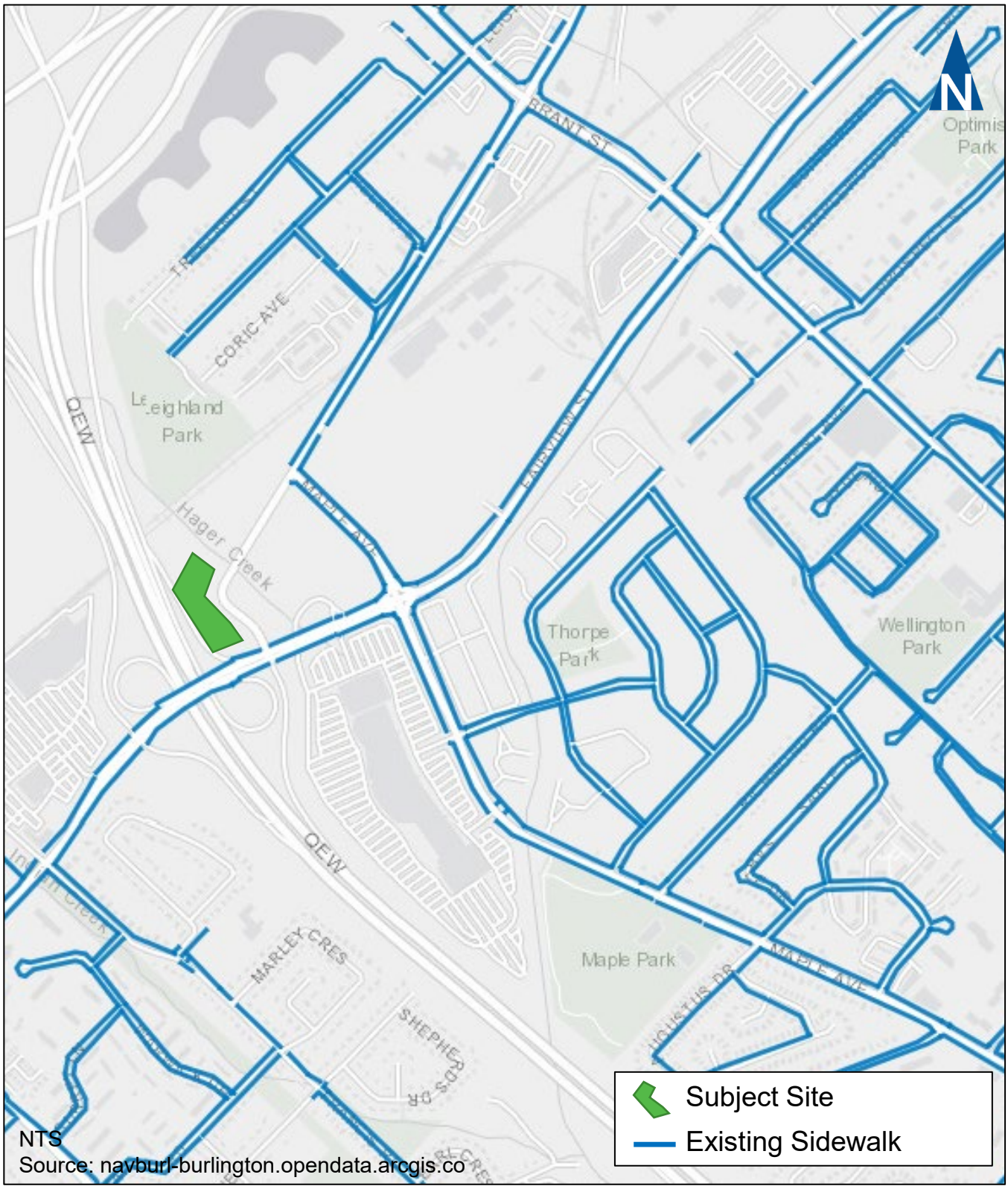
2.3 Cycling

The City of Burlington's bicycle network provides a variety of cycling facilities within the immediate area. **Figure 2.2** illustrates the existing cycling network.

Cycling infrastructure within the study area includes:

- Plains Road: On-street bicycle lane in both directions through the QEW interchange to Fairview Street. The on-street bicycle lane is discontinuous between Brant Street and Fairview Street.

  Through the QEW interchange an alternate route for cyclists is available which uses the existing sidewalks.
- Fairview Street: On-street bicycle lane in both directions.
- Brant Street: On-street bicycle lane in both directions.
- Maple Avenue: On-street bicycle lane in both directions.

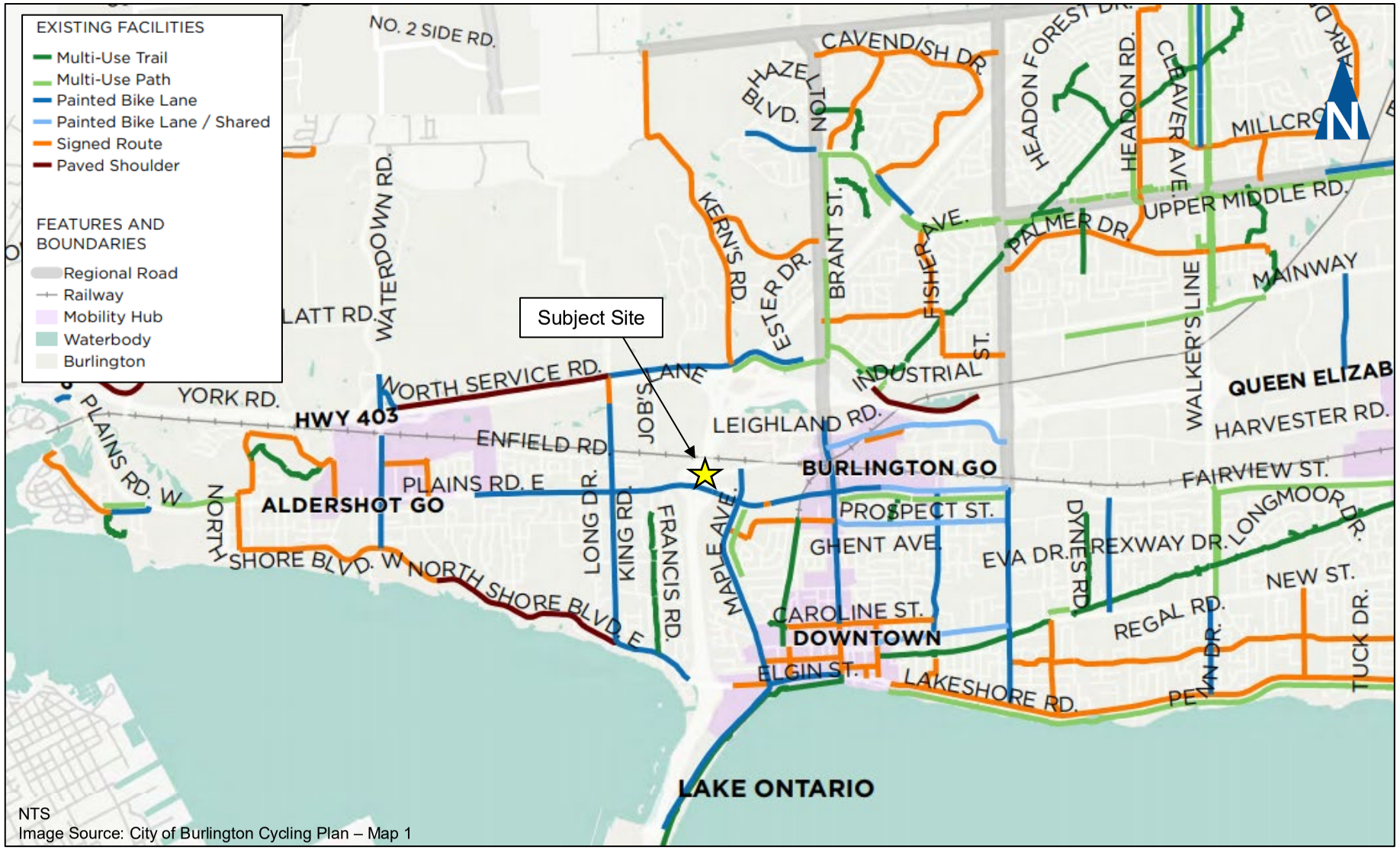


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Existing Pedestrian Network

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Figure 2.2



NTS
Image Source: City of Burlington Cycling Plan – Map 1

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Existing Cycling Network

2.4 Transit

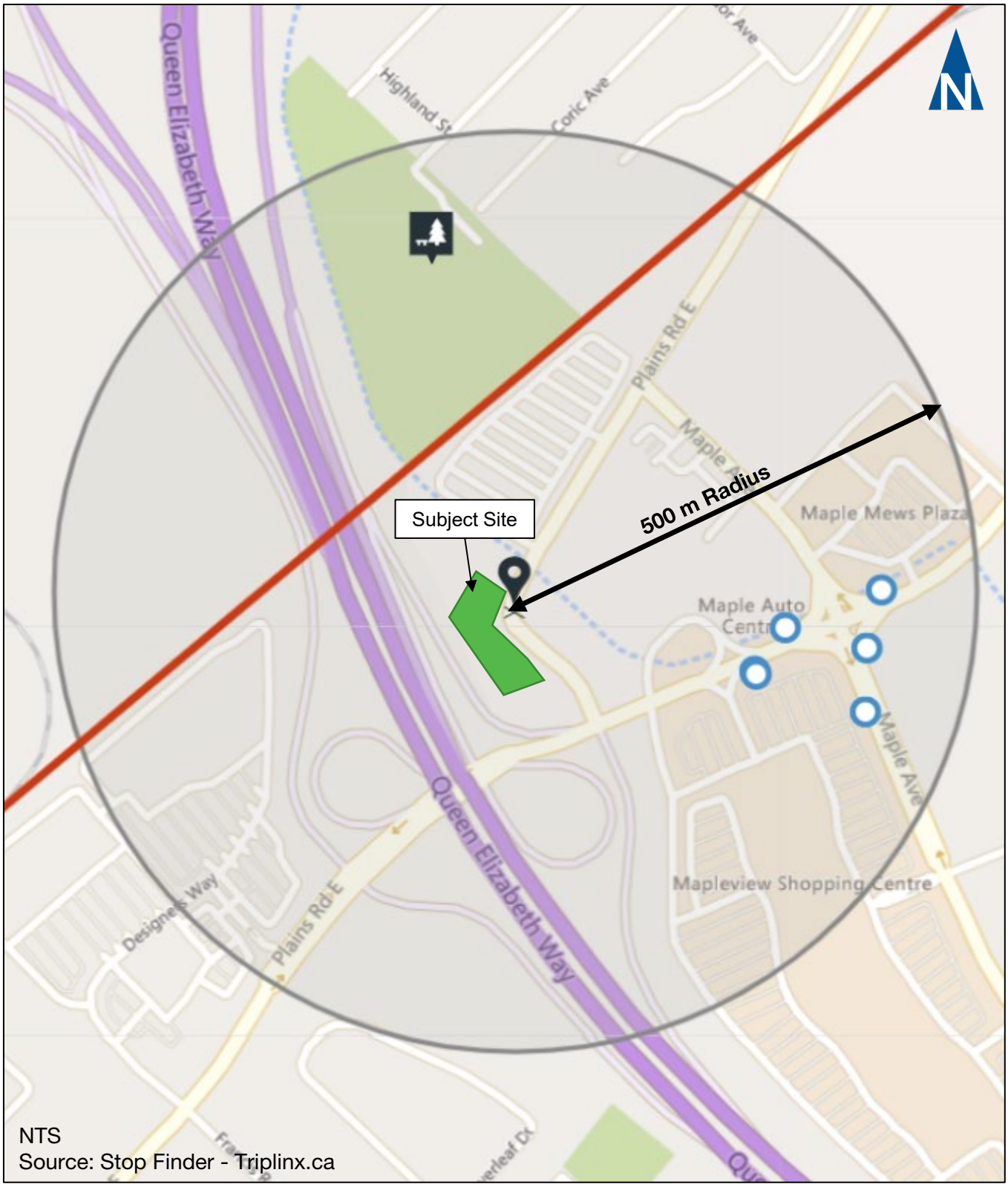
Transit service in the area is provided by Burlington Transit. **Figure 2.4** illustrates the existing transit stops within 500 metres of the subject site. The closest transit stops to the subject site are located at the intersection of Maple Avenue and Fairview Street to the east of the subject site (approximately 350 metres or a 5-minute walk). Existing transit routes at this intersection include:

- **Route 1 (Plains):** is an east-west route operating between downtown Hamilton and Appleby GO Station. It operates on weekdays from 4:45 AM to 1:00 AM with 10-minute headways. On Saturdays, the route operates from 6:30 AM to 12:30 AM with 15-minute headways. On Sundays and holidays the route operates from 6:30 AM to 10:00 PM with 15-minute headways.
- **Route 10 (New – Maple)**: is an east-west route operating between Burlington GO Station, downtown Burlington and Appleby GO Station. It operates on weekdays from 5:00 AM to 11:00 PM with 15-minute headways. On Saturdays, the route operates from 7:00 AM to 11:00 PM with 15-minute headways. On Sundays and holidays the route operates from 8:00 AM to 10:00 PM with 15-minute headways.
- **Route 50 Night Bus (Burlington South):** is a loop route operating between Fairview Street/Harvester Road, Burloak Drive, New Street and Maple Avenue. It operates Monday to Saturday from 11:00 PM to 1:15 AM with 60-minute headways.

Figure 2.5 illustrates the existing transit network.

The Burlington GO Station is located approximately 3.5 kilometres east of the subject site. At the Burlington GO Station, transfers are available to 12 other Burlington Transit routes and the Provincial GO transit network.

The Aldershot GO Station is located approximately 4.5 kilometres west of the subject site. The Aldershot GO Station offers, VIA Rail, GO Transit Train and GO Transit Bus service and functions as a turnaround point for several Burlington Transit and Hamilton Street Railway (HSR) transit routes.



NTS
Source: Stop Finder - Triplinx.ca

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Existing Transit Stops



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Existing Transit Network

2.5 Traffic Volumes

Table 2.1 summarizes the location and date of the existing turning movement count (TMC) data used in the analysis. The data was obtained from the City, Region, and MTO. **Appendix B** contains the existing count data.

TABLE 2.1: EXISTING COUNT DATA SUMMARY

Intersection	Date
Plains Road East at QEW West Ramp	June 22, 2017
Plains Road East/Fairview Street at the QEW East Ramp	November 15, 2017
Plains Road East at Maple Avenue	May 16, 2019
Plains Road East at Brant Street	April 5, 2018
Brant Street at Fairview Street	May 2, 2018

To account for possible minor traffic increases, and the inability to collect new count data due to the public health measures in place to contain COVID-19 adjustment factors were applied to the count data to achieve 2021 base year traffic volumes. In consultation with the City of Burlington, Halton Region, and MTO the following growth rates were applied:

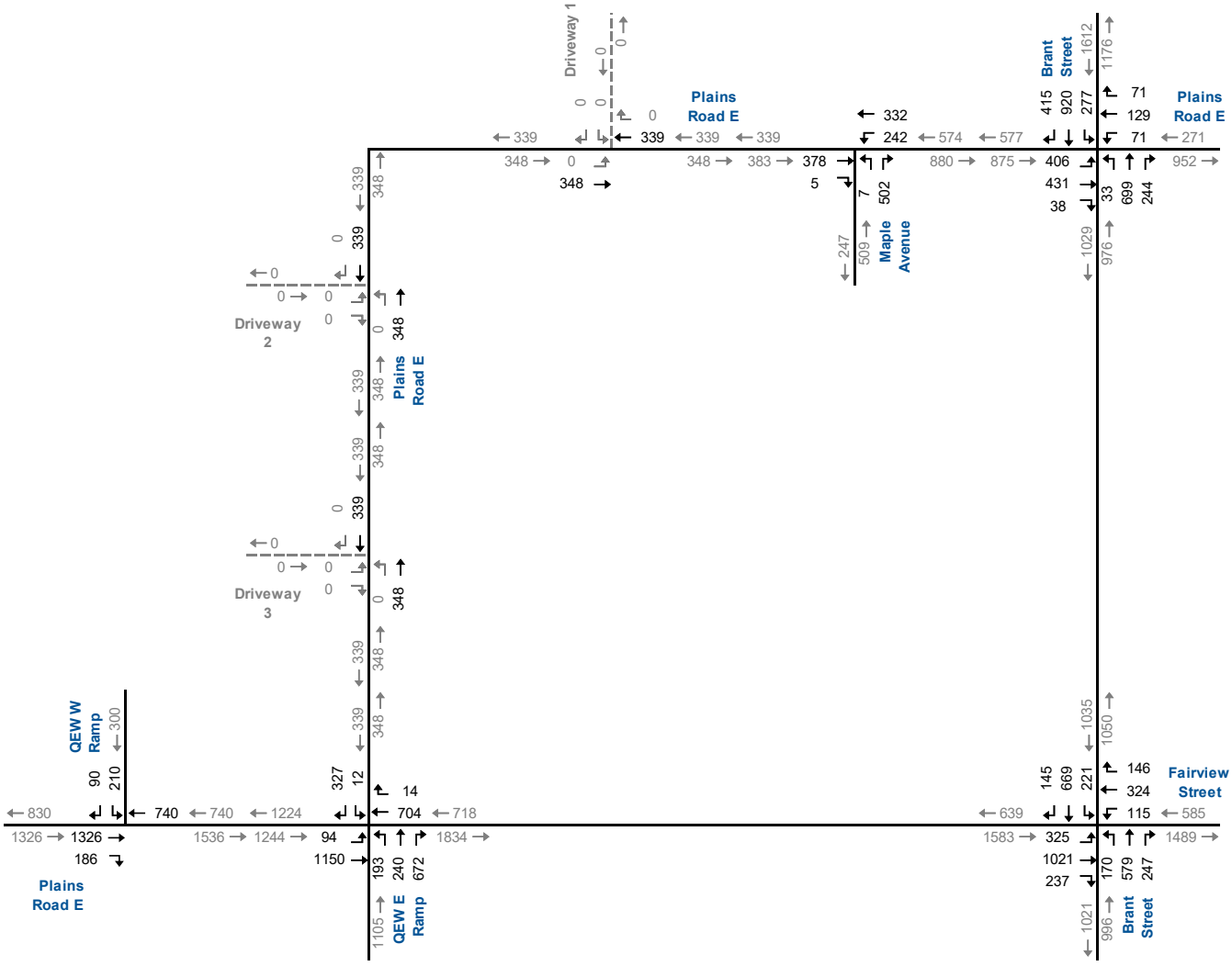
- Intersections under the City's jurisdiction – generalized growth rate of 1% per annum.
- Intersections under the Halton Region and MTO jurisdiction – generalized growth rate of 2% per annum.

Figure 2.6A and **Figure 2.6B** illustrate the existing AM and PM peak hour traffic volumes, respectively.

A potential quantum shift in travel demands and patterns may occur due to the COVID-19 global pandemic. Employers are beginning to shift away from traditional office-based environments to work-from-home models and with commercial/retail and service-based businesses adapting by adjusting business hours and/or switching to web-based e-commerce storefronts, resulting in travel demands and patterns potentially changing from the previous norm.

In a post-COVID condition, it is plausible that traffic volumes may never reach pre-COVID levels because of this quantum shift. With changes in travel demand, behaviour, and patterns, the forecasts as

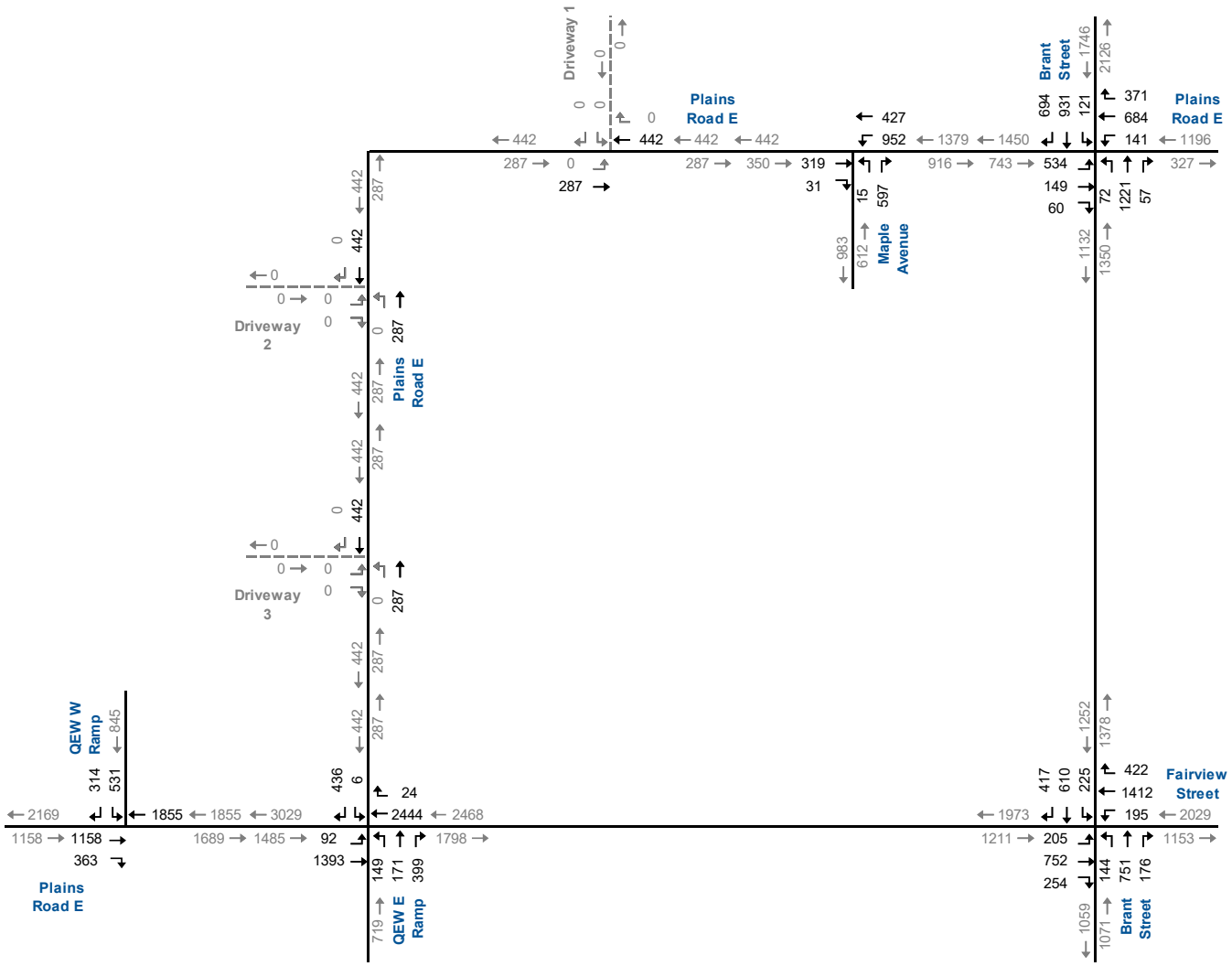
analyzed are conservative (i.e., err on the high side) and potentially under post-COVID conditions, traffic volumes may be lower.



Base Year Traffic Volumes AM Peak Hour

1134 & 1167 Plains Road East TIS
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Figure 2.6A



Base Year Traffic Volumes
PM Peak Hour

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Figure 2.6B

2.6 Traffic Operations

Intersection level of service (LOS) is a recognized method of quantifying the efficiency of traffic flow 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 desiring to make a movement, compared to the estimated capacity for that movement. The capacity is based on several criteria related to the opposing traffic flows. 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 at signalized intersections (50 seconds at unsignalized), the movement is considered to have a LOS F and remedial measures are usually implemented if they are feasible.

The operations of the intersections in the study area were evaluated using the existing lane configuration, traffic control, existing traffic volumes and signal timings. The intersection analysis considered three separate measures of performance:

- The LOS for each turning movement;
- The volume to capacity ratio (v/c) for each movement; and
- The 95th percentile queue lengths estimated using Synchro.

Synchro 10 assessed the traffic conditions and performance. In accordance with the Halton Region's TIS Guidelines and MTO Guidelines, the following criteria were used in the determination of critical movements:

Under the Region's TIS Guidelines, the following criteria indicate critical conditions and signify that mitigation measures may need to be considered:

- At signalized intersections,
  - Overall intersection operations, through movements, or shared through/turning movements increased to 0.85 or above.
  - V/C ratios for exclusive movements increased to 0.95 or above; or
  - Queues for an individual movement are projected to exceed turning lane storage.
- At unsignalized intersections,

- LOS, based on average delay per vehicle, on individual movements exceeds LOS “D”; or
- The estimated 95th percentile length for an individual movement exceeds the available queue storage.

The MTO’s Traffic Impact Study Guidelines identifies the following thresholds for critical movements for MTO controlled intersections:

- Movements with a volume to capacity ratio greater than 0.85; and
- v/c ratio for terminal ramp approaches greater than 0.75.

Table 2.2 summarizes the base year level of service conditions and notes:

- Plains Road East at QEW West Ramp:
  - Southbound left-turn – PM peak hour, LOS E, v/c ratio of less than 0.95, and queue length exceeds storage but does not impact mainline QEW.
  - Southbound right-turn – PM peak hour, LOS F and v/c ratio greater than 1.00.
- Plains Road East/Fairview Street at the QEW East Ramp:
  - Overall – PM peak hour with v/c ratio of 0.95.
  - Westbound through/right-turn – PM peak hour, LOS D, v/c ratio grater than 0.95, and queue length that extends beyond Maple Avenue.
  - Northbound left/through/right-turn – AM peak hour, LOS F range and v/c ratio greater than 1.00.
  - Northbound right-turn – AM peak hour, LOS E range, v/c ratio of 1.00, and queue length exceeds storage but does not impact mainline QEW.
  - Northbound right-turn – PM peak hour, queue length exceeds storage but does not impact mainline QEW.
  - Southbound right-turn – PM peak hour, LOS F, and v/c ratio greater than 1.00.
- Plains Road East at Brant Street:
  - Overall – AM peak hour, v/c ratio of 0.95. PM peak hour, v/c ratio less than 0.90.
  - Eastbound left-turn – PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.

- Eastbound through/right-turn – AM peak hour, LOS E and v/c ratio of less than 0.95.
- Westbound through – PM peak hour, LOS E and v/c ratio less than 0.95.
- Southbound left-turn – AM and PM peak hour, queue length exceeds storage.
- Southbound right-turn – AM and PM peak hour, queue length exceeds storage.

- Brant Street at Fairview Street:
  - Overall – PM peak hour, v/c ratio of greater than 1.00.
  - Eastbound left-turn – PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Westbound through – PM peak hour, LOS F and v/c ratio greater than 1.00.
  - Southbound left-turn – PM peak hour, LOS E range, v/c ratio greater than 0.95, and queue length exceeds storage.

Appendix C contains the Synchro 10 reports.

TABLE 2.2: EXISTING TRAFFIC OPERATIONS SUMMARY

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																Overall
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Plains Road E/Fairview Street & QEW West Ramp	TCS	LOS		A	A	A		A		A				A	D		D	D	A
			Delay		5	4	5		3		3				0	43		39	42	9
			V/C		0.39	0.13			0.22							0.56		0.06		0.41
			Q		46	6			15							34		14		
			Stor.		-	-			-				-			55	-	-		
			Avail.		-	-			-							21		-		
	QEW East Ramp/Plains Road E & Fairview Street	TCS	LOS	A	B		A		B	>	B	C	F	E	F	C		C	C	D
			Delay	8	10		10		17	>	17	29	108	77	84	28		28	28	37
			V/C	0.26	0.44				0.33	>		0.40	1.10	1.00		0.17		0.27		0.68
			Q	11	35				48	>		54	200	162		8		26		
			Stor.	30	-				-	>		-	-	45		75	-	-		
			Avail.	19	-				-	>		-	-	-117		67		-		
	Maple Avenue & Plains Road E	TCS	LOS		C	>	C	C	C		C	C		B	B					C
			Delay		35	>	35	23	33		29	23		13	13					25
			V/C		0.66	>		0.26	0.69			0.02		0.51						0.62
			Q		47	>		27	85			5		52						
			Stor.		-	>		55	-			-		-						
			Avail.		-	>		28	-			-		-						
	Brant Street & Plains Road E	TCS	LOS	D	E	>	D	E	D	D	D	C	C	>	C	D	C	C	C	D
			Delay	51	58	>	55	75	37	36	47	21	28	>	27	54	25	27	31	37
			V/C	0.78	0.92	>		0.74	0.22	0.06		0.17	0.70	>		0.91	0.49	0.46		0.95
			Q	66	168	>		37	23	0		4	92	>		102	83	66		
			Stor.	55	-	>		50	-	75		50	-	>		40	-	30		
			Avail.	-11	-	>		13	-	75		46	-	>		-62	-	-36		
	Brant Street & Fairview Street	TCS	LOS	C	D	C	D	D	C	C	C	C	D	C	D	C	D	F	D	D
			Delay	28	48	26	40	37	34	31	34	32	38	32	35	35	43	119	52	41
			V/C	0.74	0.93	0.17		0.67	0.40	0.11		0.67	0.63	0.25		0.69	0.63	0.12		0.83
			Q	77	168	18		34	49	10		42	87	30		76	111	42		
			Stor.	60	-	170		60	-	-		75	-	70		45	-	-		
			Avail.	-17	-	152		26	-	-		33	-	40		-31	-	-		
PM Peak Hour	Plains Road E/Fairview Street & QEW West Ramp	TCS	LOS		B	B	B		A		A				A	D		E	D	B
			Delay		11	10	11		6		6				0	47		58	51	17
			V/C		0.38	0.26			0.61							0.68		0.81		0.67
			Q		80	14			36							83		105		
			Stor.		-	-			-				-			55	-	-		
			Avail.		-	-			-							-28		-		
	QEW East Ramp/Plains Road E & Fairview Street	TCS	LOS	D	A		B		E	>	E	D	D	D	D	C		E	E	D
			Delay	43	9		12		73	>	73	37	46	42	43	34		66	65	50
			V/C	0.60	0.49				1.07	>		0.30	0.69	0.60		0.04		0.90		0.98
			Q	30	71				349	>		49	112	89		5		139		
			Stor.	30	-				-	>		-	-	45		75	-	-		
			Avail.	0	-				-	>		-	-	-44		70		-		
	Maple Avenue & Plains Road E	TCS	LOS		D	>	D	B	B		B	C		B	B					C
			Delay		41	>	41	18	18		18	34		14	14					20
			V/C		0.71	>		0.62	0.50			0.07		0.63						0.65
			Q		49	>		88	82			9		76						
			Stor.		-	>		55	-			-		-						
			Avail.		-	>		-33	-			-		-						
	Brant Street & Plains Road E	TCS	LOS	E	C	>	E	E	D	E	D	C	D	>	D	D	C	D	D	D
			Delay	66	35	>	57	58	53	58	55	22	39	>	38	44	33	53	42	46
			V/C	0.92	0.42	>		0.68	0.87	0.84		0.38	0.82	>		0.76	0.55	0.87		0.89
			Q	105	70	>		57	116	124		17	137	>		50	92	182		
			Stor.	55	-	>		50	-	75		50	-	>		40	-	30		
			Avail.	-50	-	>		-7	-	-49		33	-	>		-10	-	-152		
	Brant Street & Fairview Street	TCS	LOS	F	C	C	D	C	E	C	E	D	D	C	D	F	C	C	D	D
			Delay	160	31	26	52	23	77	28	62	37	53	35	48	141	28	33	50	54
			V/C	1.19	0.62	0.20		0.63	1.06	0.53		0.66	0.87	0.16		1.17	0.67	0.75		1.18
			Q	103	111	22		42	265	86		41	135	21		101	106	119		
			Stor.	60	-	170		60	-	-		75	-	70		45	-	-		
			Avail.	-43	-	148		18	-	-		34	-	49		-56	-	-		

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 1134-1167 Plains Road East in the City of Burlington. The development concept includes four residential high-rise buildings containing approximately 1,046 units with ground floor commercial space. The existing heritage building will be relocated on-site and will operate as office space. **Table 3.1** summarizes the site statistics. **Figure 3.1** illustrates the site concept plan.

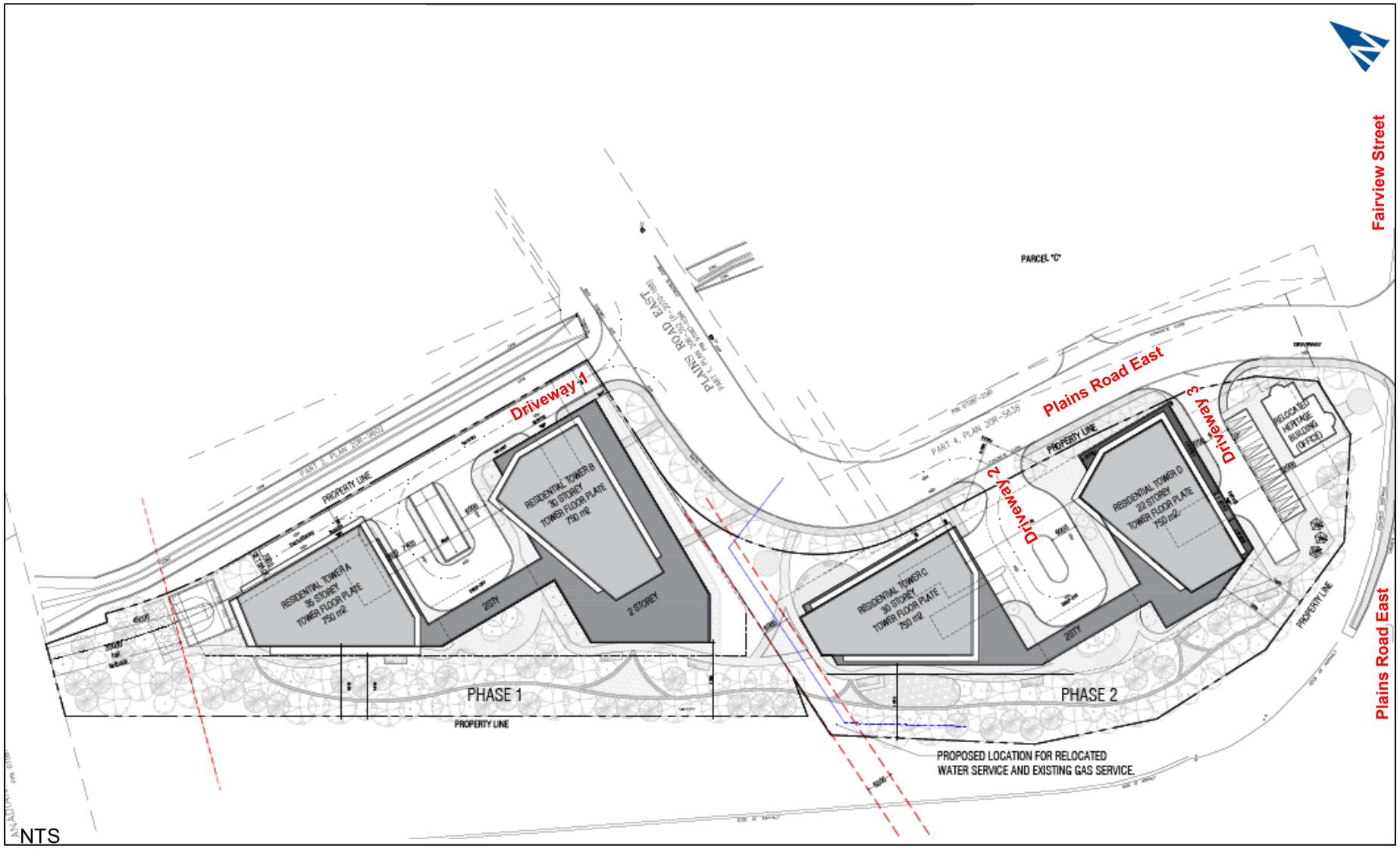
TABLE 3.1: SITE STATISTICS

	Phase 1	Phase 2	Total
Build-Out Date	Year 2027	Year 2029	Year 2029
Apartment Units	654 units	408 units	**1,062 units**
Ground Floor Commercial	810 m^2	208 m^2	**1,018 m^2**
Heritage Building – Office		465 m^2	**465 m^2**

Vehicle access to the site is proposed by three private driveways to Plains Road East. Vehicle access to Phase 1 is proposed by a private driveway to Plains Road East located approximately 180 metres north of the Fairview Street intersection. Vehicle access to Phase 2 is proposed by two private driveways to Plains Road East. The main driveway is located 100 metres north of the Fairview Street intersection. The second driveway which provides access to a small parking lot area and the Tower D loading/service zone is located 40 metres north of the Fairview Street intersection and is an existing driveway.

Sidewalks are proposed across the site's Plains Road East frontage. To support walking trips to/from the subject site and walking trips within the surrounding community the City of Burlington should extend the municipal sidewalk along Plains Road East from Maple Avenue to Fairview Street.

The site's parking demand is proposed to be accommodated on-site by approximately 1,219 spaces (1.16 spaces per unit). The parking supply for Phase 1 is identified as 667 spaces (1.14 spaces per unit). The parking supply for Phase 2 is identified as 552 spaces (1.19 spaces per unit).



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Proposed Concept Plan

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Figure 3.1

3.2 Sight Distance

The available sight distance at the proposed driveway location has been assessed based on the methodology outlined in the Transportation Association of Canada (TAC) *Geometric Design Guide for Canadian Roads*[4] ("TAC Guide"). The following parameters have been referenced in the assessment:

Table 3.2 summarizes the minimum required sight distance measurements set out in the TAC Guide applicable to this analysis.

TABLE 3.2: TAC SIGHT DISTANCES

	Design Speed (km/h)					
	20 km/h	30 km/h	40 km/h	50 km/h	60 km/h	70 km/h
Minimum stopping sight distance[5]	20 m	35 m	50 m	65 m	85 m	105 m
Intersection sight distance						
Left-turn from stop[6]	45 m	65 m	85 m	105 m	130 m	150 m
Right-turn from stop[7].	40 m	55 m	75 m	95 m	110 m	130 m

From the proposed Driveway 1 location, sight distance to the east (towards Maple Avenue) is 210 m. To the west (towards Fairview Street), the sight distance is restricted by the existing right-of-way to approximately 60 m. The available sight distance to the east exceed the measures outlined by the TAC Guide. The available sight distance to the west meets the minimum sight distance requirement for a 30 km/h design speed, 10 km/h over the advisory speed through the curve.

The sight distance from the Driveway 2 to the south (towards Fairview Street) is approximately 90 m and meets the minimum requirement for a 40 km/h design speed. The sight distance is limited by the segment length of Plains Road East. The existing traffic control signal is visible. To the north (towards Maple Avenue), the sight distance is restricted by the existing right-of-way to approximately 75 m which meets the

[4] Transportation Association of Canada. *Geometric Design Guide for Canadian Roads.* June 2017.
[5] TAC Table 2.5.2. Stopping Sight Distance on level roadways for Automobiles
[6] TAC Table 9.9.4. Design Intersection Sight Distance – Case B1, Left-Turn from Stop
[7] TAC Table 9.9.6. Design Intersection Sight Distance – Case B2, Right-Turn from Stop

minimum requirement for a 40 km/h design speed, 20 km/h over the advisory speed through the curve.

The sight distance from the Driveway 3 to the south (towards Fairview Street) is approximately 50 m. The sight distance is limited by the segment length of Plains Road East. The existing traffic control signal is visible. To the north (towards Maple Avenue), the sight distance is restricted by the existing right-of-way to approximately 105 m which meets the minimum requirement for a 50 km/h design speed, 30 km/h over the advisory speed through the curve.

The existing right-of-way for Plains Road East is a limiting factor for sight distances through the existing horizontal curve. The existing horizontal curvature requires drivers to reduce speed prior to entering the curve in both directions. The existing curve is signed with chevron alignment signs and checkerboard signs in both directions. An amber flashing beacon is also present. Drivers approaching the curve from Maple Avenue experience Rumble strips prior to approaching the curve. The existing signage, pavement markings and surface treatments will continue to encourage drivers to maintain low travel speeds through the curve and in turn allow the site driveways to operate with appropriate sightline.

Appendix D contains the sight distance triangles for the proposed driveways.

3.3 Vehicle Circulation

Heavy vehicle circulation for the loading and waste collection area has been assessed using AutoTURN swept path analysis software. Four design vehicles were used in the analysis:

- Halton Front End Loading Garbage Truck;
- NCHRP Fire Pumper Truck;
- Transportation Association of Canada (TAC) Medium Single unit (MSU); and
- TAC Passenger Vehicle (P).

Appendix E illustrates the swept path analysis. The design vehicles can maneuver through the site without impacting the proposed geometry. All design vehicles can enter and exit the site in a forward motion.

3.4 Trip Generation

The Institute of Transportation Engineers (ITE) Trip Generation[8] methods predict the site trip generation. The following land use codes were used to estimate the site's trip generation:

- Phase 1:
  - LUC 222 Multifamily Housing, High-Rise; and
  - LUC 820 Shopping Center.
- Phase 2:
  - LUC 222 Multifamily Housing, High-Rise;
  - LUC 712 Small Office Building; and
  - LUC 820 Shopping Center

Halton Region staff indicate a transit modal split of 14% along with a transportation demand management reduction of 3%. To remain conservative, no reductions for modal split or Transportation Demand Management (TDM) measures has been included in the trip generation calculation. The site trip generation can be considered conservative.

Pass-by traffic was considered for the commercial components of the subject site with distribution from the Plains Road and Maple Avenue intersection. The pass-by rates were obtained from the ITE Trip Generation Handbook 3rd Edition[9].

The highest generated trips by either using the average rate or the linear equation was used to estimate the trip generation to represent a conservative estimate. **Table 3.2** summarizes the estimated trip generation for Phase 1. Phase 1 is forecast to generate approximately 185 vehicle trips during the weekday AM peak hour and approximately 252 vehicle trips during the weekday PM peak hour.

Table 3.3 details the estimated trip generation for Phase 2. Phase 2 is forecast to generate approximately 154 vehicle trips during the weekday AM peak hour, approximately 182 vehicle trips during the weekday PM peak hour.

[8] Trip Generation Manual 10th Edition Institute of Transportation Engineers, Washington DC, September 2017

[9] Trip Generation Handbook 3rd Edition, Institute of Transportation Engineers, August 2014

The full build-out of the subject site is forecast to generate approximately 339 vehicle trips during the weekday AM peak hour, and 343 vehicle trips during the weekday PM peak hour.

The additional site generated traffic added to the network would be less than daily traffic variations typically experienced along the adjacent arterial roadways and Provincial highway.

TABLE 3.2: ESTIMATED TRIP GENERATION – PHASE 1

Land Use	Units	AM Peak Hour				PM Peak Hour			
		Rate	In	Out	Total	Rate	In	Out	Total
LUC 222 - Multifamily Housing, High-Rise (Dwelling Units)	587	Eq	43	135	**177**	Eq	127	81	**208**
LUC 820 - Shopping Center (GFA/1,000ft^2)	8.5	Avg	5	3	**8**	Avg	16	16	**32**
Phase 1 Total Trip Generation			**48**	**138**	**185**		**143**	**97**	**240**
LUC 820 Pass-by PM Peak Hour		*34%*					*-6*	*-6*	***-12***
Phase 1 Net Trip Generation			**48**	**138**	**185**		**149**	**103**	**252**

LUC 222: AM - T = 0.28(X) +12.86 | PM - T = 0.34(X) + 8.56
LUC 820: AM Aerage Rate 0.94 | PM Average Rate 3.81

43

TABLE 3.3: ESTIMATED TRIP GENERATION – PHASE 2

Land Use	Units	AM Peak Hour				PM Peak Hour			
		Rate	In	Out	Total	Rate	In	Out	Total
LUC 222 - Multifamily Housing, High-Rise (Dwelling Units)	462	Eq	34	108	**142**	Eq	101	65	**166**
LUC 712 - Small Office Building (GFA/1,000ft^2)	5.0	Avg	8	2	**10**	Avg	4	8	**12**
LUC 820 - Shopping Center (GFA/1,000ft^2)	2.2	Avg	1	1	**2**	Avg	4	4	**8**
Phase 1 Total Trip Generation			**43**	**111**	**154**		**109**	**77**	**186**
LUC 820 Pass-by PM Peak Hour		*34%*					*-2*	*-2*	***-4***
Phase 1 Net Trip Generation			**43**	**111**	**154**		**107**	**75**	**182**

LUC 222: AM - T = 0.28(X) +12.86 | PM - T = 0.34(X) + 8.56
LUC 712: AM Average Rate 1.92 | PM Average Rate 1.38
LUC 820: AM Aerage Rate 0.94 | PM Average Rate 3.81

3.5 Trip Distribution and Assignment

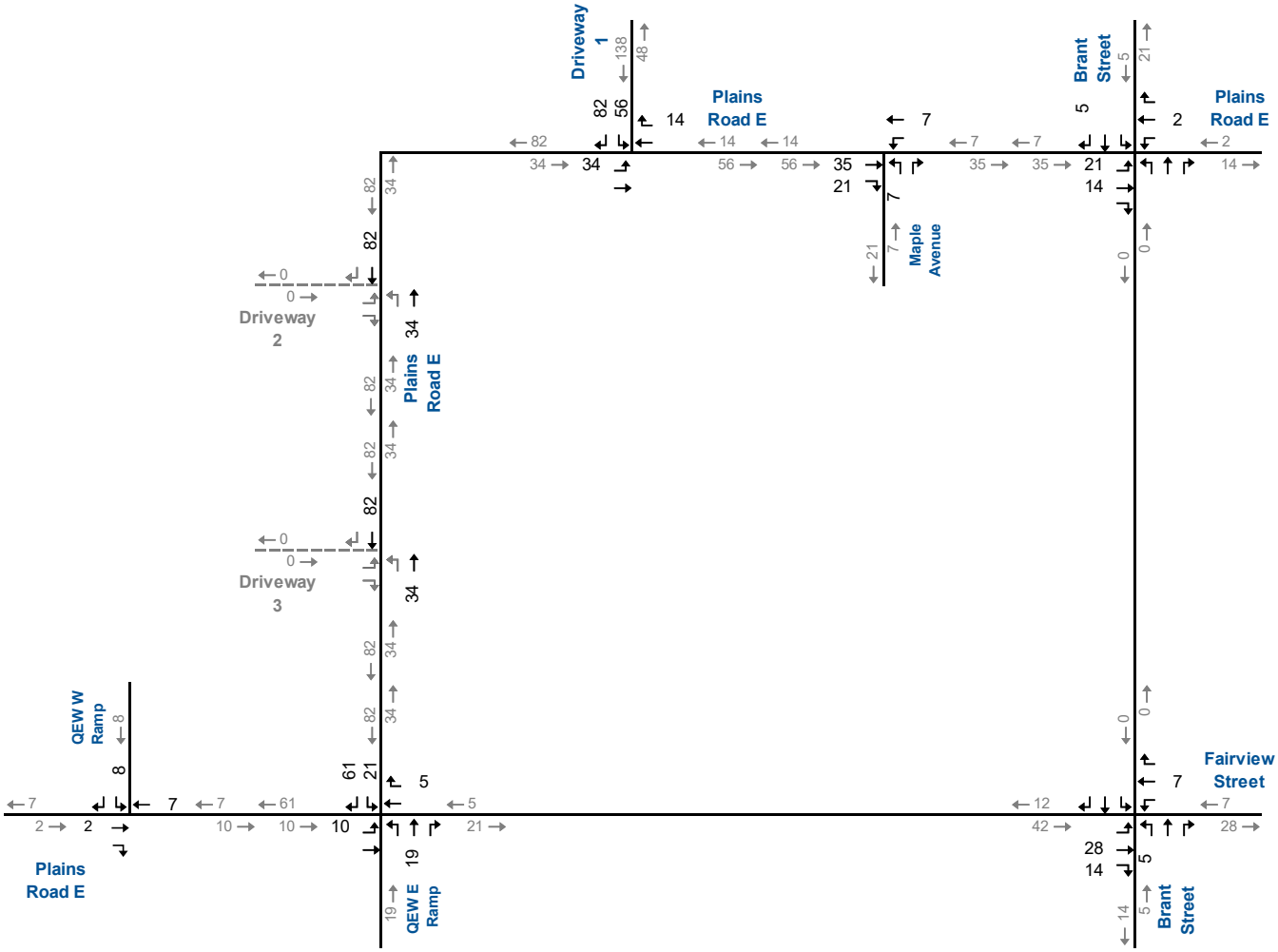
The site generated trips were assigned to the road network based on the information provided in the 2016 Transportation Tomorrow Survey[10]. **Table 3.3** summarizes the estimated site trip distribution.

TABLE 3.3: TRIP DISTRIBUTION

Route	Direction	AM		PM	
		Inbound	Outbound	Inbound	Outbound
QEW	North	15%	25%	20%	15%
	South	40%	15%	20%	20%
Plains Road	East	5%	10%	10%	5%
	West	5%	5%	5%	15%
Fairview Street	East	15%	20%	20%	20%
Brant Street	North	10%	15%	10%	5%
	South	10%	10%	10%	15%
Maple Avenue	South	0%	0%	5%	5%
Total		**100%**	**100%**	**100%**	**100%**

Figure 3.2A and **Figure 3.2B** illustrates the Phase 1 site generated traffic volumes. **Figure 3.3A** and **Figure 3.3B** illustrates the site generated traffic for the build-out of the subject site.

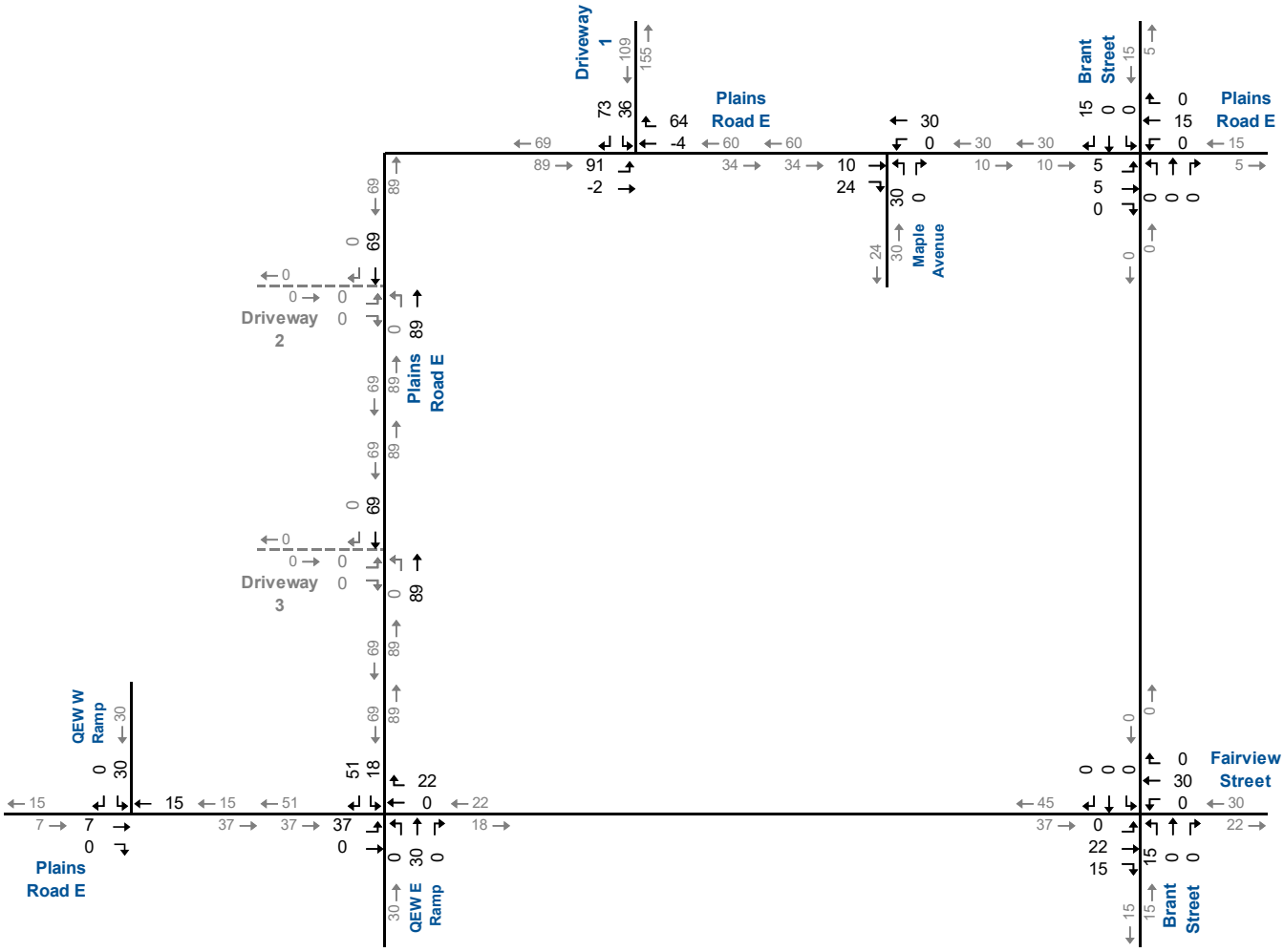
[10] Transportation Tomorrow Survey 2016, Traffic Zone 4057, 4058



Phase 1 Site Generated Traffic Volumes AM Peak Hour

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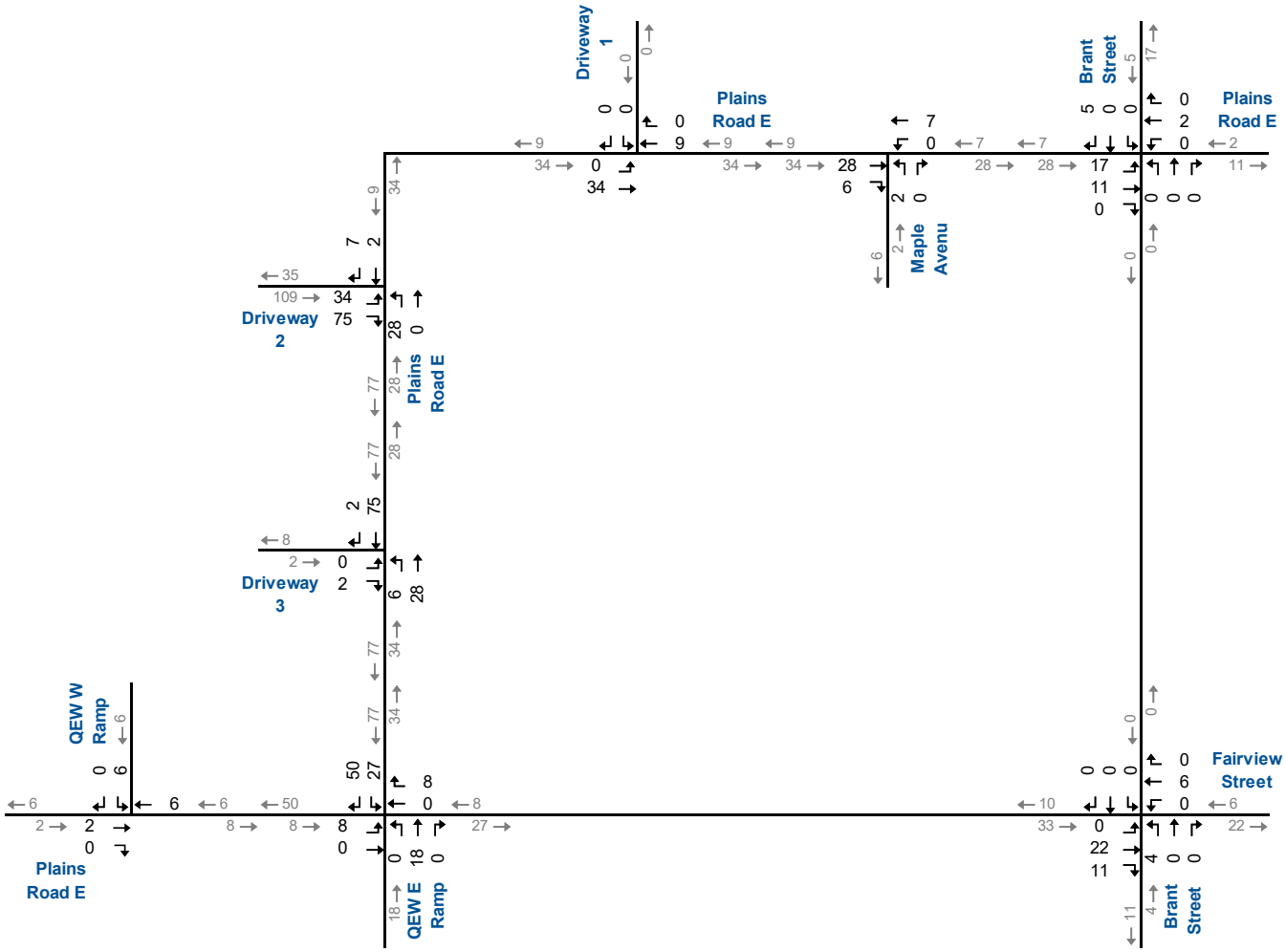
Figure 3.2A



Phase 1 Site Generated Traffic Volumes PM Peak Hour

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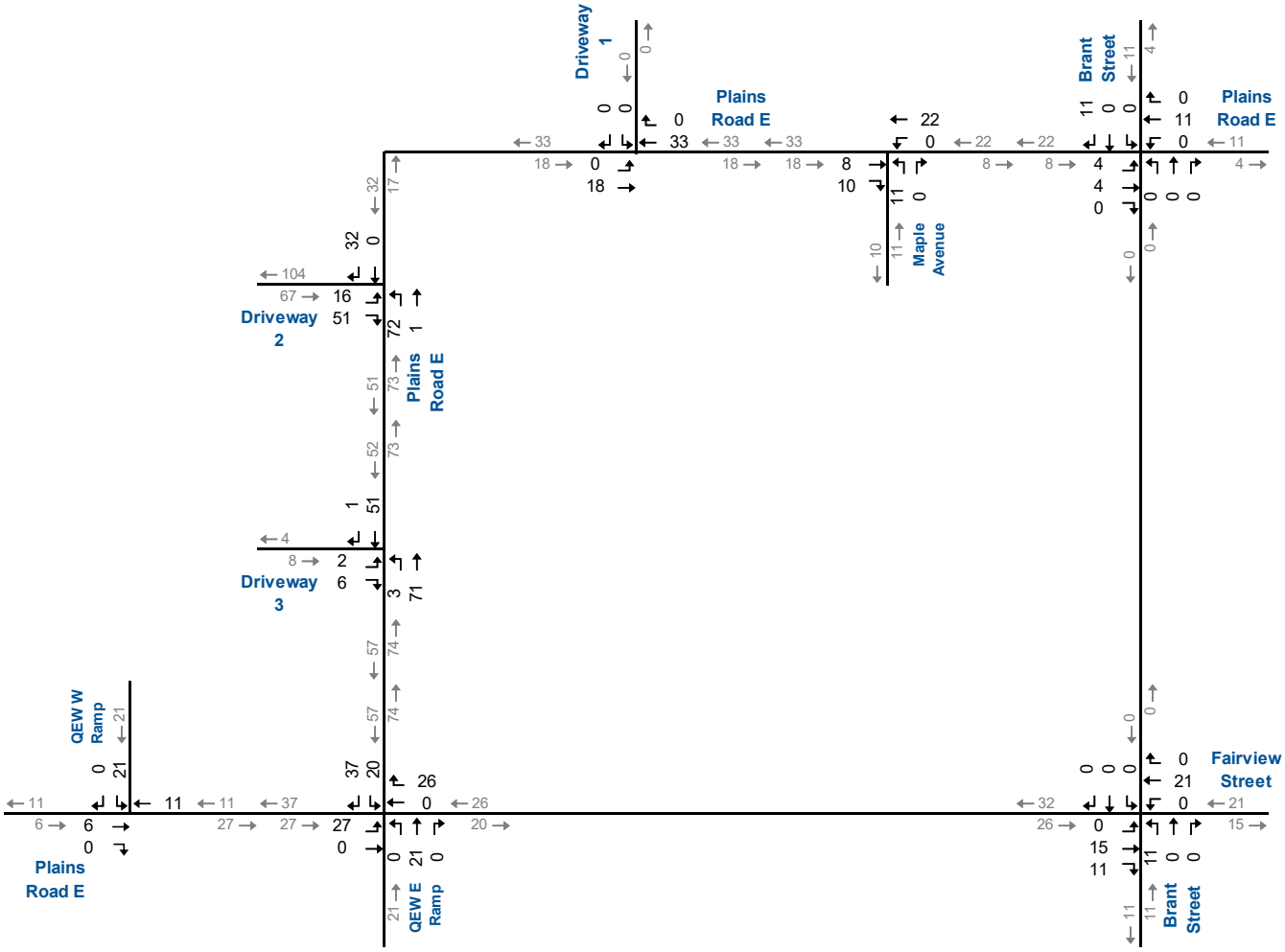
Figure 3.2B



Phase 2 Site Generated Traffic Volumes AM Peak Hour

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Figure 3.3A



Phase 2 Site Generated Traffic Volumes PM Peak Hour

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Figure 3.3B

4 Future Conditions

The assessment of the future traffic conditions contained in this section includes the traffic forecast as well as the level of service analysis.

4.1 Forecast Traffic

Three horizon years have been assessed to estimate the impact of the subject development and background roadway traffic:

- Build-out of Phase 1 (Year 2027);
- Full build-out (Year 2029);
- Five-years from full build-out (Year 2034) and
- Ten-years from full build-out (Year 2039).

Future traffic volumes near the subject site are estimated to consist of:

- Increased non-site traffic (generalized background traffic growth). A generalized growth rate of 2% per annum (compounded) was identified by the review agencies during the pre-study consultation.
- Traffic generated by adjacent development applications:
  - 1335-1355 Plains Road East[11] – Residential infill development consisting of 38 townhouse units; and
  - Brant/Ghent Mixed-Use Development[12] – Three mixed-use sites located at the intersection of Brant Street and Ghent Avenue. A total of approximately 1,020 residential units and 19,610 square metres of ground floor commercial;
- Traffic generated by the subject site.

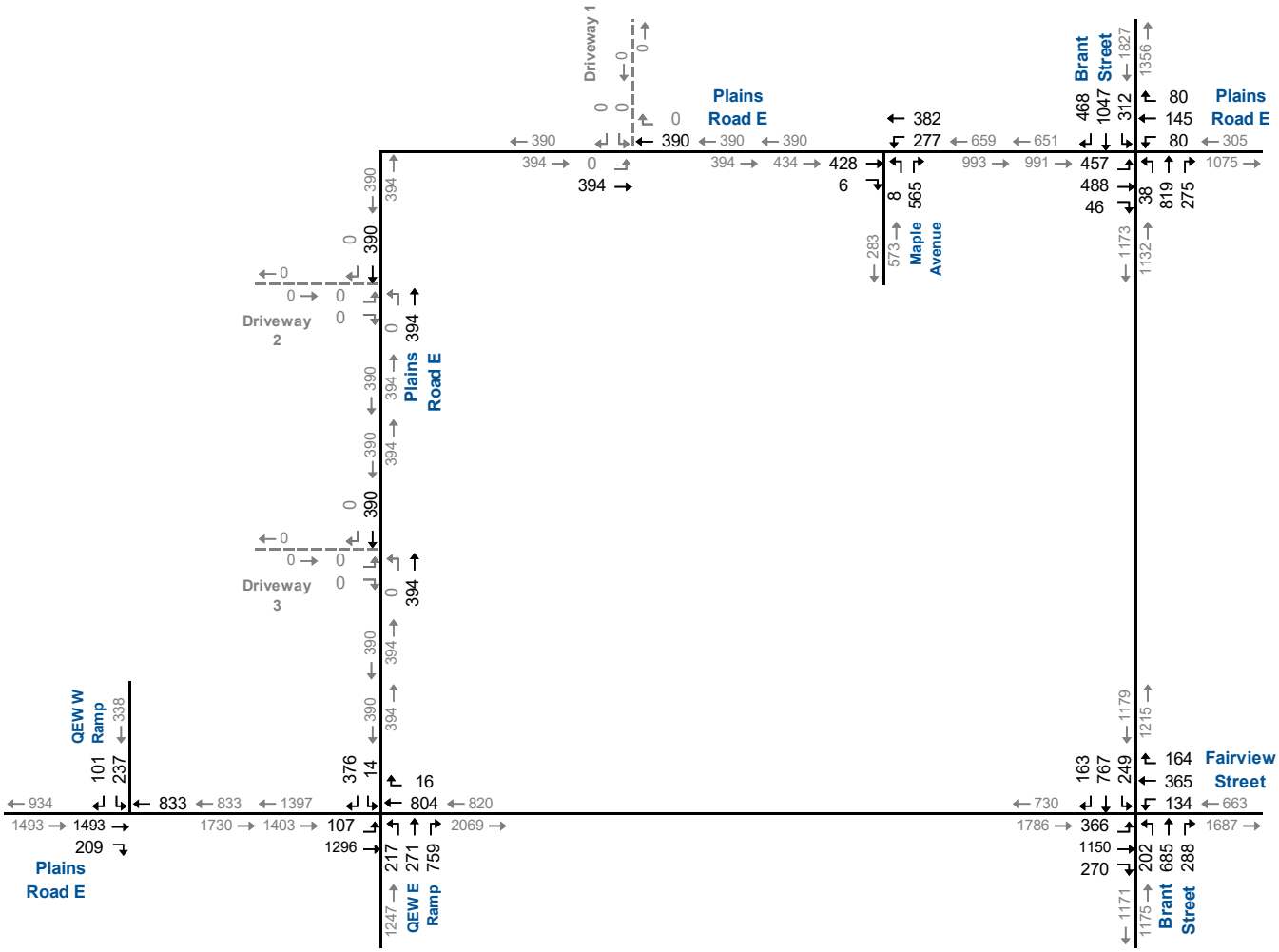
Appendix F contains the detailed traffic forecast for the adjacent development application.

[11] 1335-1355 Plains Road East, City of Burlington Traffic Brief and Parking Justification Study, Paradigm Transportation Solutions Limited, November 2017 (170263)

[12] Traffic study being conducted by Paradigm Transportation Solutions Limited. Not finalized. Project Number 200403

Figure 4.1A and **Figure 4.1B** illustrates the forecast background Phase 1 traffic volumes. **Figure 4.2A** and **Figure 4.2B** illustrates the forecast background Build-Out traffic volumes. **Figure 4.3A** and **Figure 4.3B** illustrates the forecast background Five-Year traffic volumes. **Figure 4.4A** and **Figure 4.4B** illustrates the forecast background Ten-Year traffic volumes.

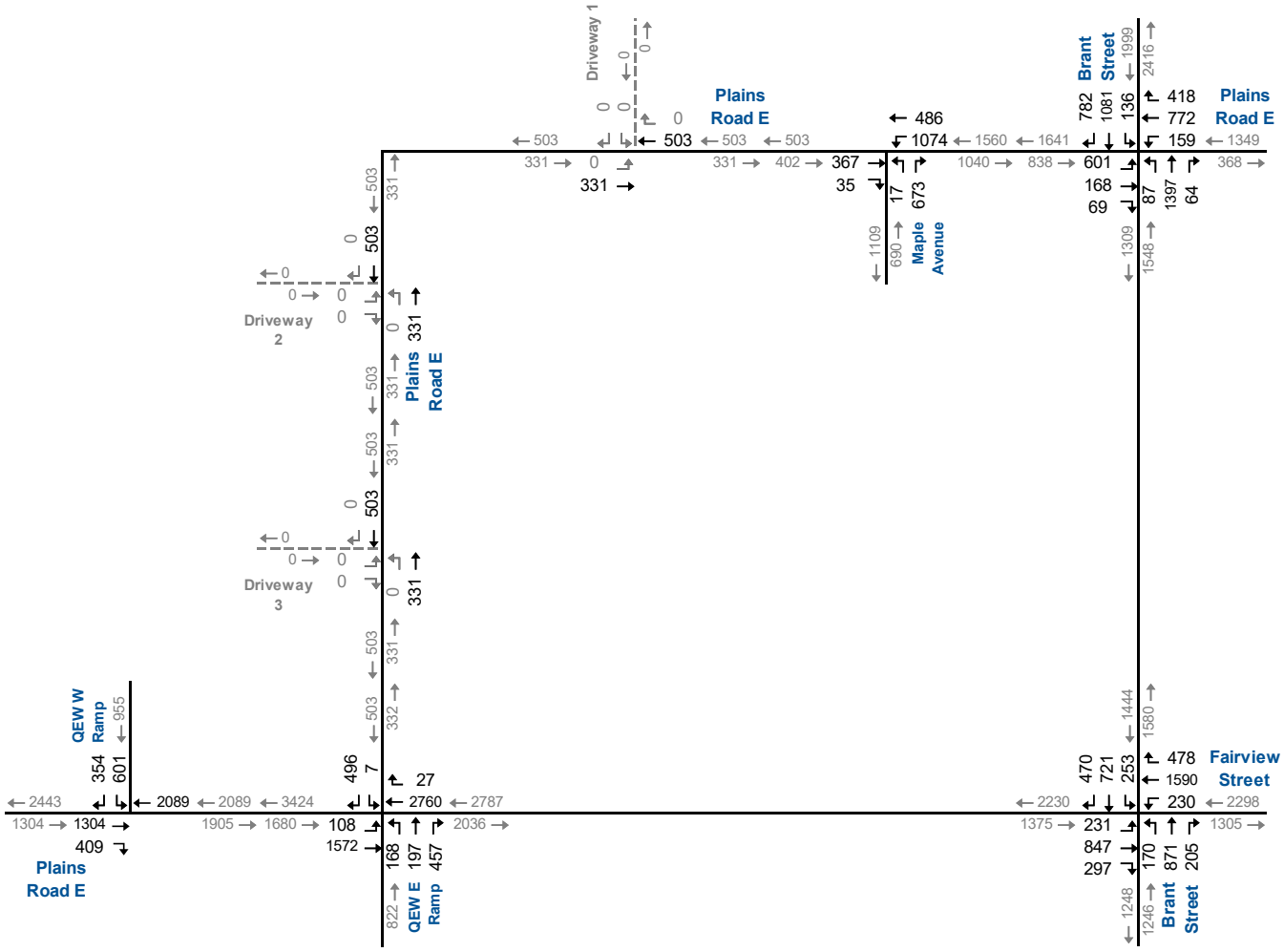
Figure 4.5A and **Figure 4.5B** illustrates the forecast Total Phase 1 traffic volumes. **Figure 4.6A** and **Figure 4.6B** illustrates the forecast Total Build-Out traffic volumes. **Figure 4.7A** and **Figure 4.7B** illustrates the forecast Total Five-Year traffic volumes. **Figure 4.8A** and **Figure 4.8B** illustrates the forecast Total Ten-Year traffic volumes.



Background Traffic
Phase 1
AM Peak Hour

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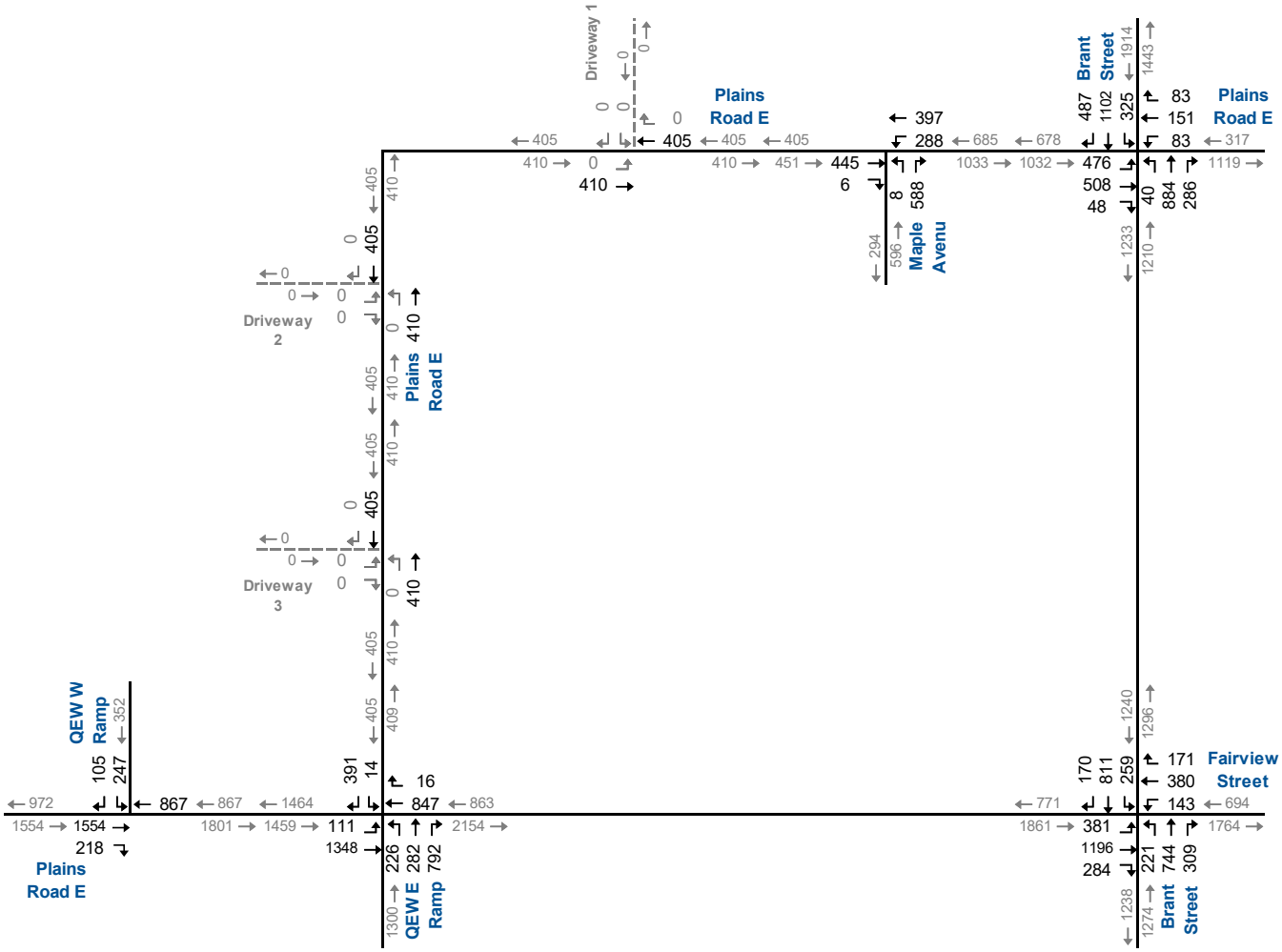
Figure 4.1A



Background Traffic
Phase 1
PM Peak Hour

1134 & 1167 Plains Road East TIS
200402

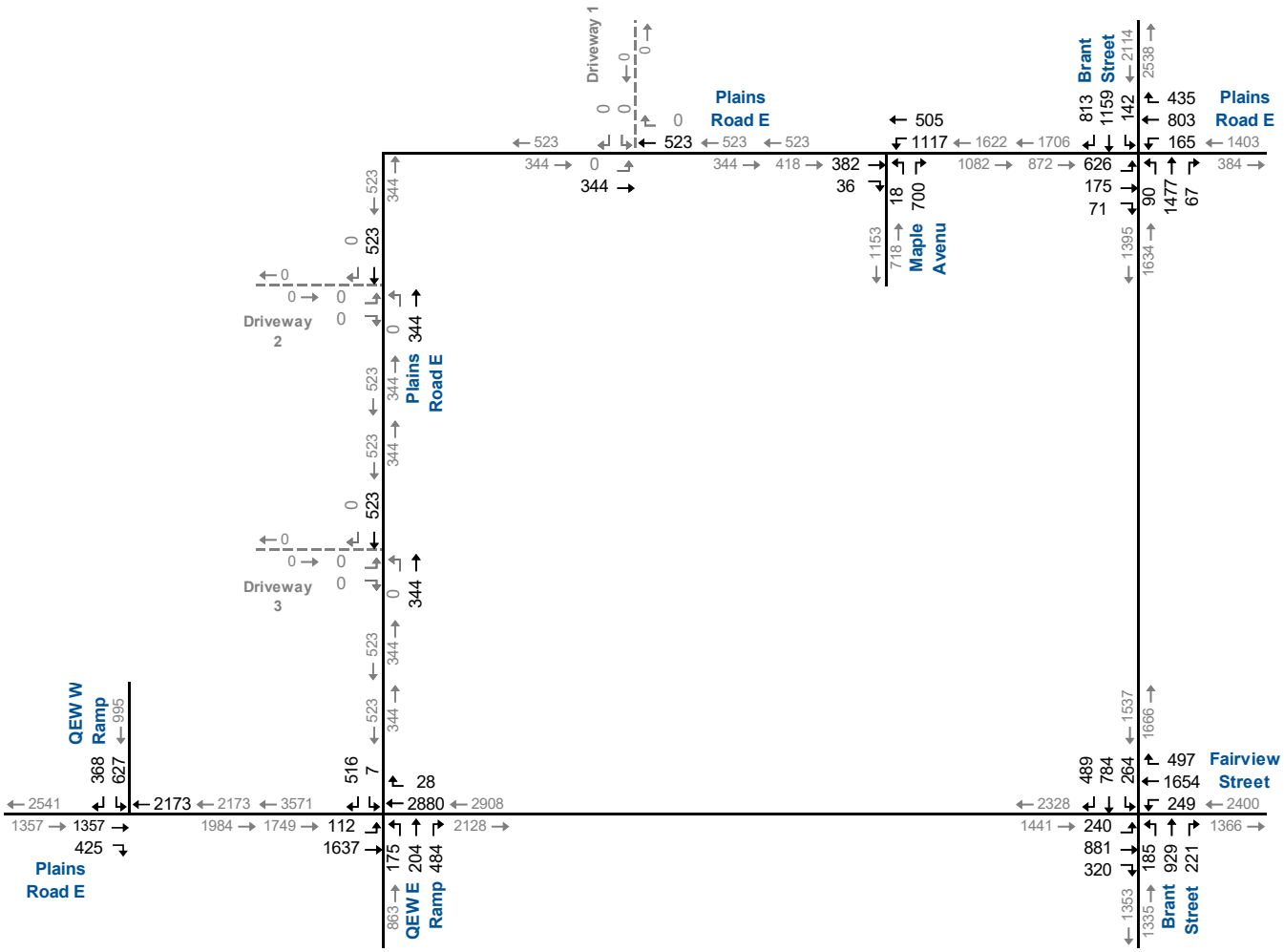
Figure 4.1B



Background Traffic
Full Build-Out
AM Peak Hour

1134 & 1167 Plains Road East TIS
200402

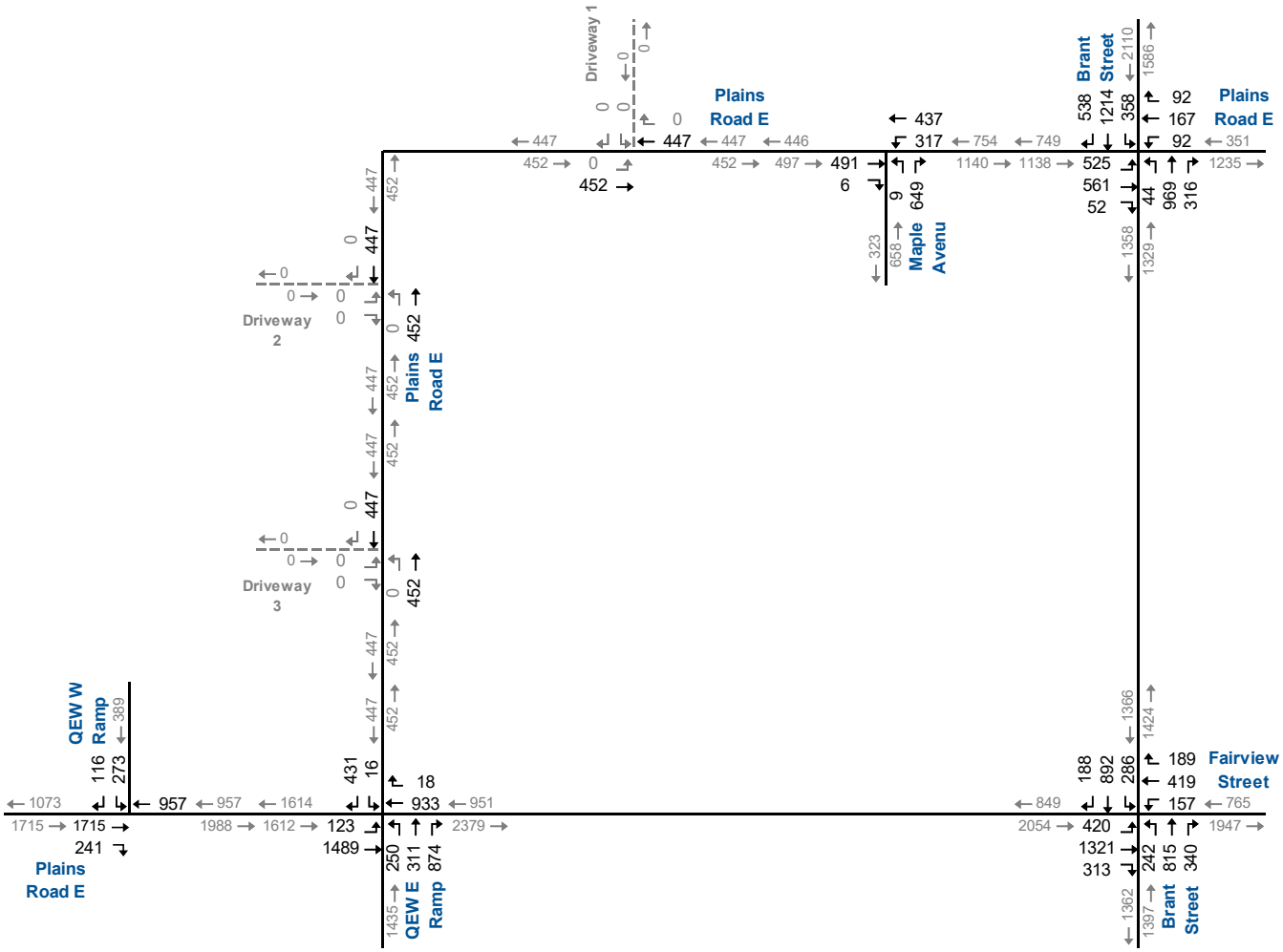
Figure 4.2A



Background Traffic
Full Build-Out
PM Peak Hour

1134 & 1167 Plains Road East TIS
200402

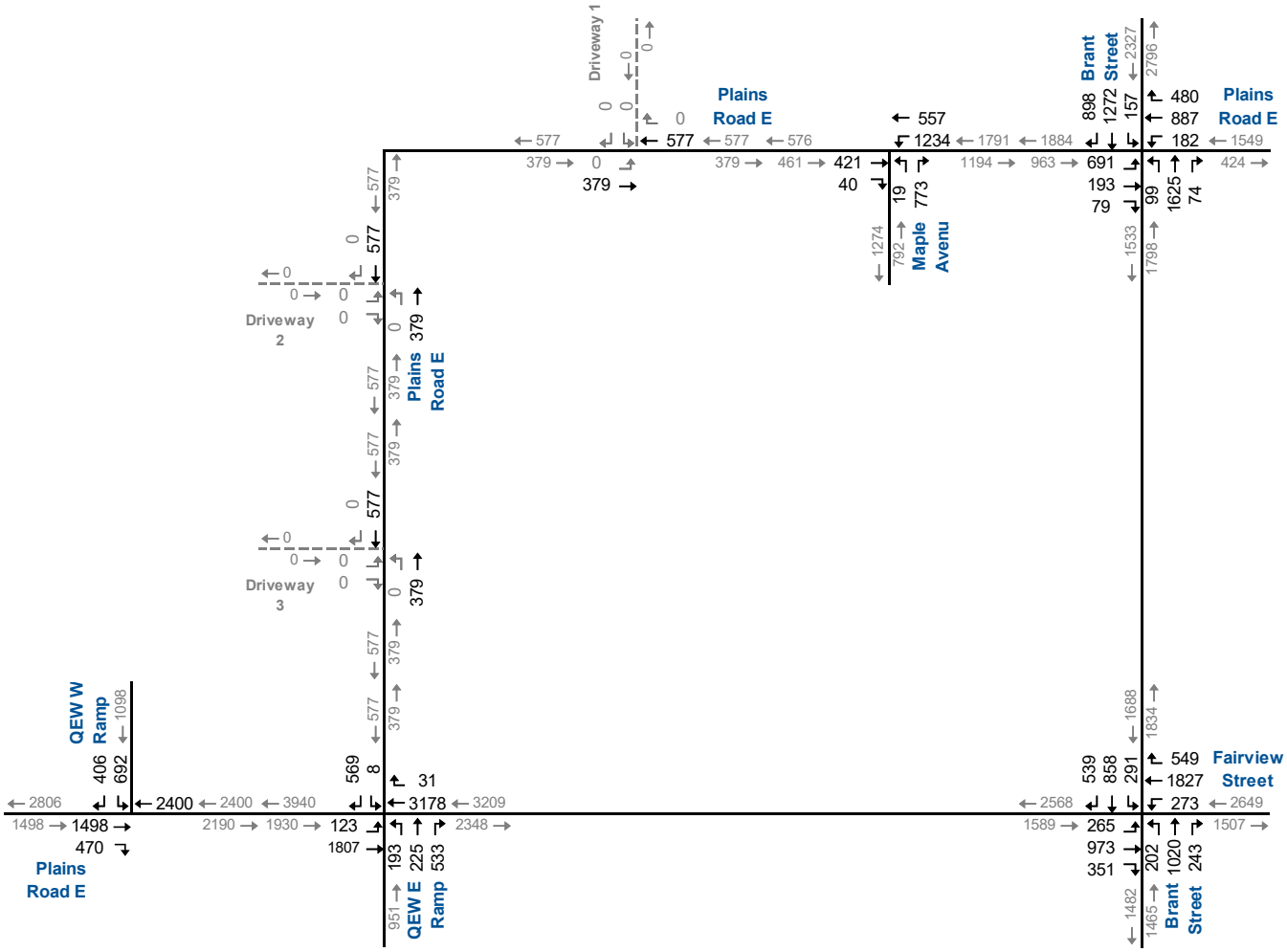
Figure 4.2B



Background Traffic Five-Year Horizon AM Peak Hour

1134 & 1167 Plains Road East TIS
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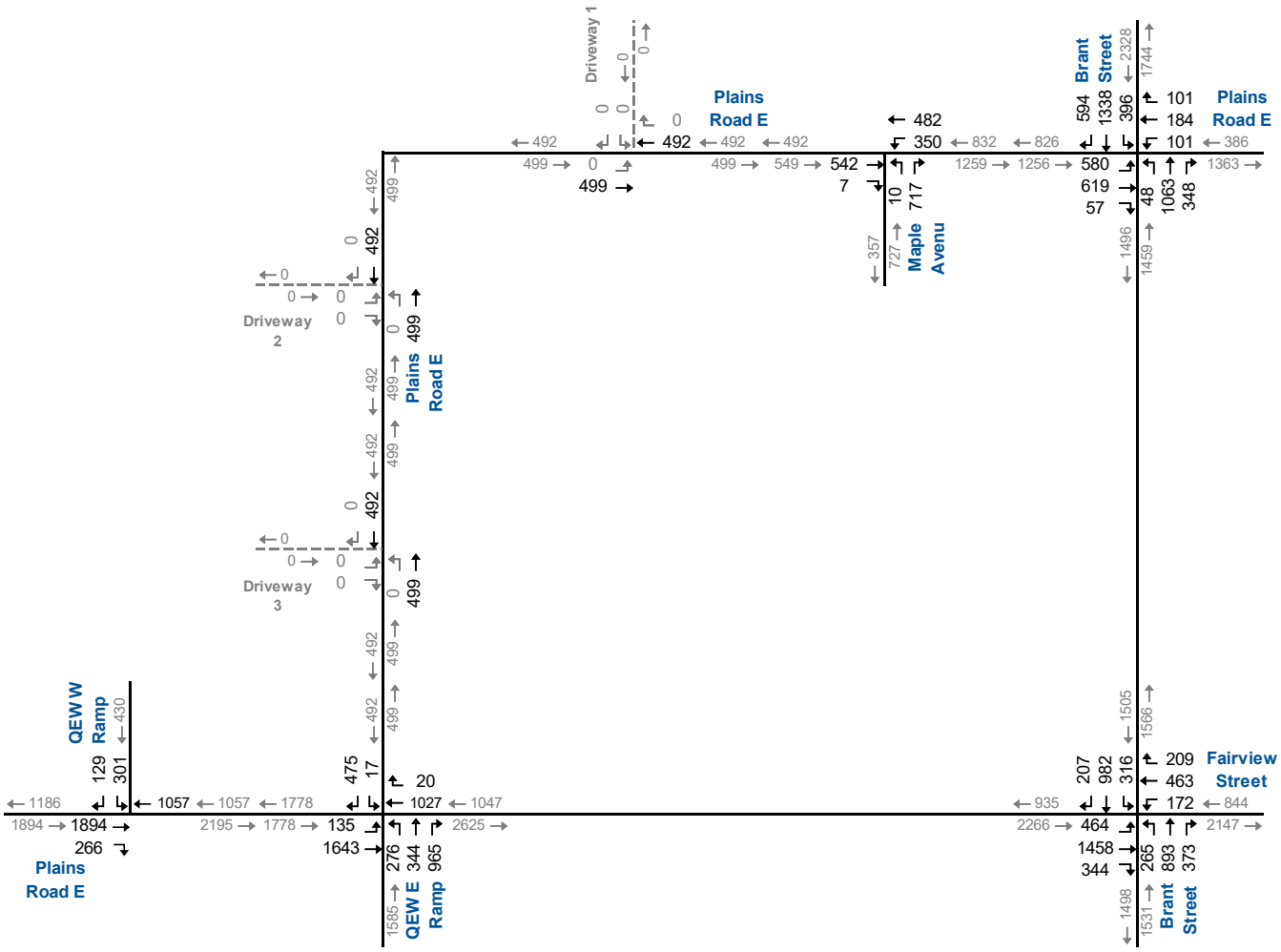
Figure 4.3A



Background Traffic Five-Year Horizon PM Peak Hour

1134 & 1167 Plains Road East TIS
200402

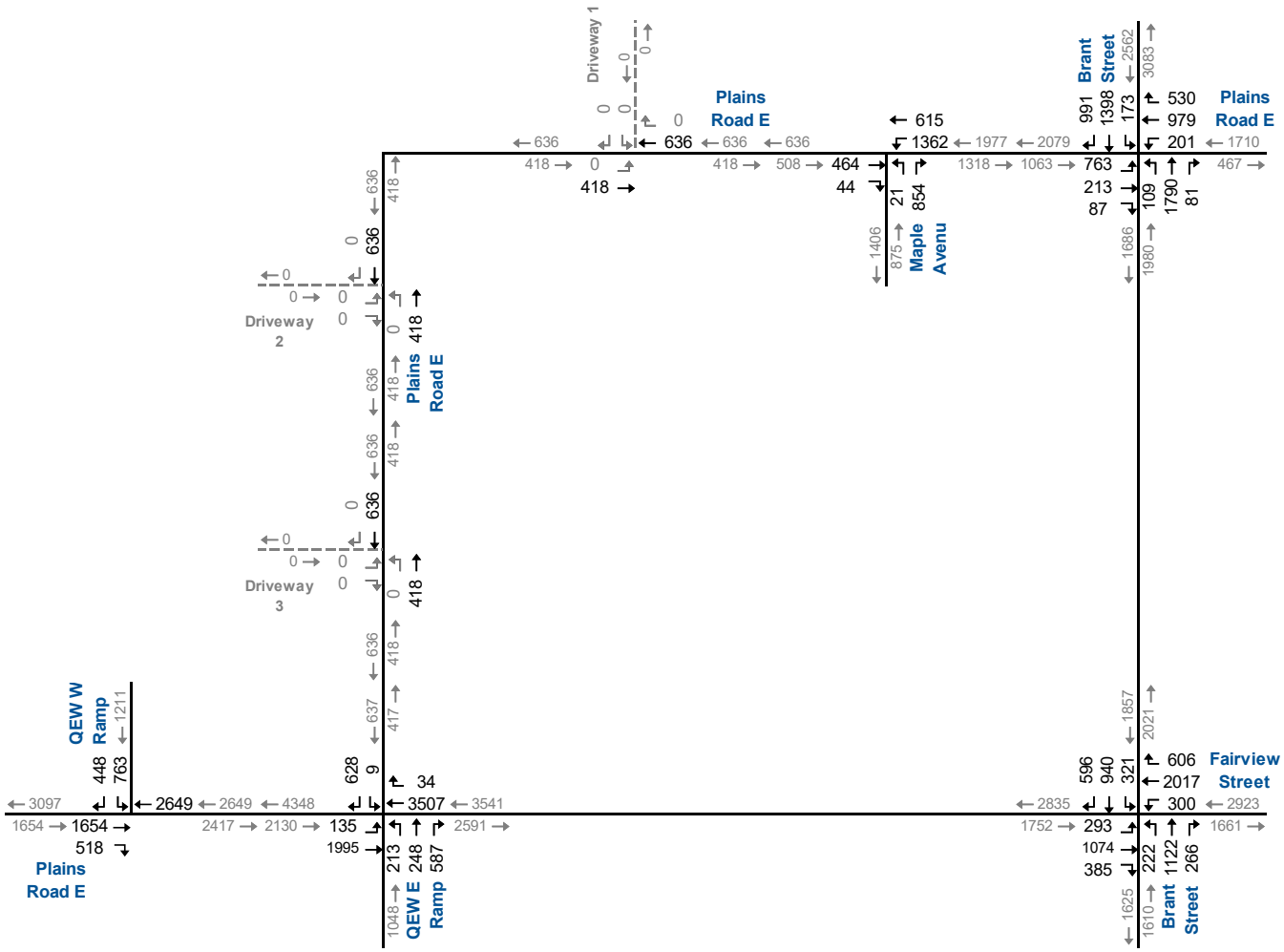
Figure 4.3B



Background Traffic Ten-Year Horizon AM Peak Hour

1134 & 1167 Plains Road East TIS
200402

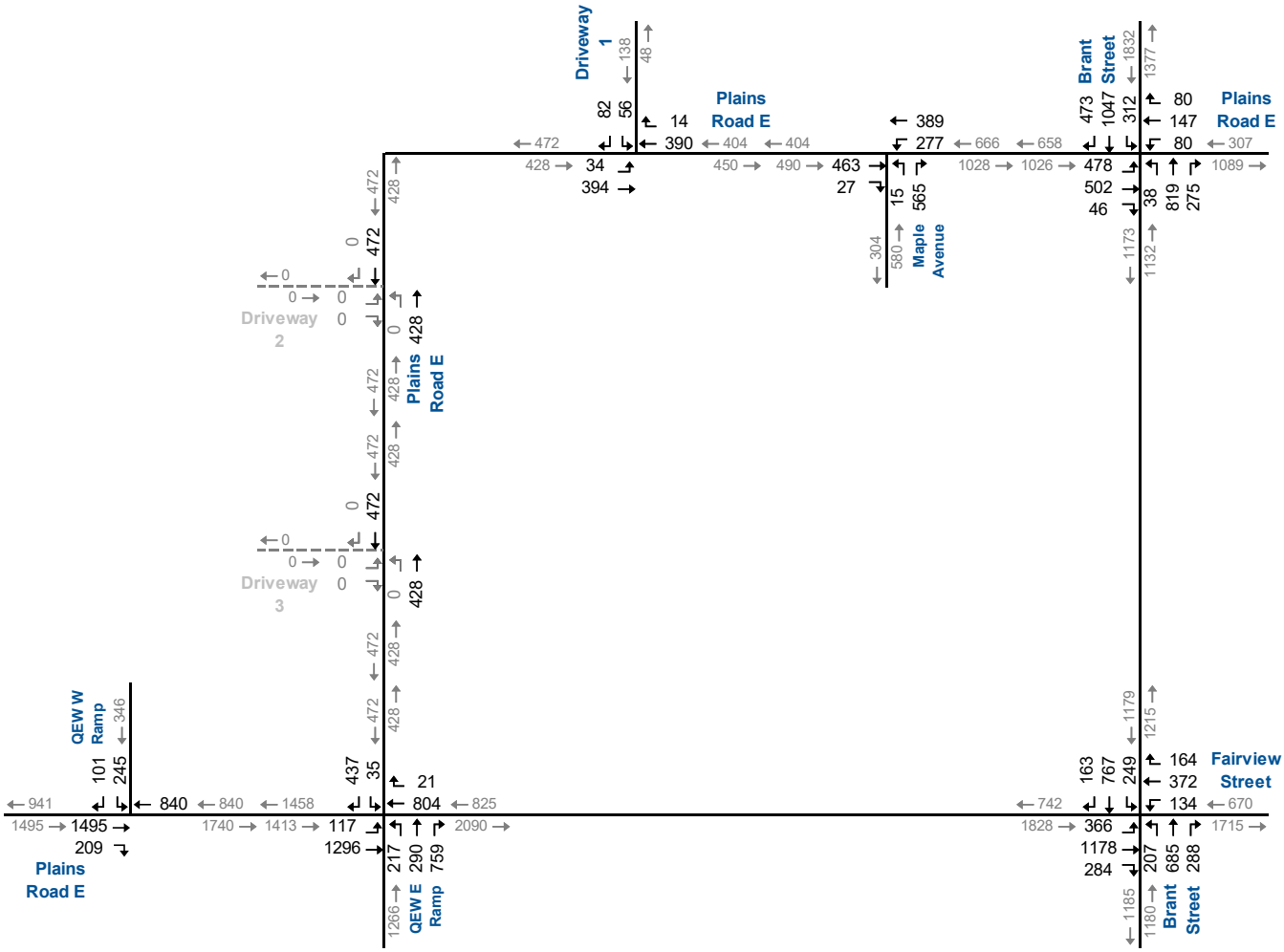
Figure 4.4A



Background Traffic Ten-Year Horizon PM Peak Hour

1134 & 1167 Plains Road East TIS
200402

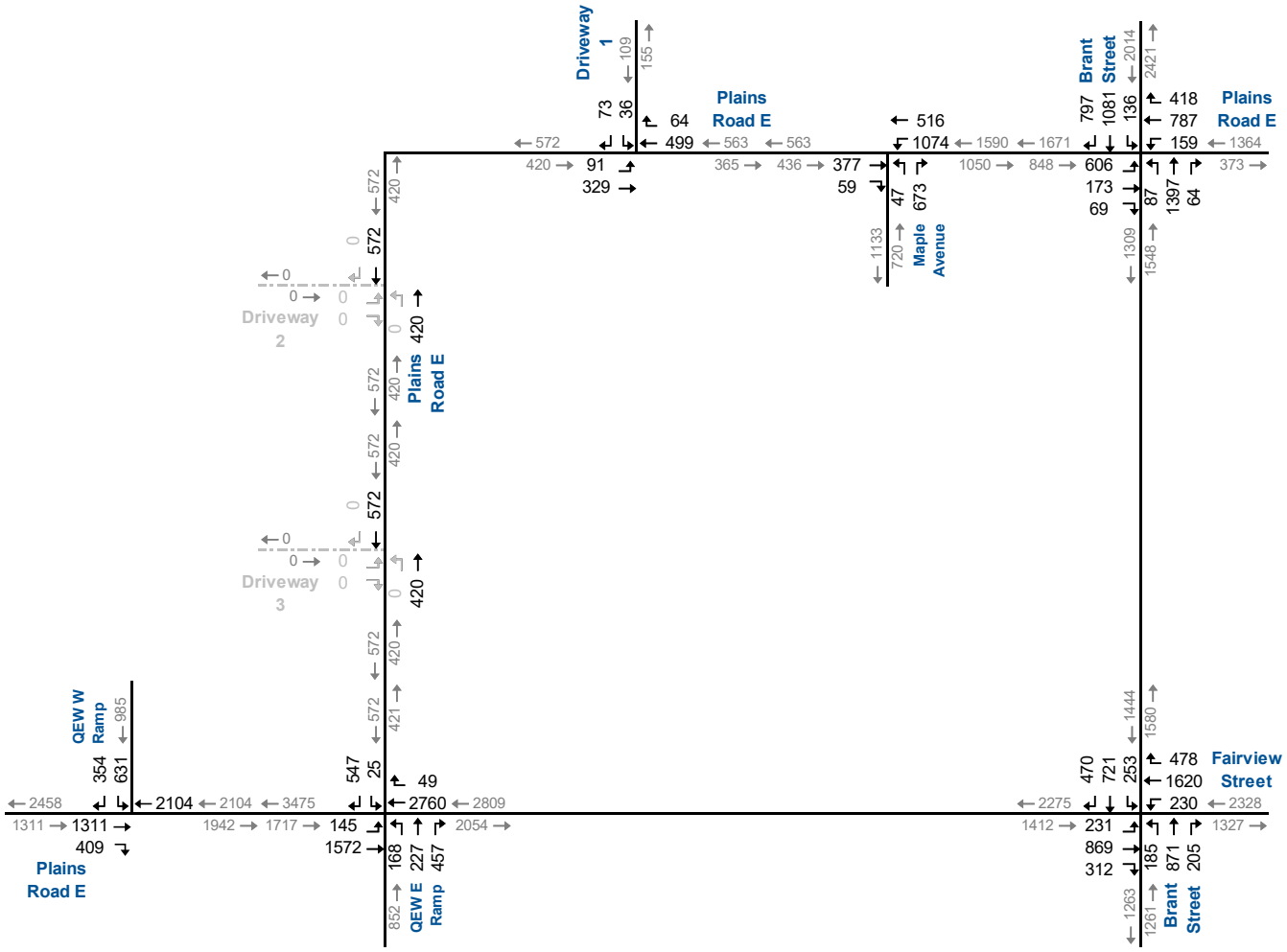
Figure 4.4B



Total Traffic Phase 1 AM Peak Hour

1134 & 1167 Plains Road East TIS
200402

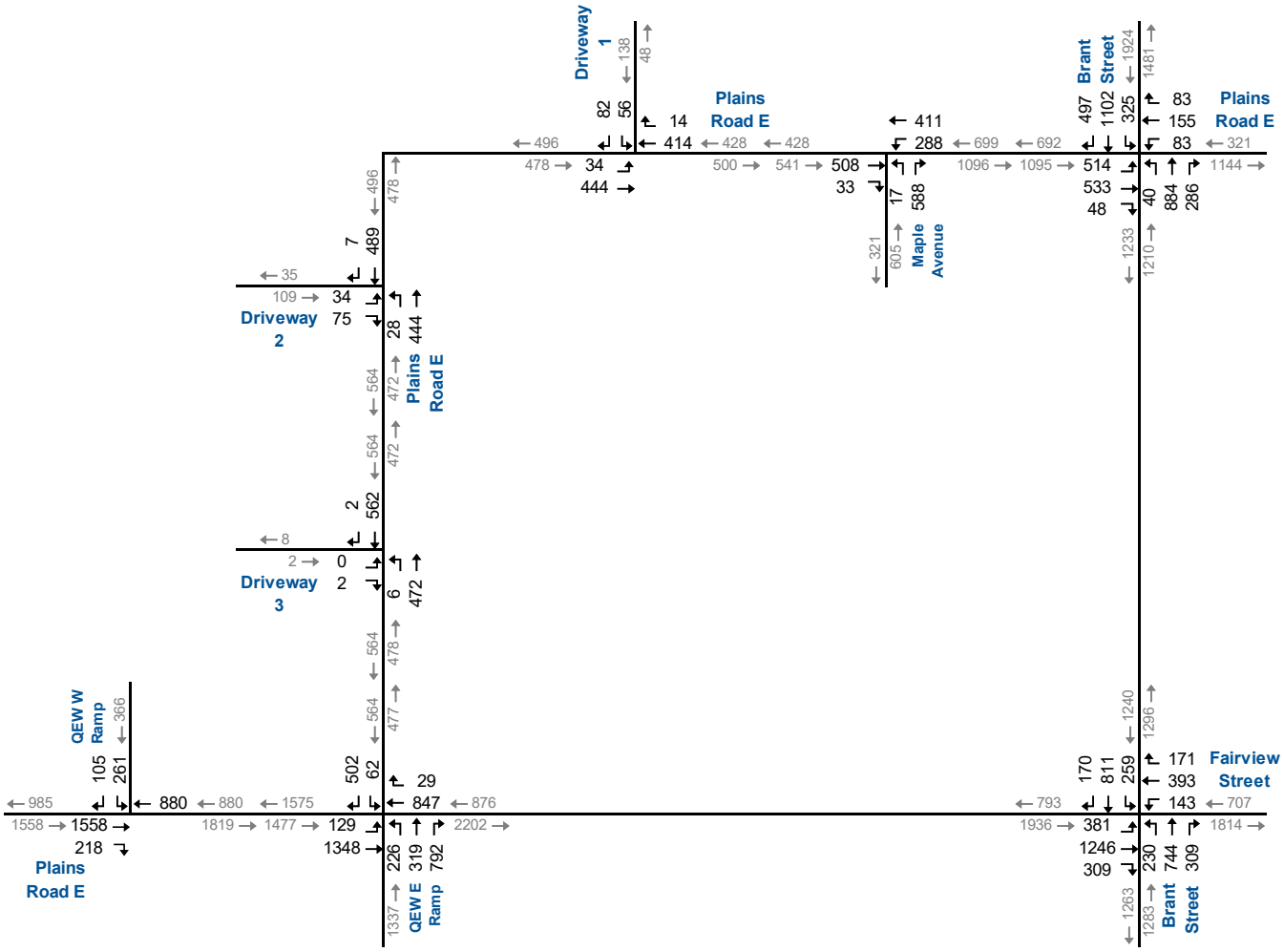
Figure 4.5A



Total Traffic Phase 1 PM Peak Hour

1134 & 1167 Plains Road East TIS
200402

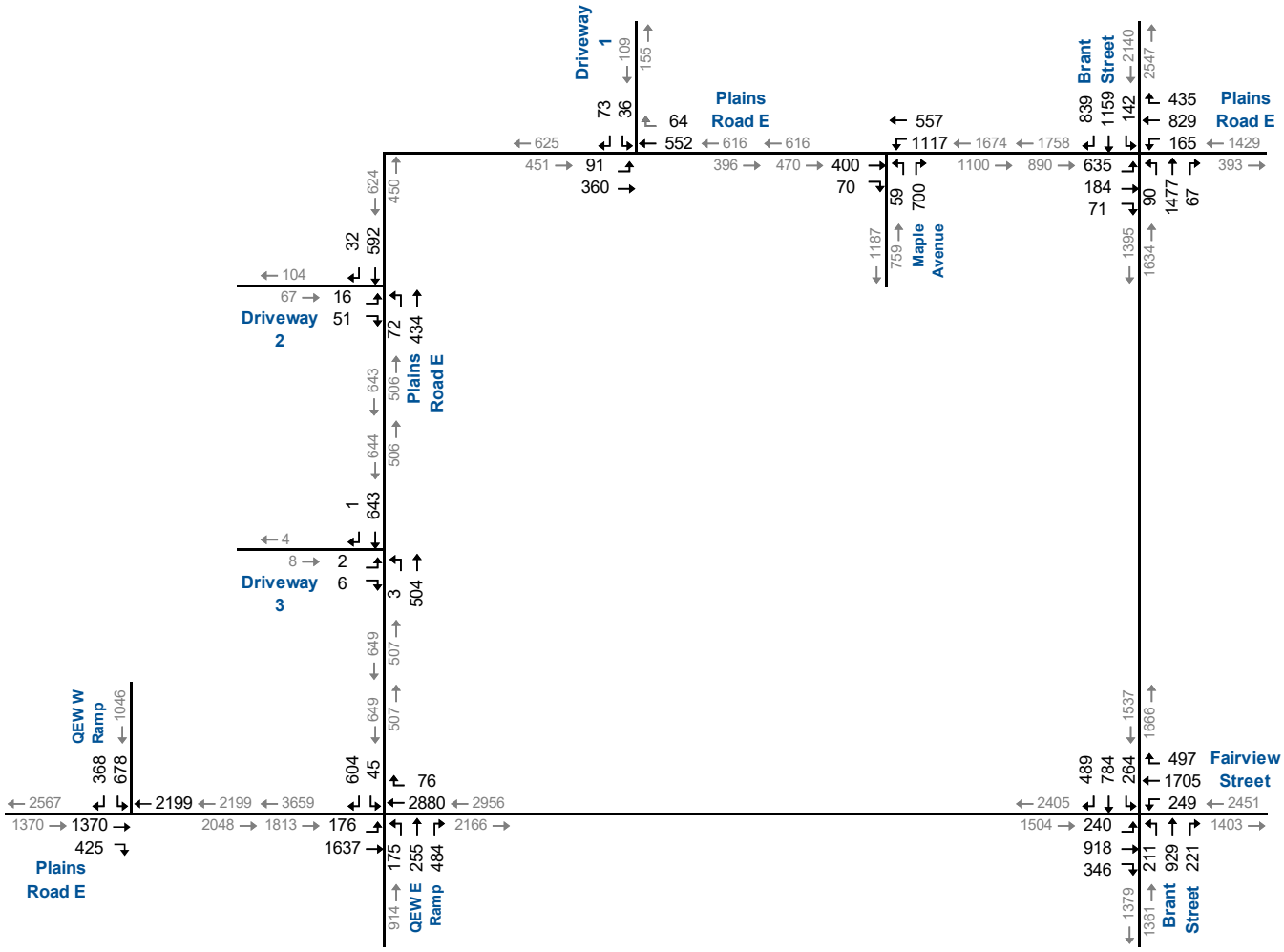
Figure 4.5B



Total Traffic
Full Build-Out
AM Peak Hour

1134 & 1167 Plains Road East TIS
200402

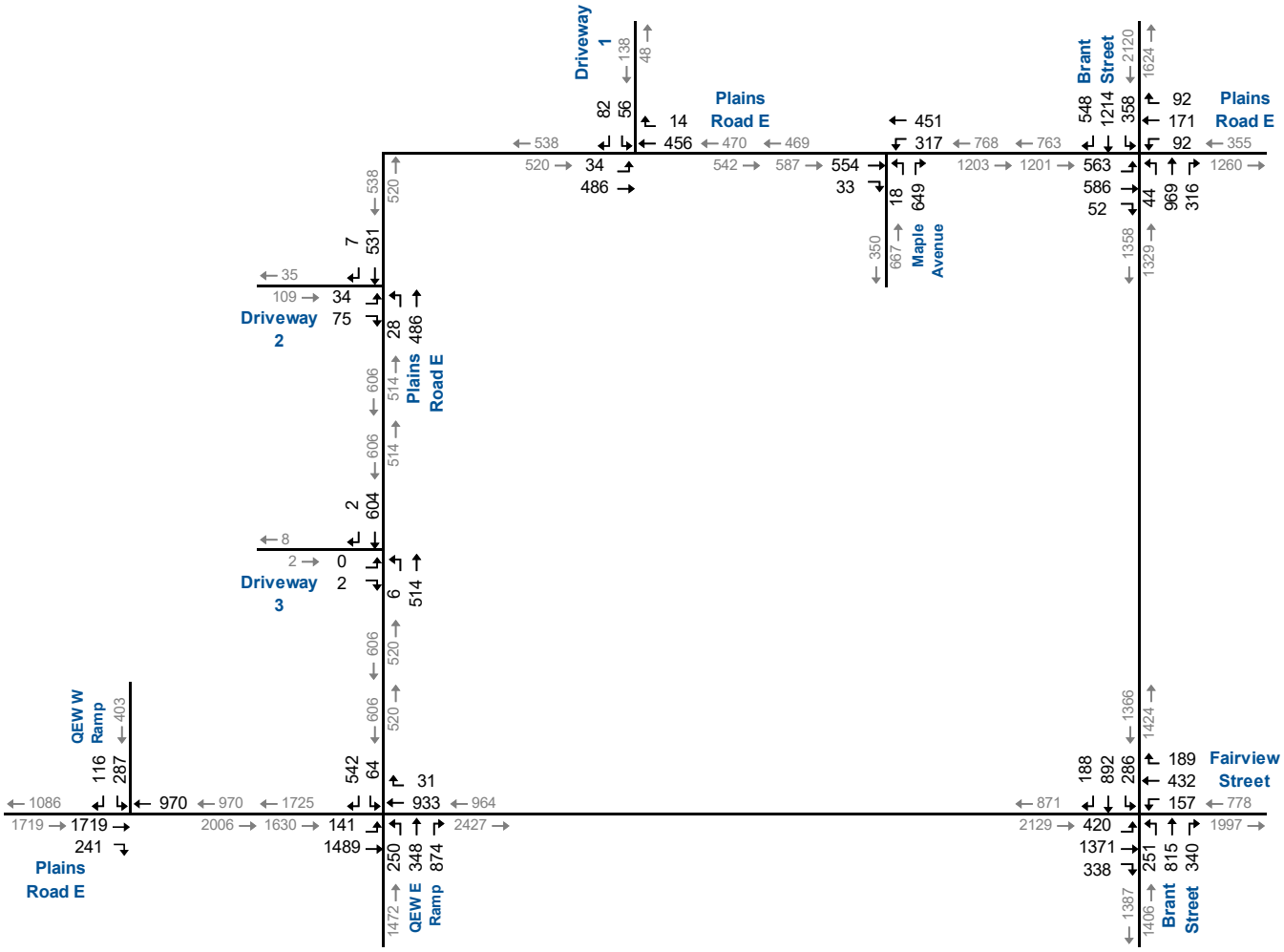
Figure 4.6A



Total Traffic
Full Build-Out
PM Peak Hour

1134 & 1167 Plains Road East TIS
200402

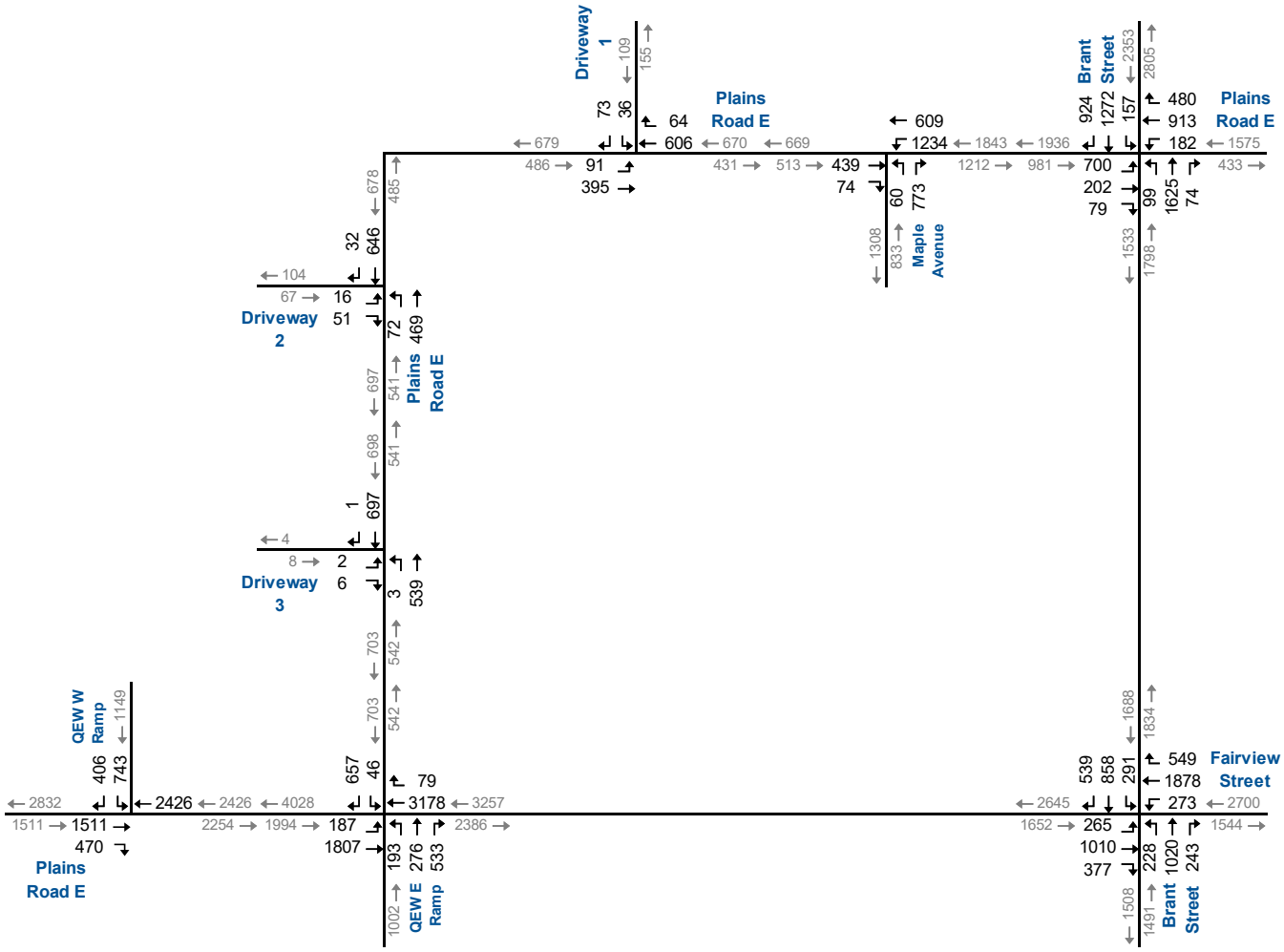
Figure 4.6B



Total Traffic
Five-Year Horizon
AM Peak Hour

1134 & 1167 Plains Road East TIS
200402

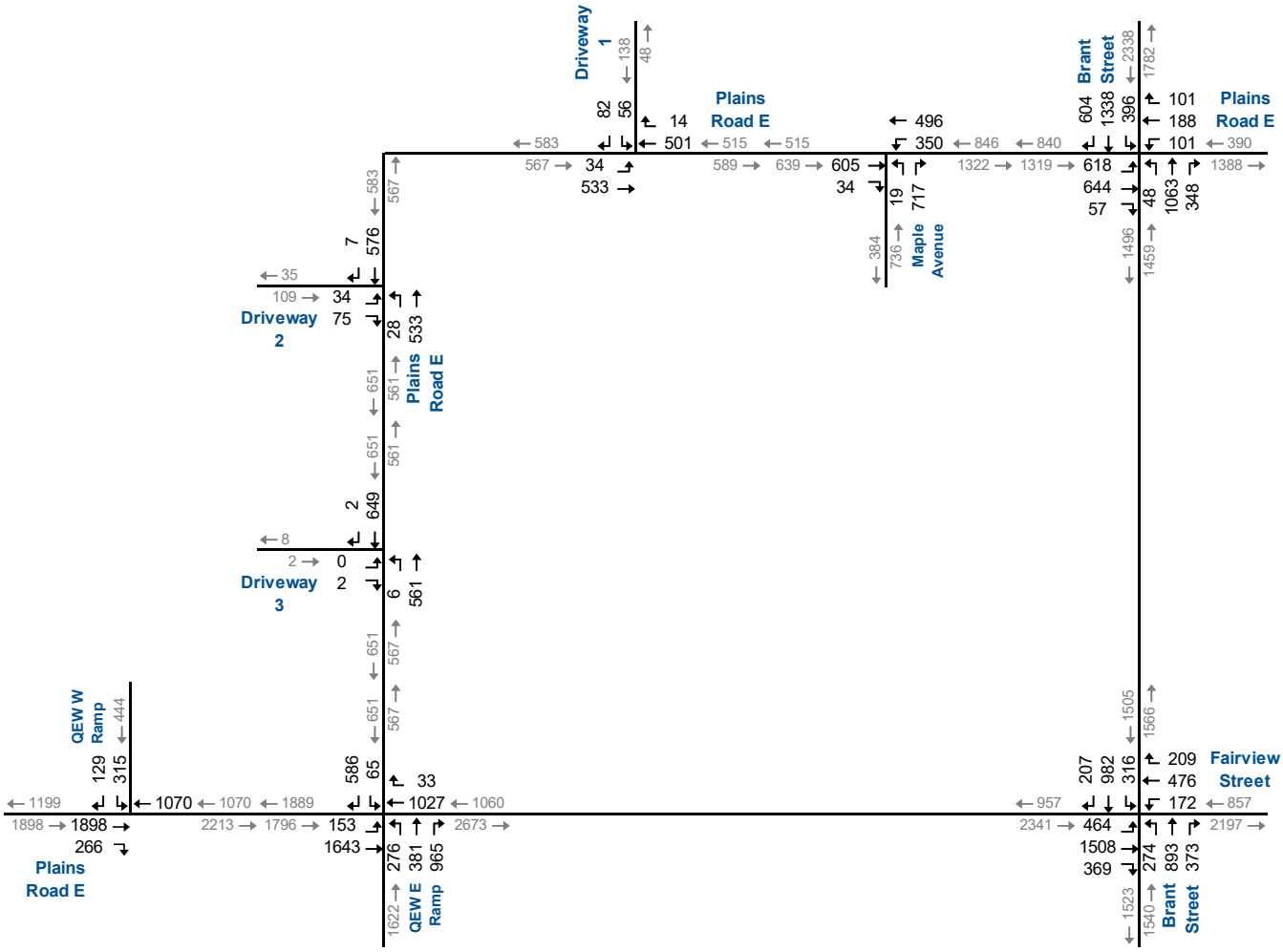
Figure 4.7A



Total Traffic
Five-Year Horizon
PM Peak Hour

1134 & 1167 Plains Road East TIS
200402

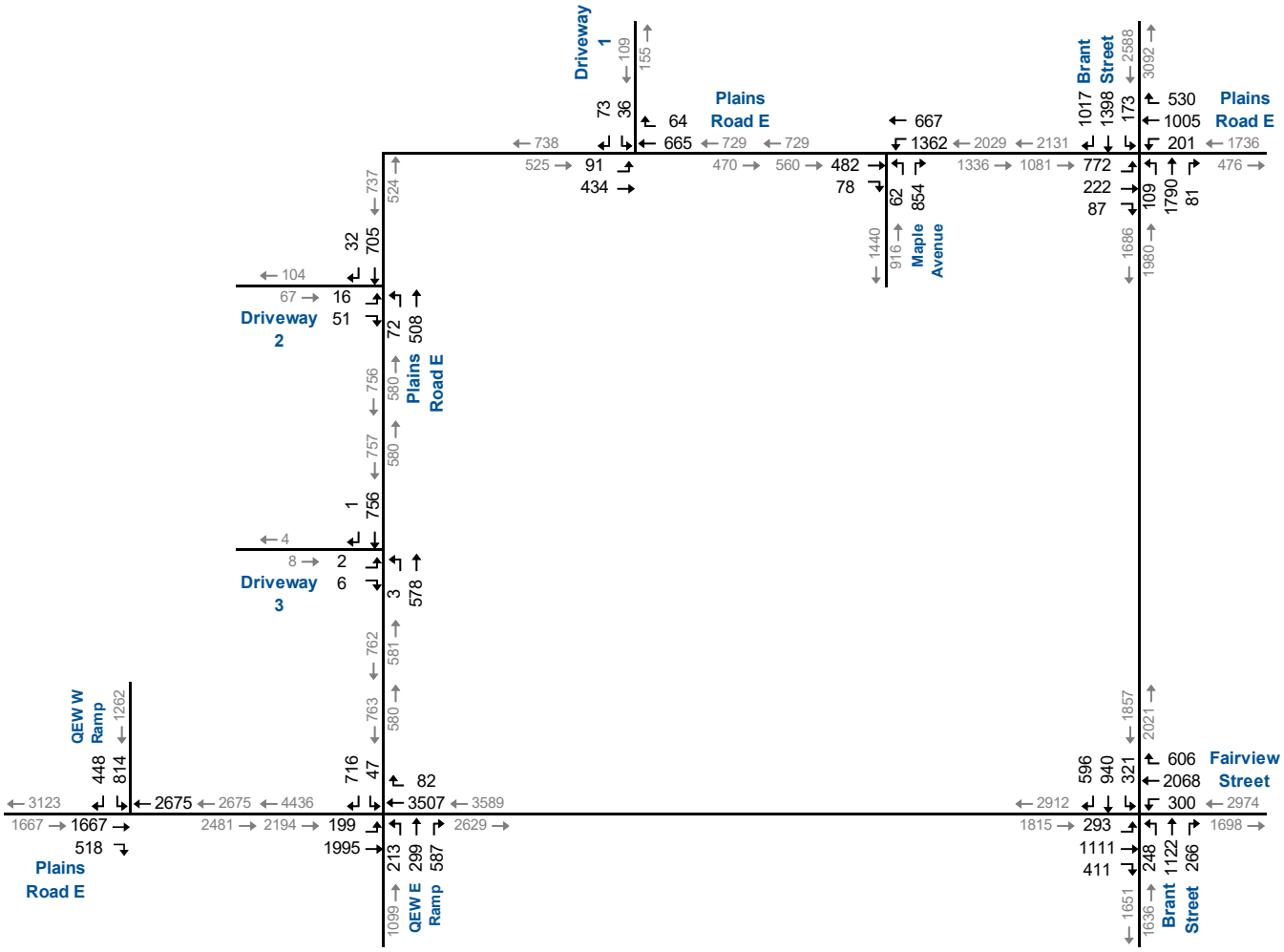
Figure 4.7B



Total Traffic
Ten-Year Horizon
AM Peak Hour

1134 & 1167 Plains Road East TIS
200402

Figure 4.8A



Total Traffic
Ten-Year Horizon
AM Peak Hour

1134 & 1167 Plains Road East TIS
200402

Figure 4.8B

4.2 Forecast Traffic Operations

The study area intersection operations analyses for the future background and future total traffic forecast followed the same methodology used for existing conditions.

4.2.1 Background Operations – Phase 1

Table 4.1 summarizes the level of service conditions. No changes to the existing lane configuration and signal timings were made. The following critical movements are noted:

- Plains Road East at QEW West Ramp:
  - Southbound left-turn – PM peak hour, queue length exceeds storage but does not impact mainline QEW.
- Plains Road East/Fairview Street at the QEW East Ramp:
  - Overall – PM peak hour, v/c ratio greater than 1.00
  - Eastbound left-turn – PM peak hour, queue length exceeds storage.
  - Westbound through/right-turn – PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length that extends beyond Maple Avenue.
  - Northbound left/through/right-turn – AM peak hour, LOS D and v/c ratio greater than 0.85.
  - Northbound right-turn – AM and PM peak hour, queue length exceeds storage but does not impact mainline QEW.
  - Southbound right-turn – PM peak hour, LOS E and v/c ratio of 0.95.
- Plains Road East at Maple Avenue:
  - Westbound left-turn – PM peak hour, queue length exceeds storage.
- Plains Road East at Brant Street:
  - Overall – AM and PM peak hour, v/c ratio greater than 1.00.
  - Eastbound left-turn – AM peak hour, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Eastbound through/right-turn – AM peak hour, LOS E and v/c ratio of 0.99.
  - Westbound right-turn – PM peak hour, LOS E, v/c ratio of 0.95, and queue length exceeds storage.

