The Willows
Traffic Impact Assessment

Prepared for:
DREAM Developments

Prepared by:
Stantec Consulting Ltd.
400 – 1820 Hamilton Street
Regina, SK S4P 2B8

111000201

August 22, 2017

Sign-off Sheet

This document entitled The Willows Traffic Impact Assessment was prepared by Stantec Consulting Ltd. ("Stantec") for the account of DREAM Developments (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by _____
(signature)

Crystal Phillips, A.Sc.T.

Reviewed by _____
(signature)

Kevin Paul, P.Eng.

Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
STANTEC CONSULTING LTD.
Number C0969
Permission to Consult held by:

Discipline	Sk. Reg. No.	Signature
TRANSPORTATION	21165	

PROFESSIONAL ENGINEER
K.L. PAUL
MEMBER 21162
17 08 22
YR. MN. DAY
SASKATCHEWAN

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1.0 INTRODUCTION

The Willows is an existing development located in the south of Saskatoon. The development is bound by Lorne Avenue to the west, Clarence Avenue to the east and Canadian National Railway line to the north. Acreages and farmland are located south of the development. **Figure 1-1** shows the project location. **Figure 1-2** shows the existing development area.

Dream Development has retained Stantec Consulting Ltd. (Stantec) to complete a Traffic Impact Assessment (TIA) for the addition and modification of the current Willows development. The objective of the TIA is to estimate the impacts that additional traffic generated by the modified development will have on the adjacent transportation system and recommend improvements to meet those demands. This TIA is also required as part of the development approval process of the City of Saskatoon (City).

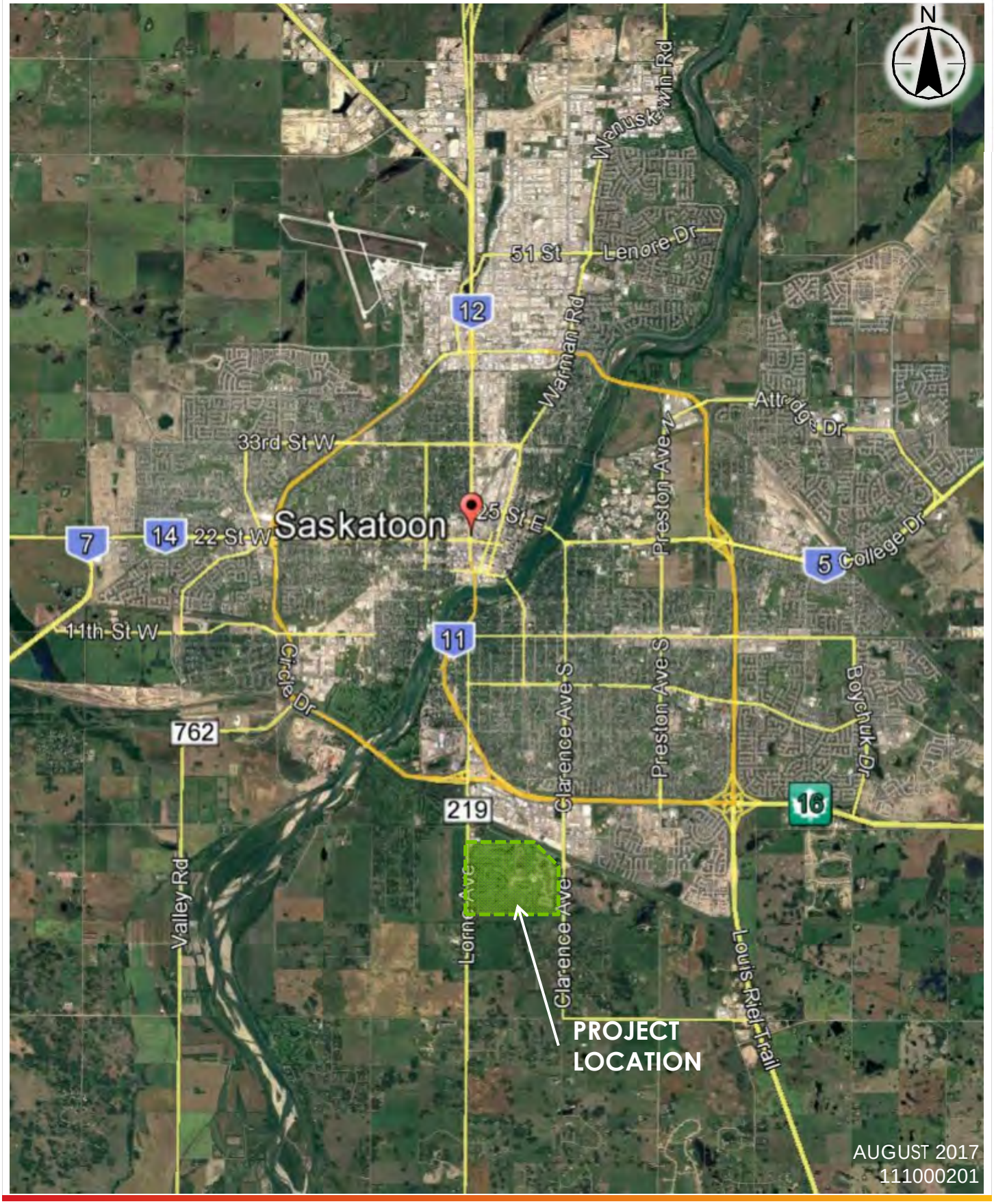
1.1 SCOPE

Stantec's transportation team understands the scope of the work to include:

- Review the existing and proposed transportation network to identify the intersections most significantly affected by the proposed development.
- Determine the future background traffic volumes at the study intersections;
- Determine the total number of new trips generated by the proposed development for the weekday morning and afternoon peak hour time periods;
- Distribute the new trips to expected origins and destinations and assign them to specific routes to and from the proposed development;
- Add the new trips generated by the proposed development to the projected background traffic volumes at the study horizon;
- Evaluate traffic operating conditions at key intersections for the background conditions and combined traffic volumes at full build out of the proposed development for the weekday morning and afternoon peak hour time periods; and
- Identify potential locations of unacceptable congestion or geometric constraints and determine roadway, intersection, and access requirements in terms of number of lanes, lane configuration, intersection radii, and intersection control to provide acceptable levels of service and safety.

The analysis periods selected for this study are the weekday morning and afternoon peak hours as they are expected to represent the highest traffic volumes. A 5 year analysis horizon was selected based on City of Saskatoon TIA Guidelines as well as a 20 year analysis horizon to capture the full build-out of the development.

This report and appendices represent the deliverables for the scope as described.



Stantec Consulting Ltd.
400 – 1820 Hamilton Street
Regina, Saskatchewan

THE WILLOWS
Traffic Impact Study

FIGURE No. **1-1**

PROJECT LOCATION

Stantec

Stantec Consulting Ltd.
400 – 1820 Hamilton Street
Regina, Saskatchewan

LEGEND

PROJECT LOCATION

THE WILLOWS

Traffic Impact Study

FIGURE No. **1-2**

DEVELOPMENT AREA

2.0 DEVELOPMENT SITE CONDITIONS

2.1 TRANSPORTATION SYSTEM

The existing transportation system, including road segments, connections, and intersections form the network upon which the analysis of current (background) and future background conditions, if the proposed development does not proceed. The existing transportation system is detailed in the following sections and shown in Error! Reference source not found..

2.1.1 Road Network

Existing roadways adjacent and within the development site have the following characteristics.

- **Clarence Avenue**, south of Cartwright Street, is a two-lane, undivided, asphalt paved road that runs concurrently with Range Road 3053 and has a posted speed of 60 km/h. This road connects mulitple acreages, including the Grasswood area to the City. North of Cartwright Street, Clarence Avenue is a four-lane, partially divided, asphalt-paved major arterial that runs north/south until it intersects with Circle Drive.

- **Lorne Avenue**, south of Cartwright St, is a two-lane, undivided, asphalt paved highway that runs concurrently with Highway 219 and Range Road 3054. This road provides access to the German Cultural Centre, Schroh Arenas, and several acreages. Concrete curbing is introduced near the Schroh Arenas. The speed limit between Cartwright Street and about 675 m south of Cartwright Street is 80 km/h. Between Cartwright St and the CN tracks, this roadway is a two-lane, undivided, asphalt-paved arterial roadway with a posted speed of 60 km/h. North of the CN tracks, the road widens to four lanes and is divided, with marked bike lanes present for both north and southbound directions. These bike lanes taper off at Exhibition Grounds Road. This roadway is locally known as a preferred cycling route as it travels outside of City limits.
- **Cartwright Street** is a two lane, undivided, asphalt-paved collector road that runs west from Clarence Avenue to the centre of the development, swings north through a roundabout and then runs parallel to the rail before intersecting with Lorne Avenue. It provides all access for the existing and some access for the modified development with a speed limit of 50 km/h. West of Lorne Ave, Cartwright St provides access to the Saskatoon Golf and Country Club, several acreages, and the Hamlet of Furdale.
- **Cartwright Terrace** is a cul-de-sac which serves two gated communities in the Willows. It is paved and roughly 7.5 metres wide. There is a median boulevard which is roughly 10.5 metres wide, including sidewalk.
- **Wentworth and Waterford Roads** are undivided private local roads which provide access to single family homes within the Willows. They are paved with a speed limit of 30 km/h.

Stantec

Stantec Consulting Ltd.
400 – 1820 Hamilton Street
Regina, Saskatchewan

LEGEND
STUDY INTERSECTION
STUDY ROADWAY

THE WILLOWS
Traffic Impact Study

FIGURE No. **2-1**

EXISTING TRANSPORTATION NETWORK

2.1.2 Existing Study Area Intersections

Several intersections already exist in the immediate area of the development which may be affected by the additional traffic it is expected to generate. **Table 2.1** summarizes the geometry and existing traffic controls at these locations.

Table 2.1: Existing Intersection Geometry and Traffic Control

Intersection	Control	Northbound	Southbound	Eastbound	Westbound
Cartwright St & Lorne Ave	WB/EB Stop	Left/Thru/Right 	Thru/Right, Thru/Left 	Left/Thru/Right 	Left/Thru/Right 
Cartwright St & Clubhouse and Red Barn Access	Roundabout (yield at entry)	Left/Thru/Right 	Left/Thru/Right 	Left/Thru/Right 	Left/Thru/Right 
Cartwright St & Clarence Ave	WB/EB Stop	Left/Thru/Right 	Left, Thru, Right 	Left/Thru, Right 	Left/Thru/Right 
Cartwright St & Waterford / Wentworth Access	NB/SB Stop	Left/Thru/Right 	Left/Thru/Right 	Left/Thru/Right 	Left/Thru/Right 
Cartwright St & Cartwright Terrace	WB Stop	Thru/Right 	Left/Thru 		Left/Right 

2.2 BACKGROUND TRAFFIC VOLUMES

Turning movement counts at the following study intersections were conducted by Stantec in October and November 2016 at the following study intersections:

- Lorne Ave & Cartwright St;
- Clarence Ave & Cartwright St;
- Cartwright St & Wentworth / Waterford Access; and
- Cartwright St & Clubhouse & Red Barn Access (roundabout).

Data collection included passenger cars, trucks, buses, cyclists, and pedestrians during two hour periods that would include the morning and afternoon peak hours (7:00am – 9:00am and 4:00pm – 6:00pm).

Given the date of the count, in October and November, it is reasonable to assume that golf course traffic was not well represented. It was assumed therefore that the traffic entering and exiting the Clubhouse should be entirely attributed to the conference centre and restaurant

located there. Golf course traffic was generated using ITE Land Use 430. Further discussion is provided in Section 4.0.

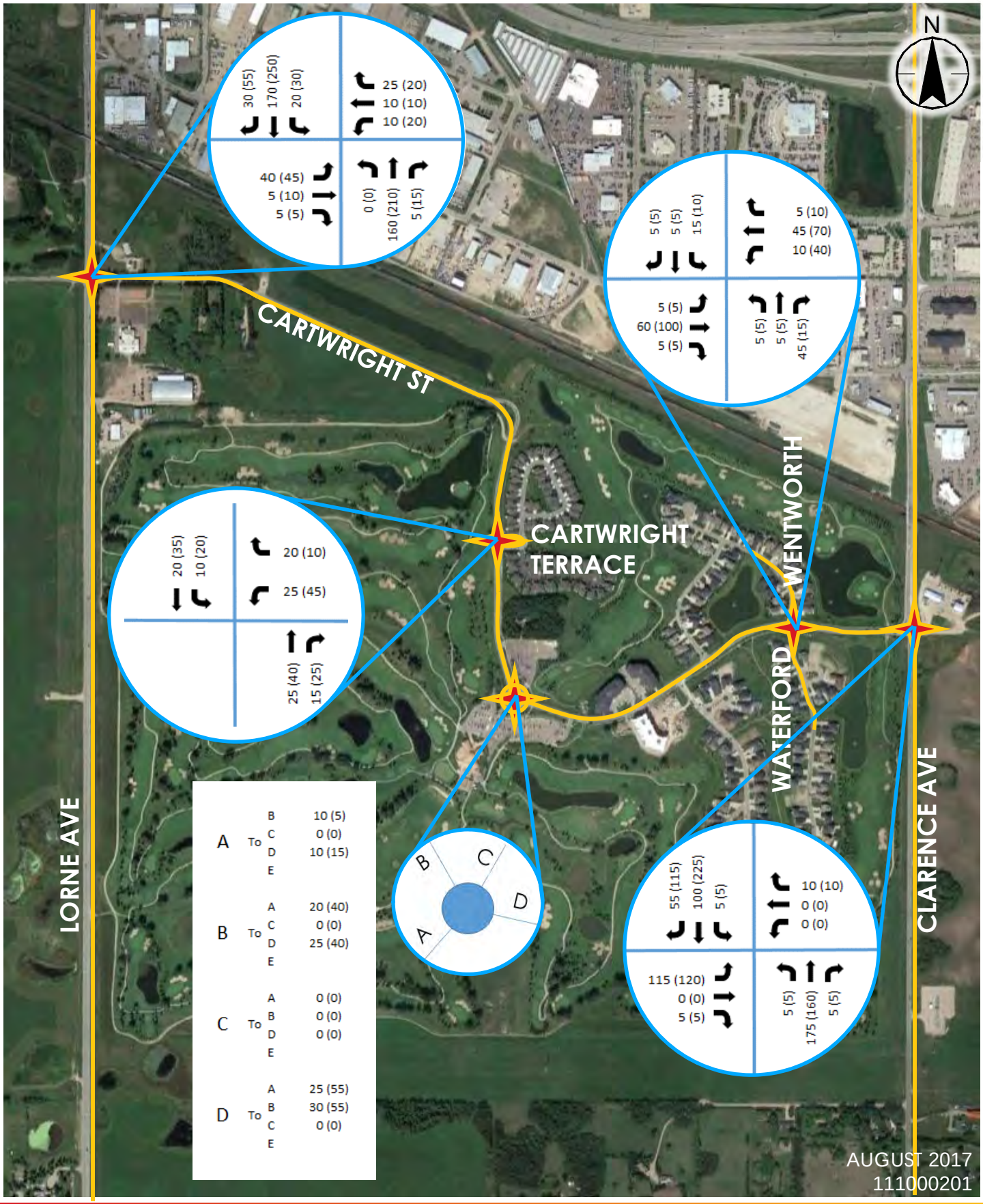
The 2016 turning movement volumes for the morning and afternoon peak hours are included in Error! Reference source not found..

Turning movements for Cartwright St & Cartwright Terrace were not collected. These volumes were interpolated using the larger of balancing between the up and downstream counts or ITE Trip Generation completed on the two gated communities for each movement.

2.2.1 Background Traffic Growth

Background traffic growth consists of known and unknown growth in the area surrounding the project location. The location of the development is on the outskirts of Saskatoon, which implies that unknown growth by traffic cutting through the development would be minimal. Therefore, it was assumed that background growth was null except for on the border roadways, Lorne Ave and Clarence Ave. According to the City of Saskatoon, their expected growth rate is 1.9%. The Ministry of Highways and Infrastructure has confirmed this to be an appropriate rate to use for this location. For analysis on the conservative side for this study, a growth rate of 1.9% was chosen and applied to Lorne Ave and Clarence Ave.

Final background traffic volumes at the 5 year horizon and 20 year horizon are shown on **Figure 2-3** and **2.4** respectively.



Stantec

Stantec Consulting Ltd.
400 – 1820 Hamilton Street
Regina, Saskatchewan

LEGEND

## (##)	AM PEAK (PM PEAK)
A	CLUBHOUSE
B	CARTWRIGHT ST
C	THE RED BARN
D	CARTWRIGHT ST

THE WILLOWS
Traffic Impact Study

FIGURE No. **2-2**

INTERSECTION BACKGROUND
TURNING MOVEMENT VOLUMES

Stantec

Stantec Consulting Ltd.
400 – 1820 Hamilton Street
Regina, Saskatchewan

LEGEND

## (##)	AM PEAK (PM PEAK)
A	CLUBHOUSE
B	CARTWRIGHT ST
C	THE RED BARN
D	CARTWRIGHT ST

THE WILLOWS
Traffic Impact Study

FIGURE No. **2-3**

5 YEAR FUTURE BACKGROUND
TURNING MOVEMENT VOLUMES

Stantec

Stantec Consulting Ltd.
400 – 1820 Hamilton Street
Regina, Saskatchewan

LEGEND

## (##)	AM PEAK (PM PEAK)
A	CLUBHOUSE
B	CARTWRIGHT ST
C	THE RED BARN
D	CARTWRIGHT ST

THE WILLOWS
Traffic Impact Study

FIGURE No. **2-4**

20 YEAR FUTURE BACKGROUND
TURNING MOVEMENT VOLUMES

3.0 PROPOSED DEVELOPMENT

Currently, the Willows contains a 36-hole golf course with single and multifamily residential housing, primarily located on the east side of the parcel. The proposed development includes reducing the golf course to 18 holes, relocating some of the course, and building single and multifamily residential housing to complete the west and south portions of the parcel.

3.1 PROPOSED TRANSPORTATION NETWORK

Access A is a short, 2 lane roadway which will provide an additional access option to Lorne Avenue / Highway 219. This access is proposed to accommodate construction traffic related to the new development as well as some development traffic. The access would be classified as "temporary" as there is no intention to turn this into an interchange in the future. It is unclear at this time whether Access A will remain in place after full build out or if it will be removed. The intersection of Access A with Highway 219 is proposed with a right-in-right-out configuration. The Ministry of Highways and Infrastructure (MHI)'s previous approval of this access is included in **Appendix A**.

Access B is the north portion of the primary new road which services most of the single and multifamily residential blocks. This road travels north from Access A and intersects with Cartwright St & Cartwright Terrace.

Access C is the south portion of the primary new road which travels a wide loop on the south portion of the parcel. This road intersects with Cartwright St at the roundabout.

The site plan with proposed intersections is shown in **Figure 3-1**. This figure shows the areas and locations of the single and multi-family development. Additional new development will occur on the current clubhouse parcel and is further described in the following section.

3.2 LAND USE

There are multiple land use types on the proposed site plan that are expected to generate traffic. As discussed in Section 2.2, the traffic generated by the golf course is poorly represented in the traffic counts. As such, traffic generated by 18 holes will be added as new trips.

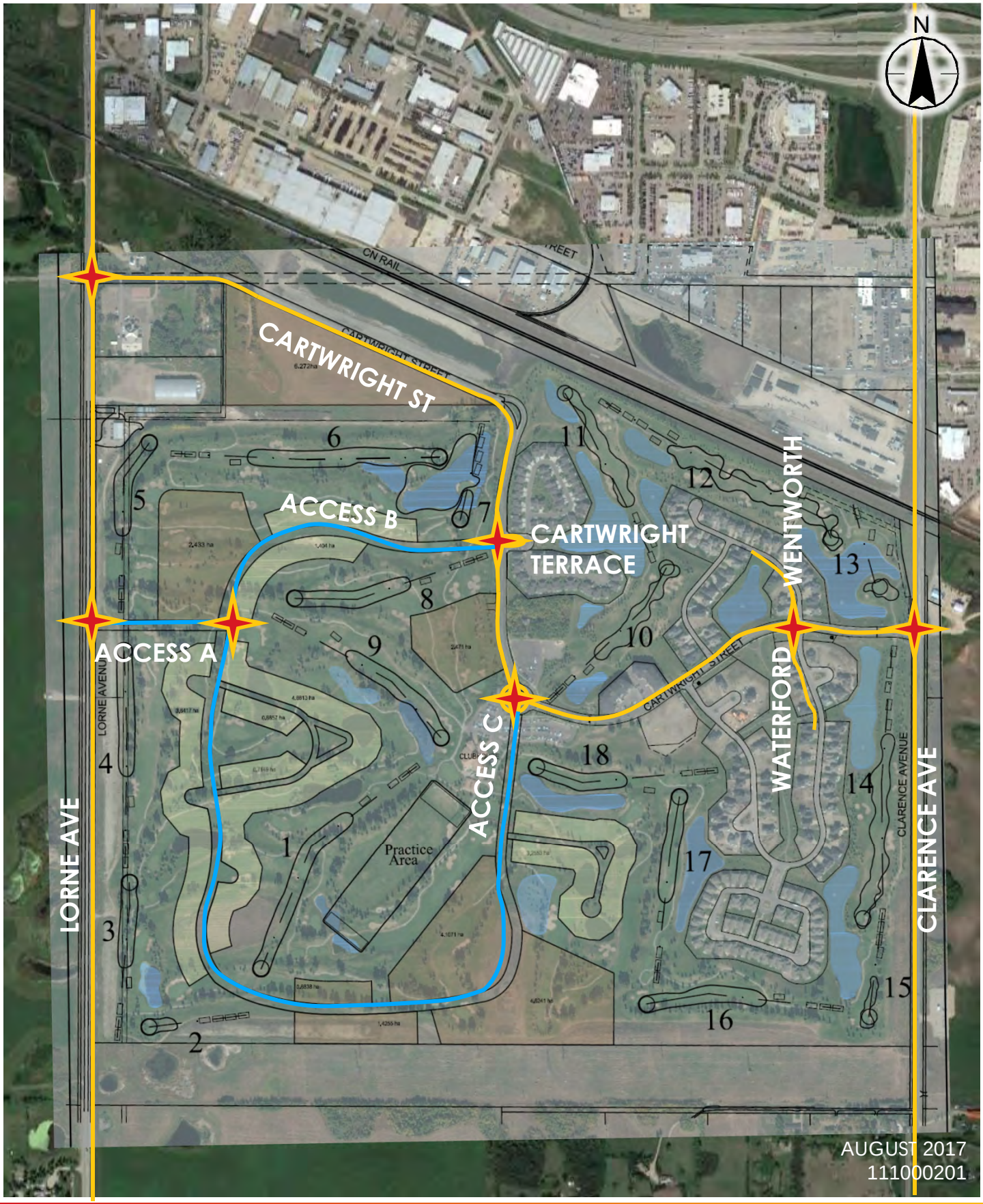
Single Family (15.75 Ha) – ITE Land Use 210 (Single Family Detached Housing) was selected to represent this use and includes houses of various sizes and in various locations in a City. The trip generation is based on the number of acres.

Multi Family (~400 units)– ITE Land Use 230 (Residential Townhouse/Condominium) was selected to represent this use as these units are expected to be owned rather than rented and includes low-rise and high-rise building configurations. In addition to the ~400 units contemplated as part of this development, an estimated 310 units were included to represent the development of the parcel south of Cartwright Street and east of Shroh Arenas.

Hotel (80 rooms) – ITE Land Use 320 (Motel) was selected to represent this use because of its limited additional services provided onsite. Other options available were Hotel (ITE Land Use 310) or Business Hotel (ITE Land Use 312), however Hotel includes many services already included at this location, such as restaurants and banquet facilities and Business Hotel had a limited number of studies.

Retail Shopping (43,500 sq.ft.) – ITE Land Use 820 (Shopping Centre) was selected to represent this use because of confidence in the number of studies and the reasonable trip rate provided. Specialty Retail (ITE Lane Use 826) was considered, however there was low confidence in the data and the trip rate seemed unreasonably high for what is being proposed. Square footage was estimated based on a 25% site coverage of the 4-ac parcel at the current clubhouse location.

Golf Course (18 holes) – ITE Land Use 430 was selected to represent this use and includes facilities such as a clubhouse, pro-shops, restaurant, lounge, and banquet facilities.



Stantec

Stantec Consulting Ltd.
400 – 1820 Hamilton Street
Regina, Saskatchewan

LEGEND

- STUDY INTERSECTION
- STUDY ROADWAY
- NEW ROADWAY

THE WILLOWS
Traffic Impact Study

FIGURE No. **3-1**

SITE PLAN

4.0 DEVELOPMENT TRAFFIC

Trips generated by the proposed development were estimated in accordance with the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 8th Edition* wherever possible. This manual is a standard reference used by jurisdictions throughout Canada and the United States.

The trips generated by the land uses within the proposed development must be distributed and assigned to the roadway network. Trip distribution refers to the location of origins and destinations of trips generated by the proposed development. Trip assignment refers to the assignment of generated trips to the roadway network.

The assigned trips are added to existing or projected background traffic volumes and analyzed under the proposed geometric conditions. This analysis enables the identification of improvements necessary to provide an adequate level of service (LOS) and safety.

4.1 TRIP GENERATION

For this study, trip generation rates were used as described in section 3.2 to estimate the number of new vehicle trips generated by the proposed land uses. Trip generation for the proposed development for weekday morning and afternoon peak hours of adjacent street traffic (i.e. one hour between 7:00 am and 9:00 am and one hour between 4:00 pm and 6:00 pm) were used.

When deciding whether to use the average trip generation rate or the equation, consideration was given to the R^2 value, the difference between the average and the equation, and the number of units for which trips were being generated. In cases where the equation was used, the equation represented a slightly more conservative estimate.

The land uses and trip generation rates for this study are summarized in **Table 4.1**:

Table 4.1: Trip Generation Rates

			AM Generation			PM Generation		
Description	ITE Use	Unit	Rate	Enter	Exit	Rate	Enter	Exit
Single Family	210	Acre	Ln(T)=0.77Ln(X)+1.58	31%	69%	2.74 trips / acre	66%	34%
Multi Family	230	People	Ln(T)=0.88Ln(X)-0.92	16%	84%	T=0.17(X)+32.33	67%	33%
Golf Course	430	Hole	2.23 trips / hole	79%	21%	2.78 trips/hole	45%	55%
Hotel	320	Room	0.45 trips/room	36%	64%	0.47 trips/room	54%	46%
Retail Shopping	820	ft^2	1 trip/1,000 ft^2	61%	39%	3.73 trips/1,000 ft^2	49%	51%

[1] T= Average Vehicle Trip Ends, X= Number of Units of Land Use

4.1.1 Golf Course Traffic Volumes

As mentioned in Section 2.2, given the season of the traffic count, it was assumed that golf course traffic was not represented in the count. Therefore, golf course traffic for 18 holes was added to the site traffic.

4.1.2 Reductions in Traffic Volumes

Trips generated by new developments are often not "new" trips but rather trips that are already on the transportation network and either diverted from their original route or are passing by and decide to make a stop at the development.

No reductions were applied to the residential land uses and motel land use. Given the nature and location of the golf course, most trips will be primary trips and will not have any reductions. It was assumed that roughly 8% of total golf course traffic came from within the development and drove to get there. These trips were assigned and distributed across the internal network and included in analysis.

Reductions of 50% were applied to the shopping centre land use as it is believed that many shoppers will come from surrounding land uses and stop in to shop as their secondary purpose.

Trip generation for the development is summarized in **Table 4.2**.

Table 4.2: Generated Trips by Land Use

	AM Peak Hour			PM Peak Hour		
Land Use	Entering	Exiting	Total	Entering	Exiting	Total
Single Family	25	55	80	70	36	106
Multi Family	59	288	347	275	135	410
Golf Course (18 Holes)	32	8	40	20	28	48
Hotel	13	23	36	20	17	37
Retail Shopping	14	8	22	40	41	81

4.2 TRIP DISTRIBUTION

Trip distribution refers to the linkage of generated trip origins and destinations. Distribution can be understood as high-level desire lines based on employment, services, and recreation. For this development, existing travel distribution was used to inform the trip distribution, while acknowledging that the site creates a destination for trips originating outside the community. Trip distribution for the development is summarized in **Table 4.3.**

Table 4.3: Trip Distribution

Origin/Destination	Percentage
North on Lorne Ave or Clarence Ave	98%
South	1%
East	0%
West	1%
Total	100%

4.3 TRIP ASSIGNMENT

Trip assignment refers to the allocation of expected traffic to a specific route on the transportation network. Typically, traffic is assigned to a route to and from the most convenient external access point in relation to their origin or destination, with consideration given to the minimization of travel times and conflicts.

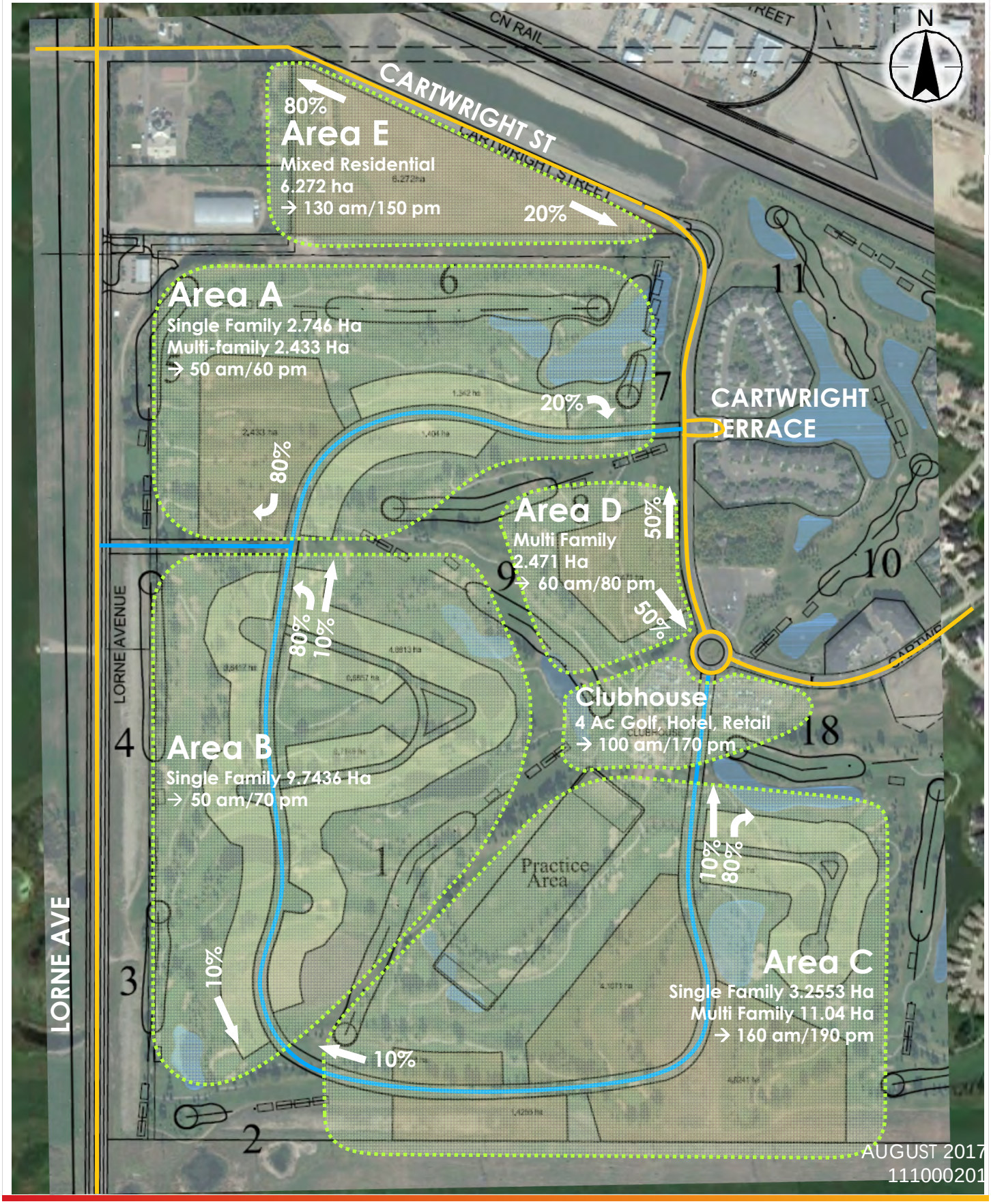
In the AM and PM peak hours, roughly 50 percent of traffic was assumed to use Clarence Ave and 50% was assumed to use Lorne Ave to travel places north. To access Lorne Ave, 17% of traffic used the Cartwright St access and 33% used Access A.

In the case where Access A is approved only as a temporary access and removed in the future, all traffic previously utilizing Access A was rerouted to travel through Access B/Cartwright Terrace and further north through Lorne Ave & Cartwright St.

Development traffic trip generation and assignment are shown in **Figure 4-1**.

4.4 COMBINED TRAFFIC VOLUMES

The trips generated by the development were added to the future background traffic volumes to arrive at the combined traffic volumes for the weekday morning and afternoon peak hour time periods for both the 5 and 20 year horizons. The combined traffic volumes for the 5 year horizon at the analysis intersections are shown in **Figure 4-2**. The combined traffic volumes for the 20 year horizon at the analysis intersections are shown in **Figure 4-3.**



Stantec

Stantec Consulting Ltd.
400 – 1820 Hamilton Street
Regina, Saskatchewan

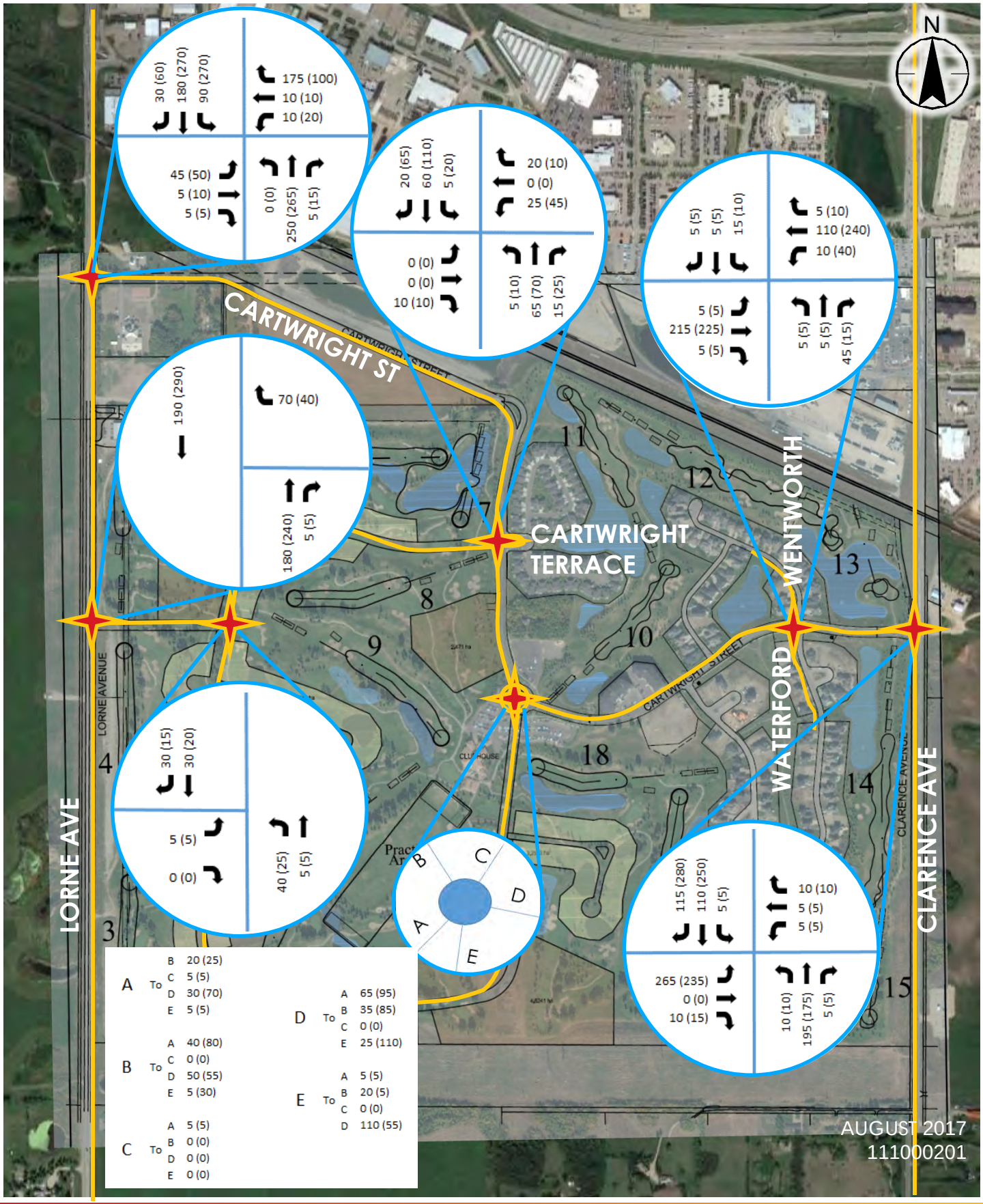
LEGEND

STUDY ROADWAY
NEW ROADWAY

THE WILLOWS
Traffic Impact Study

FIGURE No. **4-1**

TRIP GENERATION AND ASSIGNMENT



Stantec

Stantec Consulting Ltd.
400 – 1820 Hamilton Street
Regina, Saskatchewan

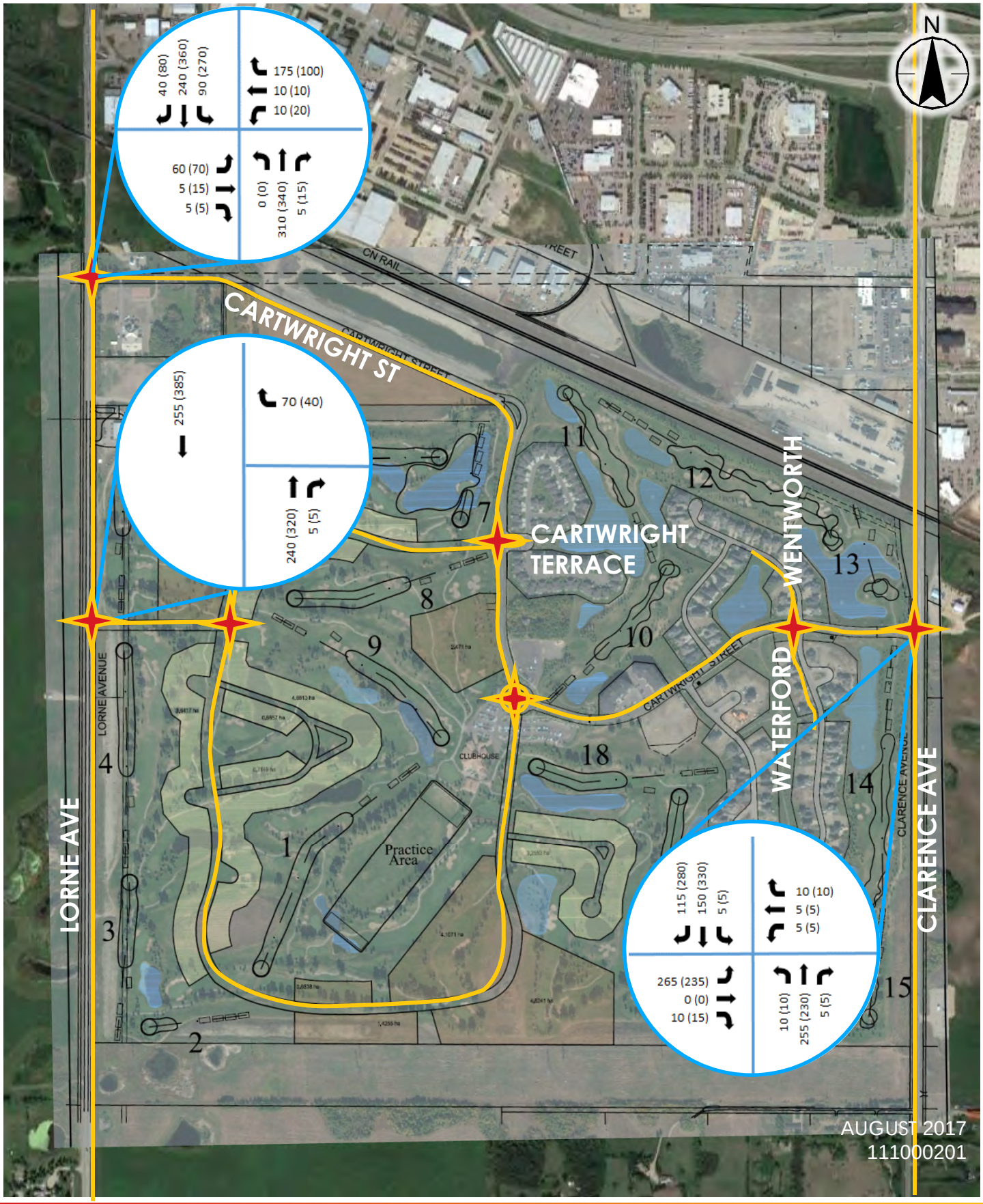
LEGEND

## (##)	AM PEAK (PM PEAK)
A	CLUBHOUSE
B	CARTWRIGHT ST
C	THE RED BARN
D	CARTWRIGHT ST
E	ACCESS C

THE WILLOWS
Traffic Impact Study

FIGURE No. **4-2**

COMBINED TURNING MOVEMENT VOLUMES
5 YEAR HORIZON



Stantec

Stantec Consulting Ltd.
400 – 1820 Hamilton Street
Regina, Saskatchewan

LEGEND

## (##)	AM PEAK (PM PEAK)
A	CLUBHOUSE
B	CARTWRIGHT ST
C	THE RED BARN
D	CARTWRIGHT ST
E	ACCESS C

THE WILLOWS
Traffic Impact Study

FIGURE No. **4-3**

COMBINED TURNING MOVEMENT VOLUMES
20 YEAR HORIZON

5.0 TRAFFIC IMPACT ANALYSIS

5.1 ANALYSIS METHODOLOGY

Capacity analysis at the study intersections was performed using Synchro Studio 9. Synchro is an industry standard software that models performance at both signalized and un-signalized intersections. Synchro's output includes two standard measures of intersection operational effectiveness: Level of Service (LOS) – a measure of delay per vehicle, and volume-to-capacity ratio – a measure of the remaining available capacity of a movement at an intersection and thus the ability to accommodate fluctuations in traffic flow. Synchro analysis follows the methodology detailed in the 2010 edition of the *Highway Capacity Manual (HCM)* and the percentile method.

Queuing analysis was performed using SimTraffic, a traffic simulation software within Synchro that randomly "seeds" the road network with traffic based on given hourly volumes, heavy vehicle percentages, peak hour factors, pedestrian calls, and other driver behavioural parameters. SimTraffic then "observes" and measures the performance of each movement. It is particularly effective to determine queue lengths and locations of potential blocking. The results for the SimTraffic analysis are based on the average of ten 15-minute simulations for each analysis scenario.

5.1.1 Analysis Parameters

The study intersections were analyzed under the full build-out 5 year horizon network scenario to determine operating conditions under anticipated traffic volumes at the analysis horizon.

- Peak hour traffic volumes as shown in **Figure 2-2** for the 2016 Background (current) scenario;
- Peak hour traffic volumes as shown in **Figure 2-3** for the Future (5 year horizon) Background scenario;
- Peak hour traffic volumes as shown in **Figure 2-4** for the Future (20 year horizon) Background scenario;
- Peak hour traffic volumes as shown in **Figure 4-2** were used for the 5 year combined traffic analysis;
- Peak hour traffic volumes as shown in **Figure 4.3** were used for the 20 year combined traffic analysis; and
- Roadway, intersection lane configurations, and controls as shown in **Table 2.1** were assumed for the initial analysis.

The following parameters were used within Synchro and SimTraffic:

- Traffic signal saturation flows of 1,800 vehicles per hour;
- 3.6 m wide lanes;
- Peak Hour Factor as measured during traffic counts, otherwise 0.95 was assumed;

- If zero vehicles were observed or assigned to a movement, 5 vehicles were assigned in the model as a nominal value; and
- Heavy vehicles were less than 1% as measured in the field, but were rounded up to 1% for analysis.

5.1.2 Measures of Effectiveness

Traffic analysis was conducted for the weekday morning and afternoon peak hour time periods at the analysis horizon years, assuming full build-out of the development. Level of service (LOS), approach delay (s), volume to capacity (v/c) ratio, and 95th percentile queue length are the four performance measures used to describe the quality and efficiency of traffic flow for the purposes of this TIA.

On signalized intersections, the 50th percentile queue length would also be analysed and considered. However, because there are no signalized intersections in this study, this measure was not considered.

LOS is defined by ranges of average delay per vehicle traveling through an intersection. LOS A represents the lowest range of average delay and therefore the best conditions, while LOS F represents the highest range of delay and the worst conditions. **Table 5.1** shows the ranges of delay associated with each level of service for un-signalized intersections.

Table 5.1: Ranges of Delay for Levels of Service

Level of Service	Delay per Vehicle (seconds)
	Un-signalized Intersections
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Generally, an overall LOS D or better is desired for each intersection, approach, and turning movement during the morning and afternoon peak hours, however, individual movements experiencing LOS E may be considered acceptable (especially for left-turning movements), provided the queue lengths and/or v/c ratios are within acceptable limits.

The v/c ratios provide a quantitative value that can indicate the intersection's ability to accommodate fluctuations in traffic flow. If this ratio is greater than 1.00, the available capacity has been completely utilized and any small fluctuation would cause traffic conditions to break down. For the purpose of this analysis, a v/c threshold of 0.85 and a LOS threshold of E were used to trigger identification of critical movements for which improvements are to be considered.

The 95th percentile queue lengths for all turning movements can be used to estimate adequate storage lengths for turning lanes such that traffic does not block access to other lanes. It is also used to verify that turning lanes do not overlap and that there is sufficient distance available to provide proper tapers.

All Synchro and SimTraffic reports are included in Appendix B and C respectively.

5.2 ANALYSIS RESULTS

The background traffic volume (2016) and the future background traffic volume scenarios were analysed, considering the background traffic observed in 2016 and projected to the analysis horizons. This provides a likely traffic scenario were the development not to proceed, rather, that the parcels remained as a 36-hole golf course.

We compare the future background scenario to the full build-out scenario to assess the potential effect of the development on the adjacent transportation network.

5.2.1 2016 Background Scenario

Table 5.2 shows the expected LOS, approach delays, v/c ratios, and queues for the 2016 Background (current) Traffic scenario for the morning and afternoon peak hour periods for existing study intersections.

Table 5.2: Analysis Results for 2016 Background Scenario

Intersection	Control	Peak	Measure	Eastbound			Westbound			Northbound			Southbound			Overall Intersection LOS
				L	T	R	L	T	R	L	T	R	L	T	R	
Lorne Ave & Cartwright St	EB / WB Stop	AM	Level of Service		C			B			A			A		A
			Delay (s)		15.6			11.8			0.4			1.8		
			V/C Ratio		0.19			0.11			0.01			0.08		
			Queue (95%) (m)		14.9			3			0			4.1		
		PM	Level of Service		C			B			A			A		A
			Delay (s)		24.2			14.8			0.8			1.6		
			V/C Ratio		0.35			0.13			0.02			0.15		
			Queue (95%) (m)		3.1			3.7			0			7.3		
Cartwright Terrace & Cartwright St	WB Stop	AM	Level of Service					A			A		A			A
			Delay (s)					8.8			0		1.6			
			V/C Ratio					0.05			0.01		0			
			Queue (95%) (m)					10			0		1.5			
		PM	Level of Service					A			A		A			A
			Delay (s)					9.3			0		3			
			V/C Ratio					0.05			0.02		0.01			
			Queue (95%) (m)					10.4			0		3.4			
Wentworth / Waterford & Cartwright St	NB / SB Stop	AM	Level of Service		A			A			A			B		A
			Delay (s)		1.5			1.6			9.4			11.2		
			V/C Ratio		0.01			0.01			0.1			0.1		
			Queue (95%) (m)		2.3			1.8			13.4			13		
		PM	Level of Service		A			A			B			B		A
			Delay (s)		0.5			3			11.5			11.1		
			V/C Ratio		0.01			0.04			0.09			0.07		
			Queue (95%) (m)		1.5			6.8			12.4			11.1		

Intersection	Control	Peak	Measure	Eastbound			Westbound			Northbound			Southbound			Overall Intersection LOS
				L	T	R	L	T	R	L	T	R	L	T	R	
Clarence Ave & Cartwright St	EB / WB Stop	AM	Level of Service	B		A	B			A			A	A	A	A
			Delay (s)	14.2		8.9	10.9			0.3			7.7			
			V/C Ratio	0.28		0.01	0.08			0.01			0.01	0.07	0.05	
			Queue (95%) (m)	16.5		5.1	12.1			3			1.4	0	1.2	
		PM	Level of Service	C		A	B			A			A	A	A	A
			Delay (s)	15.5		9.7	13			6			7.6			
			V/C Ratio	0.25		0.01	0.12			0.01			0.01	0.15	0.08	
			Queue (95%) (m)	17.2		6.2	12.5			3.4			2.5	0	1.6	

Intersection	Control	Peak	Measure	Clubhouse Approach	Cartwright St Westbound Approach	Cartwright St Southbound Approach	The Red Barn Approach	Access C Approach	Overall Intersection LOS
Roundabout	Yield on Entry	AM	Level of Service	A	A	A	A		A
			Approach Delay (s)	3.5	3.8	3.8	3.6		
			V/C Ratio	0.21	0.06	0.05	0.02		
			Queue Length (95%) (m)	2.6	3	4.3	2.9		
		PM	Level of Service	A	A	A	A		A
			Approach Delay (s)	3.6	4.3	4.2	3.8		
			V/C Ratio	0.02	0.12	0.09	0.02		
			Queue Length (95%) (m)	2.9	3.7	7.4	4.2		

All movements show satisfactory Level of Service, approach delay, v/c ratio, and 95th percentile queue length at each study intersection.

5.2.2 Future 5 Year Horizon Background Scenario

The results of the analysis of the Future 5 Year Horizon Background scenario, including the expected LOS, approach delay, v/c ratios, and queues for the morning and afternoon peak hour periods are shown in **Table 5.3** for study intersections that are subject to background growth.

Table 5.3: Analysis Results for Future 5 Year Horizon Background Scenario

Intersection	Control	Peak	Measure	Eastbound			Westbound			Northbound			Southbound			Overall Intersection LOS
				L	T	R	L	T	R	L	T	R	L	T	R	
Lorne Ave & Cartwright St	EB / WB Stop	AM	Level of Service	C			B			A			A			A
			Delay (s)	16.9			12.2			0.4			1.7			
			V/C Ratio	0.22			0.11			0.01			0.09			
			Queue (95%) (m)	14.8			13.4			2.9			5.5			
		PM	Level of Service	D			C			A			A			A
			Delay (s)	29.7			15.9			0.7			1.7			
			V/C Ratio	0.44			0.14			0.02			0.17			
			Queue (95%) (m)	16.5			14.6			5.8			10.2			
Clarence Ave & Cartwright St	EB / WB Stop	AM	Level of Service	B		A	B			A			A	A	A	A
			Delay (s)	14.8		8.9	11.1			0.3			0.4			
			V/C Ratio	0.3		0.01	0.08			0.01			0.01	0.08	0.05	
			Queue (95%) (m)	16.9		6	12			2.1			2.3	0	0.9	
		PM	Level of Service	C		A	B			A			A	A	A	A
			Delay (s)	15.6		9.7	13.5			0.6			0.2			
			V/C Ratio	0.25		0.01	0.12			0.01			0.01	0.17	0.08	
			Queue (95%) (m)	15.7		6.6	11.5			3.1			1.2	0	2.1	

All movements show satisfactory Level of Service, approach delay, v/c ratio and 95% queue length at each study intersection. However, it is noted that the eastbound approach at the

intersection of Lorne Ave & Cartwright St is performing with LOS D with a delay of 25.5 seconds. Other measures including v/c ratio and queue length remain acceptable.

5.2.3 Future 20 Year Horizon Background Scenario

The results of the analysis of the Future 20 Year Horizon Background scenario, including the expected LOS, approach delay, v/c ratios, and queues for the morning and afternoon peak hour periods are shown in **Table 5.4** for existing study intersections that are subject to background growth.

Table 5.4: Analysis Results for Future 20 Year Horizon Background Scenario

Intersection	Control	Peak	Measure	Eastbound			Westbound			Northbound			Southbound			Overall Intersection LOS
				L	T	R	L	T	R	L	T	R	L	T	R	
Lorne Ave & Cartwright St	EB / WB Stop	AM	Level of Service		C			B			A			A		A
			Delay (s)		24.2			13.7			0.3			1.4		
			V/C Ratio		0.37			0.13			0.01			0.12		
			Queue (95%) (m)		16.8			14.8			3.7			7.5		
		PM	Level of Service		F			C			A			A		A
			Delay (s)		101.2			22			0.7			1.8		
			V/C Ratio		0.9			0.21			0.02			0.22		
			Queue (95%) (m)		19.4			14.9			6			12.2		
Clarence Ave & Cartwright St	EB / WB Stop	AM	Level of Service	C		A		B			A		A	A	A	A
			Delay (s)	17.7		9.2		12			0.3			0.4		
			V/C Ratio	0.35		0.01		0.09			0.01		0.01	0.1	0.05	
			Queue (95%) (m)	18.5				11.7			3.7		2.8	0	0.9	
		PM	Level of Service	C		B		C			A		A	A	A	A
			Delay (s)	21.3		10.4		15.7			0.5			0.1		
			V/C Ratio	0.34		0.01		0.15			0.01		0.01	0.22	0.08	
			Queue (95%) (m)	17.2				11.1			5.2		2.4	0.7	1	

The eastbound approach at Lorne Ave and Cartwright St shows a LOS F with a delay of 101 seconds in the PM Peak Hour. All other movements show satisfactory Level of Service, approach delay, v/c ratio and 95% queue length at each study intersection.

5.2.4 Combined Full Build-Out Scenario - 5 Year Horizon

Table 5.5 shows the analysis results for the combined full build-out scenario - 5 year horizon, at existing and proposed intersections, with generated traffic volumes as assigned to the proposed network for the morning and afternoon peak hour volumes.

Table 5.5: Analysis Results for the Full Build-Out Scenario - 5 Year Horizon

Intersection	Control	Peak	Measure	Eastbound			Westbound			Northbound			Southbound			Overall Intersection LOS
				L	T	R	L	T	R	L	T	R	L	T	R	
Lorne Ave & Cartwright St	EB / WB Stop	AM	Level of Service		F			C			A			A		A
			Delay (s)		56.7			15.3			0.3			4.6		
			V/C Ratio		0.57			0.39			0.01			0.1		
			Queue (95%) (m)		15.4			23.9			4			13.5		
		PM	Level of Service		F			E			A			A		A
			Delay (s)		526.9			44.2			0.7			6.4		
			V/C Ratio		1.82			0.63			0.02			0.25		
			Queue (95%) (m)		20.6			23.6			9.9			23.1		

Intersection	Control	Peak	Measure	Eastbound			Westbound			Northbound			Southbound			Overall Intersection LOS
				L	T	R	L	T	R	L	T	R	L	T	R	
Cartwright Terrace/ Access B & Cartwright St	WB Stop	AM	Level of Service		A			B			A			A		A
			Delay (s)		9.9			10.4			0.5			0.5		
			V/C Ratio		0.03			0.07			0.01			0.01		
			Queue (95%) (m)		11			9.9			2.3			3.2		
		PM	Level of Service		B			B			A			A		A
			Delay (s)		11.1			12			0.3			0.7		
			V/C Ratio		0.03			0.1			0.02			0.02		
			Queue (95%) (m)		10.8			10.7			4.3			3.7		
Wentworth / Waterford & Cartwright St	NB / SB Stop	AM	Level of Service		A			A			B			B		A
			Delay (s)		0.6			0.9			11.1			14.8		
			V/C Ratio		0.01			0.02			0.13			0.14		
			Queue (95%) (m)		4.5			4.5			14.3			12.1		
		PM	Level of Service		A			A			C			C		A
			Delay (s)		0.4			1.7			17			16.5		
			V/C Ratio		0.01			0.05			0.16			0.12		
			Queue (95%) (m)		4.2			9			12.7			11.9		
Clarence Ave & Cartwright St	EB / WB Stop	AM	Level of Service	C		A		B			A		A	A	A	A
			Delay (s)	23.8		8.9		11.4			0.3			7.7		
			V/C Ratio	0.65		0.01		0.08			0.01		0.01	0.08	0.1	
			Queue (95%) (m)	30.2		7.6		11.9			5.7		2.4	0	1.5	
		PM	Level of Service	D		A		B			A		A	A	A	A
			Delay (s)	25.5		9.9		14.9			0.6			7.7		
			V/C Ratio	0.6		0.02		0.14			0.01		0.01	0.17	0.2	
			Queue (95%) (m)	27		10		10.9			5.4		2.1	0	2.5	
Lorne Ave & Access A	WB Stop	AM	Level of Service						A		A			A		A
			Delay (s)						9.6		0			0		
			V/C Ratio						0.08		0.12			0		
			Queue (95%) (m)						14.2		0			0		
		PM	Level of Service						A		A			A		A
			Delay (s)						9.9		0			0		
			V/C Ratio						0.05		0.16			0.19		
			Queue (95%) (m)						13		0			0		
Access A & Access B	EB Stop	AM	Level of Service		A					A				A		A
			Delay (s)		8.9					7.4				0		
			V/C Ratio		0.01					0.03				0.02		
			Queue (95%) (m)		6.1					4.2				0		
		PM	Level of Service		A					A				A		A
			Delay (s)		8.7					7.3				0		
			V/C Ratio		0.01					0.02				0		
			Queue (95%) (m)		6.2					2.4				0		

Intersection	Control	Peak	Measure	Clubhouse Approach	Cartwright St Westbound Approach	Cartwright St Southbound Approach	The Red Barn Approach	Access C Approach	Overall Intersection LOS
Roundabout	Yield on Entry	AM	Level of Service	A	A	A	A	A	A
			Delay (s)	4.3	4.5	4.9	4	4.9	
			V/C Ratio	0.07	0.13	0.15	0.02	0.15	
			Queue (95%) (m)	8.2	7.1	10.8	4.4	9.9	
		PM	Level of Service	A	A	A	A	A	A
			Delay (s)	5.1	6.5	6.1	4.9	6.1	
			V/C Ratio	0.13	0.31	0.21	0.03	0.21	
			Queue (95%) (m)	12.8	13.4	14.7	7.3	7.9	

For the existing intersections, the combined scenario shows the eastbound and westbound approaches at Lorne Ave & Cartwright St with a LOS F and LOS E and delays of 527 and 44 seconds respectively. V/C ratios exceed 1.00 for the eastbound approach in the PM peak hour. Results for the remaining intersections are acceptable.

5.2.5 Combined Full Build-Out Scenario - 20 Year Horizon

Table 5.6: shows the analysis results for the combined full build-out scenario – 20 year horizon, at existing and proposed intersections, with generated traffic volumes as assigned to the proposed network for the morning and afternoon peak hour volumes. Internal intersections are not subject to growth once full build-out is achieved – operational performance should remain the same as at the 5-year combined scenario.

Table 5.6: Analysis Results for the Full Build-Out Scenario - 20 Year Horizon

Intersection	Control	Peak	Measure	Eastbound			Westbound			Northbound			Southbound			Overall Intersection LOS
				L	T	R	L	T	R	L	T	R	L	T	R	
Lorne Ave & Cartwright St	EB / WB Stop	AM	Level of Service	F			C			A			A			B
			Delay (s)	168.4			18.1			0.3			4.3			
			V/C Ratio	1.02			0.45			0.01			0.12			
			Queue (95%) (m)	18.3			24.8			4.8			15.4			
		PM	Level of Service	F			F			A			A			B
			Delay (s)	>300			286.4			0.6			6.6			
			V/C Ratio	4.01			1.37			0.02			0.29			
			Queue (95%) (m)	39			28.2			9.7			32.5			
Clarence Ave & Cartwright St	EB / WB Stop	AM	Level of Service	E		A	B			A			A	A	A	A
			Delay (s)	38.1		9.2	11.8			7.6			7.9			
			V/C Ratio	0.79		0.01	0.09			0.01			0.01	0	0	
			Queue (95%) (m)	34.7		8	12.9			6.3			2.7	1.4	2.1	
		PM	Level of Service	E		B	C			A			A	A	A	A
			Delay (s)	46.4		10.5	15			8.1			7.8			
			V/C Ratio	0.78		0.02	0.14			0.02			0.01	0	0	
			Queue (95%) (m)	28.8		10.3	11.8			5.8			2.1	0	2.1	
Lorne Ave & Access A	WB Stop	AM	Level of Service				B				A		A			A
			Delay (s)				10.1				0		0			
			V/C Ratio				0.08				0.16		0.16			
			Queue (95%) (m)				14.7				0		0			
		PM	Level of Service				B				A		A			A
			Delay (s)				10.5				0		0			
			V/C Ratio				0.05				0.21		0.25			
			Queue (95%) (m)				12.9				0		0			

For the Lorne Ave & Cartwright St intersection, the eastbound and westbound approaches exceed acceptable limits for V/C ratio and LOS in the AM and PM peak hours. This intersection's eastbound approach is in breakdown condition at this horizon.

The eastbound approach at Clarence Ave & Cartwright St shows a LOS E in AM and PM Peak Hours. Results for the remaining intersections fall within acceptable thresholds.

5.2.6 Combined Full Build-Out Scenario - 5 Year Horizon – Signalized

Lorne Ave & Cartwright St may experience undesirable measures of effectiveness in the combined 5 year horizon. As a result, the same scenario was analysed with traffic signals at Lorne Ave & Carwright St and Clarence Ave & Cartwright St. Clarence Ave & Cartwright St is nearing an unacceptable delay and was included in analysis for that reason. **Table 5.7** shows the analysis results for the combined full build-out scenario – 5 year horizon, with generated traffic volumes as assigned to the proposed network for the morning and afternoon peak hour volumes.

