

KERBEL GROUP INC.

KERBEL WHL EMPLOYMENT LANDS TRANSPORTATION IMPACT STUDY

APRIL 09, 2025





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KERBEL GROUP INC.

PROJECT NO.: CA0042506.9787

DATE: APRIL 09, 2025

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April 09, 2025

KERBEL GROUP INC.
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Attention: Joanne Barnett

Dear Madam/Sir:

Subject: Kerbel WHL Employment Lands Transportation Impact Study

WSP Canada Inc. (WSP) is pleased to present the findings of the transportation study for the proposed development located southeast of the intersection of Crimson King Way and Highway 11 in the Town of East Gwillimbury.

Based on the enclosed study findings of this report, it is expected that the proposed development can be readily accommodated by the study area transportation network. The proposed auto parking arrangements will also adequately serve the needs of the subject development based on the proposed supply. The loading requirements of the building, and all loading spaces can be accessed adequately.

Please do not hesitate to contact us if you have any questions or comments.

Yours sincerely,

Ismet Medic, B.A.Sc.
Technical DirectorSenior
Project Manager

Rebekah Clarke Robinson, B.Eng.
Transportation Planner

XX/xx
Encl.
cc:
WSP ref.: CA0042506.9787

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SIGNATURES

PREPARED BY

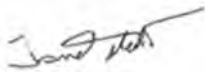


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1 INTRODUCTION

WSP Canada Inc. (WSP) was retained by Kerbel Group Inc. to prepare a Transportation Impact Study (TIS) for the proposed development located southeast of the intersection of Highway 11 and Crimson King Way in the Town of East Gwillimbury. As shown in **Figure 1-1**, the subject site, which is currently vacant, is bounded by Highway 11 to the west, Crimson King Way to the north, and residential neighbourhoods south and east of the site.



Figure 1-1 Subject Site Location

The proposed development will include a gas station with four fueling stations, a carwash, a fast-food restaurant with a drive-thru, and three employment use buildings. The site will be served by a right in/right out access on Highway 11 and a full movement access Crimson King Way. The site plan is shown in **Figure 1-2**.

The objective of this study is to evaluate if there are any adverse impacts on the local transportation network related to the proposed development and to evaluate the proposed parking and loading arrangements, in support of a development application to the Town of East Gwillimbury. Our study approach and findings are documented herein.

A terms of reference (TOR) was established with the Town of East Gwillimbury and the Region of York with consideration of the *York Region Transportation Mobility Plan Guidelines*, dated 2016. The TOR is provided in **Appendix A**.



Site Plan

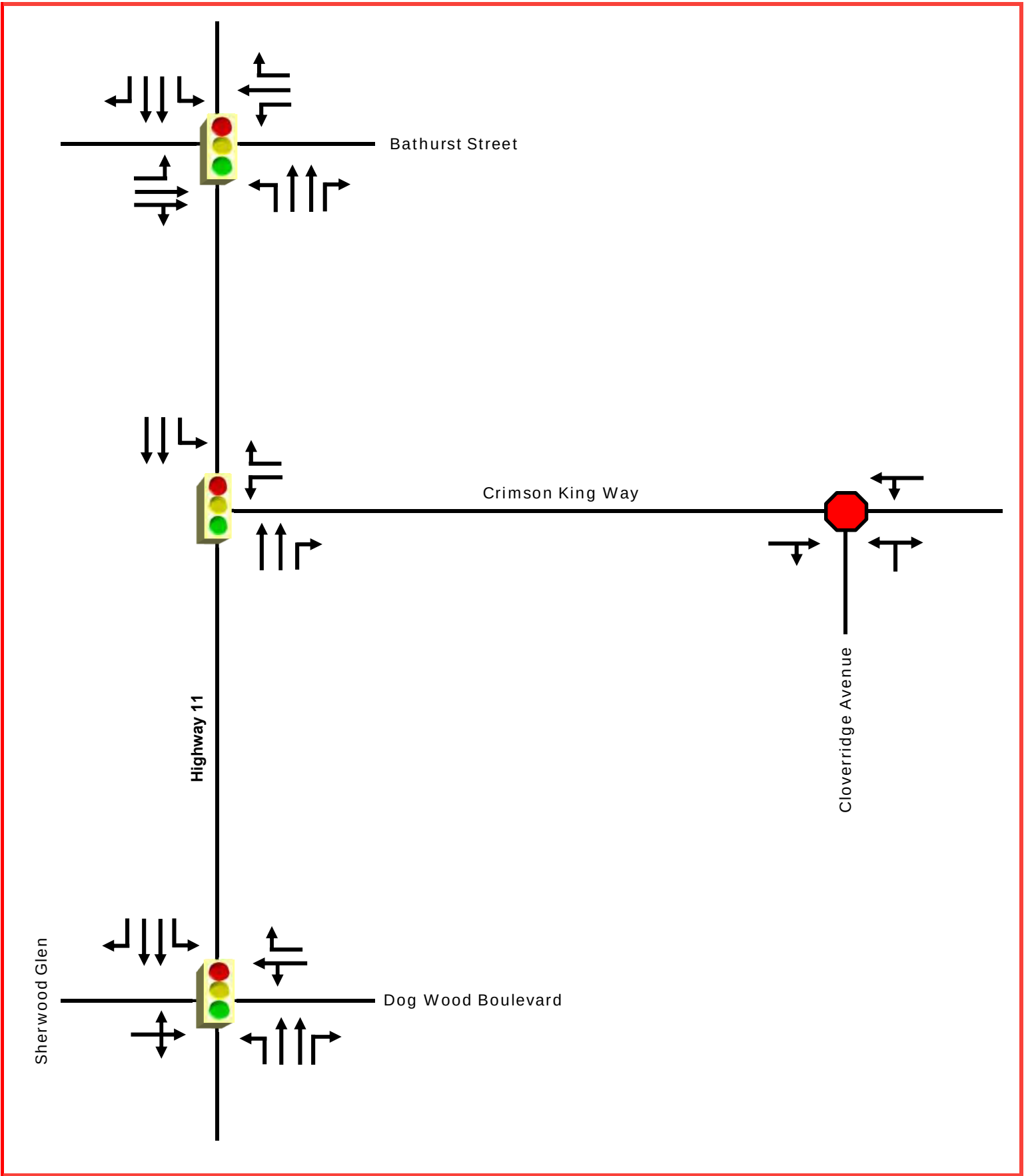
2 EXISTING TRANSPORTATION CONTEXT

2.1 BOUNDARY ROADWAYS

The characteristics of the study area roadways, including active transportation infrastructure, are summarized as follows:

- **Highway 11** is an arterial road under the jurisdiction of the Region of York. Within the vicinity of the site, it generally runs in the north-south direction and has a posted speed limit of 70 km/hr. There are pedestrian crossing facilities at the intersection with Bathurst Street;
- **Bathurst Street** is an arterial road under the jurisdiction of the Region of York. Within the vicinity of the subject site, it generally runs in the north-south direction and has a posted speed limit of 60 km/hr. Per the *York Region 2021-2022 Cycling Map*, there is a paved shoulder for cyclists, and there are pedestrian crossing facilities at the intersection with Highway 11;
- **Crimson King Way** is a local road under the jurisdiction of the Town of East Gwillimbury. It runs in the east-west direction and has an unposted speed limit of 40 km/hr. There is a sidewalk along the southern side of the road;
- **Dog Wood Boulevard** is a local road under the jurisdiction of the Town of East Gwillimbury. It generally runs in the north-south direction, however approximately 700 metres south of Crimson King Way, it begins to run east-west and connects with Highway 11. It has a posted speed limit of 40 km/hr. There are sidewalks along the northern and southern side of the street;
- **Sherwood Glen** is a rural road under the jurisdiction of the Town of East Gwillimbury. It has a posted speed limit of 40 km/hr. It generally runs in the east-west direction within the vicinity of the subject site; and
- **Cloverridge Avenue** is a local road under the jurisdiction of the Town of East Gwillimbury. It runs in the north-south direction and has a posted speed limit of 40 km/hr. There is a sidewalk along the eastern side of the road.

The existing lane configurations at the study intersections are illustrated in **Figure 2-1**. The proposed site accesses onto Highway 11, and Crimson King Way are shown in **Figure 4-1**.



Signalized

Legend



Unsignalized

Figure 2-1
Existing Lane
Configurations

2.2 TRAFFIC DATA

Turning movement counts (TMCs) were collected for all study intersections as summarized in **Table 2-1**. These volumes are illustrated in **Figure 2-2**, and the detailed TMCs are included in **Appendix B**. Signal timing plans (STPs) were obtained from the Region of York and are also included in **Appendix B**. Existing traffic volumes were balanced using a conservative approach. The balancing applied to these volumes is shown in **Figure 2-3**, and the resulting balanced existing volumes are shown in **Figure 2-4**.

Table 2-1 Intersection Turning Movement Count Sources

Intersection	Count Date (AM/PM)	Count Date (SAT)	Source
Highway 11 and Dog Wood Boulevard / Sherwood Glen	February 21 st , 2023	November 20 th , 2024	Horizon Data Services Ltd.
Highway 11 and Crimson King Way			
Crimson King Way and Cloverridge Avenue			
Highway 11 and Bathurst Street	March 7 th , 2023		

At the intersection of Highway 11 and Bathurst Street during the p.m. peak hour data collection there was a collision between an eastbound-left turning and a westbound-through vehicle at approximately 4:56 p.m. Due to the presence of emergency services vehicles on scene until approximately 5:56 p.m., WSP assumed the counts taken between 4:15 and 4:45 p.m. would be most representative of typical conditions. To estimate the peak hour volumes those counts were multiplied by two. This represents a conservative estimate as the total vehicles at the intersection between 4:15 p.m. and 4:45 p.m. was higher than the total number 4:45 p.m. and 5:15 p.m. (2059 versus 1949).



xx

A.M. Peak Hour
Traffic Volumes

(xx)