- Northbound through/right-turn – AM peak hour, LOS E and v/c ratio of 0.94. PM peak hour, LOS D and v/c ratio of 0.98.
- Southbound left-turn – AM peak hour, LOS E, v/c ratio of 0.98, and queue length exceeds storage. PM peak hour, queue length exceeds storage.
- Southbound right-turn – AM peak hour, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.

- Brant Street at Fairview Street:
  - Overall – AM peak hour, v/c ratio of 0.97. PM peak hour, v/c ratio greater than 1.00.
  - Eastbound left-turn – AM peak hour, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Westbound left-turn – PM peak hour, queue length exceeds storage.
  - Westbound through – PM peak hour, LOS F and v/c ratio greater than 1.00.
  - Northbound left-turn – AM peak hour, LOS F, v/c ratio of 0.99, and queue length exceeds storage.
  - Northbound through – PM peak hour, LOS E and v/c ratio greater than 1.00.
  - Southbound left-turn – AM peak hour, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.

Appendix G1 contains the detailed Synchro 10 reports.

The above noted capacity issues are expected to occur without the development of the subject site.



TABLE 4.1: BACKGROUND OPERATIONS – PHASE 1

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	Plains Road E/Fairview Street & QEW West Ramp	TCS	LOS		A	A	**A**		A		**A**				**A**	D		D	**D**	**A**
			Delay		6	4	**6**		5		**5**				**0**	43		38	**42**	**10**
			V/C		0.44	0.15			0.25							0.59		0.07		**0.46**
			Q		57	7			34							37		15		
			Stor.		-	-			-				-			55	-	-		
			Avail.		-	-			-							18		-		
	QEW East Ramp/Plains Road E & Fairview Street	TCS	LOS	B	C		**B**		C	>	**C**	B	D	C	**C**	B		B	**B**	**C**
			Delay	15	20		**20**		30	>	**30**	19	39	30	**32**	17		20	**20**	**26**
			V/C	0.42	0.66				0.57	>		0.30	0.88	0.78		0.11		0.40		**0.80**
			Q	17	110				73	>		44	182	127		6		42		
			Stor.	30	-				-	>		-	-	45		75	-	-		
			Avail.	13	-				-	>		-	-	-82		69		-		
	Maple Avenue & Plains Road E	TCS	LOS		D	>	**D**	B	B		**B**	C		B	**B**					**C**
			Delay		40	>	**40**	15	20		**18**	32		15	**16**					**23**
			V/C		0.78	>		0.20	0.54			0.04		0.65						**0.68**
			Q		57	>		24	78			6		77						
			Stor.		-	>		55	-			-		-						
			Avail.		-	>		31	-			-		-						
	Brant Street & Plains Road E	TCS	LOS	E	E	>	**E**	E	C	C	**D**	C	D	>	**D**	E	C	C	**D**	**D**
			Delay	63	73	>	**69**	74	35	34	**45**	25	38	>	**37**	73	29	31	**37**	**45**
			V/C	0.90	0.99	>		0.75	0.21	0.06		0.25	0.94	>		0.98	0.59	0.57		**1.03**
			Q	87	205	>		47	25	0		4	120	>		118	93	84		
			Stor.	55	-	>		50	-	75		50	-	>		40	-	30		
			Avail.	-32	-	>		3	-	75		46	-	>		-78	-	-54		
	Brant Street & Fairview Street	TCS	LOS	C	D	C	**D**	D	C	C	**D**	F	D	D	**E**	E	D	F	**E**	**D**
			Delay	27	47	24	**39**	47	34	31	**36**	89	54	40	**56**	67	53	136	**68**	**50**
			V/C	0.77	0.94	0.21		0.78	0.44	0.12		0.99	0.89	0.46		0.94	0.86	0.14		**0.97**
			Q	82	187	21		48	56	17		83	119	55		96	129	44		
			Stor.	60	-	170		60	-	-		75	-	70		45	-	-		
			Avail.	-22	-	149		12	-	-		-8	-	15		-51	-	-		
PM Peak Hour	Plains Road E/Fairview Street & QEW West Ramp	TCS	LOS		B	B	**B**		A		**A**				**A**	D		E	**D**	**B**
			Delay		13	12	**13**		7		**7**				**0**	45		58	**50**	**18**
			V/C		0.45	0.30			0.72							0.69		0.84		**0.76**
			Q		98	15			35							92		119		
			Stor.		-	-			-				-			55	-	-		
			Avail.		-	-			-							-37		-		
	QEW East Ramp/Plains Road E & Fairview Street	TCS	LOS	D	B		**B**		F	>	**F**	C	D	D	**D**	C		E	**E**	**F**
			Delay	50	13		**16**		169	>	**169**	34	45	40	**41**	31		72	**71**	**98**
			V/C	0.70	0.58				1.29	>		0.30	0.73	0.64		0.05		0.95		**1.12**
			Q	42	111				419	>		54	136	106		6		184		
			Stor.	30	-				-	>		-	-	45		75	-	-		
			Avail.	-12	-				-	>		-	-	-61		69		-		
	Maple Avenue & Plains Road E	TCS	LOS		D	>	**D**	C	B		**B**	D		B	**B**					**C**
			Delay		44	>	**44**	20	19		**20**	35		17	**17**					**23**
			V/C		0.78	>		0.70	0.57			0.08		0.73						**0.74**
			Q		58	>		104	97			9		99						
			Stor.		-	>		55	-			-		-						
			Avail.		-	>		-49	-			-		-						
	Brant Street & Plains Road E	TCS	LOS	F	D	>	**E**	E	E	E	**E**	C	D	>	**D**	E	D	F	**E**	**E**
			Delay	89	35	>	**74**	60	62	76	**66**	24	48	>	**46**	60	37	114	**69**	**63**
			V/C	1.02	0.48	>		0.72	0.94	0.95		0.53	0.98	>		0.85	0.69	1.11		**1.03**
			Q	126	80	>		64	147	154		18	143	>		59	109	239		
			Stor.	55	-	>		50	-	75		50	-	>		40	-	30		
			Avail.	-71	-	>		-14	-	-79		32	-	>		-19	-	-209		
	Brant Street & Fairview Street	TCS	LOS	F	C	C	**E**	C	F	C	**F**	E	E	D	**E**	F	C	D	**E**	**E**
			Delay	217	35	28	**64**	35	130	31	**100**	80	76	36	**70**	200	30	44	**64**	**78**
			V/C	1.34	0.71	0.32		0.80	1.19	0.64		0.93	1.01	0.24		1.32	0.79	0.92		**1.32**
			Q	120	129	43		67	317	110		67	172	31		120	128	160		
			Stor.	60	-	170		60	-	-		75	-	70		45	-	-		
			Avail.	-60	-	127		-7	-	-		8	-	39		-75	-	-		

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

4.2.2 Background Operations – Build-Out

Table 4.2 summarizes the level of service conditions. No changes to the existing lane configuration and signal timings were made. The following critical movements are noted:

- Plains Road East at QEW West Ramp:
  - Southbound left-turn – PM peak hour, queue length exceeds storage but does not impact mainline QEW.
- Plains Road East/Fairview Street at the QEW East Ramp:
  - Overall – PM peak hour, v/c ratio greater than 1.00
  - Eastbound left-turn – PM peak hour, queue length exceeds storage.
  - Westbound through/right-turn – PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length that extends beyond Maple Avenue.
  - Northbound left/through/right-turn – AM peak hour, LOS D and v/c ratio of 0.90.
  - Northbound right-turn – AM and PM peak hour, queue length exceeds storage but does not impact mainline QEW.
  - Southbound right-turn – PM peak hour, LOS E and v/c ratio of 0.97.
- Plains Road East at Maple Avenue:
  - Westbound left-turn – PM peak hour, queue length exceeds storage.
- Plains Road East at Brant Street:
  - Overall – AM and PM peak hour, v/c ratio greater than 1.00.
  - Eastbound left-turn – AM peak hour, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Eastbound through/right-turn – AM peak hour, LOS F and v/c ratio greater than 1.00.
  - Westbound left-turn – PM peak hour, queue length exceeds storage length.
  - Westbound right-turn – PM peak hour, LOS F, v/c ratio of 1.00, and queue length exceeds storage.
  - Northbound through/right-turn – AM peak hour, LOS D and v/c ratio greater than 1.00. PM peak hour, LOS E and v/c ratio greater than 1.00.

- Southbound left-turn – AM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage. PM peak hour, queue length exceeds storage.
- Southbound right-turn – AM peak hour, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.

- Brant Street at Fairview Street:
  - Overall – AM and PM peak hours, v/c ratio greater than 1.00.
  - Eastbound left-turn – AM peak hour, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Eastbound through – AM peak hour, LOS D and v/c ratio of 0.97.
  - Westbound left-turn – PM peak hour, queue length exceeds storage.
  - Westbound through – PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Northbound left-turn – AM and PM peak hours, LOS F, v/c ratio of 0.99, and queue length exceeds storage.
  - Northbound through – AM peak hour, LOS E and v/c ratio of 0.96. PM peak hour, LOS F and v/c ratio greater than 1.00.
  - Southbound left-turn – AM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Southbound right-turn – PM peak hour, LOS D and v/c ratio of 0.98.

Appendix G2 contains the detailed Synchro 10 reports.

The above noted capacity issues are expected to occur without the development of the subject site.

TABLE 4.2: BACKGROUND OPERATIONS – FULL BUILD-OUT

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	Plains Road E/Fairview Street & QEW West Ramp	TCS	LOS		A	A	A		A		A				A	D		D	D	A
			Delay		6	4	6		5		5				0	43		38	42	10
			V/C		0.46	0.16			0.26							0.60		0.07		0.48
			Q		61	7			38							39		15		
			Stor.		-	-			-				-			55	-	-		
			Avail.		-	-			-							16		-		
	QEW East Ramp/Plains Road E & Fairview Street	TCS	LOS	B	C		C		C	>	C	B	D	C	C	B		B	B	C
			Delay	16	21		21		31	>	31	18	41	31	34	17		20	20	27
			V/C	0.47	0.69				0.61	>		0.30	0.90	0.80		0.12		0.42		0.83
			Q	18	115				77	>		46	195	137		6		46		
			Stor.	30	-				-	>		-	-	45		75	-	-		
			Avail.	12	-				-	>		-	-	-92		69		-		
	Maple Avenue & Plains Road E	TCS	LOS		D	>	D	B	C		B	C		B	B					C
			Delay		40	>	40	15	20		18	32		16	17					23
			V/C		0.80	>		0.21	0.56			0.04		0.69						0.71
			Q		61	>		25	82			6		84						
			Stor.		-	>		55	-			-		-						
			Avail.		-	>		30	-			-		-						
	Brant Street & Plains Road E	TCS	LOS	E	F	>	E	E	C	C	D	C	D	>	D	F	C	C	D	D
			Delay	67	84	>	77	77	35	34	46	26	49	>	48	85	29	32	40	51
			V/C	0.93	1.04	>		0.78	0.22	0.07		0.28	1.01	>		1.02	0.62	0.61		1.07
			Q	92	218	>		48	26	0		4	125	>		126	99	93		
			Stor.	55	-	>		50	-	75		50	-	>		40	-	30		
			Avail.	-37	-	>		2	-	75		46	-	>		-86	-	-63		
	Brant Street & Fairview Street	TCS	LOS	C	D	C	D	D	C	C	D	F	E	D	E	F	E	F	E	E
			Delay	29	52	24	43	54	34	31	37	130	64	42	70	86	57	137	74	56
			V/C	0.81	0.97	0.25		0.82	0.45	0.12		1.12	0.96	0.53		1.01	0.91	0.14		1.02
			Q	87	200	26		53	58	18		94	136	64		102	142	46		
			Stor.	60	-	170		60	-	-		75	-	70		45	-	-		
			Avail.	-27	-	144		7	-	-		-19	-	6		-57	-	-		
PM Peak Hour	Plains Road E/Fairview Street & QEW West Ramp	TCS	LOS		B	B	B		A		A				A	D		E	D	B
			Delay		14	13	14		7		7				0	44		58	50	18
			V/C		0.47	0.31			0.76							0.70		0.85		0.79
			Q		103	16			34							97		125		
			Stor.		-	-			-				-			55	-	-		
			Avail.		-	-			-							-42		-		
	QEW East Ramp/Plains Road E & Fairview Street	TCS	LOS	D	B		B		F	>	F	C	D	D	D	C		E	E	F
			Delay	53	14		17		206	>	206	33	45	40	41	30		75	74	116
			V/C	0.73	0.62				1.38	>		0.31	0.75	0.66		0.05		0.97		1.18
			Q	45	121				446	>		56	145	114		6		197		
			Stor.	30	-				-	>		-	-	45		75	-	-		
			Avail.	-15	-				-	>		-	-	-69		69		-		
	Maple Avenue & Plains Road E	TCS	LOS		D	>	D	C	B		C	D		B	B					C
			Delay		45	>	45	21	20		20	36		18	19					24
			V/C		0.81	>		0.72	0.60			0.09		0.77						0.77
			Q		64	>		111	102			10		109						
			Stor.		-	>		55	-			-		-						
			Avail.		-	>		-56	-			-		-						
	Brant Street & Plains Road E	TCS	LOS	F	D	>	F	E	E	F	E	C	E	>	D	E	D	F	F	E
			Delay	101	36	>	83	60	69	89	74	24	56	>	54	71	39	146	82	73
			V/C	1.06	0.50	>		0.73	0.98	1.00		0.58	1.03	>		0.90	0.74	1.20		1.08
			Q	134	83	>		66	157	166		18	146	>		62	119	262		
			Stor.	55	-	>		50	-	75		50	-	>		40	-	30		
			Avail.	-79	-	>		-16	-	-91		32	-	>		-22	-	-232		
	Brant Street & Fairview Street	TCS	LOS	F	D	C	E	D	F	C	F	F	F	D	F	F	C	D	E	F
			Delay	239	36	29	68	51	151	32	116	134	97	37	92	226	32	53	72	91
			V/C	1.40	0.75	0.38		0.88	1.24	0.67		1.11	1.08	0.28		1.37	0.86	0.98		1.37
			Q	124	136	53		88	336	118		88	189	36		124	140	174		
			Stor.	60	-	170		60	-	-		75	-	70		45	-	-		
			Avail.	-64	-	117		-28	-	-		-13	-	34		-79	-	-		

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

4.2.3 Background Operations – Five-Year Horizon

Table 4.3 summarizes the level of service conditions. No changes to the existing lane configuration and signal timings were made. The following critical movements are noted:

- Plains Road East at QEW West Ramp:
  - Overall – PM peak hour, v/c ratio of 0.87.
  - Southbound left-turn – PM peak hour, queue length exceeds storage but does not impact mainline QEW.
- Plains Road East/Fairview Street at the QEW East Ramp:
  - Overall – AM peak hour, v/c ratio of 0.92. PM peak hour, v/c ratio greater than 1.00
  - Eastbound left-turn – PM peak hour, queue length exceeds storage.
  - Westbound through/right-turn – PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length that extends beyond Maple Avenue.
  - Northbound left/through/right-turn – AM peak hour, LOS D and v/c ratio of 0.95.
  - Northbound right-turn – AM and PM peak hour, queue length exceeds storage but does not impact mainline QEW.
  - Southbound right-turn – PM peak hour, LOS F and v/c ratio greater than 1.00.
- Plains Road East at Maple Avenue:
  - Overall – PM peak hour, v/c ratio of 0.86.
  - Eastbound through/right-turn – AM peak hour, LOS D and v/c ratio of 0.86. PM peak hour, LOS D and v/c ratio of 0.87.
  - Westbound left-turn – PM peak hour, queue length exceeds storage.
- Plains Road East at Brant Street:
  - Overall – AM and PM peak hour, v/c ratio greater than 1.00.
  - Eastbound left-turn – AM and PM peak hours, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Eastbound through/right-turn – AM peak hour, LOS F and v/c ratio greater than 1.00.
  - Westbound left-turn – AM and PM peak hour, queue length exceeds storage length.

- Westbound right-turn – PM peak hour, LOS F, v/c ratio of 1.00, and queue length exceeds storage.
- Northbound through/right-turn – AM and PM peak hours, LOS F and v/c ratio greater than 1.00.
- Southbound left-turn – AM and PM peak hours, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
- Southbound right-turn – AM peak hour, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.

- Brant Street at Fairview Street:
  - Overall – AM and PM peak hours, v/c ratio greater than 1.00.
  - Eastbound left-turn – AM peak hour, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Eastbound through – AM peak hour, LOS F and v/c ratio greater than 1.00.
  - Westbound left-turn – AM peak hour, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Westbound through – PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Northbound left-turn – AM and PM peak hours, LOS F, v/c ratio of 0.99, and queue length exceeds storage.
  - Northbound through – AM and PM peak hours, LOS F and v/c ratio greater than 1.00.
  - Southbound left-turn – AM and PM peak hours, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Southbound right-turn – PM peak hour, LOS D and v/c ratio of 0.98.

Appendix G3 contains the detailed Synchro 10 reports.

The above noted capacity issues are expected to occur without the development of the subject site.



TABLE 4.3: BACKGROUND OPERATIONS – FIVE-YEAR HORIZON

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	Plains Road E/Fairview Street & QEW West Ramp	TCS	LOS		A	A	A		A		A				A	D		D	D	B
			Delay		7	5	7		6		6				0	43		38	41	11
			V/C		0.51	0.17			0.29							0.63		0.08		0.53
			Q		74	7			46							42		16		
			Stor.		-	-			-				-			55	-	-		
			Avail.		-	-			-							13		-		
	QEW East Ramp/Plains Road E & Fairview Street	TCS	LOS	C	C		C		C	>	C	B	D	C	D	B		B	B	C
			Delay	24	25		25		35	>	35	17	48	34	38	17		19	19	31
			V/C	0.60	0.81				0.72	>		0.32	0.95	0.86		0.17		0.47		0.92
			Q	24	122				86	>		50	228	179		7		58		
			Stor.	30	-				-	>		-	-	45		75	-	-		
			Avail.	6	-				-	>		-	-	-134		68		-		
	Maple Avenue & Plains Road E	TCS	LOS		D	>	D	B	C		B	C		B	B					C
			Delay		45	>	45	15	22		19	32		20	20					26
			V/C		0.86	>		0.23	0.62			0.04		0.77						0.79
			Q		74	>		27	92			6		102						
			Stor.		-	>		55	-			-		-						
			Avail.		-	>		28	-			-		-						
	Brant Street & Plains Road E	TCS	LOS	F	F	>	F	F	D	C	D	C	F	>	F	F	C	D	D	E
			Delay	91	122	>	108	94	35	34	50	29	83	>	81	118	32	38	48	71
			V/C	1.03	1.15	>		0.86	0.25	0.07		0.33	1.11	>		1.12	0.71	0.73		1.18
			Q	106	250	>		55	28	0		4	134	>		146	112	123		
			Stor.	55	-	>		50	-	75		50	-	>		40	-	30		
			Avail.	-51	-	>		-5	-	75		46	-	>		-106	-	-93		
	Brant Street & Fairview Street	TCS	LOS	D	F	C	E	E	D	C	D	F	F	D	F	F	E	F	F	E
			Delay	42	81	24	64	72	36	32	42	170	87	46	91	113	68	128	86	73
			V/C	0.91	1.07	0.31		0.91	0.52	0.14		1.23	1.05	0.64		1.11	1.00	0.17		1.13
			Q	111	234	36		63	64	18		107	155	78		115	164	48		
			Stor.	60	-	170		60	-	-		75	-	70		45	-	-		
			Avail.	-51	-	134		-3	-	-		-32	-	-8		-70	-	-		
PM Peak Hour	Plains Road E/Fairview Street & QEW West Ramp	TCS	LOS		B	B	B		A		A				A	D		E	D	B
			Delay		17	15	16		9		9				0	43		59	49	20
			V/C		0.54	0.34			0.87							0.72		0.87		0.87
			Q		118	16			34							108		143		
			Stor.		-	-			-				-			55	-	-		
			Avail.		-	-			-							-53		-		
	QEW East Ramp/Plains Road E & Fairview Street	TCS	LOS	E	B		C		F	>	F	C	D	D	D	C		F	F	F
			Delay	62	18		21		284	>	284	32	48	42	43	29		98	97	157
			V/C	0.81	0.69				1.55	>		0.33	0.81	0.71		0.07		1.06		1.30
			Q	54	147				512	>		62	177	130		6		232		
			Stor.	30	-				-	>		-	-	45		75	-	-		
			Avail.	-24	-				-	>		-	-	-85		69		-		
	Maple Avenue & Plains Road E	TCS	LOS		D	>	D	C	C		C	D		C	C					C
			Delay		50	>	50	23	21		23	36		24	24					27
			V/C		0.87	>		0.80	0.66			0.10		0.86						0.86
			Q		74	>		130	117			10		139						
			Stor.		-	>		55	-			-		-						
			Avail.		-	>		-75	-			-		-						
	Brant Street & Plains Road E	TCS	LOS	F	D	>	F	E	F	F	F	C	F	>	F	F	D	F	F	F
			Delay	141	38	>	112	63	99	129	104	26	100	>	96	100	41	220	114	107
			V/C	1.17	0.56	>		0.77	1.08	1.12		0.64	1.13	>		1.00	0.81	1.37		1.22
			Q	153	93	>		73	183	194		18	156	>		73	134	311		
			Stor.	55	-	>		50	-	75		50	-	>		40	-	30		
			Avail.	-98	-	>		-23	-	-119		32	-	>		-33	-	-281		
	Brant Street & Fairview Street	TCS	LOS	F	D	C	F	F	F	D	F	F	F	D	F	F	D	F	F	F
			Delay	300	41	31	82	101	208	36	161	172	137	38	126	287	39	90	98	123
			V/C	1.54	0.84	0.47		1.04	1.37	0.76		1.22	1.18	0.34		1.51	0.95	1.11		1.51
			Q	141	155	68		119	387	145		100	217	43		129	163	204		
			Stor.	60	-	170		60	-	-		75	-	70		45	-	-		
			Avail.	-81	-	102		-59	-	-		-25	-	27		-84	-	-		

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

4.2.4 Background Operations – Ten-Year Horizon

Table 4.4 summarizes the level of service conditions. No changes to the existing lane configuration and signal timings were made. The following critical movements are noted:

- Plains Road East at QEW West Ramp:
  - Overall – PM peak hour, v/c ratio of 0.96.
  - Westbound through – PM peak hour, v/c ratio 0.99.
  - Southbound left-turn – PM peak hour, queue length exceeds storage b but does not impact mainline QEW.
- Plains Road East/Fairview Street at the QEW East Ramp:
  - Overall – AM peak hour, v/c ratio of 0.92. PM peak hour, v/c ratio greater than 1.00
  - Eastbound left-turn – PM peak hour, queue length exceeds storage.
  - Westbound through/right-turn – PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length that extends beyond Maple Avenue.
  - Northbound left/through/right-turn – AM peak hour, LOS E and v/c ratio greater than 1.00.
  - Northbound right-turn – AM and PM peak hour, queue length exceeds storage but does not impact mainline QEW.
  - Southbound right-turn – PM peak hour, LOS F and v/c ratio greater than 1.00.
- Plains Road East at Maple Avenue:
  - Overall – AM peak hour, v/c ratio greater than 0.85. PM peak hour, v/c ratio of 0.95.
  - Eastbound through/right-turn – AM peak hour, LOS D and v/c ratio of 0.93. PM peak hour, LOS E and v/c ratio of 0.96.
  - Westbound left-turn – PM peak hour, queue length exceeds storage.
- Plains Road East at Brant Street:
  - Overall – AM and PM peak hour, v/c ratio greater than 1.00.
  - Eastbound left-turn – AM and PM peak hours, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Eastbound through/right-turn – AM peak hour, LOS F and v/c ratio greater than 1.00.

- Westbound left-turn – AM peak hour, LOS F, v/c ratio of 0.95, and queue length exceed storage. PM peak hour, queue length exceeds storage length.
- Westbound through – PM peak hour, LOS F and v/c ration greater than 1.00.
- Westbound right-turn – PM peak hour, LOS F, v/c ratio of 1.00, and queue length exceeds storage.
- Northbound through/right-turn – AM and PM peak hours, LOS F and v/c ratio greater than 1.00.
- Southbound left-turn – AM and PM peak hours, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
- Southbound right-turn – AM peak hour, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.

- Brant Street at Fairview Street:
  - Overall – AM and PM peak hours, v/c ratio greater than 1.00.
  - Eastbound left-turn – AM peak hour, LOS E, v/c ratio greater than 1.00, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Eastbound through – AM peak hour, LOS F and v/c ratio greater than 1.00.
  - Westbound left-turn – AM peak hour, LOS F, v/c ratio of 0.99, and queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Westbound through – PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Northbound left-turn – AM and PM peak hours, LOS F, v/c ratio of 0.99, and queue length exceeds storage.
  - Northbound through – AM and PM peak hours, LOS F and v/c ratio greater than 1.00.
  - Northbound right-turn – AM peak hour, queue length exceeds storage.
  - Southbound left-turn – AM and PM peak hours, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Southbound through – AM peak hour, LOS F and v/c ratio greater than 1.00. PM peak hour, LOS E and v/c ratio greater than 1.00.

- Southbound right-turn – PM peak hour, LOS D and v/c ratio of 0.98.

Appendix G4 contains the detailed Synchro 10 reports.

The above noted capacity issues are expected to occur without the development of the subject site.

TABLE 4.4: BACKGROUND OPERATIONS – TEN-YEAR HORIZON

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	Plains Road E/Fairview Street & QEW West Ramp	TCS	LOS		A	A	A		A		A				A	D		D	D	B
			Delay		8	5	7		8		8				0	44		38	42	12
			V/C		0.57	0.19			0.32							0.66		0.17		0.59
			Q		86	8			54							46		21		
			Stor.		-	-			-				-			55	-	-		
			Avail.		-	-			-							9		-		
	QEW East Ramp/Plains Road E & Fairview Street	TCS	LOS	C	C		C		D	>	D	B	E	D	D	B		B	B	D
			Delay	32	30		30		39	>	39	17	69	45	51	17		20	19	38
			V/C	0.69	0.91				0.82	>		0.35	1.04	0.94		0.24		0.53		1.01
			Q	35	146				97	>		56	265	211		8		72		
			Stor.	30	-				-	>		-	-	45		75	-	-		
			Avail.	-5	-				-	>		-	-	-166		67		-		
	Maple Avenue & Plains Road E	TCS	LOS		D	>	D	B	C		C	C		C	C					C
			Delay		54	>	54	15	24		20	33		26	26					31
			V/C		0.93	>		0.26	0.68			0.05		0.86						0.88
			Q		86	>		30	106			6		150						
			Stor.		-	>		55	-			-		-						
			Avail.		-	>		25	-			-		-						
	Brant Street & Plains Road E	TCS	LOS	F	F	>	F	F	D	C	E	C	F	>	F	F	C	D	E	F
			Delay	126	169	>	149	117	35	34	56	32	130	>	127	162	34	46	59	98
			V/C	1.13	1.26	>		0.95	0.27	0.08		0.36	1.22	>		1.24	0.78	0.84		1.31
			Q	122	285	>		61	31	0		4	134	>		167	127	161		
			Stor.	55	-	>		50	-	75		50	-	>		40	-	30		
			Avail.	-67	-	>		-11	-	75		46	-	>		-127	-	-131		
	Brant Street & Fairview Street	TCS	LOS	E	F	C	F	F	D	C	D	F	F	D	F	F	F	F	F	F
			Delay	73	125	25	99	95	37	32	48	217	123	51	122	153	98	102	110	100
			V/C	1.04	1.18	0.37		0.99	0.58	0.16		1.35	1.15	0.74		1.23	1.10	0.23		1.24
			Q	148	272	46		71	71	20		121	178	103		125	187	48		
			Stor.	60	-	170		60	-	-		75	-	70		45	-	-		
			Avail.	-88	-	124		-11	-	-		-46	-	-33		-80	-	-		
PM Peak Hour	Plains Road E/Fairview Street & QEW West Ramp	TCS	LOS		B	B	B		B		B				A	D		E	D	C
			Delay		20	16	19		16		16				0	42		62	50	24
			V/C		0.61	0.37			0.99							0.74		0.91		0.96
			Q		135	16			35							122		176		
			Stor.		-	-			-				-			55	-	-		
			Avail.		-	-			-							-67		-		
	QEW East Ramp/Plains Road E & Fairview Street	TCS	LOS	E	C		C		F	>	F	C	E	D	D	C		F	F	F
			Delay	76	22		25		356	>	356	33	59	47	49	30		145	143	198
			V/C	0.89	0.76				1.71	>		0.36	0.90	0.79		0.10		1.19		1.45
			Q	60	173				584	>		68	208	160		7		271		
			Stor.	30	-				-	>		-	-	45		75	-	-		
			Avail.	-30	-				-	>		-	-	-115		68		-		
	Maple Avenue & Plains Road E	TCS	LOS		E	>	E	C	C		C	D		D	D					C
			Delay		64	>	64	28	23		26	36		36	36					34
			V/C		0.96	>		0.88	0.73			0.11		0.95						0.95
			Q		86	>		155	136			11		202						
			Stor.		-	>		55	-			-		-						
			Avail.		-	>		-100	-			-		-						
	Brant Street & Plains Road E	TCS	LOS	F	D	>	F	E	F	F	F	C	F	>	F	F	D	F	F	F
			Delay	192	41	>	149	66	142	183	146	28	151	>	144	129	46	306	152	148
			V/C	1.29	0.64	>		0.81	1.19	1.26		0.70	1.25	>		1.10	0.89	1.57		1.39
			Q	175	104	>		85	210	224		18	169	>		84	151	365		
			Stor.	55	-	>		50	-	75		50	-	>		40	-	30		
			Avail.	-120	-	>		-35	-	-149		32	-	>		-44	-	-335		
	Brant Street & Fairview Street	TCS	LOS	F	D	C	F	F	F	D	F	F	F	D	F	F	E	F	F	F
			Delay	369	49	32	99	135	271	44	210	218	187	40	167	358	57	148	138	161
			V/C	1.70	0.93	0.54		1.14	1.51	0.86		1.33	1.30	0.41		1.67	1.04	1.26		1.67
			Q	158	190	82		136	442	192		112	248	52		135	182	229		
			Stor.	60	-	170		60	-	-		75	-	70		45	-	-		
			Avail.	-98	-	88		-76	-	-		-37	-	18		-90	-	-		

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

4.2.5 Total Operations – Phase 1

Table 4.5 summarizes the level of service conditions. No changes to the existing lane configuration and signal timings were made. Overall, the incremental impact of the proposed development is considered minor. The following critical movements are noted:

- Plains Road East at QEW West Ramp:
  - Southbound left-turn – PM peak hour, queue length exceeds storage but does not impact mainline QEW.
- Plains Road East/Fairview Street at the QEW East Ramp:
  - Overall – PM peak hour, v/c ratio greater than 1.00
  - Eastbound left-turn – PM peak hour, LOS F, v/c ratio of 0.95, and queue length exceeds storage.
  - Westbound through/right-turn – PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length that extends beyond Maple Avenue.
  - Northbound left/through/right-turn – AM peak hour, LOS D and v/c ratio greater than 0.85.
  - Northbound right-turn – AM and PM peak hour, queue length exceeds storage but does not impact mainline QEW.
  - Southbound right-turn – PM peak hour, LOS F and v/c ratio greater than 1.00.
- Plains Road East at Maple Avenue:
  - Westbound left-turn – PM peak hour, queue length exceeds storage.
- Plains Road East at Brant Street:
  - Overall – AM and PM peak hour, v/c ratio greater than 1.00.
  - Eastbound left-turn – AM peak hour, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Eastbound through/right-turn – AM peak hour, LOS E and v/c ratio greater than 1.00.
  - Westbound right-turn – PM peak hour, LOS E, v/c ratio of 0.95, and queue length exceeds storage.
  - Northbound through/right-turn – AM peak hour, LOS D and v/c ratio of 0.94. PM peak hour, LOS D and v/c ratio of 0.97.

- Southbound left-turn – AM peak hour, LOS E, v/c ratio of 0.98, and queue length exceeds storage. PM peak hour, queue length exceeds storage.
- Southbound right-turn – AM peak hour, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.

- Brant Street at Fairview Street:
  - Overall – AM peak hour, v/c ratio of 0.99. PM peak hour, v/c ratio greater than 1.00.
  - Eastbound left-turn – AM peak hour, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Westbound left-turn – PM peak hour, queue length exceeds storage.
  - Westbound through – PM peak hour, LOS F and v/c ratio greater than 1.00.
  - Northbound left-turn – AM peak hour, LOS F, v/c ratio of 0.99, and queue length exceeds storage.
  - Northbound through – PM peak hour, LOS E and v/c ratio greater than 1.00.
  - Southbound left-turn – AM peak hour, LOS E, v/c ratio of 0.97, and queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
- Site Driveway
  - The site driveway is forecast to operate with low levels of delay and v/c ratios during the AM and PM peak hours. Queues into and out of the Driveway 1 are forecast to be 2 vehicles or less. The queue spill back from the southbound right-turn at Plains Road East and Fairview Street is forecast to extend past the site driveway during the PM peak hour.

Appendix H1 contains the detailed Synchro 10 reports.

The capacity issues experienced under the background traffic horizon are expected to continue to occur with or without the development of the subject site. Site traffic impacts are minimal with minor changes in delay at the study area intersections.

TABLE 4.5A: TOTAL OPERATIONS – PHASE 1 (AM PEAK HOUR)

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	Plains Road E/Fairview Street & QEW West Ramp	TCS	LOS		A	A	**A**		A		**A**				**A**	D		D	**D**	**A**
			Delay		6	4	**6**		5		**5**				**0**	43		38	**42**	**10**
			V/C		0.44	0.15			0.25							0.60		0.07		**0.47**
			Q		57	7			34							38		15		
			Stor.		-	-			-				-			55	-	-		
			Avail.		-	-			-							17		-		
	QEW East Ramp/Plains Road E & Fairview Street	TCS	LOS	B	C		**B**		C	>	**C**	B	D	C	**C**	B		C	**C**	**C**
			Delay	16	20		**20**		30	>	**30**	19	39	32	**33**	20		21	**21**	**26**
			V/C	0.46	0.66				0.57	>		0.30	0.88	0.81		0.28		0.50		**0.80**
			Q	18	110				73	>		44	182	134		13		59		
			Stor.	30	-				-	>		-	-	45		25	-	-		
			Avail.	12	-				-	>		-	-	-89		12		-		
	Maple Avenue & Plains Road E	TCS	LOS		D	>	**D**	B	C		**B**	C		B	**B**					**C**
			Delay		45	>	**45**	15	20		**18**	33		16	**16**					**25**
			V/C		0.85	>		0.20	0.55			0.07		0.67						**0.71**
			Q		72	>		24	80			8		78						
			Stor.		-	>		55	-			-		-						
			Avail.		-	>		31	-			-		-						
	Brant Street & Plains Road E	TCS	LOS	E	F	>	**E**	E	C	C	**D**	C	D	>	**D**	E	C	C	**D**	**D**
			Delay	69	81	>	**75**	74	35	34	**45**	25	38	>	**37**	73	29	31	**37**	**47**
			V/C	0.94	1.02	>		0.75	0.22	0.06		0.25	0.94	>		0.98	0.59	0.58		**1.05**
			Q	93	214	>		47	25	0		4	120	>		118	93	85		
			Stor.	55	-	>		50	-	75		50	-	>		40	-	30		
			Avail.	-38	-	>		3	-	75		46	-	>		-78	-	-55		
	Brant Street & Fairview Street	TCS	LOS	C	D	C	**D**	D	C	C	**D**	F	D	D	**E**	E	D	F	**E**	**D**
			Delay	27	49	24	**40**	47	34	30	**36**	108	53	40	**60**	75	53	136	**69**	**51**
			V/C	0.77	0.96	0.24		0.78	0.44	0.12		1.05	0.88	0.47		0.97	0.86	0.14		**0.99**
			Q	82	195	25		49	56	17		86	119	55		96	129	44		
			Stor.	60	-	170		60	-	-		75	-	70		45	-	-		
			Avail.	-22	-	145		11	-	-		-11	-	15		-51	-	-		
	Plains Road E & Driveway 1	TWSC	LOS	<	A		**A**		A	>	**A**					C		>	**C**	**A**
			Delay	<	1		**1**		0	>	**0**					17		>	**17**	**3**
			V/C	<	0.03				0.26	>						0.34		>		
			Q	<	1				0	>						12		>		

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

TABLE 4.5B: TOTAL OPERATIONS – PHASE 1 (PM PEAK HOUR)

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	
PM Peak Hour	Plains Road E/Fairview Street & QEW West Ramp	TCS	LOS		B	B	B		A		A				A	D		E	D	B
			Delay		13	12	13		7		7				0	47		60	51	18
			V/C		0.44	0.30			0.72							0.74		0.85		0.76
			Q		93	14			34							101		123		
			Stor.		-	-			-				-			55	-	-		
			Avail.		-	-			-							-46		-		
	QEW East Ramp/Plains Road E & Fairview Street	TCS	LOS	F	B		C		F	>	F	C	D	D	D	C		F	F	F
			Delay	100	14		21		198	>	198	32	42	39	39	30		86	83	113
			V/C	0.95	0.60				1.36	>		0.29	0.72	0.63		0.16		1.01		1.19
			Q	70	98				424	>		54	144	112		13		218		
			Stor.	30	-				-	>		-	-	45		75	-	-		
			Avail.	-40	-				-	>		-	-	-67		62		-		
	Maple Avenue & Plains Road E	TCS	LOS		D	>	D	C	B		C	D		B	B					C
			Delay		47	>	47	20	20		20	38		17	18					24
			V/C		0.84	>		0.70	0.61			0.24		0.74						0.76
			Q		67	>		104	105			20		100						
			Stor.		-	>		55	-			-		-						
			Avail.		-	>		-49	-			-		-						
	Brant Street & Plains Road E	TCS	LOS	F	D	>	E	E	E	E	E	C	D	>	D	E	D	F	E	E
			Delay	91	36	>	76	60	64	76	67	24	47	>	46	63	37	122	73	65
			V/C	1.03	0.49	>		0.72	0.96	0.95		0.54	0.97	>		0.87	0.69	1.13		1.04
			Q	128	82	>		64	152	154		18	141	>		58	109	245		
			Stor.	55	-	>		50	-	75		50	-	>		40	-	30		
			Avail.	-73	-	>		-14	-	-79		32	-	>		-18	-	-215		
	Brant Street & Fairview Street	TCS	LOS	F	D	C	E	C	F	C	F	F	E	D	E	F	C	E	E	F
			Delay	262	35	28	71	32	118	29	91	115	76	36	75	243	32	58	77	80
			V/C	1.45	0.74	0.35		0.78	1.17	0.62		1.05	1.01	0.24		1.42	0.82	0.98		1.4
			Q	124	137	48		62	318	107		82	172	31		123	128	172		
			Stor.	60	-	170		60	-	-		75	-	70		45	-	-		
			Avail.	-64	-	122		-2	-	-		-7	-	39		-78	-	-		
	Plains Road E & Driveway 1	TWSC	LOS	<	A		A		A	>	A					C		>	C	A
			Delay	<	3		3		0	>	0					20		>	20	3
			V/C	<	0.11				0.36	>						0.34		>		
			Q	<	3				0	>						12		>		

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

4.2.6 Total Operations – Build-Out

Table 4.7 summarizes the level of service conditions. No changes to the existing lane configuration and signal timings were made. Overall, the incremental impact of the proposed development is considered minor. The following critical movements are noted:

- Plains Road East at QEW West Ramp:
  - Southbound left-turn – PM peak hour, queue length exceeds storage but does not impact mainline QEW.
- Plains Road East/Fairview Street at the QEW East Ramp:
  - Overall – PM peak hour, v/c ratio greater than 1.00
  - Eastbound left-turn – PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Westbound through/right-turn – PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length that extends beyond Maple Avenue.
  - Northbound left/through/right-turn – AM peak hour, LOS D and v/c ratio of 0.91.
  - Northbound right-turn – AM and PM peak hour, queue length exceeds storage but does not impact mainline QEW.
  - Southbound right-turn – PM peak hour, LOS F and v/c ratio greater than 1.00.
- Plains Road East at Maple Avenue:
  - Eastbound through/right-turn – AM peak hour, LOS D and v/c ratio of 0.93. PM peak hour, LOS D and v/c ratio greater than 0.85.
  - Westbound left-turn – PM peak hour, queue length exceeds storage.
- Plains Road East at Brant Street:
  - Overall – AM and PM peak hour, v/c ratio greater than 1.00.
  - Eastbound left-turn – AM and PM peak hours, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Eastbound through/right-turn – AM peak hour, LOS F and v/c ratio greater than 1.00.
  - Westbound left-turn – PM peak hour, queue length exceeds storage length.
  - Westbound right-turn – PM peak hour, LOS F, v/c ratio of 1.00, and queue length exceeds storage.



- Northbound through/right-turn – AM peak hour, LOS D and v/c ratio greater than 1.00. PM peak hour, LOS E and v/c ratio greater than 1.00.
- Southbound left-turn – AM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage. PM peak hour, queue length exceeds storage.
- Southbound right-turn – AM peak hour, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.

- Brant Street at Fairview Street:
  - Overall – AM and PM peak hours, v/c ratio greater than 1.00.
  - Eastbound left-turn – AM peak hour, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Eastbound through – AM peak hour, LOS E and v/c ratio greater than 1.00.
  - Westbound left-turn – PM peak hour, queue length exceeds storage.
  - Westbound through – PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Northbound left-turn – AM and PM peak hours, LOS F, v/c ratio of 0.99, and queue length exceeds storage.
  - Northbound through – AM peak hour, LOS E and v/c ratio of 0.96. PM peak hour, LOS F and v/c ratio greater than 1.00.
  - Southbound left-turn – AM and PM peak hours, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Southbound right-turn – PM peak hour, LOS E and v/c ratio greater than 1.00.
- Site Driveway – Phase 1
  - The site driveway is forecast to operate with low levels of delay and v/c ratios during the AM and PM peak hours. Queues into and out of Driveway 1 are forecast to be 2 vehicles or less. The queue spill back from the southbound right-turn at Plains Road East and Fairview Street is forecast to extend past the site driveway during the PM peak hour.

- Site Driveways – Phase 2
  - The site driveways are forecast to operate with low levels of delay and v/c ratios during the AM and PM peak hours. Queues into and out Driveway 2 and Driveway 3 are forecast to be 1 vehicle or less. The queue spill back from the southbound right-turn at Plains Road East and Fairview Street is forecast to extend past the two driveways during the PM peak hour.

Appendix H2 contains the detailed Synchro 10 reports.

The capacity issues experienced under the background traffic horizon are expected to continue to occur with or without the development of the subject site. Site traffic impacts are minimal with minor changes in delay at the study area intersections.

TABLE 4.7A: TOTAL OPERATIONS – BUILD-OUT AM PEAK HOUR

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	Plains Road E/Fairview Street & QEW West Ramp	TCS	LOS		A	A	**A**		A		**A**				**A**	D		D	**D**	**B**
			Delay		6	5	**6**		5		**5**				**0**	43		38	**42**	**10**
			V/C		0.46	0.16			0.27							0.62		0.07		**0.49**
			Q		62	7			37							40		15		
			Stor.		-	-			-				-			55	-	-		
			Avail.		-	-			-							15		-		
	QEW East Ramp/Plains Road E & Fairview Street	TCS	LOS	B	C		**C**		C	>	**C**	B	D	C	**C**	C		C	**C**	**C**
			Delay	19	22		**22**		32	>	**32**	18	42	32	**34**	27		22	**23**	**28**
			V/C	0.56	0.71				0.64	>		0.30	0.91	0.82		0.57		0.59		**0.84**
			Q	20	110				78	>		46	205	146		30		80		
			Stor.	30	-				-	>		-	-	45		25	-	-		
			Avail.	10	-				-	>		-	-	-101		-5		-		
	Maple Avenue & Plains Road E	TCS	LOS		D	>	**D**	B	C		**B**	C		B	**B**					**C**
			Delay		54	>	**54**	15	21		**18**	33		17	**18**					**29**
			V/C		0.93	>		0.21	0.58			0.08		0.70						**0.76**
			Q		85	>		25	86			9		85						
			Stor.		-	>		55	-			-		-						
			Avail.		-	>		30	-			-		-						
	Brant Street & Plains Road E	TCS	LOS	F	F	>	**F**	E	C	C	**D**	C	D	>	**D**	F	C	C	**D**	**E**
			Delay	86	100	>	**93**	77	35	34	**46**	25	49	>	**48**	85	29	33	**40**	**55**
			V/C	1.01	1.08	>		0.78	0.23	0.07		0.28	1.01	>		1.02	0.62	0.63		**1.10**
			Q	103	231	>		48	26	0		4	125	>		126	99	96		
			Stor.	55	-	>		50	-	75		50	-	>		40	-	30		
			Avail.	-48	-	>		2	-	75		46	-	>		-86	-	-66		
	Brant Street & Fairview Street	TCS	LOS	C	E	C	**D**	D	C	C	**D**	F	E	D	**E**	F	E	F	**E**	**E**
			Delay	30	62	24	**50**	54	34	31	**38**	147	64	42	**73**	86	57	136	**74**	**60**
			V/C	0.81	1.01	0.29		0.82	0.47	0.12		1.17	0.96	0.54		1.01	0.91	0.14		**1.06**
			Q	89	214	33		53	60	18		100	136	64		102	141	46		
			Stor.	60	-	170		60	-	-		75	-	70		45	-	-		
			Avail.	-29	-	137		7	-	-		-25	-	6		-57	-	-		
	Plains Road E & Driveway 2	TWSC	LOS	B		>	**B**					<	A		**A**		A	>	**A**	**A**
			Delay	12		>	**12**					<	0		**0**		0	>	**0**	**0**
			V/C	0.00		>						<	0.01				0.36	>		
			Q	0		>						<	0				0	>		
	Plains Road E & Driveway 3	TWSC	LOS	B		>	**B**					<	A		**A**		A	>	**A**	**A**
			Delay	14		>	**14**					<	1		**1**		0	>	**0**	**2**
			V/C	0.22		>						<	0.03				0.32	>		
			Q	7		>						<	1				0	>		
	Plains Road E & Driveway 1	TWSC	LOS	<	A		**A**		A	>	**A**					C		>	**C**	**A**
			Delay	<	1		**1**		0	>	**0**					19		>	**19**	**3**
			V/C	<	0.03				0.27	>						0.38		>		
			Q	<	1				0	>						14		>		

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

TABLE 4.7B: TOTAL OPERATIONS – BUILD-OUT PM PEAK HOUR

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	
PM Peak Hour	Plains Road E/Fairview Street & QEW West Ramp	TCS	LOS		B	B	**B**		A		**A**				**A**	D		E	**D**	**B**
			Delay		14	13	**14**		8		**8**				**0**	47		59	**51**	**19**
			V/C		0.47	0.31			0.76							0.77		0.85		**0.79**
			Q		98	15			34							110		130		
			Stor.		-	-			-				-			55	-	-		
			Avail.		-	-			-							-55		-		
	QEW East Ramp/Plains Road E & Fairview Street	TCS	LOS	F	B		**C**		F	>	**F**	C	D	D	**D**	C		F	**F**	**F**
			Delay	162	15		**29**		230	>	**230**	32	46	41	**42**	34		125	**118**	**134**
			V/C	1.15	0.63				1.43	>		0.30	0.79	0.68		0.34		1.13		**1.29**
			Q	92	106				456	>		56	162	123		23		255		
			Stor.	30	-				-	>		-	-	45		25	-	-		
			Avail.	-62	-				-	>		-	-	-78		2		-		
	Maple Avenue & Plains Road E	TCS	LOS		D	>	**D**	C	C		**C**	D		B	**C**					**C**
			Delay		52	>	**52**	21	21		**21**	40		19	**20**					**26**
			V/C		0.88	>		0.72	0.66			0.31		0.77						**0.80**
			Q		75	>		111	117			23		110						
			Stor.		-	>		55	-			-		-						
			Avail.		-	>		-56	-			-		-						
	Brant Street & Plains Road E	TCS	LOS	F	D	>	**F**	E	E	F	**E**	C	E	>	**D**	E	D	F	**F**	**E**
			Delay	106	36	>	**86**	60	77	89	**79**	25	56	>	**54**	71	39	162	**89**	**77**
			V/C	1.07	0.52	>		0.73	1.01	1.00		0.58	1.03	>		0.90	0.74	1.23		**1.10**
			Q	136	86	>		66	165	166		18	144	>		62	119	273		
			Stor.	55	-	>		50	-	75		50	-	>		40	-	30		
			Avail.	-81	-	>		-16	-	-91		32	-	>		-22	-	-243		
	Brant Street & Fairview Street	TCS	LOS	F	D	C	**E**	D	F	C	**F**	F	F	D	**F**	F	D	E	**F**	**F**
			Delay	286	39	30	**76**	50	144	30	**111**	191	97	37	**102**	271	35	72	**88**	**96**
			V/C	1.51	0.80	0.44		0.85	1.23	0.65		1.27	1.08	0.28		1.48	0.89	1.05		**1.45**
			Q	129	147	64		86	343	115		105	189	36		127	144	186		
			Stor.	60	-	170		60	-	-		75	-	70		45	-	-		
			Avail.	-69	-	106		-26	-	-		-30	-	34		-82	-	-		
	Plains Road E & Driveway 2	TWSC	LOS	B		>	**B**					<	A		**A**		A	>	**A**	**A**
			Delay	13		>	**13**					<	0		**0**		0	>	**0**	**0**
			V/C	0.02		>						<	0.00				0.41	>		
			Q	1		>						<	0				0	>		
	Plains Road E & Driveway 3	TWSC	LOS	B		>	**B**					<	A		**A**		A	>	**A**	**A**
			Delay	14		>	**14**					<	2		**2**		0	>	**0**	**2**
			V/C	0.15		>						<	0.09				0.40	>		
			Q	4		>						<	2				0	>		
	Plains Road E & Driveway 1	TWSC	LOS	<	A		**A**		A	>	**A**					C		>	**C**	**A**
			Delay	<	3		**3**		0	>	**0**					24		>	**24**	**3**
			V/C	<	0.11				0.39	>						0.39		>		
			Q	<	3				0	>						14		>		

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

4.2.7 Total Operations – Five-Year Horizon

Table 4.9 summarizes the level of service conditions. No changes to the existing lane configuration and signal timings were made. Overall, the incremental impact of the proposed development is considered minor. The following critical movements are noted:

- Plains Road East at QEW West Ramp:
  - Overall – PM peak hour, v/c ratio greater than 0.85.
  - Southbound left-turn – PM peak hour, queue length exceeds storage but does not impact mainline QEW.
- Plains Road East/Fairview Street at the QEW East Ramp:
  - Overall – AM peak hour, v/c ratio of 0.93. PM peak hour, v/c ratio greater than 1.00
  - Eastbound left-turn – PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Westbound through/right-turn – PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length that extends beyond Maple Avenue.
  - Northbound left/through/right-turn – AM peak hour, LOS D and v/c ratio of 0.97.
  - Northbound right-turn – AM and PM peak hour, queue length exceeds storage but does not impact mainline QEW.
  - Southbound right-turn – PM peak hour, LOS F and v/c ratio greater than 1.00.
- Plains Road East at Maple Avenue:
  - Overall – PM peak hour, v/c ratio greater than 0.85.
  - Eastbound through/right-turn – AM peak hour, LOS E and v/c ratio greater than 1.00. PM peak hour, LOS D and v/c ratio of 0.96.
  - Westbound left-turn – PM peak hour, queue length exceeds storage.
- Plains Road East at Brant Street:
  - Overall – AM and PM peak hour, v/c ratio greater than 1.00.
  - Eastbound left-turn – AM and PM peak hours, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Eastbound through/right-turn – AM peak hour, LOS F and v/c ratio greater than 1.00.

- Westbound left-turn – AM and PM peak hour, queue length exceeds storage length.
- Westbound through – PM peak hour, LOS F and v/c ratio greater than 1.00.
- Westbound right-turn – PM peak hour, LOS F, v/c ratio of 1.00, and queue length exceeds storage.
- Northbound through/right-turn – AM and PM peak hours, LOS F and v/c ratio greater than 1.00.
- Southbound left-turn – AM and PM peak hours, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
- Southbound right-turn – AM peak hour, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.

- Brant Street at Fairview Street:
  - Overall – AM and PM peak hours, v/c ratio greater than 1.00.
  - Eastbound left-turn – AM peak hour, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Eastbound through – AM peak hour, LOS F and v/c ratio greater than 1.00.
  - Westbound left-turn – AM peak hour, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Westbound through – PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Northbound left-turn – AM and PM peak hours, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Northbound through – AM and PM peak hours, LOS F and v/c ratio greater than 1.00.
  - Southbound left-turn – AM and PM peak hours, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Southbound right-turn – PM peak hour, LOS F and v/c ratio greater than 1.00.
- Site Driveway – Phase 1
  - The site driveway is forecast to operate with low levels of delay and v/c ratios during the AM and PM peak hours. Queues into and out of the Driveway 1 are forecast to be 3 vehicles or less. The queue spill back from the southbound

right-turn at Plains Road East and Fairview Street is forecast to extend past the site driveway during the PM peak hour.

- Site Driveways – Phase 2
  - The site driveways are forecast to operate with low levels of delay and v/c ratios during the AM and PM peak hours. Queues into and out Driveway 2 and Driveway 3 are forecast to be 1 vehicle or less. The queue spill back from the southbound right-turn at Plains Road East and Fairview Street is forecast to extend past the two driveways during the PM peak hour.

Appendix H3 contains the detailed Synchro 10 reports.

The capacity issues experienced under the background traffic horizon are expected to continue to occur with or without the development of the subject site. Site traffic impacts are minimal with minor changes in delay at the study area intersections.

TABLE 4.9A: TOTAL OPERATIONS FIVE-YEAR HORIZON – AM PEAK HOUR

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	Plains Road E/Fairview Street & QEW West Ramp	TCS	LOS		A	A	**A**		A		**A**				**A**	D		D	**D**	**B**
			Delay		7	5	**7**		6		**6**				**0**	43		37	**42**	**11**
			V/C		0.52	0.17			0.30							0.64		0.08		**0.54**
			Q		74	7			44							44		16		
			Stor.		-	-			-				-			55	-	-		
			Avail.		-	-			-							11		-		
	QEW East Ramp/Plains Road E & Fairview Street	TCS	LOS	C	C		**C**		D	>	**D**	B	D	D	**D**	E		C	**C**	**C**
			Delay	31	25		**26**		36	>	**36**	17	51	36	**40**	58		22	**26**	**32**
			V/C	0.71	0.81				0.74	>		0.32	0.97	0.88		0.79		0.64		**0.93**
			Q	37	122				88	>		50	238	188		40		95		
			Stor.	30	-				-	>		-	-	45		25	-	-		
			Avail.	-7	-				-	>		-	-	-143		-15		-		
	Maple Avenue & Plains Road E	TCS	LOS		E	>	**E**	B	C		**B**	C		C	**C**					**C**
			Delay		72	>	**72**	15	22		**19**	33		20	**21**					**35**
			V/C		1.01	>		0.23	0.64			0.09		0.78						**0.83**
			Q		95	>		27	97			10		104						
			Stor.		-	>		55	-			-		-						
			Avail.		-	>		28	-			-		-						
	Brant Street & Plains Road E	TCS	LOS	F	F	>	**F**	F	D	C	**D**	C	F	>	**F**	F	C	D	**D**	**E**
			Delay	115	140	>	**128**	94	35	34	**50**	29	83	>	**81**	118	32	39	**48**	**76**
			V/C	1.10	1.19	>		0.86	0.25	0.07		0.33	1.11	>		1.12	0.71	0.74		**1.21**
			Q	117	264	>		55	29	0		4	134	>		146	112	133		
			Stor.	55	-	>		50	-	75		50	-	>		40	-	30		
			Avail.	-62	-	>		-5	-	75		46	-	>		-106	-	-103		
	Brant Street & Fairview Street	TCS	LOS	D	F	C	**E**	E	D	C	**D**	F	F	D	**F**	F	E	F	**F**	**E**
			Delay	43	96	25	**74**	71	36	32	**42**	188	87	46	**95**	112	68	128	**86**	**78**
			V/C	0.92	1.11	0.35		0.90	0.54	0.14		1.28	1.05	0.64		1.11	1.00	0.17		**1.16**
			Q	116	248	43		63	66	18		113	155	78		115	164	48		
			Stor.	60	-	170		60	-	-		75	-	70		45	-	-		
			Avail.	-56	-	127		-3	-	-		-38	-	-8		-70	-	-		
	Plains Road E & Driveway 2	TWSC	LOS	B		>	**B**					<	A		**A**		A	>	**A**	**A**
			Delay	12		>	**12**					<	0		**0**		0	>	**0**	**0**
			V/C	0.00		>						<	0.01				0.39	>		
			Q	0		>						<	0				0	>		
	Plains Road E & Driveway 3	TWSC	LOS	B		>	**B**					<	A		**A**		A	>	**A**	**A**
			Delay	14		>	**14**					<	1		**1**		0	>	**0**	**2**
			V/C	0.23		>						<	0.03				0.34	>		
			Q	7		>						<	1				0	>		
	Plains Road E & Driveway 1	TWSC	LOS	<	A		**A**		A	>	**A**					C		>	**C**	**A**
			Delay	<	1		**1**		0	>	**0**					22		>	**22**	**3**
			V/C	<	0.04				0.30	>						0.41		>		
			Q	<	1				0	>						16		>		

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

TABLE 4.9B: TOTAL OPERATIONS FIVE-YEAR HORIZON – PM PEAK HOUR

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	
PM Peak Hour	Plains Road E/Fairview Street & QEW West Ramp	TCS	LOS		B	B	**B**		B		**B**				**A**	D		E	**D**	**C**
			Delay		16	14	**16**		10		**10**				**0**	47		64	**53**	**21**
			V/C		0.53	0.34			0.87							0.79		0.90		**0.88**
			Q		112	15			35							123		158		
			Stor.		-	-			-				-			55	-	-		
			Avail.		-	-			-							-68		-		
	QEW East Ramp/Plains Road E & Fairview Street	TCS	LOS	F	B		**C**		F	>	**F**	C	D	D	**D**	D		F	**F**	**F**
			Delay	186	18		**33**		295	>	**295**	32	54	44	**46**	36		169	**160**	**170**
			V/C	1.22	0.69				1.57	>		0.33	0.86	0.76		0.45		1.25		**1.42**
			Q	98	131				522	>		62	196	141		26		290		
			Stor.	30	-				-	>		-	-	45		25	-	-		
			Avail.	-68	-				-	>		-	-	-96		-1		-		
	Maple Avenue & Plains Road E	TCS	LOS		E	>	**E**	C	C		**C**	D		C	**C**					**C**
			Delay		65	>	**65**	23	23		**23**	40		24	**25**					**30**
			V/C		0.96	>		0.80	0.72			0.32		0.86						**0.88**
			Q		86	>		130	134			24		140						
			Stor.		-	>		55	-			-		-						
			Avail.		-	>		-75	-			-		-						
	Brant Street & Plains Road E	TCS	LOS	F	D	>	**F**	E	F	F	**F**	C	F	>	**F**	F	D	F	**F**	**F**
			Delay	148	38	>	**116**	63	110	129	**110**	26	100	>	**96**	100	41	237	**122**	**112**
			V/C	1.19	0.59	>		0.77	1.11	1.12		0.64	1.13	>		1.00	0.81	1.41		**1.24**
			Q	156	97	>		73	190	194		18	152	>		73	134	322		
			Stor.	55	-	>		50	-	75		50	-	>		40	-	30		
			Avail.	-101	-	>		-23	-	-119		32	-	>		-33	-	-292		
	Brant Street & Fairview Street	TCS	LOS	F	D	C	**F**	E	F	C	**F**	F	F	D	**F**	F	D	F	**F**	**F**
			Delay	353	47	32	**92**	69	199	33	**152**	233	137	38	**136**	339	45	119	**119**	**128**
			V/C	1.66	0.90	0.53		0.93	1.35	0.74		1.37	1.18	0.34		1.63	0.97	1.18		**1.60**
			Q	145	179	79		107	393	140		116	217	43		132	168	228		
			Stor.	60	-	170		60	-	-		75	-	70		45	-	-		
			Avail.	-85	-	91		-47	-	-		-41	-	27		-87	-	-		
	Plains Road E & Driveway 2	TWSC	LOS	B		>	**B**					<	A		**A**		A	>	**A**	**A**
			Delay	14		>	**14**					<	0		**0**		0	>	**0**	**0**
			V/C	0.02		>						<	0.00				0.45	>		
			Q	1		>						<	0				0	>		
	Plains Road E & Driveway 3	TWSC	LOS	B		>	**B**					<	A		**A**		A	>	**A**	**A**
			Delay	15		>	**15**					<	2		**2**		0	>	**0**	**2**
			V/C	0.16		>						<	0.10				0.43	>		
			Q	7		>						<	3				0	>		
	Plains Road E & Driveway 1	TWSC	LOS	<	A		**A**		A	>	**A**					D		>	**D**	**A**
			Delay	<	3		**3**		0	>	**0**					30		>	**30**	**4**
			V/C	<	0.12				0.43	>						0.45		>		
			Q	<	3				0	>						18		>		

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

4.2.8 Total Operations – Ten-Year Horizon

Table 4.11 summarizes the level of service conditions. No changes to the existing lane configuration and signal timings were made. Overall, the incremental impact of the proposed development is considered minor. The following critical movements are noted:

- Plains Road East at QEW West Ramp:
  - Overall – PM peak hour, v/c ratio of 0.97.
  - Westbound through – PM peak hour, v/c ratio 0.99.
  - Southbound left-turn – PM peak hour, queue length exceeds storage but does not impact mainline QEW.
- Plains Road East/Fairview Street at the QEW East Ramp:
  - Overall – AM and PM peak hours, v/c ratio greater than 1.00.
  - Eastbound left-turn – PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Westbound through/right-turn – PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length that extends beyond Maple Avenue.
  - Northbound left/through/right-turn – AM peak hour, LOS E and v/c ratio greater than 1.00.
  - Northbound right-turn – AM and PM peak hour, queue length exceeds storage.
  - Southbound right-turn – PM peak hour, LOS F and v/c ratio greater than 1.00.
- Plains Road East at Maple Avenue:
  - Overall – AM peak hour, v/c ratio of 0.92. PM peak hour, v/c ratio of 0.97.
  - Eastbound through/right-turn – AM and PM peak hours, LOS F and v/c ratio greater than 1.00.
  - Westbound left-turn – PM peak hour, queue length exceeds storage.
- Plains Road East at Brant Street:
  - Overall – AM and PM peak hour, v/c ratio greater than 1.00.
  - Eastbound left-turn – AM and PM peak hours, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Eastbound through/right-turn – AM peak hour, LOS F and v/c ratio greater than 1.00.

- Westbound left-turn – AM peak hour, LOS F, v/c ratio of 0.95, and queue length exceed storage. PM peak hour, queue length exceeds storage length.
- Westbound through – PM peak hour, LOS F and v/c ration greater than 1.00.
- Westbound right-turn – PM peak hour, LOS F, v/c ratio of 1.00, and queue length exceeds storage.
- Northbound through/right-turn – AM and PM peak hours, LOS F and v/c ratio greater than 1.00.
- Southbound left-turn – AM and PM peak hours, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
- Southbound right-turn – AM peak hour, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.

- Brant Street at Fairview Street:
  - Overall – AM and PM peak hours, v/c ratio greater than 1.00.
  - Eastbound left-turn – AM peak hour, LOS E, v/c ratio greater than 1.00, queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Eastbound through – AM peak hour, LOS F and v/c ratio greater than 1.00.
  - Westbound left-turn – AM peak hour, LOS F, v/c ratio of 0.99, and queue length exceeds storage. PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Westbound through – PM peak hour, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Northbound left-turn – AM and PM peak hours, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Northbound through – AM and PM peak hours, LOS F and v/c ratio greater than 1.00.
  - Northbound right-turn – AM peak hour, queue length exceeds storage.
  - Southbound left-turn – AM and PM peak hours, LOS F, v/c ratio greater than 1.00, and queue length exceeds storage.
  - Southbound through – AM peak hour, LOS F and v/c ratio greater than 1.00. PM peak hour, LOS E and v/c ratio greater than 1.00.

- Southbound right-turn – PM peak hour, LOS F and v/c ratio greater than 1.00.

- Site Driveway – Phase 1
  - The site driveway is forecast to operate with low levels of delay and v/c ratios during the AM peak hour. During the PM peak hour, the southbound left/right-turn movement is forecast to operate at LOS E and v/c ratio of 0.55. The low v/c ratio indicates that while there is delay, there remains excess capacity for this movement. Queues into and out of the Driveway 1 are forecast to be 4 vehicles or less. The queue spill back from the southbound right-turn at Plains Road East and Fairview Street is forecast to extend past the site driveway during the PM peak hour.
- Site Driveways – Phase 2
  - The site driveways are forecast to operate with low levels of delay and v/c ratios during the AM and PM peak hours. Queues into and out Driveway 2 and Driveway 3 are forecast to be 1 vehicle or less. The queue spill back from the southbound right-turn at Plains Road East and Fairview Street is forecast to extend past the two driveways during the PM peak hour.

Appendix H4 contains the detailed Synchro 10 reports.

The capacity issues experienced under the background traffic horizon are expected to continue to occur with or without the development of the subject site. Site traffic impacts are minimal with minor changes in delay at the study area intersections.

TABLE 4.11A: TOTAL OPERATIONS TEN-YEAR HORIZON – AM PEAK HOUR

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	Plains Road E/Fairview Street & QEW West Ramp	TCS	LOS		A	A	**A**		A		**A**				**A**	D		D	**D**	**B**
			Delay		8	5	**8**		7		**7**				**0**	44		38	**42**	**12**
			V/C		0.58	0.19			0.33							0.68		0.18		**0.59**
			Q		87	8			51							48		22		
			Stor.		-	-			-				-			55	-	-		
			Avail.		-	-			-							7		-		
	QEW East Ramp/Plains Road E & Fairview Street	TCS	LOS	D	C		**C**		D	>	**D**	B	E	D	**E**	F		C	**C**	**D**
			Delay	39	30		**30**		40	>	**40**	17	75	51	**57**	105		24	**32**	**41**
			V/C	0.78	0.91				0.83	>		0.35	1.06	0.97		0.93		0.70		**1.02**
			Q	45	146				98	>		56	274	221		43		113		
			Stor.	30	-				-	>		-	-	45		25	-	-		
			Avail.	-15	-				-	>		-	-	-176		-18		-		
	Maple Avenue & Plains Road E	TCS	LOS		F	>	**F**	B	C		**C**	C		C	**C**					**D**
			Delay		99	>	**99**	15	24		**20**	33		26	**26**					**45**
			V/C		1.10	>		0.26	0.70			0.09		0.86						**0.92**
			Q		107	>		30	110			10		152						
			Stor.		-	>		55	-			-		-						
			Avail.		-	>		25	-			-		-						
	Brant Street & Plains Road E	TCS	LOS	F	F	>	**F**	F	D	C	**E**	C	F	>	**F**	F	C	D	**E**	**F**
			Delay	156	189	>	**173**	117	36	34	**56**	32	130	>	**127**	162	34	48	**59**	**104**
			V/C	1.21	1.31	>		0.95	0.28	0.08		0.36	1.22	>		1.24	0.78	0.85		**1.33**
			Q	133	298	>		61	31	0		4	134	>		167	127	164		
			Stor.	55	-	>		50	-	75		50	-	>		40	-	30		
			Avail.	-78	-	>		-11	-	75		46	-	>		-127	-	-134		
	Brant Street & Fairview Street	TCS	LOS	E	F	C	**F**	F	D	C	**D**	F	F	D	**F**	F	F	F	**F**	**F**
			Delay	77	142	26	**111**	95	38	32	**48**	236	123	51	**126**	153	98	102	**110**	**106**
			V/C	1.05	1.22	0.42		0.99	0.60	0.16		1.39	1.15	0.74		1.23	1.10	0.23		**1.28**
			Q	151	285	54		71	73	20		126	178	103		125	187	48		
			Stor.	60	-	170		60	-	-		75	-	70		45	-	-		
			Avail.	-91	-	116		-11	-	-		-51	-	-33		-80	-	-		
	Plains Road E & Driveway 2	TWSC	LOS	B		>	**B**					<	A		**A**		A	>	**A**	**A**
			Delay	13		>	**13**					<	0		**0**		0	>	**0**	**0**
			V/C	0.00		>						<	0.01				0.42	>		
			Q	0		>						<	0				0	>		
	Plains Road E & Driveway 3	TWSC	LOS	B		>	**B**					<	A		**A**		A	>	**A**	**A**
			Delay	15		>	**15**					<	1		**1**		0	>	**0**	**2**
			V/C	0.25		>						<	0.03				0.37	>		
			Q	8		>						<	1				0	>		
	Plains Road E & Driveway 1	TWSC	LOS	<	A		**A**		A	>	**A**					D		>	**D**	**A**
			Delay	<	1		**1**		0	>	**0**					26		>	**26**	**3**
			V/C	<	0.04				0.33	>						0.47		>		
			Q	<	1				0	>						19		>		

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

TABLE 4.11B: TOTAL OPERATIONS TEN-YEAR HORIZON – PM PEAK HOUR

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Overall
PM Peak Hour	Plains Road E/Fairview Street & QEW West Ramp	TCS	LOS		B	B	**B**		B		**B**				**A**	D		E	**D**	**C**
			Delay		19	16	**18**		16		**16**				**0**	46		69	**54**	**24**
			V/C		0.61	0.37			0.99							0.82		0.94		**0.97**
			Q		129	16			35							137		186		
			Stor.		-	-			-				-			55	-	-		
			Avail.		-	-			-							-82		-		
	QEW East Ramp/Plains Road E & Fairview Street	TCS	LOS	F	C		**D**		F	>	**F**	C	E	D	**E**	E		F	**F**	**F**
			Delay	213	21		**39**		367	>	**367**	33	70	50	**56**	65		223	**213**	**213**
			V/C	1.30	0.76				1.73	>		0.36	0.96	0.83		0.71		1.37		**1.56**
			Q	103	159				595	>		68	230	172		37		327		
			Stor.	30	-				-	>		-	-	45		25	-	-		
			Avail.	-73	-				-	>		-	-	-127		-12		-		
	Maple Avenue & Plains Road E	TCS	LOS		F	>	**F**	C	C		**C**	D		D	**D**					**D**
			Delay		90	>	**90**	28	26		**27**	40		36	**36**					**40**
			V/C		1.05	>		0.88	0.79			0.33		0.95						**0.97**
			Q		98	>		155	155			24		219						
			Stor.		-	>		55	-			-		-						
			Avail.		-	>		-100	-			-		-						
	Brant Street & Plains Road E	TCS	LOS	F	D	>	**F**	E	F	F	**F**	C	F	>	**F**	F	D	F	**F**	**F**
			Delay	198	42	>	**153**	66	155	183	**153**	28	152	>	**145**	129	46	324	**161**	**154**
			V/C	1.31	0.66	>		0.81	1.22	1.26		0.70	1.25	>		1.10	0.89	1.61		**1.41**
			Q	178	107	>		85	218	224		18	167	>		84	151	377		
			Stor.	55	-	>		50	-	75		50	-	>		40	-	30		
			Avail.	-123	-	>		-35	-	-149		32	-	>		-44	-	-347		
	Brant Street & Fairview Street	TCS	LOS	F	E	D	**F**	F	F	D	**F**	F	F	D	**F**	F	E	F	**F**	**F**
			Delay	429	68	35	**119**	84	260	40	**197**	284	187	40	**178**	415	69	182	**165**	**169**
			V/C	1.84	1.01	0.62		0.99	1.49	0.83		1.49	1.30	0.41		1.80	1.07	1.34		**1.76**
			Q	162	209	95		124	449	186		130	248	52		139	186	238		
			Stor.	60	-	170		60	-	-		75	-	70		45	-	-		
			Avail.	-102	-	75		-64	-	-		-55	-	18		-94	-	-		
	Plains Road E & Driveway 2	TWSC	LOS	B		>	**B**					<	A		**A**		A	>	**A**	**A**
			Delay	15		>	**15**					<	0		**0**		0	>	**0**	**0**
			V/C	0.02		>						<	0.00				0.48	>		
			Q	1		>						<	0				0	>		
	Plains Road E & Driveway 3	TWSC	LOS	C		>	**C**					<	A		**A**		A	>	**A**	**A**
			Delay	16		>	**16**					<	3		**3**		0	>	**0**	**2**
			V/C	0.18		>						<	0.11				0.47	>		
			Q	5		>						<	3				0	>		
	Plains Road E & Driveway 1	TWSC	LOS	<	A		**A**		A	>	**A**					E		>	**E**	**A**
			Delay	<	3		**3**		0	>	**0**					40		>	**40**	**5**
			V/C	<	0.13				0.47	>						0.55		>		
			Q	<	4				0	>						23		>		

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

4.3 Site Traffic Increases

Overall, the incremental impact of the proposed development is considered minor as the addition of the site generated traffic increases the overall intersection delay by 15 seconds or less.

Under background (without subject development) traffic conditions, operational issues are noted at the study area intersections. With the addition of site-generated traffic, the intersection operations are slightly exacerbated.

Table 4.12 summarizes the forecast increase in traffic related to the Phase 1. **Table 4.13** summarizes the forecast increase in traffic related to the build-out of the subject site. **Table 4.14** summarizes the forecast increase in traffic related to the build-out of the subject site for the five-year horizon. **Table 4.15** summarizes the forecast increase in traffic related to the build-out of the subject site for the ten-year horizon.

With the full build-out the subject site, the intersections of Plains Road East at Fairview Street and Plains Road East at Maple Avenue are forecast to see an increase slightly above the daily traffic variations (6% - 7%). The percentages decrease to 5% or less under the five-year and ten-year horizons.



TABLE 4.12: TRAFFIC VOLUME INCREASE – PHASE 1

Intersection	Entering Volumes				
	Existing	Background	Site	Total	%
AM Peak Hour					
QEW West Ramp & Plains Road East	2,552	2,873	17	2,890	0.59%
QEW East Ramp/Plains Road East & Fairview Street	3,406	3,860	116	3,976	3.01%
Plains Road East & Maple Avenue	1,466	1,666	70	1,736	4.20%
Plains Road East & Brant Street	3,734	4,255	42	4,297	0.99%
Brant Street & Fairview Street	4,199	4,803	54	4,857	1.12%
PM Peak Hour					
QEW West Ramp & Plains Road East	4,221	4,757	52	4,809	1.09%
QEW East Ramp/Plains Road East & Fairview Street	5,114	5,792	158	5,950	2.73%
Plains Road East & Maple Avenue	2,341	2,652	94	2,746	3.54%
Plains Road East & Brant Street	5,035	5,734	40	5,774	0.70%
Brant Street & Fairview Street	5,563	6,363	82	6,445	1.29%

TABLE 4.13: TRAFFIC VOLUME INCREASE – BUILD-OUT

Intersection	Entering Volumes				
	Existing	Background	Site	Total	%
AM Peak Hour					
QEW West Ramp & Plains Road East	2,552	2,991	31	3,022	1.04%
QEW East Ramp/Plains Road East & Fairview Street	3,406	4,027	227	4,254	5.64%
Plains Road East & Maple Avenue	1,466	1,732	113	1,845	6.52%
Plains Road East & Brant Street	3,734	4,473	77	4,550	1.72%
Brant Street & Fairview Street	4,199	5,069	97	5,166	1.91%
PM Peak Hour					
QEW West Ramp & Plains Road East	4,221	4,950	90	5,040	1.82%
QEW East Ramp/Plains Road East & Fairview Street	5,114	6,043	289	6,332	4.78%
Plains Road East & Maple Avenue	2,341	2,758	145	2,903	5.26%
Plains Road East & Brant Street	5,035	6,023	70	6,093	1.16%
Brant Street & Fairview Street	5,563	6,713	140	6,853	2.09%



TABLE 4.10: TRAFFIC VOLUME INCREASE – FIVE-YEAR HORIZON

Intersection	Entering Volumes				
	Existing	Background	Site	Total	%
AM Peak Hour					
QEW West Ramp & Plains Road East	2,552	3,302	31	3,333	0.94%
QEW East Ramp/Plains Road East & Fairview Street	3,406	4,445	227	4,672	5.11%
Plains Road East & Maple Avenue	1,466	1,909	113	2,022	5.92%
Plains Road East & Brant Street	3,734	4,928	77	5,005	1.56%
Brant Street & Fairview Street	4,199	5,582	97	5,679	1.74%
PM Peak Hour					
QEW West Ramp & Plains Road East	4,221	5,466	90	5,556	1.65%
QEW East Ramp/Plains Road East & Fairview Street	5,114	6,667	289	6,956	4.33%
Plains Road East & Maple Avenue	2,341	3,044	145	3,189	4.76%
Plains Road East & Brant Street	5,035	6,637	70	6,707	1.05%
Brant Street & Fairview Street	5,563	7,391	140	7,531	1.89%

TABLE 4.12: TRAFFIC VOLUME INCREASE – TEN-YEAR HORIZON

Intersection	Entering Volumes				
	Existing	Background	Site	Total	%
AM Peak Hour					
QEW West Ramp & Plains Road East	2,552	3,647	31	3,678	0.85%
QEW East Ramp/Plains Road East & Fairview Street	3,406	4,902	227	5,129	4.63%
Plains Road East & Maple Avenue	1,466	2,108	113	2,221	5.36%
Plains Road East & Brant Street	3,734	5,429	77	5,506	1.42%
Brant Street & Fairview Street	4,199	6,146	97	6,243	1.58%
PM Peak Hour					
QEW West Ramp & Plains Road East	4,221	6,032	90	6,122	1.49%
QEW East Ramp/Plains Road East & Fairview Street	5,114	7,356	289	7,645	3.93%
Plains Road East & Maple Avenue	2,341	3,360	145	3,505	4.32%
Plains Road East & Brant Street	5,035	7,315	70	7,385	0.96%
Brant Street & Fairview Street	5,563	8,142	140	8,282	1.72%

4.4 Queue Assessment

An assessment of the queuing conditions at the study area intersections was conducted to examine the queue length for the turning lanes vs. the available storage. The queue lengths noted in the operation tables in **Section 4** note the Synchro 95th percentile queue results.

Table 4.13 summarizes the average (50th percentile) and 95th percentile queue reach for the auxiliary turn lanes at the study area intersections. The following is noted:

- Plains Road East at QEW West Ramp:
  - Southbound left-turn – the forecast queue length is approximately 135 metres under the ten-year horizon. The existing available storage is approximately 55 metres. The forecast queue length is not expected to spill back onto the mainline QEW approach.
- Fairview Street at Plains Road East/QEW East Ramp:
  - Eastbound left-turn – the forecast queue length is approximately 103 metres under the ten-year horizon. The existing available storage is approximately 30 metres. The left-turn has a short taper length and is not able to accommodate the reported queue length. Optimization of the signal timings are required.
  - Westbound through/right-turn – while not an auxiliary turn lane, the forecast queue length is approximately 595 metres under the ten-year horizon. The existing available storage is 290 metres. The forecast queue reach spills back beyond the Maple Avenue intersection with or without the site generated traffic. Optimization of the signal timings are required.
  - Northbound right-turn –the forecast queue length is approximately 172 metres under the ten-year horizon. The existing available storage is approximately 45 metres. The forecast queue length is not expected to spill back onto the mainline QEW approach. Optimization of the signal timings are required.
  - Southbound left-turn – the forecast queue length is approximately 43 metres under the ten-year horizon. The existing available storage is approximately 25 metres. The queue can be accommodated in the existing two-way centre left-turn lane.

- Southbound right-turn – while not an auxiliary turn lane, the forecast queue length is approximately 327 metres under the ten-year horizon. The forecast queue reach spills back beyond the horizontal curve on Plains Road East past the three site driveways. Optimization of the signal timings are required.

- Plains Road East at Maple Avenue:
  - Westbound dual left-turn – the forecast queue length is approximately 155 metres under the ten-year horizon. The existing available storage is approximately 55 metres. The inside left-turn lane queue could be accommodated by the two-way centre left-turn lane while the outside can be accommodated in the left westbound lane. Optimization of the signal timings are required.
- Plains Road East at Brant Street:
  - Eastbound let-turn – the forecast queue length is approximately 178 metres under the ten-year horizon. The existing available storage is approximately 55 metres. The left-turn queue length will spill back into the left eastbound lane of Plains Road East. Optimization of the signal timings are required.
  - Westbound left-turn – the forecast queue length is approximately 85 m under the ten-year horizon. The existing available storage is approximately 45 metres. The taper can accommodate approximately up to 70 metres of the queue length with the remaining 15 metres of queue impacting the left through lane on Plains Road East. Optimization of the signal timings are required.
  - Westbound right-turn – the forecast queue length is approximately 224 metres under the ten-year horizon. The existing available storage is approximately 45 metres. The taper can accommodate approximately 100 metres of queue with the remaining 124 metres of queue length impacting the through lanes. Optimization of the signal timings are required.
  - Northbound left-turn – the forecast queue length is approximately 20 metres under the ten-year horizon. The existing available storage is approximately 50 metres. The forecast queue length can be accommodated by the available storage.
  - Southbound left-turn – the forecast queue length is approximately 167 metres under the ten-year horizon. The existing available storage is approximately 40 metres.

Approximately 70 metres of the 167 metres can be accommodated in the left-turn storage and taper lane. The remaining 97 metres will impact the through lanes. Optimization of the signal timings are required.

- Southbound right-turn – the forecast queue length is approximately 377 metres under the ten-year horizon. The existing available storage is approximately 30 metres. The queue length will impact the through lanes on Brant Street. Optimization of the signal timings are required.

- Fairview Street at Brant Street:
  - Eastbound left-turn – the forecast queue length is approximately 162 metres under the ten-year horizon. The queue can be accommodated in the left-turn lane as the eastbound left-lane on Fairview Street is designated as the left-turn lane.
  - Eastbound right-turn – the forecast queue length is approximately 95 metres under the ten-year horizon. The existing available storage is approximately 170 metres. There are no concerns with forecast queue length for this movement.
  - Westbound left-turn lane, the forecast queue length is approximately 124 metres under the ten-year horizon. The existing available storage is approximately 60 metres. The queue could be accommodated in the painted median of Fairview Street prior to the beginning of the eastbound left-turn taper for the commercial development.
  - Northbound left-turn – the forecast queue length is approximately 130 metres under the ten-year horizon. The existing available storage is approximately 75 metres. The average queue length can be accommodated by the available storage up to the ten-year horizon. Optimization of the signal timings are required.
  - Northbound right-turn – the forecast queue length is approximately 103 metres under the ten-year horizon. The existing available storage is approximately 70 metres. The average queue length can be accommodated by the available storage length. Optimization of the signal timings are required.
  - Southbound left-turn – the forecast queue length is approximately 139 metres under the ten-year horizon. The existing available storage is approximately 45 metres. Optimization of the signal timings are required.

TABLE 4.13: QUEUE LENGTH

Intersection	Movement	Storage (m)	Total - Phase 1				Total - Full Build-Out				Total Five-Year Horizon				Total Ten-Year Horizon			
			AM		PM		AM		PM		AM		PM		AM		PM	
			Avg (m)	95th (m)	Avg (m)	95th (m)	Avg (m)	95th (m)	Avg (m)	95th (m)	Avg (m)	95th (m)	Avg (m)	95th (m)	Avg (m)	95th (m)	Avg (m)	95th (m)
Plains Road East/Fairview Street & QEW West Ramp	SBL	55	27	38	87	101	29	40	93	110	31	44	100	123	34	48	112	137
Fairview Street & Plains Road East/QEW East Ramp	EBL	30	11	18	25	70	12	20	42	92	13	37	48.6	98	14	45	56	103
	WBT/R*	290	58	73	398	424	63	78	431	456	71	88	500	522	80	98	575	595
	NBR	45	86	134	74	112	91	146	82	123	109	188	95	141	133	221	109	172
	SBL	25	5	13	5	13	9	30	10	23	12	40	11	26	13	43	12	37
	SBR	--	29	59	138	218	43	80	178	255	52	95	212	290	64	113	248	327
Plains Road East & Maple Avenue	WBL	55	16	24	81	104	16	25	86	111	18	27	101	130	20	30	119	155
Brant Street & Plains Road East	EBL	55	61	93	90	128	66	103	96	136	81	117	117	156	96	133	138	178
	WBL	50	20	47	41	64	20	48	43	66	23	55	47	73	25	61	51	85
	WBR	45	0	0	87	154	0	0	94	166	0	0	124	194	0	0	153	224
	NBL	50	3	4	17	18	3	4	17	18	3	4	19	18	3	4	20	18
	SBL	40	59	118	22	58	64	126	23	62	84	146	26	73	104	167	35	84
	SBR	30	42	85	165	245	49	96	192	273	65	133	240	322	86	164	293	377
Brant Street & Fairview Street	EBL	60	56	82	68	124	59	89	74	129	67	116	88	145	84	151	103	162
	EBR	170	6	25	18	48	10	33	31	64	16	43	43	79	24	54	55	95
	WBL	60	17	49	32	62	18	53	44	86	21	63	55	107	25	71	64	124
	NBL	75	35	86	35	82	47	100	52	105	58	113	62	116	71	126	75	130
	NBR	70	24	55	9	31	31	64	12	36	41	78	17	43	52	103	22	52
	SBL	45	60	96	68	123	63	102	74	127	77	115	90	132	79	125	107	139

* Available distance back to Maple Avenue

4.5 Intersection Summary

4.5.1 Plains Road East at QEW West Ramp

The Plains Road East and QEW West Ramp intersection is forecast to operate within acceptable levels of service during the weekday AM and PM peak hours for all horizon years. The southbound left-turn is forecast to have a queue length that exceeds its storage under Background Phase 1 conditions. The queue spill back will not impact the mainline QEW.

Beyond signal optimization, no mitigation measures are recommended at this intersection.

4.5.2 Plains Road East/QEW East Ramp at Fairview Street

The intersection of Plains Road East/QEW East Ramp and Fairview Street is currently experiencing delay and capacity constraints under existing and background traffic conditions. With the addition of the site generated traffic, the eastbound left-turn movement is forecast to experience capacity constraints.

The capacity constraint could be mitigated by lengthening the eastbound left-turn storage lane however, this could impact the QEW overpass structures with the required widening of Plains Road East to accommodate the extended left-turn lane.

The QEW East Ramp is forecast to have queue lengths greater than its available storage during background and total traffic conditions. The forecast queue lengths are not expected to impact the operations of the mainline QEW. The existing ramps can contain the forecast queue lengths.

The road authorities should monitor future traffic volumes at this intersection and optimize the signal timings where possible.

4.5.3 Plains Road East at Maple Avenue

The intersection of Plains Road East/QEW East Ramp and Fairview Street is currently experiencing delay and capacity constraints under existing and background traffic conditions. With the addition of the site generated traffic, the eastbound through/right-turn movement is forecast to experience capacity constraints.

Beyond signal optimization, no mitigation measures are recommended at this intersection.



4.5.4 Plains Road East at Brant Street

The intersection of Plains Road East and Brant Street is currently experiencing delay and capacity constraints under existing and future traffic conditions with or without the site generated traffic.

Beyond signal optimization, no mitigation measures are recommended at this intersection.

4.5.4 Fairview Street at Brant Street

The intersection of Plains Road East and Fairview Street is currently experiencing delay and capacity constraints under existing and future traffic conditions with or without the site generated traffic.

Beyond signal optimization, no mitigation measures are recommended at this intersection.

5 Remedial Measures

Site traffic forecast to be added by the full build-out of the development to the study area road network results in relatively small impacts. Deficiencies currently existing at certain locations, primarily along the Fairview Street and Brant Street corridors and they can be expected to persist in the future with anticipated growth in traffic independent of the subject development.

Due to the high levels of congestion occurring, further remedial measures to improve intersection capacity are not likely to be implemented. Rather, future improvements to the transportation network should be focused on public transit and active transportation infrastructure to reduce the use of single-occupant vehicles such as the current work being done for under the City of Burlington Integrated Mobility Plan[13].

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

5.1 Auxiliary Turn Lanes

5.1.1 Left-Turn Lanes

The proposed site driveway connections to Plains Road East were assessed to determine if the projected traffic volumes warrant installation of left-turn lanes. The warrants for left-turn lanes follow the requirements in the Ministry of Transportation's (MTO) Geometric Design Standards[14]. A design speed of 60 km/h (10 km/h over the posted speed limit) was used.

The percentages of left-turning vehicles in the approaching volume were rounded to the nearest 5%, as nomographs are only provided for 5% increments. This requirement is due to the nature of the warrant procedure that assumes a minimum of 5% of left turning vehicles in the advancing volume.

Table 5.1 summarizes the left-turn lane warrant analysis for Driveway 1 (Phase 1). An eastbound left-turn lane with 30 metres of storage is warranted.

[13] Integrated Mobility Plan - City of Burlington
[14] Design Supplement for TAC Geometric Design Guide for Canadian Roads, Ministry of Transportation Ontario, June 2017

TABLE 5.1: LEFT-TURN LANE WARRANT SUMMARY – DRIVEWAY 1

Intersection	Plains Road East & Driveway 1							
Approach Direction Design Speed	Eastbound 60 km/h							
Horizon	Total (2027)		Total (2029)		Total (2034)		Total (2039)	
Peak Hour	AM	PM	AM	PM	AM	PM	AM	PM
Advancing Volume	428	420	478	451	520	486	567	525
Opposing Volumes	404	563	428	616	470	670	501	729
Left Turning Traffic	34	91	34	91	34	91	34	91
% of Left Turning Traffic	8%	22%	7%	20%	7%	19%	6%	17%
Figure Used*	9A-6	9A-7	9A-6	9A-7	9A-6	9A-7	9A-6	9A-7
Warranted	**Yes**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Storage Length Required	15m	25m	--	25m	15m	30m	15m	30m

*Based on MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads - June 2017

Table 5.2 summarizes the left-turn lane warrant analysis for Site Driveway 2 (Phase 2). A northbound left-turn lane with 30 metres of storage is warranted.

TABLE 5.2: LEFT-TURN LANE WARRANT SUMMARY – DRIVEWAY 2

Intersection	Plains Road East & Driveway 2							
Approach Direction Design Speed	Northbound 60 km/h							
Horizon	Total (2027)		Total (2029)		Total (2034)		Total (2039)	
Peak Hour	AM	PM	AM	PM	AM	PM	AM	PM
Advancing Volume	--	--	572	506	514	541	561	580
Opposing Volumes	--	--	496	624	538	678	583	737
Left Turning Traffic	--	--	28	72	28	72	28	72
% of Left Turning Traffic	--	--	5%	14%	5%	13%	5%	12%
Figure Used*			9A-6	9A-7	9A-6	9A-7	9A-6	9A-6
Warranted			**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Storage Length Required			15m	25m	15m	30m	15m	30m

*Based on MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads - June 2017

Table 5.3 summarizes the left-turn lane warrant analysis for Driveway 3 (Phase 2). As the northbound left-turn volumes accounts for less than 5% of advancing volumes, a northbound left-turn lane is not warranted.

TABLE 5.3: LEFT-TURN LANE WARRANT SUMMARY – DRIVEWAY 3

Intersection	Plains Road East & Driveway 3							
Approach Direction Design Speed	Northbound 60 km/h							
Horizon	Total (2027)		Total (2029)		Total (2034)		Total (2039)	
Peak Hour	AM	PM	AM	PM	AM	PM	AM	PM
Advancing Volume	--	--	478	507	520	542	567	581
Opposing Volumes	--	--	564	644	606	698	651	757
Left Turning Traffic	--	--	6	3	6	3	6	3
% of Left Turning Traffic Figure Used*	--	--	1%	1%	1%	1%	1%	1%
Warranted			**No**	**No**	**No**	**No**	**No**	**No**
Storage Length Required			--	--	--	--	--	--

*Based on MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads - June

Appendix H contains the left-turn lane warrant nomographs.

With left-turn lanes being warranted for the Phase 1 site access and the main Phase 2 (northerly) site access, it is recommended that the existing two-way centre left-turn lane (TWLTL) be extended to the Phase 1 site access.

5.1.2 Right-Turn Lanes

Ministry of Transportation (MTO) guidelines[15] note that right-turn lanes or tapers may be considered where right-turn volumes exceed 60 vehicles per hour.

The forecast right-turn volumes at the site driveways do not warrant the need for a right-turn lane. Right-turning volumes at the three site driveways are less than 60 vehicles per hour.

[15] Geometric Design Standards for Ontario Highways, Ministry of Transportation, Ontario

6 Conclusions and Recommendations

6.1 Conclusions

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

- **Existing Traffic Operations:** Capacity issues are identified at the following intersections:
  - Plains Road East/Fairview Street at the QEW East Ramp;
  - Plains Road East at Brant Street; and
  - Brant Street at Fairview Street.
- **Estimated Site Generated Traffic:** Phase 1 (Year 2027) of the subject site is estimated to generate approximately 161 AM peak hour trips and 186 PM peak hour trips. Phase 2 (Year 2029) of the subject site is estimated to generate approximately 103 AM peak hour trips and 118 PM peak hour trips. Full build-out of the subject site is estimated to generate approximately 339 AM peak hour trips and 434 PM peak hour trips.
- **Background Traffic Operations:** The capacity deficiencies identified under existing conditions will continue to occur with the forecast increase in non-site related traffic. Under background traffic conditions capacity issues are identified at the following intersections:
  - QEW West Ramp at Plains Road East/Fairview Street;
  - Plains Road East/Fairview Street at the QEW East Ramp;
  - Plains Road East at Maple Avenue;
  - Plains Road East at Brant Street; and
  - Brant Street at Fairview Street.
- **Total Traffic Operations**: The capacity deficiencies identified under background conditions will continue to occur with the addition of site generated traffic. Site generated traffic results in new capacity deficiencies at the following intersections:
  - Plains Road East/Fairview Street at the QEW East Ramp;
    - Eastbound left-turn;
  - Plains Road East at Maple Avenue;
    - Eastbound through/right-turn.

- The site driveways to Plains Road East are forecast to operate with acceptable levels of services with exception to the Phase 1 driveway under the forecast Ten-Year Horizon.

  The site driveway is forecast to operate with low levels of delay and v/c ratios during the AM peak hour. During the PM peak hour, the southbound left/right-turn movement is forecast to operate at LOS E and v/c ratio of 0.55.

- **Remedial Measures**: Left-Turn lane are warranted at the Phase 1 and Phase 2 (north) site access. To accommodate left-turn movements into the site the existing two-way centre left-turn lane on Plains Road East should be extended to the Phase 1 site access.

  Right-turn lanes on Plains Road East at the three site accesses are not warranted.

6.2 Recommendations

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

- The City of Burlington should extend the municipal sidewalk along Plains Road East from Maple Avenue to Fairview Street.
- The existing two-way centre left-turn lane on Plains Road East be extended to the Phase 1 site access.
- The Halton Region and the City of Burlington monitor the future traffic volumes at the study area intersections and optimize the signal timings accordingly. The need for signal timing improvements at these intersections are noted to occur with or without the development of the subject sites.

Appendix A

Pre-Study Consultation

From: Pasquini, Alexsandria
To: Kayla Royce
Subject: RE: (200402) 1134 & 1167 Plains Road East - Pre-study scope confirmation
Date: August 20, 2020 1:52:46 PM
Attachments: image001.png

Hello Kayla,

Regional staff have had the opportunity to review the provided TOR for 1134 & 167 Plains Road East and offer the following comments:

As stated in the terms of reference, the Study will be in accordance to Halton Region's Transportation Impact Study Guidelines (2015).

The study intersections listed in the terms of reference are acceptable. The study area must be expanded, due to the anticipated development traffic impacts with +1100 proposed residential units (full build-out), to include the following Regional intersections:

-Brant Street at Plains Road
-Brant Street at Fairview Street

Data Requests:

For the traffic volume counts and traffic signal timing, information can be requested from our Road Operations group at trafficdatarequests@halton.ca. *Considering the current times we are experiencing with COVID-19, older counts may be used with an acceptable growth rate of 2% for through and turning movements at any Regional intersection (Brant at Plains, Brant at Fairview). I would ask that if this is the case, please obtain at least two counts from past years and, review the consistency in all movements for both counts, prior to using. Should you find a discrepancy, please discuss with Regional Staff prior to moving forward.

Analysis Phases:

Please include phases for 2020 (existing), Phase 1, Phase 2 and year 2030.

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

Transit Mode Splits:

Halton's Transportation Master Plan 2011 utilizes a transit mode split of 10% for 2021, 15% for 2026 and 20% for 2031. Assumption of travel via other modes (active transportation i.e.: walk, cycle) should utilize a 5% mode split for 2031. Transportation Demand Management (TDM) assumptions of 3% for 2031 would also be acceptable.

Background Growth Rates and Background Developments:

Background Growth Rates and Background Developments are to be provided by the City of Burlington.

Background roadway improvements:

Brant Street is shown in the 2018-2031 Capital Forecast as scheduled to be widened from 4 to 6 lanes, from the North Service Road to Brant Street, with start of construction in 2027. This however is outside of the study area intersections (Brant at Plains, Brant at Fairview)

Let me know if there are any questions.

Thank you.
Alex

Alexsandria Pasquini
Intermediate Planner
Planning Services
Legislative & Planning Services
Halton Region
905-825-6000, ext. 7185 | 1-866-442-5866



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From: Kayla Royce [mailto:kroyce@ptsl.com]
Sent: Wednesday, August 19, 2020 11:00 AM
To: Pasquini, Alexsandria <Alex.Pasquini@halton.ca>
Subject: FW: (200402) 1134 & 1167 Plains Road East - Pre-study scope confirmation

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Hi Alex,

I got an automatic reply from Walter indicating he's on vacation until the 31st. Would you be able to assist me with the scope approval for this site (see email below)?

Regards,

Kayla Royce, MEng, P.Eng.
Transportation Engineer

Paradigm Transportation Solutions Limited
p: 416.479.9684 x508

From: Kayla Royce
Sent: August 19, 2020 10:48 AM
To: Scattolon, Walter <Walter.Scattolon@halton.ca>
Cc: Chris Day <cday@ptsl.com>
Subject: (200402) 1134 & 1167 Plains Road East - Pre-study scope confirmation

Hi Walter,

Paradigm Transportation Solutions Limited has been retained to complete a Transportation Impact Study for the proposed residential development located at **1134 & 1167 Plains Road East** in Burlington. The subject development consists of two phases (see attached site plans and stats for context):

- Phase 1 (1167 Plains Road East) – 733 residential units with vehicle access via one all-moves driveway to Plains Road E. at the northern edge of the site, next to the property line
- Phase 2 (1134 Plains Road East) – 426 residential units with vehicles access via three all-moves driveways, two of which are where the existing driveways are and the

third will be in between these driveways.

We will be preparing our TIS report based on the following , and would ask for these to be reviewed/confirmed by Halton Region staff:

- The study will follow Halton Region's TIS guidelines (Jan 2015)
- Weekday AM and PM peak hours will be analyzed
- Study area to include the following intersections;
    - Plains Road East and Fairview Street (signalized)
    - Plains Road East and Maple Avenue (signalized)
    - The four site driveways.
    - **Please advise if Halton Region has traffic counts at the above noted intersections**
    - If recent traffic counts are unavailable, we will follow up with you regarding appropriate data collection and establishment of base year conditions given the changes in traffic patterns caused by the COVID-19 pandemic.
- Horizon Years – ten years from date of TIS (2030).
- Background Growth Rate: **Please confirm and appropriate background growth rate**
- Background Developments: **please confirm if there are any nearby instream or approved developments to be considered in our background traffic forecasts.**
- Background roadway improvements: **are there any planned roadway improvements that should be considered in our analysis?**
- Trip Generation: ITE Trip Generation Manual (10^{th} Edition)
- Trip Assignment: TTS 2016 and existing traffic patterns
- Based on the analysis results, we will identify any operational deficiencies as well as the net impact of the proposed development on the study area road network. The need for road improvements and/or other mitigating measures to address deficiencies will be determined.
- We will assess the potential impact and requirements of the site for non-auto modes of transportation. This would include identifying existing and planned transit, walking, and cycling routes and facilities that would enhance connectivity both within the subdivision and with the rest of the municipality for these modes.
- Access and Circulation: An AutoTURN assessment will be conducted to review the site accesses and circulation designs. Sight lines and access spacing will also be reviewed.

Note that we are also contacting MTO and the City of Burlington as part of our pre-study consult.
Please let me know if you have any concerns, additions, or changes.
Regards,

Kayla Royce, MEng, P.Eng.
Transportation Engineer

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road, Cambridge ON N1R 8J8
p: 416.479.9684 x508
e: kroyce@ptsl.com
w: www.ptsl.com

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From:	White, Mark J. (MTO)
To:	Kayla Royce
Cc:	Chris Day; Routledge, Graham (MTO); Shen, Rey (MTO); Aurini, Shawn (MTO)
Subject:	RE: (200402) 1134 & 1167 Plains Road East - Pre-study scope confirmation
Date:	August 31, 2020 2:45:43 PM
Attachments:	image001.png QEW at Fairview ST (East off-ramp) (June 22, 2017).pdf QEW at Plains Rd (West off-ramp) (June 22, 2017).pdf

Good afternoon Kayla,

The traffic office has reviewed the TOR provided by Paradigm for the development at 1134 & 1167 Plains Rd East. Comments are provided below. If you have any questions or concerns, please let me know.

1) Please include the following intersections in your traffic analysis.
   a) QEW and Fairview St (East and West Ramp Terminals)
2) Ensure the following horizon years are included in analysis. As per MTO guidelines, build out, and 5 and 10 year horizons beyond full build out of the site should be included in assessment.
3) 2% background growth rate should be used for the QEW and Fairview St (East and West Ramp Terminals). I have attached in the email, the latest TMCs which we have available.

Please let me know if you have any questions.

Regards,

Mark White
Corridor Management Officer
Ministry of Transportation | Central Region
159 Sir William Hearst Ave. 7th Floor,
Toronto, ON M3M 0B7
Mark.j.white@ontario.ca

From: Kayla Royce <kroyce@ptsl.com>
Sent: August 31, 2020 2:34 PM
To: Routledge, Graham (MTO) <Graham.Routledge@ontario.ca>; Shen, Rey (MTO) <Rey.Shen@ontario.ca>; White, Mark J. (MTO) <Mark.J.White@ontario.ca>
Cc: Chris Day <cday@ptsl.com>
Subject: RE: (200402) 1134 & 1167 Plains Road East - Pre-study scope confirmation

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Hi Mark/Rey/Graham,

Have any of you had the chance to review our scope yet?
A quick response would be greatly appreciated - we'd like to get going asap on our work.

Thanks!

Kayla Royce, MEng, P.Eng.
Transportation Engineer

Paradigm Transportation Solutions Limited
p: 416.479.9684 x508

From: Polus, Asia (MTO) <Asia.Polus@ontario.ca>
Sent: August 19, 2020 12:46 PM
To: Kayla Royce <kroyce@ptsl.com>
Cc: Chris Day <cday@ptsl.com>; Routledge, Graham (MTO) <Graham.Routledge@ontario.ca>; Shen, Rey (MTO) <Rey.Shen@ontario.ca>; White, Mark J. (MTO) <Mark.J.White@ontario.ca>
Subject: RE: (200402) 1134 & 1167 Plains Road East - Pre-study scope confirmation

Hi Kayla,

Thank you for your email, please note that it will be forwarded to MTO Traffic Office for verification and we will contact you as soon as we have any comments from the Traffic office.

Additionally, I would like to add that I will retire next week and further correspondence regarding this development proposal should be addressed to Mark and/or Graham attention, both of them are included in this email.

Thank you
Best Regards
Asia Polus

From: Kayla Royce <kroyce@ptsl.com>
Sent: August 19, 2020 10:48 AM
To: Polus, Asia (MTO) <Asia.Polus@ontario.ca>
Cc: Chris Day <cday@ptsl.com>
Subject: (200402) 1134 & 1167 Plains Road East - Pre-study scope confirmation

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Hi Asia,

Paradigm Transportation Solutions Limited has been retained to complete a Transportation Impact Study for the proposed residential development located at **1134 & 1167 Plains Road East** in Burlington. The subject development consists of two phases (see attached site plans and stats for context):

- Phase 1 (1167 Plains Road East) – 733 residential units with vehicle access via one all-moves driveway to Plains Road E. at the northern edge of the site, next to the

property line
- Phase 2 (1134 Plains Road East) – 426 residential units with vehicles access via three all-moves driveways, two of which are where the existing driveways are and the third will be in between these driveways.

We will be preparing our TIS report based on the following , and would ask for these to be reviewed/confirmed by MTO staff:

- The study will follow Halton Region's TIS guidelines (Jan 2015)
- Weekday AM and PM peak hours will be analyzed
- Study area to include the following intersections;
    - Plains Road East and Fairview Street (signalized)
    - Plains Road East and Maple Avenue (signalized)
    - The four site driveways.
    - **Please advise if MTO has traffic counts at the above noted intersections**
    - If recent traffic counts are unavailable, we will follow up with you regarding appropriate data collection and establishment of base year conditions given the changes in traffic patterns caused by the COVID-19 pandemic.
- Horizon Years – ten years from date of TIS (2030).
- Background Growth Rate: **Please confirm an appropriate background growth rate**
- Background Developments: **please confirm if there are any nearby instream or approved developments to be considered in our background traffic forecasts.**
- Trip Generation: ITE Trip Generation Manual (10^{th} Edition)
- Trip Assignment: TTS 2016 and existing traffic patterns
- Based on the analysis results, we will identify any operational deficiencies as well as the net impact of the proposed development on the study area road network. The need for road improvements and/or other mitigating measures to address deficiencies will be determined.
- We will assess the potential impact and requirements of the site for non-auto modes of transportation. This would include identifying existing and planned transit, walking, and cycling routes and facilities that would enhance connectivity both within the subdivision and with the rest of the municipality for these modes.
- Access and Circulation: An AutoTURN assessment will be conducted to review the site accesses and circulation designs. Sight lines and access spacing will also be reviewed.

Note that we are also contacting the City of Burlington and Halton Region as part of our pre-study consult.
Please let me know if you have any concerns, additions, or changes.
Regards,

Kayla Royce, MEng, P.Eng.
Transportation Engineer

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road, Cambridge ON N1R 8J8
p: 416.479.9684 x508
e: kroyce@ptsl.com
w: www.ptsl.com

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From: Lucas, Steve
To: Chris Day
Cc: Kayla Royce
Subject: Re: (200402) 1134 & 1167 Plains Road East - Pre-study scope confirmation
Date: November 9, 2020 9:49:54 AM
Attachments: image005.png
image006.jpg
image002.jpg

Good Morning!

I hope you both had a great weekend and got a chance to enjoy this warm weather. I agree with your approach Chris, let us use the 1% growth rate for our local streets in your analysis.

Thank you,

-Steve

From: Chris Day <cday@ptsl.com>
Sent: Friday, November 6, 2020 1:41 PM
To: Lucas, Steve <Steve.Lucas@burlington.ca>
Cc: Kayla Royce <kroyce@ptsl.com>
Subject: RE: (200402) 1134 & 1167 Plains Road East - Pre-study scope confirmation

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Good Afternoon Steve,

Thank you for getting back to us.

We have previously received direction from both the City and Region for a site we are working on at Brant & Ghent to use a 1% growth factor for both Brant Street and the city roads. Given the relatively close proximity, including an overlap of a study area intersection at Brant and Fairview we feel a 1% growth factor would be more reasonable. Could you please advise if you agree and if not could you please provide us with historical counts in the study area (i.e. Brant Street, Plains Road and Fairview St) to assist us in confirming what growth factor would be appropriate? Our intent was to only apply the MTO's 2% growth factor for the movements related to the highway ramps and 1% for all others.

Please feel free to call me if you would like to discuss this further.

Thanks,

Chris Day, C.E.T.
Senior Project Manager

Paradigm Transportation Solutions Limited
p: 905.381.2229 x304
m: 905.746.1796

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From: Lucas, Steve <Steve.Lucas@burlington.ca>
Sent: November 5, 2020 4:00 PM
To: Kayla Royce <kroyce@ptsl.com>; Chris Day <cday@ptsl.com>
Subject: Re: (200402) 1134 & 1167 Plains Road East - Pre-study scope confirmation

Hello Kayla,

Sorry I don't have access to my desk phone since I've been working remotely. Thank you for following up with me via email! That said, we would follow suit with the MTO's proposed growth rate for consistency in the analysis.

Have a great day,

-Steve

From: Kayla Royce <kroyce@ptsl.com>
Sent: Thursday, November 5, 2020 3:51 PM
To: Lucas, Steve <Steve.Lucas@burlington.ca>; Chris Day <cday@ptsl.com>
Subject: RE: (200402) 1134 & 1167 Plains Road East - Pre-study scope confirmation

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Hi Steve,

I'm just following up with Chris's voicemail he left the other day.
We were told by MTO to use a growth rate of 2% on the QEW ramp intersections and were told by the Region to use growth rates provided by the City.
We propose using a growth rate of 1% for the non-QEW intersections within our study area and just wanted to run this by you before proceeding with our analysis.

We'd appreciate a speedy response,

Thanks!

Kayla Royce, MEng, P.Eng.
Transportation Engineer

Paradigm Transportation Solutions Limited
p: 416.479.9684 x508

From: Lucas, Steve <Steve.Lucas@burlington.ca>
Sent: September 8, 2020 3:03 PM
To: Chris Day <cday@ptsl.com>
Cc: Kayla Royce <kroyce@ptsl.com>
Subject: Re: (200402) 1134 & 1167 Plains Road East - Pre-study scope confirmation

Hello Chris & Kayla,

I hope you both had an excellent long weekend. Please see my comments in the subsequent email chain below, in Red.

Thank you,

Steve Lucas
Transportation Planning Technologist
Transportation
(905) 335-7600 ext.7691
steve.lucas@burlington.ca

From: Chris Day <cday@ptsl.com>
Sent: Tuesday, September 8, 2020 2:07 PM
To: Lucas, Steve <Steve.Lucas@burlington.ca>
Cc: Kayla Royce <kroyce@ptsl.com>
Subject: RE: (200402) 1134 & 1167 Plains Road East - Pre-study scope confirmation

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Good Afternoon Steve,

I trust all is well at the City of Burlington.

Could we please have the City comments on this scope of work as soon as possible?

We have heard back from both the Region and MTO, as attached.

Thanks,

Chris Day, C.E.T.
Senior Project Manager

Paradigm Transportation Solutions Limited
p: 905.381.2229 x304
m: 905.746.1796

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From: Kayla Royce <kroyce@ptsl.com>
Sent: August 31, 2020 2:44 PM
To: Lucas, Steve (Steve.Lucas@burlington.ca) <Steve.Lucas@burlington.ca>
Cc: Chris Day <cday@ptsl.com>
Subject: RE: (200402) 1134 & 1167 Plains Road East - Pre-study scope confirmation

Hi Steve,

Just following up on this.
Have you had a chance to review our study scope?

Thanks,

Kayla Royce, MEng, P.Eng.
Transportation Engineer

Paradigm Transportation Solutions Limited
p: 416.479.9684 x508

From: Kayla Royce
Sent: August 19, 2020 10:48 AM
To: Lucas, Steve (Steve.Lucas@burlington.ca) <Steve.Lucas@burlington.ca>

Cc: Chris Day <cday@ptsl.com>
Subject: (200402) 1134 & 1167 Plains Road East - Pre-study scope confirmation

Hi Steve,

Paradigm Transportation Solutions Limited has been retained to complete a Transportation Impact Study for the proposed residential development located at **1134 & 1167 Plains Road East** in Burlington. The subject development consists of two phases (see attached site plans and stats for context):

- Phase 1 (1167 Plains Road East) – 733 residential units with vehicle access via one all-moves driveway to Plains Road E. at the northern edge of the site, next to the property line
- Phase 2 (1134 Plains Road East) – 426 residential units with vehicles access via three all-moves driveways, two of which are where the existing driveways are and the third will be in between these driveways.

We will be preparing our TIS report based on the following , and would ask for these to be reviewed/confirmed by City staff:

- The study will follow Halton Region's TIS guidelines (Jan 2015)
- Weekday AM and PM peak hours will be analyzed
- Study area to include the following intersections;
    - Plains Road East and Fairview Street (signalized)
    - Plains Road East and Maple Avenue (signalized)
    - The four site driveways.
    - We will contact Florin Patrau for available traffic counts and Steve Vrakela for signal timing plans.
        - Thank you!
    - If recent traffic counts are unavailable, we will follow up with you regarding appropriate data collection and establishment of base year conditions given the changes in traffic patterns caused by the COVID-19 pandemic.
- Horizon Years – ten years from date of TIS (2030).
- Background Growth Rate: **Please confirm an appropriate background growth rate**
    - We support the rates proposed by the MTO / Region.
- Background Developments: **please confirm if there are any nearby instream or approved developments to be considered in our background traffic forecasts.**
    - See the following URL's for relevant developments:
        - https://www.burlington.ca/en/services-for-you/dvlp-property-group-inc-1335-1355-plains-road-e.asp
- Background roadway improvements: **are there any planned roadway improvements that should be considered in our analysis?**
    - There are no planned (City of Burlington) capital road work improvements near the location of the site that should be considered.
- Trip Generation: ITE Trip Generation Manual (10th Edition)
- Trip Assignment: TTS 2016 and existing traffic patterns
- Based on the analysis results, we will identify any operational deficiencies as well as the net impact of the proposed development on the study area road network. The

need for road improvements and/or other mitigating measures to address deficiencies will be determined.

- We will assess the potential impact and requirements of the site for non-auto modes of transportation. This would include identifying existing and planned transit, walking, and cycling routes and facilities that would enhance connectivity both within the subdivision and with the rest of the municipality for these modes.
- Access and Circulation: An AutoTURN assessment will be conducted to review the site accesses and circulation designs. Sight lines and access spacing will also be reviewed.