Table 5.7 Analysis Results for Full Build-Out 5 Year Horizon with Signals

Intersection	Control	Peak	Measure	Eastbound			Westbound			Northbound			Southbound			Overall Intersection LOS
				L	T	R	L	T	R	L	T	R	L	T	R	
Lorne Ave & Cartwright St	EB / WB Stop	AM	Level of Service	A			A			C			B			B
			Delay (s)	9.4			3.7			20.6			16.8			
			V/C Ratio	0.15			0.27			0.57			0.49			
			Queue (95%) (m)	16			23.8			43.2			42.7			
		PM	Level of Service	B			A			B			D			C
			Delay (s)	12.3			5.4			19.2			36.8			
			V/C Ratio	0.22			0.22			0.57			0.92			
			Queue (95%) (m)	19.4			25			51.8			91.9			
Clarence Ave & Cartwright St	EB / WB Stop	AM	Level of Service	B		A	A			B			B	B	A	B
			Delay (s)	18.7		0	6.5			17.1			13.8	15.5	4.1	
			V/C Ratio	0.6		0.01	0.07			0.39			0.03	0.21	0.27	
			Queue (95%) (m)	41.4		7.8	10.6			36			6.5	23.8	17	
		PM	Level of Service	B		A	A			B			B	B	A	B
			Delay (s)	16.6		1.7	8.2			15			12.2	16.8	4.2	
			V/C Ratio	0.5		0.03	0.1			0.36			0.02	0.45	0.46	
			Queue (95%) (m)	33.1		6.6	9.2			34.9			7.3	39.2	30.1	

All movements show satisfactory Level of Service, approach delay, v/c ratio and 95% queue length at each study intersection. However, it is noted that the southbound approach at the intersection of Lorne Ave & Cartwright St has a queue length of 91.9 m. This queues is approaching an unacceptable level, however the queue will not impede other traffic movements and is an additional 150 m away from the rail crossing. Other measures including v/c ratio and queue length remain acceptable.

5.2.7 Combined Full Build-Out Scenario - 20 Year Horizon – Signalized

Lorne Ave & Cartwright St and Clarence Ave & Cartwright St may experience undesirable measures of effectiveness in the combined 20 year horizon. As a result, the same scenario was analysed with traffic signals at Lorne Ave & Cartwright St and Clarence Ave & Cartwright St. **Table 5.8** shows the analysis results for the combined full build-out scenario – 20 year horizon, with generated traffic volumes as assigned to the proposed network for the morning and afternoon peak hour volumes.

Table 5.8 Analysis Results for Full Build-Out 20 Year Horizon with Signals

Intersection	Control	Peak	Measure	Eastbound			Westbound			Northbound			Southbound			Overall Intersection LOS
				L	T	R	L	T	R	L	T	R	L	T	R	
Lorne Ave & Cartwright St	EB / WB Stop	AM	Level of Service	A			A			B			B			B
			Delay (s)	8.4			3.1			19.4			16.1			
			V/C Ratio	0.17			0.25			0.61			0.55			
			Queue (95%) (m)	19.6			23.9			53.7			57.7			
		PM	Level of Service	C			A			B			C			C
			Delay (s)	21.7			8.1			15.5			25.4			
			V/C Ratio	0.35			0.27			0.52			0.85			
			Queue (95%) (m)	27.1			26.4			56.8			88.9			
Clarence Ave & Cartwright St	EB / WB Stop	AM	Level of Service	B		A	A			B			B	B	A	B
			Delay (s)	17.6		0	6			14.9			11	12.8	3.4	
			V/C Ratio	0.61		0.01	0.07			0.44			0.03	0.25	0.25	
			Queue (95%) (m)	44.2		7.8	10			42			6.7	27.6	16.9	
		PM	Level of Service	B		A	A			B			B	B	A	B
			Delay (s)	16.5		1.7	8.2			16.8			12.2	19.4	4.2	
			V/C Ratio	0.49		0.03	0.1			0.47			0.03	0.59	0.45	
			Queue (95%) (m)	34.2		9.4	10.2			41.5			6.7	47.8	29.9	

All movements show satisfactory Level of Service, approach delay, v/c ratio and 95% queue length at Lorne Ave & Cartwright St and Clarence Ave & Cartwright St intersections.

5.3 SIGNAL WARRANT ANALYSIS

Transportation Association of Canada (TAC) *Traffic Signal and Pedestrian Signal Head Warrant Handbook* describes the accepted procedure for determining whether vehicle traffic volumes are sufficient to warrant installation of a traffic signal. This analysis considers proximity to schools, presence of bus routes, heavy vehicle traffic, and both vehicular and pedestrian traffic volume over six hours to calculate risk exposure at a given intersection. The procedure assigns warrant points to the intersection based on a number of parameters. A score of 100 basis points or more suggests that a traffic signal is warranted at the intersection based on the users' exposure to risk.

Another consideration when determining locations for traffic signals is intersection geometry. Best practice suggests that any intersection with at least one leg having more than two approach lanes should be either free-flow or signalized.

Traffic signal warrant analysis was performed for the Lorne Ave & Cartwright St and Clarence Ave & Cartwright St intersections in the 20 year horizon for the background scenario and 5 and 20 year horizons for the combined scenario. Table 5.9 shows the calculated warrant points for the Background scenario and Table 5.10 shows the calculated warrant points for the Combined Scenario. These warrants are available in **Appendix D**.

Table 5.9: Signal Warrant Points for Background Scenario

Intersection	20 Year	
	Points	Warrant
Lorne Ave & Cartwright St	56	Not Met

Clarence Ave & Cartwright St	50	Not Met

According to TAC Signal Warrants, the vehicle and pedestrian traffic volumes are not high enough to warrant signalization of Lorne Ave & Cartwright St and Clarence Ave & Cartwright St in the Background scenario.

Table 5.10: Signal Warrant Points for Combined Scenario

Intersection	Horizon			
	5 Year		20 Year	
	Points	Warrant	Points	Warrant
Lorne Ave & Cartwright St	125	Met	130	Met
Clarence Ave & Cartwright St	117	Met	158	Met

Signals are warranted for both intersections in the 5 year full build-out combined scenario.

5.4 ROADWAY CLASSIFICATIONS

Recommended classification for the study roadways was determined based on the City of Saskatoon *New Neighbourhood Design and Development Standards Manual*, Section Eight (Transportation). The recommendations are based mainly on Annual Average Daily Traffic(AADT), but also were developed considering the roadway purpose and level of access. The daily traffic volumes and design speeds that are used by the City to establish road classification are shown in **Table 5.11:**, below:

Table 5.11: Road Classification Criteria

Roadway Type	Daily Service Volume (vehicles/day)	Design Speed	Posted Speed (Maximum)
Freeways and Expressways	>20,000	20 km/h above proposed posted speed limit	100 km/h
Arterials	5,000 to 30,000	10 km/h above proposed posted speed limit	70 km/h
Collectors	1,000 to 15,000	10 km/h above proposed posted speed limit	50 km/h
Local Streets	<1,000	50 km/h	50 km/h
Lanes	None specified	30-40 km/h	20 km/h

Table 3-1: Daily Service Volumes and Design Speeds, from City of Saskatoon New Neighbourhood Design and Development Standards Manual, Section Eight

To calculate the expected AADT volumes for the study roadways, Stantec used the following formula provided by the City of Saskatoon, which calculates daily traffic volumes based on the AM and PM peak hour volumes:

$$AADT = \frac{16.5 * (AM) + 11.78 * (PM)}{2}$$

The resulting approximate AADT for Access A, B, and C are 690, 760, and 1480 respectively. This would suggest Access C will be a Collector roadway with posted speed of 50 km/h and design speed of 60 km/h while Accesses A and B would be Local Streets with a design and posted speed of 50 km/h. However, given that Access A will connect to a future arterial, it will be classified as a collector with a design speed of 60 km/h and posted speed of 50 km/h.

5.5 SPEED AND SAFETY

City of Saskatoon Municipal limits abut Highway 219 for one mile (1.6 km) south of the intersection with Cartwright St. Northbound motorists will note the development on the east side of the roadway prior to arriving at the Cartwright St intersection. With additional development, the function of the road transitions from rural to increasingly urban. Currently, the speed limit is 60 km/h north of Cartwright St, then 80 km/h from Cartwright St to the approximate location of the proposed Access A. Immediately south, the speed limit increases to 100 km/h for the extent of the Highway.

Stantec reviewed the traffic safety of the area, and considered the following when generating recommendations:

- As this roadway is designated Highway 219, MHI's Design Manual was consulted for guidelines on speed limits and speed zones (DM 2130). It is important that speed limits are not set too low, as this can cause problems in terms of monitoring and does not ensure compliance.
- The prevailing vehicle speed on Highway 219 is generally decreasing in closer proximity to Cartwright Street and the urbanized area.
- Signalization of the intersection of Cartwright St with Lorne Avenue (Highway 219) will contribute to an increasingly urban character of the area.
- Traffic characteristics will be altered as a new intersection at Access A is introduced. While the intersection will be a right-in/ right-out only, there is expected to be heavy westbound right turn entering the highway.
- The traffic entering the highway (northbound) may not accelerate to highway speed in anticipation of the signalized intersection (as warranted) at Cartwright Street.

- Pedestrian activity is not expected to increase across Highway 219 as a result of this development, however, it may increase along the highway.
- The Lorne Ave / Highway 219 corridor is frequented by cyclists who use the highway for athletic training. This poses a potential safety concern that could be impacted by additional traffic generated by this development.

In order to be effective, speed limits must be safe, enforceable, accepted by the majority of road users, and consistent. Lower vehicle speeds reduce the stopping distance, reduce the severity of accidents, and communicate relevant information to the driver, such as indicating the change in the surrounding land use and the relative risk.

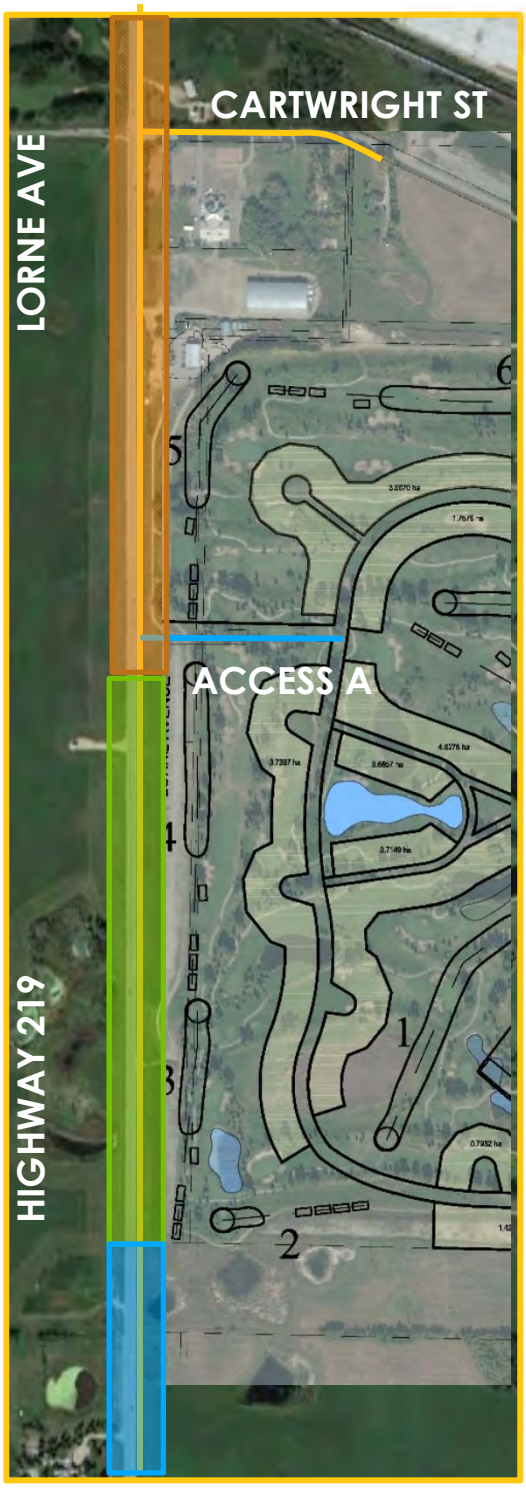
Considering the following, a change in location of speed reduction along Highway 219 is proposed as part of this development:

- Relocate the speed reduction to 80 km/hr south to align with the southern extent of the Willows development, indicating to drivers a change is road character and increasing urbanization.
- Relocate the speed reduction to 60 km/hr south just beyond the Access A intersection, further indicating the increasingly urban character, the increased potential for entering vehicles, and the potential for pedestrian and cyclists to be present.

Figure 5-1 shows the existing and proposed speed limits.

EXISTING

PROPOSED



N

AUGUST 2017
111000201

Stantec
Stantec Consulting Ltd.
400 – 1820 Hamilton Street
Regina, Saskatchewan

LEGEND
100 KM/H
80 KM/H
60 KM/H

THE WILLOWS
Traffic Impact Study

FIGURE No. **5-1**

EXISTING AND PROPOSED SPEED LIMITS

6.0 MHI WARRANTS

Intersection treatment warrants and area lighting warrants were considered for the intersection of Highway 219 and Access A in the 20-year Horizon. All warrants, including treatment designs, are provided in **Appendix E**.

6.1 INTERSECTION TREATMENT WARRANTS

Saskatchewan Ministry of Highways and Infrastructure (MHI) intersection treatment warrants are provided as a guideline for assisting in the determination of an appropriate geometry for intersections with Saskatchewan's highway network. One new intersection is proposed with Highway 219 as part of this development. Access A and Lorne Avenue (Highway 219) is proposed as a right-in/right-out only.

MHI standard plan 20615 was reviewed and relevant warrants were applied to the proposed intersection of Access A and Highway 219.

- Warrants for Left Turn lanes (SP 20610) is not applicable to this location.
- Warrants for Channelized Intersections (SP 20611) is not applicable to this location. The right-in/right-out access will be constructed with channelization to prevent left turns entering and exiting Access A.
- Warrants for Bypass Lanes (SP 20612) is not applicable to this location and left turns will be prohibited.
- Warrants for Flared Intersections (SP 20613) is applicable. Flared intersection would be warranted under warrant 2: all accesses to towns and villages where highway classification is a collector or local and the population exceeds 700, however Access A would be considered a secondary or alternate access and would not necessarily warrant a flared intersection treatment. Given the right-in/right-out geometry, the construction of an island to prevent left turns will necessitate slight flaring at this intersection. The flare would not be sufficient for additional lanes, but would ease the vehicle turning movement approaching and departing the intersection. Flaring would be limited to normal entrance and exit taper lengths at the applicable design speed.
- Warrants for Right Turn lanes (SP 20614) is applicable. Analysis of these warrants is included in the following section.
- Spot Improvement Warrant (SP 20615) was applied with the following results:
  - Total points = 45, consisting of the maximum points for AADT (35 pts), and points for Access to urban centres with a population of >400 (10 pts). This score suggests a right turn lane may be warranted.
  - Note that Access A is a secondary access to a suburban development within the City of Saskatoon.

6.1.1 Right Turn Lane

According to standard plan 20614 in MHI's Design Manual Part 1, a right turn lane is warranted if the calculated point falls to the right of the curve. **Figure 6-1** below shows the graph pertaining to standard plan 20614 where:

- V_A is the advancing volume including left, through, and right unless there is an exclusive left turn lane;
- V_R is the right turning volume; and
- R is the proportion of V_R / V_A.

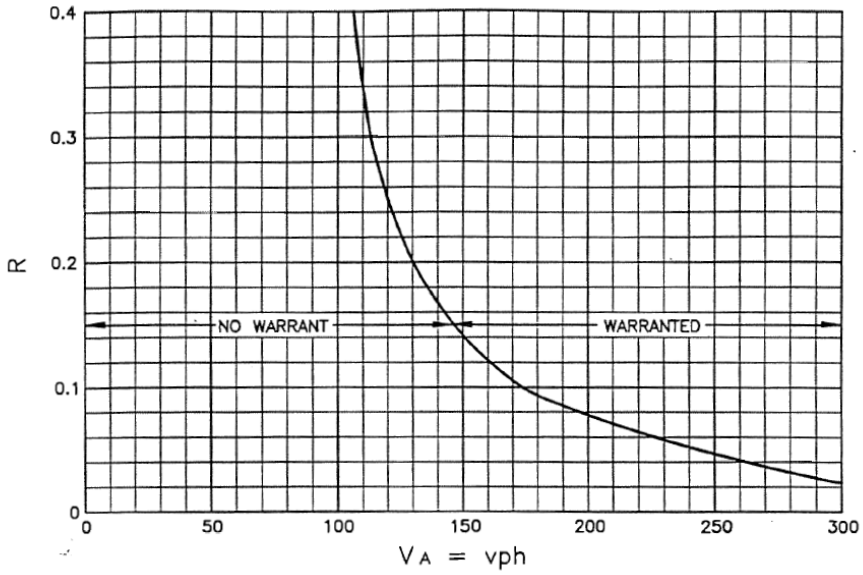


Figure 6-1: Right Turn Lane Warrant Graph

For the northbound approach, the maximum V_A is 320 and V_R is expected to be < 5. R is calculated as < 0.015. With very small turning volumes, it is not expected that a right turn lane will be necessary for the 20 year horizon, however, this also means that northbound traffic will be less likely to expect a leading vehicle to decelerate to turn right at this location as it will be a relatively rare occurrence. Adjustment of speed limits in this area as proposed will help to signal motorists that intersections are more frequent and to exercise a higher level of vigilance in watching leading vehicles for slowing and turning actions.

6.1.2 Acceleration Lane

There is currently no standard warrant for acceleration lanes. MHI documentation (SKS 2.3.5 F) allows for the decision about acceleration lanes to be based upon the forecast level of service for the entering vehicles. In this case, the westbound right turning vehicles are expected to

encounter sufficient gaps in northbound through traffic to safety enter the traffic stream without provision of an acceleration lane.

6.1.3 Intersection Lighting

Partial intersection lighting is the illumination of the intersection area and the adjacent through and auxiliary lanes of the through highway to a specified lighting criteria. These are key decision areas that would demand full driver care and alertness; the lighting is an indication to the driver that a decision and reaction may be required.

According to MHI's Design Manual DM 2621-1, partial roadway lighting shall be provided at provincial highway intersection in accordance with the candidate and design criteria.

The intersection of Access A and highway 219 would be classified under the following candidate criteria:

1) Rural and urban public highway intersection with a provincial highway with an intersecting roadway traffic volume greater that 150 AADT or 250 SADT for seasonal recreation roads qualify for intersection delineation lighting.

Intersection lighting is subject to priority ranking. The Priority ranking points for this intersection are included in Appendix E.

7.0 ALTERNATIVE MODES

7.1 TRANSIT

There are no transit lines which currently pass through the development. The closest routes are Route 20 and 17. Route 20 connects on Lorne Ave & Melville St, which would require a 1.7 km walk from Cartwright Terrace. Route 17 connects at Clarence Ave & Stonebridge Blvd, which requires an 0.8 km walk from the Wentworth and Waterford communities.

7.2 ACTIVE TRANSPORTATION

Figure 7-1 shows desire lines as well both existing and proposed sidewalks and pathways in the development. The recreational character of the development is maintained through the provision of a pathway network linking the many open green spaces.

Due to the nature and isolated location of the development, pedestrian and cyclist demand to and from the existing development and proposed development are expected to remain low. Pedestrians within the development will be accommodated on sidewalks provided on both sides of the proposed development roadways and the existing walks along Cartwright St. as well as the significant pathway network throughout the development.

There are four locations where the proposed pathway crosses the proposed new local road. These locations should be signed and painted as crosswalks, either with parallel twin lines or a zebra/ladder pavement marking. In addition, pedestrian signage will be required, with RA-4 signage on both sides of the roadway. Where sight lines are limited, it may also be prudent to install an advance warning sign such as the WC-2 on both sides of the roadway.

RA-4L WC-2R

Recent studies have examined the efficacy of various signs that warn drivers of the possible presence of pedestrians and warn pedestrians to watch for vehicles.

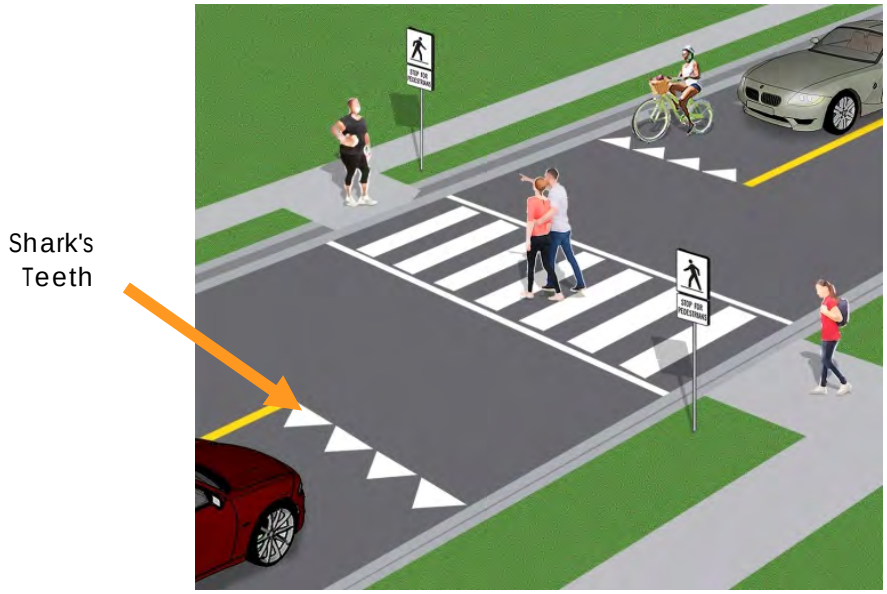
At signalized intersections and midblock crossing, or on multi-lane roads with unsignalised crosswalks, the vehicle stop line can be moved farther back from the pedestrian crosswalk for an improved factor of safety and for improved visibility of pedestrians. Placing the stop line 4.5 to

9 m back from the marked crosswalk has been shown to have considerable safety benefits for pedestrians.

Placing a sign "STOP HERE FOR PEDESTRIANS" (R1-5c) has also been shown to improve safety (see sign left). This sign does not yet appear in the *Manual of Uniform Traffic Control Devices for Canada,* but is included in the United States' MUTCD.

The advance warnings allow pedestrians and drivers to have a clearer view of each other and more time to assess the other's intentions.

The advanced pavement markings may also include a combination known as "shark's teeth" or "saw-tooth markings" (shown below). This pavement parking takes the place of the Stop Line.



SOURCE: Ontario Ministry of Transportation

It is anticipated that neither pedestrian nor vehicular traffic volumes will warrant pedestrian-actuated signals.

7.3 TRAFFIC CALMING

The free-flow design of the new local loop may be conducive to speeding. The high percentage of park frontage also reduces perceived friction and may contribute to a sense of safety at

higher speeds. Given the recreational character and the potential for high pedestrian volumes, it may be prudent to include traffic calming measures.

Of the four new crossing locations, three of them are mid-block crossings. The potential for vehicles to speed through this area may be mitigated by traffic calming measures. Walkway-to-walkway are an appropriate treatment for these mid-block crossings.

An example of a walkway-to-walkway curb extension is included in **Appendix F** and follows City of Saskatoon's Standard Drawing #102-0002-064r002. These will serve a dual purpose in the development. First, they will lower the inclination to speed through Access C, a long, free flow street with no stops and park space adjacent to the roadway. Second, it will raise the profile of pedestrians, giving them a clearly defined place to walk within the road right-of-way.

Locations for proposed walkway-to-walkway curb extensions are shown in **Figure 7-1**

Stantec

Stantec Consulting Ltd.
400 – 1820 Hamilton Street
Regina, Saskatchewan

LEGEND

- STUDY ROADWAY
- EXISTING SEPARATE WALK
- PROPOSED SIDEWALK
- PROPOSED ASPHALT PATHWAY
- GREEN SPACE / PARK
- WALKWAY-TO-WALKWAY CURB EXTENSION

THE WILLOWS
Traffic Impact Study

FIGURE No. **7-1**

ACTIVE TRANSPORTATION

8.0 CONCLUSIONS AND RECOMMENDATIONS

8.1 SUMMARY OF ANALYSIS RESULTS

Based on the analysis conducted, the proposed roadway network, with the exception of Cartwright St & Lorne Ave and Cartwright St & Clarence Ave, is capable of accommodating the vehicular traffic volumes generated by the proposed development at the analysis horizon years.

Based on the traffic analysis performed, with a permanent right-in-right-out intersection at Access A, the following remarks regarding the impact of the proposed development on the intersection of **Cartwright Street & Lorne Avenue** are mentioned:

- Background traffic growth as a result of ongoing growth results in a LOS D for the eastbound approach in the PM peak hour for the 5 year horizon and a LOS F for the same movement in the 20 year horizon.
- TAC Signal warrant points are not met at this intersection for the background scenario in the 20 year horizon.
- Combined traffic volumes for the 5 and 20 year horizons show that the eastbound and westbound approaches in the AM and PM peak hours exceed acceptable delays.
- Once signalized, all measures of effectiveness reach satisfactory levels.
- TAC Signal warrants were met for the 5 and 20 year horizons in the Combined Scenario.

Based on the traffic analysis performed, the following remarks regarding the impact of the proposed development on the intersection of **Cartwright Street & Clarence Avenue** are mentioned:

- TAC Signal warrant points are not met at this intersection for the background scenario in the 20 year horizon.
- Combined traffic volumes for the 20 year horizon shows that the eastbound approach in the AM and PM peak hours exceed acceptable delays.
- Once signalized, all measures of effectiveness reach satisfactory levels.
- TAC Signal warrants were met for the 5 and 20 year horizons in the Combined Scenario.

The following remarks regarding the impact of the proposed development on Highway 219:

- A right turn lane is not warranted for Access A and Highway 219;
- Access A and Highway 219 would qualify for partial intersection illumination as the intersecting roadway is expected to have a traffic volume of greater than 150 AADT;
- Cyclists needs should be given consideration when examining speed limit changes to Lorne Ave / Highway 219;

All other intersections perform at a satisfactory level within the development for all horizons.

8.2 RECOMMENDATIONS

It is therefore recommended that:

1) Clarence Avenue & Cartwright Street: traffic signals are recommended at this location at or prior to full build-out of the proposed development.
2) Lorne Avenue & Cartwright Street: traffic signals are recommended at this location at or prior to full build-out of the proposed development.
3) Highway 219 & Access A to be constructed as a right-in/right-out access
    a. with raised concrete island to discourage left turning movements; and
    b. incorporating slight flaring (taper only) on northbound approach and departure legs to ease turning movements.
4) Highway 219:
    a. the speed limit be changed to 80 km /h where the Willows golf course abuts Highway 219, as proposed herein;
    b. the speed limit be changed to 60 km/h on Highway 219 south of the Access A location, as proposed herein; and
    c. Partial intersection lighting be provided at Access A & Highway 219, in accordance with DM 2621 – 1.
5) Install walkway-to-walkway curb extensions at locations shown in **Figure 7-1**.

Appendix A HIGHWAY 219 ACCESS CORRESPONDENCE

Zoning Map of The Willows

City of Saskatoon

Note: The information contained on this map is for reference only and is not to be used for legal purposes

Bylaw 8770

Scale 1:5,500

031–0

Sep 18, 2015

uma

102-6624-014-01

March 28, 2003

Saskatchewan Highways and Transportation
2nd Floor, Lancaster Place
2174 Airport Drive
Saskatoon, Saskatchewan
S7L 6M6

Attention: Mr. Terry Schmidt
Executive Director

RECEIVED
MAR 3 1 2003

COPY

Dear Terry:

Re: Willows Golf Course Development
Access to Highway 219/Lorne Avenue

The purpose of this letter is to update you on the status of the above noted project. As you may or may not know, the annexation agreement between the City of Saskatoon and the RM of Corman Park was recently finalized and the proposed Willow development is now proceeding at an accelerated pace.

Back in 1998, we completed a preliminary traffic and roadway analysis for the site. We met with your department to confirm location of access points on Lorne Avenue/Highway 219 (see attached letters). Subsequently, we also with Mike Prime and Dick Bettie on a couple occasions (April 2000) to exchange information and discuss Highway's functional proposal to widen Highway 219.

It is my understanding Dick is now retired and I am not certain who is the appropriate contact within your group regarding this project. Therefore I would like to schedule a meeting between the Department of Highway, UMA and the developer (Dundee) to discuss the proposed Willows development, widening of Highway 219, project scheduling (Dept. of Highway & Dundee), alignment of Cartwright Road, etc.

UMA Engineering Ltd. 200 - 2100 8th Street East PO Box 539 Saskatoon Saskatchewan S7H 0V1 Canada
telephone (306) 955-3300 ***facsimile*** (306) 955-0044 ***web site*** www.umagroup.com

Once you have an opportunity to review this file, please let us know who is the contact person from your Department and we can schedule a convenient time for all parties to meet.

Yours truly,
UMA Engineering Ltd.

Garry Mak, P. Eng.
Senior Project Engineer

cc: Don Armstrong, Dundee Development Corporation

Saskatchewan
Highways and
Transportation

Saskatchewan
2nd Floor Lancaster Place
2174 Airport Drive
Saskatoon, Saskatchewan
S7L 6M6

September 4, 1998

File: CS 219-04

UMA Engineering Ltd.
Box 539, 200 – 2100 8th Street East
Saskatoon, SK
S7H 0V1

Attention: Garry Mak, P. Eng
Senior Project Engineer

Dear Garry

Re: Proposed Residential Development
Willows Golf Course

I am writing in response to your letter dated July 6, 1998. The access points indicated on the conceptual plan dated June 19, 1998 are acceptable to the Department under the condition that the access point in the SW 9 also provides access to the utility corridor. An additional direct access to Highway No. 219 for the utility corridor will not be permitted.

Traffic counts were conducted at the intersection of Highway No. 219 and Cartright Road from June 2 to June 8, 1998. The Average Annual Daily Traffic (AADT) on Highway No. 219 north of Cartright Road is approximately 5,000 vehicles per day, approximately 3,300 vehicles per day south of Cartright Road and approximately 1,400 vehicles per day on Cartright Road.

Traffic counts were also conducted at the intersection of Highway No. 219 and Grasswood Road from June 9 to June 15, 1998. The AADT on Highway No. 219 north of Grasswoods Road is approximately 3,300 vehicles per day, approximately 2,000 vehicles per day south of Grasswoods Road and approximately 1,300 vehicles per day on Grasswoods Road.

If you have any further questions or wish to discuss this proposal in more detail please give me a call at 933-5185.

Yours truly

Terry Schmidt
Director of Operations Services
Central Region

c Don Armstrong, Dundee Developments Inc.

UMA Engineering Ltd.
Engineers, Planners & Surveyors

P.O. Box 539, 200 - 2100 8th St. East, Saskatoon, Saskatchewan, Canada S7H 0V1
Telephone (306) 955-3300, Fax No.: (306) 955-0044

026-6624-014-01

July 6, 1998

Saskatchewan Highways and Transportation
2nd Floor, 2174 Airport Drive
Saskatoon, Saskatchewan
S7L 6M6

Attention: **Mr. Terry Schmidt, P.Eng.**
Director, Operation Services

Dear Terry:

Re: **Proposed Residential Development**
Willows Golf Course - Access To Highway No. 219

Regarding your letter of June 11, 1998, we have reviewed the letter with Preston Developments Inc. and concurred with the various issues that you noted. Once the development proceeds to the next stage, we will be in contact with your office again to review specific design details.

There is just one point in your letter regarding Access Points that we wish to clarified:

1. Access point (SW 9)

   As noted in your letter, one access point will be allowed. This is shown as Location A on the attache concept plan. This access point will utilized to serve both the utility corridor and the proposed residential complex. The attached Sk-1 shows 2 possible access configurations for the combine use option.

2. Access point (NW 9)

   One access is permitted to serve proposed residential development. This is shown as Location B on the concept plan.

3. Existing Golf Course Maintenance Facility

   The Willows currently has an access points to their maintenance facility. It is possible that the maintenance compound will be relocated as part of the overall re-development. If this is the case, the access will be removed. If the facility remains at its current location, an

alternate access will be provided via a service road. We assumed the access road will also be utilized by the arena complex and other landowners to the north.

Finally, Dick Beattie mentioned during our initial meeting that SHT is conducting some traffic counts on Highway No. 219, north and south of Cartwright Road. Can you provide our office with a copy of the data? What is the approximate schedule for the counts?

Look forward to hearing from you.

Yours truly,
UMA Engineering Ltd.

Garry Mak, P. Eng.
Senior Project Engineer

cc: Don Armstrong, Preston Developments Inc.

Appendix B SYNCHRO REPORTS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	116	5	5	5	5	12	6	176	5	5	101	53
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	121	5	0	22	0	0	187	0	5	101	53
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.91	0.85	0.95	0.99	0.85	0.95	1.00	0.85
Saturated Flow (vph)	0	1714	1530	0	1634	0	0	1790	0	1710	1800	1530
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.4			0.0			0.0			4.2
Adj Reference Time (s)			8.0			0.0			0.0			8.2
Permitted Option												
Adj Saturation A (vph)	0	521		0	365		0	1228		169	1800	
Reference Time A (s)	0.0	27.9		0.0	7.2		0.0	18.3		3.6	6.7	
Adj Saturation B (vph	0	0		0	0		0	0		NA	NA	
Reference Time B (s)	16.1	16.5		8.4	9.6		8.4	20.5		NA	NA	
Reference Time (s)		16.5			7.2			18.3			6.7	
Adj Reference Time (s)		20.5			11.2			22.3			10.7	
Split Option												
Ref Time Combined (s)	0.0	8.5		0.0	1.6		0.0	12.5		0.4	6.7	
Ref Time Seperate (s)	8.1	0.3		0.4	0.4		0.4	11.8		0.4	6.7	
Reference Time (s)	8.5	8.5		1.6	1.6		12.5	12.5		6.7	6.7	
Adj Reference Time (s)	12.5	12.5		8.0	8.0		16.5	16.5		10.7	10.7	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	20.5	22.3	
Split Option (s)	20.5	27.3	
Minimum (s)	20.5	22.3	42.8

Right Turns	EBR	SBR
Adj Reference Time (s)	8.0	8.2
Cross Thru Ref Time (s)	10.7	8.0
Oncoming Left Ref Time (s)	8.0	16.5
Combined (s)	26.7	32.7

Intersection Summary			
Intersection Capacity Utilization	35.6%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	5	5	5	5	12	6	176	5	5	101	53
Future Volume (Veh/h)	116	5	5	5	5	12	6	176	5	5	101	53
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.50	0.75	0.43	0.43	0.43	0.75	0.92	0.25	0.42	0.84	0.66
Hourly flow rate (vph)	143	10	7	12	12	28	8	191	20	12	120	80
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)			3									
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	395	371	120	370	441	201	200			211		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	395	371	120	370	441	201	200			211		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	73	98	99	98	98	97	99			99		
cM capacity (veh/h)	532	552	934	570	504	842	1378			1366		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2	SB 3
Volume Total	160	52	219	12	120	80
Volume Left	143	12	8	12	0	0
Volume Right	7	28	20	0	0	80
cSH	558	666	1378	1366	1700	1700
Volume to Capacity	0.29	0.08	0.01	0.01	0.07	0.05
Queue Length 95th (m)	9.0	1.9	0.1	0.2	0.0	0.0
Control Delay (s)	14.2	10.9	0.3	7.7	0.0	0.0
Lane LOS	B	B	A	A		
Approach Delay (s)	14.2	10.9	0.3	0.4		
Approach LOS	B	B				

Intersection Summary				
Average Delay	4.7			
Intersection Capacity Utilization	35.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	116	5	5	5	5	12	6	176	5	5	101	53
Future Vol, veh/h	116	5	5	5	5	12	6	176	5	5	101	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	-	-	-	-	200	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	50	75	43	43	43	75	92	25	42	84	66
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	143	10	7	12	12	28	8	191	20	12	120	80

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	381	371	120	366	361	201	120	0	0	211	0	0
Stage 1	144	144	-	217	217	-	-	-	-	-	-	-
Stage 2	237	227	-	149	144	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	579	560	934	592	568	842	1474	-	-	1366	-	-
Stage 1	861	780	-	788	725	-	-	-	-	-	-	-
Stage 2	768	718	-	856	780	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	545	552	934	573	560	842	1474	-	-	1366	-	-
Mov Cap-2 Maneuver	545	552	-	573	560	-	-	-	-	-	-	-
Stage 1	856	773	-	783	721	-	-	-	-	-	-	-
Stage 2	726	714	-	832	773	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14	10.6	0.3	0.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1474	-	-	545	934	690	1366	-	-
HCM Lane V/C Ratio	0.005	-	-	0.281	0.007	0.074	0.009	-	-
HCM Control Delay (s)	7.5	0	-	14.2	8.9	10.6	7.7	-	-
HCM Lane LOS	A	A	-	B	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.1	0	0.2	0	-	-

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	SBL2	SBL	SBR	SWL	SWR	SWR2
Lane Configurations												
Volume (vph)	6	5	9	30	27	5	5	25	18	5	5	5
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right					No	No			No		No	No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	0	20	62	0	0	0	48	0	15	0	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.97	0.92	0.85	0.85	0.95	0.91	0.85	0.89	0.85	0.85
Saturated Flow (vph)	0	0	1751	1661	0	0	0	1646	0	1593	0	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)			0.00	0.00				0.00		0.00		
Protected Option Allowed			No	No				No		No		
Reference Time (s)					0.0	0.0			0.0		0.0	0.0
Adj Reference Time (s)					0.0	0.0			0.0		0.0	0.0
Permitted Option												
Adj Saturation A (vph)	0	0	184	1661			0	110		106		
Reference Time A (s)	0.0	0.0	13.0	4.5			0.0	52.5		16.9		
Adj Saturation B (vph	0	0	0	1661			NA	NA		NA		
Reference Time B (s)	8.4	8.4	9.4	4.5			NA	NA		NA		
Reference Time (s)			9.4	4.5								
Adj Reference Time (s)			13.4	8.5								
Split Option												
Ref Time Combined (s)	0.0	0.0	1.4	4.5			0.0	3.5		1.1		
Ref Time Seperate (s)	0.4	0.4	0.6	2.2			0.4	1.8		0.4		
Reference Time (s)	1.4	1.4	1.4	4.5			3.5	3.5		1.1		
Adj Reference Time (s)	8.0	8.0	8.0	8.5			8.0	8.0		8.0		

Summary	EB WB	SB	SW	Combined
Protected Option (s)	NA	NA	NA	
Permitted Option (s)	13.4	Err	Err	
Split Option (s)	16.5	8.0	8.0	
Minimum (s)	13.4	8.0	8.0	29.4

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	24.5%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	SBL2	SBL	SBR	SWL	SWR	SWR2
Right Turn Channelized												
Traffic Volume (veh/h)	6	5	9	30	27	5	5	25	18	5	5	5
Future Volume (veh/h)	6	5	9	30	27	5	5	25	18	5	5	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	6	10	33	30	6	6	28	20	6	6	6
Approach Volume (veh/h)			23	69				54		18		
Crossing Volume (veh/h)			40	19				45		70		
High Capacity (veh/h)			1342	1364				1337		1311		
High v/c (veh/h)			0.02	0.05				0.04		0.01		
Low Capacity (veh/h)			1123	1143				1118		1094		
Low v/c (veh/h)			0.02	0.06				0.05		0.02		

Intersection Summary												
Maximum v/c High			0.05									
Maximum v/c Low			0.06									
Intersection Capacity Utilization			24.5%		ICU Level of Service				A			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	41	5	5	6	6	24	5	162	5	19	166	29
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	51	0	0	36	0	0	172	0	0	214	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.89	0.85	0.95	0.99	0.85	0.95	0.98	0.85
Saturated Flow (vph)	0	1702	0	0	1607	0	0	1790	0	0	3343	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	478		0	1679		0	1265		0	490	
Reference Time A (s)	0.0	12.8		0.0	2.6		0.0	16.3		0.0	16.9	
Adj Saturation B (vph	0	0		0	0		NA	NA		NA	NA	
Reference Time B (s)	10.9	11.6		8.4	10.7		NA	NA		NA	NA	
Reference Time (s)		11.6			2.6			16.3			16.9	
Adj Reference Time (s)		15.6			8.0			20.3			20.9	
Split Option												
Ref Time Combined (s)	0.0	3.6		0.0	2.7		0.0	11.5		0.0	7.7	
Ref Time Seperate (s)	2.9	0.4		0.4	0.5		0.4	10.8		1.3	5.9	
Reference Time (s)	3.6	3.6		2.7	2.7		11.5	11.5		7.7	7.7	
Adj Reference Time (s)	8.0	8.0		8.0	8.0		15.5	15.5		11.7	11.7	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	15.6	20.9	
Split Option (s)	16.0	27.2	
Minimum (s)	15.6	20.9	36.5

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	30.4%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	5	5	6	6	24	5	162	5	19	166	29
Future Volume (Veh/h)	41	5	5	6	6	24	5	162	5	19	166	29
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.68	0.50	0.50	0.38	0.38	0.75	0.50	0.79	0.38	0.68	0.80	0.72
Hourly flow rate (vph)	60	10	10	16	16	32	10	205	13	28	208	40
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	556	522	124	406	536	212	248			218		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	556	522	124	406	536	212	248			218		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	84	98	99	97	96	96	99			98		
cM capacity (veh/h)	380	447	907	506	439	797	1322			1356		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	80	64	228	132	144
Volume Left	60	16	10	28	0
Volume Right	10	32	13	0	40
cSH	418	591	1322	1356	1700
Volume to Capacity	0.19	0.11	0.01	0.02	0.08
Queue Length 95th (m)	5.3	2.8	0.2	0.5	0.0
Control Delay (s)	15.6	11.8	0.4	1.8	0.0
Lane LOS	C	B	A	A	
Approach Delay (s)	15.6	11.8	0.4	0.8	
Approach LOS	C	B			

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	30.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	41	5	5	6	6	24	5	162	5	19	166	29
Future Vol, veh/h	41	5	5	6	6	24	5	162	5	19	166	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	68	50	50	38	38	75	50	79	38	68	80	72
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	60	10	10	16	16	32	10	205	13	28	208	40

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	540	522	124	397	536	212	248	0	0	218	0	0
Stage 1	284	284	-	232	232	-	-	-	-	-	-	-
Stage 2	256	238	-	165	304	-	-	-	-	-	-	-
Critical Hdwy	7.315	6.515	6.915	7.315	6.515	6.215	4.115	-	-	4.115	-	-
Critical Hdwy Stg 1	6.515	5.515	-	6.115	5.515	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.115	5.515	-	6.515	5.515	-	-	-	-	-	-	-
Follow-up Hdwy	3.5095	4.0095	3.3095	3.5095	4.0095	3.3095	2.2095	-	-	2.2095	-	-
Pot Cap-1 Maneuver	440	460	907	552	452	830	1323	-	-	1357	-	-
Stage 1	702	678	-	773	714	-	-	-	-	-	-	-
Stage 2	750	710	-	824	664	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	401	445	907	523	437	830	1323	-	-	1357	-	-
Mov Cap-2 Maneuver	401	445	-	523	437	-	-	-	-	-	-	-
Stage 1	696	662	-	766	708	-	-	-	-	-	-	-
Stage 2	699	704	-	783	648	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.1	11.6	0.3	0.9
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1323	-	-	437	606	1357	-	-
HCM Lane V/C Ratio	0.008	-	-	0.184	0.105	0.021	-	-
HCM Control Delay (s)	7.7	0	-	15.1	11.6	7.7	0.1	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0.3	0.1	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	24	17	19	14	5	19
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No		No		
Ideal Flow	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	41	0	19	14	0	24
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.91	0.85	1.00	0.85	0.95	0.99
Saturated Flow (vph)	1639	0	1800	1530	0	1781
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00		0.00			0.00
Protected Option Allowed	No		No			No
Reference Time (s)		0.0		1.1		
Adj Reference Time (s)		0.0		8.0		
Permitted Option						
Adj Saturation A (vph)	109		1800		0	427
Reference Time A (s)	45.0		1.3		0.0	6.7
Adj Saturation B (vph	NA		1800		0	0
Reference Time B (s)	NA		1.3		8.4	9.6
Reference Time (s)			1.3			6.7
Adj Reference Time (s)			8.0			10.7
Split Option						
Ref Time Combined (s)	3.0		1.3		0.0	1.6
Ref Time Seperate (s)	1.8		1.3		0.4	1.3
Reference Time (s)	3.0		1.3		1.6	1.6
Adj Reference Time (s)	8.0		8.0		8.0	8.0

Summary	WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	Err	10.7	
Split Option (s)	8.0	16.0	
Minimum (s)	8.0	10.7	18.7

Right Turns	NBR
Adj Reference Time (s)	8.0
Cross Thru Ref Time (s)	0.0
Oncoming Left Ref Time (s)	8.0
Combined (s)	16.0

Intersection Summary			
Intersection Capacity Utilization	15.6%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	24	17	19	14	5	19
Future Volume (Veh/h)	24	17	19	14	5	19
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	27	19	21	16	6	21
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	54	21			37	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	54	21			37	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	98			100	
cM capacity (veh/h)	953	1059			1580	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	46	21	16	27
Volume Left	27	0	0	6
Volume Right	19	0	16	0
cSH	994	1700	1700	1580
Volume to Capacity	0.05	0.01	0.01	0.00
Queue Length 95th (m)	1.1	0.0	0.0	0.1
Control Delay (s)	8.8	0.0	0.0	1.6
Lane LOS	A			A
Approach Delay (s)	8.8	0.0		1.6
Approach LOS	A			

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	15.6%	ICU Level of Service	A
Analysis Period (min)	15		

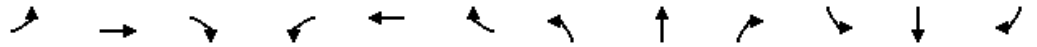
Intersection	
Int Delay, s/veh	4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	24	17	19	14	5	19
Future Vol, veh/h	24	17	19	14	5	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	250	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	27	19	21	16	6	21

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	53	21	0	0	21	0
Stage 1	21	-	-	-	-	-
Stage 2	32	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	958	1059	-	-	1601	-
Stage 1	1004	-	-	-	-	-
Stage 2	993	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	954	1059	-	-	1601	-
Mov Cap-2 Maneuver	954	-	-	-	-	-
Stage 1	1004	-	-	-	-	-
Stage 2	989	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	1.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	995	1601	-
HCM Lane V/C Ratio	-	-	0.046	0.003	-
HCM Control Delay (s)	-	-	8.8	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-



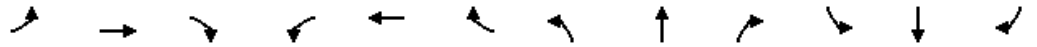
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	59	5	12	45	6	5	5	46	16	5	5
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	69	0	0	63	0	0	56	0	0	26	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.99	0.85	0.95	0.98	0.85	0.95	0.87	0.85	0.95	0.94	0.85
Saturated Flow (vph)	0	1774	0	0	1757	0	0	1571	0	0	1694	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	1604		0	925		0	1589		0	407	
Reference Time A (s)	0.0	5.2		0.0	8.2		0.0	4.2		0.0	7.7	
Adj Saturation B (vph	0	0		0	0		0	0		0	0	
Reference Time B (s)	8.4	12.7		8.8	12.3		8.4	12.3		9.1	9.8	
Reference Time (s)		5.2			8.2			4.2			7.7	
Adj Reference Time (s)		9.2			12.2			8.2			11.7	
Split Option												
Ref Time Combined (s)	0.0	4.7		0.0	4.3		0.0	4.3		0.0	1.8	
Ref Time Seperate (s)	0.4	4.0		0.8	3.1		0.4	0.4		1.1	0.4	
Reference Time (s)	4.7	4.7		4.3	4.3		4.3	4.3		1.8	1.8	
Adj Reference Time (s)	8.7	8.7		8.3	8.3		8.3	8.3		8.0	8.0	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	12.2	11.7	
Split Option (s)	17.0	16.3	
Minimum (s)	12.2	11.7	23.8

Right Turns	
Adj Reference Time (s)	
Cross Thru Ref Time (s)	
Oncoming Left Ref Time (s)	
Combined (s)	

Intersection Summary			
Intersection Capacity Utilization	19.9%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	59	5	12	45	6	5	5	46	16	5	5
Future Volume (Veh/h)	5	59	5	12	45	6	5	5	46	16	5	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.78	0.50	0.60	0.66	0.75	0.64	0.64	0.64	0.50	0.25	0.50
Hourly flow rate (vph)	20	76	10	20	68	8	8	8	72	32	20	10
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	76			86			253	237	81	309	238	72
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	76			86			253	237	81	309	238	72
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			99			99	99	93	94	97	99
cM capacity (veh/h)	1529			1517			665	648	982	581	647	993

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	106	96	88	62
Volume Left	20	20	8	32
Volume Right	10	8	72	10
cSH	1529	1517	901	645
Volume to Capacity	0.01	0.01	0.10	0.10
Queue Length 95th (m)	0.3	0.3	2.5	2.4
Control Delay (s)	1.5	1.6	9.4	11.2
Lane LOS	A	A	A	B
Approach Delay (s)	1.5	1.6	9.4	11.2
Approach LOS			A	B

Intersection Summary				
Average Delay	5.2			
Intersection Capacity Utilization	19.9%	ICU Level of Service	A	
Analysis Period (min)	15			

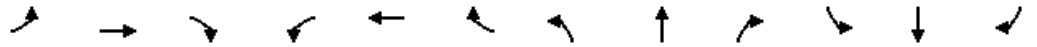
Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	59	5	12	45	6	5	5	46	16	5	5
Future Vol, veh/h	5	59	5	12	45	6	5	5	46	16	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	78	50	60	66	75	64	64	64	50	25	50
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	20	76	10	20	68	8	8	8	72	32	20	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	76	0	0	86	0	0	248	237	81	272	238	72
Stage 1	-	-	-	-	-	-	121	121	-	112	112	-
Stage 2	-	-	-	-	-	-	127	116	-	160	126	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1529	-	-	1517	-	-	708	666	982	683	665	993
Stage 1	-	-	-	-	-	-	886	798	-	895	805	-
Stage 2	-	-	-	-	-	-	879	802	-	845	794	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1529	-	-	1517	-	-	670	647	982	614	647	993
Mov Cap-2 Maneuver	-	-	-	-	-	-	670	647	-	614	647	-
Stage 1	-	-	-	-	-	-	874	787	-	882	794	-
Stage 2	-	-	-	-	-	-	836	791	-	765	783	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	1.5	9.4	11
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	903	1529	-	-	1517	-	-	666
HCM Lane V/C Ratio	0.097	0.013	-	-	0.013	-	-	0.093
HCM Control Delay (s)	9.4	7.4	0	-	7.4	0	-	11
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	116	5	5	5	5	12	6	256	5	5	147	53
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	121	5	0	22	0	0	267	0	5	147	53
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.91	0.85	0.95	1.00	0.85	0.95	1.00	0.85
Saturated Flow (vph)	0	1714	1530	0	1634	0	0	1793	0	1710	1800	1530
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.4			0.0			0.0			4.2
Adj Reference Time (s)			8.0			0.0			0.0			8.2
Permitted Option												
Adj Saturation A (vph)	0	521		0	365		0	1359		152	1800	
Reference Time A (s)	0.0	27.9		0.0	7.2		0.0	23.6		3.9	9.8	
Adj Saturation B (vph	0	0		0	0		NA	NA		NA	NA	
Reference Time B (s)	16.1	16.5		8.4	9.6		NA	NA		NA	NA	
Reference Time (s)		16.5			7.2			23.6			9.8	
Adj Reference Time (s)		20.5			11.2			27.6			13.8	
Split Option												
Ref Time Combined (s)	0.0	8.5		0.0	1.6		0.0	17.9		0.4	9.8	
Ref Time Seperate (s)	8.1	0.3		0.4	0.4		0.4	17.1		0.4	9.8	
Reference Time (s)	8.5	8.5		1.6	1.6		17.9	17.9		9.8	9.8	
Adj Reference Time (s)	12.5	12.5		8.0	8.0		21.9	21.9		13.8	13.8	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	20.5	27.6	
Split Option (s)	20.5	35.7	
Minimum (s)	20.5	27.6	48.0

Right Turns	EBR	SBR
Adj Reference Time (s)	8.0	8.2
Cross Thru Ref Time (s)	13.8	8.0
Oncoming Left Ref Time (s)	8.0	21.9
Combined (s)	29.8	38.0

Intersection Summary			
Intersection Capacity Utilization	40.0%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	5	5	5	5	12	6	256	5	5	147	53
Future Volume (Veh/h)	116	5	5	5	5	12	6	256	5	5	147	53
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.50	0.75	0.43	0.43	0.43	0.75	0.92	0.25	0.42	0.84	0.66
Hourly flow rate (vph)	143	10	7	12	12	28	8	278	20	12	175	80
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)			3									
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	537	513	175	512	583	288	255			298		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	537	513	175	512	583	288	255			298		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	66	98	99	97	97	96	99			99		
cM capacity (veh/h)	425	459	871	457	419	753	1316			1269		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2	SB 3
Volume Total	160	52	306	12	175	80
Volume Left	143	12	8	12	0	0
Volume Right	7	28	20	0	0	80
cSH	446	565	1316	1269	1700	1700
Volume to Capacity	0.36	0.09	0.01	0.01	0.10	0.05
Queue Length 95th (m)	12.2	2.3	0.1	0.2	0.0	0.0
Control Delay (s)	17.7	12.0	0.3	7.9	0.0	0.0
Lane LOS	C	B	A	A		
Approach Delay (s)	17.7	12.0	0.3	0.4		
Approach LOS	C	B				

Intersection Summary				
Average Delay	4.6			
Intersection Capacity Utilization	40.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	116	5	5	5	5	12	6	256	5	5	147	53
Future Vol, veh/h	116	5	5	5	5	12	6	256	5	5	147	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	-	-	-	-	200	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	50	75	43	43	43	75	92	25	42	84	66
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	143	10	7	12	12	28	8	278	20	12	175	80

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	523	513	175	508	503	288	175	0	0	298	0	0
Stage 1	199	199	-	304	304	-	-	-	-	-	-	-
Stage 2	324	314	-	204	199	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	466	466	871	477	472	753	1407	-	-	1269	-	-
Stage 1	805	738	-	708	665	-	-	-	-	-	-	-
Stage 2	690	658	-	800	738	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	435	458	871	460	464	753	1407	-	-	1269	-	-
Mov Cap-2 Maneuver	435	458	-	460	464	-	-	-	-	-	-	-
Stage 1	799	731	-	703	660	-	-	-	-	-	-	-
Stage 2	648	653	-	776	731	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.3	11.7	0.2	0.4
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1407	-	-	436	871	585	1269	-	-
HCM Lane V/C Ratio	0.006	-	-	0.351	0.008	0.087	0.009	-	-
HCM Control Delay (s)	7.6	0	-	17.7	9.2	11.7	7.9	-	-
HCM Lane LOS	A	A	-	C	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.6	0	0.3	0	-	-

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	SBL2	SBL	SBR	SWL	SWR	SWR2
Lane Configurations												
Volume (vph)	6	5	9	30	27	5	5	25	18	5	5	5
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right					No	No			No		No	No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	0	20	62	0	0	0	48	0	15	0	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.97	0.92	0.85	0.85	0.95	0.91	0.85	0.89	0.85	0.85
Saturated Flow (vph)	0	0	1751	1661	0	0	0	1646	0	1593	0	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)			0.00	0.00				0.00		0.00		
Protected Option Allowed			No	No				No		No		
Reference Time (s)					0.0	0.0			0.0		0.0	0.0
Adj Reference Time (s)					0.0	0.0			0.0		0.0	0.0
Permitted Option												
Adj Saturation A (vph)	0	0	184	1661			0	110		106		
Reference Time A (s)	0.0	0.0	13.0	4.5			0.0	52.5		16.9		
Adj Saturation B (vph	0	0	0	1661			NA	NA		NA		
Reference Time B (s)	8.4	8.4	9.4	4.5			NA	NA		NA		
Reference Time (s)			9.4	4.5								
Adj Reference Time (s)			13.4	8.5								
Split Option												
Ref Time Combined (s)	0.0	0.0	1.4	4.5			0.0	3.5		1.1		
Ref Time Seperate (s)	0.4	0.4	0.6	2.2			0.4	1.8		0.4		
Reference Time (s)	1.4	1.4	1.4	4.5			3.5	3.5		1.1		
Adj Reference Time (s)	8.0	8.0	8.0	8.5			8.0	8.0		8.0		

Summary	EB WB	SB	SW	Combined
Protected Option (s)	NA	NA	NA	
Permitted Option (s)	13.4	Err	Err	
Split Option (s)	16.5	8.0	8.0	
Minimum (s)	13.4	8.0	8.0	29.4

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	24.5%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	SBL2	SBL	SBR	SWL	SWR	SWR2
Right Turn Channelized												
Traffic Volume (veh/h)	6	5	9	30	27	5	5	25	18	5	5	5
Future Volume (veh/h)	6	5	9	30	27	5	5	25	18	5	5	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	6	10	33	30	6	6	28	20	6	6	6
Approach Volume (veh/h)			23	69				54		18		
Crossing Volume (veh/h)			40	19				45		70		
High Capacity (veh/h)			1342	1364				1337		1311		
High v/c (veh/h)			0.02	0.05				0.04		0.01		
Low Capacity (veh/h)			1123	1143				1118		1094		
Low v/c (veh/h)			0.02	0.06				0.05		0.02		

Intersection Summary												
Maximum v/c High			0.05									
Maximum v/c Low			0.06									
Intersection Capacity Utilization			24.5%		ICU Level of Service				A			

Intersection	
Intersection Delay, s/veh	3.7
Intersection LOS	A

Approach	EB	WB	SB	SW
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	23	69	54	18
Demand Flow Rate, veh/h	23	69	54	18
Vehicles Circulating, veh/h	40	19	45	70
Vehicles Exiting, veh/h	59	44	43	18
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.5	3.8	3.8	3.6
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LT	TR	LR	LR
Assumed Moves	LT	TR	LR	LR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	23	69	54	18
Cap Entry Lane, veh/h	1086	1109	1080	1054
Entry HV Adj Factor	0.993	0.995	0.999	1.000
Flow Entry, veh/h	23	69	54	18
Cap Entry, veh/h	1078	1103	1079	1054
V/C Ratio	0.021	0.062	0.050	0.017
Control Delay, s/veh	3.5	3.8	3.8	3.6
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	5	5	6	6	24	5	236	5	19	242	42
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	70	0	0	36	0	0	246	0	0	303	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.89	0.85	0.95	1.00	0.85	0.95	0.98	0.85
Saturated Flow (vph)	0	1704	0	0	1607	0	0	1793	0	0	3345	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	453		0	1692		0	1392		0	643	
Reference Time A (s)	0.0	18.5		0.0	2.6		0.0	21.2		0.0	21.2	
Adj Saturation B (vph	0	0		0	0		NA	NA		NA	NA	
Reference Time B (s)	12.2	12.9		8.4	10.7		NA	NA		NA	NA	
Reference Time (s)		12.9			2.6			21.2			21.2	
Adj Reference Time (s)		16.9			8.0			25.2			25.2	
Split Option												
Ref Time Combined (s)	0.0	4.9		0.0	2.7		0.0	16.5		0.0	10.9	
Ref Time Seperate (s)	4.2	0.4		0.4	0.5		0.4	15.8		1.3	8.7	
Reference Time (s)	4.9	4.9		2.7	2.7		16.5	16.5		10.9	10.9	
Adj Reference Time (s)	8.9	8.9		8.0	8.0		20.5	20.5		14.9	14.9	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	16.9	25.2	
Split Option (s)	16.9	35.3	
Minimum (s)	16.9	25.2	42.1

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	35.1%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	5	5	6	6	24	5	236	5	19	242	42
Future Volume (Veh/h)	60	5	5	6	6	24	5	236	5	19	242	42
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.68	0.50	0.50	0.38	0.38	0.75	0.50	0.79	0.38	0.68	0.80	0.72
Hourly flow rate (vph)	88	10	10	16	16	32	10	299	13	28	303	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)								368				
pX, platoon unblocked												
vC, conflicting volume	754	720	180	548	742	306	361			312		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	754	720	180	548	742	306	361			312		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	67	97	99	96	95	95	99			98		
cM capacity (veh/h)	269	344	834	398	333	693	1201			1252		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	108	64	322	180	210
Volume Left	88	16	10	28	0
Volume Right	10	32	13	0	58
cSH	294	476	1201	1252	1700
Volume to Capacity	0.37	0.13	0.01	0.02	0.12
Queue Length 95th (m)	12.4	3.5	0.2	0.5	0.0
Control Delay (s)	24.2	13.7	0.3	1.4	0.0
Lane LOS	C	B	A	A	
Approach Delay (s)	24.2	13.7	0.3	0.6	
Approach LOS	C	B			

Intersection Summary				
Average Delay	4.4			
Intersection Capacity Utilization	35.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	60	5	5	6	6	24	5	236	5	19	242	42
Future Vol, veh/h	60	5	5	6	6	24	5	236	5	19	242	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	68	50	50	38	38	75	50	79	38	68	80	72
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	88	10	10	16	16	32	10	299	13	28	303	58