Legend

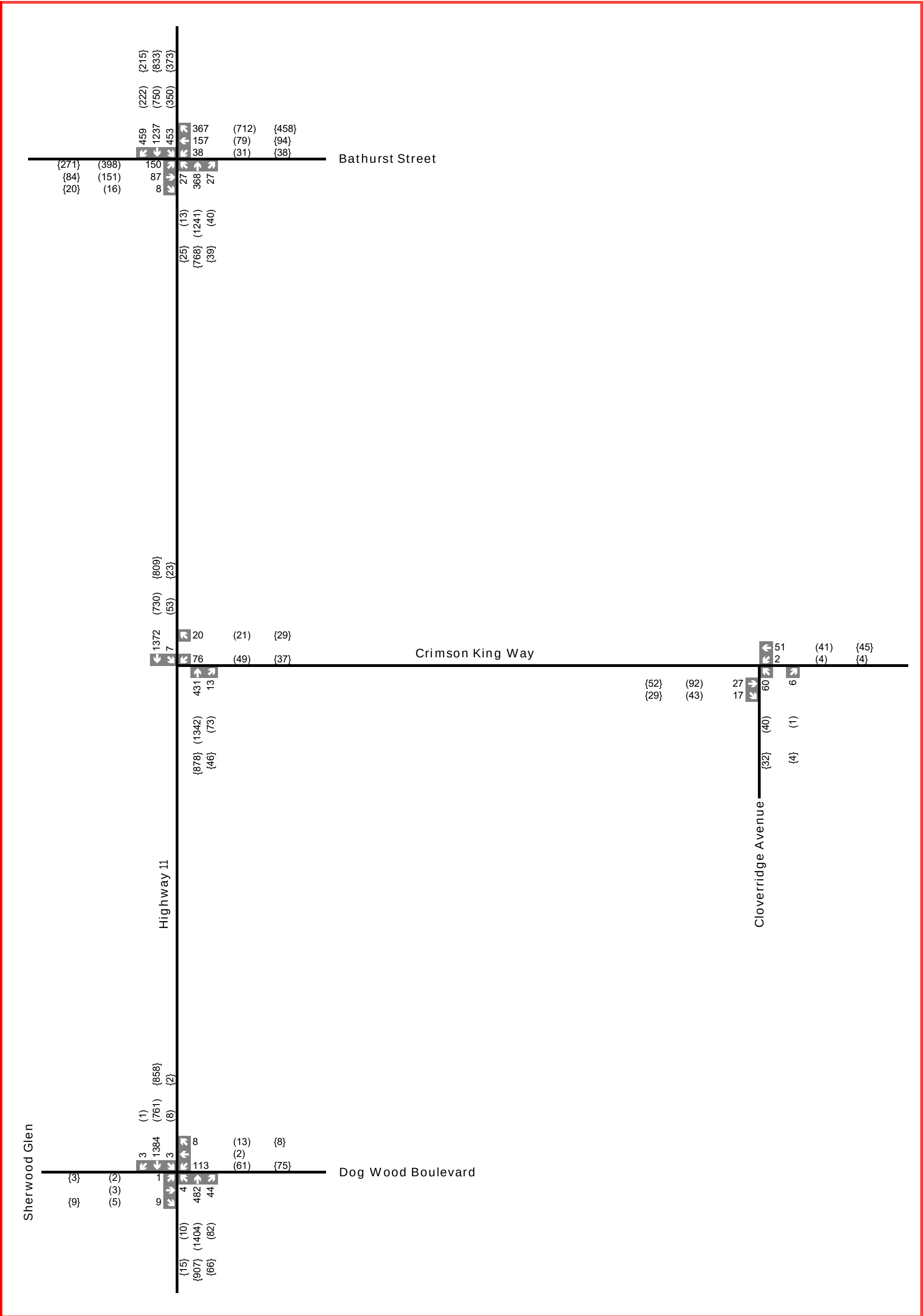
P.M. Peak Hour
Traffic Volumes

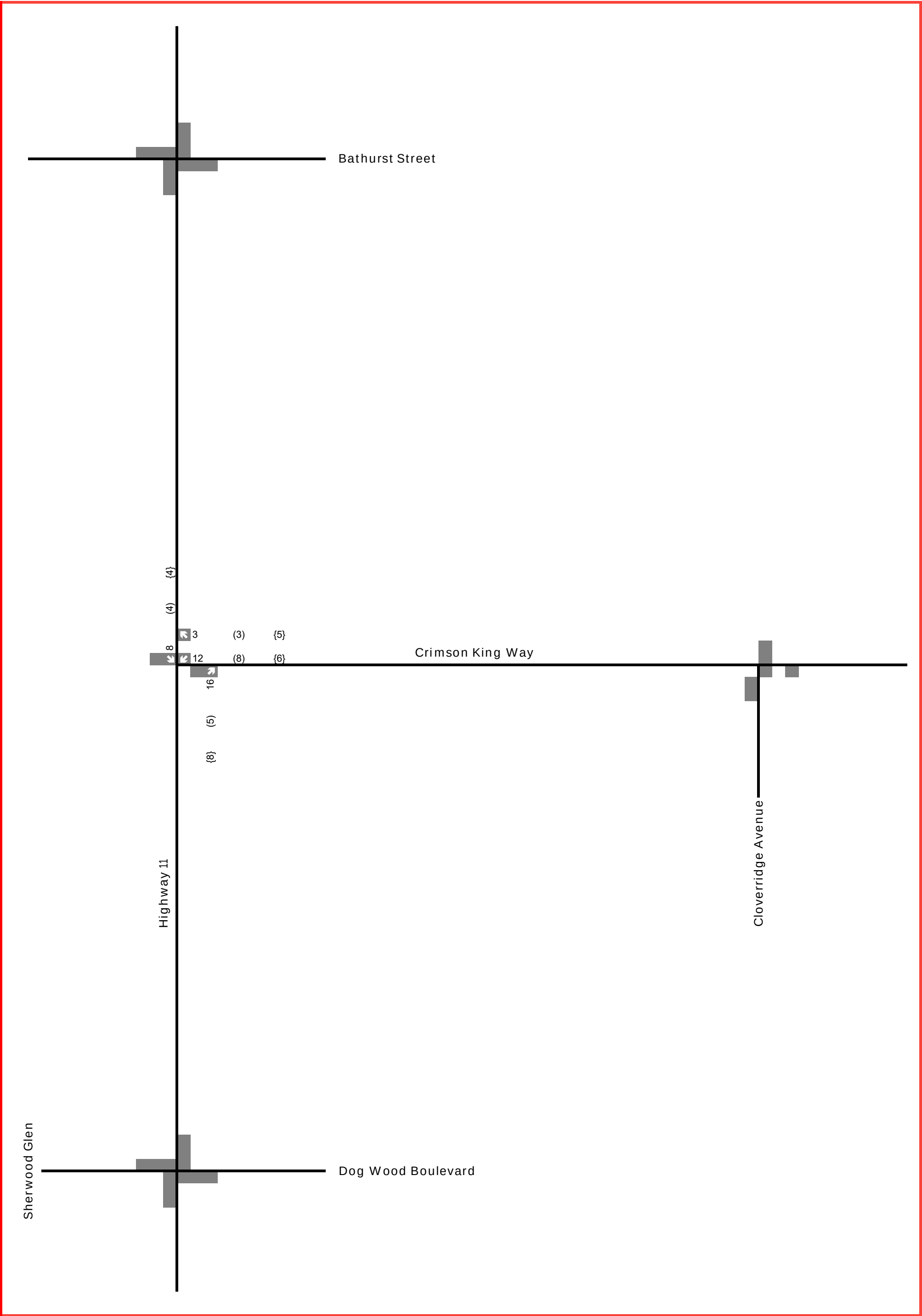
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Weekend Peak Hour
Traffic Volumes

Figure 2-2

Existing Traffic Volumes





xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes

Legend

Figure 2-3
Balancing Applied to
Existing Traffic Volumes



xx

A.M. Peak Hour
Traffic Volumes

(xx)

Legend

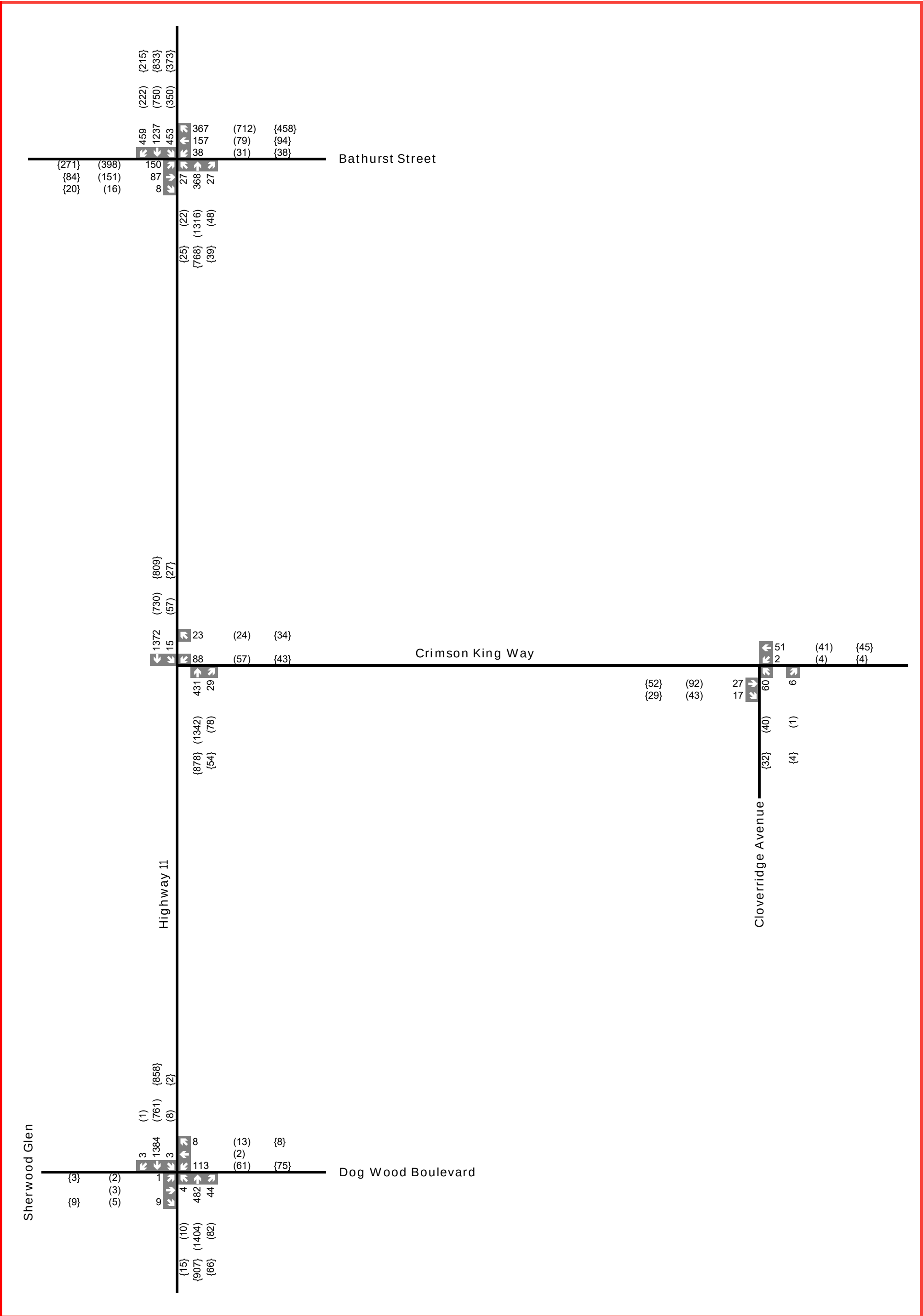
P.M. Peak Hour
Traffic Volumes

{xx}

Weekend Peak Hour
Traffic Volumes

Balanced Existing Traffic
Volumes

Figure 2-4



2.3 MODELLING METHODOLOGY

2.3.1 INPUTS AND PARAMETERS

The Synchro input parameters used in the analysis were established in accordance with the *York Region Transportation Mobility Plan Guidelines*, dated November 2016.

Existing lane configurations were obtained from Google Earth satellite and Street View imagery. Heavy vehicle percentages and conflicting pedestrian volumes as derived from the existing turning movement counts. The Synchro default heavy vehicle percentage of 2% and peak hour factor of 0.92 were applied at the site accesses.

The Synchro default ideal saturation flow rate of 2000 vehicles per hour per lane (vphpl) was applied to all roads.

Default loss time adjustments (LTA) of 0 seconds were applied to all movements.

Intersection peak hour factors (PHF) were calculated from the 15-minute peak hour traffic counts and are summarized in **Table 2-2**.

Table 2-2 Intersection Peak Hour Factors

Intersection	Peak Hour Factor		
	A.M. Peak Hour	P.M. Peak Hour	SAT Peak Hour
Highway 11 and Dog Wood Boulevard / Sherwood Glen	0.89	0.95	0.94
Highway 11 and Crimson King Way	0.89	0.97	0.92
Crimson King Way and Cloverridge Avenue	0.91	0.83	0.76
Highway 11 and Bathurst Street	0.92	0.96 ¹	0.94

1. The peak hour factor for the intersection of Highway 11 and Bathurst Street during the p.m. peak hour was calculated using the volumes counted between 4:15 pm and 4:45 pm as discussed in Section 2.2.

2.3.2 INTERSECTION LEVEL OF SERVICE

Intersection level of service (LOS) is a method of quantifying the quality of traffic operations at signalized and unsignalized intersections. LOS is indicated through a lettering system, with LOS A representing an excellent level of service (generally under free-flow conditions), and LOS F representing a very poor level of service (generally under congested conditions). **Appendix C** contains the definitions for level of service for both signalized and unsignalized intersections.

In addition to LOS, the volume-to-capacity (v/c) ratio represents the sufficiency of an intersection to accommodate the vehicular demand, as compared to the vehicular capacity. A v/c ratio less than 0.85 generally indicates adequate capacity and vehicles are not expected to experience significant delays or queueing conditions. As the v/c ratio approaches or exceeds 1.00, traffic flow becomes unstable resulting in significant delays and queueing conditions. LOS D is typically considered acceptable peak hour performance in an urban setting, and lower LOS conditions may be tolerable for short term time periods during peak hours when heavier traffic volumes are expected.

The 50th percentile queue length represents the maximum back of the queue on a typical cycle. The 95th percentile queue length is defined as the queue length that would only be exceeded five percent of the time, and it is not typical of what an average driver would experience.

The 95th percentile queue is considered to represent the worst-case scenario and is used as an indicator to determine where further examination of storage length is required.

The operations of the study area intersections have been evaluated using Synchro 12, with Highway Capacity Manual (HCM) 2000 procedures. The analysis has considered Level-of-Service (LOS), volume-to-capacity (v/c) ratios, and queuing conditions.

2.4 EXISTING TRAFFIC OPERATIONS

The results of the existing intersection operations analysis are summarized in **Table 2-3** for the a.m., p.m., and Saturday peak hours. Only movements operating under critical conditions (i.e., v/c ratios greater than 0.85 or LOS 'E' or 'F') are included. Detailed Synchro intersection capacity analysis sheets are included in **Appendix D**.

Table 2-3 Existing Traffic Operations Analysis

Intersection	A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
	LOS (Delay in seconds)	Critical Movements [v/c Ratio] ¹	LOS (Delay in seconds)	Critical Movements [v/c Ratio] ¹	LOS (Delay in seconds)	Critical Movements [v/c Ratio] ¹
Hwy 11 & Crimson King Way	A (7.1)	-	B (12.3)	-	A (6.1)	-
Hwy 11 & Dog Wood Blvd / Sherwood Glen	B (14.2)	-	A (6.5)	-	A (7.3)	-
Hwy 11 & Bathurst St <i>Uncalibrated</i>	C (23.0)	-	E (73.1)	WB-R (1.33) NB-T (0.94) SB-L (1.11)	C (30.9)	-
Highway 11 & Bathurst St <i>Calibrated</i>	N/A	N/A	D (42.9)	WB-R (0.92) NB-T (0.94) SB-L (0.99)	N/A	N/A
Crimson King Way & Cloverridge Ave	A (7.5)	NB-LR (0.09)	A (7.7)	EB-TR (0.18)	A (7.5)	EB-TR (0.12)

1. Critical movements are defined as those with a volume-to-capacity ratio exceeding 0.85 for a signalized intersection or with an LOS of 'E' or 'F' for an unsignalized intersection. Critical movements that are at a volume-to-capacity ratio of 1.00 or more are highlighted in red.
2. The LOS at an unsignalized intersection is defined by the movement with the highest delay.