Note that we are also contacting MTO and Halton Region as part of our pre-study consult. Please let me know if you have any concerns, additions, or changes.
Regards,

Kayla Royce, MEng, P.Eng.
Transportation Engineer

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Appendix B

Traffic Data

Fairview St & QEW E Ramp

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

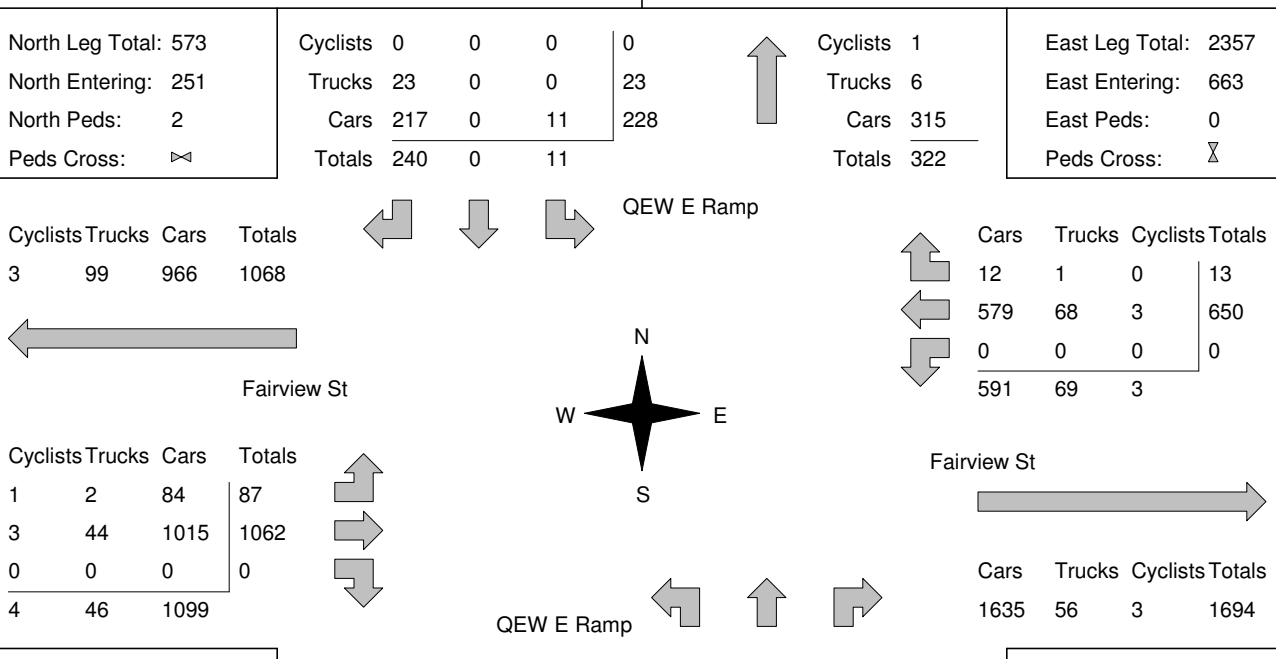
Municipality: Burlington
Site #: 0000201936
Intersection: Fairview St & QEW E Ramp
TFR File #: 1
Count date: 15-Nov-2017

Weather conditions:
Cloudy

Person(s) who counted:
Nikola
Mike

**** Signalized Intersection ****

Major Road: Fairview St runs W/E



Comments

Fairview St & QEW E Ramp

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 12:30:00
To: 13:30:00

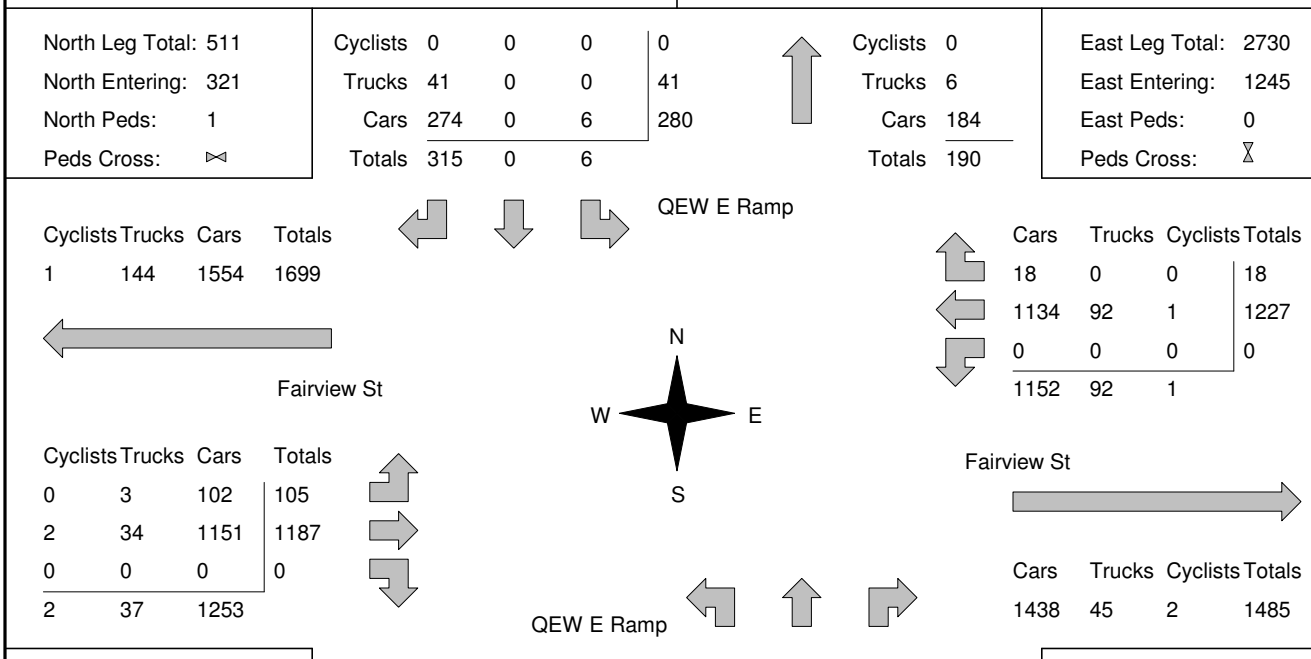
Municipality: Burlington
Site #: 0000201936
Intersection: Fairview St & QEW E Ramp
TFR File #: 1
Count date: 15-Nov-2017

Weather conditions:
Cloudy

Person(s) who counted:
Nikola
Mike

**** Signalized Intersection ****

Major Road: Fairview St runs W/E



Comments

Fairview St & QEW E Ramp

Afternoon Peak Diagram

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

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

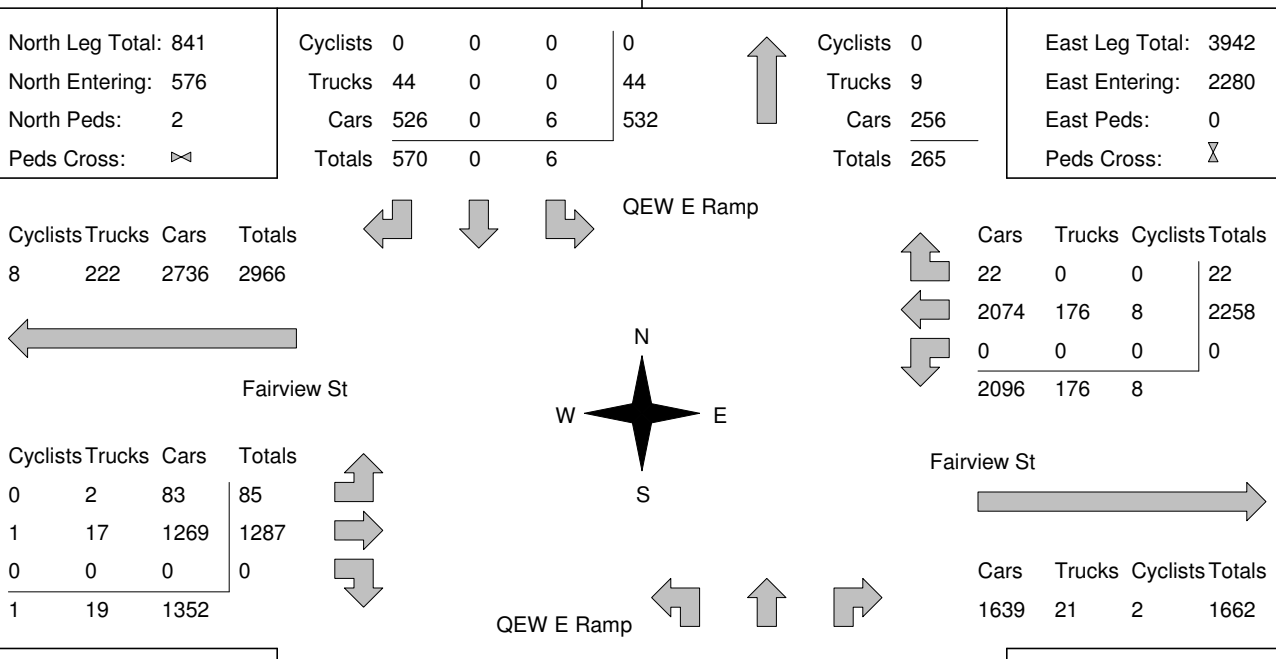
Municipality: Burlington
Site #: 0000201936
Intersection: Fairview St & QEW E Ramp
TFR File #: 1
Count date: 15-Nov-2017

Weather conditions:
Cloudy

Person(s) who counted:
Nikola
Mike

**** Signalized Intersection ****

Major Road: Fairview St runs W/E



Comments

Fairview St & QEW E Ramp

Total Count Diagram

Municipality: Burlington
Site #: 0000201936
Intersection: Fairview St & QEW E Ramp
TFR File #: 1
Count date: 15-Nov-2017

Weather conditions:
Cloudy

Person(s) who counted:
Nikola
Mike

**** Signalized Intersection ****

Major Road: Fairview St runs W/E

North Leg Total:	4957			
North Entering:	2978			
North Peds:	28			
Peds Cross:	⋈			
Cyclists	0	0	0	0
Trucks	268	0	3	271
Cars	2648	0	59	2707
Totals	2916	0	62	
Cyclists	1			
Trucks	74			
Cars	1904			
Totals	1979			
East Leg Total:	23269			
East Entering:	11059			
East Peds:	8			
Peds Cross:	⧖			

QEW E Ramp

Cyclists	Trucks	Cars	Totals
22	1218	13844	15084

Cars	Trucks	Cyclists	Totals
116	4	0	120
10036	881	22	10939
0	0	0	0
10152	885	22	

Fairview St

N
W E
S

Cyclists	Trucks	Cars	Totals
1	30	766	797
31	234	8868	9133
0	0	0	0
32	264	9634	

Fairview St

Cars	Trucks	Cyclists	Totals
11870	308	32	12210

QEW E Ramp

Peds Cross:	⧖			
West Peds:	0			
West Entering:	9930			
West Leg Total:	25014			
Cars	0			
Trucks	0			
Cyclists	0			
Totals	0			
Cars	1160	1022	2943	5125
Trucks	69	40	71	180
Cyclists	0	0	1	1
Totals	1229	1062	3015	
Peds Cross:	⋈			
South Peds:	61			
South Entering:	5306			
South Leg Total:	5306			

Comments

Fairview St & QEW E Ramp
Traffic Count Summary

Intersection: Fairview St & QEW E Ramp | **Count Date:** 15-Nov-2017 | **Municipality:** Burlington

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	10	0	187	197	0	1298
9:00:00	9	0	257	266	4	1088
11:00:00	0	0	0	0	0	0
12:00:00	4	0	284	288	9	824
13:00:00	12	0	311	323	1	890
14:00:00	7	0	318	325	3	841
15:00:00	0	0	0	0	0	0
16:00:00	6	0	440	446	5	929
17:00:00	9	0	562	571	5	1218
18:00:00	5	0	557	562	1	1196
Totals:	62	0	2916	2978	28	8284

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	155	276	670	1101	2
9:00:00	176	177	469	822	2
11:00:00	0	0	0	0	0
12:00:00	138	68	330	536	5
13:00:00	178	65	324	567	13
14:00:00	151	75	290	516	12
15:00:00	0	0	0	0	0
16:00:00	138	101	244	483	10
17:00:00	149	151	347	647	7
18:00:00	144	149	341	634	10
Totals:	1229	1062	3015	5306	61

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	0	558	6	564	0	1520
9:00:00	0	678	11	689	0	1921
11:00:00	0	0	0	0	0	0
12:00:00	0	1082	8	1090	2	2285
13:00:00	0	1181	18	1199	0	2470
14:00:00	0	1244	18	1262	1	2530
15:00:00	0	0	0	0	0	0
16:00:00	0	1847	20	1867	5	3173
17:00:00	0	2138	18	2156	0	3488
18:00:00	0	2211	21	2232	0	3602
Totals:	0	10939	120	11059	8	20989

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	73	883	0	956	0
9:00:00	112	1120	0	1232	0
11:00:00	0	0	0	0	0
12:00:00	98	1097	0	1195	0
13:00:00	113	1158	0	1271	0
14:00:00	116	1152	0	1268	0
15:00:00	0	0	0	0	0
16:00:00	100	1206	0	1306	0
17:00:00	99	1233	0	1332	0
18:00:00	86	1284	0	1370	0
Totals:	797	9133	0	9930	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	441	362	212	255	234	250	309	298

Brant St @ Fairview St

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

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

Municipality: Halton Region
Site #: 1020550100
Intersection: Fairview St & Brant St
TFR File #: 4
Count date: 2-May-2018

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Fairview St runs W/E

North Leg Total:	1965			
North Entering:	975			
North Peds:	6			
Peds Cross:	⋈			
Heavys	20	11	3	34
Trucks	7	9	0	16
Cars	110	610	205	925
Totals	137	630	208	
Heavys	39			
Trucks	11			
Cars	940			
Totals	990			
East Leg Total:	1954			
East Entering:	551			
East Peds:	21			
Peds Cross:	⧖			

Brant St

Heavys	Trucks	Cars	Totals
32	12	558	602

	Cars	Trucks	Heavys	Totals
	129	4	5	138
	290	4	11	305
	103	4	1	108
	522	12	17	

Fairview St

N
W E
S

Heavys	Trucks	Cars	Totals
17	5	284	306
6	15	941	962
3	4	216	223
26	24	1441	

Fairview St

Cars	Trucks	Heavys	Totals
1376	18	9	1403

Brant St

Peds Cross:	⧖			
West Peds:	22			
West Entering:	1491			
West Leg Total:	2093			
Cars	929			
Trucks	17			
Heavys	15			
Totals	961			
Cars	158	527	230	915
Trucks	1	2	3	6
Heavys	1	17	0	18
Totals	160	546	233	
Peds Cross:	⋈			
South Peds:	1			
South Entering:	939			
South Leg Total:	1900			

Comments

Brant St @ Fairview St

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 12:15:00
To: 13:15:00

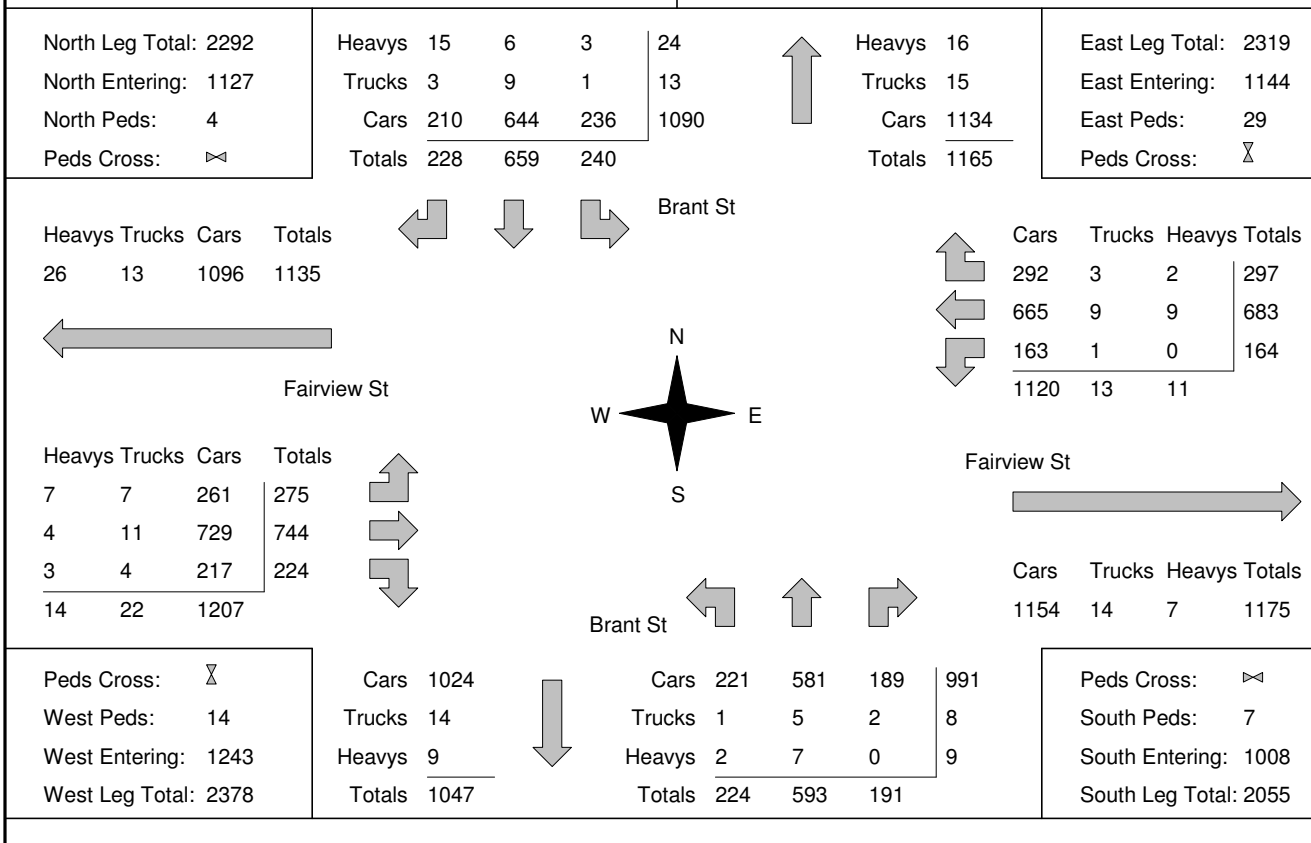
Municipality: Halton Region
Site #: 1020550100
Intersection: Fairview St & Brant St
TFR File #: 4
Count date: 2-May-2018

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Fairview St runs W/E



Comments

Brant St @ Fairview St

Afternoon Peak Diagram

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

One Hour Peak
From: 16:30:00
To: 17:30:00

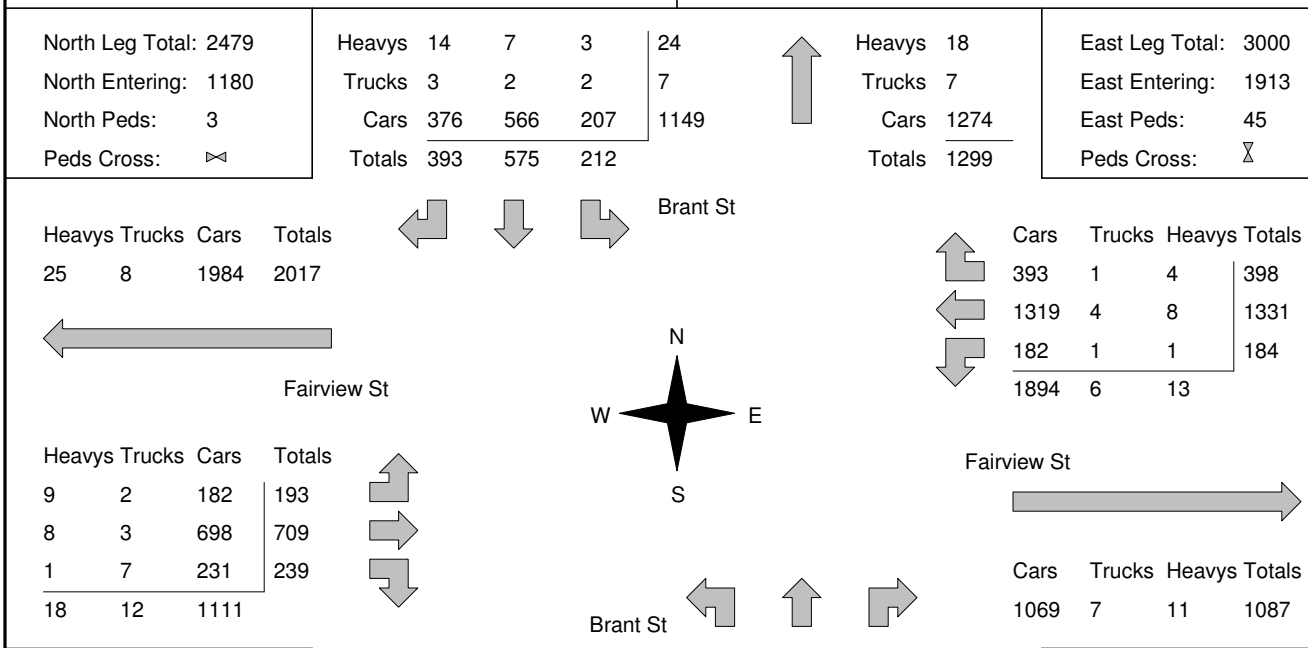
Municipality: Halton Region
Site #: 1020550100
Intersection: Fairview St & Brant St
TFR File #: 4
Count date: 2-May-2018

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Fairview St runs W/E



Comments

Brant St @ Fairview St

Total Count Diagram

Municipality: Halton Region
Site #: 1020550100
Intersection: Fairview St & Brant St
TFR File #: 4
Count date: 2-May-2018

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Fairview St runs W/E

North Leg Total:	17273			
North Entering:	8005			
North Peds:	38			
Peds Cross:	⋈			
Heavys	105	65	24	194
Trucks	42	49	14	105
Cars	1777	4336	1593	7706
Totals	1924	4450	1631	
Heavys	184			
Trucks	92			
Cars	8992			
Totals	9268			
East Leg Total:	18335			
East Entering:	9409			
East Peds:	245			
Peds Cross:	⧖			

Brant St

Heavys	Trucks	Cars	Totals
194	101	9311	9606

Cars	Trucks	Heavys	Totals
2154	22	27	2203
5849	48	72	5969
1215	16	6	1237
9218	86	105	

Fairview St

N
W E
S

Heavys	Trucks	Cars	Totals
88	31	1998	2117
60	52	5627	5739
17	31	1593	1641
165	114	9218	

Fairview St

Cars	Trucks	Heavys	Totals
8754	83	89	8926

Brant St

Peds Cross:	⧖			
West Peds:	143			
West Entering:	9497			
West Leg Total:	19103			
Cars	7144			
Trucks	96			
Heavys	88			
Totals	7328			
Cars	1685	4840	1534	8059
Trucks	11	39	17	67
Heavys	17	69	5	91
Totals	1713	4948	1556	
Peds Cross:	⋈			
South Peds:	49			
South Entering:	8217			
South Leg Total:	15545			

Comments

Brant St @ Plains Rd E

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

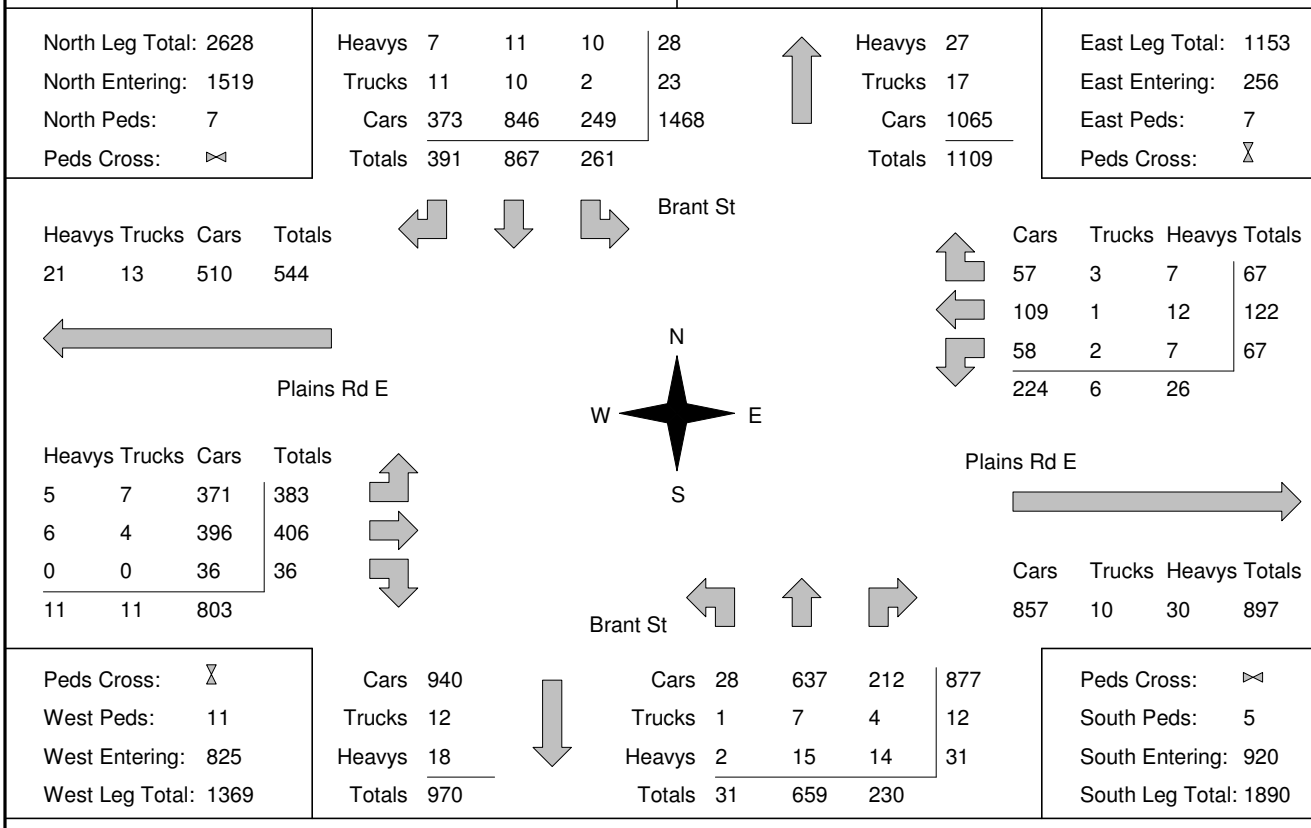
Municipality: Halton Region
Site #: 1020610100
Intersection: Brant St & Plains Rd E
TFR File #: 6
Count date: 5-Apr-2018

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Brant St runs N/S



Comments

Brant St @ Plains Rd E

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

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

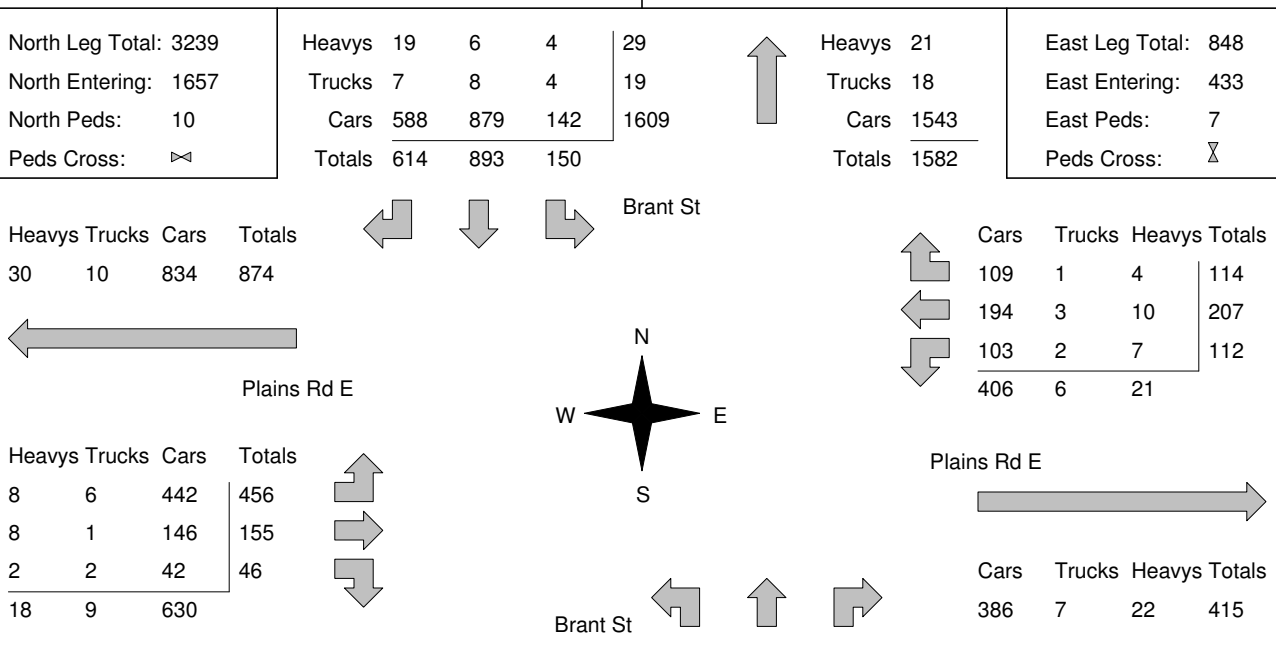
Municipality: Halton Region
Site #: 1020610100
Intersection: Brant St & Plains Rd E
TFR File #: 6
Count date: 5-Apr-2018

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Brant St runs N/S



Comments

Brant St @ Plains Rd E

Afternoon Peak Diagram

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

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

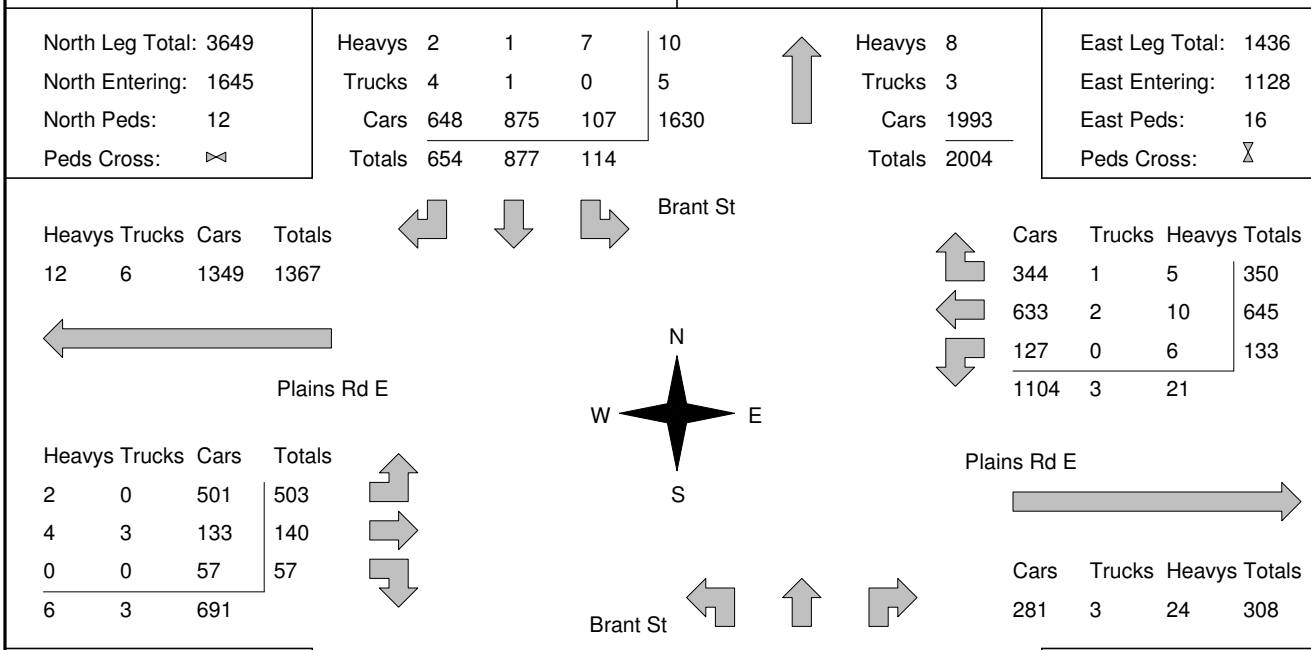
Municipality: Halton Region
Site #: 1020610100
Intersection: Brant St & Plains Rd E
TFR File #: 6
Count date: 5-Apr-2018

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Brant St runs N/S



Comments

Brant St @ Plains Rd E

Total Count Diagram

Municipality: Halton Region
Site #: 1020610100
Intersection: Brant St & Plains Rd E
TFR File #: 6
Count date: 5-Apr-2018

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Brant St runs N/S

North Leg Total:	24333			
North Entering:	12082			
North Peds:	65			
Peds Cross:	⋈			
Heavys	60	61	54	175
Trucks	56	63	12	131
Cars	4051	6481	1244	11776
Totals	4167	6605	1310	
Heavys	178			
Trucks	125			
Cars	11948			
Totals	12251			
East Leg Total:	8376			
East Entering:	4379			
East Peds:	71			
Peds Cross:	⧖			

Brant St

Heavys	Trucks	Cars	Totals
155	80	6616	6851

Cars	Trucks	Heavys	Totals
1300	13	51	1364
2196	18	88	2302
655	7	51	713
4151	38	190	

Plains Rd E

N
W E
S

Heavys	Trucks	Cars	Totals
52	50	3411	3513
47	15	1562	1624
4	8	352	364
103	73	5325	

Plains Rd E

Cars	Trucks	Heavys	Totals
3759	42	196	3997

Brant St

Peds Cross:	⧖			
West Peds:	70			
West Entering:	5501			
West Leg Total:	12352			
Cars	7488			
Trucks	78			
Heavys	116			
Totals	7682			
Cars	369	7237	953	8559
Trucks	6	62	15	83
Heavys	7	75	95	177
Totals	382	7374	1063	
Peds Cross:	⋈			
South Peds:	18			
South Entering:	8819			
South Leg Total:	16501			

Comments

Ontario

INTERSECTION LAYOUT SHEET

Date: 2017-06-22 Day: Thursday Request # 909 Observer(s) Video

Gretch Code (LHRS O/S): 3101160000 Ramp #

Hwy # QEW Location Fairview St (East off-ramp)

Reg/Mun Burlington Town/City

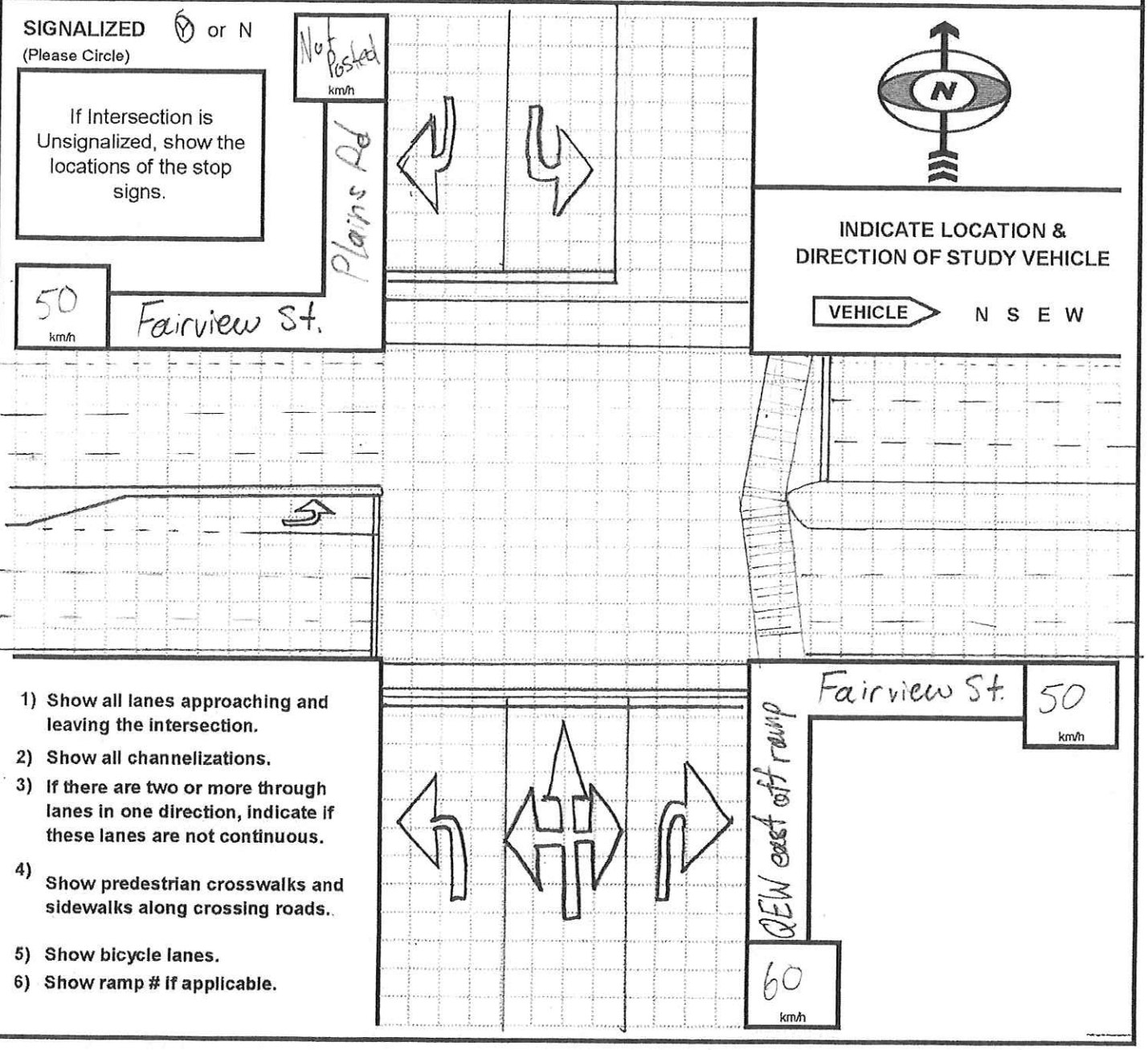
Comments

Segment 1 - AM or PM (Please Circle ONE) Weather Clear

DATASETS
For office use only:
Edit File:
AM Peak:
PM Peak:
Processed by:

SIGNALIZED (Y) or N
(Please Circle)

If Intersection is Unsignalized, show the locations of the stop signs.



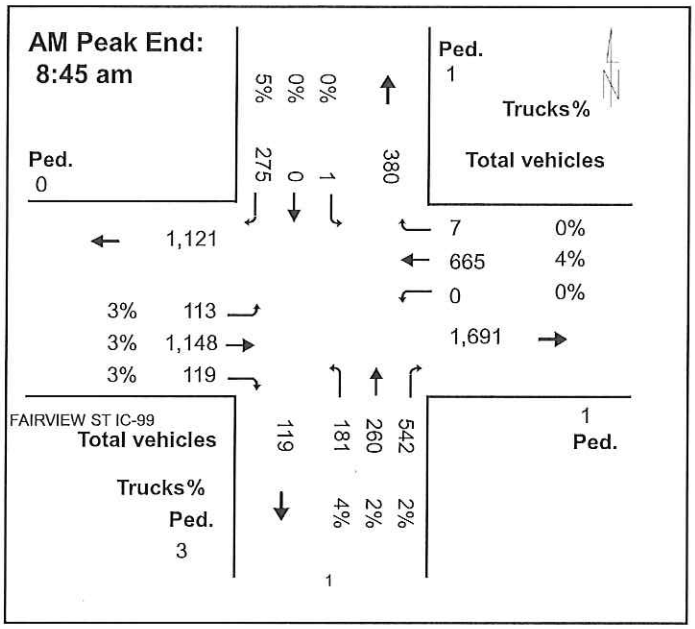
1) Show all lanes approaching and leaving the intersection.
2) Show all channelizations.
3) If there are two or more through lanes in one direction, indicate if these lanes are not continuous.
4) Show predestrian crosswalks and sidewalks along crossing roads.
5) Show bicycle lanes.
6) Show ramp # if applicable.

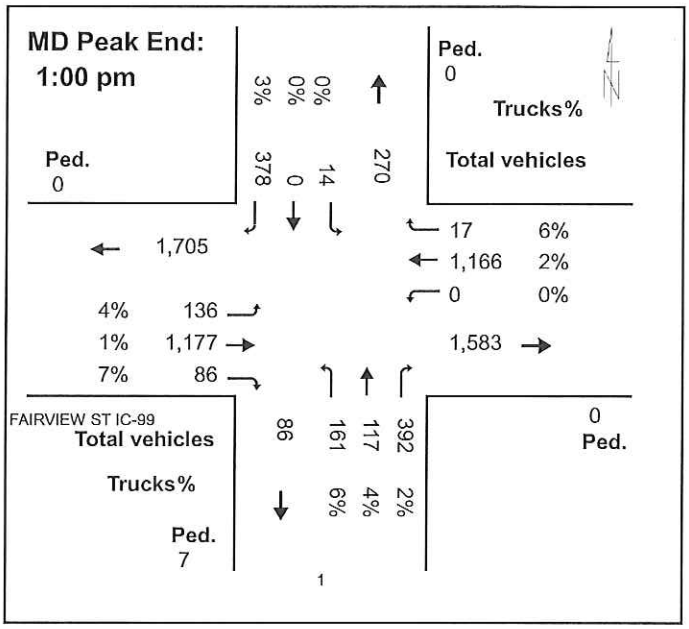
Ontario

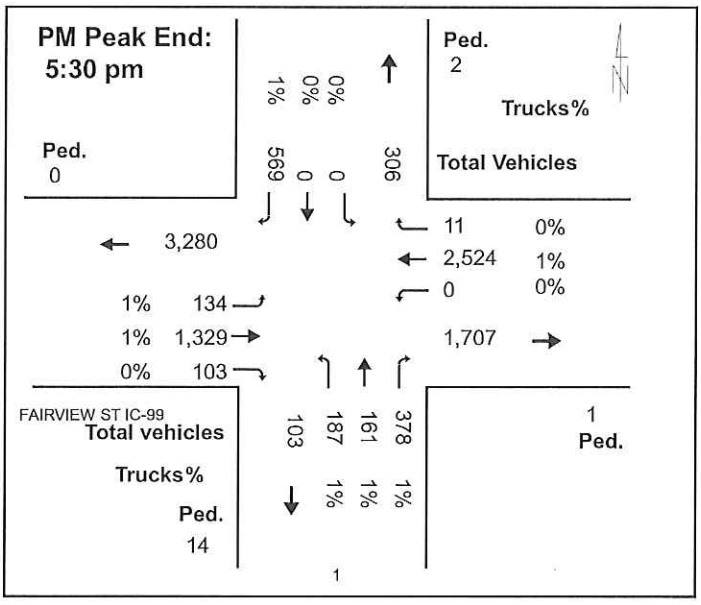
HWY 1 @ FAIRVIEW ST IC-99

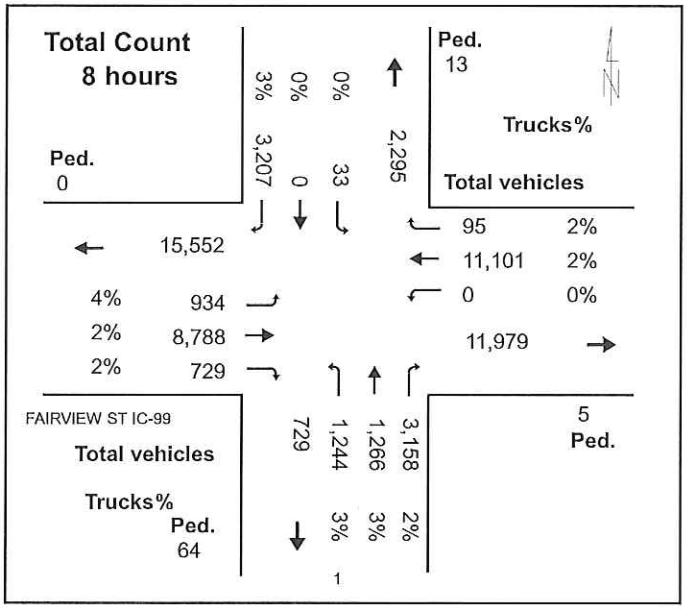
Central

Intersection ID:101160000(--E--) **Count Day: Thursday** **Count Date: 22-Jun-2017**









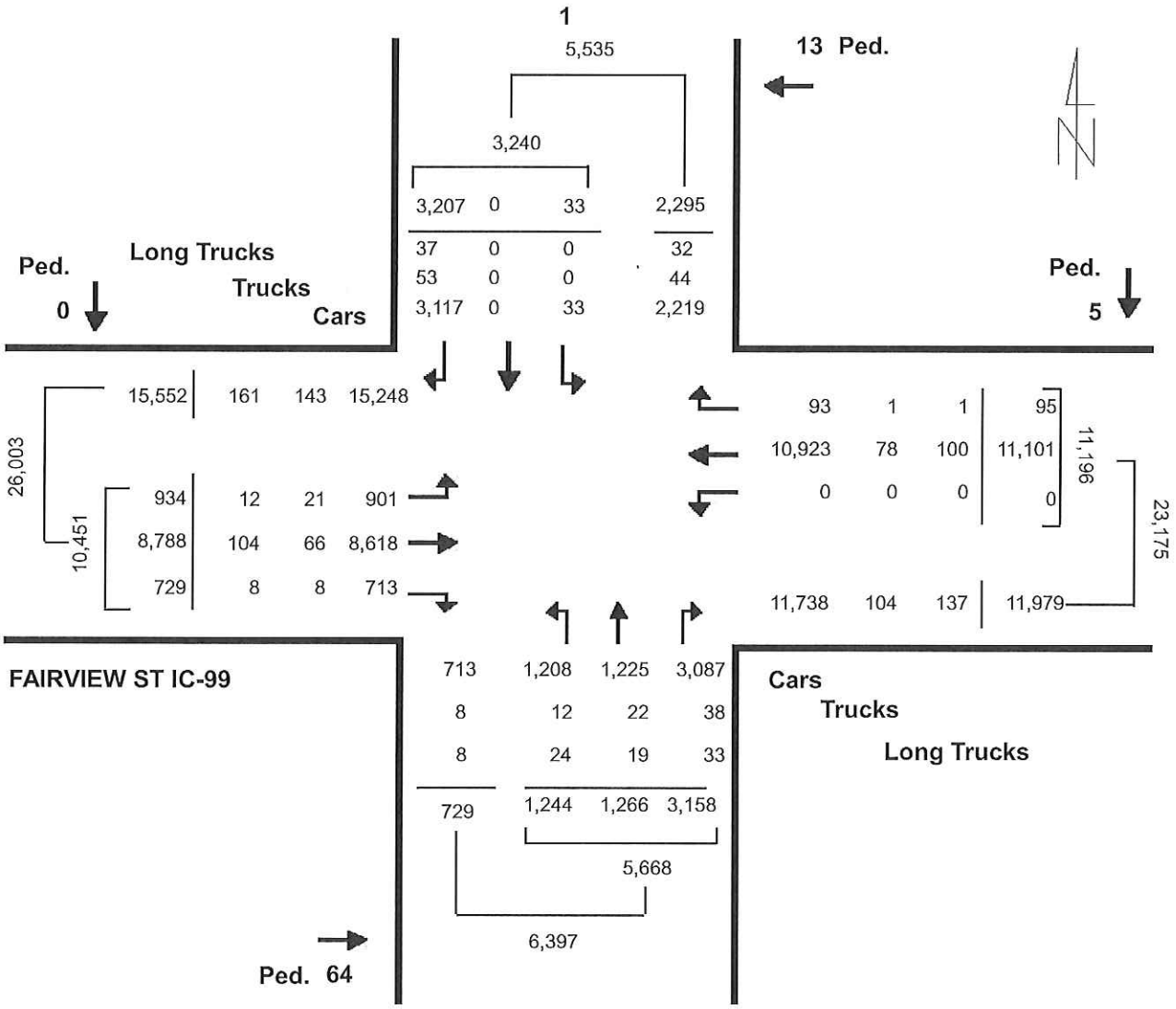
Traffic
Engineering
Software

COUNT TOTAL

HWY 1 @ FAIRVIEW ST IC-99

Central

Intersection ID:101160000(--E--) **Date: 22-Jun-2017**



15 MIN REPORT

Intersection ID:101160000(--E--) **HWY 1 @ FAIRVIEW ST IC-99** **Municipality: Central** **Date: 22-Jun-2017**

	NORTH APPROACH										EAST APPROACH									
Time	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Period1																				
7:15	0	0	47	0	0	1	0	0	1	0	0	104	0	0	0	0	0	5	0	0
7:30	0	0	55	0	0	2	0	0	3	0	0	130	1	0	0	0	0	3	0	0
7:45	2	0	56	0	0	1	0	0	2	2	0	143	0	0	1	0	0	3	0	1
8:00	0	0	79	0	0	0	0	0	2	0	0	149	0	0	4	0	0	3	0	0
8:15	1	0	67	0	0	1	0	0	0	0	0	162	2	0	1	0	0	3	0	1
8:30	0	0	66	0	0	2	0	0	0	0	0	158	1	0	5	0	0	3	0	0
8:45	0	0	50	0	0	5	0	0	3	1	0	171	4	0	3	0	0	3	0	0
9:00	0	0	69	0	0	2	0	0	1	1	0	166	1	0	1	0	0	3	0	0
9:15	0	0	62	0	0	0	0	0	0	0	0	166	3	0	3	0	0	6	0	0
9:30	0	0	71	0	0	4	0	0	3	0	0	183	0	0	2	1	0	0	0	0
9:45	0	0	65	0	0	0	0	0	0	0	0	181	3	0	3	0	0	5	0	0
10:00	0	0	83	0	0	3	0	0	1	0	0	179	2	0	2	0	0	2	0	0
Period2																				
12:15	5	0	93	0	0	1	0	0	4	0	0	279	4	0	1	0	0	3	1	0
12:30	2	0	88	0	0	2	0	0	1	0	0	292	4	0	2	0	0	1	0	0
12:45	4	0	94	0	0	2	0	0	0	0	0	281	2	0	3	0	0	2	0	0
13:00	3	0	90	0	0	2	0	0	1	0	0	292	6	0	4	0	0	6	0	0
13:15	1	0	75	0	0	1	0	0	1	1	0	284	8	0	2	0	0	4	0	0
13:30	1	0	118	0	0	4	0	0	2	0	0	313	8	0	7	0	0	2	0	0
13:45	0	0	73	0	0	3	0	0	2	0	0	302	3	0	1	0	0	4	0	0
14:00	3	0	88	0	0	2	0	0	2	1	0	338	4	0	3	0	0	4	0	1
Period3																				
16:15	0	0	127	0	0	3	0	0	0	1	0	558	8	0	1	0	0	3	0	1
16:30	2	0	149	0	0	1	0	0	3	0	0	527	2	0	3	0	0	3	0	0
16:45	0	0	138	0	0	1	0	0	1	1	0	620	4	0	5	0	0	6	0	0
17:00	0	0	143	0	0	0	0	0	1	0	0	619	3	0	1	0	0	1	0	0
17:15	0	0	131	0	0	0	0	0	0	0	0	664	2	0	1	0	0	7	0	0
17:30	0	0	150	0	0	3	0	0	1	1	0	593	2	0	5	0	0	2	0	1
17:45	2	0	129	0	0	0	0	0	0	2	0	635	3	0	2	0	0	1	0	0
18:00	2	0	152	0	0	2	0	0	0	1	0	567	2	0	3	0	0	4	0	0
18:15	1	0	134	0	0	1	0	0	0	1	0	564	0	0	2	0	0	4	0	0
18:30	2	0	143	0	0	2	0	0	0	0	0	488	0	0	0	0	0	2	0	0
18:45	1	0	125	0	0	1	0	0	1	0	0	464	8	0	3	0	0	2	0	0
19:00	1	0	107	0	0	1	0	0	1	0	0	351	3	0	4	0	0	0	0	0

	SOUTH APPROACH										WEST APPROACH										
Time	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Period1																					
7:15	28	62	116	0	0	0	0	0	0	0	21	155	22	0	0	0	2	4	1	0	569
7:30	35	92	177	0	0	2	0	1	1	0	25	190	31	0	4	1	1	4	0	0	758
7:45	33	72	161	0	2	0	3	0	2	1	33	237	23	0	5	0	1	6	0	0	790
8:00	46	87	188	0	1	0	1	0	1	1	28	255	31	2	2	0	0	6	1	0	887
8:15	38	59	110	1	1	0	2	1	1	1	23	291	27	0	4	1	0	3	0	0	801
8:30	41	57	122	2	0	4	0	0	1	0	35	270	38	0	3	0	0	7	0	0	815
8:45	49	52	111	0	1	2	1	1	2	1	24	299	20	0	3	0	1	5	1	0	813
9:00	37	38	101	0	2	4	0	1	1	1	30	273	19	2	3	2	1	5	1	0	765
9:15	37	35	109	2	1	2	0	1	2	0	35	210	12	0	3	0	0	11	0	0	700
9:30	41	39	95	0	4	4	0	2	0	2	25	217	18	1	1	0	0	3	0	0	716
9:45	38	31	94	1	0	3	0	1	2	3	23	244	16	1	3	0	1	3	0	0	721
10:00	42	17	95	0	1	4	1	1	3	2	19	211	14	1	2	0	1	4	0	0	690
Period2																					
12:15	38	39	106	2	1	1	2	0	1	0	34	301	19	0	3	0	1	1	1	0	941
12:30	39	28	96	0	1	2	2	2	0	2	34	258	28	2	2	2	1	3	0	0	894
12:45	41	25	82	0	0	1	2	0	1	3	30	280	18	1	2	1	1	2	1	0	879
13:00	34	20	99	0	1	2	1	0	1	2	32	323	15	0	1	0	0	1	1	0	937
13:15	30	25	64	1	2	2	1	0	0	1	32	245	22	0	1	1	0	4	0	0	808
13:30	33	23	81	1	1	1	1	1	0	4	30	243	26	1	1	0	0	2	1	0	905
13:45	30	11	79	0	1	1	2	0	2	2	33	270	28	0	3	0	0	3	0	0	853
14:00	37	20	54	0	0	0	0	0	0	2	30	249	20	4	3	0	0	2	0	0	867
Period3																					
16:15	28	29	65	1	1	0	0	1	1	2	25	288	26	1	2	0	0	3	0	0	1175
16:30	47	36	70	1	0	0	0	0	1	1	34	311	20	0	2	0	0	4	0	0	1217
16:45	44	34	89	0	0	0	1	0	0	2	37	332	25	0	2	0	0	0	0	0	1342
17:00	51	35	108	0	0	0	1	1	2	6	35	327	23	0	3	0	0	4	0	0	1364
17:15	37	41	84	0	0	0	0	0	0	4	31	338	24	1	1	0	0	4	0	0	1370
17:30	53	49	93	0	0	1	0	1	1	2	30	318	31	0	0	0	0	0	0	0	1337
17:45	46	32	74	0	0	0	2	1	3	3	17	321	13	0	1	0	0	1	0	0	1288
18:00	35	43	80	0	0	1	0	0	1	3	21	294	16	1	2	0	0	3	0	0	1233
18:15	31	19	56	0	0	0	1	0	0	6	21	304	19	2	3	0	0	2	0	0	1171
18:30	34	31	98	0	0	0	0	3	1	3	31	245	19	0	0	0	0	2	0	0	1104
18:45	33	19	75	0	0	1	0	0	1	1	21	255	32	1	1	0	0	0	0	0	1045
19:00	22	25	55	0	1	0	0	0	1	3	22	264	18	0	0	0	1	2	0	0	882

BICYLE COUNT FORM

Location: QEW at FAIRVIEW ST/PLAINS RD(EAST RAMP)
Site ID: 8101160000 HWY: QEW
Count Start Date: 06/22/2017

Time	North Approach			East Approach			South Approach			West Approach		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
06:00 to 06:15												
06:15 to 06:30												
06:30 to 06:45												
06:45 to 07:00												
07:00 to 07:15					1					1	1	
07:15 to 07:30			1									
07:30 to 07:45											2	
07:45 to 08:00											1	
08:00 to 08:15					1						1	
08:15 to 08:30												
08:30 to 08:45											1	
08:45 to 09:00			1								1	
09:00 to 09:15					1						1	
09:15 to 09:30											1	
09:30 to 09:45											1	
09:45 to 10:00												
10:00 to 10:15												
10:15 to 10:30												
10:30 to 10:45												
10:45 to 11:00												
11:00 to 11:15												
11:15 to 11:30												
11:30 to 11:45												
11:45 to 12:00												
12:00 to 12:15					1						2	
12:15 to 12:30												
12:30 to 12:45											1	
12:45 to 13:00												
13:00 to 13:15											1	
13:15 to 13:30					1					1		
13:30 to 13:45												
13:45 to 14:00												
14:00 to 14:15												
14:15 to 14:30												
14:30 to 14:45												
14:45 to 15:00												
15:00 to 15:15												
15:15 to 15:30												
15:30 to 15:45												
15:45 to 16:00												
16:00 to 16:15											1	
16:15 to 16:30											1	
16:30 to 16:45					1						1	
16:45 to 17:00											1	
17:00 to 17:15					2						1	
17:15 to 17:30					1						1	
17:30 to 17:45					3							
17:45 to 18:00					1						1	
18:00 to 18:15												
18:15 to 18:30					1							
18:30 to 18:45												
18:45 to 19:00												
19:00 to 19:15												
19:15 to 19:30												
19:30 to 19:45												
19:45 to 20:00												
Sub Totals	0	0	2	0	14	0	0	0	0	2	21	0
Total	2			14			0			23		

Ontario

INTERSECTION LAYOUT SHEET

Date: 2017-06-22 Day: Thursday Request # 913 Observer(s) Video

Gretch Code (LHRS O/S): 4101160000 Ramp # _____

Hwy # QEW Location Plains Rd (West off-ramp)

Reg/Mun Burlington Town/City _____

Comments _____

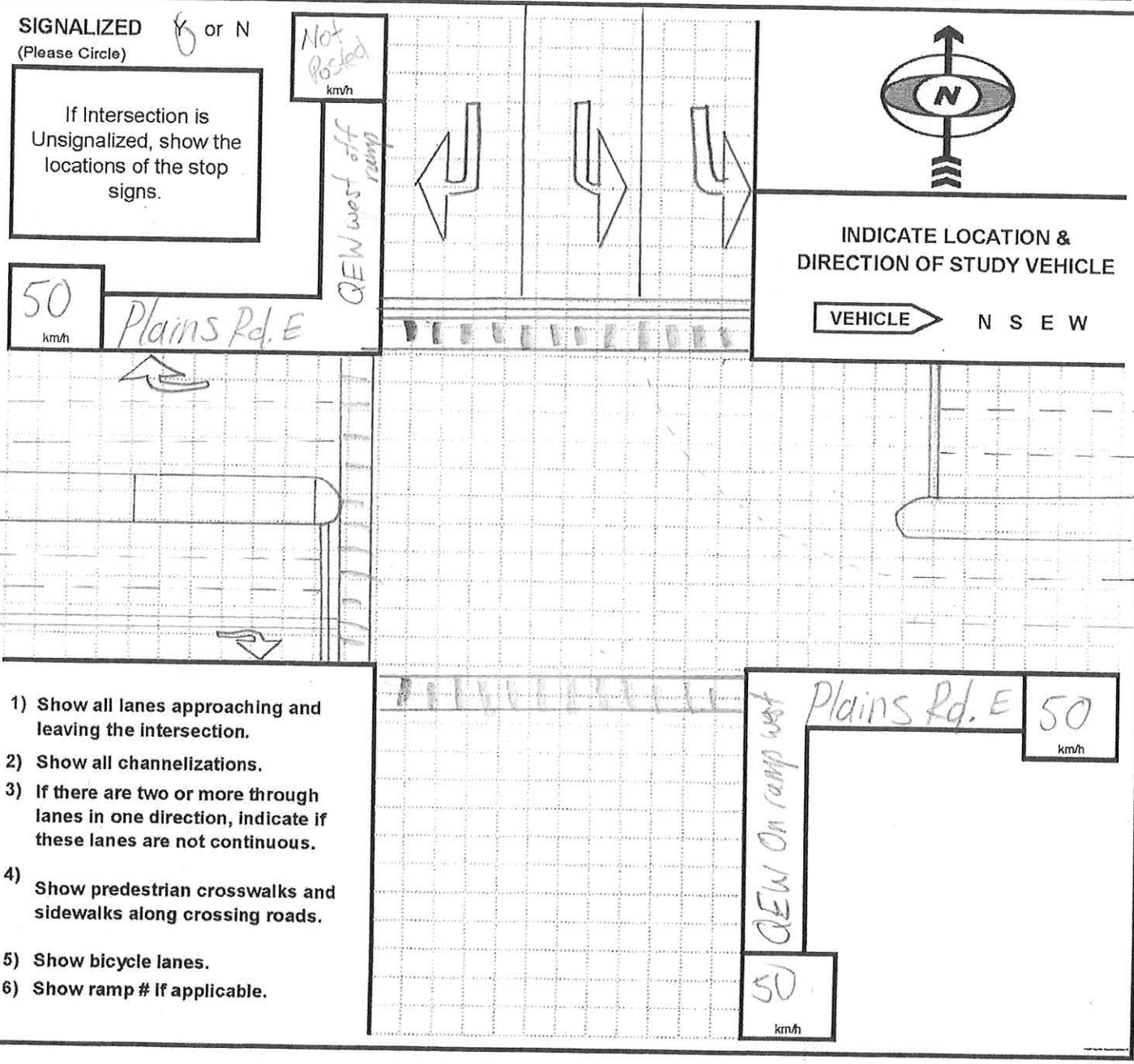
Segment 1 - AM or PM (Please Circle **ONE**) Weather Clear

DATASETS
For office use only:

Edit File: _____
AM Peak: _____
PM Peak: _____
Processed by: _____

SIGNALIZED (Please Circle) Y or N

If Intersection is Unsignalized, show the locations of the stop signs.



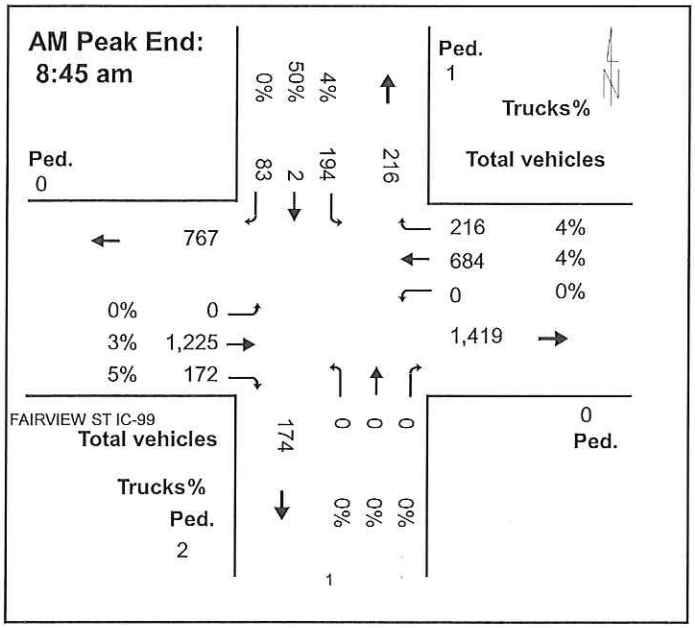
1) Show all lanes approaching and leaving the intersection.
2) Show all channelizations.
3) If there are two or more through lanes in one direction, indicate if these lanes are not continuous.
4) Show predestrian crosswalks and sidewalks along crossing roads.
5) Show bicycle lanes.
6) Show ramp # if applicable.

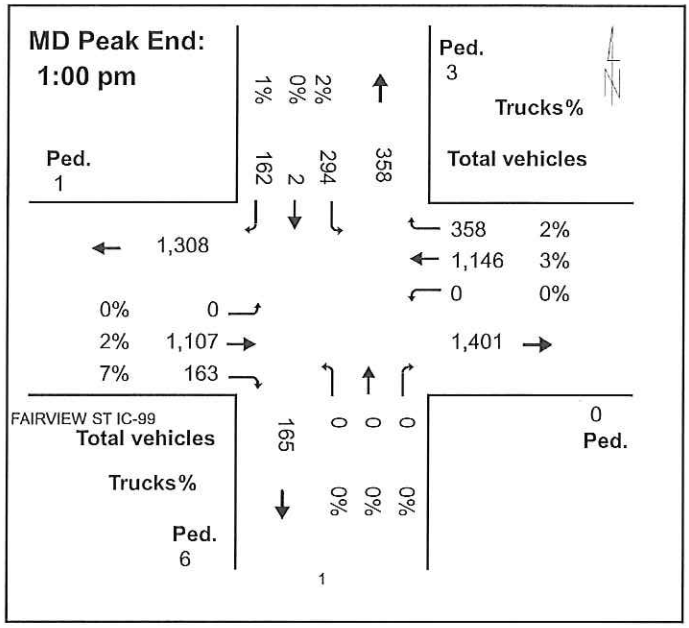
Ontario

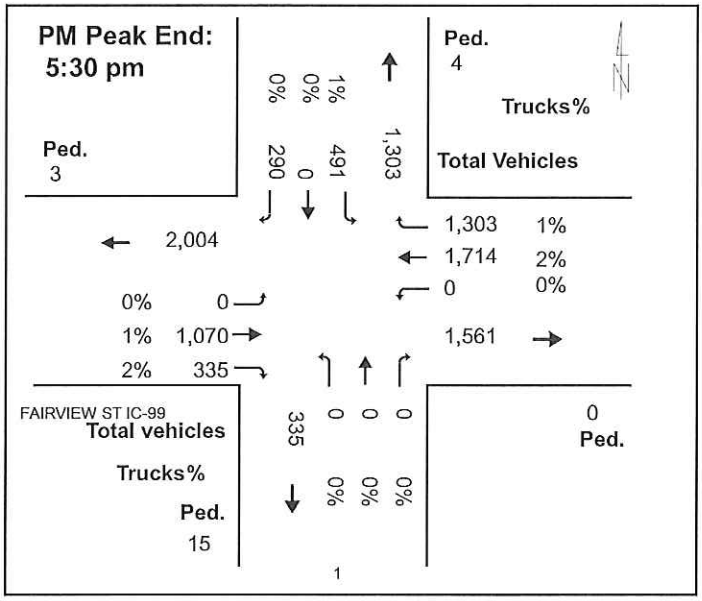
HWY 1 @ FAIRVIEW ST IC-99

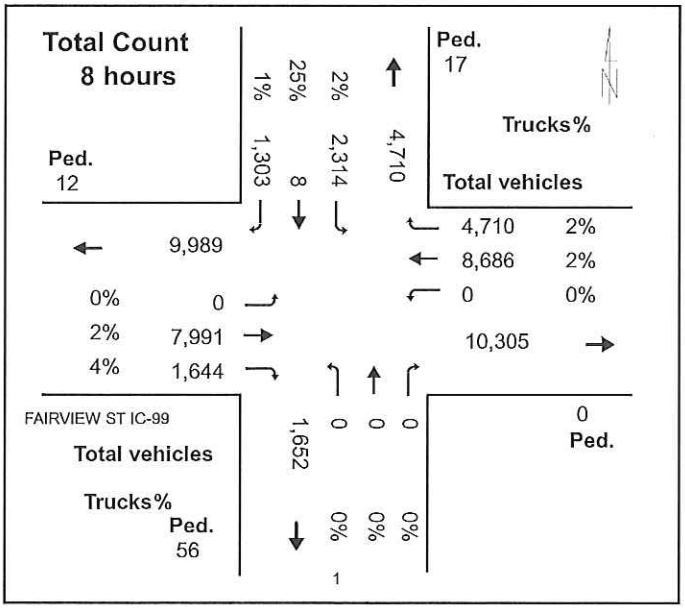
Central

Intersection ID:101160000(--W--) **Count Day: Thursday** **Count Date: 22-Jun-2017**









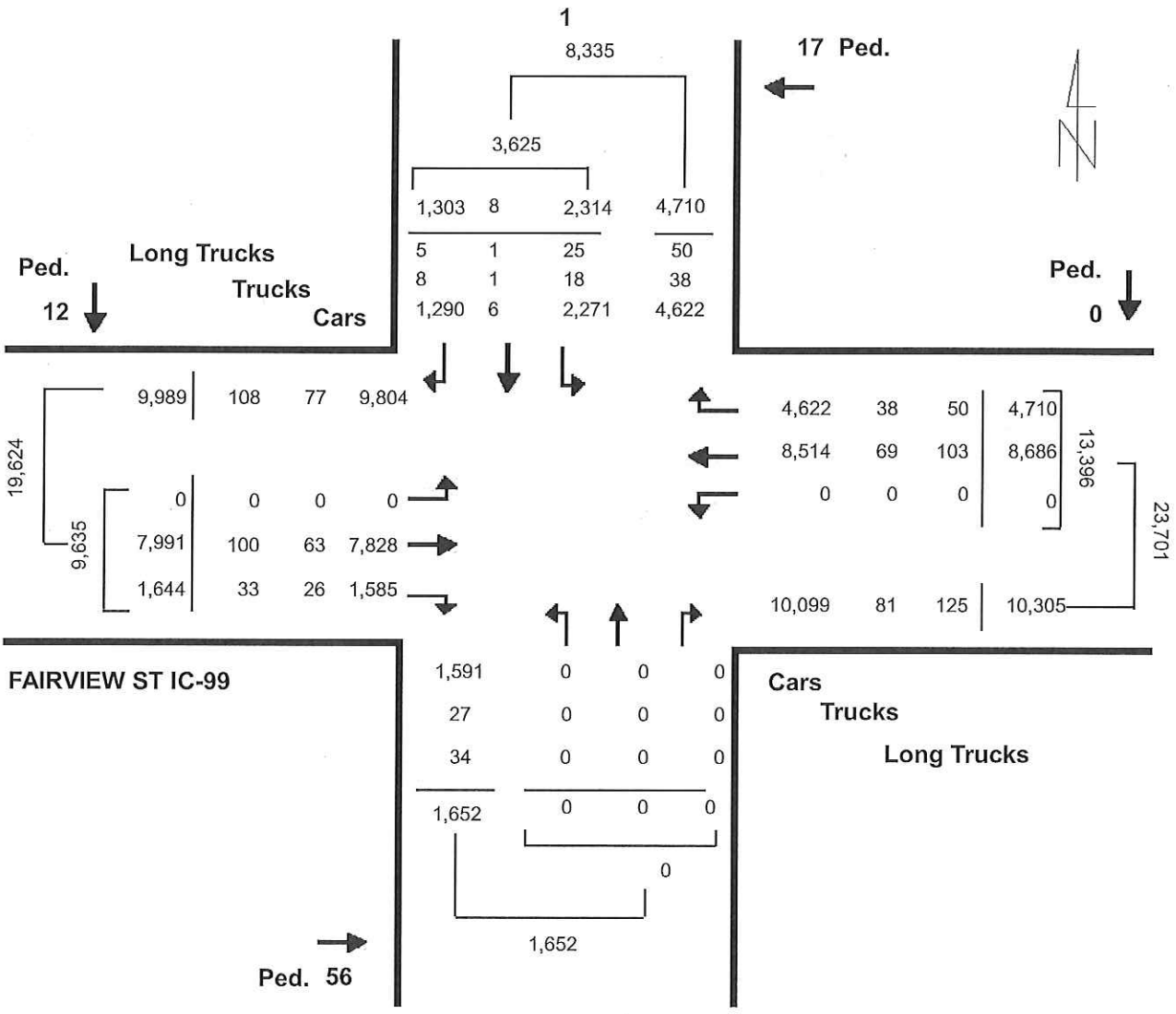
Traffic Engineering Software

COUNT TOTAL

HWY 1 @ FAIRVIEW ST IC-99

Central

Intersection ID:101160000(--W--) **Date: 22-Jun-2017**



15 MIN REPORT

Intersection ID:101160000(--W--) HWY 1 @ FAIRVIEW ST IC-99 **Municipality: Central** **Date: 22-Jun-2017**

	NORTH APPROACH										EAST APPROACH										SOUTH APPROACH										WEST APPROACH										
Time	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Cars			Trucks			Heavies			Ped	Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Period1																																									
7:15	13	0	6	0	0	1	1	0	0	0	0	87	57	0	1	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	185	15	0	0	1	0	6	2	0	381
7:30	20	0	13	0	0	1	0	0	1	0	0	107	60	0	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	232	39	0	4	0	0	5	1	0	488
7:45	30	0	16	1	0	0	1	0	0	2	0	111	59	0	0	3	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	267	44	0	4	0	0	7	0	0	552
8:00	34	0	24	0	0	0	1	0	0	0	0	166	55	0	1	2	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	289	33	0	4	1	0	5	0	0	620
8:15	44	1	25	2	0	0	1	0	0	1	0	162	51	0	2	1	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	305	41	0	4	1	0	5	1	0	652
8:30	56	0	20	0	0	0	2	0	0	0	0	141	53	0	5	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	306	51	0	1	1	0	3	2	0	645
8:45	52	0	14	0	0	0	2	1	0	0	0	188	49	0	4	3	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	293	39	0	1	0	0	9	2	0	662
9:00	60	0	31	0	0	0	0	0	0	1	0	163	51	0	1	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	251	31	0	3	0	0	4	0	0	600
9:15	42	0	17	2	0	1	0	0	0	0	0	197	34	0	4	1	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	204	25	0	2	1	0	12	3	0	550
9:30	56	0	26	1	0	0	0	0	0	0	0	197	53	0	5	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	1	225	24	0	2	0	0	3	0	0	596
9:45	62	0	23	2	0	1	1	0	1	0	0	191	65	0	3	0	0	5	2	0	0	0	0	0	0	0	0	0	0	0	2	201	23	0	0	2	0	3	4	2	593
10:00	15	0	12	1	0	0	1	0	1	0	0	51	12	0	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	48	6	0	1	0	0	1	0	0	153
Period2																																									
12:15	72	0	44	1	0	1	1	0	0	0	0	277	81	0	1	2	0	5	0	0	0	0	0	0	0	0	0	0	0	0	1	274	35	0	2	0	0	3	1	0	801
12:30	67	1	36	1	0	0	2	0	0	0	0	267	92	0	4	1	0	5	0	0	0	0	0	0	0	0	0	0	0	0	2	265	33	0	3	2	0	1	1	0	783
12:45	66	0	37	0	0	0	1	0	0	3	0	300	69	0	3	1	0	5	0	0	0	0	0	0	0	0	0	0	0	0	2	258	37	0	4	3	0	3	2	0	794
13:00	82	1	43	0	0	1	1	0	0	0	0	271	109	0	4	0	0	4	3	0	0	0	0	0	0	0	0	0	0	0	1	291	46	0	1	2	0	2	1	1	864
13:15	56	1	45	1	1	1	1	0	0	1	0	243	90	0	2	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	233	45	0	3	0	0	2	1	0	730
13:30	60	0	34	0	0	0	1	0	0	0	0	270	127	0	5	5	0	2	1	0	0	0	0	0	0	0	0	0	0	0	4	246	47	0	2	2	0	1	2	2	811
13:45	68	0	33	1	0	1	1	0	0	1	0	252	90	0	0	2	0	4	4	0	0	0	0	0	0	0	0	0	0	0	2	255	44	0	3	1	0	2	3	0	767
14:00	66	0	50	0	0	0	0	0	1	1	0	275	101	0	3	1	0	2	4	0	0	0	0	0	0	0	0	0	0	0	3	242	58	0	5	2	0	4	1	0	819
Period3																																									
16:15	80	0	61	0	0	0	1	0	1	0	0	362	259	0	1	2	0	2	3	0	0	0	0	0	0	0	0	0	0	0	2	263	92	0	0	1	0	3	0	0	1133
16:30	115	1	64	0	0	0	0	0	0	0	0	411	253	0	1	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	1	279	57	0	2	0	0	3	0	0	1192
16:45	135	0	70	1	0	0	0	0	0	2	0	404	340	0	3	0	0	6	5	0	0	0	0	0	0	0	0	0	0	0	4	254	79	0	1	1	0	1	2	0	1308
17:00	117	0	79	1	0	0	2	0	0	0	0	427	328	0	1	0	0	7	1	0	0	0	0	0	0	0	0	0	0	0	5	276	62	0	1	2	0	2	1	2	1314
17:15	123	0	69	0	0	0	2	0	0	1	0	418	303	0	0	1	0	5	3	0	0	0	0	0	0	0	0	0	0	0	4	291	95	0	1	0	0	1	0	1	1318
17:30	110	0	72	0	0	0	0	0	0	1	0	436	319	0	7	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	242	93	0	0	0	0	0	0	0	1285
17:45	125	0	55	1	0	0	0	0	0	0	0	409	311	0	1	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3	224	64	0	1	0	0	1	1	0	1199
18:00	104	0	67	1	0	0	1	0	0	1	0	404	263	0	3	1	0	2	4	0	0	0	0	0	0	0	0	0	0	0	2	229	66	0	1	2	0	2	0	0	1153
18:15	111	0	57	1	0	0	0	0	0	2	0	351	317	0	2	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	5	231	85	0	4	0	0	2	1	0	1173
18:30	72	1	57	0	0	0	0	0	0	0	0	369	234	0	0	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2	216	65	0	0	0	0	2	1	2	1025
18:45	91	0	51	0	0	0	1	0	0	0	0	332	198	0	0	0	0	2	4	0	0	0	0	0	0	0	0	0	0	0	3	233	48	0	2	0	0	0	0	0	965
19:00	67	0	39	0	0	0	0	0	0	0	0	275	139	0	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	220	63	0	1	1	0	2	0	2	815

BICYLE COUNT FORM

Location: QEW at FAIRVIEW ST/PLAINS RD(WEST RAMP)
Site ID: 9101160000 HWY: QEW
Count Start Date: 06/22/2017

Time	North Approach			East Approach			South Approach			West Approach		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
06:00 to 06:15												
06:15 to 06:30												
06:30 to 06:45												
06:45 to 07:00												
07:00 to 07:15											1	
07:15 to 07:30					1						1	
07:30 to 07:45											3	
07:45 to 08:00												
08:00 to 08:15					1						1	
08:15 to 08:30					1						1	
08:30 to 08:45											1	
08:45 to 09:00					1						1	
09:00 to 09:15					1						1	
09:15 to 09:30											2	
09:30 to 09:45											1	
09:45 to 10:00												
10:00 to 10:15												
10:15 to 10:30												
10:30 to 10:45												
10:45 to 11:00												
11:00 to 11:15												
11:15 to 11:30												
11:30 to 11:45												
11:45 to 12:00												
12:00 to 12:15					2						1	
12:15 to 12:30												
12:30 to 12:45												
12:45 to 13:00												
13:00 to 13:15												
13:15 to 13:30					1							
13:30 to 13:45												
13:45 to 14:00												
14:00 to 14:15												
14:15 to 14:30												
14:30 to 14:45												
14:45 to 15:00												
15:00 to 15:15												
15:15 to 15:30												
15:30 to 15:45												
15:45 to 16:00												
16:00 to 16:15											2	
16:15 to 16:30											1	
16:30 to 16:45					1						1	
16:45 to 17:00											1	
17:00 to 17:15					2						1	
17:15 to 17:30					1						1	
17:30 to 17:45					3							
17:45 to 18:00					1						1	1
18:00 to 18:15											1	
18:15 to 18:30												
18:30 to 18:45												
18:45 to 19:00					1						1	
19:00 to 19:15												
19:15 to 19:30												
19:30 to 19:45												
19:45 to 20:00												
Sub Totals	0	0	0	0	17	0	0	0	0	0	24	1
Total	0			17			0			25		

Intersection Name:	TS ID:	Line No:	Model:	IP address:	Controller Make:
Brant St @ Fairview St	151	1	ACS/3	172.22.66.2	Econolite

Type of Operation: 8 Phase Semi-Actuated

*-Start from Main Menu

No	Date			Description	Prepared by
	Y	M	D		MA
1	2016	12	6	Timing Changed(optimization) Amber & Allred changed as per OTM Book 12	

PHASE DESCRIPTION

Ph1	SBLT- Brant Street	Ph5	NBLT- Brant Street
Ph2	NB- Brant Street	Ph6	SB- Brant Street
Ph3	WBLT-Fairview Street	Ph7	EBLT-Fairview Street
Ph4	EB-Fairview Street	Ph8	WB-Fairview Street

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

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

CONTROLLER TIMING DATA - VEHICLE TIMING * - 2 - 1

Timing Plan: 1

	Phase: 1	2	3	4	5	6	7	8
Minimum Green	7	8	7	8	7	8	7	8
Walk		7		7		7		7
Ped. Clearance		17		17		17		17
Pedestrian Carry Over								
Vehicle Extension	3	3	3	3	3	3	3	3
MAX 1	15	40	15	35	15	40	15	35
MAX 2	15	40	15	35	15	40	15	35
Yellow Change	3	3.3	3	3.7	3	3.3	3	3.7
Red Clearance	1	3.2	1	2.7	1	3.2	1	2.7
Phase Minimum:	12	31.5	12	31.4	12	31.5	12	31.4

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

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

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

Coordinator Pattern (CP)	Cycle Length	Offset (sec)	Timing Plan	Split Pattern	Phases (sec)							
					1	2	3	4	5	6	7	8
1	110	107	1	1	18	36	12	44	12	42	21	35
2	110	70	1	2	19	34	12	45	19	34	17	40
3	120	89	1	3	22	36	20	42	22	36	13	49
4	100	0	1	4	15	36	15	34	15	36	15	34
5	120	0	1	5	17	37	19	47	17	37	14	52
10	0	0	1	10	0	0	0	0	0	0	0	0

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

Day Plan	Sched. #	Action Plan	Time Period	Pattern	Timing Plan
1	1	1	06:00	1	1
1	1	2	09:00	2	1
1	1	3	15:15	3	1
1	1	5	17:15	5	1
1	1	3	17:30	3	1
1	1	5	18:00	5	1
1	1	3	18:15	3	1
1	1	2	19:00	2	1
1	1	10	21:30	254	1
2	2	4	07:00	4	1
2	2	1	08:30	1	1
2	2	4	17:30	4	1
2	2	10	23:00	254	1
3	3	4	07:30	4	1
3	3	1	12:00	1	1
3	3	4	17:30	4	1
3	3	10	22:00	254	1

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

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

Action Plan 10 = free (254)

Special Programming:

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

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

Sum of 1&2		Sum of 3&4		Calculated	
				Total 1-4	Total 5-8
				Actual	Actual
1&2	5&6	3&4	7&8		
54	54	56	56	110	110
53	53	57	57	110	110
58	58	62	62	120	120
51	51	49	49	100	100
54	54	66	66	120	120
0	0	0	0	0	0
0	0	0	0	0	0

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Brant St @ Plains Rd - TS 161 - 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)	262F
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**	X		.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.		.	.	.	.	.	.	.	.	.	.	.	.	.
	4	.	.	.		.	.	.	.	.	.	.	.	.	.	.	.
	5	.	.	.	.		.	.	.	.	.	.	.	.	.	.	.
	6	.	.	.	.	X		.	.	.	.	.	.	.	.	.	.
	7	.	.	.	.	.	.		.	.	.	.	.	.	.	.	.
	8	.	.	.	.	.	.	.		.	.	.	.	.	.	.	.
	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	1	O				-	Auto	X		
14	2	O				+	Auto	X		X
15	3	O				-	Auto	X		
16	4	O				+	Auto	X		X

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Brant St @ Plains Rd - TS 161 - 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						
Detector Rack	X	X	X					

Enable TS2/MMU Type Cabinet: No
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: Yes

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

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

City of Burlington

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MOVING TRAFFIC FORWARD

Brant St @ Plains Rd - TS 161 - Econolite Type - ASC/3

Configuration Communications 1 (SDLC)

Ethernet Port Configuration (MM) 1-5-1

Controller IP:	172.24.68.2
Subnet Mask:	255.255.0.0
Default Gateway IP:	172.24.254.254
Server IP:	192.168.210.120

NTCIP (MM) 1-5-5

NTCIP Backup Time (Sec):	60
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	Yes
Data Rate (BPS)	9600	19.2K	1200
Data, Parity, Stop	8 N 1	8 N 1	8 O 1
Address	0	0	1
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	3.0
RTS Turn Off Delay	n/a	n/a	2.0
Dropout Time	10	10	300
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:	1
Expanded System Detector Address:	0

System Detector Assignment

System Detector	Local Detector

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Brant St @ Plains Rd - TS 161 - 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:	Advanced
Trans Mode Pop-Up Disable:	No

Sign On (MM) 8-5

Sign On Message Line 1: Solutions that Move the World
Sign On Message Line 2:

Software Modules (MM) 8-7

Application Version: 02.58.00
OS (Boot) Version: 01.14.03

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Brant St @ Plains Rd - TS 161 - Econolite Type - ASC/3

Logic Processor Page 1

Logic Statement Control (MM) 1-8-1

Logic #	Statement Control
1	E
2	E
6	E
7	E
8	E
9	E
10	E

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Brant St @ Plains Rd - TS 161 - 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	COORD CYCLE TIMER		IS	0

Logic #: 6

If:

	Assignment	#	State
IF	LP CIB CODE ON		69

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	6	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	6	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	15.0 Sec.	
DET SET VEH 1-16	4	On
CTR SET FO RING	2	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

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Brant St @ Plains Rd - TS 161 - 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	8	8	7	8	8	8	0	0	0	0	0	0	0	0
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	7	0	7	0	7	0	7	0	0	0	0	0	0	0	0
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	18	0	18	0	18	0	18	0	0	0	0	0	0	0	0
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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	40	20	25	10	40	20	25	0	0	0	0	0	0	0	0
Max2	15	40	20	25	10	40	20	25	0	0	0	0	0	0	0	0
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	3.7	3.0	3.7	3.0	3.7	3.0	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Clear	1.0	2.3	2.0	2.6	1.0	2.3	2.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	15	0	0	0	15	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	8	8	7	8	8	8	0	0	0	0	0	0	0	0
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	7	0	7	0	7	0	7	0	0	0	0	0	0	0	0
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	18	0	18	0	18	0	18	0	0	0	0	0	0	0	0
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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	40	20	25	10	40	20	25	0	0	0	0	0	0	0	0
Max2	15	40	20	25	10	40	20	25	0	0	0	0	0	0	0	0
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	3.7	3.0	3.7	3.0	3.7	3.0	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Clear	1.0	2.3	2.0	2.6	1.0	2.3	2.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	15	0	0	0	15	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	10	0	10	0	10	0	10	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	16	0	16	0	16	0	16	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	10	0	10	0	10	0	10	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	16	0	16	0	16	0	16	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

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Brant St @ Plains Rd - TS 161 - 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	0	0	0	0.0	0.0	0
B02	0	0	0	0.0	0.0	0
C03	0	0	0	0.0	0.0	0
D04	0	0	0	0.0	0.0	0
E05	0	0	0	0.0	0.0	0
F06	0	0	0	0.0	0.0	0
G07	0	0	0	0.0	0.0	0
H08	0	0	0	0.0	0.0	0
I09	0	0	0	0.0	0.0	0
J10	0	0	0	0.0	0.0	0
K11	5	0	0	0.0	0.0	0
L12	0	0	0	0.0	0.0	0
M13	0	0	0	0.0	0.0	0
N14	0	0	0	0.0	0.0	0
O15	0	0	0	0.0	0.0	0
P16	0	0	0	0.0	0.0	0

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MOVING TRAFFIC FORWARD

Brant St @ Plains Rd - TS 161 - Econolite Type - ASC/3

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

Included	Pedestrian Overlaps

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Brant St @ Plains Rd - TS 161 - 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

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Brant St @ Plains Rd - TS 161 - 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																
Vehicle Recall																
Ped Recall		X				X										
Max Recall																
Soft Recall																
No Rest																
AI Calc																

Plan # 2

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

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Brant St @ Plains Rd - TS 161 - 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

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Brant St @ Plains Rd - TS 161 - 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	110	Std (COS)	0	Offsets In	Seconds
Offset Value	40s	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)	20	35	14	41	12	43	25	30	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	110s	110s	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	110	Std (COS)	0	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 2)	12	41	21	36	12	41	26	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	110s	110s	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	120	Std (COS)	0	Offsets In	Seconds
Offset Value	45s	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)	14	48	24	34	14	48	24	34	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 # 4

Split Pattern	4	TS2 (Pat-Off)	1-1	Splits In	Seconds
Cycle	100	Std (COS)	0	Offsets In	Seconds
Offset Value	0s	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	42	15	29	14	42	23	21	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	100s	100s	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)	0	Offsets In	Seconds
Offset Value	45s	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)	13	42	29	36	13	42	29	36	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 # 6

Split Pattern	6	TS2 (Pat-Off)	1-3	Splits In	Seconds
Cycle	120	Std (COS)	0	Offsets In	Seconds
Offset Value	44s	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 6)	21	39	15	45	12	47	24	37	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																

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Brant St @ Plains Rd - TS 161 - Econolite Type - ASC/3

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)	20	35	14	41	12	43	25	30	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	110s	110s	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)	12	41	21	36	12	41	26	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	110s	110s	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)	14	48	24	34	14	48	24	34	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 # 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	42	15	29	14	42	23	21	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	100s	100s	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)	13	42	29	36	13	42	29	36	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 # 6

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)	21	39	15	45	12	47	24	37	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

Brant St @ Plains Rd - TS 161 - 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	No	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	No	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	8	8	4.0	3.0
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	0.0	0.0
	Min Dwell	Pmt Ext	Max Time	Yellow	Red
Dwell / Cycle-Exit	0	0.0	0	0.0	0.0

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	No	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	No	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	8	6	4.0	3.0
	Min Grn	**Ext Grn**	**Max Grn**	**Yellow**	**Red**
Track Clear	0	0	0	0.0	0.0
	Min Dwell	**Pmt Ext**	**Max Time**	**Yellow**	**Red**
Dwell / Cycle-Exit	0	0.0	0	0.0	0.0

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				X				X								
Exit Calls																
Special Function																

Enable	Yes	Preempt Override	No	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	No	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	8	8	4.0	3.0
	Min Grn	**Ext Grn**	**Max Grn**	**Yellow**	**Red**
Track Clear	0	0	0	4.0	3.0
	Min Dwell	**Pmt Ext**	**Max Time**	**Yellow**	**Red**
Dwell / Cycle-Exit	8	0.0	35	4.0	3.0

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	No	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	No	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	8	8	4.0	3.0
	Min Grn	**Ext Grn**	**Max Grn**	**Yellow**	**Red**
Track Clear	0	0	0	4.0	3.0
	Min Dwell	**Pmt Ext**	**Max Time**	**Yellow**	**Red**
Dwell / Cycle-Exit	8	0.0	35	4.0	3.0

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 5

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	No	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	No	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	8	8	4.0	3.0
	Min Grn	**Ext Grn**	**Max Grn**	**Yellow**	**Red**
Track Clear	0	0	0	4.0	3.0
	Min Dwell	**Pmt Ext**	**Max Time**	**Yellow**	**Red**
Dwell / Cycle-Exit	8	0.0	35	4.0	3.0

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 6

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	No	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	No	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	8	8	4.0	3.0
	Min Grn	**Ext Grn**	**Max Grn**	**Yellow**	**Red**
Track Clear	0	0	0	4.0	3.0
	Min Dwell	**Pmt Ext**	**Max Time**	**Yellow**	**Red**
Dwell / Cycle-Exit	8	0.0	35	4.0	3.0

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

Brant St @ Plains Rd - TS 161 - Econolite Type - ASC/3

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

Input	Solid	Pulsing
1	...BYPASSED...	...BYPASSED...
2	...BYPASSED...	...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

Brant St @ Plains Rd - TS 161 - 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

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Brant St @ Plains Rd - TS 161 - 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

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Brant St @ Plains Rd - TS 161 - 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																
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																
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																
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 - 6

Pattern	6	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 - 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	.	.	.	.	.	.	.	.	.	.					

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Brant St @ Plains Rd - TS 161 - Econolite Type - ASC/3

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

Day Plan #1

Event	Action Plan	Start Time
1	1	06:00
2	2	09:00
3	3	15:15
4	5	16:15
5	3	16:45
6	2	19:00
7	10	21:30

Day Plan #2

Event	Action Plan	Start Time
1	4	07:00
2	6	08:30
3	4	17:30
4	10	23:00

Day Plan #3

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

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

Brant St @ Plains Rd - TS 161 - 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

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Brant St @ Plains Rd - TS 161 - 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	1	N
2	2	2	N
3	3	3	N
4	4	4	N
5	5	5	N
6	6	6	N
7	7	7	N
8	8	8	N
9	9		N
10	10		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	16		N
17	1	1	N
18	2		N
19	3	3	N
20	4		N
21	5	5	N
22	6		N
23	7	7	N
24	8		N
26	2		N
28	4		N
30	6		N
31	7	7	N
32	8		N
34	2		N
38	6		N

Vehicle Detector Plan Number - 2

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

Vehicle Detector Plan Number - 3

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

Vehicle Detector Plan Number - 4

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

Vehicle Detector Setup (MM) 6-2

Veh Detector	Type	TS2 Detector	Description
1	N-NTCIP	Yes	
2	N-NTCIP	Yes	
3	N-NTCIP	Yes	
4	N-NTCIP	Yes	
5	N-NTCIP	Yes	
6	N-NTCIP	Yes	
7	N-NTCIP	Yes	
8	N-NTCIP	Yes	
9	N-NTCIP	No	
10	N-NTCIP	No	
11	N-NTCIP	No	
12	N-NTCIP	No	
13	N-NTCIP	No	
14	N-NTCIP	No	
15	N-NTCIP	No	
16	N-NTCIP	No	
17	N-NTCIP	Yes	
18	N-NTCIP	Yes	
19	N-NTCIP	Yes	
20	N-NTCIP	Yes	
21	N-NTCIP	Yes	
22	N-NTCIP	Yes	
23	N-NTCIP	Yes	
24	N-NTCIP	Yes	

25	N-NTCIP	Yes	
26	N-NTCIP	Yes	
27	N-NTCIP	Yes	
28	N-NTCIP	Yes	
29	N-NTCIP	Yes	
30	N-NTCIP	Yes	
31	N-NTCIP	Yes	
32	N-NTCIP	Yes	
33	N-NTCIP	Yes	
34	N-NTCIP	Yes	
35	N-NTCIP	Yes	
36	N-NTCIP	Yes	
37	N-NTCIP	Yes	
38	N-NTCIP	Yes	
39	N-NTCIP	Yes	
40	N-NTCIP	Yes	
41	N-NTCIP	Yes	
42	N-NTCIP	Yes	
43	N-NTCIP	Yes	
44	N-NTCIP	Yes	
45	N-NTCIP	Yes	
46	N-NTCIP	Yes	
47	N-NTCIP	Yes	
48	N-NTCIP	Yes	
49	N-NTCIP	Yes	
50	N-NTCIP	Yes	
51	N-NTCIP	Yes	
52	N-NTCIP	Yes	
53	N-NTCIP	Yes	
54	N-NTCIP	Yes	
55	N-NTCIP	Yes	
56	N-NTCIP	Yes	
57	N-NTCIP	Yes	
58	N-NTCIP	Yes	
59	N-NTCIP	Yes	
60	N-NTCIP	Yes	
61	N-NTCIP	Yes	
62	N-NTCIP	Yes	
63	N-NTCIP	Yes	
64	N-NTCIP	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	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
17	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
18	2	No	No	0.0	None	0.0	0	No	0	None	No	No	No

19	3	No	Yes	0.0	Passage	0.0	0	No	0	Red	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	No	0.0	None	0.0	0	No	0	None	No	No	No
23	7	No	Yes	0.0	Passage	0.0	0	No	0	Red	No	No	No
24	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
26	2	No	No	0.0	None	0.0	0	No	0	None	No	No	No
28	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
30	6	No	No	0.0	None	0.0	0	No	0	None	No	No	No
31	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
32	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
34	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
38	6	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
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	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 3

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	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

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
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	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Ped Detector Phase Assignment (MM) 6-3

Mode: NTCIP

Called Phase	Detector
2	2
4	4
6	6
8	8

City of Burlington

ECONOLITE

MOVING TRAFFIC FORWARD

Brant St @ Plains Rd - TS 161 - 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
4	0	0	10	1
6	0	0	10	1
8	0	0	10	1

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

Intersection Name:	TS ID:	Line No:	Model:	IP address:	Controller Make:
Plains Rd @ QEW West Ramp	120	1	ACS/3	172.22.23.2	Econolite

Type of Operation: 4 Phase Semi-Actuated

*-Start from Main Menu

No	Date			Description	Prepared by
	Y	M	D		MA
3	2019	5	15	Timing changes from Plains Road Optimization	

PHASE DESCRIPTION

Ph1		Ph5		
Ph2	EB - Plains Road	Ph6	WB - Plains Road	
Ph3		Ph7		
Ph4		Ph8	NB /SB- QEW West Ramp	

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

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

CONTROLLER TIMING DATA - VEHICLE TIMING * - 2 - 1

Timing Plan: 1

	Phase: 1	2	3	4	5	6	7	8
Minimum Green		8				8		8
Walk		25				25		8
Ped. Clearance		9				9		21
Pedestrian Carry Over								
Vehicle Extension		3				3		5
MAX 1		35				35		25
MAX 2		35				35		25
Yellow Change		4				4		4
Red Clearance		3				3		3
Phase Minimum:	**1**	**42**	**1**	**1**	**1**	**42**	**1**	**37**

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

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

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

Coordinator Pattern (CP)	Cycle Length	Offset (sec)	Timing Plan	Split Pattern	Phases (sec)							
					1	2	3	4	5	6	7	8
1	100	66	1	1		75				75		25
2	100	31	1	2		75				75		25
3	130	34	1	3		100				100		30
4	100	56	1	4		60				60		40
10	0	0	1	10		0				0		0

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

Day Plan	Sched. #	Action Plan	Time Period	Pattern	Timing Plan
1	1	1	06:00	1	1
1	1	2	09:00	2	1
1	1	3	15:30	3	1
1	1	4	19:00	4	1
1	1	10	22:00	254	1
2	2	4	08:00	4	1
2	2	3	11:30	3	1
2	2	4	19:00	4	1
2	2	10	22:00	254	1
3	3	4	09:00	4	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/ MON	DOW/ DOW	WOM/ Year	Day Plan
New Year's Day	1	Fixed	1	1	0	3
Family Day	2	Float	2	2	3	3
Good Friday	3	Float	4	6	1	3
Victoria Day	4	Float	5	2	3	3
Canada Day	5	Fixed	7	1	0	3
Civic Day	6	Float	8	2	1	3
Labour Day	7	Float	9	2	1	3
Thanksgiving	8	Float	10	2	2	3
Christmas Day	9	Fixed	12	25	0	3

Intersection Name:	TS ID:	Group NO:	IP address:
Plains Rd @ Maple Ave	122		172.22.58.2

Controller Make:	Model:	Firmware Rev. No:	
Econolite	ACS/3		

Type of Operation 4 Phase Semi-Actuated

Revision

NO	Date Y	Date M	Date D	Description	Prepared by
1	2015	3	3	Implement timings in Centracs	MA

*- Start From Main Menu

PHASE DESCRIPTION

Ph1		Ph5	
Ph2	WB - Plains Rd	PH6	
Ph3	EB - Plains Rd	Ph7	
Ph4	NB -Maple Ave	Ph8	

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

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

CONTROLLER TIMING DATA - VEHICLE TIMINGS (4 available) * - 2 - 1

Timing Plan: 1

Phase:	1	2	3	4	5	6	7	8
Minimum Green :		8	8	8				
Conditional Service Min. Green :								
Walk :		8	8	10				
Ped. Clearance :		8	16	11				
Pedestrians Carry Over :								
Vehicle Extension :		3	3	3				
MAX 1 :		30	30	25				
MAX 2 :		30	30	25				
Yellow Change :		4	4	4				
Red Clearance :		3	3	2				

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

Phase:	1	2	3	4	5	6	7	8
Lock Detector :								
Vehicle Recall :								
Pedestrian Recall :		X						
MAX Recall :		X						
Soft 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	85	0	1	1		35	32	18				
2	80	0	1	2		30	32	18				
3	90	0	1	3		40	32	18				

Intersection Name:	TS ID:	Group NO:	IP address:
Plains Rd @ Maple Ave	122		172.22.58.2
Controller Make:	**Model:**	**Firmware Rev. No:**	
Econolite	ACS/3		

CP # 1, 2, 10	Phase:	1	2	3	4	5	6	7	8
Coord Phase	:		X						
Vehicle Recall	:								
Pedestrian Recall *(3-3, 5-2)	:		X						
Recall to MAX Time	:								
Phase Omit	:								
Special Function Outputs	:								

Coordinator Pattern #	Prefer.	Phase 1	2	3	4	5	6	7	8
	1								
	2								

X - select "." deselect

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	07:30	1	1
1	1	2	09:00	2	1
1	1	3	15:30	3	1
1	1	10	19:00	254	1
2	2	10	00:00	254	1
3	3	10	00:00	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)

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

Events	Exception Day		MON/ MON	DOW/ DOM	WOM/ Year	Day Plan
New Year's Day	1	Fixed	01	1	0	3
Family Day	2	Float	2	2	3	3
Good Friday	3	Float	04	6	1	3
Victoria Day	4	Float	05	2	3	3
Canada Day	5	Fixed	07	1	0	3
Civic Day	6	Float	08	2	1	3
Labour Day	7	Float	09	2	1	3
Thanksgiving	8	Float	10	2	2	3
Christmas Day	9	Fixed	12	25	0	3

Intersection Name:	TS ID:	Line No:	Model:	IP address:	Controller Make:
Fairview @ QEW East Ramp	120	1	ACS/3	172.22.24.2	Econolite

Type of Operation: 8 Phase Semi-Actuated

*-Start from Main Menu

No	Date			Description	Prepared by
	Y	M	D		MA
6	2019	5	15	Optimization	

PHASE DESCRIPTION

Ph1		Ph5	EBLT - Fairview St
Ph2	EB - Fairview St	Ph6	WB - Fairview St
Ph3		Ph7	
Ph4	NB - QEW East Ramp / Plains Rd	Ph8	SB- QEW East Ramp / Plains Rd

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

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

CONTROLLER TIMING DATA - VEHICLE TIMING * - 2 - 1

Timing Plan: 1	Phase: 1	2	3	4	5	6	7	8
Minimum Green		8		8	6	8		8
Walk		15		8		15		8
Ped. Clearance		13		21		13		21
Pedestrian Carry Over								
Vehicle Extension		3		3	3	3		3
MAX 1		35		25	15	35		25
MAX 2		35		25	15	35		25
Yellow Change		4		4	3	4		4
Red Clearance		3		3	0	3		3
Phase Minimum:	1	36	1	37	10	36	1	37

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

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

MAX Recall		X				X		
Min Recall								

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

Coordinator Pattern (CP)	Cycle Length	Offset (sec)	Timing Plan	Split Pattern	Phases (sec)							
					1	2	3	4	5	6	7	8
1	100	96	1	1		51		33	16	51		33
2	100	15	1	2		58		25	17	58		25
3	130	16	1	3		94		36	16	78		36
4	100	19	1	4		58		30	12	58		30
10	0	0	1	10		0		0	0	0		0

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

Day Plan	Sched. #	Action Plan	Time Period	Pattern	Timing Plan
1	1	1	06:00	1	1
1	1	2	09:00	2	1
1	1	3	15:30	3	1
1	1	4	19:00	4	1
1	1	10	22:00	254	1
2	2	4	08:00	4	1
2	2	3	11:30	3	1
2	2	4	19:00	4	1
2	2	10	22:00	254	1
3	3	4	09:00	4	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:

Appendix C

Existing Operation Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1326	186	0	740	0	0	0	0	210	0	90
Future Volume (vph)	0	1326	186	0	740	0	0	0	0	210	0	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	55.0		0.0
Storage Lanes	0		1	0		0	0		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor			0.98									
Frt			0.850									0.850
Flt Protected										0.950		
Satd. Flow (prot)	0	5036	1538	0	4988	0	0	0	0	3367	0	1615
Flt Permitted										0.950		
Satd. Flow (perm)	0	5036	1503	0	4988	0	0	0	0	3367	0	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			202									98
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		175.7			307.2			140.0			199.7	
Travel Time (s)		12.7			22.1			10.1			14.4	
Confl. Peds. (#/hr)	1		2	2		1						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	5%	4%	4%	0%	0%	0%	0%	4%	50%	0%
Adj. Flow (vph)	0	1441	202	0	804	0	0	0	0	228	0	98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1441	202	0	804	0	0	0	0	228	0	98
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Detector Phase		2	2		6					8		8
Switch Phase												
Minimum Initial (s)		8.0	8.0		8.0					8.0		8.0
Minimum Split (s)		43.0	43.0		43.0					25.0		25.0
Total Split (s)		75.0	75.0		75.0					25.0		25.0
Total Split (%)		75.0%	75.0%		75.0%					25.0%		25.0%
Yellow Time (s)		4.0	4.0		4.0					4.0		4.0
All-Red Time (s)		3.0	3.0		3.0					3.0		3.0
Lost Time Adjust (s)		0.0	0.0		0.0					0.0		0.0
Total Lost Time (s)		7.0	7.0		7.0					7.0		7.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max		C-Max					None		None
Act Effct Green (s)		73.9	73.9		73.9					12.1		12.1
Actuated g/C Ratio		0.74	0.74		0.74					0.12		0.12
v/c Ratio		0.39	0.17		0.22					0.56		0.35
Control Delay		5.3	1.0		3.3					46.6		11.7
Queue Delay		0.0	0.0		0.0					0.0		0.0
Total Delay		5.3	1.0		3.3					46.6		11.7
LOS		A	A		A					D		B
Approach Delay		4.8			3.3						36.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A						D	
Queue Length 50th (m)		33.0	0.0		12.6					22.9		0.0
Queue Length 95th (m)		46.0	6.0		m15.3					33.9		14.3
Internal Link Dist (m)		151.7			283.2			116.0			175.7	
Turn Bay Length (m)										55.0		
Base Capacity (vph)		3723	1163		3688					606		371
Starvation Cap Reductn		0	0		0					0		0
Spillback Cap Reductn		0	0		0					0		0
Storage Cap Reductn		0	0		0					0		0
Reduced v/c Ratio		0.39	0.17		0.22					0.38		0.26

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 66 (66%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 8.0		Intersection LOS: A	
Intersection Capacity Utilization 46.7%		ICU Level of Service A	
Analysis Period (min) 15			

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

Splits and Phases: 1: Plains Road E/Fairview Street & QEW West Ramp



Queues
1: Plains Road E/Fairview Street & QEW West Ramp

Base Year (2021)
AM Peak Hour

Lane Group	EBT	EBR	WBT	SBL	SBR
Lane Group Flow (vph)	1441	202	804	228	98
v/c Ratio	0.39	0.17	0.22	0.56	0.35
Control Delay	5.3	1.0	3.3	46.6	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.3	1.0	3.3	46.6	11.7
Queue Length 50th (m)	33.0	0.0	12.6	22.9	0.0
Queue Length 95th (m)	46.0	6.0	m15.3	33.9	14.3
Internal Link Dist (m)	151.7		283.2		
Turn Bay Length (m)				55.0	
Base Capacity (vph)	3723	1163	3688	606	371
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.39	0.17	0.22	0.38	0.26

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Plains Road E/Fairview Street & QEW West Ramp

Base Year (2021)
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1326	186	0	740	0	0	0	0	210	0	90
Future Volume (vph)	0	1326	186	0	740	0	0	0	0	210	0	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0					7.0		7.0
Lane Util. Factor		0.91	1.00		0.91					0.97		1.00
Frpb, ped/bikes		1.00	0.98		1.00					1.00		1.00
Flpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Frt		1.00	0.85		1.00					1.00		0.85
Flt Protected		1.00	1.00		1.00					0.95		1.00
Satd. Flow (prot)		5036	1503		4988					3367		1615
Flt Permitted		1.00	1.00		1.00					0.95		1.00
Satd. Flow (perm)		5036	1503		4988					3367		1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1441	202	0	804	0	0	0	0	228	0	98
RTOR Reduction (vph)	0	0	53	0	0	0	0	0	0	0	0	86
Lane Group Flow (vph)	0	1441	149	0	804	0	0	0	0	228	0	12
Confl. Peds. (#/hr)	1		2	2		1						
Heavy Vehicles (%)	0%	3%	5%	4%	4%	0%	0%	0%	0%	4%	50%	0%
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Actuated Green, G (s)		73.9	73.9		73.9					12.1		12.1
Effective Green, g (s)		73.9	73.9		73.9					12.1		12.1
Actuated g/C Ratio		0.74	0.74		0.74					0.12		0.12
Clearance Time (s)		7.0	7.0		7.0					7.0		7.0
Vehicle Extension (s)		3.0	3.0		3.0					3.0		3.0
Lane Grp Cap (vph)		3721	1110		3686					407		195
v/s Ratio Prot		c0.29			0.16							
v/s Ratio Perm			0.10							c0.07		0.01
v/c Ratio		0.39	0.13		0.22					0.56		0.06
Uniform Delay, d1		4.8	3.8		4.1					41.4		38.9
Progression Factor		1.00	1.00		0.75					1.00		1.00
Incremental Delay, d2		0.3	0.3		0.1					1.8		0.1
Delay (s)		5.1	4.0		3.2					43.2		39.0
Level of Service		A	A		A					D		D
Approach Delay (s)		4.9			3.2			0.0			42.0	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
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)	94	1150	0	0	704	14	193	240	672	12	0	327
Future Volume (vph)	94	1150	0	0	704	14	193	240	672	12	0	327
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		45.0	75.0		0.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.91	0.95	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00			0.99	0.99	1.00		
Frt					0.997			0.930	0.850			0.850
Flt Protected	0.950						0.950	0.998		0.950		
Satd. Flow (prot)	1752	5036	0	0	4974	0	1649	1562	1504	1805	0	1538
Flt Permitted	0.303						0.950	0.998		0.138		
Satd. Flow (perm)	559	5036	0	0	4974	0	1649	1562	1485	262	0	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					3			45	76			332
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		307.2			410.6			180.0			138.0	
Travel Time (s)		22.1			29.6			13.0			9.9	
Confl. Peds. (#/hr)	1		3	3		1			1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	0%	4%	0%	4%	2%	2%	0%	0%	5%
Adj. Flow (vph)	102	1250	0	0	765	15	210	261	730	13	0	355
Shared Lane Traffic (%)							10%		34%			
Lane Group Flow (vph)	102	1250	0	0	780	0	189	530	482	13	0	355
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Detector Phase	5	2			6		4	4	4	8		8
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0		8.0	8.0	8.0	8.0		8.0
Minimum Split (s)	11.0	35.0			35.0		36.0	36.0	36.0	36.0		36.0
Total Split (s)	16.0	64.0			48.0		36.0	36.0	36.0	36.0		36.0
Total Split (%)	16.0%	64.0%			48.0%		36.0%	36.0%	36.0%	36.0%		36.0%
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	0.0	3.0			3.0		3.0	3.0	3.0	3.0		3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	None	C-Max			C-Max		None	None	None	None		None
Act Effct Green (s)	61.0	57.0			47.7		29.0	29.0	29.0	29.0		29.0
Actuated g/C Ratio	0.61	0.57			0.48		0.29	0.29	0.29	0.29		0.29
v/c Ratio	0.23	0.44			0.33		0.40	1.10	1.00	0.17		0.52
Control Delay	7.3	10.1			17.3		31.5	101.6	71.3	33.5		7.2
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Delay	7.3	10.1			17.3		31.5	101.6	71.3	33.5		7.2
LOS	A	B			B		C	F	E	C		A
Approach Delay		9.9			17.3			78.4			8.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			B			E			A	
Queue Length 50th (m)	6.1	30.7			36.0		32.4	~127.4	89.7	2.0		3.4
Queue Length 95th (m)	10.7	35.3			47.5		54.2	#199.7	#162.5	7.7		26.2
Internal Link Dist (m)		283.2			386.6			156.0			114.0	
Turn Bay Length (m)	30.0								45.0	75.0		
Base Capacity (vph)	496	2870			2373		478	484	484	75		681
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	0.21	0.44			0.33		0.40	1.10	1.00	0.17		0.52

Intersection Summary		
Area Type:	Other	
Cycle Length: 100		
Actuated Cycle Length: 100		
Offset: 96 (96%), Referenced to phase 2:EBTL and 6:WBT, Start of Green		
Natural Cycle: 85		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.10		
Intersection Signal Delay: 33.5	Intersection LOS: C	
Intersection Capacity Utilization 79.8%	ICU Level of Service D	
Analysis Period (min) 15		

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

Splits and Phases: 2: QEW East Ramp/Plains Road E & Fairview Street



Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	102	1250	780	189	530	482	13	355
v/c Ratio	0.23	0.44	0.33	0.40	1.10	1.00	0.17	0.52
Control Delay	7.3	10.1	17.3	31.5	101.6	71.3	33.5	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.3	10.1	17.3	31.5	101.6	71.3	33.5	7.2
Queue Length 50th (m)	6.1	30.7	36.0	32.4	~127.4	89.7	2.0	3.4
Queue Length 95th (m)	10.7	35.3	47.5	54.2	#199.7	#162.5	7.7	26.2
Internal Link Dist (m)		283.2	386.6		156.0			
Turn Bay Length (m)	30.0					45.0	75.0	
Base Capacity (vph)	496	2870	2373	478	484	484	75	681
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	0.21	0.44	0.33	0.40	1.10	1.00	0.17	0.52

Intersection Summary

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	1150	0	0	704	14	193	240	672	12	0	327
Future Volume (vph)	94	1150	0	0	704	14	193	240	672	12	0	327
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lane Util. Factor	1.00	0.91			0.91		0.95	0.91	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	0.99	0.99	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			1.00		1.00	0.93	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1752	5036			4975		1649	1562	1485	1805		1538
Flt Permitted	0.30	1.00			1.00		0.95	1.00	1.00	0.14		1.00
Satd. Flow (perm)	559	5036			4975		1649	1562	1485	262		1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	102	1250	0	0	765	15	210	261	730	13	0	355
RTOR Reduction (vph)	0	0	0	0	2	0	0	32	54	0	0	236
Lane Group Flow (vph)	102	1250	0	0	778	0	189	498	428	13	0	119
Confl. Peds. (#/hr)	1		3	3		1			1	1		
Heavy Vehicles (%)	3%	3%	3%	0%	4%	0%	4%	2%	2%	0%	0%	5%
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Actuated Green, G (s)	57.0	57.0			47.1		29.0	29.0	29.0	29.0		29.0
Effective Green, g (s)	57.0	57.0			47.1		29.0	29.0	29.0	29.0		29.0
Actuated g/C Ratio	0.57	0.57			0.47		0.29	0.29	0.29	0.29		0.29
Clearance Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		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)	400	2870			2343		478	452	430	75		446
v/s Ratio Prot	0.02	c0.25			0.16							
v/s Ratio Perm	0.13						0.11	0.32	0.29	0.05		0.08
v/c Ratio	0.26	0.44			0.33		0.40	1.10	1.00	0.17		0.27
Uniform Delay, d1	10.0	12.3			16.6		28.5	35.5	35.4	26.5		27.3
Progression Factor	0.75	0.78			1.00		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	0.3	0.5			0.4		0.5	72.9	41.9	1.1		0.3
Delay (s)	7.8	10.1			17.0		29.0	108.4	77.4	27.6		27.6
Level of Service	A	B			B		C	F	E	C		C
Approach Delay (s)		9.9			17.0			83.5			27.6	
Approach LOS		A			B			F			C	

Intersection Summary				
HCM 2000 Control Delay	37.0	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	79.8%	ICU Level of Service	D	
Analysis Period (min)	15			

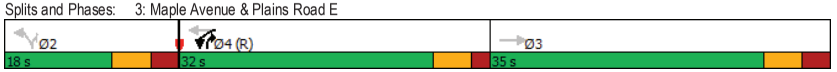
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	378	5	242	332	7	502
Future Volume (vph)	378	5	242	332	7	502
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		80.0	55.0		0.0	0.0
Storage Lanes		0	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	0.97	1.00	1.00	1.00
Ped Bike Factor	1.00		0.99			0.99
Frt	0.998					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3417	0	3303	1712	1805	1568
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3417	0	3277	1712	1805	1547
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	1					202
Link Speed (k/h)	50			60	50	
Link Distance (m)	207.1			887.5	183.4	
Travel Time (s)	14.9			53.3	13.2	
Confl. Peds. (#/hr)		7	7			1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	40%	6%	11%	0%	3%
Adj. Flow (vph)	411	5	263	361	8	546
Shared Lane Traffic (%)						
Lane Group Flow (vph)	416	0	263	361	8	546
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Detector Phase	3		4	4	2	4
Switch Phase						
Minimum Initial (s)	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	17.0		27.0	27.0	18.0	27.0
Total Split (s)	35.0		32.0	32.0	18.0	32.0
Total Split (%)	41.2%		37.6%	37.6%	21.2%	37.6%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None		C-Max	C-Max	Max	C-Max
Act Effct Green (s)	15.7		26.0	26.0	23.3	50.3
Actuated g/C Ratio	0.18		0.31	0.31	0.27	0.59
v/c Ratio	0.66		0.26	0.69	0.02	0.54
Control Delay	37.1		23.1	34.0	24.9	7.2
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	37.1		23.1	34.0	24.9	7.2
LOS	D		C	C	C	A
Approach Delay	37.1			29.4	7.5	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	D			C	A	
Queue Length 50th (m)	35.0		17.3	53.9	1.0	22.6
Queue Length 95th (m)	47.3		27.0	85.1	4.6	51.7
Internal Link Dist (m)	183.1			863.5	159.4	
Turn Bay Length (m)			55.0			
Base Capacity (vph)	1126		1010	523	495	1004
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.37		0.26	0.69	0.02	0.54

Intersection Summary			
Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 85			
Offset: 27 (32%), Referenced to phase 4:WBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 23.8		Intersection LOS: C	
Intersection Capacity Utilization 52.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Maple Avenue & Plains Road E



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	416	263	361	8	546
v/c Ratio	0.66	0.26	0.69	0.02	0.54
Control Delay	37.1	23.1	34.0	24.9	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.1	23.1	34.0	24.9	7.2
Queue Length 50th (m)	35.0	17.3	53.9	1.0	22.6
Queue Length 95th (m)	47.3	27.0	85.1	4.6	51.7
Internal Link Dist (m)	183.1		863.5	159.4	
Turn Bay Length (m)		55.0			
Base Capacity (vph)	1126	1010	523	495	1004
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.37	0.26	0.69	0.02	0.54

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	378	5	242	332	7	502
Future Volume (vph)	378	5	242	332	7	502
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		6.0	6.0	7.0	6.0
Lane Util. Factor	0.95		0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3417		3303	1712	1805	1558
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3417		3303	1712	1805	1558
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	411	5	263	361	8	546
RTOR Reduction (vph)	1	0	0	0	0	85
Lane Group Flow (vph)	415	0	263	361	8	461
Confl. Peds. (#/hr)		7	7			1
Heavy Vehicles (%)	5%	40%	6%	11%	0%	3%
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Actuated Green, G (s)	15.7		26.0	26.0	23.3	49.3
Effective Green, g (s)	15.7		26.0	26.0	23.3	49.3
Actuated g/C Ratio	0.18		0.31	0.31	0.27	0.58
Clearance Time (s)	7.0		6.0	6.0	7.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	631		1010	523	494	903
v/s Ratio Prot			0.08			c0.16
v/s Ratio Perm	c0.12			c0.21	0.00	0.14
v/c Ratio	0.66		0.26	0.69	0.02	0.51
Uniform Delay, d1	32.2		22.2	26.0	22.5	10.7
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5		0.6	7.3	0.1	2.1
Delay (s)	34.6		22.9	33.2	22.6	12.7
Level of Service	C		C	C	C	B
Approach Delay (s)	34.6			28.9	12.9	
Approach LOS	C			C	B	

Intersection Summary				
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

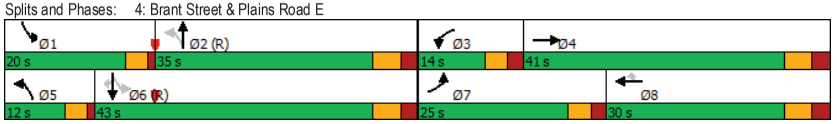
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	406	431	38	71	129	71	33	699	244	277	920	415
Future Volume (vph)	406	431	38	71	129	71	33	699	244	277	920	415
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	50.0		75.0	50.0		0.0	40.0		30.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.99	1.00		1.00		0.98	1.00	0.99		1.00		0.97
Frt		0.988				0.850		0.961				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	1841	0	1597	3252	1404	1641	4736	0	1719	5085	1538
Flt Permitted	0.950			0.950			0.274			0.132		
Satd. Flow (perm)	3372	1841	0	1592	3252	1374	472	4736	0	238	5085	1498
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				208		77				289
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		887.5			190.4			463.4			229.3	
Travel Time (s)		53.3			11.4			27.8			13.8	
Confl. Peds. (#/hr)	7		5	5		7	11		7	7		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	0%	13%	11%	15%	10%	3%	8%	5%	2%	5%
Adj. Flow (vph)	441	468	41	77	140	77	36	760	265	301	1000	451
Shared Lane Traffic (%)												
Lane Group Flow (vph)	441	509	0	77	140	77	36	1025	0	301	1000	451
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Detector Phase	7	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	7.0	8.0		7.0	8.0	8.0
Minimum Split (s)	13.0	31.3		13.0	29.3	29.3	11.0	31.0		11.0	31.0	31.0
Total Split (s)	25.0	41.0		14.0	30.0	30.0	12.0	35.0		20.0	43.0	43.0
Total Split (%)	22.7%	37.3%		12.7%	27.3%	27.3%	10.9%	31.8%		18.2%	39.1%	39.1%
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.7		3.0	3.7	3.7
All-Red Time (s)	2.0	2.6		2.0	2.6	2.6	1.0	2.3		1.0	2.3	2.3
Lost Time Adjust (s)	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	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	18.3	32.9		8.8	20.8	20.8	42.7	33.4		55.6	46.7	46.7
Actuated g/C Ratio	0.17	0.30		0.08	0.19	0.19	0.39	0.30		0.51	0.42	0.42
v/c Ratio	0.78	0.92		0.61	0.23	0.18	0.14	0.69		0.89	0.46	0.56
Control Delay	54.2	60.4		69.3	37.4	0.9	15.1	26.0		53.5	25.9	13.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	54.2	60.4		69.3	37.4	0.9	15.1	26.0		53.5	25.9	13.1
LOS	D	E		E	D	A	B	C		D	C	B
Approach Delay		57.5			36.2			25.7			27.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			D			C			C	
Queue Length 50th (m)	49.1	107.4		17.1	13.6	0.0	2.1	74.4		48.9	66.8	28.5
Queue Length 95th (m)	66.5	#168.3		#37.1	22.8	0.0	m4.2	92.2		#102.5	82.6	66.4
Internal Link Dist (m)		863.5			166.4			439.4			205.3	
Turn Bay Length (m)	55.0			50.0		75.0	50.0			40.0		30.0
Base Capacity (vph)	618	583		130	708	462	271	1490		340	2159	802
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.71	0.87		0.59	0.20	0.17	0.13	0.69		0.89	0.46	0.56

Intersection Summary		
Area Type:	Other	
Cycle Length: 110		
Actuated Cycle Length: 110		
Offset: 40 (36%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.92		
Intersection Signal Delay: 34.6	Intersection LOS: C	
Intersection Capacity Utilization 85.6%	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: 4: Brant Street & Plains Road E



Queues
4: Brant Street & Plains Road E

Base Year (2021)
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	441	509	77	140	77	36	1025	301	1000	451
v/c Ratio	0.78	0.92	0.61	0.23	0.18	0.14	0.69	0.89	0.46	0.56
Control Delay	54.2	60.4	69.3	37.4	0.9	15.1	26.0	53.5	25.9	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.2	60.4	69.3	37.4	0.9	15.1	26.0	53.5	25.9	13.1
Queue Length 50th (m)	49.1	107.4	17.1	13.6	0.0	2.1	74.4	48.9	66.8	28.5
Queue Length 95th (m)	66.5	#168.3	#37.1	22.8	0.0	m4.2	92.2	#102.5	82.6	66.4
Internal Link Dist (m)		863.5		166.4			439.4		205.3	
Turn Bay Length (m)	55.0		50.0		75.0	50.0		40.0		30.0
Base Capacity (vph)	618	583	130	708	462	271	1490	340	2159	802
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.87	0.59	0.20	0.17	0.13	0.69	0.89	0.46	0.56

Intersection Summary

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.