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	737	720	180	537	742	305	361	0	0	312	0	0
Stage 1	388	388	-	325	325	-	-	-	-	-	-	-
Stage 2	349	332	-	212	417	-	-	-	-	-	-	-
Critical Hdwy	7.315	6.515	6.915	7.315	6.515	6.215	4.115	-	-	4.115	-	-
Critical Hdwy Stg 1	6.515	5.515	-	6.115	5.515	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.115	5.515	-	6.515	5.515	-	-	-	-	-	-	-
Follow-up Hdwy	3.5095	4.0095	3.3095	3.5095	4.0095	3.3095	2.2095	-	-	2.2095	-	-
Pot Cap-1 Maneuver	322	355	835	442	345	737	1202	-	-	1253	-	-
Stage 1	610	610	-	689	650	-	-	-	-	-	-	-
Stage 2	669	646	-	774	593	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	288	342	835	415	332	737	1202	-	-	1253	-	-
Mov Cap-2 Maneuver	288	342	-	415	332	-	-	-	-	-	-	-
Stage 1	604	593	-	682	644	-	-	-	-	-	-	-
Stage 2	618	640	-	731	576	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.6	13.4	0.2	0.6
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1202	-	-	311	493	1253	-	-
HCM Lane V/C Ratio	0.008	-	-	0.348	0.129	0.022	-	-
HCM Control Delay (s)	8	0	-	22.6	13.4	7.9	0.1	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.5	0.4	0.1	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	24	17	19	14	5	19
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No		No		
Ideal Flow	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	41	0	19	14	0	24
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.91	0.85	1.00	0.85	0.95	0.99
Saturated Flow (vph)	1639	0	1800	1530	0	1781
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00		0.00			0.00
Protected Option Allowed	No		No			No
Reference Time (s)		0.0		1.1		
Adj Reference Time (s)		0.0		8.0		
Permitted Option						
Adj Saturation A (vph)	109		1800		0	427
Reference Time A (s)	45.0		1.3		0.0	6.7
Adj Saturation B (vph	NA		1800		0	0
Reference Time B (s)	NA		1.3		8.4	9.6
Reference Time (s)			1.3			6.7
Adj Reference Time (s)			8.0			10.7
Split Option						
Ref Time Combined (s)	3.0		1.3		0.0	1.6
Ref Time Seperate (s)	1.8		1.3		0.4	1.3
Reference Time (s)	3.0		1.3		1.6	1.6
Adj Reference Time (s)	8.0		8.0		8.0	8.0

Summary	WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	Err	10.7	
Split Option (s)	8.0	16.0	
Minimum (s)	8.0	10.7	18.7

Right Turns	NBR
Adj Reference Time (s)	8.0
Cross Thru Ref Time (s)	0.0
Oncoming Left Ref Time (s)	8.0
Combined (s)	16.0

Intersection Summary			
Intersection Capacity Utilization	15.6%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	24	17	19	14	5	19
Future Volume (Veh/h)	24	17	19	14	5	19
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	27	19	21	16	6	21
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	54	21			37	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	54	21			37	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	98			100	
cM capacity (veh/h)	953	1059			1580	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	46	21	16	27
Volume Left	27	0	0	6
Volume Right	19	0	16	0
cSH	994	1700	1700	1580
Volume to Capacity	0.05	0.01	0.01	0.00
Queue Length 95th (m)	1.1	0.0	0.0	0.1
Control Delay (s)	8.8	0.0	0.0	1.6
Lane LOS	A			A
Approach Delay (s)	8.8	0.0		1.6
Approach LOS	A			

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	15.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	24	17	19	14	5	19
Future Vol, veh/h	24	17	19	14	5	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	250	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	27	19	21	16	6	21

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	53	21	0	0	21	0
Stage 1	21	-	-	-	-	-
Stage 2	32	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	958	1059	-	-	1601	-
Stage 1	1004	-	-	-	-	-
Stage 2	993	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	954	1059	-	-	1601	-
Mov Cap-2 Maneuver	954	-	-	-	-	-
Stage 1	1004	-	-	-	-	-
Stage 2	989	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	1.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	995	1601	-
HCM Lane V/C Ratio	-	-	0.046	0.003	-
HCM Control Delay (s)	-	-	8.8	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

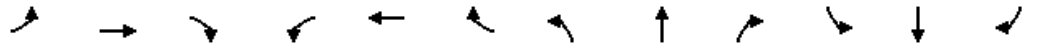
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (vph)	5	59	5	12	45	6	5	5	46	16	5	5
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	69	0	0	63	0	0	56	0	0	26	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.99	0.85	0.95	0.98	0.85	0.95	0.87	0.85	0.95	0.94	0.85
Saturated Flow (vph)	0	1774	0	0	1757	0	0	1571	0	0	1694	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	1604		0	925		0	1589		0	407	
Reference Time A (s)	0.0	5.2		0.0	8.2		0.0	4.2		0.0	7.7	
Adj Saturation B (vph	0	0		0	0		0	0		0	0	
Reference Time B (s)	8.4	12.7		8.8	12.3		8.4	12.3		9.1	9.8	
Reference Time (s)		5.2			8.2			4.2			7.7	
Adj Reference Time (s)		9.2			12.2			8.2			11.7	
Split Option												
Ref Time Combined (s)	0.0	4.7		0.0	4.3		0.0	4.3		0.0	1.8	
Ref Time Seperate (s)	0.4	4.0		0.8	3.1		0.4	0.4		1.1	0.4	
Reference Time (s)	4.7	4.7		4.3	4.3		4.3	4.3		1.8	1.8	
Adj Reference Time (s)	8.7	8.7		8.3	8.3		8.3	8.3		8.0	8.0	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	12.2	11.7	
Split Option (s)	17.0	16.3	
Minimum (s)	12.2	11.7	23.8

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	19.9%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	59	5	12	45	6	5	5	46	16	5	5
Future Volume (Veh/h)	5	59	5	12	45	6	5	5	46	16	5	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.78	0.50	0.60	0.66	0.75	0.64	0.64	0.64	0.50	0.25	0.50
Hourly flow rate (vph)	20	76	10	20	68	8	8	8	72	32	20	10
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	76			86			253	237	81	309	238	72
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	76			86			253	237	81	309	238	72
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			99			99	99	93	94	97	99
cM capacity (veh/h)	1529			1517			665	648	982	581	647	993

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	106	96	88	62
Volume Left	20	20	8	32
Volume Right	10	8	72	10
cSH	1529	1517	901	645
Volume to Capacity	0.01	0.01	0.10	0.10
Queue Length 95th (m)	0.3	0.3	2.5	2.4
Control Delay (s)	1.5	1.6	9.4	11.2
Lane LOS	A	A	A	B
Approach Delay (s)	1.5	1.6	9.4	11.2
Approach LOS			A	B

Intersection Summary				
Average Delay	5.2			
Intersection Capacity Utilization	19.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	59	5	12	45	6	5	5	46	16	5	5
Future Vol, veh/h	5	59	5	12	45	6	5	5	46	16	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	78	50	60	66	75	64	64	64	50	25	50
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	20	76	10	20	68	8	8	8	72	32	20	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	76	0	0	86	0	0	248	237	81	272	238	72
Stage 1	-	-	-	-	-	-	121	121	-	112	112	-
Stage 2	-	-	-	-	-	-	127	116	-	160	126	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1529	-	-	1517	-	-	708	666	982	683	665	993
Stage 1	-	-	-	-	-	-	886	798	-	895	805	-
Stage 2	-	-	-	-	-	-	879	802	-	845	794	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1529	-	-	1517	-	-	670	647	982	614	647	993
Mov Cap-2 Maneuver	-	-	-	-	-	-	670	647	-	614	647	-
Stage 1	-	-	-	-	-	-	874	787	-	882	794	-
Stage 2	-	-	-	-	-	-	836	791	-	765	783	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	1.5	9.4	11
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	903	1529	-	-	1517	-	-	666
HCM Lane V/C Ratio	0.097	0.013	-	-	0.013	-	-	0.093
HCM Control Delay (s)	9.4	7.4	0	-	7.4	0	-	11
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	77	5	5	5	5	10	5	230	5	5	328	115
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	82	5	0	20	0	0	240	0	5	328	115
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.91	0.85	0.95	1.00	0.85	0.95	1.00	0.85
Saturated Flow (vph)	0	1715	1530	0	1644	0	0	1793	0	1710	1800	1530
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.4			0.0			0.0			9.0
Adj Reference Time (s)			8.0			0.0			0.0			13.0
Permitted Option												
Adj Saturation A (vph)	0	571		0	340		0	1384		150	1800	
Reference Time A (s)	0.0	17.2		0.0	7.1		0.0	20.8		4.0	21.9	
Adj Saturation B (vph	0	0		0	0		NA	NA		NA	NA	
Reference Time B (s)	13.4	13.7		8.4	9.5		NA	NA		NA	NA	
Reference Time (s)		13.7			7.1			20.8			21.9	
Adj Reference Time (s)		17.7			11.1			24.8			25.9	
Split Option												
Ref Time Combined (s)	0.0	5.7		0.0	1.5		0.0	16.1		0.4	21.9	
Ref Time Seperate (s)	5.4	0.3		0.4	0.4		0.4	15.4		0.4	21.9	
Reference Time (s)	5.7	5.7		1.5	1.5		16.1	16.1		21.9	21.9	
Adj Reference Time (s)	9.7	9.7		8.0	8.0		20.1	20.1		25.9	25.9	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	17.7	25.9	
Split Option (s)	17.7	45.9	
Minimum (s)	17.7	25.9	43.6

Right Turns	EBR	SBR
Adj Reference Time (s)	8.0	13.0
Cross Thru Ref Time (s)	25.9	8.0
Oncoming Left Ref Time (s)	8.0	20.1
Combined (s)	41.9	41.1

Intersection Summary			
Intersection Capacity Utilization	36.3%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	5	5	5	5	10	5	230	5	5	328	115
Future Volume (Veh/h)	77	5	5	5	5	10	5	230	5	5	328	115
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.25	0.62	0.25	0.25	0.50	0.38	0.92	0.25	0.50	0.87	0.85
Hourly flow rate (vph)	92	20	8	20	20	20	13	250	20	10	377	135
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)			3									
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	713	693	377	697	818	260	512			270		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	713	693	377	697	818	260	512			270		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	71	94	99	94	93	97	99			99		
cM capacity (veh/h)	317	361	672	333	306	781	1058			1299		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2	SB 3
Volume Total	120	60	283	10	377	135
Volume Left	92	20	13	10	0	0
Volume Right	8	20	20	0	0	135
cSH	348	397	1058	1299	1700	1700
Volume to Capacity	0.34	0.15	0.01	0.01	0.22	0.08
Queue Length 95th (m)	11.4	4.0	0.3	0.2	0.0	0.0
Control Delay (s)	21.0	15.7	0.5	7.8	0.0	0.0
Lane LOS	C	C	A	A		
Approach Delay (s)	21.0	15.7	0.5	0.1		
Approach LOS	C	C				

Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	36.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	77	5	5	5	5	10	5	230	5	5	328	115
Future Vol, veh/h	77	5	5	5	5	10	5	230	5	5	328	115
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	-	-	-	-	200	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	25	62	25	25	50	38	92	25	50	87	85
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	92	20	8	20	20	20	13	250	20	10	377	135

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	703	693	377	693	683	260	377	0	0	270	0	0
Stage 1	397	397	-	286	286	-	-	-	-	-	-	-
Stage 2	306	296	-	407	397	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	354	368	672	359	373	781	1187	-	-	1299	-	-
Stage 1	631	605	-	724	677	-	-	-	-	-	-	-
Stage 2	706	670	-	623	605	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	325	360	672	334	365	781	1187	-	-	1299	-	-
Mov Cap-2 Maneuver	325	360	-	334	365	-	-	-	-	-	-	-
Stage 1	623	600	-	715	668	-	-	-	-	-	-	-
Stage 2	659	661	-	590	600	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.6	14.8	0.4	0.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1187	-	-	331	672	428	1299	-	-
HCM Lane V/C Ratio	0.011	-	-	0.337	0.012	0.14	0.008	-	-
HCM Control Delay (s)	8.1	0	-	21.3	10.4	14.8	7.8	-	-
HCM Lane LOS	A	A	-	C	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.5	0	0.5	0	-	-

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	SBL2	SBL	SBR	SWL	SWR	SWR2
Lane Configurations												
Volume (vph)	5	5	12	54	55	5	5	39	42	5	5	5
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right					No	No			No		No	No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	0	22	114	0	0	0	86	0	15	0	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.98	0.92	0.85	0.85	0.95	0.90	0.85	0.89	0.85	0.85
Saturated Flow (vph)	0	0	1759	1658	0	0	0	1625	0	1593	0	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)			0.00	0.00				0.00		0.00		
Protected Option Allowed			No	No				No		No		
Reference Time (s)					0.0	0.0			0.0		0.0	0.0
Adj Reference Time (s)					0.0	0.0			0.0		0.0	0.0
Permitted Option												
Adj Saturation A (vph)	0	0	218	1658			0	108		106		
Reference Time A (s)	0.0	0.0	12.1	8.3			0.0	95.2		16.9		
Adj Saturation B (vph	0	0	0	1658			NA	NA		NA		
Reference Time B (s)	8.4	8.4	9.5	8.3			NA	NA		NA		
Reference Time (s)			9.5	8.3								
Adj Reference Time (s)			13.5	12.3								
Split Option												
Ref Time Combined (s)	0.0	0.0	1.5	8.3			0.0	6.3		1.1		
Ref Time Seperate (s)	0.4	0.4	0.8	3.9			0.4	2.9		0.4		
Reference Time (s)	1.5	1.5	1.5	8.3			6.3	6.3		1.1		
Adj Reference Time (s)	8.0	8.0	8.0	12.3			10.3	10.3		8.0		

Summary	EB WB	SB	SW	Combined
Protected Option (s)	NA	NA	NA	
Permitted Option (s)	13.5	Err	Err	
Split Option (s)	20.3	10.3	8.0	
Minimum (s)	13.5	10.3	8.0	31.8

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	26.5%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	SBL2	SBL	SBR	SWL	SWR	SWR2
Right Turn Channelized												
Traffic Volume (veh/h)	5	5	12	54	55	5	5	39	42	5	5	5
Future Volume (veh/h)	5	5	12	54	55	5	5	39	42	5	5	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	5	13	57	58	5	5	41	44	5	5	5
Approach Volume (veh/h)			23	120				90		15		
Crossing Volume (veh/h)			51	15				67		120		
High Capacity (veh/h)			1331	1369				1314		1261		
High v/c (veh/h)			0.02	0.09				0.07		0.01		
Low Capacity (veh/h)			1112	1147				1097		1049		
Low v/c (veh/h)			0.02	0.10				0.08		0.01		

Intersection Summary					
Maximum v/c High	0.09				
Maximum v/c Low	0.10				
Intersection Capacity Utilization	26.5%	ICU Level of Service		A	

Intersection	
Intersection Delay, s/veh	4.1
Intersection LOS	A

Approach	EB	WB	SB	SW
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	23	120	90	15
Demand Flow Rate, veh/h	23	122	90	15
Vehicles Circulating, veh/h	51	15	68	122
Vehicles Exiting, veh/h	107	59	69	15
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.6	4.2	4.2	3.7
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LT	TR	LR	LR
Assumed Moves	LT	TR	LR	LR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	23	122	90	15
Cap Entry Lane, veh/h	1074	1113	1056	1000
Entry HV Adj Factor	0.992	0.987	0.999	1.000
Flow Entry, veh/h	23	120	90	15
Cap Entry, veh/h	1065	1099	1055	1000
V/C Ratio	0.021	0.110	0.085	0.015
Control Delay, s/veh	3.6	4.2	4.2	3.7
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	15	5	18	6	16	5	300	17	42	356	79
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	87	0	0	40	0	0	322	0	0	477	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.92	0.85	0.95	0.99	0.85	0.95	0.97	0.85
Saturated Flow (vph)	0	1716	0	0	1654	0	0	1784	0	0	3327	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	1040		0	1672		0	1463		0	417	
Reference Time A (s)	0.0	10.0		0.0	2.9		0.0	26.4		0.0	44.5	
Adj Saturation B (vph	0	0		0	0		NA	NA		NA	NA	
Reference Time B (s)	12.7	14.1		9.3	10.9		NA	NA		NA	NA	
Reference Time (s)		10.0			2.9			26.4			44.5	
Adj Reference Time (s)		14.0			8.0			30.4			48.5	
Split Option												
Ref Time Combined (s)	0.0	6.1		0.0	2.9		0.0	21.7		0.0	17.2	
Ref Time Seperate (s)	4.7	1.0		1.3	0.4		0.4	20.2		2.9	12.8	
Reference Time (s)	6.1	6.1		2.9	2.9		21.7	21.7		17.2	17.2	
Adj Reference Time (s)	10.1	10.1		8.0	8.0		25.7	25.7		21.2	21.2	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	14.0	48.5	
Split Option (s)	18.1	46.9	
Minimum (s)	14.0	46.9	60.9

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	50.7%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	15	5	18	6	16	5	300	17	42	356	79
Future Volume (Veh/h)	67	15	5	18	6	16	5	300	17	42	356	79
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.36	0.50	0.64	0.75	0.80	0.25	0.87	0.50	0.72	0.66	0.75
Hourly flow rate (vph)	93	42	10	28	8	20	20	345	34	58	539	105
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								326				
pX, platoon unblocked												
vC, conflicting volume	1134	1126	322	818	1162	362	644			379		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1134	1126	322	818	1162	362	644			379		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	34	78	99	87	96	97	98			95		
cM capacity (veh/h)	141	191	677	209	182	638	944			1183		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	145	56	399	328	374
Volume Left	93	28	20	58	0
Volume Right	10	20	34	0	105
cSH	162	268	944	1183	1700
Volume to Capacity	0.90	0.21	0.02	0.05	0.22
Queue Length 95th (m)	48.6	5.9	0.5	1.2	0.0
Control Delay (s)	101.2	22.0	0.7	1.8	0.0
Lane LOS	F	C	A	A	
Approach Delay (s)	101.2	22.0	0.7	0.9	
Approach LOS	F	C			

Intersection Summary				
Average Delay	12.9			
Intersection Capacity Utilization	50.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	11.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	67	15	5	18	6	16	5	300	17	42	356	79
Future Vol, veh/h	67	15	5	18	6	16	5	300	17	42	356	79
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	36	50	64	75	80	25	87	50	72	66	75
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	93	42	10	28	8	20	20	345	34	58	539	105

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1125	1128	322	809	1163	362	645	0	0	379	0	0
Stage 1	709	709	-	402	402	-	-	-	-	-	-	-
Stage 2	416	419	-	407	761	-	-	-	-	-	-	-
Critical Hdwy	7.315	6.515	6.915	7.315	6.515	6.215	4.115	-	-	4.115	-	-
Critical Hdwy Stg 1	6.515	5.515	-	6.115	5.515	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.115	5.515	-	6.515	5.515	-	-	-	-	-	-	-
Follow-up Hdwy	3.5095	4.0095	3.3095	3.5095	4.0095	3.3095	2.2095	-	-	2.2095	-	-
Pot Cap-1 Maneuver	172	205	677	287	195	685	944	-	-	1184	-	-
Stage 1	394	438	-	626	602	-	-	-	-	-	-	-
Stage 2	616	591	-	595	415	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	149	184	677	216	175	685	944	-	-	1184	-	-
Mov Cap-2 Maneuver	149	184	-	216	175	-	-	-	-	-	-	-
Stage 1	383	404	-	609	586	-	-	-	-	-	-	-
Stage 2	574	575	-	485	383	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	93	21.5	0.4	0.9
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	944	-	-	167	274	1184	-	-
HCM Lane V/C Ratio	0.021	-	-	0.867	0.205	0.049	-	-
HCM Control Delay (s)	8.9	0	-	93	21.5	8.2	0.3	-
HCM Lane LOS	A	A	-	F	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	6.1	0.8	0.2	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	35	6	34	25	20	31
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No		No		
Ideal Flow	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	41	0	34	25	0	51
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.94	0.85	1.00	0.85	0.95	0.98
Saturated Flow (vph)	1685	0	1800	1530	0	1765
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00		0.00			0.00
Protected Option Allowed	No		No			No
Reference Time (s)		0.0		2.0		
Adj Reference Time (s)		0.0		8.0		
Permitted Option						
Adj Saturation A (vph)	112		1800		0	249
Reference Time A (s)	43.8		2.3		0.0	24.6
Adj Saturation B (vph	NA		1800		0	0
Reference Time B (s)	NA		2.3		9.4	11.5
Reference Time (s)			2.3			11.5
Adj Reference Time (s)			8.0			15.5
Split Option						
Ref Time Combined (s)	2.9		2.3		0.0	3.5
Ref Time Seperate (s)	2.5		2.3		1.4	2.1
Reference Time (s)	2.9		2.3		3.5	3.5
Adj Reference Time (s)	8.0		8.0		8.0	8.0

Summary	WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	Err	15.5	
Split Option (s)	8.0	16.0	
Minimum (s)	8.0	15.5	23.5

Right Turns	NBR
Adj Reference Time (s)	8.0
Cross Thru Ref Time (s)	0.0
Oncoming Left Ref Time (s)	8.0
Combined (s)	16.0

Intersection Summary			
Intersection Capacity Utilization	19.6%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	35	6	34	25	20	31
Future Volume (Veh/h)	35	6	34	25	20	31
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	39	7	38	28	22	34
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	116	38			66	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	116	38			66	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	99			99	
cM capacity (veh/h)	870	1037			1542	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	46	38	28	56
Volume Left	39	0	0	22
Volume Right	7	0	28	0
cSH	892	1700	1700	1542
Volume to Capacity	0.05	0.02	0.02	0.01
Queue Length 95th (m)	1.2	0.0	0.0	0.3
Control Delay (s)	9.3	0.0	0.0	3.0
Lane LOS	A			A
Approach Delay (s)	9.3	0.0		3.0
Approach LOS	A			

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	19.6%	ICU Level of Service	A
Analysis Period (min)	15		

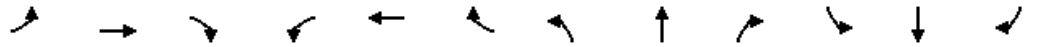
Intersection	
Int Delay, s/veh	3.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	35	6	34	25	20	31
Future Vol, veh/h	35	6	34	25	20	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	250	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	39	7	38	28	22	34

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	117	38	0	0	38	0
Stage 1	38	-	-	-	-	-
Stage 2	79	-	-	-	-	-
Critical Hdwy	7.11	6.21	-	-	4.11	-
Critical Hdwy Stg 1	6.11	-	-	-	-	-
Critical Hdwy Stg 2	6.11	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	862	1037	-	-	1579	-
Stage 1	980	-	-	-	-	-
Stage 2	932	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	853	1037	-	-	1579	-
Mov Cap-2 Maneuver	853	-	-	-	-	-
Stage 1	980	-	-	-	-	-
Stage 2	919	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	2.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	876	1579	-
HCM Lane V/C Ratio	-	-	0.052	0.014	-
HCM Control Delay (s)	-	-	9.3	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (vph)	5	100	5	38	68	13	5	5	16	9	5	5
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	110	0	0	119	0	0	26	0	0	19	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.99	0.85	0.95	0.97	0.85	0.95	0.90	0.85	0.95	0.94	0.85
Saturated Flow (vph)	0	1784	0	0	1742	0	0	1618	0	0	1688	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	1743		0	533		0	1543		0	797	
Reference Time A (s)	0.0	7.6		0.0	26.8		0.0	2.0		0.0	2.9	
Adj Saturation B (vph	0	0		0	0		0	0		0	0	
Reference Time B (s)	8.4	15.4		10.7	16.2		8.4	9.9		8.6	9.4	
Reference Time (s)		7.6			16.2			2.0			2.9	
Adj Reference Time (s)		11.6			20.2			8.0			8.0	
Split Option												
Ref Time Combined (s)	0.0	7.4		0.0	8.2		0.0	1.9		0.0	1.4	
Ref Time Seperate (s)	0.4	6.7		2.7	4.6		0.4	0.4		0.6	0.4	
Reference Time (s)	7.4	7.4		8.2	8.2		1.9	1.9		1.4	1.4	
Adj Reference Time (s)	11.4	11.4		12.2	12.2		8.0	8.0		8.0	8.0	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	20.2	8.0	
Split Option (s)	23.6	16.0	
Minimum (s)	20.2	8.0	28.2

Right Turns	
Adj Reference Time (s)	
Cross Thru Ref Time (s)	
Oncoming Left Ref Time (s)	
Combined (s)	

Intersection Summary			
Intersection Capacity Utilization	23.5%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	100	5	38	68	13	5	5	16	9	5	5
Future Volume (Veh/h)	5	100	5	38	68	13	5	5	16	9	5	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.38	0.52	0.50	0.68	0.85	0.65	0.50	0.25	0.57	0.75	0.50	0.25
Hourly flow rate (vph)	13	192	10	56	80	20	10	20	28	12	10	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	100			202			450	435	197	463	430	90
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	100			202			450	435	197	463	430	90
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			96			98	96	97	97	98	98
cM capacity (veh/h)	1499			1376			484	491	847	461	494	971

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	215	156	58	42
Volume Left	13	56	10	12
Volume Right	10	20	28	20
cSH	1499	1376	614	628
Volume to Capacity	0.01	0.04	0.09	0.07
Queue Length 95th (m)	0.2	1.0	2.4	1.6
Control Delay (s)	0.5	3.0	11.5	11.1
Lane LOS	A	A	B	B
Approach Delay (s)	0.5	3.0	11.5	11.1
Approach LOS			B	B

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	23.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	100	5	38	68	13	5	5	16	9	5	5
Future Vol, veh/h	5	100	5	38	68	13	5	5	16	9	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	52	50	68	85	65	50	25	57	75	50	25
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	13	192	10	56	80	20	10	20	28	12	10	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	100	0	0	202	0	0	441	436	197	450	431	90
Stage 1	-	-	-	-	-	-	224	224	-	202	202	-
Stage 2	-	-	-	-	-	-	217	212	-	248	229	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1499	-	-	1376	-	-	528	515	847	521	519	971
Stage 1	-	-	-	-	-	-	781	720	-	802	736	-
Stage 2	-	-	-	-	-	-	788	729	-	758	717	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1499	-	-	1376	-	-	489	488	847	468	492	971
Mov Cap-2 Maneuver	-	-	-	-	-	-	489	488	-	468	492	-
Stage 1	-	-	-	-	-	-	773	713	-	794	704	-
Stage 2	-	-	-	-	-	-	728	698	-	705	710	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	2.8	11.5	11.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	614	1499	-	-	1376	-	-	631
HCM Lane V/C Ratio	0.095	0.009	-	-	0.041	-	-	0.067
HCM Control Delay (s)	11.5	7.4	0	-	7.7	0	-	11.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-	-	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	116	5	5	5	5	12	6	193	5	5	111	53
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	121	5	0	22	0	0	204	0	5	111	53
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.91	0.85	0.95	0.99	0.85	0.95	1.00	0.85
Saturated Flow (vph)	0	1714	1530	0	1634	0	0	1791	0	1710	1800	1530
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.4			0.0			0.0			4.2
Adj Reference Time (s)			8.0			0.0			0.0			8.2
Permitted Option												
Adj Saturation A (vph)	0	521		0	365		0	1262		164	1800	
Reference Time A (s)	0.0	27.9		0.0	7.2		0.0	19.4		3.7	7.4	
Adj Saturation B (vph	0	0		0	0		0	0		NA	NA	
Reference Time B (s)	16.1	16.5		8.4	9.6		8.4	21.7		NA	NA	
Reference Time (s)		16.5			7.2			19.4			7.4	
Adj Reference Time (s)		20.5			11.2			23.4			11.4	
Split Option												
Ref Time Combined (s)	0.0	8.5		0.0	1.6		0.0	13.7		0.4	7.4	
Ref Time Seperate (s)	8.1	0.3		0.4	0.4		0.4	12.9		0.4	7.4	
Reference Time (s)	8.5	8.5		1.6	1.6		13.7	13.7		7.4	7.4	
Adj Reference Time (s)	12.5	12.5		8.0	8.0		17.7	17.7		11.4	11.4	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	20.5	23.4	
Split Option (s)	20.5	29.1	
Minimum (s)	20.5	23.4	43.9

Right Turns	EBR	SBR
Adj Reference Time (s)	8.0	8.2
Cross Thru Ref Time (s)	11.4	8.0
Oncoming Left Ref Time (s)	8.0	17.7
Combined (s)	27.4	33.8

Intersection Summary			
Intersection Capacity Utilization	36.6%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	5	5	5	5	12	6	193	5	5	111	53
Future Volume (Veh/h)	116	5	5	5	5	12	6	193	5	5	111	53
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.50	0.75	0.43	0.43	0.43	0.75	0.92	0.25	0.42	0.84	0.66
Hourly flow rate (vph)	143	10	7	12	12	28	8	210	20	12	132	80
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)			3									
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	426	402	132	400	472	220	212			230		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	426	402	132	400	472	220	212			230		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	72	98	99	98	98	97	99			99		
cM capacity (veh/h)	506	531	920	543	484	822	1364			1344		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2	SB 3
Volume Total	160	52	238	12	132	80
Volume Left	143	12	8	12	0	0
Volume Right	7	28	20	0	0	80
cSH	531	643	1364	1344	1700	1700
Volume to Capacity	0.30	0.08	0.01	0.01	0.08	0.05
Queue Length 95th (m)	9.6	2.0	0.1	0.2	0.0	0.0
Control Delay (s)	14.8	11.1	0.3	7.7	0.0	0.0
Lane LOS	B	B	A	A		
Approach Delay (s)	14.8	11.1	0.3	0.4		
Approach LOS	B	B				

Intersection Summary				
Average Delay	4.6			
Intersection Capacity Utilization	36.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	116	5	5	5	5	12	6	193	5	5	111	53
Future Vol, veh/h	116	5	5	5	5	12	6	193	5	5	111	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	-	-	-	-	200	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	50	75	43	43	43	75	92	25	42	84	66
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	143	10	7	12	12	28	8	210	20	12	132	80

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	412	402	132	397	392	220	132	0	0	230	0	0
Stage 1	156	156	-	236	236	-	-	-	-	-	-	-
Stage 2	256	246	-	161	156	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	552	538	920	565	545	822	1459	-	-	1344	-	-
Stage 1	849	770	-	769	712	-	-	-	-	-	-	-
Stage 2	751	704	-	843	770	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	519	530	920	547	537	822	1459	-	-	1344	-	-
Mov Cap-2 Maneuver	519	530	-	547	537	-	-	-	-	-	-	-
Stage 1	844	763	-	764	708	-	-	-	-	-	-	-
Stage 2	709	700	-	819	763	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.6	10.9	0.3	0.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1459	-	-	520	920	666	1344	-	-
HCM Lane V/C Ratio	0.005	-	-	0.295	0.007	0.077	0.009	-	-
HCM Control Delay (s)	7.5	0	-	14.8	8.9	10.9	7.7	-	-
HCM Lane LOS	A	A	-	B	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.2	0	0.2	0	-	-

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	SBL2	SBL	SBR	SWL	SWR	SWR2
Lane Configurations												
Volume (vph)	6	5	9	30	27	5	5	25	18	5	5	5
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right					No	No			No		No	No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	0	20	62	0	0	0	48	0	15	0	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.97	0.92	0.85	0.85	0.95	0.91	0.85	0.89	0.85	0.85
Saturated Flow (vph)	0	0	1751	1661	0	0	0	1646	0	1593	0	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)			0.00	0.00				0.00		0.00		
Protected Option Allowed			No	No				No		No		
Reference Time (s)					0.0	0.0			0.0		0.0	0.0
Adj Reference Time (s)					0.0	0.0			0.0		0.0	0.0
Permitted Option												
Adj Saturation A (vph)	0	0	184	1661			0	110		106		
Reference Time A (s)	0.0	0.0	13.0	4.5			0.0	52.5		16.9		
Adj Saturation B (vph	0	0	0	1661			NA	NA		NA		
Reference Time B (s)	8.4	8.4	9.4	4.5			NA	NA		NA		
Reference Time (s)			9.4	4.5								
Adj Reference Time (s)			13.4	8.5								
Split Option												
Ref Time Combined (s)	0.0	0.0	1.4	4.5			0.0	3.5		1.1		
Ref Time Seperate (s)	0.4	0.4	0.6	2.2			0.4	1.8		0.4		
Reference Time (s)	1.4	1.4	1.4	4.5			3.5	3.5		1.1		
Adj Reference Time (s)	8.0	8.0	8.0	8.5			8.0	8.0		8.0		

Summary	EB WB	SB	SW	Combined
Protected Option (s)	NA	NA	NA	
Permitted Option (s)	13.4	Err	Err	
Split Option (s)	16.5	8.0	8.0	
Minimum (s)	13.4	8.0	8.0	29.4

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	24.5%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	SBL2	SBL	SBR	SWL	SWR	SWR2
Right Turn Channelized												
Traffic Volume (veh/h)	6	5	9	30	27	5	5	25	18	5	5	5
Future Volume (veh/h)	6	5	9	30	27	5	5	25	18	5	5	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	6	10	33	30	6	6	28	20	6	6	6
Approach Volume (veh/h)			23	69				54		18		
Crossing Volume (veh/h)			40	19				45		70		
High Capacity (veh/h)			1342	1364				1337		1311		
High v/c (veh/h)			0.02	0.05				0.04		0.01		
Low Capacity (veh/h)			1123	1143				1118		1094		
Low v/c (veh/h)			0.02	0.06				0.05		0.02		

Intersection Summary												
Maximum v/c High			0.05									
Maximum v/c Low			0.06									
Intersection Capacity Utilization			24.5%		ICU Level of Service				A			

Intersection	
Intersection Delay, s/veh	3.7
Intersection LOS	A

Approach	EB	WB	SB	SW
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	23	69	54	18
Demand Flow Rate, veh/h	23	69	54	18
Vehicles Circulating, veh/h	40	19	45	70
Vehicles Exiting, veh/h	59	44	43	18
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.5	3.8	3.8	3.6
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LT	TR	LR	LR
Assumed Moves	LT	TR	LR	LR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	23	69	54	18
Cap Entry Lane, veh/h	1086	1109	1080	1054
Entry HV Adj Factor	0.993	0.995	0.999	1.000
Flow Entry, veh/h	23	69	54	18
Cap Entry, veh/h	1078	1103	1079	1054
V/C Ratio	0.021	0.062	0.050	0.017
Control Delay, s/veh	3.5	3.8	3.8	3.6
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	5	6	6	24	5	178	5	19	182	32
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	55	0	0	36	0	0	188	0	0	233	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.89	0.85	0.95	0.99	0.85	0.95	0.98	0.85
Saturated Flow (vph)	0	1703	0	0	1607	0	0	1790	0	0	3343	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	471		0	1682		0	1299		0	528	
Reference Time A (s)	0.0	14.0		0.0	2.6		0.0	17.4		0.0	17.8	
Adj Saturation B (vph	0	0		0	0		NA	NA		NA	NA	
Reference Time B (s)	11.2	11.9		8.4	10.7		NA	NA		NA	NA	
Reference Time (s)		11.9			2.6			17.4			17.8	
Adj Reference Time (s)		15.9			8.0			21.4			21.8	
Split Option												
Ref Time Combined (s)	0.0	3.9		0.0	2.7		0.0	12.6		0.0	8.4	
Ref Time Seperate (s)	3.2	0.4		0.4	0.5		0.4	11.9		1.3	6.5	
Reference Time (s)	3.9	3.9		2.7	2.7		12.6	12.6		8.4	8.4	
Adj Reference Time (s)	8.0	8.0		8.0	8.0		16.6	16.6		12.4	12.4	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	15.9	21.8	
Split Option (s)	16.0	29.0	
Minimum (s)	15.9	21.8	37.7

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	31.4%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	5	5	6	6	24	5	178	5	19	182	32
Future Volume (Veh/h)	45	5	5	6	6	24	5	178	5	19	182	32
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.68	0.50	0.50	0.38	0.38	0.75	0.50	0.79	0.38	0.68	0.80	0.72
Hourly flow rate (vph)	66	10	10	16	16	32	10	225	13	28	228	44
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								344				
pX, platoon unblocked												
vC, conflicting volume	598	564	136	436	580	232	272			238		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	598	564	136	436	580	232	272			238		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	81	98	99	97	96	96	99			98		
cM capacity (veh/h)	354	423	891	481	414	774	1296			1333		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	86	64	248	142	158
Volume Left	66	16	10	28	0
Volume Right	10	32	13	0	44
cSH	388	565	1296	1333	1700
Volume to Capacity	0.22	0.11	0.01	0.02	0.09
Queue Length 95th (m)	6.3	2.9	0.2	0.5	0.0
Control Delay (s)	16.9	12.2	0.4	1.7	0.0
Lane LOS	C	B	A	A	
Approach Delay (s)	16.9	12.2	0.4	0.8	
Approach LOS	C	B			

Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	31.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	45	5	5	6	6	24	5	178	5	19	182	32
Future Vol, veh/h	45	5	5	6	6	24	5	178	5	19	182	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	68	50	50	38	38	75	50	79	38	68	80	72
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	66	10	10	16	16	32	10	225	13	28	228	44

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	582	564	136	427	580	232	272	0	0	238	0	0
Stage 1	306	306	-	252	252	-	-	-	-	-	-	-
Stage 2	276	258	-	175	328	-	-	-	-	-	-	-
Critical Hdwy	7.315	6.515	6.915	7.315	6.515	6.215	4.115	-	-	4.115	-	-
Critical Hdwy Stg 1	6.515	5.515	-	6.115	5.515	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.115	5.515	-	6.515	5.515	-	-	-	-	-	-	-
Follow-up Hdwy	3.5095	4.0095	3.3095	3.5095	4.0095	3.3095	2.2095	-	-	2.2095	-	-
Pot Cap-1 Maneuver	412	436	891	527	427	809	1296	-	-	1334	-	-
Stage 1	682	663	-	754	700	-	-	-	-	-	-	-
Stage 2	732	696	-	813	648	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	374	421	891	498	413	809	1296	-	-	1334	-	-
Mov Cap-2 Maneuver	374	421	-	498	413	-	-	-	-	-	-	-
Stage 1	676	646	-	747	694	-	-	-	-	-	-	-
Stage 2	681	690	-	772	632	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.2	12	0.3	0.8
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1296	-	-	407	581	1334	-	-
HCM Lane V/C Ratio	0.008	-	-	0.212	0.109	0.021	-	-
HCM Control Delay (s)	7.8	0	-	16.2	12	7.8	0.1	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.8	0.4	0.1	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	24	17	19	14	5	19
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No		No		
Ideal Flow	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	41	0	19	14	0	24
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.91	0.85	1.00	0.85	0.95	0.99
Saturated Flow (vph)	1639	0	1800	1530	0	1781
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00		0.00			0.00
Protected Option Allowed	No		No			No
Reference Time (s)		0.0		1.1		
Adj Reference Time (s)		0.0		8.0		
Permitted Option						
Adj Saturation A (vph)	109		1800		0	427
Reference Time A (s)	45.0		1.3		0.0	6.7
Adj Saturation B (vph	NA		1800		0	0
Reference Time B (s)	NA		1.3		8.4	9.6
Reference Time (s)			1.3			6.7
Adj Reference Time (s)			8.0			10.7
Split Option						
Ref Time Combined (s)	3.0		1.3		0.0	1.6
Ref Time Seperate (s)	1.8		1.3		0.4	1.3
Reference Time (s)	3.0		1.3		1.6	1.6
Adj Reference Time (s)	8.0		8.0		8.0	8.0

Summary	WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	Err	10.7	
Split Option (s)	8.0	16.0	
Minimum (s)	8.0	10.7	18.7

Right Turns	NBR
Adj Reference Time (s)	8.0
Cross Thru Ref Time (s)	0.0
Oncoming Left Ref Time (s)	8.0
Combined (s)	16.0

Intersection Summary			
Intersection Capacity Utilization	15.6%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	24	17	19	14	5	19
Future Volume (Veh/h)	24	17	19	14	5	19
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	27	19	21	16	6	21
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	54	21			37	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	54	21			37	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	98			100	
cM capacity (veh/h)	953	1059			1580	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	46	21	16	27
Volume Left	27	0	0	6
Volume Right	19	0	16	0
cSH	994	1700	1700	1580
Volume to Capacity	0.05	0.01	0.01	0.00
Queue Length 95th (m)	1.1	0.0	0.0	0.1
Control Delay (s)	8.8	0.0	0.0	1.6
Lane LOS	A			A
Approach Delay (s)	8.8	0.0		1.6
Approach LOS	A			

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	15.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	24	17	19	14	5	19
Future Vol, veh/h	24	17	19	14	5	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	250	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	27	19	21	16	6	21

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	53	21	0	0	21	0
Stage 1	21	-	-	-	-	-
Stage 2	32	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	958	1059	-	-	1601	-
Stage 1	1004	-	-	-	-	-
Stage 2	993	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	954	1059	-	-	1601	-
Mov Cap-2 Maneuver	954	-	-	-	-	-
Stage 1	1004	-	-	-	-	-
Stage 2	989	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	1.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	995	1601	-
HCM Lane V/C Ratio	-	-	0.046	0.003	-
HCM Control Delay (s)	-	-	8.8	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

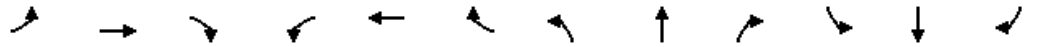
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (vph)	5	59	5	12	45	6	5	5	46	16	5	5
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	69	0	0	63	0	0	56	0	0	26	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.99	0.85	0.95	0.98	0.85	0.95	0.87	0.85	0.95	0.94	0.85
Saturated Flow (vph)	0	1774	0	0	1757	0	0	1571	0	0	1694	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	1604		0	925		0	1589		0	407	
Reference Time A (s)	0.0	5.2		0.0	8.2		0.0	4.2		0.0	7.7	
Adj Saturation B (vph	0	0		0	0		0	0		0	0	
Reference Time B (s)	8.4	12.7		8.8	12.3		8.4	12.3		9.1	9.8	
Reference Time (s)		5.2			8.2			4.2			7.7	
Adj Reference Time (s)		9.2			12.2			8.2			11.7	
Split Option												
Ref Time Combined (s)	0.0	4.7		0.0	4.3		0.0	4.3		0.0	1.8	
Ref Time Seperate (s)	0.4	4.0		0.8	3.1		0.4	0.4		1.1	0.4	
Reference Time (s)	4.7	4.7		4.3	4.3		4.3	4.3		1.8	1.8	
Adj Reference Time (s)	8.7	8.7		8.3	8.3		8.3	8.3		8.0	8.0	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	12.2	11.7	
Split Option (s)	17.0	16.3	
Minimum (s)	12.2	11.7	23.8

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	19.9%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	59	5	12	45	6	5	5	46	16	5	5
Future Volume (Veh/h)	5	59	5	12	45	6	5	5	46	16	5	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.78	0.50	0.60	0.66	0.75	0.64	0.64	0.64	0.50	0.25	0.50
Hourly flow rate (vph)	20	76	10	20	68	8	8	8	72	32	20	10
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	76			86			253	237	81	309	238	72
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	76			86			253	237	81	309	238	72
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			99			99	99	93	94	97	99
cM capacity (veh/h)	1529			1517			665	648	982	581	647	993

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	106	96	88	62
Volume Left	20	20	8	32
Volume Right	10	8	72	10
cSH	1529	1517	901	645
Volume to Capacity	0.01	0.01	0.10	0.10
Queue Length 95th (m)	0.3	0.3	2.5	2.4
Control Delay (s)	1.5	1.6	9.4	11.2
Lane LOS	A	A	A	B
Approach Delay (s)	1.5	1.6	9.4	11.2
Approach LOS			A	B

Intersection Summary				
Average Delay	5.2			
Intersection Capacity Utilization	19.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	59	5	12	45	6	5	5	46	16	5	5
Future Vol, veh/h	5	59	5	12	45	6	5	5	46	16	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	78	50	60	66	75	64	64	64	50	25	50
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	20	76	10	20	68	8	8	8	72	32	20	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	76	0	0	86	0	0	248	237	81	272	238	72
Stage 1	-	-	-	-	-	-	121	121	-	112	112	-
Stage 2	-	-	-	-	-	-	127	116	-	160	126	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1529	-	-	1517	-	-	708	666	982	683	665	993
Stage 1	-	-	-	-	-	-	886	798	-	895	805	-
Stage 2	-	-	-	-	-	-	879	802	-	845	794	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1529	-	-	1517	-	-	670	647	982	614	647	993
Mov Cap-2 Maneuver	-	-	-	-	-	-	670	647	-	614	647	-
Stage 1	-	-	-	-	-	-	874	787	-	882	794	-
Stage 2	-	-	-	-	-	-	836	791	-	765	783	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	1.5	9.4	11
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	903	1529	-	-	1517	-	-	666
HCM Lane V/C Ratio	0.097	0.013	-	-	0.013	-	-	0.093
HCM Control Delay (s)	9.4	7.4	0	-	7.4	0	-	11
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	77	5	5	5	5	10	5	158	5	5	225	115
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	82	5	0	20	0	0	168	0	5	225	115
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.91	0.85	0.95	0.99	0.85	0.95	1.00	0.85
Saturated Flow (vph)	0	1715	1530	0	1644	0	0	1789	0	1710	1800	1530
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.4			0.0			0.0			9.0
Adj Reference Time (s)			8.0			0.0			0.0			13.0
Permitted Option												
Adj Saturation A (vph)	0	571		0	340		0	1256		165	1800	
Reference Time A (s)	0.0	17.2		0.0	7.1		0.0	16.0		3.6	15.0	
Adj Saturation B (vph	0	0		0	0		NA	NA		NA	NA	
Reference Time B (s)	13.4	13.7		8.4	9.5		NA	NA		NA	NA	
Reference Time (s)		13.7			7.1			16.0			15.0	
Adj Reference Time (s)		17.7			11.1			20.0			19.0	
Split Option												
Ref Time Combined (s)	0.0	5.7		0.0	1.5		0.0	11.3		0.4	15.0	
Ref Time Seperate (s)	5.4	0.3		0.4	0.4		0.4	10.6		0.4	15.0	
Reference Time (s)	5.7	5.7		1.5	1.5		11.3	11.3		15.0	15.0	
Adj Reference Time (s)	9.7	9.7		8.0	8.0		15.3	15.3		19.0	19.0	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	17.7	20.0	
Split Option (s)	17.7	34.3	
Minimum (s)	17.7	20.0	37.8

Right Turns	EBR	SBR
Adj Reference Time (s)	8.0	13.0
Cross Thru Ref Time (s)	19.0	8.0
Oncoming Left Ref Time (s)	8.0	15.3
Combined (s)	35.0	36.3

Intersection Summary			
Intersection Capacity Utilization	31.5%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	5	5	5	5	10	5	158	5	5	225	115
Future Volume (Veh/h)	77	5	5	5	5	10	5	158	5	5	225	115
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.25	0.62	0.25	0.25	0.50	0.38	0.92	0.25	0.50	0.87	0.85
Hourly flow rate (vph)	92	20	8	20	20	20	13	172	20	10	259	135
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)			3									
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	517	497	259	501	622	182	394			192		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	517	497	259	501	622	182	394			192		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	79	96	99	96	95	98	99			99		
cM capacity (veh/h)	436	467	782	455	397	863	1170			1388		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2	SB 3
Volume Total	120	60	205	10	259	135
Volume Left	92	20	13	10	0	0
Volume Right	8	20	20	0	0	135
cSH	473	511	1170	1388	1700	1700
Volume to Capacity	0.25	0.12	0.01	0.01	0.15	0.08
Queue Length 95th (m)	7.6	3.0	0.3	0.2	0.0	0.0
Control Delay (s)	15.5	13.0	0.6	7.6	0.0	0.0
Lane LOS	C	B	A	A		
Approach Delay (s)	15.5	13.0	0.6	0.2		
Approach LOS	C	B				

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	31.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	77	5	5	5	5	10	5	158	5	5	225	115
Future Vol, veh/h	77	5	5	5	5	10	5	158	5	5	225	115
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	-	-	-	-	200	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	25	62	25	25	50	38	92	25	50	87	85
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	92	20	8	20	20	20	13	172	20	10	259	135

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	507	497	259	497	487	182	259	0	0	192	0	0
Stage 1	279	279	-	208	208	-	-	-	-	-	-	-
Stage 2	228	218	-	289	279	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	478	476	782	485	482	863	1311	-	-	1388	-	-
Stage 1	730	682	-	796	732	-	-	-	-	-	-	-
Stage 2	777	724	-	721	682	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	446	467	782	458	473	863	1311	-	-	1388	-	-
Mov Cap-2 Maneuver	446	467	-	458	473	-	-	-	-	-	-	-
Stage 1	722	677	-	787	724	-	-	-	-	-	-	-
Stage 2	730	716	-	687	677	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.2	12.3	0.5	0.2
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1311	-	-	450	782	550	1388	-	-
HCM Lane V/C Ratio	0.01	-	-	0.248	0.01	0.109	0.007	-	-
HCM Control Delay (s)	7.8	0	-	15.6	9.7	12.3	7.6	-	-
HCM Lane LOS	A	A	-	C	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1	0	0.4	0	-	-

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	SBL2	SBL	SBR	SWL	SWR	SWR2
Lane Configurations												
Volume (vph)	5	5	12	54	55	5	5	39	42	5	5	5
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right					No	No			No		No	No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	0	22	114	0	0	0	86	0	15	0	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.98	0.92	0.85	0.85	0.95	0.90	0.85	0.89	0.85	0.85
Saturated Flow (vph)	0	0	1759	1658	0	0	0	1625	0	1593	0	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)			0.00	0.00				0.00		0.00		
Protected Option Allowed			No	No				No		No		
Reference Time (s)					0.0	0.0			0.0		0.0	0.0
Adj Reference Time (s)					0.0	0.0			0.0		0.0	0.0
Permitted Option												
Adj Saturation A (vph)	0	0	218	1658			0	108		106		
Reference Time A (s)	0.0	0.0	12.1	8.3			0.0	95.2		16.9		
Adj Saturation B (vph	0	0	0	1658			NA	NA		NA		
Reference Time B (s)	8.4	8.4	9.5	8.3			NA	NA		NA		
Reference Time (s)			9.5	8.3								
Adj Reference Time (s)			13.5	12.3								
Split Option												
Ref Time Combined (s)	0.0	0.0	1.5	8.3			0.0	6.3		1.1		
Ref Time Seperate (s)	0.4	0.4	0.8	3.9			0.4	2.9		0.4		
Reference Time (s)	1.5	1.5	1.5	8.3			6.3	6.3		1.1		
Adj Reference Time (s)	8.0	8.0	8.0	12.3			10.3	10.3		8.0		

Summary	EB WB	SB	SW	Combined
Protected Option (s)	NA	NA	NA	
Permitted Option (s)	13.5	Err	Err	
Split Option (s)	20.3	10.3	8.0	
Minimum (s)	13.5	10.3	8.0	31.8

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	26.5%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	SBL2	SBL	SBR	SWL	SWR	SWR2
Right Turn Channelized												
Traffic Volume (veh/h)	5	5	12	54	55	5	5	39	42	5	5	5
Future Volume (veh/h)	5	5	12	54	55	5	5	39	42	5	5	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	5	13	57	58	5	5	41	44	5	5	5
Approach Volume (veh/h)			23	120				90		15		
Crossing Volume (veh/h)			51	15				67		120		
High Capacity (veh/h)			1331	1369				1314		1261		
High v/c (veh/h)			0.02	0.09				0.07		0.01		
Low Capacity (veh/h)			1112	1147				1097		1049		
Low v/c (veh/h)			0.02	0.10				0.08		0.01		

Intersection Summary												
Maximum v/c High			0.09									
Maximum v/c Low			0.10									
Intersection Capacity Utilization			26.5%		ICU Level of Service				A			

Intersection	
Intersection Delay, s/veh	4.1
Intersection LOS	A

Approach	EB	WB	SB	SW
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	23	120	90	15
Demand Flow Rate, veh/h	23	122	90	15
Vehicles Circulating, veh/h	51	15	68	122
Vehicles Exiting, veh/h	107	59	69	15
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.6	4.2	4.2	3.7
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LT	TR	LR	LR
Assumed Moves	LT	TR	LR	LR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	23	122	90	15
Cap Entry Lane, veh/h	1074	1113	1056	1000
Entry HV Adj Factor	0.992	0.987	0.999	1.000
Flow Entry, veh/h	23	120	90	15
Cap Entry, veh/h	1065	1099	1055	1000
V/C Ratio	0.021	0.110	0.085	0.015
Control Delay, s/veh	3.6	4.2	4.2	3.7
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	51	11	5	18	6	16	5	226	13	32	268	59
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	67	0	0	40	0	0	244	0	0	359	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.92	0.85	0.95	0.99	0.85	0.95	0.97	0.85
Saturated Flow (vph)	0	1712	0	0	1654	0	0	1784	0	0	3328	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	1045		0	1663		0	1382		0	439	
Reference Time A (s)	0.0	7.7		0.0	2.9		0.0	21.2		0.0	31.6	
Adj Saturation B (vph	0	0		0	0		NA	NA		NA	NA	
Reference Time B (s)	11.6	12.7		9.3	10.9		NA	NA		NA	NA	
Reference Time (s)		7.7			2.9			21.2			31.6	
Adj Reference Time (s)		11.7			8.0			25.2			35.6	
Split Option												
Ref Time Combined (s)	0.0	4.7		0.0	2.9		0.0	16.4		0.0	12.9	
Ref Time Seperate (s)	3.6	0.8		1.3	0.4		0.4	15.2		2.2	9.6	
Reference Time (s)	4.7	4.7		2.9	2.9		16.4	16.4		12.9	12.9	
Adj Reference Time (s)	8.7	8.7		8.0	8.0		20.4	20.4		16.9	16.9	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	11.7	35.6	
Split Option (s)	16.7	37.4	
Minimum (s)	11.7	35.6	47.3

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	39.4%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	11	5	18	6	16	5	226	13	32	268	59
Future Volume (Veh/h)	51	11	5	18	6	16	5	226	13	32	268	59
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.36	0.50	0.64	0.75	0.80	0.25	0.87	0.50	0.72	0.66	0.75
Hourly flow rate (vph)	71	31	10	28	8	20	20	260	26	44	406	79
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	870	860	242	630	886	273	485			286		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	870	860	242	630	886	273	485			286		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	69	89	99	91	97	97	98			97		
cM capacity (veh/h)	225	279	761	320	269	728	1081			1280		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	112	56	306	247	282
Volume Left	71	28	20	44	0
Volume Right	10	20	26	0	79
cSH	255	387	1081	1280	1700
Volume to Capacity	0.44	0.14	0.02	0.03	0.17
Queue Length 95th (m)	16.0	3.8	0.4	0.8	0.0
Control Delay (s)	29.7	15.9	0.7	1.7	0.0
Lane LOS	D	C	A	A	
Approach Delay (s)	29.7	15.9	0.7	0.8	
Approach LOS	D	C			

Intersection Summary				
Average Delay	4.8			
Intersection Capacity Utilization	39.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	51	11	5	18	6	16	5	226	13	32	268	59
Future Vol, veh/h	51	11	5	18	6	16	5	226	13	32	268	59
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	36	50	64	75	80	25	87	50	72	66	75
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	71	31	10	28	8	20	20	260	26	44	406	79

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	861	860	242	620	887	273	485	0	0	286	0	0
Stage 1	534	534	-	313	313	-	-	-	-	-	-	-
Stage 2	327	326	-	307	574	-	-	-	-	-	-	-
Critical Hdwy	7.315	6.515	6.915	7.315	6.515	6.215	4.115	-	-	4.115	-	-
Critical Hdwy Stg 1	6.515	5.515	-	6.115	5.515	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.115	5.515	-	6.515	5.515	-	-	-	-	-	-	-
Follow-up Hdwy	3.5095	4.0095	3.3095	3.5095	4.0095	3.3095	2.2095	-	-	2.2095	-	-
Pot Cap-1 Maneuver	264	294	762	388	284	768	1082	-	-	1281	-	-
Stage 1	501	526	-	699	658	-	-	-	-	-	-	-
Stage 2	687	650	-	681	504	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	238	274	762	332	264	768	1082	-	-	1281	-	-
Mov Cap-2 Maneuver	238	274	-	332	264	-	-	-	-	-	-	-
Stage 1	490	501	-	684	644	-	-	-	-	-	-	-
Stage 2	646	636	-	601	480	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	28.2	15.5	0.5	0.8
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1082	-	-	264	398	1281	-	-
HCM Lane V/C Ratio	0.018	-	-	0.422	0.141	0.035	-	-
HCM Control Delay (s)	8.4	0	-	28.2	15.5	7.9	0.2	-
HCM Lane LOS	A	A	-	D	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2	0.5	0.1	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	35	6	34	25	20	31
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No		No		
Ideal Flow	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	41	0	34	25	0	51
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.94	0.85	1.00	0.85	0.95	0.98
Saturated Flow (vph)	1685	0	1800	1530	0	1765
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00		0.00			0.00
Protected Option Allowed	No		No			No
Reference Time (s)		0.0		2.0		
Adj Reference Time (s)		0.0		8.0		
Permitted Option						
Adj Saturation A (vph)	112		1800		0	249
Reference Time A (s)	43.8		2.3		0.0	24.6
Adj Saturation B (vph	NA		1800		0	0
Reference Time B (s)	NA		2.3		9.4	11.5
Reference Time (s)			2.3			11.5
Adj Reference Time (s)			8.0			15.5
Split Option						
Ref Time Combined (s)	2.9		2.3		0.0	3.5
Ref Time Seperate (s)	2.5		2.3		1.4	2.1
Reference Time (s)	2.9		2.3		3.5	3.5
Adj Reference Time (s)	8.0		8.0		8.0	8.0

Summary	WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	Err	15.5	
Split Option (s)	8.0	16.0	
Minimum (s)	8.0	15.5	23.5

Right Turns	NBR
Adj Reference Time (s)	8.0
Cross Thru Ref Time (s)	0.0
Oncoming Left Ref Time (s)	8.0
Combined (s)	16.0

Intersection Summary			
Intersection Capacity Utilization	19.6%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	35	6	34	25	20	31
Future Volume (Veh/h)	35	6	34	25	20	31
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	39	7	38	28	22	34
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	116	38			66	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	116	38			66	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	99			99	
cM capacity (veh/h)	870	1037			1542	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	46	38	28	56
Volume Left	39	0	0	22
Volume Right	7	0	28	0
cSH	892	1700	1700	1542
Volume to Capacity	0.05	0.02	0.02	0.01
Queue Length 95th (m)	1.2	0.0	0.0	0.3
Control Delay (s)	9.3	0.0	0.0	3.0
Lane LOS	A			A
Approach Delay (s)	9.3	0.0		3.0
Approach LOS	A			

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	19.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	3.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	35	6	34	25	20	31
Future Vol, veh/h	35	6	34	25	20	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	250	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	39	7	38	28	22	34

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	117	38	0	0	38	0
Stage 1	38	-	-	-	-	-
Stage 2	79	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	881	1037	-	-	1579	-
Stage 1	987	-	-	-	-	-
Stage 2	947	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	869	1037	-	-	1579	-
Mov Cap-2 Maneuver	869	-	-	-	-	-
Stage 1	987	-	-	-	-	-
Stage 2	934	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	2.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	890	1579	-
HCM Lane V/C Ratio	-	-	0.051	0.014	-
HCM Control Delay (s)	-	-	9.3	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (vph)	5	100	5	38	68	13	5	5	16	9	5	5
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	110	0	0	119	0	0	26	0	0	19	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.99	0.85	0.95	0.97	0.85	0.95	0.90	0.85	0.95	0.94	0.85
Saturated Flow (vph)	0	1784	0	0	1742	0	0	1618	0	0	1688	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	1743		0	533		0	1543		0	797	
Reference Time A (s)	0.0	7.6		0.0	26.8		0.0	2.0		0.0	2.9	
Adj Saturation B (vph	0	0		0	0		0	0		0	0	
Reference Time B (s)	8.4	15.4		10.7	16.2		8.4	9.9		8.6	9.4	
Reference Time (s)		7.6			16.2			2.0			2.9	
Adj Reference Time (s)		11.6			20.2			8.0			8.0	
Split Option												
Ref Time Combined (s)	0.0	7.4		0.0	8.2		0.0	1.9		0.0	1.4	
Ref Time Seperate (s)	0.4	6.7		2.7	4.6		0.4	0.4		0.6	0.4	
Reference Time (s)	7.4	7.4		8.2	8.2		1.9	1.9		1.4	1.4	
Adj Reference Time (s)	11.4	11.4		12.2	12.2		8.0	8.0		8.0	8.0	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	20.2	8.0	
Split Option (s)	23.6	16.0	
Minimum (s)	20.2	8.0	28.2

Right Turns	
Adj Reference Time (s)	
Cross Thru Ref Time (s)	
Oncoming Left Ref Time (s)	
Combined (s)	

Intersection Summary			
Intersection Capacity Utilization	23.5%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	100	5	38	68	13	5	5	16	9	5	5
Future Volume (Veh/h)	5	100	5	38	68	13	5	5	16	9	5	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.38	0.52	0.50	0.68	0.85	0.65	0.50	0.25	0.57	0.75	0.50	0.25
Hourly flow rate (vph)	13	192	10	56	80	20	10	20	28	12	10	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	100			202			450	435	197	463	430	90
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	100			202			450	435	197	463	430	90
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			96			98	96	97	97	98	98
cM capacity (veh/h)	1499			1376			484	491	847	461	494	971

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	215	156	58	42
Volume Left	13	56	10	12
Volume Right	10	20	28	20
cSH	1499	1376	614	628
Volume to Capacity	0.01	0.04	0.09	0.07
Queue Length 95th (m)	0.2	1.0	2.4	1.6
Control Delay (s)	0.5	3.0	11.5	11.1
Lane LOS	A	A	B	B
Approach Delay (s)	0.5	3.0	11.5	11.1
Approach LOS			B	B

