Dickson Drive Extension

Township of Centre Wellington

Traffic Impact Study

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1.0 INTRODUCTION

Triton Engineering Services Limited was retained by the Township of Centre Wellington (Township) to complete a Traffic Impact Study to support a Municipal Class Environmental Assessment (EA) for the proposed extension of Dickson Drive in Fergus. The Township owns property east of the existing limit of Dickson Drive. In order to facilitate development of these lands, the Township is proposing to extend Dickson Drive. The proposed extension will provide access to industrial, commercial, and/or institutional employment lands to allow for continued economic growth and promote a live/work opportunity within the Township. The purpose of the study is to address the impact of this road extension on the adjacent road system.

1.1 Background Documents

The following documents prepared on behalf of the Township of Centre Wellington provide background reference for this Study:

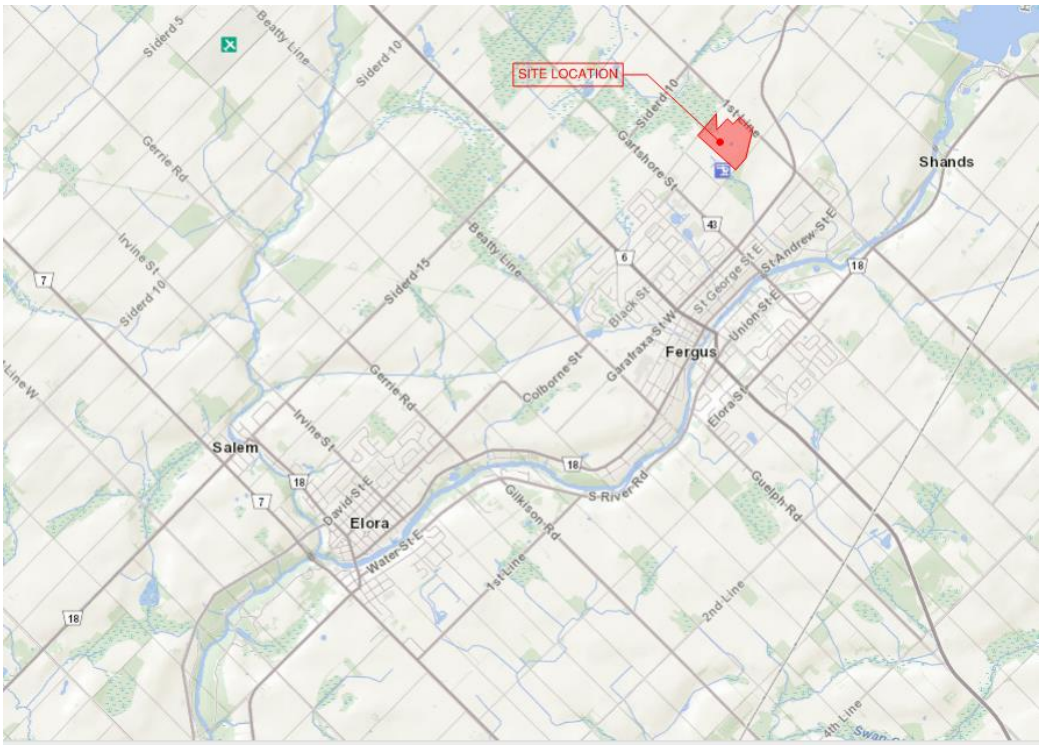
Centre Wellington Business Park Strategy Report, March 2021, McSweeney establishes the objectives and criteria for the development of the subject property as a Business Park. Proposed uses for the property are identified. The Report includes the extension of Dickson Drive to First Line.

Township of Centre Wellington Transportation Master Plan, January 2019 (TMP) addressed the existing transportation system and identified future improvements to accommodate forecast growth. The TMP contemplates the extension of Dickson Drive to First Avenue. It also identified long term transportation improvements including the identification of future roadways to improve north-south connectivity in Fergus.

2.0 EXISTING CONDITIONS

2.1 Road Network

The proposed site is located on 6518 First Line, in the Township of Centre Wellington, with a proposed connection to the east end of Dickson Drive and to First Line, approximately 850m north of the intersection with Wellington Road 19. The location of the site is shown on the Key Plan below.



Key Plan

Dickson Drive is an existing east-west industrial road under the jurisdiction of the Township of Centre Wellington. It is paved with a rural cross-section, with one travel lane in each direction, gravel shoulders and an assumed speed limit of 50km/h.

Gartshore Street at Dickson Drive is an existing north-south arterial road under the jurisdiction of the County of Wellington. It is paved with a rural cross-section, with one travel lane in each direction, gravel shoulders and a posted speed limit of 50km/h. The intersection of Gartshore Street and Dickson Drive is an unsignalized, three-leg intersection, with Dickson Drive under stop control

Gartshore Street at Garafraxa Street is a north-south arterial road under the jurisdiction of the County of Wellington. It is a paved road with one travel lane in each direction, and has an urban cross-section with concrete curb and gutter. It has a posted speed limit of 50km/h, and a separate left-turn lane at the intersection with Garafraxa Street. Garafraxa Street is an east-west arterial road under the jurisdiction of the County of Wellington. It has an urban cross-section with one lane in each direction, a posted speed limit of 40km/h, and a separate left-turn lane at the intersection with Gartshore Street. The intersection of Gartshore Street and Garafraxa Street is signalized

First Line is a north-south paved road under the jurisdiction of the Township of Centre Wellington. It has a rural cross-section with one lane in each direction and an assumed speed limit of 80km/h. Wellington Road 19 is an east-west road under the jurisdiction of

the County of Wellington. It is a paved road with a rural cross-section, with one lane in each direction, gravel shoulders, and a posted speed limit of 70km/h. The intersection of First Line and Wellington Road 19 is unsignalized, with right turn tapers on Wellington Road 19. The south approach of the intersection is named Anderson Street and is a two lane paved local street.

St. David Street (Highway 6) is a north-south arterial road under the jurisdiction of the Township of Centre Wellington. It has an urban cross-section with one lane in each direction and a two-way centre left-turn lane. St. David Street falls under the connecting link program and has a posted speed limit of 50km/h, and separate left-turn lanes at the intersection with Gordon Street. Gordon Street is an east-west collector road under the jurisdiction of the Township of Centre Wellington with one lane in each direction, a posted speed limit of 50km/h, and a separate left-turn lane at the intersection with St. David Street. The intersection of St. David Street and Gordon Street is signalized with an advanced left turn phase for southbound traffic during the AM peak and an advanced left turn for northbound traffic during the PM peak.

2.2 Adjacent Land Use

The surrounding area of the site is zoned a mixture of agricultural, conservation area, general industrial, and institutional. There are agricultural lands to the east and south, a conservation area to the north, and industrial lands to the west.

2.3 Existing Property

The existing property is an agricultural field bounded by First Line to the east, conservation area to the north, industrial properties to the west and the Elora Cataract Trailway to the south. There is a Canadian Reformed Church and two residential dwellings on the northeast corner of the property. A Heritage residential dwelling is on the existing property, with a driveway to First Line approximately 750m north of the intersection with Wellington Road 19. The building is proposed to remain, but the driveway will be removed, with a new entrance provided on the proposed Dickson Drive extension.

3.0 PROPOSED DEVELOPMENT

A preliminary road plan is enclosed in Appendix A. The proposed extension consists of a new road connection from the existing Dickson Drive to First Line, and a 220m long cul-de-sac approximately 300m west of the connection to First Line. The lot fabric and proposed land use will be determined as the property is sold to prospective developers. For the purposes of the Class EA and this study, a lot fabric has been assumed as shown on the preliminary plan and the land use is expected to be a mix of light industrial, offices, servicing, or warehousing. The total area of the site is 55.9 acres, with 42.9 acres being

available for development. The remaining area of the site includes the proposed road and a GRCA wetland on the north side of the site.

The extension is expected to be constructed in 2023.

4.0 EXISTING TRAFFIC

Weekday morning and afternoon peak period traffic counts were performed on the dates listed in Table 1 below.

Table 1: Traffic Count Dates

Intersection	Date of Traffic Count
Dickson Drive and Gartshore Street	21/09/2021
Gartshore Street and Garafraxa Street	22/09/2021
First Line and Wellington Road 19	23/09/2021
St. David Street and Gordon Street	08/12/2021

The existing AM and PM peak hours were determined for each intersection and are illustrated with the volumes on Figure 1.

Existing levels of service for each intersection were analyzed based on the *Highway Capacity Manual, 2000,* using Synchro 10 software version 10.1. Level of Service definitions are included in Appendix B. The detailed capacity analyses outputs are included in Appendix C. Table 2 outlines the existing levels of service for the intersections.

Table 2: 2021 Existing Traffic Level of Service

Intersection	Movement	Level of Service (Delay, s)	
		Weekday AM	Weekday PM
St. David Street and Gordon Street (Signalized)	EB left	C (28.9)	C (29.6)
	EB thru-right	C (28.8)	C (28.4)
	EB Overall	**C (28.8)**	**C (28.6)**
	WB left	C (32.8)	C (33.0)
	WB thru-right	C (29.8)	C (29.3)
	WB Overall	**C (30.9)**	**C (30.4)**
	NB left	A (7.3)	A (6.9)
	NB thru-right	B (11.7)	B (14.5)
	NB Overall	**B (11.4)**	**B (13.4)**
	SB left	A (4.7)	A (6.3)
	SB thru-right	A (7.6)	B (10.2)
	SB Overall	**A (6.4)**	**A (8.8)**
Dickson Drive and Gartshore Street (Unsignalized)	WB left-right	B (12.8)	B (12.5)
	NB thru-right	A (0.0)	A (0.0)
	SB left-thru	A (1.6)	A (0.5)

Intersection	Movement	Level of Service (Delay, s)	
		Weekday AM	Weekday PM
Gartshore Street and Garafraxa Street (Signalized)	EB left	B (16.3)	B (16.8)
	EB thru-right	B (18.1)	B (19.7)
	EB Overall	**B (18.0)**	**B (19.4)**
	WB left	C (21.1)	B (18.8)
	WB thru-right	B (19.8)	B (18.5)
	WB Overall	**C (20.3)**	**B (18.6)**
	NB left	A (7.3)	A (6.7)
	NB thru-right	A (7.8)	A (7.6)
	NB Overall	**A (7.6)**	**A (7.4)**
	SB left	A (6.8)	A (6.4)
	SB thru-right	A (7.5)	A (8.7)
	SB Overall	**A (7.4)**	**A (8.4)**
First Line and Wellington Road 19 (Unsignalized)	EB left-thru-right	A (1.1)	A (0.4)
	WB left-thru-right	A (0.7)	A (0.9)
	NB left-thru-right	B (10.8)	B (11.4)
	SB left-thru-right	B (11.2)	B (11.9)

All intersections are operating at good to acceptable levels of service during the Weekday AM and PM peak hours.

5.0 EXISTING TRAFFIC AFTER DICKSON DRIVE EXTENSION COMPLETED

The existing traffic volumes were re-distributed based on the completion of the Dickson Drive extension to First Line. For the purposes of this analysis, it was assumed that 15% of the traffic entering/exiting the existing industrial lands on Dickson Drive would be coming from/traveling to the east via Wellington Road 19. Once Dickson Drive is extended to First Line, it was assumed that this 15% of traffic would be entering/existing the industrial lands via First Line as shown on Figure 2.

Levels of service were calculated for the Weekday AM and PM peaks at the intersections, including the proposed intersection of Dickson Drive and First Line, and are summarized in Table 3. The detailed capacity analyses outputs are included in Appendix C.

Table 3: Existing Levels of Service After Dickson Drive Constructed

Intersection	Movement	Level of Service (Delay, s)	
		Weekday AM	Weekday PM
St. David Street and Gordon Street (Signalized)	EB left	C (28.9)	C (29.6)
	EB thru-right	C (28.8)	C (28.4)
	EB Overall	**C (28.8)**	**C (28.6)**
	WB left	C (32.8)	C (33.0)
	WB thru-right	C (29.8)	C (29.3)
	WB Overall	**C (30.9)**	**C (30.4)**
	NB left	A (7.3)	A (6.9)
	NB thru-right	B (11.7)	B (14.5)
	NB Overall	**B (11.4)**	**B (13.4)**
	SB left	A (4.7)	A (6.3)
	SB thru-right	A (7.6)	B (10.2)
	SB Overall	**A (6.4)**	**A (8.8)**
Dickson Drive and Gartshore Street (Unsignalized)	WB left-right	B (12.5)	B (12.2)
	NB thru-right	A (0.0)	A (0.0)
	SB left-thru	A (1.6)	A (0.5)
Gartshore Street and Garafraxa Street (Signalized)	EB left	B (16.3)	B (16.8)
	EB thru-right	B (18.1)	B (19.7)
	EB Overall	**B (18.0)**	**B (19.4)**
	WB left	C (21.1)	B (18.8)
	WB thru-right	B (19.8)	B (18.5)
	WB Overall	**C (20.3)**	**B (18.6)**
	NB left	A (7.3)	A (6.7)
	NB thru-right	A (7.8)	A (7.6)
	NB Overall	**A (7.6)**	**A (7.4)**
	SB left	A (6.8)	A (6.4)
	SB thru-right	A (7.5)	A (8.7)
	SB Overall	**A (7.4)**	**A (8.4)**
First Line and Wellington Road 19 (Unsignalized)	EB left-thru-right	A (1.1)	A (0.4)
	WB left-thru-right	A (0.7)	A (0.9)
	NB left-thru-right	B (10.8)	B (11.4)
	SB left-thru-right	B (12.0)	B (13.2)
Dickson Drive and First Line (Unsignalized)	EB left-right	A (8.4)	A (8.4)
	NB thru-right	A (1.2)	A (1.4)
	SB left-thru	A (0.0)	A (0.0)

After the extension is constructed to First Line, the existing intersections will continue to operate at good to acceptable levels of service, with negligible difference in delays due to the traffic re-distribution. The proposed intersection of Dickson Drive and First Line will operate at a very good level of service during the weekday AM and PM peak hours. The surrounding road network can fully accommodate the extension of Dickson Drive to First Line.

6.0 FUTURE BACKGROUND TRAFFIC

For the purpose of this study, the current year, a 5-year horizon, and a 10-year horizon were used. A conservative annual growth rate of 2% was applied to the existing traffic volumes to establish the background 2026 and 2031 traffic for this study, illustrated in Figures 3 and 4 respectively. The area surrounding the development is expected to remain relatively stable over the next few years.

Levels of service were calculated for the Weekday AM and PM peaks at the intersections using the background traffic volumes and are summarized in Table 4 and

Table 5. The detailed capacity analyses outputs are included in Appendix C.

Table 4: 2026 Background Traffic Levels of Service

Intersection	Movement	Level of Service (Delay, s)	
		Weekday AM	Weekday PM
St. David Street and Gordon Street (Signalized)	EB left	C (29.1)	C (30.1)
	EB thru-right	C (28.8)	C (28.4)
	EB Overall	**C (28.9)**	**C (28.7)**
	WB left	C (33.5)	C (34.1)
	WB thru-right	C (29.9)	C (29.4)
	WB Overall	**C (31.2)**	**C (30.8)**
	NB left	A (7.7)	A (7.2)
	NB thru-right	B (12.8)	B (16.6)
	NB Overall	**B (12.5)**	**B (15.1)**
	SB left	A (5.1)	A (7.5)
	SB thru-right	A (8.0)	B (11.1)
	SB Overall	**A (6.9)**	**A (9.8)**
Dickson Drive and Gartshore Street (Unsignalized)	WB left-right	B (13.2)	B (12.9)
	NB thru-right	A (0.0)	A (0.0)
	SB left-thru	A (1.6)	A (0.5)
Gartshore Street and Garafraxa Street (Signalized)	EB left	B (16.1)	B (16.7)
	EB thru-right	B (18.2)	B (20.0)
	EB Overall	**B (18.1)**	**B (19.6)**
	WB left	C (22.7)	B (19.0)
	WB thru-right	B (20.0)	B (18.7)
	WB Overall	**C (20.9)**	**B (18.8)**
	NB left	A (8.0)	A (7.4)
	NB thru-right	A (8.6)	A (8.2)
	NB Overall	**A (8.4)**	**A (8.0)**
	SB left	A (7.4)	A (6.8)
	SB thru-right	A (8.3)	A (10.0)
	SB Overall	**A (8.1)**	**A (9.6)**

Intersection	Movement	Level of Service (Delay, s)	
		Weekday AM	Weekday PM
First Line and Wellington Road 19 (Unsignalized)	EB left-thru-right	A (1.2)	A (0.4)
	WB left-thru-right	A (0.8)	A (0.9)
	NB left-thru-right	B (11.3)	B (12.1)
	SB left-thru-right	B (13.2)	B (14.6)
Dickson Drive and First Line (Unsignalized)	EB left-right	A (8.4)	A (8.4)
	NB thru-right	A (1.2)	A (1.4)
	SB left-thru	A (0.0)	A (0.0)

Table 5: 2031 Background Traffic Levels of Service

Intersection	Movement	Level of Service (Delay, s)	
		Weekday AM	Weekday PM
St. David Street and Gordon Street (Signalized)	EB left	C (28.7)	C (30.6)
	EB thru-right	C (28.4)	C (28.6)
	EB Overall	**C (28.5)**	**C (28.9)**
	WB left	C (34.5)	D (35.4)
	WB thru-right	C (29.6)	C (30.3)
	WB Overall	**C (31.3)**	**C (31.5)**
	NB left	A (7.6)	A (7.9)
	NB thru-right	B (14.3)	B (19.8)
	NB Overall	**B (13.8)**	**B (18.0)**
	SB left	A (5.9)	B (10.3)
	SB thru-right	A (9.3)	B (12.3)
	SB Overall	**A (7.9)**	**B (11.6)**
Dickson Drive and Gartshore Street (Unsignalized)	WB left-right	B (14.1)	B (13.9)
	NB thru-right	A (0.0)	A (0.0)
	SB left-thru	A (1.7)	A (0.6)
Gartshore Street and Garafraxa Street (Signalized)	EB left	B (16.0)	B (16.6)
	EB thru-right	B (18.6)	C (20.3)
	EB Overall	**B (18.4)**	**B (19.9)**
	WB left	C (26.3)	B (19.6)
	WB thru-right	C (20.4)	B (18.9)
	WB Overall	**C (22.4)**	**B (19.1)**
	NB left	A (8.8)	A (8.5)
	NB thru-right	A (9.4)	A (8.9)
	NB Overall	**A (9.2)**	**A (8.8)**
	SB left	A (8.1)	A (7.4)
	SB thru-right	A (9.0)	B (11.8)
	SB Overall	**A (8.8)**	**B (11.2)**
First Line and Wellington Road 19	EB left-thru-right	A (1.2)	A (0.5)
	WB left-thru-right	A (0.8)	A (1.0)

Intersection	Movement	Level of Service (Delay, s)	
		Weekday AM	Weekday PM
(Unsignalized)	NB left-thru-right SB left-thru-right	B (11.8) B (13.9)	B (12.9) C (15.9)
Dickson Drive and First Line (Unsignalized)	EB left-right NB thru-right SB left-thru	A (8.4) A (1.5) A (0.0)	A (8.5) A (1.3) A (0.0)

The intersections will continue to operate at good to acceptable levels of service during the 2026 and 2031 AM and PM peak hours.

7.0 SITE GENERATED TRAFFIC

6.1 General

As identified in the *Centre Wellington Business Park Strategy* Report prepared by McSweeney, target uses include light industrial, office uses, research and development, training centres, contractors and trades. The uses are not intended to cater to the general public, or include large scale industrial facilities.

At this time, the usage and timing of each site development is not known. Estimates of future traffic will be based on anticipated usage. As the individual lots are identified and sold, the purchasers will be required to provide a traffic impact study based on the proposed usage. The level of study required will be based on the proposed usage.