HCM Signalized Intersection Capacity Analysis
4: Brant Street & Plains Road E

Base Year (2021)
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	406	431	38	71	129	71	33	699	244	277	920	415
Future Volume (vph)	406	431	38	71	129	71	33	699	244	277	920	415
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	1.00		1.00	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	0.99		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
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3400	1840		1597	3252	1374	1640	4737		1719	5085	1498
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.27	1.00		0.13	1.00	1.00
Satd. Flow (perm)	3400	1840		1597	3252	1374	473	4737		238	5085	1498
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	441	468	41	77	140	77	36	760	265	301	1000	451
RTOR Reduction (vph)	0	3	0	0	0	62	0	54	0	0	0	173
Lane Group Flow (vph)	441	506	0	77	140	15	36	971	0	301	1000	278
Confl. Peds. (#/hr)	7		5	5		7	11		7	7		11
Heavy Vehicles (%)	3%	2%	0%	13%	11%	15%	10%	3%	8%	5%	2%	5%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Actuated Green, G (s)	18.3	32.9		7.2	21.8	21.8	36.9	32.4		52.6	44.1	44.1
Effective Green, g (s)	18.3	32.9		7.2	21.8	21.8	36.9	32.4		52.6	44.1	44.1
Actuated g/C Ratio	0.17	0.30		0.07	0.20	0.20	0.34	0.29		0.48	0.40	0.40
Clearance Time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	565	550		104	644	272	206	1395		331	2038	600
v/s Ratio Prot	c0.13	c0.28		0.05	0.04		0.01	0.20		c0.13	0.20	
v/s Ratio Perm						0.01	0.05			c0.30		0.19
v/c Ratio	0.78	0.92		0.74	0.22	0.06	0.17	0.70		0.91	0.49	0.46
Uniform Delay, d1	43.9	37.3		50.5	37.0	35.8	24.8	34.4		26.7	24.6	24.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.83	0.73		1.00	1.00	1.00
Incremental Delay, d2	6.9	20.8		24.3	0.2	0.1	0.3	2.3		27.4	0.8	2.6
Delay (s)	50.8	58.1		74.8	37.1	35.8	20.9	27.6		54.1	25.4	26.8
Level of Service	D	E		E	D	D	C	C		D	C	C
Approach Delay (s)		54.7			46.7			27.3			30.7	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	36.6	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.95			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.3	
Intersection Capacity Utilization	85.6%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

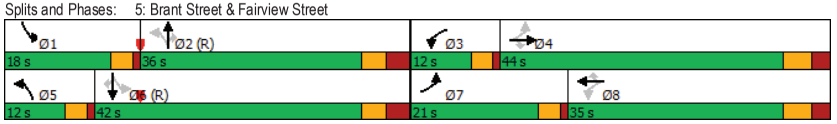
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	325	1021	237	115	324	146	170	579	247	221	669	145
Future Volume (vph)	325	1021	237	115	324	146	170	579	247	221	669	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		170.0	60.0		0.0	75.0		70.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.99	1.00		0.98	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)	1687	3539	1568	1703	3438	1538	1787	3505	1599	1787	3505	1346
Flt Permitted	0.425			0.140			0.271			0.234		
Satd. Flow (perm)	751	3539	1547	251	3438	1507	505	3505	1535	437	3505	1290
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			257			193			224			158
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		261.1			251.5			231.2			463.4	
Travel Time (s)		15.7			15.1			16.6			27.8	
Confl. Peds. (#/hr)	6		1	1		6	22		21	21		22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	2%	3%	6%	5%	5%	1%	3%	1%	1%	3%	20%
Adj. Flow (vph)	353	1110	258	125	352	159	185	629	268	240	727	158
Shared Lane Traffic (%)												
Lane Group Flow (vph)	353	1110	258	125	352	159	185	629	268	240	727	158
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		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	31.4	31.4	12.0	31.4	31.4	12.0	31.5	31.5	12.0	31.5	31.5
Total Split (s)	21.0	44.0	44.0	12.0	35.0	35.0	12.0	36.0	36.0	18.0	42.0	42.0
Total Split (%)	19.1%	40.0%	40.0%	10.9%	31.8%	31.8%	10.9%	32.7%	32.7%	16.4%	38.2%	38.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
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)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	51.3	37.1	37.1	38.7	28.5	28.5	41.8	31.3	31.3	50.2	36.1	36.1
Actuated g/C Ratio	0.47	0.34	0.34	0.35	0.26	0.26	0.38	0.28	0.28	0.46	0.33	0.33
v/c Ratio	0.72	0.93	0.37	0.65	0.40	0.30	0.65	0.63	0.45	0.67	0.63	0.30
Control Delay	29.4	49.6	4.9	36.5	35.2	3.9	31.9	38.3	9.8	34.9	43.9	21.7
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	29.4	49.6	4.9	36.5	35.2	3.9	31.9	38.3	9.8	34.9	43.9	21.7
LOS	C	D	A	D	D	A	C	D	A	C	D	C
Approach Delay		38.8			27.6			30.1			38.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			C			C			D	
Queue Length 50th (m)	51.6	125.6	0.2	15.6	34.5	0.0	24.8	66.8	7.5	52.6	91.3	22.4
Queue Length 95th (m)	76.9	#168.0	17.7	#34.2	48.6	9.9	#41.6	87.3	30.4	m76.2	m111.4	m41.9
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	495	1209	697	194	893	534	285	995	596	373	1150	529
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	0.71	0.92	0.37	0.64	0.39	0.30	0.65	0.63	0.45	0.64	0.63	0.30

Intersection Summary		
Area Type:	Other	
Cycle Length: 110		
Actuated Cycle Length: 110		
Offset: 107 (97%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.93		
Intersection Signal Delay: 35.2	Intersection LOS: D	
Intersection Capacity Utilization 84.3%	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: 5: Brant Street & Fairview Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	353	1110	258	125	352	159	185	629	268	240	727	158
v/c Ratio	0.72	0.93	0.37	0.65	0.40	0.30	0.65	0.63	0.45	0.67	0.63	0.30
Control Delay	29.4	49.6	4.9	36.5	35.2	3.9	31.9	38.3	9.8	34.9	43.9	21.7
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	29.4	49.6	4.9	36.5	35.2	3.9	31.9	38.3	9.8	34.9	43.9	21.7
Queue Length 50th (m)	51.6	125.6	0.2	15.6	34.5	0.0	24.8	66.8	7.5	52.6	91.3	22.4
Queue Length 95th (m)	76.9	#168.0	17.7	#34.2	48.6	9.9	#41.6	87.3	30.4	m76.2	m111.4	m41.9
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	495	1209	697	194	893	534	285	995	596	373	1150	529
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	0.71	0.92	0.37	0.64	0.39	0.30	0.65	0.63	0.45	0.64	0.63	0.30

Intersection Summary

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	325	1021	237	115	324	146	170	579	247	221	669	145
Future Volume (vph)	325	1021	237	115	324	146	170	579	247	221	669	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	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)	1684	3539	1547	1703	3438	1507	1783	3505	1535	1784	3505	1290
Flt Permitted	0.43	1.00	1.00	0.14	1.00	1.00	0.27	1.00	1.00	0.23	1.00	1.00
Satd. Flow (perm)	754	3539	1547	252	3438	1507	509	3505	1535	440	3505	1290
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	353	1110	258	125	352	159	185	629	268	240	727	158
RTOR Reduction (vph)	0	0	170	0	0	118	0	0	160	0	0	106
Lane Group Flow (vph)	353	1110	88	125	352	41	185	629	108	240	727	52
Confl. Peds. (#/hr)	6		1	1		6	22		21	21		22
Heavy Vehicles (%)	7%	2%	3%	6%	5%	5%	1%	3%	1%	1%	3%	20%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	49.0	37.1	37.1	36.4	28.5	28.5	39.3	31.2	31.2	48.1	36.0	36.0
Effective Green, g (s)	49.0	37.1	37.1	36.4	28.5	28.5	39.3	31.2	31.2	48.1	36.0	36.0
Actuated g/C Ratio	0.45	0.34	0.34	0.33	0.26	0.26	0.36	0.28	0.28	0.44	0.33	0.33
Clearance Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
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)	475	1193	521	187	890	390	275	994	435	350	1147	422
v/s Ratio Prot	c0.11	c0.31		0.05	0.10		0.05	0.18		c0.08	0.21	
v/s Ratio Perm	0.22		0.06	0.17		0.03	0.19		0.07	c0.22		0.04
v/c Ratio	0.74	0.93	0.17	0.67	0.40	0.11	0.67	0.63	0.25	0.69	0.63	0.12
Uniform Delay, d1	21.7	35.2	25.6	28.7	33.6	31.0	25.9	34.4	30.4	21.7	31.4	25.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.37	1.30	4.59
Incremental Delay, d2	6.2	12.7	0.2	8.7	0.3	0.1	6.3	3.1	1.4	4.9	2.4	0.5
Delay (s)	27.9	47.9	25.8	37.4	33.9	31.2	32.2	37.5	31.7	34.7	43.3	119.4
Level of Service	C	D	C	D	C	C	C	D	C	C	D	F
Approach Delay (s)		40.5			33.9			35.1			52.2	
Approach LOS		D			C			D			D	

Intersection Summary

HCM 2000 Control Delay	41.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.9
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

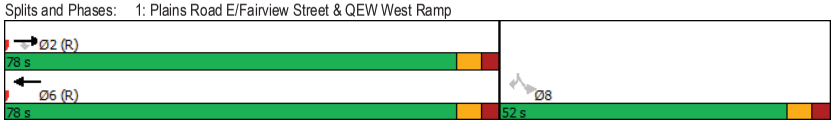
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1158	363	0	1855	0	0	0	0	531	0	314
Future Volume (vph)	0	1158	363	0	1855	0	0	0	0	531	0	314
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	55.0		0.0
Storage Lanes	0		1	0		0	0		0	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor			0.95									0.98
Frt			0.850									0.850
Flt Protected										0.950		
Satd. Flow (prot)	0	5136	1583	0	5085	0	0	0	0	3467	0	1615
Flt Permitted										0.950		
Satd. Flow (perm)	0	5136	1507	0	5085	0	0	0	0	3467	0	1585
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			395									34
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		175.7			307.2			140.0			199.7	
Travel Time (s)		12.7			22.1			10.1			14.4	
Confl. Peds. (#/hr)	4		15	15		4	3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	2%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Adj. Flow (vph)	0	1259	395	0	2016	0	0	0	0	577	0	341
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1259	395	0	2016	0	0	0	0	577	0	341
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Detector Phase		2	2		6					8		8
Switch Phase												
Minimum Initial (s)		8.0	8.0		8.0					8.0		8.0
Minimum Split (s)		43.0	43.0		43.0					25.0		25.0
Total Split (s)		78.0	78.0		78.0					52.0		52.0
Total Split (%)		60.0%	60.0%		60.0%					40.0%		40.0%
Yellow Time (s)		4.0	4.0		4.0					4.0		4.0
All-Red Time (s)		3.0	3.0		3.0					3.0		3.0
Lost Time Adjust (s)		0.0	0.0		0.0					0.0		0.0
Total Lost Time (s)		7.0	7.0		7.0					7.0		7.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max		C-Max					None		None
Act Effct Green (s)		84.1	84.1		84.1					31.9		31.9
Actuated g/C Ratio		0.65	0.65		0.65					0.25		0.25
v/c Ratio		0.38	0.35		0.61					0.68		0.82
Control Delay		12.0	2.1		6.1					47.8		57.2
Queue Delay		0.0	0.0		0.0					0.0		0.0
Total Delay		12.0	2.1		6.1					47.8		57.2
LOS		B	A		A					D		E
Approach Delay		9.7			6.1						51.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A						D	
Queue Length 50th (m)		54.6	0.0		35.4					72.7		79.3
Queue Length 95th (m)		80.1	14.1		m35.6					82.7		104.7
Internal Link Dist (m)		151.7			283.2			116.0			175.7	
Turn Bay Length (m)										55.0		
Base Capacity (vph)		3321	1113		3288					1200		570
Starvation Cap Reductn		0	0		0					0		0
Spillback Cap Reductn		0	0		0					0		0
Storage Cap Reductn		0	0		0					0		0
Reduced v/c Ratio		0.38	0.35		0.61					0.48		0.60

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 34 (26%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 16.4		Intersection LOS: B	
Intersection Capacity Utilization 67.3%		ICU Level of Service C	
Analysis Period (min) 15			

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

Splits and Phases: 1: Plains Road E/Fairview Street & QEW West Ramp



Lane Group	EBT	EBR	WBT	SBL	SBR
Lane Group Flow (vph)	1259	395	2016	577	341
v/c Ratio	0.38	0.35	0.61	0.68	0.82
Control Delay	12.0	2.1	6.1	47.8	57.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.0	2.1	6.1	47.8	57.2
Queue Length 50th (m)	54.6	0.0	35.4	72.7	79.3
Queue Length 95th (m)	80.1	14.1	m35.6	82.7	104.7
Internal Link Dist (m)	151.7		283.2		
Turn Bay Length (m)				55.0	
Base Capacity (vph)	3321	1113	3288	1200	570
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.38	0.35	0.61	0.48	0.60

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1158	363	0	1855	0	0	0	0	531	0	314
Future Volume (vph)	0	1158	363	0	1855	0	0	0	0	531	0	314
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0					7.0		7.0
Lane Util. Factor		0.91	1.00		0.91					0.97		1.00
Frpb, ped/bikes		1.00	0.95		1.00					1.00		0.98
Flpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Frt		1.00	0.85		1.00					1.00		0.85
Flt Protected		1.00	1.00		1.00					0.95		1.00
Satd. Flow (prot)		5136	1507		5085					3467		1585
Flt Permitted		1.00	1.00		1.00					0.95		1.00
Satd. Flow (perm)		5136	1507		5085					3467		1585
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1259	395	0	2016	0	0	0	0	577	0	341
RTOR Reduction (vph)	0	0	139	0	0	0	0	0	0	0	0	26
Lane Group Flow (vph)	0	1259	256	0	2016	0	0	0	0	577	0	315
Confl. Peds. (#/hr)	4		15	15		4	3					3
Heavy Vehicles (%)	0%	1%	2%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Actuated Green, G (s)		84.1	84.1		84.1					31.9		31.9
Effective Green, g (s)		84.1	84.1		84.1					31.9		31.9
Actuated g/C Ratio		0.65	0.65		0.65					0.25		0.25
Clearance Time (s)		7.0	7.0		7.0					7.0		7.0
Vehicle Extension (s)		3.0	3.0		3.0					3.0		3.0
Lane Grp Cap (vph)		3322	974		3289					850		388
v/s Ratio Prot		0.25			c0.40							
v/s Ratio Perm			0.17							0.17		c0.20
v/c Ratio		0.38	0.26		0.61					0.68		0.81
Uniform Delay, d1		10.7	9.8		13.4					44.4		46.2
Progression Factor		1.00	1.00		0.40					1.00		1.00
Incremental Delay, d2		0.3	0.7		0.2					2.2		12.2
Delay (s)		11.1	10.4		5.6					46.6		58.5
Level of Service		B	B		A					D		E
Approach Delay (s)		10.9			5.6			0.0			51.0	
Approach LOS		B			A			A			D	

Intersection Summary

HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
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)	92	1393	0	0	2444	24	149	171	399	6	0	436
Future Volume (vph)	92	1393	0	0	2444	24	149	171	399	6	0	436
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		45.0	75.0		0.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.91	0.95	1.00	1.00	1.00
Ped Bike Factor					1.00							
Frt					0.999			0.941	0.850			0.850
Flt Protected	0.950						0.950	0.998		0.950		
Satd. Flow (prot)	1770	5136	0	0	4800	0	1698	1581	1519	1805	0	1495
Flt Permitted	0.057						0.950	0.998		0.301		
Satd. Flow (perm)	106	5136	0	0	4800	0	1698	1581	1519	572	0	1495
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					1			26	59			127
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		307.2			385.1			180.0			159.4	
Travel Time (s)		22.1			27.7			13.0			11.5	
Confl. Peds. (#/hr)	2		7	7		2						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	1%	0%	0%	8%	0%	1%	4%	1%	0%	0%	8%
Adj. Flow (vph)	100	1514	0	0	2657	26	162	186	434	7	0	474
Shared Lane Traffic (%)							10%		30%			
Lane Group Flow (vph)	100	1514	0	0	2683	0	146	332	304	7	0	474
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Detector Phase	5	2			6		4	4	4	8		8
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0		8.0	8.0	8.0	8.0		8.0
Minimum Split (s)	11.0	35.0			35.0		36.0	36.0	36.0	36.0		36.0
Total Split (s)	11.0	79.0			68.0		51.0	51.0	51.0	51.0		51.0
Total Split (%)	8.5%	60.8%			52.3%		39.2%	39.2%	39.2%	39.2%		39.2%
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	0.0	3.0			3.0		3.0	3.0	3.0	3.0		3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	None	C-Max			C-Max		None	None	None	None		None
Act Effct Green (s)	82.8	78.8			67.7		37.2	37.2	37.2	37.2		37.2
Actuated g/C Ratio	0.64	0.61			0.52		0.29	0.29	0.29	0.29		0.29
v/c Ratio	0.59	0.49			1.07		0.30	0.71	0.64	0.04		0.92
Control Delay	37.6	10.0			72.3		36.4	45.8	37.7	30.3		55.2
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Delay	37.6	10.0			72.3		36.4	45.8	37.7	30.3		55.2
LOS	D	A			E		D	D	D	C		E
Approach Delay		11.7			72.3			40.9			54.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			E			D			D	
Queue Length 50th (m)	11.0	43.1			~303.1		31.6	79.7	59.7	1.3		93.4
Queue Length 95th (m)	#30.0	70.6			#348.9		48.8	111.9	88.8	5.1		#138.9
Internal Link Dist (m)		283.2			361.1			156.0			135.4	
Turn Bay Length (m)	30.0								45.0	75.0		
Base Capacity (vph)	170	3113			2500		574	552	553	193		590
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	0.59	0.49			1.07		0.25	0.60	0.55	0.04		0.80

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 16 (12%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 135			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.07			
Intersection Signal Delay: 48.8		Intersection LOS: D	
Intersection Capacity Utilization 104.9%		ICU Level of Service G	
Analysis Period (min) 15			

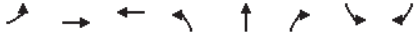
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: QEW East Ramp/Plains Road E & Fairview Street



Queues
2: QEW East Ramp/Plains Road E & Fairview Street

Base Year (2021)
PM Peak Hour



Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	100	1514	2683	146	332	304	7	474
v/c Ratio	0.59	0.49	1.07	0.30	0.71	0.64	0.04	0.92
Control Delay	37.6	10.0	72.3	36.4	45.8	37.7	30.3	55.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.6	10.0	72.3	36.4	45.8	37.7	30.3	55.2
Queue Length 50th (m)	11.0	43.1	~303.1	31.6	79.7	59.7	1.3	93.4
Queue Length 95th (m)	#30.0	70.6	#348.9	48.8	111.9	88.8	5.1	#138.9
Internal Link Dist (m)		283.2	361.1		156.0			
Turn Bay Length (m)	30.0					45.0	75.0	
Base Capacity (vph)	170	3113	2500	574	552	553	193	590
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	0.59	0.49	1.07	0.25	0.60	0.55	0.04	0.80

Intersection Summary

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

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

HCM Signalized Intersection Capacity Analysis
2: QEW East Ramp/Plains Road E & Fairview Street

Base Year (2021)
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	1393	0	0	2444	24	149	171	399	6	0	436
Future Volume (vph)	92	1393	0	0	2444	24	149	171	399	6	0	436
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lane Util. Factor	1.00	0.91			0.91		0.95	0.91	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			1.00		1.00	0.94	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1770	5136			4798		1698	1581	1519	1805		1495
Flt Permitted	0.06	1.00			1.00		0.95	1.00	1.00	0.30		1.00
Satd. Flow (perm)	105	5136			4798		1698	1581	1519	572		1495
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	100	1514	0	0	2657	26	162	186	434	7	0	474
RTOR Reduction (vph)	0	0	0	0	0	0	0	19	42	0	0	91
Lane Group Flow (vph)	100	1514	0	0	2683	0	146	313	262	7	0	383
Confl. Peds. (#/hr)	2		7	7		2						
Heavy Vehicles (%)	2%	1%	0%	0%	8%	0%	1%	4%	1%	0%	0%	8%
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Actuated Green, G (s)	78.8	78.8			67.7		37.2	37.2	37.2	37.2		37.2
Effective Green, g (s)	78.8	78.8			67.7		37.2	37.2	37.2	37.2		37.2
Actuated g/C Ratio	0.61	0.61			0.52		0.29	0.29	0.29	0.29		0.29
Clearance Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		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)	167	3113			2498		485	452	434	163		427
v/s Ratio Prot	c0.04	0.29			c0.56							
v/s Ratio Perm	0.32						0.09	0.20	0.17	0.01		c0.26
v/c Ratio	0.60	0.49			1.07		0.30	0.69	0.60	0.04		0.90
Uniform Delay, d1	28.8	14.3			31.1		36.2	41.3	40.0	33.5		44.6
Progression Factor	1.31	0.62			1.00		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	5.3	0.5			41.6		0.4	4.6	2.4	0.1		21.0
Delay (s)	43.1	9.4			72.8		36.6	45.9	42.4	33.6		65.5
Level of Service	D	A			E		D	D	D	C		E
Approach Delay (s)		11.5			72.8			42.8			65.1	
Approach LOS		B			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	50.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	104.9%	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)	319	31	952	427	15	597
Future Volume (vph)	319	31	952	427	15	597
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	55.0		0.0	0.0
Storage Lanes		0	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	0.97	1.00	1.00	1.00
Ped Bike Factor	1.00		0.99			
Frt	0.987					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3423	0	3433	1881	1687	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3423	0	3416	1881	1687	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	10					63
Link Speed (k/h)	50			60	50	
Link Distance (m)	207.1			887.5	183.4	
Travel Time (s)	14.9			53.3	13.2	
Confl. Peds. (#/hr)		4	4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	2%	1%	7%	2%
Adj. Flow (vph)	347	34	1035	464	16	649
Shared Lane Traffic (%)						
Lane Group Flow (vph)	381	0	1035	464	16	649
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Detector Phase	3		4	4	2	4
Switch Phase						
Minimum Initial (s)	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	17.0		27.0	27.0	18.0	27.0
Total Split (s)	22.0		50.0	50.0	18.0	50.0
Total Split (%)	24.4%		55.6%	55.6%	20.0%	55.6%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None		C-Max	C-Max	Max	C-Max
Act Effct Green (s)	13.8		44.0	44.0	12.2	63.2
Actuated g/C Ratio	0.15		0.49	0.49	0.14	0.70
v/c Ratio	0.71		0.62	0.50	0.07	0.57
Control Delay	43.1		18.8	18.0	35.9	8.6
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	43.1		18.8	18.0	35.9	8.6
LOS	D		B	B	D	A
Approach Delay	43.1			18.6	9.3	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	D			B	A	
Queue Length 50th (m)	33.6		67.8	54.8	2.6	47.1
Queue Length 95th (m)	49.1		88.1	82.1	8.7	75.9
Internal Link Dist (m)	183.1			863.5	159.4	
Turn Bay Length (m)			55.0			
Base Capacity (vph)	578		1678	919	228	1130
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.66		0.62	0.50	0.07	0.57

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 4:WBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 19.8		Intersection LOS: B	
Intersection Capacity Utilization 60.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: Maple Avenue & Plains Road E



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	381	1035	464	16	649
v/c Ratio	0.71	0.62	0.50	0.07	0.57
Control Delay	43.1	18.8	18.0	35.9	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	43.1	18.8	18.0	35.9	8.6
Queue Length 50th (m)	33.6	67.8	54.8	2.6	47.1
Queue Length 95th (m)	49.1	88.1	82.1	8.7	75.9
Internal Link Dist (m)	183.1		863.5	159.4	
Turn Bay Length (m)		55.0			
Base Capacity (vph)	578	1678	919	228	1130
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.66	0.62	0.50	0.07	0.57

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	319	31	952	427	15	597
Future Volume (vph)	319	31	952	427	15	597
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		6.0	6.0	7.0	6.0
Lane Util. Factor	0.95		0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3422		3433	1881	1687	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3422		3433	1881	1687	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	347	34	1035	464	16	649
RTOR Reduction (vph)	8	0	0	0	0	24
Lane Group Flow (vph)	373	0	1035	464	16	625
Confl. Peds. (#/hr)		4	4			
Heavy Vehicles (%)	4%	3%	2%	1%	7%	2%
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Actuated Green, G (s)	13.8		44.0	44.0	12.2	56.2
Effective Green, g (s)	13.8		44.0	44.0	12.2	56.2
Actuated g/C Ratio	0.15		0.49	0.49	0.14	0.62
Clearance Time (s)	7.0		6.0	6.0	7.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	524		1678	919	228	988
v/s Ratio Prot			0.30			c0.31
v/s Ratio Perm	c0.11			0.25	0.01	0.09
v/c Ratio	0.71		0.62	0.50	0.07	0.63
Uniform Delay, d1	36.2		16.8	15.6	33.9	10.5
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	4.5		1.7	2.0	0.6	3.1
Delay (s)	40.7		18.5	17.6	34.5	13.6
Level of Service	D		B	B	C	B
Approach Delay (s)	40.7			18.2	14.1	
Approach LOS	D			B	B	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

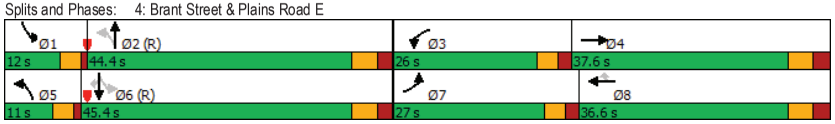
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	534	149	60	141	684	371	72	1221	57	121	931	694
Future Volume (vph)	534	149	60	141	684	371	72	1221	57	121	931	694
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	50.0		75.0	50.0		0.0	40.0		30.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.99					0.97	1.00	1.00				0.97
Frt		0.957				0.850		0.993				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3502	1756	0	1719	3539	1583	1805	5083	0	1687	5187	1599
Flt Permitted	0.950			0.950			0.191			0.095		
Satd. Flow (perm)	3478	1756	0	1719	3539	1535	362	5083	0	169	5187	1557
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16				121		6				431
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		887.5			190.4			463.4			229.3	
Travel Time (s)		53.3			11.4			27.8			13.8	
Confl. Peds. (#/hr)	12					12	10		16	16		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	5%	0%	5%	2%	2%	0%	0%	24%	7%	0%	1%
Adj. Flow (vph)	580	162	65	153	743	403	78	1327	62	132	1012	754
Shared Lane Traffic (%)												
Lane Group Flow (vph)	580	227	0	153	743	403	78	1389	0	132	1012	754
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Detector Phase	7	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	7.0	8.0		7.0	8.0	8.0
Minimum Split (s)	13.0	31.3		13.0	29.3	29.3	11.0	31.0		11.0	31.0	31.0
Total Split (s)	27.0	37.6		26.0	36.6	36.6	11.0	44.4		12.0	45.4	45.4
Total Split (%)	22.5%	31.3%		21.7%	30.5%	30.5%	9.2%	37.0%		10.0%	37.8%	37.8%
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.7		3.0	3.7	3.7
All-Red Time (s)	2.0	2.6		2.0	2.6	2.6	1.0	2.3		1.0	2.3	2.3
Lost Time Adjust (s)	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	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	21.7	35.0		15.8	29.1	29.1	48.8	39.7		51.6	43.0	43.0
Actuated g/C Ratio	0.18	0.29		0.13	0.24	0.24	0.41	0.33		0.43	0.36	0.36
v/c Ratio	0.92	0.43		0.68	0.87	0.87	0.34	0.82		0.75	0.54	0.90
Control Delay	68.7	35.6		64.3	55.1	50.0	19.6	39.9		49.8	33.0	32.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	68.7	35.6		64.3	55.1	50.0	19.6	39.9		49.8	33.0	32.0
LOS	E	D		E	E	D	B	D		D	C	C
Approach Delay		59.4			54.6			38.8			33.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			D			D			C	
Queue Length 50th (m)	73.2	41.6		36.6	92.1	69.0	13.5	128.9		19.6	76.4	92.8
Queue Length 95th (m)	#105.3	70.0		57.1	116.4	#124.3	m16.6	m136.6		#50.1	91.6	#181.9
Internal Link Dist (m)		863.5			166.4			439.4			205.3	
Turn Bay Length (m)	55.0			50.0		75.0	50.0			40.0		30.0
Base Capacity (vph)	642	524		300	893	478	232	1686		175	1859	834
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.90	0.43		0.51	0.83	0.84	0.34	0.82		0.75	0.54	0.90

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 45 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 43.8		Intersection LOS: D	
Intersection Capacity Utilization 83.6%		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: 4: Brant Street & Plains Road E



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	580	227	153	743	403	78	1389	132	1012	754
v/c Ratio	0.92	0.43	0.68	0.87	0.87	0.34	0.82	0.75	0.54	0.90
Control Delay	68.7	35.6	64.3	55.1	50.0	19.6	39.9	49.8	33.0	32.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.7	35.6	64.3	55.1	50.0	19.6	39.9	49.8	33.0	32.0
Queue Length 50th (m)	73.2	41.6	36.6	92.1	69.0	13.5	128.9	19.6	76.4	92.8
Queue Length 95th (m)	#105.3	70.0	57.1	116.4	#124.3	m16.6	m136.6	#50.1	91.6	#181.9
Internal Link Dist (m)		863.5		166.4			439.4		205.3	
Turn Bay Length (m)	55.0		50.0		75.0	50.0		40.0		30.0
Base Capacity (vph)	642	524	300	893	478	232	1686	175	1859	834
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.43	0.51	0.83	0.84	0.34	0.82	0.75	0.54	0.90

Intersection Summary

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	534	149	60	141	684	371	72	1221	57	121	931	694
Future Volume (vph)	534	149	60	141	684	371	72	1221	57	121	931	694
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	1.00		1.00	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00		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
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	1756		1719	3539	1535	1804	5085		1687	5187	1557
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.19	1.00		0.09	1.00	1.00
Satd. Flow (perm)	3502	1756		1719	3539	1535	363	5085		168	5187	1557
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	580	162	65	153	743	403	78	1327	62	132	1012	754
RTOR Reduction (vph)	0	11	0	0	0	92	0	4	0	0	0	279
Lane Group Flow (vph)	580	216	0	153	743	311	78	1385	0	132	1012	475
Confl. Peds. (#/hr)	12					12	10		16	16		10
Heavy Vehicles (%)	0%	5%	0%	5%	2%	2%	0%	0%	24%	7%	0%	1%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Actuated Green, G (s)	21.7	35.0		15.8	29.1	29.1	45.4	39.7		50.4	42.2	42.2
Effective Green, g (s)	21.7	35.0		15.8	29.1	29.1	45.4	39.7		50.4	42.2	42.2
Actuated g/C Ratio	0.18	0.29		0.13	0.24	0.24	0.38	0.33		0.42	0.35	0.35
Clearance Time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	633	512		226	858	372	205	1682		174	1824	547
v/s Ratio Prot	c0.17	0.12		0.09	c0.21		0.02	0.27		c0.05	0.20	
v/s Ratio Perm						0.20	0.13			0.27		c0.30
v/c Ratio	0.92	0.42		0.68	0.87	0.84	0.38	0.82		0.76	0.55	0.87
Uniform Delay, d1	48.3	34.3		49.7	43.6	43.2	24.9	36.9		26.4	31.3	36.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.87	1.00		1.00	1.00	1.00
Incremental Delay, d2	18.0	0.6		7.8	9.1	15.0	0.6	2.5		17.1	1.2	16.8
Delay (s)	66.3	34.9		57.5	52.7	58.2	22.4	39.4		43.5	32.6	53.1
Level of Service	E	C		E	D	E	C	D		D	C	D
Approach Delay (s)		57.4			55.0			38.5			41.5	
Approach LOS		E			D			D			D	

Intersection Summary					
HCM 2000 Control Delay	46.2	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.89				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.3		
Intersection Capacity Utilization	83.6%	ICU Level of Service	E		
Analysis Period (min)	15				

c Critical Lane Group

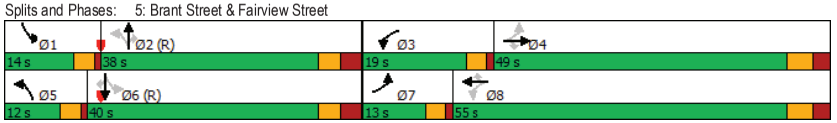
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	205	752	254	195	1412	422	144	751	176	225	610	417
Future Volume (vph)	205	752	254	195	1412	422	144	751	176	225	610	417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		170.0	60.0		0.0	75.0		70.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.97	1.00		0.98	0.99		0.92	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)	1703	3539	1568	1787	3574	1599	1787	3574	1599	1770	3539	1553
Flt Permitted	0.089			0.197			0.244			0.119		
Satd. Flow (perm)	160	3539	1526	370	3574	1573	456	3574	1474	219	3539	1498
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			260			200			177			196
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		261.1			251.5			231.2			463.4	
Travel Time (s)		15.7			15.1			16.6			27.8	
Confl. Peds. (#/hr)	3		10	10		3	16		45	45		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	2%	3%	1%	1%	1%	1%	1%	1%	2%	2%	4%
Adj. Flow (vph)	223	817	276	212	1535	459	157	816	191	245	663	453
Shared Lane Traffic (%)												
Lane Group Flow (vph)	223	817	276	212	1535	459	157	816	191	245	663	453
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		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	31.4	31.4	12.0	31.4	31.4	12.0	31.5	31.5	12.0	31.5	31.5
Total Split (s)	13.0	49.0	49.0	19.0	55.0	55.0	12.0	38.0	38.0	14.0	40.0	40.0
Total Split (%)	10.8%	40.8%	40.8%	15.8%	45.8%	45.8%	10.0%	31.7%	31.7%	11.7%	33.3%	33.3%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
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)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	56.4	45.0	45.0	62.9	48.6	48.6	42.0	31.5	31.5	46.0	33.5	33.5
Actuated g/C Ratio	0.47	0.38	0.38	0.52	0.40	0.40	0.35	0.26	0.26	0.38	0.28	0.28
v/c Ratio	1.17	0.62	0.38	0.62	1.06	0.61	0.63	0.87	0.37	1.15	0.67	0.81
Control Delay	147.5	33.4	5.6	23.2	76.7	19.0	37.5	53.5	8.6	131.0	28.2	24.8
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	147.5	33.4	5.6	23.2	76.7	19.0	37.5	53.5	8.6	131.0	28.2	24.8
LOS	F	C	A	C	E	B	D	D	A	F	C	C
Approach Delay		46.9			59.6			44.0			45.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			E			D			D	
Queue Length 50th (m)	~49.5	86.2	2.5	26.7	~220.2	49.4	25.3	102.0	2.6	~48.2	82.4	82.7
Queue Length 95th (m)	#102.9	111.3	21.5	41.6	#264.7	85.5	41.3	#134.8	21.4	#100.8	106.3	#119.1
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	190	1326	734	374	1447	756	248	938	517	213	987	559
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	1.17	0.62	0.38	0.57	1.06	0.61	0.63	0.87	0.37	1.15	0.67	0.81

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 89 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 50.7	Intersection LOS: D
Intersection Capacity Utilization 101.0%	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: 5: Brant Street & Fairview Street



Queues
5: Brant Street & Fairview Street

Base Year (2021)
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	223	817	276	212	1535	459	157	816	191	245	663	453
v/c Ratio	1.17	0.62	0.38	0.62	1.06	0.61	0.63	0.87	0.37	1.15	0.67	0.81
Control Delay	147.5	33.4	5.6	23.2	76.7	19.0	37.5	53.5	8.6	131.0	28.2	24.8
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	147.5	33.4	5.6	23.2	76.7	19.0	37.5	53.5	8.6	131.0	28.2	24.8
Queue Length 50th (m)	~49.5	86.2	2.5	26.7	~220.2	49.4	25.3	102.0	2.6	~48.2	82.4	82.7
Queue Length 95th (m)	#102.9	111.3	21.5	41.6	#264.7	85.5	41.3	#134.8	21.4	#100.8	106.3	#119.1
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	190	1326	734	374	1447	756	248	938	517	213	987	559
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	1.17	0.62	0.38	0.57	1.06	0.61	0.63	0.87	0.37	1.15	0.67	0.81

Intersection Summary

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

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

HCM Signalized Intersection Capacity Analysis
5: Brant Street & Fairview Street

Base Year (2021)
PM Peak Hour

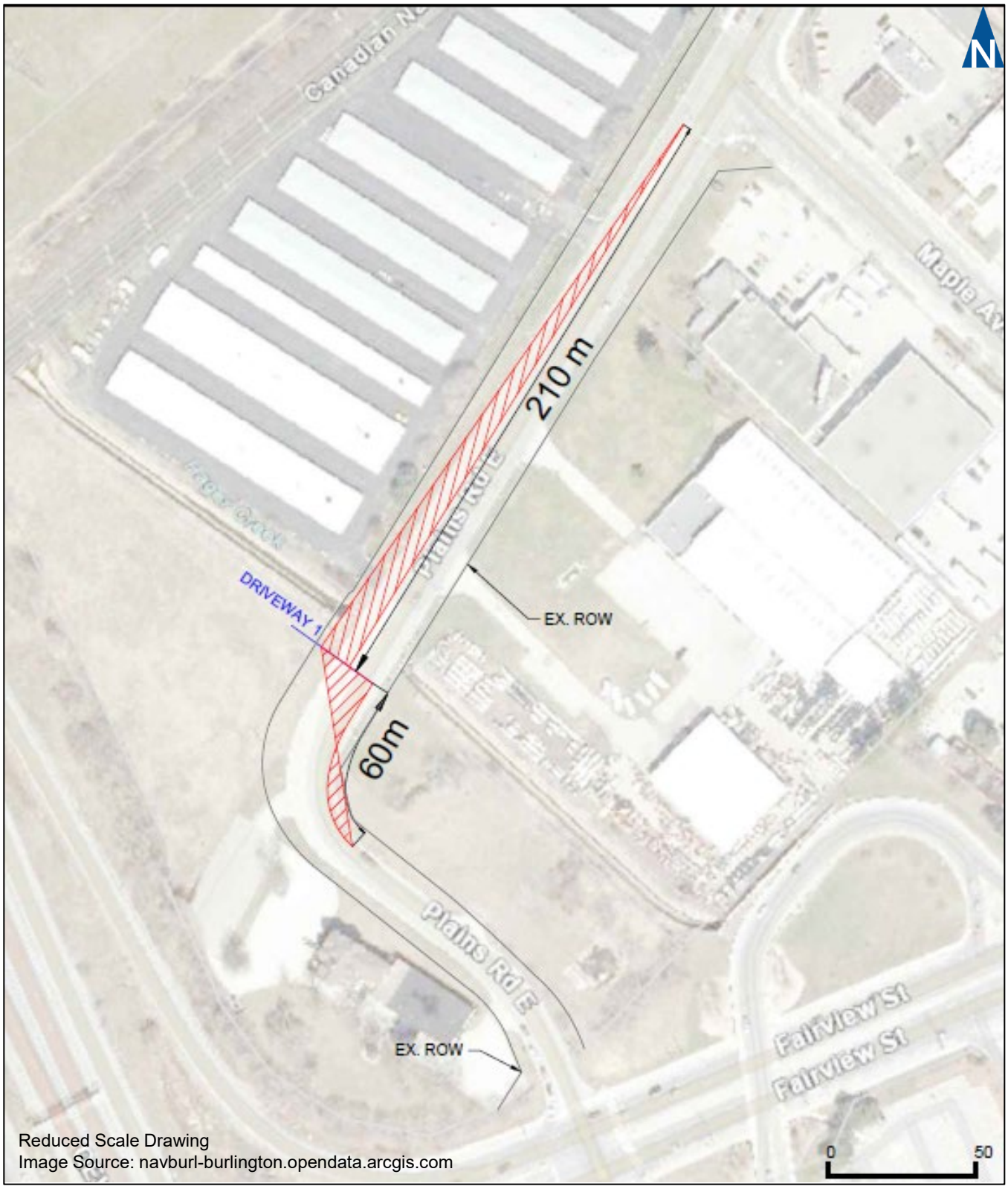
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	205	752	254	195	1412	422	144	751	176	225	610	417
Future Volume (vph)	205	752	254	195	1412	422	144	751	176	225	610	417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.92	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)	1703	3539	1526	1786	3574	1573	1785	3574	1474	1768	3539	1498
Flt Permitted	0.09	1.00	1.00	0.20	1.00	1.00	0.24	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	159	3539	1526	370	3574	1573	458	3574	1474	222	3539	1498
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	817	276	212	1535	459	157	816	191	245	663	453
RTOR Reduction (vph)	0	0	163	0	0	119	0	0	131	0	0	141
Lane Group Flow (vph)	223	817	114	212	1535	340	157	816	60	245	663	312
Confl. Peds. (#/hr)	3		10	10		3	16		45	45		16
Heavy Vehicles (%)	6%	2%	3%	1%	1%	1%	1%	1%	1%	2%	2%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	54.0	45.0	45.0	61.2	48.6	48.6	39.5	31.5	31.5	43.5	33.5	33.5
Effective Green, g (s)	54.0	45.0	45.0	61.2	48.6	48.6	39.5	31.5	31.5	43.5	33.5	33.5
Actuated g/C Ratio	0.45	0.38	0.38	0.51	0.41	0.41	0.33	0.26	0.26	0.36	0.28	0.28
Clearance Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
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)	187	1327	572	337	1447	637	239	938	386	209	987	418
v/s Ratio Prot	c0.09	0.23		c0.07	0.43		0.04	0.23		c0.10	0.19	
v/s Ratio Perm	c0.45		0.07	0.25		0.22	0.17		0.04	c0.33		0.21
v/c Ratio	1.19	0.62	0.20	0.63	1.06	0.53	0.66	0.87	0.16	1.17	0.67	0.75
Uniform Delay, d1	32.3	30.5	25.3	19.0	35.7	27.1	30.4	42.3	34.0	31.3	38.4	39.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	0.65	0.58
Incremental Delay, d2	127.2	0.9	0.2	3.7	41.6	0.9	6.4	10.8	0.9	113.2	3.2	10.3
Delay (s)	159.6	31.3	25.5	22.7	77.3	28.0	36.8	53.1	34.9	141.3	28.0	33.3
Level of Service	F	C	C	C	E	C	D	D	C	F	C	C
Approach Delay (s)		51.8			61.8			47.9			50.2	
Approach LOS		D			E			D			D	

Intersection Summary				
HCM 2000 Control Delay	54.3	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.18			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	101.0%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Appendix D

Sight Distance Figures

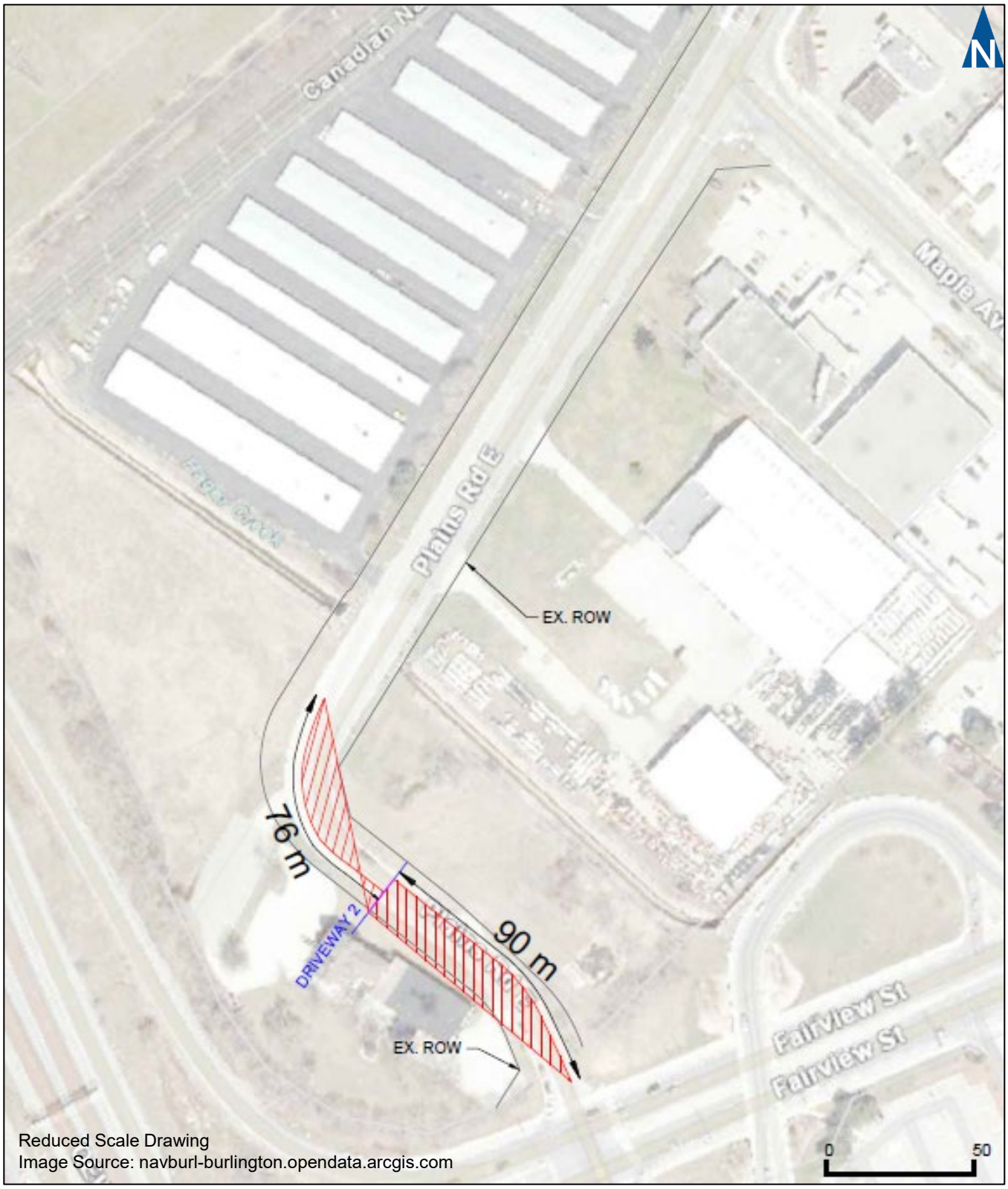


Reduced Scale Drawing
Image Source: navburl-burlington.opendata.arcgis.com

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Driveway 1
Existing Available Sight Distances

Appendix D

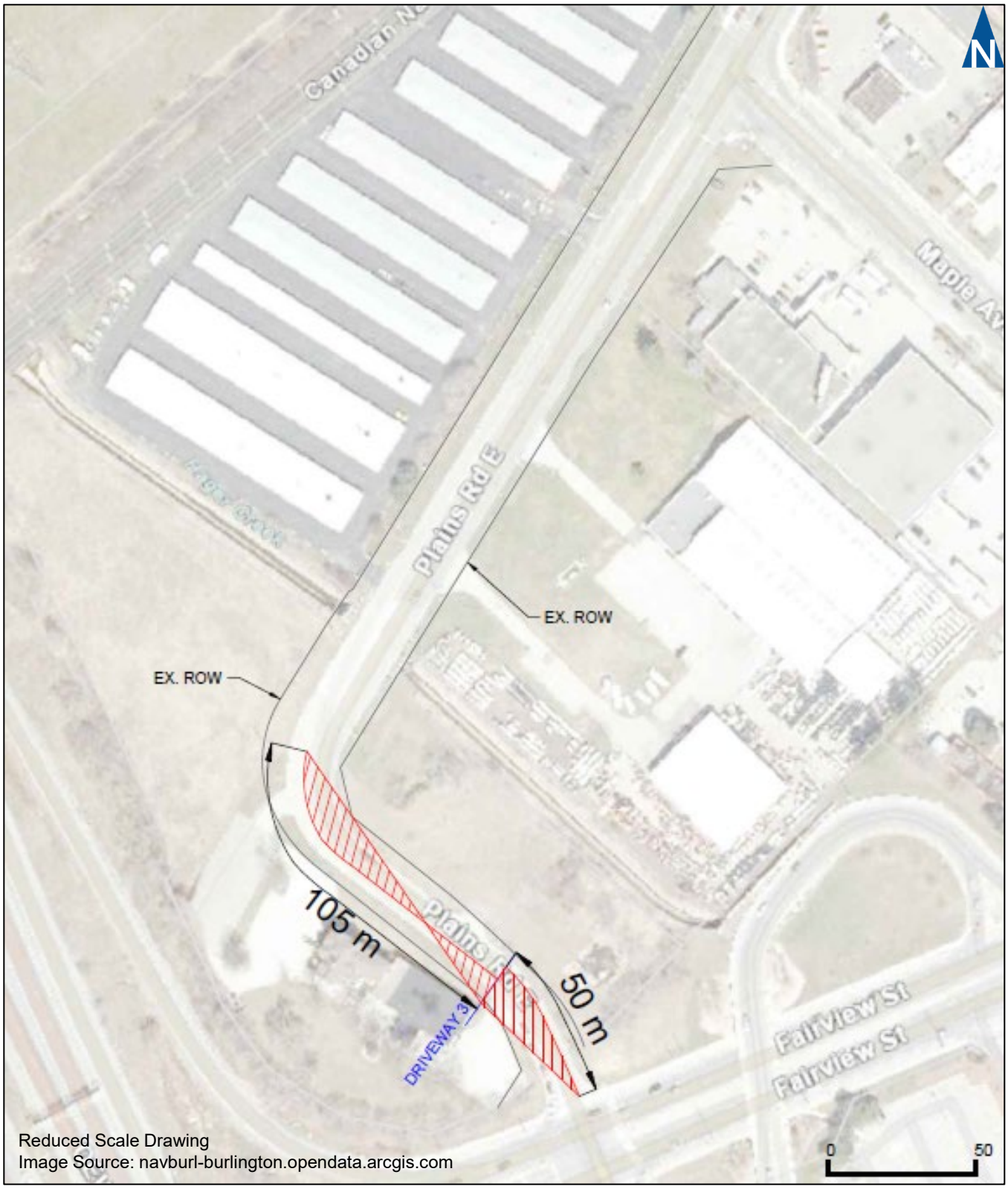


Reduced Scale Drawing
Image Source: navburl-burlington.opendata.arcgis.com

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Driveway 2
Existing Available Sight Distances

Appendix D



Reduced Scale Drawing
Image Source: navburl-burlington.opendata.arcgis.com

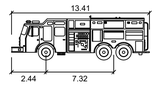
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Driveway 3
Existing Available Sight Distances

Appendix D

Appendix E

Swept Path Analysis



Pumper Fire Truck

	meters
Width	: 2.59
Track	: 2.59
Lock to Lock Time	: 6.0
Steering Angle	: 37.8

PART 2, PLAN 20R-9602

PROPERTY LINE

PLAINS ROAD EAST (P-2070-135) PIN 07087-0484 PART 1, PLAN 20R-9602

PIN 07087-0381

PART 4, PLAN 20R-5638

DRIVEWAY

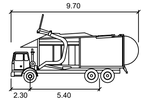
RELOCATED HERITAGE BUILDING (OFFICE)

CONCRETE CURB

CONCRETE SIDEWALK

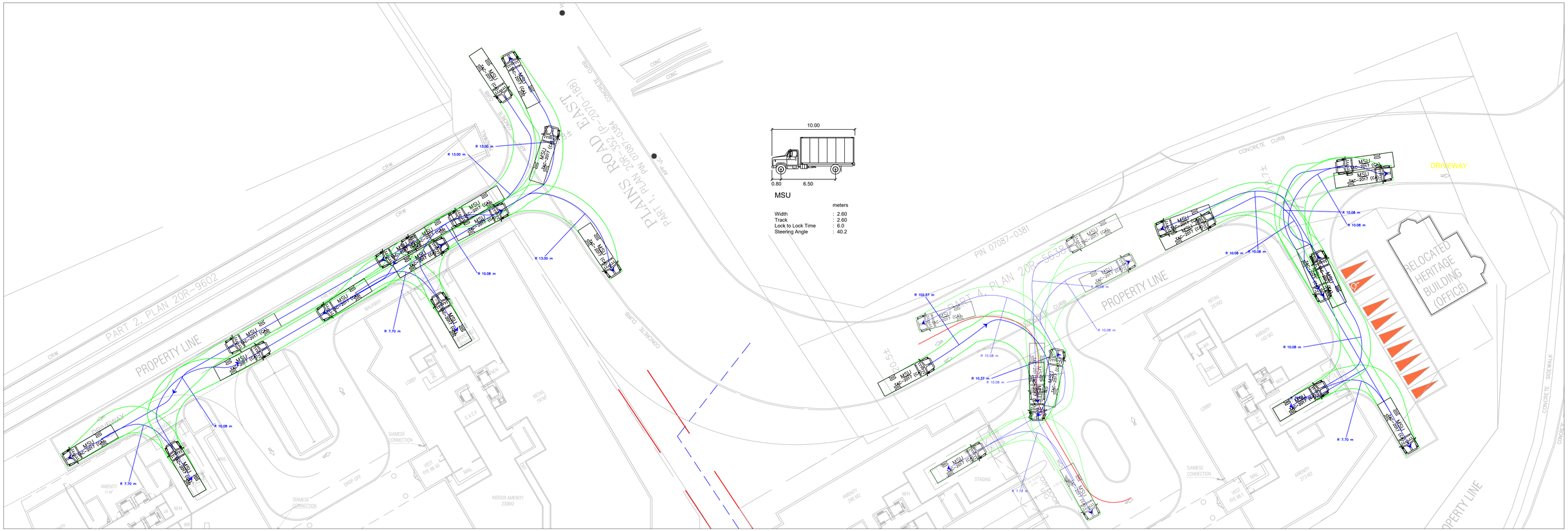
CRW

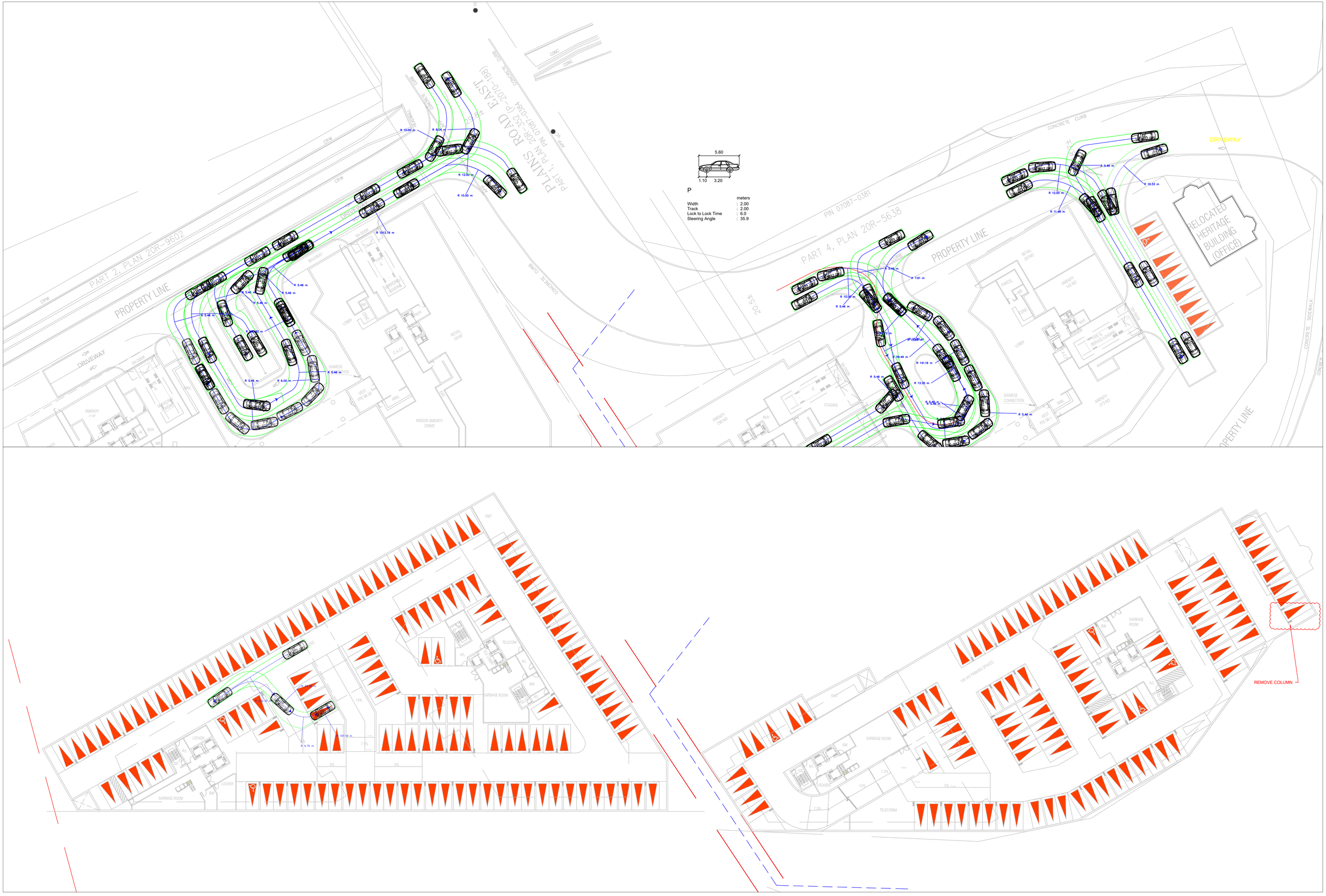
R 11.95 m



Halton Front End Loader

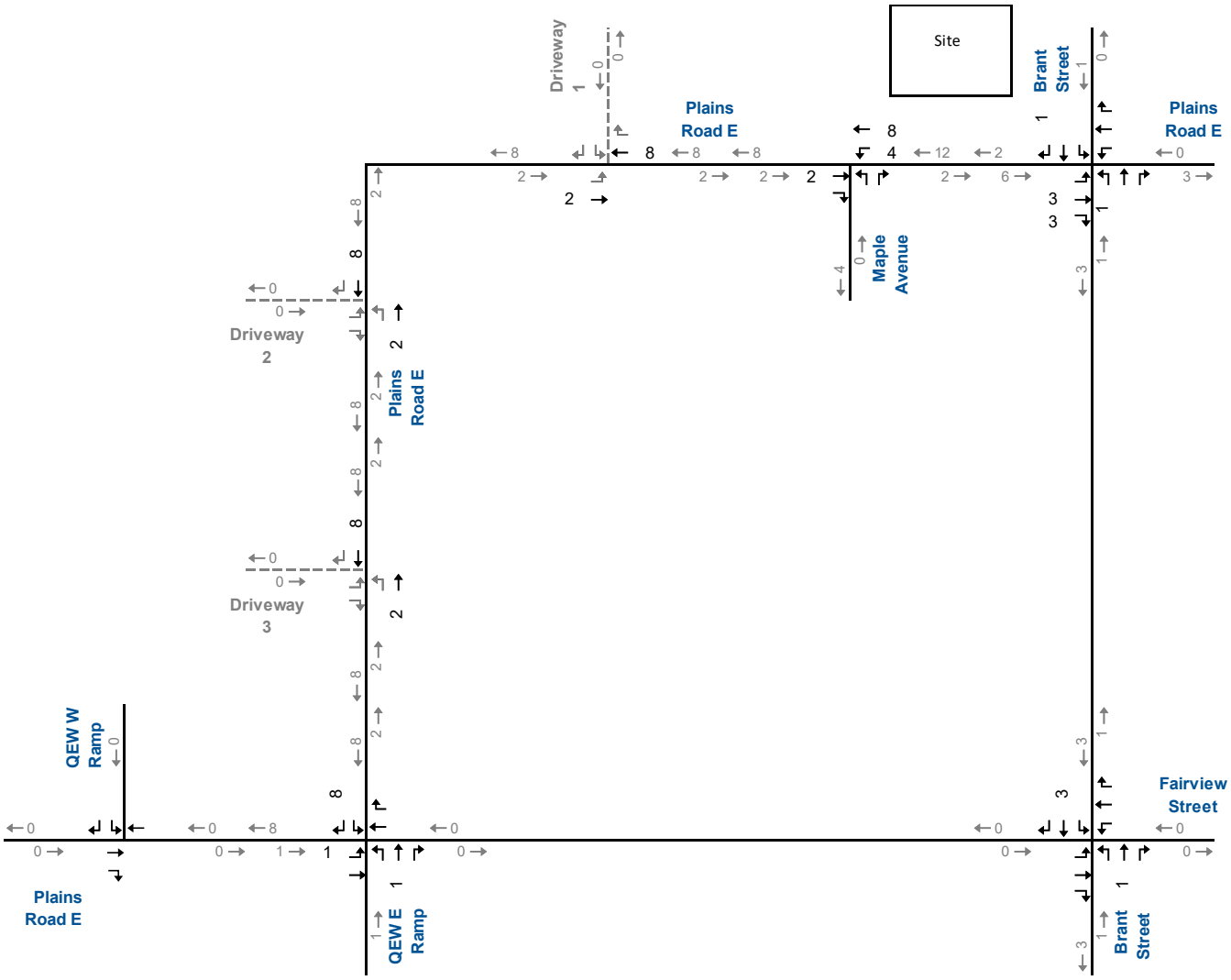
	meters
Width	: 2.70
Track	: 2.70
Lock to Lock Time	: 6.0
Steering Angle	: 24.5


10.00
0.80
6.50
MSU
meters
Width : 2.60
Track : 2.60
Lock to Lock Time : 6.0
Steering Angle : 40.2
PLAINS ROAD EAST
PART 1, PLAN 20R-15548 (PIN 07087-0384)
PART 2, PLAN 20R-9602
PROPERTY LINE
PIN 07087-0381
PART 1, PLAN 20R-9602
DRIVEWAY
RELOCATED HERITAGE BUILDING (OFFICE)
CONCRETE CURB
CONCRETE SIDEWALK
CRW
R 13.00 m
R 10.08 m
R 7.70 m
R 102.87 m
R 10.37 m
MSU
2AC-20IT (Cab)
SIAMESE CONNECTION
DROP-OFF
INDOOR AMENITY 230M2
AMENITY 290 M2
AMENITY 143 M2
AMENITY 273 M2
STAGING
OUTDOOR AMENITY
LOBBY
RETAIL 727M2
RETAIL 1010M2
MAIL
VEST
FIRE RISER
ELEC
PARCEL
MAIN
M/H
CONC


5.60
1.10
3.20
P
meters
Width : 2.00
Track : 2.00
Lock to Lock Time : 6.0
Steering Angle : 35.9
PART 2, PLAN 20R-9602
PROPERTY LINE
PLAINS ROAD EAST
PART 1, PLAN 20R-20535 (PIN 07087-0484)
PART 4, PLAN 20R-5638
PIN 07087-0381
DRIVEWAY
CONCRETE CURB
CONCRETE SIDEWALK
RELOCATED HERITAGE BUILDING (OFFICE)
REMOVE COLUMN
GARBAGE ROOM
TELECOMM
LOCKER
SWT
INDOOR AMENITY 230M2
AMENITY 71.9M
AMENITY 143.M2
AMENITY 273.M2
AMENITY 280.M2
STAGING
RETAIL 1574M2
SIAMESE CONNECTION
VEST. FFE 98.35
VEST. FFE 99.1
LOBBY
MAIL
ELEC
MECH
WHEEL
GARBAGE ROOM
TELECOMM
SW
A/C
15%
7.5%
5%
R 15.00 m
R 8.04 m
R 12.00 m
R 10.00 m
R 1313.79 m
R 5.46 m
R 6.00 m
R 7.61 m
R 10.33 m
R 11.48 m
R 141.16 m
R 13.35 m
R 4.75 m
R 197.19 m

Appendix F

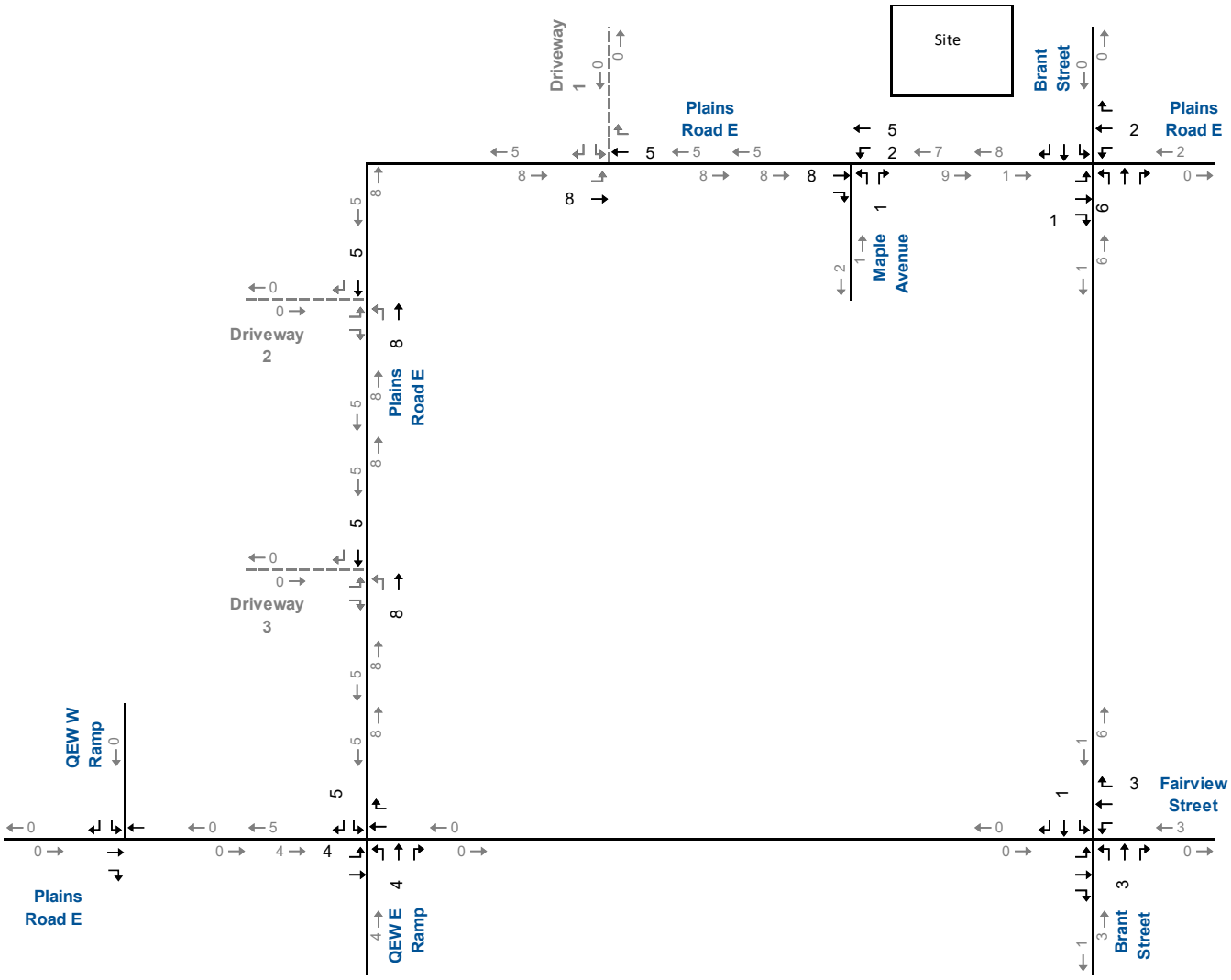
Background Development Traffic Assignment



1335-1355 Plains Road
Traffic Volumes
AM Peak Hour

1134 & 1167 Plains Road East TIS
200402

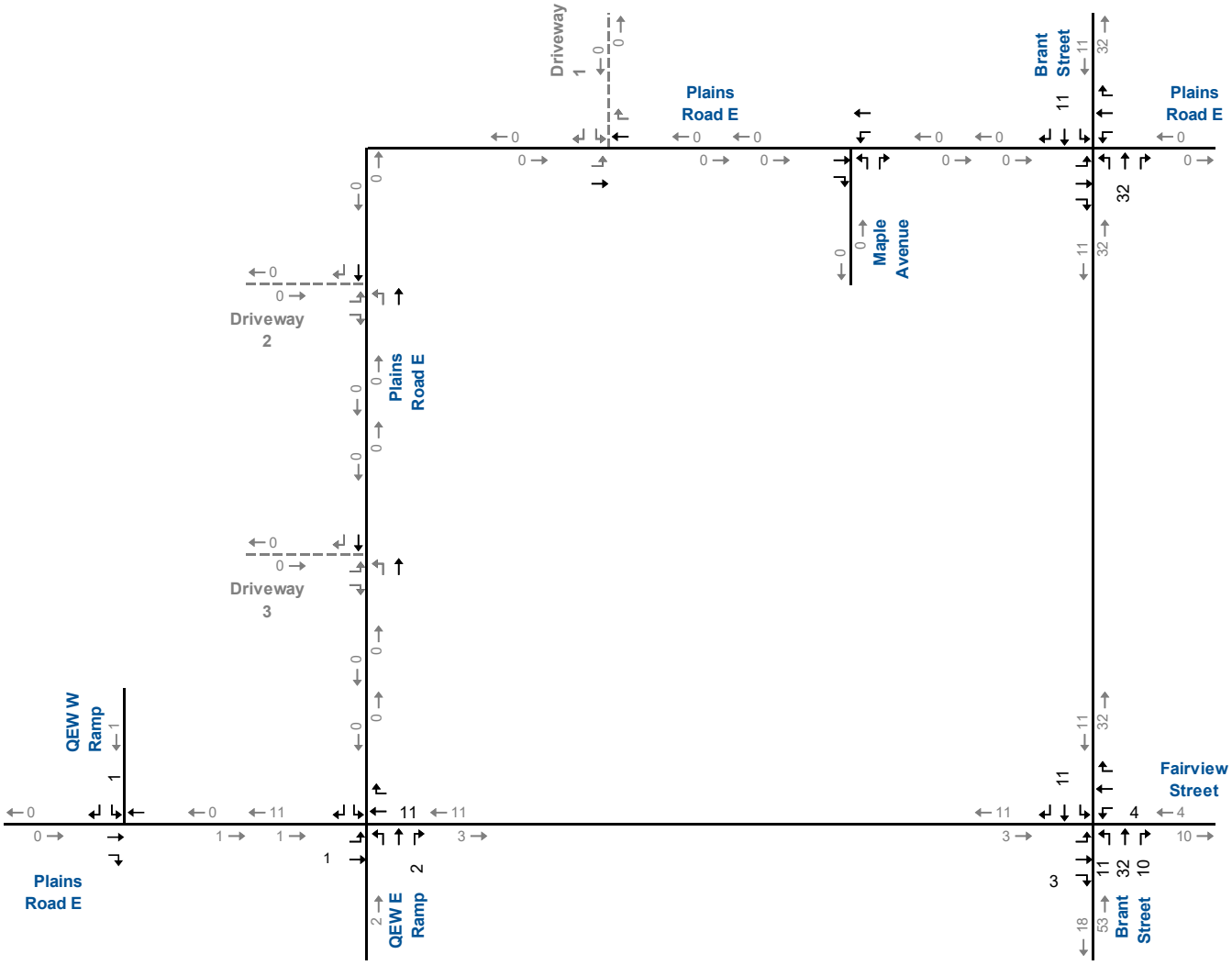
Figure A.1



1335-1355 Plains Road
Traffic Volumes
PM Peak Hour

1134 & 1167 Plains Road East TIS
200402

Figure A.2

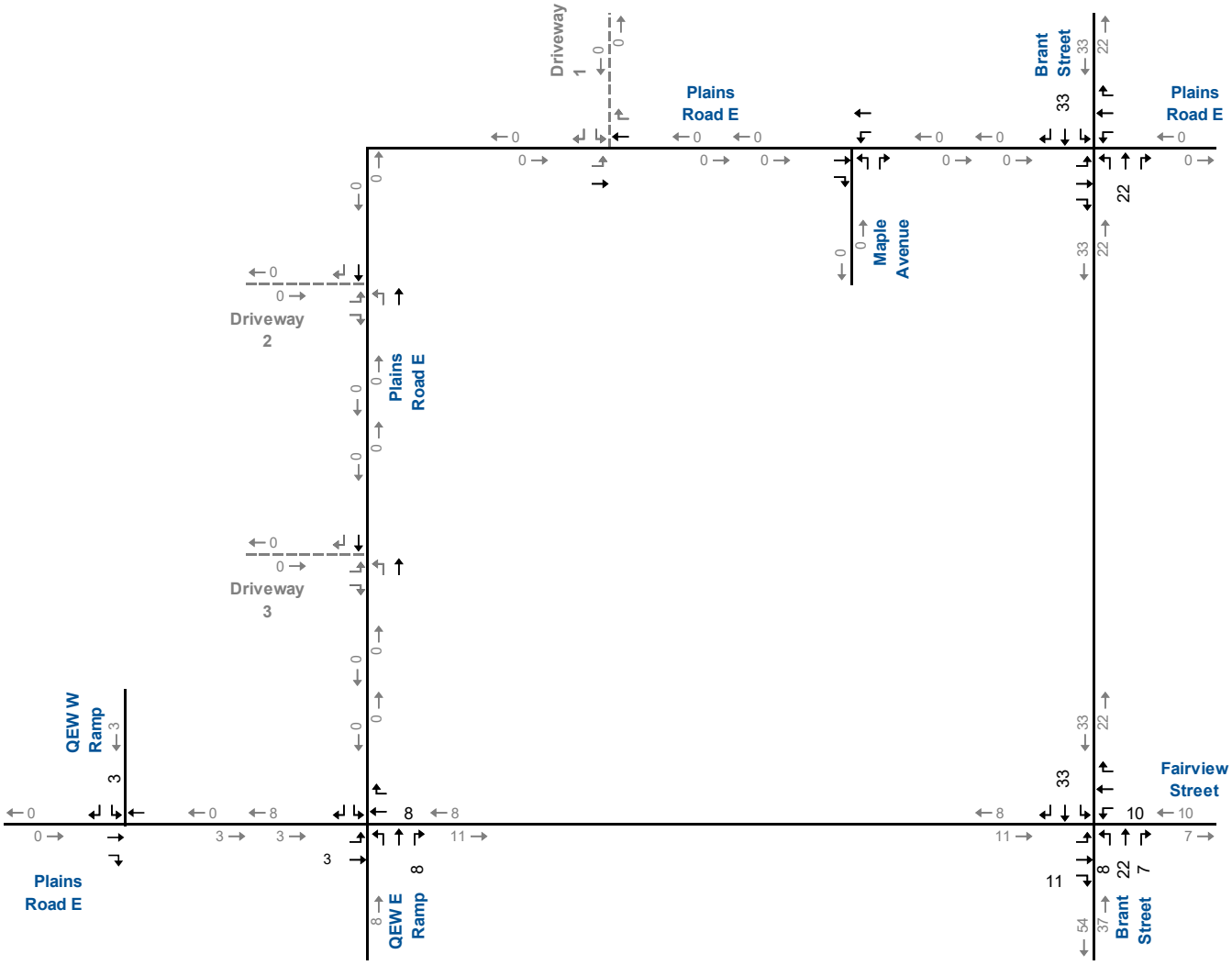


Brant/Ghent – Phase 1
Traffic Volumes
AM Peak Hour

1134 & 1167 Plains Road East TIS

200402

Figure B.1

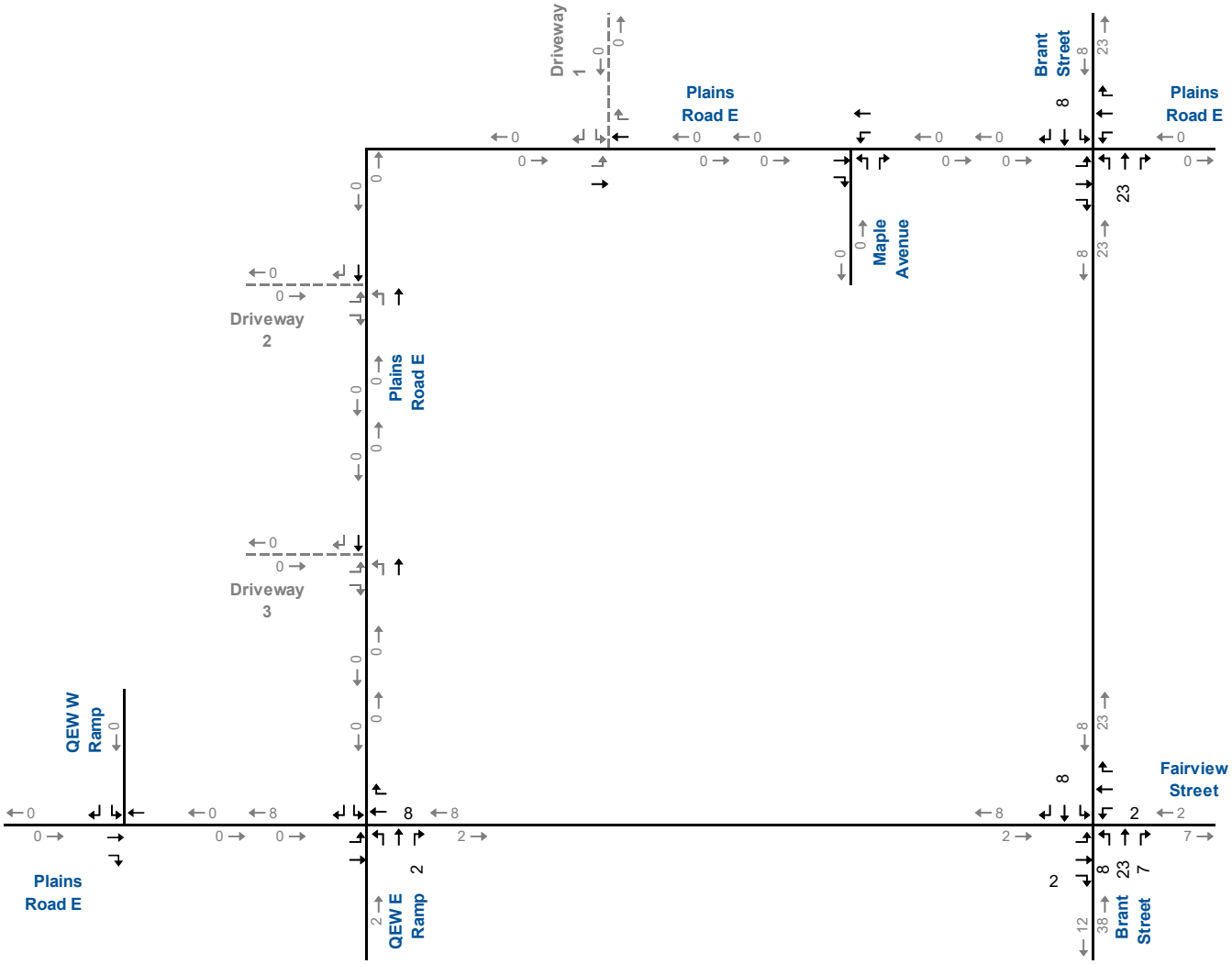


Brant/Ghent – Phase 1
Traffic Volumes
PM Peak Hour

1134 & 1167 Plains Road East TIS

200402

Figure B.2

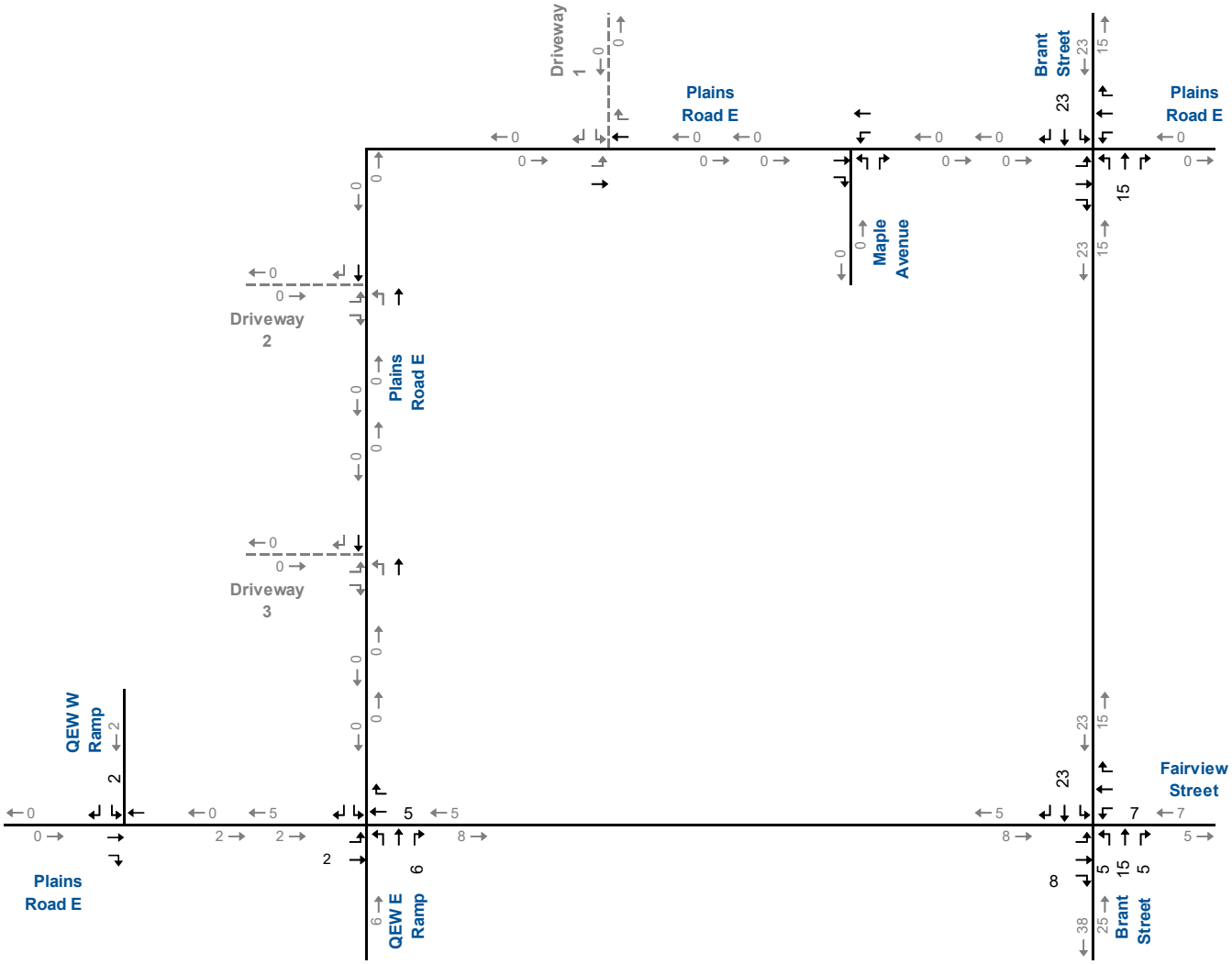


Brant/Ghent – Phase 2
Traffic Volumes
AM Peak Hour

1134 & 1167 Plains Road East TIS

200402

Figure C.1

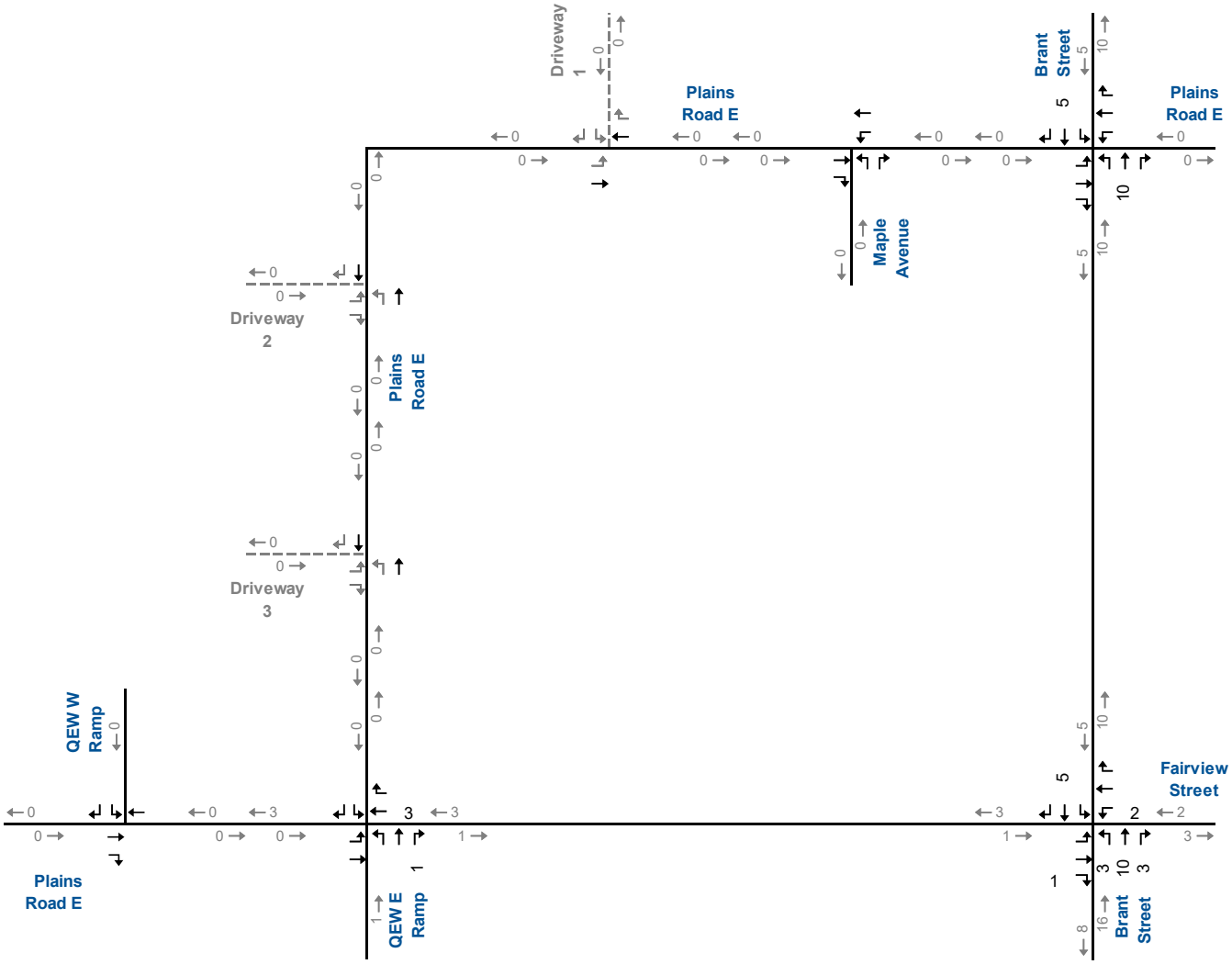


Brant/Ghent – Phase 2
Traffic Volumes
PM Peak Hour

1134 & 1167 Plains Road East TIS

200402

Figure C.2

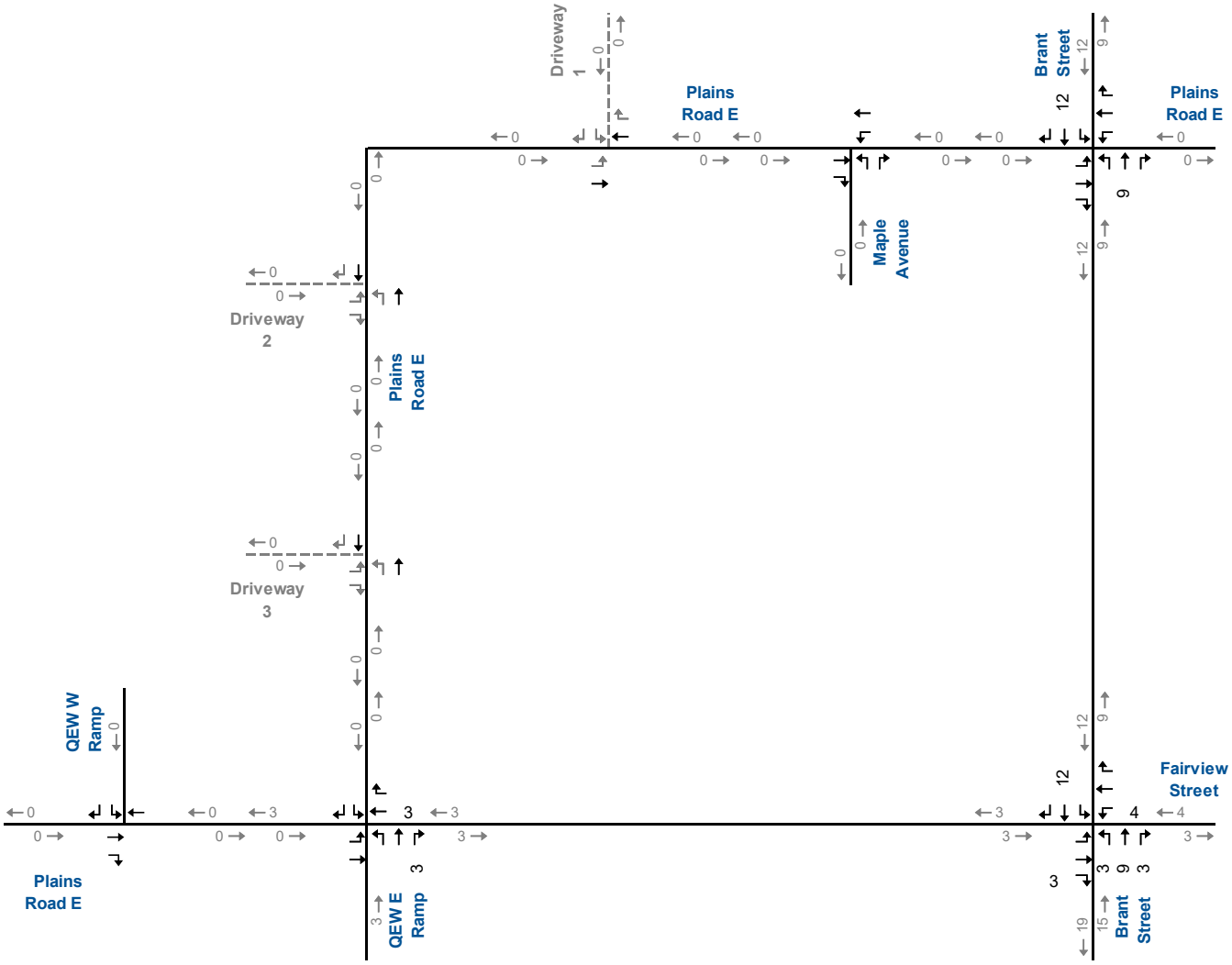


Brant/Ghent – Phase 3
Traffic Volumes
AM Peak Hour

1134 & 1167 Plains Road East TIS

200402

Figure D.1



Brant/Ghent – Phase 3
Traffic Volumes
PM Peak Hour

1134 & 1167 Plains Road East TIS

200402

Figure D.2

Appendix G1

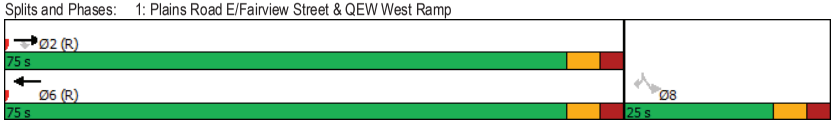
2027 Background Operation Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1493	209	0	833	0	0	0	0	237	0	101
Future Volume (vph)	0	1493	209	0	833	0	0	0	0	237	0	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	55.0		0.0
Storage Lanes	0		1	0		0	0		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor			0.98									
Frt			0.850									0.850
Flt Protected										0.950		
Satd. Flow (prot)	0	5036	1538	0	4988	0	0	0	0	3367	0	1615
Flt Permitted										0.950		
Satd. Flow (perm)	0	5036	1503	0	4988	0	0	0	0	3367	0	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			227									110
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		175.7			307.2			140.0			199.7	
Travel Time (s)		12.7			22.1			10.1			14.4	
Confl. Peds. (#/hr)	1		2	2		1						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	5%	4%	4%	0%	0%	0%	0%	4%	50%	0%
Adj. Flow (vph)	0	1623	227	0	905	0	0	0	0	258	0	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1623	227	0	905	0	0	0	0	258	0	110
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Detector Phase		2	2		6					8		8
Switch Phase												
Minimum Initial (s)		8.0	8.0		8.0					8.0		8.0
Minimum Split (s)		43.0	43.0		43.0					25.0		25.0
Total Split (s)		75.0	75.0		75.0					25.0		25.0
Total Split (%)		75.0%	75.0%		75.0%					25.0%		25.0%
Yellow Time (s)		4.0	4.0		4.0					4.0		4.0
All-Red Time (s)		3.0	3.0		3.0					3.0		3.0
Lost Time Adjust (s)		0.0	0.0		0.0					0.0		0.0
Total Lost Time (s)		7.0	7.0		7.0					7.0		7.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max		C-Max					None		None
Act Effct Green (s)		73.1	73.1		73.1					12.9		12.9
Actuated g/C Ratio		0.73	0.73		0.73					0.13		0.13
v/c Ratio		0.44	0.20		0.25					0.59		0.36
Control Delay		6.0	1.1		4.8					46.6		11.0
Queue Delay		0.0	0.0		0.0					0.0		0.0
Total Delay		6.0	1.1		4.8					46.6		11.0
LOS		A	A		A					D		B
Approach Delay		5.4			4.8						35.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A						D	
Queue Length 50th (m)		40.7	0.0		16.9					25.9		0.0
Queue Length 95th (m)		56.7	6.6		34.3					37.4		15.1
Internal Link Dist (m)		151.7			283.2			116.0			175.7	
Turn Bay Length (m)										55.0		
Base Capacity (vph)		3681	1159		3646					606		380
Starvation Cap Reductn		0	0		0					0		0
Spillback Cap Reductn		0	0		0					0		0
Storage Cap Reductn		0	0		0					0		0
Reduced v/c Ratio		0.44	0.20		0.25					0.43		0.29

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 66 (66%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 8.8		Intersection LOS: A	
Intersection Capacity Utilization 46.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Plains Road E/Fairview Street & QEW West Ramp



Lane Group	EBT	EBR	WBT	SBL	SBR
Lane Group Flow (vph)	1623	227	905	258	110
v/c Ratio	0.44	0.20	0.25	0.59	0.36
Control Delay	6.0	1.1	4.8	46.6	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.0	1.1	4.8	46.6	11.0
Queue Length 50th (m)	40.7	0.0	16.9	25.9	0.0
Queue Length 95th (m)	56.7	6.6	34.3	37.4	15.1
Internal Link Dist (m)	151.7		283.2		
Turn Bay Length (m)				55.0	
Base Capacity (vph)	3681	1159	3646	606	380
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.44	0.20	0.25	0.43	0.29

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1493	209	0	833	0	0	0	0	237	0	101
Future Volume (vph)	0	1493	209	0	833	0	0	0	0	237	0	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0					7.0		7.0
Lane Util. Factor		0.91	1.00		0.91					0.97		1.00
Frpb, ped/bikes		1.00	0.98		1.00					1.00		1.00
Flpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Frt		1.00	0.85		1.00					1.00		0.85
Flt Protected		1.00	1.00		1.00					0.95		1.00
Satd. Flow (prot)		5036	1503		4988					3367		1615
Flt Permitted		1.00	1.00		1.00					0.95		1.00
Satd. Flow (perm)		5036	1503		4988					3367		1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1623	227	0	905	0	0	0	0	258	0	110
RTOR Reduction (vph)	0	0	61	0	0	0	0	0	0	0	0	96
Lane Group Flow (vph)	0	1623	166	0	905	0	0	0	0	258	0	14
Confl. Peds. (#/hr)	1		2	2		1						
Heavy Vehicles (%)	0%	3%	5%	4%	4%	0%	0%	0%	0%	4%	50%	0%
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Actuated Green, G (s)		73.1	73.1		73.1					12.9		12.9
Effective Green, g (s)		73.1	73.1		73.1					12.9		12.9
Actuated g/C Ratio		0.73	0.73		0.73					0.13		0.13
Clearance Time (s)		7.0	7.0		7.0					7.0		7.0
Vehicle Extension (s)		3.0	3.0		3.0					3.0		3.0
Lane Grp Cap (vph)		3681	1098		3646					434		208
v/s Ratio Prot		c0.32			0.18							
v/s Ratio Perm			0.11							c0.08		0.01
v/c Ratio		0.44	0.15		0.25					0.59		0.07
Uniform Delay, d1		5.3	4.1		4.4					41.1		38.3
Progression Factor		1.00	1.00		1.00					1.00		1.00
Incremental Delay, d2		0.4	0.3		0.1					2.2		0.1
Delay (s)		5.7	4.4		4.6					43.3		38.4
Level of Service		A	A		A					D		D
Approach Delay (s)		5.6			4.6			0.0			41.8	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

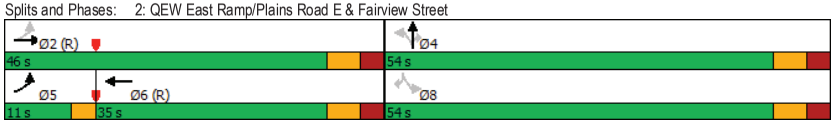
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	1296	0	0	804	16	217	271	759	14	0	376
Future Volume (vph)	107	1296	0	0	804	16	217	271	759	14	0	376
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		45.0	75.0		0.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.91	0.95	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00			0.99	0.99	1.00		
Frt					0.997			0.930	0.850			0.850
Flt Protected	0.950						0.950	0.998		0.950		
Satd. Flow (prot)	1752	5036	0	0	4974	0	1649	1562	1504	1805	0	1538
Flt Permitted	0.208						0.950	0.998		0.168		
Satd. Flow (perm)	384	5036	0	0	4974	0	1649	1562	1485	319	0	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					3			7	76			254
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		307.2			385.1			180.0			159.4	
Travel Time (s)		22.1			27.7			13.0			11.5	
Confl. Peds. (#/hr)	1		3	3		1			1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	0%	4%	0%	4%	2%	2%	0%	0%	5%
Adj. Flow (vph)	116	1409	0	0	874	17	236	295	825	15	0	409
Shared Lane Traffic (%)							10%		34%			
Lane Group Flow (vph)	116	1409	0	0	891	0	212	600	544	15	0	409
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Detector Phase	5	2			6		4	4	4	8		8
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0		8.0	8.0	8.0	8.0		8.0
Minimum Split (s)	11.0	35.0			35.0		36.0	36.0	36.0	36.0		36.0
Total Split (s)	11.0	46.0			35.0		54.0	54.0	54.0	54.0		54.0
Total Split (%)	11.0%	46.0%			35.0%		54.0%	54.0%	54.0%	54.0%		54.0%
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	0.0	3.0			3.0		3.0	3.0	3.0	3.0		3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	None	C-Max			C-Max		None	None	None	None		None
Act Effct Green (s)	46.7	42.7			31.6		43.3	43.3	43.3	43.3		43.3
Actuated g/C Ratio	0.47	0.43			0.32		0.43	0.43	0.43	0.43		0.43
v/c Ratio	0.40	0.66			0.57		0.30	0.88	0.79	0.11		0.51
Control Delay	16.8	21.1			31.0		18.9	41.3	29.9	17.5		8.9
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Delay	16.8	21.1			31.0		18.9	41.3	29.9	17.5		8.9
LOS	B	C			C		B	D	C	B		A
Approach Delay		20.7			31.0			33.2			9.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			C			C			A	
Queue Length 50th (m)	9.8	91.5			58.0		27.1	112.3	80.9	1.7		18.3
Queue Length 95th (m)	16.9	109.8			72.8		43.6	#181.8	126.8	5.9		42.5
Internal Link Dist (m)		283.2			361.1			156.0			135.4	
Turn Bay Length (m)	30.0								45.0	75.0		
Base Capacity (vph)	291	2151			1571		775	737	738	149		857
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	0.66			0.57		0.27	0.81	0.74	0.10		0.48

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 96 (96%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 25.8 Intersection LOS: C
Intersection Capacity Utilization 85.1% 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.

Splits and Phases: 2: QEW East Ramp/Plains Road E & Fairview Street



Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	116	1409	891	212	600	544	15	409
v/c Ratio	0.40	0.66	0.57	0.30	0.88	0.79	0.11	0.51
Control Delay	16.8	21.1	31.0	18.9	41.3	29.9	17.5	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.8	21.1	31.0	18.9	41.3	29.9	17.5	8.9
Queue Length 50th (m)	9.8	91.5	58.0	27.1	112.3	80.9	1.7	18.3
Queue Length 95th (m)	16.9	109.8	72.8	43.6	#181.8	126.8	5.9	42.5
Internal Link Dist (m)		283.2	361.1		156.0			
Turn Bay Length (m)	30.0					45.0	75.0	
Base Capacity (vph)	291	2151	1571	775	737	738	149	857
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	0.66	0.57	0.27	0.81	0.74	0.10	0.48

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	1296	0	0	804	16	217	271	759	14	0	376
Future Volume (vph)	107	1296	0	0	804	16	217	271	759	14	0	376
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lane Util. Factor	1.00	0.91			0.91		0.95	0.91	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	0.99	0.99	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			1.00		1.00	0.93	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1752	5036			4975		1649	1562	1485	1805		1538
Flt Permitted	0.21	1.00			1.00		0.95	1.00	1.00	0.17		1.00
Satd. Flow (perm)	383	5036			4975		1649	1562	1485	319		1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	116	1409	0	0	874	17	236	295	825	15	0	409
RTOR Reduction (vph)	0	0	0	0	2	0	0	4	43	0	0	144
Lane Group Flow (vph)	116	1409	0	0	889	0	212	596	501	15	0	265
Confl. Peds. (#/hr)	1		3	3		1			1	1		
Heavy Vehicles (%)	3%	3%	3%	0%	4%	0%	4%	2%	2%	0%	0%	5%
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Actuated Green, G (s)	42.7	42.7			31.5		43.3	43.3	43.3	43.3		43.3
Effective Green, g (s)	42.7	42.7			31.5		43.3	43.3	43.3	43.3		43.3
Actuated g/C Ratio	0.43	0.43			0.32		0.43	0.43	0.43	0.43		0.43
Clearance Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		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)	275	2150			1567		714	676	643	138		665
v/s Ratio Prot	0.03	c0.28			0.18							
v/s Ratio Perm	0.15						0.13	0.38	0.34	0.05		0.17
v/c Ratio	0.42	0.66			0.57		0.30	0.88	0.78	0.11		0.40
Uniform Delay, d1	18.4	22.8			28.6		18.4	26.0	24.3	16.9		19.4
Progression Factor	0.78	0.82			1.00		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	1.0	1.4			1.5		0.2	12.9	5.9	0.3		0.4
Delay (s)	15.2	20.2			30.1		18.7	38.9	30.2	17.2		19.8
Level of Service	B	C			C		B	D	C	B		B
Approach Delay (s)		19.8			30.1			32.3			19.7	
Approach LOS		B			C			C			B	

Intersection Summary				
HCM 2000 Control Delay	26.0	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)	17.0	
Intersection Capacity Utilization	85.1%	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)	428	6	277	382	8	565
Future Volume (vph)	428	6	277	382	8	565
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	55.0		0.0	0.0
Storage Lanes		0	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	0.97	1.00	1.00	1.00
Ped Bike Factor	1.00		0.99			0.99
Frt	0.998					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3413	0	3303	1712	1805	1568
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3413	0	3279	1712	1805	1547
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	2					35
Link Speed (k/h)	50			60	50	
Link Distance (m)	207.1			887.5	183.4	
Travel Time (s)	14.9			53.3	13.2	
Confl. Peds. (#/hr)		7	7			1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	40%	6%	11%	0%	3%
Adj. Flow (vph)	465	7	301	415	9	614
Shared Lane Traffic (%)						
Lane Group Flow (vph)	472	0	301	415	9	614
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Detector Phase	3		4	4	2	4
Switch Phase						
Minimum Initial (s)	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	17.0		27.0	27.0	18.0	27.0
Total Split (s)	23.0		44.0	44.0	18.0	44.0
Total Split (%)	27.1%		51.8%	51.8%	21.2%	51.8%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None		C-Max	C-Max	Max	C-Max
Act Effct Green (s)	15.1		38.0	38.0	11.9	50.9
Actuated g/C Ratio	0.18		0.45	0.45	0.14	0.60
v/c Ratio	0.78		0.20	0.54	0.04	0.65
Control Delay	42.8		14.8	20.5	32.9	12.8
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	42.8		14.8	20.5	32.9	12.8
LOS	D		B	C	C	B
Approach Delay	42.8			18.1	13.0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	D			B	B	
Queue Length 50th (m)	40.1		15.5	50.0	1.4	48.0
Queue Length 95th (m)	57.3		23.7	78.0	5.7	77.1
Internal Link Dist (m)	183.1			863.5	159.4	
Turn Bay Length (m)			55.0			
Base Capacity (vph)	644		1476	765	252	949
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.73		0.20	0.54	0.04	0.65

Intersection Summary			
Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 85			
Offset: 27 (32%), Referenced to phase 4:WBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 22.8		Intersection LOS: C	
Intersection Capacity Utilization 58.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: Maple Avenue & Plains Road E



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	472	301	415	9	614
v/c Ratio	0.78	0.20	0.54	0.04	0.65
Control Delay	42.8	14.8	20.5	32.9	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	14.8	20.5	32.9	12.8
Queue Length 50th (m)	40.1	15.5	50.0	1.4	48.0
Queue Length 95th (m)	57.3	23.7	78.0	5.7	77.1
Internal Link Dist (m)	183.1		863.5	159.4	
Turn Bay Length (m)		55.0			
Base Capacity (vph)	644	1476	765	252	949
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.73	0.20	0.54	0.04	0.65

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	428	6	277	382	8	565
Future Volume (vph)	428	6	277	382	8	565
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		6.0	6.0	7.0	6.0
Lane Util. Factor	0.95		0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3412		3303	1712	1805	1563
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3412		3303	1712	1805	1563
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	465	7	301	415	9	614
RTOR Reduction (vph)	2	0	0	0	0	14
Lane Group Flow (vph)	470	0	301	415	9	600
Confl. Peds. (#/hr)		7	7			1
Heavy Vehicles (%)	5%	40%	6%	11%	0%	3%
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Actuated Green, G (s)	15.1		38.0	38.0	11.9	49.9
Effective Green, g (s)	15.1		38.0	38.0	11.9	49.9
Actuated g/C Ratio	0.18		0.45	0.45	0.14	0.59
Clearance Time (s)	7.0		6.0	6.0	7.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	606		1476	765	252	917
v/s Ratio Prot			0.09			c0.29
v/s Ratio Perm	c0.14			0.24	0.00	0.09
v/c Ratio	0.78		0.20	0.54	0.04	0.65
Uniform Delay, d1	33.3		14.3	17.2	31.6	11.8
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	6.2		0.3	2.8	0.3	3.6
Delay (s)	39.5		14.6	19.9	31.9	15.4
Level of Service	D		B	B	C	B
Approach Delay (s)	39.5			17.7	15.6	
Approach LOS	D			B	B	

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

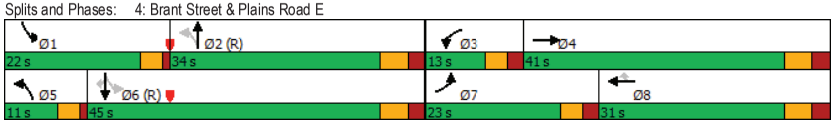
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	457	488	46	80	145	80	38	819	275	312	1047	468
Future Volume (vph)	457	488	46	80	145	80	38	819	275	312	1047	468
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	50.0		75.0	50.0		0.0	40.0		30.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.99	1.00		1.00		0.98	1.00	0.99		1.00		0.97
Frt		0.987				0.850		0.962				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	1839	0	1597	3252	1404	1641	4744	0	1719	5085	1538
Flt Permitted	0.950			0.950			0.231			0.125		
Satd. Flow (perm)	3372	1839	0	1593	3252	1374	398	4744	0	226	5085	1498
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				208		74				294
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		887.5			190.4			463.4			229.3	
Travel Time (s)		53.3			11.4			27.8			13.8	
Confl. Peds. (#/hr)	7		5	5		7	11		7	7		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	0%	13%	11%	15%	10%	3%	8%	5%	2%	5%
Adj. Flow (vph)	497	530	50	87	158	87	41	890	299	339	1138	509
Shared Lane Traffic (%)												
Lane Group Flow (vph)	497	580	0	87	158	87	41	1189	0	339	1138	509
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Detector Phase	7	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	7.0	8.0		7.0	8.0	8.0
Minimum Split (s)	13.0	31.3		13.0	29.3	29.3	11.0	31.0		11.0	31.0	31.0
Total Split (s)	23.0	41.0		13.0	31.0	31.0	11.0	34.0		22.0	45.0	45.0
Total Split (%)	20.9%	37.3%		11.8%	28.2%	28.2%	10.0%	30.9%		20.0%	40.9%	40.9%
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.7		3.0	3.7	3.7
All-Red Time (s)	2.0	2.6		2.0	2.6	2.6	1.0	2.3		1.0	2.3	2.3
Lost Time Adjust (s)	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	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	17.8	34.7		8.0	24.9	24.9	37.0	28.0		52.0	43.4	43.4
Actuated g/C Ratio	0.16	0.32		0.07	0.23	0.23	0.34	0.25		0.47	0.39	0.39
v/c Ratio	0.90	0.99		0.75	0.21	0.18	0.19	0.94		0.97	0.57	0.66
Control Delay	66.3	74.2		86.6	35.7	0.9	16.0	36.9		69.9	28.2	16.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	66.3	74.2		86.6	35.7	0.9	16.0	36.9		69.9	28.2	16.6
LOS	E	E		F	D	A	B	D		E	C	B
Approach Delay		70.5			39.9			36.2			32.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			D			D			C	
Queue Length 50th (m)	57.3	129.3		19.6	15.4	0.0	2.5	87.3		59.4	77.5	41.1
Queue Length 95th (m)	#86.9	#205.1		#47.1	24.8	0.0	m3.9	m#120.1		#118.4	93.3	83.6
Internal Link Dist (m)		863.5			166.4			439.4			205.3	
Turn Bay Length (m)	55.0			50.0		75.0	50.0			40.0		30.0
Base Capacity (vph)	556	583		116	735	471	212	1262		351	2006	768
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.89	0.99		0.75	0.21	0.18	0.19	0.94		0.97	0.57	0.66

Intersection Summary		
Area Type:	Other	
Cycle Length: 110		
Actuated Cycle Length: 110		
Offset: 40 (36%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 100		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.99		
Intersection Signal Delay: 42.8	Intersection LOS: D	
Intersection Capacity Utilization 92.4%	ICU Level of Service F	
Analysis Period (min) 15		

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

Splits and Phases: 4: Brant Street & Plains Road E



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	497	580	87	158	87	41	1189	339	1138	509
v/c Ratio	0.90	0.99	0.75	0.21	0.18	0.19	0.94	0.97	0.57	0.66
Control Delay	66.3	74.2	86.6	35.7	0.9	16.0	36.9	69.9	28.2	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.3	74.2	86.6	35.7	0.9	16.0	36.9	69.9	28.2	16.6
Queue Length 50th (m)	57.3	129.3	19.6	15.4	0.0	2.5	87.3	59.4	77.5	41.1
Queue Length 95th (m)	#86.9	#205.1	#47.1	24.8	0.0	m3.9	m#120.1	#118.4	93.3	83.6
Internal Link Dist (m)		863.5		166.4			439.4		205.3	
Turn Bay Length (m)	55.0		50.0		75.0	50.0		40.0		30.0
Base Capacity (vph)	556	583	116	735	471	212	1262	351	2006	768
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.99	0.75	0.21	0.18	0.19	0.94	0.97	0.57	0.66

Intersection Summary

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	457	488	46	80	145	80	38	819	275	312	1047	468
Future Volume (vph)	457	488	46	80	145	80	38	819	275	312	1047	468
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	1.00		1.00	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	0.99		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
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3400	1839		1597	3252	1374	1640	4745		1719	5085	1498
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.23	1.00		0.12	1.00	1.00
Satd. Flow (perm)	3400	1839		1597	3252	1374	399	4745		226	5085	1498
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	497	530	50	87	158	87	41	890	299	339	1138	509
RTOR Reduction (vph)	0	3	0	0	0	67	0	55	0	0	0	182
Lane Group Flow (vph)	497	577	0	87	158	20	41	1134	0	339	1138	327
Confl. Peds. (#/hr)	7		5	5		7	11		7	7		11
Heavy Vehicles (%)	3%	2%	0%	13%	11%	15%	10%	3%	8%	5%	2%	5%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Actuated Green, G (s)	17.8	34.7		8.0	24.9	24.9	32.2	28.0		50.0	41.8	41.8
Effective Green, g (s)	17.8	34.7		8.0	24.9	24.9	32.2	28.0		50.0	41.8	41.8
Actuated g/C Ratio	0.16	0.32		0.07	0.23	0.23	0.29	0.25		0.45	0.38	0.38
Clearance Time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	550	580		116	736	311	164	1207		347	1932	569
v/s Ratio Prot	c0.15	c0.31		0.05	0.05		0.01	0.24		c0.16	0.22	
v/s Ratio Perm						0.01	0.06			c0.28		0.22
v/c Ratio	0.90	0.99		0.75	0.21	0.06	0.25	0.94		0.98	0.59	0.57
Uniform Delay, d1	45.3	37.5		50.0	34.6	33.4	28.2	40.2		31.6	27.2	27.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.86	0.68		1.00	1.00	1.00
Incremental Delay, d2	18.2	35.7		23.5	0.1	0.1	0.5	10.4		41.7	1.3	4.2
Delay (s)	63.4	73.2		73.5	34.7	33.5	24.8	37.7		73.3	28.6	31.2
Level of Service	E	E		E	C	C	C	D		E	C	C
Approach Delay (s)		68.7			44.6			37.3			36.9	
Approach LOS		E			D			D			D	

Intersection Summary					
HCM 2000 Control Delay	44.9	HCM 2000 Level of Service		D	
HCM 2000 Volume to Capacity ratio	1.03				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		21.3	
Intersection Capacity Utilization	92.4%	ICU Level of Service		F	
Analysis Period (min)	15				

c Critical Lane Group

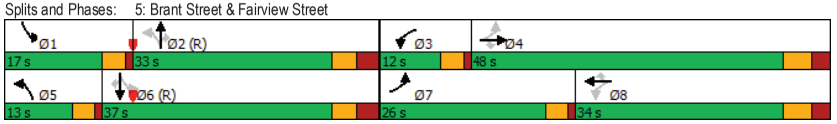
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	366	1150	270	134	365	164	202	685	288	249	767	163
Future Volume (vph)	366	1150	270	134	365	164	202	685	288	249	767	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		170.0	60.0		0.0	75.0		70.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.99	1.00		0.98	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)	1687	3539	1568	1703	3438	1538	1787	3505	1599	1787	3505	1346
Flt Permitted	0.389			0.137			0.152			0.132		
Satd. Flow (perm)	688	3539	1547	246	3438	1507	284	3505	1535	247	3505	1290
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			271			178			187			177
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		261.1			251.5			231.2			463.4	
Travel Time (s)		15.7			15.1			16.6			27.8	
Confl. Peds. (#/hr)	6		1	1		6	22		21	21		22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	2%	3%	6%	5%	5%	1%	3%	1%	1%	3%	20%
Adj. Flow (vph)	398	1250	293	146	397	178	220	745	313	271	834	177
Shared Lane Traffic (%)												
Lane Group Flow (vph)	398	1250	293	146	397	178	220	745	313	271	834	177
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		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	31.4	31.4	12.0	31.4	31.4	12.0	31.5	31.5	12.0	31.5	31.5
Total Split (s)	26.0	48.0	48.0	12.0	34.0	34.0	13.0	33.0	33.0	17.0	37.0	37.0
Total Split (%)	23.6%	43.6%	43.6%	10.9%	30.9%	30.9%	11.8%	30.0%	30.0%	15.5%	33.6%	33.6%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
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)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	55.5	41.1	41.1	39.5	29.1	29.1	38.5	26.5	26.5	46.5	30.5	30.5
Actuated g/C Ratio	0.50	0.37	0.37	0.36	0.26	0.26	0.35	0.24	0.24	0.42	0.28	0.28
v/c Ratio	0.75	0.94	0.39	0.76	0.44	0.34	0.96	0.88	0.61	0.93	0.86	0.36
Control Delay	27.7	48.4	5.4	47.1	35.9	6.8	77.9	53.7	20.3	63.8	53.4	23.5
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	27.7	48.4	5.4	47.1	35.9	6.8	77.9	53.7	20.3	63.8	53.4	23.5
LOS	C	D	A	D	D	A	E	D	C	E	D	C
Approach Delay		37.7			31.0			49.7			51.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			C			D			D	
Queue Length 50th (m)	55.6	141.1	3.1	17.0	40.1	0.0	32.4	85.7	24.2	60.0	106.0	24.9
Queue Length 95th (m)	81.8	#187.4	21.1	#48.1	55.6	17.4	#83.2	#119.0	55.0	m#96.2	m#128.9	m44.1
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	547	1338	753	193	908	529	228	844	511	292	971	485
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	0.93	0.39	0.76	0.44	0.34	0.96	0.88	0.61	0.93	0.86	0.36

Intersection Summary		
Area Type:	Other	
Cycle Length: 110		
Actuated Cycle Length: 110		
Offset: 107 (97%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.96		
Intersection Signal Delay: 43.1	Intersection LOS: D	
Intersection Capacity Utilization 90.4%	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: 5: Brant Street & Fairview Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	398	1250	293	146	397	178	220	745	313	271	834	177
v/c Ratio	0.75	0.94	0.39	0.76	0.44	0.34	0.96	0.88	0.61	0.93	0.86	0.36
Control Delay	27.7	48.4	5.4	47.1	35.9	6.8	77.9	53.7	20.3	63.8	53.4	23.5
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	27.7	48.4	5.4	47.1	35.9	6.8	77.9	53.7	20.3	63.8	53.4	23.5
Queue Length 50th (m)	55.6	141.1	3.1	17.0	40.1	0.0	32.4	85.7	24.2	60.0	106.0	24.9
Queue Length 95th (m)	81.8	#187.4	21.1	#48.1	55.6	17.4	#83.2	#119.0	55.0	m#96.2	m#128.9	m44.1
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	547	1338	753	193	908	529	228	844	511	292	971	485
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	0.93	0.39	0.76	0.44	0.34	0.96	0.88	0.61	0.93	0.86	0.36

Intersection Summary

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	366	1150	270	134	365	164	202	685	288	249	767	163
Future Volume (vph)	366	1150	270	134	365	164	202	685	288	249	767	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	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)	1685	3539	1547	1703	3438	1507	1786	3505	1535	1786	3505	1290
Flt Permitted	0.39	1.00	1.00	0.14	1.00	1.00	0.15	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)	690	3539	1547	246	3438	1507	285	3505	1535	247	3505	1290
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	398	1250	293	146	397	178	220	745	313	271	834	177
RTOR Reduction (vph)	0	0	169	0	0	131	0	0	142	0	0	128
Lane Group Flow (vph)	398	1250	124	146	397	47	220	745	171	271	834	49
Confl. Peds. (#/hr)	6		1	1		6	22		21	21		22
Heavy Vehicles (%)	7%	2%	3%	6%	5%	5%	1%	3%	1%	1%	3%	20%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	53.2	41.2	41.2	37.1	29.1	29.1	35.9	26.4	26.4	43.9	30.4	30.4
Effective Green, g (s)	53.2	41.2	41.2	37.1	29.1	29.1	35.9	26.4	26.4	43.9	30.4	30.4
Actuated g/C Ratio	0.48	0.37	0.37	0.34	0.26	0.26	0.33	0.24	0.24	0.40	0.28	0.28
Clearance Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
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)	515	1325	579	188	909	398	222	841	368	287	968	356
v/s Ratio Prot	c0.14	c0.35		0.06	0.12		0.09	0.21		c0.12	0.24	
v/s Ratio Perm	0.23		0.08	0.20		0.03	0.24		0.11	c0.26		0.04
v/c Ratio	0.77	0.94	0.21	0.78	0.44	0.12	0.99	0.89	0.46	0.94	0.86	0.14
Uniform Delay, d1	19.7	33.3	23.4	28.8	33.6	30.7	31.4	40.3	35.8	28.3	37.8	29.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.20	1.19	4.52
Incremental Delay, d2	7.1	13.4	0.2	18.0	0.3	0.1	57.7	13.2	4.2	33.3	8.3	0.7
Delay (s)	26.8	46.7	23.6	46.9	34.0	30.8	89.1	53.6	39.9	67.2	53.3	135.8
Level of Service	C	D	C	D	C	C	F	D	D	E	D	F
Approach Delay (s)		39.1			35.8			56.3			67.6	
Approach LOS		D			D			E			E	

Intersection Summary				
HCM 2000 Control Delay	49.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.97			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	90.4%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

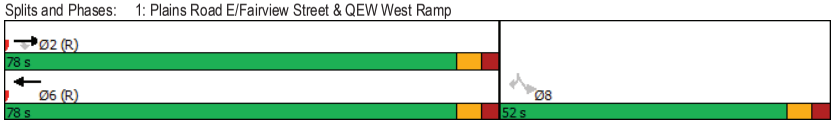
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1304	409	0	2089	0	0	0	0	601	0	354
Future Volume (vph)	0	1304	409	0	2089	0	0	0	0	601	0	354
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	55.0		0.0
Storage Lanes	0		1	0		0	0		0	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor			0.95									0.98
Frt			0.850									0.850
Flt Protected										0.950		
Satd. Flow (prot)	0	5136	1583	0	5085	0	0	0	0	3467	0	1615
Flt Permitted										0.950		
Satd. Flow (perm)	0	5136	1507	0	5085	0	0	0	0	3467	0	1585
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			445									34
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		175.7			307.2			140.0			199.7	
Travel Time (s)		12.7			22.1			10.1			14.4	
Confl. Peds. (#/hr)	4		15	15		4	3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	2%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Adj. Flow (vph)	0	1417	445	0	2271	0	0	0	0	653	0	385
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1417	445	0	2271	0	0	0	0	653	0	385
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Detector Phase		2	2		6					8		8
Switch Phase												
Minimum Initial (s)		8.0	8.0		8.0					8.0		8.0
Minimum Split (s)		43.0	43.0		43.0					25.0		25.0
Total Split (s)		78.0	78.0		78.0					52.0		52.0
Total Split (%)		60.0%	60.0%		60.0%					40.0%		40.0%
Yellow Time (s)		4.0	4.0		4.0					4.0		4.0
All-Red Time (s)		3.0	3.0		3.0					3.0		3.0
Lost Time Adjust (s)		0.0	0.0		0.0					0.0		0.0
Total Lost Time (s)		7.0	7.0		7.0					7.0		7.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max		C-Max					None		None
Act Effct Green (s)		80.6	80.6		80.6					35.4		35.4
Actuated g/C Ratio		0.62	0.62		0.62					0.27		0.27
v/c Ratio		0.44	0.40		0.72					0.69		0.84
Control Delay		14.4	2.4		7.3					45.8		57.0
Queue Delay		0.0	0.0		0.0					0.0		0.0
Total Delay		14.4	2.4		7.3					45.8		57.0
LOS		B	A		A					D		E
Approach Delay		11.5			7.3						49.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A						D	
Queue Length 50th (m)		69.7	0.0		41.2					81.2		90.3
Queue Length 95th (m)		97.5	15.4		m34.9					92.1		119.0
Internal Link Dist (m)		151.7			283.2			116.0			175.7	
Turn Bay Length (m)										55.0		
Base Capacity (vph)		3185	1103		3153					1200		570
Starvation Cap Reductn		0	0		0					0		0
Spillback Cap Reductn		0	0		0					0		0
Storage Cap Reductn		0	0		0					0		0
Reduced v/c Ratio		0.44	0.40		0.72					0.54		0.68

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 34 (26%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 17.4		Intersection LOS: B	
Intersection Capacity Utilization 74.3%		ICU Level of Service D	
Analysis Period (min) 15			

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

Splits and Phases: 1: Plains Road E/Fairview Street & QEW West Ramp



Lane Group	EBT	EBR	WBT	SBL	SBR
Lane Group Flow (vph)	1417	445	2271	653	385
v/c Ratio	0.44	0.40	0.72	0.69	0.84
Control Delay	14.4	2.4	7.3	45.8	57.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.4	2.4	7.3	45.8	57.0
Queue Length 50th (m)	69.7	0.0	41.2	81.2	90.3
Queue Length 95th (m)	97.5	15.4	m34.9	92.1	119.0
Internal Link Dist (m)	151.7		283.2		
Turn Bay Length (m)				55.0	
Base Capacity (vph)	3185	1103	3153	1200	570
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.44	0.40	0.72	0.54	0.68

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1304	409	0	2089	0	0	0	0	601	0	354
Future Volume (vph)	0	1304	409	0	2089	0	0	0	0	601	0	354
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0					7.0		7.0
Lane Util. Factor		0.91	1.00		0.91					0.97		1.00
Frpb, ped/bikes		1.00	0.95		1.00					1.00		0.98
Flpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Frt		1.00	0.85		1.00					1.00		0.85
Flt Protected		1.00	1.00		1.00					0.95		1.00
Satd. Flow (prot)		5136	1507		5085					3467		1585
Flt Permitted		1.00	1.00		1.00					0.95		1.00
Satd. Flow (perm)		5136	1507		5085					3467		1585
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1417	445	0	2271	0	0	0	0	653	0	385
RTOR Reduction (vph)	0	0	169	0	0	0	0	0	0	0	0	25
Lane Group Flow (vph)	0	1417	276	0	2271	0	0	0	0	653	0	360
Confl. Peds. (#/hr)	4		15	15		4	3					3
Heavy Vehicles (%)	0%	1%	2%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Actuated Green, G (s)		80.6	80.6		80.6					35.4		35.4
Effective Green, g (s)		80.6	80.6		80.6					35.4		35.4
Actuated g/C Ratio		0.62	0.62		0.62					0.27		0.27
Clearance Time (s)		7.0	7.0		7.0					7.0		7.0
Vehicle Extension (s)		3.0	3.0		3.0					3.0		3.0
Lane Grp Cap (vph)		3184	934		3152					944		431
v/s Ratio Prot		0.28			c0.45							
v/s Ratio Perm			0.18							0.19		c0.23
v/c Ratio		0.45	0.30		0.72					0.69		0.84
Uniform Delay, d1		13.0	11.5		17.0					42.4		44.6
Progression Factor		1.00	1.00		0.39					1.00		1.00
Incremental Delay, d2		0.5	0.8		0.1					2.2		13.1
Delay (s)		13.4	12.3		6.7					44.6		57.7
Level of Service		B	B		A					D		E
Approach Delay (s)		13.1			6.7			0.0			49.5	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	74.3%	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)	108	1572	0	0	2760	27	168	197	457	7	0	496
Future Volume (vph)	108	1572	0	0	2760	27	168	197	457	7	0	496
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		45.0	75.0		0.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.91	0.95	1.00	1.00	1.00
Ped Bike Factor					1.00							
Frt					0.999			0.941	0.850			0.850
Flt Protected	0.950						0.950	0.998		0.950		
Satd. Flow (prot)	1770	5136	0	0	4800	0	1698	1581	1519	1805	0	1495
Flt Permitted	0.060						0.950	0.998		0.270		
Satd. Flow (perm)	112	5136	0	0	4800	0	1698	1581	1519	513	0	1495
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					1			16	59			127
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		307.2			385.1			180.0			159.4	
Travel Time (s)		22.1			27.7			13.0			11.5	
Confl. Peds. (#/hr)	2		7	7		2						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	1%	0%	0%	8%	0%	1%	4%	1%	0%	0%	8%
Adj. Flow (vph)	117	1709	0	0	3000	29	183	214	497	8	0	539
Shared Lane Traffic (%)							10%		30%			
Lane Group Flow (vph)	117	1709	0	0	3029	0	165	381	348	8	0	539
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Detector Phase	5	2			6		4	4	4	8		8
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0		8.0	8.0	8.0	8.0		8.0
Minimum Split (s)	11.0	35.0			35.0		36.0	36.0	36.0	36.0		36.0
Total Split (s)	11.0	79.0			68.0		51.0	51.0	51.0	51.0		51.0
Total Split (%)	8.5%	60.8%			52.3%		39.2%	39.2%	39.2%	39.2%		39.2%
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	0.0	3.0			3.0		3.0	3.0	3.0	3.0		3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	None	C-Max			C-Max		None	None	None	None		None
Act Effct Green (s)	78.5	74.5			63.4		41.5	41.5	41.5	41.5		41.5
Actuated g/C Ratio	0.60	0.57			0.49		0.32	0.32	0.32	0.32		0.32
v/c Ratio	0.69	0.58			1.29		0.30	0.74	0.66	0.05		0.96
Control Delay	45.2	13.7			165.6		34.4	47.0	37.8	30.1		61.7
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Delay	45.2	13.7			165.6		34.4	47.0	37.8	30.1		61.7
LOS	D	B			F		C	D	D	C		E
Approach Delay		15.7			165.6			41.1			61.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			F			D			E	
Queue Length 50th (m)	14.6	81.5			~392.8		34.2	93.6	69.0	1.5		112.0
Queue Length 95th (m)	#42.2	111.4			#419.1		54.4	135.9	105.6	5.5		#184.2
Internal Link Dist (m)		283.2			361.1			156.0			135.4	
Turn Bay Length (m)	30.0								45.0	75.0		
Base Capacity (vph)	170	2944			2342		574	545	553	173		590
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	0.69	0.58			1.29		0.29	0.70	0.63	0.05		0.91

Intersection Summary		
Area Type:	Other	
Cycle Length: 130		
Actuated Cycle Length: 130		
Offset: 16 (12%), Referenced to phase 2:EBTL and 6:WBT, Start of Green		
Natural Cycle: 145		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.29		
Intersection Signal Delay: 95.4	Intersection LOS: F	
Intersection Capacity Utilization 116.6%	ICU Level of Service H	
Analysis Period (min) 15		

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

Splits and Phases: 2: QEW East Ramp/Plains Road E & Fairview Street



Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	117	1709	3029	165	381	348	8	539
v/c Ratio	0.69	0.58	1.29	0.30	0.74	0.66	0.05	0.96
Control Delay	45.2	13.7	165.6	34.4	47.0	37.8	30.1	61.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.2	13.7	165.6	34.4	47.0	37.8	30.1	61.7
Queue Length 50th (m)	14.6	81.5	~392.8	34.2	93.6	69.0	1.5	112.0
Queue Length 95th (m)	#42.2	111.4	#419.1	54.4	135.9	105.6	5.5	#184.2
Internal Link Dist (m)		283.2	361.1		156.0			
Turn Bay Length (m)	30.0					45.0	75.0	
Base Capacity (vph)	170	2944	2342	574	545	553	173	590
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	0.69	0.58	1.29	0.29	0.70	0.63	0.05	0.91

Intersection Summary

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	1572	0	0	2760	27	168	197	457	7	0	496
Future Volume (vph)	108	1572	0	0	2760	27	168	197	457	7	0	496
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lane Util. Factor	1.00	0.91			0.91		0.95	0.91	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			1.00		1.00	0.94	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1770	5136			4798		1698	1581	1519	1805		1495
Flt Permitted	0.06	1.00			1.00		0.95	1.00	1.00	0.27		1.00
Satd. Flow (perm)	112	5136			4798		1698	1581	1519	514		1495
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	1709	0	0	3000	29	183	214	497	8	0	539
RTOR Reduction (vph)	0	0	0	0	1	0	0	11	40	0	0	86
Lane Group Flow (vph)	117	1709	0	0	3028	0	165	370	308	8	0	453
Confl. Peds. (#/hr)	2		7	7		2						
Heavy Vehicles (%)	2%	1%	0%	0%	8%	0%	1%	4%	1%	0%	0%	8%
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Actuated Green, G (s)	74.5	74.5			63.4		41.5	41.5	41.5	41.5		41.5
Effective Green, g (s)	74.5	74.5			63.4		41.5	41.5	41.5	41.5		41.5
Actuated g/C Ratio	0.57	0.57			0.49		0.32	0.32	0.32	0.32		0.32
Clearance Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		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)	167	2943			2339		542	504	484	164		477
v/s Ratio Prot	c0.04	0.33			c0.63							
v/s Ratio Perm	0.36						0.10	0.23	0.20	0.02		c0.30
v/c Ratio	0.70	0.58			1.29		0.30	0.73	0.64	0.05		0.95
Uniform Delay, d1	29.9	17.8			33.3		33.4	39.3	37.8	30.6		43.2
Progression Factor	1.28	0.70			1.00		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	11.2	0.8			135.9		0.3	5.5	2.7	0.1		28.3
Delay (s)	49.6	13.3			169.2		33.7	44.8	40.5	30.7		71.5
Level of Service	D	B			F		C	D	D	C		E
Approach Delay (s)		15.6			169.2			41.1			70.9	
Approach LOS		B			F			D			E	

Intersection Summary			
HCM 2000 Control Delay	97.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	116.6%	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)	367	35	1074	486	17	673
Future Volume (vph)	367	35	1074	486	17	673
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	55.0		0.0	0.0
Storage Lanes		0	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	0.97	1.00	1.00	1.00
Ped Bike Factor	1.00		1.00			
Frt	0.987					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3423	0	3433	1881	1687	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3423	0	3417	1881	1687	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	10					41
Link Speed (k/h)	50			60	50	
Link Distance (m)	207.1			887.5	183.4	
Travel Time (s)	14.9			53.3	13.2	
Confl. Peds. (#/hr)		4	4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	2%	1%	7%	2%
Adj. Flow (vph)	399	38	1167	528	18	732
Shared Lane Traffic (%)						
Lane Group Flow (vph)	437	0	1167	528	18	732
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Detector Phase	3		4	4	2	4
Switch Phase						
Minimum Initial (s)	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	17.0		27.0	27.0	18.0	27.0
Total Split (s)	22.0		50.0	50.0	18.0	50.0
Total Split (%)	24.4%		55.6%	55.6%	20.0%	55.6%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None		C-Max	C-Max	Max	C-Max
Act Effct Green (s)	14.4		44.0	44.0	11.6	62.6
Actuated g/C Ratio	0.16		0.49	0.49	0.13	0.70
v/c Ratio	0.79		0.70	0.57	0.08	0.66
Control Delay	46.6		20.6	19.5	36.2	10.9
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	46.6		20.6	19.5	36.2	10.9
LOS	D		C	B	D	B
Approach Delay	46.6			20.2	11.5	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	D			C	B	
Queue Length 50th (m)	39.4		81.0	65.3	3.0	62.0
Queue Length 95th (m)	#57.6		104.4	96.8	9.4	99.3
Internal Link Dist (m)	183.1			863.5	159.4	
Turn Bay Length (m)			55.0			
Base Capacity (vph)	578		1678	919	217	1113
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.76		0.70	0.57	0.08	0.66

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 4:WBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 21.9		Intersection LOS: C	
Intersection Capacity Utilization 65.3%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Maple Avenue & Plains Road E



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	437	1167	528	18	732
v/c Ratio	0.79	0.70	0.57	0.08	0.66
Control Delay	46.6	20.6	19.5	36.2	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	20.6	19.5	36.2	10.9
Queue Length 50th (m)	39.4	81.0	65.3	3.0	62.0
Queue Length 95th (m)	#57.6	104.4	96.8	9.4	99.3
Internal Link Dist (m)	183.1		863.5	159.4	
Turn Bay Length (m)		55.0			
Base Capacity (vph)	578	1678	919	217	1113
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.76	0.70	0.57	0.08	0.66

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	367	35	1074	486	17	673
Future Volume (vph)	367	35	1074	486	17	673
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		6.0	6.0	7.0	6.0
Lane Util. Factor	0.95		0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3423		3433	1881	1687	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3423		3433	1881	1687	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	399	38	1167	528	18	732
RTOR Reduction (vph)	8	0	0	0	0	16
Lane Group Flow (vph)	429	0	1167	528	18	716
Confl. Peds. (#/hr)		4	4			
Heavy Vehicles (%)	4%	3%	2%	1%	7%	2%
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Actuated Green, G (s)	14.4		44.0	44.0	11.6	55.6
Effective Green, g (s)	14.4		44.0	44.0	11.6	55.6
Actuated g/C Ratio	0.16		0.49	0.49	0.13	0.62
Clearance Time (s)	7.0		6.0	6.0	7.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	547		1678	919	217	977
v/s Ratio Prot			0.34			c0.36
v/s Ratio Perm	c0.13			0.28	0.01	0.09
v/c Ratio	0.78		0.70	0.57	0.08	0.73
Uniform Delay, d1	36.3		17.8	16.3	34.5	12.0
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	7.2		2.4	2.6	0.7	4.9
Delay (s)	43.5		20.2	19.0	35.3	16.9
Level of Service	D		C	B	D	B
Approach Delay (s)	43.5			19.8	17.3	
Approach LOS	D			B	B	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

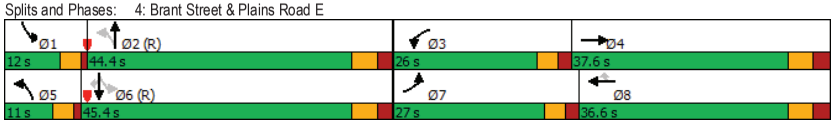
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	601	168	69	159	772	418	87	1397	64	136	1081	782
Future Volume (vph)	601	168	69	159	772	418	87	1397	64	136	1081	782
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	50.0		75.0	50.0		0.0	40.0		30.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.99					0.97	1.00	1.00				0.97
Frt		0.956				0.850		0.993				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3502	1754	0	1719	3539	1583	1805	5084	0	1687	5187	1599
Flt Permitted	0.950			0.950			0.121			0.101		
Satd. Flow (perm)	3481	1754	0	1719	3539	1535	229	5084	0	179	5187	1557
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17				118		6				419
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		887.5			190.4			463.4			229.3	
Travel Time (s)		53.3			11.4			27.8			13.8	
Confl. Peds. (#/hr)	12					12	10		16	16		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	5%	0%	5%	2%	2%	0%	0%	24%	7%	0%	1%
Adj. Flow (vph)	653	183	75	173	839	454	95	1518	70	148	1175	850
Shared Lane Traffic (%)												
Lane Group Flow (vph)	653	258	0	173	839	454	95	1588	0	148	1175	850
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Detector Phase	7	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	7.0	8.0		7.0	8.0	8.0
Minimum Split (s)	13.0	31.3		13.0	29.3	29.3	11.0	31.0		11.0	31.0	31.0
Total Split (s)	27.0	37.6		26.0	36.6	36.6	11.0	44.4		12.0	45.4	45.4
Total Split (%)	22.5%	31.3%		21.7%	30.5%	30.5%	9.2%	37.0%		10.0%	37.8%	37.8%
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.7		3.0	3.7	3.7
All-Red Time (s)	2.0	2.6		2.0	2.6	2.6	1.0	2.3		1.0	2.3	2.3
Lost Time Adjust (s)	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	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	22.0	35.4		16.8	30.1	30.1	47.4	38.4		49.7	39.6	39.6
Actuated g/C Ratio	0.18	0.30		0.14	0.25	0.25	0.40	0.32		0.41	0.33	0.33
v/c Ratio	1.02	0.49		0.72	0.94	0.96	0.52	0.97		0.84	0.69	1.07
Control Delay	88.4	37.2		66.1	63.8	65.7	21.0	47.3		61.1	37.4	73.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	88.4	37.2		66.1	63.8	65.7	21.0	47.3		61.1	37.4	73.3
LOS	F	D		E	E	E	C	D		E	D	E
Approach Delay		73.9			64.7			45.8			53.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			E			D			D	
Queue Length 50th (m)	~86.3	49.3		41.3	107.6	86.5	16.4	150.5		22.2	92.3	~159.5
Queue Length 95th (m)	#126.0	79.9		64.2	#147.4	#154.4	m17.8	m143.1		#58.8	109.3	#239.2
Internal Link Dist (m)		863.5			166.4			439.4			205.3	
Turn Bay Length (m)	55.0			50.0		75.0	50.0			40.0		30.0
Base Capacity (vph)	642	529		300	893	475	182	1630		176	1710	794
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.02	0.49		0.58	0.94	0.96	0.52	0.97		0.84	0.69	1.07

Intersection Summary		
Area Type:	Other	
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 45 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 120		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.07		
Intersection Signal Delay: 56.9	Intersection LOS: E	
Intersection Capacity Utilization 92.3%	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: 4: Brant Street & Plains Road E