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	23.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	100	5	38	68	13	5	5	16	9	5	5
Future Vol, veh/h	5	100	5	38	68	13	5	5	16	9	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	52	50	68	85	65	50	25	57	75	50	25
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	13	192	10	56	80	20	10	20	28	12	10	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	100	0	0	202	0	0	441	436	197	450	431	90
Stage 1	-	-	-	-	-	-	224	224	-	202	202	-
Stage 2	-	-	-	-	-	-	217	212	-	248	229	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1499	-	-	1376	-	-	528	515	847	521	519	971
Stage 1	-	-	-	-	-	-	781	720	-	802	736	-
Stage 2	-	-	-	-	-	-	788	729	-	758	717	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1499	-	-	1376	-	-	489	488	847	468	492	971
Mov Cap-2 Maneuver	-	-	-	-	-	-	489	488	-	468	492	-
Stage 1	-	-	-	-	-	-	773	713	-	794	704	-
Stage 2	-	-	-	-	-	-	728	698	-	705	710	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	2.8	11.5	11.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	614	1499	-	-	1376	-	-	631
HCM Lane V/C Ratio	0.095	0.009	-	-	0.041	-	-	0.067
HCM Control Delay (s)	11.5	7.4	0	-	7.7	0	-	11.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-	-	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	77	5	5	5	5	10	5	158	5	5	225	115
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	82	5	0	20	0	0	168	0	5	225	115
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.91	0.85	0.95	0.99	0.85	0.95	1.00	0.85
Saturated Flow (vph)	0	1715	1530	0	1644	0	0	1789	0	1710	1800	1530
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.4			0.0			0.0			9.0
Adj Reference Time (s)			8.0			0.0			0.0			13.0
Permitted Option												
Adj Saturation A (vph)	0	571		0	340		0	1256		165	1800	
Reference Time A (s)	0.0	17.2		0.0	7.1		0.0	16.0		3.6	15.0	
Adj Saturation B (vph	0	0		0	0		NA	NA		NA	NA	
Reference Time B (s)	13.4	13.7		8.4	9.5		NA	NA		NA	NA	
Reference Time (s)		13.7			7.1			16.0			15.0	
Adj Reference Time (s)		17.7			11.1			20.0			19.0	
Split Option												
Ref Time Combined (s)	0.0	5.7		0.0	1.5		0.0	11.3		0.4	15.0	
Ref Time Seperate (s)	5.4	0.3		0.4	0.4		0.4	10.6		0.4	15.0	
Reference Time (s)	5.7	5.7		1.5	1.5		11.3	11.3		15.0	15.0	
Adj Reference Time (s)	9.7	9.7		8.0	8.0		15.3	15.3		19.0	19.0	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	17.7	20.0	
Split Option (s)	17.7	34.3	
Minimum (s)	17.7	20.0	37.8

Right Turns	EBR	SBR
Adj Reference Time (s)	8.0	13.0
Cross Thru Ref Time (s)	19.0	8.0
Oncoming Left Ref Time (s)	8.0	15.3
Combined (s)	35.0	36.3

Intersection Summary			
Intersection Capacity Utilization	31.5%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	5	5	5	5	10	5	158	5	5	225	115
Future Volume (Veh/h)	77	5	5	5	5	10	5	158	5	5	225	115
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.25	0.62	0.25	0.25	0.50	0.38	0.92	0.25	0.50	0.87	0.85
Hourly flow rate (vph)	92	20	8	20	20	20	13	172	20	10	259	135
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)			3									
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	517	497	259	501	622	182	394			192		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	517	497	259	501	622	182	394			192		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	79	96	99	96	95	98	99			99		
cM capacity (veh/h)	436	467	782	455	397	863	1170			1388		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2	SB 3
Volume Total	120	60	205	10	259	135
Volume Left	92	20	13	10	0	0
Volume Right	8	20	20	0	0	135
cSH	473	511	1170	1388	1700	1700
Volume to Capacity	0.25	0.12	0.01	0.01	0.15	0.08
Queue Length 95th (m)	7.6	3.0	0.3	0.2	0.0	0.0
Control Delay (s)	15.5	13.0	0.6	7.6	0.0	0.0
Lane LOS	C	B	A	A		
Approach Delay (s)	15.5	13.0	0.6	0.2		
Approach LOS	C	B				

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	31.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	77	5	5	5	5	10	5	158	5	5	225	115
Future Vol, veh/h	77	5	5	5	5	10	5	158	5	5	225	115
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	-	-	-	-	200	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	25	62	25	25	50	38	92	25	50	87	85
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	92	20	8	20	20	20	13	172	20	10	259	135

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	507	497	259	497	487	182	259	0	0	192	0	0
Stage 1	279	279	-	208	208	-	-	-	-	-	-	-
Stage 2	228	218	-	289	279	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	478	476	782	485	482	863	1311	-	-	1388	-	-
Stage 1	730	682	-	796	732	-	-	-	-	-	-	-
Stage 2	777	724	-	721	682	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	446	467	782	458	473	863	1311	-	-	1388	-	-
Mov Cap-2 Maneuver	446	467	-	458	473	-	-	-	-	-	-	-
Stage 1	722	677	-	787	724	-	-	-	-	-	-	-
Stage 2	730	716	-	687	677	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.2	12.3	0.5	0.2
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1311	-	-	450	782	550	1388	-	-
HCM Lane V/C Ratio	0.01	-	-	0.248	0.01	0.109	0.007	-	-
HCM Control Delay (s)	7.8	0	-	15.6	9.7	12.3	7.6	-	-
HCM Lane LOS	A	A	-	C	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1	0	0.4	0	-	-

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	SBL2	SBL	SBR	SWL	SWR	SWR2
Lane Configurations												
Volume (vph)	5	5	12	54	55	5	5	39	42	5	5	5
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right					No	No			No		No	No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	0	22	114	0	0	0	86	0	15	0	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.98	0.92	0.85	0.85	0.95	0.90	0.85	0.89	0.85	0.85
Saturated Flow (vph)	0	0	1759	1658	0	0	0	1625	0	1593	0	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)			0.00	0.00				0.00		0.00		
Protected Option Allowed			No	No				No		No		
Reference Time (s)					0.0	0.0			0.0		0.0	0.0
Adj Reference Time (s)					0.0	0.0			0.0		0.0	0.0
Permitted Option												
Adj Saturation A (vph)	0	0	218	1658			0	108		106		
Reference Time A (s)	0.0	0.0	12.1	8.3			0.0	95.2		16.9		
Adj Saturation B (vph	0	0	0	1658			NA	NA		NA		
Reference Time B (s)	8.4	8.4	9.5	8.3			NA	NA		NA		
Reference Time (s)			9.5	8.3								
Adj Reference Time (s)			13.5	12.3								
Split Option												
Ref Time Combined (s)	0.0	0.0	1.5	8.3			0.0	6.3		1.1		
Ref Time Seperate (s)	0.4	0.4	0.8	3.9			0.4	2.9		0.4		
Reference Time (s)	1.5	1.5	1.5	8.3			6.3	6.3		1.1		
Adj Reference Time (s)	8.0	8.0	8.0	12.3			10.3	10.3		8.0		

Summary	EB WB	SB	SW	Combined
Protected Option (s)	NA	NA	NA	
Permitted Option (s)	13.5	Err	Err	
Split Option (s)	20.3	10.3	8.0	
Minimum (s)	13.5	10.3	8.0	31.8

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	26.5%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	SBL2	SBL	SBR	SWL	SWR	SWR2
Right Turn Channelized												
Traffic Volume (veh/h)	5	5	12	54	55	5	5	39	42	5	5	5
Future Volume (veh/h)	5	5	12	54	55	5	5	39	42	5	5	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	6	13	60	61	6	6	43	47	6	6	6
Approach Volume (veh/h)			25	127				96		18		
Crossing Volume (veh/h)			55	18				72		127		
High Capacity (veh/h)			1327	1365				1309		1254		
High v/c (veh/h)			0.02	0.09				0.07		0.01		
Low Capacity (veh/h)			1108	1144				1092		1042		
Low v/c (veh/h)			0.02	0.11				0.09		0.02		

Intersection Summary					
Maximum v/c High	0.09				
Maximum v/c Low	0.11				
Intersection Capacity Utilization	26.5%	ICU Level of Service		A	

Intersection	
Intersection Delay, s/veh	4.2
Intersection LOS	A

Approach	EB	WB	SB	SW
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	25	127	96	18
Demand Flow Rate, veh/h	25	129	96	18
Vehicles Circulating, veh/h	55	18	73	129
Vehicles Exiting, veh/h	114	62	74	18
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.6	4.3	4.2	3.8
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LT	TR	LR	LR
Assumed Moves	LT	TR	LR	LR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	25	129	96	18
Cap Entry Lane, veh/h	1069	1110	1050	993
Entry HV Adj Factor	0.992	0.988	0.999	1.000
Flow Entry, veh/h	25	127	96	18
Cap Entry, veh/h	1061	1096	1050	993
V/C Ratio	0.023	0.116	0.091	0.018
Control Delay, s/veh	3.6	4.3	4.2	3.8
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	10	5	18	6	16	5	206	12	29	244	54
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	61	0	0	40	0	0	223	0	0	327	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.92	0.85	0.95	0.99	0.85	0.95	0.97	0.85
Saturated Flow (vph)	0	1711	0	0	1654	0	0	1783	0	0	3327	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	1050		0	1657		0	1353		0	452	
Reference Time A (s)	0.0	7.0		0.0	2.9		0.0	19.8		0.0	28.0	
Adj Saturation B (vph	0	0		0	0		NA	NA		NA	NA	
Reference Time B (s)	11.2	12.3		9.3	10.9		NA	NA		NA	NA	
Reference Time (s)		7.0			2.9			19.8			28.0	
Adj Reference Time (s)		11.0			8.0			23.8			32.0	
Split Option												
Ref Time Combined (s)	0.0	4.3		0.0	2.9		0.0	15.0		0.0	11.8	
Ref Time Seperate (s)	3.2	0.7		1.3	0.4		0.4	13.8		2.0	8.8	
Reference Time (s)	4.3	4.3		2.9	2.9		15.0	15.0		11.8	11.8	
Adj Reference Time (s)	8.3	8.3		8.0	8.0		19.0	19.0		15.8	15.8	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	11.0	32.0	
Split Option (s)	16.3	34.8	
Minimum (s)	11.0	32.0	43.0

Right Turns	
Adj Reference Time (s)	
Cross Thru Ref Time (s)	
Oncoming Left Ref Time (s)	
Combined (s)	

Intersection Summary			
Intersection Capacity Utilization	35.8%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	10	5	18	6	16	5	206	12	29	244	54
Future Volume (Veh/h)	46	10	5	18	6	16	5	206	12	29	244	54
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.36	0.50	0.64	0.75	0.80	0.25	0.87	0.50	0.72	0.66	0.75
Hourly flow rate (vph)	64	28	10	28	8	20	20	237	24	40	370	72
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	799	787	221	578	811	249	442			261		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	799	787	221	578	811	249	442			261		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	75	91	99	92	97	97	98			97		
cM capacity (veh/h)	256	309	786	355	299	754	1122			1308		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	102	56	281	225	257
Volume Left	64	28	20	40	0
Volume Right	10	20	24	0	72
cSH	288	424	1122	1308	1700
Volume to Capacity	0.35	0.13	0.02	0.03	0.15
Queue Length 95th (m)	11.7	3.4	0.4	0.7	0.0
Control Delay (s)	24.2	14.8	0.8	1.6	0.0
Lane LOS	C	B	A	A	
Approach Delay (s)	24.2	14.8	0.8	0.8	
Approach LOS	C	B			

Intersection Summary				
Average Delay	4.2			
Intersection Capacity Utilization	35.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	46	10	5	18	6	16	5	206	12	29	244	54
Future Vol, veh/h	46	10	5	18	6	16	5	206	12	29	244	54
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	36	50	64	75	80	25	87	50	72	66	75
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	64	28	10	28	8	20	20	237	24	40	370	72

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	789	787	221	568	811	249	442	0	0	261	0	0
Stage 1	486	486	-	289	289	-	-	-	-	-	-	-
Stage 2	303	301	-	279	522	-	-	-	-	-	-	-
Critical Hdwy	7.315	6.515	6.915	7.315	6.515	6.215	4.115	-	-	4.115	-	-
Critical Hdwy Stg 1	6.515	5.515	-	6.115	5.515	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.115	5.515	-	6.515	5.515	-	-	-	-	-	-	-
Follow-up Hdwy	3.5095	4.0095	3.3095	3.5095	4.0095	3.3095	2.2095	-	-	2.2095	-	-
Pot Cap-1 Maneuver	296	324	786	421	314	792	1122	-	-	1308	-	-
Stage 1	534	552	-	720	674	-	-	-	-	-	-	-
Stage 2	708	666	-	707	532	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	269	304	786	369	295	792	1122	-	-	1308	-	-
Mov Cap-2 Maneuver	269	304	-	369	295	-	-	-	-	-	-	-
Stage 1	523	529	-	705	660	-	-	-	-	-	-	-
Stage 2	667	652	-	634	510	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.2	14.5	0.6	0.7
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1122	-	-	298	436	1308	-	-
HCM Lane V/C Ratio	0.018	-	-	0.341	0.129	0.031	-	-
HCM Control Delay (s)	8.3	0	-	23.2	14.5	7.8	0.1	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.5	0.4	0.1	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	35	6	34	25	20	31
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No		No		
Ideal Flow	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	41	0	34	25	0	51
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.94	0.85	1.00	0.85	0.95	0.98
Saturated Flow (vph)	1685	0	1800	1530	0	1765
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00		0.00			0.00
Protected Option Allowed	No		No			No
Reference Time (s)		0.0		2.0		
Adj Reference Time (s)		0.0		8.0		
Permitted Option						
Adj Saturation A (vph)	112		1800		0	249
Reference Time A (s)	43.8		2.3		0.0	24.6
Adj Saturation B (vph	NA		1800		0	0
Reference Time B (s)	NA		2.3		9.4	11.5
Reference Time (s)			2.3			11.5
Adj Reference Time (s)			8.0			15.5
Split Option						
Ref Time Combined (s)	2.9		2.3		0.0	3.5
Ref Time Seperate (s)	2.5		2.3		1.4	2.1
Reference Time (s)	2.9		2.3		3.5	3.5
Adj Reference Time (s)	8.0		8.0		8.0	8.0

Summary	WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	Err	15.5	
Split Option (s)	8.0	16.0	
Minimum (s)	8.0	15.5	23.5

Right Turns	NBR
Adj Reference Time (s)	8.0
Cross Thru Ref Time (s)	0.0
Oncoming Left Ref Time (s)	8.0
Combined (s)	16.0

Intersection Summary			
Intersection Capacity Utilization	19.6%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	35	6	34	25	20	31
Future Volume (Veh/h)	35	6	34	25	20	31
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	39	7	38	28	22	34
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	116	38			66	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	116	38			66	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	99			99	
cM capacity (veh/h)	870	1037			1542	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1
Volume Total	46	38	28	56
Volume Left	39	0	0	22
Volume Right	7	0	28	0
cSH	892	1700	1700	1542
Volume to Capacity	0.05	0.02	0.02	0.01
Queue Length 95th (m)	1.2	0.0	0.0	0.3
Control Delay (s)	9.3	0.0	0.0	3.0
Lane LOS	A			A
Approach Delay (s)	9.3	0.0		3.0
Approach LOS	A			

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	19.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	3.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	35	6	34	25	20	31
Future Vol, veh/h	35	6	34	25	20	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	250	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	39	7	38	28	22	34

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	117	38	0	0	38	0
Stage 1	38	-	-	-	-	-
Stage 2	79	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	881	1037	-	-	1579	-
Stage 1	987	-	-	-	-	-
Stage 2	947	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	869	1037	-	-	1579	-
Mov Cap-2 Maneuver	869	-	-	-	-	-
Stage 1	987	-	-	-	-	-
Stage 2	934	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	2.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	890	1579	-
HCM Lane V/C Ratio	-	-	0.051	0.014	-
HCM Control Delay (s)	-	-	9.3	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (vph)	5	100	5	38	68	13	5	5	16	9	5	5
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	110	0	0	119	0	0	26	0	0	19	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.99	0.85	0.95	0.97	0.85	0.95	0.90	0.85	0.95	0.94	0.85
Saturated Flow (vph)	0	1784	0	0	1742	0	0	1618	0	0	1688	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	1743		0	533		0	1543		0	797	
Reference Time A (s)	0.0	7.6		0.0	26.8		0.0	2.0		0.0	2.9	
Adj Saturation B (vph	0	0		0	0		0	0		0	0	
Reference Time B (s)	8.4	15.4		10.7	16.2		8.4	9.9		8.6	9.4	
Reference Time (s)		7.6			16.2			2.0			2.9	
Adj Reference Time (s)		11.6			20.2			8.0			8.0	
Split Option												
Ref Time Combined (s)	0.0	7.4		0.0	8.2		0.0	1.9		0.0	1.4	
Ref Time Seperate (s)	0.4	6.7		2.7	4.6		0.4	0.4		0.6	0.4	
Reference Time (s)	7.4	7.4		8.2	8.2		1.9	1.9		1.4	1.4	
Adj Reference Time (s)	11.4	11.4		12.2	12.2		8.0	8.0		8.0	8.0	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	20.2	8.0	
Split Option (s)	23.6	16.0	
Minimum (s)	20.2	8.0	28.2

Right Turns	
Adj Reference Time (s)	
Cross Thru Ref Time (s)	
Oncoming Left Ref Time (s)	
Combined (s)	

Intersection Summary			
Intersection Capacity Utilization	23.5%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	100	5	38	68	13	5	5	16	9	5	5
Future Volume (Veh/h)	5	100	5	38	68	13	5	5	16	9	5	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.38	0.52	0.50	0.68	0.85	0.65	0.50	0.25	0.57	0.75	0.50	0.25
Hourly flow rate (vph)	13	192	10	56	80	20	10	20	28	12	10	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	100			202			450	435	197	463	430	90
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	100			202			450	435	197	463	430	90
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			96			98	96	97	97	98	98
cM capacity (veh/h)	1499			1376			484	491	847	461	494	971

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	215	156	58	42
Volume Left	13	56	10	12
Volume Right	10	20	28	20
cSH	1499	1376	614	628
Volume to Capacity	0.01	0.04	0.09	0.07
Queue Length 95th (m)	0.2	1.0	2.4	1.6
Control Delay (s)	0.5	3.0	11.5	11.1
Lane LOS	A	A	B	B
Approach Delay (s)	0.5	3.0	11.5	11.1
Approach LOS			B	B

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	23.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	100	5	38	68	13	5	5	16	9	5	5
Future Vol, veh/h	5	100	5	38	68	13	5	5	16	9	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	52	50	68	85	65	50	25	57	75	50	25
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	13	192	10	56	80	20	10	20	28	12	10	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	100	0	0	202	0	0	441	436	197	450	431	90
Stage 1	-	-	-	-	-	-	224	224	-	202	202	-
Stage 2	-	-	-	-	-	-	217	212	-	248	229	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1499	-	-	1376	-	-	528	515	847	521	519	971
Stage 1	-	-	-	-	-	-	781	720	-	802	736	-
Stage 2	-	-	-	-	-	-	788	729	-	758	717	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1499	-	-	1376	-	-	489	488	847	468	492	971
Mov Cap-2 Maneuver	-	-	-	-	-	-	489	488	-	468	492	-
Stage 1	-	-	-	-	-	-	773	713	-	794	704	-
Stage 2	-	-	-	-	-	-	728	698	-	705	710	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	2.8	11.5	11.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	614	1499	-	-	1376	-	-	631
HCM Lane V/C Ratio	0.095	0.009	-	-	0.041	-	-	0.067
HCM Control Delay (s)	11.5	7.4	0	-	7.7	0	-	11.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-	-	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	264	5	5	5	5	12	6	193	5	5	111	116
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	269	5	0	22	0	0	204	0	5	111	116
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.91	0.85	0.95	0.99	0.85	0.95	1.00	0.85
Saturated Flow (vph)	0	1712	1530	0	1634	0	0	1791	0	1710	1800	1530
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.4			0.0			0.0			9.1
Adj Reference Time (s)			8.0			0.0			0.0			13.1
Permitted Option												
Adj Saturation A (vph)	0	511		0	365		0	1262		164	1800	
Reference Time A (s)	0.0	63.2		0.0	7.2		0.0	19.4		3.7	7.4	
Adj Saturation B (vph	0	0		0	0		0	0		NA	NA	
Reference Time B (s)	26.5	26.9		8.4	9.6		8.4	21.7		NA	NA	
Reference Time (s)		26.9			7.2			19.4			7.4	
Adj Reference Time (s)		30.9			11.2			23.4			11.4	
Split Option												
Ref Time Combined (s)	0.0	18.9		0.0	1.6		0.0	13.7		0.4	7.4	
Ref Time Seperate (s)	18.5	0.3		0.4	0.4		0.4	12.9		0.4	7.4	
Reference Time (s)	18.9	18.9		1.6	1.6		13.7	13.7		7.4	7.4	
Adj Reference Time (s)	22.9	22.9		8.0	8.0		17.7	17.7		11.4	11.4	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	30.9	23.4	
Split Option (s)	30.9	29.1	
Minimum (s)	30.9	23.4	54.3

Right Turns	EBR	SBR
Adj Reference Time (s)	8.0	13.1
Cross Thru Ref Time (s)	11.4	8.0
Oncoming Left Ref Time (s)	8.0	17.7
Combined (s)	27.4	38.8

Intersection Summary			
Intersection Capacity Utilization	45.2%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	264	5	5	5	5	12	6	193	5	5	111	116
Future Volume (Veh/h)	264	5	5	5	5	12	6	193	5	5	111	116
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.50	0.75	0.43	0.43	0.43	0.75	0.92	0.25	0.42	0.84	0.66
Hourly flow rate (vph)	326	10	7	12	12	28	8	210	20	12	132	176
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)			3									
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	426	402	132	400	568	220	308			230		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	426	402	132	400	568	220	308			230		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	35	98	99	98	97	97	99			99		
cM capacity (veh/h)	505	530	920	543	427	822	1258			1344		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2	SB 3
Volume Total	343	52	238	12	132	176
Volume Left	326	12	8	12	0	0
Volume Right	7	28	20	0	0	176
cSH	516	617	1258	1344	1700	1700
Volume to Capacity	0.66	0.08	0.01	0.01	0.08	0.10
Queue Length 95th (m)	36.9	2.1	0.1	0.2	0.0	0.0
Control Delay (s)	24.8	11.4	0.3	7.7	0.0	0.0
Lane LOS	C	B	A	A		
Approach Delay (s)	24.8	11.4	0.3	0.3		
Approach LOS	C	B				

Intersection Summary				
Average Delay	9.7			
Intersection Capacity Utilization	45.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	9.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	264	5	5	5	5	12	6	193	5	5	111	116
Future Vol, veh/h	264	5	5	5	5	12	6	193	5	5	111	116
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	-	-	-	-	200	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	50	75	43	43	43	75	92	25	42	84	66
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	326	10	7	12	12	28	8	210	20	12	132	176

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	412	402	132	397	392	220	132	0	0	230	0	0
Stage 1	156	156	-	236	236	-	-	-	-	-	-	-
Stage 2	256	246	-	161	156	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	552	538	920	565	545	822	1459	-	-	1344	-	-
Stage 1	849	770	-	769	712	-	-	-	-	-	-	-
Stage 2	751	704	-	843	770	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	519	530	920	547	537	822	1459	-	-	1344	-	-
Mov Cap-2 Maneuver	519	530	-	547	537	-	-	-	-	-	-	-
Stage 1	844	763	-	764	708	-	-	-	-	-	-	-
Stage 2	709	700	-	819	763	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.5	10.9	0.3	0.3
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1459	-	-	519	920	666	1344	-	-
HCM Lane V/C Ratio	0.005	-	-	0.647	0.007	0.077	0.009	-	-
HCM Control Delay (s)	7.5	0	-	23.8	8.9	10.9	7.7	-	-
HCM Lane LOS	A	A	-	C	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	4.6	0	0.2	0	-	-

Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations												
Volume (vph)	22	5	31	5	17	65	43	5	5	7	5	58
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right				No			No	No			No	No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	0	63	0	0	130	0	0	0	75	0	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.97	0.85	0.95	0.94	0.85	0.85	0.95	0.87	0.85	0.85
Saturated Flow (vph)	0	0	1740	0	0	1689	0	0	0	1568	0	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)			0.00			0.00				0.00		
Protected Option Allowed			No			No				No		
Reference Time (s)				0.0			0.0	0.0			0.0	0.0
Adj Reference Time (s)				0.0			0.0	0.0			0.0	0.0
Permitted Option												
Adj Saturation A (vph)	0	0	706		0	1628			0	1595		
Reference Time A (s)	0.0	0.0	10.7		0.0	9.6			0.0	5.6		
Adj Saturation B (vph	0	0	0		0	0			0	0		
Reference Time B (s)	9.5	8.4	12.3		9.2	17.2			8.4	13.7		
Reference Time (s)			10.7			9.6				5.6		
Adj Reference Time (s)			14.7			13.6				9.6		
Split Option												
Ref Time Combined (s)	0.0	0.0	4.3		0.0	9.2			0.0	5.7		
Ref Time Seperate (s)	1.5	0.4	2.1		1.2	4.6			0.4	0.5		
Reference Time (s)	4.3	4.3	4.3		9.2	9.2			5.7	5.7		
Adj Reference Time (s)	8.3	8.3	8.3		13.2	13.2			9.7	9.7		

Summary	EB WB	NB SB	SW	Combined
Protected Option (s)	NA	NA	NA	
Permitted Option (s)	14.7	22.4	Err	
Split Option (s)	21.6	24.1	8.0	
Minimum (s)	14.7	22.4	8.0	45.1

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	37.6%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	SBL2	SBL	SBT	SBR	SWL2	SWL	SWR	SWR2
Lane Configurations								
Volume (vph)	5	96	5	38	5	5	5	5
Pedestrians								
Ped Button								
Pedestrian Timing (s)								
Free Right				No			No	No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	0	144	0	0	20	0	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.93	0.85	0.95	0.90	0.85	0.85
Saturated Flow (vph)	0	0	1668	0	0	1623	0	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)			0.00			0.00		
Protected Option Allowed			No			No		
Reference Time (s)				0.0			0.0	0.0
Adj Reference Time (s)				0.0			0.0	0.0
Permitted Option								
Adj Saturation A (vph)	0	0	304		0	108		
Reference Time A (s)	0.0	0.0	56.9		0.0	22.2		
Adj Saturation B (vph	0	0	0		NA	NA		
Reference Time B (s)	8.4	14.7	18.4		NA	NA		
Reference Time (s)			18.4					
Adj Reference Time (s)			22.4					
Split Option								
Ref Time Combined (s)	0.0	0.0	10.4		0.0	1.5		
Ref Time Seperate (s)	0.4	6.7	0.4		0.4	0.4		
Reference Time (s)	10.4	10.4	10.4		1.5	1.5		
Adj Reference Time (s)	14.4	14.4	14.4		8.0	8.0		

Summary

Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Right Turn Channelized												
Traffic Volume (veh/h)	22	5	31	5	17	65	43	5	5	7	5	58
Future Volume (veh/h)	22	5	31	5	17	65	43	5	5	7	5	58
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	5	33	5	18	68	45	5	5	7	5	61
Approach Volume (veh/h)			66			136				78		
Crossing Volume (veh/h)			139			50				172		
High Capacity (veh/h)			1242			1332				1210		
High v/c (veh/h)			0.05			0.10				0.06		
Low Capacity (veh/h)			1032			1113				1003		
Low v/c (veh/h)			0.06			0.12				0.08		

Intersection Summary					
Maximum v/c High	0.12				
Maximum v/c Low	0.14				
Intersection Capacity Utilization	37.6%	ICU Level of Service		A	

Movement	SBL2	SBL	SBT	SBR	SWL2	SWL	SWR	SWR2
Right Turn Channelized								
Traffic Volume (veh/h)	5	96	5	38	5	5	5	5
Future Volume (veh/h)	5	96	5	38	5	5	5	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	101	5	40	5	5	5	5
Approach Volume (veh/h)			151			20		
Crossing Volume (veh/h)			106			166		
High Capacity (veh/h)			1275			1216		
High v/c (veh/h)			0.12			0.02		
Low Capacity (veh/h)			1061			1008		
Low v/c (veh/h)			0.14			0.02		

Intersection Summary

Intersection	
Intersection Delay, s/veh	4.6
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	66	136	78	151
Demand Flow Rate, veh/h	66	137	79	152
Vehicles Circulating, veh/h	140	50	173	107
Vehicles Exiting, veh/h	119	202	33	80
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.3	4.5	4.6	4.9
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	66	137	79	152
Cap Entry Lane, veh/h	982	1075	950	1015
Entry HV Adj Factor	0.992	0.995	0.986	0.993
Flow Entry, veh/h	65	136	78	151
Cap Entry, veh/h	974	1069	938	1008
V/C Ratio	0.067	0.127	0.083	0.150
Control Delay, s/veh	4.3	4.5	4.6	4.9
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Approach	SW
Entry Lanes	1
Conflicting Circle Lanes	1
Adj Approach Flow, veh/h	20
Demand Flow Rate, veh/h	20
Vehicles Circulating, veh/h	167
Vehicles Exiting, veh/h	20
Follow-Up Headway, s	3.186
Ped Vol Crossing Leg, #/h	0
Ped Cap Adj	1.000
Approach Delay, s/veh	4.0
Approach LOS	A

Lane	Left
Designated Moves	LR
Assumed Moves	LR
RT Channelized	
Lane Util	1.000
Critical Headway, s	5.193
Entry Flow, veh/h	20
Cap Entry Lane, veh/h	956
Entry HV Adj Factor	0.998
Flow Entry, veh/h	20
Cap Entry, veh/h	954
V/C Ratio	0.021
Control Delay, s/veh	4.0
LOS	A
95th %tile Queue, veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	5	7	6	139	5	236	5	82	182	32
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	55	0	0	152	0	0	246	0	0	296	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.86	0.85	0.95	1.00	0.85	0.95	0.97	0.85
Saturated Flow (vph)	0	1703	0	0	1550	0	0	1793	0	0	3325	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	227		0	1576		0	1392		0	145	
Reference Time A (s)	0.0	29.1		0.0	11.6		0.0	21.2		0.0	68.0	
Adj Saturation B (vph	NA	NA		0	0		NA	NA		NA	NA	
Reference Time B (s)	NA	NA		8.5	19.8		NA	NA		NA	NA	
Reference Time (s)		29.1			11.6			21.2			68.0	
Adj Reference Time (s)		33.1			15.6			25.2			72.0	
Split Option												
Ref Time Combined (s)	0.0	3.9		0.0	11.8		0.0	16.5		0.0	10.7	
Ref Time Seperate (s)	3.2	0.4		0.5	0.5		0.4	15.8		5.8	6.5	
Reference Time (s)	3.9	3.9		11.8	11.8		16.5	16.5		10.7	10.7	
Adj Reference Time (s)	8.0	8.0		15.8	15.8		20.5	20.5		14.7	14.7	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	33.1	72.0	
Split Option (s)	23.8	35.1	
Minimum (s)	23.8	35.1	58.9

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	49.1%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	5	5	7	6	139	5	236	5	82	182	32
Future Volume (Veh/h)	45	5	5	7	6	139	5	236	5	82	182	32
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.68	0.50	0.50	0.38	0.38	0.75	0.50	0.79	0.38	0.68	0.80	0.72
Hourly flow rate (vph)	66	10	10	18	16	185	10	299	13	121	228	44
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	1010	824	136	696	840	306	272			312		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1010	824	136	696	840	306	272			312		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	48	96	99	94	94	73	99			90		
cM capacity (veh/h)	126	277	891	292	271	693	1296			1252		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	86	219	322	235	158
Volume Left	66	18	10	121	0
Volume Right	10	185	13	0	44
cSH	151	565	1296	1252	1700
Volume to Capacity	0.57	0.39	0.01	0.10	0.09
Queue Length 95th (m)	22.3	13.8	0.2	2.4	0.0
Control Delay (s)	56.7	15.3	0.3	4.6	0.0
Lane LOS	F	C	A	A	
Approach Delay (s)	56.7	15.3	0.3	2.8	
Approach LOS	F	C			

Intersection Summary				
Average Delay	9.2			
Intersection Capacity Utilization	49.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	7.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	45	5	5	7	6	139	5	236	5	82	182	32
Future Vol, veh/h	45	5	5	7	6	139	5	236	5	82	182	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	68	50	50	38	38	75	50	79	38	68	80	72
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	66	10	10	18	16	185	10	299	13	121	228	44

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	917	823	136	685	838	305	272	0	0	312	0	0
Stage 1	491	491	-	325	325	-	-	-	-	-	-	-
Stage 2	426	332	-	360	513	-	-	-	-	-	-	-
Critical Hdwy	7.315	6.515	6.915	7.315	6.515	6.215	4.115	-	-	4.115	-	-
Critical Hdwy Stg 1	6.515	5.515	-	6.115	5.515	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.115	5.515	-	6.515	5.515	-	-	-	-	-	-	-
Follow-up Hdwy	3.5095	4.0095	3.3095	3.5095	4.0095	3.3095	2.2095	-	-	2.2095	-	-
Pot Cap-1 Maneuver	241	309	891	350	303	737	1296	-	-	1253	-	-
Stage 1	531	549	-	689	650	-	-	-	-	-	-	-
Stage 2	608	646	-	634	537	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	156	271	891	305	266	737	1296	-	-	1253	-	-
Mov Cap-2 Maneuver	156	271	-	305	266	-	-	-	-	-	-	-
Stage 1	526	486	-	683	644	-	-	-	-	-	-	-
Stage 2	440	640	-	544	476	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	41.4	14.6	0.2	2.6
HCM LOS	E	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1296	-	-	182	591	1253	-	-
HCM Lane V/C Ratio	0.008	-	-	0.473	0.371	0.096	-	-
HCM Control Delay (s)	7.8	0	-	41.4	14.6	8.2	0.2	-
HCM Lane LOS	A	A	-	E	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	2.3	1.7	0.3	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	5	10	25	5	17	9	135	15	5	60	23
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	20	0	0	47	0	0	144	15	0	88	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.91	0.85	0.95	0.92	0.85	0.95	1.00	0.85	0.95	0.96	0.85
Saturated Flow (vph)	0	1644	0	0	1657	0	0	1794	1530	0	1725	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			1.2			0.0
Adj Reference Time (s)			0.0			0.0			8.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	1570		0	848		0	1370		0	947	
Reference Time A (s)	0.0	1.5		0.0	6.6		0.0	12.6		0.0	11.2	
Adj Saturation B (vph	0	0		0	0		0	0		NA	NA	
Reference Time B (s)	8.4	9.5		9.8	11.4		8.6	17.6		NA	NA	
Reference Time (s)		1.5			6.6			12.6			11.2	
Adj Reference Time (s)		8.0			10.6			16.6			15.2	
Split Option												
Ref Time Combined (s)	0.0	1.5		0.0	3.4		0.0	9.6		0.0	6.1	
Ref Time Seperate (s)	0.4	0.4		1.8	0.4		0.6	9.0		0.4	4.2	
Reference Time (s)	1.5	1.5		3.4	3.4		9.6	9.6		6.1	6.1	
Adj Reference Time (s)	8.0	8.0		8.0	8.0		13.6	13.6		10.1	10.1	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	10.6	16.6	
Split Option (s)	16.0	23.8	
Minimum (s)	10.6	16.6	27.3

Right Turns	NBR
Adj Reference Time (s)	8.0
Cross Thru Ref Time (s)	8.0
Oncoming Left Ref Time (s)	10.1
Combined (s)	26.1

Intersection Summary			
Intersection Capacity Utilization	22.7%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	5	10	25	5	17	9	135	15	5	60	23
Future Volume (Veh/h)	5	5	10	25	5	17	9	135	15	5	60	23
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	6	11	28	6	19	10	150	17	6	67	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	284	279	80	276	275	150	93			167		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	284	279	80	276	275	150	93			167		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	96	99	98	99			100		
cM capacity (veh/h)	646	624	983	660	627	899	1508			1417		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	23	53	160	17	99
Volume Left	6	28	10	0	6
Volume Right	11	19	0	17	26
cSH	764	725	1508	1700	1417
Volume to Capacity	0.03	0.07	0.01	0.01	0.00
Queue Length 95th (m)	0.7	1.8	0.2	0.0	0.1
Control Delay (s)	9.9	10.4	0.5	0.0	0.5
Lane LOS	A	B	A		A
Approach Delay (s)	9.9	10.4	0.5		0.5
Approach LOS	A	B			

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	22.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↑	↱		↔	
Traffic Vol, veh/h	5	5	10	25	5	17	9	135	15	5	60	23
Future Vol, veh/h	5	5	10	25	5	17	9	135	15	5	60	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	250	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	6	6	11	28	6	19	10	150	17	6	67	26

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	273	261	79	269	273	150	92	0	0	150	0	0
Stage 1	91	91	-	170	170	-	-	-	-	-	-	-
Stage 2	182	170	-	99	103	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	681	645	984	686	636	899	1509	-	-	1437	-	-
Stage 1	919	821	-	834	760	-	-	-	-	-	-	-
Stage 2	822	760	-	910	812	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	657	638	984	668	629	899	1509	-	-	1437	-	-
Mov Cap-2 Maneuver	657	638	-	668	629	-	-	-	-	-	-	-
Stage 1	913	818	-	828	755	-	-	-	-	-	-	-
Stage 2	793	755	-	890	809	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.7	10.3	0.4	0.4
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1509	-	-	781	731	1437	-	-
HCM Lane V/C Ratio	0.007	-	-	0.028	0.071	0.004	-	-
HCM Control Delay (s)	7.4	0	-	9.7	10.3	7.5	0	-
HCM Lane LOS	A	A	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	58	181	5	0	189
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No		No		
Ideal Flow	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	0	58	186	0	0	189
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.85	1.00	0.85	0.95	1.00
Saturated Flow (vph)	0	1530	1793	0	0	1800
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00		0.00			0.00
Protected Option Allowed	No		No			No
Reference Time (s)		4.5		0.0		
Adj Reference Time (s)		8.5		0.0		
Permitted Option						
Adj Saturation A (vph)	0		1793		0	1800
Reference Time A (s)	0.0		12.5		0.0	12.6
Adj Saturation B (vph	NA		NA		NA	NA
Reference Time B (s)	NA		NA		NA	NA
Reference Time (s)			12.5			12.6
Adj Reference Time (s)			16.5			16.6
Split Option						
Ref Time Combined (s)	0.0		12.5		0.0	12.6
Ref Time Seperate (s)	0.0		12.1		0.0	12.6
Reference Time (s)	0.0		12.5		12.6	12.6
Adj Reference Time (s)	0.0		16.5		16.6	16.6

Summary	WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	Err	16.6	
Split Option (s)	0.0	33.1	
Minimum (s)	0.0	16.6	16.6

Right Turns	WBR
Adj Reference Time (s)	8.5
Cross Thru Ref Time (s)	16.5
Oncoming Left Ref Time (s)	0.0
Combined (s)	25.0

Intersection Summary			
Intersection Capacity Utilization	20.8%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	58	181	5	0	189
Future Volume (Veh/h)	0	58	181	5	0	189
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	64	201	6	0	210
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	414	204			207	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	414	204			207	
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	92			100	
cM capacity (veh/h)	597	839			1370	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	64	207	210
Volume Left	0	0	0
Volume Right	64	6	0
cSH	839	1700	1370
Volume to Capacity	0.08	0.12	0.00
Queue Length 95th (m)	1.9	0.0	0.0
Control Delay (s)	9.6	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.6	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	20.8%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	58	181	5	0	189
Future Vol, veh/h	0	58	181	5	0	189
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	0	64	201	6	0	210

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	204	0	0	207	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.21	-	-	4.11	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	0	839	-	-	1370	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	839	-	-	1370	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	839	1370	-
HCM Lane V/C Ratio	-	-	0.077	-	-
HCM Control Delay (s)	-	-	9.6	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	5	5	38	5	36	19
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No				No
Ideal Flow	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	10	0	38	5	36	19
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.90	0.85	0.95	1.00	1.00	0.85
Saturated Flow (vph)	1623	0	1710	1800	1800	1530
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00			0.00	0.00	
Protected Option Allowed	No			Yes	Yes	
Reference Time (s)		0.0	2.7	0.3	2.4	1.5
Adj Reference Time (s)		0.0	8.0	8.0	8.0	8.0
Permitted Option						
Adj Saturation A (vph)	108		114	1800	1800	
Reference Time A (s)	11.1		40.0	0.3	2.4	
Adj Saturation B (vph	NA		0	1800	1800	
Reference Time B (s)	NA		10.7	0.3	2.4	
Reference Time (s)				10.7	2.4	
Adj Reference Time (s)				14.7	8.0	
Split Option						
Ref Time Combined (s)	0.7		2.7	0.3	2.4	
Ref Time Seperate (s)	0.4		2.7	0.3	2.4	
Reference Time (s)	0.7		2.7	2.7	2.4	
Adj Reference Time (s)	8.0		8.0	8.0	8.0	

Summary	EB	NB SB	Combined
Protected Option (s)	NA	16.0	
Permitted Option (s)	Err	14.7	
Split Option (s)	8.0	16.0	
Minimum (s)	8.0	14.7	22.7

Right Turns	SBR
Adj Reference Time (s)	8.0
Cross Thru Ref Time (s)	0.0
Oncoming Left Ref Time (s)	8.0
Combined (s)	16.0

Intersection Summary			
Intersection Capacity Utilization	18.9%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	5	38	5	36	19
Future Volume (Veh/h)	5	5	38	5	36	19
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	6	42	6	40	21
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	130	40	61			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	130	40	61			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	97			
cM capacity (veh/h)	843	1034	1549			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	12	42	6	40	21
Volume Left	6	42	0	0	0
Volume Right	6	0	0	0	21
cSH	929	1549	1700	1700	1700
Volume to Capacity	0.01	0.03	0.00	0.02	0.01
Queue Length 95th (m)	0.3	0.6	0.0	0.0	0.0
Control Delay (s)	8.9	7.4	0.0	0.0	0.0
Lane LOS	A	A			
Approach Delay (s)	8.9	6.5		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	18.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	5	38	5	36	19
Future Vol, veh/h	5	5	38	5	36	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	250	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	6	6	42	6	40	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	130	40	40	0	-	0
Stage 1	40	-	-	-	-	-
Stage 2	90	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	867	1034	1576	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	936	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	844	1034	1576	-	-	-
Mov Cap-2 Maneuver	844	-	-	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	911	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	6.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1576	-	929	-	-
HCM Lane V/C Ratio	0.027	-	0.012	-	-
HCM Control Delay (s)	7.3	-	8.9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (vph)	5	208	5	12	110	6	5	5	46	16	5	5
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	218	0	0	128	0	0	56	0	0	26	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	1.00	0.85	0.95	0.99	0.85	0.95	0.87	0.85	0.95	0.94	0.85
Saturated Flow (vph)	0	1792	0	0	1779	0	0	1571	0	0	1694	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	1674		0	983		0	1589		0	407	
Reference Time A (s)	0.0	15.6		0.0	15.6		0.0	4.2		0.0	7.7	
Adj Saturation B (vph	0	0		NA	NA		0	0		0	0	
Reference Time B (s)	8.4	22.6		NA	NA		8.4	12.3		9.1	9.8	
Reference Time (s)		15.6			15.6			4.2			7.7	
Adj Reference Time (s)		19.6			19.6			8.2			11.7	
Split Option												
Ref Time Combined (s)	0.0	14.6		0.0	8.6		0.0	4.3		0.0	1.8	
Ref Time Seperate (s)	0.4	13.9		0.8	7.4		0.4	0.4		1.1	0.4	
Reference Time (s)	14.6	14.6		8.6	8.6		4.3	4.3		1.8	1.8	
Adj Reference Time (s)	18.6	18.6		12.6	12.6		8.3	8.3		8.0	8.0	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	19.6	11.7	
Split Option (s)	31.2	16.3	
Minimum (s)	19.6	11.7	31.3

Right Turns	
Adj Reference Time (s)	
Cross Thru Ref Time (s)	
Oncoming Left Ref Time (s)	
Combined (s)	

Intersection Summary			
Intersection Capacity Utilization	26.1%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	208	5	12	110	6	5	5	46	16	5	5
Future Volume (Veh/h)	5	208	5	12	110	6	5	5	46	16	5	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.78	0.50	0.60	0.66	0.75	0.64	0.64	0.64	0.50	0.25	0.50
Hourly flow rate (vph)	20	267	10	20	167	8	8	8	72	32	20	10
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	175			277			543	527	272	599	528	171
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	175			277			543	527	272	599	528	171
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			98	98	91	91	95	99
cM capacity (veh/h)	1407			1292			422	444	769	363	444	875

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	297	195	88	62
Volume Left	20	20	8	32
Volume Right	10	8	72	10
cSH	1407	1292	674	428
Volume to Capacity	0.01	0.02	0.13	0.14
Queue Length 95th (m)	0.3	0.4	3.4	3.8
Control Delay (s)	0.6	0.9	11.1	14.8
Lane LOS	A	A	B	B
Approach Delay (s)	0.6	0.9	11.1	14.8
Approach LOS			B	B

Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	26.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	208	5	12	110	6	5	5	46	16	5	5
Future Vol, veh/h	5	208	5	12	110	6	5	5	46	16	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	78	50	60	66	75	64	64	64	50	25	50
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	20	267	10	20	167	8	8	8	72	32	20	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	175	0	0	277	0	0	538	527	272	563	528	171
Stage 1	-	-	-	-	-	-	312	312	-	211	211	-
Stage 2	-	-	-	-	-	-	226	215	-	352	317	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1407	-	-	1292	-	-	456	458	769	438	457	875
Stage 1	-	-	-	-	-	-	701	659	-	793	730	-
Stage 2	-	-	-	-	-	-	779	727	-	667	656	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1407	-	-	1292	-	-	424	443	769	382	442	875
Mov Cap-2 Maneuver	-	-	-	-	-	-	424	443	-	382	442	-
Stage 1	-	-	-	-	-	-	689	648	-	780	718	-
Stage 2	-	-	-	-	-	-	736	715	-	587	645	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.8	11.1	14.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	676	1407	-	-	1292	-	-	441
HCM Lane V/C Ratio	0.129	0.014	-	-	0.015	-	-	0.141
HCM Control Delay (s)	11.1	7.6	0	-	7.8	0	-	14.5
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	0	0	0	0	0
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No				No
Ideal Flow	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	0	0	0	0	0	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	0.95	1.00
Turning Factor (vph)	0.95	0.85	0.95	1.00	1.00	0.85
Saturated Flow (vph)	0	0	0	1800	3427	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00			0.00	0.00	
Protected Option Allowed	No			Yes	Yes	
Reference Time (s)		0.0	0.0	0.0	0.0	0.0
Adj Reference Time (s)		0.0	0.0	8.0	8.0	0.0
Permitted Option						
Adj Saturation A (vph)	0		0	1800	1714	
Reference Time A (s)	0.0		0.0	0.0	0.0	
Adj Saturation B (vph	NA		0	1800	3427	
Reference Time B (s)	NA		0.0	0.0	0.0	
Reference Time (s)				0.0	0.0	
Adj Reference Time (s)				8.0	8.0	
Split Option						
Ref Time Combined (s)	0.0		0.0	0.0	0.0	
Ref Time Seperate (s)	0.0		0.0	0.0	0.0	
Reference Time (s)	0.0		0.0	0.0	0.0	
Adj Reference Time (s)	0.0		0.0	0.0	0.0	

Summary	EB	NB SB	Combined
Protected Option (s)	NA	8.0	
Permitted Option (s)	Err	8.0	
Split Option (s)	0.0	0.0	
Minimum (s)	0.0	0.0	0.0

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0	0			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1026	1088	1629			

Direction, Lane #	NB 1	SB 1	SB 2
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			
Approach Delay (s)	0.0	0.0	
Approach LOS			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	268	5	5	5	5	12	8	256	5	5	147	116
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	273	5	0	22	0	0	269	0	5	147	116
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.91	0.85	0.95	1.00	0.85	0.95	1.00	0.85
Saturated Flow (vph)	0	1712	1530	0	1634	0	0	1792	0	1710	1800	1530
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.4			0.0			0.0			9.1
Adj Reference Time (s)			8.0			0.0			0.0			13.1
Permitted Option												
Adj Saturation A (vph)	0	511		0	365		0	1259		165	1800	
Reference Time A (s)	0.0	64.2		0.0	7.2		0.0	25.6		3.6	9.8	
Adj Saturation B (vph	0	0		0	0		NA	NA		NA	NA	
Reference Time B (s)	26.8	27.1		8.4	9.6		NA	NA		NA	NA	
Reference Time (s)		27.1			7.2			25.6			9.8	
Adj Reference Time (s)		31.1			11.2			29.6			13.8	
Split Option												
Ref Time Combined (s)	0.0	19.1		0.0	1.6		0.0	18.0		0.4	9.8	
Ref Time Seperate (s)	18.8	0.3		0.4	0.4		0.6	17.1		0.4	9.8	
Reference Time (s)	19.1	19.1		1.6	1.6		18.0	18.0		9.8	9.8	
Adj Reference Time (s)	23.1	23.1		8.0	8.0		22.0	22.0		13.8	13.8	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	31.1	29.6	
Split Option (s)	31.1	35.8	
Minimum (s)	31.1	29.6	60.8

Right Turns	EBR	SBR
Adj Reference Time (s)	8.0	13.1
Cross Thru Ref Time (s)	13.8	8.0
Oncoming Left Ref Time (s)	8.0	22.0
Combined (s)	29.8	43.1

Intersection Summary			
Intersection Capacity Utilization	50.7%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	268	5	5	5	5	12	8	256	5	5	147	116
Future Volume (Veh/h)	268	5	5	5	5	12	8	256	5	5	147	116
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.50	0.75	0.43	0.43	0.43	0.75	0.92	0.25	0.42	0.84	0.66
Hourly flow rate (vph)	331	10	7	12	12	28	11	278	20	12	175	176
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)			3									
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	543	519	175	518	685	288	351			298		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	543	519	175	518	685	288	351			298		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	21	98	99	97	97	96	99			99		
cM capacity (veh/h)	418	454	871	452	365	753	1213			1269		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2	SB 3
Volume Total	348	52	309	12	175	176
Volume Left	331	12	11	12	0	0
Volume Right	7	28	20	0	0	176
cSH	426	538	1213	1269	1700	1700
Volume to Capacity	0.82	0.10	0.01	0.01	0.10	0.10
Queue Length 95th (m)	57.2	2.4	0.2	0.2	0.0	0.0
Control Delay (s)	41.4	12.4	0.4	7.9	0.0	0.0
Lane LOS	E	B	A	A		
Approach Delay (s)	41.4	12.4	0.4	0.3		
Approach LOS	E	B				

Intersection Summary				
Average Delay	14.3			
Intersection Capacity Utilization	50.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	12.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	268	5	5	5	5	12	8	256	5	5	147	116
Future Vol, veh/h	268	5	5	5	5	12	8	256	5	5	147	116
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	-	-	-	-	200	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	50	75	43	43	43	75	92	25	42	84	66
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	331	10	7	12	12	28	11	278	20	12	175	176

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	528	519	175	514	509	288	175	0	0	298	0	0
Stage 1	199	199	-	310	310	-	-	-	-	-	-	-
Stage 2	329	320	-	204	199	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	463	463	871	473	469	753	1407	-	-	1269	-	-
Stage 1	805	738	-	702	661	-	-	-	-	-	-	-
Stage 2	686	654	-	800	738	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	431	454	871	455	460	753	1407	-	-	1269	-	-
Mov Cap-2 Maneuver	431	454	-	455	460	-	-	-	-	-	-	-
Stage 1	798	731	-	696	655	-	-	-	-	-	-	-
Stage 2	643	648	-	776	731	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	37.5	11.8	0.3	0.3
HCM LOS	E	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1407	-	-	432	871	582	1269	-	-
HCM Lane V/C Ratio	0.008	-	-	0.789	0.008	0.088	0.009	-	-
HCM Control Delay (s)	7.6	0	-	38.1	9.2	11.8	7.9	-	-
HCM Lane LOS	A	A	-	E	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	7	0	0.3	0	-	-

Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations												
Volume (vph)	22	5	31	5	17	65	43	5	5	7	5	58
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right				No			No	No			No	No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	0	63	0	0	130	0	0	0	75	0	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.97	0.85	0.95	0.94	0.85	0.85	0.95	0.87	0.85	0.85
Saturated Flow (vph)	0	0	1740	0	0	1689	0	0	0	1568	0	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)			0.00			0.00				0.00		
Protected Option Allowed			No			No				No		
Reference Time (s)				0.0			0.0	0.0			0.0	0.0
Adj Reference Time (s)				0.0			0.0	0.0			0.0	0.0
Permitted Option												
Adj Saturation A (vph)	0	0	706		0	1628			0	1595		
Reference Time A (s)	0.0	0.0	10.7		0.0	9.6			0.0	5.6		
Adj Saturation B (vph	0	0	0		0	0			0	0		
Reference Time B (s)	9.5	8.4	12.3		9.2	17.2			8.4	13.7		
Reference Time (s)			10.7			9.6				5.6		
Adj Reference Time (s)			14.7			13.6				9.6		
Split Option												
Ref Time Combined (s)	0.0	0.0	4.3		0.0	9.2			0.0	5.7		
Ref Time Seperate (s)	1.5	0.4	2.1		1.2	4.6			0.4	0.5		
Reference Time (s)	4.3	4.3	4.3		9.2	9.2			5.7	5.7		
Adj Reference Time (s)	8.3	8.3	8.3		13.2	13.2			9.7	9.7		

Summary	EB WB	NB SB	SW	Combined
Protected Option (s)	NA	NA	NA	
Permitted Option (s)	14.7	22.4	Err	
Split Option (s)	21.6	24.1	8.0	
Minimum (s)	14.7	22.4	8.0	45.1

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	37.6%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	SBL2	SBL	SBT	SBR	SWL2	SWL	SWR	SWR2
Lane Configurations								
Volume (vph)	5	96	5	38	5	5	5	5
Pedestrians								
Ped Button								
Pedestrian Timing (s)								
Free Right				No			No	No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	0	144	0	0	20	0	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.93	0.85	0.95	0.90	0.85	0.85
Saturated Flow (vph)	0	0	1668	0	0	1623	0	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)			0.00			0.00		
Protected Option Allowed			No			No		
Reference Time (s)				0.0			0.0	0.0
Adj Reference Time (s)				0.0			0.0	0.0
Permitted Option								
Adj Saturation A (vph)	0	0	304		0	108		
Reference Time A (s)	0.0	0.0	56.9		0.0	22.2		
Adj Saturation B (vph	0	0	0		NA	NA		
Reference Time B (s)	8.4	14.7	18.4		NA	NA		
Reference Time (s)			18.4					
Adj Reference Time (s)			22.4					
Split Option								
Ref Time Combined (s)	0.0	0.0	10.4		0.0	1.5		
Ref Time Seperate (s)	0.4	6.7	0.4		0.4	0.4		
Reference Time (s)	10.4	10.4	10.4		1.5	1.5		
Adj Reference Time (s)	14.4	14.4	14.4		8.0	8.0		

Summary

Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Right Turn Channelized												
Traffic Volume (veh/h)	22	5	31	5	17	65	43	5	5	7	5	58
Future Volume (veh/h)	22	5	31	5	17	65	43	5	5	7	5	58
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	5	33	5	18	68	45	5	5	7	5	61
Approach Volume (veh/h)			66			136				78		
Crossing Volume (veh/h)			139			50				172		
High Capacity (veh/h)			1242			1332				1210		
High v/c (veh/h)			0.05			0.10				0.06		
Low Capacity (veh/h)			1032			1113				1003		
Low v/c (veh/h)			0.06			0.12				0.08		

Intersection Summary					
Maximum v/c High	0.12				
Maximum v/c Low	0.14				
Intersection Capacity Utilization	37.6%	ICU Level of Service		A	

Movement	SBL2	SBL	SBT	SBR	SWL2	SWL	SWR	SWR2
Right Turn Channelized								
Traffic Volume (veh/h)	5	96	5	38	5	5	5	5
Future Volume (veh/h)	5	96	5	38	5	5	5	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	101	5	40	5	5	5	5
Approach Volume (veh/h)			151			20		
Crossing Volume (veh/h)			106			166		
High Capacity (veh/h)			1275			1216		
High v/c (veh/h)			0.12			0.02		
Low Capacity (veh/h)			1061			1008		
Low v/c (veh/h)			0.14			0.02		

Intersection Summary

Intersection	
Intersection Delay, s/veh	4.6
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	66	136	78	151
Demand Flow Rate, veh/h	66	137	79	152
Vehicles Circulating, veh/h	140	50	173	107
Vehicles Exiting, veh/h	119	202	33	80
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.3	4.5	4.6	4.9
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	66	137	79	152
Cap Entry Lane, veh/h	982	1075	950	1015
Entry HV Adj Factor	0.992	0.995	0.986	0.993
Flow Entry, veh/h	65	136	78	151
Cap Entry, veh/h	974	1069	938	1008
V/C Ratio	0.067	0.127	0.083	0.150
Control Delay, s/veh	4.3	4.5	4.6	4.9
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Approach	SW
Entry Lanes	1
Conflicting Circle Lanes	1
Adj Approach Flow, veh/h	20
Demand Flow Rate, veh/h	20
Vehicles Circulating, veh/h	167
Vehicles Exiting, veh/h	20
Follow-Up Headway, s	3.186
Ped Vol Crossing Leg, #/h	0
Ped Cap Adj	1.000
Approach Delay, s/veh	4.0
Approach LOS	A

Lane	Left
Designated Moves	LR
Assumed Moves	LR
RT Channelized	
Lane Util	1.000
Critical Headway, s	5.193
Entry Flow, veh/h	20
Cap Entry Lane, veh/h	956
Entry HV Adj Factor	0.998
Flow Entry, veh/h	20
Cap Entry, veh/h	954
V/C Ratio	0.021
Control Delay, s/veh	4.0
LOS	A
95th %tile Queue, veh	0

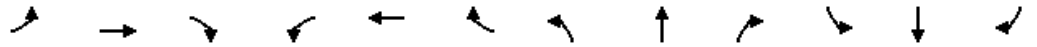
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	5	5	7	6	139	5	294	5	82	242	42
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	70	0	0	152	0	0	304	0	0	366	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.86	0.85	0.95	1.00	0.85	0.95	0.97	0.85
Saturated Flow (vph)	0	1704	0	0	1550	0	0	1794	0	0	3330	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	218		0	1579		0	1456		0	138	
Reference Time A (s)	0.0	38.5		0.0	11.6		0.0	25.1		0.0	71.1	
Adj Saturation B (vph	NA	NA		0	0		NA	NA		NA	NA	
Reference Time B (s)	NA	NA		8.5	19.8		NA	NA		NA	NA	
Reference Time (s)		38.5			11.6			25.1			71.1	
Adj Reference Time (s)		42.5			15.6			29.1			75.1	
Split Option												
Ref Time Combined (s)	0.0	4.9		0.0	11.8		0.0	20.3		0.0	13.2	
Ref Time Seperate (s)	4.2	0.4		0.5	0.5		0.4	19.6		5.8	8.7	
Reference Time (s)	4.9	4.9		11.8	11.8		20.3	20.3		13.2	13.2	
Adj Reference Time (s)	8.9	8.9		15.8	15.8		24.3	24.3		17.2	17.2	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	42.5	75.1	
Split Option (s)	24.7	41.5	
Minimum (s)	24.7	41.5	66.2

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	55.2%	ICU Level of Service	B

Reference Times and Phasing Options do not represent an optimized timing plan.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	5	5	7	6	139	5	294	5	82	242	42
Future Volume (Veh/h)	60	5	5	7	6	139	5	294	5	82	242	42
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.68	0.50	0.50	0.38	0.38	0.75	0.50	0.79	0.38	0.68	0.80	0.72
Hourly flow rate (vph)	88	10	10	18	16	185	10	372	13	121	303	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	1166	979	180	807	1002	378	361			385		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1166	979	180	807	1002	378	361			385		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	4	96	99	92	93	70	99			90		
cM capacity (veh/h)	91	223	834	240	216	622	1201			1177		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	108	219	395	272	210
Volume Left	88	18	10	121	0
Volume Right	10	185	13	0	58
cSH	106	491	1201	1177	1700
Volume to Capacity	1.02	0.45	0.01	0.10	0.12
Queue Length 95th (m)	49.4	17.2	0.2	2.6	0.0
Control Delay (s)	168.4	18.1	0.3	4.3	0.0
Lane LOS	F	C	A	A	
Approach Delay (s)	168.4	18.1	0.3	2.4	
Approach LOS	F	C			

Intersection Summary				
Average Delay	19.5			
Intersection Capacity Utilization	55.2%	ICU Level of Service	B	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	13.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	60	5	5	7	6	139	5	294	5	82	242	42
Future Vol, veh/h	60	5	5	7	6	139	5	294	5	82	242	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	68	50	50	38	38	75	50	79	38	68	80	72
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	88	10	10	18	16	185	10	372	13	121	303	58

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1072	978	180	796	1001	379	361	0	0	385	0	0
Stage 1	573	573	-	399	399	-	-	-	-	-	-	-
Stage 2	499	405	-	397	602	-	-	-	-	-	-	-
Critical Hdwy	7.315	6.515	6.915	7.315	6.515	6.215	4.115	-	-	4.115	-	-
Critical Hdwy Stg 1	6.515	5.515	-	6.115	5.515	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.115	5.515	-	6.515	5.515	-	-	-	-	-	-	-
Follow-up Hdwy	3.5095	4.0095	3.3095	3.5095	4.0095	3.3095	2.2095	-	-	2.2095	-	-
Pot Cap-1 Maneuver	187	251	835	293	243	670	1202	-	-	1178	-	-
Stage 1	475	505	-	629	604	-	-	-	-	-	-	-
Stage 2	555	600	-	603	490	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	114	216	835	250	209	670	1202	-	-	1178	-	-
Mov Cap-2 Maneuver	114	216	-	250	209	-	-	-	-	-	-	-
Stage 1	470	439	-	622	597	-	-	-	-	-	-	-
Stage 2	387	593	-	507	426	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	103.6	17	0.2	2.3
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1202	-	-	130	516	1178	-	-
HCM Lane V/C Ratio	0.008	-	-	0.833	0.425	0.102	-	-
HCM Control Delay (s)	8	0	-	103.6	17	8.4	0.3	-
HCM Lane LOS	A	A	-	F	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	5.2	2.1	0.3	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	5	10	25	5	17	9	135	15	5	60	23
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	20	0	0	47	0	0	144	15	0	88	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.91	0.85	0.95	0.92	0.85	0.95	1.00	0.85	0.95	0.96	0.85
Saturated Flow (vph)	0	1644	0	0	1657	0	0	1794	1530	0	1725	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			1.2			0.0
Adj Reference Time (s)			0.0			0.0			8.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	1570		0	848		0	1370		0	947	
Reference Time A (s)	0.0	1.5		0.0	6.6		0.0	12.6		0.0	11.2	
Adj Saturation B (vph	0	0		0	0		0	0		NA	NA	
Reference Time B (s)	8.4	9.5		9.8	11.4		8.6	17.6		NA	NA	
Reference Time (s)		1.5			6.6			12.6			11.2	
Adj Reference Time (s)		8.0			10.6			16.6			15.2	
Split Option												
Ref Time Combined (s)	0.0	1.5		0.0	3.4		0.0	9.6		0.0	6.1	
Ref Time Seperate (s)	0.4	0.4		1.8	0.4		0.6	9.0		0.4	4.2	
Reference Time (s)	1.5	1.5		3.4	3.4		9.6	9.6		6.1	6.1	
Adj Reference Time (s)	8.0	8.0		8.0	8.0		13.6	13.6		10.1	10.1	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	10.6	16.6	
Split Option (s)	16.0	23.8	
Minimum (s)	10.6	16.6	27.3