To make a preliminary estimate of future traffic, trip generation was forecast for future developments using the *Institute of Transportation Engineers (ITE) Trip Generation Manual,* which provides trip generation rates for various uses from studies of similar developments, and was used in this analysis. For the purpose of this study, it is assumed that all trips generated by the development are primary trips, providing a conservative approach.

6.2 Trip Generation

The lot layout for the development site is unknown at this time but is expected to provide a variety of uses as described in the Land Feasibility Study, March 2021 completed by McSweeney for the Township. The Business Park ITE Code 770 provides trip generation for a site that contains a variety of business uses, including office spaces, studios, contractors and trades, research and development facility, etc., and was considered to be the most appropriate data source for the proposed usage.

Based on the preliminary site lot fabric and an assumed average building size of 15,000 ft², the total site gross floor area was used to calculate the total trips generated by the site during the AM and PM peak hour and is illustrated in Table 6. As noted previously, the lot fabric is preliminary only. If larger buildings are proposed, it is anticipated that larger lots

would be created to accommodate them, which would decrease the total number of lots. The estimated total gross floor area of 360,000 ft^2 provides a reasonable estimate of the total building coverage anticipated for the property.

Table 6: Trip Generation

Land Use	Total Site Gross Floor Area	Trips Generated per Unit					
		Weekday AM			Weekday PM		
		Total	Entering	Exiting	Total	Entering	Exiting
Business Park	360,000 ft²	457	389	68	451	118	333

The trips generated by the development were distributed and assigned to the road network based on local traffic patterns, as well as expected origin and destination, as shown in Table 7 below. The site generated distributions and traffic volumes are also illustrated on Figures 5 and 6.

Table 7: Site Generated Trip Distribution

Direction	Route	Distribution
South	Gartshore Street	20%
West	Gartshore Street and Garafraxa Street	25%
West	First Line and Garafraxa Street	10%
North	Gartshore Street and Gordon/St. David Street	30%
East	First Line and Wellington Road 18	15%
Total		**100%**

8.0 FUTURE TRAFFIC

The total site generated traffic was added to the 2026 and 2031 background traffic volumes at each of the analyzed intersections to determine the total 2026 and 2031 future peak hour traffic, as illustrated in Figures 7 and 8 respectively.

8.1 Site Generated Traffic Impact Analysis

A level of service analysis was carried out to determine the impact of the trips generated by the development on the intersections during the Weekday AM and PM peak hours. The detailed capacity analyses are included in Appendix C. Table 8 and Table 9 summarize the future levels of service in 2026 and 2031 respectively.

Table 8: 2026 Future Traffic Levels of Service

Intersection	Movement	Level of Service (Delay, s)	
		Weekday AM	Weekday PM
St. David Street and Gordon Street (Signalized)	EB left	C (30.1)	C (30.4)
	EB thru-right	C (29.6)	C (28.7)
	EB Overall	**C (29.8)**	**C (29.0)**
	WB left	C (34.7)	C (34.7)
	WB thru-right	C (30.9)	C (30.3)
	WB Overall	**C (32.1)**	**C (31.3)**
	NB left	A (8.2)	A (7.5)
	NB thru-right	B (13.7)	B (17.0)
	NB Overall	**B (13.3)**	**B (15.5)**
	SB left	A (7.3)	A (8.3)
	SB thru-right	A (7.9)	B (11.0)
	SB Overall	**A (7.6)**	**A (9.9)**
Dickson Drive and Gartshore Street (Unsignalized)	WB left-right	E (35.4)	F (98.6)
	NB thru-right	A (0.0)	A (0.0)
	SB left-thru	A (5.9)	A (3.3)
Gartshore Street and Garafraxa Street (Signalized)	EB left	C (22.4)	B (18.2)
	EB thru-right	C (20.6)	C (20.1)
	EB Overall	**C (21.2)**	**B (19.7)**
	WB left	C (26.6)	B (19.0)
	WB thru-right	B (19.8)	B (19.6)
	WB Overall	**C (22.1)**	**B (19.4)**
	NB left	A (8.5)	C (21.3)
	NB thru-right	A (9.9)	A (8.7)
	NB Overall	**A (9.6)**	**B (10.7)**
	SB left	A (8.1)	A (7.1)
	SB thru-right	A (9.0)	C (34.6)
	SB Overall	**A (8.8)**	**C (32.3)**
First Line and Wellington Road 19 (Unsignalized)	EB left-thru-right	A (3.7)	A (1.0)
	WB left-thru-right	A (0.6)	A (0.8)
	NB left-thru-right	B (13.4)	B (12.9)
	SB left-thru-right	C (17.7)	D (28.3)
Dickson Drive and First Line (Unsignalized)	EB left-right	A (8.5)	A (8.8)
	NB thru-right	A (6.1)	A (5.4)
	SB left-thru	A (0.0)	A (0.0)

Table 9: 2031 Future Traffic Levels of Service

Intersection	Movement	Level of Service (Delay, s)	
		Weekday AM	Weekday PM
St. David Street and Gordon Street (Signalized)	EB left	C (29.6)	C (31.1)
	EB thru-right	C (29.1)	C (29.0)
	EB Overall	**C (29.3)**	**C (29.4)**
	WB left	D (35.5)	D (36.3)
	WB thru-right	C (30.5)	C (30.8)
	WB Overall	**C (32.1)**	**C (32.1)**
	NB left	A (8.2)	A (8.2)
	NB thru-right	B (15.3)	B (20.6)
	NB Overall	**B (14.8)**	**B (18.7)**
	SB left	B (10.6)	B (12.6)
	SB thru-right	A (9.1)	B (12.1)
	SB Overall	**A (9.9)**	**B (12.3)**
Dickson Drive and Gartshore Street (Unsignalized)	WB left-right	E (43.5)	F (143.9)
	NB thru-right	A (0.0)	A (0.0)
	SB left-thru	A (5.9)	A (3.3)
Gartshore Street and Garafraxa Street (Signalized)	EB left	C (23.5)	B (18.5)
	EB thru-right	C (21.1)	C (20.1)
	EB Overall	**C (21.9)**	**B (19.7)**
	WB left	C (34.2)	B (19.2)
	WB thru-right	C (20.3)	C (20.6)
	WB Overall	**C (25.0)**	**C (20.2)**
	NB left	A (9.4)	C (32.7)
	NB thru-right	B (11.1)	A (9.9)
	NB Overall	**B (10.7)**	**B (13.5)**
	SB left	A (8.9)	A (8.0)
	SB thru-right	A (9.7)	E (60.9)
	SB Overall	**A (9.6)**	**E (56.4)**
First Line and Wellington Road 19 (Unsignalized)	EB left-thru-right	A (3.7)	A (1.0)
	WB left-thru-right	A (0.6)	A (0.8)
	NB left-thru-right	B (14.0)	B (13.8)
	SB left-thru-right	C (19.3)	E (36.2)
Dickson Drive and First Line (Unsignalized)	EB left-right	A (8.5)	A (8.8)
	NB thru-right	A (6.0)	A (5.3)
	SB left-thru	A (0.0)	A (0.0)

The levels of service for the unsignalized intersection of Dickson Drive and Gartshore Street decline to an unacceptable level for the westbound movement during the 2026 horizon year, with a volume/capacity ratio of 98.6, indicating that capacity will have been reached. To alleviate delays at this intersection, it was analyzed as a signalized

intersection with a separate southbound left turn lane during the 2031 horizon year and the levels of service are shown in the table below.

Table 10: Dickson Drive and Gartshore Street Level of Service for Signalization

Intersection	Movement	Level of Service (Delay, s)	
		AM	PM
Dickson Drive and Gartshore Street (Signalized)	WB left-right	D (37.3)	B (19.0)
	NB thru-right	A (7.9)	B (11.2)
	SB left	A (9.6)	A (9.1)
	SB thru-right	A (5.9)	A (8.4)
	SB Overall	**A (7.7)**	**A (8.5)**

Upgrading the intersection with signals will improve the levels of service to acceptable levels. Since the final development land use and lot fabric is not known and could vary, it is recommended to monitor traffic operations at this intersection and require developers on the site to submit a Traffic Impact Study with updated traffic counts at this intersection to determine the need and timing for traffic signals at this intersection.

The other studied intersections will continue to operate at a good to acceptable level of service during the AM and PM peak hours with very minor increases in delay times with the following exceptions:

- Gartshore and Garafraxa SB thru-right movement declines from LOS B (11.8) to LOS E (60.9) during the 2031 PM Peak;
- First Line and WR 19 SB left-thru-right movement declines from LOS C (15.9) to LOS E (36.2) during the 2031 PM Peak.

While these declines in LOS will be noticeable over time, LOS E is considered to be an acceptable condition during peak traffic operations, and the V/C ratios indicate that there will still be sufficient reserve capacity for these movements.

8.2 Left Turn Lane Warrant Analysis

A left turn lane warrant analysis was undertaken for the unsignalized intersection of Dickson Drive and First Line based on the MTO's Geometric Design Standards. The results of the analysis are in Table 11 below for the horizon years 2026 and 2031.

Table 11: Left Turn Lane Warrant Analysis based on 2026 Horizon Year

Intersection	Design Speed (km/h)	Peak Hour Period	Percentage of left turns	Volume of approaching traffic	Volume of opposing traffic	Warranted?
Future Horizon Year 2026						
Dickson Drive and First Line	80	AM	81%	126	13	No
		PM	73%	45	22	No
Future Horizon Year 2031						
Dickson Drive and First Line	80	AM	80%	129	14	No
		PM	72%	46	24	No

A left turn lane will not be warranted at the intersection of Dickson Drive and First Line due to the low volumes of opposing traffic.

8.3 Sight Distance Analysis

Minimum stopping sight distances for various road grades and design speeds are provided in Table 2.5.3 in the TAC *Geometric Design Guide for Canadian Roads.* It was assumed the speed limit of First Line is 80km/h. The approximate sight distances at the proposed intersection are compared to the minimum provided by TAC in Table 12 below.

Table 12: Proposed Intersection Sight Distance Comparison

Direction	Grade	Minimum Stopping Sight Distance (m)	Approximate Sight Distance at Entrance (m)
South	Level	130	850
North	Level	130	150

The sightlines in both directions at the proposed entrance location are greater than the minimum required.

8.4 Integration with the Township of Centre Wellington Transportation Master Plan

The Township's Transportation Master Study identifies road network improvements for short, medium, and long term time frames. Included in the long term period is an extension of Gartshore Street northerly to Sideroad 15, and improvements to SR 15 to Highway 6. This would provide a northerly connection from Highway 6 to the industrial area that would divert traffic from Gordon Street. The long term time frame is identified as 2041 (20 year horizon). As this time period is beyond the maximum horizon period for this study (2031), this connection was not considered in the analysis. In the long term, this connection would improve access to Dickson Drive from the north. As traffic volumes are monitored, the need and timing of these long term improvements can be reviewed and updated as required.

9.0 CONCLUSIONS AND RECOMMENDATIONS

- The existing road network can accommodate the proposed extension of Dickson Drive to First Line;
- As the Business Park develops, improvements will be required at the intersection of Gartshore Street and Dickson Drive, including traffic signals and a SB left turn lane. The timing of these improvements will depend on the actual development of the business park properties;
- Since details on the number of developments and their land uses are not known at this time, it is recommended to have the developments submit updated studies and traffic counts to confirm the need and timing of improvements;
- The sightlines at the proposed intersection of First Line and Dickson Drive are acceptable.

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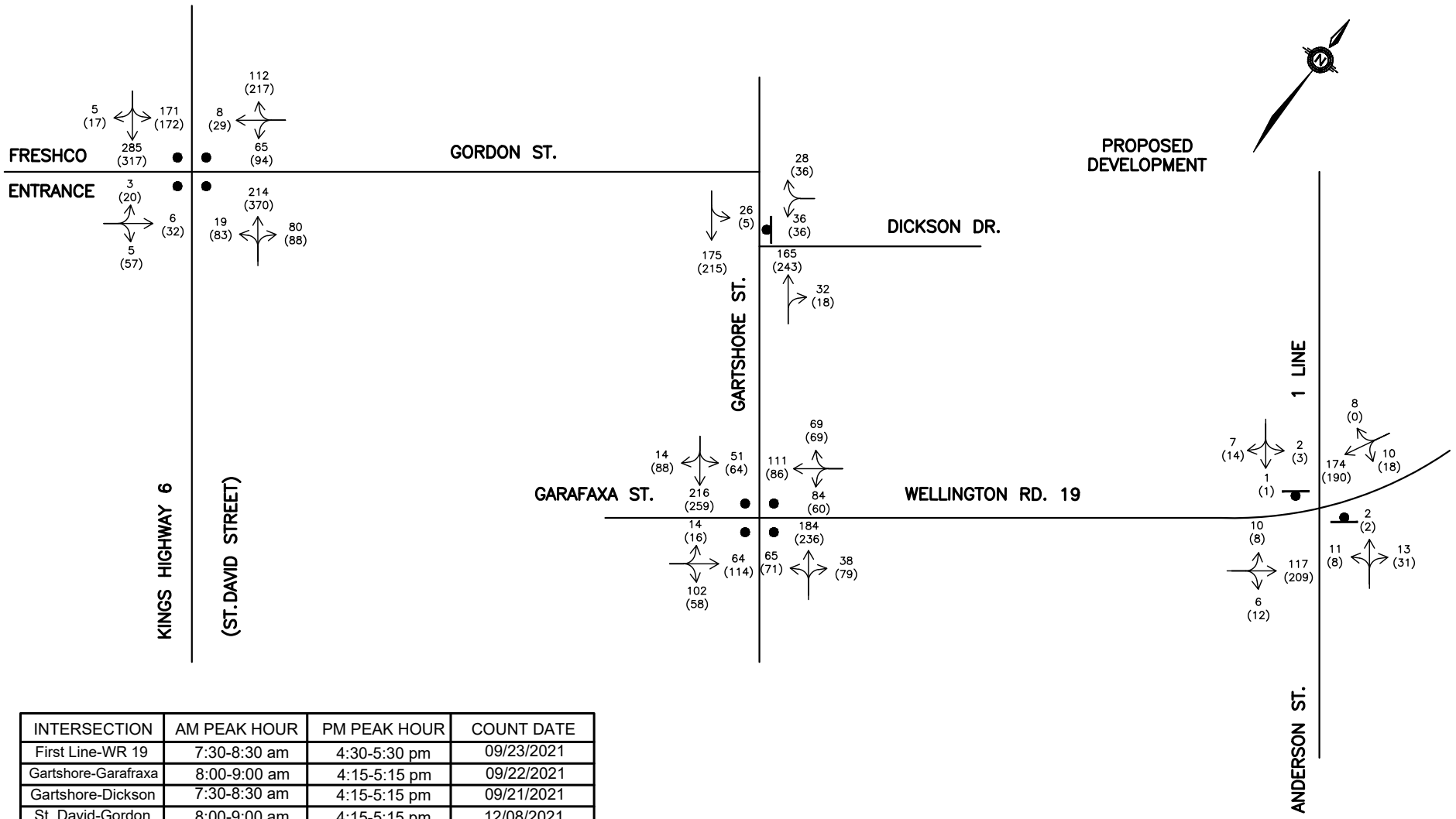


Taylor Kramp, P. Eng.



Howard Wray, P. Eng.

FIGURES



INTERSECTION	AM PEAK HOUR	PM PEAK HOUR	COUNT DATE
First Line-WR 19	7:30-8:30 am	4:30-5:30 pm	09/23/2021
Gartshore-Garafraxa	8:00-9:00 am	4:15-5:15 pm	09/22/2021
Gartshore-Dickson	7:30-8:30 am	4:15-5:15 pm	09/21/2021
St. David-Gordon	8:00-9:00 am	4:15-5:15 pm	12/08/2021

(NOT TO SCALE)

LEGEND:

STOP CONTROL

25 (25) AM PEAK HOUR / PM PEAK HOUR TRAFFIC VOLUMES

EXISTING ROAD

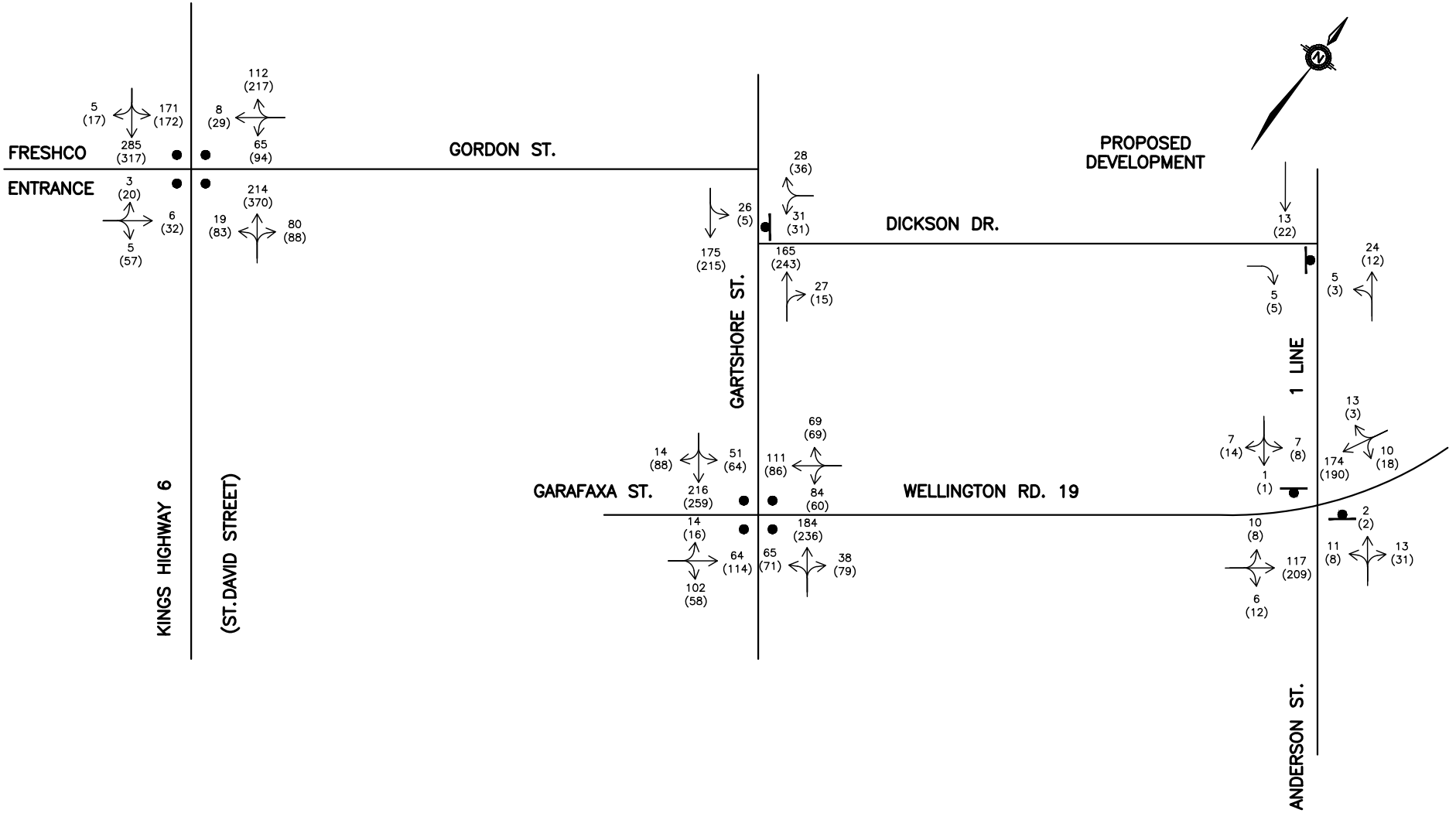
TRAFFIC FLOW

TRAFFIC SIGNALS

PROPOSED ENTRANCE

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Consulting Engineers

FIGURE 1:
2021 EXISTING PEAK HOUR TRAFFIC



(NOT TO SCALE)