Queues
4: Brant Street & Plains Road E

Background (2027)
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	653	258	173	839	454	95	1588	148	1175	850
v/c Ratio	1.02	0.49	0.72	0.94	0.96	0.52	0.97	0.84	0.69	1.07
Control Delay	88.4	37.2	66.1	63.8	65.7	21.0	47.3	61.1	37.4	73.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.4	37.2	66.1	63.8	65.7	21.0	47.3	61.1	37.4	73.3
Queue Length 50th (m)	~86.3	49.3	41.3	107.6	86.5	16.4	150.5	22.2	92.3	~159.5
Queue Length 95th (m)	#126.0	79.9	64.2	#147.4	#154.4	m17.8	m143.1	#58.8	109.3	#239.2
Internal Link Dist (m)		863.5		166.4			439.4		205.3	
Turn Bay Length (m)	55.0		50.0		75.0	50.0		40.0		30.0
Base Capacity (vph)	642	529	300	893	475	182	1630	176	1710	794
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.49	0.58	0.94	0.96	0.52	0.97	0.84	0.69	1.07

Intersection Summary

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

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

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

HCM Signalized Intersection Capacity Analysis
4: Brant Street & Plains Road E

Background (2027)
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	601	168	69	159	772	418	87	1397	64	136	1081	782
Future Volume (vph)	601	168	69	159	772	418	87	1397	64	136	1081	782
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	1.00		1.00	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00		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
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	1755		1719	3539	1535	1805	5086		1687	5187	1557
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.12	1.00		0.10	1.00	1.00
Satd. Flow (perm)	3502	1755		1719	3539	1535	229	5086		180	5187	1557
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	653	183	75	173	839	454	95	1518	70	148	1175	850
RTOR Reduction (vph)	0	12	0	0	0	88	0	4	0	0	0	281
Lane Group Flow (vph)	653	246	0	173	839	366	95	1584	0	148	1175	569
Confl. Peds. (#/hr)	12					12	10		16	16		10
Heavy Vehicles (%)	0%	5%	0%	5%	2%	2%	0%	0%	24%	7%	0%	1%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Actuated Green, G (s)	22.0	35.4		16.8	30.2	30.2	45.3	38.3		47.7	39.5	39.5
Effective Green, g (s)	22.0	35.4		16.8	30.2	30.2	45.3	38.3		47.7	39.5	39.5
Actuated g/C Ratio	0.18	0.29		0.14	0.25	0.25	0.38	0.32		0.40	0.33	0.33
Clearance Time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	642	517		240	890	386	178	1623		174	1707	512
v/s Ratio Prot	c0.19	0.14		0.10	0.24		0.03	0.31		c0.06	0.23	
v/s Ratio Perm						c0.24	0.17			0.28		c0.37
v/c Ratio	1.02	0.48		0.72	0.94	0.95	0.53	0.98		0.85	0.69	1.11
Uniform Delay, d1	49.0	34.7		49.4	44.1	44.1	26.3	40.4		29.4	34.9	40.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.86	0.98		1.00	1.00	1.00
Incremental Delay, d2	39.9	0.7		10.2	17.8	32.2	0.9	7.9		30.7	2.3	73.8
Delay (s)	88.9	35.4		59.5	61.8	76.3	23.7	47.5		60.1	37.2	114.1
Level of Service	F	D		E	E	E	C	D		E	D	F
Approach Delay (s)		73.7			66.0			46.1			68.8	
Approach LOS		E			E			D			E	

Intersection Summary					
HCM 2000 Control Delay	62.8	HCM 2000 Level of Service		E	
HCM 2000 Volume to Capacity ratio	1.03				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		21.3	
Intersection Capacity Utilization	92.3%	ICU Level of Service		F	
Analysis Period (min)	15				

c Critical Lane Group

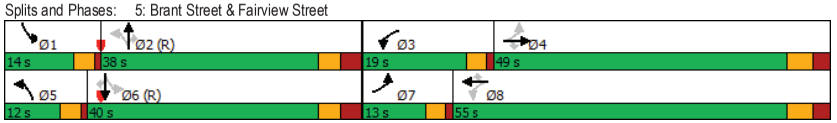
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	231	847	297	230	1590	478	170	871	205	253	721	470
Future Volume (vph)	231	847	297	230	1590	478	170	871	205	253	721	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		170.0	60.0		0.0	75.0		70.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.97			0.98	0.99		0.92			0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1703	3539	1568	1787	3574	1599	1787	3574	1599	1770	3539	1553
Flt Permitted	0.091			0.143			0.161			0.119		
Satd. Flow (perm)	163	3539	1526	269	3574	1573	301	3574	1474	222	3539	1498
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			226			192			178			178
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		261.1			251.5			231.2			463.4	
Travel Time (s)		15.7			15.1			16.6			27.8	
Confl. Peds. (#/hr)	3		10	10		3	16		45	45		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	2%	3%	1%	1%	1%	1%	1%	1%	2%	2%	4%
Adj. Flow (vph)	251	921	323	250	1728	520	185	947	223	275	784	511
Shared Lane Traffic (%)												
Lane Group Flow (vph)	251	921	323	250	1728	520	185	947	223	275	784	511
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		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	31.4	31.4	12.0	31.4	31.4	12.0	31.5	31.5	12.0	31.5	31.5
Total Split (s)	13.0	49.0	49.0	19.0	55.0	55.0	12.0	38.0	38.0	14.0	40.0	40.0
Total Split (%)	10.8%	40.8%	40.8%	15.8%	45.8%	45.8%	10.0%	31.7%	31.7%	11.7%	33.3%	33.3%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
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)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	55.2	43.8	43.8	63.6	48.6	48.6	42.0	31.5	31.5	46.0	33.5	33.5
Actuated g/C Ratio	0.46	0.36	0.36	0.53	0.40	0.40	0.35	0.26	0.26	0.38	0.28	0.28
v/c Ratio	1.32	0.71	0.46	0.79	1.19	0.69	0.91	1.01	0.43	1.29	0.79	0.94
Control Delay	204.2	36.8	11.3	36.9	127.6	23.6	71.8	75.9	11.7	181.0	30.1	37.4
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	204.2	36.8	11.3	36.9	127.6	23.6	71.8	75.9	11.7	181.0	30.1	37.4
LOS	F	D	B	D	F	C	E	E	B	F	C	D
Approach Delay		59.4			96.9			64.8			58.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			F			E			E	
Queue Length 50th (m)	~65.0	104.0	16.4	32.3	~272.6	67.4	30.3	~125.9	8.5	~63.9	101.5	100.4
Queue Length 95th (m)	#119.6	128.9	42.7	#67.0	#317.4	110.2	#67.0	#171.7	30.7	#119.7	127.5	#159.5
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	190	1290	700	333	1447	751	204	938	518	214	987	546
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	1.32	0.71	0.46	0.75	1.19	0.69	0.91	1.01	0.43	1.29	0.79	0.94

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 89 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 130			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.32			
Intersection Signal Delay: 73.9		Intersection LOS: E	
Intersection Capacity Utilization 112.3%		ICU Level of Service H	
Analysis Period (min) 15			

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

Splits and Phases: 5: Brant Street & Fairview Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	251	921	323	250	1728	520	185	947	223	275	784	511
v/c Ratio	1.32	0.71	0.46	0.79	1.19	0.69	0.91	1.01	0.43	1.29	0.79	0.94
Control Delay	204.2	36.8	11.3	36.9	127.6	23.6	71.8	75.9	11.7	181.0	30.1	37.4
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	204.2	36.8	11.3	36.9	127.6	23.6	71.8	75.9	11.7	181.0	30.1	37.4
Queue Length 50th (m)	~65.0	104.0	16.4	32.3	~272.6	67.4	30.3	~125.9	8.5	~63.9	101.5	100.4
Queue Length 95th (m)	#119.6	128.9	42.7	#67.0	#317.4	110.2	#67.0	#171.7	30.7	#119.7	127.5	#159.5
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	190	1290	700	333	1447	751	204	938	518	214	987	546
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	1.32	0.71	0.46	0.75	1.19	0.69	0.91	1.01	0.43	1.29	0.79	0.94

Intersection Summary

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	231	847	297	230	1590	478	170	871	205	253	721	470
Future Volume (vph)	231	847	297	230	1590	478	170	871	205	253	721	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.92	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)	1703	3539	1526	1787	3574	1573	1786	3574	1474	1770	3539	1498
Flt Permitted	0.09	1.00	1.00	0.14	1.00	1.00	0.16	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	164	3539	1526	270	3574	1573	302	3574	1474	222	3539	1498
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	251	921	323	250	1728	520	185	947	223	275	784	511
RTOR Reduction (vph)	0	0	144	0	0	114	0	0	131	0	0	128
Lane Group Flow (vph)	251	921	179	250	1728	406	185	947	92	275	784	383
Confl. Peds. (#/hr)	3		10	10		3	16		45	45		16
Heavy Vehicles (%)	6%	2%	3%	1%	1%	1%	1%	1%	1%	2%	2%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	52.8	43.8	43.8	61.6	48.6	48.6	39.5	31.5	31.5	43.5	33.5	33.5
Effective Green, g (s)	52.8	43.8	43.8	61.6	48.6	48.6	39.5	31.5	31.5	43.5	33.5	33.5
Actuated g/C Ratio	0.44	0.36	0.36	0.51	0.41	0.41	0.33	0.26	0.26	0.36	0.28	0.28
Clearance Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
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)	187	1291	556	313	1447	637	198	938	386	209	987	418
v/s Ratio Prot	c0.10	0.26		c0.09	0.48		0.06	0.26		c0.11	0.22	
v/s Ratio Perm	c0.49		0.12	0.32		0.26	0.24		0.06	c0.37		0.26
v/c Ratio	1.34	0.71	0.32	0.80	1.19	0.64	0.93	1.01	0.24	1.32	0.79	0.92
Uniform Delay, d1	31.9	32.7	27.4	21.3	35.7	28.6	34.2	44.2	34.8	32.2	40.1	41.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.04	0.61	0.48
Incremental Delay, d2	185.4	1.9	0.3	13.3	94.5	2.1	45.3	31.8	1.4	166.6	5.3	23.2
Delay (s)	217.3	34.6	27.8	34.6	130.2	30.7	79.5	76.0	36.3	200.3	29.8	43.5
Level of Service	F	C	C	C	F	C	E	E	D	F	C	D
Approach Delay (s)		63.8			99.9			70.0			64.1	
Approach LOS		E			F			E			E	

Intersection Summary				
HCM 2000 Control Delay	78.1	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.32			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	112.3%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Appendix G2

2029 Background Operation Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1554	218	0	867	0	0	0	0	247	0	105
Future Volume (vph)	0	1554	218	0	867	0	0	0	0	247	0	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	55.0		0.0
Storage Lanes	0		1	0		0	0		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor			0.98									
Frt			0.850									0.850
Flt Protected										0.950		
Satd. Flow (prot)	0	5036	1538	0	4988	0	0	0	0	3367	0	1615
Flt Permitted										0.950		
Satd. Flow (perm)	0	5036	1503	0	4988	0	0	0	0	3367	0	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			237									114
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		175.7			307.2			140.0			199.7	
Travel Time (s)		12.7			22.1			10.1			14.4	
Confl. Peds. (#/hr)	1		2	2		1						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	5%	4%	4%	0%	0%	0%	0%	4%	50%	0%
Adj. Flow (vph)	0	1689	237	0	942	0	0	0	0	268	0	114
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1689	237	0	942	0	0	0	0	268	0	114
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Detector Phase		2	2		6					8		8
Switch Phase												
Minimum Initial (s)		8.0	8.0		8.0					8.0		8.0
Minimum Split (s)		43.0	43.0		43.0					25.0		25.0
Total Split (s)		75.0	75.0		75.0					25.0		25.0
Total Split (%)		75.0%	75.0%		75.0%					25.0%		25.0%
Yellow Time (s)		4.0	4.0		4.0					4.0		4.0
All-Red Time (s)		3.0	3.0		3.0					3.0		3.0
Lost Time Adjust (s)		0.0	0.0		0.0					0.0		0.0
Total Lost Time (s)		7.0	7.0		7.0					7.0		7.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max		C-Max					None		None
Act Effct Green (s)		72.8	72.8		72.8					13.2		13.2
Actuated g/C Ratio		0.73	0.73		0.73					0.13		0.13
v/c Ratio		0.46	0.20		0.26					0.60		0.37
Control Delay		6.3	1.1		5.4					46.5		10.8
Queue Delay		0.0	0.0		0.0					0.0		0.0
Total Delay		6.3	1.1		5.4					46.5		10.8
LOS		A	A		A					D		B
Approach Delay		5.7			5.4						35.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A						D	
Queue Length 50th (m)		43.9	0.0		20.1					26.9		0.0
Queue Length 95th (m)		60.8	6.8		m37.8					38.6		15.0
Internal Link Dist (m)		151.7			283.2			116.0			175.7	
Turn Bay Length (m)										55.0		
Base Capacity (vph)		3666	1158		3631					606		384
Starvation Cap Reductn		0	0		0					0		0
Spillback Cap Reductn		0	0		0					0		0
Storage Cap Reductn		0	0		0					0		0
Reduced v/c Ratio		0.46	0.20		0.26					0.44		0.30

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 66 (66%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 9.1		Intersection LOS: A	
Intersection Capacity Utilization 46.7%		ICU Level of Service A	
Analysis Period (min) 15			

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

Splits and Phases: 1: Plains Road E/Fairview Street & QEW West Ramp



Lane Group	EBT	EBR	WBT	SBL	SBR
Lane Group Flow (vph)	1689	237	942	268	114
v/c Ratio	0.46	0.20	0.26	0.60	0.37
Control Delay	6.3	1.1	5.4	46.5	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.3	1.1	5.4	46.5	10.8
Queue Length 50th (m)	43.9	0.0	20.1	26.9	0.0
Queue Length 95th (m)	60.8	6.8	m37.8	38.6	15.0
Internal Link Dist (m)	151.7		283.2		
Turn Bay Length (m)				55.0	
Base Capacity (vph)	3666	1158	3631	606	384
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.46	0.20	0.26	0.44	0.30

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1554	218	0	867	0	0	0	0	247	0	105
Future Volume (vph)	0	1554	218	0	867	0	0	0	0	247	0	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0					7.0		7.0
Lane Util. Factor		0.91	1.00		0.91					0.97		1.00
Frpb, ped/bikes		1.00	0.98		1.00					1.00		1.00
Flpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Frt		1.00	0.85		1.00					1.00		0.85
Flt Protected		1.00	1.00		1.00					0.95		1.00
Satd. Flow (prot)		5036	1503		4988					3367		1615
Flt Permitted		1.00	1.00		1.00					0.95		1.00
Satd. Flow (perm)		5036	1503		4988					3367		1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1689	237	0	942	0	0	0	0	268	0	114
RTOR Reduction (vph)	0	0	64	0	0	0	0	0	0	0	0	99
Lane Group Flow (vph)	0	1689	173	0	942	0	0	0	0	268	0	15
Confl. Peds. (#/hr)	1		2	2		1						
Heavy Vehicles (%)	0%	3%	5%	4%	4%	0%	0%	0%	0%	4%	50%	0%
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Actuated Green, G (s)		72.8	72.8		72.8					13.2		13.2
Effective Green, g (s)		72.8	72.8		72.8					13.2		13.2
Actuated g/C Ratio		0.73	0.73		0.73					0.13		0.13
Clearance Time (s)		7.0	7.0		7.0					7.0		7.0
Vehicle Extension (s)		3.0	3.0		3.0					3.0		3.0
Lane Grp Cap (vph)		3666	1094		3631					444		213
v/s Ratio Prot		c0.34			0.19							
v/s Ratio Perm			0.11							c0.08		0.01
v/c Ratio		0.46	0.16		0.26					0.60		0.07
Uniform Delay, d1		5.6	4.2		4.6					40.9		38.0
Progression Factor		1.00	1.00		1.08					1.00		1.00
Incremental Delay, d2		0.4	0.3		0.1					2.3		0.1
Delay (s)		6.0	4.5		5.1					43.2		38.2
Level of Service		A	A		A					D		D
Approach Delay (s)		5.8			5.1			0.0			41.7	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

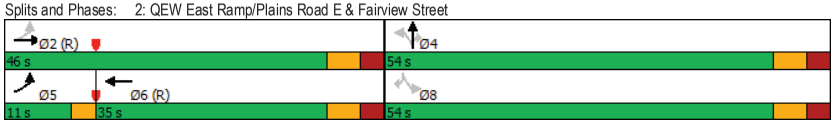
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	1348	0	0	847	16	226	282	792	14	0	391
Future Volume (vph)	111	1348	0	0	847	16	226	282	792	14	0	391
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		45.0	75.0		0.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.91	0.95	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00			0.99	0.99	1.00		
Frt					0.997			0.930	0.850			0.850
Flt Protected	0.950						0.950	0.998		0.950		
Satd. Flow (prot)	1752	5036	0	0	4974	0	1649	1562	1504	1805	0	1538
Flt Permitted	0.186						0.950	0.998		0.152		
Satd. Flow (perm)	343	5036	0	0	4974	0	1649	1562	1485	289	0	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					3			6	76			252
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		307.2			385.1			180.0			159.4	
Travel Time (s)		22.1			27.7			13.0			11.5	
Confl. Peds. (#/hr)	1		3	3		1			1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	0%	4%	0%	4%	2%	2%	0%	0%	5%
Adj. Flow (vph)	121	1465	0	0	921	17	246	307	861	15	0	425
Shared Lane Traffic (%)							10%		34%			
Lane Group Flow (vph)	121	1465	0	0	938	0	221	625	568	15	0	425
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Detector Phase	5	2			6		4	4	4	8		8
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0		8.0	8.0	8.0	8.0		8.0
Minimum Split (s)	11.0	35.0			35.0		36.0	36.0	36.0	36.0		36.0
Total Split (s)	11.0	46.0			35.0		54.0	54.0	54.0	54.0		54.0
Total Split (%)	11.0%	46.0%			35.0%		54.0%	54.0%	54.0%	54.0%		54.0%
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	0.0	3.0			3.0		3.0	3.0	3.0	3.0		3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	None	C-Max			C-Max		None	None	None	None		None
Act Effct Green (s)	45.9	41.9			30.8		44.1	44.1	44.1	44.1		44.1
Actuated g/C Ratio	0.46	0.42			0.31		0.44	0.44	0.44	0.44		0.44
v/c Ratio	0.45	0.69			0.61		0.30	0.90	0.81	0.12		0.52
Control Delay	18.2	22.1			32.1		18.6	43.4	31.2	17.9		9.6
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Delay	18.2	22.1			32.1		18.6	43.4	31.2	17.9		9.6
LOS	B	C			C		B	D	C	B		A
Approach Delay		21.8			32.1			34.6			9.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			C			C			A	
Queue Length 50th (m)	10.2	97.3			61.8		28.1	118.3	85.8	1.7		20.4
Queue Length 95th (m)	17.5	115.3			77.1		45.5	#194.9	136.6	6.0		46.5
Internal Link Dist (m)		283.2			361.1			156.0			135.4	
Turn Bay Length (m)	30.0								45.0	75.0		
Base Capacity (vph)	270	2109			1535		775	737	738	135		856
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	0.45	0.69			0.61		0.29	0.85	0.77	0.11		0.50

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 96 (96%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 27.0 Intersection LOS: C
Intersection Capacity Utilization 86.9% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: QEW East Ramp/Plains Road E & Fairview Street



Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	121	1465	938	221	625	568	15	425
v/c Ratio	0.45	0.69	0.61	0.30	0.90	0.81	0.12	0.52
Control Delay	18.2	22.1	32.1	18.6	43.4	31.2	17.9	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.2	22.1	32.1	18.6	43.4	31.2	17.9	9.6
Queue Length 50th (m)	10.2	97.3	61.8	28.1	118.3	85.8	1.7	20.4
Queue Length 95th (m)	17.5	115.3	77.1	45.5	#194.9	136.6	6.0	46.5
Internal Link Dist (m)		283.2	361.1		156.0			
Turn Bay Length (m)	30.0					45.0	75.0	
Base Capacity (vph)	270	2109	1535	775	737	738	135	856
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	0.45	0.69	0.61	0.29	0.85	0.77	0.11	0.50

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	1348	0	0	847	16	226	282	792	14	0	391
Future Volume (vph)	111	1348	0	0	847	16	226	282	792	14	0	391
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lane Util. Factor	1.00	0.91			0.91		0.95	0.91	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	0.99	0.99	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			1.00		1.00	0.93	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1752	5036			4975		1649	1562	1485	1805		1538
Flt Permitted	0.19	1.00			1.00		0.95	1.00	1.00	0.15		1.00
Satd. Flow (perm)	344	5036			4975		1649	1562	1485	289		1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	1465	0	0	921	17	246	307	861	15	0	425
RTOR Reduction (vph)	0	0	0	0	2	0	0	3	42	0	0	141
Lane Group Flow (vph)	121	1465	0	0	936	0	221	622	526	15	0	284
Confl. Peds. (#/hr)	1		3	3		1			1	1		
Heavy Vehicles (%)	3%	3%	3%	0%	4%	0%	4%	2%	2%	0%	0%	5%
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Actuated Green, G (s)	41.9	41.9			30.9		44.1	44.1	44.1	44.1		44.1
Effective Green, g (s)	41.9	41.9			30.9		44.1	44.1	44.1	44.1		44.1
Actuated g/C Ratio	0.42	0.42			0.31		0.44	0.44	0.44	0.44		0.44
Clearance Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		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)	256	2110			1537		727	688	654	127		678
v/s Ratio Prot	0.04	c0.29			0.19							
v/s Ratio Perm	0.16						0.13	0.40	0.35	0.05		0.18
v/c Ratio	0.47	0.69			0.61		0.30	0.90	0.80	0.12		0.42
Uniform Delay, d1	19.1	23.8			29.4		18.0	26.0	24.2	16.5		19.2
Progression Factor	0.79	0.82			1.00		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	1.2	1.7			1.8		0.2	15.2	7.1	0.4		0.4
Delay (s)	16.3	21.3			31.2		18.3	41.2	31.3	16.9		19.6
Level of Service	B	C			C		B	D	C	B		B
Approach Delay (s)		20.9			31.2			33.6			19.5	
Approach LOS		C			C			C			B	

Intersection Summary				
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	86.9%	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)	445	6	288	397	8	588
Future Volume (vph)	445	6	288	397	8	588
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	55.0		0.0	0.0
Storage Lanes		0	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	0.97	1.00	1.00	1.00
Ped Bike Factor	1.00		0.99			0.99
Frt	0.998					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3414	0	3303	1712	1805	1568
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3414	0	3280	1712	1805	1547
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	1					30
Link Speed (k/h)	50			60	50	
Link Distance (m)	207.1			887.5	183.4	
Travel Time (s)	14.9			53.3	13.2	
Confl. Peds. (#/hr)		7	7			1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	40%	6%	11%	0%	3%
Adj. Flow (vph)	484	7	313	432	9	639
Shared Lane Traffic (%)						
Lane Group Flow (vph)	491	0	313	432	9	639
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Detector Phase	3		4	4	2	4
Switch Phase						
Minimum Initial (s)	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	17.0		27.0	27.0	18.0	27.0
Total Split (s)	23.0		44.0	44.0	18.0	44.0
Total Split (%)	27.1%		51.8%	51.8%	21.2%	51.8%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None		C-Max	C-Max	Max	C-Max
Act Effct Green (s)	15.3		38.0	38.0	11.7	50.7
Actuated g/C Ratio	0.18		0.45	0.45	0.14	0.60
v/c Ratio	0.80		0.21	0.56	0.04	0.68
Control Delay	44.0		14.8	21.0	32.9	13.9
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	44.0		14.8	21.0	32.9	13.9
LOS	D		B	C	C	B
Approach Delay	44.0			18.4	14.2	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	D			B	B	
Queue Length 50th (m)	42.1		16.2	52.7	1.4	52.0
Queue Length 95th (m)	#61.1		24.6	82.2	5.7	83.7
Internal Link Dist (m)	183.1			863.5	159.4	
Turn Bay Length (m)			55.0			
Base Capacity (vph)	643		1476	765	248	943
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.76		0.21	0.56	0.04	0.68

Intersection Summary		
Area Type:	Other	
Cycle Length: 85		
Actuated Cycle Length: 85		
Offset: 27 (32%), Referenced to phase 4:WBTL, Start of Green		
Natural Cycle: 65		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.80		
Intersection Signal Delay: 23.6		Intersection LOS: C
Intersection Capacity Utilization 59.9%		ICU Level of Service B
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		

Splits and Phases: 3: Maple Avenue & Plains Road E



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	491	313	432	9	639
v/c Ratio	0.80	0.21	0.56	0.04	0.68
Control Delay	44.0	14.8	21.0	32.9	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	14.8	21.0	32.9	13.9
Queue Length 50th (m)	42.1	16.2	52.7	1.4	52.0
Queue Length 95th (m)	#61.1	24.6	82.2	5.7	83.7
Internal Link Dist (m)	183.1		863.5	159.4	
Turn Bay Length (m)		55.0			
Base Capacity (vph)	643	1476	765	248	943
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.76	0.21	0.56	0.04	0.68

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	445	6	288	397	8	588
Future Volume (vph)	445	6	288	397	8	588
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		6.0	6.0	7.0	6.0
Lane Util. Factor	0.95		0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3413		3303	1712	1805	1563
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3413		3303	1712	1805	1563
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	484	7	313	432	9	639
RTOR Reduction (vph)	1	0	0	0	0	12
Lane Group Flow (vph)	490	0	313	432	9	627
Confl. Peds. (#/hr)		7	7			1
Heavy Vehicles (%)	5%	40%	6%	11%	0%	3%
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Actuated Green, G (s)	15.3		38.0	38.0	11.7	49.7
Effective Green, g (s)	15.3		38.0	38.0	11.7	49.7
Actuated g/C Ratio	0.18		0.45	0.45	0.14	0.58
Clearance Time (s)	7.0		6.0	6.0	7.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	614		1476	765	248	913
v/s Ratio Prot			0.09			c0.31
v/s Ratio Perm	c0.14			0.25	0.00	0.09
v/c Ratio	0.80		0.21	0.56	0.04	0.69
Uniform Delay, d1	33.4		14.4	17.4	31.8	12.2
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	7.2		0.3	3.0	0.3	4.2
Delay (s)	40.5		14.7	20.4	32.0	16.4
Level of Service	D		B	C	C	B
Approach Delay (s)	40.5			18.0	16.6	
Approach LOS	D			B	B	

Intersection Summary			
HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
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)	476	508	48	83	151	83	40	884	286	325	1102	487
Future Volume (vph)	476	508	48	83	151	83	40	884	286	325	1102	487
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	50.0		75.0	50.0		0.0	40.0		30.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.99	1.00		1.00		0.98	1.00	0.99				0.97
Frt		0.987				0.850		0.963				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	1839	0	1597	3252	1404	1641	4752	0	1719	5085	1538
Flt Permitted	0.950			0.950			0.206			0.125		
Satd. Flow (perm)	3373	1839	0	1593	3252	1374	355	4752	0	226	5085	1498
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				208		71				290
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		887.5			190.4			463.4			229.3	
Travel Time (s)		53.3			11.4			27.8			13.8	
Confl. Peds. (#/hr)	7		5	5		7	11		7	7		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	0%	13%	11%	15%	10%	3%	8%	5%	2%	5%
Adj. Flow (vph)	517	552	52	90	164	90	43	961	311	353	1198	529
Shared Lane Traffic (%)												
Lane Group Flow (vph)	517	604	0	90	164	90	43	1272	0	353	1198	529
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Detector Phase	7	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	7.0	8.0		7.0	8.0	8.0
Minimum Split (s)	13.0	31.3		13.0	29.3	29.3	11.0	31.0		11.0	31.0	31.0
Total Split (s)	23.0	41.0		13.0	31.0	31.0	11.0	34.0		22.0	45.0	45.0
Total Split (%)	20.9%	37.3%		11.8%	28.2%	28.2%	10.0%	30.9%		20.0%	40.9%	40.9%
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.7		3.0	3.7	3.7
All-Red Time (s)	2.0	2.6		2.0	2.6	2.6	1.0	2.3		1.0	2.3	2.3
Lost Time Adjust (s)	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	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	18.0	34.7		8.0	24.7	24.7	37.0	28.0		52.0	43.4	43.4
Actuated g/C Ratio	0.16	0.32		0.07	0.22	0.22	0.34	0.25		0.47	0.39	0.39
v/c Ratio	0.93	1.04		0.78	0.22	0.19	0.21	1.01		1.01	0.60	0.69
Control Delay	70.2	84.4		90.1	35.8	0.9	16.5	48.1		79.9	28.7	18.2
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	70.2	84.4		90.1	35.8	0.9	16.5	48.1		79.9	28.7	18.2
LOS	E	F		F	D	A	B	D		E	C	B
Approach Delay		77.8			40.9			47.1			34.7	

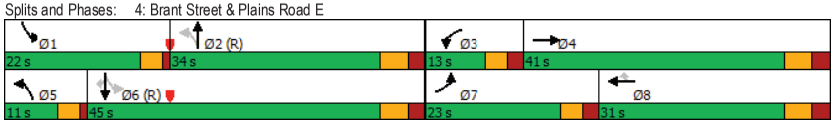
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			D			D			C	
Queue Length 50th (m)	60.0	~146.5		20.3	16.0	0.0	2.5	~98.5		~64.1	82.9	47.5
Queue Length 95th (m)	#92.2	#217.6		#48.5	25.8	0.0	m3.8	m#124.9		#126.1	99.4	92.8
Internal Link Dist (m)		863.5			166.4			439.4			205.3	
Turn Bay Length (m)	55.0			50.0		75.0	50.0			40.0		30.0
Base Capacity (vph)	556	583		116	730	469	201	1262		351	2006	766
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.93	1.04		0.78	0.22	0.19	0.21	1.01		1.01	0.60	0.69

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 40 (36%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.04
Intersection Signal Delay: 48.5 Intersection LOS: D
Intersection Capacity Utilization 95.8% 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: 4: Brant Street & Plains Road E



Queues
4: Brant Street & Plains Road E

Background (2029)
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	517	604	90	164	90	43	1272	353	1198	529
v/c Ratio	0.93	1.04	0.78	0.22	0.19	0.21	1.01	1.01	0.60	0.69
Control Delay	70.2	84.4	90.1	35.8	0.9	16.5	48.1	79.9	28.7	18.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.2	84.4	90.1	35.8	0.9	16.5	48.1	79.9	28.7	18.2
Queue Length 50th (m)	60.0	~146.5	20.3	16.0	0.0	2.5	~98.5	~64.1	82.9	47.5
Queue Length 95th (m)	#92.2	#217.6	#48.5	25.8	0.0	m3.8	m#124.9	#126.1	99.4	92.8
Internal Link Dist (m)		863.5		166.4			439.4		205.3	
Turn Bay Length (m)	55.0		50.0		75.0	50.0		40.0		30.0
Base Capacity (vph)	556	583	116	730	469	201	1262	351	2006	766
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	1.04	0.78	0.22	0.19	0.21	1.01	1.01	0.60	0.69

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
4: Brant Street & Plains Road E

Background (2029)
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	476	508	48	83	151	83	40	884	286	325	1102	487
Future Volume (vph)	476	508	48	83	151	83	40	884	286	325	1102	487
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	1.00		1.00	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	0.99		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
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3400	1839		1597	3252	1374	1640	4753		1719	5085	1498
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.21	1.00		0.12	1.00	1.00
Satd. Flow (perm)	3400	1839		1597	3252	1374	355	4753		226	5085	1498
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	517	552	52	90	164	90	43	961	311	353	1198	529
RTOR Reduction (vph)	0	3	0	0	0	70	0	53	0	0	0	180
Lane Group Flow (vph)	517	601	0	90	164	20	43	1219	0	353	1198	349
Confl. Peds. (#/hr)	7		5	5		7	11		7	7		11
Heavy Vehicles (%)	3%	2%	0%	13%	11%	15%	10%	3%	8%	5%	2%	5%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Actuated Green, G (s)	18.0	34.7		8.0	24.7	24.7	32.2	28.0		50.0	41.8	41.8
Effective Green, g (s)	18.0	34.7		8.0	24.7	24.7	32.2	28.0		50.0	41.8	41.8
Actuated g/C Ratio	0.16	0.32		0.07	0.22	0.22	0.29	0.25		0.45	0.38	0.38
Clearance Time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	556	580		116	730	308	152	1209		347	1932	569
v/s Ratio Prot	c0.15	c0.33		0.06	0.05		0.01	0.26		c0.17	0.24	
v/s Ratio Perm						0.01	0.07			c0.30		0.23
v/c Ratio	0.93	1.04		0.78	0.22	0.07	0.28	1.01		1.02	0.62	0.61
Uniform Delay, d1	45.4	37.6		50.1	34.8	33.6	28.3	41.0		32.4	27.7	27.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.88	0.67		1.00	1.00	1.00
Incremental Delay, d2	22.0	46.8		27.0	0.2	0.1	0.6	21.1		52.8	1.5	4.9
Delay (s)	67.4	84.5		77.1	35.0	33.7	25.5	48.7		85.2	29.2	32.5
Level of Service	E	F		E	C	C	C	D		F	C	C
Approach Delay (s)		76.6			45.7			48.0			39.5	
Approach LOS		E			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	50.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.07			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.3	
Intersection Capacity Utilization	95.8%	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)	381	1196	284	143	380	171	221	744	309	259	811	170
Future Volume (vph)	381	1196	284	143	380	171	221	744	309	259	811	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		170.0	60.0		0.0	75.0		70.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.99	1.00		0.98	0.99		0.96	1.00		0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3539	1568	1703	3438	1538	1787	3505	1599	1787	3505	1346
Flt Permitted	0.376			0.137			0.151			0.131		
Satd. Flow (perm)	665	3539	1547	246	3438	1507	282	3505	1535	245	3505	1290
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			265			186			184			185
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		261.1			251.5			231.2			463.4	
Travel Time (s)		15.7			15.1			16.6			27.8	
Confl. Peds. (#/hr)	6		1	1		6	22		21	21		22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	2%	3%	6%	5%	5%	1%	3%	1%	1%	3%	20%
Adj. Flow (vph)	414	1300	309	155	413	186	240	809	336	282	882	185
Shared Lane Traffic (%)												
Lane Group Flow (vph)	414	1300	309	155	413	186	240	809	336	282	882	185
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		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	31.4	31.4	12.0	31.4	31.4	12.0	31.5	31.5	12.0	31.5	31.5
Total Split (s)	26.0	48.0	48.0	12.0	34.0	34.0	13.0	33.0	33.0	17.0	37.0	37.0
Total Split (%)	23.6%	43.6%	43.6%	10.9%	30.9%	30.9%	11.8%	30.0%	30.0%	15.5%	33.6%	33.6%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
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)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	56.0	41.6	41.6	39.5	29.1	29.1	38.0	26.5	26.5	46.0	30.5	30.5
Actuated g/C Ratio	0.51	0.38	0.38	0.36	0.26	0.26	0.35	0.24	0.24	0.42	0.28	0.28
v/c Ratio	0.78	0.97	0.41	0.80	0.45	0.35	1.09	0.96	0.66	0.99	0.91	0.38
Control Delay	29.7	52.9	6.5	52.7	36.2	6.8	113.7	64.2	23.6	78.0	57.0	23.2
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	29.7	52.9	6.5	52.7	36.2	6.8	113.7	64.2	23.6	78.0	57.0	23.2
LOS	C	D	A	D	D	A	F	E	C	E	E	C
Approach Delay		41.1			32.3			62.9			56.8	

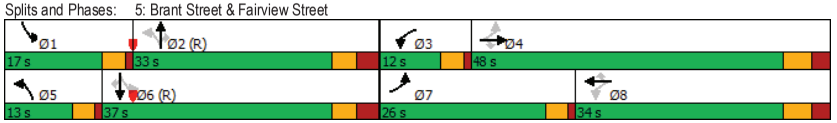
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			C			E			E	
Queue Length 50th (m)	58.6	150.1	6.3	18.3	41.9	0.0	~42.8	95.3	30.3	62.6	112.3	26.1
Queue Length 95th (m)	#86.6	#199.8	26.2	#53.1	57.7	17.6	#94.5	#135.6	63.8	m#101.8	m#141.6	m46.3
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	542	1338	749	194	910	535	220	844	509	284	971	491
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	0.76	0.97	0.41	0.80	0.45	0.35	1.09	0.96	0.66	0.99	0.91	0.38

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 107 (97%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.09
Intersection Signal Delay: 49.2 Intersection LOS: D
Intersection Capacity Utilization 93.3% 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: 5: Brant Street & Fairview Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	414	1300	309	155	413	186	240	809	336	282	882	185
v/c Ratio	0.78	0.97	0.41	0.80	0.45	0.35	1.09	0.96	0.66	0.99	0.91	0.38
Control Delay	29.7	52.9	6.5	52.7	36.2	6.8	113.7	64.2	23.6	78.0	57.0	23.2
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	29.7	52.9	6.5	52.7	36.2	6.8	113.7	64.2	23.6	78.0	57.0	23.2
Queue Length 50th (m)	58.6	150.1	6.3	18.3	41.9	0.0	~42.8	95.3	30.3	62.6	112.3	26.1
Queue Length 95th (m)	#86.6	#199.8	26.2	#53.1	57.7	17.6	#94.5	#135.6	63.8	m#101.8	m#141.6	m46.3
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	542	1338	749	194	910	535	220	844	509	284	971	491
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	0.76	0.97	0.41	0.80	0.45	0.35	1.09	0.96	0.66	0.99	0.91	0.38

Intersection Summary

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

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	381	1196	284	143	380	171	221	744	309	259	811	170
Future Volume (vph)	381	1196	284	143	380	171	221	744	309	259	811	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	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)	1685	3539	1547	1703	3438	1507	1786	3505	1535	1786	3505	1290
Flt Permitted	0.38	1.00	1.00	0.14	1.00	1.00	0.15	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)	666	3539	1547	246	3438	1507	284	3505	1535	247	3505	1290
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	414	1300	309	155	413	186	240	809	336	282	882	185
RTOR Reduction (vph)	0	0	165	0	0	137	0	0	140	0	0	134
Lane Group Flow (vph)	414	1300	144	155	413	49	240	809	196	282	882	51
Confl. Peds. (#/hr)	6		1	1		6	22		21	21		22
Heavy Vehicles (%)	7%	2%	3%	6%	5%	5%	1%	3%	1%	1%	3%	20%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	53.6	41.6	41.6	37.1	29.1	29.1	35.5	26.5	26.5	43.5	30.5	30.5
Effective Green, g (s)	53.6	41.6	41.6	37.1	29.1	29.1	35.5	26.5	26.5	43.5	30.5	30.5
Actuated g/C Ratio	0.49	0.38	0.38	0.34	0.26	0.26	0.32	0.24	0.24	0.40	0.28	0.28
Clearance Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
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)	514	1338	585	188	909	398	214	844	369	279	971	357
v/s Ratio Prot	c0.15	c0.37		0.06	0.12		0.09	0.23		c0.12	0.25	
v/s Ratio Perm	0.24		0.09	0.22		0.03	c0.27		0.13	0.28		0.04
v/c Ratio	0.81	0.97	0.25	0.82	0.45	0.12	1.12	0.96	0.53	1.01	0.91	0.14
Uniform Delay, d1	19.8	33.6	23.5	29.4	33.8	30.8	32.3	41.2	36.4	29.7	38.4	29.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.18	1.18	4.54
Incremental Delay, d2	8.9	18.1	0.2	24.5	0.4	0.1	98.0	22.4	5.4	50.4	11.3	0.7
Delay (s)	28.8	51.7	23.7	53.8	34.2	30.9	130.3	63.6	41.8	85.5	56.7	136.6
Level of Service	C	D	C	D	C	C	F	E	D	F	E	F
Approach Delay (s)		42.7			37.4			69.9			73.7	
Approach LOS		D			D			E			E	

Intersection Summary				
HCM 2000 Control Delay	56.4	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.02			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	93.3%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

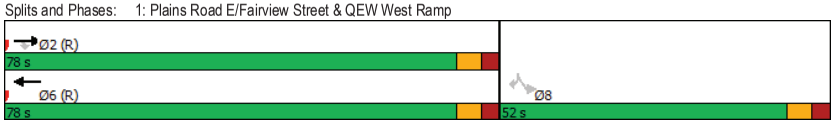
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1357	425	0	2173	0	0	0	0	627	0	368
Future Volume (vph)	0	1357	425	0	2173	0	0	0	0	627	0	368
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	55.0		0.0
Storage Lanes	0		1	0		0	0		0	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor			0.95									0.98
Frt			0.850									0.850
Flt Protected										0.950		
Satd. Flow (prot)	0	5136	1583	0	5085	0	0	0	0	3467	0	1615
Flt Permitted										0.950		
Satd. Flow (perm)	0	5136	1507	0	5085	0	0	0	0	3467	0	1585
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			462									34
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		175.7			307.2			140.0			199.7	
Travel Time (s)		12.7			22.1			10.1			14.4	
Confl. Peds. (#/hr)	4		15	15		4	3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	2%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Adj. Flow (vph)	0	1475	462	0	2362	0	0	0	0	682	0	400
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1475	462	0	2362	0	0	0	0	682	0	400
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Detector Phase		2	2		6					8		8
Switch Phase												
Minimum Initial (s)		8.0	8.0		8.0					8.0		8.0
Minimum Split (s)		43.0	43.0		43.0					25.0		25.0
Total Split (s)		78.0	78.0		78.0					52.0		52.0
Total Split (%)		60.0%	60.0%		60.0%					40.0%		40.0%
Yellow Time (s)		4.0	4.0		4.0					4.0		4.0
All-Red Time (s)		3.0	3.0		3.0					3.0		3.0
Lost Time Adjust (s)		0.0	0.0		0.0					0.0		0.0
Total Lost Time (s)		7.0	7.0		7.0					7.0		7.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max		C-Max					None		None
Act Effct Green (s)		79.7	79.7		79.7					36.3		36.3
Actuated g/C Ratio		0.61	0.61		0.61					0.28		0.28
v/c Ratio		0.47	0.42		0.76					0.70		0.86
Control Delay		15.1	2.5		7.8					45.6		57.8
Queue Delay		0.0	0.0		0.0					0.0		0.0
Total Delay		15.1	2.5		7.8					45.6		57.8
LOS		B	A		A					D		E
Approach Delay		12.1			7.8						50.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A						D	
Queue Length 50th (m)		75.8	0.0		43.1					84.5		94.1
Queue Length 95th (m)		102.6	15.5		m34.5					96.8		124.8
Internal Link Dist (m)		151.7			283.2			116.0			175.7	
Turn Bay Length (m)										55.0		
Base Capacity (vph)		3148	1102		3117					1200		570
Starvation Cap Reductn		0	0		0					0		0
Spillback Cap Reductn		0	0		0					0		0
Storage Cap Reductn		0	0		0					0		0
Reduced v/c Ratio		0.47	0.42		0.76					0.57		0.70

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 34 (26%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 17.9		Intersection LOS: B	
Intersection Capacity Utilization 76.8%		ICU Level of Service D	
Analysis Period (min) 15			

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

Splits and Phases: 1: Plains Road E/Fairview Street & QEW West Ramp



Lane Group	EBT	EBR	WBT	SBL	SBR
Lane Group Flow (vph)	1475	462	2362	682	400
v/c Ratio	0.47	0.42	0.76	0.70	0.86
Control Delay	15.1	2.5	7.8	45.6	57.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.1	2.5	7.8	45.6	57.8
Queue Length 50th (m)	75.8	0.0	43.1	84.5	94.1
Queue Length 95th (m)	102.6	15.5	m34.5	96.8	124.8
Internal Link Dist (m)	151.7		283.2		
Turn Bay Length (m)				55.0	
Base Capacity (vph)	3148	1102	3117	1200	570
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.47	0.42	0.76	0.57	0.70

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1357	425	0	2173	0	0	0	0	627	0	368
Future Volume (vph)	0	1357	425	0	2173	0	0	0	0	627	0	368
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0					7.0		7.0
Lane Util. Factor		0.91	1.00		0.91					0.97		1.00
Frpb, ped/bikes		1.00	0.95		1.00					1.00		0.98
Flpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Frt		1.00	0.85		1.00					1.00		0.85
Flt Protected		1.00	1.00		1.00					0.95		1.00
Satd. Flow (prot)		5136	1507		5085					3467		1585
Flt Permitted		1.00	1.00		1.00					0.95		1.00
Satd. Flow (perm)		5136	1507		5085					3467		1585
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1475	462	0	2362	0	0	0	0	682	0	400
RTOR Reduction (vph)	0	0	179	0	0	0	0	0	0	0	0	25
Lane Group Flow (vph)	0	1475	283	0	2362	0	0	0	0	682	0	375
Confl. Peds. (#/hr)	4		15	15		4	3					3
Heavy Vehicles (%)	0%	1%	2%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Actuated Green, G (s)		79.7	79.7		79.7					36.3		36.3
Effective Green, g (s)		79.7	79.7		79.7					36.3		36.3
Actuated g/C Ratio		0.61	0.61		0.61					0.28		0.28
Clearance Time (s)		7.0	7.0		7.0					7.0		7.0
Vehicle Extension (s)		3.0	3.0		3.0					3.0		3.0
Lane Grp Cap (vph)		3148	923		3117					968		442
v/s Ratio Prot		0.29			c0.46							
v/s Ratio Perm			0.19							0.20		c0.24
v/c Ratio		0.47	0.31		0.76					0.70		0.85
Uniform Delay, d1		13.7	12.0		18.2					42.0		44.3
Progression Factor		1.00	1.00		0.39					1.00		1.00
Incremental Delay, d2		0.5	0.9		0.2					2.4		14.1
Delay (s)		14.2	12.8		7.2					44.4		58.4
Level of Service		B	B		A					D		E
Approach Delay (s)		13.8			7.2			0.0			49.6	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	76.8%	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)	112	1637	0	0	2880	28	175	204	484	7	0	516
Future Volume (vph)	112	1637	0	0	2880	28	175	204	484	7	0	516
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		45.0	75.0		0.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.91	0.95	1.00	1.00	1.00
Ped Bike Factor					1.00							
Frt					0.999			0.941	0.850			0.850
Flt Protected	0.950						0.950	0.998		0.950		
Satd. Flow (prot)	1770	5136	0	0	4800	0	1698	1582	1519	1805	0	1495
Flt Permitted	0.061						0.950	0.998		0.258		
Satd. Flow (perm)	114	5136	0	0	4800	0	1698	1582	1519	490	0	1495
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					1			13	59			127
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		307.2			385.1			180.0			159.4	
Travel Time (s)		22.1			27.7			13.0			11.5	
Confl. Peds. (#/hr)	2		7	7		2						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	1%	0%	0%	8%	0%	1%	4%	1%	0%	0%	8%
Adj. Flow (vph)	122	1779	0	0	3130	30	190	222	526	8	0	561
Shared Lane Traffic (%)							10%		30%			
Lane Group Flow (vph)	122	1779	0	0	3160	0	171	399	368	8	0	561
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Detector Phase	5	2			6		4	4	4	8		8
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0		8.0	8.0	8.0	8.0		8.0
Minimum Split (s)	11.0	35.0			35.0		36.0	36.0	36.0	36.0		36.0
Total Split (s)	11.0	79.0			68.0		51.0	51.0	51.0	51.0		51.0
Total Split (%)	8.5%	60.8%			52.3%		39.2%	39.2%	39.2%	39.2%		39.2%
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	0.0	3.0			3.0		3.0	3.0	3.0	3.0		3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	None	C-Max			C-Max		None	None	None	None		None
Act Effct Green (s)	77.2	73.2			62.2		42.8	42.8	42.8	42.8		42.8
Actuated g/C Ratio	0.59	0.56			0.48		0.33	0.33	0.33	0.33		0.33
v/c Ratio	0.72	0.62			1.38		0.31	0.75	0.68	0.05		0.97
Control Delay	48.5	14.8			201.6		33.9	47.6	38.4	30.3		64.5
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Delay	48.5	14.8			201.6		33.9	47.6	38.4	30.3		64.5
LOS	D	B			F		C	D	D	C		E
Approach Delay		17.0			201.6			41.5			64.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			F			D			E	
Queue Length 50th (m)	15.8	85.4			~420.1		35.5	100.6	75.2	1.5		120.8
Queue Length 95th (m)	#45.1	121.0			#445.6		56.4	145.1	114.3	5.5		#197.3
Internal Link Dist (m)		283.2			361.1			156.0			135.4	
Turn Bay Length (m)	30.0								45.0	75.0		
Base Capacity (vph)	169	2892			2297		574	544	553	165		590
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	0.72	0.62			1.38		0.30	0.73	0.67	0.05		0.95

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 16 (12%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.38			
Intersection Signal Delay: 113.4		Intersection LOS: F	
Intersection Capacity Utilization 120.9%		ICU Level of Service H	
Analysis Period (min) 15			

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

Splits and Phases: 2: QEW East Ramp/Plains Road E & Fairview Street



Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	122	1779	3160	171	399	368	8	561
v/c Ratio	0.72	0.62	1.38	0.31	0.75	0.68	0.05	0.97
Control Delay	48.5	14.8	201.6	33.9	47.6	38.4	30.3	64.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	14.8	201.6	33.9	47.6	38.4	30.3	64.5
Queue Length 50th (m)	15.8	85.4	~420.1	35.5	100.6	75.2	1.5	120.8
Queue Length 95th (m)	#45.1	121.0	#445.6	56.4	145.1	114.3	5.5	#197.3
Internal Link Dist (m)		283.2	361.1		156.0			
Turn Bay Length (m)	30.0					45.0	75.0	
Base Capacity (vph)	169	2892	2297	574	544	553	165	590
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	0.72	0.62	1.38	0.30	0.73	0.67	0.05	0.95

Intersection Summary

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	1637	0	0	2880	28	175	204	484	7	0	516
Future Volume (vph)	112	1637	0	0	2880	28	175	204	484	7	0	516
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lane Util. Factor	1.00	0.91			0.91		0.95	0.91	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			1.00		1.00	0.94	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1770	5136			4798		1698	1580	1519	1805		1495
Flt Permitted	0.06	1.00			1.00		0.95	1.00	1.00	0.26		1.00
Satd. Flow (perm)	114	5136			4798		1698	1580	1519	490		1495
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	122	1779	0	0	3130	30	190	222	526	8	0	561
RTOR Reduction (vph)	0	0	0	0	1	0	0	9	40	0	0	85
Lane Group Flow (vph)	122	1779	0	0	3159	0	171	390	328	8	0	476
Confl. Peds. (#/hr)	2		7	7		2						
Heavy Vehicles (%)	2%	1%	0%	0%	8%	0%	1%	4%	1%	0%	0%	8%
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Actuated Green, G (s)	73.2	73.2			62.2		42.8	42.8	42.8	42.8		42.8
Effective Green, g (s)	73.2	73.2			62.2		42.8	42.8	42.8	42.8		42.8
Actuated g/C Ratio	0.56	0.56			0.48		0.33	0.33	0.33	0.33		0.33
Clearance Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		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)	166	2891			2295		559	520	500	161		492
v/s Ratio Prot	c0.05	0.35			c0.66							
v/s Ratio Perm	0.37						0.10	0.25	0.22	0.02		c0.32
v/c Ratio	0.73	0.62			1.38		0.31	0.75	0.66	0.05		0.97
Uniform Delay, d1	30.7	19.0			33.9		32.5	38.8	37.3	29.7		42.9
Progression Factor	1.27	0.72			1.00		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	13.8	0.9			172.3		0.3	6.0	3.1	0.1		31.9
Delay (s)	52.8	14.5			206.2		32.8	44.9	40.4	29.9		74.8
Level of Service	D	B			F		C	D	D	C		E
Approach Delay (s)		17.0			206.2			40.9			74.2	
Approach LOS		B			F			D			E	

Intersection Summary			
HCM 2000 Control Delay	116.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	120.9%	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)	382	36	1117	505	18	700
Future Volume (vph)	382	36	1117	505	18	700
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	55.0		0.0	0.0
Storage Lanes		0	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	0.97	1.00	1.00	1.00
Ped Bike Factor	1.00		1.00			
Frt	0.987					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3423	0	3433	1881	1687	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3423	0	3417	1881	1687	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	9					35
Link Speed (k/h)	50			60	50	
Link Distance (m)	207.1			887.5	183.4	
Travel Time (s)	14.9			53.3	13.2	
Confl. Peds. (#/hr)		4	4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	2%	1%	7%	2%
Adj. Flow (vph)	415	39	1214	549	20	761
Shared Lane Traffic (%)						
Lane Group Flow (vph)	454	0	1214	549	20	761
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Detector Phase	3		4	4	2	4
Switch Phase						
Minimum Initial (s)	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	17.0		27.0	27.0	18.0	27.0
Total Split (s)	22.0		50.0	50.0	18.0	50.0
Total Split (%)	24.4%		55.6%	55.6%	20.0%	55.6%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None		C-Max	C-Max	Max	C-Max
Act Effct Green (s)	14.5		44.0	44.0	11.5	62.5
Actuated g/C Ratio	0.16		0.49	0.49	0.13	0.69
v/c Ratio	0.81		0.72	0.60	0.09	0.69
Control Delay	48.2		21.3	20.0	36.4	11.8
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	48.2		21.3	20.0	36.4	11.8
LOS	D		C	B	D	B
Approach Delay	48.2			20.9	12.4	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	D			C	B	
Queue Length 50th (m)	41.3		86.0	69.0	3.3	67.6
Queue Length 95th (m)	#63.5		110.7	102.4	10.1	109.0
Internal Link Dist (m)	183.1			863.5	159.4	
Turn Bay Length (m)			55.0			
Base Capacity (vph)	578		1678	919	215	1109
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.79		0.72	0.60	0.09	0.69

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 4:WBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 22.8		Intersection LOS: C	
Intersection Capacity Utilization 66.9%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Maple Avenue & Plains Road E



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	454	1214	549	20	761
v/c Ratio	0.81	0.72	0.60	0.09	0.69
Control Delay	48.2	21.3	20.0	36.4	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	48.2	21.3	20.0	36.4	11.8
Queue Length 50th (m)	41.3	86.0	69.0	3.3	67.6
Queue Length 95th (m)	#63.5	110.7	102.4	10.1	109.0
Internal Link Dist (m)	183.1		863.5	159.4	
Turn Bay Length (m)		55.0			
Base Capacity (vph)	578	1678	919	215	1109
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.79	0.72	0.60	0.09	0.69

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	382	36	1117	505	18	700
Future Volume (vph)	382	36	1117	505	18	700
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		6.0	6.0	7.0	6.0
Lane Util. Factor	0.95		0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3424		3433	1881	1687	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3424		3433	1881	1687	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	415	39	1214	549	20	761
RTOR Reduction (vph)	8	0	0	0	0	13
Lane Group Flow (vph)	446	0	1214	549	20	748
Confl. Peds. (#/hr)		4	4			
Heavy Vehicles (%)	4%	3%	2%	1%	7%	2%
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Actuated Green, G (s)	14.5		44.0	44.0	11.5	55.5
Effective Green, g (s)	14.5		44.0	44.0	11.5	55.5
Actuated g/C Ratio	0.16		0.49	0.49	0.13	0.62
Clearance Time (s)	7.0		6.0	6.0	7.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	551		1678	919	215	976
v/s Ratio Prot			0.35			c0.37
v/s Ratio Perm	c0.13			0.29	0.01	0.10
v/c Ratio	0.81		0.72	0.60	0.09	0.77
Uniform Delay, d1	36.4		18.2	16.6	34.6	12.5
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	8.8		2.7	2.9	0.9	5.7
Delay (s)	45.2		20.9	19.5	35.5	18.3
Level of Service	D		C	B	D	B
Approach Delay (s)	45.2			20.5	18.7	
Approach LOS	D			C	B	

Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

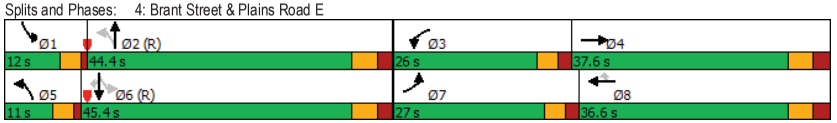
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	626	175	71	165	803	435	90	1477	67	142	1159	813
Future Volume (vph)	626	175	71	165	803	435	90	1477	67	142	1159	813
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	50.0		75.0	50.0		0.0	40.0		30.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.99					0.97	1.00	1.00				0.97
Frt		0.957				0.850		0.993				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3502	1756	0	1719	3539	1583	1805	5085	0	1687	5187	1599
Flt Permitted	0.950			0.950			0.104			0.102		
Satd. Flow (perm)	3481	1756	0	1719	3539	1535	197	5085	0	181	5187	1557
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16				117		6				406
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		887.5			190.4			463.4			229.3	
Travel Time (s)		53.3			11.4			27.8			13.8	
Confl. Peds. (#/hr)	12					12	10		16	16		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	5%	0%	5%	2%	2%	0%	0%	24%	7%	0%	1%
Adj. Flow (vph)	680	190	77	179	873	473	98	1605	73	154	1260	884
Shared Lane Traffic (%)												
Lane Group Flow (vph)	680	267	0	179	873	473	98	1678	0	154	1260	884
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Detector Phase	7	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	7.0	8.0		7.0	8.0	8.0
Minimum Split (s)	13.0	31.3		13.0	29.3	29.3	11.0	31.0		11.0	31.0	31.0
Total Split (s)	27.0	37.6		26.0	36.6	36.6	11.0	44.4		12.0	45.4	45.4
Total Split (%)	22.5%	31.3%		21.7%	30.5%	30.5%	9.2%	37.0%		10.0%	37.8%	37.8%
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.7		3.0	3.7	3.7
All-Red Time (s)	2.0	2.6		2.0	2.6	2.6	1.0	2.3		1.0	2.3	2.3
Lost Time Adjust (s)	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	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	22.0	35.2		17.1	30.3	30.3	47.4	38.4		49.4	39.4	39.4
Actuated g/C Ratio	0.18	0.29		0.14	0.25	0.25	0.40	0.32		0.41	0.33	0.33
v/c Ratio	1.06	0.51		0.73	0.98	1.00	0.57	1.03		0.89	0.74	1.13
Control Delay	99.2	38.0		66.6	69.9	74.5	19.8	55.3		69.2	38.9	95.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	99.2	38.0		66.6	69.9	74.5	19.8	55.3		69.2	38.9	95.3
LOS	F	D		E	E	E	B	E		E	D	F
Approach Delay		81.9			71.0			53.4			62.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			E			D			E	
Queue Length 50th (m)	~95.4	51.9		42.7	113.4	93.5	16.9	~166.0		23.2	101.0	~181.9
Queue Length 95th (m)	#133.7	83.0		66.2	#156.9	#165.8	m17.6	m146.1		#62.1	119.0	#262.2
Internal Link Dist (m)		863.5			166.4			439.4			205.3	
Turn Bay Length (m)	55.0			50.0		75.0	50.0			40.0		30.0
Base Capacity (vph)	642	526		300	893	475	171	1631		174	1703	783
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.06	0.51		0.60	0.98	1.00	0.57	1.03		0.89	0.74	1.13

Intersection Summary		
Area Type:	Other	
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 45 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 120		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.13		
Intersection Signal Delay: 64.9	Intersection LOS: E	
Intersection Capacity Utilization 95.8%	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: 4: Brant Street & Plains Road E





Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	680	267	179	873	473	98	1678	154	1260	884
v/c Ratio	1.06	0.51	0.73	0.98	1.00	0.57	1.03	0.89	0.74	1.13
Control Delay	99.2	38.0	66.6	69.9	74.5	19.8	55.3	69.2	38.9	95.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	99.2	38.0	66.6	69.9	74.5	19.8	55.3	69.2	38.9	95.3
Queue Length 50th (m)	~95.4	51.9	42.7	113.4	93.5	16.9	~166.0	23.2	101.0	~181.9
Queue Length 95th (m)	#133.7	83.0	66.2	#156.9	#165.8	m17.6	m146.1	#62.1	119.0	#262.2
Internal Link Dist (m)		863.5		166.4			439.4		205.3	
Turn Bay Length (m)	55.0		50.0		75.0	50.0		40.0		30.0
Base Capacity (vph)	642	526	300	893	475	171	1631	174	1703	783
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.06	0.51	0.60	0.98	1.00	0.57	1.03	0.89	0.74	1.13

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	626	175	71	165	803	435	90	1477	67	142	1159	813
Future Volume (vph)	626	175	71	165	803	435	90	1477	67	142	1159	813
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	1.00		1.00	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00		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
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	1755		1719	3539	1535	1805	5087		1687	5187	1557
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.10	1.00		0.10	1.00	1.00
Satd. Flow (perm)	3502	1755		1719	3539	1535	198	5087		180	5187	1557
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	680	190	77	179	873	473	98	1605	73	154	1260	884
RTOR Reduction (vph)	0	11	0	0	0	87	0	4	0	0	0	273
Lane Group Flow (vph)	680	256	0	179	873	386	98	1674	0	154	1260	611
Confl. Peds. (#/hr)	12					12	10		16	16		10
Heavy Vehicles (%)	0%	5%	0%	5%	2%	2%	0%	0%	24%	7%	0%	1%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Actuated Green, G (s)	22.0	35.2		17.1	30.3	30.3	45.4	38.4		47.4	39.4	39.4
Effective Green, g (s)	22.0	35.2		17.1	30.3	30.3	45.4	38.4		47.4	39.4	39.4
Actuated g/C Ratio	0.18	0.29		0.14	0.25	0.25	0.38	0.32		0.39	0.33	0.33
Clearance Time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	642	514		244	893	387	168	1627		171	1703	511
v/s Ratio Prot	c0.19	c0.15		0.10	0.25		0.03	0.33		c0.06	0.24	
v/s Ratio Perm						c0.25	0.19			0.29		c0.39
v/c Ratio	1.06	0.50		0.73	0.98	1.00	0.58	1.03		0.90	0.74	1.20
Uniform Delay, d1	49.0	35.1		49.3	44.5	44.8	26.9	40.8		29.9	35.8	40.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.89	0.98		1.00	1.00	1.00
Incremental Delay, d2	52.2	0.8		10.8	24.4	44.5	0.5	15.9		41.5	2.9	106.2
Delay (s)	101.2	35.8		60.1	69.0	89.3	24.5	55.9		71.4	38.7	146.5
Level of Service	F	D		E	E	F	C	E		E	D	F
Approach Delay (s)		82.8			74.2			54.2			82.3	
Approach LOS		F			E			D			F	

Intersection Summary					
HCM 2000 Control Delay	72.9	HCM 2000 Level of Service		E	
HCM 2000 Volume to Capacity ratio	1.08				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		21.3	
Intersection Capacity Utilization	95.8%	ICU Level of Service		F	
Analysis Period (min)	15				

c Critical Lane Group

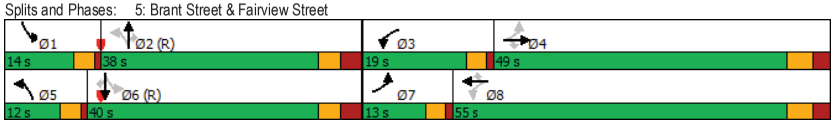
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	881	320	249	1654	497	185	929	221	264	784	489
Future Volume (vph)	240	881	320	249	1654	497	185	929	221	264	784	489
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		170.0	60.0		0.0	75.0		70.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.97			0.98	1.00		0.92			0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1703	3539	1568	1787	3574	1599	1787	3574	1599	1770	3539	1553
Flt Permitted	0.093			0.124			0.127			0.119		
Satd. Flow (perm)	167	3539	1526	233	3574	1573	238	3574	1474	222	3539	1498
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			214			191			179			172
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		261.1			251.5			231.2			463.4	
Travel Time (s)		15.7			15.1			16.6			27.8	
Confl. Peds. (#/hr)	3		10	10		3	16		45	45		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	2%	3%	1%	1%	1%	1%	1%	1%	2%	2%	4%
Adj. Flow (vph)	261	958	348	271	1798	540	201	1010	240	287	852	532
Shared Lane Traffic (%)												
Lane Group Flow (vph)	261	958	348	271	1798	540	201	1010	240	287	852	532
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		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	31.4	31.4	12.0	31.4	31.4	12.0	31.5	31.5	12.0	31.5	31.5
Total Split (s)	13.0	49.0	49.0	19.0	55.0	55.0	12.0	38.0	38.0	14.0	40.0	40.0
Total Split (%)	10.8%	40.8%	40.8%	15.8%	45.8%	45.8%	10.0%	31.7%	31.7%	11.7%	33.3%	33.3%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
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)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	54.5	43.1	43.1	63.9	48.6	48.6	42.0	31.5	31.5	46.0	33.5	33.5
Actuated g/C Ratio	0.45	0.36	0.36	0.53	0.40	0.40	0.35	0.26	0.26	0.38	0.28	0.28
v/c Ratio	1.37	0.75	0.51	0.87	1.24	0.72	1.08	1.08	0.46	1.34	0.86	0.98
Control Delay	222.6	38.5	14.0	50.1	147.7	25.1	118.3	94.5	13.6	203.5	33.0	45.6
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	222.6	38.5	14.0	50.1	147.7	25.1	118.3	94.5	13.6	203.5	33.0	45.6
LOS	F	D	B	D	F	C	F	F	B	F	C	D
Approach Delay		63.7			112.2			84.4			66.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			F			F			E	
Queue Length 50th (m)	~69.5	109.7	23.9	40.4	~291.6	73.4	~37.5	~146.8	11.7	~70.5	112.7	105.7
Queue Length 95th (m)	#124.5	135.7	53.0	#87.5	#336.1	118.5	#87.6	#189.2	35.8 m	#123.6	#140.2	#174.1
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	191	1270	684	318	1447	750	186	938	518	214	987	542
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	1.37	0.75	0.51	0.85	1.24	0.72	1.08	1.08	0.46	1.34	0.86	0.98

Intersection Summary		
Area Type:	Other	
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 89 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 140		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.37		
Intersection Signal Delay: 85.8	Intersection LOS: F	
Intersection Capacity Utilization 116.7%	ICU Level of Service H	
Analysis Period (min) 15		

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

Splits and Phases: 5: Brant Street & Fairview Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	261	958	348	271	1798	540	201	1010	240	287	852	532
v/c Ratio	1.37	0.75	0.51	0.87	1.24	0.72	1.08	1.08	0.46	1.34	0.86	0.98
Control Delay	222.6	38.5	14.0	50.1	147.7	25.1	118.3	94.5	13.6	203.5	33.0	45.6
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	222.6	38.5	14.0	50.1	147.7	25.1	118.3	94.5	13.6	203.5	33.0	45.6
Queue Length 50th (m)	~69.5	109.7	23.9	40.4	~291.6	73.4	~37.5	~146.8	11.7	~70.5	112.7	105.7
Queue Length 95th (m)	#124.5	135.7	53.0	#87.5	#336.1	118.5	#87.6	#189.2	35.8	m#123.6	#140.2	#174.1
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	191	1270	684	318	1447	750	186	938	518	214	987	542
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	1.37	0.75	0.51	0.85	1.24	0.72	1.08	1.08	0.46	1.34	0.86	0.98

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	881	320	249	1654	497	185	929	221	264	784	489
Future Volume (vph)	240	881	320	249	1654	497	185	929	221	264	784	489
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.92	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)	1703	3539	1526	1787	3574	1573	1787	3574	1474	1770	3539	1498
Flt Permitted	0.09	1.00	1.00	0.12	1.00	1.00	0.13	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	166	3539	1526	234	3574	1573	239	3574	1474	222	3539	1498
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	261	958	348	271	1798	540	201	1010	240	287	852	532
RTOR Reduction (vph)	0	0	137	0	0	114	0	0	132	0	0	124
Lane Group Flow (vph)	261	958	211	271	1798	426	201	1010	108	287	852	408
Confl. Peds. (#/hr)	3		10	10		3	16		45	45		16
Heavy Vehicles (%)	6%	2%	3%	1%	1%	1%	1%	1%	1%	2%	2%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	52.1	43.1	43.1	61.6	48.6	48.6	39.5	31.5	31.5	43.5	33.5	33.5
Effective Green, g (s)	52.1	43.1	43.1	61.6	48.6	48.6	39.5	31.5	31.5	43.5	33.5	33.5
Actuated g/C Ratio	0.43	0.36	0.36	0.51	0.41	0.41	0.33	0.26	0.26	0.36	0.28	0.28
Clearance Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
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)	187	1271	548	307	1447	637	181	938	386	209	987	418
v/s Ratio Prot	c0.10	0.27		0.11	c0.50		0.07	0.28		c0.11	0.24	
v/s Ratio Perm	c0.50		0.14	0.35		0.27	0.29		0.07	c0.38		0.27
v/c Ratio	1.40	0.75	0.38	0.88	1.24	0.67	1.11	1.08	0.28	1.37	0.86	0.98
Uniform Delay, d1	31.7	33.8	28.6	26.4	35.7	29.1	34.7	44.2	35.2	32.2	41.1	42.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.13	0.60	0.46
Incremental Delay, d2	207.2	2.6	0.5	24.4	115.2	2.7	99.6	52.3	1.8	189.3	7.8	32.9
Delay (s)	239.0	36.4	29.0	50.8	150.9	31.8	134.3	96.6	37.0	225.8	32.4	52.6
Level of Service	F	D	C	D	F	C	F	F	D	F	C	D
Approach Delay (s)		68.5			115.9			91.9			72.1	
Approach LOS		E			F			F			E	

Intersection Summary				
HCM 2000 Control Delay	90.9	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.37			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	116.7%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Appendix G3

2034 Background Operation Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1715	241	0	957	0	0	0	0	273	0	116
Future Volume (vph)	0	1715	241	0	957	0	0	0	0	273	0	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	55.0		0.0
Storage Lanes	0		1	0		0	0		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor			0.98									
Frt			0.850									0.850
Flt Protected										0.950		
Satd. Flow (prot)	0	5036	1538	0	4988	0	0	0	0	3367	0	1615
Flt Permitted										0.950		
Satd. Flow (perm)	0	5036	1503	0	4988	0	0	0	0	3367	0	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			262									126
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		175.7			307.2			140.0			199.7	
Travel Time (s)		12.7			22.1			10.1			14.4	
Confl. Peds. (#/hr)	1		2	2		1						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	5%	4%	4%	0%	0%	0%	0%	4%	50%	0%
Adj. Flow (vph)	0	1864	262	0	1040	0	0	0	0	297	0	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1864	262	0	1040	0	0	0	0	297	0	126
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Detector Phase		2	2		6					8		8
Switch Phase												
Minimum Initial (s)		8.0	8.0		8.0					8.0		8.0
Minimum Split (s)		43.0	43.0		43.0					25.0		25.0
Total Split (s)		75.0	75.0		75.0					25.0		25.0
Total Split (%)		75.0%	75.0%		75.0%					25.0%		25.0%
Yellow Time (s)		4.0	4.0		4.0					4.0		4.0
All-Red Time (s)		3.0	3.0		3.0					3.0		3.0
Lost Time Adjust (s)		0.0	0.0		0.0					0.0		0.0
Total Lost Time (s)		7.0	7.0		7.0					7.0		7.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max		C-Max					None		None
Act Effct Green (s)		71.9	71.9		71.9					14.1		14.1
Actuated g/C Ratio		0.72	0.72		0.72					0.14		0.14
v/c Ratio		0.51	0.23		0.29					0.63		0.38
Control Delay		7.1	1.2		6.7					46.3		10.1
Queue Delay		0.0	0.0		0.0					0.0		0.0
Total Delay		7.1	1.2		6.7					46.3		10.1
LOS		A	A		A					D		B
Approach Delay		6.4			6.7						35.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A						D	
Queue Length 50th (m)		53.3	0.0		29.0					29.8		0.0
Queue Length 95th (m)		73.5	7.4		m46.0					41.9		15.6
Internal Link Dist (m)		151.7			283.2			116.0			175.7	
Turn Bay Length (m)										55.0		
Base Capacity (vph)		3622	1154		3588					606		394
Starvation Cap Reductn		0	0		0					0		0
Spillback Cap Reductn		0	0		0					0		0
Storage Cap Reductn		0	0		0					0		0
Reduced v/c Ratio		0.51	0.23		0.29					0.49		0.32

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 66 (66%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 9.9		Intersection LOS: A	
Intersection Capacity Utilization 50.1%		ICU Level of Service A	
Analysis Period (min) 15			

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

Splits and Phases: 1: Plains Road E/Fairview Street & QEW West Ramp



Lane Group	EBT	EBR	WBT	SBL	SBR
Lane Group Flow (vph)	1864	262	1040	297	126
v/c Ratio	0.51	0.23	0.29	0.63	0.38
Control Delay	7.1	1.2	6.7	46.3	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	1.2	6.7	46.3	10.1
Queue Length 50th (m)	53.3	0.0	29.0	29.8	0.0
Queue Length 95th (m)	73.5	7.4	m46.0	41.9	15.6
Internal Link Dist (m)	151.7		283.2		
Turn Bay Length (m)				55.0	
Base Capacity (vph)	3622	1154	3588	606	394
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.51	0.23	0.29	0.49	0.32

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1715	241	0	957	0	0	0	0	273	0	116
Future Volume (vph)	0	1715	241	0	957	0	0	0	0	273	0	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0					7.0		7.0
Lane Util. Factor		0.91	1.00		0.91					0.97		1.00
Frpb, ped/bikes		1.00	0.98		1.00					1.00		1.00
Flpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Frt		1.00	0.85		1.00					1.00		0.85
Flt Protected		1.00	1.00		1.00					0.95		1.00
Satd. Flow (prot)		5036	1503		4988					3367		1615
Flt Permitted		1.00	1.00		1.00					0.95		1.00
Satd. Flow (perm)		5036	1503		4988					3367		1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1864	262	0	1040	0	0	0	0	297	0	126
RTOR Reduction (vph)	0	0	74	0	0	0	0	0	0	0	0	108
Lane Group Flow (vph)	0	1864	188	0	1040	0	0	0	0	297	0	18
Confl. Peds. (#/hr)	1		2	2		1						
Heavy Vehicles (%)	0%	3%	5%	4%	4%	0%	0%	0%	0%	4%	50%	0%
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Actuated Green, G (s)		71.9	71.9		71.9					14.1		14.1
Effective Green, g (s)		71.9	71.9		71.9					14.1		14.1
Actuated g/C Ratio		0.72	0.72		0.72					0.14		0.14
Clearance Time (s)		7.0	7.0		7.0					7.0		7.0
Vehicle Extension (s)		3.0	3.0		3.0					3.0		3.0
Lane Grp Cap (vph)		3620	1080		3586					474		227
v/s Ratio Prot		c0.37			0.21							
v/s Ratio Perm			0.13							c0.09		0.01
v/c Ratio		0.51	0.17		0.29					0.63		0.08
Uniform Delay, d1		6.3	4.5		5.0					40.5		37.3
Progression Factor		1.00	1.00		1.24					1.00		1.00
Incremental Delay, d2		0.5	0.4		0.2					2.6		0.1
Delay (s)		6.8	4.9		6.3					43.1		37.5
Level of Service		A	A		A					D		D
Approach Delay (s)		6.6			6.3			0.0			41.4	
Approach LOS		A			A			A			D	

Intersection Summary					
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.53				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0		
Intersection Capacity Utilization	50.1%	ICU Level of Service	A		
Analysis Period (min)	15				

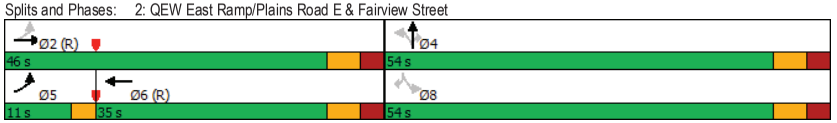
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	123	1489	0	0	933	18	250	311	874	16	0	431
Future Volume (vph)	123	1489	0	0	933	18	250	311	874	16	0	431
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		45.0	75.0		0.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.91	0.95	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00			0.99	0.99			
Frt					0.997			0.930	0.850			0.850
Flt Protected	0.950						0.950	0.998		0.950		
Satd. Flow (prot)	1752	5036	0	0	4974	0	1649	1562	1504	1805	0	1538
Flt Permitted	0.141						0.950	0.998		0.116		
Satd. Flow (perm)	260	5036	0	0	4974	0	1649	1562	1485	220	0	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					3			3	76			248
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		307.2			385.1			180.0			159.4	
Travel Time (s)		22.1			27.7			13.0			11.5	
Confl. Peds. (#/hr)	1		3	3		1			1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	0%	4%	0%	4%	2%	2%	0%	0%	5%
Adj. Flow (vph)	134	1618	0	0	1014	20	272	338	950	17	0	468
Shared Lane Traffic (%)							10%		34%			
Lane Group Flow (vph)	134	1618	0	0	1034	0	245	688	627	17	0	468
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Detector Phase	5	2			6		4	4	4	8		8
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0		8.0	8.0	8.0	8.0		8.0
Minimum Split (s)	11.0	35.0			35.0		36.0	36.0	36.0	36.0		36.0
Total Split (s)	11.0	46.0			35.0		54.0	54.0	54.0	54.0		54.0
Total Split (%)	11.0%	46.0%			35.0%		54.0%	54.0%	54.0%	54.0%		54.0%
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	0.0	3.0			3.0		3.0	3.0	3.0	3.0		3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	None	C-Max			C-Max		None	None	None	None		None
Act Effct Green (s)	43.9	39.9			28.9		46.1	46.1	46.1	46.1		46.1
Actuated g/C Ratio	0.44	0.40			0.29		0.46	0.46	0.46	0.46		0.46
v/c Ratio	0.58	0.81			0.72		0.32	0.95	0.86	0.17		0.56
Control Delay	26.0	25.4			35.5		18.2	50.9	35.0	20.4		11.2
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Delay	26.0	25.4			35.5		18.2	50.9	35.0	20.4		11.2
LOS	C	C			D		B	D	D	C		B
Approach Delay		25.4			35.5			39.4			11.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			D			D			B	
Queue Length 50th (m)	11.3	111.6			69.8		31.6	140.5	103.1	1.9		28.3
Queue Length 95th (m)	24.5	121.9			86.3		50.5	#227.9	#178.8	7.1		58.2
Internal Link Dist (m)		283.2			361.1			156.0			135.4	
Turn Bay Length (m)	30.0								45.0	75.0		
Base Capacity (vph)	233	2008			1438		775	735	738	103		854
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	0.58	0.81			0.72		0.32	0.94	0.85	0.17		0.55

Intersection Summary		
Area Type:	Other	
Cycle Length: 100		
Actuated Cycle Length: 100		
Offset: 96 (96%), Referenced to phase 2:EBTL and 6:WBT, Start of Green		
Natural Cycle: 85		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.95		
Intersection Signal Delay: 30.7	Intersection LOS: C	
Intersection Capacity Utilization 91.6%	ICU Level of Service F	
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		

Splits and Phases: 2: QEW East Ramp/Plains Road E & Fairview Street



Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	134	1618	1034	245	688	627	17	468
v/c Ratio	0.58	0.81	0.72	0.32	0.95	0.86	0.17	0.56
Control Delay	26.0	25.4	35.5	18.2	50.9	35.0	20.4	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	25.4	35.5	18.2	50.9	35.0	20.4	11.2
Queue Length 50th (m)	11.3	111.6	69.8	31.6	140.5	103.1	1.9	28.3
Queue Length 95th (m)	24.5	121.9	86.3	50.5	#227.9	#178.8	7.1	58.2
Internal Link Dist (m)		283.2	361.1		156.0			
Turn Bay Length (m)	30.0					45.0	75.0	
Base Capacity (vph)	233	2008	1438	775	735	738	103	854
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	0.58	0.81	0.72	0.32	0.94	0.85	0.17	0.55

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	123	1489	0	0	933	18	250	311	874	16	0	431
Future Volume (vph)	123	1489	0	0	933	18	250	311	874	16	0	431
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lane Util. Factor	1.00	0.91			0.91		0.95	0.91	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	0.99	0.99	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			1.00		1.00	0.93	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1752	5036			4975		1649	1562	1485	1805		1538
Flt Permitted	0.14	1.00			1.00		0.95	1.00	1.00	0.12		1.00
Satd. Flow (perm)	260	5036			4975		1649	1562	1485	219		1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	1618	0	0	1014	20	272	338	950	17	0	468
RTOR Reduction (vph)	0	0	0	0	2	0	0	2	41	0	0	134
Lane Group Flow (vph)	134	1618	0	0	1032	0	245	686	586	17	0	334
Confl. Peds. (#/hr)	1		3	3		1			1	1		
Heavy Vehicles (%)	3%	3%	3%	0%	4%	0%	4%	2%	2%	0%	0%	5%
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Actuated Green, G (s)	39.9	39.9			28.9		46.1	46.1	46.1	46.1		46.1
Effective Green, g (s)	39.9	39.9			28.9		46.1	46.1	46.1	46.1		46.1
Actuated g/C Ratio	0.40	0.40			0.29		0.46	0.46	0.46	0.46		0.46
Clearance Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		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)	223	2009			1437		760	720	684	100		709
v/s Ratio Prot	0.05	c0.32			0.21							
v/s Ratio Perm	0.19						0.15	0.44	0.39	0.08		0.22
v/c Ratio	0.60	0.81			0.72		0.32	0.95	0.86	0.17		0.47
Uniform Delay, d1	21.1	26.6			31.9		17.1	25.9	24.0	15.8		18.6
Progression Factor	0.97	0.82			1.00		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	3.9	3.1			3.1		0.2	22.6	10.3	0.8		0.5
Delay (s)	24.5	24.9			35.0		17.3	48.5	34.3	16.6		19.1
Level of Service	C	C			D		B	D	C	B		B
Approach Delay (s)		24.9			35.0			37.9			19.0	
Approach LOS		C			D			D			B	

Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	91.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	491	6	317	437	9	649
Future Volume (vph)	491	6	317	437	9	649
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	55.0		0.0	0.0
Storage Lanes		0	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	0.97	1.00	1.00	1.00
Ped Bike Factor	1.00		0.99			0.99
Frt	0.998					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3415	0	3303	1712	1805	1568
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3415	0	3281	1712	1805	1547
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	1					21
Link Speed (k/h)	50			60	50	
Link Distance (m)	207.1			887.5	183.4	
Travel Time (s)	14.9			53.3	13.2	
Confl. Peds. (#/hr)		7	7			1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	40%	6%	11%	0%	3%
Adj. Flow (vph)	534	7	345	475	10	705
Shared Lane Traffic (%)						
Lane Group Flow (vph)	541	0	345	475	10	705
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Detector Phase	3		4	4	2	4
Switch Phase						
Minimum Initial (s)	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	17.0		27.0	27.0	18.0	27.0
Total Split (s)	23.0		44.0	44.0	18.0	44.0
Total Split (%)	27.1%		51.8%	51.8%	21.2%	51.8%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None		C-Max	C-Max	Max	C-Max
Act Effct Green (s)	15.7		38.0	38.0	11.3	50.3
Actuated g/C Ratio	0.18		0.45	0.45	0.13	0.59
v/c Ratio	0.86		0.23	0.62	0.04	0.75
Control Delay	48.5		15.0	22.4	33.0	17.3
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	48.5		15.0	22.4	33.0	17.3
LOS	D		B	C	C	B
Approach Delay	48.5			19.3	17.5	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	D			B	B	
Queue Length 50th (m)	47.2		18.0	59.9	1.5	63.1
Queue Length 95th (m)	#74.0		27.0	92.5	6.2	102.2
Internal Link Dist (m)	183.1			863.5	159.4	
Turn Bay Length (m)			55.0			
Base Capacity (vph)	643		1476	765	240	934
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.84		0.23	0.62	0.04	0.75

Intersection Summary			
Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 85			
Offset: 27 (32%), Referenced to phase 4:WBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 26.3		Intersection LOS: C	
Intersection Capacity Utilization 64.9%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Maple Avenue & Plains Road E



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	541	345	475	10	705
v/c Ratio	0.86	0.23	0.62	0.04	0.75
Control Delay	48.5	15.0	22.4	33.0	17.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	15.0	22.4	33.0	17.3
Queue Length 50th (m)	47.2	18.0	59.9	1.5	63.1
Queue Length 95th (m)	#74.0	27.0	92.5	6.2	102.2
Internal Link Dist (m)	183.1		863.5	159.4	
Turn Bay Length (m)		55.0			
Base Capacity (vph)	643	1476	765	240	934
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.84	0.23	0.62	0.04	0.75

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	491	6	317	437	9	649
Future Volume (vph)	491	6	317	437	9	649
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		6.0	6.0	7.0	6.0
Lane Util. Factor	0.95		0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3416		3303	1712	1805	1563
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3416		3303	1712	1805	1563
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	534	7	345	475	10	705
RTOR Reduction (vph)	1	0	0	0	0	9
Lane Group Flow (vph)	540	0	345	475	10	696
Confl. Peds. (#/hr)		7	7			1
Heavy Vehicles (%)	5%	40%	6%	11%	0%	3%
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Actuated Green, G (s)	15.7		38.0	38.0	11.3	49.3
Effective Green, g (s)	15.7		38.0	38.0	11.3	49.3
Actuated g/C Ratio	0.18		0.45	0.45	0.13	0.58
Clearance Time (s)	7.0		6.0	6.0	7.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	630		1476	765	239	906
v/s Ratio Prot			0.10			c0.34
v/s Ratio Perm	c0.16			0.28	0.01	0.10
v/c Ratio	0.86		0.23	0.62	0.04	0.77
Uniform Delay, d1	33.6		14.5	18.0	32.1	13.5
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	11.1		0.4	3.8	0.3	6.2
Delay (s)	44.7		14.9	21.8	32.5	19.7
Level of Service	D		B	C	C	B
Approach Delay (s)	44.7			18.9	19.9	
Approach LOS	D			B	B	

Intersection Summary			
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

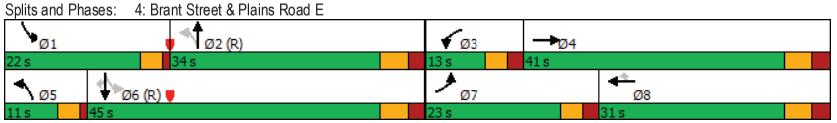
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	525	561	52	92	167	92	44	969	316	358	1214	538
Future Volume (vph)	525	561	52	92	167	92	44	969	316	358	1214	538
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	50.0		75.0	50.0		0.0	40.0		30.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.99	1.00		1.00		0.98	1.00	0.99				0.97
Frt		0.987				0.850		0.963				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	1839	0	1597	3252	1404	1641	4751	0	1719	5085	1538
Flt Permitted	0.950			0.950			0.146			0.125		
Satd. Flow (perm)	3373	1839	0	1593	3252	1374	252	4751	0	226	5085	1498
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				208		72				291
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		887.5			190.4			463.4			229.3	
Travel Time (s)		53.3			11.4			27.8			13.8	
Confl. Peds. (#/hr)	7		5	5		7	11		7	7		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	0%	13%	11%	15%	10%	3%	8%	5%	2%	5%
Adj. Flow (vph)	571	610	57	100	182	100	48	1053	343	389	1320	585
Shared Lane Traffic (%)												
Lane Group Flow (vph)	571	667	0	100	182	100	48	1396	0	389	1320	585
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Detector Phase	7	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	7.0	8.0		7.0	8.0	8.0
Minimum Split (s)	13.0	31.3		13.0	29.3	29.3	11.0	31.0		11.0	31.0	31.0
Total Split (s)	23.0	41.0		13.0	31.0	31.0	11.0	34.0		22.0	45.0	45.0
Total Split (%)	20.9%	37.3%		11.8%	28.2%	28.2%	10.0%	30.9%		20.0%	40.9%	40.9%
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.7		3.0	3.7	3.7
All-Red Time (s)	2.0	2.6		2.0	2.6	2.6	1.0	2.3		1.0	2.3	2.3
Lost Time Adjust (s)	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	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	18.0	34.7		8.0	24.7	24.7	37.0	28.0		52.0	41.2	41.2
Actuated g/C Ratio	0.16	0.32		0.07	0.22	0.22	0.34	0.25		0.47	0.37	0.37
v/c Ratio	1.03	1.15		0.86	0.25	0.21	0.28	1.11		1.11	0.69	0.79
Control Delay	90.9	119.9		104.3	36.1	1.0	19.4	80.1		110.1	32.0	24.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	90.9	119.9		104.3	36.1	1.0	19.4	80.1		110.1	32.0	24.4
LOS	F	F		F	D	A	B	F		F	C	C
Approach Delay		106.5			44.8			78.1			43.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			D			E			D	
Queue Length 50th (m)	~71.1	~177.1		22.8	17.8	0.0	2.7	~126.8		~83.9	94.2	63.4
Queue Length 95th (m)	#106.3	#250.1		#55.1	28.2	0.0	m3.8	m#134.2		#145.8	112.0	#123.3
Internal Link Dist (m)		863.5			166.4			439.4			205.3	
Turn Bay Length (m)	55.0			50.0		75.0	50.0			40.0		30.0
Base Capacity (vph)	556	582		116	730	469	173	1263		351	1904	742
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.03	1.15		0.86	0.25	0.21	0.28	1.11		1.11	0.69	0.79

Intersection Summary		
Area Type:	Other	
Cycle Length: 110		
Actuated Cycle Length: 110		
Offset: 40 (36%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 140		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.15		
Intersection Signal Delay: 67.4	Intersection LOS: E	
Intersection Capacity Utilization 102.9%	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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Brant Street & Plains Road E



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	571	667	100	182	100	48	1396	389	1320	585
v/c Ratio	1.03	1.15	0.86	0.25	0.21	0.28	1.11	1.11	0.69	0.79
Control Delay	90.9	119.9	104.3	36.1	1.0	19.4	80.1	110.1	32.0	24.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.9	119.9	104.3	36.1	1.0	19.4	80.1	110.1	32.0	24.4
Queue Length 50th (m)	~71.1	~177.1	22.8	17.8	0.0	2.7	~126.8	~83.9	94.2	63.4
Queue Length 95th (m)	#106.3	#250.1	#55.1	28.2	0.0	m3.8	m#134.2	#145.8	112.0	#123.3
Internal Link Dist (m)		863.5		166.4			439.4		205.3	
Turn Bay Length (m)	55.0		50.0		75.0	50.0		40.0		30.0
Base Capacity (vph)	556	582	116	730	469	173	1263	351	1904	742
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	1.15	0.86	0.25	0.21	0.28	1.11	1.11	0.69	0.79

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	525	561	52	92	167	92	44	969	316	358	1214	538
Future Volume (vph)	525	561	52	92	167	92	44	969	316	358	1214	538
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	1.00		1.00	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	0.99		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
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3400	1839		1597	3252	1374	1641	4752		1719	5085	1498
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.15	1.00		0.12	1.00	1.00
Satd. Flow (perm)	3400	1839		1597	3252	1374	252	4752		226	5085	1498
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	571	610	57	100	182	100	48	1053	343	389	1320	585
RTOR Reduction (vph)	0	3	0	0	0	78	0	54	0	0	0	184
Lane Group Flow (vph)	571	664	0	100	182	22	48	1342	0	389	1320	401
Confl. Peds. (#/hr)	7		5	5		7	11		7	7		11
Heavy Vehicles (%)	3%	2%	0%	13%	11%	15%	10%	3%	8%	5%	2%	5%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Actuated Green, G (s)	18.0	34.7		8.0	24.7	24.7	33.6	28.0		50.0	40.4	40.4
Effective Green, g (s)	18.0	34.7		8.0	24.7	24.7	33.6	28.0		50.0	40.4	40.4
Actuated g/C Ratio	0.16	0.32		0.07	0.22	0.22	0.31	0.25		0.45	0.37	0.37
Clearance Time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	556	580		116	730	308	147	1209		347	1867	550
v/s Ratio Prot	c0.17	c0.36		0.06	0.06		0.02	0.28		c0.18	0.26	
v/s Ratio Perm						0.02	0.08			c0.33		0.27
v/c Ratio	1.03	1.15		0.86	0.25	0.07	0.33	1.11		1.12	0.71	0.73
Uniform Delay, d1	46.0	37.6		50.5	35.0	33.6	27.6	41.0		32.5	29.7	30.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.02	0.69		1.00	1.00	1.00
Incremental Delay, d2	45.2	84.3		44.0	0.2	0.1	0.5	55.0		85.2	2.3	8.2
Delay (s)	91.2	122.0		94.5	35.2	33.7	28.6	83.3		117.7	32.0	38.3
Level of Service	F	F		F	D	C	C	F		F	C	D
Approach Delay (s)		107.8			50.3			81.4			48.2	
Approach LOS		F			D			F			D	

Intersection Summary					
HCM 2000 Control Delay	71.1	HCM 2000 Level of Service	E		
HCM 2000 Volume to Capacity ratio	1.18				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.3		
Intersection Capacity Utilization	102.9%	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)	420	1321	313	157	419	189	242	815	340	286	892	188
Future Volume (vph)	420	1321	313	157	419	189	242	815	340	286	892	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		170.0	60.0		0.0	75.0		70.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.99			0.98	1.00		0.96			0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3539	1568	1703	3438	1538	1787	3505	1599	1787	3505	1346
Flt Permitted	0.335			0.142			0.151			0.131		
Satd. Flow (perm)	593	3539	1547	255	3438	1507	283	3505	1535	246	3505	1290
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			257			205			177			199
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		261.1			251.5			231.2			463.4	
Travel Time (s)		15.7			15.1			16.6			27.8	
Confl. Peds. (#/hr)	6		1	1		6	22		21	21		22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	2%	3%	6%	5%	5%	1%	3%	1%	1%	3%	20%
Adj. Flow (vph)	457	1436	340	171	455	205	263	886	370	311	970	204
Shared Lane Traffic (%)												
Lane Group Flow (vph)	457	1436	340	171	455	205	263	886	370	311	970	204
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		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	31.4	31.4	12.0	31.4	31.4	12.0	31.5	31.5	12.0	31.5	31.5
Total Split (s)	26.0	48.0	48.0	12.0	34.0	34.0	13.0	33.0	33.0	17.0	37.0	37.0
Total Split (%)	23.6%	43.6%	43.6%	10.9%	30.9%	30.9%	11.8%	30.0%	30.0%	15.5%	33.6%	33.6%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
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)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	56.0	41.6	41.6	38.5	28.1	28.1	38.0	26.5	26.5	46.0	30.5	30.5
Actuated g/C Ratio	0.51	0.38	0.38	0.35	0.26	0.26	0.35	0.24	0.24	0.42	0.28	0.28
v/c Ratio	0.89	1.07	0.46	0.88	0.52	0.38	1.20	1.05	0.73	1.10	1.00	0.41
Control Delay	39.9	80.5	8.7	65.3	37.8	6.8	149.3	85.8	29.4	102.0	68.6	22.8
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	39.9	80.5	8.7	65.3	37.8	6.8	149.3	85.8	29.4	102.0	68.6	22.8
LOS	D	F	A	E	D	A	F	F	C	F	E	C
Approach Delay		61.3			35.9			83.1			69.3	

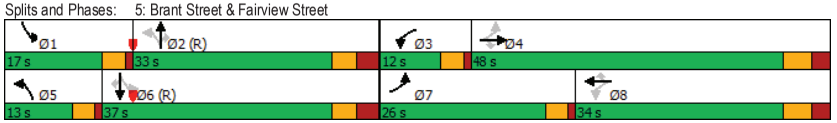
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			D			F			E	
Queue Length 50th (m)	66.9	~190.2	12.2	21.5	46.8	0.0	~53.3	~115.0	40.7	~76.8	124.0	29.5
Queue Length 95th (m)	#111.2	#234.3	35.9	#63.0	63.6	18.4	#107.4	#155.4	77.8	m#115.2	m#164.2	m48.2
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	520	1338	744	194	876	536	220	844	504	284	971	501
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	0.88	1.07	0.46	0.88	0.52	0.38	1.20	1.05	0.73	1.10	1.00	0.41

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 107 (97%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.20
Intersection Signal Delay: 65.2 Intersection LOS: E
Intersection Capacity Utilization 101.0% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Brant Street & Fairview Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	457	1436	340	171	455	205	263	886	370	311	970	204
v/c Ratio	0.89	1.07	0.46	0.88	0.52	0.38	1.20	1.05	0.73	1.10	1.00	0.41
Control Delay	39.9	80.5	8.7	65.3	37.8	6.8	149.3	85.8	29.4	102.0	68.6	22.8
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	39.9	80.5	8.7	65.3	37.8	6.8	149.3	85.8	29.4	102.0	68.6	22.8
Queue Length 50th (m)	66.9	~190.2	12.2	21.5	46.8	0.0	~53.3	~115.0	40.7	~76.8	124.0	29.5
Queue Length 95th (m)	#111.2	#234.3	35.9	#63.0	63.6	18.4	#107.4	#155.4	77.8	m#115.2	m#164.2	m48.2
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	520	1338	744	194	876	536	220	844	504	284	971	501
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	0.88	1.07	0.46	0.88	0.52	0.38	1.20	1.05	0.73	1.10	1.00	0.41

Intersection Summary

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

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	420	1321	313	157	419	189	242	815	340	286	892	188
Future Volume (vph)	420	1321	313	157	419	189	242	815	340	286	892	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	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)	1685	3539	1547	1703	3438	1507	1786	3505	1535	1787	3505	1290
Flt Permitted	0.33	1.00	1.00	0.14	1.00	1.00	0.15	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)	593	3539	1547	255	3438	1507	284	3505	1535	247	3505	1290
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	457	1436	340	171	455	205	263	886	370	311	970	204
RTOR Reduction (vph)	0	0	160	0	0	153	0	0	134	0	0	144
Lane Group Flow (vph)	457	1436	180	171	455	52	263	886	236	311	970	60
Confl. Peds. (#/hr)	6		1	1		6	22		21	21		22
Heavy Vehicles (%)	7%	2%	3%	6%	5%	5%	1%	3%	1%	1%	3%	20%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	53.6	41.6	41.6	36.1	28.1	28.1	35.5	26.5	26.5	43.5	30.5	30.5
Effective Green, g (s)	53.6	41.6	41.6	36.1	28.1	28.1	35.5	26.5	26.5	43.5	30.5	30.5
Actuated g/C Ratio	0.49	0.38	0.38	0.33	0.26	0.26	0.32	0.24	0.24	0.40	0.28	0.28
Clearance Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
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)	502	1338	585	188	878	384	214	844	369	279	971	357
v/s Ratio Prot	c0.18	c0.41		0.07	0.13		0.10	0.25		c0.13	0.28	
v/s Ratio Perm	0.27		0.12	0.23		0.03	c0.30		0.15	0.31		0.05
v/c Ratio	0.91	1.07	0.31	0.91	0.52	0.14	1.23	1.05	0.64	1.11	1.00	0.17
Uniform Delay, d1	20.8	34.2	24.1	31.1	35.1	31.6	32.9	41.8	37.5	30.1	39.7	30.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.10	1.13	4.23
Incremental Delay, d2	20.6	46.8	0.3	40.5	0.5	0.2	137.0	44.9	8.2	79.4	23.6	0.7
Delay (s)	41.5	81.0	24.4	71.6	35.7	31.8	169.9	86.6	45.7	112.6	68.5	128.1
Level of Service	D	F	C	E	D	C	F	F	D	F	E	F
Approach Delay (s)		64.3			42.1			91.1			85.9	
Approach LOS		E			D			F			F	

Intersection Summary				
HCM 2000 Control Delay	73.2	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.13			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	101.0%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

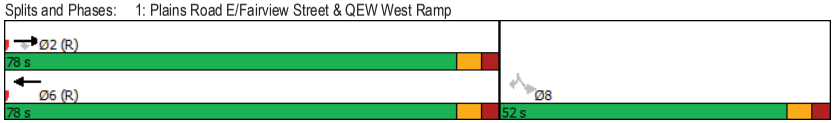
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1498	470	0	2400	0	0	0	0	692	0	406
Future Volume (vph)	0	1498	470	0	2400	0	0	0	0	692	0	406
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	55.0		0.0
Storage Lanes	0		1	0		0	0		0	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor			0.95									0.98
Frt			0.850									0.850
Flt Protected										0.950		
Satd. Flow (prot)	0	5136	1583	0	5085	0	0	0	0	3467	0	1615
Flt Permitted										0.950		
Satd. Flow (perm)	0	5136	1507	0	5085	0	0	0	0	3467	0	1585
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			511									34
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		175.7			307.2			140.0			199.7	
Travel Time (s)		12.7			22.1			10.1			14.4	
Confl. Peds. (#/hr)	4		15	15		4	3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	2%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Adj. Flow (vph)	0	1628	511	0	2609	0	0	0	0	752	0	441
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1628	511	0	2609	0	0	0	0	752	0	441
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Detector Phase		2	2		6					8		8
Switch Phase												
Minimum Initial (s)		8.0	8.0		8.0					8.0		8.0
Minimum Split (s)		43.0	43.0		43.0					25.0		25.0
Total Split (s)		78.0	78.0		78.0					52.0		52.0
Total Split (%)		60.0%	60.0%		60.0%					40.0%		40.0%
Yellow Time (s)		4.0	4.0		4.0					4.0		4.0
All-Red Time (s)		3.0	3.0		3.0					3.0		3.0
Lost Time Adjust (s)		0.0	0.0		0.0					0.0		0.0
Total Lost Time (s)		7.0	7.0		7.0					7.0		7.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max		C-Max					None		None
Act Effct Green (s)		76.8	76.8		76.8					39.2		39.2
Actuated g/C Ratio		0.59	0.59		0.59					0.30		0.30
v/c Ratio		0.54	0.46		0.87					0.72		0.88
Control Delay		17.5	2.7		10.5					44.2		58.7
Queue Delay		0.0	0.0		0.0					0.0		0.0
Total Delay		17.5	2.7		10.5					44.2		58.7
LOS		B	A		B					D		E
Approach Delay		14.0			10.5						49.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			B						D	
Queue Length 50th (m)		95.2	0.0		48.2					91.2		103.3
Queue Length 95th (m)		117.5	16.1		m34.2					108.4		142.6
Internal Link Dist (m)		151.7			283.2			116.0			175.7	
Turn Bay Length (m)										55.0		
Base Capacity (vph)		3034	1099		3004					1200		570
Starvation Cap Reductn		0	0		0					0		0
Spillback Cap Reductn		0	0		0					0		0
Storage Cap Reductn		0	0		0					0		0
Reduced v/c Ratio		0.54	0.46		0.87					0.63		0.77

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 34 (26%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 19.6		Intersection LOS: B	
Intersection Capacity Utilization 83.5%		ICU Level of Service E	
Analysis Period (min) 15			

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

Splits and Phases: 1: Plains Road E/Fairview Street & QEW West Ramp



Lane Group	EBT	EBR	WBT	SBL	SBR
Lane Group Flow (vph)	1628	511	2609	752	441
v/c Ratio	0.54	0.46	0.87	0.72	0.88
Control Delay	17.5	2.7	10.5	44.2	58.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.5	2.7	10.5	44.2	58.7
Queue Length 50th (m)	95.2	0.0	48.2	91.2	103.3
Queue Length 95th (m)	117.5	16.1	m34.2	108.4	142.6
Internal Link Dist (m)	151.7		283.2		
Turn Bay Length (m)				55.0	
Base Capacity (vph)	3034	1099	3004	1200	570
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.54	0.46	0.87	0.63	0.77

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1498	470	0	2400	0	0	0	0	692	0	406
Future Volume (vph)	0	1498	470	0	2400	0	0	0	0	692	0	406
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0					7.0		7.0
Lane Util. Factor		0.91	1.00		0.91					0.97		1.00
Frpb, ped/bikes		1.00	0.95		1.00					1.00		0.98
Flpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Frt		1.00	0.85		1.00					1.00		0.85
Flt Protected		1.00	1.00		1.00					0.95		1.00
Satd. Flow (prot)		5136	1507		5085					3467		1585
Flt Permitted		1.00	1.00		1.00					0.95		1.00
Satd. Flow (perm)		5136	1507		5085					3467		1585
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1628	511	0	2609	0	0	0	0	752	0	441
RTOR Reduction (vph)	0	0	209	0	0	0	0	0	0	0	0	24
Lane Group Flow (vph)	0	1628	302	0	2609	0	0	0	0	752	0	417
Confl. Peds. (#/hr)	4		15	15		4	3					3
Heavy Vehicles (%)	0%	1%	2%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Actuated Green, G (s)		76.8	76.8		76.8					39.2		39.2
Effective Green, g (s)		76.8	76.8		76.8					39.2		39.2
Actuated g/C Ratio		0.59	0.59		0.59					0.30		0.30
Clearance Time (s)		7.0	7.0		7.0					7.0		7.0
Vehicle Extension (s)		3.0	3.0		3.0					3.0		3.0
Lane Grp Cap (vph)		3034	890		3004					1045		477
v/s Ratio Prot		0.32			c0.51							
v/s Ratio Perm			0.20							0.22		c0.26
v/c Ratio		0.54	0.34		0.87					0.72		0.87
Uniform Delay, d1		15.9	13.6		22.4					40.5		43.1
Progression Factor		1.00	1.00		0.40					1.00		1.00
Incremental Delay, d2		0.7	1.0		0.4					2.4		16.2
Delay (s)		16.6	14.6		9.4					42.9		59.3
Level of Service		B	B		A					D		E
Approach Delay (s)		16.2			9.4			0.0			49.0	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	83.5%	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)	123	1807	0	0	3178	31	193	225	533	8	0	569
Future Volume (vph)	123	1807	0	0	3178	31	193	225	533	8	0	569
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		45.0	75.0		0.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.91	0.95	1.00	1.00	1.00
Ped Bike Factor					1.00							
Frt					0.999			0.941	0.850			0.850
Flt Protected	0.950						0.950	0.998		0.950		
Satd. Flow (prot)	1770	5136	0	0	4800	0	1698	1582	1519	1805	0	1495
Flt Permitted	0.062						0.950	0.998		0.215		
Satd. Flow (perm)	115	5136	0	0	4800	0	1698	1582	1519	408	0	1495
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					1			8	59			127
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		307.2			385.1			180.0			159.4	
Travel Time (s)		22.1			27.7			13.0			11.5	
Confl. Peds. (#/hr)	2		7	7		2						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	1%	0%	0%	8%	0%	1%	4%	1%	0%	0%	8%
Adj. Flow (vph)	134	1964	0	0	3454	34	210	245	579	9	0	618
Shared Lane Traffic (%)							10%		30%			
Lane Group Flow (vph)	134	1964	0	0	3488	0	189	440	405	9	0	618
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Detector Phase	5	2			6		4	4	4	8		8
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0		8.0	8.0	8.0	8.0		8.0
Minimum Split (s)	11.0	35.0			35.0		36.0	36.0	36.0	36.0		36.0
Total Split (s)	11.0	79.0			68.0		51.0	51.0	51.0	51.0		51.0
Total Split (%)	8.5%	60.8%			52.3%		39.2%	39.2%	39.2%	39.2%		39.2%
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	0.0	3.0			3.0		3.0	3.0	3.0	3.0		3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	None	C-Max			C-Max		None	None	None	None		None
Act Effct Green (s)	76.0	72.0			61.0		44.0	44.0	44.0	44.0		44.0
Actuated g/C Ratio	0.58	0.55			0.47		0.34	0.34	0.34	0.34		0.34
v/c Ratio	0.79	0.69			1.55		0.33	0.81	0.73	0.07		1.05
Control Delay	55.6	18.3			277.3		34.0	52.1	41.1	31.0		83.5
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Delay	55.6	18.3			277.3		34.0	52.1	41.1	31.0		83.5
LOS	E	B			F		C	D	D	C		F
Approach Delay		20.7			277.3			44.5			82.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			F			D			F	
Queue Length 50th (m)	19.2	101.1			~488.5		39.7	116.8	87.1	1.6		~156.9
Queue Length 95th (m)	#53.6	147.2			#511.6		61.8	#176.8	130.4	6.2		#232.0
Internal Link Dist (m)		283.2			361.1			156.0			135.4	
Turn Bay Length (m)	30.0								45.0	75.0		
Base Capacity (vph)	169	2844			2252		574	540	553	138		590
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	0.79	0.69			1.55		0.33	0.81	0.73	0.07		1.05

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 16 (12%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.55			
Intersection Signal Delay: 153.0		Intersection LOS: F	
Intersection Capacity Utilization 131.5%		ICU Level of Service H	
Analysis Period (min) 15			

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

Splits and Phases: 2: QEW East Ramp/Plains Road E & Fairview Street



Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	134	1964	3488	189	440	405	9	618
v/c Ratio	0.79	0.69	1.55	0.33	0.81	0.73	0.07	1.05
Control Delay	55.6	18.3	277.3	34.0	52.1	41.1	31.0	83.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.6	18.3	277.3	34.0	52.1	41.1	31.0	83.5
Queue Length 50th (m)	19.2	101.1	~488.5	39.7	116.8	87.1	1.6	~156.9
Queue Length 95th (m)	#53.6	147.2	#511.6	61.8	#176.8	130.4	6.2	#232.0
Internal Link Dist (m)		283.2	361.1		156.0			
Turn Bay Length (m)	30.0					45.0	75.0	
Base Capacity (vph)	169	2844	2252	574	540	553	138	590
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	0.79	0.69	1.55	0.33	0.81	0.73	0.07	1.05

Intersection Summary

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	123	1807	0	0	3178	31	193	225	533	8	0	569
Future Volume (vph)	123	1807	0	0	3178	31	193	225	533	8	0	569
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lane Util. Factor	1.00	0.91			0.91		0.95	0.91	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			1.00		1.00	0.94	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1770	5136			4798		1698	1580	1519	1805		1495
Flt Permitted	0.06	1.00			1.00		0.95	1.00	1.00	0.22		1.00
Satd. Flow (perm)	116	5136			4798		1698	1580	1519	409		1495
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	1964	0	0	3454	34	210	245	579	9	0	618
RTOR Reduction (vph)	0	0	0	0	1	0	0	5	39	0	0	84
Lane Group Flow (vph)	134	1964	0	0	3487	0	189	435	366	9	0	534
Confl. Peds. (#/hr)	2		7	7		2						
Heavy Vehicles (%)	2%	1%	0%	0%	8%	0%	1%	4%	1%	0%	0%	8%
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Actuated Green, G (s)	72.0	72.0			61.0		44.0	44.0	44.0	44.0		44.0
Effective Green, g (s)	72.0	72.0			61.0		44.0	44.0	44.0	44.0		44.0
Actuated g/C Ratio	0.55	0.55			0.47		0.34	0.34	0.34	0.34		0.34
Clearance Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		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)	166	2844			2251		574	534	514	138		506
v/s Ratio Prot	c0.05	0.38			c0.73							
v/s Ratio Perm	0.40						0.11	0.28	0.24	0.02		c0.36
v/c Ratio	0.81	0.69			1.55		0.33	0.81	0.71	0.07		1.06
Uniform Delay, d1	33.0	21.0			34.5		32.0	39.3	37.5	29.1		43.0
Progression Factor	1.24	0.81			1.00		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	20.7	1.2			249.4		0.3	9.2	4.6	0.2		55.4
Delay (s)	61.5	18.1			283.9		32.4	48.5	42.1	29.3		98.4
Level of Service	E	B			F		C	D	D	C		F
Approach Delay (s)		20.9			283.9			43.1			97.4	
Approach LOS		C			F			D			F	

Intersection Summary			
HCM 2000 Control Delay	157.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	131.5%	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)	421	40	1234	557	19	773
Future Volume (vph)	421	40	1234	557	19	773
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	55.0		0.0	0.0
Storage Lanes		0	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	0.97	1.00	1.00	1.00
Ped Bike Factor	1.00		1.00			
Frt	0.987					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3423	0	3433	1881	1687	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3423	0	3418	1881	1687	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	9					24
Link Speed (k/h)	50			60	50	
Link Distance (m)	207.1			887.5	183.4	
Travel Time (s)	14.9			53.3	13.2	
Confl. Peds. (#/hr)		4	4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	2%	1%	7%	2%
Adj. Flow (vph)	458	43	1341	605	21	840
Shared Lane Traffic (%)						
Lane Group Flow (vph)	501	0	1341	605	21	840
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Detector Phase	3		4	4	2	4
Switch Phase						
Minimum Initial (s)	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	17.0		27.0	27.0	18.0	27.0
Total Split (s)	22.0		50.0	50.0	18.0	50.0
Total Split (%)	24.4%		55.6%	55.6%	20.0%	55.6%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None		C-Max	C-Max	Max	C-Max
Act Effct Green (s)	14.9		44.0	44.0	11.1	62.1
Actuated g/C Ratio	0.17		0.49	0.49	0.12	0.69
v/c Ratio	0.87		0.80	0.66	0.10	0.76
Control Delay	53.8		23.8	21.6	36.5	14.8
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	53.8		23.8	21.6	36.5	14.8
LOS	D		C	C	D	B
Approach Delay	53.8			23.1	15.3	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	D			C	B	
Queue Length 50th (m)	46.4		100.8	79.4	3.5	84.5
Queue Length 95th (m)	#74.4		129.5	117.4	10.5	139.4
Internal Link Dist (m)	183.1			863.5	159.4	
Turn Bay Length (m)			55.0			
Base Capacity (vph)	578		1678	919	209	1100
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.87		0.80	0.66	0.10	0.76

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 4:WBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 25.7		Intersection LOS: C	
Intersection Capacity Utilization 71.6%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Maple Avenue & Plains Road E



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	501	1341	605	21	840
v/c Ratio	0.87	0.80	0.66	0.10	0.76
Control Delay	53.8	23.8	21.6	36.5	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	23.8	21.6	36.5	14.8
Queue Length 50th (m)	46.4	100.8	79.4	3.5	84.5
Queue Length 95th (m)	#74.4	129.5	117.4	10.5	139.4
Internal Link Dist (m)	183.1		863.5	159.4	
Turn Bay Length (m)		55.0			
Base Capacity (vph)	578	1678	919	209	1100
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.87	0.80	0.66	0.10	0.76

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	421	40	1234	557	19	773
Future Volume (vph)	421	40	1234	557	19	773
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		6.0	6.0	7.0	6.0
Lane Util. Factor	0.95		0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3424		3433	1881	1687	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3424		3433	1881	1687	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	458	43	1341	605	21	840
RTOR Reduction (vph)	8	0	0	0	0	9
Lane Group Flow (vph)	493	0	1341	605	21	831
Confl. Peds. (#/hr)		4	4			
Heavy Vehicles (%)	4%	3%	2%	1%	7%	2%
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Actuated Green, G (s)	14.9		44.0	44.0	11.1	55.1
Effective Green, g (s)	14.9		44.0	44.0	11.1	55.1
Actuated g/C Ratio	0.17		0.49	0.49	0.12	0.61
Clearance Time (s)	7.0		6.0	6.0	7.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	566		1678	919	208	969
v/s Ratio Prot			0.39			c0.42
v/s Ratio Perm	c0.14			0.32	0.01	0.11
v/c Ratio	0.87		0.80	0.66	0.10	0.86
Uniform Delay, d1	36.6		19.3	17.3	35.0	14.2
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	13.8		4.1	3.7	1.0	9.7
Delay (s)	50.4		23.4	21.0	36.0	23.9
Level of Service	D		C	C	D	C
Approach Delay (s)	50.4			22.6	24.2	
Approach LOS	D			C	C	

Intersection Summary

HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
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)	691	193	79	182	887	480	99	1625	74	157	1272	898
Future Volume (vph)	691	193	79	182	887	480	99	1625	74	157	1272	898
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	50.0		75.0	50.0		0.0	40.0		30.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	1.00					0.97	1.00	1.00				0.97
Frt		0.956				0.850		0.993				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3502	1754	0	1719	3539	1583	1805	5085	0	1687	5187	1599
Flt Permitted	0.950			0.950			0.104			0.102		
Satd. Flow (perm)	3484	1754	0	1719	3539	1535	197	5085	0	181	5187	1557
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17				116		6				408
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		887.5			190.4			463.4			229.3	
Travel Time (s)		53.3			11.4			27.8			13.8	
Confl. Peds. (#/hr)	12					12	10		16	16		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	5%	0%	5%	2%	2%	0%	0%	24%	7%	0%	1%
Adj. Flow (vph)	751	210	86	198	964	522	108	1766	80	171	1383	976
Shared Lane Traffic (%)												
Lane Group Flow (vph)	751	296	0	198	964	522	108	1846	0	171	1383	976
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Detector Phase	7	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	7.0	8.0		7.0	8.0	8.0
Minimum Split (s)	13.0	31.3		13.0	29.3	29.3	11.0	31.0		11.0	31.0	31.0
Total Split (s)	27.0	37.6		26.0	36.6	36.6	11.0	44.4		12.0	45.4	45.4
Total Split (%)	22.5%	31.3%		21.7%	30.5%	30.5%	9.2%	37.0%		10.0%	37.8%	37.8%
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.7		3.0	3.7	3.7
All-Red Time (s)	2.0	2.6		2.0	2.6	2.6	1.0	2.3		1.0	2.3	2.3
Lost Time Adjust (s)	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	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	22.0	34.4		17.9	30.3	30.3	47.4	38.4		49.4	39.4	39.4
Actuated g/C Ratio	0.18	0.29		0.15	0.25	0.25	0.40	0.32		0.41	0.33	0.33
v/c Ratio	1.17	0.57		0.77	1.08	1.10	0.63	1.13		0.98	0.81	1.24
Control Delay	135.6	40.5		68.9	96.6	104.9	21.4	97.3		91.4	41.5	142.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	135.6	40.5		68.9	96.6	104.9	21.4	97.3		91.4	41.5	142.1
LOS	F	D		E	F	F	C	F		F	D	F
Approach Delay		108.7			95.9			93.1			83.7	

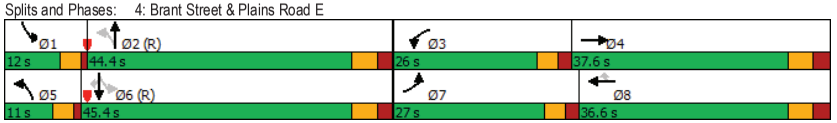
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			F			F			F	
Queue Length 50th (m)	~114.3	59.9		47.2	~140.4	~124.2	18.5	~198.8		26.3	114.5	~229.5
Queue Length 95th (m)	#153.4	92.7		73.0	#182.7	#194.0	m18.1	m#155.5		#73.1	133.8	#310.8
Internal Link Dist (m)		863.5			166.4			439.4			205.3	
Turn Bay Length (m)	55.0			50.0		75.0	50.0			40.0		30.0
Base Capacity (vph)	642	515		300	893	474	171	1631		174	1703	785
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.17	0.57		0.66	1.08	1.10	0.63	1.13		0.98	0.81	1.24

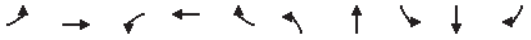
Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 45 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.24
Intersection Signal Delay: 92.7 Intersection LOS: F
Intersection Capacity Utilization 103.8% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Brant Street & Plains Road E





Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	751	296	198	964	522	108	1846	171	1383	976
v/c Ratio	1.17	0.57	0.77	1.08	1.10	0.63	1.13	0.98	0.81	1.24
Control Delay	135.6	40.5	68.9	96.6	104.9	21.4	97.3	91.4	41.5	142.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	135.6	40.5	68.9	96.6	104.9	21.4	97.3	91.4	41.5	142.1
Queue Length 50th (m)	~114.3	59.9	47.2	~140.4	~124.2	18.5	~198.8	26.3	114.5	~229.5
Queue Length 95th (m)	#153.4	92.7	73.0	#182.7	#194.0	m18.1	m#155.5	#73.1	133.8	#310.8
Internal Link Dist (m)		863.5		166.4			439.4		205.3	
Turn Bay Length (m)	55.0		50.0		75.0	50.0		40.0		30.0
Base Capacity (vph)	642	515	300	893	474	171	1631	174	1703	785
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.17	0.57	0.66	1.08	1.10	0.63	1.13	0.98	0.81	1.24

Intersection Summary

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

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

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	691	193	79	182	887	480	99	1625	74	157	1272	898
Future Volume (vph)	691	193	79	182	887	480	99	1625	74	157	1272	898
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	1.00		1.00	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00		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
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	1755		1719	3539	1535	1805	5087		1687	5187	1557
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.10	1.00		0.10	1.00	1.00
Satd. Flow (perm)	3502	1755		1719	3539	1535	198	5087		180	5187	1557
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	751	210	86	198	964	522	108	1766	80	171	1383	976
RTOR Reduction (vph)	0	12	0	0	0	87	0	4	0	0	0	274
Lane Group Flow (vph)	751	284	0	198	964	435	108	1842	0	171	1383	702
Confl. Peds. (#/hr)	12					12	10		16	16		10
Heavy Vehicles (%)	0%	5%	0%	5%	2%	2%	0%	0%	24%	7%	0%	1%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Actuated Green, G (s)	22.0	34.4		17.9	30.3	30.3	45.4	38.4		47.4	39.4	39.4
Effective Green, g (s)	22.0	34.4		17.9	30.3	30.3	45.4	38.4		47.4	39.4	39.4
Actuated g/C Ratio	0.18	0.29		0.15	0.25	0.25	0.38	0.32		0.39	0.33	0.33
Clearance Time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	642	503		256	893	387	168	1627		171	1703	511
v/s Ratio Prot	c0.21	c0.16		0.12	0.27		0.04	0.36		c0.07	0.27	
v/s Ratio Perm						c0.28	0.21			0.33		c0.45
v/c Ratio	1.17	0.56		0.77	1.08	1.12	0.64	1.13		1.00	0.81	1.37
Uniform Delay, d1	49.0	36.4		49.1	44.9	44.9	27.8	40.8		30.8	36.9	40.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.90	0.97		1.00	1.00	1.00
Incremental Delay, d2	92.4	1.5		13.5	53.9	84.1	0.8	60.3		68.8	4.3	180.2
Delay (s)	141.4	37.9		62.6	98.8	129.0	25.9	100.0		99.6	41.3	220.5
Level of Service	F	D		E	F	F	C	F		F	D	F
Approach Delay (s)		112.1			103.9			95.9			114.4	
Approach LOS		F			F			F			F	

Intersection Summary					
HCM 2000 Control Delay	106.6	HCM 2000 Level of Service		F	
HCM 2000 Volume to Capacity ratio	1.22				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		21.3	
Intersection Capacity Utilization	103.8%	ICU Level of Service		G	
Analysis Period (min)	15				

c Critical Lane Group

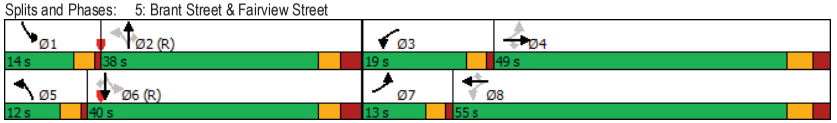
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	265	973	351	273	1827	549	202	1020	243	291	858	539
Future Volume (vph)	265	973	351	273	1827	549	202	1020	243	291	858	539
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		170.0	60.0		0.0	75.0		70.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.97			0.98	1.00		0.92			0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1703	3539	1568	1787	3574	1599	1787	3574	1599	1770	3539	1553
Flt Permitted	0.094			0.086			0.127			0.119		
Satd. Flow (perm)	168	3539	1526	162	3574	1573	238	3574	1474	222	3539	1498
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			199			187			179			169
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		261.1			251.5			231.2			463.4	
Travel Time (s)		15.7			15.1			16.6			27.8	
Confl. Peds. (#/hr)	3		10	10		3	16		45	45		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	2%	3%	1%	1%	1%	1%	1%	1%	2%	2%	4%
Adj. Flow (vph)	288	1058	382	297	1986	597	220	1109	264	316	933	586
Shared Lane Traffic (%)												
Lane Group Flow (vph)	288	1058	382	297	1986	597	220	1109	264	316	933	586
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		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	31.4	31.4	12.0	31.4	31.4	12.0	31.5	31.5	12.0	31.5	31.5
Total Split (s)	13.0	49.0	49.0	19.0	55.0	55.0	12.0	38.0	38.0	14.0	40.0	40.0
Total Split (%)	10.8%	40.8%	40.8%	15.8%	45.8%	45.8%	10.0%	31.7%	31.7%	11.7%	33.3%	33.3%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
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)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	54.0	42.6	42.6	64.0	48.6	48.6	42.0	31.5	31.5	46.0	33.5	33.5
Actuated g/C Ratio	0.45	0.36	0.36	0.53	0.40	0.40	0.35	0.26	0.26	0.38	0.28	0.28
v/c Ratio	1.52	0.84	0.57	1.03	1.37	0.80	1.18	1.18	0.51	1.48	0.95	1.09
Control Delay	282.9	43.0	18.0	92.8	202.9	30.4	151.8	132.5	16.2	259.1	40.3	74.8
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	282.9	43.0	18.0	92.8	202.9	30.4	151.8	132.5	16.2	259.1	40.3	74.8
LOS	F	D	B	F	F	C	F	F	B	F	D	E
Approach Delay		77.5			155.8			115.9			89.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			F			F			F	
Queue Length 50th (m)	~83.4	126.1	35.2	~61.0	~342.6	92.1	~47.2	~173.7	16.6	~85.8	126.7	~132.1
Queue Length 95th (m)	#140.6	154.7	67.8	#118.7	#386.8	144.9	#99.6	#216.8	43.3 m	#128.6	#163.4 m	#204.5
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	190	1256	670	289	1447	748	186	938	518	214	987	540
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	1.52	0.84	0.57	1.03	1.37	0.80	1.18	1.18	0.51	1.48	0.95	1.09

Intersection Summary		
Area Type:	Other	
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 89 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 140		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.52		
Intersection Signal Delay: 115.8	Intersection LOS: F	
Intersection Capacity Utilization 126.9%	ICU Level of Service H	
Analysis Period (min) 15		

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

Splits and Phases: 5: Brant Street & Fairview Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	288	1058	382	297	1986	597	220	1109	264	316	933	586
v/c Ratio	1.52	0.84	0.57	1.03	1.37	0.80	1.18	1.18	0.51	1.48	0.95	1.09
Control Delay	282.9	43.0	18.0	92.8	202.9	30.4	151.8	132.5	16.2	259.1	40.3	74.8
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	282.9	43.0	18.0	92.8	202.9	30.4	151.8	132.5	16.2	259.1	40.3	74.8
Queue Length 50th (m)	~83.4	126.1	35.2	~61.0	~342.6	92.1	~47.2	~173.7	16.6	~85.8	126.7	~132.1
Queue Length 95th (m)	#140.6	154.7	67.8	#118.7	#386.8	144.9	#99.6	#216.8	43.3	m#128.6	#163.4	m#204.5
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	190	1256	670	289	1447	748	186	938	518	214	987	540
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	1.52	0.84	0.57	1.03	1.37	0.80	1.18	1.18	0.51	1.48	0.95	1.09

Intersection Summary

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

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	265	973	351	273	1827	549	202	1020	243	291	858	539
Future Volume (vph)	265	973	351	273	1827	549	202	1020	243	291	858	539
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.92	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)	1703	3539	1526	1787	3574	1573	1787	3574	1474	1770	3539	1498
Flt Permitted	0.09	1.00	1.00	0.09	1.00	1.00	0.13	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	168	3539	1526	161	3574	1573	239	3574	1474	222	3539	1498
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	288	1058	382	297	1986	597	220	1109	264	316	933	586
RTOR Reduction (vph)	0	0	128	0	0	111	0	0	132	0	0	122
Lane Group Flow (vph)	288	1058	254	297	1986	486	220	1109	132	316	933	464
Confl. Peds. (#/hr)	3		10	10		3	16		45	45		16
Heavy Vehicles (%)	6%	2%	3%	1%	1%	1%	1%	1%	1%	2%	2%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	51.6	42.6	42.6	61.6	48.6	48.6	39.5	31.5	31.5	43.5	33.5	33.5
Effective Green, g (s)	51.6	42.6	42.6	61.6	48.6	48.6	39.5	31.5	31.5	43.5	33.5	33.5
Actuated g/C Ratio	0.43	0.36	0.36	0.51	0.41	0.41	0.33	0.26	0.26	0.36	0.28	0.28
Clearance Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
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)	187	1256	541	285	1447	637	181	938	386	209	987	418
v/s Ratio Prot	c0.12	0.30		c0.13	0.56		0.08	0.31		c0.13	0.26	
v/s Ratio Perm	c0.54		0.17	0.40		0.31	0.32		0.09	c0.42		0.31
v/c Ratio	1.54	0.84	0.47	1.04	1.37	0.76	1.22	1.18	0.34	1.51	0.95	1.11
Uniform Delay, d1	31.6	35.6	29.9	36.4	35.7	30.7	35.3	44.2	35.9	32.2	42.4	43.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.26	0.59	0.44
Incremental Delay, d2	267.9	5.3	0.6	64.7	172.1	5.4	136.7	93.0	2.4	246.8	13.9	70.7
Delay (s)	299.5	40.9	30.6	101.1	207.8	36.1	172.1	137.3	38.3	287.4	39.1	89.6
Level of Service	F	D	C	F	F	D	F	F	D	F	D	F
Approach Delay (s)		81.7			161.2			125.7			97.9	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM 2000 Control Delay	122.6	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.51			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	126.9%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Appendix G4

2039 Background Operation Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1894	266	0	1057	0	0	0	0	301	0	129
Future Volume (vph)	0	1894	266	0	1057	0	0	0	0	301	0	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	55.0		0.0
Storage Lanes	0		1	0		0	0		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor			0.98									
Frt			0.850									0.850
Flt Protected										0.950		
Satd. Flow (prot)	0	5036	1538	0	4988	0	0	0	0	3367	0	1615
Flt Permitted										0.950		
Satd. Flow (perm)	0	5036	1503	0	4988	0	0	0	0	3367	0	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			289									117
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		175.7			307.2			140.0			199.7	
Travel Time (s)		12.7			22.1			10.1			14.4	
Confl. Peds. (#/hr)	1		2	2		1						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	5%	4%	4%	0%	0%	0%	0%	4%	50%	0%
Adj. Flow (vph)	0	2059	289	0	1149	0	0	0	0	327	0	140
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2059	289	0	1149	0	0	0	0	327	0	140
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Detector Phase		2	2		6					8		8
Switch Phase												
Minimum Initial (s)		8.0	8.0		8.0					8.0		8.0
Minimum Split (s)		43.0	43.0		43.0					25.0		25.0
Total Split (s)		75.0	75.0		75.0					25.0		25.0
Total Split (%)		75.0%	75.0%		75.0%					25.0%		25.0%
Yellow Time (s)		4.0	4.0		4.0					4.0		4.0
All-Red Time (s)		3.0	3.0		3.0					3.0		3.0
Lost Time Adjust (s)		0.0	0.0		0.0					0.0		0.0
Total Lost Time (s)		7.0	7.0		7.0					7.0		7.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max		C-Max					None		None
Act Effct Green (s)		71.3	71.3		71.3					14.7		14.7
Actuated g/C Ratio		0.71	0.71		0.71					0.15		0.15
v/c Ratio		0.57	0.25		0.32					0.66		0.42
Control Delay		8.0	1.2		8.0					46.7		14.0
Queue Delay		0.0	0.0		0.0					0.0		0.0
Total Delay		8.0	1.2		8.0					46.7		14.0
LOS		A	A		A					D		B
Approach Delay		7.2			8.0						36.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A						D	
Queue Length 50th (m)		64.9	0.0		37.5					32.8		4.1
Queue Length 95th (m)		86.5	7.7		m53.9					45.8		20.7
Internal Link Dist (m)		151.7			283.2			116.0			175.7	
Turn Bay Length (m)										55.0		
Base Capacity (vph)		3589	1154		3555					606		386
Starvation Cap Reductn		0	0		0					0		0
Spillback Cap Reductn		0	0		0					0		0
Storage Cap Reductn		0	0		0					0		0
Reduced v/c Ratio		0.57	0.25		0.32					0.54		0.36

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 66 (66%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 10.9		Intersection LOS: B	
Intersection Capacity Utilization 54.3%		ICU Level of Service A	
Analysis Period (min) 15			

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

Splits and Phases: 1: Plains Road E/Fairview Street & QEW West Ramp



Lane Group	EBT	EBR	WBT	SBL	SBR
Lane Group Flow (vph)	2059	289	1149	327	140
v/c Ratio	0.57	0.25	0.32	0.66	0.42
Control Delay	8.0	1.2	8.0	46.7	14.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	8.0	1.2	8.0	46.7	14.0
Queue Length 50th (m)	64.9	0.0	37.5	32.8	4.1
Queue Length 95th (m)	86.5	7.7	m53.9	45.8	20.7
Internal Link Dist (m)	151.7		283.2		
Turn Bay Length (m)				55.0	
Base Capacity (vph)	3589	1154	3555	606	386
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.57	0.25	0.32	0.54	0.36

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1894	266	0	1057	0	0	0	0	301	0	129
Future Volume (vph)	0	1894	266	0	1057	0	0	0	0	301	0	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0					7.0		7.0
Lane Util. Factor		0.91	1.00		0.91					0.97		1.00
Frpb, ped/bikes		1.00	0.98		1.00					1.00		1.00
Flpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Frt		1.00	0.85		1.00					1.00		0.85
Flt Protected		1.00	1.00		1.00					0.95		1.00
Satd. Flow (prot)		5036	1503		4988					3367		1615
Flt Permitted		1.00	1.00		1.00					0.95		1.00
Satd. Flow (perm)		5036	1503		4988					3367		1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2059	289	0	1149	0	0	0	0	327	0	140
RTOR Reduction (vph)	0	0	83	0	0	0	0	0	0	0	0	100
Lane Group Flow (vph)	0	2059	206	0	1149	0	0	0	0	327	0	40
Confl. Peds. (#/hr)	1		2	2		1						
Heavy Vehicles (%)	0%	3%	5%	4%	4%	0%	0%	0%	0%	4%	50%	0%
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Actuated Green, G (s)		71.3	71.3		71.3					14.7		14.7
Effective Green, g (s)		71.3	71.3		71.3					14.7		14.7
Actuated g/C Ratio		0.71	0.71		0.71					0.15		0.15
Clearance Time (s)		7.0	7.0		7.0					7.0		7.0
Vehicle Extension (s)		3.0	3.0		3.0					3.0		3.0
Lane Grp Cap (vph)		3590	1071		3556					494		237
v/s Ratio Prot		c0.41			0.23							
v/s Ratio Perm			0.14							c0.10		0.02
v/c Ratio		0.57	0.19		0.32					0.66		0.17
Uniform Delay, d1		7.0	4.8		5.4					40.3		37.3
Progression Factor		1.00	1.00		1.39					1.00		1.00
Incremental Delay, d2		0.7	0.4		0.2					3.3		0.3
Delay (s)		7.6	5.2		7.6					43.6		37.7
Level of Service		A	A		A					D		D
Approach Delay (s)		7.3			7.6			0.0			41.8	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
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)	135	1643	0	0	1027	20	276	344	965	17	0	475
Future Volume (vph)	135	1643	0	0	1027	20	276	344	965	17	0	475
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		45.0	75.0		0.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.91	0.95	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00			0.99	0.99			
Frt					0.997			0.930	0.850			0.850
Flt Protected	0.950						0.950	0.998		0.950		
Satd. Flow (prot)	1752	5036	0	0	4974	0	1649	1562	1504	1805	0	1538
Flt Permitted	0.129						0.950	0.998		0.085		
Satd. Flow (perm)	238	5036	0	0	4974	0	1649	1562	1485	162	0	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					3			2	76			246
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		307.2			385.1			180.0			159.4	
Travel Time (s)		22.1			27.7			13.0			11.5	
Confl. Peds. (#/hr)	1		3	3		1			1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	0%	4%	0%	4%	2%	2%	0%	0%	5%
Adj. Flow (vph)	147	1786	0	0	1116	22	300	374	1049	18	0	516
Shared Lane Traffic (%)							10%		34%			
Lane Group Flow (vph)	147	1786	0	0	1138	0	270	761	692	18	0	516
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Detector Phase	5	2			6		4	4	4	8		8
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0		8.0	8.0	8.0	8.0		8.0
Minimum Split (s)	11.0	35.0			35.0		36.0	36.0	36.0	36.0		36.0
Total Split (s)	11.0	46.0			35.0		54.0	54.0	54.0	54.0		54.0
Total Split (%)	11.0%	46.0%			35.0%		54.0%	54.0%	54.0%	54.0%		54.0%
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	0.0	3.0			3.0		3.0	3.0	3.0	3.0		3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	None	C-Max			C-Max		None	None	None	None		None
Act Effct Green (s)	43.0	39.0			28.0		47.0	47.0	47.0	47.0		47.0
Actuated g/C Ratio	0.43	0.39			0.28		0.47	0.47	0.47	0.47		0.47
v/c Ratio	0.66	0.91			0.82		0.35	1.04	0.94	0.24		0.60
Control Delay	32.3	30.4			39.2		18.4	70.4	44.8	25.6		13.1
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Delay	32.3	30.4			39.2		18.4	70.4	44.8	25.6		13.1
LOS	C	C			D		B	E	D	C		B
Approach Delay		30.6			39.2			52.0			13.5	

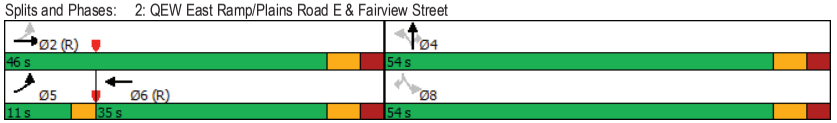
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			D			D			B	
Queue Length 50th (m)	12.4	128.2			79.0		35.4	~184.5	125.0	2.1		37.6
Queue Length 95th (m)	#34.7	#146.1			96.7		56.0	#265.4	#210.9	8.5		71.8
Internal Link Dist (m)		283.2			361.1			156.0			135.4	
Turn Bay Length (m)	30.0								45.0	75.0		
Base Capacity (vph)	223	1964			1394		775	735	738	76		853
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	0.66	0.91			0.82		0.35	1.04	0.94	0.24		0.60

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 96 (96%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.04
Intersection Signal Delay: 37.6 Intersection LOS: D
Intersection Capacity Utilization 96.8% 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.