As shown in Table 2-3, all intersections are operating at an LOS of 'C' or better during all peak hours, with the exception of the intersection of Highway 11 and Bathurst Street during the p.m. peak hour which is operating at an LOS 'D'. All movements are projected to operate within capacity, except for the westbound right turn and southbound left turn movements at the intersection of Highway 11 and Bathurst Street during the p.m. peak hour, which operate at v/c ratios of 1.33 and 1.11, respectively. As it is theoretically impossible for movements to be over-capacity under existing conditions, the following calibration measures were applied to bring the movements to within capacity:

- Peak hour factors of 1.00 were applied to the westbound-right, and southbound-left movements. As intersection conditions become busier, the PHF becomes closer and closer to 1.00, given these movements were operating over-capacity, the increased PHF is appropriate;
- A lost time adjustment of -2.0 seconds was applied to the westbound-right, and of -1.0 seconds was applied to the southbound-left during the p.m. peak hour;

- The observed number of vehicles making the westbound-right turn on red was greater than the Synchro-calculated right-turn on red (sRTOR) saturation flow rate. The following calibration approach was followed:
 - The videos used to collect TMC data were reviewed the count the number of vehicles making the westbound-right turn on red during the p.m. peak hour prior to the accident (between 4:15 p.m. and 5:45 p.m. (as discussed in Section 2.2), and then multiplied by 2 to get an estimate for the full peak hour. Based on the video footage, 117 vehicles were observed making the westbound-right turn on red for the 30-minute period which translates to 234 vehicles for the full hour;
 - Per Synchro 11 User Guide, the following equation was used to calculate sRTOR based on observed field volumes: $sRTOR = (\text{field measured RTOR volumes}) * (\text{Cycle length}) / (\text{red time, seconds})$;
 - Given the intersection does not have a set cycle length as it operates under free conditions, the actuated cycle length of 131.6 seconds as calculated by Synchro was used. Red time was calculated by subtracting both the actuated effective green time (43.1 seconds) and the amber time for phase 5 the southbound-left/westbound-right phase (3.0 second) from the actuated cycle length;
 - Based on the above noted equation and values, a sRTOR of 360 was calculated and applied to the westbound-right movement during the p.m. peak hour.

These Synchro parameters are carried forward from the existing conditions to the future assessment to allow for the “Apples to Apples” comparisons. The results of the queuing assessment at exclusive turning lanes are shown in **Table 2-4**. The 50th percentile queue length represents the median queue, meaning that half of the queues that occur within a peak hour will be of this length or less. The 95th percentile queue length provides the queue length that would only be exceeded five percent of the time. The 95th percentile queue is considered to represent the worst-case scenario and is used as an indicator to determine where further examination of storage length is required. Detailed queuing reports are included in **Appendix D**.

Table 2-4 Existing Queueing Analysis

Intersection	Movement	Storage Length (m)	95th Percentile Queue (m) [50th Percentile Queue (m)] ¹		
			A.M. Peak Hour	P.M. Peak Hour	SAT Peak Hour
Hwy 11 & Crimson King Way	WBL	-	39 [23]	25 [13]	15 [7]
	WBR	45	9 [0]	9 [0]	8 [0]
	NBR	92	0 [0]	9 [5]	5 [0]
	SBL	84	2 [1]	5 [2]	3 [1]
Hwy 11 & Dog Wood Blvd / Sherwood Glen	WBR	65	0 [0]	0 [0]	0 [0]
	NBL	71	2 [1]	4 [1]	5 [1]
	NBR	45	3 [0]	7 [1]	3 [0]
	SBL	70	m1 [1]	1 [1]	1 [1]
	SBR	90	m0 [0]	m0 [0]	-
Hwy 11 & Bathurst St <i>Uncalibrated</i>	EBL	67 (175) ²	50 [32]	#138 [99]	87 [61]
	EBR	54	0 [0]	0 [0]	0 [0]
	WBL	31	16 [8]	14 [6]	16 [8]
	WBR	28	42 [12]	#332 [253]	#145 [92]
	NBL	137	9 [3]	5 [2]	8 [3]
	NBR	162	0 [0]	0 [0]	0 [0]
	SBL	148	107 [65]	#172 [99]	#116 [53]
	SBR	154	20 [0]	15 [0]	15 [0]
Hwy 11 & Bathurst St <i>Calibrated</i>	EBL	67 (175) ²	N/A	#138 [99]	N/A
	EBR	54		0 [0]	
	WBL	31		14 [6]	
	WBR	28		#189 [106]	

Intersection	Movement	Storage Length (m)	95th Percentile Queue (m) [50th Percentile Queue (m)] ¹		
			A.M. Peak Hour	P.M. Peak Hour	SAT Peak Hour
	NBL	137		5 [2]	
	NBR	162		0 [0]	
	SBL	148		#151 [79]	
	SBR	154		15 [0]	

1. All queues have been rounded up to nearest whole number.

2. Based on the pavement marking the storage length is 67 metres. However, the EBL lane extends, as a lane separated from a through traffic by yellow solid line, all the way to Graham Sideroad. Hence, the effective storage length is 175 metres.

The results of the queuing analysis, summarized in Table 2-4, shows that all 95th or 50th percentile queue lengths at exclusive turning lanes are contained within their available storage lengths except for the eastbound-left turn during the p.m. peak hour and Saturday peak hour, the westbound-right turn during all peak hours, and the southbound-left movement during the p.m. peak hour at the intersection of Highway 11 and Bathurst Street.

The westbound approach is the 80-metre leg between Highway 11 and Holland Landing Road. Although calibration measures were applied to this movement, the eastbound-left and westbound-right queue extends to the T-intersection of Bathurst Street and Holland Landing Road during the p.m. peak hour period in both calibrated and uncalibrated scenarios. However, since the intersection of Bathurst Street and Holland Landing Road is stop controlled, and most of the westbound-right traffic is originating from the northbound-left traffic on Holland Landing Road, this queuing issue does not represent a safety concern during all peak hour periods.

The eastbound left queue extends into the eastbound through lane which can result in higher delays for the eastbound approach at Highway 11 and Bathurst Street during the p.m. peak hour and Saturday peak hour. In the case of the eastbound-left, it should be noted that while based on the pavement marking, the storage length is 67 metres. However, the EBL lane extends, as a lane separated from through traffic by yellow solid line, all the way to Graham Sideroad. Hence, the effective storage length is 175 metres (which both the 95th and 50th queue length are less than).

2.5 ACTIVE TRANSPORTATION AND TRANSIT NETWORK

There are no transit services within the vicinity of the study area and very little active transportation infrastructure along the study area roadways. As previously noted in Section 2.1, there are sidewalks along one side of Crimson King Way and Cloverrick Avenue, and along both sides of Dog Wood Blvd. There are pedestrian crossing facilities at the intersection of Highway 11 and Bathurst Street. Additionally, there is a paved shoulder along Bathurst Street for cyclists.

3 FUTURE BACKGROUND CONDITIONS

3.1 HORIZON YEARS

It was assumed that the development would be fully built within 5-years, therefore horizon years of 2030 (full build-out), and 2035 (5 years after full build-out) were analyzed.

3.2 FUTURE ROAD NETWORK IMPROVEMENTS

Based on confirmation with Regional staff, there are no planned changes or improvements in the vicinity of the site, as per the Region's 2022 10-Year Roads and Transit Capital Construction Program. Therefore, the future background road network is assumed to remain the same as existing conditions (illustrated in Figure 2-1).

3.3 BACKGROUND TRAFFIC GROWTH

The general background growth rate applicable to Highway 11 was determined based on a review of historical TMC data for the morning and afternoon peak hours. The TMCs and further details on the growth rate calculations are included in **Appendix E**. A summary of the average annual growth rates at the two intersections examined is shown in **Table 3-1**. The analysis found that along Highway 11, growth rates were either negative or almost 0%. A review of surrounding background developments indicated that there was no growth rates applied along Highway 11. Therefore, no background growth rates were applied at the intersection.

Table 3-1 Background Growth Rates

Intersection	Average Annual Growth Rate (%)	
	A.M. Peak Hour	P.M. Peak Hour
Highway 11 and Dog Wood Boulevard / Sherwood Glen	-0.48%	-3.37%
Highway 11 and Bathurst Street	-0.08%	-2.57%

3.4 BACKGROUND DEVELOPMENTS

In addition to background traffic growth, traffic generated background developments within the vicinity of the subject site were considered. **Table 3-2** summarizes the developments which were included based on a review of the Town of East Gwillimbury's Interactive Mapping Tool for active planning applications and knowledge of other projects WSP has completed nearby.

Table 3-2 Background Developments per East Gwillimbury Mapping Tool

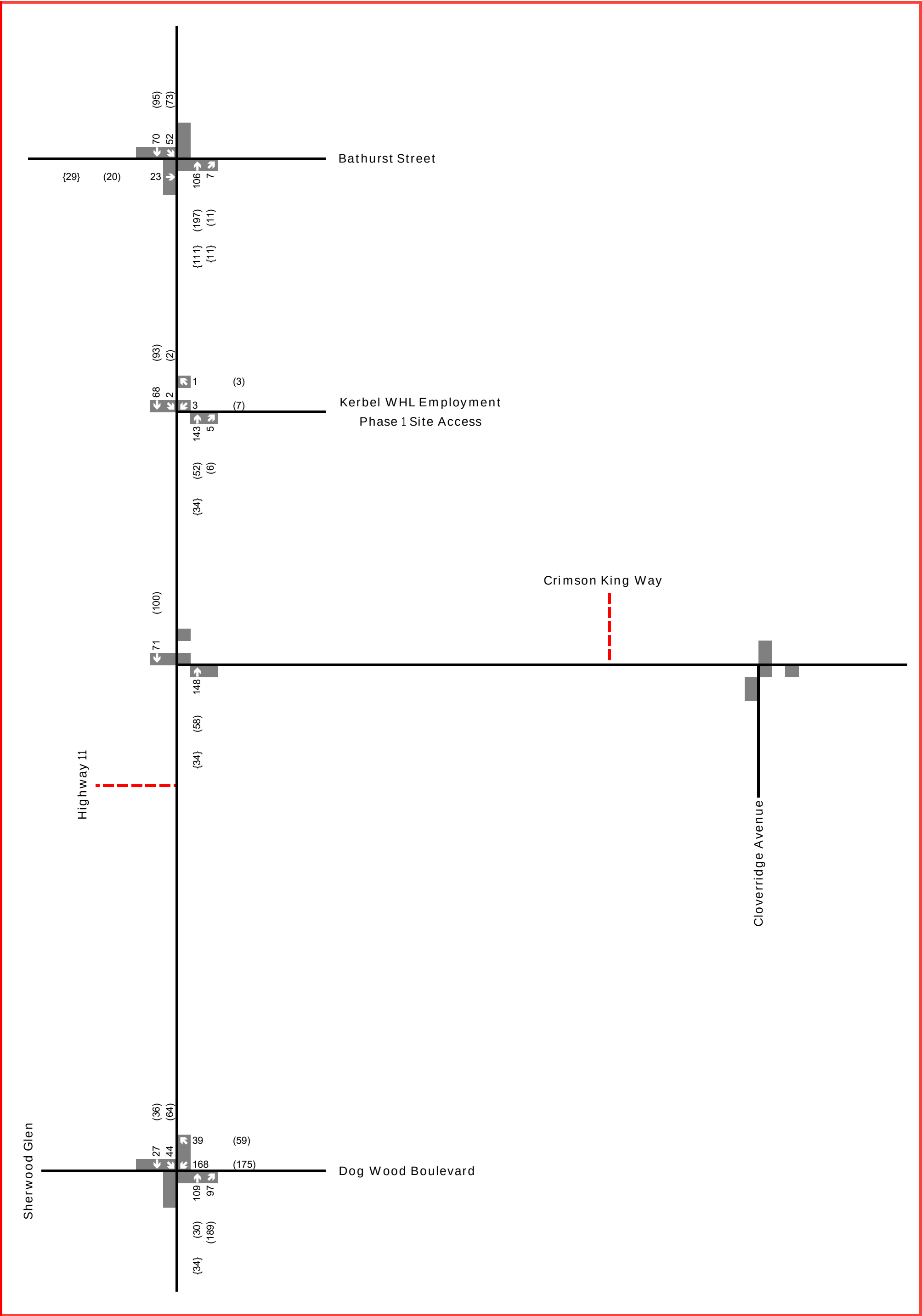
Background Development	Description	Traffic Volume Source
West Holland Landing Subdivision (Multiple Owners, File No: 19T-88085, 19T-94036, 19T-89112, 19T-90015, and 19T-09001.)	1289 residential units, 7 part lots, and blocks dedicated to business park, commercial, and school uses	Transportation Impact Study, dated February 2015, prepared by MMM Group. ¹

Background Development	Description	Traffic Volume Source
Holland Green Village (OLV Developments Inc.)	522 residential units, 3,618 m ² of retail, 567 m ² of community centre, and 1,682 m ² of church space.	Transportation Study, dated December 10 th , 2021, prepared by WSP. Addendum #1 – Response to Regional and Municipal Transportation Comments, dated December 20 th , 2022, prepared by WSP.
Kerbel WHL Employment Lands (Kerbel Group Inc.)	9,327.47 m ² of self-storage facility space, and 29,515.85 m ² of industrial space.	Transportation Impact Study, dated June 2023, prepared by WSP.
19820 Holland Landing Road Inc. (Six Development Inc.)	Commercial office development, 2 three-storey buildings, 2 single-storey buildings	Transportation Impact Study, dated July 2024, prepared by Nextrans Consulting Group. (Under Review)

1. Adjustments to total site generated volumes included in Holland Green Village December 2021 Transportation Study which accounted for the completed portion of the subdivision were applied.