LEGEND:

STOP CONTROL

25 (25) AM PEAK HOUR / PM PEAK HOUR TRAFFIC VOLUMES

EXISTING ROAD

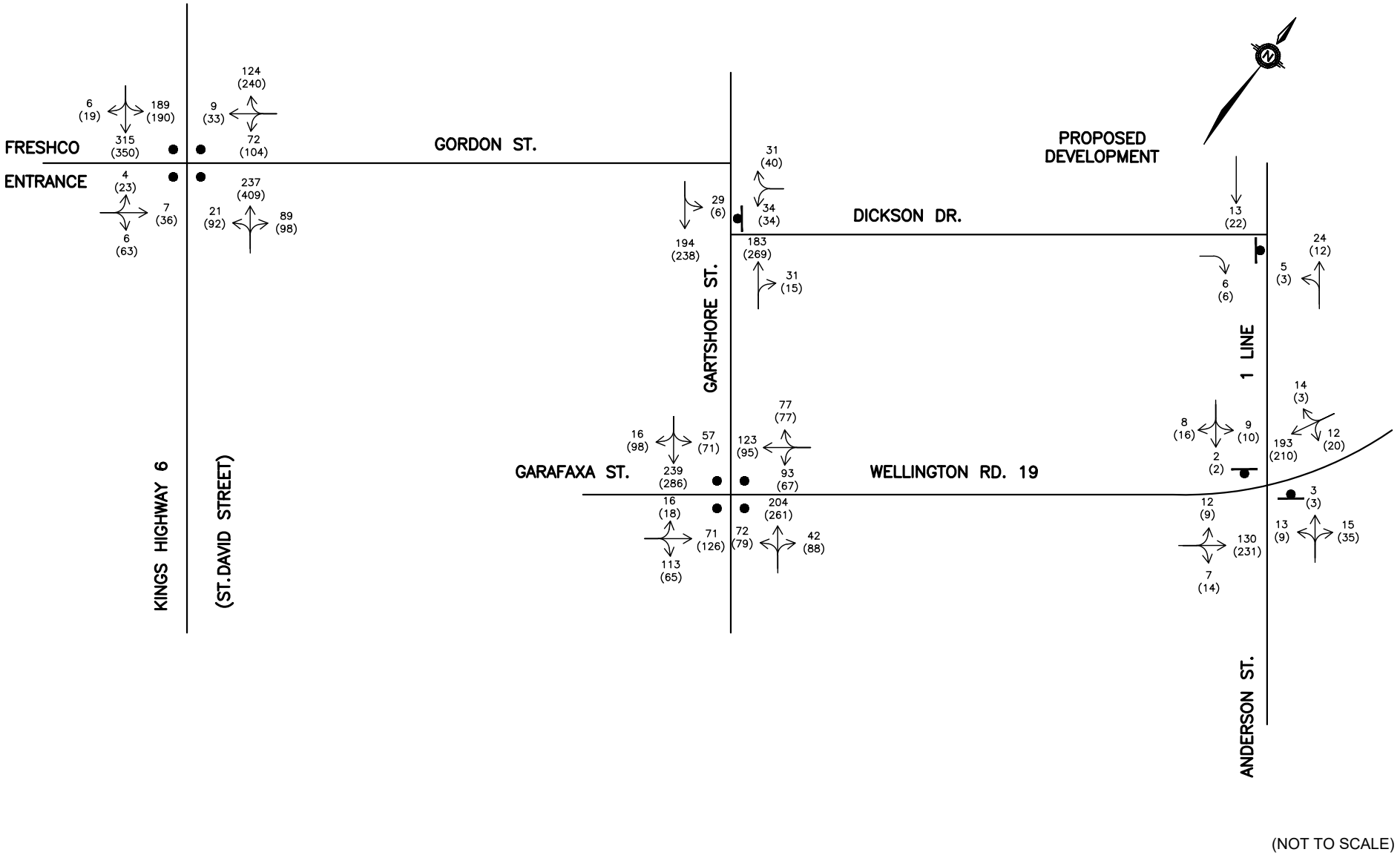
TRAFFIC FLOW

TRAFFIC SIGNALS

PROPOSED ENTRANCE

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FIGURE 2:
EXISTING PEAK HOUR TRAFFIC AFTER EXTENSION COMPLETED



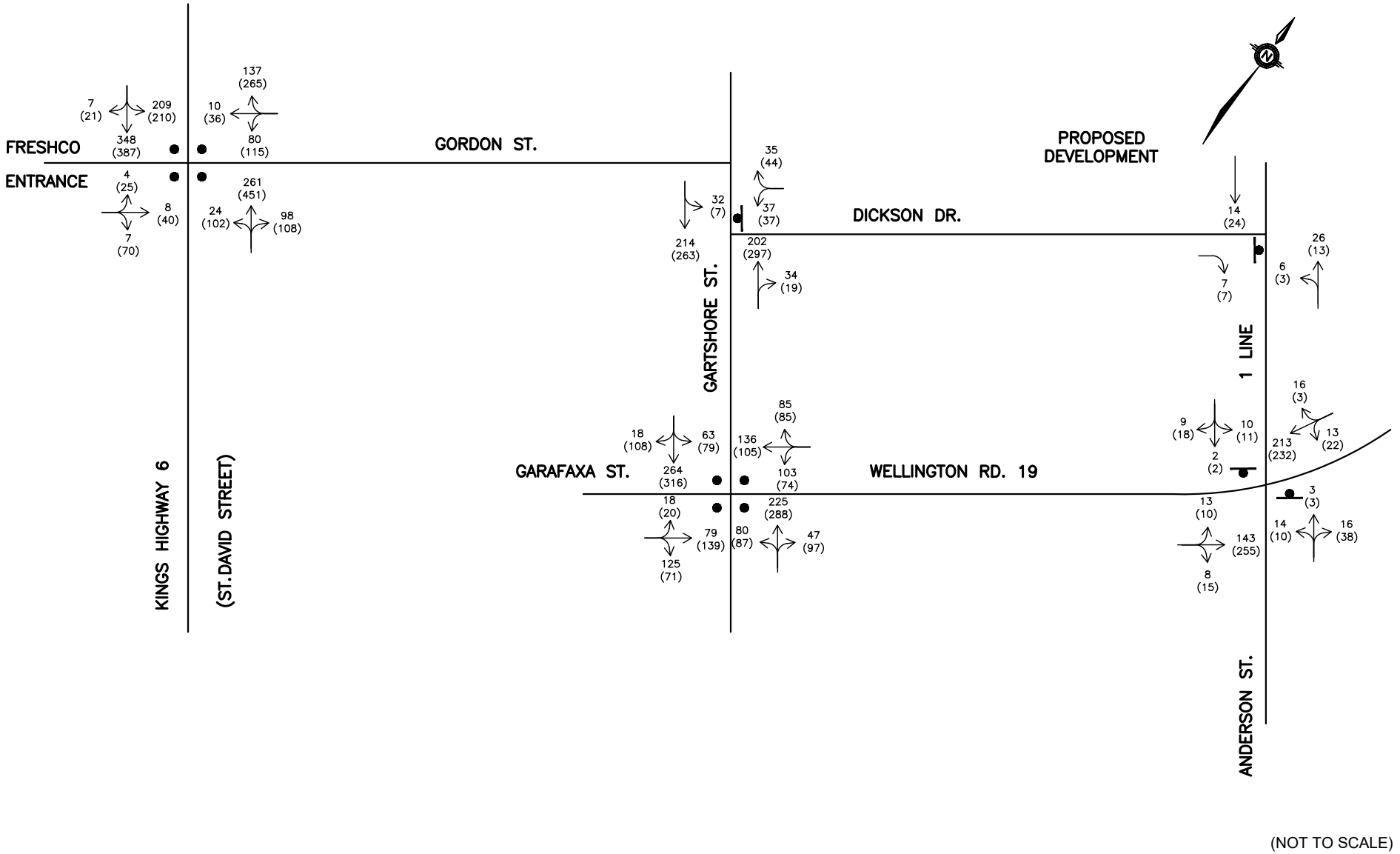
(NOT TO SCALE)

LEGEND:

STOP CONTROL	25 (25)	AM PEAK HOUR PM PEAK HOUR	TRAFFIC VOLUMES	EXISTING ROAD	
TRAFFIC FLOW		TRAFFIC SIGNALS		PROPOSED ENTRANCE	

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Consulting Engineers

FIGURE 3:
2026 BACKGROUND PEAK HOUR TRAFFIC



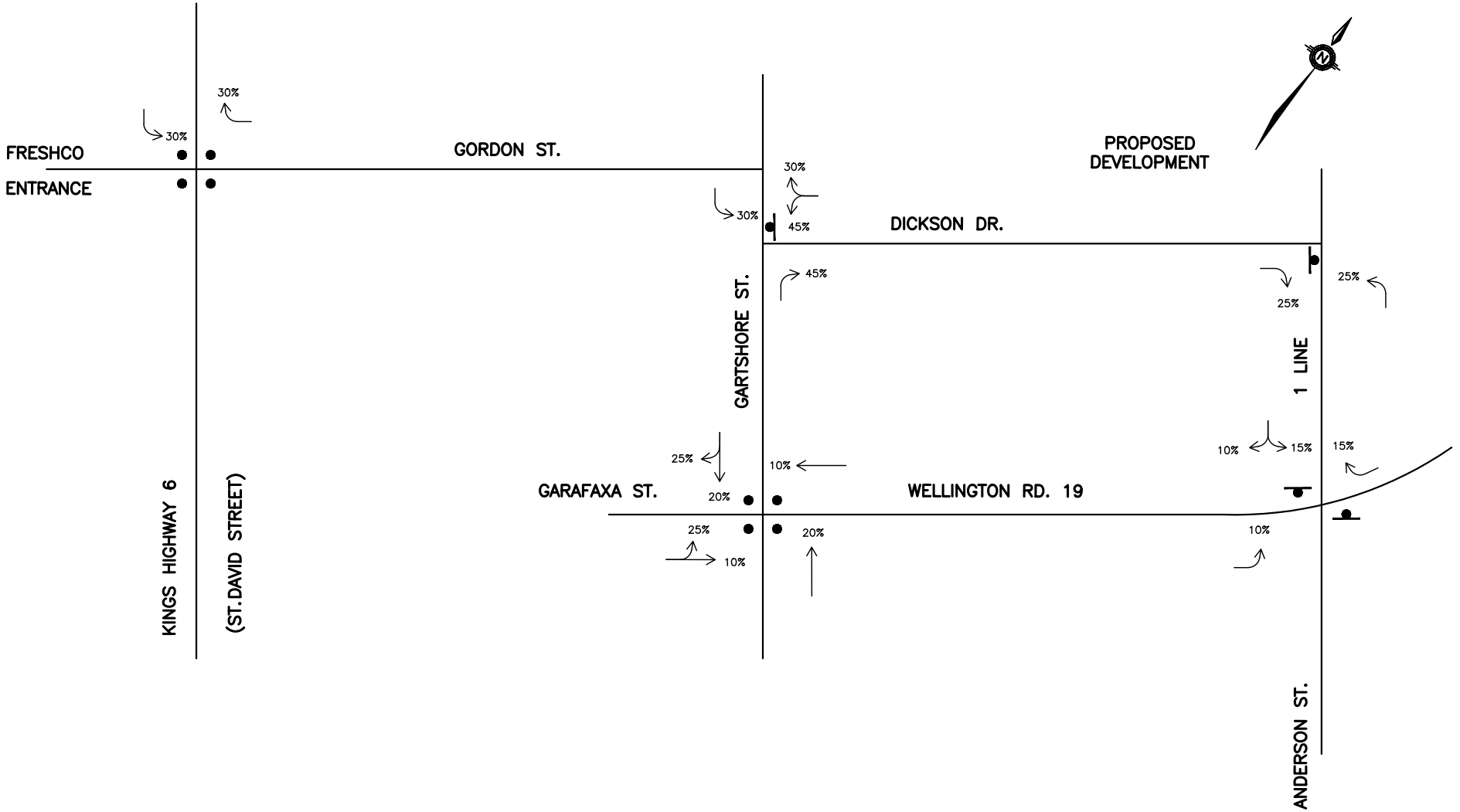
(NOT TO SCALE)

LEGEND:

STOP CONTROL	25 (25)	AM PEAK HOUR PM PEAK HOUR	TRAFFIC VOLUMES	EXISTING ROAD	
TRAFFIC FLOW		TRAFFIC SIGNALS		PROPOSED ENTRANCE	

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FIGURE 4:
2031 BACKGROUND PEAK HOUR TRAFFIC



LEGEND:

STOP CONTROL

25 AM PEAK HOUR
(25) PM PEAK HOUR
TRAFFIC VOLUMES

EXISTING ROAD

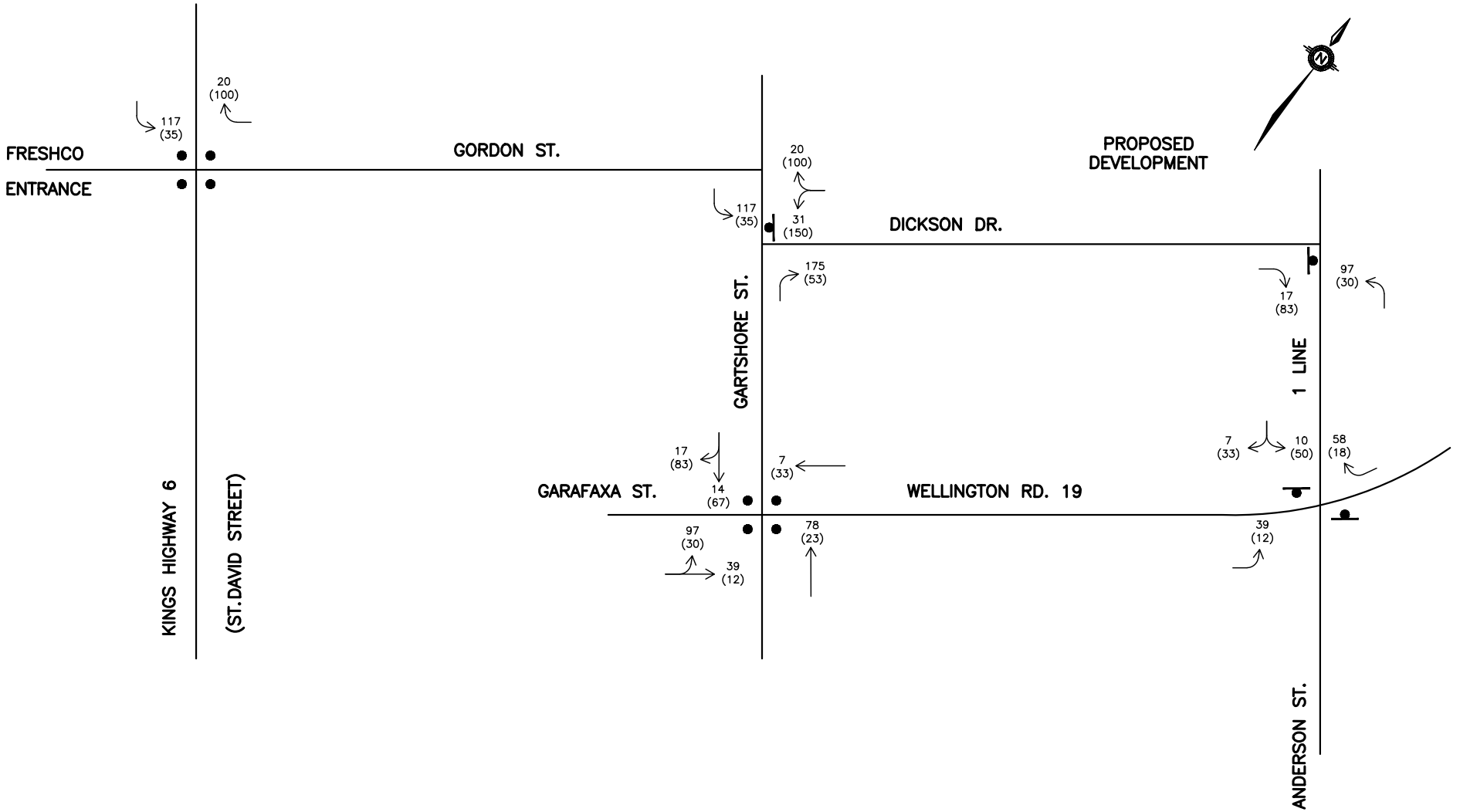
TRAFFIC FLOW

TRAFFIC SIGNALS

PROPOSED ENTRANCE

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FIGURE 5:
SITE GENERATED TRAFFIC DISTRIBUTION



LEGEND:

STOP CONTROL

25 (25) AM PEAK HOUR / PM PEAK HOUR TRAFFIC VOLUMES

EXISTING ROAD

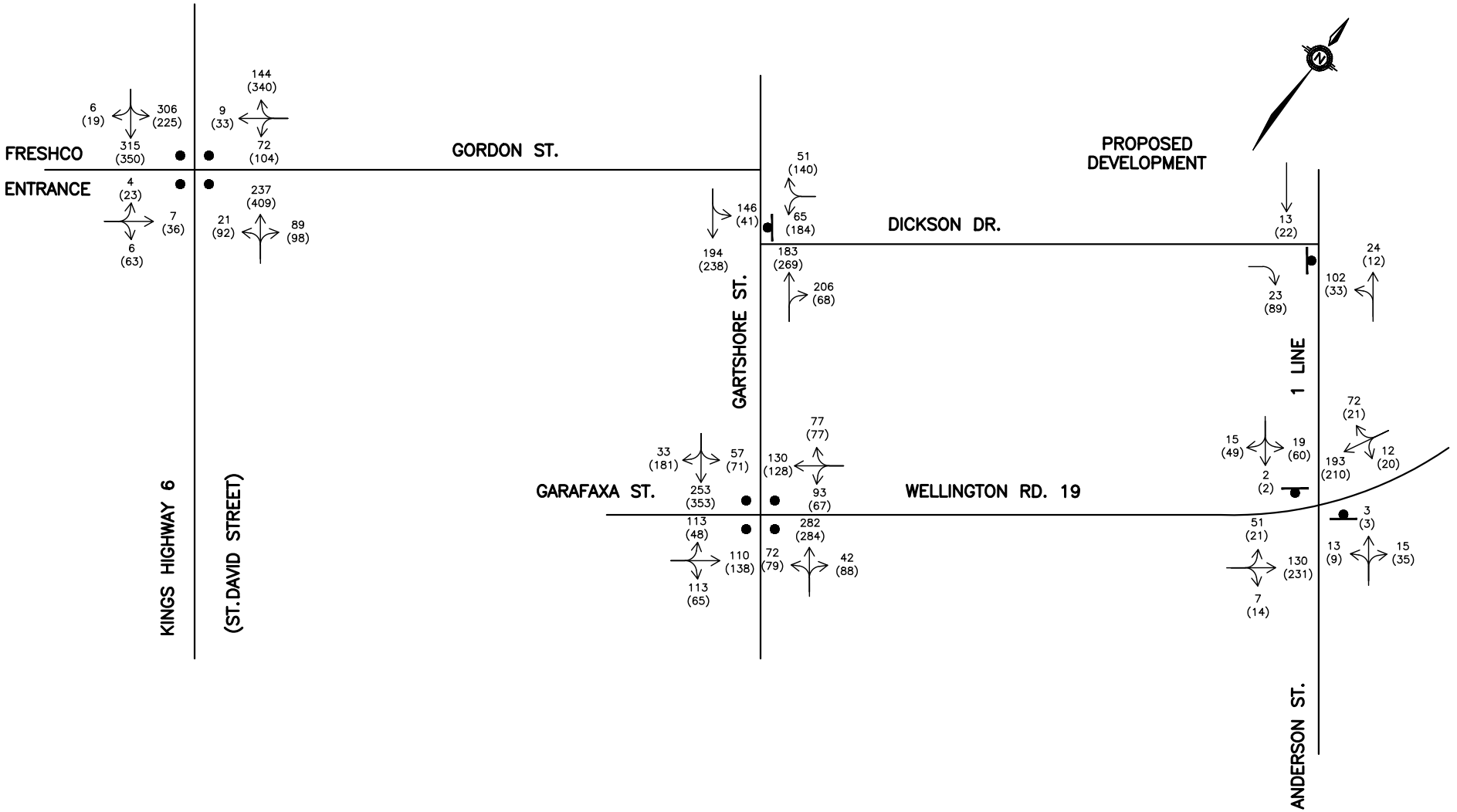
TRAFFIC FLOW

TRAFFIC SIGNALS

PROPOSED ENTRANCE

TRITON ENGINEERING SERVICES LIMITED
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FIGURE 6:
SITE GENERATED TRAFFIC