Splits and Phases: 2: QEW East Ramp/Plains Road E & Fairview Street



Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	147	1786	1138	270	761	692	18	516
v/c Ratio	0.66	0.91	0.82	0.35	1.04	0.94	0.24	0.60
Control Delay	32.3	30.4	39.2	18.4	70.4	44.8	25.6	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.3	30.4	39.2	18.4	70.4	44.8	25.6	13.1
Queue Length 50th (m)	12.4	128.2	79.0	35.4	~184.5	125.0	2.1	37.6
Queue Length 95th (m)	#34.7	#146.1	96.7	56.0	#265.4	#210.9	8.5	71.8
Internal Link Dist (m)		283.2	361.1		156.0			
Turn Bay Length (m)	30.0					45.0	75.0	
Base Capacity (vph)	223	1964	1394	775	735	738	76	853
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	0.66	0.91	0.82	0.35	1.04	0.94	0.24	0.60

Intersection Summary

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	1643	0	0	1027	20	276	344	965	17	0	475
Future Volume (vph)	135	1643	0	0	1027	20	276	344	965	17	0	475
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lane Util. Factor	1.00	0.91			0.91		0.95	0.91	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	0.99	0.99	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			1.00		1.00	0.93	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1752	5036			4975		1649	1562	1485	1805		1538
Flt Permitted	0.13	1.00			1.00		0.95	1.00	1.00	0.09		1.00
Satd. Flow (perm)	238	5036			4975		1649	1562	1485	162		1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	147	1786	0	0	1116	22	300	374	1049	18	0	516
RTOR Reduction (vph)	0	0	0	0	2	0	0	1	40	0	0	130
Lane Group Flow (vph)	147	1786	0	0	1136	0	270	760	652	18	0	386
Confl. Peds. (#/hr)	1		3	3		1			1	1		
Heavy Vehicles (%)	3%	3%	3%	0%	4%	0%	4%	2%	2%	0%	0%	5%
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Actuated Green, G (s)	39.0	39.0			28.0		47.0	47.0	47.0	47.0		47.0
Effective Green, g (s)	39.0	39.0			28.0		47.0	47.0	47.0	47.0		47.0
Actuated g/C Ratio	0.39	0.39			0.28		0.47	0.47	0.47	0.47		0.47
Clearance Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		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)	213	1964			1393		775	734	697	76		722
v/s Ratio Prot	0.05	c0.35			0.23							
v/s Ratio Perm	0.21						0.16	0.49	0.44	0.11		0.25
v/c Ratio	0.69	0.91			0.82		0.35	1.04	0.94	0.24		0.53
Uniform Delay, d1	22.4	28.8			33.6		16.8	26.5	25.1	15.8		18.8
Progression Factor	1.07	0.81			1.00		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	7.7	6.6			5.4		0.3	42.7	19.7	1.6		0.8
Delay (s)	31.8	29.8			38.9		17.1	69.2	44.8	17.4		19.5
Level of Service	C	C			D		B	E	D	B		B
Approach Delay (s)		30.0			38.9			51.2			19.4	
Approach LOS		C			D			D			B	

Intersection Summary					
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service		D	
HCM 2000 Volume to Capacity ratio	1.01				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		17.0	
Intersection Capacity Utilization	96.8%	ICU Level of Service		F	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	542	7	350	482	10	717
Future Volume (vph)	542	7	350	482	10	717
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	55.0		0.0	0.0
Storage Lanes		0	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	0.97	1.00	1.00	1.00
Ped Bike Factor	1.00		0.99			0.99
Frt	0.998					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3415	0	3303	1712	1805	1568
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3415	0	3283	1712	1805	1547
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	1					14
Link Speed (k/h)	50			60	50	
Link Distance (m)	207.1			887.5	183.4	
Travel Time (s)	14.9			53.3	13.2	
Confl. Peds. (#/hr)		7	7			1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	40%	6%	11%	0%	3%
Adj. Flow (vph)	589	8	380	524	11	779
Shared Lane Traffic (%)						
Lane Group Flow (vph)	597	0	380	524	11	779
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Detector Phase	3		4	4	2	4
Switch Phase						
Minimum Initial (s)	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	17.0		27.0	27.0	18.0	27.0
Total Split (s)	23.0		44.0	44.0	18.0	44.0
Total Split (%)	27.1%		51.8%	51.8%	21.2%	51.8%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None		C-Max	C-Max	Max	C-Max
Act Effct Green (s)	16.0		38.0	38.0	11.0	50.0
Actuated g/C Ratio	0.19		0.45	0.45	0.13	0.59
v/c Ratio	0.93		0.26	0.68	0.05	0.84
Control Delay	57.0		15.3	24.4	33.1	23.1
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	57.0		15.3	24.4	33.1	23.1
LOS	E		B	C	C	C
Approach Delay	57.0			20.6	23.2	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	E			C	C	
Queue Length 50th (m)	53.1		20.2	68.9	1.7	77.4
Queue Length 95th (m)	#86.0		29.6	105.9	6.5	#150.2
Internal Link Dist (m)	183.1			863.5	159.4	
Turn Bay Length (m)			55.0			
Base Capacity (vph)	643		1476	765	233	925
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.93		0.26	0.68	0.05	0.84

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 27 (32%), Referenced to phase 4:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 31.0 Intersection LOS: C
Intersection Capacity Utilization 70.6% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Maple Avenue & Plains Road E



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	597	380	524	11	779
v/c Ratio	0.93	0.26	0.68	0.05	0.84
Control Delay	57.0	15.3	24.4	33.1	23.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	15.3	24.4	33.1	23.1
Queue Length 50th (m)	53.1	20.2	68.9	1.7	77.4
Queue Length 95th (m)	#86.0	29.6	105.9	6.5	#150.2
Internal Link Dist (m)	183.1		863.5	159.4	
Turn Bay Length (m)		55.0			
Base Capacity (vph)	643	1476	765	233	925
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.93	0.26	0.68	0.05	0.84

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	542	7	350	482	10	717
Future Volume (vph)	542	7	350	482	10	717
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		6.0	6.0	7.0	6.0
Lane Util. Factor	0.95		0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3415		3303	1712	1805	1563
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3415		3303	1712	1805	1563
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	589	8	380	524	11	779
RTOR Reduction (vph)	1	0	0	0	0	6
Lane Group Flow (vph)	596	0	380	524	11	773
Confl. Peds. (#/hr)		7	7			1
Heavy Vehicles (%)	5%	40%	6%	11%	0%	3%
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Actuated Green, G (s)	16.0		38.0	38.0	11.0	49.0
Effective Green, g (s)	16.0		38.0	38.0	11.0	49.0
Actuated g/C Ratio	0.19		0.45	0.45	0.13	0.58
Clearance Time (s)	7.0		6.0	6.0	7.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	642		1476	765	233	901
v/s Ratio Prot			0.12			c0.38
v/s Ratio Perm	c0.17			0.31	0.01	0.11
v/c Ratio	0.93		0.26	0.68	0.05	0.86
Uniform Delay, d1	33.9		14.7	18.7	32.4	15.1
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	19.7		0.4	4.9	0.4	10.4
Delay (s)	53.7		15.1	23.7	32.8	25.5
Level of Service	D		B	C	C	C
Approach Delay (s)	53.7			20.1	25.6	
Approach LOS	D			C	C	

Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

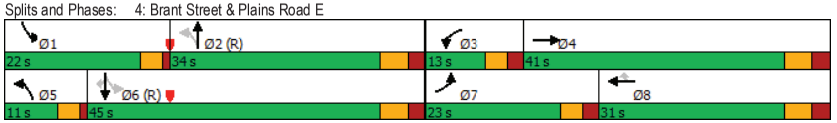
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	580	619	57	101	184	101	48	1063	348	396	1338	594
Future Volume (vph)	580	619	57	101	184	101	48	1063	348	396	1338	594
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	50.0		75.0	50.0		0.0	40.0		30.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.99	1.00		1.00		0.98	1.00	0.99				0.97
Frt		0.987				0.850		0.963				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	1839	0	1597	3252	1404	1641	4751	0	1719	5085	1538
Flt Permitted	0.950			0.950			0.143			0.125		
Satd. Flow (perm)	3374	1839	0	1594	3252	1374	247	4751	0	226	5085	1498
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				208		72				292
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		887.5			190.4			463.4			229.3	
Travel Time (s)		53.3			11.4			27.8			13.8	
Confl. Peds. (#/hr)	7		5	5		7	11		7	7		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	0%	13%	11%	15%	10%	3%	8%	5%	2%	5%
Adj. Flow (vph)	630	673	62	110	200	110	52	1155	378	430	1454	646
Shared Lane Traffic (%)												
Lane Group Flow (vph)	630	735	0	110	200	110	52	1533	0	430	1454	646
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Detector Phase	7	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	7.0	8.0		7.0	8.0	8.0
Minimum Split (s)	13.0	31.3		13.0	29.3	29.3	11.0	31.0		11.0	31.0	31.0
Total Split (s)	23.0	41.0		13.0	31.0	31.0	11.0	34.0		22.0	45.0	45.0
Total Split (%)	20.9%	37.3%		11.8%	28.2%	28.2%	10.0%	30.9%		20.0%	40.9%	40.9%
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.7		3.0	3.7	3.7
All-Red Time (s)	2.0	2.6		2.0	2.6	2.6	1.0	2.3		1.0	2.3	2.3
Lost Time Adjust (s)	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	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	18.0	34.7		8.0	24.7	24.7	37.0	28.0		52.0	41.2	41.2
Actuated g/C Ratio	0.16	0.32		0.07	0.22	0.22	0.34	0.25		0.47	0.37	0.37
v/c Ratio	1.13	1.26		0.95	0.27	0.23	0.30	1.21		1.23	0.76	0.87
Control Delay	122.7	165.0		122.7	36.4	1.2	20.3	124.1		152.8	34.0	31.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	122.7	165.0		122.7	36.4	1.2	20.3	124.1		152.8	34.0	31.8
LOS	F	F		F	D	A	C	F		F	C	C
Approach Delay		145.5			49.8			120.7			53.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			D			F			D	
Queue Length 50th (m)	~85.4	~209.7		25.2	19.7	0.0	3.2	~151.4		~103.6	107.7	83.2
Queue Length 95th (m)	#121.7	#284.7		#61.3	30.6	0.0	m3.7	m#134.5		#167.4	127.2	#160.7
Internal Link Dist (m)		863.5			166.4			439.4			205.3	
Turn Bay Length (m)	55.0			50.0		75.0	50.0			40.0		30.0
Base Capacity (vph)	556	582		116	730	469	171	1263		351	1904	743
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.13	1.26		0.95	0.27	0.23	0.30	1.21		1.23	0.76	0.87

Intersection Summary	
Area Type:	Other
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 40 (36%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.26	
Intersection Signal Delay: 92.6	Intersection LOS: F
Intersection Capacity Utilization 110.9%	ICU Level of Service H
Analysis Period (min) 15	

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

Splits and Phases: 4: Brant Street & Plains Road E



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	630	735	110	200	110	52	1533	430	1454	646
v/c Ratio	1.13	1.26	0.95	0.27	0.23	0.30	1.21	1.23	0.76	0.87
Control Delay	122.7	165.0	122.7	36.4	1.2	20.3	124.1	152.8	34.0	31.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	122.7	165.0	122.7	36.4	1.2	20.3	124.1	152.8	34.0	31.8
Queue Length 50th (m)	~85.4	~209.7	25.2	19.7	0.0	3.2	~151.4	~103.6	107.7	83.2
Queue Length 95th (m)	#121.7	#284.7	#61.3	30.6	0.0	m3.7	m#134.5	#167.4	127.2	#160.7
Internal Link Dist (m)		863.5		166.4			439.4		205.3	
Turn Bay Length (m)	55.0		50.0		75.0	50.0		40.0		30.0
Base Capacity (vph)	556	582	116	730	469	171	1263	351	1904	743
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.13	1.26	0.95	0.27	0.23	0.30	1.21	1.23	0.76	0.87

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	580	619	57	101	184	101	48	1063	348	396	1338	594
Future Volume (vph)	580	619	57	101	184	101	48	1063	348	396	1338	594
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	1.00		1.00	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	0.99		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
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3400	1839		1597	3252	1374	1641	4751		1719	5085	1498
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.14	1.00		0.12	1.00	1.00
Satd. Flow (perm)	3400	1839		1597	3252	1374	247	4751		226	5085	1498
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	630	673	62	110	200	110	52	1155	378	430	1454	646
RTOR Reduction (vph)	0	3	0	0	0	85	0	54	0	0	0	185
Lane Group Flow (vph)	630	732	0	110	200	25	52	1479	0	430	1454	461
Confl. Peds. (#/hr)	7		5	5		7	11		7	7		11
Heavy Vehicles (%)	3%	2%	0%	13%	11%	15%	10%	3%	8%	5%	2%	5%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Actuated Green, G (s)	18.0	34.7		8.0	24.7	24.7	33.6	28.0		50.0	40.4	40.4
Effective Green, g (s)	18.0	34.7		8.0	24.7	24.7	33.6	28.0		50.0	40.4	40.4
Actuated g/C Ratio	0.16	0.32		0.07	0.22	0.22	0.31	0.25		0.45	0.37	0.37
Clearance Time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	556	580		116	730	308	146	1209		347	1867	550
v/s Ratio Prot	c0.19	c0.40		0.07	0.06		0.02	0.31		c0.20	0.29	
v/s Ratio Perm						0.02	0.09			c0.36		0.31
v/c Ratio	1.13	1.26		0.95	0.27	0.08	0.36	1.22		1.24	0.78	0.84
Uniform Delay, d1	46.0	37.6		50.8	35.2	33.7	28.0	41.0		32.5	30.8	31.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.13	0.70		1.00	1.00	1.00
Incremental Delay, d2	80.4	131.5		66.6	0.2	0.1	0.1	101.3		129.9	3.3	14.2
Delay (s)	126.4	169.2		117.4	35.4	33.8	31.9	130.1		162.4	34.1	46.0
Level of Service	F	F		F	D	C	C	F		F	C	D
Approach Delay (s)		149.4			56.5			126.9			59.0	
Approach LOS		F			E			F			E	

Intersection Summary

HCM 2000 Control Delay	98.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	110.9%	ICU Level of Service	H
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)	464	1458	344	172	463	209	265	893	373	316	982	207
Future Volume (vph)	464	1458	344	172	463	209	265	893	373	316	982	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		170.0	60.0		0.0	75.0		70.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.99			0.98			0.96			0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3539	1568	1703	3438	1538	1787	3505	1599	1787	3505	1346
Flt Permitted	0.293			0.145			0.151			0.131		
Satd. Flow (perm)	519	3539	1547	260	3438	1507	284	3505	1535	246	3505	1290
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			251			223			172			199
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		261.1			251.5			231.2			463.4	
Travel Time (s)		15.7			15.1			16.6			27.8	
Confl. Peds. (#/hr)	6		1	1		6	22		21	21		22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	2%	3%	6%	5%	5%	1%	3%	1%	1%	3%	20%
Adj. Flow (vph)	504	1585	374	187	503	227	288	971	405	343	1067	225
Shared Lane Traffic (%)												
Lane Group Flow (vph)	504	1585	374	187	503	227	288	971	405	343	1067	225
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		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	31.4	31.4	12.0	31.4	31.4	12.0	31.5	31.5	12.0	31.5	31.5
Total Split (s)	26.0	48.0	48.0	12.0	34.0	34.0	13.0	33.0	33.0	17.0	37.0	37.0
Total Split (%)	23.6%	43.6%	43.6%	10.9%	30.9%	30.9%	11.8%	30.0%	30.0%	15.5%	33.6%	33.6%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
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)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	56.0	41.6	41.6	38.0	27.6	27.6	38.0	26.5	26.5	46.0	30.5	30.5
Actuated g/C Ratio	0.51	0.38	0.38	0.35	0.25	0.25	0.35	0.24	0.24	0.42	0.28	0.28
v/c Ratio	1.01	1.18	0.50	0.96	0.58	0.42	1.30	1.15	0.81	1.21	1.10	0.45
Control Delay	66.2	123.2	10.9	83.0	39.4	7.2	190.4	119.8	36.4	139.8	95.8	23.4
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	66.2	123.2	10.9	83.0	39.4	7.2	190.4	119.8	36.4	139.8	95.8	23.4
LOS	E	F	B	F	D	A	F	F	D	F	F	C
Approach Delay		94.5			40.3			111.7			95.1	

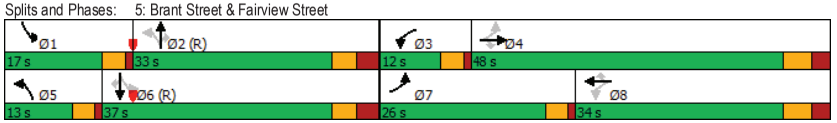
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			D			F			F	
Queue Length 50th (m)	~77.2	~227.2	18.5	25.0	52.6	0.7	~65.9	~136.1	51.5	~79.2	~149.1	31.8
Queue Length 95th (m)	#148.3	#271.5	46.1	#71.4	70.6	20.0	#121.1	#177.5	#102.6	m#124.7	m#186.9	m48.2
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	497	1338	741	194	862	545	221	844	500	284	971	501
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	1.01	1.18	0.50	0.96	0.58	0.42	1.30	1.15	0.81	1.21	1.10	0.45

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 107 (97%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.30
Intersection Signal Delay: 91.5 Intersection LOS: F
Intersection Capacity Utilization 109.4% ICU Level of Service H
Analysis Period (min) 15

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

Splits and Phases: 5: Brant Street & Fairview Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	504	1585	374	187	503	227	288	971	405	343	1067	225
v/c Ratio	1.01	1.18	0.50	0.96	0.58	0.42	1.30	1.15	0.81	1.21	1.10	0.45
Control Delay	66.2	123.2	10.9	83.0	39.4	7.2	190.4	119.8	36.4	139.8	95.8	23.4
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	66.2	123.2	10.9	83.0	39.4	7.2	190.4	119.8	36.4	139.8	95.8	23.4
Queue Length 50th (m)	~77.2	~227.2	18.5	25.0	52.6	0.7	~65.9	~136.1	51.5	~79.2	~149.1	31.8
Queue Length 95th (m)	#148.3	#271.5	46.1	#71.4	70.6	20.0	#121.1	#177.5	#102.6	m#124.7	m#186.9	m48.2
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	497	1338	741	194	862	545	221	844	500	284	971	501
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	1.01	1.18	0.50	0.96	0.58	0.42	1.30	1.15	0.81	1.21	1.10	0.45

Intersection Summary

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

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	464	1458	344	172	463	209	265	893	373	316	982	207
Future Volume (vph)	464	1458	344	172	463	209	265	893	373	316	982	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	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)	1686	3539	1547	1703	3438	1507	1787	3505	1535	1787	3505	1290
Flt Permitted	0.29	1.00	1.00	0.14	1.00	1.00	0.15	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)	519	3539	1547	260	3438	1507	284	3505	1535	247	3505	1290
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	504	1585	374	187	503	227	288	971	405	343	1067	225
RTOR Reduction (vph)	0	0	156	0	0	167	0	0	131	0	0	144
Lane Group Flow (vph)	504	1585	218	187	503	60	288	971	274	343	1067	81
Confl. Peds. (#/hr)	6		1	1		6	22		21	21		22
Heavy Vehicles (%)	7%	2%	3%	6%	5%	5%	1%	3%	1%	1%	3%	20%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	53.6	41.6	41.6	35.6	27.6	27.6	35.5	26.5	26.5	43.5	30.5	30.5
Effective Green, g (s)	53.6	41.6	41.6	35.6	27.6	27.6	35.5	26.5	26.5	43.5	30.5	30.5
Actuated g/C Ratio	0.49	0.38	0.38	0.32	0.25	0.25	0.32	0.24	0.24	0.40	0.28	0.28
Clearance Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
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)	486	1338	585	189	862	378	214	844	369	279	971	357
v/s Ratio Prot	c0.21	c0.45		0.07	0.15		0.11	0.28		c0.14	0.30	
v/s Ratio Perm	0.30		0.14	0.25		0.04	0.32		0.18	c0.34		0.06
v/c Ratio	1.04	1.18	0.37	0.99	0.58	0.16	1.35	1.15	0.74	1.23	1.10	0.23
Uniform Delay, d1	22.4	34.2	24.8	33.4	36.2	32.1	33.2	41.8	38.6	30.1	39.8	30.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.07	1.11	3.30
Incremental Delay, d2	50.7	91.0	0.4	61.7	1.0	0.2	183.4	81.3	12.7	120.6	54.4	0.9
Delay (s)	73.1	125.2	25.2	95.1	37.2	32.3	216.6	123.0	51.4	152.7	98.4	102.1
Level of Service	E	F	C	F	D	C	F	F	D	F	F	F
Approach Delay (s)		99.3			47.8			121.8			110.3	
Approach LOS		F			D			F			F	

Intersection Summary				
HCM 2000 Control Delay	100.5	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.24			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	109.4%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

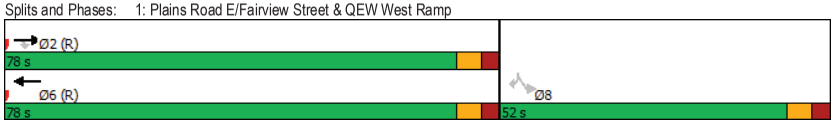
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1654	518	0	2649	0	0	0	0	763	0	448
Future Volume (vph)	0	1654	518	0	2649	0	0	0	0	763	0	448
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	55.0		0.0
Storage Lanes	0		1	0		0	0		0	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor			0.95									0.98
Frt			0.850									0.850
Flt Protected										0.950		
Satd. Flow (prot)	0	5136	1583	0	5085	0	0	0	0	3467	0	1615
Flt Permitted										0.950		
Satd. Flow (perm)	0	5136	1507	0	5085	0	0	0	0	3467	0	1585
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			563									34
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		175.7			307.2			140.0			199.7	
Travel Time (s)		12.7			22.1			10.1			14.4	
Confl. Peds. (#/hr)	4		15	15		4	3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	2%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Adj. Flow (vph)	0	1798	563	0	2879	0	0	0	0	829	0	487
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1798	563	0	2879	0	0	0	0	829	0	487
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Detector Phase		2	2		6					8		8
Switch Phase												
Minimum Initial (s)		8.0	8.0		8.0					8.0		8.0
Minimum Split (s)		43.0	43.0		43.0					25.0		25.0
Total Split (s)		78.0	78.0		78.0					52.0		52.0
Total Split (%)		60.0%	60.0%		60.0%					40.0%		40.0%
Yellow Time (s)		4.0	4.0		4.0					4.0		4.0
All-Red Time (s)		3.0	3.0		3.0					3.0		3.0
Lost Time Adjust (s)		0.0	0.0		0.0					0.0		0.0
Total Lost Time (s)		7.0	7.0		7.0					7.0		7.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max		C-Max					None		None
Act Effct Green (s)		74.1	74.1		74.1					41.9		41.9
Actuated g/C Ratio		0.57	0.57		0.57					0.32		0.32
v/c Ratio		0.61	0.51		0.99					0.74		0.91
Control Delay		20.1	3.0		17.6					43.5		61.8
Queue Delay		0.0	0.0		0.0					0.0		0.0
Total Delay		20.1	3.0		17.6					43.5		61.8
LOS		C	A		B					D		E
Approach Delay		16.0			17.6						50.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			B						D	
Queue Length 50th (m)		119.3	0.0		~315.3					98.6		114.2
Queue Length 95th (m)		135.4	16.5		m34.6					121.9		#175.8
Internal Link Dist (m)		151.7			283.2			116.0			175.7	
Turn Bay Length (m)										55.0		
Base Capacity (vph)		2929	1101		2900					1200		570
Starvation Cap Reductn		0	0		0					0		0
Spillback Cap Reductn		0	0		0					0		0
Storage Cap Reductn		0	0		0					0		0
Reduced v/c Ratio		0.61	0.51		0.99					0.69		0.85

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 34 (26%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 23.6		Intersection LOS: C	
Intersection Capacity Utilization 90.9%		ICU Level of Service E	
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: Plains Road E/Fairview Street & QEW West Ramp



Lane Group	EBT	EBR	WBT	SBL	SBR
Lane Group Flow (vph)	1798	563	2879	829	487
v/c Ratio	0.61	0.51	0.99	0.74	0.91
Control Delay	20.1	3.0	17.6	43.5	61.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	3.0	17.6	43.5	61.8
Queue Length 50th (m)	119.3	0.0	~315.3	98.6	114.2
Queue Length 95th (m)	135.4	16.5	m34.6	121.9	#175.8
Internal Link Dist (m)	151.7		283.2		
Turn Bay Length (m)				55.0	
Base Capacity (vph)	2929	1101	2900	1200	570
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.61	0.51	0.99	0.69	0.85

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1654	518	0	2649	0	0	0	0	763	0	448
Future Volume (vph)	0	1654	518	0	2649	0	0	0	0	763	0	448
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0					7.0		7.0
Lane Util. Factor		0.91	1.00		0.91					0.97		1.00
Frpb, ped/bikes		1.00	0.95		1.00					1.00		0.98
Flpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Frt		1.00	0.85		1.00					1.00		0.85
Flt Protected		1.00	1.00		1.00					0.95		1.00
Satd. Flow (prot)		5136	1507		5085					3467		1585
Flt Permitted		1.00	1.00		1.00					0.95		1.00
Satd. Flow (perm)		5136	1507		5085					3467		1585
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1798	563	0	2879	0	0	0	0	829	0	487
RTOR Reduction (vph)	0	0	242	0	0	0	0	0	0	0	0	23
Lane Group Flow (vph)	0	1798	321	0	2879	0	0	0	0	829	0	464
Confl. Peds. (#/hr)	4		15	15		4	3					3
Heavy Vehicles (%)	0%	1%	2%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Actuated Green, G (s)		74.1	74.1		74.1					41.9		41.9
Effective Green, g (s)		74.1	74.1		74.1					41.9		41.9
Actuated g/C Ratio		0.57	0.57		0.57					0.32		0.32
Clearance Time (s)		7.0	7.0		7.0					7.0		7.0
Vehicle Extension (s)		3.0	3.0		3.0					3.0		3.0
Lane Grp Cap (vph)		2927	858		2898					1117		510
v/s Ratio Prot		0.35			c0.57							
v/s Ratio Perm			0.21							0.24		c0.29
v/c Ratio		0.61	0.37		0.99					0.74		0.91
Uniform Delay, d1		18.5	15.3		27.7					39.2		42.2
Progression Factor		1.00	1.00		0.43					1.00		1.00
Incremental Delay, d2		1.0	1.2		3.7					2.7		20.0
Delay (s)		19.5	16.5		15.5					41.9		62.3
Level of Service		B	B		B					D		E
Approach Delay (s)		18.8			15.5			0.0			49.5	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	90.9%	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)	135	1995	0	0	3507	34	213	248	587	9	0	628
Future Volume (vph)	135	1995	0	0	3507	34	213	248	587	9	0	628
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		45.0	75.0		0.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.91	0.95	1.00	1.00	1.00
Ped Bike Factor					1.00							
Frt					0.999			0.941	0.850			0.850
Flt Protected	0.950						0.950	0.998		0.950		
Satd. Flow (prot)	1770	5136	0	0	4800	0	1698	1581	1519	1805	0	1495
Flt Permitted	0.062						0.950	0.998		0.158		
Satd. Flow (perm)	115	5136	0	0	4800	0	1698	1581	1519	300	0	1495
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					1			5	59			126
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		307.2			385.1			180.0			159.4	
Travel Time (s)		22.1			27.7			13.0			11.5	
Confl. Peds. (#/hr)	2		7	7		2						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	1%	0%	0%	8%	0%	1%	4%	1%	0%	0%	8%
Adj. Flow (vph)	147	2168	0	0	3812	37	232	270	638	10	0	683
Shared Lane Traffic (%)							10%		30%			
Lane Group Flow (vph)	147	2168	0	0	3849	0	209	484	447	10	0	683
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Detector Phase	5	2			6		4	4	4	8		8
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0		8.0	8.0	8.0	8.0		8.0
Minimum Split (s)	11.0	35.0			35.0		36.0	36.0	36.0	36.0		36.0
Total Split (s)	11.0	79.0			68.0		51.0	51.0	51.0	51.0		51.0
Total Split (%)	8.5%	60.8%			52.3%		39.2%	39.2%	39.2%	39.2%		39.2%
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	0.0	3.0			3.0		3.0	3.0	3.0	3.0		3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	None	C-Max			C-Max		None	None	None	None		None
Act Effct Green (s)	76.0	72.0			61.0		44.0	44.0	44.0	44.0		44.0
Actuated g/C Ratio	0.58	0.55			0.47		0.34	0.34	0.34	0.34		0.34
v/c Ratio	0.87	0.76			1.71		0.36	0.90	0.81	0.10		1.16
Control Delay	65.1	22.3			347.4		34.7	61.7	46.6	32.8		121.9
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Delay	65.1	22.3			347.4		34.7	61.7	46.6	32.8		121.9
LOS	E	C			F		C	E	D	C		F
Approach Delay		25.0			347.4			50.8			120.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			F			D			F	
Queue Length 50th (m)	23.1	149.3			~563.7		44.6	134.8	101.7	1.8		~194.3
Queue Length 95th (m)	m#60.0	173.3			#584.2		68.5	#207.5	#159.5	6.6		#271.1
Internal Link Dist (m)		283.2			361.1			156.0			135.4	
Turn Bay Length (m)	30.0								45.0	75.0		
Base Capacity (vph)	169	2844			2252		574	538	553	101		589
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	0.87	0.76			1.71		0.36	0.90	0.81	0.10		1.16

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 16 (12%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.71			
Intersection Signal Delay: 192.1		Intersection LOS: F	
Intersection Capacity Utilization 143.3%		ICU Level of Service H	
Analysis Period (min) 15			

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

Splits and Phases: 2: QEW East Ramp/Plains Road E & Fairview Street



Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	147	2168	3849	209	484	447	10	683
v/c Ratio	0.87	0.76	1.71	0.36	0.90	0.81	0.10	1.16
Control Delay	65.1	22.3	347.4	34.7	61.7	46.6	32.8	121.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.1	22.3	347.4	34.7	61.7	46.6	32.8	121.9
Queue Length 50th (m)	23.1	149.3	~563.7	44.6	134.8	101.7	1.8	~194.3
Queue Length 95th (m)	m#60.0	173.3	#584.2	68.5	#207.5	#159.5	6.6	#271.1
Internal Link Dist (m)		283.2	361.1		156.0			
Turn Bay Length (m)	30.0					45.0	75.0	
Base Capacity (vph)	169	2844	2252	574	538	553	101	589
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	0.87	0.76	1.71	0.36	0.90	0.81	0.10	1.16

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	1995	0	0	3507	34	213	248	587	9	0	628
Future Volume (vph)	135	1995	0	0	3507	34	213	248	587	9	0	628
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lane Util. Factor	1.00	0.91			0.91		0.95	0.91	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			1.00		1.00	0.94	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1770	5136			4798		1698	1581	1519	1805		1495
Flt Permitted	0.06	1.00			1.00		0.95	1.00	1.00	0.16		1.00
Satd. Flow (perm)	116	5136			4798		1698	1581	1519	301		1495
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	147	2168	0	0	3812	37	232	270	638	10	0	683
RTOR Reduction (vph)	0	0	0	0	1	0	0	3	39	0	0	83
Lane Group Flow (vph)	147	2168	0	0	3848	0	209	481	408	10	0	600
Confl. Peds. (#/hr)	2		7	7		2						
Heavy Vehicles (%)	2%	1%	0%	0%	8%	0%	1%	4%	1%	0%	0%	8%
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Actuated Green, G (s)	72.0	72.0			61.0		44.0	44.0	44.0	44.0		44.0
Effective Green, g (s)	72.0	72.0			61.0		44.0	44.0	44.0	44.0		44.0
Actuated g/C Ratio	0.55	0.55			0.47		0.34	0.34	0.34	0.34		0.34
Clearance Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		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)	166	2844			2251		574	535	514	101		506
v/s Ratio Prot	c0.05	0.42			c0.80							
v/s Ratio Perm	0.43						0.12	0.30	0.27	0.03		c0.40
v/c Ratio	0.89	0.76			1.71		0.36	0.90	0.79	0.10		1.19
Uniform Delay, d1	35.6	22.4			34.5		32.4	40.9	38.9	29.4		43.0
Progression Factor	1.22	0.91			1.00		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	32.0	1.5			321.3		0.4	17.7	8.2	0.4		101.9
Delay (s)	75.5	22.0			355.8		32.8	58.6	47.1	29.9		144.9
Level of Service	E	C			F		C	E	D	C		F
Approach Delay (s)		25.4			355.8			49.4			143.2	
Approach LOS		C			F			D			F	

Intersection Summary					
HCM 2000 Control Delay	198.0	HCM 2000 Level of Service	F		
HCM 2000 Volume to Capacity ratio	1.45				
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.0		
Intersection Capacity Utilization	143.3%	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)	464	44	1362	615	21	854
Future Volume (vph)	464	44	1362	615	21	854
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	55.0		0.0	0.0
Storage Lanes		0	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	0.97	1.00	1.00	1.00
Ped Bike Factor	1.00		1.00			
Frt	0.987					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3423	0	3433	1881	1687	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3423	0	3419	1881	1687	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	9					16
Link Speed (k/h)	50			60	50	
Link Distance (m)	207.1			887.5	183.4	
Travel Time (s)	14.9			53.3	13.2	
Confl. Peds. (#/hr)		4	4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	2%	1%	7%	2%
Adj. Flow (vph)	504	48	1480	668	23	928
Shared Lane Traffic (%)						
Lane Group Flow (vph)	552	0	1480	668	23	928
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Detector Phase	3		4	4	2	4
Switch Phase						
Minimum Initial (s)	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	17.0		27.0	27.0	18.0	27.0
Total Split (s)	22.0		50.0	50.0	18.0	50.0
Total Split (%)	24.4%		55.6%	55.6%	20.0%	55.6%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None		C-Max	C-Max	Max	C-Max
Act Effct Green (s)	15.0		44.0	44.0	11.0	62.0
Actuated g/C Ratio	0.17		0.49	0.49	0.12	0.69
v/c Ratio	0.96		0.88	0.73	0.11	0.85
Control Delay	65.8		28.5	24.0	36.7	19.8
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	65.8		28.5	24.0	36.7	19.8
LOS	E		C	C	D	B
Approach Delay	65.8			27.1	20.2	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	E			C	C	
Queue Length 50th (m)	52.2		119.2	92.1	3.8	107.2
Queue Length 95th (m)	#85.7		#155.4	135.9	11.2	#202.0
Internal Link Dist (m)	183.1			863.5	159.4	
Turn Bay Length (m)			55.0			
Base Capacity (vph)	578		1678	919	206	1095
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.96		0.88	0.73	0.11	0.85

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 4:WBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 31.2		Intersection LOS: C	
Intersection Capacity Utilization 78.0%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Maple Avenue & Plains Road E



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	552	1480	668	23	928
v/c Ratio	0.96	0.88	0.73	0.11	0.85
Control Delay	65.8	28.5	24.0	36.7	19.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	65.8	28.5	24.0	36.7	19.8
Queue Length 50th (m)	52.2	119.2	92.1	3.8	107.2
Queue Length 95th (m)	#85.7	#155.4	135.9	11.2	#202.0
Internal Link Dist (m)	183.1		863.5	159.4	
Turn Bay Length (m)		55.0			
Base Capacity (vph)	578	1678	919	206	1095
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.96	0.88	0.73	0.11	0.85

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	464	44	1362	615	21	854
Future Volume (vph)	464	44	1362	615	21	854
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		6.0	6.0	7.0	6.0
Lane Util. Factor	0.95		0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3423		3433	1881	1687	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3423		3433	1881	1687	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	504	48	1480	668	23	928
RTOR Reduction (vph)	8	0	0	0	0	6
Lane Group Flow (vph)	545	0	1480	668	23	922
Confl. Peds. (#/hr)		4	4			
Heavy Vehicles (%)	4%	3%	2%	1%	7%	2%
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Actuated Green, G (s)	15.0		44.0	44.0	11.0	55.0
Effective Green, g (s)	15.0		44.0	44.0	11.0	55.0
Actuated g/C Ratio	0.17		0.49	0.49	0.12	0.61
Clearance Time (s)	7.0		6.0	6.0	7.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	570		1678	919	206	967
v/s Ratio Prot			0.43			c0.47
v/s Ratio Perm	c0.16			0.36	0.01	0.12
v/c Ratio	0.96		0.88	0.73	0.11	0.95
Uniform Delay, d1	37.2		20.7	18.2	35.2	16.3
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	26.7		7.1	5.0	1.1	19.6
Delay (s)	63.8		27.7	23.2	36.2	35.9
Level of Service	E		C	C	D	D
Approach Delay (s)	63.8			26.3	35.9	
Approach LOS	E			C	D	

Intersection Summary			
HCM 2000 Control Delay	34.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

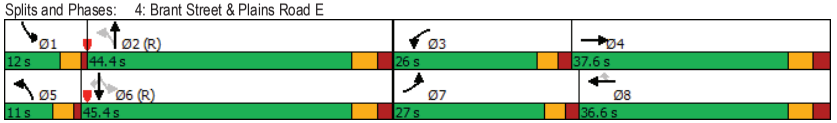
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	763	213	87	201	979	530	109	1790	81	173	1398	991
Future Volume (vph)	763	213	87	201	979	530	109	1790	81	173	1398	991
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	50.0		75.0	50.0		0.0	40.0		30.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	1.00					0.97		1.00				0.97
Frt		0.956				0.850		0.994				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3502	1754	0	1719	3539	1583	1805	5090	0	1687	5187	1599
Flt Permitted	0.950			0.950			0.104			0.102		
Satd. Flow (perm)	3487	1754	0	1719	3539	1535	198	5090	0	181	5187	1557
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17				116		6				410
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		887.5			190.4			463.4			229.3	
Travel Time (s)		53.3			11.4			27.8			13.8	
Confl. Peds. (#/hr)	12					12	10		16	16		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	5%	0%	5%	2%	2%	0%	0%	24%	7%	0%	1%
Adj. Flow (vph)	829	232	95	218	1064	576	118	1946	88	188	1520	1077
Shared Lane Traffic (%)												
Lane Group Flow (vph)	829	327	0	218	1064	576	118	2034	0	188	1520	1077
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Detector Phase	7	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	7.0	8.0		7.0	8.0	8.0
Minimum Split (s)	13.0	31.3		13.0	29.3	29.3	11.0	31.0		11.0	31.0	31.0
Total Split (s)	27.0	37.6		26.0	36.6	36.6	11.0	44.4		12.0	45.4	45.4
Total Split (%)	22.5%	31.3%		21.7%	30.5%	30.5%	9.2%	37.0%		10.0%	37.8%	37.8%
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.7		3.0	3.7	3.7
All-Red Time (s)	2.0	2.6		2.0	2.6	2.6	1.0	2.3		1.0	2.3	2.3
Lost Time Adjust (s)	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	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	22.0	33.5		18.8	30.3	30.3	47.4	38.4		49.4	39.4	39.4
Actuated g/C Ratio	0.18	0.28		0.16	0.25	0.25	0.40	0.32		0.41	0.33	0.33
v/c Ratio	1.29	0.65		0.81	1.19	1.22	0.69	1.25		1.08	0.89	1.37
Control Delay	182.4	44.0		71.3	136.9	146.6	22.9	146.3		118.4	46.2	196.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	182.4	44.0		71.3	136.9	146.6	22.9	146.3		118.4	46.2	196.8
LOS	F	D		E	F	F	C	F		F	D	F
Approach Delay		143.2			132.3			139.5			109.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			F			F			F	
Queue Length 50th (m)	~135.0	69.5		51.8	~167.5	~152.6	20.0	~232.5		~35.3	130.5	~281.8
Queue Length 95th (m)	#174.9	103.8		#85.4	#210.4	#224.4	m17.6	m#169.4		#84.1	151.3	#365.2
Internal Link Dist (m)		863.5			166.4			439.4			205.3	
Turn Bay Length (m)	55.0			50.0		75.0	50.0			40.0		30.0
Base Capacity (vph)	642	501		300	893	474	171	1632		174	1703	786
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.29	0.65		0.73	1.19	1.22	0.69	1.25		1.08	0.89	1.37

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 45 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.37			
Intersection Signal Delay: 127.8		Intersection LOS: F	
Intersection Capacity Utilization 112.6%		ICU Level of Service H	
Analysis Period (min) 15			

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

Splits and Phases: 4: Brant Street & Plains Road E





Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	829	327	218	1064	576	118	2034	188	1520	1077
v/c Ratio	1.29	0.65	0.81	1.19	1.22	0.69	1.25	1.08	0.89	1.37
Control Delay	182.4	44.0	71.3	136.9	146.6	22.9	146.3	118.4	46.2	196.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	182.4	44.0	71.3	136.9	146.6	22.9	146.3	118.4	46.2	196.8
Queue Length 50th (m)	~135.0	69.5	51.8	~167.5	~152.6	20.0	~232.5	~35.3	130.5	~281.8
Queue Length 95th (m)	#174.9	103.8	#85.4	#210.4	#224.4	m17.6	m#169.4	#84.1	151.3	#365.2
Internal Link Dist (m)		863.5		166.4			439.4		205.3	
Turn Bay Length (m)	55.0		50.0		75.0	50.0		40.0		30.0
Base Capacity (vph)	642	501	300	893	474	171	1632	174	1703	786
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.29	0.65	0.73	1.19	1.22	0.69	1.25	1.08	0.89	1.37

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	763	213	87	201	979	530	109	1790	81	173	1398	991
Future Volume (vph)	763	213	87	201	979	530	109	1790	81	173	1398	991
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	1.00		1.00	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00		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
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	1755		1719	3539	1535	1805	5088		1687	5187	1557
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.10	1.00		0.10	1.00	1.00
Satd. Flow (perm)	3502	1755		1719	3539	1535	198	5088		180	5187	1557
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	829	232	95	218	1064	576	118	1946	88	188	1520	1077
RTOR Reduction (vph)	0	12	0	0	0	87	0	4	0	0	0	275
Lane Group Flow (vph)	829	315	0	218	1064	489	118	2030	0	188	1520	802
Confl. Peds. (#/hr)	12					12	10		16	16		10
Heavy Vehicles (%)	0%	5%	0%	5%	2%	2%	0%	0%	24%	7%	0%	1%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Actuated Green, G (s)	22.0	33.5		18.8	30.3	30.3	45.4	38.4		47.4	39.4	39.4
Effective Green, g (s)	22.0	33.5		18.8	30.3	30.3	45.4	38.4		47.4	39.4	39.4
Actuated g/C Ratio	0.18	0.28		0.16	0.25	0.25	0.38	0.32		0.39	0.33	0.33
Clearance Time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	642	489		269	893	387	168	1628		171	1703	511
v/s Ratio Prot	c0.24	c0.18		0.13	0.30		0.04	0.40		c0.07	0.29	
v/s Ratio Perm						c0.32	0.22			0.36		c0.51
v/c Ratio	1.29	0.64		0.81	1.19	1.26	0.70	1.25		1.10	0.89	1.57
Uniform Delay, d1	49.0	38.0		48.9	44.9	44.9	28.9	40.8		30.8	38.3	40.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.91	0.97		1.00	1.00	1.00
Incremental Delay, d2	142.5	2.9		16.7	97.3	138.1	1.2	111.6		97.9	7.6	265.3
Delay (s)	191.5	40.9		65.5	142.1	183.0	27.7	151.3		128.7	45.9	305.6
Level of Service	F	D		E	F	F	C	F		F	D	F
Approach Delay (s)		148.9			145.8			144.5			151.9	
Approach LOS		F			F			F			F	

Intersection Summary					
HCM 2000 Control Delay	148.0	HCM 2000 Level of Service	F		
HCM 2000 Volume to Capacity ratio	1.39				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.3		
Intersection Capacity Utilization	112.6%	ICU Level of Service	H		
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)	293	1074	385	300	2017	606	222	1122	266	321	940	596
Future Volume (vph)	293	1074	385	300	2017	606	222	1122	266	321	940	596
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		170.0	60.0		0.0	75.0		70.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.97			0.98			0.92			0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1703	3539	1568	1787	3574	1599	1787	3574	1599	1770	3539	1553
Flt Permitted	0.094			0.086			0.127			0.119		
Satd. Flow (perm)	168	3539	1526	162	3574	1573	239	3574	1474	222	3539	1498
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			193			185			179			166
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		261.1			251.5			231.2			463.4	
Travel Time (s)		15.7			15.1			16.6			27.8	
Confl. Peds. (#/hr)	3		10	10		3	16		45	45		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	2%	3%	1%	1%	1%	1%	1%	1%	2%	2%	4%
Adj. Flow (vph)	318	1167	418	326	2192	659	241	1220	289	349	1022	648
Shared Lane Traffic (%)												
Lane Group Flow (vph)	318	1167	418	326	2192	659	241	1220	289	349	1022	648
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		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	31.4	31.4	12.0	31.4	31.4	12.0	31.5	31.5	12.0	31.5	31.5
Total Split (s)	13.0	49.0	49.0	19.0	55.0	55.0	12.0	38.0	38.0	14.0	40.0	40.0
Total Split (%)	10.8%	40.8%	40.8%	15.8%	45.8%	45.8%	10.0%	31.7%	31.7%	11.7%	33.3%	33.3%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
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)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	54.0	42.6	42.6	64.0	48.6	48.6	42.0	31.5	31.5	46.0	33.5	33.5
Actuated g/C Ratio	0.45	0.36	0.36	0.53	0.40	0.40	0.35	0.26	0.26	0.38	0.28	0.28
v/c Ratio	1.67	0.93	0.63	1.13	1.51	0.88	1.30	1.30	0.56	1.63	1.04	1.21
Control Delay	349.5	50.9	21.4	123.6	264.3	38.5	193.7	179.9	18.8	323.5	58.7	121.2
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	349.5	50.9	21.4	123.6	264.3	38.5	193.7	179.9	18.8	323.5	58.7	121.2
LOS	F	D	C	F	F	D	F	F	B	F	E	F
Approach Delay		94.3			203.0			155.2			124.6	

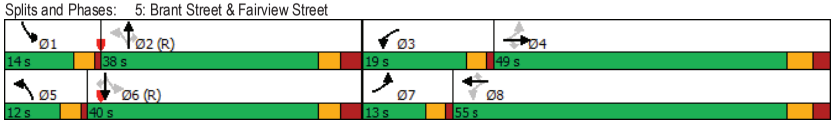
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			F			F			F	
Queue Length 50th (m)	~99.2	145.4	45.7	~76.2	~398.5	114.4	~58.5	~203.8	22.1	~103.2	~144.7	~166.3
Queue Length 95th (m)	#158.4	#190.0	81.9	#136.0	#442.2	#191.6	#112.0	#247.8	51.8	m#135.2	m#182.0	m#228.9
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	190	1256	666	289	1447	747	186	938	518	214	987	537
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	1.67	0.93	0.63	1.13	1.51	0.88	1.30	1.30	0.56	1.63	1.04	1.21

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 89 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.67
Intersection Signal Delay: 152.3 Intersection LOS: F
Intersection Capacity Utilization 138.2% ICU Level of Service H
Analysis Period (min) 15

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

Splits and Phases: 5: Brant Street & Fairview Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	318	1167	418	326	2192	659	241	1220	289	349	1022	648
v/c Ratio	1.67	0.93	0.63	1.13	1.51	0.88	1.30	1.30	0.56	1.63	1.04	1.21
Control Delay	349.5	50.9	21.4	123.6	264.3	38.5	193.7	179.9	18.8	323.5	58.7	121.2
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	349.5	50.9	21.4	123.6	264.3	38.5	193.7	179.9	18.8	323.5	58.7	121.2
Queue Length 50th (m)	~99.2	145.4	45.7	~76.2	~398.5	114.4	~58.5	~203.8	22.1	~103.2	~144.7	~166.3
Queue Length 95th (m)	#158.4	#190.0	81.9	#136.0	#442.2	#191.6	#112.0	#247.8	51.8	m#135.2	m#182.0	m#228.9
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	190	1256	666	289	1447	747	186	938	518	214	987	537
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	1.67	0.93	0.63	1.13	1.51	0.88	1.30	1.30	0.56	1.63	1.04	1.21

Intersection Summary

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

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	293	1074	385	300	2017	606	222	1122	266	321	940	596
Future Volume (vph)	293	1074	385	300	2017	606	222	1122	266	321	940	596
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.92	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)	1703	3539	1526	1787	3574	1573	1787	3574	1474	1770	3539	1498
Flt Permitted	0.09	1.00	1.00	0.09	1.00	1.00	0.13	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	168	3539	1526	161	3574	1573	239	3574	1474	222	3539	1498
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	318	1167	418	326	2192	659	241	1220	289	349	1022	648
RTOR Reduction (vph)	0	0	124	0	0	110	0	0	132	0	0	120
Lane Group Flow (vph)	318	1167	294	326	2192	549	241	1220	157	349	1022	528
Confl. Peds. (#/hr)	3		10	10		3	16		45	45		16
Heavy Vehicles (%)	6%	2%	3%	1%	1%	1%	1%	1%	1%	2%	2%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	51.6	42.6	42.6	61.6	48.6	48.6	39.5	31.5	31.5	43.5	33.5	33.5
Effective Green, g (s)	51.6	42.6	42.6	61.6	48.6	48.6	39.5	31.5	31.5	43.5	33.5	33.5
Actuated g/C Ratio	0.43	0.36	0.36	0.51	0.41	0.41	0.33	0.26	0.26	0.36	0.28	0.28
Clearance Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
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)	187	1256	541	285	1447	637	181	938	386	209	987	418
v/s Ratio Prot	c0.13	0.33		0.14	c0.61		0.09	0.34		c0.14	0.29	
v/s Ratio Perm	c0.60		0.19	0.44		0.35	0.35		0.11	c0.46		0.35
v/c Ratio	1.70	0.93	0.54	1.14	1.51	0.86	1.33	1.30	0.41	1.67	1.04	1.26
Uniform Delay, d1	31.6	37.2	30.9	37.0	35.7	32.6	35.9	44.2	36.5	32.2	43.2	43.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.35	0.58	0.41
Incremental Delay, d2	337.1	11.9	1.1	97.9	235.3	11.5	181.9	143.1	3.2	313.8	31.9	130.1
Delay (s)	368.6	49.2	32.0	134.9	271.0	44.2	217.9	187.4	39.7	357.5	57.2	147.9
Level of Service	F	D	C	F	F	D	F	F	D	F	E	F
Approach Delay (s)		98.8			210.0			167.2			138.2	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM 2000 Control Delay	161.2	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.67			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	138.2%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Appendix H1

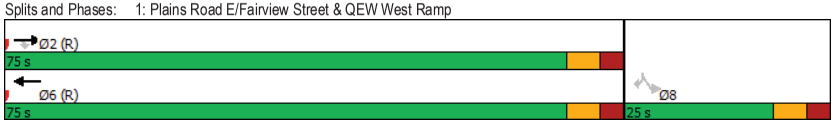
2027 Total Operation Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1495	209	0	840	0	0	0	0	245	0	101
Future Volume (vph)	0	1495	209	0	840	0	0	0	0	245	0	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	55.0		0.0
Storage Lanes	0		1	0		0	0		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor			0.98									
Frt			0.850									0.850
Flt Protected										0.950		
Satd. Flow (prot)	0	5036	1538	0	4988	0	0	0	0	3367	0	1615
Flt Permitted										0.950		
Satd. Flow (perm)	0	5036	1503	0	4988	0	0	0	0	3367	0	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			227									110
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		175.7			307.2			140.0			199.7	
Travel Time (s)		12.7			22.1			10.1			14.4	
Confl. Peds. (#/hr)	1		2	2		1						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	5%	4%	4%	0%	0%	0%	0%	4%	50%	0%
Adj. Flow (vph)	0	1625	227	0	913	0	0	0	0	266	0	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1625	227	0	913	0	0	0	0	266	0	110
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Detector Phase		2	2		6					8		8
Switch Phase												
Minimum Initial (s)		8.0	8.0		8.0					8.0		8.0
Minimum Split (s)		43.0	43.0		43.0					25.0		25.0
Total Split (s)		75.0	75.0		75.0					25.0		25.0
Total Split (%)		75.0%	75.0%		75.0%					25.0%		25.0%
Yellow Time (s)		4.0	4.0		4.0					4.0		4.0
All-Red Time (s)		3.0	3.0		3.0					3.0		3.0
Lost Time Adjust (s)		0.0	0.0		0.0					0.0		0.0
Total Lost Time (s)		7.0	7.0		7.0					7.0		7.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max		C-Max					None		None
Act Effct Green (s)		72.9	72.9		72.9					13.1		13.1
Actuated g/C Ratio		0.73	0.73		0.73					0.13		0.13
v/c Ratio		0.44	0.20		0.25					0.60		0.36
Control Delay		6.1	1.1		4.8					46.5		10.9
Queue Delay		0.0	0.0		0.0					0.0		0.0
Total Delay		6.1	1.1		4.8					46.5		10.9
LOS		A	A		A					D		B
Approach Delay		5.5			4.8						36.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A						D	
Queue Length 50th (m)		41.4	0.0		16.8					26.7		0.0
Queue Length 95th (m)		57.2	6.6		33.7					38.4		15.0
Internal Link Dist (m)		151.7			283.2			116.0			175.7	
Turn Bay Length (m)										55.0		
Base Capacity (vph)		3669	1156		3634					606		380
Starvation Cap Reductn		0	0		0					0		0
Spillback Cap Reductn		0	0		0					0		0
Storage Cap Reductn		0	0		0					0		0
Reduced v/c Ratio		0.44	0.20		0.25					0.44		0.29

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 66 (66%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 9.0		Intersection LOS: A	
Intersection Capacity Utilization 46.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Plains Road E/Fairview Street & QEW West Ramp



Queues
1: Plains Road E/Fairview Street & QEW West Ramp

Total (2027)
AM Peak Hour

Lane Group	EBT	EBR	WBT	SBL	SBR
Lane Group Flow (vph)	1625	227	913	266	110
v/c Ratio	0.44	0.20	0.25	0.60	0.36
Control Delay	6.1	1.1	4.8	46.5	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.1	1.1	4.8	46.5	10.9
Queue Length 50th (m)	41.4	0.0	16.8	26.7	0.0
Queue Length 95th (m)	57.2	6.6	33.7	38.4	15.0
Internal Link Dist (m)	151.7		283.2		
Turn Bay Length (m)				55.0	
Base Capacity (vph)	3669	1156	3634	606	380
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.44	0.20	0.25	0.44	0.29

Intersection Summary

HCM Signalized Intersection Capacity Analysis
1: Plains Road E/Fairview Street & QEW West Ramp

Total (2027)
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1495	209	0	840	0	0	0	0	245	0	101
Future Volume (vph)	0	1495	209	0	840	0	0	0	0	245	0	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0					7.0		7.0
Lane Util. Factor		0.91	1.00		0.91					0.97		1.00
Frpb, ped/bikes		1.00	0.98		1.00					1.00		1.00
Flpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Frt		1.00	0.85		1.00					1.00		0.85
Flt Protected		1.00	1.00		1.00					0.95		1.00
Satd. Flow (prot)		5036	1503		4988					3367		1615
Flt Permitted		1.00	1.00		1.00					0.95		1.00
Satd. Flow (perm)		5036	1503		4988					3367		1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1625	227	0	913	0	0	0	0	266	0	110
RTOR Reduction (vph)	0	0	62	0	0	0	0	0	0	0	0	96
Lane Group Flow (vph)	0	1625	165	0	913	0	0	0	0	266	0	14
Confl. Peds. (#/hr)	1		2	2		1						
Heavy Vehicles (%)	0%	3%	5%	4%	4%	0%	0%	0%	0%	4%	50%	0%
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Actuated Green, G (s)		72.9	72.9		72.9					13.1		13.1
Effective Green, g (s)		72.9	72.9		72.9					13.1		13.1
Actuated g/C Ratio		0.73	0.73		0.73					0.13		0.13
Clearance Time (s)		7.0	7.0		7.0					7.0		7.0
Vehicle Extension (s)		3.0	3.0		3.0					3.0		3.0
Lane Grp Cap (vph)		3671	1095		3636					441		211
v/s Ratio Prot		c0.32			0.18							
v/s Ratio Perm			0.11							c0.08		0.01
v/c Ratio		0.44	0.15		0.25					0.60		0.07
Uniform Delay, d1		5.4	4.1		4.5					41.0		38.1
Progression Factor		1.00	1.00		0.99					1.00		1.00
Incremental Delay, d2		0.4	0.3		0.1					2.3		0.1
Delay (s)		5.8	4.4		4.6					43.3		38.2
Level of Service		A	A		A					D		D
Approach Delay (s)		5.6			4.6			0.0			41.8	
Approach LOS		A			A			A			D	

Intersection Summary					
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.47				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		14.0	
Intersection Capacity Utilization	46.7%	ICU Level of Service		A	
Analysis Period (min)	15				

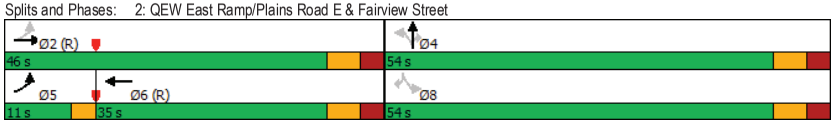
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	1296	0	0	804	21	217	290	759	35	0	437
Future Volume (vph)	117	1296	0	0	804	21	217	290	759	35	0	437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		45.0	25.0		0.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			15.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.91	0.95	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00			0.99	0.99	1.00		
Frt					0.996			0.934	0.850			0.850
Flt Protected	0.950						0.950	0.998		0.950		
Satd. Flow (prot)	1752	5036	0	0	4970	0	1649	1570	1504	1805	0	1538
Flt Permitted	0.205						0.950	0.998		0.165		
Satd. Flow (perm)	378	5036	0	0	4970	0	1649	1570	1485	313	0	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					4			7	76			254
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		307.2			385.1			180.0			111.4	
Travel Time (s)		22.1			27.7			13.0			8.0	
Confl. Peds. (#/hr)	1		3	3		1			1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	0%	4%	0%	4%	2%	2%	0%	0%	5%
Adj. Flow (vph)	127	1409	0	0	874	23	236	315	825	38	0	475
Shared Lane Traffic (%)							10%		32%			
Lane Group Flow (vph)	127	1409	0	0	897	0	212	603	561	38	0	475
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Detector Phase	5	2			6		4	4	4	8		8
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0		8.0	8.0	8.0	8.0		8.0
Minimum Split (s)	11.0	35.0			35.0		36.0	36.0	36.0	36.0		36.0
Total Split (s)	11.0	46.0			35.0		54.0	54.0	54.0	54.0		54.0
Total Split (%)	11.0%	46.0%			35.0%		54.0%	54.0%	54.0%	54.0%		54.0%
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	0.0	3.0			3.0		3.0	3.0	3.0	3.0		3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	None	C-Max			C-Max		None	None	None	None		None
Act Effct Green (s)	46.7	42.7			31.5		43.3	43.3	43.3	43.3		43.3
Actuated g/C Ratio	0.47	0.43			0.32		0.43	0.43	0.43	0.43		0.43
v/c Ratio	0.44	0.66			0.57		0.30	0.88	0.82	0.28		0.59
Control Delay	17.6	21.0			31.1		18.9	41.2	31.8	23.1		12.0
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Delay	17.6	21.0			31.1		18.9	41.2	31.8	23.1		12.0
LOS	B	C			C		B	D	C	C		B
Approach Delay		20.7			31.1			33.9			12.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			C			C			B	
Queue Length 50th (m)	10.8	91.5			58.4		27.1	112.8	85.5	4.6		29.0
Queue Length 95th (m)	18.2	109.6			73.3		43.6	#182.3	134.0	13.0		58.8
Internal Link Dist (m)		283.2			361.1			156.0			87.4	
Turn Bay Length (m)	30.0								45.0	25.0		
Base Capacity (vph)	289	2151			1568		775	741	738	147		857
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	0.44	0.66			0.57		0.27	0.81	0.76	0.26		0.55

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 96 (96%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 26.1		Intersection LOS: C	
Intersection Capacity Utilization 89.4%		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: 2: QEW East Ramp/Plains Road E & Fairview Street



Queues
2: QEW East Ramp/Plains Road E & Fairview Street

Total (2027)
AM Peak Hour

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	127	1409	897	212	603	561	38	475
v/c Ratio	0.44	0.66	0.57	0.30	0.88	0.82	0.28	0.59
Control Delay	17.6	21.0	31.1	18.9	41.2	31.8	23.1	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.6	21.0	31.1	18.9	41.2	31.8	23.1	12.0
Queue Length 50th (m)	10.8	91.5	58.4	27.1	112.8	85.5	4.6	29.0
Queue Length 95th (m)	18.2	109.6	73.3	43.6	#182.3	134.0	13.0	58.8
Internal Link Dist (m)		283.2	361.1		156.0			
Turn Bay Length (m)	30.0					45.0	25.0	
Base Capacity (vph)	289	2151	1568	775	741	738	147	857
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	0.44	0.66	0.57	0.27	0.81	0.76	0.26	0.55

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
2: QEW East Ramp/Plains Road E & Fairview Street

Total (2027)
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	1296	0	0	804	21	217	290	759	35	0	437
Future Volume (vph)	117	1296	0	0	804	21	217	290	759	35	0	437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lane Util. Factor	1.00	0.91			0.91		0.95	0.91	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	0.99	0.99	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			1.00		1.00	0.93	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1752	5036			4970		1649	1570	1485	1805		1538
Flt Permitted	0.21	1.00			1.00		0.95	1.00	1.00	0.16		1.00
Satd. Flow (perm)	379	5036			4970		1649	1570	1485	313		1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	127	1409	0	0	874	23	236	315	825	38	0	475
RTOR Reduction (vph)	0	0	0	0	3	0	0	4	43	0	0	144
Lane Group Flow (vph)	127	1409	0	0	894	0	212	599	518	38	0	331
Confl. Peds. (#/hr)	1		3	3		1			1	1		
Heavy Vehicles (%)	3%	3%	3%	0%	4%	0%	4%	2%	2%	0%	0%	5%
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Actuated Green, G (s)	42.7	42.7			31.5		43.3	43.3	43.3	43.3		43.3
Effective Green, g (s)	42.7	42.7			31.5		43.3	43.3	43.3	43.3		43.3
Actuated g/C Ratio	0.43	0.43			0.32		0.43	0.43	0.43	0.43		0.43
Clearance Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		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)	274	2150			1565		714	679	643	135		665
v/s Ratio Prot	0.04	c0.28			0.18							
v/s Ratio Perm	0.16						0.13	0.38	0.35	0.12		0.22
v/c Ratio	0.46	0.66			0.57		0.30	0.88	0.81	0.28		0.50
Uniform Delay, d1	18.5	22.8			28.6		18.4	26.0	24.7	18.3		20.5
Progression Factor	0.78	0.82			1.00		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	1.1	1.4			1.5		0.2	12.9	7.3	1.1		0.6
Delay (s)	15.6	20.2			30.1		18.7	38.9	32.0	19.5		21.1
Level of Service	B	C			C		B	D	C	B		C
Approach Delay (s)		19.8			30.1			33.0			21.0	
Approach LOS		B			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	26.3	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)	17.0	
Intersection Capacity Utilization	89.4%	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)	463	27	277	389	15	565
Future Volume (vph)	463	27	277	389	15	565
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	55.0		0.0	0.0
Storage Lanes		0	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	0.97	1.00	1.00	1.00
Ped Bike Factor	1.00		0.99			0.99
Frt	0.992					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3346	0	3303	1712	1805	1568
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3346	0	3281	1712	1805	1547
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	6					26
Link Speed (k/h)	50			60	50	
Link Distance (m)	209.7			887.5	183.4	
Travel Time (s)	15.1			53.3	13.2	
Confl. Peds. (#/hr)		7	7			1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	40%	6%	11%	0%	3%
Adj. Flow (vph)	503	29	301	423	16	614
Shared Lane Traffic (%)						
Lane Group Flow (vph)	532	0	301	423	16	614
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Detector Phase	3		4	4	2	4
Switch Phase						
Minimum Initial (s)	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	17.0		27.0	27.0	18.0	27.0
Total Split (s)	23.0		44.0	44.0	18.0	44.0
Total Split (%)	27.1%		51.8%	51.8%	21.2%	51.8%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None		C-Max	C-Max	Max	C-Max
Act Effct Green (s)	15.7		38.0	38.0	11.3	50.3
Actuated g/C Ratio	0.18		0.45	0.45	0.13	0.59
v/c Ratio	0.86		0.20	0.55	0.07	0.66
Control Delay	48.3		14.8	20.7	33.4	13.4
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	48.3		14.8	20.7	33.4	13.4
LOS	D		B	C	C	B
Approach Delay	48.3			18.2	13.9	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	D			B	B	
Queue Length 50th (m)	46.0		15.5	51.2	2.5	48.9
Queue Length 95th (m)	#72.5		23.7	79.8	8.3	78.4
Internal Link Dist (m)	185.7			863.5	159.4	
Turn Bay Length (m)			55.0			
Base Capacity (vph)	634		1476	765	240	936
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.84		0.20	0.55	0.07	0.66

Intersection Summary			
Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 85			
Offset: 27 (32%), Referenced to phase 4:WBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 25.3		Intersection LOS: C	
Intersection Capacity Utilization 59.6%		ICU Level of Service B	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Maple Avenue & Plains Road E



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	532	301	423	16	614
v/c Ratio	0.86	0.20	0.55	0.07	0.66
Control Delay	48.3	14.8	20.7	33.4	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	48.3	14.8	20.7	33.4	13.4
Queue Length 50th (m)	46.0	15.5	51.2	2.5	48.9
Queue Length 95th (m)	#72.5	23.7	79.8	8.3	78.4
Internal Link Dist (m)	185.7		863.5	159.4	
Turn Bay Length (m)		55.0			
Base Capacity (vph)	634	1476	765	240	936
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.84	0.20	0.55	0.07	0.66

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	463	27	277	389	15	565
Future Volume (vph)	463	27	277	389	15	565
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		6.0	6.0	7.0	6.0
Lane Util. Factor	0.95		0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3345		3303	1712	1805	1563
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3345		3303	1712	1805	1563
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	503	29	301	423	16	614
RTOR Reduction (vph)	5	0	0	0	0	11
Lane Group Flow (vph)	527	0	301	423	16	603
Confl. Peds. (#/hr)		7	7			1
Heavy Vehicles (%)	5%	40%	6%	11%	0%	3%
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Actuated Green, G (s)	15.7		38.0	38.0	11.3	49.3
Effective Green, g (s)	15.7		38.0	38.0	11.3	49.3
Actuated g/C Ratio	0.18		0.45	0.45	0.13	0.58
Clearance Time (s)	7.0		6.0	6.0	7.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	617		1476	765	239	906
v/s Ratio Prot			0.09			c0.30
v/s Ratio Perm	c0.16			0.25	0.01	0.09
v/c Ratio	0.85		0.20	0.55	0.07	0.67
Uniform Delay, d1	33.5		14.3	17.3	32.2	12.2
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	11.1		0.3	2.9	0.5	3.9
Delay (s)	44.7		14.6	20.1	32.8	16.1
Level of Service	D		B	C	C	B
Approach Delay (s)	44.7			17.8	16.5	
Approach LOS	D			B	B	

Intersection Summary			
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
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)	478	502	46	80	147	80	38	819	275	312	1047	473
Future Volume (vph)	478	502	46	80	147	80	38	819	275	312	1047	473
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	50.0		75.0	50.0		0.0	40.0		30.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.99	1.00		1.00		0.98	1.00	0.99		1.00		0.97
Frt		0.987				0.850		0.962				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	1839	0	1597	3252	1404	1641	4744	0	1719	5085	1538
Flt Permitted	0.950			0.950			0.231			0.125		
Satd. Flow (perm)	3372	1839	0	1593	3252	1374	398	4744	0	226	5085	1498
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				208		74				297
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		887.5			190.4			463.4			229.3	
Travel Time (s)		53.3			11.4			27.8			13.8	
Confl. Peds. (#/hr)	7		5	5		7	11		7	7		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	0%	13%	11%	15%	10%	3%	8%	5%	2%	5%
Adj. Flow (vph)	520	546	50	87	160	87	41	890	299	339	1138	514
Shared Lane Traffic (%)												
Lane Group Flow (vph)	520	596	0	87	160	87	41	1189	0	339	1138	514
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Detector Phase	7	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	7.0	8.0		7.0	8.0	8.0
Minimum Split (s)	13.0	31.3		13.0	29.3	29.3	11.0	31.0		11.0	31.0	31.0
Total Split (s)	23.0	41.0		13.0	31.0	31.0	11.0	34.0		22.0	45.0	45.0
Total Split (%)	20.9%	37.3%		11.8%	28.2%	28.2%	10.0%	30.9%		20.0%	40.9%	40.9%
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.7		3.0	3.7	3.7
All-Red Time (s)	2.0	2.6		2.0	2.6	2.6	1.0	2.3		1.0	2.3	2.3
Lost Time Adjust (s)	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	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	18.0	34.7		8.0	24.7	24.7	37.0	28.0		52.0	43.4	43.4
Actuated g/C Ratio	0.16	0.32		0.07	0.22	0.22	0.34	0.25		0.47	0.39	0.39
v/c Ratio	0.94	1.02		0.75	0.22	0.19	0.19	0.94		0.97	0.57	0.67
Control Delay	71.2	81.3		86.6	35.8	0.9	16.0	37.0		69.9	28.2	16.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	71.2	81.3		86.6	35.8	0.9	16.0	37.0		69.9	28.2	16.7
LOS	E	F		F	D	A	B	D		E	C	B
Approach Delay		76.6			39.9			36.3			32.3	

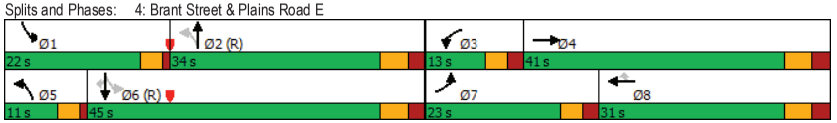
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			D			D			C	
Queue Length 50th (m)	60.5	~143.0		19.6	15.6	0.0	2.5	87.3		59.4	77.5	41.7
Queue Length 95th (m)	#93.2	#213.6		#47.1	25.2	0.0	m3.9	m#120.1		#118.4	93.3	84.6
Internal Link Dist (m)		863.5			166.4			439.4			205.3	
Turn Bay Length (m)	55.0			50.0		75.0	50.0			40.0		30.0
Base Capacity (vph)	556	582		116	730	469	212	1262		351	2006	770
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.94	1.02		0.75	0.22	0.19	0.19	0.94		0.97	0.57	0.67

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 40 (36%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 44.5 Intersection LOS: D
Intersection Capacity Utilization 93.1% 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: 4: Brant Street & Plains Road E



Queues
4: Brant Street & Plains Road E

Total (2027)
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	520	596	87	160	87	41	1189	339	1138	514
v/c Ratio	0.94	1.02	0.75	0.22	0.19	0.19	0.94	0.97	0.57	0.67
Control Delay	71.2	81.3	86.6	35.8	0.9	16.0	37.0	69.9	28.2	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.2	81.3	86.6	35.8	0.9	16.0	37.0	69.9	28.2	16.7
Queue Length 50th (m)	60.5	~143.0	19.6	15.6	0.0	2.5	87.3	59.4	77.5	41.7
Queue Length 95th (m)	#93.2	#213.6	#47.1	25.2	0.0	m3.9	m#120.1	#118.4	93.3	84.6
Internal Link Dist (m)		863.5		166.4			439.4		205.3	
Turn Bay Length (m)	55.0		50.0		75.0	50.0		40.0		30.0
Base Capacity (vph)	556	582	116	730	469	212	1262	351	2006	770
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	1.02	0.75	0.22	0.19	0.19	0.94	0.97	0.57	0.67

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
4: Brant Street & Plains Road E

Total (2027)
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	478	502	46	80	147	80	38	819	275	312	1047	473
Future Volume (vph)	478	502	46	80	147	80	38	819	275	312	1047	473
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	1.00		1.00	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	0.99		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
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3400	1839		1597	3252	1374	1640	4745		1719	5085	1498
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.23	1.00		0.12	1.00	1.00
Satd. Flow (perm)	3400	1839		1597	3252	1374	399	4745		226	5085	1498
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	520	546	50	87	160	87	41	890	299	339	1138	514
RTOR Reduction (vph)	0	3	0	0	0	67	0	55	0	0	0	184
Lane Group Flow (vph)	520	593	0	87	160	20	41	1134	0	339	1138	330
Confl. Peds. (#/hr)	7		5	5		7	11		7	7		11
Heavy Vehicles (%)	3%	2%	0%	13%	11%	15%	10%	3%	8%	5%	2%	5%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Actuated Green, G (s)	18.0	34.7		8.0	24.7	24.7	32.2	28.0		50.0	41.8	41.8
Effective Green, g (s)	18.0	34.7		8.0	24.7	24.7	32.2	28.0		50.0	41.8	41.8
Actuated g/C Ratio	0.16	0.32		0.07	0.22	0.22	0.29	0.25		0.45	0.38	0.38
Clearance Time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	556	580		116	730	308	164	1207		347	1932	569
v/s Ratio Prot	c0.15	c0.32		0.05	0.05		0.01	0.24		c0.16	0.22	
v/s Ratio Perm						0.01	0.06			c0.28		0.22
v/c Ratio	0.94	1.02		0.75	0.22	0.06	0.25	0.94		0.98	0.59	0.58
Uniform Delay, d1	45.4	37.6		50.0	34.8	33.6	28.2	40.2		31.6	27.2	27.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.86	0.68		1.00	1.00	1.00
Incremental Delay, d2	23.1	43.3		23.5	0.2	0.1	0.5	10.5		41.7	1.3	4.3
Delay (s)	68.6	80.9		73.5	34.9	33.6	24.7	37.8		73.3	28.6	31.4
Level of Service	E	F		E	C	C	C	D		E	C	C
Approach Delay (s)		75.2			44.6			37.3			36.9	
Approach LOS		E			D			D			D	

Intersection Summary						
HCM 2000 Control Delay	46.7	HCM 2000 Level of Service	D			
HCM 2000 Volume to Capacity ratio	1.05					
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.3			
Intersection Capacity Utilization	93.1%	ICU Level of Service	F			
Analysis Period (min)	15					

c Critical Lane Group

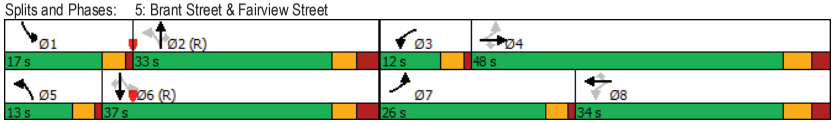
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	366	1178	284	134	372	164	207	685	288	249	767	163
Future Volume (vph)	366	1178	284	134	372	164	207	685	288	249	767	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		170.0	60.0		0.0	75.0		70.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.99	1.00		0.98	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)	1687	3539	1568	1703	3438	1538	1787	3505	1599	1787	3505	1346
Flt Permitted	0.386			0.135			0.151			0.131		
Satd. Flow (perm)	683	3539	1547	242	3438	1507	282	3505	1535	245	3505	1290
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			270			178			186			177
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		261.1			251.5			231.2			463.4	
Travel Time (s)		15.7			15.1			16.6			27.8	
Confl. Peds. (#/hr)	6		1	1		6	22		21	21		22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	2%	3%	6%	5%	5%	1%	3%	1%	1%	3%	20%
Adj. Flow (vph)	398	1280	309	146	404	178	225	745	313	271	834	177
Shared Lane Traffic (%)												
Lane Group Flow (vph)	398	1280	309	146	404	178	225	745	313	271	834	177
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		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	31.4	31.4	12.0	31.4	31.4	12.0	31.5	31.5	12.0	31.5	31.5
Total Split (s)	26.0	48.0	48.0	12.0	34.0	34.0	13.0	33.0	33.0	17.0	37.0	37.0
Total Split (%)	23.6%	43.6%	43.6%	10.9%	30.9%	30.9%	11.8%	30.0%	30.0%	15.5%	33.6%	33.6%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
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)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	56.0	41.6	41.6	40.0	29.6	29.6	38.0	26.5	26.5	46.0	30.5	30.5
Actuated g/C Ratio	0.51	0.38	0.38	0.36	0.27	0.27	0.35	0.24	0.24	0.42	0.28	0.28
v/c Ratio	0.75	0.96	0.41	0.75	0.44	0.33	1.02	0.88	0.61	0.95	0.86	0.36
Control Delay	27.5	50.2	6.2	47.1	35.7	6.8	93.4	53.7	20.5	69.4	53.4	23.5
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	27.5	50.2	6.2	47.1	35.7	6.8	93.4	53.7	20.5	69.4	53.4	23.5
LOS	C	D	A	D	D	A	F	D	C	E	D	C
Approach Delay		38.8			30.9			52.5			52.7	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			C			D			D	
Queue Length 50th (m)	55.6	146.4	5.6	17.0	40.8	0.0	~34.7	85.7	24.4	60.0	106.1	24.9
Queue Length 95th (m)	81.8	#194.9	25.2	#48.6	56.4	17.4	#85.9	#119.0	55.3	m#95.8	m#128.6	m44.1
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	548	1338	752	194	924	535	220	844	510	284	971	485
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	0.96	0.41	0.75	0.44	0.33	1.02	0.88	0.61	0.95	0.86	0.36

Intersection Summary		
Area Type:	Other	
Cycle Length: 110		
Actuated Cycle Length: 110		
Offset: 107 (97%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 100		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.02		
Intersection Signal Delay: 44.4	Intersection LOS: D	
Intersection Capacity Utilization 91.2%	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: 5: Brant Street & Fairview Street



Queues
5: Brant Street & Fairview Street

Total (2027)
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	398	1280	309	146	404	178	225	745	313	271	834	177
v/c Ratio	0.75	0.96	0.41	0.75	0.44	0.33	1.02	0.88	0.61	0.95	0.86	0.36
Control Delay	27.5	50.2	6.2	47.1	35.7	6.8	93.4	53.7	20.5	69.4	53.4	23.5
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	27.5	50.2	6.2	47.1	35.7	6.8	93.4	53.7	20.5	69.4	53.4	23.5
Queue Length 50th (m)	55.6	146.4	5.6	17.0	40.8	0.0	~34.7	85.7	24.4	60.0	106.1	24.9
Queue Length 95th (m)	81.8	#194.9	25.2	#48.6	56.4	17.4	#85.9	#119.0	55.3	m#95.8	m#128.6	m44.1
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	548	1338	752	194	924	535	220	844	510	284	971	485
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	0.96	0.41	0.75	0.44	0.33	1.02	0.88	0.61	0.95	0.86	0.36

Intersection Summary

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

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

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

HCM Signalized Intersection Capacity Analysis
5: Brant Street & Fairview Street

Total (2027)
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	366	1178	284	134	372	164	207	685	288	249	767	163
Future Volume (vph)	366	1178	284	134	372	164	207	685	288	249	767	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	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)	1685	3539	1547	1703	3438	1507	1786	3505	1535	1786	3505	1290
Flt Permitted	0.39	1.00	1.00	0.14	1.00	1.00	0.15	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)	685	3539	1547	242	3438	1507	284	3505	1535	247	3505	1290
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	398	1280	309	146	404	178	225	745	313	271	834	177
RTOR Reduction (vph)	0	0	168	0	0	130	0	0	141	0	0	128
Lane Group Flow (vph)	398	1280	141	146	404	48	225	745	172	271	834	49
Confl. Peds. (#/hr)	6		1	1		6	22		21	21		22
Heavy Vehicles (%)	7%	2%	3%	6%	5%	5%	1%	3%	1%	1%	3%	20%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	53.6	41.6	41.6	37.6	29.6	29.6	35.5	26.5	26.5	43.5	30.5	30.5
Effective Green, g (s)	53.6	41.6	41.6	37.6	29.6	29.6	35.5	26.5	26.5	43.5	30.5	30.5
Actuated g/C Ratio	0.49	0.38	0.38	0.34	0.27	0.27	0.32	0.24	0.24	0.40	0.28	0.28
Clearance Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
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)	515	1338	585	188	925	405	214	844	369	279	971	357
v/s Ratio Prot	c0.14	c0.36		0.06	0.12		0.09	0.21		c0.11	0.24	
v/s Ratio Perm	0.24		0.09	0.21		0.03	0.25		0.11	c0.27		0.04
v/c Ratio	0.77	0.96	0.24	0.78	0.44	0.12	1.05	0.88	0.47	0.97	0.86	0.14
Uniform Delay, d1	19.5	33.3	23.4	28.8	33.3	30.3	32.0	40.3	35.7	28.7	37.7	29.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.19	1.19	4.52
Incremental Delay, d2	7.1	15.3	0.2	18.0	0.3	0.1	75.7	12.9	4.2	40.6	8.1	0.6
Delay (s)	26.6	48.6	23.6	46.8	33.6	30.5	107.7	53.1	39.9	74.7	53.0	135.5
Level of Service	C	D	C	D	C	C	F	D	D	E	D	F
Approach Delay (s)		40.3			35.5			59.5			69.0	
Approach LOS		D			D			E			E	

Intersection Summary				
HCM 2000 Control Delay	51.3	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	91.2%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	34	394	390	14	56	82
Future Volume (vph)	34	394	390	14	56	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.995		0.920	
Flt Protected		0.996			0.980	
Satd. Flow (prot)	0	1855	1853	0	1679	0
Flt Permitted		0.996			0.980	
Satd. Flow (perm)	0	1855	1853	0	1679	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		47.1	32.3		62.0	
Travel Time (s)		3.4	2.3		4.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	37	428	424	15	61	89
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	465	439	0	150	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	34	394	390	14	56	82
Future Volume (Veh/h)	34	394	390	14	56	82
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)	37	428	424	15	61	89
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		206	242			
pX, platoon unblocked	0.83				0.83	0.83
vC, conflicting volume	439				934	432
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	219				796	210
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				79	87
cM capacity (veh/h)	1118				287	688

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	465	439	150
Volume Left	37	0	61
Volume Right	0	15	89
cSH	1118	1700	438
Volume to Capacity	0.03	0.26	0.34
Queue Length 95th (m)	0.8	0.0	12.0
Control Delay (s)	1.0	0.0	17.4
Lane LOS	A		C
Approach Delay (s)	1.0	0.0	17.4
Approach LOS			C

Intersection Summary					
Average Delay		2.9			
Intersection Capacity Utilization		62.1%	ICU Level of Service		B
Analysis Period (min)		15			

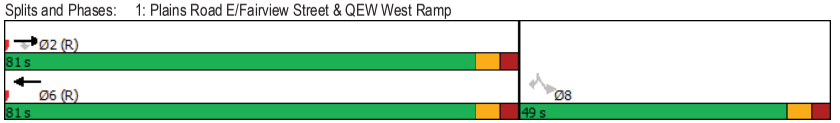
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1311	409	0	2104	0	0	0	0	631	0	354
Future Volume (vph)	0	1311	409	0	2104	0	0	0	0	631	0	354
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	55.0		0.0
Storage Lanes	0		1	0		0	0		0	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor			0.95									0.98
Frt			0.850									0.850
Flt Protected										0.950		
Satd. Flow (prot)	0	5136	1583	0	5085	0	0	0	0	3467	0	1615
Flt Permitted										0.950		
Satd. Flow (perm)	0	5136	1507	0	5085	0	0	0	0	3467	0	1585
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			445									34
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		175.7			307.2			140.0			199.7	
Travel Time (s)		12.7			22.1			10.1			14.4	
Confl. Peds. (#/hr)	4		15	15		4	3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	2%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Adj. Flow (vph)	0	1425	445	0	2287	0	0	0	0	686	0	385
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1425	445	0	2287	0	0	0	0	686	0	385
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Detector Phase		2	2		6					8		8
Switch Phase												
Minimum Initial (s)		8.0	8.0		8.0					8.0		8.0
Minimum Split (s)		43.0	43.0		43.0					25.0		25.0
Total Split (s)		81.0	81.0		81.0					49.0		49.0
Total Split (%)		62.3%	62.3%		62.3%					37.7%		37.7%
Yellow Time (s)		4.0	4.0		4.0					4.0		4.0
All-Red Time (s)		3.0	3.0		3.0					3.0		3.0
Lost Time Adjust (s)		0.0	0.0		0.0					0.0		0.0
Total Lost Time (s)		7.0	7.0		7.0					7.0		7.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max		C-Max					None		None
Act Effct Green (s)		81.2	81.2		81.2					34.8		34.8
Actuated g/C Ratio		0.62	0.62		0.62					0.27		0.27
v/c Ratio		0.44	0.40		0.72					0.74		0.86
Control Delay		13.9	2.3		7.2					48.1		59.3
Queue Delay		0.0	0.0		0.0					0.0		0.0
Total Delay		13.9	2.3		7.2					48.1		59.3
LOS		B	A		A					D		E
Approach Delay		11.2			7.3						52.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A						D	
Queue Length 50th (m)		70.0	0.0		41.5					86.5		90.5
Queue Length 95th (m)		92.7	14.5		m33.6					101.2		123.4
Internal Link Dist (m)		151.7			283.2			116.0			175.7	
Turn Bay Length (m)										55.0		
Base Capacity (vph)		3209	1108		3177					1120		535
Starvation Cap Reductn		0	0		0					0		0
Spillback Cap Reductn		0	0		0					0		0
Storage Cap Reductn		0	0		0					0		0
Reduced v/c Ratio		0.44	0.40		0.72					0.61		0.72

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 34 (26%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 17.9		Intersection LOS: B	
Intersection Capacity Utilization 74.6%		ICU Level of Service D	
Analysis Period (min) 15			

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

Splits and Phases: 1: Plains Road E/Fairview Street & QEW West Ramp



Queues
1: Plains Road E/Fairview Street & QEW West Ramp

Total (2027)
PM Peak Hour

Lane Group	EBT	EBR	WBT	SBL	SBR
Lane Group Flow (vph)	1425	445	2287	686	385
v/c Ratio	0.44	0.40	0.72	0.74	0.86
Control Delay	13.9	2.3	7.2	48.1	59.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.9	2.3	7.2	48.1	59.3
Queue Length 50th (m)	70.0	0.0	41.5	86.5	90.5
Queue Length 95th (m)	92.7	14.5	m33.6	101.2	123.4
Internal Link Dist (m)	151.7		283.2		
Turn Bay Length (m)				55.0	
Base Capacity (vph)	3209	1108	3177	1120	535
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.44	0.40	0.72	0.61	0.72

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Plains Road E/Fairview Street & QEW West Ramp

Total (2027)
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1311	409	0	2104	0	0	0	0	631	0	354
Future Volume (vph)	0	1311	409	0	2104	0	0	0	0	631	0	354
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0					7.0		7.0
Lane Util. Factor		0.91	1.00		0.91					0.97		1.00
Frpb, ped/bikes		1.00	0.95		1.00					1.00		0.98
Flpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Frt		1.00	0.85		1.00					1.00		0.85
Flt Protected		1.00	1.00		1.00					0.95		1.00
Satd. Flow (prot)		5136	1507		5085					3467		1585
Flt Permitted		1.00	1.00		1.00					0.95		1.00
Satd. Flow (perm)		5136	1507		5085					3467		1585
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1425	445	0	2287	0	0	0	0	686	0	385
RTOR Reduction (vph)	0	0	167	0	0	0	0	0	0	0	0	25
Lane Group Flow (vph)	0	1425	278	0	2287	0	0	0	0	686	0	360
Confl. Peds. (#/hr)	4		15	15		4	3					3
Heavy Vehicles (%)	0%	1%	2%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Actuated Green, G (s)		81.2	81.2		81.2					34.8		34.8
Effective Green, g (s)		81.2	81.2		81.2					34.8		34.8
Actuated g/C Ratio		0.62	0.62		0.62					0.27		0.27
Clearance Time (s)		7.0	7.0		7.0					7.0		7.0
Vehicle Extension (s)		3.0	3.0		3.0					3.0		3.0
Lane Grp Cap (vph)		3208	941		3176					928		424
v/s Ratio Prot		0.28			c0.45							
v/s Ratio Perm			0.18							0.20		c0.23
v/c Ratio		0.44	0.30		0.72					0.74		0.85
Uniform Delay, d1		12.7	11.2		16.6					43.5		45.1
Progression Factor		1.00	1.00		0.40					1.00		1.00
Incremental Delay, d2		0.4	0.8		0.1					3.1		14.6
Delay (s)		13.1	12.0		6.8					46.6		59.8
Level of Service		B	B		A					D		E
Approach Delay (s)		12.9			6.8			0.0			51.3	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	74.6%	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)	145	1572	0	0	2760	49	168	227	457	25	0	547
Future Volume (vph)	145	1572	0	0	2760	49	168	227	457	25	0	547
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		45.0	75.0		0.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.91	0.95	1.00	1.00	1.00
Ped Bike Factor					1.00							
Frt					0.997			0.950	0.850			0.850
Flt Protected	0.950						0.950	0.998		0.950		
Satd. Flow (prot)	1770	5136	0	0	4792	0	1698	1594	1519	1805	0	1495
Flt Permitted	0.062						0.950	0.998		0.269		
Satd. Flow (perm)	115	5136	0	0	4792	0	1698	1594	1519	511	0	1495
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					3			16	59			127
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		307.2			385.1			180.0			111.1	
Travel Time (s)		22.1			27.7			13.0			8.0	
Confl. Peds. (#/hr)	2		7	7		2						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	1%	0%	0%	8%	0%	1%	4%	1%	0%	0%	8%
Adj. Flow (vph)	158	1709	0	0	3000	53	183	247	497	27	0	595
Shared Lane Traffic (%)							10%		27%			
Lane Group Flow (vph)	158	1709	0	0	3053	0	165	399	363	27	0	595
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Detector Phase	5	2			6		4	4	4	8		8
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0		8.0	8.0	8.0	8.0		8.0
Minimum Split (s)	11.0	35.0			35.0		36.0	36.0	36.0	36.0		36.0
Total Split (s)	11.0	79.0			68.0		51.0	51.0	51.0	51.0		51.0
Total Split (%)	8.5%	60.8%			52.3%		39.2%	39.2%	39.2%	39.2%		39.2%
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	0.0	3.0			3.0		3.0	3.0	3.0	3.0		3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	None	C-Max			C-Max		None	None	None	None		None
Act Effct Green (s)	76.0	72.0			61.0		44.0	44.0	44.0	44.0		44.0
Actuated g/C Ratio	0.58	0.55			0.47		0.34	0.34	0.34	0.34		0.34
v/c Ratio	0.93	0.60			1.36		0.29	0.73	0.66	0.16		1.01
Control Delay	84.2	14.0			193.9		33.2	45.1	36.9	33.2		73.1
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Delay	84.2	14.0			193.9		33.2	45.1	36.9	33.2		73.1
LOS	F	B			F		C	D	D	C		E
Approach Delay		19.9			193.9			39.8			71.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			F			D			E	
Queue Length 50th (m)	24.9	69.5			~398.0		34.2	99.4	73.6	5.1		~137.9
Queue Length 95th (m)	#69.8	98.2			#424.1		54.4	143.6	112.1	13.2		#217.8
Internal Link Dist (m)		283.2			361.1			156.0			87.1	
Turn Bay Length (m)	30.0								45.0	75.0		
Base Capacity (vph)	169	2844			2250		574	550	553	172		590
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	0.93	0.60			1.36		0.29	0.73	0.66	0.16		1.01

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 16 (12%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.36
Intersection Signal Delay: 109.8 Intersection LOS: F
Intersection Capacity Utilization 121.1% ICU Level of Service H
Analysis Period (min) 15

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

Splits and Phases: 2: QEW East Ramp/Plains Road E & Fairview Street



Queues
2: QEW East Ramp/Plains Road E & Fairview Street

Total (2027)
PM Peak Hour

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	158	1709	3053	165	399	363	27	595
v/c Ratio	0.93	0.60	1.36	0.29	0.73	0.66	0.16	1.01
Control Delay	84.2	14.0	193.9	33.2	45.1	36.9	33.2	73.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.2	14.0	193.9	33.2	45.1	36.9	33.2	73.1
Queue Length 50th (m)	24.9	69.5	~398.0	34.2	99.4	73.6	5.1	~137.9
Queue Length 95th (m)	#69.8	98.2	#424.1	54.4	143.6	112.1	13.2	#217.8
Internal Link Dist (m)		283.2	361.1		156.0			
Turn Bay Length (m)	30.0					45.0	75.0	
Base Capacity (vph)	169	2844	2250	574	550	553	172	590
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	0.93	0.60	1.36	0.29	0.73	0.66	0.16	1.01

Intersection Summary

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

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

HCM Signalized Intersection Capacity Analysis
2: QEW East Ramp/Plains Road E & Fairview Street

Total (2027)
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	1572	0	0	2760	49	168	227	457	25	0	547
Future Volume (vph)	145	1572	0	0	2760	49	168	227	457	25	0	547
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lane Util. Factor	1.00	0.91			0.91		0.95	0.91	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			1.00		1.00	0.95	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1770	5136			4794		1698	1593	1519	1805		1495
Flt Permitted	0.06	1.00			1.00		0.95	1.00	1.00	0.27		1.00
Satd. Flow (perm)	116	5136			4794		1698	1593	1519	511		1495
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	1709	0	0	3000	53	183	247	497	27	0	595
RTOR Reduction (vph)	0	0	0	0	2	0	0	11	39	0	0	84
Lane Group Flow (vph)	158	1709	0	0	3051	0	165	388	324	27	0	511
Confl. Peds. (#/hr)	2		7	7		2						
Heavy Vehicles (%)	2%	1%	0%	0%	8%	0%	1%	4%	1%	0%	0%	8%
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Actuated Green, G (s)	72.0	72.0			61.0		44.0	44.0	44.0	44.0		44.0
Effective Green, g (s)	72.0	72.0			61.0		44.0	44.0	44.0	44.0		44.0
Actuated g/C Ratio	0.55	0.55			0.47		0.34	0.34	0.34	0.34		0.34
Clearance Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		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)	166	2844			2249		574	539	514	172		506
v/s Ratio Prot	c0.06	0.33			c0.64							
v/s Ratio Perm	0.47						0.10	0.24	0.21	0.05		c0.34
v/c Ratio	0.95	0.60			1.36		0.29	0.72	0.63	0.16		1.01
Uniform Delay, d1	37.6	19.4			34.5		31.5	37.6	36.2	30.0		43.0
Progression Factor	1.30	0.67			1.00		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	51.4	0.8			163.5		0.3	4.7	2.5	0.4		42.5
Delay (s)	100.4	13.9			198.0		31.8	42.3	38.7	30.5		85.5
Level of Service	F	B			F		C	D	D	C		F
Approach Delay (s)		21.2			198.0			39.0			83.1	
Approach LOS		C			F			D			F	

Intersection Summary			
HCM 2000 Control Delay	113.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	121.1%	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)	377	59	1074	516	47	673
Future Volume (vph)	377	59	1074	516	47	673
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	55.0		0.0	0.0
Storage Lanes		0	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	0.97	1.00	1.00	1.00
Ped Bike Factor	1.00		1.00			
Frt	0.980					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3397	0	3433	1881	1687	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3397	0	3418	1881	1687	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	17					37
Link Speed (k/h)	50			60	50	
Link Distance (m)	209.7			887.5	183.4	
Travel Time (s)	15.1			53.3	13.2	
Confl. Peds. (#/hr)		4	4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	2%	1%	7%	2%
Adj. Flow (vph)	410	64	1167	561	51	732
Shared Lane Traffic (%)						
Lane Group Flow (vph)	474	0	1167	561	51	732
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Detector Phase	3		4	4	2	4
Switch Phase						
Minimum Initial (s)	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	17.0		27.0	27.0	18.0	27.0
Total Split (s)	22.0		50.0	50.0	18.0	50.0
Total Split (%)	24.4%		55.6%	55.6%	20.0%	55.6%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None		C-Max	C-Max	Max	C-Max
Act Effct Green (s)	14.6		44.0	44.0	11.4	62.4
Actuated g/C Ratio	0.16		0.49	0.49	0.13	0.69
v/c Ratio	0.84		0.70	0.61	0.24	0.66
Control Delay	49.7		20.6	20.3	39.0	11.0
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	49.7		20.6	20.3	39.0	11.0
LOS	D		C	C	D	B
Approach Delay	49.7			20.5	12.9	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	D			C	B	
Queue Length 50th (m)	42.7		81.0	71.1	8.5	62.4
Queue Length 95th (m)	#67.3		104.4	105.3	19.7	100.0
Internal Link Dist (m)	185.7			863.5	159.4	
Turn Bay Length (m)			55.0			
Base Capacity (vph)	580		1678	919	213	1108
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.82		0.70	0.61	0.24	0.66

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 4:WBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 23.1		Intersection LOS: C	
Intersection Capacity Utilization 66.3%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Maple Avenue & Plains Road E



Queues
3: Maple Avenue & Plains Road E

Total (2027)
PM Peak Hour

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	474	1167	561	51	732
v/c Ratio	0.84	0.70	0.61	0.24	0.66
Control Delay	49.7	20.6	20.3	39.0	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	49.7	20.6	20.3	39.0	11.0
Queue Length 50th (m)	42.7	81.0	71.1	8.5	62.4
Queue Length 95th (m)	#67.3	104.4	105.3	19.7	100.0
Internal Link Dist (m)	185.7		863.5	159.4	
Turn Bay Length (m)		55.0			
Base Capacity (vph)	580	1678	919	213	1108
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.82	0.70	0.61	0.24	0.66

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
3: Maple Avenue & Plains Road E

Total (2027)
PM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	377	59	1074	516	47	673
Future Volume (vph)	377	59	1074	516	47	673
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		6.0	6.0	7.0	6.0
Lane Util. Factor	0.95		0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3396		3433	1881	1687	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3396		3433	1881	1687	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	410	64	1167	561	51	732
RTOR Reduction (vph)	14	0	0	0	0	14
Lane Group Flow (vph)	460	0	1167	561	51	718
Confl. Peds. (#/hr)		4	4			
Heavy Vehicles (%)	4%	3%	2%	1%	7%	2%
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Actuated Green, G (s)	14.6		44.0	44.0	11.4	55.4
Effective Green, g (s)	14.6		44.0	44.0	11.4	55.4
Actuated g/C Ratio	0.16		0.49	0.49	0.13	0.62
Clearance Time (s)	7.0		6.0	6.0	7.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	550		1678	919	213	974
v/s Ratio Prot			0.34			c0.36
v/s Ratio Perm	c0.14			0.30	0.03	0.09
v/c Ratio	0.84		0.70	0.61	0.24	0.74
Uniform Delay, d1	36.5		17.8	16.8	35.4	12.2
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	10.6		2.4	3.0	2.6	5.0
Delay (s)	47.2		20.2	19.8	38.0	17.1
Level of Service	D		C	B	D	B
Approach Delay (s)	47.2			20.1	18.5	
Approach LOS	D			C	B	

Intersection Summary

HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

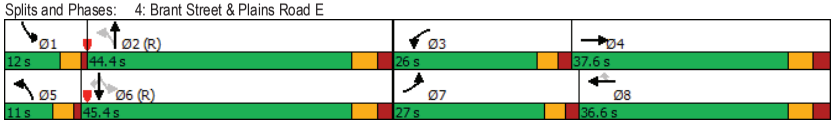
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	606	173	69	159	787	418	87	1397	64	136	1081	797
Future Volume (vph)	606	173	69	159	787	418	87	1397	64	136	1081	797
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	50.0		75.0	50.0		0.0	40.0		30.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.99					0.97	1.00	1.00				0.97
Frt		0.957				0.850		0.993				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3502	1756	0	1719	3539	1583	1805	5084	0	1687	5187	1599
Flt Permitted	0.950			0.950			0.119			0.102		
Satd. Flow (perm)	3482	1756	0	1719	3539	1535	226	5084	0	181	5187	1557
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16				118		6				427
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		887.5			190.4			463.4			229.3	
Travel Time (s)		53.3			11.4			27.8			13.8	
Confl. Peds. (#/hr)	12					12	10		16	16		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	5%	0%	5%	2%	2%	0%	0%	24%	7%	0%	1%
Adj. Flow (vph)	659	188	75	173	855	454	95	1518	70	148	1175	866
Shared Lane Traffic (%)												
Lane Group Flow (vph)	659	263	0	173	855	454	95	1588	0	148	1175	866
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Detector Phase	7	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	7.0	8.0		7.0	8.0	8.0
Minimum Split (s)	13.0	31.3		13.0	29.3	29.3	11.0	31.0		11.0	31.0	31.0
Total Split (s)	27.0	37.6		26.0	36.6	36.6	11.0	44.4		12.0	45.4	45.4
Total Split (%)	22.5%	31.3%		21.7%	30.5%	30.5%	9.2%	37.0%		10.0%	37.8%	37.8%
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.7		3.0	3.7	3.7
All-Red Time (s)	2.0	2.6		2.0	2.6	2.6	1.0	2.3		1.0	2.3	2.3
Lost Time Adjust (s)	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	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	22.0	35.5		16.8	30.3	30.3	47.4	38.4		49.4	39.4	39.4
Actuated g/C Ratio	0.18	0.30		0.14	0.25	0.25	0.40	0.32		0.41	0.33	0.33
v/c Ratio	1.03	0.50		0.72	0.96	0.96	0.52	0.97		0.85	0.69	1.09
Control Delay	90.6	37.5		66.1	65.9	64.9	21.1	47.3		63.0	37.6	78.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	90.6	37.5		66.1	65.9	64.9	21.1	47.3		63.0	37.6	78.0
LOS	F	D		E	E	E	C	D		E	D	E
Approach Delay		75.4			65.6			45.8			55.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			E			D			E	
Queue Length 50th (m)	~89.8	50.8		41.3	110.3	86.5	16.5	150.3		22.2	92.3	~165.0
Queue Length 95th (m)	#127.6	81.5		64.2	#151.7	#154.4	m17.9	m141.3		#58.4	109.3	#244.7
Internal Link Dist (m)		863.5			166.4			439.4			205.3	
Turn Bay Length (m)	55.0			50.0		75.0	50.0			40.0		30.0
Base Capacity (vph)	642	531		300	893	475	181	1630		174	1703	798
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.03	0.50		0.58	0.96	0.96	0.52	0.97		0.85	0.69	1.09

Intersection Summary		
Area Type:	Other	
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 45 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 120		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.09		
Intersection Signal Delay: 58.1	Intersection LOS: E	
Intersection Capacity Utilization 92.8%	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: 4: Brant Street & Plains Road E



Queues
4: Brant Street & Plains Road E

Total (2027)
PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	659	263	173	855	454	95	1588	148	1175	866
v/c Ratio	1.03	0.50	0.72	0.96	0.96	0.52	0.97	0.85	0.69	1.09
Control Delay	90.6	37.5	66.1	65.9	64.9	21.1	47.3	63.0	37.6	78.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.6	37.5	66.1	65.9	64.9	21.1	47.3	63.0	37.6	78.0
Queue Length 50th (m)	~89.8	50.8	41.3	110.3	86.5	16.5	150.3	22.2	92.3	~165.0
Queue Length 95th (m)	#127.6	81.5	64.2	#151.7	#154.4	m17.9	m141.3	#58.4	109.3	#244.7
Internal Link Dist (m)		863.5		166.4			439.4		205.3	
Turn Bay Length (m)	55.0		50.0		75.0	50.0		40.0		30.0
Base Capacity (vph)	642	531	300	893	475	181	1630	174	1703	798
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.50	0.58	0.96	0.96	0.52	0.97	0.85	0.69	1.09

Intersection Summary

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

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

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

HCM Signalized Intersection Capacity Analysis
4: Brant Street & Plains Road E

Total (2027)
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	606	173	69	159	787	418	87	1397	64	136	1081	797
Future Volume (vph)	606	173	69	159	787	418	87	1397	64	136	1081	797
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	1.00		1.00	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00		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
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	1756		1719	3539	1535	1805	5086		1687	5187	1557
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.12	1.00		0.10	1.00	1.00
Satd. Flow (perm)	3502	1756		1719	3539	1535	227	5086		180	5187	1557
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	659	188	75	173	855	454	95	1518	70	148	1175	866
RTOR Reduction (vph)	0	11	0	0	0	88	0	4	0	0	0	287
Lane Group Flow (vph)	659	252	0	173	855	366	95	1584	0	148	1175	579
Confl. Peds. (#/hr)	12					12	10		16	16		10
Heavy Vehicles (%)	0%	5%	0%	5%	2%	2%	0%	0%	24%	7%	0%	1%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Actuated Green, G (s)	22.0	35.5		16.8	30.3	30.3	45.4	38.4		47.4	39.4	39.4
Effective Green, g (s)	22.0	35.5		16.8	30.3	30.3	45.4	38.4		47.4	39.4	39.4
Actuated g/C Ratio	0.18	0.30		0.14	0.25	0.25	0.38	0.32		0.39	0.33	0.33
Clearance Time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	642	519		240	893	387	177	1627		171	1703	511
v/s Ratio Prot	c0.19	0.14		0.10	c0.24		0.03	0.31		c0.06	0.23	
v/s Ratio Perm						0.24	0.17			0.28		c0.37
v/c Ratio	1.03	0.49		0.72	0.96	0.95	0.54	0.97		0.87	0.69	1.13
Uniform Delay, d1	49.0	34.7		49.4	44.2	44.0	26.3	40.3		29.5	35.0	40.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.87	0.99		1.00	1.00	1.00
Incremental Delay, d2	42.4	0.7		10.2	20.3	31.7	0.9	7.3		33.7	2.3	82.0
Delay (s)	91.4	35.5		59.5	64.5	75.8	23.8	47.1		63.2	37.3	122.3
Level of Service	F	D		E	E	E	C	D		E	D	F
Approach Delay (s)		75.5			67.4			45.8			72.7	
Approach LOS		E			E			D			E	

Intersection Summary					
HCM 2000 Control Delay	64.6	HCM 2000 Level of Service		E	
HCM 2000 Volume to Capacity ratio	1.04				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		21.3	
Intersection Capacity Utilization	92.8%	ICU Level of Service		F	
Analysis Period (min)	15				

c Critical Lane Group

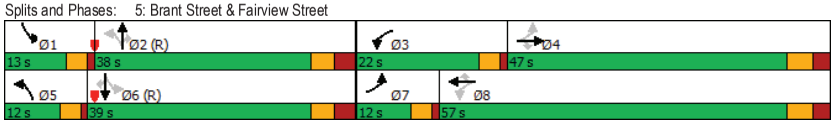
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	231	869	312	230	1620	478	185	871	205	253	721	470
Future Volume (vph)	231	869	312	230	1620	478	185	871	205	253	721	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		170.0	60.0		0.0	75.0		70.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.97			0.98	1.00		0.92			0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1703	3539	1568	1787	3574	1599	1787	3574	1599	1770	3539	1553
Flt Permitted	0.092			0.132			0.146			0.123		
Satd. Flow (perm)	165	3539	1526	248	3574	1573	273	3574	1474	229	3539	1498
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			231			193			178			154
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		261.1			251.5			231.2			463.4	
Travel Time (s)		15.7			15.1			16.6			27.8	
Confl. Peds. (#/hr)	3		10	10		3	16		45	45		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	2%	3%	1%	1%	1%	1%	1%	1%	2%	2%	4%
Adj. Flow (vph)	251	945	339	250	1761	520	201	947	223	275	784	511
Shared Lane Traffic (%)												
Lane Group Flow (vph)	251	945	339	250	1761	520	201	947	223	275	784	511
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		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	31.4	31.4	12.0	31.4	31.4	12.0	31.5	31.5	12.0	31.5	31.5
Total Split (s)	12.0	47.0	47.0	22.0	57.0	57.0	12.0	38.0	38.0	13.0	39.0	39.0
Total Split (%)	10.0%	39.2%	39.2%	18.3%	47.5%	47.5%	10.0%	31.7%	31.7%	10.8%	32.5%	32.5%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
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)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	54.0	43.6	43.6	64.7	50.6	50.6	42.0	31.5	31.5	44.0	32.5	32.5
Actuated g/C Ratio	0.45	0.36	0.36	0.54	0.42	0.42	0.35	0.26	0.26	0.37	0.27	0.27
v/c Ratio	1.43	0.73	0.48	0.77	1.17	0.67	1.03	1.01	0.43	1.38	0.82	0.99
Control Delay	246.5	37.9	12.2	35.6	116.2	21.9	101.8	75.9	11.7	220.6	32.0	49.9
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	246.5	37.9	12.2	35.6	116.2	21.9	101.8	75.9	11.7	220.6	32.0	49.9
LOS	F	D	B	D	F	C	F	E	B	F	C	D
Approach Delay		66.3			88.9			69.3			70.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			F			E			E	
Queue Length 50th (m)	~68.2	107.3	18.4	31.9	~273.5	64.9	~35.0	~125.9	8.5	~67.8	102.4	101.5
Queue Length 95th (m)	#124.4	137.1	47.8	61.6	#318.0	106.6	#82.3	#171.7	30.7	#123.4	127.6	#171.5
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	176	1286	701	365	1507	774	196	938	518	199	958	518
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	1.43	0.73	0.48	0.68	1.17	0.67	1.03	1.01	0.43	1.38	0.82	0.99

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 89 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.43	
Intersection Signal Delay: 76.1	Intersection LOS: E
Intersection Capacity Utilization 113.1%	ICU Level of Service H
Analysis Period (min) 15	

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

Splits and Phases: 5: Brant Street & Fairview Street



Queues
5: Brant Street & Fairview Street

Total (2027)
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	251	945	339	250	1761	520	201	947	223	275	784	511
v/c Ratio	1.43	0.73	0.48	0.77	1.17	0.67	1.03	1.01	0.43	1.38	0.82	0.99
Control Delay	246.5	37.9	12.2	35.6	116.2	21.9	101.8	75.9	11.7	220.6	32.0	49.9
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	246.5	37.9	12.2	35.6	116.2	21.9	101.8	75.9	11.7	220.6	32.0	49.9
Queue Length 50th (m)	~68.2	107.3	18.4	31.9	~273.5	64.9	~35.0	~125.9	8.5	~67.8	102.4	101.5
Queue Length 95th (m)	#124.4	137.1	47.8	61.6	#318.0	106.6	#82.3	#171.7	30.7	#123.4	127.6	#171.5
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	176	1286	701	365	1507	774	196	938	518	199	958	518
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	1.43	0.73	0.48	0.68	1.17	0.67	1.03	1.01	0.43	1.38	0.82	0.99

Intersection Summary

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

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

HCM Signalized Intersection Capacity Analysis
5: Brant Street & Fairview Street

Total (2027)
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	231	869	312	230	1620	478	185	871	205	253	721	470
Future Volume (vph)	231	869	312	230	1620	478	185	871	205	253	721	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.92	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)	1703	3539	1526	1787	3574	1573	1786	3574	1474	1770	3539	1498
Flt Permitted	0.09	1.00	1.00	0.13	1.00	1.00	0.15	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	164	3539	1526	249	3574	1573	275	3574	1474	229	3539	1498
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	251	945	339	250	1761	520	201	947	223	275	784	511
RTOR Reduction (vph)	0	0	147	0	0	112	0	0	131	0	0	112
Lane Group Flow (vph)	251	945	192	250	1761	408	201	947	92	275	784	399
Confl. Peds. (#/hr)	3		10	10		3	16		45	45		16
Heavy Vehicles (%)	6%	2%	3%	1%	1%	1%	1%	1%	1%	2%	2%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	51.6	43.6	43.6	62.6	50.6	50.6	39.5	31.5	31.5	41.5	32.5	32.5
Effective Green, g (s)	51.6	43.6	43.6	62.6	50.6	50.6	39.5	31.5	31.5	41.5	32.5	32.5
Actuated g/C Ratio	0.43	0.36	0.36	0.52	0.42	0.42	0.33	0.26	0.26	0.35	0.27	0.27
Clearance Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
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)	173	1285	554	322	1507	663	191	938	386	194	958	405
v/s Ratio Prot	c0.10	0.27		0.10	c0.49		0.07	0.26		c0.11	0.22	
v/s Ratio Perm	c0.53		0.13	0.31		0.26	0.28		0.06	c0.38		0.27
v/c Ratio	1.45	0.74	0.35	0.78	1.17	0.62	1.05	1.01	0.24	1.42	0.82	0.98
Uniform Delay, d1	30.3	33.2	27.8	21.4	34.7	27.1	35.4	44.2	34.8	34.0	41.0	43.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.96	0.62	0.49
Incremental Delay, d2	232.2	2.2	0.4	11.1	83.4	1.7	79.6	31.8	1.4	210.4	6.3	36.3
Delay (s)	262.5	35.4	28.2	32.5	118.1	28.8	115.0	76.0	36.3	243.2	31.6	57.7
Level of Service	F	D	C	C	F	C	F	E	D	F	C	E
Approach Delay (s)		70.9			91.3			75.3			77.2	
Approach LOS		E			F			E			E	

Intersection Summary				
HCM 2000 Control Delay	80.5	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.40			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	113.1%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	91	329	499	64	36	73
Future Volume (vph)	91	329	499	64	36	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.985		0.910	
Flt Protected		0.989			0.984	
Satd. Flow (prot)	0	1842	1835	0	1668	0
Flt Permitted		0.989			0.984	
Satd. Flow (perm)	0	1842	1835	0	1668	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		47.1	32.3		62.0	
Travel Time (s)		3.4	2.3		4.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	358	542	70	39	79
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	457	612	0	118	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	91	329	499	64	36	73
Future Volume (Veh/h)	91	329	499	64	36	73
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)	99	358	542	70	39	79
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		206	242			
pX, platoon unblocked	0.76				0.78	0.76
vC, conflicting volume	612				1133	577
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	338				962	293
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				80	86
cM capacity (veh/h)	933				197	571

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	457	612	118
Volume Left	99	0	39
Volume Right	0	70	79
cSH	933	1700	351
Volume to Capacity	0.11	0.36	0.34
Queue Length 95th (m)	2.8	0.0	11.6
Control Delay (s)	3.0	0.0	20.4
Lane LOS	A		C
Approach Delay (s)	3.0	0.0	20.4
Approach LOS			C

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

Appendix H2

2029 Total Operation Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1558	218	0	880	0	0	0	0	261	0	105
Future Volume (vph)	0	1558	218	0	880	0	0	0	0	261	0	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	55.0		0.0
Storage Lanes	0		1	0		0	0		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor			0.98									
Frt			0.850									0.850
Flt Protected										0.950		
Satd. Flow (prot)	0	5036	1538	0	4988	0	0	0	0	3367	0	1615
Flt Permitted										0.950		
Satd. Flow (perm)	0	5036	1503	0	4988	0	0	0	0	3367	0	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			237									114
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		175.7			307.2			140.0			199.7	
Travel Time (s)		12.7			22.1			10.1			14.4	
Confl. Peds. (#/hr)	1		2	2		1						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	5%	4%	4%	0%	0%	0%	0%	4%	50%	0%
Adj. Flow (vph)	0	1693	237	0	957	0	0	0	0	284	0	114
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1693	237	0	957	0	0	0	0	284	0	114
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Detector Phase		2	2		6					8		8
Switch Phase												
Minimum Initial (s)		8.0	8.0		8.0					8.0		8.0
Minimum Split (s)		43.0	43.0		43.0					25.0		25.0
Total Split (s)		75.0	75.0		75.0					25.0		25.0
Total Split (%)		75.0%	75.0%		75.0%					25.0%		25.0%
Yellow Time (s)		4.0	4.0		4.0					4.0		4.0
All-Red Time (s)		3.0	3.0		3.0					3.0		3.0
Lost Time Adjust (s)		0.0	0.0		0.0					0.0		0.0
Total Lost Time (s)		7.0	7.0		7.0					7.0		7.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max		C-Max					None		None
Act Effct Green (s)		72.3	72.3		72.3					13.7		13.7
Actuated g/C Ratio		0.72	0.72		0.72					0.14		0.14
v/c Ratio		0.46	0.21		0.27					0.62		0.36
Control Delay		6.5	1.1		5.4					46.4		10.5
Queue Delay		0.0	0.0		0.0					0.0		0.0
Total Delay		6.5	1.1		5.4					46.4		10.5
LOS		A	A		A					D		B
Approach Delay		5.9			5.4						36.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A						D	
Queue Length 50th (m)		45.1	0.0		20.7					28.5		0.0
Queue Length 95th (m)		62.5	6.9		m36.8					40.4		14.9
Internal Link Dist (m)		151.7			283.2			116.0			175.7	
Turn Bay Length (m)										55.0		
Base Capacity (vph)		3643	1152		3608					606		384
Starvation Cap Reductn		0	0		0					0		0
Spillback Cap Reductn		0	0		0					0		0
Storage Cap Reductn		0	0		0					0		0
Reduced v/c Ratio		0.46	0.21		0.27					0.47		0.30