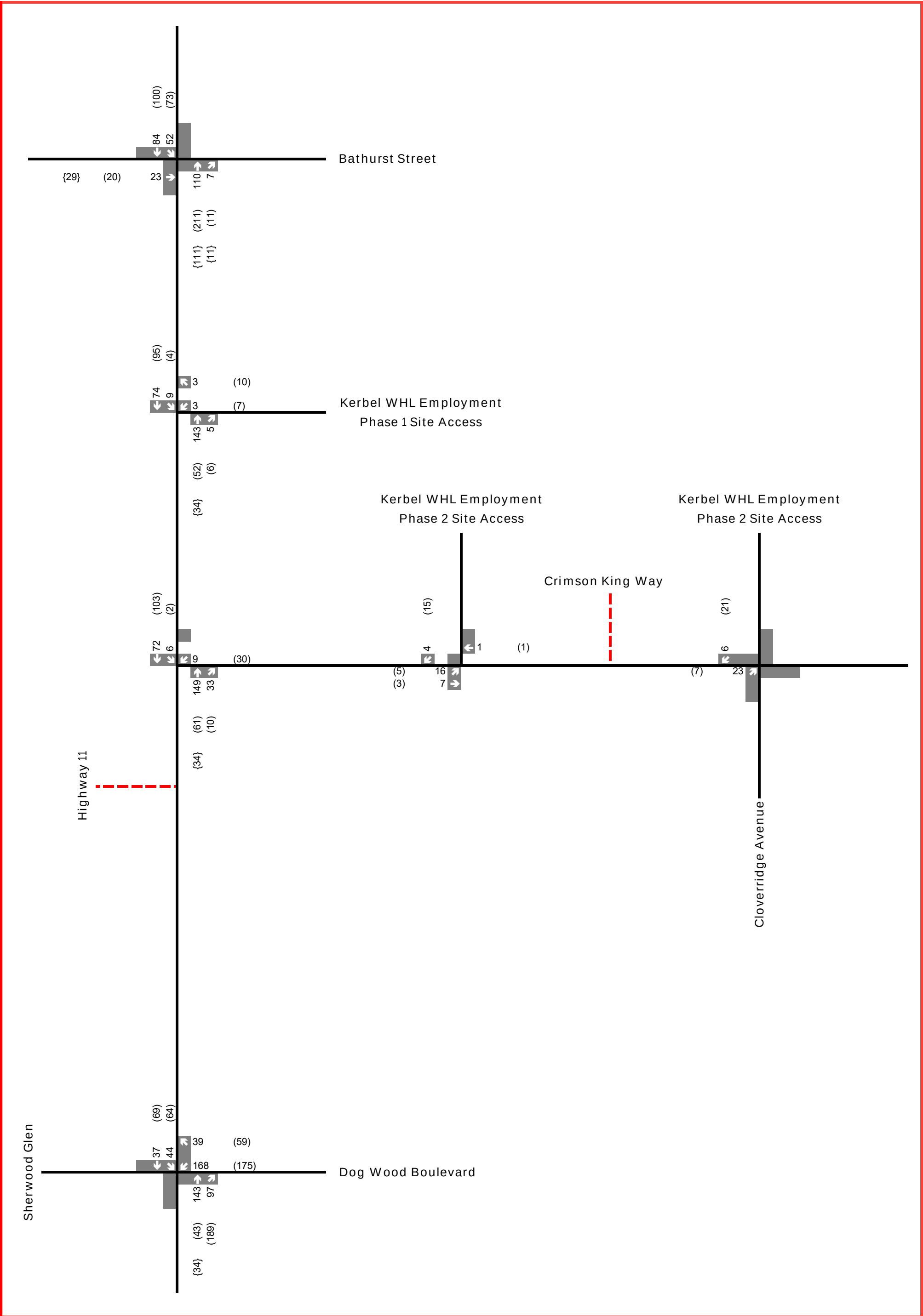
Satellite imagery shows that portions of the West Holland Landing Subdivision (WHL) have been completed and are occupied. This is further supported by the fact that the TMCs collected showed volumes exiting both Crimson King Way and Dog Wood Boulevard onto Highway 11 (both of these roads were built along with the subdivision, in the 2015 TS they are referred to as Street E and Street A, respectively). While completing the December 2021 TIS for Holland Green Village (HGV), WSP undertook a site visit and determined that approximately 78% of the subdivision was occupied at the time of data collection in September 2021. In the previous study, in order to avoid double-counting, only volumes associated with the unbuilt 22% were considered, and they were distributed based on the location of the non-occupied blocks and the surrounding road network.

For the purposes of this study, the volumes and traffic assignment of the unbuilt 22% of the WHL as analyzed in the HGV December 2021 TIS has been applied. Given it has been approximately 3.5 years since the site visit, a review of the most recent aerial images from Google Earth indicated that there is less than 10% of the WHL that is currently unbuilt. It is still assumed that both WHL and HGV would be fully built and occupied by the horizon year in 2030. The resulting 2030 background development traffic volumes are shown in **Figure 3-1** and the resulting 2035 background development traffic volumes are shown in **Figure 3-2**.



xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes

Figure 3-1
2030 Background
Development Traffic Volumes



xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes

Figure 3-2
2035 Background
Development Traffic Volumes

3.5 FUTURE BACKGROUND TRAFFIC OPERATIONS

Future background traffic volumes were developed by aggregating the volumes associated with background traffic growth and those associated with background developments (shown in **Figure 3-1** and **Figure 3-2**). The resulting future background traffic volumes are shown in **Figure 3-3** and **Figure 3-4**. The results of the future background traffic operations and queueing analyses are shown in **Table 3-3** and **Table 3-4**, respectively. Detailed Synchro intersection capacity and queueing reports are included in **Appendix F**.

Table 3-3 Future Background Traffic Operations Analysis

Intersection	Horizon Year	A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
		LOS (Delay in seconds)	Critical Movements [v/c Ratio] ¹	LOS (Delay in seconds)	Critical Movements [v/c Ratio] ¹	LOS (Delay in seconds)	Critical Movements [v/c Ratio] ¹
Signalized Intersections							
Highway 11 & Crimson King Way	2030	A (7.1)	-	A (6.6)	-	A (7.0)	-
	2035	A (7.4)	-	A (9.2)	-	A (7.0)	-
Hwy 11 & Dog Wood Blvd / Sherwood Glen	2030	C (25.6)	WB-LT (0.89)	B (19.7)	-	A (7.3)	-
	2035	C (26.0)	WB-LT (0.89)	B (19.6)	-	A (7.3)	-
Hwy 11 & Bathurst St	2030 – Existing Splits	C (26.1)	SB-L (0.89)	E (70.4)	WB-R (0.92) NB-T (1.15) SB-L (1.19)	C (33.9)	WB-R (0.87) SB-L (0.92)
	2030 - Optimized Splits	N/A	N/A	E (58.6)	EB-L (0.96) WB-R (0.89) NB-T (1.08) SB-L (1.10)	N/A	N/A
	2035 – Existing Splits	C (26.3)	SB-L (0.89)	E (71.9)	WB-R (0.92) NB-T (1.16) SB-L (1.19)	C (33.9)	WB-R (0.87) SB-L (0.92)
	2035 - Optimized Splits	N/A	N/A	E (59.8)	EB-L (0.96) WB-R (0.89) NB-T (1.09) SB-L (1.10)	N/A	N/A
Highway 11 & Kerbel WHL Employment Phase 1 Site Access	2030	A (1.1)	-	A (1.1)	-	A (0.2)	-
	2035	A (1.2)	-	A (1.5)	-	A (0.2)	-
Unsignalized Intersections ²							
Crimson King Way & Cloverridge Ave	2030	A (7.5)	NB-LR (0.09)	A (7.7)	EB-TR (0.18)	A (7.5)	EB-TR (0.12)
Crimson King Way & Cloverridge Ave / Kerbel WHL	2035	A (7.6)	EB-LTR (0.09) NB-LTR (0.09)	A (7.8)	EB-LTR (0.19)	A (7.5)	EB-TR (0.12)

Intersection	Horizon Year	A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
		LOS (Delay in seconds)	Critical Movements [v/c Ratio] ¹	LOS (Delay in seconds)	Critical Movements [v/c Ratio] ¹	LOS (Delay in seconds)	Critical Movements [v/c Ratio] ¹
Employment Phase 2 Site Access (East)							
Crimson King Way & Kerbel WHL Employment Phase 2 Site Access (West)	2035	A (0.8)	WB-TR (0.07)	A (0.7)	WB-TR (0.05)	A (0.0)	WB-TR (0.05)

1. Critical movements are defined as those with a volume-to-capacity ratio exceeding 0.85 for a signalized intersection or with an LOS of 'E' or 'F' for an unsignalized intersection. Critical movements that are at a volume-to-capacity ratio of 1.00 or more are highlighted in red.
2. The LOS at an unsignalized intersection is defined by the movement with the highest delay.

As shown in Table 3-3, all intersections are operating at an LOS of 'C' or better during all peak hours, with exception of the intersection of Highway 11 and Bathurst Street during the p.m. peak hour which is operating at an LOS 'E' for both horizons. The majority of movements are operating within capacity with a few exceptions at the intersection of Highway 11 & Bathurst Street during the p.m. peak hour.

The intersection of Highway 11 & Bathurst Street is impacted by the addition of background development traffic most significantly during the morning and afternoon peak hours, with an overall delay increase of approximately 4 seconds during the morning peak hour and approximately 7 seconds during the afternoon peak hour (relative to existing conditions). Additionally, the northbound-through and southbound-left movements are projected to exceed capacity during the afternoon peak hour under both horizon years. It should be noted that all over-capacity movements were considered critical under existing conditions. Minor adjustments to the maximum green times during the p.m. peak hour were applied, to reduce the degree to which these movements were exceeding capacity. The adjustments reduced the overall intersection delay during the p.m. peak hour by approximately 12 seconds under both horizon years.

It should be noted that it is anticipated that the implementation of the Bradford Bypass will result in a significant diversion of traffic volumes from this intersection to the Bradford Bypass, and that the results of the capacity analysis represent the conservative estimate.

Table 3-4 Future Background Queueing Analysis

Intersection	Movement	Storage Length (m)	95th Percentile Queue (m) [50th Percentile Queue (m)] ¹					
			A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
			2030	2035	2030	2035	2030	2035
Hwy 11 & Crimson King Way	WBL	-	44 [26]	47 [29]	28 [15]	38 [22]	16 [8]	
	WBR	45	9 [0]		9 [0]		8 [0]	
	NBR	92	1 [0]		m0 [2]	m1 [3]	5 [0]	
	SBL	84	m3 [1]		5 [2]	6 [3]	3 [1]	
Hwy 11 & Dog Wood Blvd / Sherwood Glen	WBR	65	7 [0]		12 [0]		0 [0]	
	NBL	71	3 [1]		5 [2]		5 [1]	
	NBR	45	11 [0]		41 [18]	42 [18]	3 [0]	
	SBL	70	m14 [6]		13 [5]	14 [4]	1 [1]	
	SBR	90	m0 [0]		m0 [0]		-	
Hwy 11 & Bathurst St - Unoptimized	EBL	67 (175) ²	51 [32]		#138 [99]		87 [61]	
	EBR	54	0 [0]		0 [0]		0 [0]	
	WBL	31	16 [8]		14 [6]		16 [8]	
	WBR	28	60 [25]	59 [27]	#189 [106]		#153 [95]	
	NBL	137	9 [3]		8 [3]		8 [3]	
	NBR	162	0 [0]		0 [0]		0 [0]	
	SBL	148	#164 [76]	#165 [76]	#198 [121]		#141 [66]	
Hwy 11 & Bathurst St - Optimized	SBR	154	20 [0]		15 [0]		15 [0]	
	EBL	67 (175) ²	N/A	N/A	#178 [106]		N/A	N/A
	EBR	54			0 [0]			
	WBL	31			15 [7]			
	WBR	28			#185 [104]			
	NBL	137			7 [3]			
	NBR	162			0 [0]			
	SBL	148			#190 [113]			
	SBR	154			14 [0]			
Hwy 11 & Kerbel WHL Employment Phase 1 Site Access	WBL	-	5 [1]	6 [1]	8 [2]	10 [2]	-	
	NBR	30	m1 [0]		m0 [0]		-	
	SBL	15	1 [0]	2 [0]	1 [0]		-	

1. All queues have been rounded up to nearest whole number.

2. Based on the pavement marking the storage length is 67 metres. However, the EBL lane extends, as a lane separated from a through traffic by yellow solid line, all the way to Graham Sideroad. Hence, the effective storage length is 175 metres.