(NOT TO SCALE)

LEGEND:

STOP CONTROL

25 (25) AM PEAK HOUR / PM PEAK HOUR TRAFFIC VOLUMES

EXISTING ROAD

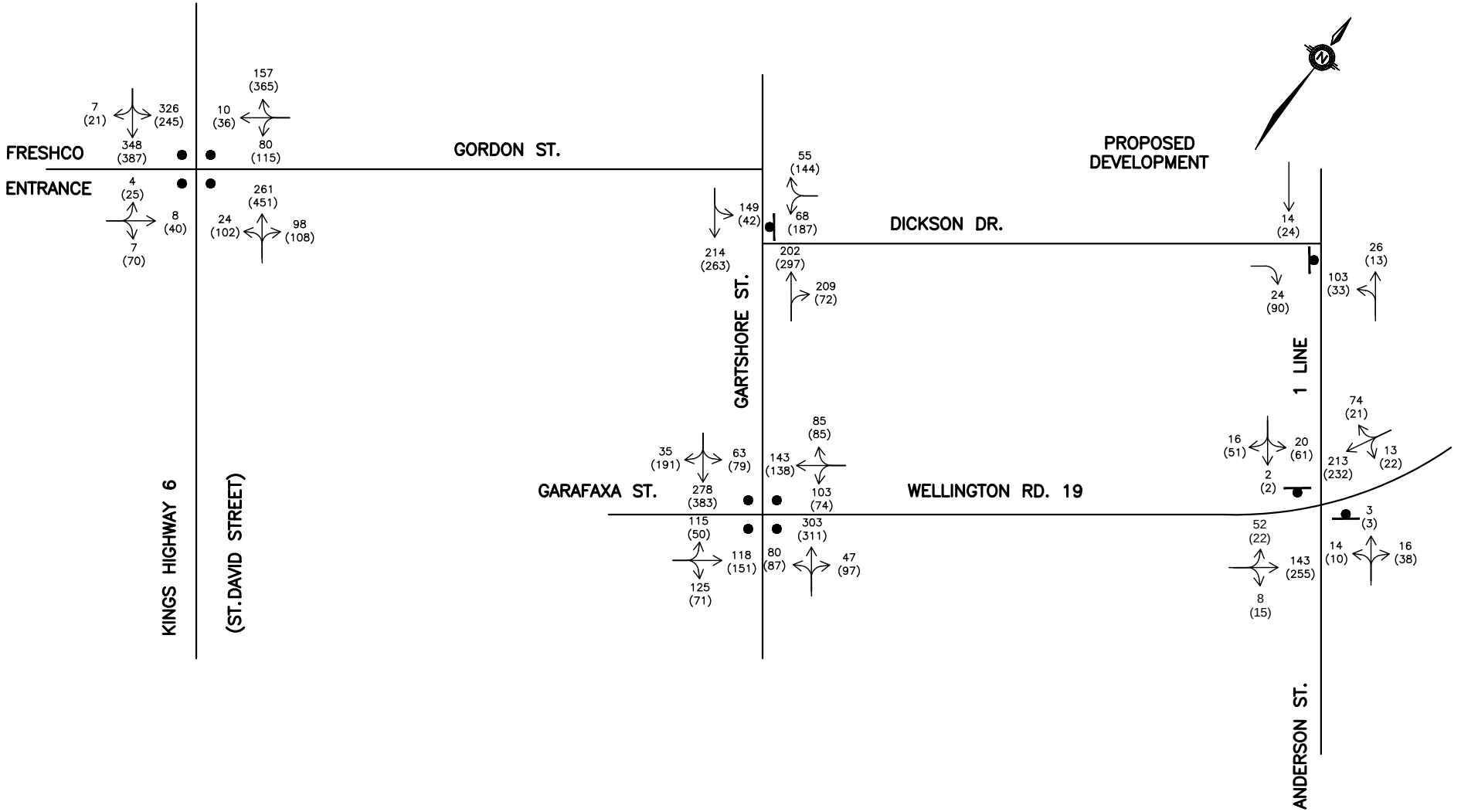
TRAFFIC FLOW

TRAFFIC SIGNALS

PROPOSED ENTRANCE

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FIGURE 7:
2026 FUTURE PEAK HOUR TRAFFIC



(NOT TO SCALE)

LEGEND:

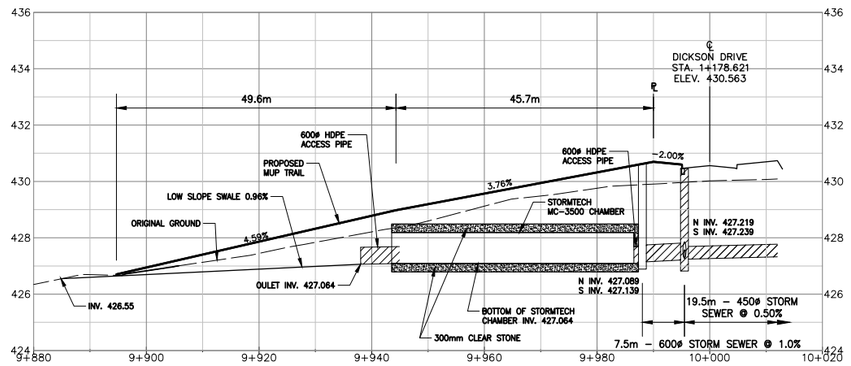
- STOP CONTROL
- TRAFFIC FLOW
- 25 (25) AM PEAK HOUR / PM PEAK HOUR TRAFFIC VOLUMES
- TRAFFIC SIGNALS
- EXISTING ROAD
- PROPOSED ENTRANCE

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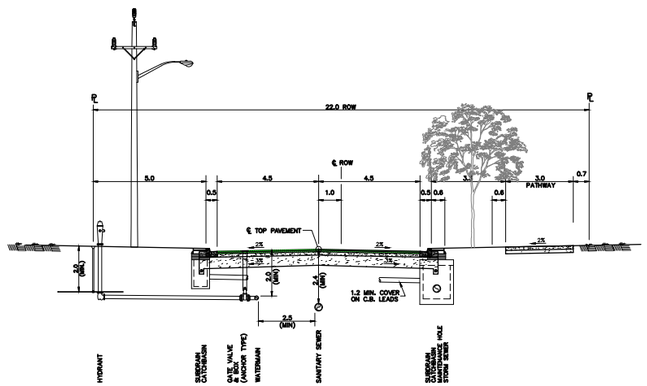
FIGURE 8:
2031 FUTURE PEAK HOUR TRAFFIC

APPENDIX A

PRELIMINARY SITE PLAN



PROPOSED GRAVEL MULTI USE PATHWAY
N.T.S.



URBAN TYPICAL SECTION – 22m ROW WITH MULTI USE PATHWAY
N.T.S.

LEGEND:

- ASPHALT PAVEMENT
- CONCRETE PATHWAY
- GRAVEL PATHWAY
- CONCRETE CURB AND GUTTER
- STORM SEWER
- SANITARY SEWER
- SANITARY FORCEMAIN
- WATERMAIN

DICKSON DRIVE

STREET A

FIRST LINE

WETLAND BOUNDARY

PROPOSED 3.0m WIDE GRANULAR (LIMESTONE SCREENINGS) MUP

LOW SLOPE SWALE

PROPOSED GRAVEL MUP ALIGNMENT

STORMTECH CHAMBER (BELOW GRADE)

SWM BLOCK (BELOW GRADE)

PROPOSED 12.0m WIDE BLOCK FOR MUP CONNECTION TO TRESTLE TRAIL

15m DAYLIGHT TRIANGLE

GARAGE

SHED

HOUSE No.6518

Lot 1 2.49ac
Lot 2 2.08ac
Lot 3 1.45ac
Lot 4 1.68ac
Lot 5 2.04ac
Lot 6 2.13ac
Lot 7 2.11ac
Lot 8 1.48ac
Lot 9 1.24ac
Lot 10 1.68ac
Lot 11 1.65ac
Lot 12 1.62ac
Lot 13 1.83ac
Lot 14 3.21ac
Lot 15 2.15ac
Lot 16 1.11ac
Lot 17 1.21ac
Lot 18 2.07ac
Lot 19 1.37ac
Lot 20 1.33ac
Lot 21 1.37ac
Lot 22 2.17ac
Lot 23 1.82ac
Lot 24 1.63ac

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Consulting Engineers

DICKSON DRIVE EXTENSION

EAST OF GARTSHORE STREET TO FIRST LINE

OCTOBER 2021	SCALE 1:1000	M6468

APPENDIX B

LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE

Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay (sec/veh)	Impact on Minor Street Traffic
A	≤ 10	Free Flow
B	>10 – 20	Stable Flow (slight delays)
C	> 20 – 35	Stable Flow (acceptable delays)
D	> 35 – 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	> 55 – 80	Unstable Flow (intolerable delay)
F	> 80	Forced Flow (jammed)

Source: Highway Capacity Manual, 2000.

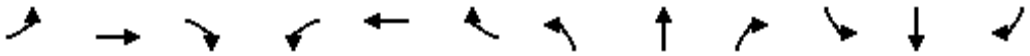
Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (sec/veh)	Impact on Minor Street Traffic
A	≤ 10	Little or no delay
B	>10-15	Short traffic delays
C	> 15-25	Average traffic delays
D	> 25-35	Long traffic delays
E	> 35-50	Very long traffic delays
F	> 50	Unacceptable traffic delays

Source: Transportation Research Board, 2000.

APPENDIX C

LEVEL OF SERVICE OUTPUTS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	6	5	65	8	112	19	214	80	171	285	5
Future Volume (vph)	3	6	5	65	8	112	19	214	80	171	285	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.86		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1758		1703	1446		1719	1668		1719	1884	
Flt Permitted	0.60	1.00		0.75	1.00		0.56	1.00		0.46	1.00	
Satd. Flow (perm)	1147	1758		1339	1446		1010	1668		833	1884	
Peak-hour factor, PHF	0.38	0.75	0.63	0.71	0.50	0.74	0.68	0.81	0.69	0.74	0.88	0.42
Adj. Flow (vph)	8	8	8	92	16	151	28	264	116	231	324	12
RTOR Reduction (vph)	0	7	0	0	130	0	0	14	0	0	1	0
Lane Group Flow (vph)	8	9	0	92	37	0	28	366	0	231	335	0
Heavy Vehicles (%)	0%	0%	0%	6%	0%	15%	5%	9%	8%	5%	0%	8%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	10.6	10.6		10.6	10.6		43.6	41.6		53.3	47.3	
Effective Green, g (s)	10.6	10.6		10.6	10.6		43.6	41.6		53.3	47.3	
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.57	0.54		0.69	0.62	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	158	242		184	199		591	902		666	1158	
v/s Ratio Prot		0.01			0.03		0.00	c0.22		c0.03	0.18	
v/s Ratio Perm	0.01			c0.07			0.03			0.21		
v/c Ratio	0.05	0.04		0.50	0.18		0.05	0.41		0.35	0.29	
Uniform Delay, d1	28.8	28.7		30.7	29.3		7.3	10.4		4.5	6.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		2.1	0.5		0.0	1.4		0.1	0.6	
Delay (s)	28.9	28.8		32.8	29.8		7.3	11.7		4.7	7.6	
Level of Service	C	C		C	C		A	B		A	A	
Approach Delay (s)		28.8			30.9			11.4			6.4	
Approach LOS		C			C			B			A	

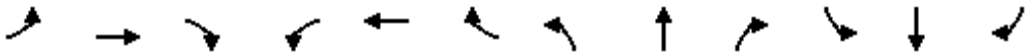
Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	76.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	36	28	165	32	26	175
Future Volume (Veh/h)	36	28	165	32	26	175
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.88	0.75	0.89	0.65	0.89
Hourly flow rate (vph)	48	32	220	36	40	197
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			273			
pX, platoon unblocked						
vC, conflicting volume	515	238			256	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	515	238			256	
tC, single (s)	6.6	6.7			4.2	
tC, 2 stage (s)						
tF (s)	3.7	3.7			2.3	
p0 queue free %	90	95			97	
cM capacity (veh/h)	471	704			1275	

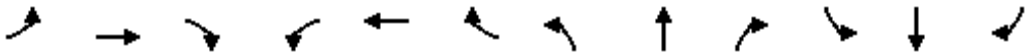
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	80	256	237
Volume Left	48	0	40
Volume Right	32	36	0
cSH	543	1700	1275
Volume to Capacity	0.15	0.15	0.03
Queue Length 95th (m)	4.1	0.0	0.8
Control Delay (s)	12.8	0.0	1.6
Lane LOS	B		A
Approach Delay (s)	12.8	0.0	1.6
Approach LOS	B		

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	64	102	84	111	69	65	184	38	51	216	14
Future Volume (vph)	14	64	102	84	111	69	65	184	38	51	216	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.94		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1632		1719	1650		1719	1749		1641	1741	
Flt Permitted	0.60	1.00		0.56	1.00		0.59	1.00		0.56	1.00	
Satd. Flow (perm)	1139	1632		1014	1650		1061	1749		965	1741	
Peak-hour factor, PHF	0.70	0.76	0.59	0.68	0.75	0.78	0.49	0.71	0.50	0.71	0.82	0.70
Adj. Flow (vph)	20	84	173	124	148	88	133	259	76	72	263	20
RTOR Reduction (vph)	0	130	0	0	38	0	0	14	0	0	4	0
Lane Group Flow (vph)	20	127	0	124	198	0	133	321	0	72	279	0
Heavy Vehicles (%)	0%	6%	4%	5%	5%	15%	5%	4%	8%	10%	7%	21%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	14.2	14.2		14.2	14.2		30.1	30.1		30.1	30.1	
Effective Green, g (s)	14.2	14.2		14.2	14.2		30.1	30.1		30.1	30.1	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.53	0.53		0.53	0.53	
Clearance Time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	286	410		254	414		565	931		514	927	
v/s Ratio Prot		0.08			0.12			c0.18			0.16	
v/s Ratio Perm	0.02			c0.12			0.13			0.07		
v/c Ratio	0.07	0.31		0.49	0.48		0.24	0.34		0.14	0.30	
Uniform Delay, d1	16.1	17.2		18.0	18.0		7.1	7.6		6.7	7.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.9		3.1	1.8		0.2	0.2		0.1	0.2	
Delay (s)	16.3	18.1		21.1	19.8		7.3	7.8		6.8	7.5	
Level of Service	B	B		C	B		A	A		A	A	
Approach Delay (s)		18.0			20.3			7.6			7.4	
Approach LOS		B			C			A			A	

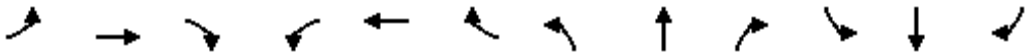
Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	56.5	Sum of lost time (s)	12.2
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	117	6	10	174	8	11	2	13	2	1	7
Future Volume (Veh/h)	10	117	6	10	174	8	11	2	13	2	1	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.94	0.50	0.50	0.85	0.50	0.92	0.50	0.81	0.25	0.25	0.58
Hourly flow rate (vph)	20	124	12	20	205	16	12	4	16	8	4	12
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	221			136			423	425	124	427	421	205
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	221			136			423	425	124	427	421	205
tC, single (s)	4.1			4.2			7.2	6.5	6.2	7.1	7.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.3	3.5	4.9	3.3
p0 queue free %	99			99			98	99	98	98	99	99
cM capacity (veh/h)	1360			1400			506	509	932	517	390	841

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	144	12	225	16	32	24
Volume Left	20	0	20	0	12	8
Volume Right	0	12	0	16	16	12
cSH	1360	1700	1400	1700	657	600
Volume to Capacity	0.01	0.01	0.01	0.01	0.05	0.04
Queue Length 95th (m)	0.4	0.0	0.3	0.0	1.2	1.0
Control Delay (s)	1.2	0.0	0.8	0.0	10.8	11.2
Lane LOS	A		A		B	B
Approach Delay (s)	1.1		0.7		10.8	11.2
Approach LOS					B	B

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	26.4%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	32	57	94	29	217	83	370	88	172	317	17
Future Volume (vph)	20	32	57	94	29	217	83	370	88	172	317	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	0.87		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1702		1805	1603		1805	1810		1656	1806	
Flt Permitted	0.34	1.00		0.69	1.00		0.55	1.00		0.34	1.00	
Satd. Flow (perm)	644	1702		1306	1603		1040	1810		598	1806	
Peak-hour factor, PHF	0.83	0.80	0.84	0.84	0.73	0.95	0.86	0.86	0.81	0.90	0.95	0.71
Adj. Flow (vph)	24	40	68	112	40	228	97	430	109	191	334	24
RTOR Reduction (vph)	0	57	0	0	193	0	0	9	0	0	2	0
Lane Group Flow (vph)	24	51	0	112	75	0	97	530	0	191	356	0
Heavy Vehicles (%)	0%	3%	0%	0%	0%	4%	0%	2%	1%	9%	4%	6%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	11.8	11.8		11.8	11.8		44.8	40.0		50.0	42.6	
Effective Green, g (s)	11.8	11.8		11.8	11.8		44.8	40.0		50.0	42.6	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.59	0.52		0.66	0.56	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	99	263		202	248		659	950		495	1009	
v/s Ratio Prot		0.03			0.05		0.01	c0.29		c0.04	0.20	
v/s Ratio Perm	0.04			c0.09			0.08			0.22		
v/c Ratio	0.24	0.19		0.55	0.30		0.15	0.56		0.39	0.35	
Uniform Delay, d1	28.3	28.0		29.8	28.6		6.8	12.2		6.1	9.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	0.4		3.3	0.7		0.0	2.4		0.2	1.0	
Delay (s)	29.6	28.4		33.0	29.3		6.9	14.5		6.3	10.2	
Level of Service	C	C		C	C		A	B		A	B	
Approach Delay (s)		28.6			30.4			13.4			8.8	
Approach LOS		C			C			B			A	

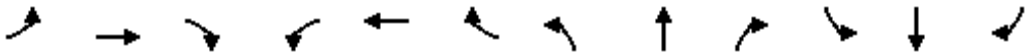
Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	76.2	Sum of lost time (s)	17.0
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	36	36	243	18	5	215
Future Volume (Veh/h)	36	36	243	18	5	215
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.82	0.88	0.75	0.42	0.79
Hourly flow rate (vph)	48	44	276	24	12	272
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			273			
pX, platoon unblocked						
vC, conflicting volume	584	288			300	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	584	288			300	
tC, single (s)	6.4	6.2			4.7	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.7	
p0 queue free %	90	94			99	
cM capacity (veh/h)	472	749			993	