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 66 (66%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 9.4		Intersection LOS: A	
Intersection Capacity Utilization 46.7%		ICU Level of Service A	
Analysis Period (min) 15			

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

Splits and Phases: 1: Plains Road E/Fairview Street & QEW West Ramp



Queues
1: Plains Road E/Fairview Street & QEW West Ramp

Total (2029)
AM Peak Hour

Lane Group	EBT	EBR	WBT	SBL	SBR
Lane Group Flow (vph)	1693	237	957	284	114
v/c Ratio	0.46	0.21	0.27	0.62	0.36
Control Delay	6.5	1.1	5.4	46.4	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	1.1	5.4	46.4	10.5
Queue Length 50th (m)	45.1	0.0	20.7	28.5	0.0
Queue Length 95th (m)	62.5	6.9	m36.8	40.4	14.9
Internal Link Dist (m)	151.7		283.2		
Turn Bay Length (m)				55.0	
Base Capacity (vph)	3643	1152	3608	606	384
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.46	0.21	0.27	0.47	0.30

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Plains Road E/Fairview Street & QEW West Ramp

Total (2029)
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1558	218	0	880	0	0	0	0	261	0	105
Future Volume (vph)	0	1558	218	0	880	0	0	0	0	261	0	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0					7.0		7.0
Lane Util. Factor		0.91	1.00		0.91					0.97		1.00
Frpb, ped/bikes		1.00	0.98		1.00					1.00		1.00
Flpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Frt		1.00	0.85		1.00					1.00		0.85
Flt Protected		1.00	1.00		1.00					0.95		1.00
Satd. Flow (prot)		5036	1503		4988					3367		1615
Flt Permitted		1.00	1.00		1.00					0.95		1.00
Satd. Flow (perm)		5036	1503		4988					3367		1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1693	237	0	957	0	0	0	0	284	0	114
RTOR Reduction (vph)	0	0	66	0	0	0	0	0	0	0	0	98
Lane Group Flow (vph)	0	1693	171	0	957	0	0	0	0	284	0	16
Confl. Peds. (#/hr)	1		2	2		1						
Heavy Vehicles (%)	0%	3%	5%	4%	4%	0%	0%	0%	0%	4%	50%	0%
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Actuated Green, G (s)		72.3	72.3		72.3					13.7		13.7
Effective Green, g (s)		72.3	72.3		72.3					13.7		13.7
Actuated g/C Ratio		0.72	0.72		0.72					0.14		0.14
Clearance Time (s)		7.0	7.0		7.0					7.0		7.0
Vehicle Extension (s)		3.0	3.0		3.0					3.0		3.0
Lane Grp Cap (vph)		3641	1086		3606					461		221
v/s Ratio Prot		c0.34			0.19							
v/s Ratio Perm			0.11							c0.08		0.01
v/c Ratio		0.46	0.16		0.27					0.62		0.07
Uniform Delay, d1		5.8	4.3		4.7					40.7		37.6
Progression Factor		1.00	1.00		1.05					1.00		1.00
Incremental Delay, d2		0.4	0.3		0.1					2.4		0.1
Delay (s)		6.2	4.6		5.1					43.1		37.7
Level of Service		A	A		A					D		D
Approach Delay (s)		6.0			5.1			0.0			41.6	
Approach LOS		A			A			A			D	

Intersection Summary					
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.49				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		14.0	
Intersection Capacity Utilization	46.7%	ICU Level of Service		A	
Analysis Period (min)	15				

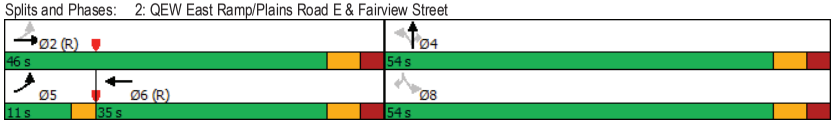
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	129	1348	0	0	847	29	226	319	792	62	0	502
Future Volume (vph)	129	1348	0	0	847	29	226	319	792	62	0	502
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		45.0	25.0		0.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			15.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.91	0.95	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00			0.99	0.99	1.00		
Frt					0.995			0.936	0.850			0.850
Flt Protected	0.950						0.950	0.998		0.950		
Satd. Flow (prot)	1752	5036	0	0	4965	0	1649	1573	1504	1805	0	1538
Flt Permitted	0.176						0.950	0.998		0.138		
Satd. Flow (perm)	325	5036	0	0	4965	0	1649	1573	1485	262	0	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					5			6	76			252
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		307.2			385.1			180.0			69.7	
Travel Time (s)		22.1			27.7			13.0			5.0	
Confl. Peds. (#/hr)	1		3	3		1			1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	0%	4%	0%	4%	2%	2%	0%	0%	5%
Adj. Flow (vph)	140	1465	0	0	921	32	246	347	861	67	0	546
Shared Lane Traffic (%)							10%		32%			
Lane Group Flow (vph)	140	1465	0	0	953	0	221	648	585	67	0	546
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Detector Phase	5	2			6		4	4	4	8		8
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0		8.0	8.0	8.0	8.0		8.0
Minimum Split (s)	11.0	35.0			35.0		36.0	36.0	36.0	36.0		36.0
Total Split (s)	11.0	46.0			35.0		54.0	54.0	54.0	54.0		54.0
Total Split (%)	11.0%	46.0%			35.0%		54.0%	54.0%	54.0%	54.0%		54.0%
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	0.0	3.0			3.0		3.0	3.0	3.0	3.0		3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	None	C-Max			C-Max		None	None	None	None		None
Act Effct Green (s)	45.2	41.2			30.0		44.8	44.8	44.8	44.8		44.8
Actuated g/C Ratio	0.45	0.41			0.30		0.45	0.45	0.45	0.45		0.45
v/c Ratio	0.53	0.71			0.64		0.30	0.92	0.83	0.57		0.66
Control Delay	21.0	22.5			33.0		18.3	44.7	32.0	42.0		14.9
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Delay	21.0	22.5			33.0		18.3	44.7	32.0	42.0		14.9
LOS	C	C			C		B	D	C	D		B
Approach Delay		22.4			33.0			35.6			17.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			C			D			B	
Queue Length 50th (m)	12.0	97.6			63.0		28.1	125.1	90.5	9.4		42.6
Queue Length 95th (m)	20.0	109.5			78.4		45.5	#205.2	#146.2	#30.5		79.6
Internal Link Dist (m)		283.2			361.1			156.0			45.7	
Turn Bay Length (m)	30.0								45.0	25.0		
Base Capacity (vph)	263	2074			1492		775	742	738	123		856
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	0.53	0.71			0.64		0.29	0.87	0.79	0.54		0.64

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 96 (96%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 28.1		Intersection LOS: C	
Intersection Capacity Utilization 94.7%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 2: QEW East Ramp/Plains Road E & Fairview Street



Queues
2: QEW East Ramp/Plains Road E & Fairview Street

Total (2029)
AM Peak Hour

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	140	1465	953	221	648	585	67	546
v/c Ratio	0.53	0.71	0.64	0.30	0.92	0.83	0.57	0.66
Control Delay	21.0	22.5	33.0	18.3	44.7	32.0	42.0	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.0	22.5	33.0	18.3	44.7	32.0	42.0	14.9
Queue Length 50th (m)	12.0	97.6	63.0	28.1	125.1	90.5	9.4	42.6
Queue Length 95th (m)	20.0	109.5	78.4	45.5	#205.2	#146.2	#30.5	79.6
Internal Link Dist (m)		283.2	361.1		156.0			
Turn Bay Length (m)	30.0					45.0	25.0	
Base Capacity (vph)	263	2074	1492	775	742	738	123	856
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	0.53	0.71	0.64	0.29	0.87	0.79	0.54	0.64

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
2: QEW East Ramp/Plains Road E & Fairview Street

Total (2029)
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	129	1348	0	0	847	29	226	319	792	62	0	502
Future Volume (vph)	129	1348	0	0	847	29	226	319	792	62	0	502
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lane Util. Factor	1.00	0.91			0.91		0.95	0.91	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	0.99	0.99	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			0.99		1.00	0.94	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1752	5036			4965		1649	1574	1485	1805		1538
Flt Permitted	0.18	1.00			1.00		0.95	1.00	1.00	0.14		1.00
Satd. Flow (perm)	325	5036			4965		1649	1574	1485	262		1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	140	1465	0	0	921	32	246	347	861	67	0	546
RTOR Reduction (vph)	0	0	0	0	4	0	0	3	42	0	0	139
Lane Group Flow (vph)	140	1465	0	0	950	0	221	645	543	67	0	407
Confl. Peds. (#/hr)	1		3	3		1			1	1		
Heavy Vehicles (%)	3%	3%	3%	0%	4%	0%	4%	2%	2%	0%	0%	5%
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Actuated Green, G (s)	41.2	41.2			30.0		44.8	44.8	44.8	44.8		44.8
Effective Green, g (s)	41.2	41.2			30.0		44.8	44.8	44.8	44.8		44.8
Actuated g/C Ratio	0.41	0.41			0.30		0.45	0.45	0.45	0.45		0.45
Clearance Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		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)	250	2074			1489		738	705	665	117		689
v/s Ratio Prot	0.05	c0.29			0.19							
v/s Ratio Perm	0.18						0.13	0.41	0.37	0.26		0.26
v/c Ratio	0.56	0.71			0.64		0.30	0.91	0.82	0.57		0.59
Uniform Delay, d1	19.9	24.4			30.3		17.6	25.8	24.0	20.5		20.7
Progression Factor	0.81	0.82			1.00		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	2.6	1.9			2.1		0.2	16.4	7.7	6.6		1.4
Delay (s)	18.7	21.9			32.4		17.8	42.2	31.7	27.1		22.1
Level of Service	B	C			C		B	D	C	C		C
Approach Delay (s)		21.6			32.4			34.3			22.6	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	94.7%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	508	33	288	411	17	588
Future Volume (vph)	508	33	288	411	17	588
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	55.0		0.0	0.0
Storage Lanes		0	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	0.97	1.00	1.00	1.00
Ped Bike Factor	1.00		0.99			0.99
Frt	0.991					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3334	0	3303	1712	1805	1568
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3334	0	3283	1712	1805	1547
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	7					18
Link Speed (k/h)	50			60	50	
Link Distance (m)	209.7			887.5	183.4	
Travel Time (s)	15.1			53.3	13.2	
Confl. Peds. (#/hr)		7	7			1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	40%	6%	11%	0%	3%
Adj. Flow (vph)	552	36	313	447	18	639
Shared Lane Traffic (%)						
Lane Group Flow (vph)	588	0	313	447	18	639
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Detector Phase	3		4	4	2	4
Switch Phase						
Minimum Initial (s)	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	17.0		27.0	27.0	18.0	27.0
Total Split (s)	23.0		44.0	44.0	18.0	44.0
Total Split (%)	27.1%		51.8%	51.8%	21.2%	51.8%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None		C-Max	C-Max	Max	C-Max
Act Effct Green (s)	16.0		38.0	38.0	11.0	50.0
Actuated g/C Ratio	0.19		0.45	0.45	0.13	0.59
v/c Ratio	0.93		0.21	0.58	0.08	0.69
Control Delay	57.0		14.8	21.4	33.5	14.7
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	57.0		14.8	21.4	33.5	14.7
LOS	E		B	C	C	B
Approach Delay	57.0			18.7	15.2	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	E			B	B	
Queue Length 50th (m)	51.8		16.2	55.2	2.8	53.3
Queue Length 95th (m)	#84.6		24.6	85.5	8.9	85.4
Internal Link Dist (m)	185.7			863.5	159.4	
Turn Bay Length (m)			55.0			
Base Capacity (vph)	633		1476	765	233	926
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.93		0.21	0.58	0.08	0.69

Intersection Summary			
Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 85			
Offset: 27 (32%), Referenced to phase 4:WBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 28.8		Intersection LOS: C	
Intersection Capacity Utilization 62.5%		ICU Level of Service B	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Maple Avenue & Plains Road E



Queues
3: Maple Avenue & Plains Road E

Total (2029)
AM Peak Hour

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	588	313	447	18	639
v/c Ratio	0.93	0.21	0.58	0.08	0.69
Control Delay	57.0	14.8	21.4	33.5	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	14.8	21.4	33.5	14.7
Queue Length 50th (m)	51.8	16.2	55.2	2.8	53.3
Queue Length 95th (m)	#84.6	24.6	85.5	8.9	85.4
Internal Link Dist (m)	185.7		863.5	159.4	
Turn Bay Length (m)		55.0			
Base Capacity (vph)	633	1476	765	233	926
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.93	0.21	0.58	0.08	0.69

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
3: Maple Avenue & Plains Road E

Total (2029)
AM Peak Hour

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	508	33	288	411	17	588
Future Volume (vph)	508	33	288	411	17	588
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		6.0	6.0	7.0	6.0
Lane Util. Factor	0.95		0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3334		3303	1712	1805	1563
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3334		3303	1712	1805	1563
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	552	36	313	447	18	639
RTOR Reduction (vph)	6	0	0	0	0	8
Lane Group Flow (vph)	582	0	313	447	18	631
Confl. Peds. (#/hr)		7	7			1
Heavy Vehicles (%)	5%	40%	6%	11%	0%	3%
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Actuated Green, G (s)	16.0		38.0	38.0	11.0	49.0
Effective Green, g (s)	16.0		38.0	38.0	11.0	49.0
Actuated g/C Ratio	0.19		0.45	0.45	0.13	0.58
Clearance Time (s)	7.0		6.0	6.0	7.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	627		1476	765	233	901
v/s Ratio Prot			0.09			c0.31
v/s Ratio Perm	c0.17			0.26	0.01	0.09
v/c Ratio	0.93		0.21	0.58	0.08	0.70
Uniform Delay, d1	33.9		14.4	17.6	32.5	12.8
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	20.1		0.3	3.3	0.6	4.5
Delay (s)	54.0		14.7	20.8	33.2	17.3
Level of Service	D		B	C	C	B
Approach Delay (s)	54.0			18.3	17.8	
Approach LOS	D			B	B	

Intersection Summary

HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
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)	514	533	48	83	155	83	40	884	286	325	1102	497
Future Volume (vph)	514	533	48	83	155	83	40	884	286	325	1102	497
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	50.0		75.0	50.0		0.0	40.0		30.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.99	1.00		1.00		0.98	1.00	0.99				0.97
Frt		0.988				0.850		0.963				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	1841	0	1597	3252	1404	1641	4752	0	1719	5085	1538
Flt Permitted	0.950			0.950			0.206			0.125		
Satd. Flow (perm)	3373	1841	0	1593	3252	1374	355	4752	0	226	5085	1498
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				208		71				296
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		887.5			190.4			463.4			229.3	
Travel Time (s)		53.3			11.4			27.8			13.8	
Confl. Peds. (#/hr)	7		5	5		7	11		7	7		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	0%	13%	11%	15%	10%	3%	8%	5%	2%	5%
Adj. Flow (vph)	559	579	52	90	168	90	43	961	311	353	1198	540
Shared Lane Traffic (%)												
Lane Group Flow (vph)	559	631	0	90	168	90	43	1272	0	353	1198	540
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Detector Phase	7	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	7.0	8.0		7.0	8.0	8.0
Minimum Split (s)	13.0	31.3		13.0	29.3	29.3	11.0	31.0		11.0	31.0	31.0
Total Split (s)	23.0	41.0		13.0	31.0	31.0	11.0	34.0		22.0	45.0	45.0
Total Split (%)	20.9%	37.3%		11.8%	28.2%	28.2%	10.0%	30.9%		20.0%	40.9%	40.9%
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.7		3.0	3.7	3.7
All-Red Time (s)	2.0	2.6		2.0	2.6	2.6	1.0	2.3		1.0	2.3	2.3
Lost Time Adjust (s)	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	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	18.0	34.7		8.0	24.7	24.7	37.0	28.0		52.0	43.4	43.4
Actuated g/C Ratio	0.16	0.32		0.07	0.22	0.22	0.34	0.25		0.47	0.39	0.39
v/c Ratio	1.01	1.08		0.78	0.23	0.19	0.21	1.01		1.01	0.60	0.70
Control Delay	85.9	98.1		90.1	35.9	0.9	16.4	48.0		79.9	28.7	18.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	85.9	98.1		90.1	35.9	0.9	16.4	48.0		79.9	28.7	18.6
LOS	F	F		F	D	A	B	D		E	C	B
Approach Delay		92.4			40.9			47.0			34.7	

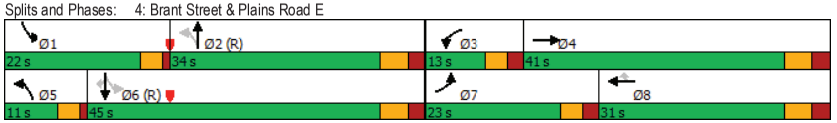
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			D			D			C	
Queue Length 50th (m)	~66.2	~159.7		20.3	16.4	0.0	2.5	~98.5		~64.1	82.9	49.0
Queue Length 95th (m)	#103.1	#231.2		#48.5	26.3	0.0	m3.7	m#124.9		#126.1	99.4	95.6
Internal Link Dist (m)		863.5			166.4			439.4			205.3	
Turn Bay Length (m)	55.0			50.0		75.0	50.0			40.0		30.0
Base Capacity (vph)	556	583		116	730	469	201	1262		351	2006	770
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.01	1.08		0.78	0.23	0.19	0.21	1.01		1.01	0.60	0.70

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 40 (36%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.08
Intersection Signal Delay: 52.3 Intersection LOS: D
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: 4: Brant Street & Plains Road E



Queues
4: Brant Street & Plains Road E

Total (2029)
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	559	631	90	168	90	43	1272	353	1198	540
v/c Ratio	1.01	1.08	0.78	0.23	0.19	0.21	1.01	1.01	0.60	0.70
Control Delay	85.9	98.1	90.1	35.9	0.9	16.4	48.0	79.9	28.7	18.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.9	98.1	90.1	35.9	0.9	16.4	48.0	79.9	28.7	18.6
Queue Length 50th (m)	~66.2	~159.7	20.3	16.4	0.0	2.5	~98.5	~64.1	82.9	49.0
Queue Length 95th (m)	#103.1	#231.2	#48.5	26.3	0.0	m3.7	m#124.9	#126.1	99.4	95.6
Internal Link Dist (m)		863.5		166.4			439.4		205.3	
Turn Bay Length (m)	55.0		50.0		75.0	50.0		40.0		30.0
Base Capacity (vph)	556	583	116	730	469	201	1262	351	2006	770
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	1.08	0.78	0.23	0.19	0.21	1.01	1.01	0.60	0.70

Intersection Summary

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

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

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

HCM Signalized Intersection Capacity Analysis
4: Brant Street & Plains Road E

Total (2029)
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	514	533	48	83	155	83	40	884	286	325	1102	497
Future Volume (vph)	514	533	48	83	155	83	40	884	286	325	1102	497
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	1.00		1.00	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	0.99		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
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3400	1840		1597	3252	1374	1640	4753		1719	5085	1498
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.21	1.00		0.12	1.00	1.00
Satd. Flow (perm)	3400	1840		1597	3252	1374	355	4753		226	5085	1498
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	559	579	52	90	168	90	43	961	311	353	1198	540
RTOR Reduction (vph)	0	3	0	0	0	70	0	53	0	0	0	184
Lane Group Flow (vph)	559	628	0	90	168	20	43	1219	0	353	1198	356
Confl. Peds. (#/hr)	7		5	5		7	11		7	7		11
Heavy Vehicles (%)	3%	2%	0%	13%	11%	15%	10%	3%	8%	5%	2%	5%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Actuated Green, G (s)	18.0	34.7		8.0	24.7	24.7	32.2	28.0		50.0	41.8	41.8
Effective Green, g (s)	18.0	34.7		8.0	24.7	24.7	32.2	28.0		50.0	41.8	41.8
Actuated g/C Ratio	0.16	0.32		0.07	0.22	0.22	0.29	0.25		0.45	0.38	0.38
Clearance Time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	556	580		116	730	308	152	1209		347	1932	569
v/s Ratio Prot	c0.16	c0.34		0.06	0.05		0.01	0.26		c0.17	0.24	
v/s Ratio Perm						0.01	0.07			c0.30		0.24
v/c Ratio	1.01	1.08		0.78	0.23	0.07	0.28	1.01		1.02	0.62	0.63
Uniform Delay, d1	46.0	37.6		50.1	34.9	33.6	28.3	41.0		32.4	27.7	27.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.88	0.67		1.00	1.00	1.00
Incremental Delay, d2	39.5	61.9		27.0	0.2	0.1	0.6	21.0		52.8	1.5	5.1
Delay (s)	85.5	99.5		77.1	35.0	33.7	25.4	48.6		85.2	29.2	32.9
Level of Service	F	F		E	D	C	C	D		F	C	C
Approach Delay (s)		92.9			45.6			47.9			39.6	
Approach LOS		F			D			D			D	

Intersection Summary					
HCM 2000 Control Delay	55.1	HCM 2000 Level of Service		E	
HCM 2000 Volume to Capacity ratio	1.10				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		21.3	
Intersection Capacity Utilization	97.1%	ICU Level of Service		F	
Analysis Period (min)	15				

c Critical Lane Group

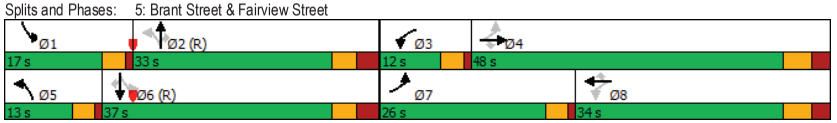
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	381	1246	309	143	393	171	230	744	309	259	811	170
Future Volume (vph)	381	1246	309	143	393	171	230	744	309	259	811	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		170.0	60.0		0.0	75.0		70.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.99			0.98	0.99		0.96	1.00		0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3539	1568	1703	3438	1538	1787	3505	1599	1787	3505	1346
Flt Permitted	0.364			0.137			0.151			0.131		
Satd. Flow (perm)	644	3539	1547	246	3438	1507	282	3505	1535	245	3505	1290
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			265			186			182			185
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		261.1			251.5			231.2			463.4	
Travel Time (s)		15.7			15.1			16.6			27.8	
Confl. Peds. (#/hr)	6		1	1		6	22		21	21		22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	2%	3%	6%	5%	5%	1%	3%	1%	1%	3%	20%
Adj. Flow (vph)	414	1354	336	155	427	186	250	809	336	282	882	185
Shared Lane Traffic (%)												
Lane Group Flow (vph)	414	1354	336	155	427	186	250	809	336	282	882	185
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		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	31.4	31.4	12.0	31.4	31.4	12.0	31.5	31.5	12.0	31.5	31.5
Total Split (s)	26.0	48.0	48.0	12.0	34.0	34.0	13.0	33.0	33.0	17.0	37.0	37.0
Total Split (%)	23.6%	43.6%	43.6%	10.9%	30.9%	30.9%	11.8%	30.0%	30.0%	15.5%	33.6%	33.6%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
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)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	56.0	41.6	41.6	39.5	29.1	29.1	38.0	26.5	26.5	46.0	30.5	30.5
Actuated g/C Ratio	0.51	0.38	0.38	0.36	0.26	0.26	0.35	0.24	0.24	0.42	0.28	0.28
v/c Ratio	0.79	1.01	0.45	0.80	0.47	0.35	1.14	0.96	0.66	0.99	0.91	0.38
Control Delay	30.4	62.2	8.0	52.8	36.5	6.8	128.5	64.2	23.9	78.0	57.0	23.2
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	30.4	62.2	8.0	52.8	36.5	6.8	128.5	64.2	23.9	78.0	57.0	23.2
LOS	C	E	A	D	D	A	F	E	C	E	E	C
Approach Delay		47.3			32.6			66.0			56.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			C			E			E	
Queue Length 50th (m)	58.6	~163.1	10.3	18.3	43.5	0.0	~47.4	95.3	30.9	62.6	112.3	26.1
Queue Length 95th (m)	#88.6	#213.5	33.1	#53.1	59.6	17.6	#100.3	#135.6	64.3	m#101.8	m#141.0	m46.3
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	536	1338	749	193	908	535	220	844	507	284	971	491
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	0.77	1.01	0.45	0.80	0.47	0.35	1.14	0.96	0.66	0.99	0.91	0.38

Intersection Summary		
Area Type:	Other	
Cycle Length: 110		
Actuated Cycle Length: 110		
Offset: 107 (97%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 110		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.14		
Intersection Signal Delay: 52.2	Intersection LOS: D	
Intersection Capacity Utilization 94.9%	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: 5: Brant Street & Fairview Street



Queues
5: Brant Street & Fairview Street

Total (2029)
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	414	1354	336	155	427	186	250	809	336	282	882	185
v/c Ratio	0.79	1.01	0.45	0.80	0.47	0.35	1.14	0.96	0.66	0.99	0.91	0.38
Control Delay	30.4	62.2	8.0	52.8	36.5	6.8	128.5	64.2	23.9	78.0	57.0	23.2
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	30.4	62.2	8.0	52.8	36.5	6.8	128.5	64.2	23.9	78.0	57.0	23.2
Queue Length 50th (m)	58.6	~163.1	10.3	18.3	43.5	0.0	~47.4	95.3	30.9	62.6	112.3	26.1
Queue Length 95th (m)	#88.6	#213.5	33.1	#53.1	59.6	17.6	#100.3	#135.6	64.3	m#101.8	m#141.0	m46.3
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	536	1338	749	193	908	535	220	844	507	284	971	491
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	0.77	1.01	0.45	0.80	0.47	0.35	1.14	0.96	0.66	0.99	0.91	0.38

Intersection Summary

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

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

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

HCM Signalized Intersection Capacity Analysis
5: Brant Street & Fairview Street

Total (2029)
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	381	1246	309	143	393	171	230	744	309	259	811	170
Future Volume (vph)	381	1246	309	143	393	171	230	744	309	259	811	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	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)	1685	3539	1547	1703	3438	1507	1786	3505	1535	1786	3505	1290
Flt Permitted	0.36	1.00	1.00	0.14	1.00	1.00	0.15	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)	646	3539	1547	246	3438	1507	284	3505	1535	247	3505	1290
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	414	1354	336	155	427	186	250	809	336	282	882	185
RTOR Reduction (vph)	0	0	165	0	0	137	0	0	138	0	0	134
Lane Group Flow (vph)	414	1354	171	155	427	49	250	809	198	282	882	51
Confl. Peds. (#/hr)	6		1	1		6	22		21	21		22
Heavy Vehicles (%)	7%	2%	3%	6%	5%	5%	1%	3%	1%	1%	3%	20%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	53.6	41.6	41.6	37.1	29.1	29.1	35.5	26.5	26.5	43.5	30.5	30.5
Effective Green, g (s)	53.6	41.6	41.6	37.1	29.1	29.1	35.5	26.5	26.5	43.5	30.5	30.5
Actuated g/C Ratio	0.49	0.38	0.38	0.34	0.26	0.26	0.32	0.24	0.24	0.40	0.28	0.28
Clearance Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
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)	508	1338	585	188	909	398	214	844	369	279	971	357
v/s Ratio Prot	c0.15	c0.38		0.06	0.12		0.10	0.23		c0.12	0.25	
v/s Ratio Perm	0.25		0.11	0.22		0.03	c0.28		0.13	0.28		0.04
v/c Ratio	0.81	1.01	0.29	0.82	0.47	0.12	1.17	0.96	0.54	1.01	0.91	0.14
Uniform Delay, d1	19.9	34.2	23.9	29.7	34.0	30.8	32.3	41.2	36.4	29.7	38.4	29.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.18	1.18	4.54
Incremental Delay, d2	9.7	27.6	0.3	24.5	0.4	0.1	114.4	22.4	5.5	50.3	11.3	0.7
Delay (s)	29.6	61.8	24.2	54.2	34.4	30.9	146.7	63.6	41.9	85.5	56.7	136.5
Level of Service	C	E	C	D	C	C	F	E	D	F	E	F
Approach Delay (s)		49.5			37.5			73.3			73.7	
Approach LOS		D			D			E			E	

Intersection Summary				
HCM 2000 Control Delay	59.6	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.06			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	94.9%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	2	6	472	562	2
Future Volume (vph)	0	2	6	472	562	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected				0.999		
Satd. Flow (prot)	1611	0	0	1861	1863	0
Flt Permitted				0.999		
Satd. Flow (perm)	1611	0	0	1861	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	33.8			69.7	42.0	
Travel Time (s)	2.4			5.0	3.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2	7	513	611	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	0	520	613	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	2	6	472	562	2
Future Volume (Veh/h)	0	2	6	472	562	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	7	513	611	2
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)				70	379	
pX, platoon unblocked	0.87	0.84	0.84			
vC, conflicting volume	1139	612	613			
vC1, stage 1 conf vol	612					
vC2, stage 2 conf vol	527					
vCu, unblocked vol	966	449	450			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	99			
cM capacity (veh/h)	446	515	938			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	2	520	613
Volume Left	0	7	0
Volume Right	2	0	2
cSH	515	938	1700
Volume to Capacity	0.00	0.01	0.36
Queue Length 95th (m)	0.1	0.2	0.0
Control Delay (s)	12.0	0.2	0.0
Lane LOS	B	A	
Approach Delay (s)	12.0	0.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	34	75	28	444	489	7
Future Volume (vph)	34	75	28	444	489	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.907				0.998	
Flt Protected	0.985			0.997		
Satd. Flow (prot)	1664	0	0	1857	1859	0
Flt Permitted	0.985			0.997		
Satd. Flow (perm)	1664	0	0	1857	1859	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	35.4			42.0	47.9	
Travel Time (s)	2.5			3.0	3.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	37	82	30	483	532	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	119	0	0	513	540	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	34	75	28	444	489	7
Future Volume (Veh/h)	34	75	28	444	489	7
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	82	30	483	532	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	None	
Median storage veh)				2		
Upstream signal (m)				112	337	
pX, platoon unblocked	0.85	0.83	0.83			
vC, conflicting volume	1079	536	540			
vC1, stage 1 conf vol	536					
vC2, stage 2 conf vol	543					
vCu, unblocked vol	902	341	346			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	86	97			
cM capacity (veh/h)	461	583	1009			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	119	513	540
Volume Left	37	30	0
Volume Right	82	0	8
cSH	539	1009	1700
Volume to Capacity	0.22	0.03	0.32
Queue Length 95th (m)	6.7	0.7	0.0
Control Delay (s)	13.6	0.8	0.0
Lane LOS	B	A	
Approach Delay (s)	13.6	0.8	0.0
Approach LOS	B		

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	59.5%	ICU Level of Service		B
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	34	444	414	14	56	82
Future Volume (vph)	34	444	414	14	56	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.996		0.920	
Flt Protected		0.996			0.980	
Satd. Flow (prot)	0	1855	1855	0	1679	0
Flt Permitted		0.996			0.980	
Satd. Flow (perm)	0	1855	1855	0	1679	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		47.1	32.3		62.0	
Travel Time (s)		3.4	2.3		4.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	37	483	450	15	61	89
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	520	465	0	150	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	34	444	414	14	56	82
Future Volume (Veh/h)	34	444	414	14	56	82
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)	37	483	450	15	61	89
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		207	242			
pX, platoon unblocked	0.81				0.82	0.81
vC, conflicting volume	465				1014	458
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	226				878	216
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				76	87
cM capacity (veh/h)	1091				251	669

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	520	465	150
Volume Left	37	0	61
Volume Right	0	15	89
cSH	1091	1700	399
Volume to Capacity	0.03	0.27	0.38
Queue Length 95th (m)	0.8	0.0	13.7
Control Delay (s)	1.0	0.0	19.3
Lane LOS	A		C
Approach Delay (s)	1.0	0.0	19.3
Approach LOS			C

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

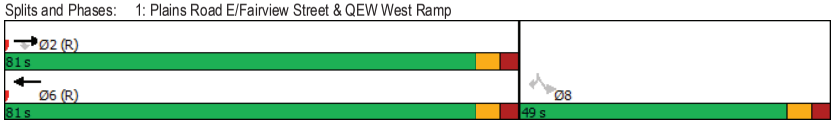
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1370	425	0	2199	0	0	0	0	678	0	368
Future Volume (vph)	0	1370	425	0	2199	0	0	0	0	678	0	368
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	55.0		0.0
Storage Lanes	0		1	0		0	0		0	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor			0.95									0.98
Frt			0.850									0.850
Flt Protected										0.950		
Satd. Flow (prot)	0	5136	1583	0	5085	0	0	0	0	3467	0	1615
Flt Permitted										0.950		
Satd. Flow (perm)	0	5136	1507	0	5085	0	0	0	0	3467	0	1585
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			462									34
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		175.7			307.2			140.0			199.7	
Travel Time (s)		12.7			22.1			10.1			14.4	
Confl. Peds. (#/hr)	4		15	15		4	3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	2%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Adj. Flow (vph)	0	1489	462	0	2390	0	0	0	0	737	0	400
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1489	462	0	2390	0	0	0	0	737	0	400
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Detector Phase		2	2		6					8		8
Switch Phase												
Minimum Initial (s)		8.0	8.0		8.0					8.0		8.0
Minimum Split (s)		43.0	43.0		43.0					25.0		25.0
Total Split (s)		81.0	81.0		81.0					49.0		49.0
Total Split (%)		62.3%	62.3%		62.3%					37.7%		37.7%
Yellow Time (s)		4.0	4.0		4.0					4.0		4.0
All-Red Time (s)		3.0	3.0		3.0					3.0		3.0
Lost Time Adjust (s)		0.0	0.0		0.0					0.0		0.0
Total Lost Time (s)		7.0	7.0		7.0					7.0		7.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max		C-Max					None		None
Act Effct Green (s)		79.9	79.9		79.9					36.1		36.1
Actuated g/C Ratio		0.61	0.61		0.61					0.28		0.28
v/c Ratio		0.47	0.42		0.76					0.77		0.86
Control Delay		14.9	2.4		8.4					48.4		58.9
Queue Delay		0.0	0.0		0.0					0.0		0.0
Total Delay		14.9	2.4		8.4					48.4		58.9
LOS		B	A		A					D		E
Approach Delay		11.9			8.4						52.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			A						D	
Queue Length 50th (m)		77.5	0.0		45.2					92.8		93.7
Queue Length 95th (m)		98.1	14.6		m34.5					110.0		129.5
Internal Link Dist (m)		151.7			283.2			116.0			175.7	
Turn Bay Length (m)										55.0		
Base Capacity (vph)		3157	1104		3126					1120		535
Starvation Cap Reductn		0	0		0					0		0
Spillback Cap Reductn		0	0		0					0		0
Storage Cap Reductn		0	0		0					0		0
Reduced v/c Ratio		0.47	0.42		0.76					0.66		0.75

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 34 (26%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 18.7		Intersection LOS: B	
Intersection Capacity Utilization 77.3%		ICU Level of Service D	
Analysis Period (min) 15			

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

Splits and Phases: 1: Plains Road E/Fairview Street & QEW West Ramp



Queues
1: Plains Road E/Fairview Street & QEW West Ramp

Total (2029)
PM Peak Hour

Lane Group	EBT	EBR	WBT	SBL	SBR
Lane Group Flow (vph)	1489	462	2390	737	400
v/c Ratio	0.47	0.42	0.76	0.77	0.86
Control Delay	14.9	2.4	8.4	48.4	58.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	2.4	8.4	48.4	58.9
Queue Length 50th (m)	77.5	0.0	45.2	92.8	93.7
Queue Length 95th (m)	98.1	14.6	m34.5	110.0	129.5
Internal Link Dist (m)	151.7		283.2		
Turn Bay Length (m)				55.0	
Base Capacity (vph)	3157	1104	3126	1120	535
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.47	0.42	0.76	0.66	0.75

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Plains Road E/Fairview Street & QEW West Ramp

Total (2029)
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1370	425	0	2199	0	0	0	0	678	0	368
Future Volume (vph)	0	1370	425	0	2199	0	0	0	0	678	0	368
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0					7.0		7.0
Lane Util. Factor		0.91	1.00		0.91					0.97		1.00
Frpb, ped/bikes		1.00	0.95		1.00					1.00		0.98
Flpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Frt		1.00	0.85		1.00					1.00		0.85
Flt Protected		1.00	1.00		1.00					0.95		1.00
Satd. Flow (prot)		5136	1507		5085					3467		1585
Flt Permitted		1.00	1.00		1.00					0.95		1.00
Satd. Flow (perm)		5136	1507		5085					3467		1585
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1489	462	0	2390	0	0	0	0	737	0	400
RTOR Reduction (vph)	0	0	178	0	0	0	0	0	0	0	0	25
Lane Group Flow (vph)	0	1489	284	0	2390	0	0	0	0	737	0	375
Confl. Peds. (#/hr)	4		15	15		4	3					3
Heavy Vehicles (%)	0%	1%	2%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Actuated Green, G (s)		79.9	79.9		79.9					36.1		36.1
Effective Green, g (s)		79.9	79.9		79.9					36.1		36.1
Actuated g/C Ratio		0.61	0.61		0.61					0.28		0.28
Clearance Time (s)		7.0	7.0		7.0					7.0		7.0
Vehicle Extension (s)		3.0	3.0		3.0					3.0		3.0
Lane Grp Cap (vph)		3156	926		3125					962		440
v/s Ratio Prot		0.29			c0.47							
v/s Ratio Perm			0.19							0.21		c0.24
v/c Ratio		0.47	0.31		0.76					0.77		0.85
Uniform Delay, d1		13.6	11.9		18.2					43.1		44.4
Progression Factor		1.00	1.00		0.42					1.00		1.00
Incremental Delay, d2		0.5	0.9		0.2					3.7		14.8
Delay (s)		14.1	12.8		7.9					46.8		59.2
Level of Service		B	B		A					D		E
Approach Delay (s)		13.8			7.9			0.0			51.2	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	77.3%	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)	176	1637	0	0	2880	76	175	255	484	45	0	604
Future Volume (vph)	176	1637	0	0	2880	76	175	255	484	45	0	604
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		45.0	25.0		0.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			15.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.91	0.95	1.00	1.00	1.00
Ped Bike Factor					1.00							
Frt					0.996			0.953	0.850			0.850
Flt Protected	0.950						0.950	0.998		0.950		
Satd. Flow (prot)	1770	5136	0	0	4790	0	1698	1598	1519	1805	0	1495
Flt Permitted	0.062						0.950	0.998		0.224		
Satd. Flow (perm)	115	5136	0	0	4790	0	1698	1598	1519	426	0	1495
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					4			13	59			127
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		307.2			385.1			180.0			73.7	
Travel Time (s)		22.1			27.7			13.0			5.3	
Confl. Peds. (#/hr)	2		7	7		2						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	1%	0%	0%	8%	0%	1%	4%	1%	0%	0%	8%
Adj. Flow (vph)	191	1779	0	0	3130	83	190	277	526	49	0	657
Shared Lane Traffic (%)							10%		26%			
Lane Group Flow (vph)	191	1779	0	0	3213	0	171	433	389	49	0	657
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Detector Phase	5	2			6		4	4	4	8		8
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0		8.0	8.0	8.0	8.0		8.0
Minimum Split (s)	11.0	35.0			35.0		36.0	36.0	36.0	36.0		36.0
Total Split (s)	11.0	79.0			68.0		51.0	51.0	51.0	51.0		51.0
Total Split (%)	8.5%	60.8%			52.3%		39.2%	39.2%	39.2%	39.2%		39.2%
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	0.0	3.0			3.0		3.0	3.0	3.0	3.0		3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	None	C-Max			C-Max		None	None	None	None		None
Act Effct Green (s)	76.0	72.0			61.0		44.0	44.0	44.0	44.0		44.0
Actuated g/C Ratio	0.58	0.55			0.47		0.34	0.34	0.34	0.34		0.34
v/c Ratio	1.13	0.63			1.43		0.30	0.79	0.70	0.34		1.11
Control Delay	137.6	14.9			225.0		33.4	49.4	39.4	40.5		105.0
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Delay	137.6	14.9			225.0		33.4	49.4	39.4	40.5		105.0
LOS	F	B			F		C	D	D	D		F
Approach Delay		26.8			225.0			42.7			100.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			F			D			F	
Queue Length 50th (m)	~41.6	72.7			~431.3		35.5	112.4	82.0	9.8		~179.1
Queue Length 95th (m)	#92.4	106.2			#456.5		56.4	#161.9	123.3	23.0		#255.4
Internal Link Dist (m)		283.2			361.1			156.0			49.7	
Turn Bay Length (m)	30.0								45.0	25.0		
Base Capacity (vph)	169	2844			2249		574	549	553	144		590
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	1.13	0.63			1.43		0.30	0.79	0.70	0.34		1.11

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 16 (12%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.43			
Intersection Signal Delay: 129.2		Intersection LOS: F	
Intersection Capacity Utilization 128.7%		ICU Level of Service H	
Analysis Period (min) 15			

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

Splits and Phases: 2: QEW East Ramp/Plains Road E & Fairview Street



Queues
2: QEW East Ramp/Plains Road E & Fairview Street

Total (2029)
PM Peak Hour

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	191	1779	3213	171	433	389	49	657
v/c Ratio	1.13	0.63	1.43	0.30	0.79	0.70	0.34	1.11
Control Delay	137.6	14.9	225.0	33.4	49.4	39.4	40.5	105.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	137.6	14.9	225.0	33.4	49.4	39.4	40.5	105.0
Queue Length 50th (m)	~41.6	72.7	~431.3	35.5	112.4	82.0	9.8	~179.1
Queue Length 95th (m)	#92.4	106.2	#456.5	56.4	#161.9	123.3	23.0	#255.4
Internal Link Dist (m)		283.2	361.1		156.0			
Turn Bay Length (m)	30.0					45.0	25.0	
Base Capacity (vph)	169	2844	2249	574	549	553	144	590
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	1.13	0.63	1.43	0.30	0.79	0.70	0.34	1.11

Intersection Summary

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

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

HCM Signalized Intersection Capacity Analysis
2: QEW East Ramp/Plains Road E & Fairview Street

Total (2029)
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	176	1637	0	0	2880	76	175	255	484	45	0	604
Future Volume (vph)	176	1637	0	0	2880	76	175	255	484	45	0	604
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lane Util. Factor	1.00	0.91			0.91		0.95	0.91	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			1.00		1.00	0.95	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1770	5136			4790		1698	1597	1519	1805		1495
Flt Permitted	0.06	1.00			1.00		0.95	1.00	1.00	0.22		1.00
Satd. Flow (perm)	116	5136			4790		1698	1597	1519	426		1495
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	191	1779	0	0	3130	83	190	277	526	49	0	657
RTOR Reduction (vph)	0	0	0	0	2	0	0	9	39	0	0	84
Lane Group Flow (vph)	191	1779	0	0	3211	0	171	424	350	49	0	573
Confl. Peds. (#/hr)	2		7	7		2						
Heavy Vehicles (%)	2%	1%	0%	0%	8%	0%	1%	4%	1%	0%	0%	8%
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Actuated Green, G (s)	72.0	72.0			61.0		44.0	44.0	44.0	44.0		44.0
Effective Green, g (s)	72.0	72.0			61.0		44.0	44.0	44.0	44.0		44.0
Actuated g/C Ratio	0.55	0.55			0.47		0.34	0.34	0.34	0.34		0.34
Clearance Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		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)	166	2844			2247		574	540	514	144		506
v/s Ratio Prot	c0.07	0.35			c0.67							
v/s Ratio Perm	0.56						0.10	0.27	0.23	0.11		c0.38
v/c Ratio	1.15	0.63			1.43		0.30	0.79	0.68	0.34		1.13
Uniform Delay, d1	38.9	19.8			34.5		31.6	38.8	37.0	32.1		43.0
Progression Factor	1.30	0.70			1.00		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	111.0	0.9			195.7		0.3	7.4	3.7	1.4		81.7
Delay (s)	161.8	14.8			230.2		31.9	46.2	40.7	33.6		124.7
Level of Service	F	B			F		C	D	D	C		F
Approach Delay (s)		29.0			230.2			41.6			118.4	
Approach LOS		C			F			D			F	

Intersection Summary			
HCM 2000 Control Delay	133.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	128.7%	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)	400	70	1117	557	59	700
Future Volume (vph)	400	70	1117	557	59	700
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	55.0		0.0	0.0
Storage Lanes		0	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	0.97	1.00	1.00	1.00
Ped Bike Factor	1.00		1.00			
Frt	0.978					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3390	0	3433	1881	1687	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3390	0	3419	1881	1687	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	19					30
Link Speed (k/h)	50			60	50	
Link Distance (m)	209.7			887.5	183.4	
Travel Time (s)	15.1			53.3	13.2	
Confl. Peds. (#/hr)		4	4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	2%	1%	7%	2%
Adj. Flow (vph)	435	76	1214	605	64	761
Shared Lane Traffic (%)						
Lane Group Flow (vph)	511	0	1214	605	64	761
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Detector Phase	3		4	4	2	4
Switch Phase						
Minimum Initial (s)	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	17.0		27.0	27.0	18.0	27.0
Total Split (s)	22.0		50.0	50.0	18.0	50.0
Total Split (%)	24.4%		55.6%	55.6%	20.0%	55.6%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None		C-Max	C-Max	Max	C-Max
Act Effct Green (s)	14.9		44.0	44.0	11.1	62.1
Actuated g/C Ratio	0.17		0.49	0.49	0.12	0.69
v/c Ratio	0.89		0.72	0.66	0.31	0.69
Control Delay	54.4		21.3	21.6	40.5	12.1
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	54.4		21.3	21.6	40.5	12.1
LOS	D		C	C	D	B
Approach Delay	54.4			21.4	14.3	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	D			C	B	
Queue Length 50th (m)	46.5		86.0	79.4	10.8	68.2
Queue Length 95th (m)	#75.3		110.7	117.4	23.2	109.7
Internal Link Dist (m)	185.7			863.5	159.4	
Turn Bay Length (m)			55.0			
Base Capacity (vph)	580		1678	919	208	1101
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.88		0.72	0.66	0.31	0.69

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 4:WBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 24.9		Intersection LOS: C	
Intersection Capacity Utilization 68.6%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Maple Avenue & Plains Road E



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	511	1214	605	64	761
v/c Ratio	0.89	0.72	0.66	0.31	0.69
Control Delay	54.4	21.3	21.6	40.5	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	54.4	21.3	21.6	40.5	12.1
Queue Length 50th (m)	46.5	86.0	79.4	10.8	68.2
Queue Length 95th (m)	#75.3	110.7	117.4	23.2	109.7
Internal Link Dist (m)	185.7		863.5	159.4	
Turn Bay Length (m)		55.0			
Base Capacity (vph)	580	1678	919	208	1101
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.88	0.72	0.66	0.31	0.69

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	400	70	1117	557	59	700
Future Volume (vph)	400	70	1117	557	59	700
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		6.0	6.0	7.0	6.0
Lane Util. Factor	0.95		0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3389		3433	1881	1687	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3389		3433	1881	1687	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	435	76	1214	605	64	761
RTOR Reduction (vph)	16	0	0	0	0	12
Lane Group Flow (vph)	495	0	1214	605	64	749
Confl. Peds. (#/hr)		4	4			
Heavy Vehicles (%)	4%	3%	2%	1%	7%	2%
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Actuated Green, G (s)	14.9		44.0	44.0	11.1	55.1
Effective Green, g (s)	14.9		44.0	44.0	11.1	55.1
Actuated g/C Ratio	0.17		0.49	0.49	0.12	0.61
Clearance Time (s)	7.0		6.0	6.0	7.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	561		1678	919	208	969
v/s Ratio Prot			0.35			c0.38
v/s Ratio Perm	c0.15			0.32	0.04	0.10
v/c Ratio	0.88		0.72	0.66	0.31	0.77
Uniform Delay, d1	36.7		18.2	17.3	35.9	12.9
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	15.1		2.7	3.7	3.8	6.0
Delay (s)	51.8		20.9	21.0	39.7	18.8
Level of Service	D		C	C	D	B
Approach Delay (s)	51.8			21.0	20.5	
Approach LOS	D			C	C	

Intersection Summary			
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
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)	635	184	71	165	829	435	90	1477	67	142	1159	839
Future Volume (vph)	635	184	71	165	829	435	90	1477	67	142	1159	839
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	50.0		75.0	50.0		0.0	40.0		30.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.99					0.97	1.00	1.00				0.97
Frt		0.958				0.850		0.993				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3502	1757	0	1719	3539	1583	1805	5085	0	1687	5187	1599
Flt Permitted	0.950			0.950			0.104			0.102		
Satd. Flow (perm)	3482	1757	0	1719	3539	1535	197	5085	0	181	5187	1557
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16				117		6				419
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		887.5			190.4			463.4			229.3	
Travel Time (s)		53.3			11.4			27.8			13.8	
Confl. Peds. (#/hr)	12					12	10		16	16		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	5%	0%	5%	2%	2%	0%	0%	24%	7%	0%	1%
Adj. Flow (vph)	690	200	77	179	901	473	98	1605	73	154	1260	912
Shared Lane Traffic (%)												
Lane Group Flow (vph)	690	277	0	179	901	473	98	1678	0	154	1260	912
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Detector Phase	7	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	7.0	8.0		7.0	8.0	8.0
Minimum Split (s)	13.0	31.3		13.0	29.3	29.3	11.0	31.0		11.0	31.0	31.0
Total Split (s)	27.0	37.6		26.0	36.6	36.6	11.0	44.4		12.0	45.4	45.4
Total Split (%)	22.5%	31.3%		21.7%	30.5%	30.5%	9.2%	37.0%		10.0%	37.8%	37.8%
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.7		3.0	3.7	3.7
All-Red Time (s)	2.0	2.6		2.0	2.6	2.6	1.0	2.3		1.0	2.3	2.3
Lost Time Adjust (s)	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	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	22.0	35.2		17.1	30.3	30.3	47.4	38.4		49.4	39.4	39.4
Actuated g/C Ratio	0.18	0.29		0.14	0.25	0.25	0.40	0.32		0.41	0.33	0.33
v/c Ratio	1.07	0.53		0.73	1.01	1.00	0.57	1.03		0.89	0.74	1.15
Control Delay	103.7	38.6		66.6	77.1	74.5	19.9	55.6		69.2	38.9	103.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	103.7	38.6		66.6	77.1	74.5	19.9	55.6		69.2	38.9	103.7
LOS	F	D		E	E	E	B	E		E	D	F
Approach Delay		85.0			75.1			53.6			66.3	

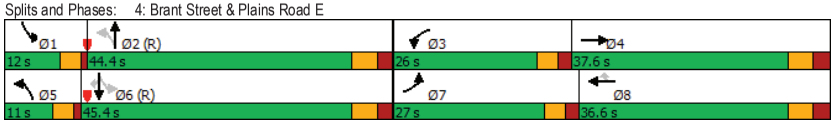
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			E			D			E	
Queue Length 50th (m)	~98.0	54.4		42.7	~119.6	93.5	17.0	~165.9		23.2	101.0	~192.0
Queue Length 95th (m)	#136.3	86.3		66.2	#164.8	#165.8	m17.8	m144.2		#62.1	119.0	#272.8
Internal Link Dist (m)		863.5			166.4			439.4			205.3	
Turn Bay Length (m)	55.0			50.0		75.0	50.0			40.0		30.0
Base Capacity (vph)	642	527		300	893	475	171	1631		174	1703	792
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.07	0.53		0.60	1.01	1.00	0.57	1.03		0.89	0.74	1.15

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 45 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.15
Intersection Signal Delay: 67.7 Intersection LOS: E
Intersection Capacity Utilization 96.7% 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: 4: Brant Street & Plains Road E



Queues
4: Brant Street & Plains Road E

Total (2029)
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	690	277	179	901	473	98	1678	154	1260	912
v/c Ratio	1.07	0.53	0.73	1.01	1.00	0.57	1.03	0.89	0.74	1.15
Control Delay	103.7	38.6	66.6	77.1	74.5	19.9	55.6	69.2	38.9	103.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.7	38.6	66.6	77.1	74.5	19.9	55.6	69.2	38.9	103.7
Queue Length 50th (m)	~98.0	54.4	42.7	~119.6	93.5	17.0	~165.9	23.2	101.0	~192.0
Queue Length 95th (m)	#136.3	86.3	66.2	#164.8	#165.8	m17.8	m144.2	#62.1	119.0	#272.8
Internal Link Dist (m)		863.5		166.4			439.4		205.3	
Turn Bay Length (m)	55.0		50.0		75.0	50.0		40.0		30.0
Base Capacity (vph)	642	527	300	893	475	171	1631	174	1703	792
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.07	0.53	0.60	1.01	1.00	0.57	1.03	0.89	0.74	1.15

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
4: Brant Street & Plains Road E

Total (2029)
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	635	184	71	165	829	435	90	1477	67	142	1159	839
Future Volume (vph)	635	184	71	165	829	435	90	1477	67	142	1159	839
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	1.00		1.00	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00		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
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	1757		1719	3539	1535	1805	5087		1687	5187	1557
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.10	1.00		0.10	1.00	1.00
Satd. Flow (perm)	3502	1757		1719	3539	1535	198	5087		180	5187	1557
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	690	200	77	179	901	473	98	1605	73	154	1260	912
RTOR Reduction (vph)	0	11	0	0	0	87	0	4	0	0	0	281
Lane Group Flow (vph)	690	266	0	179	901	386	98	1674	0	154	1260	631
Confl. Peds. (#/hr)	12					12	10		16	16		10
Heavy Vehicles (%)	0%	5%	0%	5%	2%	2%	0%	0%	24%	7%	0%	1%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Actuated Green, G (s)	22.0	35.2		17.1	30.3	30.3	45.4	38.4		47.4	39.4	39.4
Effective Green, g (s)	22.0	35.2		17.1	30.3	30.3	45.4	38.4		47.4	39.4	39.4
Actuated g/C Ratio	0.18	0.29		0.14	0.25	0.25	0.38	0.32		0.39	0.33	0.33
Clearance Time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	642	515		244	893	387	168	1627		171	1703	511
v/s Ratio Prot	c0.20	c0.15		0.10	c0.25		0.03	0.33		c0.06	0.24	
v/s Ratio Perm						0.25	0.19			0.29		c0.40
v/c Ratio	1.07	0.52		0.73	1.01	1.00	0.58	1.03		0.90	0.74	1.23
Uniform Delay, d1	49.0	35.3		49.3	44.9	44.8	26.9	40.8		29.9	35.8	40.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.90	0.99		1.00	1.00	1.00
Incremental Delay, d2	57.3	0.9		10.8	32.3	44.5	0.5	15.9		41.5	2.9	121.4
Delay (s)	106.3	36.2		60.1	77.2	89.3	24.6	56.2		71.4	38.7	161.7
Level of Service	F	D		E	E	F	C	E		E	D	F
Approach Delay (s)		86.2			78.9			54.5			89.1	
Approach LOS		F			E			D			F	

Intersection Summary					
HCM 2000 Control Delay	77.0	HCM 2000 Level of Service		E	
HCM 2000 Volume to Capacity ratio	1.10				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		21.3	
Intersection Capacity Utilization	96.7%	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)	240	918	346	249	1705	497	211	929	221	264	784	489
Future Volume (vph)	240	918	346	249	1705	497	211	929	221	264	784	489
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		170.0	60.0		0.0	75.0		70.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.97			0.98	1.00		0.92			0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1703	3539	1568	1787	3574	1599	1787	3574	1599	1770	3539	1553
Flt Permitted	0.095			0.103			0.127			0.123		
Satd. Flow (perm)	170	3539	1526	194	3574	1573	238	3574	1474	229	3539	1498
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			215			192			179			148
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		261.1			251.5			231.2			463.4	
Travel Time (s)		15.7			15.1			16.6			27.8	
Confl. Peds. (#/hr)	3		10	10		3	16		45	45		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	2%	3%	1%	1%	1%	1%	1%	1%	2%	2%	4%
Adj. Flow (vph)	261	998	376	271	1853	540	229	1010	240	287	852	532
Shared Lane Traffic (%)												
Lane Group Flow (vph)	261	998	376	271	1853	540	229	1010	240	287	852	532
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		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	31.4	31.4	12.0	31.4	31.4	12.0	31.5	31.5	12.0	31.5	31.5
Total Split (s)	12.0	47.0	47.0	22.0	57.0	57.0	12.0	38.0	38.0	13.0	39.0	39.0
Total Split (%)	10.0%	39.2%	39.2%	18.3%	47.5%	47.5%	10.0%	31.7%	31.7%	10.8%	32.5%	32.5%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
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)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	52.7	42.3	42.3	64.9	50.6	50.6	42.0	31.5	31.5	44.0	32.5	32.5
Actuated g/C Ratio	0.44	0.35	0.35	0.54	0.42	0.42	0.35	0.26	0.26	0.37	0.27	0.27
v/c Ratio	1.48	0.80	0.56	0.84	1.23	0.70	1.23	1.08	0.46	1.44	0.89	1.04
Control Delay	269.1	41.4	16.7	49.3	141.4	23.3	169.6	94.5	13.6	245.5	35.9	62.6
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	269.1	41.4	16.7	49.3	141.4	23.3	169.6	94.5	13.6	245.5	35.9	62.6
LOS	F	D	B	D	F	C	F	F	B	F	D	E
Approach Delay		72.0			108.1			93.0			80.4	

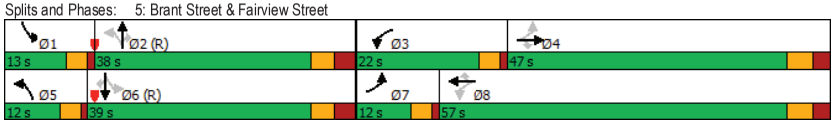
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			F			F			F	
Queue Length 50th (m)	~74.1	119.3	31.1	44.3	~298.4	70.8	~51.8	~146.8	11.7	~74.3	113.7	~113.3
Queue Length 95th (m)	#129.2	147.1	63.8	#85.8	#343.0	114.6	#104.9	#189.2	35.8 m	#127.4	#144.4	#186.0
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	176	1247	676	344	1507	774	186	938	518	199	958	513
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	1.48	0.80	0.56	0.79	1.23	0.70	1.23	1.08	0.46	1.44	0.89	1.04

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 89 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.48
Intersection Signal Delay: 91.0 Intersection LOS: F
Intersection Capacity Utilization 118.1% ICU Level of Service H
Analysis Period (min) 15

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

Splits and Phases: 5: Brant Street & Fairview Street



Queues
5: Brant Street & Fairview Street

Total (2029)
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	261	998	376	271	1853	540	229	1010	240	287	852	532
v/c Ratio	1.48	0.80	0.56	0.84	1.23	0.70	1.23	1.08	0.46	1.44	0.89	1.04
Control Delay	269.1	41.4	16.7	49.3	141.4	23.3	169.6	94.5	13.6	245.5	35.9	62.6
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	269.1	41.4	16.7	49.3	141.4	23.3	169.6	94.5	13.6	245.5	35.9	62.6
Queue Length 50th (m)	~74.1	119.3	31.1	44.3	~298.4	70.8	~51.8	~146.8	11.7	~74.3	113.7	~113.3
Queue Length 95th (m)	#129.2	147.1	63.8	#85.8	#343.0	114.6	#104.9	#189.2	35.8	m#127.4	#144.4	#186.0
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	176	1247	676	344	1507	774	186	938	518	199	958	513
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	1.48	0.80	0.56	0.79	1.23	0.70	1.23	1.08	0.46	1.44	0.89	1.04

Intersection Summary

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

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

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

HCM Signalized Intersection Capacity Analysis
5: Brant Street & Fairview Street

Total (2029)
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	918	346	249	1705	497	211	929	221	264	784	489
Future Volume (vph)	240	918	346	249	1705	497	211	929	221	264	784	489
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.92	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)	1703	3539	1526	1787	3574	1573	1787	3574	1474	1770	3539	1498
Flt Permitted	0.09	1.00	1.00	0.10	1.00	1.00	0.13	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	169	3539	1526	195	3574	1573	239	3574	1474	229	3539	1498
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	261	998	376	271	1853	540	229	1010	240	287	852	532
RTOR Reduction (vph)	0	0	139	0	0	111	0	0	132	0	0	108
Lane Group Flow (vph)	261	998	237	271	1853	429	229	1010	108	287	852	424
Confl. Peds. (#/hr)	3		10	10		3	16		45	45		16
Heavy Vehicles (%)	6%	2%	3%	1%	1%	1%	1%	1%	1%	2%	2%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	50.3	42.3	42.3	62.6	50.6	50.6	39.5	31.5	31.5	41.5	32.5	32.5
Effective Green, g (s)	50.3	42.3	42.3	62.6	50.6	50.6	39.5	31.5	31.5	41.5	32.5	32.5
Actuated g/C Ratio	0.42	0.35	0.35	0.52	0.42	0.42	0.33	0.26	0.26	0.35	0.27	0.27
Clearance Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
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)	173	1247	537	317	1507	663	181	938	386	194	958	405
v/s Ratio Prot	c0.10	0.28		0.12	c0.52		0.08	0.28		c0.11	0.24	
v/s Ratio Perm	c0.53		0.16	0.33		0.27	0.33		0.07	c0.40		0.28
v/c Ratio	1.51	0.80	0.44	0.85	1.23	0.65	1.27	1.08	0.28	1.48	0.89	1.05
Uniform Delay, d1	29.8	35.0	29.8	30.3	34.7	27.6	34.9	44.2	35.2	34.0	42.0	43.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.05	0.61	0.47
Incremental Delay, d2	256.4	3.8	0.6	19.6	109.4	2.2	155.7	52.3	1.8	235.6	9.6	51.9
Delay (s)	286.3	38.8	30.4	49.8	144.1	29.8	190.6	96.6	37.0	271.3	35.1	72.4
Level of Service	F	D	C	D	F	C	F	F	D	F	D	E
Approach Delay (s)		76.4			111.3			101.5			87.6	
Approach LOS		E			F			F			F	

Intersection Summary				
HCM 2000 Control Delay	96.4	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.45			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	118.1%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	2	6	3	504	643	1
Future Volume (vph)	2	6	3	504	643	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.895					
Flt Protected	0.989					
Satd. Flow (prot)	1649	0	0	1863	1863	0
Flt Permitted	0.989					
Satd. Flow (perm)	1649	0	0	1863	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	47.7			73.7	37.6	
Travel Time (s)	3.4			5.3	2.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	7	3	548	699	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	0	0	551	700	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	6	3	504	643	1
Future Volume (Veh/h)	2	6	3	504	643	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	7	3	548	699	1
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)				74	375	
pX, platoon unblocked	0.87	0.78	0.78			
vC, conflicting volume	1254	700	700			
vC1, stage 1 conf vol	700					
vC2, stage 2 conf vol	554					
vCu, unblocked vol	658	480	480			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	100			
cM capacity (veh/h)	460	460	849			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	9	551	700
Volume Left	2	3	0
Volume Right	7	0	1
cSH	460	849	1700
Volume to Capacity	0.02	0.00	0.41
Queue Length 95th (m)	0.5	0.1	0.0
Control Delay (s)	13.0	0.1	0.0
Lane LOS	B	A	
Approach Delay (s)	13.0	0.1	0.0
Approach LOS	B		

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		43.9%	ICU Level of Service	A
Analysis Period (min)		15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	16	51	72	434	592	32
Future Volume (vph)	16	51	72	434	592	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.897				0.993	
Flt Protected	0.988			0.993		
Satd. Flow (prot)	1651	0	0	1850	1850	0
Flt Permitted	0.988			0.993		
Satd. Flow (perm)	1651	0	0	1850	1850	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	43.3			37.6	47.9	
Travel Time (s)	3.1			2.7	3.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	55	78	472	643	35
Shared Lane Traffic (%)						
Lane Group Flow (vph)	72	0	0	550	678	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	51	72	434	592	32
Future Volume (Veh/h)	16	51	72	434	592	32
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	55	78	472	643	35
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	None	
Median storage veh)				2		
Upstream signal (m)				111	337	
pX, platoon unblocked	0.87	0.76	0.76			
vC, conflicting volume	1288	660	678			
vC1, stage 1 conf vol	660					
vC2, stage 2 conf vol	628					
vCu, unblocked vol	718	401	424			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	89	91			
cM capacity (veh/h)	428	496	867			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	72	550	678
Volume Left	17	78	0
Volume Right	55	0	35
cSH	478	867	1700
Volume to Capacity	0.15	0.09	0.40
Queue Length 95th (m)	4.2	2.4	0.0
Control Delay (s)	13.9	2.4	0.0
Lane LOS	B	A	
Approach Delay (s)	13.9	2.4	0.0
Approach LOS	B		

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	73.9%	ICU Level of Service	D	
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	91	360	552	64	36	73
Future Volume (vph)	91	360	552	64	36	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.986		0.910	
Flt Protected		0.990			0.984	
Satd. Flow (prot)	0	1844	1837	0	1668	0
Flt Permitted		0.990			0.984	
Satd. Flow (perm)	0	1844	1837	0	1668	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		47.1	32.3		62.0	
Travel Time (s)		3.4	2.3		4.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	391	600	70	39	79
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	490	670	0	118	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	91	360	552	64	36	73
Future Volume (Veh/h)	91	360	552	64	36	73
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)	99	391	600	70	39	79
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		206	242			
pX, platoon unblocked	0.73				0.74	0.73
vC, conflicting volume	670				1224	635
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	370				1065	322
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				76	85
cM capacity (veh/h)	873				163	528

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	490	670	118
Volume Left	99	0	39
Volume Right	0	70	79
cSH	873	1700	303
Volume to Capacity	0.11	0.39	0.39
Queue Length 95th (m)	3.1	0.0	14.2
Control Delay (s)	3.1	0.0	24.2
Lane LOS	A		C
Approach Delay (s)	3.1	0.0	24.2
Approach LOS			C

Intersection Summary				
Average Delay	3.4			
Intersection Capacity Utilization	73.4%	ICU Level of Service	D	
Analysis Period (min)	15			

Appendix H3

2034 Total Operation Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1719	241	0	970	0	0	0	0	287	0	116
Future Volume (vph)	0	1719	241	0	970	0	0	0	0	287	0	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	55.0		0.0
Storage Lanes	0		1	0		0	0		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor			0.98									
Frt			0.850									0.850
Flt Protected										0.950		
Satd. Flow (prot)	0	5036	1538	0	4988	0	0	0	0	3367	0	1615
Flt Permitted										0.950		
Satd. Flow (perm)	0	5036	1503	0	4988	0	0	0	0	3367	0	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			262									126
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		175.7			307.2			140.0			199.7	
Travel Time (s)		12.7			22.1			10.1			14.4	
Confl. Peds. (#/hr)	1		2	2		1						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	5%	4%	4%	0%	0%	0%	0%	4%	50%	0%
Adj. Flow (vph)	0	1868	262	0	1054	0	0	0	0	312	0	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1868	262	0	1054	0	0	0	0	312	0	126
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Detector Phase		2	2		6					8		8
Switch Phase												
Minimum Initial (s)		8.0	8.0		8.0					8.0		8.0
Minimum Split (s)		43.0	43.0		43.0					25.0		25.0
Total Split (s)		75.0	75.0		75.0					25.0		25.0
Total Split (%)		75.0%	75.0%		75.0%					25.0%		25.0%
Yellow Time (s)		4.0	4.0		4.0					4.0		4.0
All-Red Time (s)		3.0	3.0		3.0					3.0		3.0
Lost Time Adjust (s)		0.0	0.0		0.0					0.0		0.0
Total Lost Time (s)		7.0	7.0		7.0					7.0		7.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max		C-Max					None		None
Act Effct Green (s)		71.6	71.6		71.6					14.4		14.4
Actuated g/C Ratio		0.72	0.72		0.72					0.14		0.14
v/c Ratio		0.52	0.23		0.30					0.64		0.37
Control Delay		7.3	1.2		6.5					46.4		10.0
Queue Delay		0.0	0.0		0.0					0.0		0.0
Total Delay		7.3	1.2		6.5					46.4		10.0
LOS		A	A		A					D		A
Approach Delay		6.6			6.5						35.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A						D	
Queue Length 50th (m)		54.5	0.0		28.0					31.3		0.0
Queue Length 95th (m)		74.2	7.4		m44.1					43.7		15.6
Internal Link Dist (m)		151.7			283.2			116.0			175.7	
Turn Bay Length (m)										55.0		
Base Capacity (vph)		3605	1150		3571					606		394
Starvation Cap Reductn		0	0		0					0		0
Spillback Cap Reductn		0	0		0					0		0
Storage Cap Reductn		0	0		0					0		0
Reduced v/c Ratio		0.52	0.23		0.30					0.51		0.32

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 66 (66%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 10.1		Intersection LOS: B	
Intersection Capacity Utilization 50.6%		ICU Level of Service A	
Analysis Period (min) 15			

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

Splits and Phases: 1: Plains Road E/Fairview Street & QEW West Ramp



Queues
1: Plains Road E/Fairview Street & QEW West Ramp

Total (2034)
AM Peak Hour

Lane Group	EBT	EBR	WBT	SBL	SBR
Lane Group Flow (vph)	1868	262	1054	312	126
v/c Ratio	0.52	0.23	0.30	0.64	0.37
Control Delay	7.3	1.2	6.5	46.4	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.3	1.2	6.5	46.4	10.0
Queue Length 50th (m)	54.5	0.0	28.0	31.3	0.0
Queue Length 95th (m)	74.2	7.4	m44.1	43.7	15.6
Internal Link Dist (m)	151.7		283.2		
Turn Bay Length (m)				55.0	
Base Capacity (vph)	3605	1150	3571	606	394
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.52	0.23	0.30	0.51	0.32

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Plains Road E/Fairview Street & QEW West Ramp

Total (2034)
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1719	241	0	970	0	0	0	0	287	0	116
Future Volume (vph)	0	1719	241	0	970	0	0	0	0	287	0	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0					7.0		7.0
Lane Util. Factor		0.91	1.00		0.91					0.97		1.00
Frpb, ped/bikes		1.00	0.98		1.00					1.00		1.00
Flpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Frt		1.00	0.85		1.00					1.00		0.85
Flt Protected		1.00	1.00		1.00					0.95		1.00
Satd. Flow (prot)		5036	1503		4988					3367		1615
Flt Permitted		1.00	1.00		1.00					0.95		1.00
Satd. Flow (perm)		5036	1503		4988					3367		1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1868	262	0	1054	0	0	0	0	312	0	126
RTOR Reduction (vph)	0	0	74	0	0	0	0	0	0	0	0	108
Lane Group Flow (vph)	0	1868	188	0	1054	0	0	0	0	312	0	18
Confl. Peds. (#/hr)	1		2	2		1						
Heavy Vehicles (%)	0%	3%	5%	4%	4%	0%	0%	0%	0%	4%	50%	0%
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Actuated Green, G (s)		71.6	71.6		71.6					14.4		14.4
Effective Green, g (s)		71.6	71.6		71.6					14.4		14.4
Actuated g/C Ratio		0.72	0.72		0.72					0.14		0.14
Clearance Time (s)		7.0	7.0		7.0					7.0		7.0
Vehicle Extension (s)		3.0	3.0		3.0					3.0		3.0
Lane Grp Cap (vph)		3605	1076		3571					484		232
v/s Ratio Prot		c0.37			0.21							
v/s Ratio Perm			0.12							c0.09		0.01
v/c Ratio		0.52	0.17		0.30					0.64		0.08
Uniform Delay, d1		6.4	4.6		5.1					40.4		37.1
Progression Factor		1.00	1.00		1.18					1.00		1.00
Incremental Delay, d2		0.5	0.4		0.2					2.9		0.1
Delay (s)		6.9	5.0		6.2					43.3		37.2
Level of Service		A	A		A					D		D
Approach Delay (s)		6.7			6.2			0.0			41.6	
Approach LOS		A			A			A			D	

Intersection Summary					
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.54				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		14.0	
Intersection Capacity Utilization	50.6%	ICU Level of Service		A	
Analysis Period (min)	15				

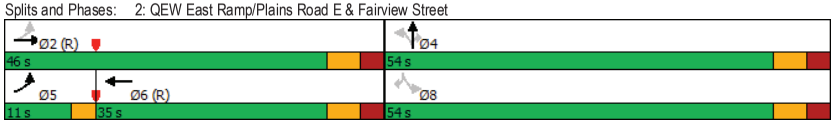
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	1489	0	0	933	31	250	348	874	64	0	542
Future Volume (vph)	141	1489	0	0	933	31	250	348	874	64	0	542
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		45.0	25.0		0.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			15.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.91	0.95	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00			0.99	0.99			
Frt					0.995			0.936	0.850			0.850
Flt Protected	0.950						0.950	0.998		0.950		
Satd. Flow (prot)	1752	5036	0	0	4965	0	1649	1573	1504	1805	0	1538
Flt Permitted	0.134						0.950	0.998		0.101		
Satd. Flow (perm)	247	5036	0	0	4965	0	1649	1573	1485	192	0	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					5			3	76			248
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		307.2			385.1			180.0			69.7	
Travel Time (s)		22.1			27.7			13.0			5.0	
Confl. Peds. (#/hr)	1		3	3		1			1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	0%	4%	0%	4%	2%	2%	0%	0%	5%
Adj. Flow (vph)	153	1618	0	0	1014	34	272	378	950	70	0	589
Shared Lane Traffic (%)							10%		32%			
Lane Group Flow (vph)	153	1618	0	0	1048	0	245	709	646	70	0	589
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Detector Phase	5	2			6		4	4	4	8		8
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0		8.0	8.0	8.0	8.0		8.0
Minimum Split (s)	11.0	35.0			35.0		36.0	36.0	36.0	36.0		36.0
Total Split (s)	11.0	46.0			35.0		54.0	54.0	54.0	54.0		54.0
Total Split (%)	11.0%	46.0%			35.0%		54.0%	54.0%	54.0%	54.0%		54.0%
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	0.0	3.0			3.0		3.0	3.0	3.0	3.0		3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	None	C-Max			C-Max		None	None	None	None		None
Act Effct Green (s)	43.5	39.5			28.5		46.5	46.5	46.5	46.5		46.5
Actuated g/C Ratio	0.44	0.40			0.28		0.46	0.46	0.46	0.46		0.46
v/c Ratio	0.67	0.81			0.74		0.32	0.97	0.88	0.79		0.69
Control Delay	32.6	25.7			36.2		18.1	53.4	37.0	78.4		16.6
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Delay	32.6	25.7			36.2		18.1	53.4	37.0	78.4		16.6
LOS	C	C			D		B	D	D	E		B
Approach Delay		26.3			36.2			41.4			23.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			D			D			C	
Queue Length 50th (m)	13.1	111.7			70.9		31.6	147.5	109.1	11.5		52.4
Queue Length 95th (m)	#36.6	121.6			87.5		50.5	#237.5	#188.0	#39.7		94.7
Internal Link Dist (m)		283.2			361.1			156.0			45.7	
Turn Bay Length (m)	30.0								45.0	25.0		
Base Capacity (vph)	227	1987			1416		775	740	738	90		854
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	0.67	0.81			0.74		0.32	0.96	0.88	0.78		0.69

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 96 (96%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 32.7		Intersection LOS: C	
Intersection Capacity Utilization 99.4%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 2: QEW East Ramp/Plains Road E & Fairview Street



Queues
2: QEW East Ramp/Plains Road E & Fairview Street

Total (2034)
AM Peak Hour

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	153	1618	1048	245	709	646	70	589
v/c Ratio	0.67	0.81	0.74	0.32	0.97	0.88	0.79	0.69
Control Delay	32.6	25.7	36.2	18.1	53.4	37.0	78.4	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	25.7	36.2	18.1	53.4	37.0	78.4	16.6
Queue Length 50th (m)	13.1	111.7	70.9	31.6	147.5	109.1	11.5	52.4
Queue Length 95th (m)	#36.6	121.6	87.5	50.5	#237.5	#188.0	#39.7	94.7
Internal Link Dist (m)		283.2	361.1		156.0			
Turn Bay Length (m)	30.0					45.0	25.0	
Base Capacity (vph)	227	1987	1416	775	740	738	90	854
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	0.67	0.81	0.74	0.32	0.96	0.88	0.78	0.69

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
2: QEW East Ramp/Plains Road E & Fairview Street

Total (2034)
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	1489	0	0	933	31	250	348	874	64	0	542
Future Volume (vph)	141	1489	0	0	933	31	250	348	874	64	0	542
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lane Util. Factor	1.00	0.91			0.91		0.95	0.91	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	0.99	0.99	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			1.00		1.00	0.94	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1752	5036			4966		1649	1573	1485	1805		1538
Flt Permitted	0.13	1.00			1.00		0.95	1.00	1.00	0.10		1.00
Satd. Flow (perm)	246	5036			4966		1649	1573	1485	192		1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	153	1618	0	0	1014	34	272	378	950	70	0	589
RTOR Reduction (vph)	0	0	0	0	4	0	0	2	41	0	0	133
Lane Group Flow (vph)	153	1618	0	0	1044	0	245	707	605	70	0	456
Confl. Peds. (#/hr)	1		3	3		1			1	1		
Heavy Vehicles (%)	3%	3%	3%	0%	4%	0%	4%	2%	2%	0%	0%	5%
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Actuated Green, G (s)	39.5	39.5			28.5		46.5	46.5	46.5	46.5		46.5
Effective Green, g (s)	39.5	39.5			28.5		46.5	46.5	46.5	46.5		46.5
Actuated g/C Ratio	0.40	0.40			0.28		0.46	0.46	0.46	0.46		0.46
Clearance Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		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)	217	1989			1415		766	731	690	89		715
v/s Ratio Prot	0.06	c0.32			0.21							
v/s Ratio Perm	0.22						0.15	0.45	0.41	0.36		0.30
v/c Ratio	0.71	0.81			0.74		0.32	0.97	0.88	0.79		0.64
Uniform Delay, d1	21.8	27.0			32.4		16.8	26.0	24.2	22.6		20.4
Progression Factor	1.02	0.82			1.00		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	8.7	3.3			3.5		0.2	25.2	12.1	35.5		1.9
Delay (s)	31.0	25.3			35.9		17.1	51.3	36.3	58.0		22.2
Level of Service	C	C			D		B	D	D	E		C
Approach Delay (s)		25.8			35.9			40.0			26.0	
Approach LOS		C			D			D			C	

Intersection Summary				
HCM 2000 Control Delay	32.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	99.4%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	554	33	317	451	18	649
Future Volume (vph)	554	33	317	451	18	649
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	55.0		0.0	0.0
Storage Lanes		0	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	0.97	1.00	1.00	1.00
Ped Bike Factor	1.00		0.99			0.99
Frt	0.992					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3343	0	3303	1712	1805	1568
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3343	0	3284	1712	1805	1547
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	6					12
Link Speed (k/h)	50			60	50	
Link Distance (m)	209.7			887.5	183.4	
Travel Time (s)	15.1			53.3	13.2	
Confl. Peds. (#/hr)		7	7			1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	40%	6%	11%	0%	3%
Adj. Flow (vph)	602	36	345	490	20	705
Shared Lane Traffic (%)						
Lane Group Flow (vph)	638	0	345	490	20	705
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Detector Phase	3		4	4	2	4
Switch Phase						
Minimum Initial (s)	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	17.0		27.0	27.0	18.0	27.0
Total Split (s)	23.0		44.0	44.0	18.0	44.0
Total Split (%)	27.1%		51.8%	51.8%	21.2%	51.8%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None		C-Max	C-Max	Max	C-Max
Act Effct Green (s)	16.0		38.0	38.0	11.0	50.0
Actuated g/C Ratio	0.19		0.45	0.45	0.13	0.59
v/c Ratio	1.01		0.23	0.64	0.09	0.76
Control Delay	73.2		15.0	23.0	33.7	17.9
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	73.2		15.0	23.0	33.7	17.9
LOS	E		B	C	C	B
Approach Delay	73.2			19.7	18.4	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	E			B	B	
Queue Length 50th (m)	~58.0		18.0	62.6	3.1	64.2
Queue Length 95th (m)	#95.1		27.0	96.6	9.5	103.6
Internal Link Dist (m)	185.7			863.5	159.4	
Turn Bay Length (m)			55.0			
Base Capacity (vph)	634		1476	765	233	924
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	1.01		0.23	0.64	0.09	0.76

Intersection Summary		
Area Type:	Other	
Cycle Length: 85		
Actuated Cycle Length: 85		
Offset: 27 (32%), Referenced to phase 4:WBTL, Start of Green		
Natural Cycle: 75		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.01		
Intersection Signal Delay: 34.8		Intersection LOS: C
Intersection Capacity Utilization 67.5%		ICU Level of Service C
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: 3: Maple Avenue & Plains Road E



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	638	345	490	20	705
v/c Ratio	1.01	0.23	0.64	0.09	0.76
Control Delay	73.2	15.0	23.0	33.7	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	73.2	15.0	23.0	33.7	17.9
Queue Length 50th (m)	~58.0	18.0	62.6	3.1	64.2
Queue Length 95th (m)	#95.1	27.0	96.6	9.5	103.6
Internal Link Dist (m)	185.7		863.5	159.4	
Turn Bay Length (m)		55.0			
Base Capacity (vph)	634	1476	765	233	924
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.01	0.23	0.64	0.09	0.76

Intersection Summary

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

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	554	33	317	451	18	649
Future Volume (vph)	554	33	317	451	18	649
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		6.0	6.0	7.0	6.0
Lane Util. Factor	0.95		0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3342		3303	1712	1805	1563
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3342		3303	1712	1805	1563
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	602	36	345	490	20	705
RTOR Reduction (vph)	5	0	0	0	0	5
Lane Group Flow (vph)	633	0	345	490	20	700
Confl. Peds. (#/hr)		7	7			1
Heavy Vehicles (%)	5%	40%	6%	11%	0%	3%
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Actuated Green, G (s)	16.0		38.0	38.0	11.0	49.0
Effective Green, g (s)	16.0		38.0	38.0	11.0	49.0
Actuated g/C Ratio	0.19		0.45	0.45	0.13	0.58
Clearance Time (s)	7.0		6.0	6.0	7.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	629		1476	765	233	901
v/s Ratio Prot			0.10			c0.35
v/s Ratio Perm	c0.19			0.29	0.01	0.10
v/c Ratio	1.01		0.23	0.64	0.09	0.78
Uniform Delay, d1	34.5		14.5	18.2	32.6	13.8
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	37.5		0.4	4.1	0.7	6.5
Delay (s)	72.0		14.9	22.3	33.3	20.3
Level of Service	E		B	C	C	C
Approach Delay (s)	72.0			19.2	20.7	
Approach LOS	E			B	C	

Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

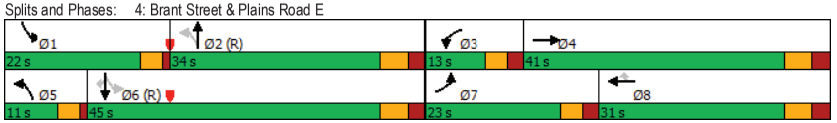
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	563	586	52	92	171	92	44	969	316	358	1214	548
Future Volume (vph)	563	586	52	92	171	92	44	969	316	358	1214	548
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	50.0		75.0	50.0		0.0	40.0		30.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.99	1.00		1.00		0.98	1.00	0.99				0.97
Frt		0.988				0.850		0.963				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	1841	0	1597	3252	1404	1641	4751	0	1719	5085	1538
Flt Permitted	0.950			0.950			0.146			0.125		
Satd. Flow (perm)	3373	1841	0	1593	3252	1374	252	4751	0	226	5085	1498
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				208		72				297
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		887.5			190.4			463.4			229.3	
Travel Time (s)		53.3			11.4			27.8			13.8	
Confl. Peds. (#/hr)	7		5	5		7	11		7	7		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	0%	13%	11%	15%	10%	3%	8%	5%	2%	5%
Adj. Flow (vph)	612	637	57	100	186	100	48	1053	343	389	1320	596
Shared Lane Traffic (%)												
Lane Group Flow (vph)	612	694	0	100	186	100	48	1396	0	389	1320	596
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Detector Phase	7	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	7.0	8.0		7.0	8.0	8.0
Minimum Split (s)	13.0	31.3		13.0	29.3	29.3	11.0	31.0		11.0	31.0	31.0
Total Split (s)	23.0	41.0		13.0	31.0	31.0	11.0	34.0		22.0	45.0	45.0
Total Split (%)	20.9%	37.3%		11.8%	28.2%	28.2%	10.0%	30.9%		20.0%	40.9%	40.9%
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.7		3.0	3.7	3.7
All-Red Time (s)	2.0	2.6		2.0	2.6	2.6	1.0	2.3		1.0	2.3	2.3
Lost Time Adjust (s)	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	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	18.0	34.7		8.0	24.7	24.7	37.0	28.0		52.0	41.2	41.2
Actuated g/C Ratio	0.16	0.32		0.07	0.22	0.22	0.34	0.25		0.47	0.37	0.37
v/c Ratio	1.10	1.19		0.86	0.25	0.21	0.28	1.11		1.11	0.69	0.80
Control Delay	111.9	136.5		104.3	36.2	1.0	19.4	80.0		110.1	32.0	24.9
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	111.9	136.5		104.3	36.2	1.0	19.4	80.0		110.1	32.0	24.9
LOS	F	F		F	D	A	B	F		F	C	C
Approach Delay		125.0			44.7			78.0			43.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			D			E			D	
Queue Length 50th (m)	~81.1	~189.9		22.8	18.2	0.0	2.7	~126.8		~83.9	94.2	65.3
Queue Length 95th (m)	#117.3	#263.9		#55.1	28.7	0.0	m3.7	m#134.0		#145.8	112.0	#133.2
Internal Link Dist (m)		863.5			166.4			439.4			205.3	
Turn Bay Length (m)	55.0			50.0		75.0	50.0			40.0		30.0
Base Capacity (vph)	556	583		116	730	469	173	1263		351	1904	746
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.10	1.19		0.86	0.25	0.21	0.28	1.11		1.11	0.69	0.80

Intersection Summary	
Area Type:	Other
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 40 (36%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 72.2	Intersection LOS: E
Intersection Capacity Utilization 104.2%	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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Brant Street & Plains Road E



Queues
4: Brant Street & Plains Road E

Total (2034)
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	612	694	100	186	100	48	1396	389	1320	596
v/c Ratio	1.10	1.19	0.86	0.25	0.21	0.28	1.11	1.11	0.69	0.80
Control Delay	111.9	136.5	104.3	36.2	1.0	19.4	80.0	110.1	32.0	24.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.9	136.5	104.3	36.2	1.0	19.4	80.0	110.1	32.0	24.9
Queue Length 50th (m)	~81.1	~189.9	22.8	18.2	0.0	2.7	~126.8	~83.9	94.2	65.3
Queue Length 95th (m)	#117.3	#263.9	#55.1	28.7	0.0	m3.7	m#134.0	#145.8	112.0	#133.2
Internal Link Dist (m)		863.5		166.4			439.4		205.3	
Turn Bay Length (m)	55.0		50.0		75.0	50.0		40.0		30.0
Base Capacity (vph)	556	583	116	730	469	173	1263	351	1904	746
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.10	1.19	0.86	0.25	0.21	0.28	1.11	1.11	0.69	0.80

Intersection Summary

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

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

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

HCM Signalized Intersection Capacity Analysis
4: Brant Street & Plains Road E

Total (2034)
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	563	586	52	92	171	92	44	969	316	358	1214	548
Future Volume (vph)	563	586	52	92	171	92	44	969	316	358	1214	548
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	1.00		1.00	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	0.99		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
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3400	1840		1597	3252	1374	1641	4752		1719	5085	1498
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.15	1.00		0.12	1.00	1.00
Satd. Flow (perm)	3400	1840		1597	3252	1374	252	4752		226	5085	1498
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	612	637	57	100	186	100	48	1053	343	389	1320	596
RTOR Reduction (vph)	0	3	0	0	0	78	0	54	0	0	0	188
Lane Group Flow (vph)	612	691	0	100	186	22	48	1342	0	389	1320	408
Confl. Peds. (#/hr)	7		5	5		7	11		7	7		11
Heavy Vehicles (%)	3%	2%	0%	13%	11%	15%	10%	3%	8%	5%	2%	5%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Actuated Green, G (s)	18.0	34.7		8.0	24.7	24.7	33.6	28.0		50.0	40.4	40.4
Effective Green, g (s)	18.0	34.7		8.0	24.7	24.7	33.6	28.0		50.0	40.4	40.4
Actuated g/C Ratio	0.16	0.32		0.07	0.22	0.22	0.31	0.25		0.45	0.37	0.37
Clearance Time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	556	580		116	730	308	147	1209		347	1867	550
v/s Ratio Prot	c0.18	c0.38		0.06	0.06		0.02	0.28		c0.18	0.26	
v/s Ratio Perm						0.02	0.08			c0.33		0.27
v/c Ratio	1.10	1.19		0.86	0.25	0.07	0.33	1.11		1.12	0.71	0.74
Uniform Delay, d1	46.0	37.6		50.5	35.1	33.6	27.6	41.0		32.5	29.7	30.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.02	0.69		1.00	1.00	1.00
Incremental Delay, d2	68.7	102.6		44.0	0.2	0.1	0.5	54.9		85.2	2.3	8.8
Delay (s)	114.7	140.2		94.5	35.3	33.7	28.7	83.1		117.7	32.0	39.0
Level of Service	F	F		F	D	C	C	F		F	C	D
Approach Delay (s)		128.2			50.2			81.3			48.3	
Approach LOS		F			D			F			D	

Intersection Summary				
HCM 2000 Control Delay	76.4	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.21			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.3	
Intersection Capacity Utilization	104.2%	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)	420	1371	338	157	432	189	251	815	340	286	892	188
Future Volume (vph)	420	1371	338	157	432	189	251	815	340	286	892	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		170.0	60.0		0.0	75.0		70.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.99			0.98	1.00		0.96			0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3539	1568	1703	3438	1538	1787	3505	1599	1787	3505	1346
Flt Permitted	0.321			0.143			0.151			0.131		
Satd. Flow (perm)	568	3539	1547	256	3438	1507	283	3505	1535	246	3505	1290
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			257			205			176			199
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		261.1			251.5			231.2			463.4	
Travel Time (s)		15.7			15.1			16.6			27.8	
Confl. Peds. (#/hr)	6		1	1		6	22		21	21		22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	2%	3%	6%	5%	5%	1%	3%	1%	1%	3%	20%
Adj. Flow (vph)	457	1490	367	171	470	205	273	886	370	311	970	204
Shared Lane Traffic (%)												
Lane Group Flow (vph)	457	1490	367	171	470	205	273	886	370	311	970	204
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		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	31.4	31.4	12.0	31.4	31.4	12.0	31.5	31.5	12.0	31.5	31.5
Total Split (s)	26.0	48.0	48.0	12.0	34.0	34.0	13.0	33.0	33.0	17.0	37.0	37.0
Total Split (%)	23.6%	43.6%	43.6%	10.9%	30.9%	30.9%	11.8%	30.0%	30.0%	15.5%	33.6%	33.6%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
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)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	56.0	41.6	41.6	38.3	27.9	27.9	38.0	26.5	26.5	46.0	30.5	30.5
Actuated g/C Ratio	0.51	0.38	0.38	0.35	0.25	0.25	0.35	0.24	0.24	0.42	0.28	0.28
v/c Ratio	0.90	1.11	0.49	0.88	0.54	0.38	1.24	1.05	0.74	1.10	1.00	0.41
Control Delay	41.7	95.2	10.2	65.5	38.3	6.9	166.2	85.8	29.6	102.0	68.6	22.8
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	41.7	95.2	10.2	65.5	38.3	6.9	166.2	85.8	29.6	102.0	68.6	22.8
LOS	D	F	B	E	D	A	F	F	C	F	E	C
Approach Delay		71.1			36.2			86.6			69.3	

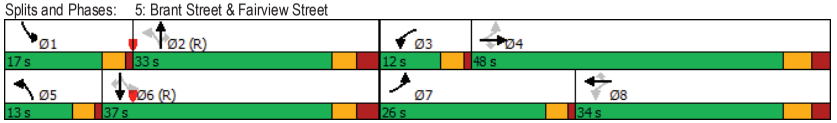
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			D			F			E	
Queue Length 50th (m)	66.9	~203.6	16.4	21.4	48.6	0.0	~57.9	~115.0	41.0	~76.8	124.0	29.5
Queue Length 95th (m)	#115.9	#247.7	42.8	#62.8	65.8	18.4	#112.6	#155.4	78.1	m#115.2	m#163.6	m48.2
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	512	1338	744	194	873	535	220	844	503	284	971	501
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	0.89	1.11	0.49	0.88	0.54	0.38	1.24	1.05	0.74	1.10	1.00	0.41

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 107 (97%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.24
Intersection Signal Delay: 69.7 Intersection LOS: E
Intersection Capacity Utilization 102.6% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Brant Street & Fairview Street



Queues
5: Brant Street & Fairview Street

Total (2034)
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	457	1490	367	171	470	205	273	886	370	311	970	204
v/c Ratio	0.90	1.11	0.49	0.88	0.54	0.38	1.24	1.05	0.74	1.10	1.00	0.41
Control Delay	41.7	95.2	10.2	65.5	38.3	6.9	166.2	85.8	29.6	102.0	68.6	22.8
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	41.7	95.2	10.2	65.5	38.3	6.9	166.2	85.8	29.6	102.0	68.6	22.8
Queue Length 50th (m)	66.9	~203.6	16.4	21.4	48.6	0.0	~57.9	~115.0	41.0	~76.8	124.0	29.5
Queue Length 95th (m)	#115.9	#247.7	42.8	#62.8	65.8	18.4	#112.6	#155.4	78.1	m#115.2	m#163.6	m48.2
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	512	1338	744	194	873	535	220	844	503	284	971	501
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	0.89	1.11	0.49	0.88	0.54	0.38	1.24	1.05	0.74	1.10	1.00	0.41

Intersection Summary

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

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

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

HCM Signalized Intersection Capacity Analysis
5: Brant Street & Fairview Street

Total (2034)
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	420	1371	338	157	432	189	251	815	340	286	892	188
Future Volume (vph)	420	1371	338	157	432	189	251	815	340	286	892	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	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)	1685	3539	1547	1703	3438	1507	1786	3505	1535	1787	3505	1290
Flt Permitted	0.32	1.00	1.00	0.14	1.00	1.00	0.15	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)	569	3539	1547	257	3438	1507	284	3505	1535	247	3505	1290
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	457	1490	367	171	470	205	273	886	370	311	970	204
RTOR Reduction (vph)	0	0	160	0	0	153	0	0	134	0	0	144
Lane Group Flow (vph)	457	1490	207	171	470	52	273	886	236	311	970	60
Confl. Peds. (#/hr)	6		1	1		6	22		21	21		22
Heavy Vehicles (%)	7%	2%	3%	6%	5%	5%	1%	3%	1%	1%	3%	20%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	53.6	41.6	41.6	35.9	27.9	27.9	35.5	26.5	26.5	43.5	30.5	30.5
Effective Green, g (s)	53.6	41.6	41.6	35.9	27.9	27.9	35.5	26.5	26.5	43.5	30.5	30.5
Actuated g/C Ratio	0.49	0.38	0.38	0.33	0.25	0.25	0.32	0.24	0.24	0.40	0.28	0.28
Clearance Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
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)	497	1338	585	189	872	382	214	844	369	279	971	357
v/s Ratio Prot	c0.18	c0.42		0.07	0.14		0.10	0.25		c0.13	0.28	
v/s Ratio Perm	0.27		0.13	0.23		0.03	c0.31		0.15	0.31		0.05
v/c Ratio	0.92	1.11	0.35	0.90	0.54	0.14	1.28	1.05	0.64	1.11	1.00	0.17
Uniform Delay, d1	21.0	34.2	24.6	31.2	35.5	31.7	32.9	41.8	37.5	30.1	39.7	30.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.10	1.13	4.23
Incremental Delay, d2	22.0	62.0	0.4	39.5	0.6	0.2	155.2	44.9	8.3	79.3	23.5	0.7
Delay (s)	43.0	96.2	24.9	70.7	36.1	31.9	188.1	86.6	45.7	112.5	68.5	128.1
Level of Service	D	F	C	E	D	C	F	F	D	F	E	F
Approach Delay (s)		74.4			42.1			94.8			85.9	
Approach LOS		E			D			F			F	

Intersection Summary				
HCM 2000 Control Delay	77.8	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.16			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	102.6%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	2	6	514	604	2
Future Volume (vph)	0	2	6	514	604	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected				0.999		
Satd. Flow (prot)	1611	0	0	1861	1863	0
Flt Permitted				0.999		
Satd. Flow (perm)	1611	0	0	1861	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	33.8			69.7	42.0	
Travel Time (s)	2.4			5.0	3.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2	7	559	657	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	0	566	659	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	2	6	514	604	2
Future Volume (Veh/h)	0	2	6	514	604	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	7	559	657	2
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)				70	379	
pX, platoon unblocked	0.83	0.81	0.81			
vC, conflicting volume	1231	658	659			
vC1, stage 1 conf vol	658					
vC2, stage 2 conf vol	573					
vCu, unblocked vol	1035	458	459			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	99			
cM capacity (veh/h)	418	487	890			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	2	566	659
Volume Left	0	7	0
Volume Right	2	0	2
cSH	487	890	1700
Volume to Capacity	0.00	0.01	0.39
Queue Length 95th (m)	0.1	0.2	0.0
Control Delay (s)	12.4	0.2	0.0
Lane LOS	B	A	
Approach Delay (s)	12.4	0.2	0.0
Approach LOS	B		

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		41.9%	ICU Level of Service	A
Analysis Period (min)		15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	34	75	28	486	531	7
Future Volume (vph)	34	75	28	486	531	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.907				0.998	
Flt Protected	0.985			0.997		
Satd. Flow (prot)	1664	0	0	1857	1859	0
Flt Permitted	0.985			0.997		
Satd. Flow (perm)	1664	0	0	1857	1859	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	35.4			42.0	47.9	
Travel Time (s)	2.5			3.0	3.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	37	82	30	528	577	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	119	0	0	558	585	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	34	75	28	486	531	7
Future Volume (Veh/h)	34	75	28	486	531	7
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	82	30	528	577	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	None	
Median storage veh)				2		
Upstream signal (m)				112	337	
pX, platoon unblocked	0.82	0.80	0.80			
vC, conflicting volume	1169	581	585			
vC1, stage 1 conf vol	581					
vC2, stage 2 conf vol	588					
vCu, unblocked vol	968	348	353			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	85	97			
cM capacity (veh/h)	433	555	962			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	119	558	585
Volume Left	37	30	0
Volume Right	82	0	8
cSH	510	962	1700
Volume to Capacity	0.23	0.03	0.34
Queue Length 95th (m)	7.2	0.8	0.0
Control Delay (s)	14.2	0.9	0.0
Lane LOS	B	A	
Approach Delay (s)	14.2	0.9	0.0
Approach LOS	B		

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	61.6%	ICU Level of Service		B
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	34	486	456	14	56	82
Future Volume (vph)	34	486	456	14	56	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.996		0.920	
Flt Protected		0.997			0.980	
Satd. Flow (prot)	0	1857	1855	0	1679	0
Flt Permitted		0.997			0.980	
Satd. Flow (perm)	0	1857	1855	0	1679	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		47.1	32.3		62.0	
Travel Time (s)		3.4	2.3		4.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	37	528	496	15	61	89
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	565	511	0	150	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	34	486	456	14	56	82
Future Volume (Veh/h)	34	486	456	14	56	82
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)	37	528	496	15	61	89
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		207	242			
pX, platoon unblocked	0.78				0.79	0.78
vC, conflicting volume	511				1106	504
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	234				942	225
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				73	86
cM capacity (veh/h)	1042				223	637

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	565	511	150
Volume Left	37	0	61
Volume Right	0	15	89
cSH	1042	1700	363
Volume to Capacity	0.04	0.30	0.41
Queue Length 95th (m)	0.9	0.0	15.7
Control Delay (s)	1.0	0.0	21.7
Lane LOS	A		C
Approach Delay (s)	1.0	0.0	21.7
Approach LOS			C

Intersection Summary					
Average Delay		3.1			
Intersection Capacity Utilization		68.3%	ICU Level of Service		C
Analysis Period (min)		15			

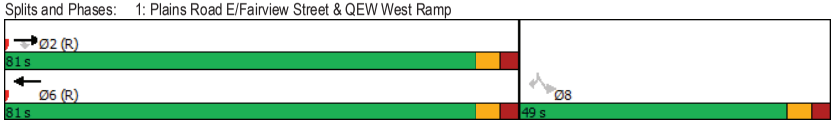
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1511	470	0	2426	0	0	0	0	743	0	406
Future Volume (vph)	0	1511	470	0	2426	0	0	0	0	743	0	406
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	55.0		0.0
Storage Lanes	0		1	0		0	0		0	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor			0.95									0.98
Frt			0.850									0.850
Flt Protected										0.950		
Satd. Flow (prot)	0	5136	1583	0	5085	0	0	0	0	3467	0	1615
Flt Permitted										0.950		
Satd. Flow (perm)	0	5136	1507	0	5085	0	0	0	0	3467	0	1585
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			511									34
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		175.7			307.2			140.0			199.7	
Travel Time (s)		12.7			22.1			10.1			14.4	
Confl. Peds. (#/hr)	4		15	15		4	3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	2%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Adj. Flow (vph)	0	1642	511	0	2637	0	0	0	0	808	0	441
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1642	511	0	2637	0	0	0	0	808	0	441
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Detector Phase		2	2		6					8		8
Switch Phase												
Minimum Initial (s)		8.0	8.0		8.0					8.0		8.0
Minimum Split (s)		43.0	43.0		43.0					25.0		25.0
Total Split (s)		81.0	81.0		81.0					49.0		49.0
Total Split (%)		62.3%	62.3%		62.3%					37.7%		37.7%
Yellow Time (s)		4.0	4.0		4.0					4.0		4.0
All-Red Time (s)		3.0	3.0		3.0					3.0		3.0
Lost Time Adjust (s)		0.0	0.0		0.0					0.0		0.0
Total Lost Time (s)		7.0	7.0		7.0					7.0		7.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max		C-Max					None		None
Act Effct Green (s)		77.8	77.8		77.8					38.2		38.2
Actuated g/C Ratio		0.60	0.60		0.60					0.29		0.29
v/c Ratio		0.53	0.46		0.87					0.79		0.90
Control Delay		16.8	2.6		11.1					48.2		62.5
Queue Delay		0.0	0.0		0.0					0.0		0.0
Total Delay		16.8	2.6		11.1					48.2		62.5
LOS		B	A		B					D		E
Approach Delay		13.4			11.1						53.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			B						D	
Queue Length 50th (m)		97.1	0.0		100.8					99.7		102.9
Queue Length 95th (m)		112.2	15.2		m34.6					122.7		#158.0
Internal Link Dist (m)		151.7			283.2			116.0			175.7	
Turn Bay Length (m)										55.0		
Base Capacity (vph)		3072	1106		3041					1120		535
Starvation Cap Reductn		0	0		5					0		0
Spillback Cap Reductn		0	0		0					0		0
Storage Cap Reductn		0	0		0					0		0
Reduced v/c Ratio		0.53	0.46		0.87					0.72		0.82

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 34 (26%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 20.6 Intersection LOS: C
Intersection Capacity Utilization 84.0% 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: 1: Plains Road E/Fairview Street & QEW West Ramp



Queues
1: Plains Road E/Fairview Street & QEW West Ramp

Total (2034)
PM Peak Hour

Lane Group	EBT	EBR	WBT	SBL	SBR
Lane Group Flow (vph)	1642	511	2637	808	441
v/c Ratio	0.53	0.46	0.87	0.79	0.90
Control Delay	16.8	2.6	11.1	48.2	62.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	16.8	2.6	11.1	48.2	62.5
Queue Length 50th (m)	97.1	0.0	100.8	99.7	102.9
Queue Length 95th (m)	112.2	15.2	m34.6	122.7	#158.0
Internal Link Dist (m)	151.7		283.2		
Turn Bay Length (m)				55.0	
Base Capacity (vph)	3072	1106	3041	1120	535
Starvation Cap Reductn	0	0	5	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.53	0.46	0.87	0.72	0.82

Intersection Summary

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.

HCM Signalized Intersection Capacity Analysis
1: Plains Road E/Fairview Street & QEW West Ramp

Total (2034)
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1511	470	0	2426	0	0	0	0	743	0	406
Future Volume (vph)	0	1511	470	0	2426	0	0	0	0	743	0	406
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0					7.0		7.0
Lane Util. Factor		0.91	1.00		0.91					0.97		1.00
Frpb, ped/bikes		1.00	0.95		1.00					1.00		0.98
Flpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Frt		1.00	0.85		1.00					1.00		0.85
Flt Protected		1.00	1.00		1.00					0.95		1.00
Satd. Flow (prot)		5136	1507		5085					3467		1585
Flt Permitted		1.00	1.00		1.00					0.95		1.00
Satd. Flow (perm)		5136	1507		5085					3467		1585
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1642	511	0	2637	0	0	0	0	808	0	441
RTOR Reduction (vph)	0	0	205	0	0	0	0	0	0	0	0	24
Lane Group Flow (vph)	0	1642	306	0	2637	0	0	0	0	808	0	417
Confl. Peds. (#/hr)	4		15	15		4	3					3
Heavy Vehicles (%)	0%	1%	2%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Actuated Green, G (s)		77.8	77.8		77.8					38.2		38.2
Effective Green, g (s)		77.8	77.8		77.8					38.2		38.2
Actuated g/C Ratio		0.60	0.60		0.60					0.29		0.29
Clearance Time (s)		7.0	7.0		7.0					7.0		7.0
Vehicle Extension (s)		3.0	3.0		3.0					3.0		3.0
Lane Grp Cap (vph)		3073	901		3043					1018		465
v/s Ratio Prot		0.32			c0.52							
v/s Ratio Perm			0.20							0.23		c0.26
v/c Ratio		0.53	0.34		0.87					0.79		0.90
Uniform Delay, d1		15.4	13.2		21.8					42.3		44.0
Progression Factor		1.00	1.00		0.46					1.00		1.00
Incremental Delay, d2		0.7	1.0		0.3					4.3		19.5
Delay (s)		16.1	14.2		10.3					46.6		63.5
Level of Service		B	B		B					D		E
Approach Delay (s)		15.6			10.3			0.0			52.6	
Approach LOS		B			B			A			D	

Intersection Summary

HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	84.0%	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)	187	1807	0	0	3178	79	193	276	533	46	0	657
Future Volume (vph)	187	1807	0	0	3178	79	193	276	533	46	0	657
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		45.0	25.0		0.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			15.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.91	0.95	1.00	1.00	1.00
Ped Bike Factor					1.00							
Frt					0.996			0.952	0.850			0.850
Flt Protected	0.950						0.950	0.998		0.950		
Satd. Flow (prot)	1770	5136	0	0	4789	0	1698	1596	1519	1805	0	1495
Flt Permitted	0.062						0.950	0.998		0.174		
Satd. Flow (perm)	115	5136	0	0	4789	0	1698	1596	1519	331	0	1495
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					4			8	59			127
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		307.2			385.1			180.0			73.7	
Travel Time (s)		22.1			27.7			13.0			5.3	
Confl. Peds. (#/hr)	2		7	7		2						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	1%	0%	0%	8%	0%	1%	4%	1%	0%	0%	8%
Adj. Flow (vph)	203	1964	0	0	3454	86	210	300	579	50	0	714
Shared Lane Traffic (%)							10%		26%			
Lane Group Flow (vph)	203	1964	0	0	3540	0	189	472	428	50	0	714
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Detector Phase	5	2			6		4	4	4	8		8
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0		8.0	8.0	8.0	8.0		8.0
Minimum Split (s)	11.0	35.0			35.0		36.0	36.0	36.0	36.0		36.0
Total Split (s)	11.0	79.0			68.0		51.0	51.0	51.0	51.0		51.0
Total Split (%)	8.5%	60.8%			52.3%		39.2%	39.2%	39.2%	39.2%		39.2%
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	0.0	3.0			3.0		3.0	3.0	3.0	3.0		3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	None	C-Max			C-Max		None	None	None	None		None
Act Effct Green (s)	76.0	72.0			61.0		44.0	44.0	44.0	44.0		44.0
Actuated g/C Ratio	0.58	0.55			0.47		0.34	0.34	0.34	0.34		0.34
v/c Ratio	1.20	0.69			1.57		0.33	0.87	0.77	0.45		1.21
Control Delay	159.8	17.7			288.3		34.0	57.0	43.9	49.0		141.3
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.2
Total Delay	159.8	17.7			288.3		34.1	57.0	43.9	49.0		141.6
LOS	F	B			F		C	E	D	D		F
Approach Delay		31.0			288.3			47.9			135.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			F			D			F	
Queue Length 50th (m)	~48.6	106.4			~499.5		39.7	128.6	95.0	10.5		~211.5
Queue Length 95th (m)	m#97.9	130.9			#522.5		61.8	#196.5	140.9	25.5		#289.5
Internal Link Dist (m)		283.2			361.1			156.0			49.7	
Turn Bay Length (m)	30.0								45.0	25.0		
Base Capacity (vph)	169	2844			2249		574	545	553	112		590
Starvation Cap Reductn	0	0			0		0	0	0	0		0
Spillback Cap Reductn	0	0			13		16	0	0	0		17
Storage Cap Reductn	0	0			0		0	0	0	0		0
Reduced v/c Ratio	1.20	0.69			1.58		0.34	0.87	0.77	0.45		1.25

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 16 (12%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 135			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.57			
Intersection Signal Delay: 164.5		Intersection LOS: F	
Intersection Capacity Utilization 139.4%		ICU Level of Service H	
Analysis Period (min) 15			

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

Splits and Phases: 2: QEW East Ramp/Plains Road E & Fairview Street



Queues
2: QEW East Ramp/Plains Road E & Fairview Street

Total (2034)
PM Peak Hour

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	203	1964	3540	189	472	428	50	714
v/c Ratio	1.20	0.69	1.57	0.33	0.87	0.77	0.45	1.21
Control Delay	159.8	17.7	288.3	34.0	57.0	43.9	49.0	141.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	159.8	17.7	288.3	34.1	57.0	43.9	49.0	141.6
Queue Length 50th (m)	~48.6	106.4	~499.5	39.7	128.6	95.0	10.5	~211.5
Queue Length 95th (m)	m#97.9	130.9	#522.5	61.8	#196.5	140.9	25.5	#289.5
Internal Link Dist (m)		283.2	361.1		156.0			
Turn Bay Length (m)	30.0					45.0	25.0	
Base Capacity (vph)	169	2844	2249	574	545	553	112	590
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	13	16	0	0	0	17
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.20	0.69	1.58	0.34	0.87	0.77	0.45	1.25

Intersection Summary

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

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

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

HCM Signalized Intersection Capacity Analysis
2: QEW East Ramp/Plains Road E & Fairview Street

Total (2034)
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	1807	0	0	3178	79	193	276	533	46	0	657
Future Volume (vph)	187	1807	0	0	3178	79	193	276	533	46	0	657
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lane Util. Factor	1.00	0.91			0.91		0.95	0.91	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			1.00		1.00	0.95	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1770	5136			4791		1698	1596	1519	1805		1495
Flt Permitted	0.06	1.00			1.00		0.95	1.00	1.00	0.17		1.00
Satd. Flow (perm)	116	5136			4791		1698	1596	1519	330		1495
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	203	1964	0	0	3454	86	210	300	579	50	0	714
RTOR Reduction (vph)	0	0	0	0	2	0	0	5	39	0	0	84
Lane Group Flow (vph)	203	1964	0	0	3538	0	189	467	389	50	0	630
Confl. Peds. (#/hr)	2		7	7		2						
Heavy Vehicles (%)	2%	1%	0%	0%	8%	0%	1%	4%	1%	0%	0%	8%
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Actuated Green, G (s)	72.0	72.0			61.0		44.0	44.0	44.0	44.0		44.0
Effective Green, g (s)	72.0	72.0			61.0		44.0	44.0	44.0	44.0		44.0
Actuated g/C Ratio	0.55	0.55			0.47		0.34	0.34	0.34	0.34		0.34
Clearance Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		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)	166	2844			2248		574	540	514	111		506
v/s Ratio Prot	c0.08	0.38			c0.74							
v/s Ratio Perm	0.60						0.11	0.29	0.26	0.15		c0.42
v/c Ratio	1.22	0.69			1.57		0.33	0.86	0.76	0.45		1.25
Uniform Delay, d1	38.9	21.0			34.5		32.0	40.2	38.2	33.6		43.0
Progression Factor	1.28	0.78			1.00		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	135.7	1.1			260.4		0.3	13.5	6.3	2.9		126.1
Delay (s)	185.6	17.5			294.9		32.4	53.7	44.5	36.5		169.1
Level of Service	F	B			F		C	D	D	D		F
Approach Delay (s)		33.3			294.9			46.4			160.4	
Approach LOS		C			F			D			F	

Intersection Summary			
HCM 2000 Control Delay	170.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.42		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	139.4%	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)	439	74	1234	609	60	773
Future Volume (vph)	439	74	1234	609	60	773
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	55.0		0.0	0.0
Storage Lanes		0	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	0.97	1.00	1.00	1.00
Ped Bike Factor	1.00		1.00			
Frt	0.978					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3390	0	3433	1881	1687	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3390	0	3419	1881	1687	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	18					21
Link Speed (k/h)	50			60	50	
Link Distance (m)	209.7			887.5	183.4	
Travel Time (s)	15.1			53.3	13.2	
Confl. Peds. (#/hr)		4	4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	2%	1%	7%	2%
Adj. Flow (vph)	477	80	1341	662	65	840
Shared Lane Traffic (%)						
Lane Group Flow (vph)	557	0	1341	662	65	840
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Detector Phase	3		4	4	2	4
Switch Phase						
Minimum Initial (s)	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	17.0		27.0	27.0	18.0	27.0
Total Split (s)	22.0		50.0	50.0	18.0	50.0
Total Split (%)	24.4%		55.6%	55.6%	20.0%	55.6%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None		C-Max	C-Max	Max	C-Max
Act Effct Green (s)	15.0		44.0	44.0	11.0	62.0
Actuated g/C Ratio	0.17		0.49	0.49	0.12	0.69
v/c Ratio	0.96		0.80	0.72	0.32	0.77
Control Delay	66.2		23.8	23.7	40.7	14.9
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	66.2		23.8	23.7	40.7	14.9
LOS	E		C	C	D	B
Approach Delay	66.2			23.8	16.8	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	E			C	B	
Queue Length 50th (m)	51.8		100.8	90.9	11.0	84.9
Queue Length 95th (m)	#86.2		129.5	134.0	23.6	140.0
Internal Link Dist (m)	185.7			863.5	159.4	
Turn Bay Length (m)			55.0			
Base Capacity (vph)	580		1678	919	206	1097
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.96		0.80	0.72	0.32	0.77

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 4:WBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 28.8		Intersection LOS: C	
Intersection Capacity Utilization 73.3%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: Maple Avenue & Plains Road E



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	557	1341	662	65	840
v/c Ratio	0.96	0.80	0.72	0.32	0.77
Control Delay	66.2	23.8	23.7	40.7	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	66.2	23.8	23.7	40.7	14.9
Queue Length 50th (m)	51.8	100.8	90.9	11.0	84.9
Queue Length 95th (m)	#86.2	129.5	134.0	23.6	140.0
Internal Link Dist (m)	185.7		863.5	159.4	
Turn Bay Length (m)		55.0			
Base Capacity (vph)	580	1678	919	206	1097
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.96	0.80	0.72	0.32	0.77

Intersection Summary

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	439	74	1234	609	60	773
Future Volume (vph)	439	74	1234	609	60	773
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		6.0	6.0	7.0	6.0
Lane Util. Factor	0.95		0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3392		3433	1881	1687	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3392		3433	1881	1687	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	477	80	1341	662	65	840
RTOR Reduction (vph)	15	0	0	0	0	8
Lane Group Flow (vph)	542	0	1341	662	65	832
Confl. Peds. (#/hr)		4	4			
Heavy Vehicles (%)	4%	3%	2%	1%	7%	2%
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Actuated Green, G (s)	15.0		44.0	44.0	11.0	55.0
Effective Green, g (s)	15.0		44.0	44.0	11.0	55.0
Actuated g/C Ratio	0.17		0.49	0.49	0.12	0.61
Clearance Time (s)	7.0		6.0	6.0	7.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	565		1678	919	206	967
v/s Ratio Prot			0.39			c0.42
v/s Ratio Perm	c0.16			0.35	0.04	0.11
v/c Ratio	0.96		0.80	0.72	0.32	0.86
Uniform Delay, d1	37.2		19.3	18.1	36.1	14.3
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	27.6		4.1	4.9	4.0	9.9
Delay (s)	64.8		23.4	23.0	40.0	24.2
Level of Service	E		C	C	D	C
Approach Delay (s)	64.8			23.3	25.4	
Approach LOS	E			C	C	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

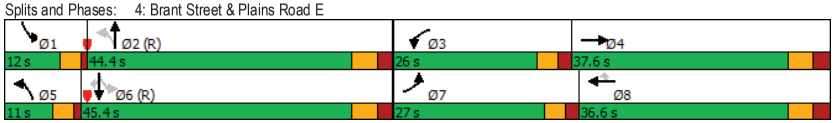
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	700	202	79	182	913	480	99	1625	74	157	1272	924
Future Volume (vph)	700	202	79	182	913	480	99	1625	74	157	1272	924
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	50.0		75.0	50.0		0.0	40.0		30.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	1.00					0.97	1.00	1.00				0.97
Frt		0.958				0.850		0.993				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3502	1757	0	1719	3539	1583	1805	5085	0	1687	5187	1599
Flt Permitted	0.950			0.950			0.104			0.102		
Satd. Flow (perm)	3486	1757	0	1719	3539	1535	197	5085	0	181	5187	1557
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16				116		6				420
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		887.5			190.4			463.4			229.3	
Travel Time (s)		53.3			11.4			27.8			13.8	
Confl. Peds. (#/hr)	12					12	10		16	16		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	5%	0%	5%	2%	2%	0%	0%	24%	7%	0%	1%
Adj. Flow (vph)	761	220	86	198	992	522	108	1766	80	171	1383	1004
Shared Lane Traffic (%)												
Lane Group Flow (vph)	761	306	0	198	992	522	108	1846	0	171	1383	1004
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Detector Phase	7	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	7.0	8.0		7.0	8.0	8.0
Minimum Split (s)	13.0	31.3		13.0	29.3	29.3	11.0	31.0		11.0	31.0	31.0
Total Split (s)	27.0	37.6		26.0	36.6	36.6	11.0	44.4		12.0	45.4	45.4
Total Split (%)	22.5%	31.3%		21.7%	30.5%	30.5%	9.2%	37.0%		10.0%	37.8%	37.8%
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.7		3.0	3.7	3.7
All-Red Time (s)	2.0	2.6		2.0	2.6	2.6	1.0	2.3		1.0	2.3	2.3
Lost Time Adjust (s)	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	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	22.0	34.4		17.9	30.3	30.3	47.4	38.4		49.4	39.4	39.4
Actuated g/C Ratio	0.18	0.29		0.15	0.25	0.25	0.40	0.32		0.41	0.33	0.33
v/c Ratio	1.19	0.59		0.77	1.11	1.10	0.63	1.13		0.98	0.81	1.27
Control Delay	141.4	41.3		68.9	107.1	104.9	21.6	97.5		91.4	41.5	151.5
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	141.4	41.3		68.9	107.1	104.9	21.6	97.5		91.4	41.5	151.5
LOS	F	D		E	F	F	C	F		F	D	F
Approach Delay		112.7			102.0			93.3			88.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			F			F			F	
Queue Length 50th (m)	~116.9	62.7		47.2	~148.0	~124.2	18.6	~198.9		26.3	114.5	~239.9
Queue Length 95th (m)	#156.3	96.8		73.0	#190.3	#194.0	m18.4	m#152.3		#73.1	133.8	#321.7
Internal Link Dist (m)		863.5			166.4			439.4			205.3	
Turn Bay Length (m)	55.0			50.0		75.0	50.0			40.0		30.0
Base Capacity (vph)	642	515		300	893	474	171	1631		174	1703	793
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.19	0.59		0.66	1.11	1.10	0.63	1.13		0.98	0.81	1.27

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 45 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.27			
Intersection Signal Delay: 96.3		Intersection LOS: F	
Intersection Capacity Utilization 104.8%		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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Brant Street & Plains Road E



Queues
4: Brant Street & Plains Road E

Total (2034)
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	761	306	198	992	522	108	1846	171	1383	1004
v/c Ratio	1.19	0.59	0.77	1.11	1.10	0.63	1.13	0.98	0.81	1.27
Control Delay	141.4	41.3	68.9	107.1	104.9	21.6	97.5	91.4	41.5	151.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	141.4	41.3	68.9	107.1	104.9	21.6	97.5	91.4	41.5	151.5
Queue Length 50th (m)	~116.9	62.7	47.2	~148.0	~124.2	18.6	~198.9	26.3	114.5	~239.9
Queue Length 95th (m)	#156.3	96.8	73.0	#190.3	#194.0	m18.4	m#152.3	#73.1	133.8	#321.7
Internal Link Dist (m)		863.5		166.4			439.4		205.3	
Turn Bay Length (m)	55.0		50.0		75.0	50.0		40.0		30.0
Base Capacity (vph)	642	515	300	893	474	171	1631	174	1703	793
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.19	0.59	0.66	1.11	1.10	0.63	1.13	0.98	0.81	1.27

Intersection Summary

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

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

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

HCM Signalized Intersection Capacity Analysis
4: Brant Street & Plains Road E

Total (2034)
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	700	202	79	182	913	480	99	1625	74	157	1272	924
Future Volume (vph)	700	202	79	182	913	480	99	1625	74	157	1272	924
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	1.00		1.00	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00		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
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	1757		1719	3539	1535	1805	5087		1687	5187	1557
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.10	1.00		0.10	1.00	1.00
Satd. Flow (perm)	3502	1757		1719	3539	1535	198	5087		180	5187	1557
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	761	220	86	198	992	522	108	1766	80	171	1383	1004
RTOR Reduction (vph)	0	11	0	0	0	87	0	4	0	0	0	282
Lane Group Flow (vph)	761	295	0	198	992	435	108	1842	0	171	1383	722
Confl. Peds. (#/hr)	12					12	10		16	16		10
Heavy Vehicles (%)	0%	5%	0%	5%	2%	2%	0%	0%	24%	7%	0%	1%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Actuated Green, G (s)	22.0	34.4		17.9	30.3	30.3	45.4	38.4		47.4	39.4	39.4
Effective Green, g (s)	22.0	34.4		17.9	30.3	30.3	45.4	38.4		47.4	39.4	39.4
Actuated g/C Ratio	0.18	0.29		0.15	0.25	0.25	0.38	0.32		0.39	0.33	0.33
Clearance Time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	642	503		256	893	387	168	1627		171	1703	511
v/s Ratio Prot	c0.22	c0.17		0.12	0.28		0.04	0.36		c0.07	0.27	
v/s Ratio Perm						c0.28	0.21			0.33		c0.46
v/c Ratio	1.19	0.59		0.77	1.11	1.12	0.64	1.13		1.00	0.81	1.41
Uniform Delay, d1	49.0	36.7		49.1	44.9	44.9	27.8	40.8		30.8	36.9	40.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.92	0.98		1.00	1.00	1.00
Incremental Delay, d2	98.6	1.7		13.5	65.3	84.1	0.8	60.3		68.8	4.3	197.1
Delay (s)	147.6	38.4		62.6	110.2	129.0	26.2	100.3		99.6	41.3	237.4
Level of Service	F	D		E	F	F	C	F		F	D	F
Approach Delay (s)		116.3			110.4			96.2			122.1	
Approach LOS		F			F			F			F	

Intersection Summary					
HCM 2000 Control Delay	111.6	HCM 2000 Level of Service	F		
HCM 2000 Volume to Capacity ratio	1.24				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.3		
Intersection Capacity Utilization	104.8%	ICU Level of Service	G		
Analysis Period (min)	15				

c Critical Lane Group

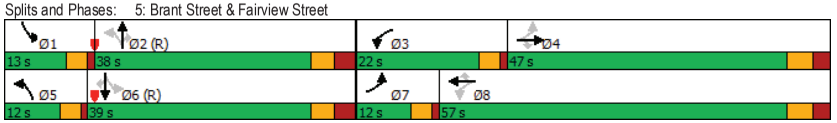
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	265	1010	377	273	1878	549	228	1020	243	291	858	539
Future Volume (vph)	265	1010	377	273	1878	549	228	1020	243	291	858	539
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		170.0	60.0		0.0	75.0		70.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.97			0.98			0.92			0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1703	3539	1568	1787	3574	1599	1787	3574	1599	1770	3539	1553
Flt Permitted	0.097			0.088			0.127			0.123		
Satd. Flow (perm)	174	3539	1526	166	3574	1573	239	3574	1474	229	3539	1498
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			203			189			179			146
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		261.1			251.5			231.2			463.4	
Travel Time (s)		15.7			15.1			16.6			27.8	
Confl. Peds. (#/hr)	3		10	10		3	16		45	45		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	2%	3%	1%	1%	1%	1%	1%	1%	2%	2%	4%
Adj. Flow (vph)	288	1098	410	297	2041	597	248	1109	264	316	933	586
Shared Lane Traffic (%)												
Lane Group Flow (vph)	288	1098	410	297	2041	597	248	1109	264	316	933	586
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		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	31.4	31.4	12.0	31.4	31.4	12.0	31.5	31.5	12.0	31.5	31.5
Total Split (s)	12.0	47.0	47.0	22.0	57.0	57.0	12.0	38.0	38.0	13.0	39.0	39.0
Total Split (%)	10.0%	39.2%	39.2%	18.3%	47.5%	47.5%	10.0%	31.7%	31.7%	10.8%	32.5%	32.5%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
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)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	51.8	41.4	41.4	65.0	50.6	50.6	42.0	31.5	31.5	44.0	32.5	32.5
Actuated g/C Ratio	0.43	0.34	0.34	0.54	0.42	0.42	0.35	0.26	0.26	0.37	0.27	0.27
v/c Ratio	1.64	0.90	0.62	0.92	1.35	0.77	1.33	1.18	0.51	1.59	0.97	1.14
Control Delay	334.1	48.7	20.8	65.1	194.4	27.8	208.8	132.5	16.2	306.5	46.2	99.0
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	334.1	48.7	20.8	65.1	194.4	27.8	208.8	132.5	16.2	306.5	46.2	99.0
LOS	F	D	C	E	F	C	F	F	B	F	D	F
Approach Delay		88.1			147.4			125.2			107.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			F			F			F	
Queue Length 50th (m)	~87.6	136.7	42.5	55.2	~349.5	88.6	~62.2	~173.7	16.6	~89.7	126.7	~143.3
Queue Length 95th (m)	#144.7	#178.6	78.6	#107.4	#393.4	139.8	#116.2	#216.8	43.3	m#132.5	#167.6	m#227.6
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	176	1220	659	333	1507	772	186	938	518	199	958	512
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	1.64	0.90	0.62	0.89	1.35	0.77	1.33	1.18	0.51	1.59	0.97	1.14