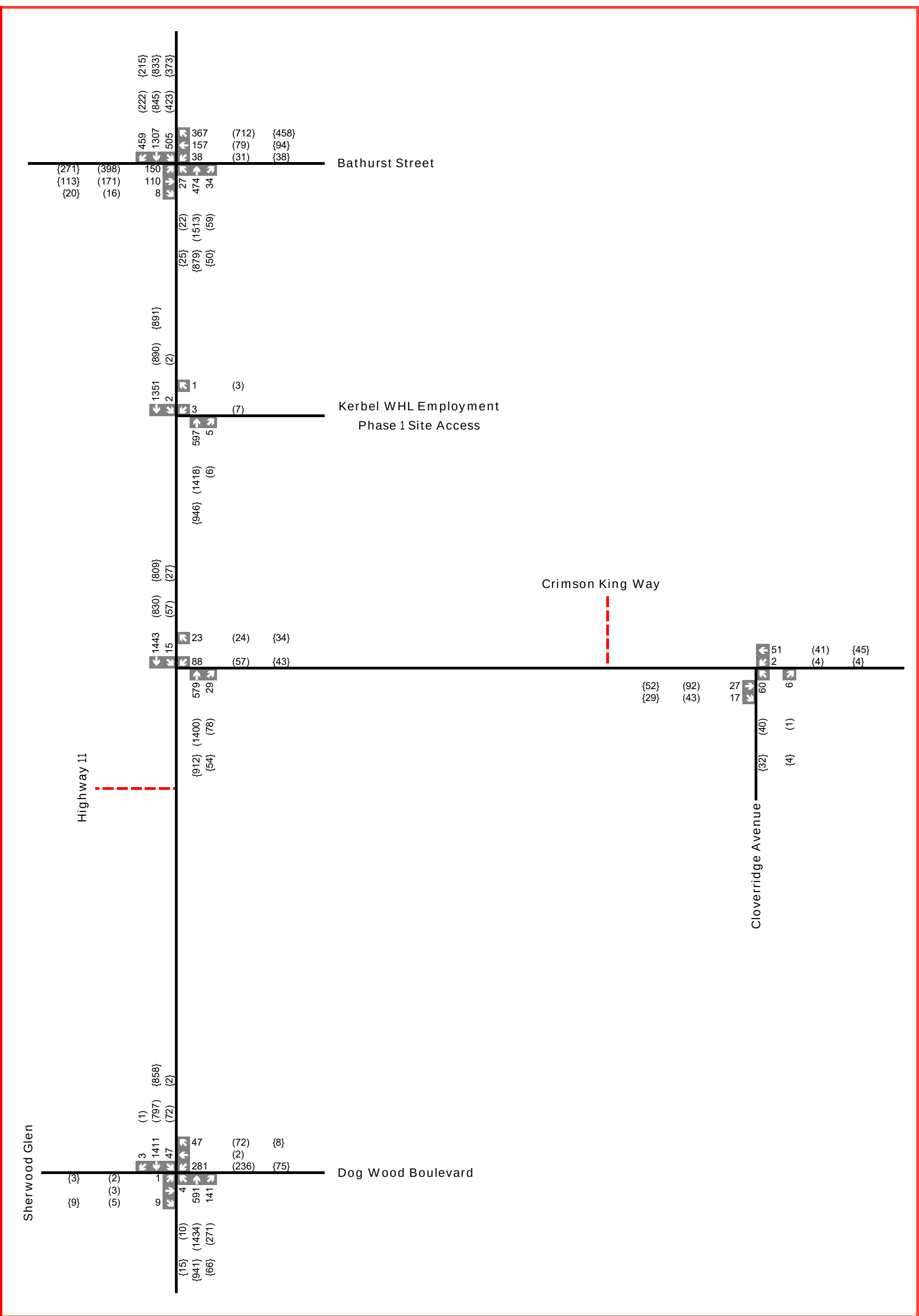
The results of the queueing analysis for both horizon years show that the majority of 95th or 50th percentile queue lengths at exclusive turning lanes are contained within their available storage lengths. The eastbound-left, westbound-right, and southbound-left movements at the intersection of Highway 11 and Bathurst Street are projected to have 95th or 50th percentile queues which exceed the available storage length.

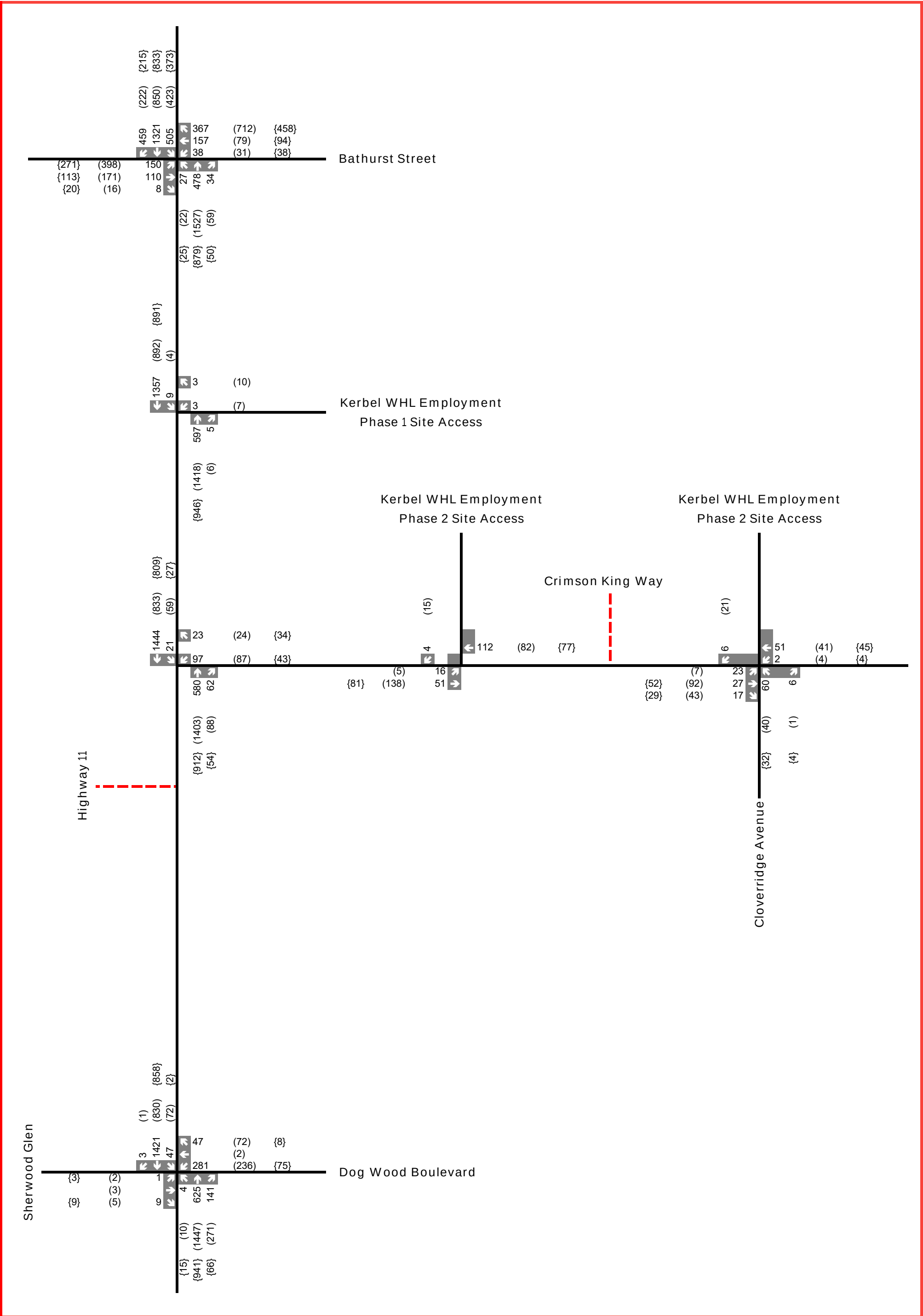
It should be noted that the westbound-right and eastbound-left movements were already projected to exceed the available storage length under existing conditions. As previously noted, the westbound approach is the 80-metre leg between Highway 11 and Holland Landing Road. Since the intersection of Bathurst Street and Holland Landing Road is stop controlled, and most of the westbound-right traffic is originating from the northbound-left traffic on Holland Landing Road, this queueing issue does not represent a safety concern during all peak hour periods.

As previously noted, the eastbound-left, while based on the pavement marking, the storage length is 67 metres. However, the eastbound-left lane extends, as a lane separated from through traffic by yellow solid line, all the

way to Graham Sideroad. Hence, the effective storage length is 175 metres (which both the 95th and 50th queue length are less than) and does not represent a safety concern during all peak hour periods.

The southbound left movement at the intersection of Highway 11 and Bathurst Street is projected to have the 95th percentile queue to exceed the available storage length during the a.m. and p.m. peak hours. However, as noted in Section 2.3.2, the 95th percentile queue is assumed to represent the worse-case scenario. The 50th percentile queue is projected to be contained within the available storage length and does not represent an issue during the a.m. and p.m. peak hours.





xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes

Figure 3-4
2035 Future Background
Traffic Volumes

4 SITE TRAFFIC

4.1 SITE ACCESSES

Once fully completed, the site is proposed to include two accesses: one onto Highway 11, and one onto Crimson King Way by the 2030 horizon year. The future lane configurations are illustrated in **Figure 4-1**.

4.2 TRIP GENERATION

The vehicle trips generated by the proposed development during the weekday a.m. and p.m. peak hours were estimated using the trip generation rates outlined in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition. The pass-by rates for each Land Use Code (LUC) were retrieved from the ITE Trip Generation Manual Appendices. The proposed development is planned to be completed by 2030. It will include three employment use office buildings (Buildings C, D, and E), a gas station with a car-wash (Buildings A and B), and a restaurant with a drive thru (Building F). The land use codes (LUC) 944 (Gasoline/Service Station), 710 (General Office Building), and 934 (Restaurant with Drive Through) were applied. The pass-by rates for LUC 944 were 63%, 57%, and 49% for the a.m., p.m., and Saturday peak hours respectively. The pass-by rates for LUC 934 were 50%, 55%, 50% for the a.m., p.m., and Saturday peak hours respectively. The trip generation rates and resulting trip generation is summarized in **Table 4-1**.

Table 4-1 Site Trip Generation

ITE Land Use Code		A.M. Peak Hour			P.M. Peak Hour			SAT Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
LUC 944: Gasoline/ Service Station (4 fueling stations)	Equation (X = # of fueling stations)	$T = 10.28X$			$T = 13.91X$			$T = 12.77X$		
	Directional Splits	50%	50%	100%	50%	50%	100%	50%	50%	100%
	Total Site Trips	21	21	42	28	28	56	26	26	52
	Pass-by Trip Rate	63%			57%			49%		
	Pass-by Trips	-13	-13	-26	-16	-16	-32	-13	-13	-26
	Sub-total	8	8	16	12	12	24	13	13	26
LUC 710: General Office Building (73,934 ft ²)	Equation (X = 1000 ft ²)	$\ln(T) = 0.86 \ln(X) + 1.16$			$\ln(T) = 0.83 \ln(X) + 1.29$			$T = 0.53X$		
	Directional Splits	88%	12%	100%	17%	83%	100%	54%	46%	100%
	Sub-total	114	15	129	22	107	129	21	18	39
LUC 934: Restaurant with Drive Through (3,455 ft ²)	Equation (X = 1000 ft ²)	$T = 0.12X + 23.62$			$T = 0.12X + 26.48$			$T = 55.25X$		
	Directional Splits	51%	49%	100%	52%	48%	100%	51%	49%	100%

ITE Land Use Code		A.M. Peak Hour			P.M. Peak Hour			SAT Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
	Total Site Trips	79	76	155	59	55	114	97	94	191
	Pass-by Trip Rate	50%			55%			50% ¹		
	Pass-by Trips	-38	-38	-76	-30	-30	-60	-47	-47	-94
	Sub-Total	41	38	79	26	25	51	51	47	98
	Net-Total	162	61	223	63	144	207	85	78	163