Right Turns	NBR
Adj Reference Time (s)	8.0
Cross Thru Ref Time (s)	8.0
Oncoming Left Ref Time (s)	10.1
Combined (s)	26.1

Intersection Summary			
Intersection Capacity Utilization	22.7%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	5	10	25	5	17	9	135	15	5	60	23
Future Volume (Veh/h)	5	5	10	25	5	17	9	135	15	5	60	23
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	6	11	28	6	19	10	150	17	6	67	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	284	279	80	276	275	150	93			167		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	284	279	80	276	275	150	93			167		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	96	99	98	99			100		
cM capacity (veh/h)	646	624	983	660	627	899	1508			1417		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	23	53	160	17	99
Volume Left	6	28	10	0	6
Volume Right	11	19	0	17	26
cSH	764	725	1508	1700	1417
Volume to Capacity	0.03	0.07	0.01	0.01	0.00
Queue Length 95th (m)	0.7	1.8	0.2	0.0	0.1
Control Delay (s)	9.9	10.4	0.5	0.0	0.5
Lane LOS	A	B	A		A
Approach Delay (s)	9.9	10.4	0.5		0.5
Approach LOS	A	B			

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	22.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↑	↱		↔	
Traffic Vol, veh/h	5	5	10	25	5	17	9	135	15	5	60	23
Future Vol, veh/h	5	5	10	25	5	17	9	135	15	5	60	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	250	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	6	6	11	28	6	19	10	150	17	6	67	26

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	273	261	79	269	273	150	92	0	0	150	0	0
Stage 1	91	91	-	170	170	-	-	-	-	-	-	-
Stage 2	182	170	-	99	103	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	681	645	984	686	636	899	1509	-	-	1437	-	-
Stage 1	919	821	-	834	760	-	-	-	-	-	-	-
Stage 2	822	760	-	910	812	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	657	638	984	668	629	899	1509	-	-	1437	-	-
Mov Cap-2 Maneuver	657	638	-	668	629	-	-	-	-	-	-	-
Stage 1	913	818	-	828	755	-	-	-	-	-	-	-
Stage 2	793	755	-	890	809	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.7	10.3	0.4	0.4
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1509	-	-	781	731	1437	-	-
HCM Lane V/C Ratio	0.007	-	-	0.028	0.071	0.004	-	-
HCM Control Delay (s)	7.4	0	-	9.7	10.3	7.5	0	-
HCM Lane LOS	A	A	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	58	240	5	0	251
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No		No		
Ideal Flow	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	0	58	245	0	0	251
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.85	1.00	0.85	0.95	1.00
Saturated Flow (vph)	0	1530	1794	0	0	1800
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00		0.00			0.00
Protected Option Allowed	No		Yes			Yes
Reference Time (s)		4.5	16.4	0.0	0.0	16.7
Adj Reference Time (s)		8.5	20.4	0.0	0.0	20.7
Permitted Option						
Adj Saturation A (vph)	0		1794		0	1800
Reference Time A (s)	0.0		16.4		0.0	16.7
Adj Saturation B (vph	NA		NA		NA	NA
Reference Time B (s)	NA		NA		NA	NA
Reference Time (s)			16.4			16.7
Adj Reference Time (s)			20.4			20.7
Split Option						
Ref Time Combined (s)	0.0		16.4		0.0	16.7
Ref Time Seperate (s)	0.0		16.0		0.0	16.7
Reference Time (s)	0.0		16.4		16.7	16.7
Adj Reference Time (s)	0.0		20.4		20.7	20.7

Summary	WB	NB SB	Combined
Protected Option (s)	NA	20.7	
Permitted Option (s)	Err	20.7	
Split Option (s)	0.0	41.1	
Minimum (s)	0.0	20.7	20.7

Right Turns	WBR
Adj Reference Time (s)	8.5
Cross Thru Ref Time (s)	20.4
Oncoming Left Ref Time (s)	0.0
Combined (s)	28.9

Intersection Summary			
Intersection Capacity Utilization	24.1%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	58	240	5	0	251
Future Volume (Veh/h)	0	58	240	5	0	251
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	64	267	6	0	279
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	549	270			273	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	549	270			273	
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	92			100	
cM capacity (veh/h)	498	771			1296	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	64	273	279
Volume Left	0	0	0
Volume Right	64	6	0
cSH	771	1700	1700
Volume to Capacity	0.08	0.16	0.16
Queue Length 95th (m)	2.1	0.0	0.0
Control Delay (s)	10.1	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.1	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	24.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	58	240	5	0	251
Future Vol, veh/h	0	58	240	5	0	251
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	0	64	267	6	0	279

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	269	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.21	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.309	-	-	-	-
Pot Cap-1 Maneuver	0	772	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	772	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	772	-
HCM Lane V/C Ratio	-	-	0.083	-
HCM Control Delay (s)	-	-	10.1	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.3	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	5	5	38	5	36	19
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No				No
Ideal Flow	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	10	0	38	5	36	19
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.90	0.85	0.95	1.00	1.00	0.85
Saturated Flow (vph)	1623	0	1710	1800	1800	1530
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00			0.00	0.00	
Protected Option Allowed	No			Yes	Yes	
Reference Time (s)		0.0	2.7	0.3	2.4	1.5
Adj Reference Time (s)		0.0	8.0	8.0	8.0	8.0
Permitted Option						
Adj Saturation A (vph)	108		114	1800	1800	
Reference Time A (s)	11.1		40.0	0.3	2.4	
Adj Saturation B (vph	NA		0	1800	1800	
Reference Time B (s)	NA		10.7	0.3	2.4	
Reference Time (s)				10.7	2.4	
Adj Reference Time (s)				14.7	8.0	
Split Option						
Ref Time Combined (s)	0.7		2.7	0.3	2.4	
Ref Time Seperate (s)	0.4		2.7	0.3	2.4	
Reference Time (s)	0.7		2.7	2.7	2.4	
Adj Reference Time (s)	8.0		8.0	8.0	8.0	

Summary	EB	NB SB	Combined
Protected Option (s)	NA	16.0	
Permitted Option (s)	Err	14.7	
Split Option (s)	8.0	16.0	
Minimum (s)	8.0	14.7	22.7

Right Turns	SBR
Adj Reference Time (s)	8.0
Cross Thru Ref Time (s)	0.0
Oncoming Left Ref Time (s)	8.0
Combined (s)	16.0

Intersection Summary			
Intersection Capacity Utilization	18.9%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	5	38	5	36	19
Future Volume (Veh/h)	5	5	38	5	36	19
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	6	42	6	40	21
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	130	40	61			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	130	40	61			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	97			
cM capacity (veh/h)	843	1034	1549			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	12	42	6	40	21
Volume Left	6	42	0	0	0
Volume Right	6	0	0	0	21
cSH	929	1549	1700	1700	1700
Volume to Capacity	0.01	0.03	0.00	0.02	0.01
Queue Length 95th (m)	0.3	0.6	0.0	0.0	0.0
Control Delay (s)	8.9	7.4	0.0	0.0	0.0
Lane LOS	A	A			
Approach Delay (s)	8.9	6.5		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	18.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	5	38	5	36	19
Future Vol, veh/h	5	5	38	5	36	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	250	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	6	6	42	6	40	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	130	40	40	0	-	0
Stage 1	40	-	-	-	-	-
Stage 2	90	-	-	-	-	-
Critical Hdwy	7.11	6.21	4.11	-	-	-
Critical Hdwy Stg 1	6.11	-	-	-	-	-
Critical Hdwy Stg 2	6.11	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	845	1034	1576	-	-	-
Stage 1	977	-	-	-	-	-
Stage 2	920	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	828	1034	1576	-	-	-
Mov Cap-2 Maneuver	828	-	-	-	-	-
Stage 1	951	-	-	-	-	-
Stage 2	895	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	6.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1576	-	920	-	-
HCM Lane V/C Ratio	0.027	-	0.012	-	-
HCM Control Delay (s)	7.3	-	9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0	-	-

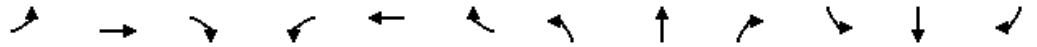
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Volume (vph)	5	208	5	12	110	6	5	5	46	16	5	5
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	218	0	0	128	0	0	56	0	0	26	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	1.00	0.85	0.95	0.99	0.85	0.95	0.87	0.85	0.95	0.94	0.85
Saturated Flow (vph)	0	1792	0	0	1779	0	0	1571	0	0	1694	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	1674		0	983		0	1589		0	407	
Reference Time A (s)	0.0	15.6		0.0	15.6		0.0	4.2		0.0	7.7	
Adj Saturation B (vph	0	0		NA	NA		0	0		0	0	
Reference Time B (s)	8.4	22.6		NA	NA		8.4	12.3		9.1	9.8	
Reference Time (s)		15.6			15.6			4.2			7.7	
Adj Reference Time (s)		19.6			19.6			8.2			11.7	
Split Option												
Ref Time Combined (s)	0.0	14.6		0.0	8.6		0.0	4.3		0.0	1.8	
Ref Time Seperate (s)	0.4	13.9		0.8	7.4		0.4	0.4		1.1	0.4	
Reference Time (s)	14.6	14.6		8.6	8.6		4.3	4.3		1.8	1.8	
Adj Reference Time (s)	18.6	18.6		12.6	12.6		8.3	8.3		8.0	8.0	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	19.6	11.7	
Split Option (s)	31.2	16.3	
Minimum (s)	19.6	11.7	31.3

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	26.1%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	208	5	12	110	6	5	5	46	16	5	5
Future Volume (Veh/h)	5	208	5	12	110	6	5	5	46	16	5	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.25	0.78	0.50	0.60	0.66	0.75	0.64	0.64	0.64	0.50	0.25	0.50
Hourly flow rate (vph)	20	267	10	20	167	8	8	8	72	32	20	10
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	175			277			543	527	272	599	528	171
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	175			277			543	527	272	599	528	171
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			98	98	91	91	95	99
cM capacity (veh/h)	1407			1292			422	444	769	363	444	875

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	297	195	88	62
Volume Left	20	20	8	32
Volume Right	10	8	72	10
cSH	1407	1292	674	428
Volume to Capacity	0.01	0.02	0.13	0.14
Queue Length 95th (m)	0.3	0.4	3.4	3.8
Control Delay (s)	0.6	0.9	11.1	14.8
Lane LOS	A	A	B	B
Approach Delay (s)	0.6	0.9	11.1	14.8
Approach LOS			B	B

Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	26.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	208	5	12	110	6	5	5	46	16	5	5
Future Vol, veh/h	5	208	5	12	110	6	5	5	46	16	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	25	78	50	60	66	75	64	64	64	50	25	50
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	20	267	10	20	167	8	8	8	72	32	20	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	175	0	0	277	0	0	538	527	272	563	528	171
Stage 1	-	-	-	-	-	-	312	312	-	211	211	-
Stage 2	-	-	-	-	-	-	226	215	-	352	317	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1407	-	-	1292	-	-	456	458	769	438	457	875
Stage 1	-	-	-	-	-	-	701	659	-	793	730	-
Stage 2	-	-	-	-	-	-	779	727	-	667	656	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1407	-	-	1292	-	-	424	443	769	382	442	875
Mov Cap-2 Maneuver	-	-	-	-	-	-	424	443	-	382	442	-
Stage 1	-	-	-	-	-	-	689	648	-	780	718	-
Stage 2	-	-	-	-	-	-	736	715	-	587	645	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.8	11.1	14.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	676	1407	-	-	1292	-	-	441
HCM Lane V/C Ratio	0.129	0.014	-	-	0.015	-	-	0.141
HCM Control Delay (s)	11.1	7.6	0	-	7.8	0	-	14.5
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	0	0	0	0	0
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No				No
Ideal Flow	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	0	0	0	0	0	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	0.95	1.00
Turning Factor (vph)	0.95	0.85	0.95	1.00	1.00	0.85
Saturated Flow (vph)	0	0	0	1800	3427	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00			0.00	0.00	
Protected Option Allowed	No			Yes	Yes	
Reference Time (s)		0.0	0.0	0.0	0.0	0.0
Adj Reference Time (s)		0.0	0.0	8.0	8.0	0.0
Permitted Option						
Adj Saturation A (vph)	0		0	1800	1714	
Reference Time A (s)	0.0		0.0	0.0	0.0	
Adj Saturation B (vph	NA		0	1800	3427	
Reference Time B (s)	NA		0.0	0.0	0.0	
Reference Time (s)				0.0	0.0	
Adj Reference Time (s)				8.0	8.0	
Split Option						
Ref Time Combined (s)	0.0		0.0	0.0	0.0	
Ref Time Seperate (s)	0.0		0.0	0.0	0.0	
Reference Time (s)	0.0		0.0	0.0	0.0	
Adj Reference Time (s)	0.0		0.0	0.0	0.0	

Summary	EB	NB SB	Combined
Protected Option (s)	NA	8.0	
Permitted Option (s)	Err	8.0	
Split Option (s)	0.0	0.0	
Minimum (s)	0.0	0.0	0.0

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0	0			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1026	1088	1629			

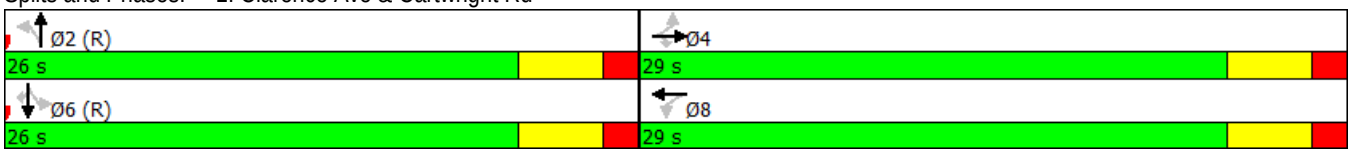
Direction, Lane #	NB 1	SB 1	SB 2
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			
Approach Delay (s)	0.0	0.0	
Approach LOS			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	268	5	5	5	5	8	256	5	147	116
Future Volume (vph)	268	5	5	5	5	8	256	5	147	116
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		4			8		2		6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	4	4	4	8	8	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	29.0	29.0	29.0	29.0	29.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	52.7%	52.7%	52.7%	52.7%	52.7%	47.3%	47.3%	47.3%	47.3%	47.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0	5.0		5.0		5.0	5.0	5.0	5.0
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)		24.0	24.0		24.0		21.0	21.0	21.0	21.0
Actuated g/C Ratio		0.44	0.44		0.44		0.38	0.38	0.38	0.38
v/c Ratio		0.61	0.01		0.07		0.44	0.03	0.25	0.25
Control Delay		17.6	0.0		6.0		14.9	11.0	12.8	3.4
Queue Delay		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		17.6	0.0		6.0		14.9	11.0	12.8	3.4
LOS		B	A		A		B	B	B	A
Approach Delay		17.3			6.0		14.9		8.2	
Approach LOS		B			A		B		A	

Intersection Summary	
Cycle Length: 55	
Actuated Cycle Length: 55	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 13.0	Intersection LOS: B
Intersection Capacity Utilization 51.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Clarence Ave & Cartwright Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	268	5	5	5	5	12	8	256	5	5	147	116
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lost Time (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Minimum Green (s)	10.0	10.0	10.0	10.0	10.0	4.0	15.0	15.0	4.0	15.0	15.0	15.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	273	5	0	22	0	0	269	0	5	147	116
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.91	0.85	0.95	1.00	0.85	0.95	1.00	0.85
Saturated Flow (vph)	0	1759	1573	0	1679	0	0	1842	0	1758	1850	1573
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.4			0.0			0.0			8.9
Adj Reference Time (s)			15.0			0.0			0.0			20.0
Permitted Option												
Adj Saturation A (vph)	0	525		0	375		0	1294		169	1850	
Reference Time A (s)	0.0	62.4		0.0	7.0		0.0	25.0		3.5	9.5	
Adj Saturation B (vph	0	0		0	0		NA	NA		NA	NA	
Reference Time B (s)	26.3	26.6		8.3	9.6		NA	NA		NA	NA	
Reference Time (s)		26.6			7.0			25.0			9.5	
Adj Reference Time (s)		31.6			15.0			30.0			20.0	
Split Option												
Ref Time Combined (s)	0.0	18.6		0.0	1.6		0.0	17.5		0.3	9.5	
Ref Time Seperate (s)	18.3	0.3		0.3	0.4		0.5	16.7		0.3	9.5	
Reference Time (s)	18.6	18.6		1.6	1.6		17.5	17.5		9.5	9.5	
Adj Reference Time (s)	23.6	23.6		15.0	15.0		22.5	22.5		20.0	20.0	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	31.6	30.0	
Split Option (s)	38.6	42.5	
Minimum (s)	31.6	30.0	61.6

Right Turns	EBR	SBR
Adj Reference Time (s)	15.0	20.0
Cross Thru Ref Time (s)	20.0	15.0
Oncoming Left Ref Time (s)	15.0	22.5
Combined (s)	50.0	57.5

Intersection Summary			
Intersection Capacity Utilization	51.3%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

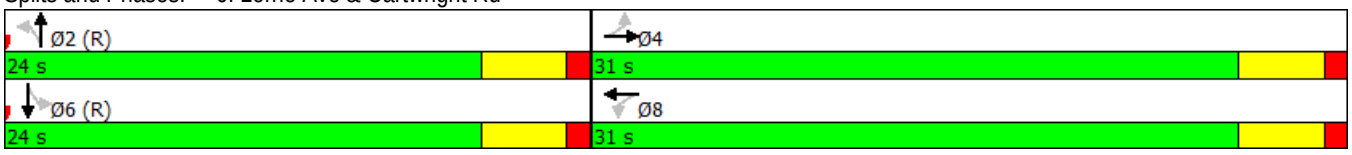
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	268	5	5	5	5	12	8	256	5	5	147	116
Future Volume (vph)	268	5	5	5	5	12	8	256	5	5	147	116
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)		5.0	5.0		5.0			5.0		5.0	5.0	5.0
Lane Util. Factor		1.00	1.00		1.00			1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.93			0.99		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.99			1.00		0.95	1.00	1.00
Satd. Flow (prot)		1766	1574		1698			1833		1759	1852	1574
Flt Permitted		0.69	1.00		0.92			0.99		0.54	1.00	1.00
Satd. Flow (perm)		1286	1574		1573			1816		1004	1852	1574
Peak-hour factor, PHF	0.81	0.50	0.75	0.43	0.43	0.43	0.75	0.92	0.25	0.42	0.84	0.66
Adj. Flow (vph)	331	10	7	12	12	28	11	278	20	12	175	176
RTOR Reduction (vph)	0	0	4	0	16	0	0	4	0	0	0	109
Lane Group Flow (vph)	0	341	3	0	36	0	0	305	0	12	175	67
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		24.0	24.0		24.0			21.0		21.0	21.0	21.0
Effective Green, g (s)		24.0	24.0		24.0			21.0		21.0	21.0	21.0
Actuated g/C Ratio		0.44	0.44		0.44			0.38		0.38	0.38	0.38
Clearance Time (s)		5.0	5.0		5.0			5.0		5.0	5.0	5.0
Lane Grp Cap (vph)		561	686		686			693		383	707	600
v/s Ratio Prot											0.09	
v/s Ratio Perm		c0.27	0.00		0.02			c0.17		0.01		0.04
v/c Ratio		0.61	0.00		0.05			0.44		0.03	0.25	0.11
Uniform Delay, d1		11.9	8.8		8.9			12.6		10.6	11.6	11.0
Progression Factor		1.00	1.00		1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2		4.8	0.0		0.1			2.0		0.2	0.8	0.4
Delay (s)		16.7	8.8		9.1			14.7		10.8	12.4	11.4
Level of Service		B	A		A			B		B	B	B
Approach Delay (s)		16.6			9.1			14.7			11.9	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	60	5	7	6	5	294	82	242
Future Volume (vph)	60	5	7	6	5	294	82	242
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	15.0	15.0	15.0	15.0
Minimum Split (s)	30.5	30.5	30.5	30.5	23.5	23.5	23.5	23.5
Total Split (s)	31.0	31.0	31.0	31.0	24.0	24.0	24.0	24.0
Total Split (%)	56.4%	56.4%	56.4%	56.4%	43.6%	43.6%	43.6%	43.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0		0.0
Total Lost Time (s)		4.5		4.5		4.5		4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)		26.5		26.5		19.5		19.5
Actuated g/C Ratio		0.48		0.48		0.35		0.35
v/c Ratio		0.17		0.25		0.61		0.55
Control Delay		8.4		3.1		19.4		16.1
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		8.4		3.1		19.4		16.1
LOS		A		A		B		B
Approach Delay		8.4		3.1		19.4		16.1
Approach LOS		A		A		B		B

Intersection Summary	
Cycle Length: 55	
Actuated Cycle Length: 55	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 14.1	Intersection LOS: B
Intersection Capacity Utilization 61.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: Lorne Ave & Cartwright Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	5	5	7	6	139	5	294	5	82	242	42
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lost Time (s)	4.5	4.5	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.5	4.5	4.0
Minimum Green (s)	10.0	10.0	4.0	10.0	10.0	4.0	15.0	15.0	4.0	15.0	15.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	70	0	0	152	0	0	304	0	0	366	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.86	0.85	0.95	1.00	0.85	0.95	0.97	0.85
Saturated Flow (vph)	0	1752	0	0	1593	0	0	1844	0	0	3423	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	224		0	1622		0	1496		0	142	
Reference Time A (s)	0.0	37.4		0.0	11.2		0.0	24.4		0.0	69.2	
Adj Saturation B (vph	NA	NA		0	0		NA	NA		NA	NA	
Reference Time B (s)	NA	NA		8.5	19.5		NA	NA		NA	NA	
Reference Time (s)		37.4			11.2			24.4			69.2	
Adj Reference Time (s)		41.9			15.7			28.9			73.7	
Split Option												
Ref Time Combined (s)	0.0	4.8		0.0	11.5		0.0	19.8		0.0	12.8	
Ref Time Seperate (s)	4.1	0.4		0.5	0.5		0.3	19.1		5.6	8.4	
Reference Time (s)	4.8	4.8		11.5	11.5		19.8	19.8		12.8	12.8	
Adj Reference Time (s)	14.5	14.5		16.0	16.0		24.3	24.3		19.5	19.5	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	41.9	73.7	
Split Option (s)	30.5	43.8	
Minimum (s)	30.5	43.8	74.2

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	61.9%	ICU Level of Service	B

Reference Times and Phasing Options do not represent an optimized timing plan.

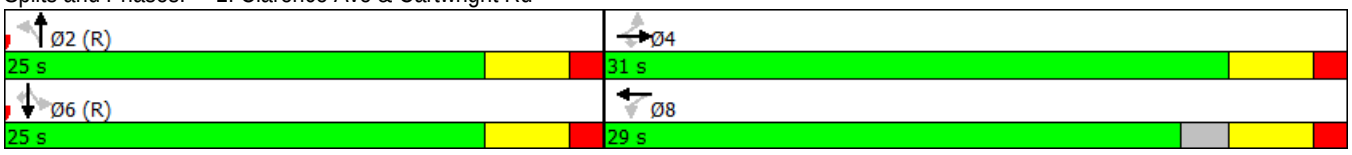
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	5	5	7	6	139	5	294	5	82	242	42
Future Volume (vph)	60	5	5	7	6	139	5	294	5	82	242	42
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		1.00			1.00			1.00			0.95	
Frt		0.99			0.89			1.00			0.98	
Flt Protected		0.96			1.00			1.00			0.99	
Satd. Flow (prot)		1757			1634			1841			3413	
Flt Permitted		0.70			0.98			0.99			0.70	
Satd. Flow (perm)		1272			1607			1816			2429	
Peak-hour factor, PHF	0.68	0.50	0.50	0.38	0.38	0.75	0.50	0.79	0.38	0.68	0.80	0.72
Adj. Flow (vph)	88	10	10	18	16	185	10	372	13	121	302	58
RTOR Reduction (vph)	0	5	0	0	96	0	0	2	0	0	19	0
Lane Group Flow (vph)	0	103	0	0	123	0	0	393	0	0	463	0
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)		26.5			26.5			19.5			19.5	
Effective Green, g (s)		26.5			26.5			19.5			19.5	
Actuated g/C Ratio		0.48			0.48			0.35			0.35	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Lane Grp Cap (vph)		612			774			643			861	
v/s Ratio Prot												
v/s Ratio Perm		c0.08			0.08			c0.22			0.19	
v/c Ratio		0.17			0.16			0.61			0.54	
Uniform Delay, d1		8.0			8.0			14.6			14.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.6			0.4			4.3			2.4	
Delay (s)		8.6			8.4			18.9			16.6	
Level of Service		A			A			B			B	
Approach Delay (s)		8.6			8.4			18.9			16.6	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	264	5	5	5	5	6	193	5	111	116
Future Volume (vph)	264	5	5	5	5	6	193	5	111	116
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		4			8		2		6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	4	4	4	8	8	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	31.0	31.0	31.0	29.0	29.0	25.0	25.0	25.0	25.0	25.0
Total Split (%)	55.4%	55.4%	55.4%	51.8%	51.8%	44.6%	44.6%	44.6%	44.6%	44.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)		2.0	2.0		2.0		2.0	2.0	2.0	2.0
Total Lost Time (s)		7.0	7.0		7.0		7.0	7.0	7.0	7.0
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)		24.0	24.0		24.0		18.0	18.0	18.0	18.0
Actuated g/C Ratio		0.43	0.43		0.43		0.32	0.32	0.32	0.32
v/c Ratio		0.61	0.01		0.08		0.40	0.03	0.22	0.28
Control Delay		18.3	0.0		6.2		16.8	13.4	15.2	4.2
Queue Delay		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		18.3	0.0		6.2		16.8	13.4	15.2	4.2
LOS		B	A		A		B	B	B	A
Approach Delay		17.9			6.2		16.8		9.1	
Approach LOS		B			A		B		A	

Intersection Summary	
Cycle Length: 56	
Actuated Cycle Length: 56	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 14.0	Intersection LOS: B
Intersection Capacity Utilization 49.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Clarence Ave & Cartwright Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	264	5	5	5	5	12	6	193	5	5	111	116
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lost Time (s)	7.0	7.0	7.0	7.0	7.0	6.0	7.0	7.0	6.0	7.0	7.0	7.0
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	269	5	0	22	0	0	204	0	5	111	116
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.91	0.85	0.95	0.99	0.85	0.95	1.00	0.85
Saturated Flow (vph)	0	1759	1573	0	1679	0	0	1840	0	1758	1850	1573
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.4			0.0			0.0			8.9
Adj Reference Time (s)			12.0			0.0			0.0			15.9
Permitted Option												
Adj Saturation A (vph)	0	525		0	375		0	1297		169	1850	
Reference Time A (s)	0.0	61.5		0.0	7.0		0.0	18.9		3.6	7.2	
Adj Saturation B (vph	0	0		0	0		0	0		NA	NA	
Reference Time B (s)	26.0	26.3		8.3	9.6		8.4	21.3		NA	NA	
Reference Time (s)		26.3			7.0			18.9			7.2	
Adj Reference Time (s)		33.3			14.0			25.9			14.2	
Split Option												
Ref Time Combined (s)	0.0	18.3		0.0	1.6		0.0	13.3		0.3	7.2	
Ref Time Seperate (s)	18.0	0.3		0.3	0.4		0.4	12.6		0.3	7.2	
Reference Time (s)	18.3	18.3		1.6	1.6		13.3	13.3		7.2	7.2	
Adj Reference Time (s)	25.3	25.3		12.0	12.0		20.3	20.3		14.2	14.2	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	33.3	25.9	
Split Option (s)	37.3	34.5	
Minimum (s)	33.3	25.9	59.2

Right Turns	EBR	SBR
Adj Reference Time (s)	12.0	15.9
Cross Thru Ref Time (s)	14.2	12.0
Oncoming Left Ref Time (s)	12.0	20.3
Combined (s)	38.2	48.2

Intersection Summary			
Intersection Capacity Utilization	49.4%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

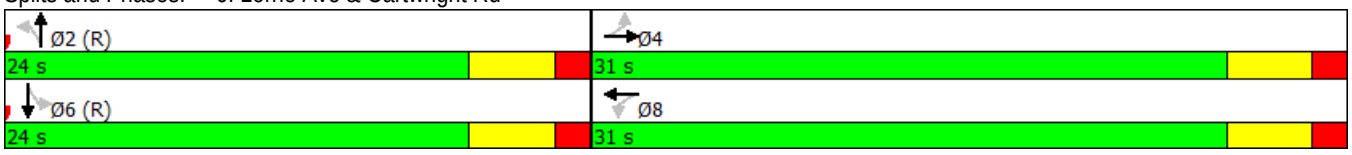
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	264	5	5	5	5	12	6	193	5	5	111	116
Future Volume (vph)	264	5	5	5	5	12	6	193	5	5	111	116
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)		7.0	7.0		7.0			7.0		7.0	7.0	7.0
Lane Util. Factor		1.00	1.00		1.00			1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.93			0.99		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.99			1.00		0.95	1.00	1.00
Satd. Flow (prot)		1766	1574		1698			1828		1759	1852	1574
Flt Permitted		0.69	1.00		0.91			0.99		0.66	1.00	1.00
Satd. Flow (perm)		1286	1574		1566			1813		1218	1852	1574
Peak-hour factor, PHF	0.81	0.50	0.75	0.43	0.43	0.43	0.75	0.92	0.25	0.42	0.84	0.66
Adj. Flow (vph)	326	10	7	12	12	28	8	210	20	12	132	176
RTOR Reduction (vph)	0	0	4	0	16	0	0	6	0	0	0	119
Lane Group Flow (vph)	0	336	3	0	36	0	0	232	0	12	132	57
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		26.0	26.0		26.0			20.0		20.0	20.0	20.0
Effective Green, g (s)		24.0	24.0		24.0			18.0		18.0	18.0	18.0
Actuated g/C Ratio		0.43	0.43		0.43			0.32		0.32	0.32	0.32
Clearance Time (s)		5.0	5.0		5.0			5.0		5.0	5.0	5.0
Lane Grp Cap (vph)		551	674		671			582		391	595	505
v/s Ratio Prot											0.07	
v/s Ratio Perm		c0.26	0.00		0.02			c0.13		0.01		0.04
v/c Ratio		0.61	0.00		0.05			0.40		0.03	0.22	0.11
Uniform Delay, d1		12.4	9.2		9.4			14.8		13.0	13.9	13.4
Progression Factor		1.00	1.00		1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2		5.0	0.0		0.2			2.0		0.1	0.9	0.4
Delay (s)		17.3	9.2		9.5			16.8		13.2	14.7	13.8
Level of Service		B	A		A			B		B	B	B
Approach Delay (s)		17.2			9.5			16.8			14.2	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	56.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	45	5	7	6	5	236	82	182
Future Volume (vph)	45	5	7	6	5	236	82	182
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	31.0	31.0	31.0	31.0	24.0	24.0	24.0	24.0
Total Split (s)	31.0	31.0	31.0	31.0	24.0	24.0	24.0	24.0
Total Split (%)	56.4%	56.4%	56.4%	56.4%	43.6%	43.6%	43.6%	43.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)		2.0		2.0		2.0		2.0
Total Lost Time (s)		7.0		7.0		7.0		7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)		24.0		24.0		17.0		17.0
Actuated g/C Ratio		0.44		0.44		0.31		0.31
v/c Ratio		0.15		0.27		0.57		0.49
Control Delay		9.4		3.7		20.6		16.8
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		9.4		3.7		20.6		16.8
LOS		A		A		C		B
Approach Delay		9.4		3.7		20.6		16.8
Approach LOS		A		A		C		B

Intersection Summary	
Cycle Length: 55	
Actuated Cycle Length: 55	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 14.6	Intersection LOS: B
Intersection Capacity Utilization 59.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: Lorne Ave & Cartwright Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	5	7	6	139	5	236	5	82	182	32
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lost Time (s)	7.0	7.0	6.0	7.0	7.0	6.0	7.0	7.0	6.0	7.0	7.0	6.0
Minimum Green (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	55	0	0	152	0	0	246	0	0	296	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.86	0.85	0.95	1.00	0.85	0.95	0.97	0.85
Saturated Flow (vph)	0	1750	0	0	1593	0	0	1842	0	0	3417	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	233		0	1620		0	1430		0	149	
Reference Time A (s)	0.0	28.3		0.0	11.3		0.0	20.6		0.0	66.2	
Adj Saturation B (vph	NA	NA		0	0		NA	NA		NA	NA	
Reference Time B (s)	NA	NA		8.5	19.5		NA	NA		NA	NA	
Reference Time (s)		28.3			11.3			20.6			66.2	
Adj Reference Time (s)		35.3			18.3			27.6			73.2	
Split Option												
Ref Time Combined (s)	0.0	3.8		0.0	11.5		0.0	16.0		0.0	10.4	
Ref Time Seperate (s)	3.1	0.4		0.5	0.5		0.3	15.4		5.6	6.3	
Reference Time (s)	3.8	3.8		11.5	11.5		16.0	16.0		10.4	10.4	
Adj Reference Time (s)	12.0	12.0		18.5	18.5		23.0	23.0		17.4	17.4	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	35.3	73.2	
Split Option (s)	30.5	40.4	
Minimum (s)	30.5	40.4	70.9

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	59.1%	ICU Level of Service	B

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	5	5	7	6	139	5	236	5	82	182	32
Future Volume (vph)	45	5	5	7	6	139	5	236	5	82	182	32
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)		7.0			7.0			7.0			7.0	
Lane Util. Factor		1.00			1.00			1.00			0.95	
Frt		0.98			0.89			0.99			0.98	
Flt Protected		0.96			1.00			1.00			0.98	
Satd. Flow (prot)		1756			1634			1839			3407	
Flt Permitted		0.70			0.98			0.98			0.74	
Satd. Flow (perm)		1275			1605			1808			2557	
Peak-hour factor, PHF	0.68	0.50	0.50	0.38	0.38	0.75	0.50	0.79	0.38	0.68	0.80	0.72
Adj. Flow (vph)	66	10	10	18	16	185	10	299	13	121	228	44
RTOR Reduction (vph)	0	6	0	0	104	0	0	3	0	0	18	0
Lane Group Flow (vph)	0	80	0	0	115	0	0	319	0	0	375	0
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)		26.0			26.0			19.0			19.0	
Effective Green, g (s)		24.0			24.0			17.0			17.0	
Actuated g/C Ratio		0.44			0.44			0.31			0.31	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		556			700			558			790	
v/s Ratio Prot												
v/s Ratio Perm		0.06			c0.07			c0.18			0.15	
v/c Ratio		0.14			0.16			0.57			0.47	
Uniform Delay, d1		9.3			9.4			15.9			15.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.5			0.5			4.2			2.0	
Delay (s)		9.9			9.9			20.2			17.4	
Level of Service		A			A			C			B	
Approach Delay (s)		9.9			9.9			20.2			17.4	
Approach LOS		A			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	59.1%	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												
Volume (vph)	193	5	10	5	5	10	5	174	5	5	247	284
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	198	10	0	20	0	0	184	0	5	247	284
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.91	0.85	0.95	0.99	0.85	0.95	1.00	0.85
Saturated Flow (vph)	0	1712	1530	0	1644	0	0	1790	0	1710	1800	1530
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.8			0.0			0.0			22.3
Adj Reference Time (s)			8.0			0.0			0.0			26.3
Permitted Option												
Adj Saturation A (vph)	0	553		0	340		0	1291		160	1800	
Reference Time A (s)	0.0	43.0		0.0	7.1		0.0	17.1		3.7	16.5	
Adj Saturation B (vph	0	0		0	0		NA	NA		NA	NA	
Reference Time B (s)	21.5	21.9		8.4	9.5		NA	NA		NA	NA	
Reference Time (s)		21.9			7.1			17.1			16.5	
Adj Reference Time (s)		25.9			11.1			21.1			20.5	
Split Option												
Ref Time Combined (s)	0.0	13.9		0.0	1.5		0.0	12.3		0.4	16.5	
Ref Time Seperate (s)	13.5	0.3		0.4	0.4		0.4	11.6		0.4	16.5	
Reference Time (s)	13.9	13.9		1.5	1.5		12.3	12.3		16.5	16.5	
Adj Reference Time (s)	17.9	17.9		8.0	8.0		16.3	16.3		20.5	20.5	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	25.9	21.1	
Split Option (s)	25.9	36.8	
Minimum (s)	25.9	21.1	47.0

Right Turns	EBR	SBR
Adj Reference Time (s)	8.0	26.3
Cross Thru Ref Time (s)	20.5	8.0
Oncoming Left Ref Time (s)	8.0	16.3
Combined (s)	36.5	50.6

Intersection Summary			
Intersection Capacity Utilization	42.2%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	193	5	10	5	5	10	5	174	5	5	247	284
Future Volume (Veh/h)	193	5	10	5	5	10	5	174	5	5	247	284
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.25	0.62	0.25	0.25	0.50	0.38	0.92	0.25	0.50	0.87	0.85
Hourly flow rate (vph)	230	20	16	20	20	20	13	189	20	10	284	334
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)			3									
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	559	539	284	547	863	199	618			209		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	559	539	284	547	863	199	618			209		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	43	95	98	95	93	98	99			99		
cM capacity (veh/h)	401	441	757	418	287	845	967			1368		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2	SB 3
Volume Total	266	60	222	10	284	334
Volume Left	230	20	13	10	0	0
Volume Right	16	20	20	0	0	334
cSH	431	425	967	1368	1700	1700
Volume to Capacity	0.62	0.14	0.01	0.01	0.17	0.20
Queue Length 95th (m)	30.8	3.7	0.3	0.2	0.0	0.0
Control Delay (s)	26.2	14.9	0.6	7.7	0.0	0.0
Lane LOS	D	B	A	A		
Approach Delay (s)	26.2	14.9	0.6	0.1		
Approach LOS	D	B				

Intersection Summary				
Average Delay	6.9			
Intersection Capacity Utilization	42.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	193	5	10	5	5	10	5	174	5	5	247	284
Future Vol, veh/h	193	5	10	5	5	10	5	174	5	5	247	284
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	-	-	-	-	200	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	25	62	25	25	50	38	92	25	50	87	85
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	230	20	16	20	20	20	13	189	20	10	284	334

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	549	539	284	539	529	199	284	0	0	209	0	0
Stage 1	304	304	-	225	225	-	-	-	-	-	-	-
Stage 2	245	235	-	314	304	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	448	451	757	455	457	845	1284	-	-	1368	-	-
Stage 1	708	665	-	780	719	-	-	-	-	-	-	-
Stage 2	761	712	-	699	665	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	417	443	757	424	449	845	1284	-	-	1368	-	-
Mov Cap-2 Maneuver	417	443	-	424	449	-	-	-	-	-	-	-
Stage 1	700	660	-	771	711	-	-	-	-	-	-	-
Stage 2	714	704	-	659	660	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	24.6	12.8	0.5	0.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1284	-	-	419	757	520	1368	-	-
HCM Lane V/C Ratio	0.01	-	-	0.596	0.021	0.115	0.007	-	-
HCM Control Delay (s)	7.8	0	-	25.5	9.9	12.8	7.7	-	-
HCM Lane LOS	A	A	-	D	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	3.8	0.1	0.4	0	-	-

Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations												
Volume (vph)	26	5	72	5	64	95	127	5	5	5	5	32
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right				No			No	No			No	No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	0	108	0	0	291	0	0	0	47	0	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.98	0.85	0.95	0.92	0.85	0.85	0.95	0.88	0.85	0.85
Saturated Flow (vph)	0	0	1762	0	0	1659	0	0	0	1579	0	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)			0.00			0.00				0.00		
Protected Option Allowed			No			No				No		
Reference Time (s)				0.0			0.0	0.0			0.0	0.0
Adj Reference Time (s)				0.0			0.0	0.0			0.0	0.0
Permitted Option												
Adj Saturation A (vph)	0	0	1188		0	1355			0	1551		
Reference Time A (s)	0.0	0.0	10.9		0.0	25.8			0.0	3.6		
Adj Saturation B (vph	NA	NA	NA		0	0			0	0		
Reference Time B (s)	NA	NA	NA		12.5	29.0			8.4	11.6		
Reference Time (s)			10.9			25.8				3.6		
Adj Reference Time (s)			14.9			29.8				8.0		
Split Option												
Ref Time Combined (s)	0.0	0.0	7.4		0.0	21.0			0.0	3.6		
Ref Time Seperate (s)	1.8	0.4	4.8		4.5	6.9			0.4	0.4		
Reference Time (s)	7.4	7.4	7.4		21.0	21.0			3.6	3.6		
Adj Reference Time (s)	11.4	11.4	11.4		25.0	25.0			8.0	8.0		

Summary	EB WB	NB SB	SW	Combined
Protected Option (s)	NA	NA	NA	
Permitted Option (s)	29.8	24.7	Err	
Split Option (s)	36.4	24.7	8.0	
Minimum (s)	29.8	24.7	8.0	62.5

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	52.1%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	SBL2	SBL	SBT	SBR	SWL2	SWL	SWR	SWR2
Lane Configurations								
Volume (vph)	5	75	15	79	5	5	5	5
Pedestrians								
Ped Button								
Pedestrian Timing (s)								
Free Right				No			No	No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	0	174	0	0	20	0	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.91	0.85	0.95	0.90	0.85	0.85
Saturated Flow (vph)	0	0	1639	0	0	1623	0	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)			0.00			0.00		
Protected Option Allowed			No			No		
Reference Time (s)				0.0			0.0	0.0
Adj Reference Time (s)				0.0			0.0	0.0
Permitted Option								
Adj Saturation A (vph)	0	0	560		0	108		
Reference Time A (s)	0.0	0.0	37.3		0.0	22.2		
Adj Saturation B (vph	0	0	0		NA	NA		
Reference Time B (s)	8.4	13.3	20.7		NA	NA		
Reference Time (s)			20.7					
Adj Reference Time (s)			24.7					
Split Option								
Ref Time Combined (s)	0.0	0.0	12.7		0.0	1.5		
Ref Time Seperate (s)	0.4	5.3	1.1		0.4	0.4		
Reference Time (s)	12.7	12.7	12.7		1.5	1.5		
Adj Reference Time (s)	16.7	16.7	16.7		8.0	8.0		

Summary

Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Right Turn Channelized												
Traffic Volume (veh/h)	26	5	72	5	64	95	127	5	5	5	5	32
Future Volume (veh/h)	26	5	72	5	64	95	127	5	5	5	5	32
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	29	6	80	6	71	106	141	6	6	6	6	36
Approach Volume (veh/h)			121			324				54		
Crossing Volume (veh/h)			189			59				210		
High Capacity (veh/h)			1194			1322				1175		
High v/c (veh/h)			0.10			0.25				0.05		
Low Capacity (veh/h)			988			1105				971		
Low v/c (veh/h)			0.12			0.29				0.06		

Intersection Summary					
Maximum v/c High	0.25				
Maximum v/c Low	0.29				
Intersection Capacity Utilization	52.1%	ICU Level of Service		A	

Movement	SBL2	SBL	SBT	SBR	SWL2	SWL	SWR	SWR2
Right Turn Channelized								
Traffic Volume (veh/h)	5	75	15	79	5	5	5	5
Future Volume (veh/h)	5	75	15	79	5	5	5	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	83	17	88	6	6	6	6
Approach Volume (veh/h)			194			24		
Crossing Volume (veh/h)			201			359		
High Capacity (veh/h)			1183			1044		
High v/c (veh/h)			0.16			0.02		
Low Capacity (veh/h)			978			853		
Low v/c (veh/h)			0.20			0.03		

Intersection Summary

Intersection	
Intersection Delay, s/veh	5.9
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	121	324	54	194
Demand Flow Rate, veh/h	122	327	54	196
Vehicles Circulating, veh/h	191	59	212	203
Vehicles Exiting, veh/h	208	207	101	183
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.1	6.5	4.5	6.1
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	122	327	54	196
Cap Entry Lane, veh/h	933	1065	914	922
Entry HV Adj Factor	0.991	0.991	0.999	0.989
Flow Entry, veh/h	121	324	54	194
Cap Entry, veh/h	925	1055	913	912
V/C Ratio	0.131	0.307	0.059	0.213
Control Delay, s/veh	5.1	6.5	4.5	6.1
LOS	A	A	A	A
95th %tile Queue, veh	0	1	0	1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Approach	SW
Entry Lanes	1
Conflicting Circle Lanes	1
Adj Approach Flow, veh/h	24
Demand Flow Rate, veh/h	24
Vehicles Circulating, veh/h	362
Vehicles Exiting, veh/h	24
Follow-Up Headway, s	3.186
Ped Vol Crossing Leg, #/h	0
Ped Cap Adj	1.000
Approach Delay, s/veh	4.9
Approach LOS	A

Lane	Left
Designated Moves	LR
Assumed Moves	LR
RT Channelized	
Lane Util	1.000
Critical Headway, s	5.193
Entry Flow, veh/h	24
Cap Entry Lane, veh/h	787
Entry HV Adj Factor	0.998
Flow Entry, veh/h	24
Cap Entry, veh/h	785
V/C Ratio	0.031
Control Delay, s/veh	4.9
LOS	A
95th %tile Queue, veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	51	14	5	19	6	86	5	258	13	226	268	59
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	70	0	0	111	0	0	276	0	0	553	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.88	0.85	0.95	0.99	0.85	0.95	0.96	0.85
Saturated Flow (vph)	0	1716	0	0	1577	0	0	1786	0	0	3303	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	534		0	1628		0	1421		0	140	
Reference Time A (s)	0.0	15.7		0.0	8.2		0.0	23.3		0.0	193.7	
Adj Saturation B (vph	0	0		0	0		NA	NA		NA	NA	
Reference Time B (s)	11.6	12.9		9.3	16.4		NA	NA		NA	NA	
Reference Time (s)		12.9			8.2			23.3			193.7	
Adj Reference Time (s)		16.9			12.2			27.3			197.7	
Split Option												
Ref Time Combined (s)	0.0	4.9		0.0	8.4		0.0	18.5		0.0	20.1	
Ref Time Seperate (s)	3.6	1.0		1.3	0.5		0.4	17.3		15.9	9.6	
Reference Time (s)	4.9	4.9		8.4	8.4		18.5	18.5		20.1	20.1	
Adj Reference Time (s)	8.9	8.9		12.4	12.4		22.5	22.5		24.1	24.1	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	16.9	197.7	
Split Option (s)	21.3	46.6	
Minimum (s)	16.9	46.6	63.5

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	52.9%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	14	5	19	6	86	5	258	13	226	268	59
Future Volume (Veh/h)	51	14	5	19	6	86	5	258	13	226	268	59
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.36	0.50	0.64	0.75	0.80	0.25	0.87	0.50	0.72	0.66	0.75
Hourly flow rate (vph)	71	39	10	30	8	108	20	297	26	314	406	79
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1536	1436	242	1210	1463	310	485			323		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1536	1436	242	1210	1463	310	485			323		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	60	99	61	92	84	98			75		
cM capacity (veh/h)	50	98	761	77	94	689	1081			1241		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	120	146	343	517	282
Volume Left	71	30	20	314	0
Volume Right	10	108	26	0	79
cSH	66	231	1081	1241	1700
Volume to Capacity	1.82	0.63	0.02	0.25	0.17
Queue Length 95th (m)	82.9	28.9	0.4	7.7	0.0
Control Delay (s)	526.9	44.2	0.7	6.4	0.0
Lane LOS	F	E	A	A	
Approach Delay (s)	526.9	44.2	0.7	4.1	
Approach LOS	F	E			

Intersection Summary				
Average Delay	52.0			
Intersection Capacity Utilization	52.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	49.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	51	14	5	19	6	86	5	258	13	226	268	59
Future Vol, veh/h	51	14	5	19	6	86	5	258	13	226	268	59
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	36	50	64	75	80	25	87	50	72	66	75
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	71	39	10	30	8	108	20	297	26	314	406	79

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1480	1436	242	1200	1463	310	485	0	0	323	0	0
Stage 1	1073	1073	-	350	350	-	-	-	-	-	-	-
Stage 2	407	363	-	850	1113	-	-	-	-	-	-	-
Critical Hdwy	7.315	6.515	6.915	7.315	6.515	6.215	4.115	-	-	4.115	-	-
Critical Hdwy Stg 1	6.515	5.515	-	6.115	5.515	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.115	5.515	-	6.515	5.515	-	-	-	-	-	-	-
Follow-up Hdwy	3.5095	4.0095	3.3095	3.5095	4.0095	3.3095	2.2095	-	-	2.2095	-	-
Pot Cap-1 Maneuver	96	134	762	152	129	732	1082	-	-	1242	-	-
Stage 1	237	297	-	668	634	-	-	-	-	-	-	-
Stage 2	622	626	-	324	285	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 55	85	762	71	82	732	1082	-	-	1242	-	-
Mov Cap-2 Maneuver	~ 55	85	-	71	82	-	-	-	-	-	-	-
Stage 1	232	193	-	653	619	-	-	-	-	-	-	-
Stage 2	512	612	-	166	185	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 496	48.8	0.5	3.8
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1082	-	-	68	219	1242	-	-
HCM Lane V/C Ratio	0.018	-	-	1.761	0.663	0.253	-	-
HCM Control Delay (s)	8.4	0	-	$ 496	48.8	8.9	0.6	-
HCM Lane LOS	A	A	-	F	E	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	10.7	4.1	1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	5	7	37	5	6	5	105	26	20	174	55
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	17	0	0	48	0	0	110	26	0	249	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.92	0.85	0.95	0.94	0.85	0.95	1.00	0.85	0.95	0.96	0.85
Saturated Flow (vph)	0	1664	0	0	1698	0	0	1796	1530	0	1733	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			2.0			0.0
Adj Reference Time (s)			0.0			0.0			8.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	1729		0	746		0	1540		0	797	
Reference Time A (s)	0.0	1.2		0.0	7.7		0.0	8.6		0.0	37.5	
Adj Saturation B (vph	0	0		0	0		NA	NA		0	0	
Reference Time B (s)	8.4	9.2		10.6	11.4		NA	NA		9.4	25.2	
Reference Time (s)		1.2			7.7			8.6			25.2	
Adj Reference Time (s)		8.0			11.7			12.6			29.2	
Split Option												
Ref Time Combined (s)	0.0	1.2		0.0	3.4		0.0	7.4		0.0	17.2	
Ref Time Seperate (s)	0.4	0.4		2.6	0.4		0.4	7.0		1.4	12.0	
Reference Time (s)	1.2	1.2		3.4	3.4		7.4	7.4		17.2	17.2	
Adj Reference Time (s)	8.0	8.0		8.0	8.0		11.4	11.4		21.2	21.2	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	11.7	29.2	
Split Option (s)	16.0	32.6	
Minimum (s)	11.7	29.2	41.0

Right Turns	NBR
Adj Reference Time (s)	8.0
Cross Thru Ref Time (s)	8.0
Oncoming Left Ref Time (s)	21.2
Combined (s)	37.2

Intersection Summary			
Intersection Capacity Utilization	34.1%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	5	7	37	5	6	5	105	26	20	174	55
Future Volume (Veh/h)	5	5	7	37	5	6	5	105	26	20	174	55
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	6	8	41	6	7	6	117	29	22	193	61
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	406	426	224	408	427	117	254			146		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	406	426	224	408	427	117	254			146		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	92	99	99	100			98		
cM capacity (veh/h)	539	512	818	537	511	938	1317			1442		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	20	54	123	29	276
Volume Left	6	41	6	0	22
Volume Right	8	7	0	29	61
cSH	613	565	1317	1700	1442
Volume to Capacity	0.03	0.10	0.00	0.02	0.02
Queue Length 95th (m)	0.8	2.4	0.1	0.0	0.4
Control Delay (s)	11.1	12.0	0.4	0.0	0.7
Lane LOS	B	B	A		A
Approach Delay (s)	11.1	12.0	0.3		0.7
Approach LOS	B	B			

Intersection Summary				
Average Delay	2.2			
Intersection Capacity Utilization	34.1%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	5	7	37	5	6	5	105	26	20	174	55
Future Vol, veh/h	5	5	7	37	5	6	5	105	26	20	174	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	250	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	6	6	8	41	6	7	6	117	29	22	193	61

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	402	396	224	403	427	117	254	0	0	117	0	0
Stage 1	268	268	-	128	128	-	-	-	-	-	-	-
Stage 2	134	128	-	275	299	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	561	543	818	560	521	938	1317	-	-	1478	-	-
Stage 1	740	689	-	878	792	-	-	-	-	-	-	-
Stage 2	872	792	-	733	668	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	543	531	818	541	510	938	1317	-	-	1478	-	-
Mov Cap-2 Maneuver	543	531	-	541	510	-	-	-	-	-	-	-
Stage 1	736	677	-	874	788	-	-	-	-	-	-	-
Stage 2	855	788	-	708	657	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.9	12	0.3	0.6
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1317	-	-	625	567	1478	-	-
HCM Lane V/C Ratio	0.004	-	-	0.03	0.094	0.015	-	-
HCM Control Delay (s)	7.7	0	-	10.9	12	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	32	240	3	0	290
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No		No		
Ideal Flow	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	0	32	243	0	0	290
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.85	1.00	0.85	0.95	1.00
Saturated Flow (vph)	0	1530	1797	0	0	1800
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00		0.00			0.00
Protected Option Allowed	No		Yes			Yes
Reference Time (s)		2.5	16.2	0.0	0.0	19.3
Adj Reference Time (s)		8.0	20.2	0.0	0.0	23.3
Permitted Option						
Adj Saturation A (vph)	0		1797		0	1800
Reference Time A (s)	0.0		16.2		0.0	19.3
Adj Saturation B (vph	NA		NA		NA	NA
Reference Time B (s)	NA		NA		NA	NA
Reference Time (s)			16.2			19.3
Adj Reference Time (s)			20.2			23.3
Split Option						
Ref Time Combined (s)	0.0		16.2		0.0	19.3
Ref Time Seperate (s)	0.0		16.0		0.0	19.3
Reference Time (s)	0.0		16.2		19.3	19.3
Adj Reference Time (s)	0.0		20.2		23.3	23.3

Summary	WB	NB SB	Combined
Protected Option (s)	NA	23.3	
Permitted Option (s)	Err	23.3	
Split Option (s)	0.0	43.6	
Minimum (s)	0.0	23.3	23.3

Right Turns	WBR
Adj Reference Time (s)	8.0
Cross Thru Ref Time (s)	20.2
Oncoming Left Ref Time (s)	0.0
Combined (s)	28.2

Intersection Summary			
Intersection Capacity Utilization	23.5%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	32	240	3	0	290
Future Volume (Veh/h)	0	32	240	3	0	290
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	36	267	3	0	322
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	590	268			270	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	590	268			270	
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	95			100	
cM capacity (veh/h)	472	773			1299	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	36	270	322
Volume Left	0	0	0
Volume Right	36	3	0
cSH	773	1700	1700
Volume to Capacity	0.05	0.16	0.19
Queue Length 95th (m)	1.1	0.0	0.0
Control Delay (s)	9.9	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.9	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	23.5%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	32	240	3	0	290
Future Vol, veh/h	0	32	240	3	0	290
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	0	36	267	3	0	322

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	268	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.21	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.309	-	-	-	-
Pot Cap-1 Maneuver	0	773	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	773	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	773	-
HCM Lane V/C Ratio	-	-	0.046	-
HCM Control Delay (s)	-	-	9.9	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	5	5	22	5	21	10
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No				No
Ideal Flow	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	10	0	22	5	21	10
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.90	0.85	0.95	1.00	1.00	0.85
Saturated Flow (vph)	1623	0	1710	1800	1800	1530
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00			0.00	0.00	
Protected Option Allowed	No			Yes	Yes	
Reference Time (s)		0.0	1.5	0.3	1.4	0.8
Adj Reference Time (s)		0.0	8.0	8.0	8.0	8.0
Permitted Option						
Adj Saturation A (vph)	108		114	1800	1800	
Reference Time A (s)	11.1		23.2	0.3	1.4	
Adj Saturation B (vph	NA		0	1800	1800	
Reference Time B (s)	NA		9.5	0.3	1.4	
Reference Time (s)				9.5	1.4	
Adj Reference Time (s)				13.5	8.0	
Split Option						
Ref Time Combined (s)	0.7		1.5	0.3	1.4	
Ref Time Seperate (s)	0.4		1.5	0.3	1.4	
Reference Time (s)	0.7		1.5	1.5	1.4	
Adj Reference Time (s)	8.0		8.0	8.0	8.0	

Summary	EB	NB SB	Combined
Protected Option (s)	NA	16.0	
Permitted Option (s)	Err	13.5	
Split Option (s)	8.0	16.0	
Minimum (s)	8.0	13.5	21.5

Right Turns	SBR
Adj Reference Time (s)	8.0
Cross Thru Ref Time (s)	0.0
Oncoming Left Ref Time (s)	8.0
Combined (s)	16.0

Intersection Summary			
Intersection Capacity Utilization	18.0%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	5	22	5	21	10
Future Volume (Veh/h)	5	5	22	5	21	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	6	24	6	23	11
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	77	23	34			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	77	23	34			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	98			
cM capacity (veh/h)	914	1057	1584			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	12	24	6	23	11
Volume Left	6	24	0	0	0
Volume Right	6	0	0	0	11
cSH	980	1584	1700	1700	1700
Volume to Capacity	0.01	0.02	0.00	0.01	0.01
Queue Length 95th (m)	0.3	0.4	0.0	0.0	0.0
Control Delay (s)	8.7	7.3	0.0	0.0	0.0
Lane LOS	A	A			
Approach Delay (s)	8.7	5.8		0.0	
Approach LOS	A				

Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	18.0%	ICU Level of Service	A	
Analysis Period (min)	15			

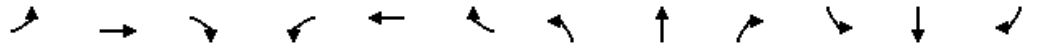
Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	5	22	5	21	10
Future Vol, veh/h	5	5	22	5	21	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	250	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	6	6	24	6	23	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	77	23	23	0	-	0
Stage 1	23	-	-	-	-	-
Stage 2	54	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	928	1057	1599	-	-	-
Stage 1	1002	-	-	-	-	-
Stage 2	971	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	914	1057	1599	-	-	-
Mov Cap-2 Maneuver	914	-	-	-	-	-
Stage 1	1002	-	-	-	-	-
Stage 2	956	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	5.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1599	-	980	-	-
HCM Lane V/C Ratio	0.015	-	0.011	-	-
HCM Control Delay (s)	7.3	-	8.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	222	7	38	241	13	5	5	16	9	5	5
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	235	0	0	292	0	0	26	0	0	19	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.99	0.85	0.95	0.99	0.85	0.95	0.90	0.85	0.95	0.94	0.85
Saturated Flow (vph)	0	1790	0	0	1776	0	0	1618	0	0	1688	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	1696		0	845		0	1543		0	797	
Reference Time A (s)	0.0	16.6		0.0	41.5		0.0	2.0		0.0	2.9	
Adj Saturation B (vph	NA	NA		NA	NA		0	0		0	0	
Reference Time B (s)	NA	NA		NA	NA		8.4	9.9		8.6	9.4	
Reference Time (s)		16.6			41.5			2.0			2.9	
Adj Reference Time (s)		20.6			45.5			8.0			8.0	
Split Option												
Ref Time Combined (s)	0.0	15.8		0.0	19.7		0.0	1.9		0.0	1.4	
Ref Time Seperate (s)	0.4	14.9		2.7	16.2		0.4	0.4		0.6	0.4	
Reference Time (s)	15.8	15.8		19.7	19.7		1.9	1.9		1.4	1.4	
Adj Reference Time (s)	19.8	19.8		23.7	23.7		8.0	8.0		8.0	8.0	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	45.5	8.0	
Split Option (s)	43.5	16.0	
Minimum (s)	43.5	8.0	51.5

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	42.9%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	222	7	38	241	13	5	5	16	9	5	5
Future Volume (Veh/h)	6	222	7	38	241	13	5	5	16	9	5	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.38	0.52	0.50	0.68	0.85	0.65	0.50	0.25	0.57	0.75	0.50	0.25
Hourly flow rate (vph)	16	427	14	56	284	20	10	20	28	12	10	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	304			441			897	882	434	910	879	294
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304			441			897	882	434	910	879	294
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			95			96	93	96	95	96	97
cM capacity (veh/h)	1263			1124			236	268	624	220	270	748

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	457	360	58	42
Volume Left	16	56	10	12
Volume Right	14	20	28	20
cSH	1263	1124	359	355
Volume to Capacity	0.01	0.05	0.16	0.12
Queue Length 95th (m)	0.3	1.2	4.3	3.0
Control Delay (s)	0.4	1.7	17.0	16.5
Lane LOS	A	A	C	C
Approach Delay (s)	0.4	1.7	17.0	16.5
Approach LOS			C	C