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 89 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.64			
Intersection Signal Delay: 121.1		Intersection LOS: F	
Intersection Capacity Utilization 128.3%		ICU Level of Service H	
Analysis Period (min) 15			

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

Splits and Phases: 5: Brant Street & Fairview Street



Queues
5: Brant Street & Fairview Street

Total (2034)
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	288	1098	410	297	2041	597	248	1109	264	316	933	586
v/c Ratio	1.64	0.90	0.62	0.92	1.35	0.77	1.33	1.18	0.51	1.59	0.97	1.14
Control Delay	334.1	48.7	20.8	65.1	194.4	27.8	208.8	132.5	16.2	306.5	46.2	99.0
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	334.1	48.7	20.8	65.1	194.4	27.8	208.8	132.5	16.2	306.5	46.2	99.0
Queue Length 50th (m)	~87.6	136.7	42.5	55.2	~349.5	88.6	~62.2	~173.7	16.6	~89.7	126.7	~143.3
Queue Length 95th (m)	#144.7	#178.6	78.6	#107.4	#393.4	139.8	#116.2	#216.8	43.3	m#132.5	#167.6	m#227.6
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	176	1220	659	333	1507	772	186	938	518	199	958	512
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	1.64	0.90	0.62	0.89	1.35	0.77	1.33	1.18	0.51	1.59	0.97	1.14

Intersection Summary

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

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

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

HCM Signalized Intersection Capacity Analysis
5: Brant Street & Fairview Street

Total (2034)
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	265	1010	377	273	1878	549	228	1020	243	291	858	539
Future Volume (vph)	265	1010	377	273	1878	549	228	1020	243	291	858	539
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.92	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)	1703	3539	1526	1787	3574	1573	1787	3574	1474	1770	3539	1498
Flt Permitted	0.10	1.00	1.00	0.09	1.00	1.00	0.13	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	173	3539	1526	166	3574	1573	239	3574	1474	229	3539	1498
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	288	1098	410	297	2041	597	248	1109	264	316	933	586
RTOR Reduction (vph)	0	0	133	0	0	109	0	0	132	0	0	106
Lane Group Flow (vph)	288	1098	277	297	2041	488	248	1109	132	316	933	480
Confl. Peds. (#/hr)	3		10	10		3	16		45	45		16
Heavy Vehicles (%)	6%	2%	3%	1%	1%	1%	1%	1%	1%	2%	2%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	49.4	41.4	41.4	62.6	50.6	50.6	39.5	31.5	31.5	41.5	32.5	32.5
Effective Green, g (s)	49.4	41.4	41.4	62.6	50.6	50.6	39.5	31.5	31.5	41.5	32.5	32.5
Actuated g/C Ratio	0.41	0.34	0.34	0.52	0.42	0.42	0.33	0.26	0.26	0.35	0.27	0.27
Clearance Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
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)	173	1220	526	318	1507	663	181	938	386	194	958	405
v/s Ratio Prot	c0.11	0.31		0.13	c0.57		0.09	0.31		c0.12	0.26	
v/s Ratio Perm	c0.57		0.18	0.35		0.31	0.36		0.09	c0.44		0.32
v/c Ratio	1.66	0.90	0.53	0.93	1.35	0.74	1.37	1.18	0.34	1.63	0.97	1.18
Uniform Delay, d1	29.6	37.3	31.5	35.8	34.7	29.1	35.6	44.2	35.9	34.0	43.3	43.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.18	0.60	0.46
Incremental Delay, d2	323.2	9.3	1.0	33.4	163.9	4.2	197.6	93.0	2.4	298.7	18.7	99.3
Delay (s)	352.8	46.6	32.4	69.2	198.6	33.3	233.2	137.3	38.3	338.8	44.7	119.2
Level of Service	F	D	C	E	F	C	F	F	D	F	D	F
Approach Delay (s)		92.5			151.9			135.8			119.1	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM 2000 Control Delay	128.3	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.60			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	128.3%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	2	6	3	539	697	1
Future Volume (vph)	2	6	3	539	697	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.895					
Flt Protected	0.989					
Satd. Flow (prot)	1649	0	0	1863	1863	0
Flt Permitted	0.989					
Satd. Flow (perm)	1649	0	0	1863	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	47.7			73.7	37.6	
Travel Time (s)	3.4			5.3	2.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	7	3	586	758	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	0	0	589	759	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	6	3	539	697	1
Future Volume (Veh/h)	2	6	3	539	697	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	7	3	586	758	1
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)				74	375	
pX, platoon unblocked	0.86	0.74	0.74			
vC, conflicting volume	1350	758	759			
vC1, stage 1 conf vol	758					
vC2, stage 2 conf vol	592					
vCu, unblocked vol	639	492	493			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	100			
cM capacity (veh/h)	435	424	788			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	9	589	759
Volume Left	2	3	0
Volume Right	7	0	1
cSH	426	788	1700
Volume to Capacity	0.02	0.00	0.45
Queue Length 95th (m)	0.5	0.1	0.0
Control Delay (s)	13.6	0.1	0.0
Lane LOS	B	A	
Approach Delay (s)	13.6	0.1	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	16	51	72	469	646	32
Future Volume (vph)	16	51	72	469	646	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.897				0.994	
Flt Protected	0.988			0.993		
Satd. Flow (prot)	1651	0	0	1850	1852	0
Flt Permitted	0.988			0.993		
Satd. Flow (perm)	1651	0	0	1850	1852	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	43.3			37.6	47.9	
Travel Time (s)	3.1			2.7	3.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	55	78	510	702	35
Shared Lane Traffic (%)						
Lane Group Flow (vph)	72	0	0	588	737	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	51	72	469	646	32
Future Volume (Veh/h)	16	51	72	469	646	32
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	55	78	510	702	35
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	None	
Median storage veh)				2		
Upstream signal (m)				111	337	
pX, platoon unblocked	0.83	0.72	0.72			
vC, conflicting volume	1386	720	737			
vC1, stage 1 conf vol	720					
vC2, stage 2 conf vol	666					
vCu, unblocked vol	738	412	436			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	88	90			
cM capacity (veh/h)	401	459	806			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	72	588	737
Volume Left	17	78	0
Volume Right	55	0	35
cSH	444	806	1700
Volume to Capacity	0.16	0.10	0.43
Queue Length 95th (m)	4.6	2.6	0.0
Control Delay (s)	14.7	2.5	0.0
Lane LOS	B	A	
Approach Delay (s)	14.7	2.5	0.0
Approach LOS	B		

Intersection Summary					
Average Delay		1.8			
Intersection Capacity Utilization		78.6%	ICU Level of Service		D
Analysis Period (min)		15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	91	395	606	64	36	73
Future Volume (vph)	91	395	606	64	36	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.987		0.910	
Flt Protected		0.991			0.984	
Satd. Flow (prot)	0	1846	1839	0	1668	0
Flt Permitted		0.991			0.984	
Satd. Flow (perm)	0	1846	1839	0	1668	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		47.1	32.3		62.0	
Travel Time (s)		3.4	2.3		4.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	429	659	70	39	79
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	528	729	0	118	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	91	395	606	64	36	73
Future Volume (Veh/h)	91	395	606	64	36	73
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)	99	429	659	70	39	79
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		206	242			
pX, platoon unblocked	0.69				0.71	0.69
vC, conflicting volume	729				1321	694
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	385				1158	335
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	88				71	84
cM capacity (veh/h)	811				134	489

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	528	729	118
Volume Left	99	0	39
Volume Right	0	70	79
cSH	811	1700	261
Volume to Capacity	0.12	0.43	0.45
Queue Length 95th (m)	3.3	0.0	17.6
Control Delay (s)	3.2	0.0	29.7
Lane LOS	A		D
Approach Delay (s)	3.2	0.0	29.7
Approach LOS			D

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		

Appendix H4

2039 Total Operation Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1898	266	0	1070	0	0	0	0	315	0	129
Future Volume (vph)	0	1898	266	0	1070	0	0	0	0	315	0	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	55.0		0.0
Storage Lanes	0		1	0		0	0		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor			0.98									
Frt			0.850									0.850
Flt Protected										0.950		
Satd. Flow (prot)	0	5036	1538	0	4988	0	0	0	0	3367	0	1615
Flt Permitted										0.950		
Satd. Flow (perm)	0	5036	1503	0	4988	0	0	0	0	3367	0	1615
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			289									113
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		175.7			307.2			140.0			199.7	
Travel Time (s)		12.7			22.1			10.1			14.4	
Confl. Peds. (#/hr)	1		2	2		1						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	5%	4%	4%	0%	0%	0%	0%	4%	50%	0%
Adj. Flow (vph)	0	2063	289	0	1163	0	0	0	0	342	0	140
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2063	289	0	1163	0	0	0	0	342	0	140
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Detector Phase		2	2		6					8		8
Switch Phase												
Minimum Initial (s)		8.0	8.0		8.0					8.0		8.0
Minimum Split (s)		43.0	43.0		43.0					25.0		25.0
Total Split (s)		75.0	75.0		75.0					25.0		25.0
Total Split (%)		75.0%	75.0%		75.0%					25.0%		25.0%
Yellow Time (s)		4.0	4.0		4.0					4.0		4.0
All-Red Time (s)		3.0	3.0		3.0					3.0		3.0
Lost Time Adjust (s)		0.0	0.0		0.0					0.0		0.0
Total Lost Time (s)		7.0	7.0		7.0					7.0		7.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max		C-Max					None		None
Act Effct Green (s)		71.0	71.0		71.0					15.0		15.0
Actuated g/C Ratio		0.71	0.71		0.71					0.15		0.15
v/c Ratio		0.58	0.25		0.33					0.68		0.41
Control Delay		8.2	1.2		7.7					46.9		14.5
Queue Delay		0.0	0.0		0.0					0.0		0.0
Total Delay		8.2	1.2		7.7					46.9		14.5
LOS		A	A		A					D		B
Approach Delay		7.4			7.7						37.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A						D	
Queue Length 50th (m)		66.4	0.0		36.1					34.2		4.8
Queue Length 95th (m)		86.9	7.7		m51.0					47.9		21.5
Internal Link Dist (m)		151.7			283.2			116.0			175.7	
Turn Bay Length (m)										55.0		
Base Capacity (vph)		3573	1150		3539					606		383
Starvation Cap Reductn		0	0		0					0		0
Spillback Cap Reductn		0	0		0					0		0
Storage Cap Reductn		0	0		0					0		0
Reduced v/c Ratio		0.58	0.25		0.33					0.56		0.37

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 66 (66%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 11.1		Intersection LOS: B	
Intersection Capacity Utilization 54.8%		ICU Level of Service A	
Analysis Period (min) 15			

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

Splits and Phases: 1: Plains Road E/Fairview Street & QEW West Ramp



Queues
1: Plains Road E/Fairview Street & QEW West Ramp

Total (2039)
AM Peak Hour

Lane Group	EBT	EBR	WBT	SBL	SBR
Lane Group Flow (vph)	2063	289	1163	342	140
v/c Ratio	0.58	0.25	0.33	0.68	0.41
Control Delay	8.2	1.2	7.7	46.9	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	8.2	1.2	7.7	46.9	14.5
Queue Length 50th (m)	66.4	0.0	36.1	34.2	4.8
Queue Length 95th (m)	86.9	7.7	m51.0	47.9	21.5
Internal Link Dist (m)	151.7		283.2		
Turn Bay Length (m)				55.0	
Base Capacity (vph)	3573	1150	3539	606	383
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.58	0.25	0.33	0.56	0.37

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Plains Road E/Fairview Street & QEW West Ramp

Total (2039)
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1898	266	0	1070	0	0	0	0	315	0	129
Future Volume (vph)	0	1898	266	0	1070	0	0	0	0	315	0	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0					7.0		7.0
Lane Util. Factor		0.91	1.00		0.91					0.97		1.00
Frpb, ped/bikes		1.00	0.98		1.00					1.00		1.00
Flpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Frt		1.00	0.85		1.00					1.00		0.85
Flt Protected		1.00	1.00		1.00					0.95		1.00
Satd. Flow (prot)		5036	1503		4988					3367		1615
Flt Permitted		1.00	1.00		1.00					0.95		1.00
Satd. Flow (perm)		5036	1503		4988					3367		1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2063	289	0	1163	0	0	0	0	342	0	140
RTOR Reduction (vph)	0	0	84	0	0	0	0	0	0	0	0	96
Lane Group Flow (vph)	0	2063	205	0	1163	0	0	0	0	342	0	44
Confl. Peds. (#/hr)	1		2	2		1						
Heavy Vehicles (%)	0%	3%	5%	4%	4%	0%	0%	0%	0%	4%	50%	0%
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Actuated Green, G (s)		71.0	71.0		71.0					15.0		15.0
Effective Green, g (s)		71.0	71.0		71.0					15.0		15.0
Actuated g/C Ratio		0.71	0.71		0.71					0.15		0.15
Clearance Time (s)		7.0	7.0		7.0					7.0		7.0
Vehicle Extension (s)		3.0	3.0		3.0					3.0		3.0
Lane Grp Cap (vph)		3575	1067		3541					505		242
v/s Ratio Prot		c0.41			0.23							
v/s Ratio Perm			0.14							c0.10		0.03
v/c Ratio		0.58	0.19		0.33					0.68		0.18
Uniform Delay, d1		7.1	4.9		5.5					40.2		37.1
Progression Factor		1.00	1.00		1.31					1.00		1.00
Incremental Delay, d2		0.7	0.4		0.2					3.6		0.4
Delay (s)		7.8	5.3		7.3					43.8		37.5
Level of Service		A	A		A					D		D
Approach Delay (s)		7.5			7.3			0.0			42.0	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	54.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

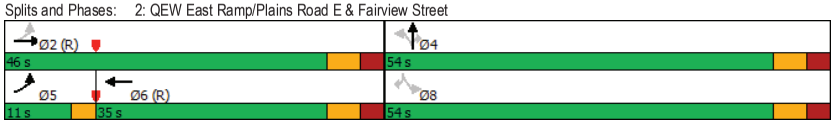
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	1643	0	0	1027	33	276	381	965	65	0	586
Future Volume (vph)	153	1643	0	0	1027	33	276	381	965	65	0	586
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		45.0	25.0		0.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			15.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.91	0.95	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00			0.99	0.99			
Frt					0.995			0.935	0.850			0.850
Flt Protected	0.950						0.950	0.998		0.950		
Satd. Flow (prot)	1752	5036	0	0	4965	0	1649	1572	1504	1805	0	1538
Flt Permitted	0.129						0.950	0.998		0.085		
Satd. Flow (perm)	238	5036	0	0	4965	0	1649	1572	1485	162	0	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					5			2	76			246
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		307.2			385.1			180.0			69.7	
Travel Time (s)		22.1			27.7			13.0			5.0	
Confl. Peds. (#/hr)	1		3	3		1			1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	0%	4%	0%	4%	2%	2%	0%	0%	5%
Adj. Flow (vph)	166	1786	0	0	1116	36	300	414	1049	71	0	637
Shared Lane Traffic (%)							10%		32%			
Lane Group Flow (vph)	166	1786	0	0	1152	0	270	780	713	71	0	637
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Detector Phase	5	2			6		4	4	4	8		8
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0		8.0	8.0	8.0	8.0		8.0
Minimum Split (s)	11.0	35.0			35.0		36.0	36.0	36.0	36.0		36.0
Total Split (s)	11.0	46.0			35.0		54.0	54.0	54.0	54.0		54.0
Total Split (%)	11.0%	46.0%			35.0%		54.0%	54.0%	54.0%	54.0%		54.0%
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	0.0	3.0			3.0		3.0	3.0	3.0	3.0		3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	None	C-Max			C-Max		None	None	None	None		None
Act Effct Green (s)	43.0	39.0			28.0		47.0	47.0	47.0	47.0		47.0
Actuated g/C Ratio	0.43	0.39			0.28		0.47	0.47	0.47	0.47		0.47
v/c Ratio	0.74	0.91			0.83		0.35	1.06	0.97	0.93		0.75
Control Delay	39.2	30.3			39.7		18.4	76.3	50.3	118.9		19.2
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Delay	39.2	30.3			39.7		18.4	76.3	50.3	118.9		19.2
LOS	D	C			D		B	E	D	F		B
Approach Delay		31.0			39.7			56.9			29.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			D			E			C	
Queue Length 50th (m)	14.1	128.4			80.2		35.4	~192.5	132.7	13.2		64.3
Queue Length 95th (m)	#45.1	#145.8			98.0		56.0	#273.8	#221.0	#43.1		112.8
Internal Link Dist (m)		283.2			361.1			156.0			45.7	
Turn Bay Length (m)	30.0								45.0	25.0		
Base Capacity (vph)	223	1964			1393		775	739	738	76		853
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	0.74	0.91			0.83		0.35	1.06	0.97	0.93		0.75

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 96 (96%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 95			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.06			
Intersection Signal Delay: 40.8		Intersection LOS: D	
Intersection Capacity Utilization 104.6%		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: 2: QEW East Ramp/Plains Road E & Fairview Street



Queues
2: QEW East Ramp/Plains Road E & Fairview Street

Total (2039)
AM Peak Hour

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	166	1786	1152	270	780	713	71	637
v/c Ratio	0.74	0.91	0.83	0.35	1.06	0.97	0.93	0.75
Control Delay	39.2	30.3	39.7	18.4	76.3	50.3	118.9	19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.2	30.3	39.7	18.4	76.3	50.3	118.9	19.2
Queue Length 50th (m)	14.1	128.4	80.2	35.4	~192.5	132.7	13.2	64.3
Queue Length 95th (m)	#45.1	#145.8	98.0	56.0	#273.8	#221.0	#43.1	112.8
Internal Link Dist (m)		283.2	361.1		156.0			
Turn Bay Length (m)	30.0					45.0	25.0	
Base Capacity (vph)	223	1964	1393	775	739	738	76	853
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	0.74	0.91	0.83	0.35	1.06	0.97	0.93	0.75

Intersection Summary

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

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

HCM Signalized Intersection Capacity Analysis
2: QEW East Ramp/Plains Road E & Fairview Street

Total (2039)
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	1643	0	0	1027	33	276	381	965	65	0	586
Future Volume (vph)	153	1643	0	0	1027	33	276	381	965	65	0	586
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lane Util. Factor	1.00	0.91			0.91		0.95	0.91	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	0.99	0.99	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			1.00		1.00	0.94	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1752	5036			4967		1649	1572	1485	1805		1538
Flt Permitted	0.13	1.00			1.00		0.95	1.00	1.00	0.09		1.00
Satd. Flow (perm)	238	5036			4967		1649	1572	1485	162		1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	166	1786	0	0	1116	36	300	414	1049	71	0	637
RTOR Reduction (vph)	0	0	0	0	4	0	0	1	40	0	0	130
Lane Group Flow (vph)	166	1786	0	0	1148	0	270	779	673	71	0	507
Confl. Peds. (#/hr)	1		3	3		1			1	1		
Heavy Vehicles (%)	3%	3%	3%	0%	4%	0%	4%	2%	2%	0%	0%	5%
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Actuated Green, G (s)	39.0	39.0			28.0		47.0	47.0	47.0	47.0		47.0
Effective Green, g (s)	39.0	39.0			28.0		47.0	47.0	47.0	47.0		47.0
Actuated g/C Ratio	0.39	0.39			0.28		0.47	0.47	0.47	0.47		0.47
Clearance Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		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)	213	1964			1390		775	738	697	76		722
v/s Ratio Prot	0.06	c0.35			0.23							
v/s Ratio Perm	0.24						0.16	0.50	0.45	0.44		0.33
v/c Ratio	0.78	0.91			0.83		0.35	1.06	0.97	0.93		0.70
Uniform Delay, d1	22.9	28.8			33.7		16.8	26.5	25.7	25.0		21.0
Progression Factor	1.12	0.80			1.00		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	13.8	6.5			5.7		0.3	48.7	25.5	80.4		3.1
Delay (s)	39.4	29.7			39.5		17.1	75.2	51.2	105.4		24.1
Level of Service	D	C			D		B	E	D	F		C
Approach Delay (s)		30.5			39.5			56.6			32.2	
Approach LOS		C			D			E			C	

Intersection Summary				
HCM 2000 Control Delay	40.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.02			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	104.6%	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)	605	34	350	496	19	717
Future Volume (vph)	605	34	350	496	19	717
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	55.0		0.0	0.0
Storage Lanes		0	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	0.97	1.00	1.00	1.00
Ped Bike Factor	1.00		0.99			0.99
Frt	0.992					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3347	0	3303	1712	1805	1568
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3347	0	3286	1712	1805	1547
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	6					8
Link Speed (k/h)	50			60	50	
Link Distance (m)	209.7			887.5	183.4	
Travel Time (s)	15.1			53.3	13.2	
Confl. Peds. (#/hr)		7	7			1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	40%	6%	11%	0%	3%
Adj. Flow (vph)	658	37	380	539	21	779
Shared Lane Traffic (%)						
Lane Group Flow (vph)	695	0	380	539	21	779
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Detector Phase	3		4	4	2	4
Switch Phase						
Minimum Initial (s)	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	17.0		27.0	27.0	18.0	27.0
Total Split (s)	23.0		44.0	44.0	18.0	44.0
Total Split (%)	27.1%		51.8%	51.8%	21.2%	51.8%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None		C-Max	C-Max	Max	C-Max
Act Effct Green (s)	16.0		38.0	38.0	11.0	50.0
Actuated g/C Ratio	0.19		0.45	0.45	0.13	0.59
v/c Ratio	1.10		0.26	0.70	0.09	0.84
Control Delay	99.1		15.3	25.1	33.8	23.4
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	99.1		15.3	25.1	33.8	23.4
LOS	F		B	C	C	C
Approach Delay	99.1			21.1	23.7	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	F			C	C	
Queue Length 50th (m)	~71.3		20.2	71.7	3.2	78.2
Queue Length 95th (m)	#107.1		29.6	110.4	9.9	#152.3
Internal Link Dist (m)	185.7			863.5	159.4	
Turn Bay Length (m)			55.0			
Base Capacity (vph)	634		1476	765	233	922
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	1.10		0.26	0.70	0.09	0.84

Intersection Summary			
Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 85			
Offset: 27 (32%), Referenced to phase 4:WBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.10			
Intersection Signal Delay: 44.4		Intersection LOS: D	
Intersection Capacity Utilization 73.2%		ICU Level of Service D	
Analysis Period (min) 15			

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

Splits and Phases: 3: Maple Avenue & Plains Road E



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	695	380	539	21	779
v/c Ratio	1.10	0.26	0.70	0.09	0.84
Control Delay	99.1	15.3	25.1	33.8	23.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	99.1	15.3	25.1	33.8	23.4
Queue Length 50th (m)	~71.3	20.2	71.7	3.2	78.2
Queue Length 95th (m)	#107.1	29.6	110.4	9.9	#152.3
Internal Link Dist (m)	185.7		863.5	159.4	
Turn Bay Length (m)		55.0			
Base Capacity (vph)	634	1476	765	233	922
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.10	0.26	0.70	0.09	0.84

Intersection Summary

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

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	605	34	350	496	19	717
Future Volume (vph)	605	34	350	496	19	717
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		6.0	6.0	7.0	6.0
Lane Util. Factor	0.95		0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3347		3303	1712	1805	1563
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3347		3303	1712	1805	1563
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	658	37	380	539	21	779
RTOR Reduction (vph)	5	0	0	0	0	3
Lane Group Flow (vph)	690	0	380	539	21	776
Confl. Peds. (#/hr)		7	7			1
Heavy Vehicles (%)	5%	40%	6%	11%	0%	3%
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Actuated Green, G (s)	16.0		38.0	38.0	11.0	49.0
Effective Green, g (s)	16.0		38.0	38.0	11.0	49.0
Actuated g/C Ratio	0.19		0.45	0.45	0.13	0.58
Clearance Time (s)	7.0		6.0	6.0	7.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	630		1476	765	233	901
v/s Ratio Prot			0.12			c0.38
v/s Ratio Perm	c0.21			0.31	0.01	0.11
v/c Ratio	1.10		0.26	0.70	0.09	0.86
Uniform Delay, d1	34.5		14.7	19.0	32.6	15.1
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	64.7		0.4	5.4	0.8	10.6
Delay (s)	99.2		15.1	24.4	33.4	25.7
Level of Service	F		B	C	C	C
Approach Delay (s)	99.2			20.5	25.9	
Approach LOS	F			C	C	

Intersection Summary

HCM 2000 Control Delay	45.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

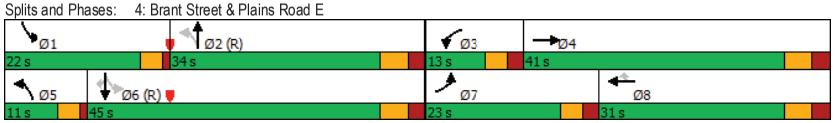
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	618	644	57	101	188	101	48	1063	348	396	1338	604
Future Volume (vph)	618	644	57	101	188	101	48	1063	348	396	1338	604
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	50.0		75.0	50.0		0.0	40.0		30.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.99	1.00		1.00		0.98	1.00	0.99				0.97
Frt		0.988				0.850		0.963				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	1841	0	1597	3252	1404	1641	4751	0	1719	5085	1538
Flt Permitted	0.950			0.950			0.143			0.125		
Satd. Flow (perm)	3374	1841	0	1594	3252	1374	247	4751	0	226	5085	1498
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				208		72				297
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		887.5			190.4			463.4			229.3	
Travel Time (s)		53.3			11.4			27.8			13.8	
Confl. Peds. (#/hr)	7		5	5		7	11		7	7		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	0%	13%	11%	15%	10%	3%	8%	5%	2%	5%
Adj. Flow (vph)	672	700	62	110	204	110	52	1155	378	430	1454	657
Shared Lane Traffic (%)												
Lane Group Flow (vph)	672	762	0	110	204	110	52	1533	0	430	1454	657
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Detector Phase	7	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	7.0	8.0		7.0	8.0	8.0
Minimum Split (s)	13.0	31.3		13.0	29.3	29.3	11.0	31.0		11.0	31.0	31.0
Total Split (s)	23.0	41.0		13.0	31.0	31.0	11.0	34.0		22.0	45.0	45.0
Total Split (%)	20.9%	37.3%		11.8%	28.2%	28.2%	10.0%	30.9%		20.0%	40.9%	40.9%
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.7		3.0	3.7	3.7
All-Red Time (s)	2.0	2.6		2.0	2.6	2.6	1.0	2.3		1.0	2.3	2.3
Lost Time Adjust (s)	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	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	18.0	34.7		8.0	24.7	24.7	37.0	28.0		52.0	41.2	41.2
Actuated g/C Ratio	0.16	0.32		0.07	0.22	0.22	0.34	0.25		0.47	0.37	0.37
v/c Ratio	1.21	1.31		0.95	0.28	0.23	0.30	1.21		1.23	0.76	0.88
Control Delay	150.1	182.9		122.7	36.5	1.2	20.3	124.1		152.8	34.0	32.9
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	150.1	182.9		122.7	36.5	1.2	20.3	124.1		152.8	34.0	32.9
LOS	F	F		F	D	A	C	F		F	C	C
Approach Delay		167.5			49.7			120.7			53.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			D			F			D	
Queue Length 50th (m)	~95.6	~222.6		25.2	20.2	0.0	3.2	~151.3		~103.6	107.7	85.6
Queue Length 95th (m)	#132.6	#298.4		#61.3	31.1	0.0	m3.7	m#133.6		#167.4	127.2	#164.4
Internal Link Dist (m)		863.5			166.4			439.4			205.3	
Turn Bay Length (m)	55.0			50.0		75.0	50.0			40.0		30.0
Base Capacity (vph)	556	583		116	730	469	171	1263		351	1904	746
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.21	1.31		0.95	0.28	0.23	0.30	1.21		1.23	0.76	0.88

Intersection Summary	
Area Type:	Other
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 40 (36%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.31	
Intersection Signal Delay: 98.5	Intersection LOS: F
Intersection Capacity Utilization 112.2%	ICU Level of Service H
Analysis Period (min) 15	

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

Splits and Phases: 4: Brant Street & Plains Road E



Queues
4: Brant Street & Plains Road E

Total (2039)
AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	672	762	110	204	110	52	1533	430	1454	657
v/c Ratio	1.21	1.31	0.95	0.28	0.23	0.30	1.21	1.23	0.76	0.88
Control Delay	150.1	182.9	122.7	36.5	1.2	20.3	124.1	152.8	34.0	32.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	150.1	182.9	122.7	36.5	1.2	20.3	124.1	152.8	34.0	32.9
Queue Length 50th (m)	~95.6	~222.6	25.2	20.2	0.0	3.2	~151.3	~103.6	107.7	85.6
Queue Length 95th (m)	#132.6	#298.4	#61.3	31.1	0.0	m3.7	m#133.6	#167.4	127.2	#164.4
Internal Link Dist (m)		863.5		166.4			439.4		205.3	
Turn Bay Length (m)	55.0		50.0		75.0	50.0		40.0		30.0
Base Capacity (vph)	556	583	116	730	469	171	1263	351	1904	746
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.21	1.31	0.95	0.28	0.23	0.30	1.21	1.23	0.76	0.88

Intersection Summary

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

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

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

HCM Signalized Intersection Capacity Analysis
4: Brant Street & Plains Road E

Total (2039)
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	618	644	57	101	188	101	48	1063	348	396	1338	604
Future Volume (vph)	618	644	57	101	188	101	48	1063	348	396	1338	604
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	1.00		1.00	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	0.99		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
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3400	1840		1597	3252	1374	1641	4751		1719	5085	1498
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.14	1.00		0.12	1.00	1.00
Satd. Flow (perm)	3400	1840		1597	3252	1374	247	4751		226	5085	1498
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	672	700	62	110	204	110	52	1155	378	430	1454	657
RTOR Reduction (vph)	0	3	0	0	0	85	0	54	0	0	0	188
Lane Group Flow (vph)	672	759	0	110	204	25	52	1479	0	430	1454	469
Confl. Peds. (#/hr)	7		5	5		7	11		7	7		11
Heavy Vehicles (%)	3%	2%	0%	13%	11%	15%	10%	3%	8%	5%	2%	5%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Actuated Green, G (s)	18.0	34.7		8.0	24.7	24.7	33.6	28.0		50.0	40.4	40.4
Effective Green, g (s)	18.0	34.7		8.0	24.7	24.7	33.6	28.0		50.0	40.4	40.4
Actuated g/C Ratio	0.16	0.32		0.07	0.22	0.22	0.31	0.25		0.45	0.37	0.37
Clearance Time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	556	580		116	730	308	146	1209		347	1867	550
v/s Ratio Prot	c0.20	c0.41		0.07	0.06		0.02	0.31		c0.20	0.29	
v/s Ratio Perm						0.02	0.09			c0.36		0.31
v/c Ratio	1.21	1.31		0.95	0.28	0.08	0.36	1.22		1.24	0.78	0.85
Uniform Delay, d1	46.0	37.6		50.8	35.3	33.7	28.0	41.0		32.5	30.8	32.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.13	0.70		1.00	1.00	1.00
Incremental Delay, d2	109.9	151.2		66.6	0.2	0.1	0.1	101.3		129.9	3.3	15.4
Delay (s)	155.9	188.8		117.4	35.5	33.8	31.9	130.1		162.4	34.1	47.5
Level of Service	F	F		F	D	C	C	F		F	C	D
Approach Delay (s)		173.4			56.3			126.9			59.3	
Approach LOS		F			E			F			E	

Intersection Summary					
HCM 2000 Control Delay	104.3	HCM 2000 Level of Service	F		
HCM 2000 Volume to Capacity ratio	1.33				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	21.3		
Intersection Capacity Utilization	112.2%	ICU Level of Service	H		
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)	464	1508	369	172	476	209	274	893	373	316	982	207
Future Volume (vph)	464	1508	369	172	476	209	274	893	373	316	982	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		170.0	60.0		0.0	75.0		70.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.99			0.98			0.96			0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3539	1568	1703	3438	1538	1787	3505	1599	1787	3505	1346
Flt Permitted	0.282			0.145			0.151			0.131		
Satd. Flow (perm)	499	3539	1547	260	3438	1507	284	3505	1535	246	3505	1290
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			251			222			172			199
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		261.1			251.5			231.2			463.4	
Travel Time (s)		15.7			15.1			16.6			27.8	
Confl. Peds. (#/hr)	6		1	1		6	22		21	21		22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	7%	2%	3%	6%	5%	5%	1%	3%	1%	1%	3%	20%
Adj. Flow (vph)	504	1639	401	187	517	227	298	971	405	343	1067	225
Shared Lane Traffic (%)												
Lane Group Flow (vph)	504	1639	401	187	517	227	298	971	405	343	1067	225
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		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	31.4	31.4	12.0	31.4	31.4	12.0	31.5	31.5	12.0	31.5	31.5
Total Split (s)	26.0	48.0	48.0	12.0	34.0	34.0	13.0	33.0	33.0	17.0	37.0	37.0
Total Split (%)	23.6%	43.6%	43.6%	10.9%	30.9%	30.9%	11.8%	30.0%	30.0%	15.5%	33.6%	33.6%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
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)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	56.0	41.6	41.6	38.0	27.6	27.6	38.0	26.5	26.5	46.0	30.5	30.5
Actuated g/C Ratio	0.51	0.38	0.38	0.35	0.25	0.25	0.35	0.24	0.24	0.42	0.28	0.28
v/c Ratio	1.03	1.22	0.54	0.96	0.60	0.42	1.35	1.15	0.81	1.21	1.10	0.45
Control Delay	69.7	139.9	12.4	83.0	39.7	7.3	208.5	119.8	36.4	139.7	95.8	23.4
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	69.7	139.9	12.4	83.0	39.7	7.3	208.5	119.8	36.4	139.7	95.8	23.4
LOS	E	F	B	F	D	A	F	F	D	F	F	C
Approach Delay		105.9			40.5			115.4			95.0	

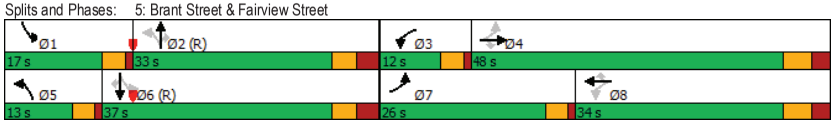
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			D			F			F	
Queue Length 50th (m)	~84.1	~240.5	23.6	25.0	54.3	0.9	~70.7	~136.1	51.5	~79.2	~149.1	31.8
Queue Length 95th (m)	#151.3	#285.0	53.8	#71.4	72.7	20.2	#126.4	#177.5	#102.6	m#124.7	m#186.6	m48.2
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	491	1338	741	194	862	544	221	844	500	284	971	501
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	1.03	1.22	0.54	0.96	0.60	0.42	1.35	1.15	0.81	1.21	1.10	0.45

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 107 (97%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.35
Intersection Signal Delay: 96.6 Intersection LOS: F
Intersection Capacity Utilization 111.0% ICU Level of Service H
Analysis Period (min) 15

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

Splits and Phases: 5: Brant Street & Fairview Street



Queues
5: Brant Street & Fairview Street

Total (2039)
AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	504	1639	401	187	517	227	298	971	405	343	1067	225
v/c Ratio	1.03	1.22	0.54	0.96	0.60	0.42	1.35	1.15	0.81	1.21	1.10	0.45
Control Delay	69.7	139.9	12.4	83.0	39.7	7.3	208.5	119.8	36.4	139.7	95.8	23.4
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	69.7	139.9	12.4	83.0	39.7	7.3	208.5	119.8	36.4	139.7	95.8	23.4
Queue Length 50th (m)	~84.1	~240.5	23.6	25.0	54.3	0.9	~70.7	~136.1	51.5	~79.2	~149.1	31.8
Queue Length 95th (m)	#151.3	#285.0	53.8	#71.4	72.7	20.2	#126.4	#177.5	#102.6	m#124.7	m#186.6	m48.2
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	491	1338	741	194	862	544	221	844	500	284	971	501
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	1.03	1.22	0.54	0.96	0.60	0.42	1.35	1.15	0.81	1.21	1.10	0.45

Intersection Summary

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

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

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

HCM Signalized Intersection Capacity Analysis
5: Brant Street & Fairview Street

Total (2039)
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	464	1508	369	172	476	209	274	893	373	316	982	207
Future Volume (vph)	464	1508	369	172	476	209	274	893	373	316	982	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	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)	1686	3539	1547	1703	3438	1507	1787	3505	1535	1787	3505	1290
Flt Permitted	0.28	1.00	1.00	0.14	1.00	1.00	0.15	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)	500	3539	1547	260	3438	1507	284	3505	1535	247	3505	1290
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	504	1639	401	187	517	227	298	971	405	343	1067	225
RTOR Reduction (vph)	0	0	156	0	0	166	0	0	131	0	0	144
Lane Group Flow (vph)	504	1639	245	187	517	61	298	971	274	343	1067	81
Confl. Peds. (#/hr)	6		1	1		6	22		21	21		22
Heavy Vehicles (%)	7%	2%	3%	6%	5%	5%	1%	3%	1%	1%	3%	20%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	53.6	41.6	41.6	35.6	27.6	27.6	35.5	26.5	26.5	43.5	30.5	30.5
Effective Green, g (s)	53.6	41.6	41.6	35.6	27.6	27.6	35.5	26.5	26.5	43.5	30.5	30.5
Actuated g/C Ratio	0.49	0.38	0.38	0.32	0.25	0.25	0.32	0.24	0.24	0.40	0.28	0.28
Clearance Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
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)	480	1338	585	189	862	378	214	844	369	279	971	357
v/s Ratio Prot	c0.21	c0.46		0.07	0.15		0.11	0.28		c0.14	0.30	
v/s Ratio Perm	0.30		0.16	0.25		0.04	c0.33		0.18	0.34		0.06
v/c Ratio	1.05	1.22	0.42	0.99	0.60	0.16	1.39	1.15	0.74	1.23	1.10	0.23
Uniform Delay, d1	22.2	34.2	25.3	33.4	36.3	32.2	33.2	41.8	38.6	30.1	39.8	30.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.07	1.11	3.30
Incremental Delay, d2	54.8	108.1	0.5	61.7	1.1	0.2	202.6	81.3	12.7	120.5	54.3	0.9
Delay (s)	77.0	142.3	25.8	95.1	37.5	32.4	235.8	123.0	51.4	152.7	98.4	102.1
Level of Service	E	F	C	F	D	C	F	F	D	F	F	F
Approach Delay (s)		111.0			47.8			125.8			110.3	
Approach LOS		F			D			F			F	

Intersection Summary					
HCM 2000 Control Delay	105.8	HCM 2000 Level of Service	F		
HCM 2000 Volume to Capacity ratio	1.28				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.9		
Intersection Capacity Utilization	111.0%	ICU Level of Service	H		
Analysis Period (min)	15				

c Critical Lane Group



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	2	6	561	649	2
Future Volume (vph)	0	2	6	561	649	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected				0.999		
Satd. Flow (prot)	1611	0	0	1861	1863	0
Flt Permitted				0.999		
Satd. Flow (perm)	1611	0	0	1861	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	33.8			69.7	42.0	
Travel Time (s)	2.4			5.0	3.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2	7	610	705	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	0	617	707	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	2	6	561	649	2
Future Volume (Veh/h)	0	2	6	561	649	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	7	610	705	2
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)				70	379	
pX, platoon unblocked	0.80	0.77	0.77			
vC, conflicting volume	1330	706	707			
vC1, stage 1 conf vol	706					
vC2, stage 2 conf vol	624					
vCu, unblocked vol	1119	463	464			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	99			
cM capacity (veh/h)	387	459	840			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	2	617	707
Volume Left	0	7	0
Volume Right	2	0	2
cSH	459	840	1700
Volume to Capacity	0.00	0.01	0.42
Queue Length 95th (m)	0.1	0.2	0.0
Control Delay (s)	12.9	0.2	0.0
Lane LOS	B	A	
Approach Delay (s)	12.9	0.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	34	75	28	533	576	7
Future Volume (vph)	34	75	28	533	576	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.907				0.998	
Flt Protected	0.985			0.998		
Satd. Flow (prot)	1664	0	0	1859	1859	0
Flt Permitted	0.985			0.998		
Satd. Flow (perm)	1664	0	0	1859	1859	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	35.4			42.0	47.9	
Travel Time (s)	2.5			3.0	3.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	37	82	30	579	626	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	119	0	0	609	634	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	64.0%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	34	75	28	533	576	7
Future Volume (Veh/h)	34	75	28	533	576	7
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	82	30	579	626	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	None	
Median storage veh)				2		
Upstream signal (m)				112	337	
pX, platoon unblocked	0.78	0.76	0.76			
vC, conflicting volume	1269	630	634			
vC1, stage 1 conf vol	630					
vC2, stage 2 conf vol	639					
vCu, unblocked vol	1050	350	355			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	84	97			
cM capacity (veh/h)	402	525	910			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	119	609	634
Volume Left	37	30	0
Volume Right	82	0	8
cSH	479	910	1700
Volume to Capacity	0.25	0.03	0.37
Queue Length 95th (m)	7.8	0.8	0.0
Control Delay (s)	15.0	0.9	0.0
Lane LOS	B	A	
Approach Delay (s)	15.0	0.9	0.0
Approach LOS	B		

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	64.0%	ICU Level of Service	C	
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	34	533	501	14	56	82
Future Volume (vph)	34	533	501	14	56	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.996		0.920	
Flt Protected		0.997			0.980	
Satd. Flow (prot)	0	1857	1855	0	1679	0
Flt Permitted		0.997			0.980	
Satd. Flow (perm)	0	1857	1855	0	1679	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		47.1	32.3		62.0	
Travel Time (s)		3.4	2.3		4.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	37	579	545	15	61	89
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	616	560	0	150	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	34	533	501	14	56	82
Future Volume (Veh/h)	34	533	501	14	56	82
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)	37	579	545	15	61	89
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		207	242			
pX, platoon unblocked	0.74				0.76	0.74
vC, conflicting volume	560				1206	552
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	237				1021	227
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				68	85
cM capacity (veh/h)	990				191	605

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	616	560	150
Volume Left	37	0	61
Volume Right	0	15	89
cSH	990	1700	322
Volume to Capacity	0.04	0.33	0.47
Queue Length 95th (m)	0.9	0.0	18.9
Control Delay (s)	1.0	0.0	25.6
Lane LOS	A		D
Approach Delay (s)	1.0	0.0	25.6
Approach LOS			D

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		

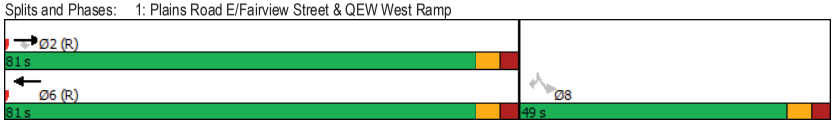
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1667	518	0	2675	0	0	0	0	814	0	448
Future Volume (vph)	0	1667	518	0	2675	0	0	0	0	814	0	448
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	55.0		0.0
Storage Lanes	0		1	0		0	0		0	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor			0.95									0.98
Frt			0.850									0.850
Flt Protected										0.950		
Satd. Flow (prot)	0	5136	1583	0	5085	0	0	0	0	3467	0	1615
Flt Permitted										0.950		
Satd. Flow (perm)	0	5136	1507	0	5085	0	0	0	0	3467	0	1585
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			563									34
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		175.7			307.2			140.0			199.7	
Travel Time (s)		12.7			22.1			10.1			14.4	
Confl. Peds. (#/hr)	4		15	15		4	3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	2%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Adj. Flow (vph)	0	1812	563	0	2908	0	0	0	0	885	0	487
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1812	563	0	2908	0	0	0	0	885	0	487
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Detector Phase		2	2		6					8		8
Switch Phase												
Minimum Initial (s)		8.0	8.0		8.0					8.0		8.0
Minimum Split (s)		43.0	43.0		43.0					25.0		25.0
Total Split (s)		81.0	81.0		81.0					49.0		49.0
Total Split (%)		62.3%	62.3%		62.3%					37.7%		37.7%
Yellow Time (s)		4.0	4.0		4.0					4.0		4.0
All-Red Time (s)		3.0	3.0		3.0					3.0		3.0
Lost Time Adjust (s)		0.0	0.0		0.0					0.0		0.0
Total Lost Time (s)		7.0	7.0		7.0					7.0		7.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max		C-Max					None		None
Act Effct Green (s)		75.4	75.4		75.4					40.6		40.6
Actuated g/C Ratio		0.58	0.58		0.58					0.31		0.31
v/c Ratio		0.61	0.51		0.99					0.82		0.94
Control Delay		19.1	2.8		17.1					48.3		67.8
Queue Delay		0.0	0.0		0.0					0.0		0.0
Total Delay		19.1	2.8		17.1					48.3		67.8
LOS		B	A		B					D		E
Approach Delay		15.2			17.1						55.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			B						E	
Queue Length 50th (m)		114.1	0.0		~305.4					111.6		118.6
Queue Length 95th (m)		129.2	15.6		m34.7					137.4		#185.9
Internal Link Dist (m)		151.7			283.2			116.0			175.7	
Turn Bay Length (m)										55.0		
Base Capacity (vph)		2980	1110		2950					1120		535
Starvation Cap Reductn		0	0		0					0		0
Spillback Cap Reductn		0	0		0					0		0
Storage Cap Reductn		0	0		0					0		0
Reduced v/c Ratio		0.61	0.51		0.99					0.79		0.91

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 34 (26%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 24.3		Intersection LOS: C	
Intersection Capacity Utilization 91.4%		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: Plains Road E/Fairview Street & QEW West Ramp



Queues
1: Plains Road E/Fairview Street & QEW West Ramp

Total (2039)
PM Peak Hour

Lane Group	EBT	EBR	WBT	SBL	SBR
Lane Group Flow (vph)	1812	563	2908	885	487
v/c Ratio	0.61	0.51	0.99	0.82	0.94
Control Delay	19.1	2.8	17.1	48.3	67.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	2.8	17.1	48.3	67.8
Queue Length 50th (m)	114.1	0.0	~305.4	111.6	118.6
Queue Length 95th (m)	129.2	15.6	m34.7	137.4	#185.9
Internal Link Dist (m)	151.7		283.2		
Turn Bay Length (m)				55.0	
Base Capacity (vph)	2980	1110	2950	1120	535
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.61	0.51	0.99	0.79	0.91

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Plains Road E/Fairview Street & QEW West Ramp

Total (2039)
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1667	518	0	2675	0	0	0	0	814	0	448
Future Volume (vph)	0	1667	518	0	2675	0	0	0	0	814	0	448
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0	7.0		7.0					7.0		7.0
Lane Util. Factor		0.91	1.00		0.91					0.97		1.00
Frpb, ped/bikes		1.00	0.95		1.00					1.00		0.98
Flpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Frt		1.00	0.85		1.00					1.00		0.85
Flt Protected		1.00	1.00		1.00					0.95		1.00
Satd. Flow (prot)		5136	1507		5085					3467		1585
Flt Permitted		1.00	1.00		1.00					0.95		1.00
Satd. Flow (perm)		5136	1507		5085					3467		1585
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1812	563	0	2908	0	0	0	0	885	0	487
RTOR Reduction (vph)	0	0	236	0	0	0	0	0	0	0	0	23
Lane Group Flow (vph)	0	1812	327	0	2908	0	0	0	0	885	0	464
Confl. Peds. (#/hr)	4		15	15		4	3					3
Heavy Vehicles (%)	0%	1%	2%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Turn Type		NA	Perm		NA					Perm		Perm
Protected Phases		2			6							
Permitted Phases			2							8		8
Actuated Green, G (s)		75.4	75.4		75.4					40.6		40.6
Effective Green, g (s)		75.4	75.4		75.4					40.6		40.6
Actuated g/C Ratio		0.58	0.58		0.58					0.31		0.31
Clearance Time (s)		7.0	7.0		7.0					7.0		7.0
Vehicle Extension (s)		3.0	3.0		3.0					3.0		3.0
Lane Grp Cap (vph)		2978	874		2949					1082		495
v/s Ratio Prot		0.35			c0.57							
v/s Ratio Perm			0.22							0.26		c0.29
v/c Ratio		0.61	0.37		0.99					0.82		0.94
Uniform Delay, d1		17.7	14.6		26.8					41.3		43.4
Progression Factor		1.00	1.00		0.49					1.00		1.00
Incremental Delay, d2		0.9	1.2		2.7					4.9		25.3
Delay (s)		18.7	15.9		15.8					46.2		68.7
Level of Service		B	B		B					D		E
Approach Delay (s)		18.0			15.8			0.0			54.2	
Approach LOS		B			B			A			D	

Intersection Summary

HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	91.4%	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)	199	1995	0	0	3507	82	213	299	587	47	0	716
Future Volume (vph)	199	1995	0	0	3507	82	213	299	587	47	0	716
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	0.0		0.0	0.0		45.0	25.0		0.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			15.0		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.91	0.95	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00							
Frt					0.997			0.950	0.850			0.850
Flt Protected	0.950						0.950	0.998		0.950		
Satd. Flow (prot)	1770	5136	0	0	4794	0	1698	1593	1519	1805	0	1495
Flt Permitted	0.062						0.950	0.998		0.112		
Satd. Flow (perm)	115	5136	0	0	4794	0	1698	1593	1519	213	0	1495
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					3			5	59			126
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		307.2			385.1			180.0			73.7	
Travel Time (s)		22.1			27.7			13.0			5.3	
Confl. Peds. (#/hr)	2		7	7		2						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	1%	0%	0%	8%	0%	1%	4%	1%	0%	0%	8%
Adj. Flow (vph)	216	2168	0	0	3812	89	232	325	638	51	0	778
Shared Lane Traffic (%)							10%		27%			
Lane Group Flow (vph)	216	2168	0	0	3901	0	209	520	466	51	0	778
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Detector Phase	5	2			6		4	4	4	8		8
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0		8.0	8.0	8.0	8.0		8.0
Minimum Split (s)	11.0	35.0			35.0		36.0	36.0	36.0	36.0		36.0
Total Split (s)	11.0	79.0			68.0		51.0	51.0	51.0	51.0		51.0
Total Split (%)	8.5%	60.8%			52.3%		39.2%	39.2%	39.2%	39.2%		39.2%
Yellow Time (s)	3.0	4.0			4.0		4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	0.0	3.0			3.0		3.0	3.0	3.0	3.0		3.0
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Recall Mode	None	C-Max			C-Max		None	None	None	None		None
Act Effct Green (s)	76.0	72.0			61.0		44.0	44.0	44.0	44.0		44.0
Actuated g/C Ratio	0.58	0.55			0.47		0.34	0.34	0.34	0.34		0.34
v/c Ratio	1.28	0.76			1.73		0.36	0.96	0.84	0.71		1.32
Control Delay	185.6	21.5			357.8		34.7	71.9	49.8	87.4		186.4
Queue Delay	0.0	0.0			0.1		0.1	0.0	0.0	0.0		0.5
Total Delay	185.6	21.5			357.9		34.8	71.9	49.8	87.4		186.9
LOS	F	C			F		C	E	D	F		F
Approach Delay		36.4			357.9			56.8			180.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			F			E			F	
Queue Length 50th (m)	~56.2	143.7			~574.6		44.6	149.2	108.7	11.9		~248.4
Queue Length 95th (m)	m#103.1	159.0			#594.9		68.5	#230.1	#172.1	#37.0		#327.4
Internal Link Dist (m)		283.2			361.1			156.0			49.7	
Turn Bay Length (m)	30.0								45.0	25.0		
Base Capacity (vph)	169	2844			2251		574	542	553	72		589
Starvation Cap Reductn	0	0			0		0	0	0	0		0
Spillback Cap Reductn	0	0			93		34	0	0	0		35
Storage Cap Reductn	0	0			0		0	0	0	0		0
Reduced v/c Ratio	1.28	0.76			1.81		0.39	0.96	0.84	0.71		1.40

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 16 (12%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.73			
Intersection Signal Delay: 204.7		Intersection LOS: F	
Intersection Capacity Utilization 151.1%		ICU Level of Service H	
Analysis Period (min) 15			

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

Splits and Phases: 2: QEW East Ramp/Plains Road E & Fairview Street



Queues
2: QEW East Ramp/Plains Road E & Fairview Street

Total (2039)
PM Peak Hour

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	216	2168	3901	209	520	466	51	778
v/c Ratio	1.28	0.76	1.73	0.36	0.96	0.84	0.71	1.32
Control Delay	185.6	21.5	357.8	34.7	71.9	49.8	87.4	186.4
Queue Delay	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.5
Total Delay	185.6	21.5	357.9	34.8	71.9	49.8	87.4	186.9
Queue Length 50th (m)	~56.2	143.7	~574.6	44.6	149.2	108.7	11.9	~248.4
Queue Length 95th (m)	m#103.1	159.0	#594.9	68.5	#230.1	#172.1	#37.0	#327.4
Internal Link Dist (m)		283.2	361.1		156.0			
Turn Bay Length (m)	30.0					45.0	25.0	
Base Capacity (vph)	169	2844	2251	574	542	553	72	589
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	93	34	0	0	0	35
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.28	0.76	1.81	0.39	0.96	0.84	0.71	1.40

Intersection Summary

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

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

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

HCM Signalized Intersection Capacity Analysis
2: QEW East Ramp/Plains Road E & Fairview Street

Total (2039)
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	1995	0	0	3507	82	213	299	587	47	0	716
Future Volume (vph)	199	1995	0	0	3507	82	213	299	587	47	0	716
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		7.0
Lane Util. Factor	1.00	0.91			0.91		0.95	0.91	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			1.00		1.00	0.95	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1770	5136			4792		1698	1594	1519	1805		1495
Flt Permitted	0.06	1.00			1.00		0.95	1.00	1.00	0.11		1.00
Satd. Flow (perm)	116	5136			4792		1698	1594	1519	214		1495
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	216	2168	0	0	3812	89	232	325	638	51	0	778
RTOR Reduction (vph)	0	0	0	0	2	0	0	3	39	0	0	83
Lane Group Flow (vph)	216	2168	0	0	3899	0	209	517	427	51	0	695
Confl. Peds. (#/hr)	2		7	7		2						
Heavy Vehicles (%)	2%	1%	0%	0%	8%	0%	1%	4%	1%	0%	0%	8%
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	5	2			6			4				
Permitted Phases	2						4		4	8		8
Actuated Green, G (s)	72.0	72.0			61.0		44.0	44.0	44.0	44.0		44.0
Effective Green, g (s)	72.0	72.0			61.0		44.0	44.0	44.0	44.0		44.0
Actuated g/C Ratio	0.55	0.55			0.47		0.34	0.34	0.34	0.34		0.34
Clearance Time (s)	3.0	7.0			7.0		7.0	7.0	7.0	7.0		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)	166	2844			2248		574	539	514	72		506
v/s Ratio Prot	c0.08	0.42			c0.81							
v/s Ratio Perm	0.64						0.12	0.32	0.28	0.24		c0.46
v/c Ratio	1.30	0.76			1.73		0.36	0.96	0.83	0.71		1.37
Uniform Delay, d1	38.9	22.4			34.5		32.4	42.1	39.6	37.4		43.0
Progression Factor	1.26	0.89			1.00		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	164.1	1.5			332.5		0.4	28.3	10.9	27.2		180.0
Delay (s)	213.0	21.3			367.0		32.8	70.4	50.5	64.6		223.0
Level of Service	F	C			F		C	E	D	E		F
Approach Delay (s)		38.7			367.0			56.1			213.2	
Approach LOS		D			F			E			F	

Intersection Summary				
HCM 2000 Control Delay	212.7	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.56			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.0	
Intersection Capacity Utilization	151.1%	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)	482	78	1362	667	62	854
Future Volume (vph)	482	78	1362	667	62	854
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)		0.0	55.0		0.0	0.0
Storage Lanes		0	1		1	1
Taper Length (m)			7.5		7.5	
Lane Util. Factor	0.95	0.95	0.97	1.00	1.00	1.00
Ped Bike Factor	1.00		1.00			
Frt	0.979					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3394	0	3433	1881	1687	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3394	0	3420	1881	1687	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	17					14
Link Speed (k/h)	50			60	50	
Link Distance (m)	209.7			887.5	183.4	
Travel Time (s)	15.1			53.3	13.2	
Confl. Peds. (#/hr)		4	4			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	2%	1%	7%	2%
Adj. Flow (vph)	524	85	1480	725	67	928
Shared Lane Traffic (%)						
Lane Group Flow (vph)	609	0	1480	725	67	928
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Detector Phase	3		4	4	2	4
Switch Phase						
Minimum Initial (s)	8.0		8.0	8.0	8.0	8.0
Minimum Split (s)	17.0		27.0	27.0	18.0	27.0
Total Split (s)	22.0		50.0	50.0	18.0	50.0
Total Split (%)	24.4%		55.6%	55.6%	20.0%	55.6%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		2.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		6.0	6.0	7.0	6.0
Lead/Lag	Lag		Lead	Lead		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None		C-Max	C-Max	Max	C-Max
Act Effct Green (s)	15.0		44.0	44.0	11.0	62.0
Actuated g/C Ratio	0.17		0.49	0.49	0.12	0.69
v/c Ratio	1.05		0.88	0.79	0.33	0.85
Control Delay	88.6		28.5	26.9	40.9	19.9
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	88.6		28.5	26.9	40.9	19.9
LOS	F		C	C	D	B
Approach Delay	88.6			28.0	21.3	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	F			C	C	
Queue Length 50th (m)	~62.8		119.2	105.0	11.3	107.5
Queue Length 95th (m)	#97.8		#155.4	155.2	24.2	#218.7
Internal Link Dist (m)	185.7			863.5	159.4	
Turn Bay Length (m)			55.0			
Base Capacity (vph)	579		1678	919	206	1094
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	1.05		0.88	0.79	0.33	0.85

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 4:WBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.05			
Intersection Signal Delay: 35.9		Intersection LOS: D	
Intersection Capacity Utilization 79.6%		ICU Level of Service D	
Analysis Period (min) 15			

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

Splits and Phases: 3: Maple Avenue & Plains Road E



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	609	1480	725	67	928
v/c Ratio	1.05	0.88	0.79	0.33	0.85
Control Delay	88.6	28.5	26.9	40.9	19.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	88.6	28.5	26.9	40.9	19.9
Queue Length 50th (m)	~62.8	119.2	105.0	11.3	107.5
Queue Length 95th (m)	#97.8	#155.4	155.2	24.2	#218.7
Internal Link Dist (m)	185.7		863.5	159.4	
Turn Bay Length (m)		55.0			
Base Capacity (vph)	579	1678	919	206	1094
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.05	0.88	0.79	0.33	0.85

Intersection Summary

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

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	482	78	1362	667	62	854
Future Volume (vph)	482	78	1362	667	62	854
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0		6.0	6.0	7.0	6.0
Lane Util. Factor	0.95		0.97	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3394		3433	1881	1687	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3394		3433	1881	1687	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	524	85	1480	725	67	928
RTOR Reduction (vph)	14	0	0	0	0	5
Lane Group Flow (vph)	595	0	1480	725	67	923
Confl. Peds. (#/hr)		4	4			
Heavy Vehicles (%)	4%	3%	2%	1%	7%	2%
Turn Type	NA		Prot	NA	Perm	pm+ov
Protected Phases			4			4
Permitted Phases	3			4	2	2
Actuated Green, G (s)	15.0		44.0	44.0	11.0	55.0
Effective Green, g (s)	15.0		44.0	44.0	11.0	55.0
Actuated g/C Ratio	0.17		0.49	0.49	0.12	0.61
Clearance Time (s)	7.0		6.0	6.0	7.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	565		1678	919	206	967
v/s Ratio Prot			0.43			c0.47
v/s Ratio Perm	c0.18			0.39	0.04	0.12
v/c Ratio	1.05		0.88	0.79	0.33	0.95
Uniform Delay, d1	37.5		20.7	19.1	36.1	16.3
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	52.5		7.1	6.8	4.2	19.8
Delay (s)	90.0		27.7	26.0	40.3	36.1
Level of Service	F		C	C	D	D
Approach Delay (s)	90.0			27.2	36.4	
Approach LOS	F			C	D	

Intersection Summary			
HCM 2000 Control Delay	39.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

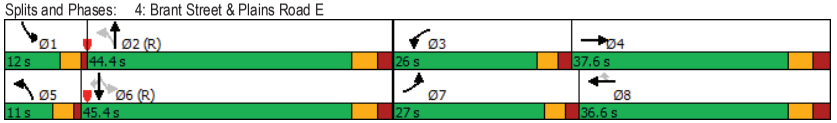
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	772	222	87	201	1005	530	109	1790	81	173	1398	1017
Future Volume (vph)	772	222	87	201	1005	530	109	1790	81	173	1398	1017
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	55.0		0.0	50.0		75.0	50.0		0.0	40.0		30.0
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor	0.98					0.97	0.99	1.00				0.97
Frt		0.958				0.850		0.994				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3502	1757	0	1719	3539	1583	1805	5090	0	1687	5187	1599
Flt Permitted	0.950			0.950			0.104			0.102		
Satd. Flow (perm)	3441	1757	0	1719	3539	1535	195	5090	0	181	5187	1557
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16				116		6				420
Link Speed (k/h)		60			60			60			60	
Link Distance (m)		887.5			190.4			463.4			229.3	
Travel Time (s)		53.3			11.4			27.8			13.8	
Confl. Peds. (#/hr)	12					12	10		16	16		10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	5%	0%	5%	2%	2%	0%	0%	24%	7%	0%	1%
Adj. Flow (vph)	839	241	95	218	1092	576	118	1946	88	188	1520	1105
Shared Lane Traffic (%)												
Lane Group Flow (vph)	839	336	0	218	1092	576	118	2034	0	188	1520	1105
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Detector Phase	7	4		3	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0	8.0	7.0	8.0		7.0	8.0	8.0
Minimum Split (s)	13.0	31.3		13.0	29.3	29.3	11.0	31.0		11.0	31.0	31.0
Total Split (s)	27.0	37.6		26.0	36.6	36.6	11.0	44.4		12.0	45.4	45.4
Total Split (%)	22.5%	31.3%		21.7%	30.5%	30.5%	9.2%	37.0%		10.0%	37.8%	37.8%
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.7		3.0	3.7	3.7
All-Red Time (s)	2.0	2.6		2.0	2.6	2.6	1.0	2.3		1.0	2.3	2.3
Lost Time Adjust (s)	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	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	22.0	33.5		18.8	30.3	30.3	47.4	38.4		49.4	39.4	39.4
Actuated g/C Ratio	0.18	0.28		0.16	0.25	0.25	0.40	0.32		0.41	0.33	0.33
v/c Ratio	1.31	0.67		0.81	1.22	1.22	0.69	1.25		1.08	0.89	1.39
Control Delay	188.6	44.9		71.3	149.2	146.6	23.1	146.5		118.4	46.2	206.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	188.6	44.9		71.3	149.2	146.6	23.1	146.5		118.4	46.2	206.7
LOS	F	D		E	F	F	C	F		F	D	F
Approach Delay		147.5			139.4			139.7			114.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			F			F			F	
Queue Length 50th (m)	~137.7	72.3		51.8	~175.1	~152.6	20.2	~233.0		~35.3	130.5	~292.9
Queue Length 95th (m)	#177.8	107.4		#85.4	#218.3	#224.4	m17.9	m#166.9		#84.1	151.3	#376.8
Internal Link Dist (m)		863.5			166.4			439.4			205.3	
Turn Bay Length (m)	55.0			50.0		75.0	50.0			40.0		30.0
Base Capacity (vph)	642	501		300	893	474	170	1632		174	1703	793
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.31	0.67		0.73	1.22	1.22	0.69	1.25		1.08	0.89	1.39

Intersection Summary		
Area Type:	Other	
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 45 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 140		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.39		
Intersection Signal Delay: 131.8	Intersection LOS: F	
Intersection Capacity Utilization 113.6%	ICU Level of Service H	
Analysis Period (min) 15		

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

Splits and Phases: 4: Brant Street & Plains Road E



Queues
4: Brant Street & Plains Road E

Total (2039)
PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	839	336	218	1092	576	118	2034	188	1520	1105
v/c Ratio	1.31	0.67	0.81	1.22	1.22	0.69	1.25	1.08	0.89	1.39
Control Delay	188.6	44.9	71.3	149.2	146.6	23.1	146.5	118.4	46.2	206.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	188.6	44.9	71.3	149.2	146.6	23.1	146.5	118.4	46.2	206.7
Queue Length 50th (m)	~137.7	72.3	51.8	~175.1	~152.6	20.2	~233.0	~35.3	130.5	~292.9
Queue Length 95th (m)	#177.8	107.4	#85.4	#218.3	#224.4	m17.9	m#166.9	#84.1	151.3	#376.8
Internal Link Dist (m)		863.5		166.4			439.4		205.3	
Turn Bay Length (m)	55.0		50.0		75.0	50.0		40.0		30.0
Base Capacity (vph)	642	501	300	893	474	170	1632	174	1703	793
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.31	0.67	0.73	1.22	1.22	0.69	1.25	1.08	0.89	1.39

Intersection Summary

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

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

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

HCM Signalized Intersection Capacity Analysis
4: Brant Street & Plains Road E

Total (2039)
PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	772	222	87	201	1005	530	109	1790	81	173	1398	1017
Future Volume (vph)	772	222	87	201	1005	530	109	1790	81	173	1398	1017
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	1.00		1.00	0.95	1.00	1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00		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
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	1756		1719	3539	1535	1805	5088		1687	5187	1557
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.10	1.00		0.10	1.00	1.00
Satd. Flow (perm)	3502	1756		1719	3539	1535	198	5088		180	5187	1557
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	839	241	95	218	1092	576	118	1946	88	188	1520	1105
RTOR Reduction (vph)	0	12	0	0	0	87	0	4	0	0	0	282
Lane Group Flow (vph)	839	324	0	218	1092	489	118	2030	0	188	1520	823
Confl. Peds. (#/hr)	12					12	10		16	16		10
Heavy Vehicles (%)	0%	5%	0%	5%	2%	2%	0%	0%	24%	7%	0%	1%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8	2			6		6
Actuated Green, G (s)	22.0	33.5		18.8	30.3	30.3	45.4	38.4		47.4	39.4	39.4
Effective Green, g (s)	22.0	33.5		18.8	30.3	30.3	45.4	38.4		47.4	39.4	39.4
Actuated g/C Ratio	0.18	0.28		0.16	0.25	0.25	0.38	0.32		0.39	0.33	0.33
Clearance Time (s)	5.0	6.3		5.0	6.3	6.3	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	642	490		269	893	387	168	1628		171	1703	511
v/s Ratio Prot	c0.24	c0.18		0.13	0.31		0.04	0.40		c0.07	0.29	
v/s Ratio Perm						c0.32	0.22			0.36		c0.53
v/c Ratio	1.31	0.66		0.81	1.22	1.26	0.70	1.25		1.10	0.89	1.61
Uniform Delay, d1	49.0	38.2		48.9	44.9	44.9	28.9	40.8		30.8	38.3	40.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.92	0.98		1.00	1.00	1.00
Incremental Delay, d2	149.1	3.4		16.7	110.3	138.1	1.2	111.6		97.9	7.6	283.7
Delay (s)	198.1	41.6		65.5	155.2	183.0	27.9	151.6		128.7	45.9	324.0
Level of Service	F	D		E	F	F	C	F		F	D	F
Approach Delay (s)		153.4			153.3			144.8			160.7	
Approach LOS		F			F			F			F	

Intersection Summary					
HCM 2000 Control Delay	153.6	HCM 2000 Level of Service		F	
HCM 2000 Volume to Capacity ratio	1.41				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		21.3	
Intersection Capacity Utilization	113.6%	ICU Level of Service		H	
Analysis Period (min)	15				

c Critical Lane Group

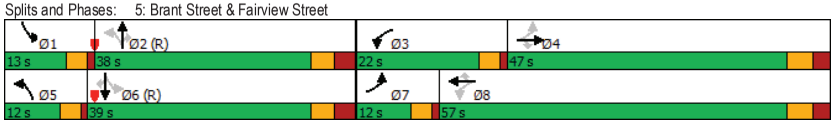
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	293	1111	411	300	2068	606	248	1122	266	321	940	596
Future Volume (vph)	293	1111	411	300	2068	606	248	1122	266	321	940	596
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	60.0		170.0	60.0		0.0	75.0		70.0	45.0		0.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.97			0.98	0.98		0.92			0.96
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1703	3539	1568	1787	3574	1599	1787	3574	1599	1770	3539	1553
Flt Permitted	0.099			0.090			0.127			0.123		
Satd. Flow (perm)	177	3539	1526	169	3574	1573	233	3574	1474	229	3539	1498
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			194			187			179			144
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		261.1			251.5			231.2			463.4	
Travel Time (s)		15.7			15.1			16.6			27.8	
Confl. Peds. (#/hr)	3		10	10		3	16		45	45		16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	2%	3%	1%	1%	1%	1%	1%	1%	2%	2%	4%
Adj. Flow (vph)	318	1208	447	326	2248	659	270	1220	289	349	1022	648
Shared Lane Traffic (%)												
Lane Group Flow (vph)	318	1208	447	326	2248	659	270	1220	289	349	1022	648
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		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	31.4	31.4	12.0	31.4	31.4	12.0	31.5	31.5	12.0	31.5	31.5
Total Split (s)	12.0	47.0	47.0	22.0	57.0	57.0	12.0	38.0	38.0	13.0	39.0	39.0
Total Split (%)	10.0%	39.2%	39.2%	18.3%	47.5%	47.5%	10.0%	31.7%	31.7%	10.8%	32.5%	32.5%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	1.0	2.7	2.7	1.0	2.7	2.7	1.0	3.2	3.2	1.0	3.2	3.2
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)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	51.0	40.6	40.6	65.0	50.6	50.6	42.0	31.5	31.5	44.0	32.5	32.5
Actuated g/C Ratio	0.42	0.34	0.34	0.54	0.42	0.42	0.35	0.26	0.26	0.37	0.27	0.27
v/c Ratio	1.81	1.01	0.69	0.98	1.49	0.85	1.46	1.30	0.56	1.75	1.07	1.27
Control Delay	407.8	68.0	25.3	77.1	253.7	34.5	259.7	179.9	18.8	376.6	69.8	149.8
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	407.8	68.0	25.3	77.1	253.7	34.5	259.7	179.9	18.8	376.6	69.8	149.8
LOS	F	E	C	E	F	C	F	F	B	F	E	F
Approach Delay		113.1			191.2			165.9			148.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			F			F			F	
Queue Length 50th (m)	~102.7	~159.7	54.7	63.5	~405.6	110.2	~74.7	~203.8	22.1	~107.1	~148.6	~177.1
Queue Length 95th (m)	#162.0	#209.1	94.8	#124.0	#449.1	#185.6	#130.3	#247.8	51.8	m#139.0	m#186.2	m#238.4
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	176	1197	644	334	1507	771	185	938	518	199	958	510
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	1.81	1.01	0.69	0.98	1.49	0.85	1.46	1.30	0.56	1.75	1.07	1.27

Intersection Summary		
Area Type:	Other	
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 89 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 150		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.81		
Intersection Signal Delay: 159.5	Intersection LOS: F	
Intersection Capacity Utilization 139.6%	ICU Level of Service H	
Analysis Period (min) 15		

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

Splits and Phases: 5: Brant Street & Fairview Street



Queues
5: Brant Street & Fairview Street

Total (2039)
PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	318	1208	447	326	2248	659	270	1220	289	349	1022	648
v/c Ratio	1.81	1.01	0.69	0.98	1.49	0.85	1.46	1.30	0.56	1.75	1.07	1.27
Control Delay	407.8	68.0	25.3	77.1	253.7	34.5	259.7	179.9	18.8	376.6	69.8	149.8
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	407.8	68.0	25.3	77.1	253.7	34.5	259.7	179.9	18.8	376.6	69.8	149.8
Queue Length 50th (m)	~102.7	~159.7	54.7	63.5	~405.6	110.2	~74.7	~203.8	22.1	~107.1	~148.6	~177.1
Queue Length 95th (m)	#162.0	#209.1	94.8	#124.0	#449.1	#185.6	#130.3	#247.8	51.8	m#139.0	m#186.2	m#238.4
Internal Link Dist (m)		237.1			227.5			207.2			439.4	
Turn Bay Length (m)	60.0		170.0	60.0			75.0		70.0	45.0		
Base Capacity (vph)	176	1197	644	334	1507	771	185	938	518	199	958	510
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	1.81	1.01	0.69	0.98	1.49	0.85	1.46	1.30	0.56	1.75	1.07	1.27

Intersection Summary

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

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

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

HCM Signalized Intersection Capacity Analysis
5: Brant Street & Fairview Street

Total (2039)
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	293	1111	411	300	2068	606	248	1122	266	321	940	596
Future Volume (vph)	293	1111	411	300	2068	606	248	1122	266	321	940	596
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.92	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)	1703	3539	1526	1787	3574	1573	1787	3574	1474	1770	3539	1498
Flt Permitted	0.10	1.00	1.00	0.09	1.00	1.00	0.13	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	177	3539	1526	169	3574	1573	239	3574	1474	229	3539	1498
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	318	1208	447	326	2248	659	270	1220	289	349	1022	648
RTOR Reduction (vph)	0	0	128	0	0	108	0	0	132	0	0	105
Lane Group Flow (vph)	318	1208	319	326	2248	551	270	1220	157	349	1022	543
Confl. Peds. (#/hr)	3		10	10		3	16		45	45		16
Heavy Vehicles (%)	6%	2%	3%	1%	1%	1%	1%	1%	1%	2%	2%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	48.6	40.6	40.6	62.6	50.6	50.6	39.5	31.5	31.5	41.5	32.5	32.5
Effective Green, g (s)	48.6	40.6	40.6	62.6	50.6	50.6	39.5	31.5	31.5	41.5	32.5	32.5
Actuated g/C Ratio	0.41	0.34	0.34	0.52	0.42	0.42	0.33	0.26	0.26	0.35	0.27	0.27
Clearance Time (s)	4.0	6.4	6.4	4.0	6.4	6.4	4.0	6.5	6.5	4.0	6.5	6.5
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)	173	1197	516	330	1507	663	181	938	386	194	958	405
v/s Ratio Prot	c0.12	0.34		0.15	c0.63		0.10	0.34		c0.13	0.29	
v/s Ratio Perm	c0.62		0.21	0.37		0.35	0.39		0.11	c0.48		0.36
v/c Ratio	1.84	1.01	0.62	0.99	1.49	0.83	1.49	1.30	0.41	1.80	1.07	1.34
Uniform Delay, d1	30.0	39.7	33.2	37.7	34.7	30.9	35.9	44.2	36.5	34.0	43.8	43.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.26	0.59	0.44
Incremental Delay, d2	398.8	28.3	2.2	45.8	224.8	8.7	248.2	143.1	3.2	371.6	42.7	163.2
Delay (s)	428.8	68.0	35.4	83.5	259.5	39.6	284.1	187.4	39.7	414.6	68.6	182.2
Level of Service	F	E	D	F	F	D	F	F	D	F	E	F
Approach Delay (s)		118.8			197.0			178.1			164.9	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM 2000 Control Delay	168.9	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.76			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.9	
Intersection Capacity Utilization	139.6%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	2	6	3	578	756	1
Future Volume (vph)	2	6	3	578	756	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.895					
Flt Protected	0.989					
Satd. Flow (prot)	1649	0	0	1863	1863	0
Flt Permitted	0.989					
Satd. Flow (perm)	1649	0	0	1863	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	47.7			73.7	37.6	
Travel Time (s)	3.4			5.3	2.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	7	3	628	822	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	0	0	631	823	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	6	3	578	756	1
Future Volume (Veh/h)	2	6	3	578	756	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	7	3	628	822	1
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)				74	375	
pX, platoon unblocked	0.71	0.68	0.68			
vC, conflicting volume	1456	822	823			
vC1, stage 1 conf vol	822					
vC2, stage 2 conf vol	634					
vCu, unblocked vol	1250	501	502			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	98	100			
cM capacity (veh/h)	341	387	721			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	9	631	823
Volume Left	2	3	0
Volume Right	7	0	1
cSH	375	721	1700
Volume to Capacity	0.02	0.00	0.48
Queue Length 95th (m)	0.6	0.1	0.0
Control Delay (s)	14.8	0.1	0.0
Lane LOS	B	A	
Approach Delay (s)	14.8	0.1	0.0
Approach LOS	B		

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	49.9%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	16	51	72	508	705	32
Future Volume (vph)	16	51	72	508	705	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.897				0.994	
Flt Protected	0.988			0.994		
Satd. Flow (prot)	1651	0	0	1852	1852	0
Flt Permitted	0.988			0.994		
Satd. Flow (perm)	1651	0	0	1852	1852	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	43.3			37.6	47.9	
Travel Time (s)	3.1			2.7	3.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	55	78	552	766	35
Shared Lane Traffic (%)						
Lane Group Flow (vph)	72	0	0	630	801	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	51	72	508	705	32
Future Volume (Veh/h)	16	51	72	508	705	32
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	55	78	552	766	35
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	None	
Median storage veh)				2		
Upstream signal (m)				111	337	
pX, platoon unblocked	0.69	0.66	0.66			
vC, conflicting volume	1492	784	801			
vC1, stage 1 conf vol	784					
vC2, stage 2 conf vol	708					
vCu, unblocked vol	1301	417	443			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	87	89			
cM capacity (veh/h)	320	421	739			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	72	630	801
Volume Left	17	78	0
Volume Right	55	0	35
cSH	392	739	1700
Volume to Capacity	0.18	0.11	0.47
Queue Length 95th (m)	5.3	2.8	0.0
Control Delay (s)	16.3	2.7	0.0
Lane LOS	C	A	
Approach Delay (s)	16.3	2.7	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	83.8%	ICU Level of Service	E	
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	91	434	665	64	36	73
Future Volume (vph)	91	434	665	64	36	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.988		0.910	
Flt Protected		0.991			0.984	
Satd. Flow (prot)	0	1846	1840	0	1668	0
Flt Permitted		0.991			0.984	
Satd. Flow (perm)	0	1846	1840	0	1668	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		47.1	32.3		62.0	
Travel Time (s)		3.4	2.3		4.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	472	723	70	39	79
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	571	793	0	118	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		



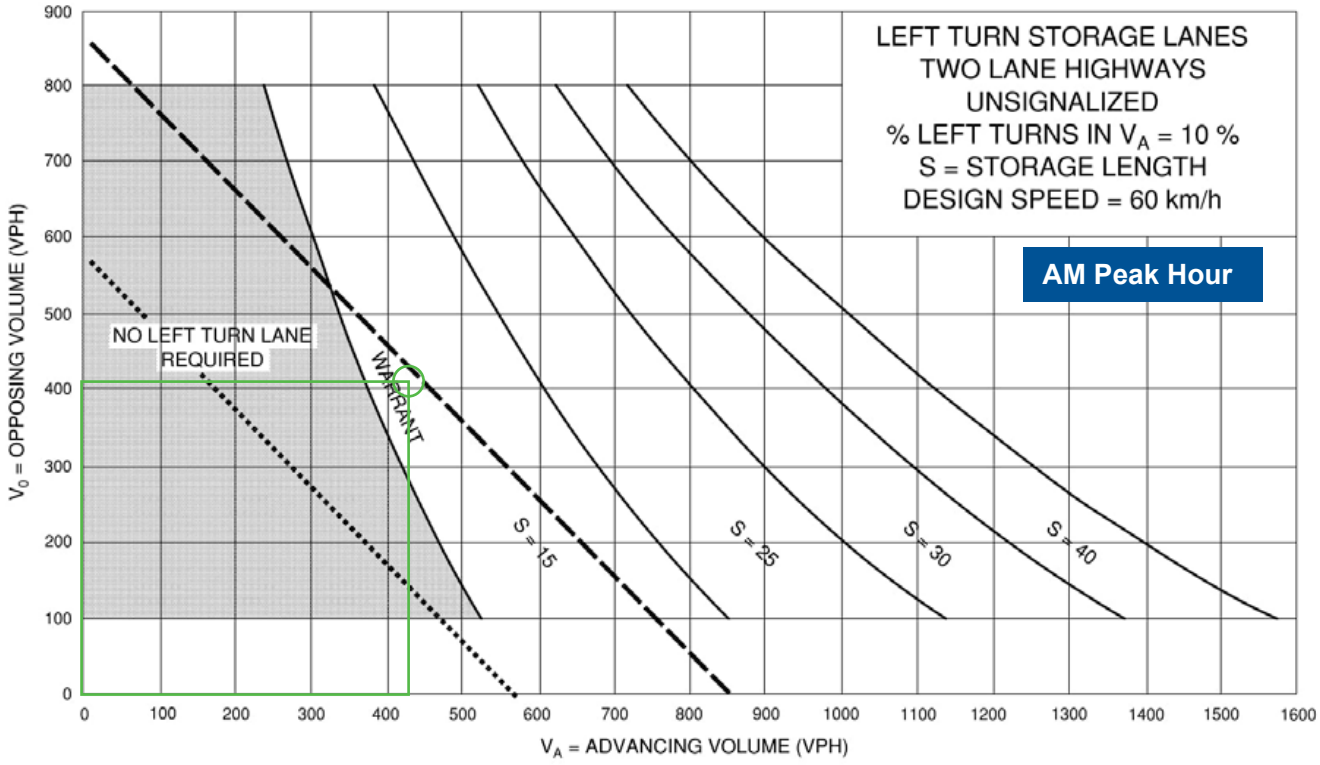
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	91	434	665	64	36	73
Future Volume (Veh/h)	91	434	665	64	36	73
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	99	472	723	70	39	79
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		206	242			
pX, platoon unblocked	0.64				0.66	0.64
vC, conflicting volume	793				1428	758
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	393				1272	339
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	87				63	82
cM capacity (veh/h)	744				105	450

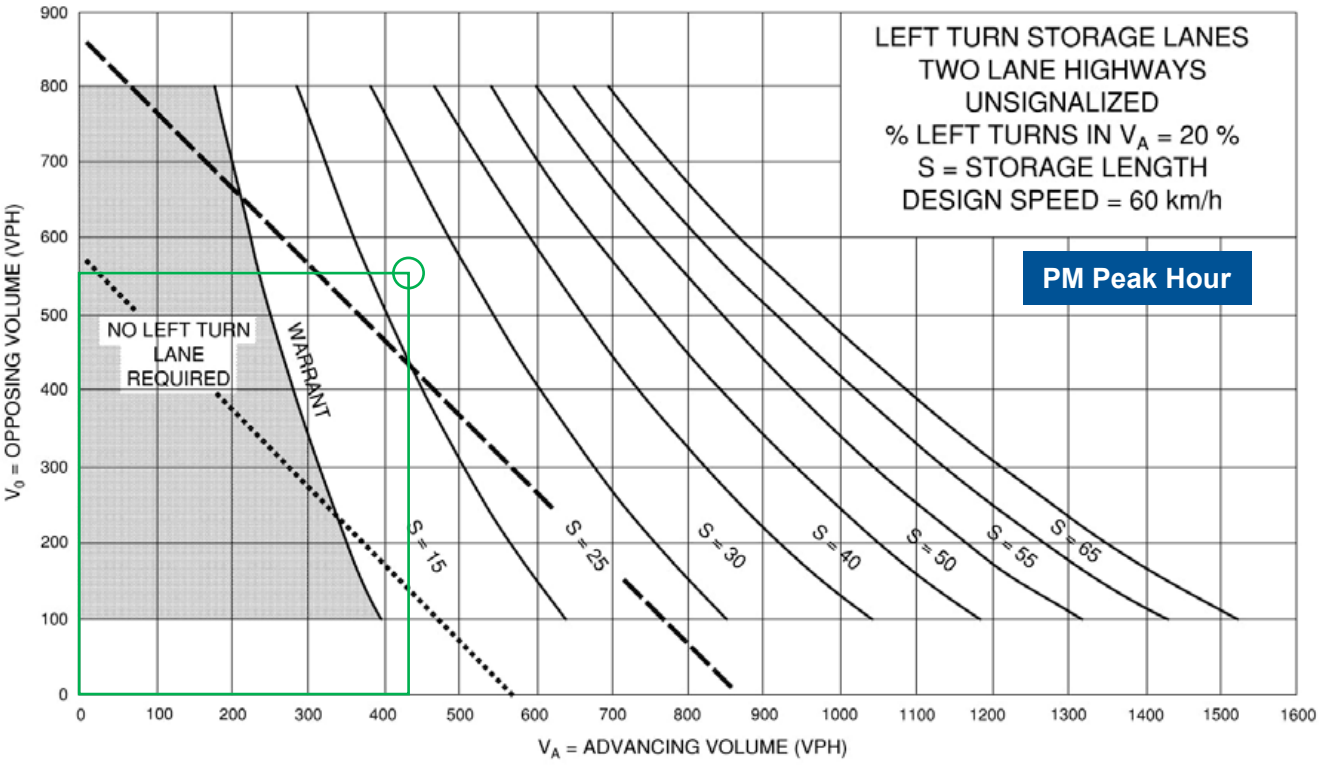
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	571	793	118
Volume Left	99	0	39
Volume Right	0	70	79
cSH	744	1700	216
Volume to Capacity	0.13	0.47	0.55
Queue Length 95th (m)	3.7	0.0	23.3
Control Delay (s)	3.4	0.0	40.1
Lane LOS	A		E
Approach Delay (s)	3.4	0.0	40.1
Approach LOS			E

Intersection Summary				
Average Delay	4.5			
Intersection Capacity Utilization	83.2%	ICU Level of Service		E
Analysis Period (min)	15			

Appendix I

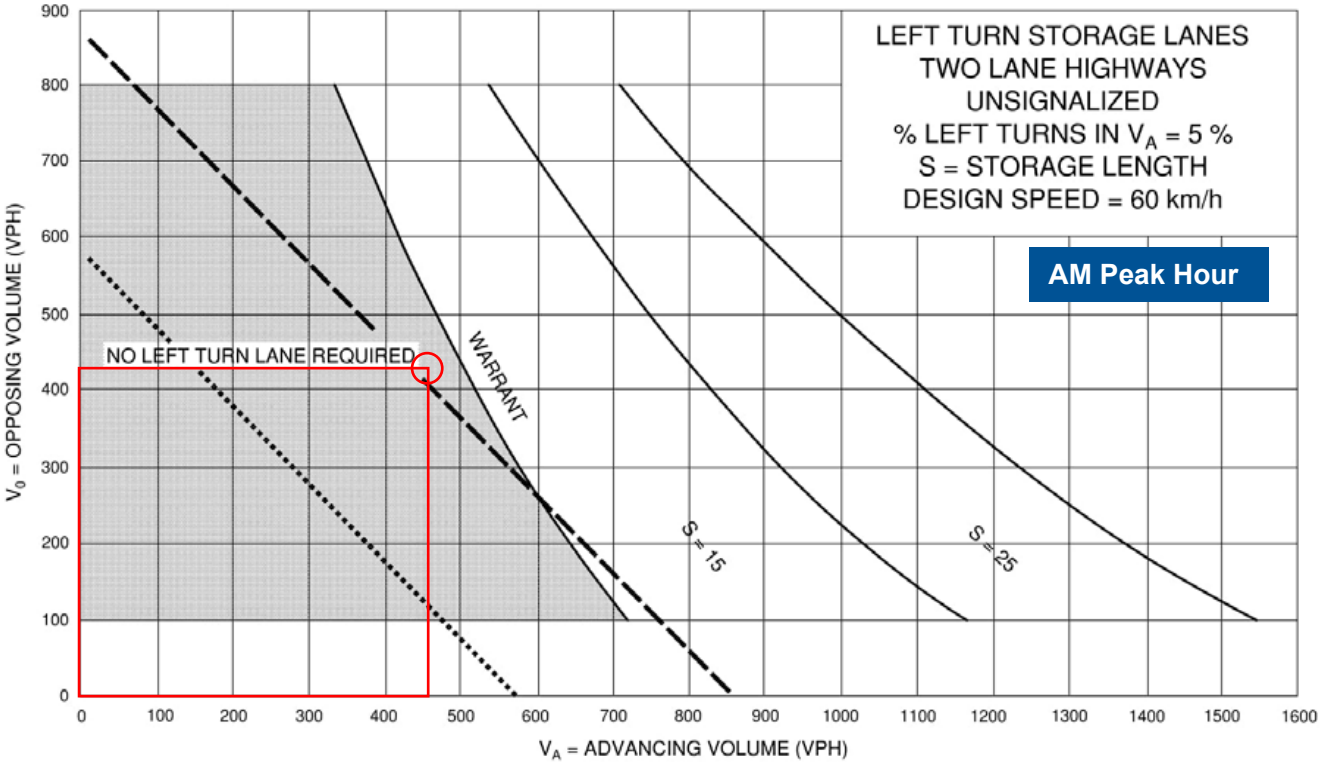
Left-Turn Lane Warrant Nomographs

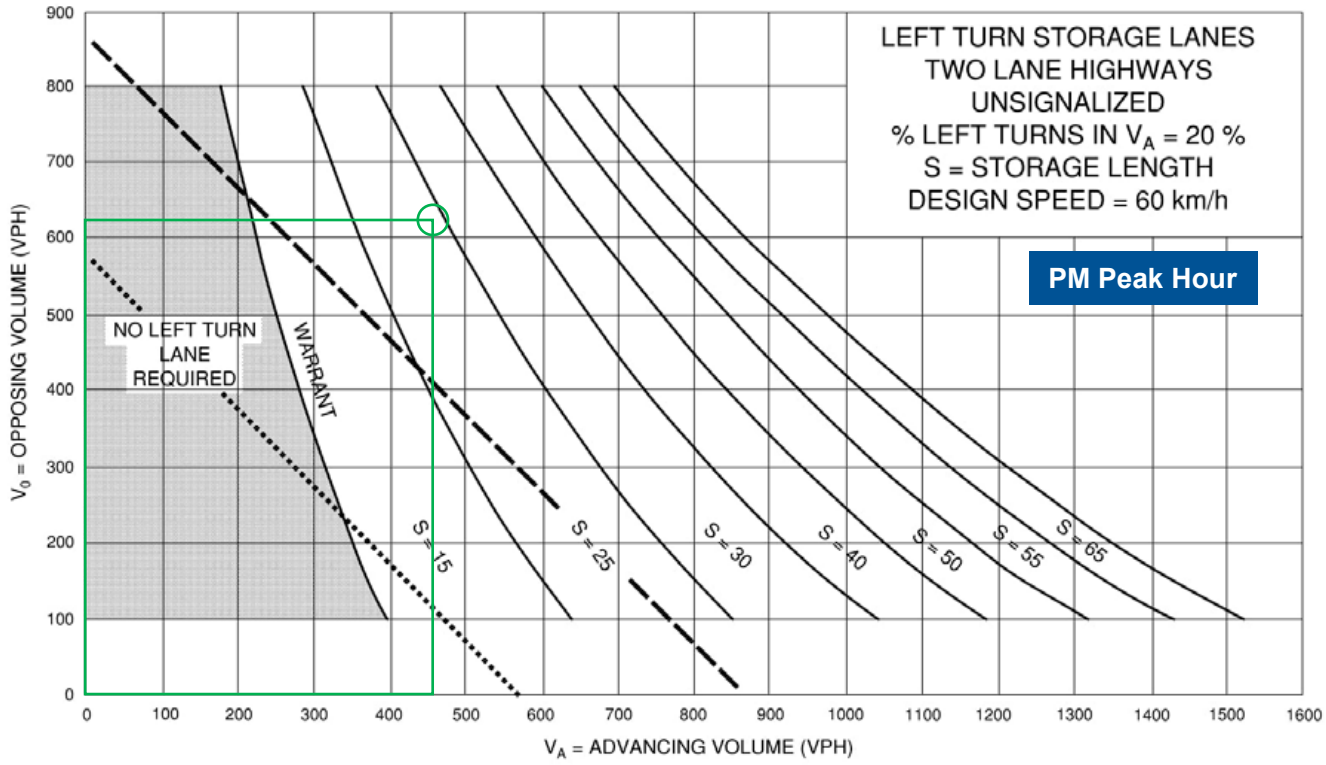




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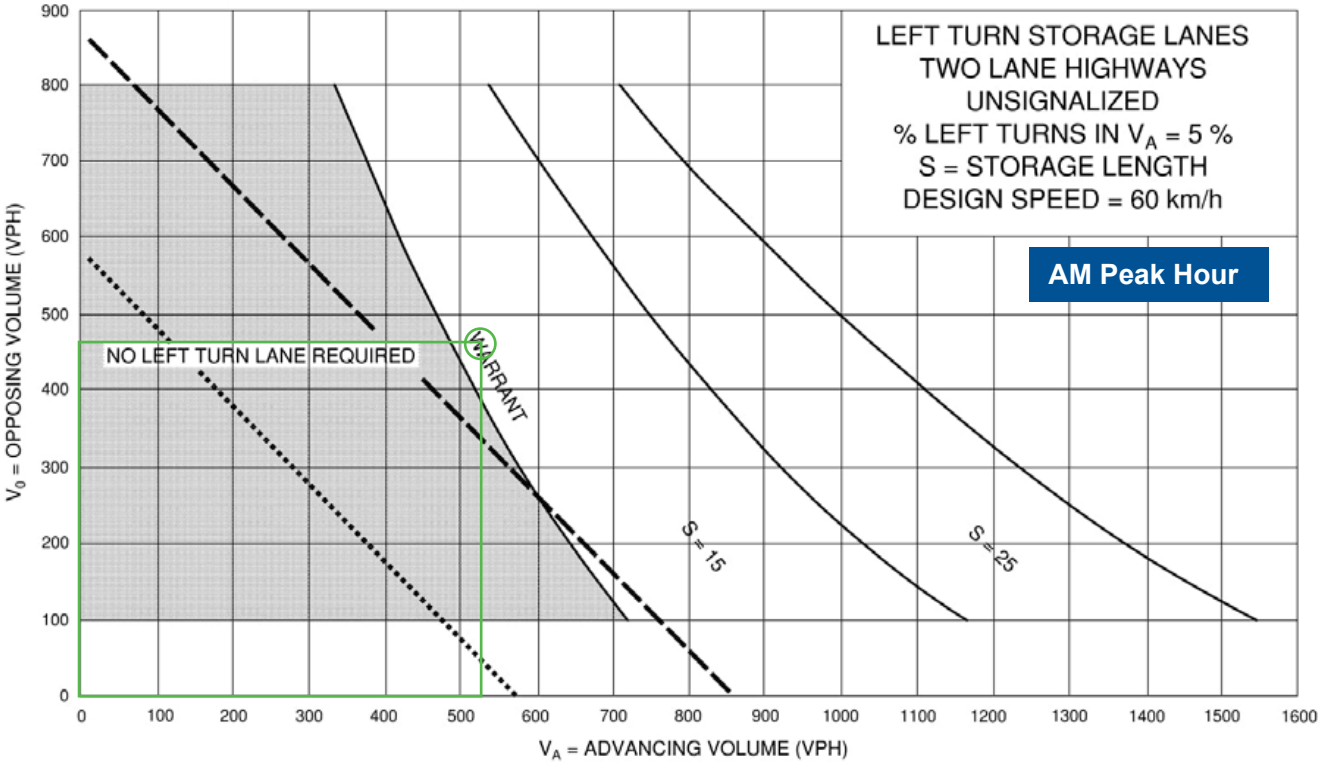
Eastbound Left-Turn Lane
Plains Road East & Site Access 1
2027 Total Traffic Volumes

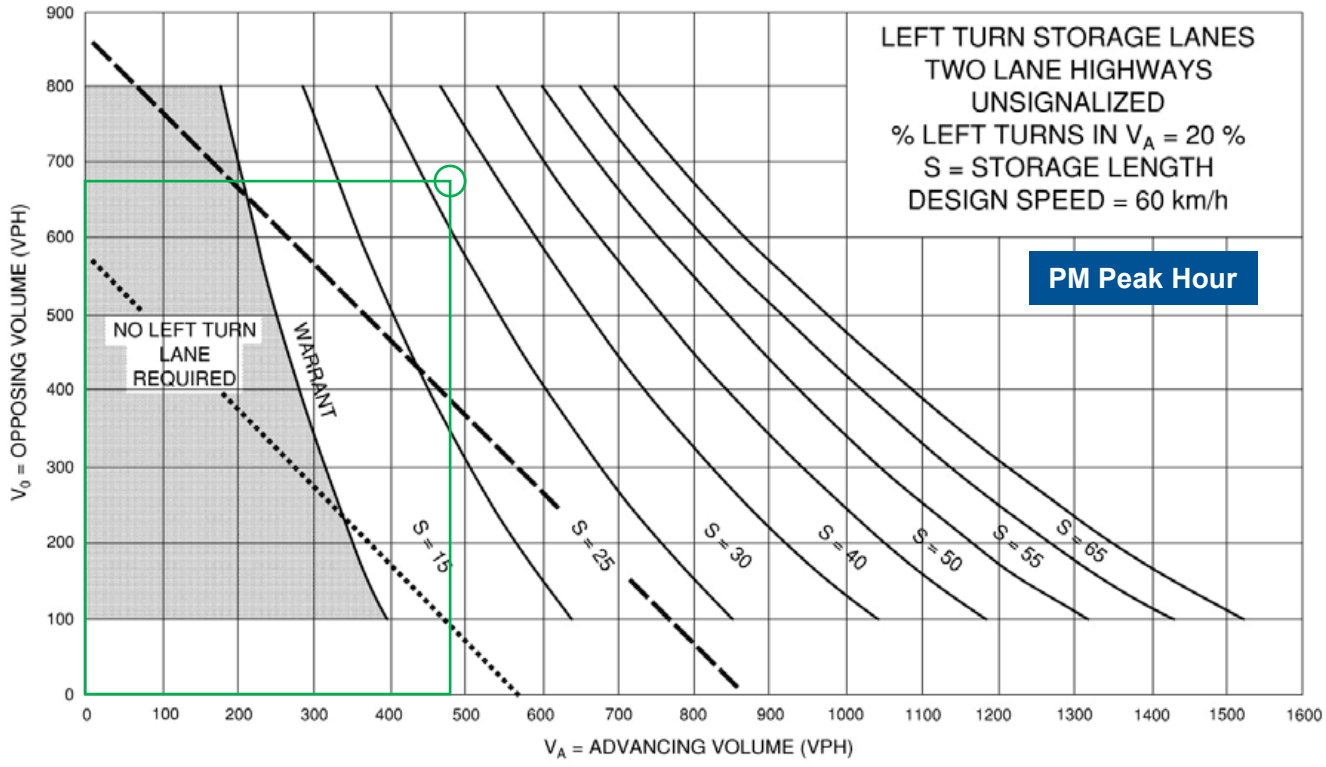




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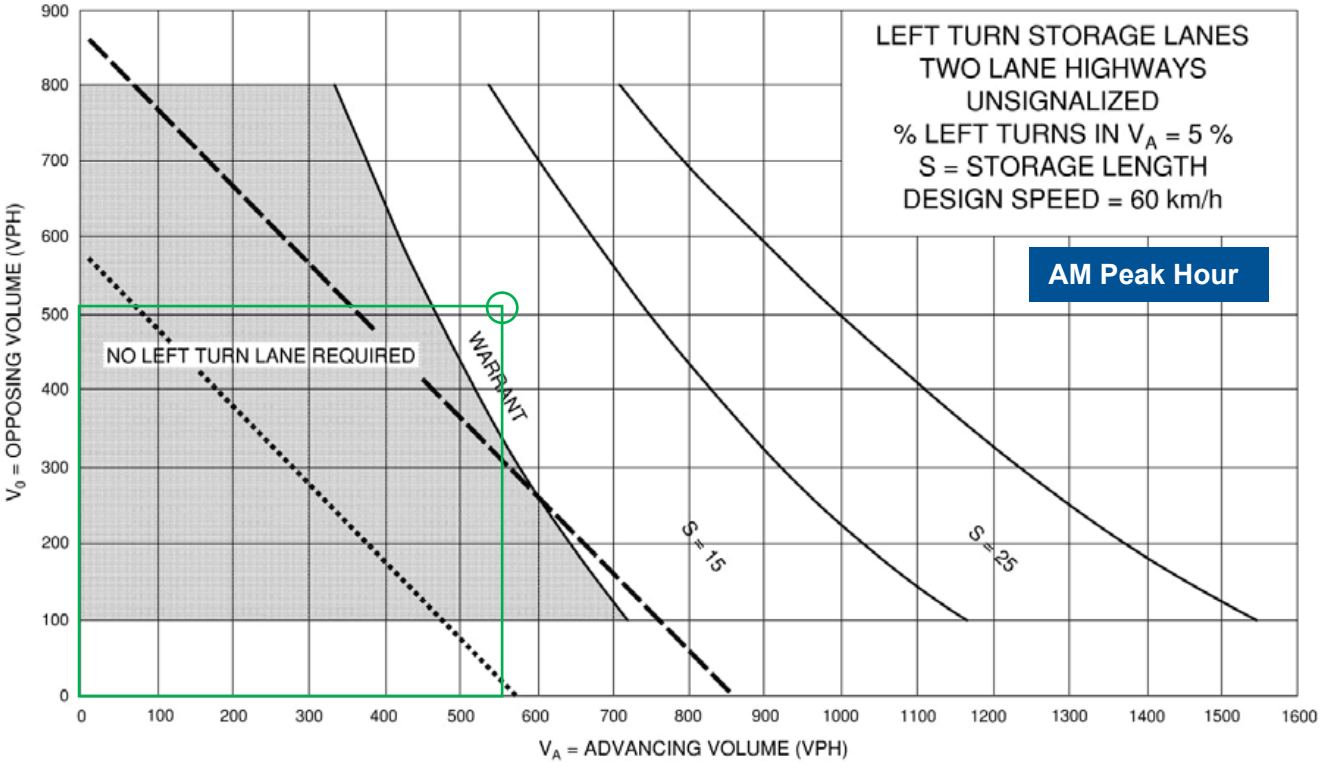
Eastbound Left-Turn Lane
Plains Road East & Site Access 1
2029 Total Traffic Volumes

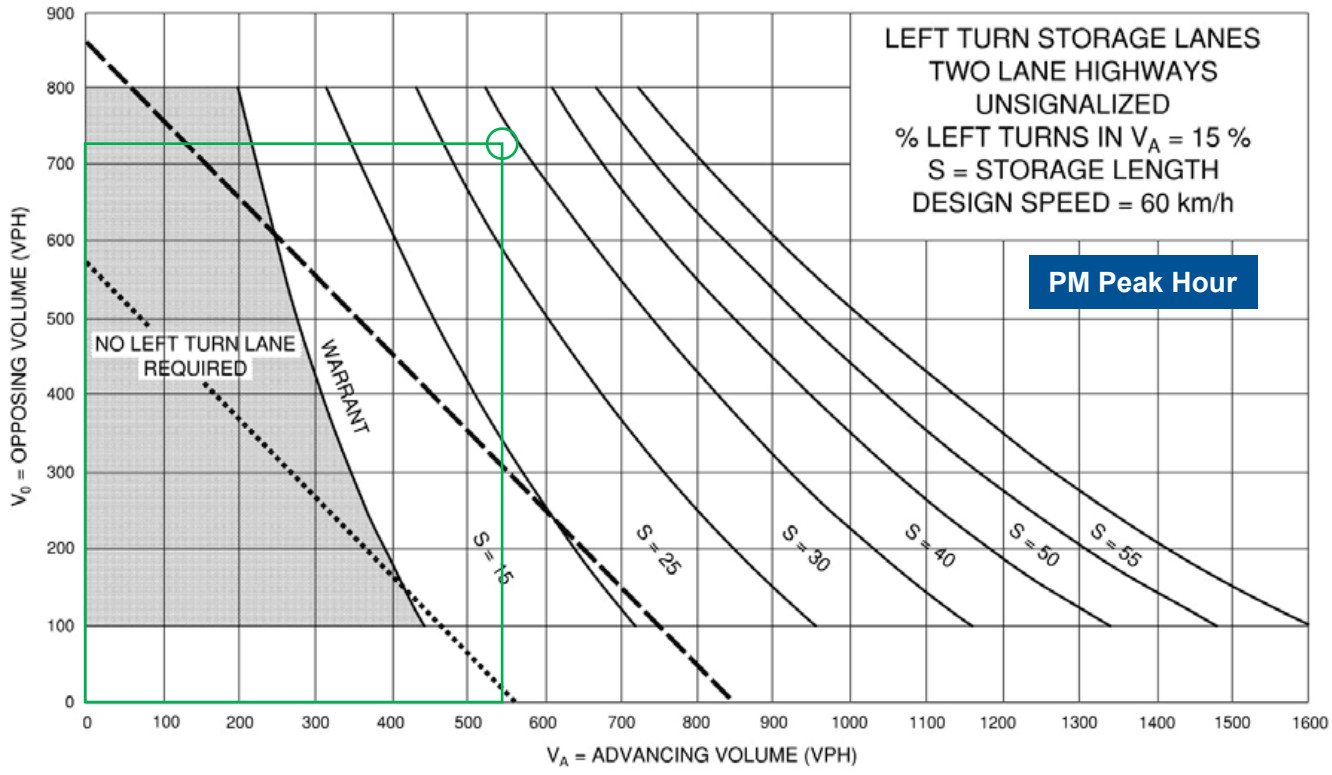




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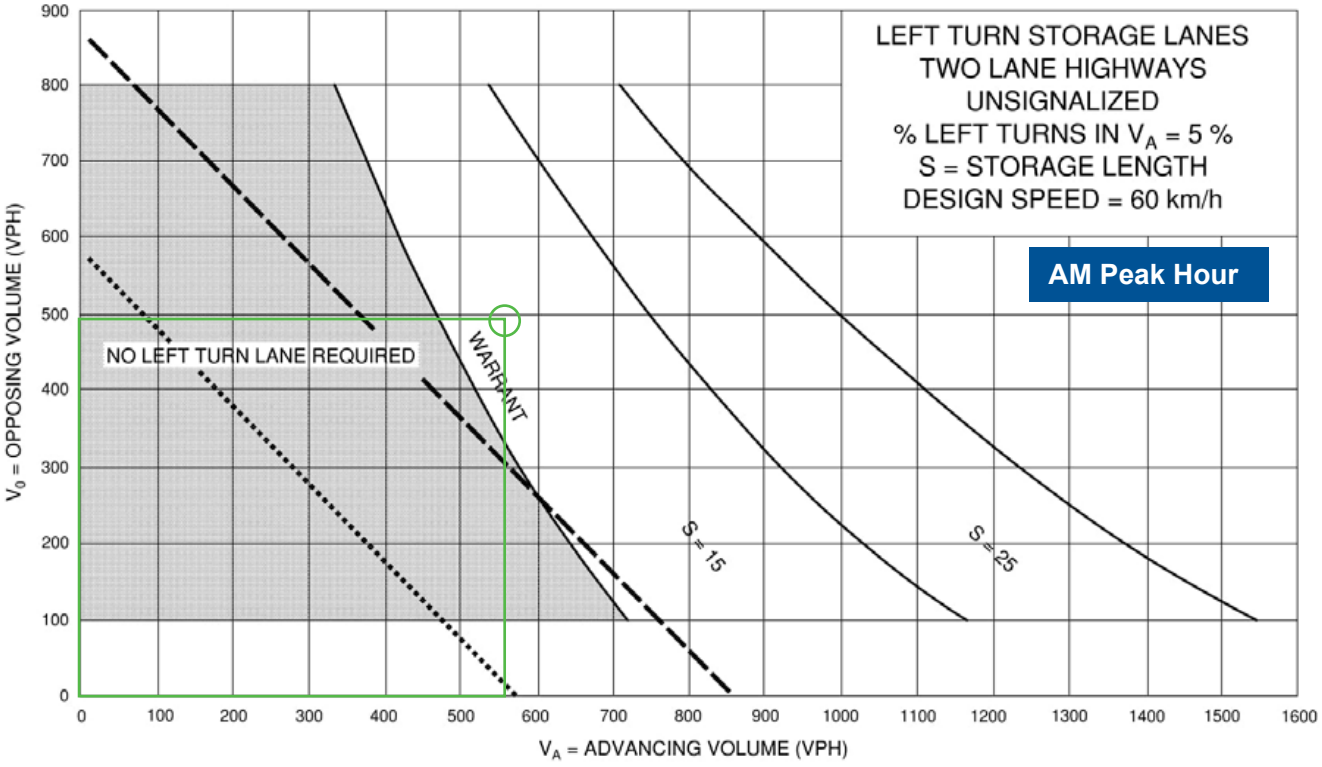
Eastbound Left-Turn Lane
Plains Road East & Site Access 1
2034 Total Traffic Volumes

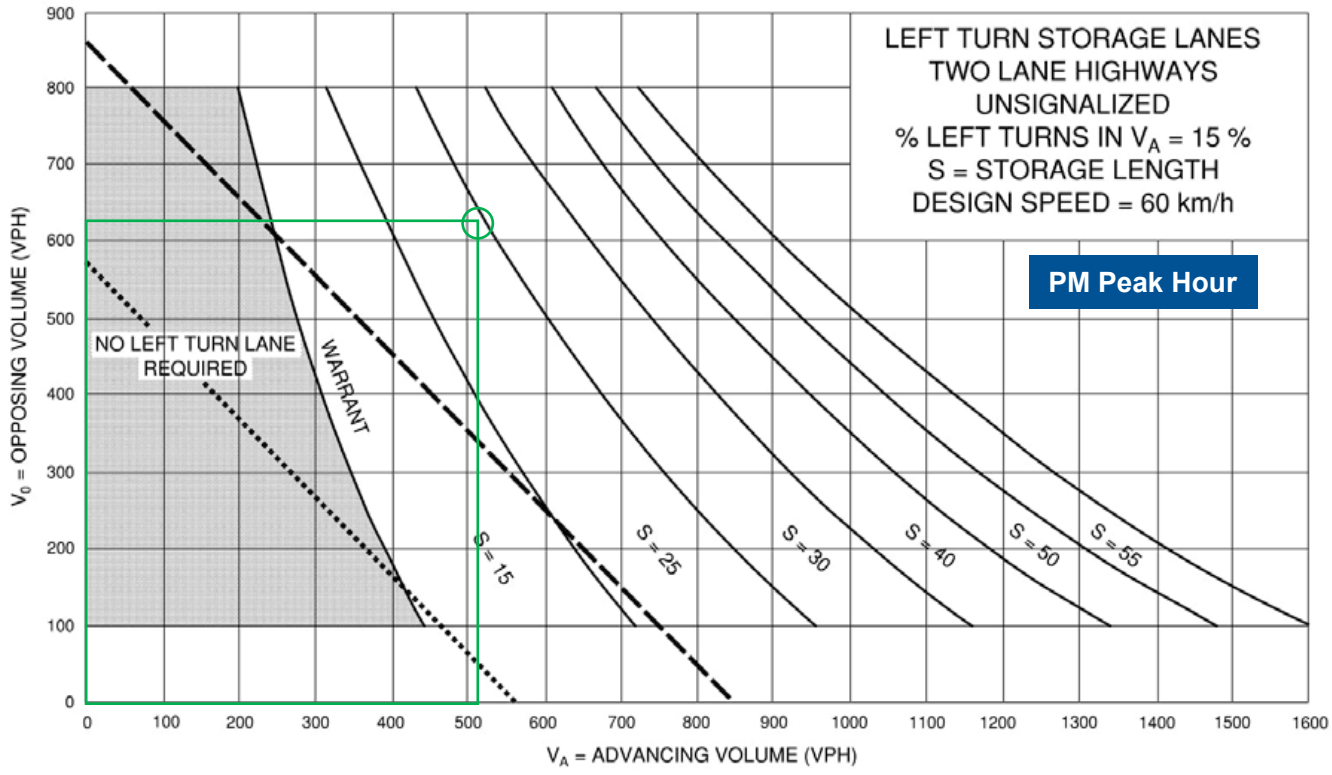




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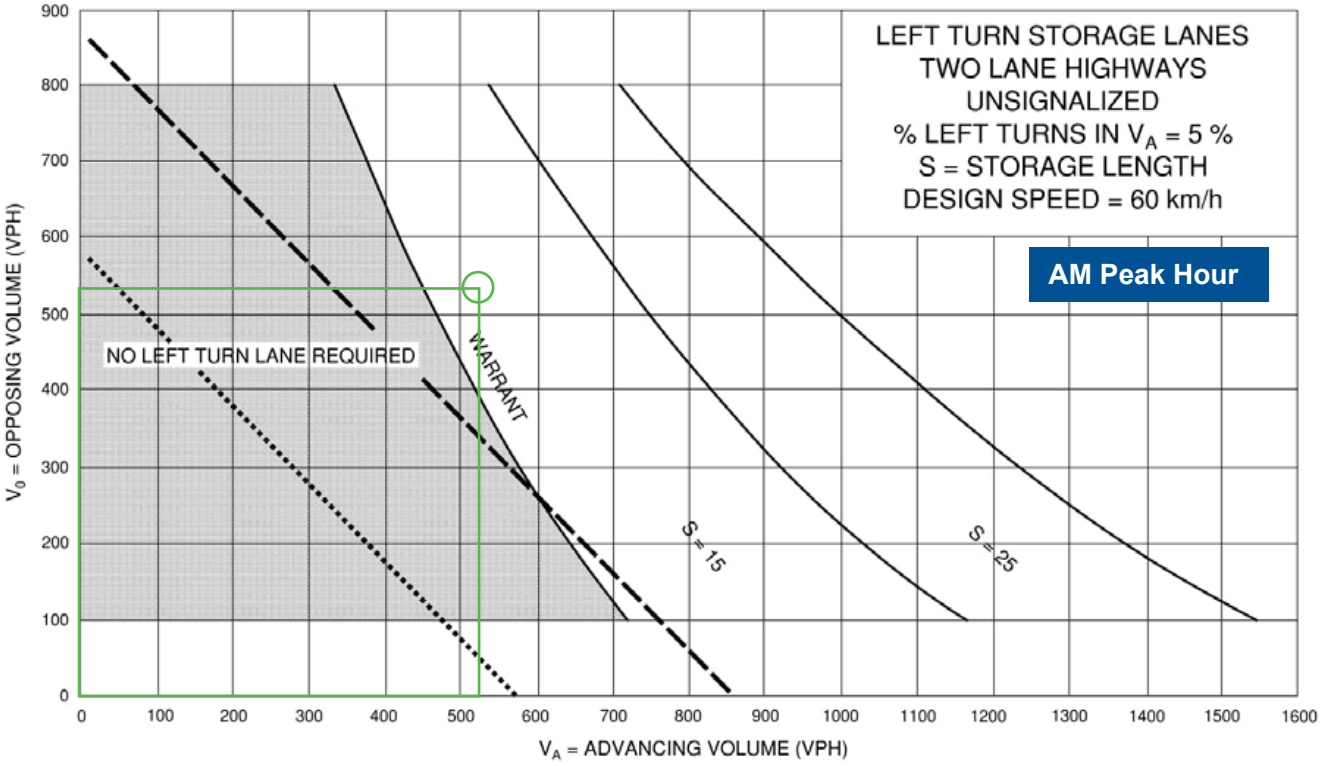
Eastbound Left-Turn Lane
Plains Road East & Site Access 1
2039 Total Traffic Volumes

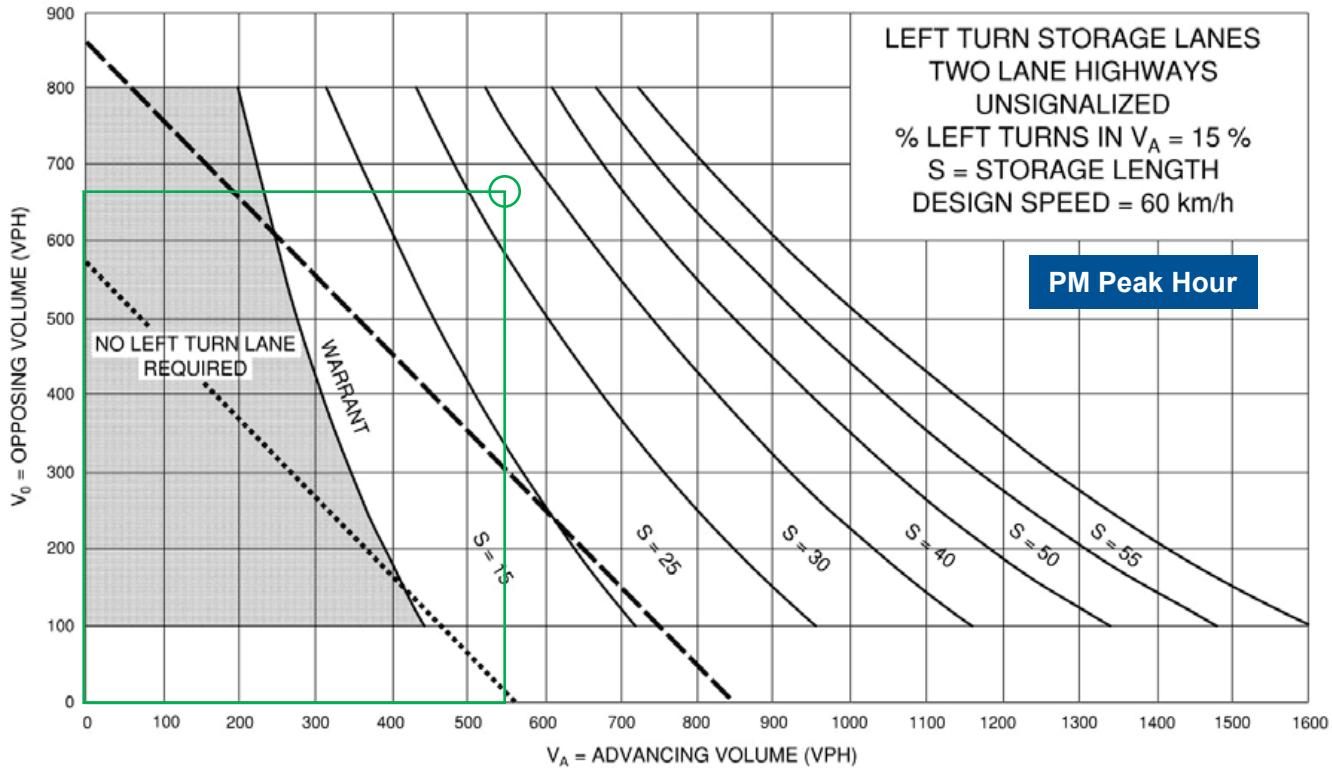




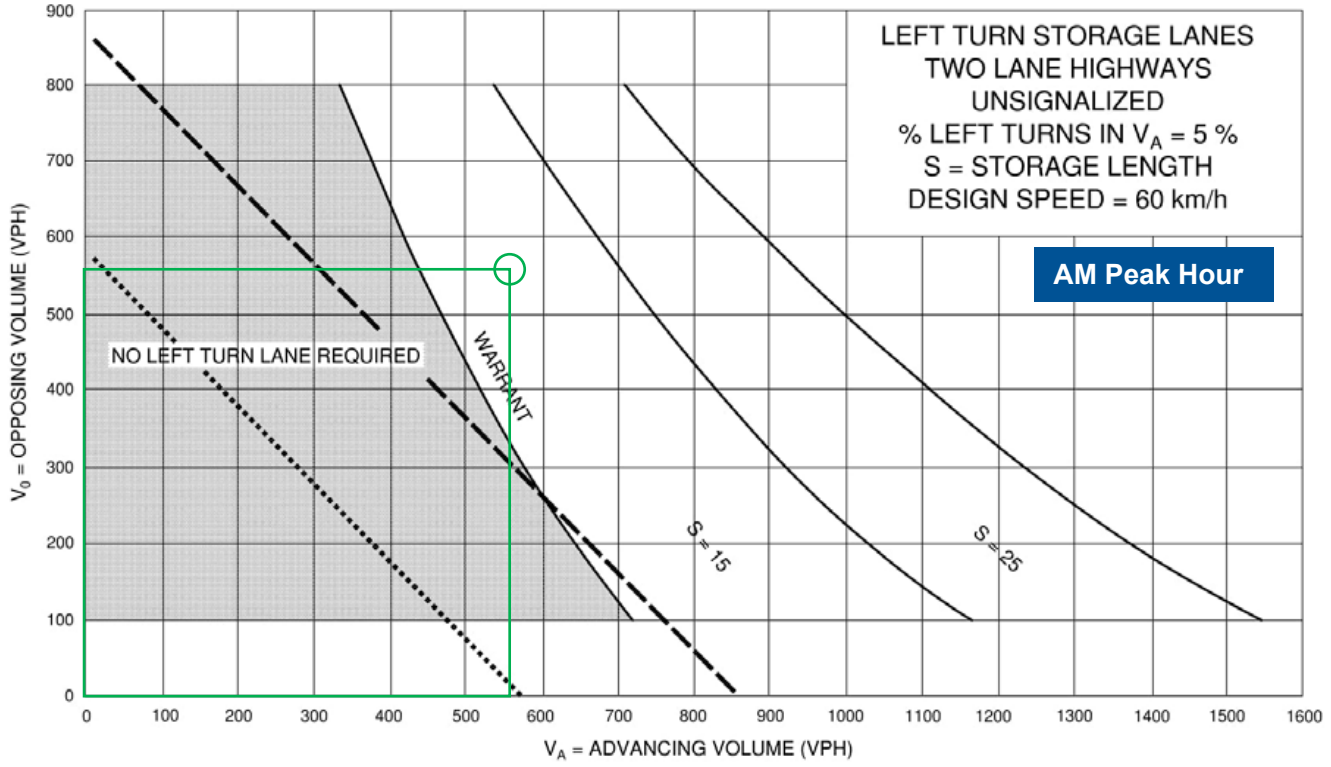
paradigm TRANSPORTATION SOLUTIONS LIMITED

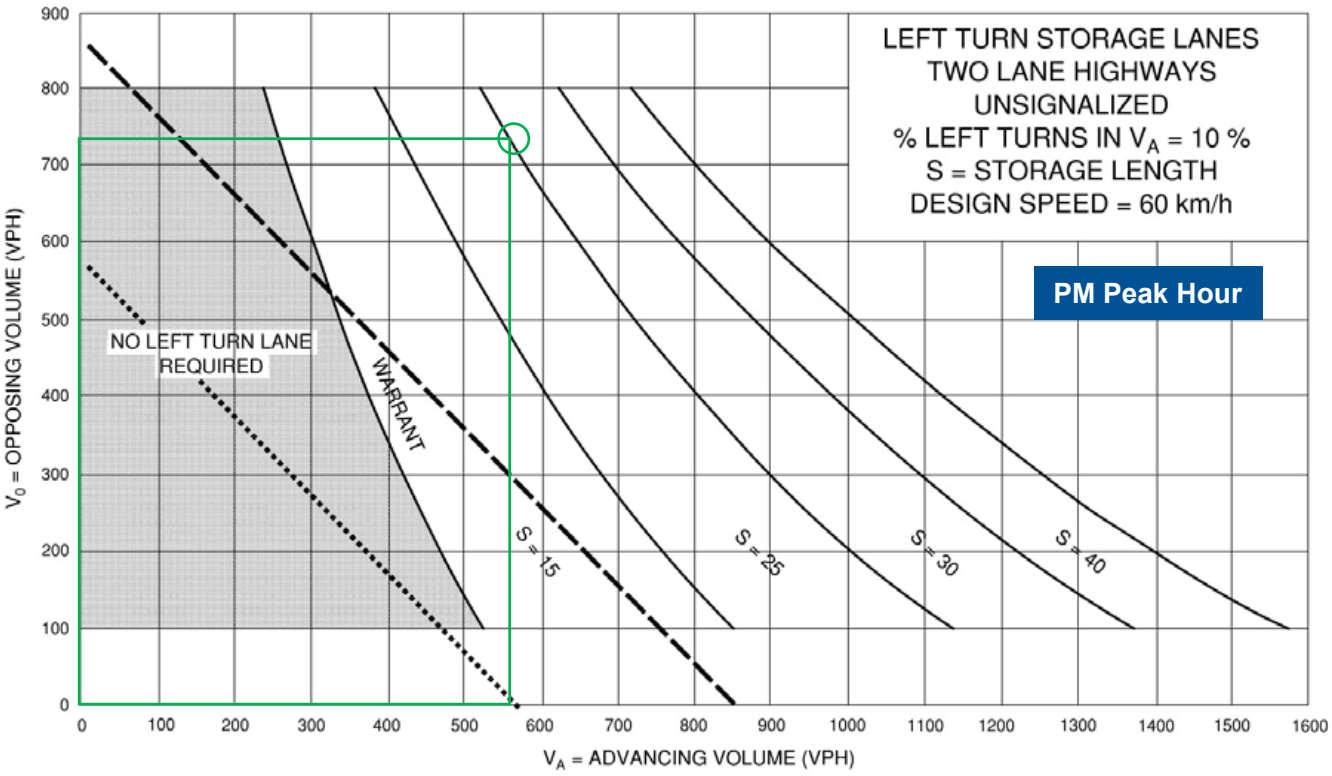
Northbound Left-Turn Lane
Plains Road East & Site Access 2
2029 Total Traffic Volumes





Northbound Left-Turn Lane
Plains Road East & Site Access 2
2034 Total Traffic Volumes





Northbound Left-Turn Lane
Plains Road East & Site Access 2
2039 Total Traffic Volumes