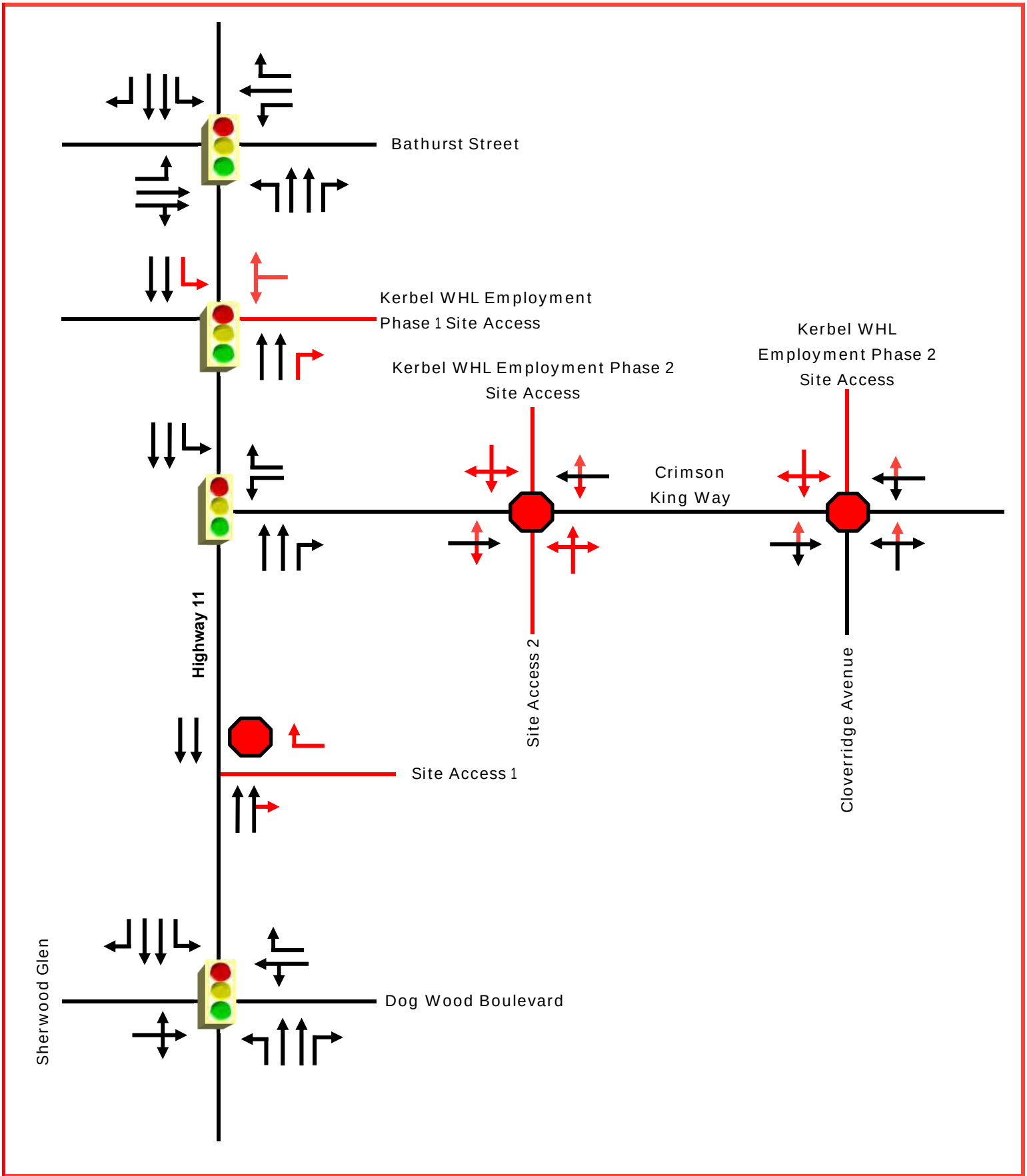
1. The pass-by percentage for the a.m. peak hour was considered as pass-by data was unavailable for the Saturday peak hour. The a.m. peak hour was the lower percentage when comparing the a.m. and p.m. pass-by percentages.

As shown in Table 4-1, the development is projected to generate 223 new vehicle trips during the a.m. peak hour (162 inbound and 61 outbound), 207 new trips during the p.m. peak hour (63 inbound and 144 outbound), and 163 new trips during the Saturday peak hour (85 inbound and 78 outbound).

Trip distribution was estimated based sizes of the surrounding communities and their locations relative to the subject site. For the gas bar, car-wash, and restaurant it was assumed that 70% of trips would originate from Newmarket and the remaining 30% from Bradford West-Gwillimbury. For the employment uses, a slightly modified distribution was assumed with 65% originating from Newmarket, 30% originating from Bradford West-Gwillimbury, and 5% of employment trips originating from the residential communities surrounding the subject site. The gas station, car-wash, and drive-thru restaurant are also projected to generate pass-by trips. 80% of pass-by trips were assumed to be generated from volumes travelling northbound along Highway 11. The remaining 20% were assumed to be from volumes travelling southbound along Highway 11.

All pass-by volumes generated by the gas station/service station and restaurant with drive-thru were assigned to both site accesses along Highway 11 and Crimson King Way. The total pass-by traffic volumes are shown in **Figure 4-2**.

The new site-generated traffic volumes for each of the different LUC are shown in **Figure 4-3**. The total site-generated traffic volumes combining the total pass-by volumes and new site-generated traffic volumes are shown in **Figure 4-4**.



Signalized

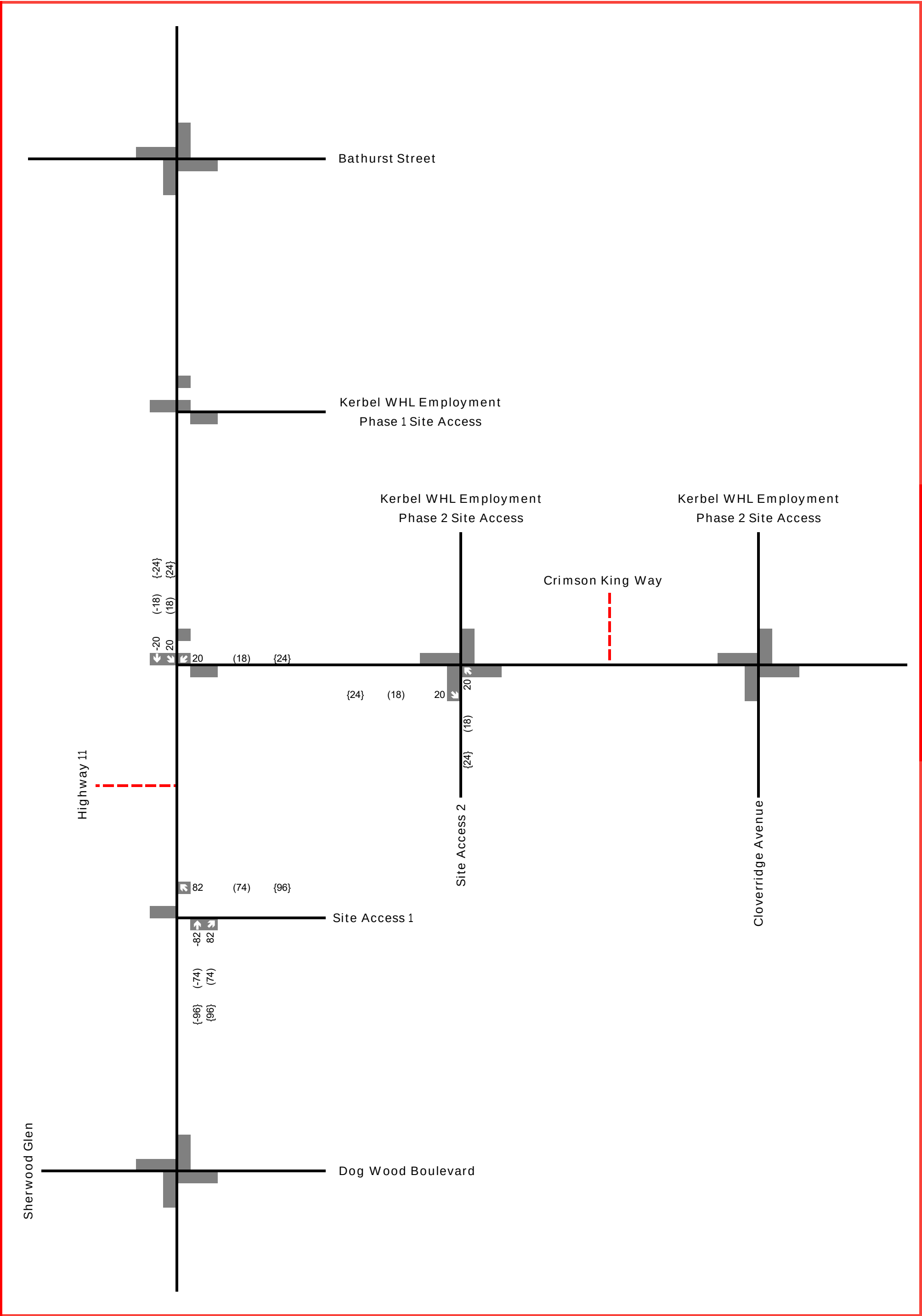


Unsignalized



Future Lane Configuration

Figure 4-1
Future Lane Configurations



xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes

Figure 4-2
Total Pass-by Traffic Volumes

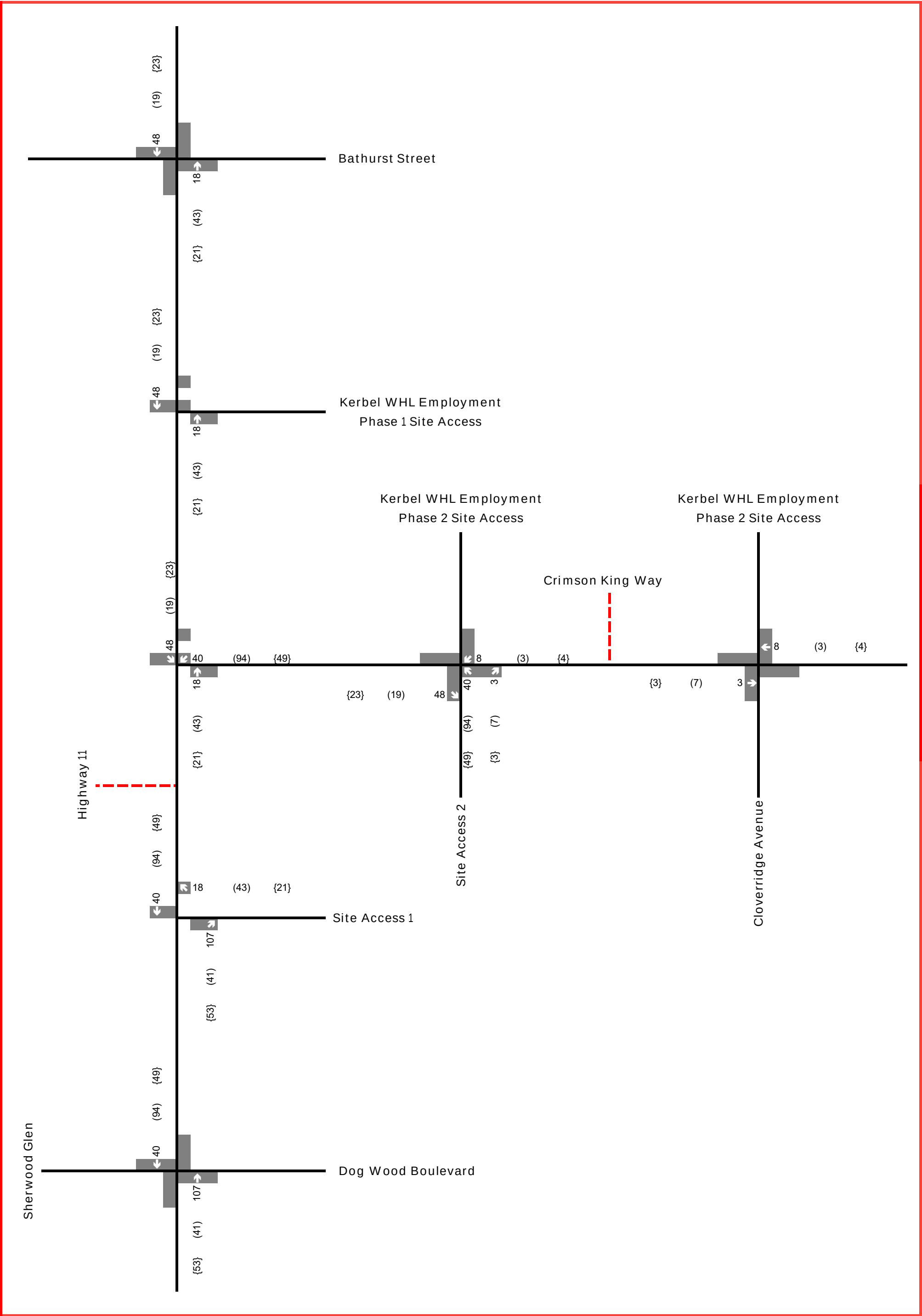
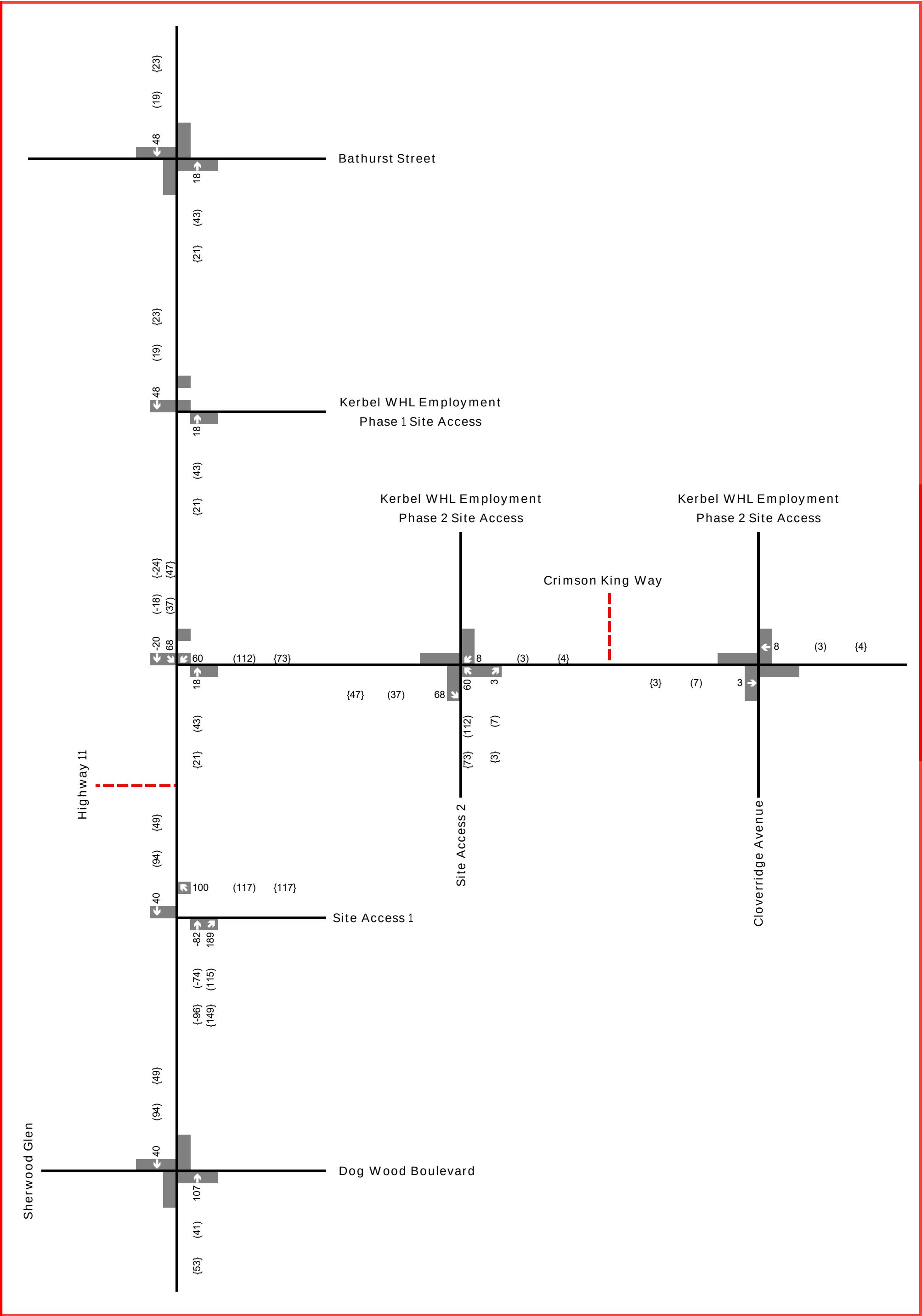