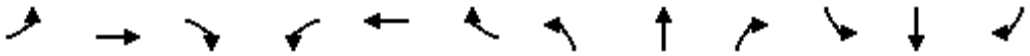
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	92	300	284
Volume Left	48	0	12
Volume Right	44	24	0
cSH	573	1700	993
Volume to Capacity	0.16	0.18	0.01
Queue Length 95th (m)	4.5	0.0	0.3
Control Delay (s)	12.5	0.0	0.5
Lane LOS	B		A
Approach Delay (s)	12.5	0.0	0.5
Approach LOS	B		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	26.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	114	58	60	86	69	71	236	79	64	259	88
Future Volume (vph)	16	114	58	60	86	69	71	236	79	64	259	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.93		1.00	0.96		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1703	1757		1770	1742		1805	1783		1752	1727	
Flt Permitted	0.64	1.00		0.63	1.00		0.38	1.00		0.51	1.00	
Satd. Flow (perm)	1146	1757		1165	1742		725	1783		942	1727	
Peak-hour factor, PHF	0.67	0.75	0.97	0.71	0.83	0.82	0.89	0.82	0.73	0.84	0.97	0.31
Adj. Flow (vph)	24	152	60	85	104	84	80	288	108	76	267	284
RTOR Reduction (vph)	0	26	0	0	53	0	0	17	0	0	50	0
Lane Group Flow (vph)	24	186	0	85	135	0	80	379	0	76	501	0
Heavy Vehicles (%)	6%	3%	5%	2%	0%	4%	0%	3%	0%	3%	1%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	13.0	13.0		13.0	13.0		30.1	30.1		30.1	30.1	
Effective Green, g (s)	13.0	13.0		13.0	13.0		30.1	30.1		30.1	30.1	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.54	0.54		0.54	0.54	
Clearance Time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	269	413		273	409		394	970		512	940	
v/s Ratio Prot		c0.11			0.08			0.21			c0.29	
v/s Ratio Perm	0.02			0.07			0.11			0.08		
v/c Ratio	0.09	0.45		0.31	0.33		0.20	0.39		0.15	0.53	
Uniform Delay, d1	16.5	18.1		17.5	17.5		6.5	7.3		6.2	8.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.6		1.4	1.0		0.3	0.3		0.1	0.6	
Delay (s)	16.8	19.7		18.8	18.5		6.7	7.6		6.4	8.7	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		19.4			18.6			7.4			8.4	
Approach LOS		B			B			A			A	

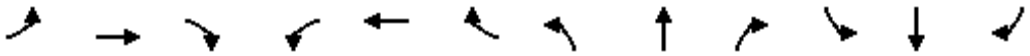
Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	55.3	Sum of lost time (s)	12.2
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	209	12	18	190	0	8	2	31	3	1	14
Future Volume (Veh/h)	8	209	12	18	190	0	8	2	31	3	1	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.67	0.92	0.75	0.64	0.75	0.25	0.50	0.50	0.70	0.38	0.25	0.88
Hourly flow rate (vph)	12	227	16	28	253	0	16	4	44	8	4	16
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	253			243			578	560	227	606	576	253
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	253			243			578	560	227	606	576	253
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			96	99	95	98	99	98
cM capacity (veh/h)	1324			1335			409	427	817	378	418	791

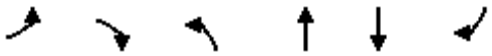
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	239	16	281	0	64	28
Volume Left	12	0	28	0	16	8
Volume Right	0	16	0	0	44	16
cSH	1324	1700	1335	1700	625	549
Volume to Capacity	0.01	0.01	0.02	0.01	0.10	0.05
Queue Length 95th (m)	0.2	0.0	0.5	0.0	2.7	1.3
Control Delay (s)	0.5	0.0	0.9	0.0	11.4	11.9
Lane LOS	A		A		B	B
Approach Delay (s)	0.4		0.9		11.4	11.9
Approach LOS					B	B

Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	35.1%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	6	5	65	8	112	19	214	80	171	285	5
Future Volume (vph)	3	6	5	65	8	112	19	214	80	171	285	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.86		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1758		1703	1446		1719	1668		1719	1884	
Flt Permitted	0.60	1.00		0.75	1.00		0.56	1.00		0.46	1.00	
Satd. Flow (perm)	1147	1758		1339	1446		1010	1668		833	1884	
Peak-hour factor, PHF	0.38	0.75	0.63	0.71	0.50	0.74	0.68	0.81	0.69	0.74	0.88	0.42
Adj. Flow (vph)	8	8	8	92	16	151	28	264	116	231	324	12
RTOR Reduction (vph)	0	7	0	0	130	0	0	14	0	0	1	0
Lane Group Flow (vph)	8	9	0	92	37	0	28	366	0	231	335	0
Heavy Vehicles (%)	0%	0%	0%	6%	0%	15%	5%	9%	8%	5%	0%	8%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	10.6	10.6		10.6	10.6		43.6	41.6		53.3	47.3	
Effective Green, g (s)	10.6	10.6		10.6	10.6		43.6	41.6		53.3	47.3	
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.57	0.54		0.69	0.62	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	158	242		184	199		591	902		666	1158	
v/s Ratio Prot		0.01			0.03		0.00	c0.22		c0.03	0.18	
v/s Ratio Perm	0.01			c0.07			0.03			0.21		
v/c Ratio	0.05	0.04		0.50	0.18		0.05	0.41		0.35	0.29	
Uniform Delay, d1	28.8	28.7		30.7	29.3		7.3	10.4		4.5	6.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		2.1	0.5		0.0	1.4		0.1	0.6	
Delay (s)	28.9	28.8		32.8	29.8		7.3	11.7		4.7	7.6	
Level of Service	C	C		C	C		A	B		A	A	
Approach Delay (s)		28.8			30.9			11.4			6.4	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	76.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	5	5	24	13	0
Future Volume (Veh/h)	0	5	5	24	13	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	5	5	26	14	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	50	14	14			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	50	14	14			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	956	1066	1604			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	5	31	14
Volume Left	0	5	0
Volume Right	5	0	0
cSH	1066	1604	1700
Volume to Capacity	0.00	0.00	0.01
Queue Length 95th (m)	0.1	0.1	0.0
Control Delay (s)	8.4	1.2	0.0
Lane LOS	A	A	
Approach Delay (s)	8.4	1.2	0.0
Approach LOS	A		

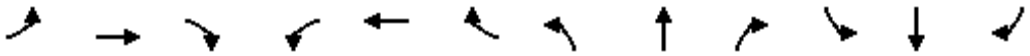
Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	15.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	31	28	165	27	26	175
Future Volume (Veh/h)	31	28	165	27	26	175
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.88	0.75	0.89	0.65	0.89
Hourly flow rate (vph)	41	32	220	30	40	197
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			273			
pX, platoon unblocked						
vC, conflicting volume	512	235			250	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	512	235			250	
tC, single (s)	6.6	6.7			4.2	
tC, 2 stage (s)						
tF (s)	3.7	3.7			2.3	
p0 queue free %	91	95			97	
cM capacity (veh/h)	473	707			1281	

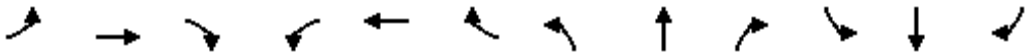
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	73	250	237
Volume Left	41	0	40
Volume Right	32	30	0
cSH	553	1700	1281
Volume to Capacity	0.13	0.15	0.03
Queue Length 95th (m)	3.6	0.0	0.8
Control Delay (s)	12.5	0.0	1.6
Lane LOS	B		A
Approach Delay (s)	12.5	0.0	1.6
Approach LOS	B		

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	34.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	64	102	84	111	69	65	184	38	51	216	14
Future Volume (vph)	14	64	102	84	111	69	65	184	38	51	216	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.94		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1632		1719	1650		1719	1749		1641	1741	
Flt Permitted	0.60	1.00		0.56	1.00		0.59	1.00		0.56	1.00	
Satd. Flow (perm)	1139	1632		1014	1650		1061	1749		965	1741	
Peak-hour factor, PHF	0.70	0.76	0.59	0.68	0.75	0.78	0.49	0.71	0.50	0.71	0.82	0.70
Adj. Flow (vph)	20	84	173	124	148	88	133	259	76	72	263	20
RTOR Reduction (vph)	0	130	0	0	38	0	0	14	0	0	4	0
Lane Group Flow (vph)	20	127	0	124	198	0	133	321	0	72	279	0
Heavy Vehicles (%)	0%	6%	4%	5%	5%	15%	5%	4%	8%	10%	7%	21%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	14.2	14.2		14.2	14.2		30.1	30.1		30.1	30.1	
Effective Green, g (s)	14.2	14.2		14.2	14.2		30.1	30.1		30.1	30.1	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.53	0.53		0.53	0.53	
Clearance Time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	286	410		254	414		565	931		514	927	
v/s Ratio Prot		0.08			0.12			c0.18			0.16	
v/s Ratio Perm	0.02			c0.12			0.13			0.07		
v/c Ratio	0.07	0.31		0.49	0.48		0.24	0.34		0.14	0.30	
Uniform Delay, d1	16.1	17.2		18.0	18.0		7.1	7.6		6.7	7.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.9		3.1	1.8		0.2	0.2		0.1	0.2	
Delay (s)	16.3	18.1		21.1	19.8		7.3	7.8		6.8	7.5	
Level of Service	B	B		C	B		A	A		A	A	
Approach Delay (s)		18.0			20.3			7.6			7.4	
Approach LOS		B			C			A			A	

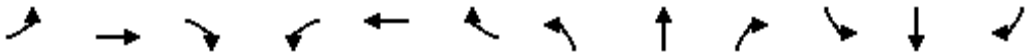
Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	56.5	Sum of lost time (s)	12.2
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	117	6	10	174	13	11	2	13	7	1	7
Future Volume (Veh/h)	10	117	6	10	174	13	11	2	13	7	1	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.94	0.50	0.50	0.85	0.50	0.92	0.50	0.81	0.25	0.25	0.58
Hourly flow rate (vph)	20	124	12	20	205	26	12	4	16	28	4	12
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	231			136			423	435	124	427	421	205
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	231			136			423	435	124	427	421	205
tC, single (s)	4.1			4.2			7.2	6.5	6.2	7.1	7.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.3	3.5	4.9	3.3
p0 queue free %	99			99			98	99	98	95	99	99
cM capacity (veh/h)	1349			1400			506	503	932	517	390	841

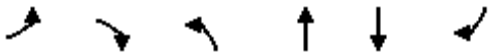
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	144	12	225	26	32	44
Volume Left	20	0	20	0	12	28
Volume Right	0	12	0	26	16	12
cSH	1349	1700	1400	1700	655	559
Volume to Capacity	0.01	0.01	0.01	0.02	0.05	0.08
Queue Length 95th (m)	0.4	0.0	0.3	0.0	1.2	2.0
Control Delay (s)	1.2	0.0	0.8	0.0	10.8	12.0
Lane LOS	A		A		B	B
Approach Delay (s)	1.1		0.7		10.8	12.0
Approach LOS					B	B

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	26.4%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	32	57	94	29	217	83	370	88	172	317	17
Future Volume (vph)	20	32	57	94	29	217	83	370	88	172	317	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	0.87		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1702		1805	1603		1805	1810		1656	1806	
Flt Permitted	0.34	1.00		0.69	1.00		0.55	1.00		0.34	1.00	
Satd. Flow (perm)	644	1702		1306	1603		1040	1810		598	1806	
Peak-hour factor, PHF	0.83	0.80	0.84	0.84	0.73	0.95	0.86	0.86	0.81	0.90	0.95	0.71
Adj. Flow (vph)	24	40	68	112	40	228	97	430	109	191	334	24
RTOR Reduction (vph)	0	57	0	0	193	0	0	9	0	0	2	0
Lane Group Flow (vph)	24	51	0	112	75	0	97	530	0	191	356	0
Heavy Vehicles (%)	0%	3%	0%	0%	0%	4%	0%	2%	1%	9%	4%	6%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	11.8	11.8		11.8	11.8		44.8	40.0		50.0	42.6	
Effective Green, g (s)	11.8	11.8		11.8	11.8		44.8	40.0		50.0	42.6	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.59	0.52		0.66	0.56	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	99	263		202	248		659	950		495	1009	
v/s Ratio Prot		0.03			0.05		0.01	c0.29		c0.04	0.20	
v/s Ratio Perm	0.04			c0.09			0.08			0.22		
v/c Ratio	0.24	0.19		0.55	0.30		0.15	0.56		0.39	0.35	
Uniform Delay, d1	28.3	28.0		29.8	28.6		6.8	12.2		6.1	9.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	0.4		3.3	0.7		0.0	2.4		0.2	1.0	
Delay (s)	29.6	28.4		33.0	29.3		6.9	14.5		6.3	10.2	
Level of Service	C	C		C	C		A	B		A	B	
Approach Delay (s)		28.6			30.4			13.4			8.8	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	76.2	Sum of lost time (s)	17.0
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	5	3	12	22	0
Future Volume (Veh/h)	0	5	3	12	22	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	5	3	13	24	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	43	24	24			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	43	24	24			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	966	1052	1591			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	5	16	24
Volume Left	0	3	0
Volume Right	5	0	0
cSH	1052	1591	1700
Volume to Capacity	0.00	0.00	0.01
Queue Length 95th (m)	0.1	0.0	0.0
Control Delay (s)	8.4	1.4	0.0
Lane LOS	A	A	
Approach Delay (s)	8.4	1.4	0.0
Approach LOS	A		

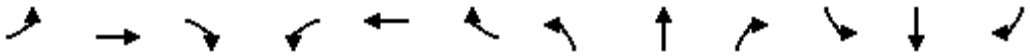
Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	31	36	243	15	5	215
Future Volume (Veh/h)	31	36	243	15	5	215
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.82	0.88	0.75	0.42	0.79
Hourly flow rate (vph)	41	44	276	20	12	272
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			273			
pX, platoon unblocked						
vC, conflicting volume	582	286			296	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	582	286			296	
tC, single (s)	6.4	6.2			4.7	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.7	
p0 queue free %	91	94			99	
cM capacity (veh/h)	473	751			997	

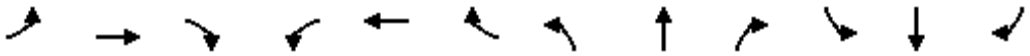
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	85	296	284
Volume Left	41	0	12
Volume Right	44	20	0
cSH	585	1700	997
Volume to Capacity	0.15	0.17	0.01
Queue Length 95th (m)	4.0	0.0	0.3
Control Delay (s)	12.2	0.0	0.5
Lane LOS	B		A
Approach Delay (s)	12.2	0.0	0.5
Approach LOS	B		

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	25.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	114	58	60	86	69	71	236	79	64	259	88
Future Volume (vph)	16	114	58	60	86	69	71	236	79	64	259	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.93		1.00	0.96		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1703	1757		1770	1742		1805	1783		1752	1727	
Flt Permitted	0.64	1.00		0.63	1.00		0.38	1.00		0.51	1.00	
Satd. Flow (perm)	1146	1757		1165	1742		725	1783		942	1727	
Peak-hour factor, PHF	0.67	0.75	0.97	0.71	0.83	0.82	0.89	0.82	0.73	0.84	0.97	0.31
Adj. Flow (vph)	24	152	60	85	104	84	80	288	108	76	267	284
RTOR Reduction (vph)	0	26	0	0	53	0	0	17	0	0	50	0
Lane Group Flow (vph)	24	186	0	85	135	0	80	379	0	76	501	0
Heavy Vehicles (%)	6%	3%	5%	2%	0%	4%	0%	3%	0%	3%	1%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	13.0	13.0		13.0	13.0		30.1	30.1		30.1	30.1	
Effective Green, g (s)	13.0	13.0		13.0	13.0		30.1	30.1		30.1	30.1	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.54	0.54		0.54	0.54	
Clearance Time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	269	413		273	409		394	970		512	940	
v/s Ratio Prot		c0.11			0.08			0.21			c0.29	
v/s Ratio Perm	0.02			0.07			0.11			0.08		
v/c Ratio	0.09	0.45		0.31	0.33		0.20	0.39		0.15	0.53	
Uniform Delay, d1	16.5	18.1		17.5	17.5		6.5	7.3		6.2	8.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.6		1.4	1.0		0.3	0.3		0.1	0.6	
Delay (s)	16.8	19.7		18.8	18.5		6.7	7.6		6.4	8.7	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		19.4			18.6			7.4			8.4	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	55.3	Sum of lost time (s)	12.2
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



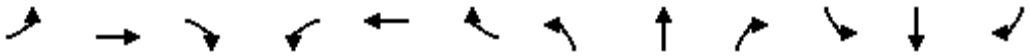
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	209	12	18	190	3	8	2	31	8	1	14
Future Volume (Veh/h)	8	209	12	18	190	3	8	2	31	8	1	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.67	0.92	0.75	0.64	0.75	0.25	0.50	0.50	0.70	0.38	0.25	0.88
Hourly flow rate (vph)	12	227	16	28	253	12	16	4	44	21	4	16
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	265			243			578	572	227	606	576	253
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	265			243			578	572	227	606	576	253
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			96	99	95	94	99	98
cM capacity (veh/h)	1311			1335			409	420	817	378	418	791

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	239	16	281	12	64	41
Volume Left	12	0	28	0	16	21
Volume Right	0	16	0	12	44	16
cSH	1311	1700	1335	1700	624	480
Volume to Capacity	0.01	0.01	0.02	0.01	0.10	0.09
Queue Length 95th (m)	0.2	0.0	0.5	0.0	2.7	2.2
Control Delay (s)	0.5	0.0	0.9	0.0	11.4	13.2
Lane LOS	A		A		B	B
Approach Delay (s)	0.4		0.9		11.4	13.2
Approach LOS					B	B

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	34.9%	ICU Level of Service		A
Analysis Period (min)	15			

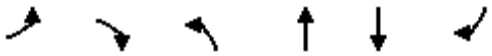
HCM Signalized Intersection Capacity Analysis
1: St. David Street & Freshco Entrance/Gordon Street

01-10-2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	7	6	72	9	124	21	237	89	189	315	6
Future Volume (vph)	4	7	6	72	9	124	21	237	89	189	315	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.86		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1750		1703	1447		1719	1668		1719	1884	
Flt Permitted	0.54	1.00		0.75	1.00		0.54	1.00		0.42	1.00	
Satd. Flow (perm)	1033	1750		1335	1447		977	1668		768	1884	
Peak-hour factor, PHF	0.38	0.75	0.63	0.71	0.50	0.74	0.68	0.81	0.69	0.74	0.88	0.42
Adj. Flow (vph)	11	9	10	101	18	168	31	293	129	255	358	14
RTOR Reduction (vph)	0	9	0	0	144	0	0	14	0	0	1	0
Lane Group Flow (vph)	11	10	0	101	42	0	31	408	0	255	371	0
Heavy Vehicles (%)	0%	0%	0%	6%	0%	15%	5%	9%	8%	5%	0%	8%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	11.2	11.2		11.2	11.2		43.7	41.7		53.7	47.7	
Effective Green, g (s)	11.2	11.2		11.2	11.2		43.7	41.7		53.7	47.7	
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.56	0.54		0.69	0.61	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	148	251		191	208		567	892		627	1153	
v/s Ratio Prot		0.01			0.03		0.00	c0.24		c0.04	0.20	
v/s Ratio Perm	0.01			c0.08			0.03			0.24		
v/c Ratio	0.07	0.04		0.53	0.20		0.05	0.46		0.41	0.32	
Uniform Delay, d1	28.9	28.7		30.9	29.4		7.6	11.1		5.0	7.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.1		2.6	0.5		0.0	1.7		0.2	0.7	
Delay (s)	29.1	28.8		33.5	29.9		7.7	12.8		5.1	8.0	
Level of Service	C	C		C	C		A	B		A	A	
Approach Delay (s)		28.9			31.2			12.5			6.9	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	77.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	6	5	24	13	0
Future Volume (Veh/h)	0	6	5	24	13	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	7	5	26	14	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	50	14	14			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	50	14	14			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	956	1066	1604			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	7	31	14
Volume Left	0	5	0
Volume Right	7	0	0
cSH	1066	1604	1700
Volume to Capacity	0.01	0.00	0.01
Queue Length 95th (m)	0.2	0.1	0.0
Control Delay (s)	8.4	1.2	0.0
Lane LOS	A	A	
Approach Delay (s)	8.4	1.2	0.0
Approach LOS	A		