Intersection Summary				
Average Delay	2.7			
Intersection Capacity Utilization	42.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	222	7	38	241	13	5	5	16	9	5	5
Future Vol, veh/h	6	222	7	38	241	13	5	5	16	9	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	52	50	68	85	65	50	25	57	75	50	25
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	16	427	14	56	284	20	10	20	28	12	10	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	304	0	0	441	0	0	886	881	434	895	878	294
Stage 1	-	-	-	-	-	-	466	466	-	405	405	-
Stage 2	-	-	-	-	-	-	420	415	-	490	473	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1263	-	-	1124	-	-	266	287	624	263	288	748
Stage 1	-	-	-	-	-	-	579	564	-	624	600	-
Stage 2	-	-	-	-	-	-	613	594	-	562	560	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1263	-	-	1124	-	-	237	265	624	223	266	748
Mov Cap-2 Maneuver	-	-	-	-	-	-	237	265	-	223	266	-
Stage 1	-	-	-	-	-	-	569	554	-	613	564	-
Stage 2	-	-	-	-	-	-	551	558	-	509	550	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	1.3	17	16.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	357	1263	-	-	1124	-	-	355
HCM Lane V/C Ratio	0.163	0.013	-	-	0.05	-	-	0.118
HCM Control Delay (s)	17	7.9	0	-	8.4	0	-	16.5
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.6	0	-	-	0.2	-	-	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	0	0	0	0	0
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No				No
Ideal Flow	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	0	0	0	0	0	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	0.95	1.00
Turning Factor (vph)	0.95	0.85	0.95	1.00	1.00	0.85
Saturated Flow (vph)	0	0	0	1800	3427	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00			0.00	0.00	
Protected Option Allowed	No			Yes	Yes	
Reference Time (s)		0.0	0.0	0.0	0.0	0.0
Adj Reference Time (s)		0.0	0.0	8.0	8.0	0.0
Permitted Option						
Adj Saturation A (vph)	0		0	1800	1714	
Reference Time A (s)	0.0		0.0	0.0	0.0	
Adj Saturation B (vph	NA		0	1800	3427	
Reference Time B (s)	NA		0.0	0.0	0.0	
Reference Time (s)				0.0	0.0	
Adj Reference Time (s)				8.0	8.0	
Split Option						
Ref Time Combined (s)	0.0		0.0	0.0	0.0	
Ref Time Seperate (s)	0.0		0.0	0.0	0.0	
Reference Time (s)	0.0		0.0	0.0	0.0	
Adj Reference Time (s)	0.0		0.0	0.0	0.0	

Summary	EB	NB SB	Combined
Protected Option (s)	NA	8.0	
Permitted Option (s)	Err	8.0	
Split Option (s)	0.0	0.0	
Minimum (s)	0.0	0.0	0.0

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0	0			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1026	1088	1629			

Direction, Lane #	NB 1	SB 1	SB 2
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			
Approach Delay (s)	0.0	0.0	
Approach LOS			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	193	5	10	5	5	10	7	230	5	5	328	284
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	198	10	0	20	0	0	242	0	5	328	284
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.91	0.85	0.95	1.00	0.85	0.95	1.00	0.85
Saturated Flow (vph)	0	1712	1530	0	1644	0	0	1792	0	1710	1800	1530
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.8			0.0			0.0			22.3
Adj Reference Time (s)			8.0			0.0			0.0			26.3
Permitted Option												
Adj Saturation A (vph)	0	553		0	340		0	1269		163	1800	
Reference Time A (s)	0.0	43.0		0.0	7.1		0.0	22.9		3.7	21.9	
Adj Saturation B (vph	0	0		0	0		NA	NA		NA	NA	
Reference Time B (s)	21.5	21.9		8.4	9.5		NA	NA		NA	NA	
Reference Time (s)		21.9			7.1			22.9			21.9	
Adj Reference Time (s)		25.9			11.1			26.9			25.9	
Split Option												
Ref Time Combined (s)	0.0	13.9		0.0	1.5		0.0	16.2		0.4	21.9	
Ref Time Seperate (s)	13.5	0.3		0.4	0.4		0.5	15.4		0.4	21.9	
Reference Time (s)	13.9	13.9		1.5	1.5		16.2	16.2		21.9	21.9	
Adj Reference Time (s)	17.9	17.9		8.0	8.0		20.2	20.2		25.9	25.9	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	25.9	26.9	
Split Option (s)	25.9	46.1	
Minimum (s)	25.9	26.9	52.8

Right Turns	EBR	SBR
Adj Reference Time (s)	8.0	26.3
Cross Thru Ref Time (s)	25.9	8.0
Oncoming Left Ref Time (s)	8.0	20.2
Combined (s)	41.9	54.5

Intersection Summary			
Intersection Capacity Utilization	45.4%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	193	5	10	5	5	10	7	230	5	5	328	284
Future Volume (Veh/h)	193	5	10	5	5	10	7	230	5	5	328	284
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.25	0.62	0.25	0.25	0.50	0.38	0.92	0.25	0.50	0.87	0.85
Hourly flow rate (vph)	230	20	16	20	20	20	18	250	20	10	377	334
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)			3									
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	723	703	377	711	1027	260	711			270		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	723	703	377	711	1027	260	711			270		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	25	94	98	94	91	97	98			99		
cM capacity (veh/h)	305	353	672	319	229	781	893			1299		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2	SB 3
Volume Total	266	60	288	10	377	334
Volume Left	230	20	18	10	0	0
Volume Right	16	20	20	0	0	334
cSH	325	342	893	1299	1700	1700
Volume to Capacity	0.82	0.18	0.02	0.01	0.22	0.20
Queue Length 95th (m)	52.9	4.8	0.5	0.2	0.0	0.0
Control Delay (s)	51.1	17.8	0.8	7.8	0.0	0.0
Lane LOS	F	C	A	A		
Approach Delay (s)	51.1	17.8	0.8	0.1		
Approach LOS	F	C				

Intersection Summary				
Average Delay	11.2			
Intersection Capacity Utilization	45.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	9.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	193	5	10	5	5	10	7	230	5	5	328	284
Future Vol, veh/h	193	5	10	5	5	10	7	230	5	5	328	284
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	250	-	-	-	-	-	-	200	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	25	62	25	25	50	38	92	25	50	87	85
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	230	20	16	20	20	20	18	250	20	10	377	334

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	714	704	377	704	694	260	377	0	0	270	0	0
Stage 1	397	397	-	297	297	-	-	-	-	-	-	-
Stage 2	317	307	-	407	397	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	348	363	672	353	368	781	1187	-	-	1299	-	-
Stage 1	631	605	-	714	669	-	-	-	-	-	-	-
Stage 2	696	663	-	623	605	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	318	354	672	323	359	781	1187	-	-	1299	-	-
Mov Cap-2 Maneuver	318	354	-	323	359	-	-	-	-	-	-	-
Stage 1	620	600	-	701	657	-	-	-	-	-	-	-
Stage 2	646	651	-	583	600	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	44.2	15	0.5	0.1
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1187	-	-	321	672	419	1299	-	-
HCM Lane V/C Ratio	0.016	-	-	0.778	0.024	0.143	0.008	-	-
HCM Control Delay (s)	8.1	0	-	46.4	10.5	15	7.8	-	-
HCM Lane LOS	A	A	-	E	B	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	6.2	0.1	0.5	0	-	-

Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations												
Volume (vph)	26	5	72	5	64	95	127	5	5	5	5	32
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right				No			No	No			No	No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	0	108	0	0	291	0	0	0	47	0	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.98	0.85	0.95	0.92	0.85	0.85	0.95	0.88	0.85	0.85
Saturated Flow (vph)	0	0	1762	0	0	1659	0	0	0	1579	0	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)			0.00			0.00				0.00		
Protected Option Allowed			No			No				No		
Reference Time (s)				0.0			0.0	0.0			0.0	0.0
Adj Reference Time (s)				0.0			0.0	0.0			0.0	0.0
Permitted Option												
Adj Saturation A (vph)	0	0	1188		0	1355			0	1551		
Reference Time A (s)	0.0	0.0	10.9		0.0	25.8			0.0	3.6		
Adj Saturation B (vph	NA	NA	NA		0	0			0	0		
Reference Time B (s)	NA	NA	NA		12.5	29.0			8.4	11.6		
Reference Time (s)			10.9			25.8				3.6		
Adj Reference Time (s)			14.9			29.8				8.0		
Split Option												
Ref Time Combined (s)	0.0	0.0	7.4		0.0	21.0			0.0	3.6		
Ref Time Seperate (s)	1.8	0.4	4.8		4.5	6.9			0.4	0.4		
Reference Time (s)	7.4	7.4	7.4		21.0	21.0			3.6	3.6		
Adj Reference Time (s)	11.4	11.4	11.4		25.0	25.0			8.0	8.0		

Summary	EB WB	NB SB	SW	Combined
Protected Option (s)	NA	NA	NA	
Permitted Option (s)	29.8	24.7	Err	
Split Option (s)	36.4	24.7	8.0	
Minimum (s)	29.8	24.7	8.0	62.5

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	52.1%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	SBL2	SBL	SBT	SBR	SWL2	SWL	SWR	SWR2
Lane Configurations								
Volume (vph)	5	75	15	79	5	5	5	5
Pedestrians								
Ped Button								
Pedestrian Timing (s)								
Free Right				No			No	No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	0	174	0	0	20	0	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.91	0.85	0.95	0.90	0.85	0.85
Saturated Flow (vph)	0	0	1639	0	0	1623	0	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)			0.00			0.00		
Protected Option Allowed			No			No		
Reference Time (s)				0.0			0.0	0.0
Adj Reference Time (s)				0.0			0.0	0.0
Permitted Option								
Adj Saturation A (vph)	0	0	560		0	108		
Reference Time A (s)	0.0	0.0	37.3		0.0	22.2		
Adj Saturation B (vph	0	0	0		NA	NA		
Reference Time B (s)	8.4	13.3	20.7		NA	NA		
Reference Time (s)			20.7					
Adj Reference Time (s)			24.7					
Split Option								
Ref Time Combined (s)	0.0	0.0	12.7		0.0	1.5		
Ref Time Seperate (s)	0.4	5.3	1.1		0.4	0.4		
Reference Time (s)	12.7	12.7	12.7		1.5	1.5		
Adj Reference Time (s)	16.7	16.7	16.7		8.0	8.0		

Summary

Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Right Turn Channelized												
Traffic Volume (veh/h)	26	5	72	5	64	95	127	5	5	5	5	32
Future Volume (veh/h)	26	5	72	5	64	95	127	5	5	5	5	32
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	29	6	80	6	71	106	141	6	6	6	6	36
Approach Volume (veh/h)			121			324				54		
Crossing Volume (veh/h)			189			59				210		
High Capacity (veh/h)			1194			1322				1175		
High v/c (veh/h)			0.10			0.25				0.05		
Low Capacity (veh/h)			988			1105				971		
Low v/c (veh/h)			0.12			0.29				0.06		

Intersection Summary					
Maximum v/c High	0.25				
Maximum v/c Low	0.29				
Intersection Capacity Utilization	52.1%	ICU Level of Service		A	

Movement	SBL2	SBL	SBT	SBR	SWL2	SWL	SWR	SWR2
Right Turn Channelized								
Traffic Volume (veh/h)	5	75	15	79	5	5	5	5
Future Volume (veh/h)	5	75	15	79	5	5	5	5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	83	17	88	6	6	6	6
Approach Volume (veh/h)			194			24		
Crossing Volume (veh/h)			201			359		
High Capacity (veh/h)			1183			1044		
High v/c (veh/h)			0.16			0.02		
Low Capacity (veh/h)			978			853		
Low v/c (veh/h)			0.20			0.03		

Intersection Summary

Intersection	
Intersection Delay, s/veh	5.9
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	121	324	54	194
Demand Flow Rate, veh/h	122	327	54	196
Vehicles Circulating, veh/h	191	59	212	203
Vehicles Exiting, veh/h	208	207	101	183
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.1	6.5	4.5	6.1
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	122	327	54	196
Cap Entry Lane, veh/h	933	1065	914	922
Entry HV Adj Factor	0.991	0.991	0.999	0.989
Flow Entry, veh/h	121	324	54	194
Cap Entry, veh/h	925	1055	913	912
V/C Ratio	0.131	0.307	0.059	0.213
Control Delay, s/veh	5.1	6.5	4.5	6.1
LOS	A	A	A	A
95th %tile Queue, veh	0	1	0	1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Approach	SW
Entry Lanes	1
Conflicting Circle Lanes	1
Adj Approach Flow, veh/h	24
Demand Flow Rate, veh/h	24
Vehicles Circulating, veh/h	362
Vehicles Exiting, veh/h	24
Follow-Up Headway, s	3.186
Ped Vol Crossing Leg, #/h	0
Ped Cap Adj	1.000
Approach Delay, s/veh	4.9
Approach LOS	A

Lane	Left
Designated Moves	LR
Assumed Moves	LR
RT Channelized	
Lane Util	1.000
Critical Headway, s	5.193
Entry Flow, veh/h	24
Cap Entry Lane, veh/h	787
Entry HV Adj Factor	0.998
Flow Entry, veh/h	24
Cap Entry, veh/h	785
V/C Ratio	0.031
Control Delay, s/veh	4.9
LOS	A
95th %tile Queue, veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	18	5	19	6	86	5	332	17	236	356	79
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	90	0	0	111	0	0	354	0	0	671	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.88	0.85	0.95	0.99	0.85	0.95	0.97	0.85
Saturated Flow (vph)	0	1719	0	0	1577	0	0	1786	0	0	3307	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	525		0	1633		0	1489		0	134	
Reference Time A (s)	0.0	20.6		0.0	8.2		0.0	28.5		0.0	212.0	
Adj Saturation B (vph	0	0		0	0		NA	NA		NA	NA	
Reference Time B (s)	12.7	14.3		9.3	16.4		NA	NA		NA	NA	
Reference Time (s)		14.3			8.2			28.5			212.0	
Adj Reference Time (s)		18.3			12.2			32.5			216.0	
Split Option												
Ref Time Combined (s)	0.0	6.3		0.0	8.4		0.0	23.8		0.0	24.3	
Ref Time Seperate (s)	4.7	1.2		1.3	0.5		0.4	22.3		16.6	12.8	
Reference Time (s)	6.3	6.3		8.4	8.4		23.8	23.8		24.3	24.3	
Adj Reference Time (s)	10.3	10.3		12.4	12.4		27.8	27.8		28.3	28.3	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	18.3	216.0	
Split Option (s)	22.7	56.1	
Minimum (s)	18.3	56.1	74.4

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	62.0%	ICU Level of Service	B

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	18	5	19	6	86	5	332	17	236	356	79
Future Volume (Veh/h)	67	18	5	19	6	86	5	332	17	236	356	79
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.36	0.50	0.64	0.75	0.80	0.25	0.87	0.50	0.72	0.66	0.75
Hourly flow rate (vph)	93	50	10	30	8	108	20	382	34	328	539	105
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	1798	1704	322	1400	1739	399	644			416		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1798	1704	322	1400	1739	399	644			416		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	22	99	0	87	82	98			71		
cM capacity (veh/h)	29	64	677	28	61	603	944			1147		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	153	146	436	598	374
Volume Left	93	30	20	328	0
Volume Right	10	108	34	0	105
cSH	38	107	944	1147	1700
Volume to Capacity	4.01	1.37	0.02	0.29	0.22
Queue Length 95th (m)	Err	77.8	0.5	9.0	0.0
Control Delay (s)	Err	286.4	0.6	6.6	0.0
Lane LOS	F	F	A	A	
Approach Delay (s)	Err	286.4	0.6	4.1	
Approach LOS	F	F			

Intersection Summary				
Average Delay	923.2			
Intersection Capacity Utilization	62.0%	ICU Level of Service	B	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	153.7

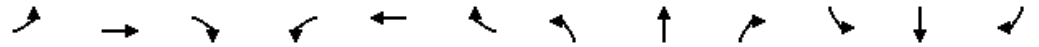
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	67	18	5	19	6	86	5	332	17	236	356	79
Future Vol, veh/h	67	18	5	19	6	86	5	332	17	236	356	79
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	36	50	64	75	80	25	87	50	72	66	75
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	93	50	10	30	8	108	20	382	34	328	539	105

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1744	1704	322	1389	1739	399	645	0	0	416	0	0
Stage 1	1248	1248	-	439	439	-	-	-	-	-	-	-
Stage 2	496	456	-	950	1300	-	-	-	-	-	-	-
Critical Hdwy	7.315	6.515	6.915	7.315	6.515	6.215	4.115	-	-	4.115	-	-
Critical Hdwy Stg 1	6.515	5.515	-	6.115	5.515	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.115	5.515	-	6.515	5.515	-	-	-	-	-	-	-
Follow-up Hdwy	3.5095	4.0095	3.3095	3.5095	4.0095	3.3095	2.2095	-	-	2.2095	-	-
Pot Cap-1 Maneuver	~ 62	92	677	111	87	653	944	-	-	1148	-	-
Stage 1	185	246	-	598	579	-	-	-	-	-	-	-
Stage 2	557	569	-	282	232	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 29	~ 49	677	-	46	653	944	-	-	1148	-	-
Mov Cap-2 Maneuver	~ 29	~ 49	-	-	46	-	-	-	-	-	-	-
Stage 1	180	135	-	581	563	-	-	-	-	-	-	-
Stage 2	446	553	-	96	127	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 1689		0.4	3.7
HCM LOS	F	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	944	-	-	36	-	1148	-	-
HCM Lane V/C Ratio	0.021	-	-	4.252	-	0.286	-	-
HCM Control Delay (s)	8.9	0	-	$ 1689	-	9.4	1	-
HCM Lane LOS	A	A	-	F	-	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	17.8	-	1.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	5	7	37	5	6	5	105	26	20	184	55
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	17	0	0	48	0	0	110	26	0	259	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.92	0.85	0.95	0.94	0.85	0.95	1.00	0.85	0.95	0.96	0.85
Saturated Flow (vph)	0	1664	0	0	1698	0	0	1796	1530	0	1736	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			2.0			0.0
Adj Reference Time (s)			0.0			0.0			8.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	1729		0	746		0	1533		0	816	
Reference Time A (s)	0.0	1.2		0.0	7.7		0.0	8.6		0.0	38.1	
Adj Saturation B (vph	0	0		0	0		NA	NA		0	0	
Reference Time B (s)	8.4	9.2		10.6	11.4		NA	NA		9.4	25.9	
Reference Time (s)		1.2			7.7			8.6			25.9	
Adj Reference Time (s)		8.0			11.7			12.6			29.9	
Split Option												
Ref Time Combined (s)	0.0	1.2		0.0	3.4		0.0	7.4		0.0	17.9	
Ref Time Seperate (s)	0.4	0.4		2.6	0.4		0.4	7.0		1.4	12.7	
Reference Time (s)	1.2	1.2		3.4	3.4		7.4	7.4		17.9	17.9	
Adj Reference Time (s)	8.0	8.0		8.0	8.0		11.4	11.4		21.9	21.9	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	11.7	29.9	
Split Option (s)	16.0	33.3	
Minimum (s)	11.7	29.9	41.6

Right Turns	NBR
Adj Reference Time (s)	8.0
Cross Thru Ref Time (s)	8.0
Oncoming Left Ref Time (s)	21.9
Combined (s)	37.9

Intersection Summary			
Intersection Capacity Utilization	34.7%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	5	7	37	5	6	5	105	26	20	184	55
Future Volume (Veh/h)	5	5	7	37	5	6	5	105	26	20	184	55
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	6	8	41	6	7	6	117	29	22	204	61
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	418	436	234	418	438	117	265			146		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	418	436	234	418	438	117	265			146		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	92	99	99	100			98		
cM capacity (veh/h)	530	505	807	528	504	938	1305			1442		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	20	54	123	29	287
Volume Left	6	41	6	0	22
Volume Right	8	7	0	29	61
cSH	604	557	1305	1700	1442
Volume to Capacity	0.03	0.10	0.00	0.02	0.02
Queue Length 95th (m)	0.8	2.4	0.1	0.0	0.4
Control Delay (s)	11.2	12.2	0.4	0.0	0.7
Lane LOS	B	B	A		A
Approach Delay (s)	11.2	12.2	0.3		0.7
Approach LOS	B	B			

Intersection Summary				
Average Delay	2.2			
Intersection Capacity Utilization	34.7%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↰	↱		↕	
Traffic Vol, veh/h	5	5	7	37	5	6	5	105	26	20	184	55
Future Vol, veh/h	5	5	7	37	5	6	5	105	26	20	184	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	250	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	6	6	8	41	6	7	6	117	29	22	204	61

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	413	407	235	414	438	117	266	0	0	117	0	0
Stage 1	279	279	-	128	128	-	-	-	-	-	-	-
Stage 2	134	128	-	286	310	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	551	535	807	550	514	938	1304	-	-	1478	-	-
Stage 1	730	682	-	878	792	-	-	-	-	-	-	-
Stage 2	872	792	-	724	661	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	533	523	807	531	502	938	1304	-	-	1478	-	-
Mov Cap-2 Maneuver	533	523	-	531	502	-	-	-	-	-	-	-
Stage 1	726	670	-	874	788	-	-	-	-	-	-	-
Stage 2	855	788	-	698	649	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11	12.1	0.3	0.6
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1304	-	-	616	558	1478	-	-
HCM Lane V/C Ratio	0.004	-	-	0.031	0.096	0.015	-	-
HCM Control Delay (s)	7.8	0	-	11	12.1	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0	-	-

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	32	318	5	0	385
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No		No		
Ideal Flow	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	0	32	323	0	0	385
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.85	1.00	0.85	0.95	1.00
Saturated Flow (vph)	0	1530	1796	0	0	1800
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00		0.00			0.00
Protected Option Allowed	No		Yes			Yes
Reference Time (s)		2.5	21.6	0.0	0.0	25.7
Adj Reference Time (s)		8.0	25.6	0.0	0.0	29.7
Permitted Option						
Adj Saturation A (vph)	0		1796		0	1800
Reference Time A (s)	0.0		21.6		0.0	25.7
Adj Saturation B (vph	NA		NA		NA	NA
Reference Time B (s)	NA		NA		NA	NA
Reference Time (s)			21.6			25.7
Adj Reference Time (s)			25.6			29.7
Split Option						
Ref Time Combined (s)	0.0		21.6		0.0	25.7
Ref Time Seperate (s)	0.0		21.2		0.0	25.7
Reference Time (s)	0.0		21.6		25.7	25.7
Adj Reference Time (s)	0.0		25.6		29.7	29.7

Summary	WB	NB SB	Combined
Protected Option (s)	NA	29.7	
Permitted Option (s)	Err	29.7	
Split Option (s)	0.0	55.3	
Minimum (s)	0.0	29.7	29.7

Right Turns	WBR
Adj Reference Time (s)	8.0
Cross Thru Ref Time (s)	25.6
Oncoming Left Ref Time (s)	0.0
Combined (s)	33.6

Intersection Summary			
Intersection Capacity Utilization	28.0%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	32	318	5	0	385
Future Volume (Veh/h)	0	32	318	5	0	385
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	36	353	6	0	428
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	784	356			359	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	784	356			359	
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	95			100	
cM capacity (veh/h)	363	690			1205	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	36	359	428
Volume Left	0	0	0
Volume Right	36	6	0
cSH	690	1700	1700
Volume to Capacity	0.05	0.21	0.25
Queue Length 95th (m)	1.3	0.0	0.0
Control Delay (s)	10.5	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.5	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	28.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	32	318	5	0	385
Future Vol, veh/h	0	32	318	5	0	385
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	0	36	353	6	0	428

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	356	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.21	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.309	-	-	-	-
Pot Cap-1 Maneuver	0	690	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	690	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	690	-
HCM Lane V/C Ratio	-	-	0.052	-
HCM Control Delay (s)	-	-	10.5	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.2	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	5	5	22	5	21	10
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No				No
Ideal Flow	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	10	0	22	5	21	10
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.90	0.85	0.95	1.00	1.00	0.85
Saturated Flow (vph)	1623	0	1710	1800	1800	1530
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00			0.00	0.00	
Protected Option Allowed	No			Yes	Yes	
Reference Time (s)		0.0	1.5	0.3	1.4	0.8
Adj Reference Time (s)		0.0	8.0	8.0	8.0	8.0
Permitted Option						
Adj Saturation A (vph)	108		114	1800	1800	
Reference Time A (s)	11.1		23.2	0.3	1.4	
Adj Saturation B (vph	NA		0	1800	1800	
Reference Time B (s)	NA		9.5	0.3	1.4	
Reference Time (s)				9.5	1.4	
Adj Reference Time (s)				13.5	8.0	
Split Option						
Ref Time Combined (s)	0.7		1.5	0.3	1.4	
Ref Time Seperate (s)	0.4		1.5	0.3	1.4	
Reference Time (s)	0.7		1.5	1.5	1.4	
Adj Reference Time (s)	8.0		8.0	8.0	8.0	

Summary	EB	NB SB	Combined
Protected Option (s)	NA	16.0	
Permitted Option (s)	Err	13.5	
Split Option (s)	8.0	16.0	
Minimum (s)	8.0	13.5	21.5

Right Turns	SBR
Adj Reference Time (s)	8.0
Cross Thru Ref Time (s)	0.0
Oncoming Left Ref Time (s)	8.0
Combined (s)	16.0

Intersection Summary			
Intersection Capacity Utilization	18.0%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	5	22	5	21	10
Future Volume (Veh/h)	5	5	22	5	21	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	6	24	6	23	11
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	77	23	34			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	77	23	34			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	98			
cM capacity (veh/h)	914	1057	1584			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	12	24	6	23	11
Volume Left	6	24	0	0	0
Volume Right	6	0	0	0	11
cSH	980	1584	1700	1700	1700
Volume to Capacity	0.01	0.02	0.00	0.01	0.01
Queue Length 95th (m)	0.3	0.4	0.0	0.0	0.0
Control Delay (s)	8.7	7.3	0.0	0.0	0.0
Lane LOS	A	A			
Approach Delay (s)	8.7	5.8		0.0	
Approach LOS	A				

Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	18.0%	ICU Level of Service	A	
Analysis Period (min)	15			

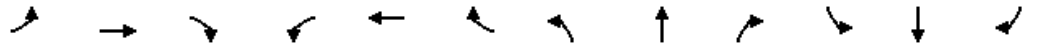
Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	5	22	5	21	10
Future Vol, veh/h	5	5	22	5	21	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	250	-	-	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	6	6	24	6	23	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	77	23	23	0	-	0
Stage 1	23	-	-	-	-	-
Stage 2	54	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	928	1057	1599	-	-	-
Stage 1	1002	-	-	-	-	-
Stage 2	971	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	914	1057	1599	-	-	-
Mov Cap-2 Maneuver	914	-	-	-	-	-
Stage 1	1002	-	-	-	-	-
Stage 2	956	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	5.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1599	-	980	-	-
HCM Lane V/C Ratio	0.015	-	0.011	-	-
HCM Control Delay (s)	7.3	-	8.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	222	7	38	241	13	6	5	16	9	5	5
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	235	0	0	292	0	0	27	0	0	19	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.99	0.85	0.95	0.99	0.85	0.95	0.90	0.85	0.95	0.94	0.85
Saturated Flow (vph)	0	1790	0	0	1776	0	0	1622	0	0	1688	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	1696		0	845		0	1524		0	869	
Reference Time A (s)	0.0	16.6		0.0	41.5		0.0	2.1		0.0	2.6	
Adj Saturation B (vph	NA	NA		NA	NA		0	0		0	0	
Reference Time B (s)	NA	NA		NA	NA		8.4	10.0		8.6	9.4	
Reference Time (s)		16.6			41.5			2.1			2.6	
Adj Reference Time (s)		20.6			45.5			8.0			8.0	
Split Option												
Ref Time Combined (s)	0.0	15.8		0.0	19.7		0.0	2.0		0.0	1.4	
Ref Time Seperate (s)	0.4	14.9		2.7	16.2		0.4	0.4		0.6	0.4	
Reference Time (s)	15.8	15.8		19.7	19.7		2.0	2.0		1.4	1.4	
Adj Reference Time (s)	19.8	19.8		23.7	23.7		8.0	8.0		8.0	8.0	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	45.5	8.0	
Split Option (s)	43.5	16.0	
Minimum (s)	43.5	8.0	51.5

Right Turns	
Adj Reference Time (s)	
Cross Thru Ref Time (s)	
Oncoming Left Ref Time (s)	
Combined (s)	

Intersection Summary			
Intersection Capacity Utilization	42.9%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	222	7	38	241	13	6	5	16	9	5	5
Future Volume (Veh/h)	6	222	7	38	241	13	6	5	16	9	5	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.38	0.52	0.50	0.68	0.85	0.65	0.50	0.25	0.57	0.75	0.50	0.25
Hourly flow rate (vph)	16	427	14	56	284	20	12	20	28	12	10	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	304			441			897	882	434	910	879	294
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304			441			897	882	434	910	879	294
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			95			95	93	96	95	96	97
cM capacity (veh/h)	1263			1124			236	268	624	220	270	748

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	457	360	60	42
Volume Left	16	56	12	12
Volume Right	14	20	28	20
cSH	1263	1124	352	355
Volume to Capacity	0.01	0.05	0.17	0.12
Queue Length 95th (m)	0.3	1.2	4.6	3.0
Control Delay (s)	0.4	1.7	17.3	16.5
Lane LOS	A	A	C	C
Approach Delay (s)	0.4	1.7	17.3	16.5
Approach LOS			C	C

Intersection Summary				
Average Delay	2.8			
Intersection Capacity Utilization	42.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	222	7	38	241	13	6	5	16	9	5	5
Future Vol, veh/h	6	222	7	38	241	13	6	5	16	9	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	38	52	50	68	85	65	50	25	57	75	50	25
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	16	427	14	56	284	20	12	20	28	12	10	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	304	0	0	441	0	0	886	881	434	895	878	294
Stage 1	-	-	-	-	-	-	466	466	-	405	405	-
Stage 2	-	-	-	-	-	-	420	415	-	490	473	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1263	-	-	1124	-	-	266	287	624	263	288	748
Stage 1	-	-	-	-	-	-	579	564	-	624	600	-
Stage 2	-	-	-	-	-	-	613	594	-	562	560	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1263	-	-	1124	-	-	237	265	624	223	266	748
Mov Cap-2 Maneuver	-	-	-	-	-	-	237	265	-	223	266	-
Stage 1	-	-	-	-	-	-	569	554	-	613	564	-
Stage 2	-	-	-	-	-	-	551	558	-	509	550	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	1.3	17.4	16.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	351	1263	-	-	1124	-	-	355
HCM Lane V/C Ratio	0.171	0.013	-	-	0.05	-	-	0.118
HCM Control Delay (s)	17.4	7.9	0	-	8.4	0	-	16.5
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.6	0	-	-	0.2	-	-	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	0	0	0	0	0
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No				No
Ideal Flow	1800	1800	1800	1800	1800	1800
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	0	0	0	0	0	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	0.95	1.00
Turning Factor (vph)	0.95	0.85	0.95	1.00	1.00	0.85
Saturated Flow (vph)	0	0	0	1800	3427	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00			0.00	0.00	
Protected Option Allowed	No			Yes	Yes	
Reference Time (s)		0.0	0.0	0.0	0.0	0.0
Adj Reference Time (s)		0.0	0.0	8.0	8.0	0.0
Permitted Option						
Adj Saturation A (vph)	0		0	1800	1714	
Reference Time A (s)	0.0		0.0	0.0	0.0	
Adj Saturation B (vph	NA		0	1800	3427	
Reference Time B (s)	NA		0.0	0.0	0.0	
Reference Time (s)				0.0	0.0	
Adj Reference Time (s)				8.0	8.0	
Split Option						
Ref Time Combined (s)	0.0		0.0	0.0	0.0	
Ref Time Seperate (s)	0.0		0.0	0.0	0.0	
Reference Time (s)	0.0		0.0	0.0	0.0	
Adj Reference Time (s)	0.0		0.0	0.0	0.0	

Summary	EB	NB SB	Combined
Protected Option (s)	NA	8.0	
Permitted Option (s)	Err	8.0	
Split Option (s)	0.0	0.0	
Minimum (s)	0.0	0.0	0.0

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0	0			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1026	1088	1629			

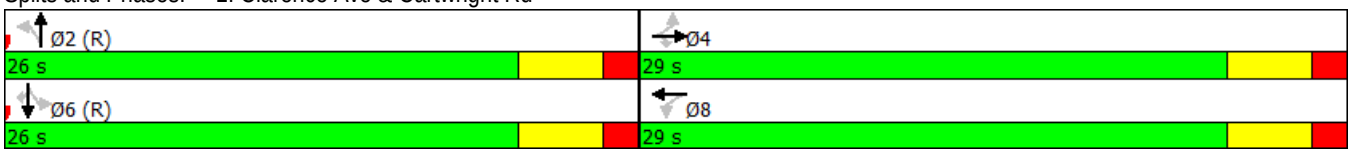
Direction, Lane #	NB 1	SB 1	SB 2
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			
Approach Delay (s)	0.0	0.0	
Approach LOS			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	193	5	10	5	5	7	230	5	328	284
Future Volume (vph)	193	5	10	5	5	7	230	5	328	284
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		4			8		2		6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	4	4	4	8	8	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	29.0	29.0	29.0	29.0	29.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	52.7%	52.7%	52.7%	52.7%	52.7%	47.3%	47.3%	47.3%	47.3%	47.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)		2.0	2.0		2.0		2.0	2.0	2.0	2.0
Total Lost Time (s)		7.0	7.0		7.0		7.0	7.0	7.0	7.0
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)		22.0	22.0		22.0		19.0	19.0	19.0	19.0
Actuated g/C Ratio		0.40	0.40		0.40		0.35	0.35	0.35	0.35
v/c Ratio		0.49	0.03		0.10		0.47	0.03	0.59	0.45
Control Delay		16.5	1.7		8.2		16.8	12.2	19.4	4.2
Queue Delay		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		16.5	1.7		8.2		16.8	12.2	19.4	4.2
LOS		B	A		A		B	B	B	A
Approach Delay		15.6			8.2		16.8		12.3	
Approach LOS		B			A		B		B	

Intersection Summary	
Cycle Length: 55	
Actuated Cycle Length: 55	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 13.7	Intersection LOS: B
Intersection Capacity Utilization 75.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Clarence Ave & Cartwright Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	193	5	10	5	5	10	7	230	5	5	328	284
Pedestrians	20		20	20		20	20		20	20		20
Ped Button		No			No			No			No	
Pedestrian Timing (s)		24.0			24.0			20.0			20.0	
Free Right			No			No			No			No
Ideal Flow	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lost Time (s)	7.0	7.0	7.0	7.0	7.0	6.0	7.0	7.0	6.0	7.0	7.0	7.0
Minimum Green (s)	10.0	10.0	10.0	10.0	10.0	4.0	15.0	15.0	4.0	15.0	15.0	15.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	198	10	0	20	0	0	242	0	5	328	284
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.91	0.85	0.95	1.00	0.85	0.95	1.00	0.85
Saturated Flow (vph)	0	1760	1573	0	1690	0	0	1842	0	1758	1850	1573
Ped Intf Time (s)	0.0	0.0	2.3	0.0	1.2	2.3	0.0	0.0	2.3	0.0	0.0	2.3
Pedestrian Frequency (%)		1.00			1.00			1.00			1.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			3.1			0.0			0.0			24.0
Adj Reference Time (s)			31.0			0.0			0.0			31.0
Permitted Option												
Adj Saturation A (vph)	0	569		0	349		0	1304		168	1850	
Reference Time A (s)	0.0	41.8		0.0	8.0		0.0	22.3		3.6	21.3	
Adj Saturation B (vph	0	0		0	0		NA	NA		NA	NA	
Reference Time B (s)	21.2	21.5		8.3	10.6		NA	NA		NA	NA	
Reference Time (s)		21.5			8.0			22.3			21.3	
Adj Reference Time (s)		31.0			31.0			29.3			28.3	
Split Option												
Ref Time Combined (s)	0.0	13.5		0.0	2.6		0.0	15.8		0.3	21.3	
Ref Time Seperate (s)	13.2	0.3		0.3	1.5		0.5	15.0		0.3	21.3	
Reference Time (s)	13.5	13.5		2.6	2.6		15.8	15.8		21.3	21.3	
Adj Reference Time (s)	31.0	31.0		31.0	31.0		27.0	27.0		28.3	28.3	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	31.0	29.3	
Split Option (s)	62.0	55.3	
Minimum (s)	31.0	29.3	60.3

Right Turns	EBR	SBR
Adj Reference Time (s)	31.0	31.0
Cross Thru Ref Time (s)	28.3	31.0
Oncoming Left Ref Time (s)	31.0	27.0
Combined (s)	90.3	89.0

Intersection Summary			
Intersection Capacity Utilization	75.2%	ICU Level of Service	D

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	5	10	5	5	10	7	230	5	5	328	284
Future Volume (vph)	193	5	10	5	5	10	7	230	5	5	328	284
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)		7.0	7.0		7.0			7.0		7.0	7.0	7.0
Lane Util. Factor		1.00	1.00		1.00			1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.96		0.99			1.00		1.00	1.00	0.95
Flpb, ped/bikes		0.98	1.00		0.99			1.00		0.98	1.00	1.00
Frt		1.00	0.85		0.95			0.99		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.98			1.00		0.95	1.00	1.00
Satd. Flow (prot)		1736	1507		1706			1821		1729	1852	1500
Flt Permitted		0.70	1.00		0.88			0.96		0.61	1.00	1.00
Satd. Flow (perm)		1271	1507		1520			1759		1102	1852	1500
Peak-hour factor, PHF	0.84	0.25	0.62	0.25	0.25	0.50	0.38	0.92	0.25	0.50	0.87	0.85
Adj. Flow (vph)	230	20	16	20	20	20	18	250	20	10	377	334
RTOR Reduction (vph)	0	0	10	0	12	0	0	5	0	0	0	219
Lane Group Flow (vph)	0	250	6	0	48	0	0	283	0	10	377	115
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		24.0	24.0		24.0			21.0		21.0	21.0	21.0
Effective Green, g (s)		22.0	22.0		22.0			19.0		19.0	19.0	19.0
Actuated g/C Ratio		0.40	0.40		0.40			0.35		0.35	0.35	0.35
Clearance Time (s)		5.0	5.0		5.0			5.0		5.0	5.0	5.0
Lane Grp Cap (vph)		508	602		608			607		380	639	518
v/s Ratio Prot											c0.20	
v/s Ratio Perm		c0.20	0.00		0.03			0.16		0.01		0.08
v/c Ratio		0.49	0.01		0.08			0.47		0.03	0.59	0.22
Uniform Delay, d1		12.3	9.9		10.2			14.0		11.9	14.8	12.8
Progression Factor		1.00	1.00		1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2		3.4	0.0		0.3			2.6		0.1	4.0	1.0
Delay (s)		15.7	10.0		10.5			16.6		12.0	18.8	13.8
Level of Service		B	A		B			B		B	B	B
Approach Delay (s)		15.4			10.5			16.6			16.4	
Approach LOS		B			B			B			B	

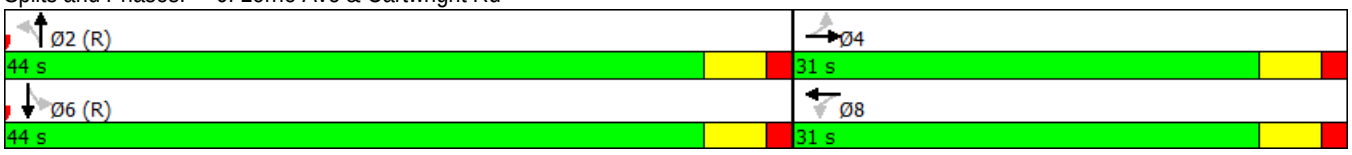
Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	67	18	19	6	5	332	236	356
Future Volume (vph)	67	18	19	6	5	332	236	356
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	15.0	15.0	15.0	15.0
Minimum Split (s)	31.0	31.0	31.0	31.0	24.0	24.0	24.0	24.0
Total Split (s)	31.0	31.0	31.0	31.0	44.0	44.0	44.0	44.0
Total Split (%)	41.3%	41.3%	41.3%	41.3%	58.7%	58.7%	58.7%	58.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)		2.0		2.0		2.0		2.0
Total Lost Time (s)		7.0		7.0		7.0		7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)		24.0		24.0		37.0		37.0
Actuated g/C Ratio		0.32		0.32		0.49		0.49
v/c Ratio		0.35		0.27		0.52		0.85
Control Delay		21.7		8.1		15.5		25.4
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		21.7		8.1		15.5		25.4
LOS		C		A		B		C
Approach Delay		21.7		8.1		15.5		25.4
Approach LOS		C		A		B		C

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Pretimed	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 21.1	Intersection LOS: C
Intersection Capacity Utilization 78.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 6: Lorne Ave & Cartwright Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	18	5	19	6	86	5	332	17	236	356	79
Pedestrians	20		20	20		20	20		20	20		20
Ped Button		No			No			No			No	
Pedestrian Timing (s)		26.0			26.0			19.0			19.0	
Free Right			No			No			No			No
Ideal Flow	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lost Time (s)	7.0	7.0	6.0	7.0	7.0	6.0	7.0	7.0	6.0	7.0	7.0	6.0
Minimum Green (s)	10.0	10.0	4.0	10.0	10.0	4.0	15.0	15.0	4.0	15.0	15.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	90	0	0	111	0	0	354	0	0	671	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.88	0.85	0.95	0.99	0.85	0.95	0.97	0.85
Saturated Flow (vph)	0	1766	0	0	1621	0	0	1835	0	0	3399	0
Ped Intf Time (s)	0.0	0.1	2.3	0.0	1.8	2.3	0.0	0.1	2.3	0.0	0.3	2.3
Pedestrian Frequency (%)		1.00			1.00			1.00			1.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	540		0	1678		0	1530		0	137	
Reference Time A (s)	0.0	20.1		0.0	9.7		0.0	27.9		0.0	206.5	
Adj Saturation B (vph	0	0		0	0		NA	NA		NA	NA	
Reference Time B (s)	12.6	14.2		9.3	18.0		NA	NA		NA	NA	
Reference Time (s)		14.2			9.7			27.9			206.5	
Adj Reference Time (s)		33.0			33.0			34.9			213.5	
Split Option												
Ref Time Combined (s)	0.0	6.2		0.0	10.0		0.0	23.3		0.0	24.0	
Ref Time Seperate (s)	4.6	1.3		1.3	2.2		0.3	21.8		16.1	12.7	
Reference Time (s)	6.2	6.2		10.0	10.0		23.3	23.3		24.0	24.0	
Adj Reference Time (s)	33.0	33.0		33.0	33.0		30.3	30.3		31.0	31.0	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	33.0	213.5	
Split Option (s)	66.0	61.2	
Minimum (s)	33.0	61.2	94.2

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	78.5%	ICU Level of Service	D

Reference Times and Phasing Options do not represent an optimized timing plan.

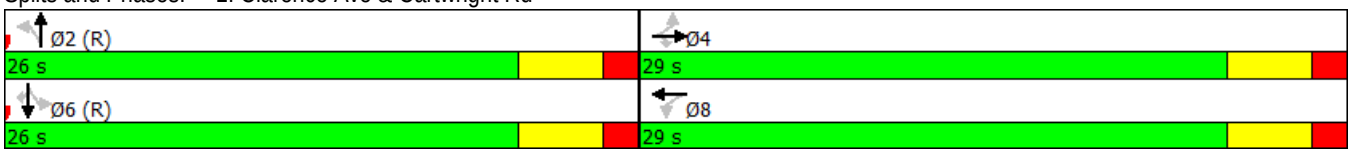
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	18	5	19	6	86	5	332	17	236	356	79
Future Volume (vph)	67	18	5	19	6	86	5	332	17	236	356	79
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)		7.0			7.0			7.0			7.0	
Lane Util. Factor		1.00			1.00			1.00			0.95	
Frpb, ped/bikes		1.00			0.96			1.00			0.99	
Flpb, ped/bikes		0.99			1.00			1.00			0.99	
Frt		0.99			0.90			0.99			0.98	
Flt Protected		0.97			0.99			1.00			0.98	
Satd. Flow (prot)		1736			1571			1801			3329	
Flt Permitted		0.76			0.92			0.94			0.68	
Satd. Flow (perm)		1352			1459			1693			2292	
Peak-hour factor, PHF	0.72	0.36	0.50	0.64	0.75	0.80	0.25	0.87	0.50	0.72	0.66	0.75
Adj. Flow (vph)	93	50	10	30	8	108	20	382	34	328	539	105
RTOR Reduction (vph)	0	3	0	0	73	0	0	4	0	0	12	0
Lane Group Flow (vph)	0	150	0	0	73	0	0	432	0	0	960	0
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	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)		26.0			26.0			39.0			39.0	
Effective Green, g (s)		24.0			24.0			37.0			37.0	
Actuated g/C Ratio		0.32			0.32			0.49			0.49	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		432			466			835			1130	
v/s Ratio Prot												
v/s Ratio Perm		c0.11			0.05			0.26			c0.42	
v/c Ratio		0.35			0.16			0.52			0.85	
Uniform Delay, d1		19.5			18.2			12.9			16.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.2			0.7			2.3			8.0	
Delay (s)		21.7			19.0			15.2			24.6	
Level of Service		C			B			B			C	
Approach Delay (s)		21.7			19.0			15.2			24.6	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	193	5	10	5	5	5	174	5	247	284
Future Volume (vph)	193	5	10	5	5	5	174	5	247	284
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		4			8		2		6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	4	4	4	8	8	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	29.0	29.0	29.0	29.0	29.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	52.7%	52.7%	52.7%	52.7%	52.7%	47.3%	47.3%	47.3%	47.3%	47.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)		2.0	2.0		2.0		2.0	2.0	2.0	2.0
Total Lost Time (s)		7.0	7.0		7.0		7.0	7.0	7.0	7.0
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)		22.0	22.0		22.0		19.0	19.0	19.0	19.0
Actuated g/C Ratio		0.40	0.40		0.40		0.35	0.35	0.35	0.35
v/c Ratio		0.50	0.03		0.10		0.36	0.02	0.45	0.46
Control Delay		16.6	1.7		8.2		15.0	12.2	16.8	4.2
Queue Delay		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		16.6	1.7		8.2		15.0	12.2	16.8	4.2
LOS		B	A		A		B	B	B	A
Approach Delay		15.7			8.2		15.0		10.0	
Approach LOS		B			A		B		B	

Intersection Summary	
Cycle Length: 55	
Actuated Cycle Length: 55	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.50	
Intersection Signal Delay: 12.2	Intersection LOS: B
Intersection Capacity Utilization 74.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Clarence Ave & Cartwright Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	193	5	10	5	5	10	5	174	5	5	247	284
Pedestrians	20		20	20		20	20		20	20		20
Ped Button		No			No			No			No	
Pedestrian Timing (s)		24.0			24.0			20.0			20.0	
Free Right			No			No			No			No
Ideal Flow	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lost Time (s)	7.0	7.0	7.0	7.0	7.0	6.0	7.0	7.0	6.0	7.0	7.0	7.0
Minimum Green (s)	5.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	198	10	0	20	0	0	184	0	5	247	284
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.91	0.85	0.95	0.99	0.85	0.95	1.00	0.85
Saturated Flow (vph)	0	1760	1573	0	1690	0	0	1840	0	1758	1850	1573
Ped Intf Time (s)	0.0	0.0	2.3	0.0	1.2	2.3	0.0	0.1	2.3	0.0	0.0	2.3
Pedestrian Frequency (%)		1.00			1.00			1.00			1.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			3.1			0.0			0.0			24.0
Adj Reference Time (s)			31.0			0.0			0.0			31.0
Permitted Option												
Adj Saturation A (vph)	0	569		0	349		0	1327		165	1850	
Reference Time A (s)	0.0	41.8		0.0	8.0		0.0	16.7		3.6	16.0	
Adj Saturation B (vph	0	0		0	0		NA	NA		NA	NA	
Reference Time B (s)	21.2	21.5		8.3	10.6		NA	NA		NA	NA	
Reference Time (s)		21.5			8.0			16.7			16.0	
Adj Reference Time (s)		31.0			31.0			27.0			27.0	
Split Option												
Ref Time Combined (s)	0.0	13.5		0.0	2.6		0.0	12.1		0.3	16.0	
Ref Time Seperate (s)	13.2	0.3		0.3	1.5		0.3	11.4		0.3	16.0	
Reference Time (s)	13.5	13.5		2.6	2.6		12.1	12.1		16.0	16.0	
Adj Reference Time (s)	31.0	31.0		31.0	31.0		27.0	27.0		27.0	27.0	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	31.0	27.0	
Split Option (s)	62.0	54.0	
Minimum (s)	31.0	27.0	58.0

Right Turns	EBR	SBR
Adj Reference Time (s)	31.0	31.0
Cross Thru Ref Time (s)	27.0	31.0
Oncoming Left Ref Time (s)	31.0	27.0
Combined (s)	89.0	89.0

Intersection Summary			
Intersection Capacity Utilization	74.2%	ICU Level of Service	D

Reference Times and Phasing Options do not represent an optimized timing plan.

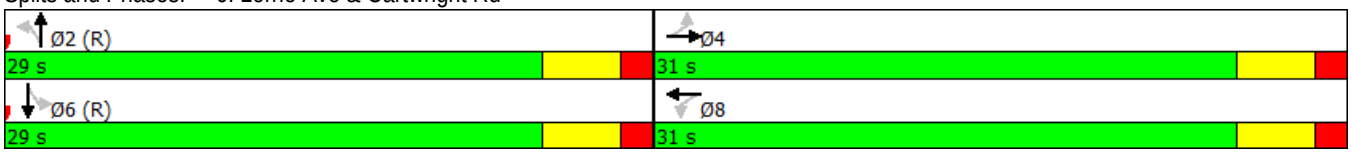
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	5	10	5	5	10	5	174	5	5	247	284
Future Volume (vph)	193	5	10	5	5	10	5	174	5	5	247	284
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)		7.0	7.0		7.0			7.0		7.0	7.0	7.0
Lane Util. Factor		1.00	1.00		1.00			1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.96		0.99			1.00		1.00	1.00	0.95
Flpb, ped/bikes		0.98	1.00		0.99			1.00		0.98	1.00	1.00
Frt		1.00	0.85		0.95			0.99		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.98			1.00		0.95	1.00	1.00
Satd. Flow (prot)		1719	1493		1689			1797		1708	1834	1486
Flt Permitted		0.70	1.00		0.88			0.97		0.69	1.00	1.00
Satd. Flow (perm)		1258	1493		1506			1754		1242	1834	1486
Peak-hour factor, PHF	0.84	0.25	0.62	0.25	0.25	0.50	0.38	0.92	0.25	0.50	0.87	0.85
Adj. Flow (vph)	230	20	16	20	20	20	13	189	20	10	284	334
RTOR Reduction (vph)	0	0	10	0	12	0	0	7	0	0	0	219
Lane Group Flow (vph)	0	250	6	0	48	0	0	215	0	10	284	115
Confl. Peds. (#/hr)	20		20	20		20	20		20	20		20
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		24.0	24.0		24.0			21.0		21.0	21.0	21.0
Effective Green, g (s)		22.0	22.0		22.0			19.0		19.0	19.0	19.0
Actuated g/C Ratio		0.40	0.40		0.40			0.35		0.35	0.35	0.35
Clearance Time (s)		5.0	5.0		5.0			5.0		5.0	5.0	5.0
Lane Grp Cap (vph)		503	597		602			605		429	633	513
v/s Ratio Prot											c0.15	
v/s Ratio Perm		c0.20	0.00		0.03			0.12		0.01		0.08
v/c Ratio		0.50	0.01		0.08			0.36		0.02	0.45	0.22
Uniform Delay, d1		12.4	9.9		10.2			13.4		11.9	13.9	12.8
Progression Factor		1.00	1.00		1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2		3.5	0.0		0.3			1.6		0.1	2.3	1.0
Delay (s)		15.8	10.0		10.5			15.1		12.0	16.2	13.8
Level of Service		B	A		B			B		B	B	B
Approach Delay (s)		15.5			10.5			15.1			14.9	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	51	14	19	6	5	258	226	268
Future Volume (vph)	51	14	19	6	5	258	226	268
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	15.0	15.0	15.0	15.0
Minimum Split (s)	31.0	31.0	31.0	31.0	24.0	24.0	24.0	24.0
Total Split (s)	31.0	31.0	31.0	31.0	29.0	29.0	29.0	29.0
Total Split (%)	51.7%	51.7%	51.7%	51.7%	48.3%	48.3%	48.3%	48.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)		2.0		2.0		2.0		2.0
Total Lost Time (s)		7.0		7.0		7.0		7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)		24.0		24.0		22.0		22.0
Actuated g/C Ratio		0.40		0.40		0.37		0.37
v/c Ratio		0.22		0.22		0.57		0.92
Control Delay		12.3		5.4		19.2		36.8
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		12.3		5.4		19.2		36.8
LOS		B		A		B		D
Approach Delay		12.3		5.4		19.2		36.8
Approach LOS		B		A		B		D

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Pretimed	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 27.1	Intersection LOS: C
Intersection Capacity Utilization 59.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: Lorne Ave & Cartwright Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	51	14	5	19	6	86	5	258	13	226	268	59
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lost Time (s)	7.0	7.0	6.0	7.0	7.0	6.0	7.0	7.0	6.0	7.0	7.0	6.0
Minimum Green (s)	10.0	10.0	4.0	10.0	10.0	4.0	15.0	15.0	4.0	15.0	15.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	70	0	0	111	0	0	276	0	0	553	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.88	0.85	0.95	0.99	0.85	0.95	0.96	0.85
Saturated Flow (vph)	0	1764	0	0	1621	0	0	1835	0	0	3395	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	549		0	1673		0	1461		0	144	
Reference Time A (s)	0.0	15.3		0.0	8.0		0.0	22.7		0.0	188.4	
Adj Saturation B (vph	0	0		0	0		NA	NA		NA	NA	
Reference Time B (s)	11.5	12.8		9.3	16.2		NA	NA		NA	NA	
Reference Time (s)		12.8			8.0			22.7			188.4	
Adj Reference Time (s)		19.8			17.0			29.7			195.4	
Split Option												
Ref Time Combined (s)	0.0	4.8		0.0	8.2		0.0	18.0		0.0	19.5	
Ref Time Seperate (s)	3.5	0.9		1.3	0.5		0.3	16.9		15.4	9.4	
Reference Time (s)	4.8	4.8		8.2	8.2		18.0	18.0		19.5	19.5	
Adj Reference Time (s)	17.0	17.0		17.0	17.0		25.0	25.0		26.5	26.5	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	19.8	195.4	
Split Option (s)	34.0	51.6	
Minimum (s)	19.8	51.6	71.4

Right Turns	
Adj Reference Time (s)	
Cross Thru Ref Time (s)	
Oncoming Left Ref Time (s)	
Combined (s)	

Intersection Summary			
Intersection Capacity Utilization	59.5%	ICU Level of Service	B

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	14	5	19	6	86	5	258	13	226	268	59
Future Volume (vph)	51	14	5	19	6	86	5	258	13	226	268	59
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)		7.0			7.0			7.0			7.0	
Lane Util. Factor		1.00			1.00			1.00			0.95	
Frt		0.99			0.90			0.99			0.99	
Flt Protected		0.97			0.99			1.00			0.98	
Satd. Flow (prot)		1711			1587			1758			3270	
Flt Permitted		0.77			0.93			0.93			0.70	
Satd. Flow (perm)		1355			1492			1641			2329	
Peak-hour factor, PHF	0.72	0.36	0.50	0.64	0.75	0.80	0.25	0.87	0.50	0.72	0.66	0.75
Adj. Flow (vph)	71	39	10	30	8	108	20	297	26	314	406	79
RTOR Reduction (vph)	0	5	0	0	65	0	0	5	0	0	14	0
Lane Group Flow (vph)	0	115	0	0	81	0	0	338	0	0	785	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
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)		26.0			26.0			24.0			24.0	
Effective Green, g (s)		24.0			24.0			22.0			22.0	
Actuated g/C Ratio		0.40			0.40			0.37			0.37	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		542			596			601			853	
v/s Ratio Prot												
v/s Ratio Perm		c0.08			0.05			0.21			c0.34	
v/c Ratio		0.21			0.14			0.56			0.92	
Uniform Delay, d1		11.8			11.4			15.2			18.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			0.5			3.8			16.7	
Delay (s)		12.7			11.9			18.9			34.8	
Level of Service		B			B			B			C	
Approach Delay (s)		12.7			11.9			18.9			34.8	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	26.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Appendix C SIMTRAFFIC REPORTS

Intersection: 1: Clarence Ave & Cartwright Rd

Movement	EB	EB	WB	NB	SB	SB
Directions Served	LT	R	LTR	LTR	L	R
Maximum Queue (m)	20.2	8.0	12.9	5.1	3.1	2.1
Average Queue (m)	10.5	0.9	4.4	0.3	0.1	0.1
95th Queue (m)	16.5	5.1	12.1	3.0	1.4	1.2
Link Distance (m)	223.9		54.5	929.6		510.1
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)		25.0			20.0	
Storage Blk Time (%)	0					
Queuing Penalty (veh)	0					

Intersection: 3: Clubhouse & Cartwright Rd & The Red Barn

Movement	EB	WB	SB	SW
Directions Served	<LT	TR>	<LR	LR>
Maximum Queue (m)	4.2	5.5	7.7	6.1
Average Queue (m)	0.2	0.3	0.5	0.3
95th Queue (m)	2.4	3.0	4.1	2.9
Link Distance (m)	123.6	576.4	284.5	95.9
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Lorne Ave & Cartwright Rd

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LT
Maximum Queue (m)	17.1	15.3	8.0	10.6
Average Queue (m)	7.7	6.3	0.4	0.9
95th Queue (m)	14.9	14.0	3.5	5.6
Link Distance (m)	146.0	259.2		79.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: Cartwright Rd & Cartwright Terrace

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	10.5	0.8
Average Queue (m)	5.1	0.1
95th Queue (m)	10.1	1.4
Link Distance (m)	51.5	250.0
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: Waterford/Wentworth & Cartwright Rd

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	2.5	3.0	12.9	12.8
Average Queue (m)	0.1	0.1	7.1	5.0
95th Queue (m)	1.6	1.6	13.4	13.0
Link Distance (m)	576.4	223.9	170.3	154.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 0

Intersection: 1: Clarence Ave & Cartwright Rd

Movement	EB	EB	WB	NB	SB	SB
Directions Served	LT	R	LTR	LTR	L	R
Maximum Queue (m)	23.0	8.0	11.0	6.5	5.5	1.4
Average Queue (m)	11.0	1.2	4.1	0.4	0.3	0.1
95th Queue (m)	18.5	6.0	11.7	3.7	2.8	0.9
Link Distance (m)	223.9		54.5	929.6		510.1
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)		25.0			20.0	
Storage Blk Time (%)	0					
Queuing Penalty (veh)	0					

Intersection: 3: Clubhouse & Cartwright Rd & The Red Barn

Movement	EB	WB	SB	SW
Directions Served	<LT	TR>	<LR	LR>
Maximum Queue (m)	2.5	5.3	9.3	6.7
Average Queue (m)	0.1	0.2	0.5	0.3
95th Queue (m)	1.3	2.4	4.2	3.1
Link Distance (m)	123.6	576.4	284.5	95.9
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Lorne Ave & Cartwright Rd

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	TR
Maximum Queue (m)	21.3	16.7	7.2	12.0	0.6
Average Queue (m)	9.0	6.5	0.4	1.5	0.0
95th Queue (m)	16.8	14.8	3.7	7.5	0.6
Link Distance (m)	146.0	259.2		79.7	79.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Cartwright Rd & Cartwright Terrace

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	12.5	1.6
Average Queue (m)	5.4	0.0
95th Queue (m)	10.6	0.8
Link Distance (m)	51.5	250.0
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: Waterford/Wentworth & Cartwright Rd

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	4.6	4.5	13.9	11.6
Average Queue (m)	0.2	0.2	7.5	4.7
95th Queue (m)	2.4	2.4	13.9	12.2
Link Distance (m)	576.4	223.9	170.3	154.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 0

Intersection: 1: Clarence Ave & Cartwright Rd

Movement	EB	EB	WB	NB	SB	SB	SB
Directions Served	LT	R	LTR	LTR	L	T	R
Maximum Queue (m)	22.6	8.0	13.4	9.6	5.3	0.5	2.1
Average Queue (m)	9.9	1.2	3.5	0.6	0.2	0.0	0.1
95th Queue (m)	17.2	5.9	11.1	5.2	2.4	0.5	1.0
Link Distance (m)	223.9		54.5	929.6		510.1	510.1
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)		25.0			20.0		
Storage Blk Time (%)	0						
Queuing Penalty (veh)	0						

Intersection: 3: Clubhouse & Cartwright Rd & The Red Barn

Movement	EB	WB	SB	SW
Directions Served	<LT	TR>	<LR	LR>
Maximum Queue (m)	4.2	5.9	10.2	5.2
Average Queue (m)	0.2	0.4	1.4	0.3
95th Queue (m)	2.3	3.5	7.0	3.0
Link Distance (m)	123.6	576.4	284.5	95.9
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Lorne Ave & Cartwright Rd

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	TR
Maximum Queue (m)	24.0	16.8	12.9	16.6	0.6
Average Queue (m)	10.6	7.0	0.8	3.7	0.0
95th Queue (m)	19.4	14.9	6.0	12.2	0.6
Link Distance (m)	146.0	259.2		79.7	79.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Cartwright Rd & Cartwright Terrace

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	11.8	8.8
Average Queue (m)	5.1	0.4
95th Queue (m)	10.3	4.0
Link Distance (m)	51.5	250.0
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: Waterford/Wentworth & Cartwright Rd

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	3.2	10.7	11.5	9.9
Average Queue (m)	0.1	1.2	4.4	4.0
95th Queue (m)	1.8	6.4	11.8	11.5
Link Distance (m)	576.4	223.9	170.3	154.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 0

Intersection: 1: Clarence Ave & Cartwright Rd

Movement	EB	EB	WB	NB	SB	SB
Directions Served	LT	R	LTR	LTR	L	R
Maximum Queue (m)	22.0	8.0	13.0	3.9	5.4	1.1
Average Queue (m)	10.6	1.3	4.4	0.2	0.2	0.0
95th Queue (m)	17.0	6.0	12.0	2.1	2.3	0.9
Link Distance (m)	223.9		54.5	929.6		510.1
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)		25.0			20.0	
Storage Blk Time (%)	0					
Queuing Penalty (veh)	0					

Intersection: 3: Clubhouse & Cartwright Rd & The Red Barn

Movement	EB	WB	SB	SW
Directions Served	<LT	TR>	<LR	LR>
Maximum Queue (m)	6.0	7.8	8.5	6.5
Average Queue (m)	0.3	0.6	0.4	0.3
95th Queue (m)	2.9	4.4	3.6	3.1
Link Distance (m)	123.6	576.4	284.5	95.9
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Lorne Ave & Cartwright Rd