Figure 4-3
New Site-Generated
Traffic Volumes



xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes

Figure 4-4
Total Site-Generated
Traffic Volumes

5 FUTURE TOTAL CONDITIONS

5.1 BASIS OF ASSESSMENT

The future total traffic volumes for each horizon year were developed by aggregating the future background traffic volumes with the site-generated traffic volumes. The resulting future total traffic volumes are shown in **Figure 5-1** for the 2030 horizon year (full build-out), and **Figure 5-2** for the 2035 horizon year (5 years after full build-out).

5.2 FUTURE TOTAL TRAFFIC OPERATIONS

The results of the future total traffic operations and queuing analyses are summarized in **Table 5-1** and **Table 5-2**, respectively. Detailed Synchro intersection capacity and queueing reports are included in **Appendix G**.

Table 5-1 Future Total Traffic Operations Analysis

Intersection	Horizon Year	A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
		LOS (Delay in seconds)	Critical Movements (v/c Ratio) ¹	LOS (Delay in seconds)	Critical Movements (v/c Ratio) ¹	LOS (Delay in seconds)	Critical Movements (v/c Ratio) ¹
Signalized Intersections							
Hwy 11 & Crimson King Way	2030	A (9.6)	-	B (15.5)	-	B (10.1)	-
	2035	B (10.7)	-	B (16.9)	-	B (10.1)	-
Hwy 11 & Dog Wood Blvd / Sherwood Glen	2030	C (28.1)	-	C (20.0)	-	A (7.4)	-
	2035	C (34.1)	-	C (20.1)	-	A (7.4)	-
Hwy 11 & Bathurst St	2030	C (26.8)	SB-L (0.90)	E (62.5)	EB-L (0.96) WB-R (0.89) NB-T (1.11) SB-L (1.10)	C (34.6)	WB-R (0.87) SB-L (0.94)
	2035	C (32.2)	SB-L (0.91)	E (63.9)	EB-L (0.96) WB-R (0.89) NB-T (1.12) SB-L (1.10)	C (34.6)	WB-R (0.87) SB-L (0.94)
Hwy 11 & Kerbel WHL Employment Phase 1 Site Access	2030	A (1.1)	-	A (1.1)	-	A (0.2)	-
	2035	A (1.5)	-	A (1.6)	-	A (0.2)	-
Unsignalized Intersections ²							
	2030	A (0.5)	SB-T (0.48)	A (1.1)	NB-TR (0.60)	A (0.9)	NB-TR (0.36)

Intersection	Horizon Year	A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
		LOS (Delay in seconds)	Critical Movements (v/c Ratio) ¹	LOS (Delay in seconds)	Critical Movements (v/c Ratio) ¹	LOS (Delay in seconds)	Critical Movements (v/c Ratio) ¹
Hwy 11 & Site Access 1	2035	A (0.5)	SB-T (0.48)	A (1.1)	NB-TR (0.60)	A (0.9)	NB-TR (0.36)
Crimson King Way & Cloverridge Ave	2030	A (7.6)	WB-TL (0.08)	A (7.7)	EB-TR (0.19)	A (7.5)	EB-TR (0.12)
Crimson King Way & Cloverridge Ave / Kerbel WHL Employment Phase 2 Access Site (East)	2035	A (7.6)	EB-LTR (0.09) NB-LTR (0.09)	A (7.8)	EB-LTR (0.20)	A (7.5)	EB-LTR (0.12)
Crimson King Way & Site Access 2	2030	A (2.3)	NB-TR (0.09)	A (3.5)	NB-LR (0.18)	A (2.8)	NB-LR (0.10)
Crimson King Way & Site Access 2 / Kerbel WHL Employment Phase 2 Site Access (West)	2035	A (7.9)	EB-LTR (0.16)	A (8.4)	EB-LTR (0.23)	A (0.9)	NB-TR (0.36)

1. Critical movements are defined as those with a volume-to-capacity ratio exceeding 0.85 for a signalized intersection or with an LOS of 'E' or 'F' for an unsignalized intersection. Critical movements that are at a volume-to-capacity ratio of 1.00 or more are highlighted in red.
2. The LOS at an unsignalized intersection is defined by the movement with the highest delay.

Table 5-2 Future Total Queueing Analysis

Intersection	Movement	Storage Length (m)	95th Percentile Queue (m) [50th Percentile Queue (m)] ¹					
			A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
			2030	2035	2030	2035	2030	2035
Hwy 11 and Crimson King Way	WBL	-	64 [44]	67 [46]	63 [42]	72 [49]	34 [18]	
	WBR	45	9 [0]		8 [0]		8 [0]	
	NBR	92	1 [0]		m4 [4]	m6 [4]	6 [0]	
	SBL	84	8 [5]	12 [6]	9 [5]	12 [6]	8 [3]	
Hwy 11 & Dog Wood Blvd / Sherwood Glen	WBR	65	6 [0]		12 [0]		0 [0]	
	NBL	71	3 [1]		5 [2]		5 [1]	
	NBR	45	16 [3]	17 [4]	42 [18]		3 [0]	
	SBL	70	m16 [8]		9 [5]	10 [5]	1 [1]	
	SBR	90	m0 [0]		m0 [0]		-	
Hwy 11 & Bathurst St	EBL	67 (175) ²	51 [32]		#178 [106]		87 [61]	
	EBR	54	0 [0]		0 [0]		0 [0]	
	WBL	31	16 [8]		15 [7]		16 [8]	
	WBR	28	62 [27]	63 [27]	#185 [104]		#155 [96]	
	NBL	137	9 [3]		7 [3]		8 [3]	
	NBR	162	0 [0]		0 [0]		0 [0]	
	SBL	148	#168 [76]	#169 [76]	#190 [113]		#145 [68]	
	SBR	154	20 [0]		14 [0]		15 [0]	
Hwy 11 & Kerbel WHL Employment Phase 1 Site Access	WBL	-	5 [1]	6 [1]	8 [2]	10 [2]	-	
	NBR	30	m1 [0]		m0 [0]		-	
	SBL	15	1 [0]	2 [0]	1 [0]		-	

1. All queues have been rounded up to nearest whole number.

2. Based on the pavement marking the storage length is 67 metres. However, the EBL lane extends, as a lane separated from a through traffic by yellow solid line, all the way to Graham Sideroad. Hence, the effective storage length is 175 metres.

Similar to future background conditions, all intersections are operating at an LOS of 'C' or better during both peak hours, with the exception of the intersection of Highway 11 and Bathurst Street during the p.m. peak hour which is operating at an LOS 'E'.

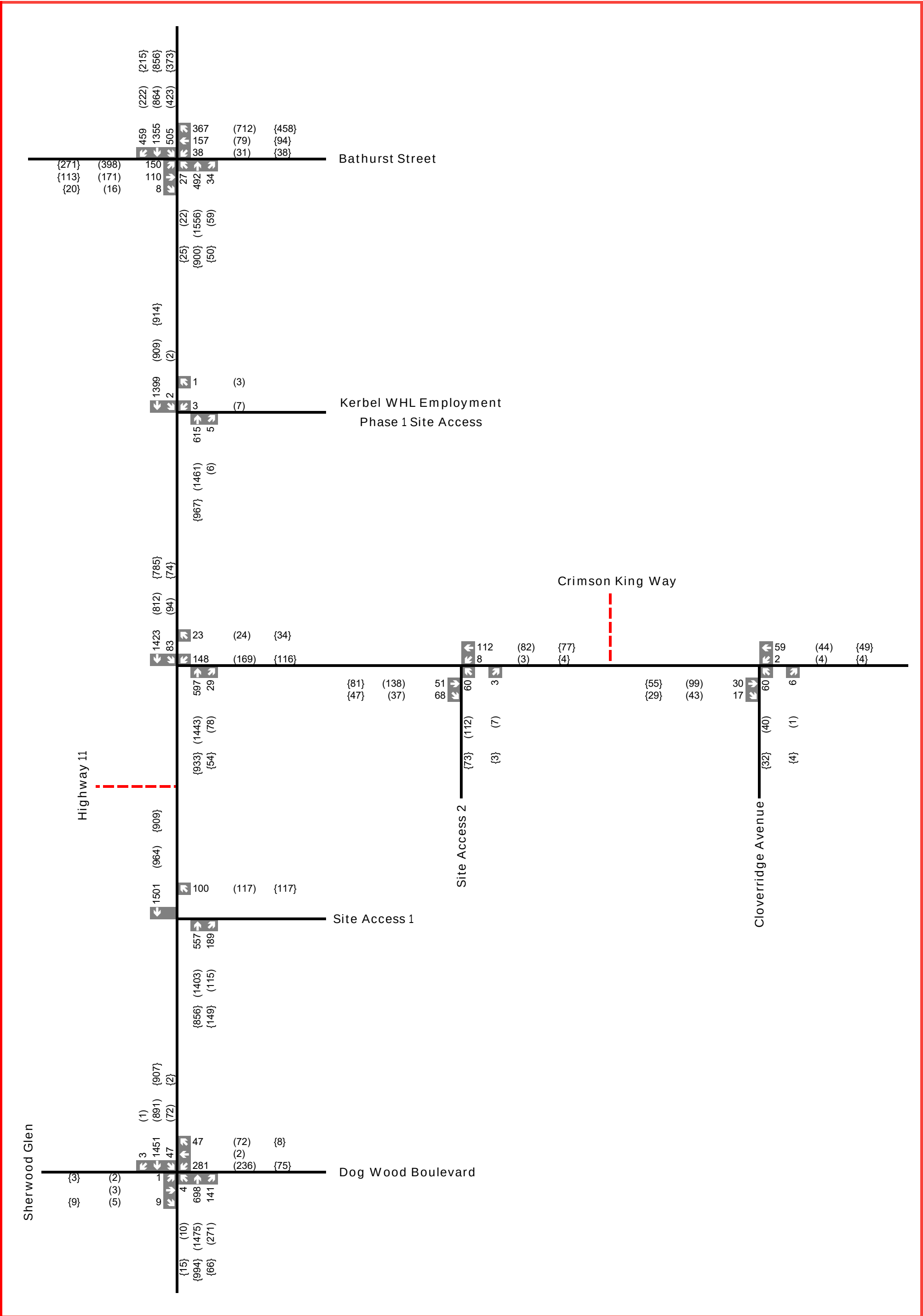
The majority of movements continue to operate within capacity with the addition of site-generated traffic. At the intersection of Highway 11 and Crimson King Way during the p.m. peak hour, the addition of site-generated traffic during the 2030 horizon year causes the northbound-through movement to slightly increase to a v/c ratio of 1.11 (relative to a v/c ratio of 1.08 under future background conditions).