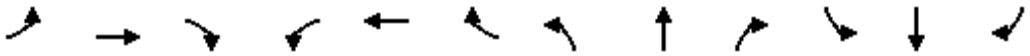
Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	15.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	34	31	183	31	29	194
Future Volume (Veh/h)	34	31	183	31	29	194
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.88	0.75	0.89	0.65	0.89
Hourly flow rate (vph)	45	35	244	35	45	218
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			273			
pX, platoon unblocked						
vC, conflicting volume	570	262			279	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	570	262			279	
tC, single (s)	6.6	6.7			4.2	
tC, 2 stage (s)						
tF (s)	3.7	3.7			2.3	
p0 queue free %	90	95			96	
cM capacity (veh/h)	435	682			1250	

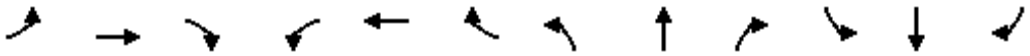
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	80	279	263
Volume Left	45	0	45
Volume Right	35	35	0
cSH	517	1700	1250
Volume to Capacity	0.15	0.16	0.04
Queue Length 95th (m)	4.4	0.0	0.9
Control Delay (s)	13.2	0.0	1.6
Lane LOS	B		A
Approach Delay (s)	13.2	0.0	1.6
Approach LOS	B		

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	37.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	71	113	93	123	77	72	204	42	57	239	16
Future Volume (vph)	16	71	113	93	123	77	72	204	42	57	239	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.94		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1632		1719	1648		1719	1750		1641	1740	
Flt Permitted	0.55	1.00		0.51	1.00		0.57	1.00		0.52	1.00	
Satd. Flow (perm)	1050	1632		930	1648		1031	1750		900	1740	
Peak-hour factor, PHF	0.70	0.76	0.59	0.68	0.75	0.78	0.49	0.71	0.50	0.71	0.82	0.70
Adj. Flow (vph)	23	93	192	137	164	99	147	287	84	80	291	23
RTOR Reduction (vph)	0	129	0	0	37	0	0	14	0	0	4	0
Lane Group Flow (vph)	23	156	0	137	226	0	147	357	0	80	310	0
Heavy Vehicles (%)	0%	6%	4%	5%	5%	15%	5%	4%	8%	10%	7%	21%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.5	15.5		15.5	15.5		30.2	30.2		30.2	30.2	
Effective Green, g (s)	15.5	15.5		15.5	15.5		30.2	30.2		30.2	30.2	
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.52	0.52		0.52	0.52	
Clearance Time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	281	436		248	441		537	912		469	907	
v/s Ratio Prot		0.10			0.14			c0.20			0.18	
v/s Ratio Perm	0.02			c0.15			0.14			0.09		
v/c Ratio	0.08	0.36		0.55	0.51		0.27	0.39		0.17	0.34	
Uniform Delay, d1	15.9	17.2		18.2	18.0		7.7	8.3		7.3	8.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.1		4.5	2.0		0.3	0.3		0.2	0.2	
Delay (s)	16.1	18.2		22.7	20.0		8.0	8.6		7.4	8.3	
Level of Service	B	B		C	B		A	A		A	A	
Approach Delay (s)		18.1			20.9			8.4			8.1	
Approach LOS		B			C			A			A	

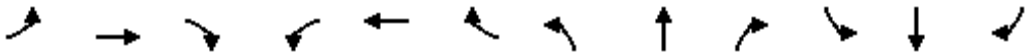
Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	57.9	Sum of lost time (s)	12.2
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	130	7	12	193	14	13	3	15	9	2	8
Future Volume (Veh/h)	12	130	7	12	193	14	13	3	15	9	2	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.94	0.50	0.50	0.85	0.50	0.92	0.50	0.81	0.25	0.25	0.58
Hourly flow rate (vph)	24	138	14	24	227	28	14	6	19	36	8	14
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	255			152			479	489	138	483	475	227
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	255			152			479	489	138	483	475	227
tC, single (s)	4.1			4.2			7.2	6.5	6.2	7.1	7.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.3	3.5	4.9	3.3
p0 queue free %	98			98			97	99	98	92	98	98
cM capacity (veh/h)	1322			1381			456	465	916	469	358	817

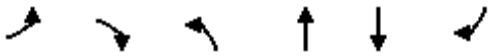
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	162	14	251	28	39	58
Volume Left	24	0	24	0	14	36
Volume Right	0	14	0	28	19	14
cSH	1322	1700	1381	1700	606	499
Volume to Capacity	0.02	0.01	0.02	0.02	0.06	0.12
Queue Length 95th (m)	0.4	0.0	0.4	0.0	1.6	3.1
Control Delay (s)	1.3	0.0	0.9	0.0	11.3	13.2
Lane LOS	A		A		B	B
Approach Delay (s)	1.2		0.8		11.3	13.2
Approach LOS					B	B

Intersection Summary				
Average Delay	3.0			
Intersection Capacity Utilization	30.0%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	36	63	104	33	240	92	409	98	190	350	19
Future Volume (vph)	23	36	63	104	33	240	92	409	98	190	350	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	0.87		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1703		1805	1604		1805	1810		1656	1806	
Flt Permitted	0.31	1.00		0.68	1.00		0.53	1.00		0.29	1.00	
Satd. Flow (perm)	598	1703		1292	1604		1004	1810		510	1806	
Peak-hour factor, PHF	0.83	0.80	0.84	0.84	0.73	0.95	0.86	0.86	0.81	0.90	0.95	0.71
Adj. Flow (vph)	28	45	75	124	45	253	107	476	121	211	368	27
RTOR Reduction (vph)	0	63	0	0	212	0	0	9	0	0	2	0
Lane Group Flow (vph)	28	57	0	124	86	0	107	588	0	211	393	0
Heavy Vehicles (%)	0%	3%	0%	0%	0%	4%	0%	2%	1%	9%	4%	6%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	12.7	12.7		12.7	12.7		45.1	40.1		50.5	42.8	
Effective Green, g (s)	12.7	12.7		12.7	12.7		45.1	40.1		50.5	42.8	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.58	0.52		0.65	0.55	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	97	279		211	262		635	936		446	997	
v/s Ratio Prot		0.03			0.05		0.01	c0.33		c0.05	0.22	
v/s Ratio Perm	0.05			c0.10			0.09			0.26		
v/c Ratio	0.29	0.21		0.59	0.33		0.17	0.63		0.47	0.39	
Uniform Delay, d1	28.4	28.0		30.0	28.6		7.2	13.4		7.2	9.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	0.4		4.1	0.7		0.0	3.2		0.3	1.2	
Delay (s)	30.1	28.4		34.1	29.4		7.2	16.6		7.5	11.1	
Level of Service	C	C		C	C		A	B		A	B	
Approach Delay (s)		28.7			30.8			15.1			9.8	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	77.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	6	3	12	22	0
Future Volume (Veh/h)	0	6	3	12	22	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	7	3	13	24	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	43	24	24			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	43	24	24			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	966	1052	1591			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	7	16	24
Volume Left	0	3	0
Volume Right	7	0	0
cSH	1052	1591	1700
Volume to Capacity	0.01	0.00	0.01
Queue Length 95th (m)	0.2	0.0	0.0
Control Delay (s)	8.4	1.4	0.0
Lane LOS	A	A	
Approach Delay (s)	8.4	1.4	0.0
Approach LOS	A		

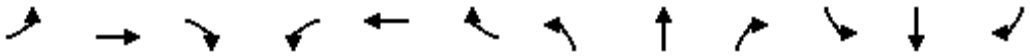
Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	34	40	269	15	6	238
Future Volume (Veh/h)	34	40	269	15	6	238
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.82	0.88	0.75	0.42	0.79
Hourly flow rate (vph)	45	49	306	20	14	301
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			273			
pX, platoon unblocked						
vC, conflicting volume	645	316			326	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	645	316			326	
tC, single (s)	6.4	6.2			4.7	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.7	
p0 queue free %	90	93			99	
cM capacity (veh/h)	434	722			969	

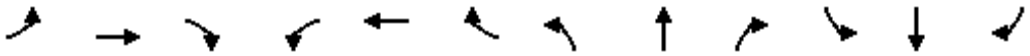
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	94	326	315
Volume Left	45	0	14
Volume Right	49	20	0
cSH	548	1700	969
Volume to Capacity	0.17	0.19	0.01
Queue Length 95th (m)	4.9	0.0	0.4
Control Delay (s)	12.9	0.0	0.5
Lane LOS	B		A
Approach Delay (s)	12.9	0.0	0.5
Approach LOS	B		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	28.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	126	65	67	95	77	79	261	88	71	286	98
Future Volume (vph)	18	126	65	67	95	77	79	261	88	71	286	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.93		1.00	0.96		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1703	1756		1770	1740		1805	1783		1752	1726	
Flt Permitted	0.63	1.00		0.60	1.00		0.33	1.00		0.47	1.00	
Satd. Flow (perm)	1125	1756		1120	1740		626	1783		867	1726	
Peak-hour factor, PHF	0.67	0.75	0.97	0.71	0.83	0.82	0.89	0.82	0.73	0.84	0.97	0.31
Adj. Flow (vph)	27	168	67	94	114	94	89	318	121	85	295	316
RTOR Reduction (vph)	0	26	0	0	53	0	0	18	0	0	51	0
Lane Group Flow (vph)	27	209	0	94	155	0	89	421	0	85	560	0
Heavy Vehicles (%)	6%	3%	5%	2%	0%	4%	0%	3%	0%	3%	1%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	13.7	13.7		13.7	13.7		30.1	30.1		30.1	30.1	
Effective Green, g (s)	13.7	13.7		13.7	13.7		30.1	30.1		30.1	30.1	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.54	0.54		0.54	0.54	
Clearance Time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	275	429		274	425		336	958		466	927	
v/s Ratio Prot		c0.12			0.09			0.24			c0.32	
v/s Ratio Perm	0.02			0.08			0.14			0.10		
v/c Ratio	0.10	0.49		0.34	0.36		0.26	0.44		0.18	0.60	
Uniform Delay, d1	16.4	18.1		17.4	17.5		7.0	7.8		6.6	8.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.8		1.6	1.1		0.4	0.3		0.2	1.1	
Delay (s)	16.7	20.0		19.0	18.7		7.4	8.2		6.8	10.0	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		19.6			18.8			8.0			9.6	
Approach LOS		B			B			A			A	

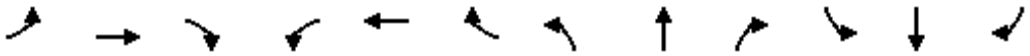
Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	56.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	231	14	20	210	3	9	3	35	10	2	16
Future Volume (Veh/h)	9	231	14	20	210	3	9	3	35	10	2	16
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.67	0.92	0.75	0.64	0.75	0.25	0.50	0.50	0.70	0.38	0.25	0.88
Hourly flow rate (vph)	13	251	19	31	280	12	18	6	50	26	8	18
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	292			270			641	631	251	672	638	280
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	292			270			641	631	251	672	638	280
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			95	98	94	92	98	98
cM capacity (veh/h)	1281			1305			366	387	793	336	384	764

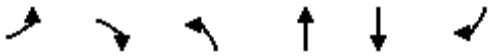
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	264	19	311	12	74	52
Volume Left	13	0	31	0	18	26
Volume Right	0	19	0	12	50	18
cSH	1281	1700	1305	1700	579	427
Volume to Capacity	0.01	0.01	0.02	0.01	0.13	0.12
Queue Length 95th (m)	0.2	0.0	0.6	0.0	3.5	3.3
Control Delay (s)	0.5	0.0	1.0	0.0	12.1	14.6
Lane LOS	A		A		B	B
Approach Delay (s)	0.4		0.9		12.1	14.6
Approach LOS					B	B

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	37.7%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	8	7	80	10	137	24	261	98	209	348	7
Future Volume (vph)	4	8	7	80	10	137	24	261	98	209	348	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.86		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1758		1703	1447		1719	1668		1719	1882	
Flt Permitted	0.49	1.00		0.74	1.00		0.52	1.00		0.39	1.00	
Satd. Flow (perm)	940	1758		1332	1447		942	1668		700	1882	
Peak-hour factor, PHF	0.38	0.75	0.63	0.71	0.50	0.74	0.68	0.81	0.69	0.74	0.88	0.42
Adj. Flow (vph)	11	11	11	113	20	185	35	322	142	282	395	17
RTOR Reduction (vph)	0	9	0	0	157	0	0	15	0	0	1	0
Lane Group Flow (vph)	11	13	0	113	48	0	35	449	0	282	411	0
Heavy Vehicles (%)	0%	0%	0%	6%	0%	15%	5%	9%	8%	5%	0%	8%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	11.8	11.8		11.8	11.8		44.0	40.9		53.3	46.2	
Effective Green, g (s)	11.8	11.8		11.8	11.8		44.0	40.9		53.3	46.2	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.56	0.52		0.68	0.59	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	142	265		201	218		561	873		587	1113	
v/s Ratio Prot		0.01			0.03		0.00	c0.27		c0.05	0.22	
v/s Ratio Perm	0.01			c0.08			0.03			0.28		
v/c Ratio	0.08	0.05		0.56	0.22		0.06	0.51		0.48	0.37	
Uniform Delay, d1	28.5	28.3		30.8	29.1		7.6	12.1		5.6	8.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.1		3.6	0.5		0.0	2.2		0.2	0.9	
Delay (s)	28.7	28.4		34.3	29.6		7.6	14.3		5.9	9.3	
Level of Service	C	C		C	C		A	B		A	A	
Approach Delay (s)		28.5			31.3			13.8			7.9	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	78.1	Sum of lost time (s)	17.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	7	6	26	14	0
Future Volume (Veh/h)	0	7	6	26	14	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	8	7	28	15	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	57	15	15			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	57	15	15			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	946	1065	1603			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	8	35	15
Volume Left	0	7	0
Volume Right	8	0	0
cSH	1065	1603	1700
Volume to Capacity	0.01	0.00	0.01
Queue Length 95th (m)	0.2	0.1	0.0
Control Delay (s)	8.4	1.5	0.0
Lane LOS	A	A	
Approach Delay (s)	8.4	1.5	0.0
Approach LOS	A		

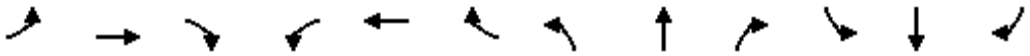
Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	16.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	37	35	202	34	32	214
Future Volume (Veh/h)	37	35	202	34	32	214
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.88	0.75	0.89	0.65	0.89
Hourly flow rate (vph)	49	40	269	38	49	240
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			273			
pX, platoon unblocked						
vC, conflicting volume	626	288			307	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	626	288			307	
tC, single (s)	6.6	6.7			4.2	
tC, 2 stage (s)						
tF (s)	3.7	3.7			2.3	
p0 queue free %	88	94			96	
cM capacity (veh/h)	401	658			1220	

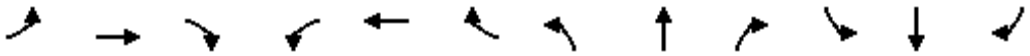
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	89	307	289
Volume Left	49	0	49
Volume Right	40	38	0
cSH	486	1700	1220
Volume to Capacity	0.18	0.18	0.04
Queue Length 95th (m)	5.3	0.0	1.0
Control Delay (s)	14.1	0.0	1.7
Lane LOS	B		A
Approach Delay (s)	14.1	0.0	1.7
Approach LOS	B		

Intersection Summary			
Average Delay		2.5	
Intersection Capacity Utilization		39.9%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	79	125	103	136	85	80	225	47	63	264	18
Future Volume (vph)	18	79	125	103	136	85	80	225	47	63	264	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.94		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1633		1719	1648		1719	1749		1641	1739	
Flt Permitted	0.51	1.00		0.47	1.00		0.54	1.00		0.48	1.00	
Satd. Flow (perm)	969	1633		846	1648		973	1749		829	1739	
Peak-hour factor, PHF	0.70	0.76	0.59	0.68	0.75	0.78	0.49	0.71	0.50	0.71	0.82	0.70
Adj. Flow (vph)	26	104	212	151	181	109	163	317	94	89	322	26
RTOR Reduction (vph)	0	125	0	0	37	0	0	15	0	0	4	0
Lane Group Flow (vph)	26	191	0	151	253	0	163	396	0	89	344	0
Heavy Vehicles (%)	0%	6%	4%	5%	5%	15%	5%	4%	8%	10%	7%	21%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.5	16.5		16.5	16.5		30.2	30.2		30.2	30.2	
Effective Green, g (s)	16.5	16.5		16.5	16.5		30.2	30.2		30.2	30.2	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.51	0.51		0.51	0.51	
Clearance Time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	271	457		236	461		498	896		425	891	
v/s Ratio Prot		0.12			0.15			c0.23			0.20	
v/s Ratio Perm	0.03			c0.18			0.17			0.11		
v/c Ratio	0.10	0.42		0.64	0.55		0.33	0.44		0.21	0.39	
Uniform Delay, d1	15.7	17.3		18.6	18.0		8.4	9.0		7.8	8.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.3		7.7	2.4		0.4	0.4		0.2	0.3	
Delay (s)	16.0	18.6		26.3	20.4		8.8	9.4		8.1	9.0	
Level of Service	B	B		C	C		A	A		A	A	
Approach Delay (s)		18.4			22.4			9.2			8.8	
Approach LOS		B			C			A			A	

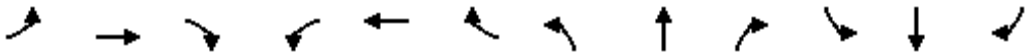
Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	58.9	Sum of lost time (s)	12.2
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	143	8	13	213	16	14	3	16	10	2	9
Future Volume (Veh/h)	13	143	8	13	213	16	14	3	16	10	2	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.94	0.50	0.50	0.85	0.50	0.92	0.50	0.81	0.25	0.25	0.58
Hourly flow rate (vph)	26	152	16	26	251	32	15	6	20	40	8	16
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	283			168			527	539	152	530	523	251
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	283			168			527	539	152	530	523	251
tC, single (s)	4.1			4.2			7.2	6.5	6.2	7.1	7.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.3	3.5	4.9	3.3
p0 queue free %	98			98			96	99	98	91	98	98
cM capacity (veh/h)	1291			1363			421	434	900	434	332	793

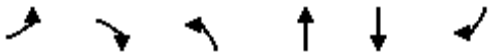
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	178	16	277	32	41	64
Volume Left	26	0	26	0	15	40
Volume Right	0	16	0	32	20	16
cSH	1291	1700	1363	1700	572	469
Volume to Capacity	0.02	0.01	0.02	0.02	0.07	0.14
Queue Length 95th (m)	0.5	0.0	0.5	0.0	1.8	3.8
Control Delay (s)	1.3	0.0	0.9	0.0	11.8	13.9
Lane LOS	A		A		B	B
Approach Delay (s)	1.2		0.8		11.8	13.9
Approach LOS					B	B