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	TR
Maximum Queue (m)	16.7	13.3	5.7	9.9	1.2
Average Queue (m)	7.9	6.0	0.3	0.8	0.0
95th Queue (m)	14.8	13.4	2.9	5.5	0.9
Link Distance (m)	146.0	259.1		79.7	79.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Cartwright Rd & Cartwright Terrace

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	9.8	3.2
Average Queue (m)	4.9	0.1
95th Queue (m)	10.1	1.8
Link Distance (m)	51.5	250.0
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: Waterford/Wentworth & Cartwright Rd

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	1.6	4.4	13.6	11.0
Average Queue (m)	0.1	0.2	7.2	5.1
95th Queue (m)	1.5	2.5	13.5	12.6
Link Distance (m)	576.4	223.9	170.3	154.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 0

Intersection: 1: Clarence Ave & Cartwright Rd

Movement	EB	EB	WB	NB	SB	SB
Directions Served	LT	R	LTR	LTR	L	R
Maximum Queue (m)	18.9	8.0	15.0	5.9	1.5	3.5
Average Queue (m)	9.4	1.5	3.5	0.3	0.1	0.2
95th Queue (m)	15.7	6.6	11.5	3.1	1.2	2.1
Link Distance (m)	223.9		54.5	929.6		510.1
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)		25.0			20.0	
Storage Blk Time (%)	0					
Queuing Penalty (veh)	0					

Intersection: 3: Clubhouse & Cartwright Rd & The Red Barn

Movement	EB	WB	SB	SW
Directions Served	<LT	TR>	<LR	LR>
Maximum Queue (m)	7.2	6.3	10.4	7.2
Average Queue (m)	0.4	0.4	1.6	0.4
95th Queue (m)	3.7	3.9	7.3	3.5
Link Distance (m)	123.6	576.4	284.5	95.9
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Lorne Ave & Cartwright Rd

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	TR
Maximum Queue (m)	19.1	16.1	12.0	16.8	2.0
Average Queue (m)	8.8	6.9	0.8	2.5	0.1
95th Queue (m)	16.5	14.6	5.8	10.2	2.3
Link Distance (m)	146.0	259.2		79.7	79.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Cartwright Rd & Cartwright Terrace

Movement	WB	NB	SB
Directions Served	LR	R	LT
Maximum Queue (m)	11.1	0.6	5.0
Average Queue (m)	5.1	0.0	0.3
95th Queue (m)	10.4	0.7	2.9
Link Distance (m)	51.5		250.0
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)		25.0	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 20: Waterford/Wentworth & Cartwright Rd

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	2.4	8.9	11.9	11.3
Average Queue (m)	0.1	1.0	4.4	3.8
95th Queue (m)	1.8	5.6	12.0	11.3
Link Distance (m)	576.4	223.9	170.3	154.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 0

Intersection: 1: Clarence Ave & Cartwright Rd

Movement	EB	EB	WB	NB	SB	SB
Directions Served	LT	R	LTR	LTR	L	R
Maximum Queue (m)	22.1	8.0	15.7	7.1	5.3	3.5
Average Queue (m)	9.7	1.3	4.1	0.3	0.2	0.1
95th Queue (m)	16.9	6.2	12.5	3.4	2.5	1.6
Link Distance (m)	223.9		54.5	929.6		510.1
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)		25.0			20.0	
Storage Blk Time (%)	0					
Queuing Penalty (veh)	0					

Intersection: 3: Clubhouse & Cartwright Rd & The Red Barn

Movement	EB	WB	SB	SW
Directions Served	<LT	TR>	<LR	LR>
Maximum Queue (m)	5.0	8.8	11.4	8.5
Average Queue (m)	0.3	0.4	1.5	0.5
95th Queue (m)	3.1	3.7	7.3	4.2
Link Distance (m)	123.6	576.4	284.5	95.9
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Lorne Ave & Cartwright Rd

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	TR
Maximum Queue (m)	19.6	17.1	8.2	11.8	0.6
Average Queue (m)	8.2	7.0	0.5	1.9	0.0
95th Queue (m)	16.1	14.6	4.4	8.2	0.7
Link Distance (m)	146.0	259.2		79.7	79.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Cartwright Rd & Cartwright Terrace

Movement	WB	NB	SB
Directions Served	LR	R	LT
Maximum Queue (m)	10.9	0.7	6.7
Average Queue (m)	5.1	0.0	0.4
95th Queue (m)	10.4	0.7	3.6
Link Distance (m)	51.5		250.0
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)		25.0	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 20: Waterford/Wentworth & Cartwright Rd

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	2.4	12.4	13.2	10.4
Average Queue (m)	0.1	1.2	4.9	3.7
95th Queue (m)	1.5	6.8	12.4	11.1
Link Distance (m)	576.4	223.9	170.3	154.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 0

Intersection: 1: Clarence Ave & Cartwright Rd

Movement	EB	EB	WB	NB	SB	SB
Directions Served	LT	R	LTR	LTR	L	R
Maximum Queue (m)	38.4	11.5	14.5	9.3	4.6	1.6
Average Queue (m)	16.8	1.2	4.5	0.5	0.2	0.0
95th Queue (m)	28.7	6.8	12.5	4.0	2.4	0.6
Link Distance (m)	223.9		54.5	929.6		510.1
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)		25.0			20.0	
Storage Blk Time (%)	2	0				
Queuing Penalty (veh)	0	0				

Intersection: 3: Clubhouse & Cartwright Rd & The Red Barn

Movement	EB	WB	NB	SB	SW
Directions Served	<LTR	LTR>	LTR>	<LTR	<LR>
Maximum Queue (m)	10.6	11.6	13.0	12.7	10.3
Average Queue (m)	1.8	1.6	2.5	3.4	0.8
95th Queue (m)	8.0	7.6	9.7	11.3	5.1
Link Distance (m)	123.6	576.4	120.0	286.2	155.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: Lorne Ave & Cartwright Rd

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LT
Maximum Queue (m)	18.0	29.9	7.4	19.1
Average Queue (m)	8.0	14.0	0.4	4.2
95th Queue (m)	15.4	23.9	4.0	13.5
Link Distance (m)	146.0	259.1		79.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: Cartwright Rd & Cartwright Terrace

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LT	LTR
Maximum Queue (m)	10.2	11.3	2.5	3.9
Average Queue (m)	4.7	5.0	0.1	0.1
95th Queue (m)	11.9	9.6	2.1	1.7
Link Distance (m)	537.9	218.1	286.2	247.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: Lorne Ave

Movement	WB
Directions Served	R
Maximum Queue (m)	17.1
Average Queue (m)	8.0
95th Queue (m)	14.7
Link Distance (m)	249.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12:

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (m)	6.4	7.4
Average Queue (m)	1.7	0.5
95th Queue (m)	6.1	3.9
Link Distance (m)	249.6	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		25.0
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: Waterford/Wentworth & Cartwright Rd

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	5.8	7.3	16.7	10.5
Average Queue (m)	0.2	0.6	7.2	4.3
95th Queue (m)	2.4	4.1	14.4	11.8
Link Distance (m)	576.4	223.9	170.3	154.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 24: Lorne Ave

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: Clarence Ave & Cartwright Rd

Movement	EB	EB	WB	NB	SB	SB	SB
Directions Served	LT	R	LTR	LTR	L	T	R
Maximum Queue (m)	52.7	13.1	10.9	11.2	6.8	0.5	2.6
Average Queue (m)	20.0	1.0	4.5	0.6	0.3	0.0	0.1
95th Queue (m)	38.9	6.7	11.9	5.3	2.8	0.6	1.6
Link Distance (m)	223.9		54.5	929.6		510.1	510.1
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)		25.0			20.0		
Storage Blk Time (%)	5	0					
Queuing Penalty (veh)	0	0					

Intersection: 3: Clubhouse & Cartwright Rd & The Red Barn

Movement	EB	WB	NB	SB	SW
Directions Served	<LTR	LTR>	LTR>	<LTR	<LR>
Maximum Queue (m)	11.0	12.0	13.0	12.6	9.9
Average Queue (m)	1.7	1.6	2.4	2.9	0.9
95th Queue (m)	7.7	7.8	9.5	10.3	5.5
Link Distance (m)	123.6	576.4	120.0	286.2	155.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: Lorne Ave & Cartwright Rd

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	TR
Maximum Queue (m)	23.8	32.8	10.5	18.4	0.6
Average Queue (m)	9.3	14.2	0.6	5.5	0.0
95th Queue (m)	18.3	24.8	4.8	15.4	0.7
Link Distance (m)	146.0	259.2		79.7	79.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Cartwright Rd & Cartwright Terrace

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LT	LTR
Maximum Queue (m)	9.6	11.5	7.0	5.2
Average Queue (m)	4.2	5.0	0.3	0.3
95th Queue (m)	11.3	10.0	3.3	2.9
Link Distance (m)	537.9	218.1	286.2	247.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: Lorne Ave

Movement	WB
Directions Served	R
Maximum Queue (m)	17.2
Average Queue (m)	7.9
95th Queue (m)	14.3
Link Distance (m)	249.7
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12:

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (m)	6.4	10.2
Average Queue (m)	1.8	0.7
95th Queue (m)	6.2	4.9
Link Distance (m)	249.7	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		25.0
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: Waterford/Wentworth & Cartwright Rd

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	5.5	9.9	16.5	12.3
Average Queue (m)	0.3	0.7	7.8	4.3
95th Queue (m)	2.9	4.7	14.6	12.1
Link Distance (m)	576.4	223.9	170.3	154.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 24: Lorne Ave

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: Clarence Ave & Cartwright Rd

Movement	EB	EB	WB	NB	SB	SB	SB
Directions Served	LT	R	LTR	LTR	L	T	R
Maximum Queue (m)	56.8	14.2	14.2	50.3	11.4	35.4	20.8
Average Queue (m)	24.5	1.2	2.8	23.9	1.3	14.0	8.9
95th Queue (m)	44.2	7.8	10.0	42.0	6.7	27.6	16.9
Link Distance (m)	223.9		54.5	929.6		510.1	510.1
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)		25.0			20.0		
Storage Blk Time (%)	7	0			0	3	
Queuing Penalty (veh)	0	0			0	0	

Intersection: 6: Lorne Ave & Cartwright Rd

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	TR
Maximum Queue (m)	26.4	29.2	68.2	69.1	49.0
Average Queue (m)	8.0	11.9	29.0	31.7	13.8
95th Queue (m)	19.6	23.9	53.7	57.7	37.2
Link Distance (m)	146.0	259.2		79.7	79.7
Upstream Blk Time (%)				0	0
Queuing Penalty (veh)				0	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

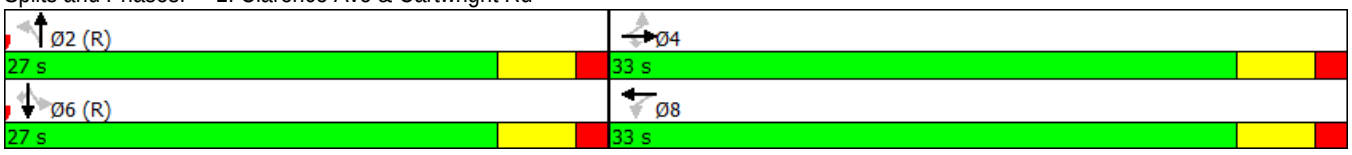
Zone Summary

Zone wide Queuing Penalty: 1

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	264	5	5	5	5	6	193	5	111	116
Future Volume (vph)	264	5	5	5	5	6	193	5	111	116
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		4			8		2		6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	4	4	4	8	8	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	15.0	15.0	15.0	15.0	15.0
Minimum Split (s)	29.0	29.0	29.0	29.0	29.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	33.0	33.0	33.0	33.0	33.0	27.0	27.0	27.0	27.0	27.0
Total Split (%)	55.0%	55.0%	55.0%	55.0%	55.0%	45.0%	45.0%	45.0%	45.0%	45.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)		2.0	2.0		2.0		2.0	2.0	2.0	2.0
Total Lost Time (s)		7.0	7.0		7.0		7.0	7.0	7.0	7.0
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)		26.0	26.0		26.0		20.0	20.0	20.0	20.0
Actuated g/C Ratio		0.43	0.43		0.43		0.33	0.33	0.33	0.33
v/c Ratio		0.60	0.01		0.07		0.39	0.03	0.21	0.27
Control Delay		18.7	0.0		6.5		17.1	13.8	15.5	4.1
Queue Delay		0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		18.7	0.0		6.5		17.1	13.8	15.5	4.1
LOS		B	A		A		B	B	B	A
Approach Delay		18.3			6.5		17.1		9.2	
Approach LOS		B			A		B		A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 14.3	Intersection LOS: B
Intersection Capacity Utilization 50.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Clarence Ave & Cartwright Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	264	5	5	5	5	12	6	193	5	5	111	116
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lost Time (s)	7.0	7.0	7.0	7.0	7.0	6.0	7.0	7.0	6.0	7.0	7.0	7.0
Minimum Green (s)	10.0	10.0	10.0	10.0	10.0	4.0	15.0	15.0	4.0	15.0	15.0	15.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	269	5	0	22	0	0	204	0	5	111	116
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.91	0.85	0.95	0.99	0.85	0.95	1.00	0.85
Saturated Flow (vph)	0	1759	1573	0	1679	0	0	1840	0	1758	1850	1573
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.4			0.0			0.0			8.9
Adj Reference Time (s)			17.0			0.0			0.0			22.0
Permitted Option												
Adj Saturation A (vph)	0	525		0	375		0	1297		169	1850	
Reference Time A (s)	0.0	61.5		0.0	7.0		0.0	18.9		3.6	7.2	
Adj Saturation B (vph	0	0		0	0		0	0		NA	NA	
Reference Time B (s)	26.0	26.3		8.3	9.6		8.4	21.3		NA	NA	
Reference Time (s)		26.3			7.0			18.9			7.2	
Adj Reference Time (s)		33.3			17.0			25.9			22.0	
Split Option												
Ref Time Combined (s)	0.0	18.3		0.0	1.6		0.0	13.3		0.3	7.2	
Ref Time Seperate (s)	18.0	0.3		0.3	0.4		0.4	12.6		0.3	7.2	
Reference Time (s)	18.3	18.3		1.6	1.6		13.3	13.3		7.2	7.2	
Adj Reference Time (s)	25.3	25.3		17.0	17.0		22.0	22.0		22.0	22.0	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	33.3	25.9	
Split Option (s)	42.3	44.0	
Minimum (s)	33.3	25.9	59.2

Right Turns	EBR	SBR
Adj Reference Time (s)	17.0	22.0
Cross Thru Ref Time (s)	22.0	17.0
Oncoming Left Ref Time (s)	17.0	22.0
Combined (s)	56.0	61.0

Intersection Summary			
Intersection Capacity Utilization	50.8%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

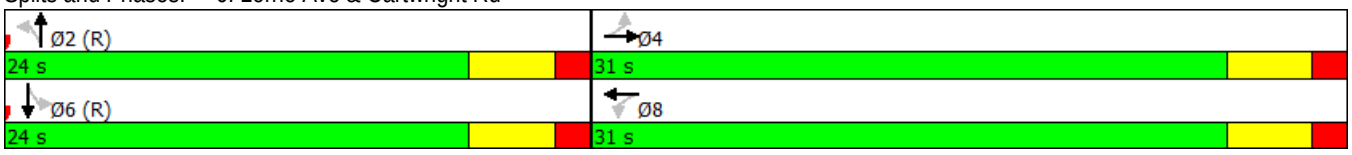
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	264	5	5	5	5	12	6	193	5	5	111	116
Future Volume (vph)	264	5	5	5	5	12	6	193	5	5	111	116
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)		7.0	7.0		7.0			7.0		7.0	7.0	7.0
Lane Util. Factor		1.00	1.00		1.00			1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.93			0.99		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.99			1.00		0.95	1.00	1.00
Satd. Flow (prot)		1766	1574		1698			1828		1759	1852	1574
Flt Permitted		0.69	1.00		0.91			0.99		0.64	1.00	1.00
Satd. Flow (perm)		1286	1574		1569			1814		1193	1852	1574
Peak-hour factor, PHF	0.81	0.50	0.75	0.43	0.43	0.43	0.75	0.92	0.25	0.42	0.84	0.66
Adj. Flow (vph)	326	10	7	12	12	28	8	210	20	12	132	176
RTOR Reduction (vph)	0	0	4	0	16	0	0	5	0	0	0	117
Lane Group Flow (vph)	0	336	3	0	36	0	0	233	0	12	132	59
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		28.0	28.0		28.0			22.0		22.0	22.0	22.0
Effective Green, g (s)		26.0	26.0		26.0			20.0		20.0	20.0	20.0
Actuated g/C Ratio		0.43	0.43		0.43			0.33		0.33	0.33	0.33
Clearance Time (s)		5.0	5.0		5.0			5.0		5.0	5.0	5.0
Lane Grp Cap (vph)		557	682		679			604		397	617	524
v/s Ratio Prot											0.07	
v/s Ratio Perm		c0.26	0.00		0.02			c0.13		0.01		0.04
v/c Ratio		0.60	0.00		0.05			0.39		0.03	0.21	0.11
Uniform Delay, d1		13.0	9.7		9.9			15.3		13.5	14.4	13.9
Progression Factor		1.00	1.00		1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2		4.8	0.0		0.1			1.9		0.1	0.8	0.4
Delay (s)		17.8	9.7		10.0			17.2		13.6	15.1	14.3
Level of Service		B	A		B			B		B	B	B
Approach Delay (s)		17.7			10.0			17.2			14.6	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	45	5	7	6	5	236	82	182
Future Volume (vph)	45	5	7	6	5	236	82	182
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	15.0	15.0	15.0	15.0
Minimum Split (s)	31.0	31.0	31.0	31.0	24.0	24.0	24.0	24.0
Total Split (s)	31.0	31.0	31.0	31.0	24.0	24.0	24.0	24.0
Total Split (%)	56.4%	56.4%	56.4%	56.4%	43.6%	43.6%	43.6%	43.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)		2.0		2.0		2.0		2.0
Total Lost Time (s)		7.0		7.0		7.0		7.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)		24.0		24.0		17.0		17.0
Actuated g/C Ratio		0.44		0.44		0.31		0.31
v/c Ratio		0.15		0.27		0.57		0.49
Control Delay		9.4		3.7		20.6		16.8
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		9.4		3.7		20.6		16.8
LOS		A		A		C		B
Approach Delay		9.4		3.7		20.6		16.8
Approach LOS		A		A		C		B

Intersection Summary	
Cycle Length: 55	
Actuated Cycle Length: 55	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 14.6	Intersection LOS: B
Intersection Capacity Utilization 66.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 6: Lorne Ave & Cartwright Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	5	5	7	6	139	5	236	5	82	182	32
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Lost Time (s)	7.0	7.0	6.0	7.0	7.0	6.0	7.0	7.0	6.0	7.0	7.0	6.0
Minimum Green (s)	10.0	10.0	4.0	10.0	10.0	4.0	15.0	15.0	4.0	15.0	15.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	55	0	0	152	0	0	246	0	0	296	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.86	0.85	0.95	1.00	0.85	0.95	0.97	0.85
Saturated Flow (vph)	0	1750	0	0	1593	0	0	1842	0	0	3417	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		No			No			No			No	
Reference Time (s)			0.0			0.0			0.0			0.0
Adj Reference Time (s)			0.0			0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	0	233		0	1620		0	1430		0	149	
Reference Time A (s)	0.0	28.3		0.0	11.3		0.0	20.6		0.0	66.2	
Adj Saturation B (vph	NA	NA		0	0		NA	NA		NA	NA	
Reference Time B (s)	NA	NA		8.5	19.5		NA	NA		NA	NA	
Reference Time (s)		28.3			11.3			20.6			66.2	
Adj Reference Time (s)		35.3			18.3			27.6			73.2	
Split Option												
Ref Time Combined (s)	0.0	3.8		0.0	11.5		0.0	16.0		0.0	10.4	
Ref Time Seperate (s)	3.1	0.4		0.5	0.5		0.3	15.4		5.6	6.3	
Reference Time (s)	3.8	3.8		11.5	11.5		16.0	16.0		10.4	10.4	
Adj Reference Time (s)	17.0	17.0		18.5	18.5		23.0	23.0		22.0	22.0	

Summary	EB WB	NB SB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	35.3	73.2	
Split Option (s)	35.5	45.0	
Minimum (s)	35.3	45.0	80.3

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	66.9%	ICU Level of Service	C

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	5	5	7	6	139	5	236	5	82	182	32
Future Volume (vph)	45	5	5	7	6	139	5	236	5	82	182	32
Ideal Flow (vphpl)	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850	1850
Total Lost time (s)		7.0			7.0			7.0			7.0	
Lane Util. Factor		1.00			1.00			1.00			0.95	
Frt		0.98			0.89			0.99			0.98	
Flt Protected		0.96			1.00			1.00			0.98	
Satd. Flow (prot)		1756			1634			1839			3407	
Flt Permitted		0.70			0.98			0.98			0.74	
Satd. Flow (perm)		1275			1605			1808			2557	
Peak-hour factor, PHF	0.68	0.50	0.50	0.38	0.38	0.75	0.50	0.79	0.38	0.68	0.80	0.72
Adj. Flow (vph)	66	10	10	18	16	185	10	299	13	121	228	44
RTOR Reduction (vph)	0	6	0	0	104	0	0	3	0	0	18	0
Lane Group Flow (vph)	0	80	0	0	115	0	0	319	0	0	375	0
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)		26.0			26.0			19.0			19.0	
Effective Green, g (s)		24.0			24.0			17.0			17.0	
Actuated g/C Ratio		0.44			0.44			0.31			0.31	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		556			700			558			790	
v/s Ratio Prot												
v/s Ratio Perm		0.06			c0.07			c0.18			0.15	
v/c Ratio		0.14			0.16			0.57			0.47	
Uniform Delay, d1		9.3			9.4			15.9			15.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.5			0.5			4.2			2.0	
Delay (s)		9.9			9.9			20.2			17.4	
Level of Service		A			A			C			B	
Approach Delay (s)		9.9			9.9			20.2			17.4	
Approach LOS		A			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: Clarence Ave & Cartwright Rd

Movement	EB	EB	WB	NB	SB	SB	SB
Directions Served	LT	R	LTR	LTR	L	T	R
Maximum Queue (m)	50.0	10.8	13.7	43.4	10.9	28.7	20.3
Average Queue (m)	23.0	1.1	3.1	21.5	1.2	13.0	9.0
95th Queue (m)	41.4	7.8	10.6	36.0	6.5	23.8	17.0
Link Distance (m)	223.9		54.5	929.6		510.1	510.1
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)		25.0			20.0		
Storage Blk Time (%)	6	0			0	2	
Queuing Penalty (veh)	0	0			0	0	

Intersection: 6: Lorne Ave & Cartwright Rd

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	TR
Maximum Queue (m)	19.3	30.8	56.4	50.4	33.1
Average Queue (m)	6.2	12.1	24.1	24.5	8.2
95th Queue (m)	16.0	23.8	43.2	42.7	21.6
Link Distance (m)	146.0	259.1		79.7	79.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 0

Intersection: 1: Clarence Ave & Cartwright Rd

Movement	EB	EB	WB	NB	SB	SB
Directions Served	LT	R	LTR	LTR	L	R
Maximum Queue (m)	31.9	13.3	15.5	8.5	5.4	6.5
Average Queue (m)	14.8	2.3	3.5	0.6	0.2	0.3
95th Queue (m)	25.7	9.2	11.6	4.6	2.5	2.7
Link Distance (m)	223.9		54.5	929.6		510.1
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)		25.0			20.0	
Storage Blk Time (%)	1	0				
Queuing Penalty (veh)	0	0				

Intersection: 3: Access E & Clubhouse & Cartwright Rd & The Red Barn

Movement	EB	WB	NB	SB	SW
Directions Served	<LTR	LTR>	LTR>	<LTR	<LR>
Maximum Queue (m)	12.9	16.9	10.7	18.7	10.0
Average Queue (m)	3.8	3.5	1.8	6.3	1.4
95th Queue (m)	12.0	12.5	8.1	16.2	6.8
Link Distance (m)	281.5	576.4	235.8	286.2	193.3
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: Lorne Ave & Cartwright Rd

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LT
Maximum Queue (m)	26.7	29.7	20.7	29.4
Average Queue (m)	10.8	13.2	1.4	11.1
95th Queue (m)	20.6	23.6	9.9	23.1
Link Distance (m)	146.0	259.1		79.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: Cartwright Rd & Access B/Cartwright Terrace

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LT	LTR
Maximum Queue (m)	8.9	11.8	8.8	10.4
Average Queue (m)	3.9	5.3	0.5	0.7
95th Queue (m)	10.9	10.4	4.2	5.8
Link Distance (m)	537.9	51.3	286.2	247.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: Access A & Lorne Ave

Movement	WB
Directions Served	R
Maximum Queue (m)	11.6
Average Queue (m)	5.9
95th Queue (m)	12.9
Link Distance (m)	249.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Access A

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (m)	6.4	1.6
Average Queue (m)	1.9	0.0
95th Queue (m)	6.4	0.9
Link Distance (m)	249.6	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		25.0
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: Waterford/Wentworth & Cartwright Rd

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	11.5	16.8	14.0	12.1
Average Queue (m)	0.5	2.4	4.4	4.5
95th Queue (m)	5.2	10.3	12.3	12.3
Link Distance (m)	576.4	223.9	170.3	154.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 24: Lorne Ave

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: Clarence Ave & Cartwright Rd

Movement	EB	EB	WB	NB	SB	SB	SB
Directions Served	LT	R	LTR	LTR	L	T	R
Maximum Queue (m)	47.5	18.9	15.0	18.7	4.6	1.5	9.7
Average Queue (m)	18.0	2.8	3.6	1.6	0.2	0.1	0.5
95th Queue (m)	35.1	11.9	11.5	9.3	2.3	1.6	4.4
Link Distance (m)	223.9		54.5	929.6		510.1	510.1
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)		25.0			20.0		
Storage Blk Time (%)	4	0				0	
Queuing Penalty (veh)	1	0				0	

Intersection: 3: Access E & Clubhouse & Cartwright Rd & The Red Barn

Movement	EB	WB	NB	SB	SW
Directions Served	<LTR	LTR>	LTR>	<LTR	<LR>
Maximum Queue (m)	13.9	16.9	10.3	18.1	10.6
Average Queue (m)	3.3	3.3	1.9	5.7	1.5
95th Queue (m)	11.2	12.2	8.1	15.3	7.2
Link Distance (m)	281.5	576.4	235.8	286.2	193.3
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: Lorne Ave & Cartwright Rd

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	TR
Maximum Queue (m)	50.5	38.0	19.9	47.1	0.6
Average Queue (m)	15.6	15.0	1.5	14.6	0.0
95th Queue (m)	39.0	28.2	9.7	32.5	0.6
Link Distance (m)	146.0	259.1		79.7	79.7
Upstream Blk Time (%)				0	
Queuing Penalty (veh)				0	
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Cartwright Rd & Access B/Cartwright Terrace

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LT	LTR
Maximum Queue (m)	10.2	11.9	7.2	14.5
Average Queue (m)	4.0	5.2	0.4	0.9
95th Queue (m)	11.1	9.9	3.7	6.6
Link Distance (m)	537.9	51.3	286.2	247.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: Access A & Lorne Ave

Movement	WB
Directions Served	R
Maximum Queue (m)	10.3
Average Queue (m)	6.2
95th Queue (m)	12.9
Link Distance (m)	249.6
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Access A

Movement	EB	NB	SB
Directions Served	LR	L	R
Maximum Queue (m)	6.4	2.4	0.6
Average Queue (m)	2.0	0.1	0.0
95th Queue (m)	6.6	1.8	0.7
Link Distance (m)	249.6		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)		25.0	25.0
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 20: Waterford/Wentworth & Cartwright Rd

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	7.9	17.3	14.0	11.1
Average Queue (m)	0.5	2.8	4.9	3.8
95th Queue (m)	4.6	11.7	12.7	11.2
Link Distance (m)	576.4	223.9	170.3	154.3
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 24: Lorne Ave

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 1

Intersection: 1: Clarence Ave & Cartwright Rd

Movement	EB	EB	WB	NB	SB	SB	SB
Directions Served	LT	R	LTR	LTR	L	T	R
Maximum Queue (m)	40.1	16.9	14.1	55.1	13.8	54.5	40.9
Average Queue (m)	18.8	1.8	2.7	21.1	1.1	28.4	16.8
95th Queue (m)	34.2	9.4	10.2	41.5	6.7	47.8	29.9
Link Distance (m)	223.9		54.5	929.6		510.1	510.1
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)		25.0			20.0		
Storage Blk Time (%)	3	0			0	15	
Queuing Penalty (veh)	0	0			0	1	

Intersection: 6: Lorne Ave & Cartwright Rd

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	TR
Maximum Queue (m)	34.4	31.6	70.0	86.3	81.7
Average Queue (m)	12.3	13.3	31.0	54.8	31.2
95th Queue (m)	27.1	26.4	56.8	88.9	71.3
Link Distance (m)	146.0	259.1		79.7	79.7
Upstream Blk Time (%)				6	1
Queuing Penalty (veh)				0	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 1

Intersection: 1: Clarence Ave & Cartwright Rd

Movement	EB	EB	WB	NB	SB	SB	SB
Directions Served	LT	R	LTR	LTR	L	T	R
Maximum Queue (m)	39.7	12.1	12.4	47.8	15.2	48.3	36.8
Average Queue (m)	17.7	1.3	2.4	17.2	1.1	22.3	17.4
95th Queue (m)	33.1	6.6	9.2	34.9	7.3	39.2	30.1
Link Distance (m)	223.9		54.5	929.6		510.1	510.1
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)		25.0			20.0		
Storage Blk Time (%)	2	0			0	9	
Queuing Penalty (veh)	0	0			0	0	

Intersection: 6: Lorne Ave & Cartwright Rd

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	TR
Maximum Queue (m)	26.8	30.8	67.9	90.4	86.9
Average Queue (m)	7.8	12.5	29.2	55.8	31.0
95th Queue (m)	19.4	25.0	51.8	91.9	75.1
Link Distance (m)	146.0	259.1		79.7	79.7
Upstream Blk Time (%)				9	2
Queuing Penalty (veh)				0	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 1

Appendix D SIGNAL WARRANT ANALYSIS

Canadian Traffic Signal Warrant Analysis

Main Street	**Clarence Ave**
Side Street	**Cartwright Rd**

Date: June 6, 2017

City: Saskatoon

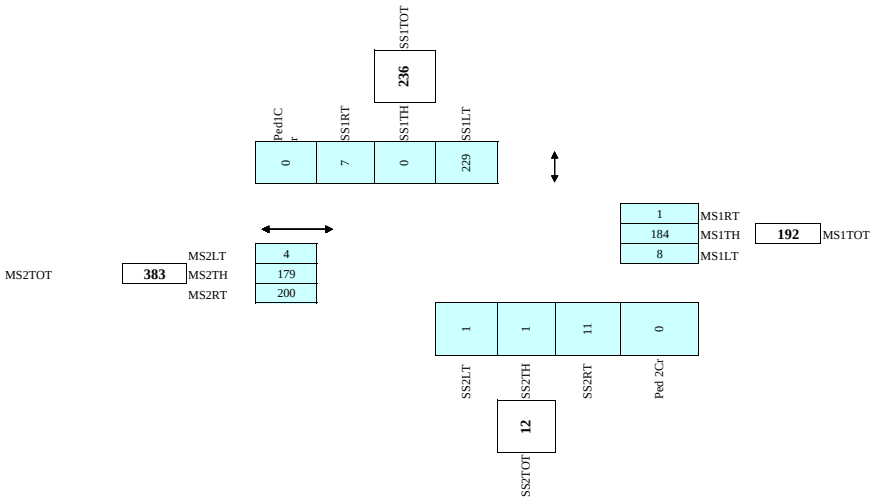
MainStreet1Lanes	(#)	1	Distance to next signal	(m)	500
MainStreet2Lanes	(#)	1	Elementary School	(y/n)	n
MainStreet LT Lanes	(#)	1	Senior's Complex	(y/n)	n
SideStreet1Lanes	(#)	1	Pathway to School	(y/n)	n
SideStreet2Lanes	(#)	1	Metro Area Population	(#)	220,000
MainStreetSpeedLimit	(km/h)	80	Side Street Bus Route	(y/n)	n
MainStreetTrucks/Buses	(%)	2.0%	Side Street Trucks	(%)	1.0%
Refuge Width on Median	(m)	0.0	T or 1-Way Intersection	(y/n)	n
			Central Business District	(y/n)	n

Vm =	**574**	(MainSt Vol Total)	Cs =	**0.997**	(Int SpacingFactor)
Vs =	**236**	(SideSt Vol Highest)	Cmt =	**1.000**	(MainStTruckFactor)
Pc =	**0**	Peds Crossing Main	Cv =	**1.100**	(SpeedFactor)
K1 =	**1,400**	veh/veh const	Cp =	**1.100**	(PopDemoFactor)
K2 =	**5,000**	veh/ped const	Csb =	**1.000**	(SideStBusFactor)
L =	**3.0**	TotalMainStLanes	Cst =	**1.000**	(SideStTruckFactor)
F =	**1.000**	(PedDemoFactor)	Vmx =	**383**	(MainStHighest)
Vm1 =	**574**	(MainStVeh-Veh#)	Vm2 =	**574**	(MainStVeh-Ped#)
Cvp =	**1.206**	(product of Cs,Cmt,Cv,Cp)	Cbt =	**1.000**	(maximum of Csb,Cst)
Ct1 =	**1.000**	T Int / one way Factor			

	MS1LT	MS1TH	MS1RT	MS2LT	MS2TH	MS2RT	SS1LT	SS1TH	SS1RT	SS2LT	SS2TH	SS2RT	PedC1	PedC2
7:00 - 8:00	8	193	1	5	111	116	264	0	4	0	0	12	0	0
8:00 - 9:00	8	193	1	5	111	116	264	0	4	0	0	12	0	0
11:00 - 12:00	7.5	183.5	0.5	3.5	179	200	228.5	0	7	0.5	0.5	11	0	0
12:00 - 13:00	7.5	183.5	0.5	3.5	179	200	228.5	0	7	0.5	0.5	11	0	0
16:00 - 17:00	7	174	0	2	247	284	193	0	10	1	1	10	0	0
17:00 - 18:00	7	174	1	2	247	284	193	0	10	1	1	10	0	0
Average	8	184	1	4	179	200	229	0	7	1	1	11	0	0

***** Enter the hourly turning movement counts averaged over the peak six hours of a typical week day**

***** Enter the peak pedestrian volume crossing the main street averaged over the same hours**



W = [Ct1xCbt(Vm1 x Vs)/K1 + (F(Vm2 x Pc)L)/K2] x Cvp

W = **117** **117** **0**

Warranted ***Veh*** ***Ped***

Roadway, Vehicle and Pedestrian Factors			**Range**			
			Min	**@**	**Max**	**@**
Cs =	(Int SpacingFactor)		0.90	<200 m	1.10	isolated
Cmt =	(MainStTruckFactor)		1.00	<5%	1.15	>20%
Cv =	(SpeedFactor)		1.00	<60 km/h	1.10	>80 km/h
Cp =	(PopDemoFactor)		1.00	>250,000	1.20	<10,000
Csb =	(SideStBusFactor)		1.00	no	1.05	yes
Cst =	(SideStTruckFactor)		1.00	<10%	1.05	>10%
F =	(Ped DemoFactor)					
	(max of)	Elementary School	1.20			
		Seniors Complex	1.10			
		Path to School	1.10			

Explanation of Factors:

Cbt = 1.05 if the side street either is a bus route, or has more than 10% trucks, otherwise = 1.00.
(it is assumed that these two factors only affect the side street vehicles trying to cross the main street, not the pedestrians)

Ci = the product of the other 4 geographic factors
(Cs = intersection spacing, Cmt = main street truck, Cv = Speed, Cp = Population)

Vm1 = the main street volume - either the total of the two approaches or the highest single approach
(if the median is >=10.0 metres) (averaged over 6 peak hours)

Vm2 = the main street volume - either the total of the two approaches or the highest single approach
(if the median is >=6.0 metres) (averaged over 6 peak hours)

Vs = the highest side street approach volume (averaged over 6 peak hours)
*** note: it has been determined that Vs must be > 75 for signals to be considered ***

F = Pedestrian demographic factor - the maximum of the 3 individual pedestrian demographic factors

Pc = the total pedestrian volume crossing the mainstreet
(averaged over 6 peak hours)

L = number of lanes that the pedestrians have to cross
(only half the street if the median is >=5.0 metres)

Kv = Vehicle - Vehicle denominator constant
(Kv = 1,100 if L<=3, Kv = 1,400 if L >3)

Kp = Vehicle - Pedestrian denominator constant
(Kp = 2,000 if L<=3, Kp = 5,000 if L >3)

Canadian Traffic Signal Warrant Analysis

Main Street		**Clarence Ave**
Side Street		**Cartwright Rd**

Date: June 6, 2017

City: Saskatoon

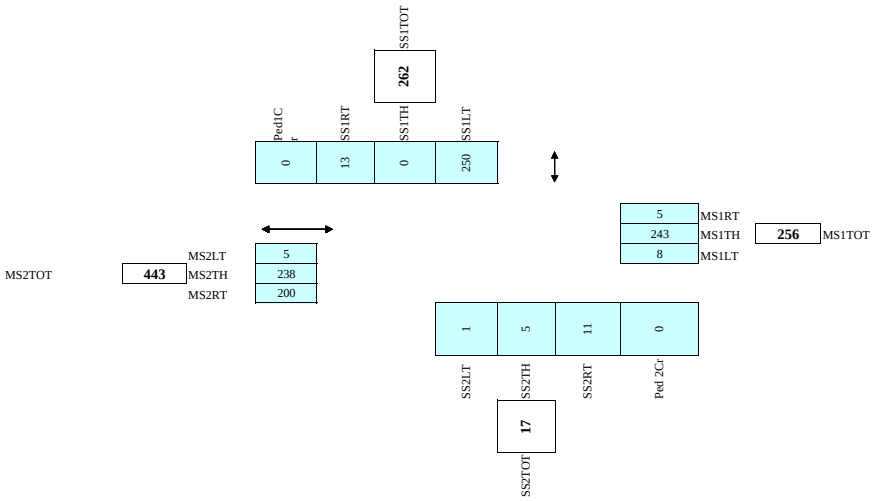
MainStreet1Lanes	(#)	1		Distance to next signal	(m)	500	Vm =	**698**	(MainSt Vol Total)
MainStreet2Lanes	(#)	1		Elementary School	(y/n)	n	Vs =	**262**	(SideSt Vol Highest)
MainStreet LT Lanes	(#)	1		Senior's Complex	(y/n)	n	Pc =	**0**	Peds Crossing Main
SideStreet1Lanes	(#)	1		Pathway to School	(y/n)	n	K1 =	**1,400**	veh/veh const
SideStreet2Lanes	(#)	1		Metro Area Population	(#)	220,000	K2 =	**5,000**	veh/ped const
MainStreetSpeedLimit	(km/h)	80		Side Street Bus Route	(y/n)	n	L =	**3.0**	TotalMainStLanes
MainStreetTrucks/Buses	(%)	2.0%		Side Street Trucks	(%)	1.0%	F =	**1.000**	(PedDemoFactor)
Refuge Width on Median	(m)	0.0		T or 1-Way Intersection	(y/n)	n	Vm1 =	**698**	(MainStVeh-Veh#)
				Central Business District	(y/n)	n	Cvp =	**1.206**	(product of Cs,Cmt,Cv,Cp)
							Ct1 =	**1.000**	T Int / one way Factor

	Cs =	**0.997**	(Int SpacingFactor)
	Cmt =	**1.000**	(MainStTruckFactor)
	Cv =	**1.100**	(SpeedFactor)
	Cp =	**1.100**	(PopDemoFactor)
	Csb =	**1.000**	(SideStBusFactor)
	Cst =	**1.000**	(SideStTruckFactor)
	Vmx =	**443**	(MainStHighest)
	Vm2 =	**698**	(MainStVeh-Ped#)
	Cbt =	**1.000**	(maximum of Csb,Cst)

	MS1LT	MS1TH	MS1RT	MS2LT	MS2TH	MS2RT	SS1LT	SS1TH	SS1RT	SS2LT	SS2TH	SS2RT	PedC1	PedC2
7:00 - 8:00	8	256	5	5	147	116	264	0	10	0	5	12	0	0
8:00 - 9:00	8	256	5	5	147	116	264	0	10	0	5	12	0	0
11:00 - 12:00	7.5	243	5	5	237.5	200	249.5	0	12.5	0.5	5	11	0	0
12:00 - 13:00	7.5	243	5	5	237.5	200	249.5	0	12.5	0.5	5	11	0	0
16:00 - 17:00	7	230	5	5	328	284	235	0	15	1	5	10	0	0
17:00 - 18:00	7	230	5	5	328	284	235	0	15	1	5	10	0	0
Average	8	243	5	5	238	200	250	0	13	1	5	11	0	0

***** Enter the hourly turning movement counts averaged over the peak six hours of a typical week day**

***** Enter the peak pedestrian volume crossing the main street averaged over the same hours**



W = [Ct1xCbt(Vm1 x Vs)/K1 + (F(Vm2 x Pc)L)/K2] x Cvp

W =	**158**	**158**	**0**
	Warranted	***Veh***	***Ped***

Roadway, Vehicle and Pedestrian Factors			**Range**			
			Min	**@**	**Max**	**@**
Cs =	(Int SpacingFactor)		0.90	<200 m	1.10	isolated
Cmt =	(MainStTruckFactor)		1.00	<5%	1.15	>20%
Cv =	(SpeedFactor)		1.00	<60 km/h	1.10	>80 km/h
Cp =	(PopDemoFactor)		1.00	>250,000	1.20	<10,000
Csb =	(SideStBusFactor)		1.00	no	1.05	yes
Cst =	(SideStTruckFactor)		1.00	<10%	1.05	>10%
F =	(Ped DemoFactor)					
	(max of)	Elementary School	1.20			
		Seniors Complex	1.10			
		Path to School	1.10			

Explanation of Factors:

Cbt = 1.05 if the side street either is a bus route, or has more than 10% trucks, otherwise = 1.00.
(it is assumed that these two factors only affect the side street vehicles trying to cross the main street, not the pedestrians)

Ci = the product of the other 4 geographic factors
(Cs = intersection spacing, Cmt = main street truck, Cv = Speed, Cp = Population)

Vm1 = the main street volume - either the total of the two approaches or the highest single approach
(if the median is >=10.0 metres) (averaged over 6 peak hours)

Vm2 = the main street volume - either the total of the two approaches or the highest single approach
(if the median is >=6.0 metres) (averaged over 6 peak hours)

Vs = the highest side street approach volume (averaged over 6 peak hours)
*** note: it has been determined that Vs must be > 75 for signals to be considered ***

F = Pedestrian demographic factor - the maximum of the 3 individual pedestrian demographic factors

Pc = the total pedestrian volume crossing the mainstreet
(averaged over 6 peak hours)

L = number of lanes that the pedestrians have to cross
(only half the street if the median is >=5.0 metres)

Kv = Vehicle - Vehicle denominator constant
(Kv = 1,100 if L<=3, Kv = 1,400 if L >3)

Kp = Vehicle - Pedestrian denominator constant
(Kp = 2,000 if L<=3, Kp = 5,000 if L >3)

Canadian Traffic Signal Warrant Analysis

Main Street		**Clarence Ave**
Side Street		**Cartwright Rd**

Date: May 10, 2017

City: Saskatoon

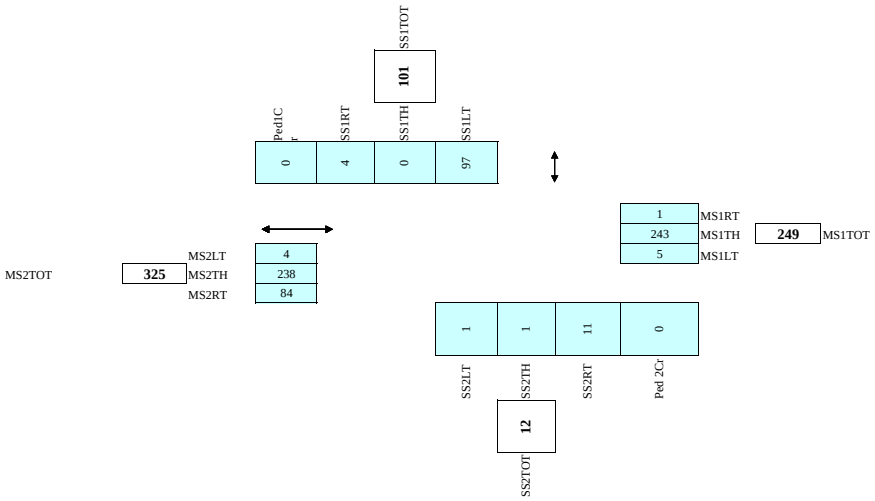
MainStreet1Lanes	(#)	1	Distance to next signal	(m)	500
MainStreet2Lanes	(#)	1	Elementary School	(y/n)	n
MainStreet LT Lanes	(#)	1	Senior's Complex	(y/n)	n
SideStreet1Lanes	(#)	1	Pathway to School	(y/n)	n
SideStreet2Lanes	(#)	1	Metro Area Population	(#)	220,000
MainStreetSpeedLimit	(km/h)	80	Side Street Bus Route	(y/n)	n
MainStreetTrucks/Buses	(%)	2.0%	Side Street Trucks	(%)	1.0%
Refuge Width on Median	(m)	0.0	T or 1-Way Intersection	(y/n)	n
			Central Business District	(y/n)	n

Vm =	**574**	(MainSt Vol Total)	Cs =	**0.997**	(Int SpacingFactor)
Vs =	**101**	(SideSt Vol Highest)	Cmt =	**1.000**	(MainStTruckFactor)
Pc =	**0**	Peds Crossing Main	Cv =	**1.100**	(SpeedFactor)
K1 =	**1,400**	veh/veh const	Cp =	**1.100**	(PopDemoFactor)
K2 =	**5,000**	veh/ped const	Csb =	**1.000**	(SideStBusFactor)
L =	**3.0**	TotalMainStLanes	Cst =	**1.000**	(SideStTruckFactor)
F =	**1.000**	(PedDemoFactor)	Vmx =	**325**	(MainStHighest)
Vm1 =	**574**	(MainStVeh-Veh#)	Vm2 =	**574**	(MainStVeh-Ped#)
Cvp =	**1.206**	(product of Cs,Cmt,Cv,Cp)	Cbt =	**1.000**	(maximum of Csb,Cst)
Ct1 =	**1.000**	T Int / one way Factor			

	MS1LT	MS1TH	MS1RT	MS2LT	MS2TH	MS2RT	SS1LT	SS1TH	SS1RT	SS2LT	SS2TH	SS2RT	PedC1	PedC2
7:00 - 8:00	6	256	1	5	147	53	116	0	3	0	0	12	0	0
8:00 - 9:00	8	256	1	5	147	53	116	0	3	0	0	12	0	0
11:00 - 12:00	5.5	243	0.5	3.5	237.5	84	96.5	0	4	0.5	0.5	11	0	0
12:00 - 13:00	5.5	243	0.5	3.5	237.5	84	96.5	0	4	0.5	0.5	11	0	0
16:00 - 17:00	3	230	0	2	328	115	77	0	5	1	1	10	0	0
17:00 - 18:00	3	230	1	2	328	115	77	0	5	1	1	10	0	0
Average	5	243	1	4	238	84	97	0	4	1	1	11	0	0

***** Enter the hourly turning movement counts averaged over the peak six hours of a typical week day**

***** Enter the peak pedestrian volume crossing the main street averaged over the same hours**



W = [Ct1xCbt(Vm1 x Vs)/K1 + (F(Vm2 x Pc)L)/K2] x Cvp

W = **50** **50** **0**

NOT Warranted ***Veh*** ***Ped***

Roadway, Vehicle and Pedestrian Factors			**Range**			
			Min	**@**	**Max**	**@**
Cs =	(Int SpacingFactor)		0.90	<200 m	1.10	isolated
Cmt =	(MainStTruckFactor)		1.00	<5%	1.15	>20%
Cv =	(SpeedFactor)		1.00	<60 km/h	1.10	>80 km/h
Cp =	(PopDemoFactor)		1.00	>250,000	1.20	<10,000
Csb =	(SideStBusFactor)		1.00	no	1.05	yes
Cst =	(SideStTruckFactor)		1.00	<10%	1.05	>10%
F =	(Ped DemoFactor)					
	(max of)	Elementary School	1.20			
		Seniors Complex	1.10			
		Path to School	1.10			

Explanation of Factors:

Cbt = 1.05 if the side street either is a bus route, or has more than 10% trucks, otherwise = 1.00.
(it is assumed that these two factors only affect the side street vehicles trying to cross the main street, not the pedestrians)

Ci = the product of the other 4 geographic factors
(Cs = intersection spacing, Cmt = main street truck, Cv = Speed, Cp = Population)

Vm1 = the main street volume - either the total of the two approaches or the highest single approach
(if the median is >=10.0 metres) (averaged over 6 peak hours)

Vm2 = the main street volume - either the total of the two approaches or the highest single approach
(if the median is >=6.0 metres) (averaged over 6 peak hours)

Vs = the highest side street approach volume (averaged over 6 peak hours)
*** note: it has been determined that Vs must be > 75 for signals to be considered ***

F = Pedestrian demographic factor - the maximum of the 3 individual pedestrian demographic factors

Pc = the total pedestrian volume crossing the mainstreet
(averaged over 6 peak hours)

L = number of lanes that the pedestrians have to cross
(only half the street if the median is >=5.0 metres)

Kv = Vehicle - Vehicle denominator constant
(Kv = 1,100 if L<=3, Kv = 1,400 if L >3)

Kp = Vehicle - Pedestrian denominator constant
(Kp = 2,000 if L<=3, Kp = 5,000 if L >3)

Canadian Traffic Signal Warrant Analysis

Main Street	**Lorne Ave**
Side Street	**Cartwright Rd**

Date: June 6, 2017

City: Saskatoon

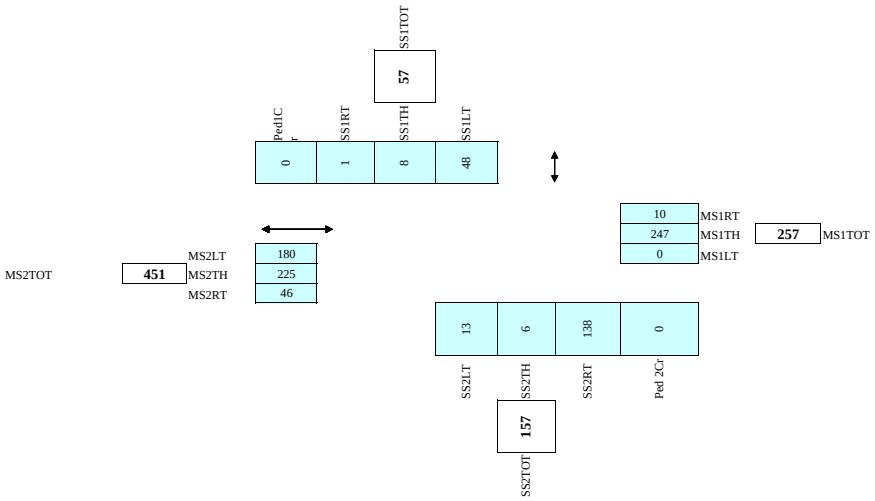
MainStreet1Lanes	(#)	1	Distance to next signal	(m)	750
MainStreet2Lanes	(#)	1	Elementary School	(y/n)	n
MainStreet LT Lanes	(#)	0	Senior's Complex	(y/n)	n
SideStreet1Lanes	(#)	1	Pathway to School	(y/n)	n
SideStreet2Lanes	(#)	1	Metro Area Population	(#)	220,000
MainStreetSpeedLimit	(km/h)	80	Side Street Bus Route	(y/n)	n
MainStreetTrucks/Buses	(%)	2.0%	Side Street Trucks	(%)	1.0%
Refuge Width on Median	(m)	0.0	T or 1-Way Intersection	(y/n)	n
			Central Business District	(y/n)	n

Vm =	**708**	(MainSt Vol Total)	Cs =	**1.028**	(Int SpacingFactor)
Vs =	**157**	(SideSt Vol Highest)	Cmt =	**1.000**	(MainStTruckFactor)
Pc =	**0**	Peds Crossing Main	Cv =	**1.100**	(SpeedFactor)
K1 =	**1,100**	veh/veh const	Cp =	**1.100**	(PopDemoFactor)
K2 =	**2,000**	veh/ped const	Csb =	**1.000**	(SideStBusFactor)
L =	**2.0**	TotalMainStLanes	Cst =	**1.000**	(SideStTruckFactor)
F =	**1.000**	(PedDemoFactor)	Vmx =	**451**	(MainStHighest)
Vm1 =	**708**	(MainStVeh-Veh#)	Vm2 =	**708**	(MainStVeh-Ped#)
Cvp =	**1.244**	(product of Cs,Cmt,Cv,Cp)	Cbt =	**1.000**	(maximum of Csb,Cst)
Ct1 =	**1.000**	T Int / one way Factor			

	MS1LT	MS1TH	MS1RT	MS2LT	MS2TH	MS2RT	SS1LT	SS1TH	SS1RT	SS2LT	SS2TH	SS2RT	PedC1	PedC2
7:00 - 8:00	0	236	5	90	182	32	45	3	0	7	6	175	0	0
8:00 - 9:00	0	236	5	90	182	32	45	2	0	7	6	175	0	0
11:00 - 12:00	0	247	10	180	225	45.5	48	8	1	13	6	137.5	0	0
12:00 - 13:00	0	247	10	180	225	45.5	48	8	1	13	6	137.5	0	0
16:00 - 17:00	0	258	15	270	268	59	51	14	2	19	6	100	0	0
17:00 - 18:00	0	258	15	270	268	59	51	14	2	19	6	100	0	0
Average	0	247	10	180	225	46	48	8	1	13	6	138	0	0

***** Enter the hourly turning movement counts averaged over the peak six hours of a typical week day**

***** Enter the peak pedestrian volume crossing the main street averaged over the same hours**



W = [Ct1xCbt(Vm1 x Vs)/K1 + (F(Vm2 x Pc)L)/K2] x Cvp

W = **125** **125** **0**

Warranted ***Veh*** ***Ped***

Roadway, Vehicle and Pedestrian Factors			**Range**			
			Min	**@**	**Max**	**@**
Cs =	(Int SpacingFactor)		0.90	<200 m	1.10	isolated
Cmt =	(MainStTruckFactor)		1.00	<5%	1.15	>20%
Cv =	(SpeedFactor)		1.00	<60 km/h	1.10	>80 km/h
Cp =	(PopDemoFactor)		1.00	>250,000	1.20	<10,000
Csb =	(SideStBusFactor)		1.00	no	1.05	yes
Cst =	(SideStTruckFactor)		1.00	<10%	1.05	>10%
F =	(Ped DemoFactor)					
	(max of)	Elementary School	1.20			
		Seniors Complex	1.10			
		Path to School	1.10			

Explanation of Factors:

Cbt = 1.05 if the side street either is a bus route, or has more than 10% trucks, otherwise = 1.00.
(it is assumed that these two factors only affect the side street vehicles trying to cross the main street, not the pedestrians)

Ci = the product of the other 4 geographic factors
(Cs = intersection spacing, Cmt = main street truck, Cv = Speed, Cp = Population)

Vm1 = the main street volume - either the total of the two approaches or the highest single approach
(if the median is >=10.0 metres) (averaged over 6 peak hours)

Vm2 = the main street volume - either the total of the two approaches or the highest single approach
(if the median is >=6.0 metres) (averaged over 6 peak hours)

Vs = the highest side street approach volume (averaged over 6 peak hours)
*** note: it has been determined that Vs must be > 75 for signals to be considered ***

F = Pedestrian demographic factor - the maximum of the 3 individual pedestrian demographic factors

Pc = the total pedestrian volume crossing the mainstreet
(averaged over 6 peak hours)

L = number of lanes that the pedestrians have to cross
(only half the street if the median is >=5.0 metres)

Kv = Vehicle - Vehicle denominator constant
(Kv = 1,100 if L<=3, Kv = 1,400 if L >3)

Kp = Vehicle - Pedestrian denominator constant
(Kp = 2,000 if L<=3, Kp = 5,000 if L >3)

Canadian Traffic Signal Warrant Analysis

Main Street		**Lorne Ave**
Side Street		**Cartwright Rd**

Date: June 6, 2017

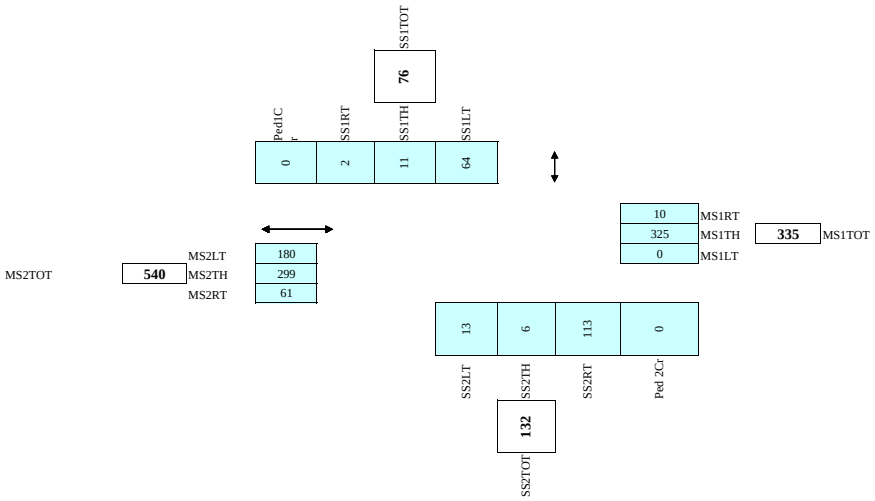
City: Saskatoon

MainStreet1Lanes	(#)	1	Distance to next signal	(m)	750	Vm =	**875**	(MainSt Vol Total)	Cs =	**1.028**	(Int SpacingFactor)
MainStreet2Lanes	(#)	1	Elementary School	(y/n)	n	Vs =	**132**	(SideSt Vol Highest)	Cmt =	**1.000**	(MainStTruckFactor)
MainStreet LT Lanes	(#)	0	Senior's Complex	(y/n)	n	Pc =	**0**	Peds Crossing Main	Cv =	**1.100**	(SpeedFactor)
SideStreet1Lanes	(#)	1	Pathway to School	(y/n)	n	K1 =	**1,100**	veh/veh const	Cp =	**1.100**	(PopDemoFactor)
SideStreet2Lanes	(#)	1	Metro Area Population	(#)	220,000	K2 =	**2,000**	veh/ped const	Csb =	**1.000**	(SideStBusFactor)
MainStreetSpeedLimit	(km/h)	80	Side Street Bus Route	(y/n)	n	L =	**2.0**	TotalMainStLanes	Cst =	**1.000**	(SideStTruckFactor)
MainStreetTrucks/Buses	(%)	2.0%	Side Street Trucks	(%)	1.0%	F =	**1.000**	(PedDemoFactor)	Vmx =	**540**	(MainStHighest)
Refuge Width on Median	(m)	0.0	T or 1-Way Intersection	(y/n)	n	Vm1 =	**875**	(MainStVeh-Veh#)	Vm2 =	**875**	(MainStVeh-Ped#)
			Central Business District	(y/n)	n	Cvp =	**1.244**	(product of Cs,Cmt,Cv,Cp)	Cbt =	**1.000**	(maximum of Csb,Cst)
						Ct1 =	**1.000**	T Int / one way Factor			

	MS1LT	MS1TH	MS1RT	MS2LT	MS2TH	MS2RT	SS1LT	SS1TH	SS1RT	SS2LT	SS2TH	SS2RT	PedC1	PedC2
7:00 - 8:00	0	310	3	90	242	42	60	3	0	7	6	139	0	0
8:00 - 9:00	0	310	3	90	242	42	60	3	0	7	6	139	0	0
11:00 - 12:00	0	325	10	180	299	60.5	63.5	10.5	1.5	13	6	112.5	0	0
12:00 - 13:00	0	325	10	180	299	60.5	63.5	10.5	1.5	13	6	112.5	0	0
16:00 - 17:00	0	340	17	270	356	79	67	18	3	19	6	86	0	0
17:00 - 18:00	0	340	17	270	356	79	67	18	3	19	6	86	0	0
Average	0	325	10	180	299	61	64	11	2	13	6	113	0	0

***** Enter the hourly turning movement counts averaged over the peak six hours of a typical week day**

***** Enter the peak pedestrian volume crossing the main street averaged over the same hours**



W = [Ct1xCbt(Vm1 x Vs)/K1 + (F(Vm2 x Pc)L)/K2] x Cvp

W =	**130**	**130**	**0**
	Warranted	***Veh***	***Ped***

Roadway, Vehicle and Pedestrian Factors			**Range**			
			Min	**@**	**Max**	**@**
Cs =	(Int SpacingFactor)		0.90	<200 m	1.10	isolated
Cmt =	(MainStTruckFactor)		1.00	<5%	1.15	>20%
Cv =	(SpeedFactor)		1.00	<60 km/h	1.10	>80 km/h
Cp =	(PopDemoFactor)		1.00	>250,000	1.20	<10,000
Csb =	(SideStBusFactor)		1.00	no	1.05	yes
Cst =	(SideStTruckFactor)		1.00	<10%	1.05	>10%
F =	(Ped DemoFactor)					
	(max of)	Elementary School	1.20			
		Seniors Complex	1.10			
		Path to School	1.10			

Explanation of Factors:

Cbt = 1.05 if the side street either is a bus route, or has more than 10% trucks, otherwise = 1.00.
(it is assumed that these two factors only affect the side street vehicles trying to cross the main street, not the pedestrians)

Ci = the product of the other 4 geographic factors
(Cs = intersection spacing, Cmt = main street truck, Cv = Speed, Cp = Population)

Vm1 = the main street volume - either the total of the two approaches or the highest single approach
(if the median is >=10.0 metres) (averaged over 6 peak hours)

Vm2 = the main street volume - either the total of the two approaches or the highest single approach
(if the median is >=6.0 metres) (averaged over 6 peak hours)

Vs = the highest side street approach volume (averaged over 6 peak hours)
*** note: it has been determined that Vs must be > 75 for signals to be considered ***

F = Pedestrian demographic factor - the maximum of the 3 individual pedestrian demographic factors

Pc = the total pedestrian volume crossing the mainstreet
(averaged over 6 peak hours)

L = number of lanes that the pedestrians have to cross
(only half the street if the median is >=5.0 metres)

Kv = Vehicle - Vehicle denominator constant
(Kv = 1,100 if L<=3, Kv = 1,400 if L >3)

Kp = Vehicle - Pedestrian denominator constant
(Kp = 2,000 if L<=3, Kp = 5,000 if L >3)

Canadian Traffic Signal Warrant Analysis

Main Street		**Lorne Ave**
Side Street		**Cartwright Rd**

Date: May 10, 2017

City: Saskatoon

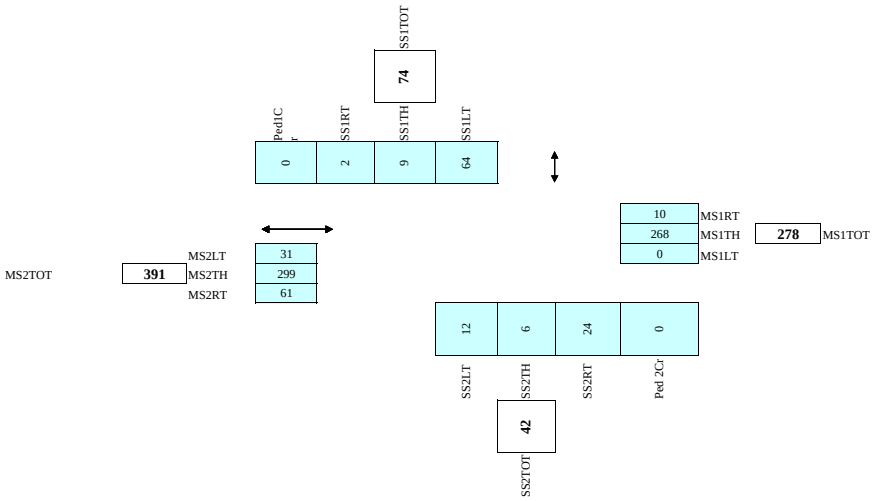
MainStreet1Lanes	(#)	1		Distance to next signal	(m)	750	Vm =	**669**	(MainSt Vol Total)
MainStreet2Lanes	(#)	1		Elementary School	(y/n)	n	Vs =	**74**	(SideSt Vol Highest)
MainStreet LT Lanes	(#)	0		Senior's Complex	(y/n)	n	Pc =	**0**	Peds Crossing Main
SideStreet1Lanes	(#)	1		Pathway to School	(y/n)	n	K1 =	**1,100**	veh/veh const
SideStreet2Lanes	(#)	1		Metro Area Population	(#)	220,000	K2 =	**2,000**	veh/ped const
MainStreetSpeedLimit	(km/h)	80		Side Street Bus Route	(y/n)	n	L =	**2.0**	TotalMainStLanes
MainStreetTrucks/Buses	(%)	2.0%		Side Street Trucks	(%)	1.0%	F =	**1.000**	(PedDemoFactor)
Refuge Width on Median	(m)	0.0		T or 1-Way Intersection	(y/n)	n	Vm1 =	**669**	(MainStVeh-Veh#)
				Central Business District	(y/n)	n	Cvp =	**1.244**	(product of Cs,Cmt,Cv,Cp)
							Ct1 =	**1.000**	T Int / one way Factor

Cs =	**1.028**	(Int SpacingFactor)
Cmt =	**1.000**	(MainStTruckFactor)
Cv =	**1.100**	(SpeedFactor)
Cp =	**1.100**	(PopDemoFactor)
Csb =	**1.000**	(SideStBusFactor)
Cst =	**1.000**	(SideStTruckFactor)
Vmx =	**391**	(MainStHighest)
Vm2 =	**669**	(MainStVeh-Ped#)
Cbt =	**1.000**	(maximum of Csb,Cst)

	MS1LT	MS1TH	MS1RT	MS2LT	MS2TH	MS2RT	SS1LT	SS1TH	SS1RT	SS2LT	SS2TH	SS2RT	PedC1	PedC2
7:00 - 8:00	0	236	3	19	242	42	60	2	0	6	6	24	0	0
8:00 - 9:00	0	236	3	19	242	42	60	2	0	6	6	24	0	0
11:00 - 12:00	0	268	10	31	299	60.5	63.5	8.5	1.5	12	6	24	0	0
12:00 - 13:00	0	268	10	31	299	60.5	63.5	8.5	1.5	12	6	24	0	0
16:00 - 17:00	0	300	17	43	356	79	67	15	3	18	6	24	0	0
17:00 - 18:00	0	300	17	43	356	79	67	15	3	18	6	24	0	0
Average	0	268	10	31	299	61	64	9	2	12	6	24	0	0

***** Enter the hourly turning movement counts averaged over the peak six hours of a typical week day**

***** Enter the peak pedestrian volume crossing the main street averaged over the same hours**



W = [Ct1xCbt(Vm1 x Vs)/K1 + (F(Vm2 x Pc)L)/K2] x Cvp

W = **56** **56** **0**

Not Warranted - Vs<75 ***Veh*** ***Ped***

Roadway, Vehicle and Pedestrian Factors			**Range**			
			Min	**@**	**Max**	**@**
Cs =	(Int SpacingFactor)		0.90	<200 m	1.10	isolated
Cmt =	(MainStTruckFactor)		1.00	<5%	1.15	>20%
Cv =	(SpeedFactor)		1.00	<60 km/h	1.10	>80 km/h
Cp =	(PopDemoFactor)		1.00	>250,000	1.20	<10,000
Csb =	(SideStBusFactor)		1.00	no	1.05	yes
Cst =	(SideStTruckFactor)		1.00	<10%	1.05	>10%
F =	(Ped DemoFactor)					
	(max of)	Elementary School	1.20			
		Seniors Complex	1.10			
		Path to School	1.10			

Explanation of Factors:

Cbt = 1.05 if the side street either is a bus route, or has more than 10% trucks, otherwise = 1.00.
(it is assumed that these two factors only affect the side street vehicles trying to cross the main street, not the pedestrians)

Ci = the product of the other 4 geographic factors
(Cs = intersection spacing, Cmt = main street truck, Cv = Speed, Cp = Population)

Vm1 = the main street volume - either the total of the two approaches or the highest single approach
(if the median is >=10.0 metres) (averaged over 6 peak hours)

Vm2 = the main street volume - either the total of the two approaches or the highest single approach
(if the median is >=6.0 metres) (averaged over 6 peak hours)

Vs = the highest side street approach volume (averaged over 6 peak hours)
*** note: it has been determined that Vs must be > 75 for signals to be considered ***

F = Pedestrian demographic factor - the maximum of the 3 individual pedestrian demographic factors

Pc = the total pedestrian volume crossing the mainstreet
(averaged over 6 peak hours)

L = number of lanes that the pedestrians have to cross
(only half the street if the median is >=5.0 metres)

Kv = Vehicle - Vehicle denominator constant
(Kv = 1,100 if L<=3, Kv = 1,400 if L >3)

Kp = Vehicle - Pedestrian denominator constant
(Kp = 2,000 if L<=3, Kp = 5,000 if L >3)

Appendix E MHI INTERSECTION WARRANTS

DEFINITIONS

Partial lighting is the illumination of key decision areas that demand full driver care and alertness by the placement of a limited number of luminaires.