Intersection Summary				
Average Delay	3.0			
Intersection Capacity Utilization	31.9%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	40	70	115	36	365	102	451	108	210	387	21
Future Volume (vph)	25	40	70	115	36	365	102	451	108	210	387	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	0.87		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1703		1805	1591		1805	1810		1656	1806	
Flt Permitted	0.29	1.00		0.67	1.00		0.49	1.00		0.23	1.00	
Satd. Flow (perm)	547	1703		1277	1591		933	1810		409	1806	
Peak-hour factor, PHF	0.83	0.80	0.84	0.84	0.73	0.95	0.86	0.86	0.81	0.90	0.95	0.71
Adj. Flow (vph)	30	50	83	137	49	384	119	524	133	233	407	30
RTOR Reduction (vph)	0	69	0	0	317	0	0	9	0	0	2	0
Lane Group Flow (vph)	30	64	0	137	116	0	119	648	0	233	435	0
Heavy Vehicles (%)	0%	3%	0%	0%	0%	4%	0%	2%	1%	9%	4%	6%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	13.9	13.9		13.9	13.9		45.5	40.2		51.9	43.4	
Effective Green, g (s)	13.9	13.9		13.9	13.9		45.5	40.2		51.9	43.4	
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.57	0.51		0.65	0.55	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	95	297		222	277		591	914		399	984	
v/s Ratio Prot		0.04			0.07		0.01	c0.36		c0.06	0.24	
v/s Ratio Perm	0.05			c0.11			0.10			0.32		
v/c Ratio	0.32	0.22		0.62	0.42		0.20	0.71		0.58	0.44	
Uniform Delay, d1	28.7	28.2		30.4	29.3		7.8	15.2		8.9	10.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	0.4		5.0	1.0		0.1	4.6		1.4	1.4	
Delay (s)	30.6	28.6		35.4	30.3		7.9	19.8		10.3	12.3	
Level of Service	C	C		D	C		A	B		B	B	
Approach Delay (s)		28.9			31.5			18.0			11.6	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	79.6	Sum of lost time (s)	17.0
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	7	3	13	24	0
Future Volume (Veh/h)	0	7	3	13	24	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	8	3	14	26	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	46	26	26			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	46	26	26			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	962	1050	1588			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	8	17	26
Volume Left	0	3	0
Volume Right	8	0	0
cSH	1050	1588	1700
Volume to Capacity	0.01	0.00	0.02
Queue Length 95th (m)	0.2	0.0	0.0
Control Delay (s)	8.5	1.3	0.0
Lane LOS	A	A	
Approach Delay (s)	8.5	1.3	0.0
Approach LOS	A		

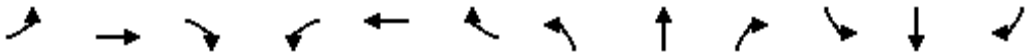
Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	37	44	297	19	7	263
Future Volume (Veh/h)	37	44	297	19	7	263
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.82	0.88	0.75	0.42	0.79
Hourly flow rate (vph)	49	54	338	25	17	333
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			273			
pX, platoon unblocked						
vC, conflicting volume	718	350			363	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	718	350			363	
tC, single (s)	6.4	6.2			4.7	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.7	
p0 queue free %	87	92			98	
cM capacity (veh/h)	392	691			936	

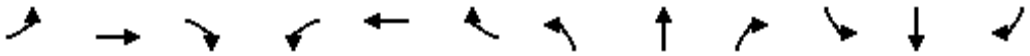
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	103	363	350
Volume Left	49	0	17
Volume Right	54	25	0
cSH	507	1700	936
Volume to Capacity	0.20	0.21	0.02
Queue Length 95th (m)	6.0	0.0	0.4
Control Delay (s)	13.9	0.0	0.6
Lane LOS	B		A
Approach Delay (s)	13.9	0.0	0.6
Approach LOS	B		

Intersection Summary			
Average Delay		2.0	
Intersection Capacity Utilization		30.9%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	139	71	74	105	85	87	288	97	79	316	108
Future Volume (vph)	20	139	71	74	105	85	87	288	97	79	316	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.93		1.00	0.96		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1703	1757		1770	1740		1805	1783		1752	1727	
Flt Permitted	0.61	1.00		0.56	1.00		0.28	1.00		0.43	1.00	
Satd. Flow (perm)	1092	1757		1041	1740		523	1783		789	1727	
Peak-hour factor, PHF	0.67	0.75	0.97	0.71	0.83	0.82	0.89	0.82	0.73	0.84	0.97	0.31
Adj. Flow (vph)	30	185	73	104	127	104	98	351	133	94	326	348
RTOR Reduction (vph)	0	25	0	0	52	0	0	18	0	0	51	0
Lane Group Flow (vph)	30	233	0	104	179	0	98	466	0	94	623	0
Heavy Vehicles (%)	6%	3%	5%	2%	0%	4%	0%	3%	0%	3%	1%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	14.4	14.4		14.4	14.4		30.1	30.1		30.1	30.1	
Effective Green, g (s)	14.4	14.4		14.4	14.4		30.1	30.1		30.1	30.1	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.53	0.53		0.53	0.53	
Clearance Time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	277	446		264	441		277	946		418	916	
v/s Ratio Prot		c0.13			0.10			0.26			c0.36	
v/s Ratio Perm	0.03			0.10			0.19			0.12		
v/c Ratio	0.11	0.52		0.39	0.41		0.35	0.49		0.22	0.68	
Uniform Delay, d1	16.2	18.2		17.5	17.6		7.7	8.4		7.1	9.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	2.1		2.0	1.3		0.8	0.4		0.3	2.0	
Delay (s)	16.6	20.3		19.6	18.9		8.5	8.9		7.4	11.8	
Level of Service	B	C		B	B		A	A		A	B	
Approach Delay (s)		19.9			19.1			8.8			11.2	
Approach LOS		B			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	56.7	Sum of lost time (s)	12.2
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



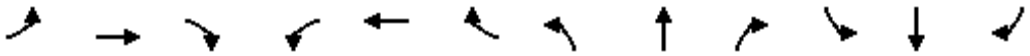
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	255	15	22	232	3	10	3	38	11	2	18
Future Volume (Veh/h)	10	255	15	22	232	3	10	3	38	11	2	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.67	0.92	0.75	0.64	0.75	0.25	0.50	0.50	0.70	0.38	0.25	0.88
Hourly flow rate (vph)	15	277	20	34	309	12	20	6	54	29	8	20
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	321			297			708	696	277	741	704	309
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	321			297			708	696	277	741	704	309
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			97			94	98	93	90	98	97
cM capacity (veh/h)	1250			1276			327	354	767	298	350	736

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	292	20	343	12	80	57
Volume Left	15	0	34	0	20	29
Volume Right	0	20	0	12	54	20
cSH	1250	1700	1276	1700	538	387
Volume to Capacity	0.01	0.01	0.03	0.01	0.15	0.15
Queue Length 95th (m)	0.3	0.0	0.7	0.0	4.2	4.1
Control Delay (s)	0.5	0.0	1.0	0.0	12.9	15.9
Lane LOS	A		A		B	C
Approach Delay (s)	0.5		1.0		12.9	15.9
Approach LOS					B	C

Intersection Summary				
Average Delay	3.0			
Intersection Capacity Utilization	40.6%	ICU Level of Service		A
Analysis Period (min)	15			

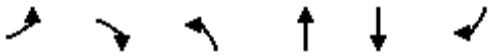
HCM Signalized Intersection Capacity Analysis
1: St. David Street & Freshco Entrance/Gordon Street

01-17-2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	7	6	72	9	144	21	237	89	306	315	6
Future Volume (vph)	4	7	6	72	9	144	21	237	89	306	315	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.86		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1750		1703	1441		1719	1668		1719	1884	
Flt Permitted	0.45	1.00		0.75	1.00		0.54	1.00		0.42	1.00	
Satd. Flow (perm)	851	1750		1335	1441		977	1668		758	1884	
Peak-hour factor, PHF	0.38	0.75	0.63	0.71	0.50	0.74	0.68	0.81	0.69	0.74	0.88	0.42
Adj. Flow (vph)	11	9	10	101	18	195	31	293	129	414	358	14
RTOR Reduction (vph)	0	9	0	0	168	0	0	15	0	0	1	0
Lane Group Flow (vph)	11	10	0	101	45	0	31	407	0	414	371	0
Heavy Vehicles (%)	0%	0%	0%	6%	0%	15%	5%	9%	8%	5%	0%	8%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	11.2	11.2		11.2	11.2		43.8	41.7		55.3	49.2	
Effective Green, g (s)	11.2	11.2		11.2	11.2		43.8	41.7		55.3	49.2	
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.55	0.52		0.70	0.62	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	119	246		188	203		557	874		643	1165	
v/s Ratio Prot		0.01			0.03		0.00	0.24		c0.08	0.20	
v/s Ratio Perm	0.01			c0.08			0.03			c0.37		
v/c Ratio	0.09	0.04		0.54	0.22		0.06	0.47		0.64	0.32	
Uniform Delay, d1	29.7	29.5		31.7	30.3		8.2	11.9		5.7	7.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.1		2.9	0.6		0.0	1.8		1.7	0.7	
Delay (s)	30.1	29.6		34.7	30.9		8.2	13.7		7.3	7.9	
Level of Service	C	C		C	C		A	B		A	A	
Approach Delay (s)		29.8			32.1			13.3			7.6	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	79.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	23	102	24	13	0
Future Volume (Veh/h)	0	23	102	24	13	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	25	111	26	14	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	262	14	14			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	262	14	14			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	93			
cM capacity (veh/h)	677	1066	1604			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	25	137	14
Volume Left	0	111	0
Volume Right	25	0	0
cSH	1066	1604	1700
Volume to Capacity	0.02	0.07	0.01
Queue Length 95th (m)	0.6	1.8	0.0
Control Delay (s)	8.5	6.1	0.0
Lane LOS	A	A	
Approach Delay (s)	8.5	6.1	0.0
Approach LOS	A		

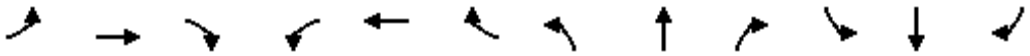
Intersection Summary			
Average Delay	6.0		
Intersection Capacity Utilization	23.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	65	51	183	206	146	194
Future Volume (Veh/h)	65	51	183	206	146	194
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.88	0.75	0.89	0.65	0.89
Hourly flow rate (vph)	87	58	244	231	225	218
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			273			
pX, platoon unblocked						
vC, conflicting volume	1028	360			475	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1028	360			475	
tC, single (s)	6.6	6.7			4.2	
tC, 2 stage (s)						
tF (s)	3.7	3.7			2.3	
p0 queue free %	54	90			79	
cM capacity (veh/h)	187	597			1056	

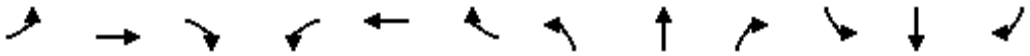
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	145	475	443
Volume Left	87	0	225
Volume Right	58	231	0
cSH	258	1700	1056
Volume to Capacity	0.56	0.28	0.21
Queue Length 95th (m)	25.1	0.0	6.4
Control Delay (s)	35.4	0.0	5.9
Lane LOS	E		A
Approach Delay (s)	35.4	0.0	5.9
Approach LOS	E		

Intersection Summary			
Average Delay	7.3		
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	110	113	93	130	77	72	282	42	57	253	33
Future Volume (vph)	113	110	113	93	130	77	72	282	42	57	253	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	0.95		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1657		1719	1653		1719	1767		1641	1711	
Flt Permitted	0.54	1.00		0.43	1.00		0.53	1.00		0.42	1.00	
Satd. Flow (perm)	1025	1657		782	1653		962	1767		724	1711	
Peak-hour factor, PHF	0.70	0.76	0.59	0.68	0.75	0.78	0.49	0.71	0.50	0.71	0.82	0.70
Adj. Flow (vph)	161	145	192	137	173	99	147	397	84	80	309	47
RTOR Reduction (vph)	0	82	0	0	35	0	0	11	0	0	8	0
Lane Group Flow (vph)	161	255	0	137	237	0	147	470	0	80	348	0
Heavy Vehicles (%)	0%	6%	4%	5%	5%	15%	5%	4%	8%	10%	7%	21%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.3	16.3		16.3	16.3		30.2	30.2		30.2	30.2	
Effective Green, g (s)	16.3	16.3		16.3	16.3		30.2	30.2		30.2	30.2	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.51	0.51		0.51	0.51	
Clearance Time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	284	460		217	459		494	909		372	880	
v/s Ratio Prot		0.15			0.14			c0.27			0.20	
v/s Ratio Perm	0.16			c0.18			0.15			0.11		
v/c Ratio	0.57	0.56		0.63	0.52		0.30	0.52		0.22	0.40	
Uniform Delay, d1	18.2	18.1		18.6	17.9		8.2	9.4		7.8	8.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.2	2.5		8.1	1.9		0.3	0.5		0.3	0.3	
Delay (s)	22.4	20.6		26.6	19.8		8.5	9.9		8.1	9.0	
Level of Service	C	C		C	B		A	A		A	A	
Approach Delay (s)		21.2			22.1			9.6			8.8	
Approach LOS		C			C			A			A	

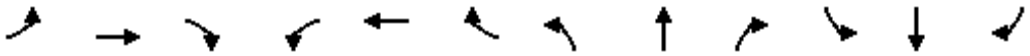
Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	58.7	Sum of lost time (s)	12.2
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	130	7	12	193	72	13	3	15	19	2	15
Future Volume (Veh/h)	51	130	7	12	193	72	13	3	15	19	2	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.94	0.50	0.50	0.85	0.50	0.92	0.50	0.81	0.25	0.25	0.58
Hourly flow rate (vph)	102	138	14	24	227	144	14	6	19	76	8	26
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	371			152			647	761	138	639	631	227
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	371			152			647	761	138	639	631	227
tC, single (s)	4.1			4.2			7.2	6.5	6.2	7.1	7.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.3	3.5	4.9	3.3
p0 queue free %	91			98			96	98	98	78	97	97
cM capacity (veh/h)	1199			1381			327	303	916	349	264	817

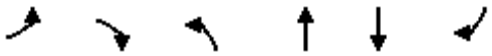
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	240	14	251	144	39	110
Volume Left	102	0	24	0	14	76
Volume Right	0	14	0	144	19	26
cSH	1199	1700	1381	1700	468	393
Volume to Capacity	0.09	0.01	0.02	0.08	0.08	0.28
Queue Length 95th (m)	2.2	0.0	0.4	0.0	2.2	9.0
Control Delay (s)	4.0	0.0	0.9	0.0	13.4	17.7
Lane LOS	A		A		B	C
Approach Delay (s)	3.7		0.6		13.4	17.7
Approach LOS					B	C

Intersection Summary				
Average Delay	4.6			
Intersection Capacity Utilization	33.8%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	36	63	104	33	340	92	409	98	225	350	19
Future Volume (vph)	23	36	63	104	33	340	92	409	98	225	350	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	0.87		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1703		1805	1590		1805	1810		1656	1806	
Flt Permitted	0.31	1.00		0.68	1.00		0.53	1.00		0.29	1.00	
Satd. Flow (perm)	598	1703		1292	1590		1005	1810		498	1806	
Peak-hour factor, PHF	0.83	0.80	0.84	0.84	0.73	0.95	0.86	0.86	0.81	0.90	0.95	0.71
Adj. Flow (vph)	28	45	75	124	45	358	107	476	121	250	368	27
RTOR Reduction (vph)	0	63	0	0	300	0	0	9	0	0	2	0
Lane Group Flow (vph)	28	57	0	124	103	0	107	588	0	250	393	0
Heavy Vehicles (%)	0%	3%	0%	0%	0%	4%	0%	2%	1%	9%	4%	6%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	12.7	12.7		12.7	12.7		45.1	40.1		51.7	43.4	
Effective Green, g (s)	12.7	12.7		12.7	12.7		45.1	40.1		51.7	43.4	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.58	0.51		0.66	0.56	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	97	276		210	258		631	929		452	1003	
v/s Ratio Prot		0.03			0.06		0.01	c0.33		c0.06	0.22	
v/s Ratio Perm	0.05			c0.10			0.09			0.31		
v/c Ratio	0.29	0.21		0.59	0.40		0.17	0.63		0.55	0.39	
Uniform Delay, d1	28.7	28.3		30.3	29.3		7.4	13.7		7.4	9.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	0.4		4.4	1.0		0.0	3.3		0.8	1.2	
Delay (s)	30.4	28.7		34.7	30.3		7.5	17.0		8.3	11.0	
Level of Service	C	C		C	C		A	B		A	B	
Approach Delay (s)		29.0			31.3			15.5			9.9	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	78.1	Sum of lost time (s)	17.0
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	89	33	12	22	0
Future Volume (Veh/h)	0	89	33	12	22	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	97	36	13	24	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	109	24	24			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	109	24	24			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	91	98			
cM capacity (veh/h)	868	1052	1591			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	97	49	24
Volume Left	0	36	0
Volume Right	97	0	0
cSH	1052	1591	1700
Volume to Capacity	0.09	0.02	0.01
Queue Length 95th (m)	2.4	0.6	0.0
Control Delay (s)	8.8	5.4	0.0
Lane LOS	A	A	
Approach Delay (s)	8.8	5.4	0.0
Approach LOS	A		

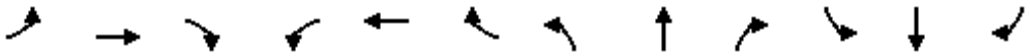
Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	21.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	184	140	269	68	41	238
Future Volume (Veh/h)	184	140	269	68	41	238
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.82	0.88	0.75	0.42	0.79
Hourly flow rate (vph)	245	171	306	91	98	301
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			273			
pX, platoon unblocked						
vC, conflicting volume	848	352			397	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	848	352			397	
tC, single (s)	6.4	6.2			4.7	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.7	
p0 queue free %	18	75			89	
cM capacity (veh/h)	298	690			907	

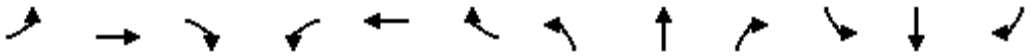
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	416	397	399
Volume Left	245	0	98
Volume Right	171	91	0
cSH	389	1700	907
Volume to Capacity	1.07	0.23	0.11
Queue Length 95th (m)	114.4	0.0	2.9
Control Delay (s)	98.6	0.0	3.3
Lane LOS	F		A
Approach Delay (s)	98.6	0.0	3.3
Approach LOS	F		

Intersection Summary			
Average Delay	34.9		
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	138	65	67	128	77	79	284	88	71	353	181
Future Volume (vph)	48	138	65	67	128	77	79	284	88	71	353	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.94		1.00	0.96		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1703	1762		1770	1765		1805	1786		1752	1697	
Flt Permitted	0.58	1.00		0.57	1.00		0.13	1.00		0.44	1.00	
Satd. Flow (perm)	1035	1762		1065	1765		252	1786		817	1697	
Peak-hour factor, PHF	0.67	0.75	0.97	0.71	0.83	0.82	0.89	0.82	0.73	0.84	0.97	0.31
Adj. Flow (vph)	72	184	67	94	154	94	89	346	121	85	364	584
RTOR Reduction (vph)	0	23	0	0	39	0	0	17	0	0	77	0
Lane Group Flow (vph)	72	228	0	94	209	0	89	450	0	85	871	0
Heavy Vehicles (%)	6%	3%	5%	2%	0%	4%	0%	3%	0%	3%	1%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	14.3	14.3		14.3	14.3		30.1	30.1		30.1	30.1	
Effective Green, g (s)	14.3	14.3		14.3	14.3		30.1	30.1		30.1	30.1	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.53	0.53		0.53	0.53	
Clearance Time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	261	445		269	445		134	949		434	902	
v/s Ratio Prot		c0.13			0.12			0.25			c0.51	
v/s Ratio Perm	0.07			0.09			0.35			0.10		
v/c Ratio	0.28	0.51		0.35	0.47		0.66	0.47		0.20	0.97	
Uniform Delay, d1	17.0	18.2		17.3	17.9		9.6	8.3		6.9	12.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	2.0		1.6	1.6		11.7	0.4		0.2	21.8	
Delay (s)	18.2	20.1		19.0	19.6		21.3	8.7		7.1	34.6	
Level of Service	B	C		B	B		C	A		A	C	
Approach Delay (s)		19.7			19.4			10.7			32.3	
Approach LOS		B			B			B			C	

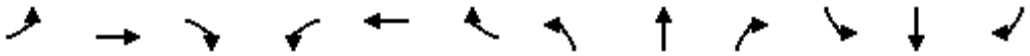
Intersection Summary			
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	56.6	Sum of lost time (s)	12.2
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	231	14	20	210	21	9	3	35	60	2	49
Future Volume (Veh/h)	21	231	14	20	210	21	9	3	35	60	2	49
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.67	0.92	0.75	0.64	0.75	0.25	0.50	0.50	0.70	0.38	0.25	0.88
Hourly flow rate (vph)	31	251	19	31	280	84	18	6	50	158	8	56
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	364			270			715	739	251	708	674	280
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	364			270			715	739	251	708	674	280
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			98			94	98	94	50	98	93
cM capacity (veh/h)	1206			1305			306	331	793	313	360	764

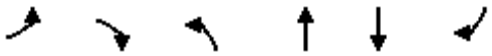
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	282	19	311	84	74	222
Volume Left	31	0	31	0	18	158
Volume Right	0	19	0	84	50	56
cSH	1206	1700	1305	1700	528	370
Volume to Capacity	0.03	0.01	0.02	0.05	0.14	0.60
Queue Length 95th (m)	0.6	0.0	0.6	0.0	3.9	29.9
Control Delay (s)	1.1	0.0	1.0	0.0	12.9	28.3
Lane LOS	A		A		B	D
Approach Delay (s)	1.0		0.8		12.9	28.3
Approach LOS					B	D

Intersection Summary				
Average Delay	7.9			
Intersection Capacity Utilization	48.6%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	8	7	80	10	157	24	261	98	326	348	7
Future Volume (vph)	4	8	7	80	10	157	24	261	98	326	348	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.86		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1758		1703	1442		1719	1668		1719	1882	
Flt Permitted	0.41	1.00		0.74	1.00		0.52	1.00		0.38	1.00	
Satd. Flow (perm)	771	1758		1332	1442		942	1668		687	1882	
Peak-hour factor, PHF	0.38	0.75	0.63	0.71	0.50	0.74	0.68	0.81	0.69	0.74	0.88	0.42
Adj. Flow (vph)	11	11	11	113	20	212	35	322	142	441	395	17
RTOR Reduction (vph)	0	9	0	0	180	0	0	15	0	0	1	0
Lane Group Flow (vph)	11	13	0	113	52	0	35	449	0	441	411	0
Heavy Vehicles (%)	0%	0%	0%	6%	0%	15%	5%	9%	8%	5%	0%	8%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	11.9	11.9		11.9	11.9		43.9	40.8		54.8	47.7	
Effective Green, g (s)	11.9	11.9		11.9	11.9		43.9	40.8		54.8	47.7	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.55	0.51		0.69	0.60	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	115	262		198	215		549	853		601	1126	
v/s Ratio Prot		0.01			0.04		0.00	0.27		c0.09	0.22	
v/s Ratio Perm	0.01			c0.08			0.03			c0.41		
v/c Ratio	0.10	0.05		0.57	0.24		0.06	0.53		0.73	0.36	
Uniform Delay, d1	29.3	29.0		31.5	29.9		8.2	13.0		6.6	8.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.1		3.9	0.6		0.0	2.3		4.0	0.9	
Delay (s)	29.6	29.1		35.5	30.5		8.2	15.3		10.6	9.1	
Level of Service	C	C		D	C		A	B		B	A	
Approach Delay (s)		29.3			32.1			14.8			9.9	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	79.7	Sum of lost time (s)	17.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	24	103	26	14	0
Future Volume (Veh/h)	0	24	103	26	14	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	26	112	28	15	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	267	15	15			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	267	15	15			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	93			
cM capacity (veh/h)	672	1065	1603			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	26	140	15
Volume Left	0	112	0
Volume Right	26	0	0
cSH	1065	1603	1700
Volume to Capacity	0.02	0.07	0.01
Queue Length 95th (m)	0.6	1.8	0.0
Control Delay (s)	8.5	6.0	0.0
Lane LOS	A	A	
Approach Delay (s)	8.5	6.0	0.0
Approach LOS	A		

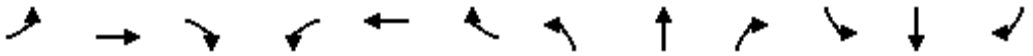
Intersection Summary			
Average Delay	5.9		
Intersection Capacity Utilization	23.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	68	55	202	209	149	214
Future Volume (Veh/h)	68	55	202	209	149	214
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.88	0.75	0.89	0.65	0.89
Hourly flow rate (vph)	91	63	269	235	229	240
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			273			
pX, platoon unblocked						
vC, conflicting volume	1084	386			504	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1084	386			504	
tC, single (s)	6.6	6.7			4.2	
tC, 2 stage (s)						
tF (s)	3.7	3.7			2.3	
p0 queue free %	47	89			78	
cM capacity (veh/h)	171	575			1030	

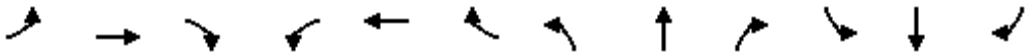
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	154	504	469
Volume Left	91	0	229
Volume Right	63	235	0
cSH	240	1700	1030
Volume to Capacity	0.64	0.30	0.22
Queue Length 95th (m)	31.5	0.0	6.8
Control Delay (s)	43.5	0.0	5.9
Lane LOS	E		A
Approach Delay (s)	43.5	0.0	5.9
Approach LOS	E		

Intersection Summary			
Average Delay	8.4		
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	118	125	103	143	85	80	303	47	63	278	35
Future Volume (vph)	115	118	125	103	143	85	80	303	47	63	278	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	0.95		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1655		1719	1654		1719	1765		1641	1713	
Flt Permitted	0.50	1.00		0.39	1.00		0.50	1.00		0.38	1.00	
Satd. Flow (perm)	946	1655		712	1654		898	1765		654	1713	
Peak-hour factor, PHF	0.70	0.76	0.59	0.68	0.75	0.78	0.49	0.71	0.50	0.71	0.82	0.70
Adj. Flow (vph)	164	155	212	151	191	109	163	427	94	89	339	50
RTOR Reduction (vph)	0	83	0	0	35	0	0	11	0	0	7	0
Lane Group Flow (vph)	164	284	0	151	265	0	163	510	0	89	382	0
Heavy Vehicles (%)	0%	6%	4%	5%	5%	15%	5%	4%	8%	10%	7%	21%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	17.3	17.3		17.3	17.3		30.2	30.2		30.2	30.2	
Effective Green, g (s)	17.3	17.3		17.3	17.3		30.2	30.2		30.2	30.2	
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.51	0.51		0.51	0.51	
Clearance Time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	274	479		206	479		454	892		330	866	
v/s Ratio Prot		0.17			0.16			c0.29			0.22	
v/s Ratio Perm	0.17			c0.21			0.18			0.14		
v/c Ratio	0.60	0.59		0.73	0.55		0.36	0.57		0.27	0.44	
Uniform Delay, d1	18.2	18.2		19.1	17.9		8.9	10.3		8.4	9.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.2	3.0		15.1	2.3		0.5	0.9		0.4	0.4	
Delay (s)	23.5	21.1		34.2	20.3		9.4	11.1		8.9	9.7	
Level of Service	C	C		C	C		A	B		A	A	
Approach Delay (s)		21.9			25.0			10.7			9.6	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	59.7	Sum of lost time (s)	12.2
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



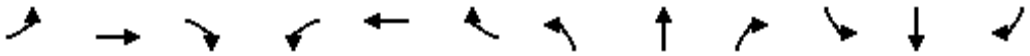
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	143	8	13	213	74	14	3	16	20	2	16
Future Volume (Veh/h)	52	143	8	13	213	74	14	3	16	20	2	16
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.94	0.50	0.50	0.85	0.50	0.92	0.50	0.81	0.25	0.25	0.58
Hourly flow rate (vph)	104	152	16	26	251	148	15	6	20	80	8	28
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	399			168			695	811	152	686	679	251
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	399			168			695	811	152	686	679	251
tC, single (s)	4.1			4.2			7.2	6.5	6.2	7.1	7.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.3	3.5	4.9	3.3
p0 queue free %	91			98			95	98	98	75	97	96
cM capacity (veh/h)	1171			1363			300	282	900	322	245	793

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	256	16	277	148	41	116
Volume Left	104	0	26	0	15	80
Volume Right	0	16	0	148	20	28
cSH	1171	1700	1363	1700	439	367
Volume to Capacity	0.09	0.01	0.02	0.09	0.09	0.32
Queue Length 95th (m)	2.3	0.0	0.5	0.0	2.5	10.7
Control Delay (s)	3.9	0.0	0.9	0.0	14.0	19.3
Lane LOS	A		A		B	C
Approach Delay (s)	3.7		0.6		14.0	19.3
Approach LOS					B	C

Intersection Summary				
Average Delay	4.7			
Intersection Capacity Utilization	35.7%	ICU Level of Service		A
Analysis Period (min)	15			

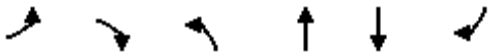
HCM Signalized Intersection Capacity Analysis
1: St. David Street & Freshco Entrance/Gordon Street

01-17-2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	40	70	115	36	365	102	451	108	245	387	21
Future Volume (vph)	25	40	70	115	36	365	102	451	108	245	387	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	0.87		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1703		1805	1591		1805	1810		1656	1806	
Flt Permitted	0.29	1.00		0.67	1.00		0.50	1.00		0.23	1.00	
Satd. Flow (perm)	547	1703		1277	1591		955	1810		394	1806	
Peak-hour factor, PHF	0.83	0.80	0.84	0.84	0.73	0.95	0.86	0.86	0.81	0.90	0.95	0.71
Adj. Flow (vph)	30	50	83	137	49	384	119	524	133	272	407	30
RTOR Reduction (vph)	0	69	0	0	318	0	0	9	0	0	2	0
Lane Group Flow (vph)	30	64	0	137	115	0	119	648	0	272	435	0
Heavy Vehicles (%)	0%	3%	0%	0%	0%	4%	0%	2%	1%	9%	4%	6%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	13.9	13.9		13.9	13.9		45.5	40.2		53.6	44.3	
Effective Green, g (s)	13.9	13.9		13.9	13.9		45.5	40.2		53.6	44.3	
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.57	0.50		0.67	0.55	
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	7.0		4.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	94	294		220	274		595	903		409	993	
v/s Ratio Prot		0.04			0.07		0.01	c0.36		c0.08	0.24	
v/s Ratio Perm	0.05			c0.11			0.10			0.36		
v/c Ratio	0.32	0.22		0.62	0.42		0.20	0.72		0.67	0.44	
Uniform Delay, d1	29.2	28.6		30.9	29.7		8.1	15.7		9.4	10.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	0.4		5.4	1.0		0.1	4.9		3.1	1.4	
Delay (s)	31.1	29.0		36.3	30.8		8.2	20.6		12.6	12.1	
Level of Service	C	C		D	C		A	C		B	B	
Approach Delay (s)		29.4			32.1			18.7			12.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	80.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	90	33	13	24	0
Future Volume (Veh/h)	0	90	33	13	24	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	98	36	14	26	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	112	26	26			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	112	26	26			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	91	98			
cM capacity (veh/h)	865	1050	1588			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	98	50	26
Volume Left	0	36	0
Volume Right	98	0	0
cSH	1050	1588	1700
Volume to Capacity	0.09	0.02	0.02
Queue Length 95th (m)	2.5	0.6	0.0
Control Delay (s)	8.8	5.3	0.0
Lane LOS	A	A	
Approach Delay (s)	8.8	5.3	0.0
Approach LOS	A		

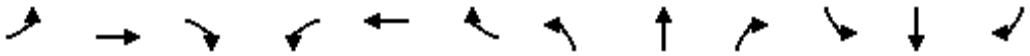
Intersection Summary			
Average Delay	6.5		
Intersection Capacity Utilization	21.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	187	144	297	72	42	263
Future Volume (Veh/h)	187	144	297	72	42	263
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.82	0.88	0.75	0.42	0.79
Hourly flow rate (vph)	249	176	338	96	100	333
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			273			
pX, platoon unblocked						
vC, conflicting volume	919	386			434	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	919	386			434	
tC, single (s)	6.4	6.2			4.7	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.7	
p0 queue free %	7	73			89	
cM capacity (veh/h)	269	660			875	

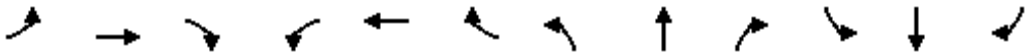
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	425	434	433
Volume Left	249	0	100
Volume Right	176	96	0
cSH	356	1700	875
Volume to Capacity	1.19	0.26	0.11
Queue Length 95th (m)	141.0	0.0	3.1
Control Delay (s)	143.9	0.0	3.3
Lane LOS	F		A
Approach Delay (s)	143.9	0.0	3.3
Approach LOS	F		

Intersection Summary			
Average Delay	48.4		
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	151	71	74	163	85	87	311	97	79	383	191
Future Volume (vph)	50	151	71	74	163	85	87	311	97	79	383	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.95		1.00	0.96		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1703	1762		1770	1777		1805	1786		1752	1699	
Flt Permitted	0.49	1.00		0.53	1.00		0.13	1.00		0.40	1.00	
Satd. Flow (perm)	878	1762		995	1777		252	1786		731	1699	
Peak-hour factor, PHF	0.67	0.75	0.97	0.71	0.83	0.82	0.89	0.82	0.73	0.84	0.97	0.31
Adj. Flow (vph)	75	201	73	104	196	104	98	379	133	94	395	616
RTOR Reduction (vph)	0	23	0	0	33	0	0	17	0	0	76	0
Lane Group Flow (vph)	75	251	0	104	267	0	98	495	0	94	935	0
Heavy Vehicles (%)	6%	3%	5%	2%	0%	4%	0%	3%	0%	3%	1%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.7	15.7		15.7	15.7		30.2	30.2		30.2	30.2	
Effective Green, g (s)	15.7	15.7		15.7	15.7		30.2	30.2		30.2	30.2	
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.52	0.52		0.52	0.52	
Clearance Time (s)	6.1	6.1		6.1	6.1		6.1	6.1		6.1	6.1	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	237	476		268	480		130	928		379	883	
v/s Ratio Prot		0.14			c0.15			0.28			c0.55	
v/s Ratio Perm	0.09			0.10			0.39			0.13		
v/c Ratio	0.32	0.53		0.39	0.56		0.75	0.53		0.25	1.06	
Uniform Delay, d1	16.9	18.0		17.3	18.2		11.0	9.3		7.7	14.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	2.0		1.9	2.4		21.6	0.6		0.3	47.0	
Delay (s)	18.5	20.1		19.2	20.6		32.7	9.9		8.0	60.9	
Level of Service	B	C		B	C		C	A		A	E	
Approach Delay (s)		19.7			20.2			13.5			56.4	
Approach LOS		B			C			B			E	

Intersection Summary			
HCM 2000 Control Delay	34.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	58.1	Sum of lost time (s)	12.2
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	255	15	22	232	21	10	3	38	61	2	51
Future Volume (Veh/h)	22	255	15	22	232	21	10	3	38	61	2	51
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.67	0.92	0.75	0.64	0.75	0.25	0.50	0.50	0.70	0.38	0.25	0.88
Hourly flow rate (vph)	33	277	20	34	309	84	20	6	54	161	8	58
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	393			297			782	804	277	777	740	309
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	393			297			782	804	277	777	740	309
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			97			93	98	93	42	98	92
cM capacity (veh/h)	1177			1276			272	302	767	278	328	736

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	310	20	343	84	80	227
Volume Left	33	0	34	0	20	161
Volume Right	0	20	0	84	54	58
cSH	1177	1700	1276	1700	488	333
Volume to Capacity	0.03	0.01	0.03	0.05	0.16	0.68
Queue Length 95th (m)	0.7	0.0	0.7	0.0	4.6	38.0
Control Delay (s)	1.1	0.0	1.0	0.0	13.8	36.2
Lane LOS	A		A		B	E
Approach Delay (s)	1.0		0.8		13.8	36.2
Approach LOS					B	E

Intersection Summary				
Average Delay	9.4			
Intersection Capacity Utilization	51.3%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	68	55	202	209	149	214
Future Volume (vph)	68	55	202	209	149	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5		5.5		5.5	5.5
Lane Util. Factor	1.00		1.00		1.00	1.00
Frt	0.94		0.94		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1323		1641		1671	1727
Flt Permitted	0.97		1.00		0.43	1.00
Satd. Flow (perm)	1323		1641		760	1727
Peak-hour factor, PHF	0.75	0.88	0.75	0.89	0.65	0.89
Adj. Flow (vph)	91	62	269	235	229	240
RTOR Reduction (vph)	28	0	35	0	0	0
Lane Group Flow (vph)	126	0	469	0	229	240
Heavy Vehicles (%)	22%	46%	8%	9%	8%	10%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	18.3		60.7		60.7	60.7
Effective Green, g (s)	18.3		60.7		60.7	60.7
Actuated g/C Ratio	0.20		0.67		0.67	0.67
Clearance Time (s)	5.5		5.5		5.5	5.5
Lane Grp Cap (vph)	269		1106		512	1164
v/s Ratio Prot	c0.10		0.29			0.14
v/s Ratio Perm					c0.30	
v/c Ratio	0.47		0.42		0.45	0.21
Uniform Delay, d1	31.6		6.7		6.8	5.5
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	5.8		1.2		2.8	0.4
Delay (s)	37.3		7.9		9.6	5.9
Level of Service	D		A		A	A
Approach Delay (s)	37.3		7.9			7.7
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	187	144	297	72	42	263
Future Volume (vph)	187	144	297	72	42	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		5.5		5.5	5.5
Lane Util. Factor	1.00		1.00		1.00	1.00
Frt	0.94		0.97		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1721		1673		1128	1827
Flt Permitted	0.97		1.00		0.45	1.00
Satd. Flow (perm)	1721		1673		539	1827
Peak-hour factor, PHF	0.75	0.82	0.88	0.75	0.42	0.79
Adj. Flow (vph)	249	176	338	96	100	333
RTOR Reduction (vph)	51	0	15	0	0	0
Lane Group Flow (vph)	374	0	419	0	100	333
Heavy Vehicles (%)	0%	3%	2%	39%	60%	4%
Turn Type	Prot		NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	15.9		24.7		24.7	24.7
Effective Green, g (s)	15.9		24.7		24.7	24.7
Actuated g/C Ratio	0.31		0.49		0.49	0.49
Clearance Time (s)	4.5		5.5		5.5	5.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	540		816		263	891
v/s Ratio Prot	c0.22		c0.25			0.18
v/s Ratio Perm					0.19	
v/c Ratio	0.69		0.51		0.38	0.37
Uniform Delay, d1	15.2		8.8		8.1	8.1
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	3.8		2.3		0.9	0.3
Delay (s)	19.0		11.2		9.1	8.4
Level of Service	B		B		A	A
Approach Delay (s)	19.0		11.2			8.5
Approach LOS	B		B			A

Intersection Summary			
HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	50.6	Sum of lost time (s)	10.0
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			