Intersection delineation lighting consists of the installation of high pressure sodium (HPS) luminaire(s) over the intersecting roadway or median connector of divided highways for the purpose of illuminating vehicles entering or crossing the through highway route.

The luminaires provide the secondary benefit of visibly marking the location of the intersecting roadway on the provincial highway system.

POLICY

Partial roadway lighting, in the form of intersection delineation lighting, shall be provided at provincial highway intersections in accordance with the candidate and design criteria as noted herein and within Standard Plans 2621-1-1, 2621-1-2 and 2621-1-3.

CANDIDATE CRITERIA

All provincial highway to highway intersections qualify for intersection delineation lighting.

All intersections of the designated community access road with the provincial highway system qualify for intersection delineation lighting.

All rural and urban public highway intersections with a provincial highway with an intersecting roadway traffic volume greater than 150 AADT or 250 SADT for seasonal recreational roads qualify for intersection delineation lighting.

COMMUNITY ACCESS ROADS

All intersections of the designated community access road with the provincial highway system qualify for intersection delineation lighting. Community access roads are assigned the 40 highway subsection identifier.

Intersection delineation lights for alternate access routes are subject to satisfying the minimum traffic volume criteria and priority ranking with all other provincial candidates.

PRIORITY RANKING

First priority should be given to any outstanding or new provincial highway to highway intersections where the availability of power permits an economical installation.

Next priority should be given to outstanding designated community access road intersections with a provincial highway where the availability of power permits an economical installation.

Other intersecting roadways that satisfy the 150 AADT or greater traffic criteria should be ranked on the basis of priority points. The candidate priority points are determined by use of Figure 2621-1-1 Intersection Delineation Lighting Priority Points.

A guideline for an acceptable price premium to bring power to the site is $1,000 to $2,000 per 100 AADT on the intersecting roadway.

FIGURE 2621-1-1

DELINEATION LIGHTING PRIORITY RANKING POINTS

The purpose of this rating is to priority rank intersections for intersection delineation lighting. Points are assigned as follows:

		Points	Maximum Points
1.	Highway Classification		
	Arterial (major or minor)	5	
	Collector	3	
	Local	1	
2.	AADT on Through Highway		
	Points = 0.01 * AADT (Through highway intersection leg with highest AADT)		25
3.	AADT on Intersecting Roadway		
	Points = 0.05 * AADT (AADT on intersecting leg to be lit)		
4.	Average Annual Number of Accidents		
	Average annual number of night accidents last 3 years * 10		30

FIGURE 2621-1-1
Continued

		Points	Maximum Points
5.	Geometric Features		
5.1	Through Highway		
5.1.1	Channelized intersection treatment	5	
5.1.2	Divided Highway	5	
5.1.3	Intersection on horizontal curve	2	
5.1.4	Intersection off curve but within 100 m of curve (ST or TS)	1	
5.1.5	Intersection road surface visible:		
	i) less than 180 m	2	
	ii) less than 370 m	1	
5.1.6	Obstructed Sight Triangle in advance of intersection:		
	i) one sight triangle obstructed	2	
	ii) both sight triangles obstructed	3	
5.1.7	Intersection angle less than 70 or more than 110 degrees	2	
5.2	Intersecting Roadway		
5.2.1	Intersection road surface visible from less than 180 m	2	
5.2.2	Horizontal curve ending less than 60 m from the intersection	1	
5.2.3	Channelized intersection or divided roadway	5	
5.2.4	Signed Hospital access route	5	

FIGURE 2621-1-1
Continued

	Points	Maximum Points
6. Environmental Factors		
Either		
6.1 Rural development with lighting : (within 150 m of intersecting leg)		
i) in four quadrants		8
ii) in three quadrants		6
iii) in two quadrants		4
iv) in one quadrant		1
or		
6.2 Urban built up area:		
i) highway commercial		8
ii) residential		4
iii) industrial with lighting		3

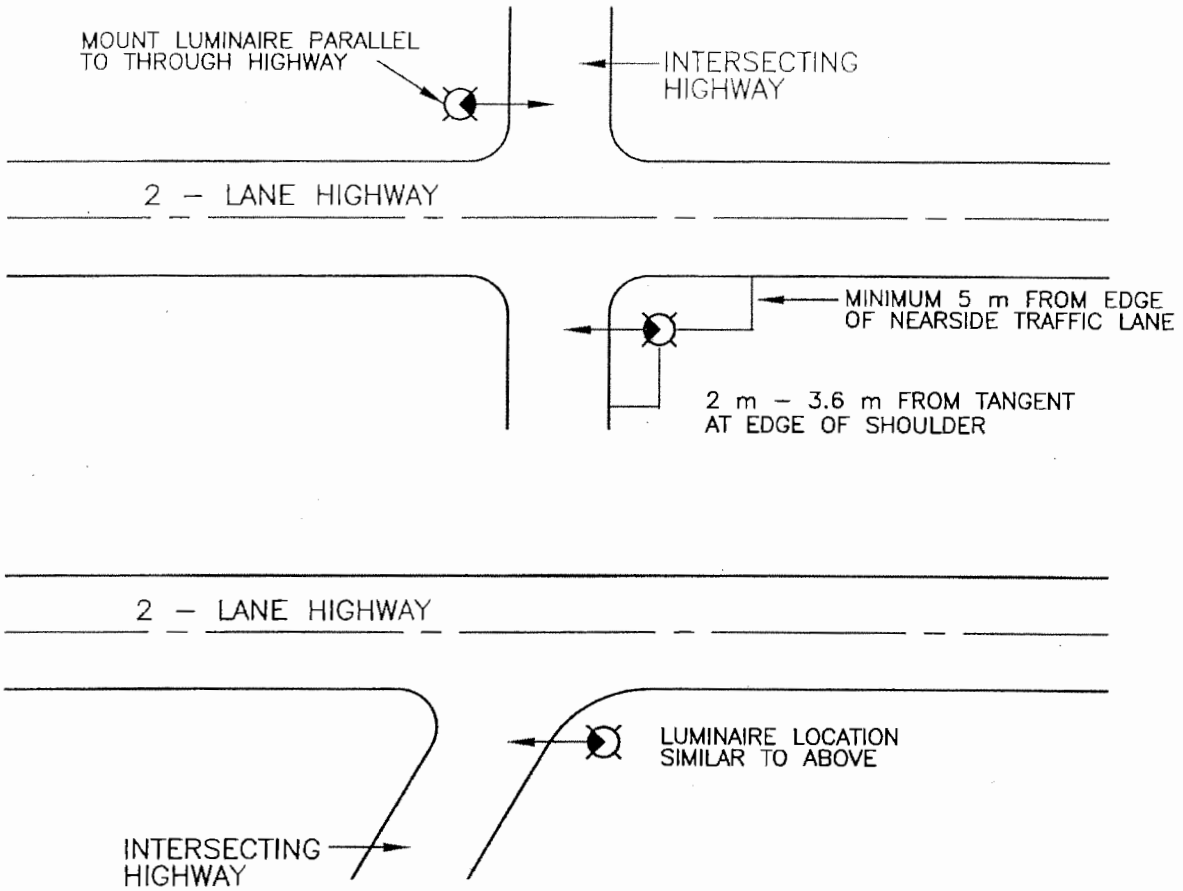
NOTES:

1. Delineation lighting is not provided if there is already an equivalent urban street light within 25 m of the intersection.

2. High speed exit/entrance roadways partial lighting should be given higher priority than at grade intersections with 60 points or less.

3. To qualify for intersection delineation lighting candidates, other than provincial highways or designated community access roads, shall incur an intersecting roadway traffic volume >= 150 AADT or 250 SADT for seasonal recreational roads.

4. Height of eye for road surface visibility should be 1.15 m.



Notes:

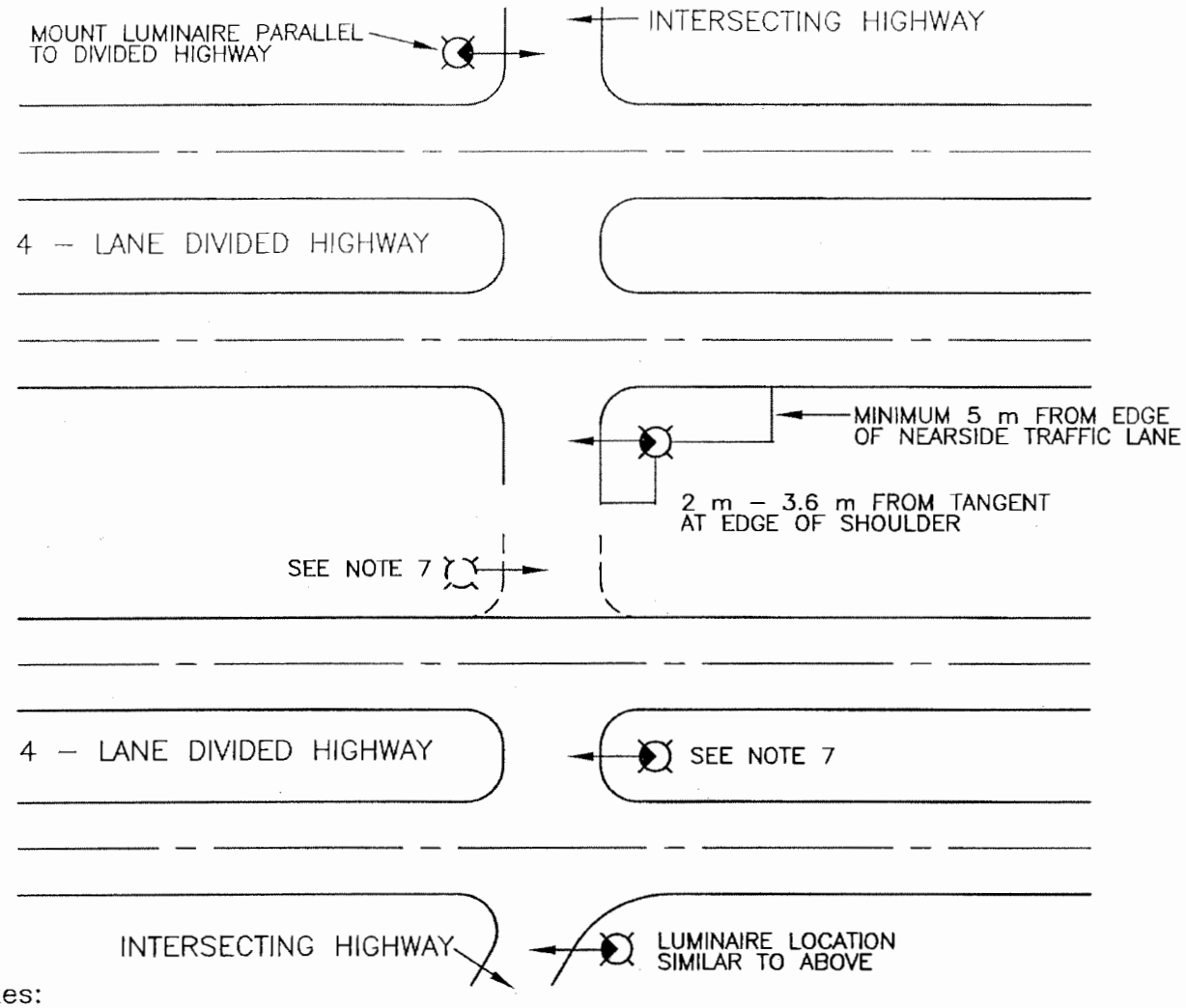
1. High Pressure Sodium Vapour Luminaire, photocell switch (150 HPS or equivalent).
2. 10.7 m high, 2.4 m davit steel pole, M.H. (road surface to luminaire) not less than 9.0 m.
3. Use approved type slip–joint or frangible base.
4. Underground wiring from nearest line pole to base of light pole.
5. Flange of slip–joint must not protrude more than 10 cm above ground.
6. Check traffic sign(s) and relocate if necessary to suit lighting.
7. At 4–leg intersections where one leg of the intersection is not a highway, a light should be installed where the road AADT is 150 or higher.

Saskatchewan Highways and Transportation

DELINEATION LIGHTING
AT RURAL HIGHWAY INTERSECTIONS
2 LANE HIGHWAY

RECOMMENDED BY:		SENIOR DESIGN ENGINEER ENGINEERING SERVICES BR.	DATE	02-05-21	STANDARD PLAN NO	2621–1–1
APPROVED BY:	R Dedger	EXECUTIVE DIRECTOR ENGINEERING SERVICES BR.	DATE	02-06-05	SHEET	1 of 1

ACAD DWG: 2621-1-1.DWG LAST REV DATE: 01/11/20



Notes:

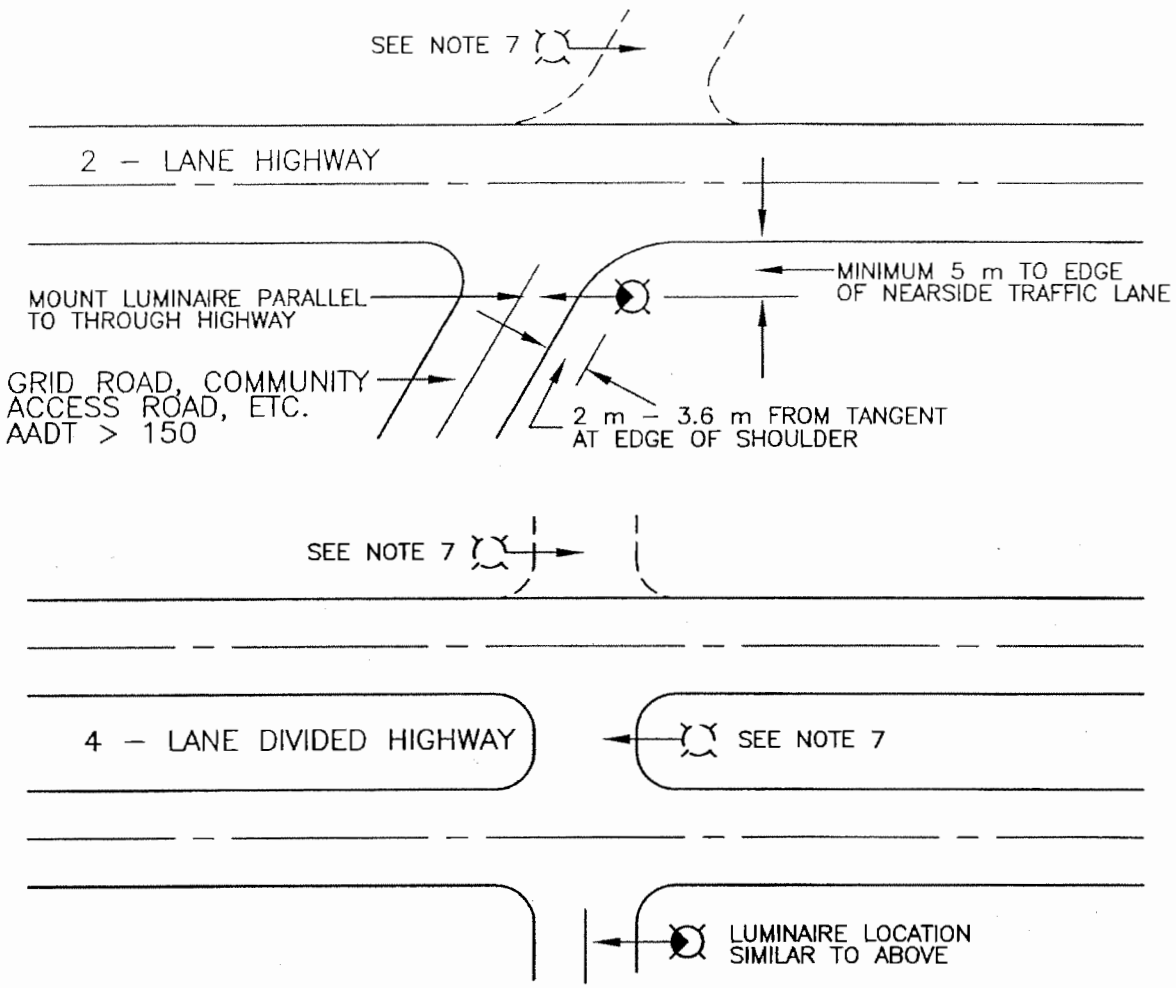
1. High Pressure Sodium Vapour Luminaire, photocell switch (150W HPS or equivalent).
2. 10.7 m high, 2.4 m davit steel pole, M.H. (road surface to luminaire) not less than 9.0 m.
3. Use approved type slip–joint or frangible base.
4. Underground wiring from nearest line pole to base of light pole.
5. Flange of slip–joint must not protrude more than 10 cm above ground.
6. Check traffic sign(s) and relocate if necessary to suit lighting.
7. a) At 4–leg intersections where one leg of the intersection is not a highway, a light shall be installed where the road AADT is 150 or higher.
   b) When the light is not required on the intersection leg, it shall be installed in the median.

Saskatchewan Highways and Transportation

DELINEATION LIGHTING
AT RURAL HIGHWAY INTERSECTIONS
DIVIDED HIGHWAY

RECOMMENDED BY:		SENIOR DESIGN ENGINEER ENGINEERING SERVICES BR.	DATE	02-05-21	STANDARD PLAN NO	2621–1–2
APPROVED BY:	R Widger	EXECUTIVE DIRECTOR ENGINEERING SERVICES BR.	DATE	02-06-05	SHEET	1 of 1

ACAD DWG: 2621–1–2.DWG LAST REV DATE: 01/11/20



Notes:

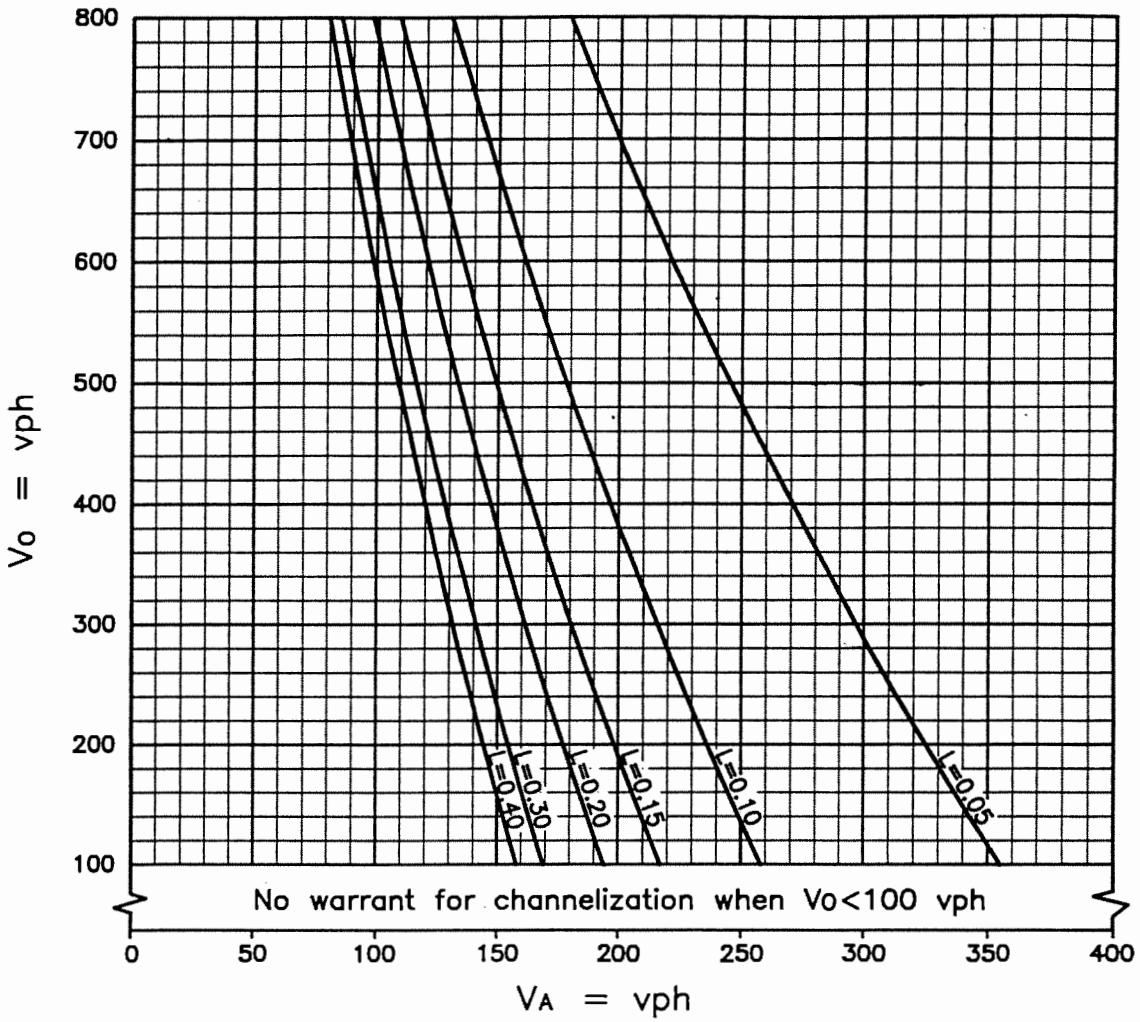
1. High Pressure Sodium Vapour Luminaire, photocell switch (150W HPS or equivalent).
2. 10.7 m high, 2.4 m davit steel pole, M.H. (road surface to luminaire) not less than 9.0 m.
3. Use approved type slip–joint or frangible base.
4. Underground wiring from nearest line pole to base of light pole.
5. Flange of slip–joint must not protrude more than 10 cm above ground.
6. Check traffic sign(s) and relocate if necessary to suit lighting.
7. a) At 4–leg intersections a light should be installed on the fourth leg where the road AADT is 150 or higher.
   b) When the light is not required on the intersection leg the second light may be installed in the median.

Saskatchewan Highways and Transportation

DELINEATION LIGHTING
AT OTHER RURAL INTERSECTIONS

RECOMMENDED BY:		SENIOR DESIGN ENGINEER ENGINEERING SERVICES BR.	DATE	02-05-21	STANDARD PLAN NO	2621–1–3
APPROVED BY:		EXECUTIVE DIRECTOR ENGINEERING SERVICES BR.	DATE	02-06-05	SHEET	1 of 1

ACAD DWG: 2621-1-3.DWG LAST REV DATE: 01/11/20



V_A = Advancing Volume, includes volume left and volume right unless exclusive right turn lane.

V_O = Opposing Volume, includes volume left, and volume right unless separated right turning roadway (ramp).

V_L = Left turn Volume.

$L = V_L/V_A$

NOTES:
1. Use corrected peak hourly volumes (vph) projected to the 10th year after the proposed construction date. Refer to correction factors under DM502–3 for further information.
2. No warrant for channelization if plotted point falls to left of applicable "L" line, or if L<0.05.
3. If channelization is not warranted, check bypass lane treatment, Standard Plan No. 20612.
4. Check right turn lane warrants, Standard Plan No. 20614.

Saskatchewan Highways and Transportation

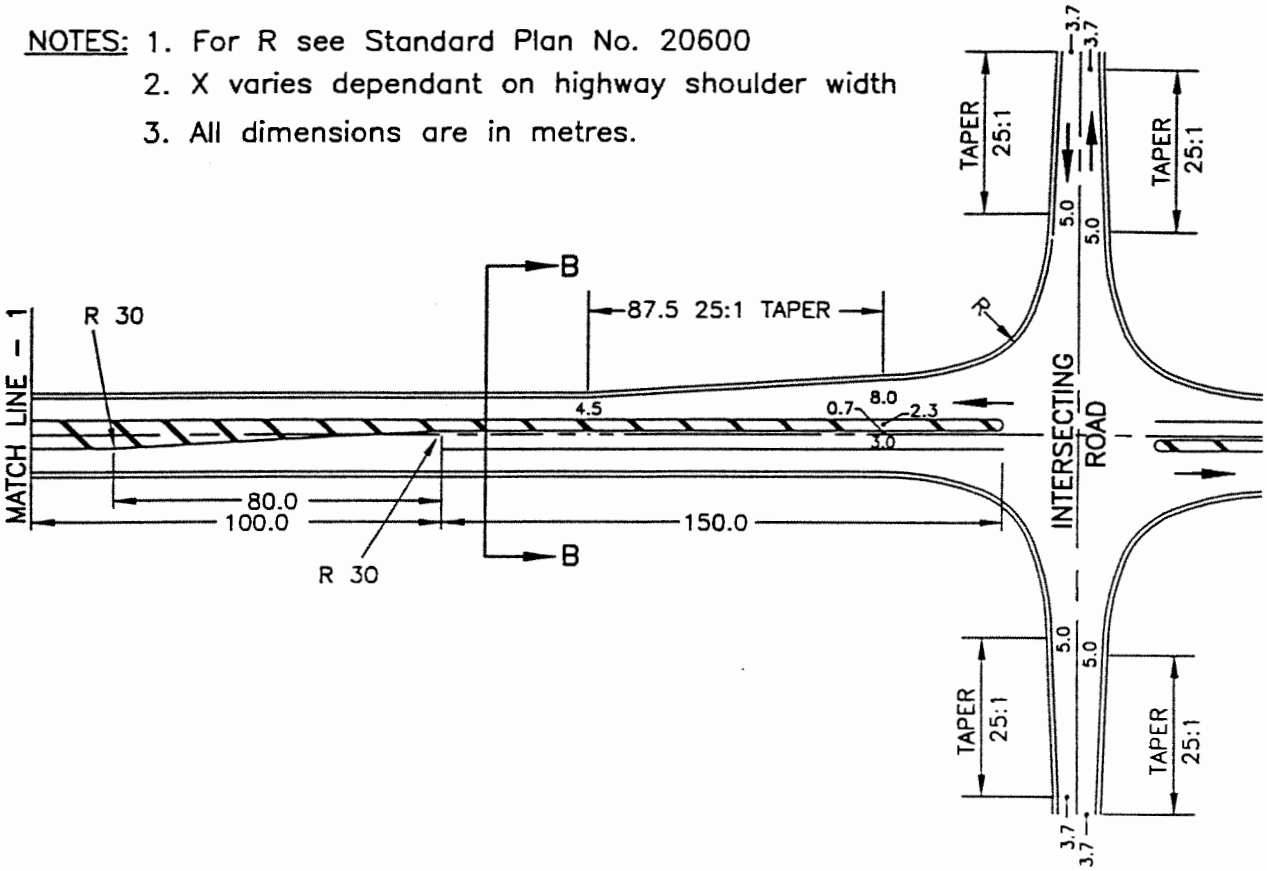
WARRANTS FOR CHANNELIZED INTERSECTIONS 2 LANE RURAL HIGHWAYS

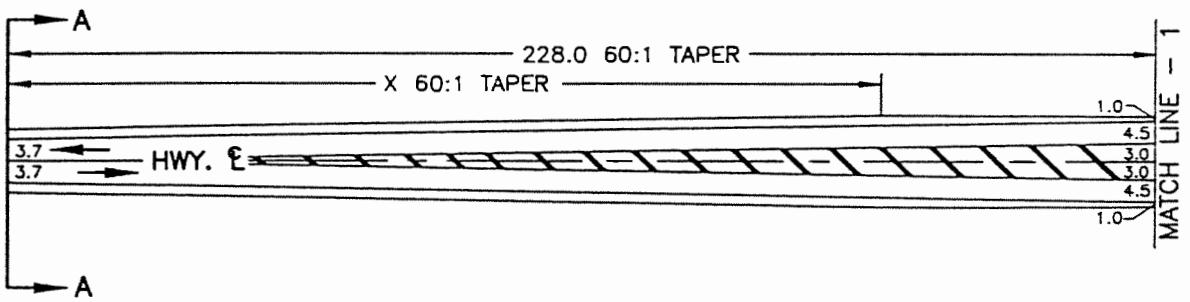
RECOMMENDED BY:		DIRECTOR TECH. STDS. & POLICIES	DATE	94.08.17	STANDARD PLAN NO	20611
APPROVED BY:		ASSIST. DEPUTY MINISTER OPERATIONS DIVISION	DATE	95-02-28	SHEET	1 of 1

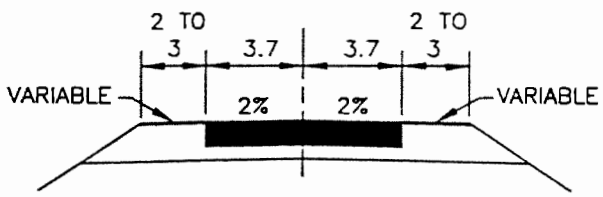
LAST REV DATE: MAY24/94

ACAD DWG: 20611

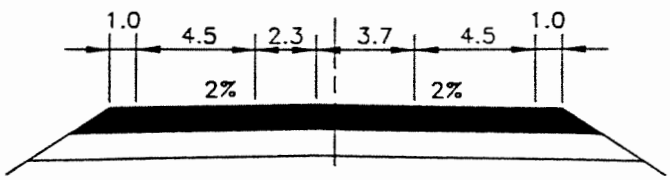
NOTES: 1. For R see Standard Plan No. 20600
2. X varies dependant on highway shoulder width
3. All dimensions are in metres.







SECTION A–A



SECTION B–B

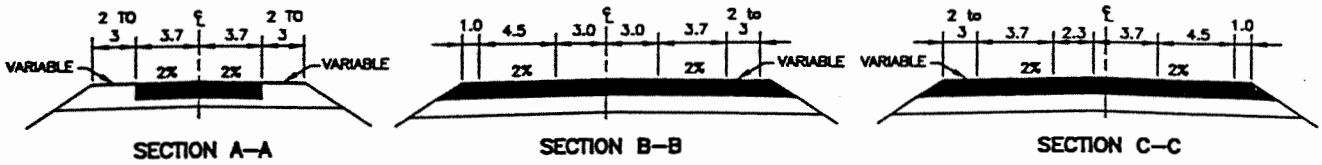
Saskatchewan Highways and Transportation

CHANNELIZED INTERSECTION
INTRODUCED MEDIAN
BOTH DIRECTIONS

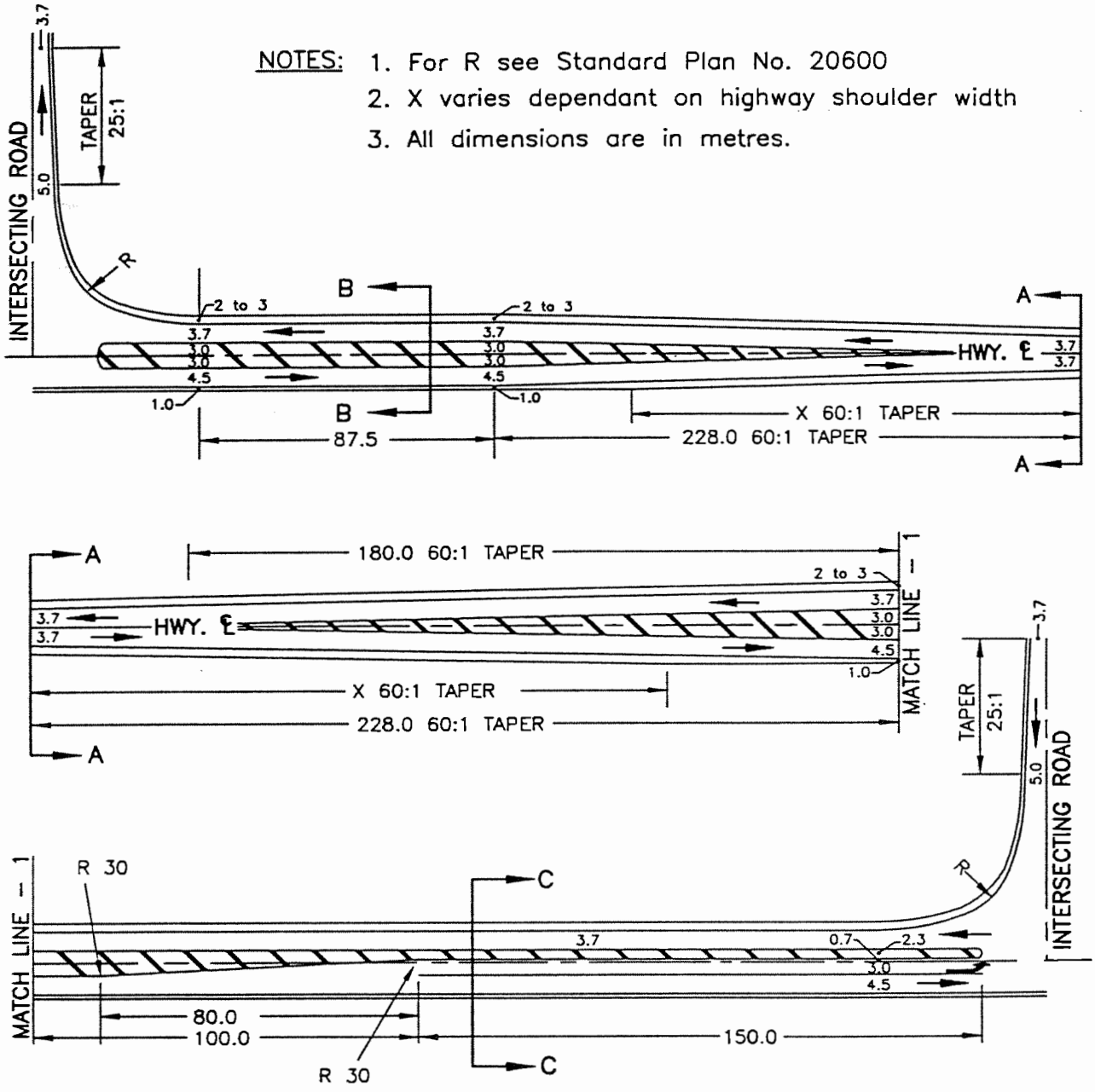
RECOMMENDED BY:		DIRECTOR TECH. STDS. & POLICIES	DATE	95.02.24	STANDARD PLAN NO	20619
APPROVED BY:		ASSIST. DEPUTY MINISTER OPERATIONS DIVISION	DATE	95-02-28	SHEET	1 of 2

LAST REV DATE: FEB.13,1995

ACAD DWG: 20619-1



NOTES:
1. For R see Standard Plan No. 20600
2. X varies dependant on highway shoulder width
3. All dimensions are in metres.

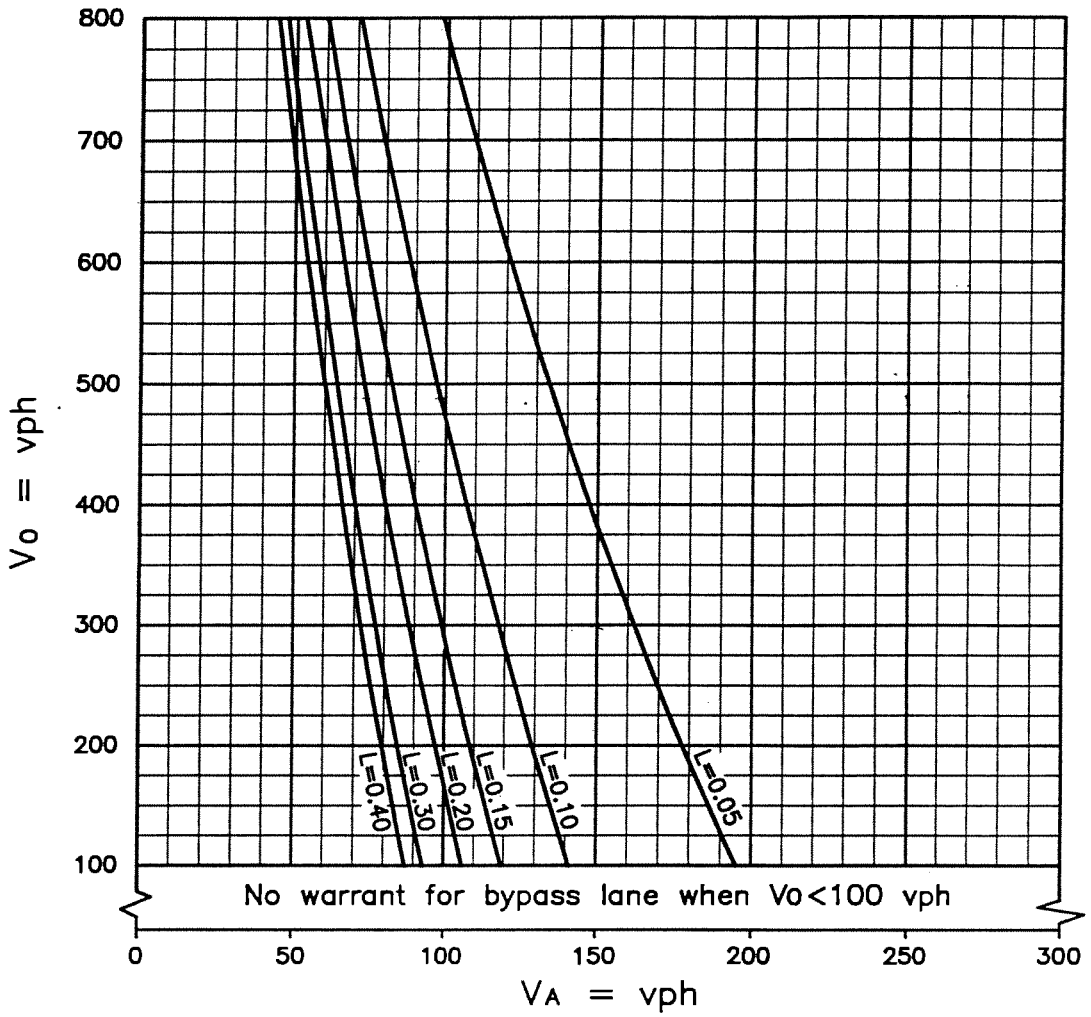


Saskatchewan Highways and Transportation

CHANNELIZED INTERSECTION
INTRODUCED MEDIAN
ONE DIRECTION

RECOMMENDED BY:		DIRECTOR TECH. STDS. & POLICIES	DATE	95-02-21	STANDARD PLAN NO	20619
APPROVED BY:		ASSIST. DEPUTY MINISTER OPERATIONS DIVISION	DATE	95-02-28	SHEET	2 of 2

ACAD DWG 9-2 LAST REV DATE: FEB.13,1995



V_A = Advancing Volume, includes volume left and volume right unless exclusive right turn lane.

Vo = Opposing Volume, includes volume left, and volume right unless separated right turning roadway (ramp).

V_L = Left turn Volume.

$L = V_L/V_A$

NOTES:
1. Use corrected peak hourly volumes (vph) projected to the 10th year after the proposed construction date. Refer to correction factors under DM502–3 for further information.
2. No warrant for a bypass lane if plotted point falls to left if applicable "L" line, or if L<0.05.
3. If a bypass lane is not warranted, check flared intersection treatment warrants, Standard Plan No. 20613.

Saskatchewan Highways and Transportation

WARRANTS FOR BYPASS LANE INTERSECTIONS 2 LANE RURAL HIGHWAYS

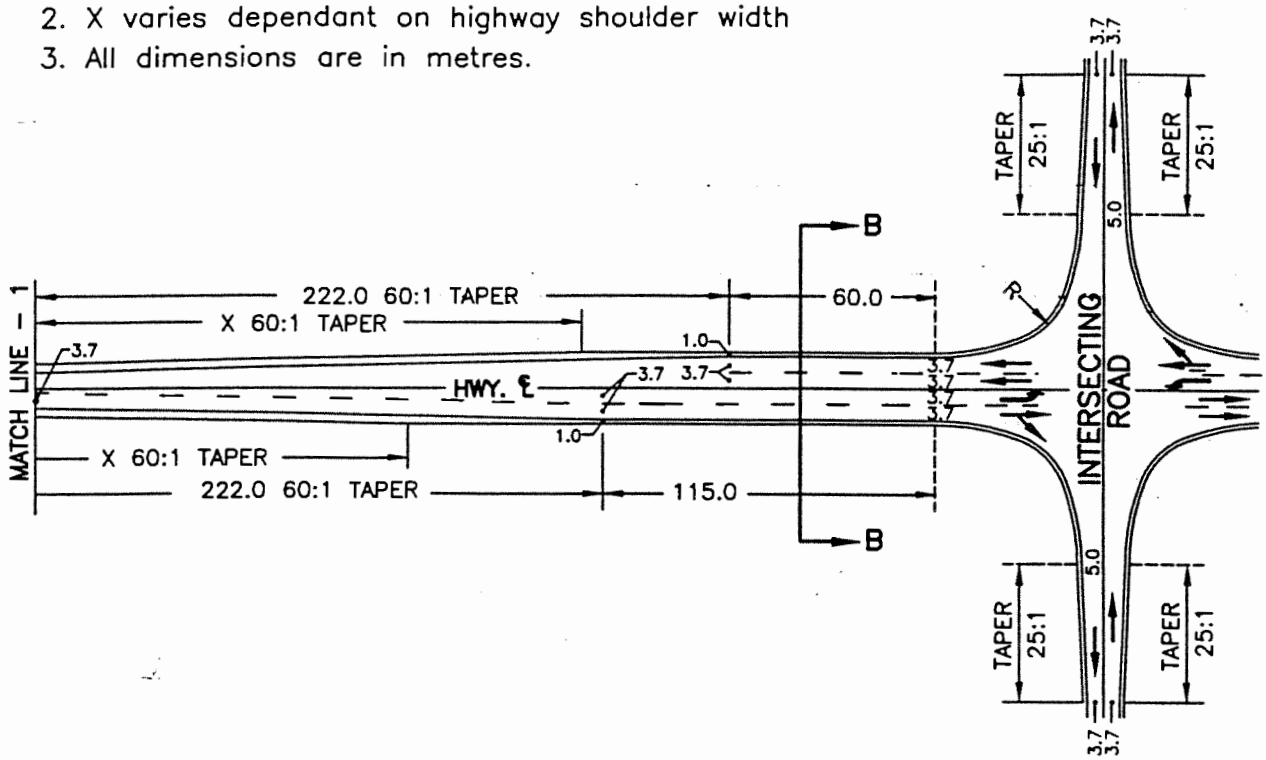
RECOMMENDED BY:		DIRECTOR TECH. STDS. & POLICIES	DATE	94.08.17	STANDARD PLAN NO	20612
APPROVED BY:		ASSIST. DEPUTY MINISTER OPERATIONS DIVISION	DATE	95-02-28	SHEET	1 of 1

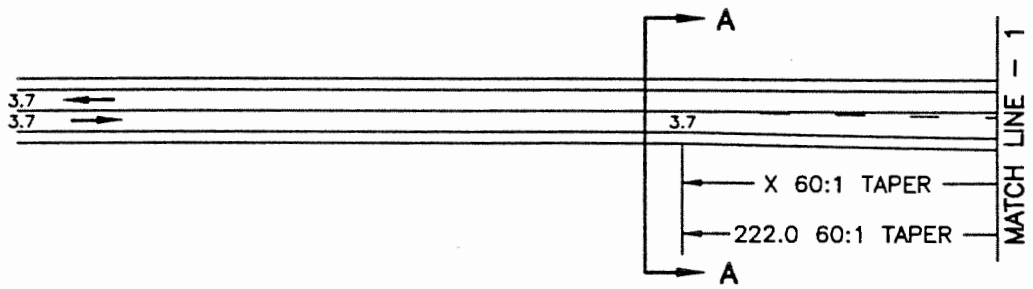
LAST REV DATE: MAY24/94

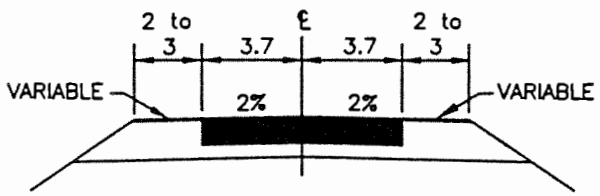
ACAD DWG: 20612

NOTES:

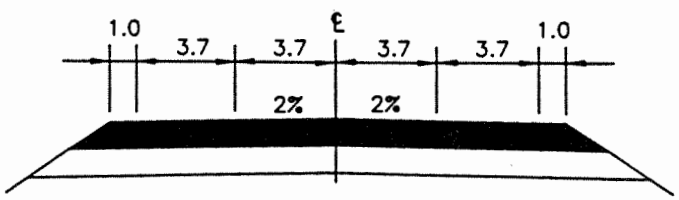
1. For R see Standard Plan No. 20600
2. X varies dependant on highway shoulder width
3. All dimensions are in metres.







SECTION A–A



SECTION B–B

Saskatchewan Highways and Transportation

INTERSECTION TREATMENT
BYPASS LANE

RECOMMENDED BY:		DIRECTOR TECH. STDS. & POLICIES	DATE	94.08.17	STANDARD PLAN NO	20620	
APPROVED BY:		ASSIST. DEPUTY MINISTER OPERATIONS DIVISION	DATE	95-02-28	SHEET	1 of 1	

LAST REV DATE: MAY24/94

ACAD DWG: 20620

A flared intersection treatment is warranted at the following locations:

1. At all intersections with Provincial Highways.

2. At all accesses to towns and villages where:

   - highway classification is a major or minor arterial and the population exceeds 500; or
   - highway classification is a collector or local and the population exceeds 700.

3. At all provincial parks, regional parks, provincial campsites, and provincial picnic sites where:

   - highway classification is a major or minor arterial; or
   - highway classification is a collector or local and the highway AADT exceeds 600 and the left turn AADT exceeds 50.

4. At all industrial access roads where:

   - the highway AADT exceeds 500 and the left turn AADT exceeds 25.

5. At all other intersection roads where:

   - the highway AADT exceeds 600 and the left turn AADT exceeds 50.

NOTE:

1. Use highway AADT projected to the 10th year after the proposed construction date.

2. Check warrants for Channelized or Bypass Lane before considering a flared intersection treatment.

Saskatchewan Highways and Transportation

WARRANTS FOR FLARED INTERSECTIONS
2 LANE RURAL HIGHWAYS

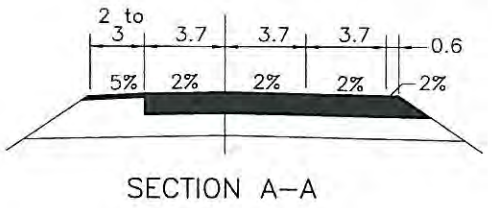
RECOMMENDED BY:		DIRECTOR TECH. STDS. & POLICIES	DATE	94.08.17	STANDARD PLAN NO	20613
APPROVED BY:		ASSIST. DEPUTY MINISTER OPERATIONS DIVISION	DATE	95-02-28	SHEET	1 of 1

LAST REV DATE: MAY24/94

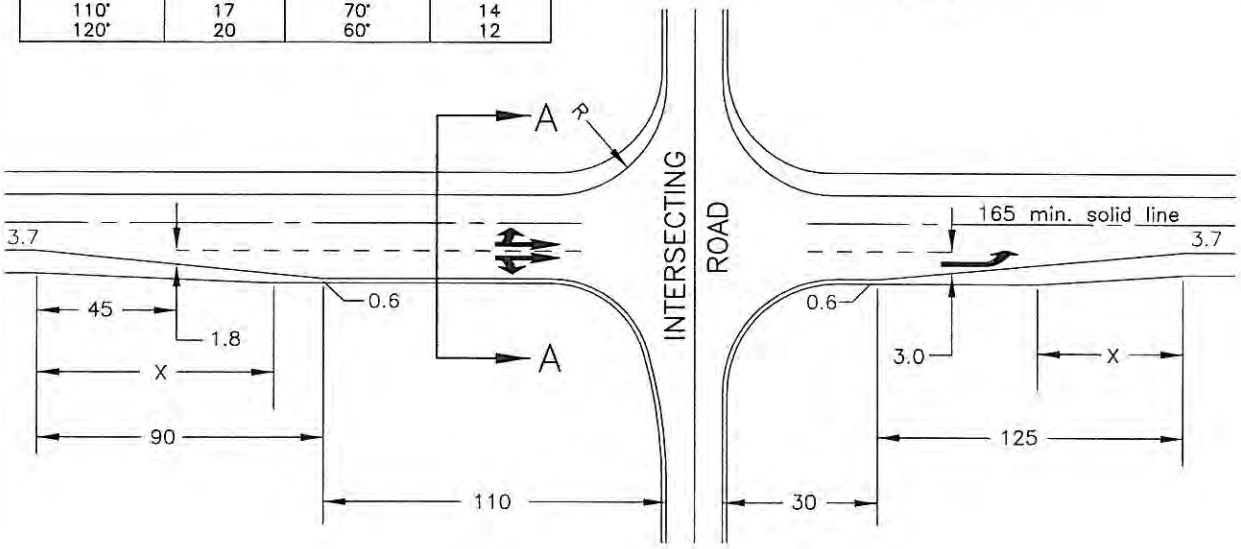
ACAD DWG: 20613

Chart 1

Distance Solid Line from Intersection of Centrelines			
Leaving Vehicle		Entering Vehicle	
Angle of Turn To Left	Distance – metres	Angle of Turn To Left	Distance – metres
60°	9	120°	20
70°	12	110°	17
80°	15	100°	15
90°	15	90°	15
100°	15	80°	15
110°	17	70°	14
120°	20	60°	12



SECTION A–A



Note: All dimensions are in metres.

NOTES:

1. For R see Standard Plan No. 20600.
2. When intersecting roadway is on skew – Measure distances from intersection of highway centreline and edge of travelled way of the intersecting leg to which the vehicle is turning.
3. If treatment falls on curve – tapers may be adjusted in length. See Standard Plan No. 20623.
4. X = 65 m for a 7430 X = 90 m for a 7420
   Use 90 m taper for other shoulder widths.
5. The nose of the last left turn arrow to be 1.5 m in advance of the solid line.
6. Spacing of arrows to be 45 m from nose to tail.
7. The nose of the last right turn arrow shall be at the beginning of the approach radius.
8. Treatment shown is for left turn in one direction. When warranted in both directions, corresponding treatment to be used on the other side of the road.
9. The distances shown in Chart 1 are for single intersection treatments, when a double treatment is used the longer distance would govern.

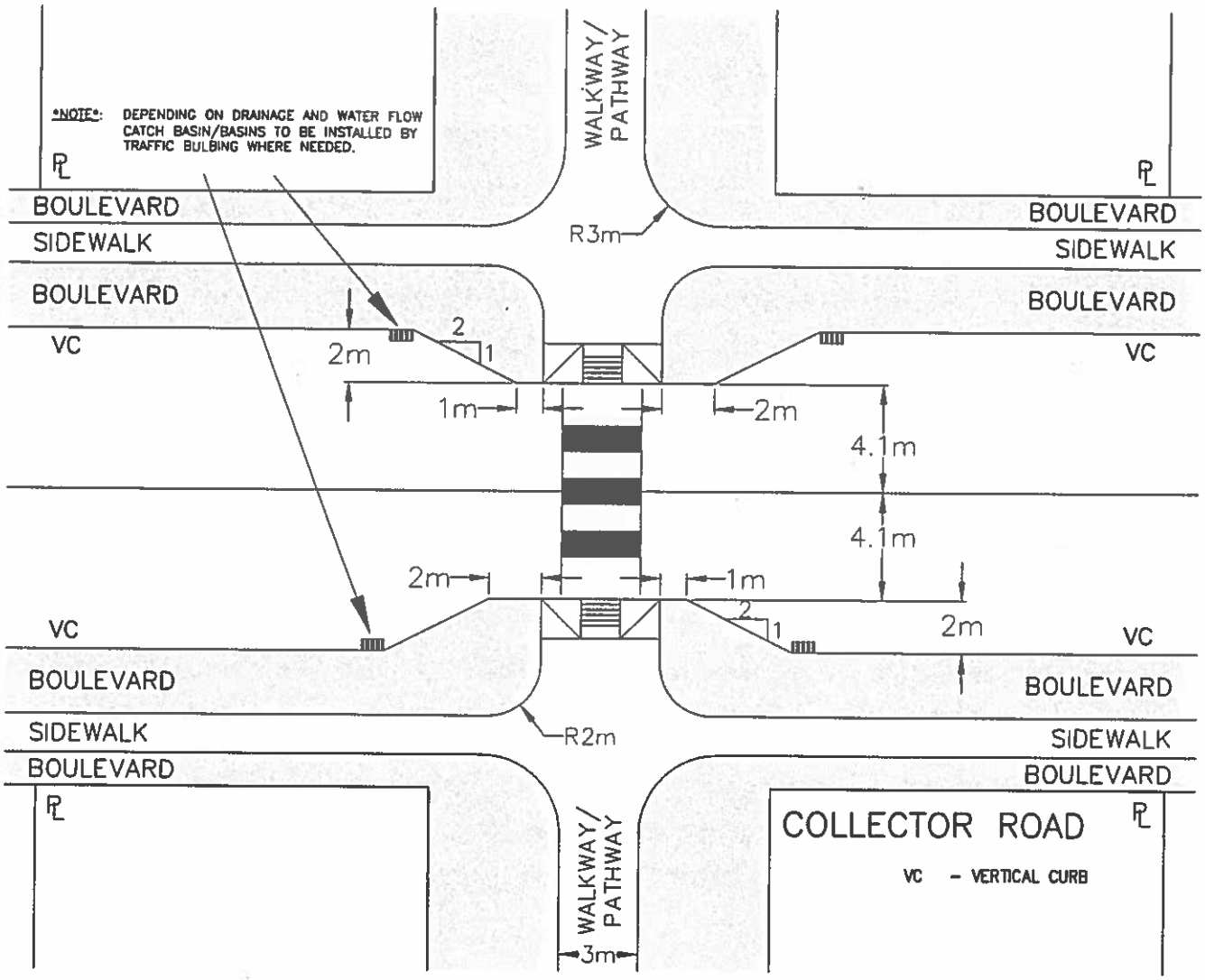
FLARED INTERSECTION TREATMENT

RECOMMENDED BY:		DIR. DESIGN & TRAFFIC OPERATIONS ENGINEERING STANDARDS BRANCH	DATE	09-01-14	STANDARD PLAN NO	20621
APPROVED BY:		EXECUTIVE DIRECTOR ENGINEERING STANDARDS BRANCH	DATE	09-02-23	SHEET	1 OF 1

LAST REV DATE: 09/01/15

ACAD DWG: 20621

Appendix F WALKWAY-TO-WALKWAY CURB EXTENSION



NOTES: SIGNING PLAN TO BE COMPLETED SEPARATELY.

REFER TO COLLECTOR CLASS "A"
DRAWING NO. 102-0029-008

PLAN DESCRIPTION/REVISIONS	
1	REVISED TITLE AND REMOVED CROSS SECTION DETAILS 2014-DEC-15 HLO
2	
3	
4	

DRAWN BY EDH
DATE 2011-DEC-14
SCALE : HOR. 1:500 VERT.

City of Saskatoon
Infrastructure Services Department

TRAFFIC CALMING AT A MID-BLOCK CROSSING
WALKWAY TO WALKWAY
(COLLECTOR ROAD)

APPROVED
ENGINEER
ENGINEER
PLAN NO. 102-0002-064r002