The northbound-through and southbound-left at the intersection of Highway 11 and Bathurst Street continue to operate over-capacity as was the case under future background conditions. The site traffic that is assigned to the movements which are anticipated to be overcapacity accounts for a very small portion of the peak hour volumes for that movement (only 2-3% of the northbound and southbound-through movements can be attributed to site-generated volumes during the afternoon peak hour). It is also important to emphasize that the addition of site-generated volumes results in a minimal increase in delays at the intersection (approximately 4 seconds during the afternoon peak hour under both horizon years) and accounts for about 3% or less of the total traffic volumes at the intersection of Highway 11 and Bathurst Street for both horizon years. Therefore, it is WSP's opinion that the addition of the site-generated volumes is projected to have minimal impact on the delay and v/c ratio of movements indicating that there is minimal traffic impact generated by the proposed development.

Similarly to the future background conditions, the results of the queueing analysis for both horizon years shows that the majority of 95th or 50th percentile queue lengths at exclusive turning lanes are contained within their available storage lengths, with the continued exception of the eastbound-left, westbound-right, and southbound-

left movements at Highway 11 and Bathurst Street. As previously noted in Section 2.3.2, the westbound approach is the 80-metre leg between Highway 11 and Holland Landing, and the queuing issue does not represent a safety concern. Also, at the intersection of Highway 11 and Bathurst Street, the eastbound-left movement during the p.m. peak hour, and southbound-left movement during the a.m. and p.m. peak hour and westbound-right during all peak hours also exceed their available storage lengths. The 95th percentile eastbound-left queue during the p.m. peak hour and the 95th percentile southbound-left queue during the a.m. and p.m. peak hour would extend into the adjacent through lane which can result in higher delays in the eastbound and southbound approach at the intersection of Highway 11 and Bathurst Street. However, the 50th percentile (average) queues for both movements are contained within the available storage.

As noted above, the intersection capacity analysis results represent the conservative estimate given that it is anticipated that there will be significant diversion of traffic volumes from this intersection to the Bradford Bypass.



xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes {xx} Weekend Peak Hour Traffic Volumes

Figure 5-1
2030 Future Total Traffic Volumes



xx

A.M. Peak Hour
Traffic Volumes

(xx)

Legend

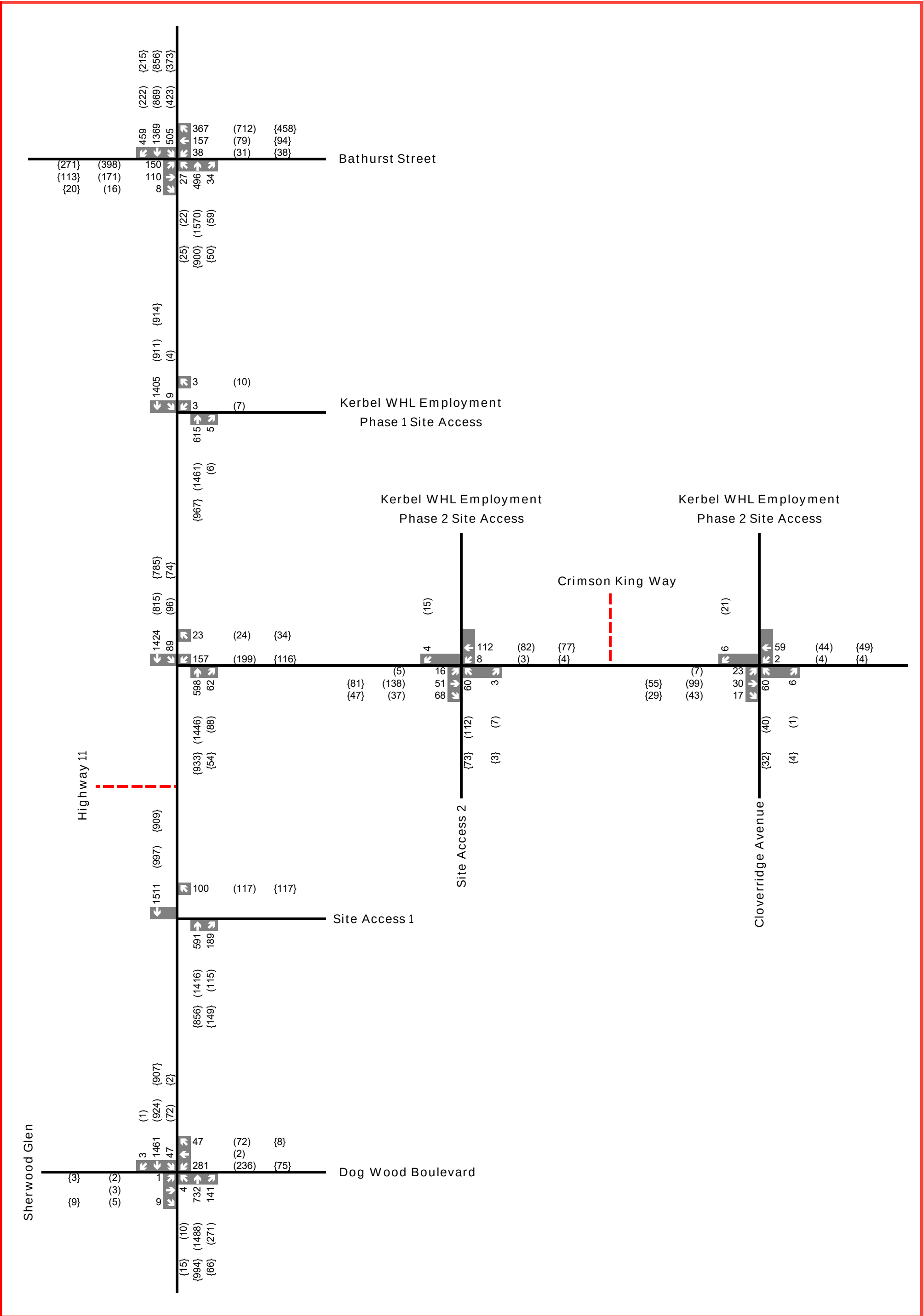
P.M. Peak Hour
Traffic Volumes

{xx}

Weekend Peak Hour
Traffic Volumes

Figure 5-2

2035 Future Total Traffic
Volumes



6 MULTIMODAL TRAVEL ASSESSMENT

6.1 TRANSIT ASSESSMENT

Since transit within the Town of East Gwillimbury is regionally operated, the transit level of service assessment criteria is based on the requirements of the *Transportation Mobility Plan Guidelines for Development Applications* from the York Region. **Table 6-1** summarizes the level of service for transit mode.

Table 6-1 Transit Level of Service Criteria¹

Level of Service	Access to Transit Stops	Transit Headways ²	Intersection Approach (transit or curb lanes)	
			Delay (seconds/vehicle)	V/C
A	90% within ≤200 m	≤5 minutes	≤10	0 to 0.60
B	90% within ≤500 m and 70% within ≤200	> 5-10 minutes	>10-20	0.61 to 0.70
C	90% within ≤500m and 50% within ≤200m	>10-15 minutes	>20-35	0.71 to 0.80
D	100% within ≤600m	>15-20 minutes	>35-55	0.81 to 0.90
E	100% within ≤800m	>20-30 minutes	>55-80	0.91 to 1.00
F	100% >800m	>30 minutes	>80	> 1.00

1. Source: Region of York Transportation Mobility Plan Guidelines Table 4.

2. Measured along walkway length and varies per route.

Given there are no transit services within the vicinity of the study area, all study intersections have a transit LOS of 'F'. Based on the York Region 2022 Transportation Master Plan, there are no improvements planned within the study area. Therefore, the LOS of 'F' is also applicable under future background and future total conditions.

6.2 ACTIVE TRANSPORTATION ASSESSMENT

The cycling and pedestrian level of service criteria in **Table 6-2** is based on the methodology outlined in the *York Region Transportation Mobility Plan Guidelines*. York Region's methodology assesses the LOS of cycling and pedestrian facilities along road segments and at intersections. Segment facilities are mainly assessed by type, signage, and width. Intersection facilities are assessed mainly based on how safe it is for cyclists and pedestrians to cross the intersection.

Table 6-2 Active Transportation Level of Service Criteria¹

Level of Service	Pedestrians		Cyclists	
	Segment	Intersection	Segment	Intersection
A	≥2.0 m sidewalk with minimum 3.5 m buffer including planting and edge zone; or ≥3.0 m multi-use path	— ≥2.0 m sidewalk with minimum 3.5 m buffer including planting and edge zone; or ≥3.0 m multi-use path	Separated cycling facilities (e.g. cycle tracks, multi-use path)	— Separated cycling facilities — Bicycle box or clearly delineated bicycle treatment or bicycle signal head

Level of Service	Pedestrians		Cyclists	
	Segment	Intersection	Segment	Intersection
		— Pedestrian signal head with sufficient pedestrian clearance time — Clearly delineated cross-walk		
B	≥1.5 m sidewalk with minimum 1.0 m buffer including edge zone; or <3.0 m multi-use path	— ≥1.5 m sidewalk with minimum 1.0 m buffer including edge zone; or <3.0 m multi-use path — Pedestrian signal head with sufficient pedestrian clearance time — Clearly delineated cross-walk	≥1.8 m dedicated cycling facilities (e.g. bicycle lanes with and without buffer)	— >1.8 m dedicated cycling facilities (e.g. bicycle lanes with and without buffer), — Bicycle box, clearly delineated bicycle treatment or bicycle signal head
C	≥1.5 m curb-faced sidewalk (no buffer)	— ≥1.5 m curb-faced sidewalk (no buffer) — Pedestrian signal head with sufficient pedestrian clearance time — Clearly delineated cross-walk	<1.8 m dedicated cycling facilities with no buffer	— <1.8 m dedicated cycling facilities with no buffer, — Bicycle box, clearly delineated bicycle treatment bicycle signal head
D	<1.5 m sidewalk	— <1.5 m sidewalk — Pedestrian signal head sufficient pedestrian clearance time — No clearly delineated cross-walk	≤1.5 m bicycle lane with no buffer	— ≤1.5 m bicycle lane and no buffer — Bicycle treatment
E	Paved shoulder or no sidewalk provision	— Paved shoulder or no sidewalk provision — No pedestrian signal head — No clearly delineated cross-walk	Shared facilities (e.g. signed routes, sharrows or paved shoulder with minimum 1.2 m in constrained area)	— Shared facilities (e.g. signed routes, sharrows or paved shoulder with minimum 1.2 m in constrained area)

Level of Service	Pedestrians		Cyclists	
	Segment	Intersection	Segment	Intersection
				— No clearly delineated bicycle treatment
F	No sidewalk provision	— No sidewalk provision — No pedestrian signal head — No clearly delineated cross-walk	No bicycle provision	No bicycle provision

1. Source: Region of York Transportation Mobility Plan Guidelines Table 6 and Table 8.

6.2.1 EXISTING ACTIVE TRANSPORTATION CONDITIONS

There are few pedestrian and cycling facilities within the study area. **Table 6-3** summarizes the corresponding LOS for the active transportation infrastructure provided within the study area based on the criteria provided in **Table 6-2**. The pedestrian and cycling targets of LOS 'C' are not met at the majority of the study intersections. However, given the proposed uses of the development it is expected to generate very few (if any) pedestrian trips at all.

Table 6-3 Existing Active Transportation Level of Service

Intersection	Direction	Segment Description	Pedestrians		Cyclists	
			Segment	Intersection	Segment	Intersection
Highway 11 & Bathurst Street	Eastbound	Bathurst Street	F	D	E	F
	Westbound		F	D	E	F
	Northbound	Highway 11	F	D	F	F
	Southbound		F	D	F	F
Highway 11 & Crimson King Way	Westbound	Crimson King Way	F	D	F	F
	Northbound	Highway 11	F	D	F	F
	Southbound		F	F	F	F
Highway 11 & Sherwood Glen / Dog Wood Boulevard	Eastbound	Sherwood Glen	F	D	F	F
	Westbound	Dog Wood Boulevard	B	D	F	F
	Northbound	Highway 11	F	D	F	F
	Southbound		F	D	F	F
Crimson King Way & Cloverridge Avenue	Eastbound	Crimson King Way	B	F	F	F
	Westbound		F	D	F	F
	Northbound	Cloverridge Avenue	B	F	F	F

6.2.2 FUTURE ACTIVE TRANSPORTATION CONDITIONS

The 2022 York Region Transportation Master Plan was reviewed to understand the future improvements to active transportation facilities within the study area. 2051 Regional Road Cycling Network, illustrated in Map 1, showed cycling facilities are recommended along Highway 11 adjacent to the subject site. The map indicates that the type of cycling facilities and the timeline during which they will be implemented have not yet been determined. The York Region 2051 Regional Road Cycling Network map is included in **Appendix H**.

The Town of East Gwillimbury is in the process of updating their 2010 Transportation Master Plan (TMP). On October 8th, 2019, the draft TMP findings were presented to council. The proposed cycling and sidewalk network maps in this presentation indicate bikeways and sidewalks are proposed along Dog Wood Boulevard, Crimson King Way, and Highway 11 in the vicinity of the subject site. The Transportation Master Plan Update Final Report dated March 1, 2024 outlined the 2041 and 2051 TMP recommendations. The 2041 and 2051 recommendation maps are included in **Appendix H**.

Given the uncertain implementation dates noted above, the future active transportation LOS analysis remains unchanged from existing (summarized in Table 6-3) and would be the same for all horizon years.

7 PARKING REQUIREMENTS

7.1 VEHICULAR PARKING REQUIREMENTS

The required vehicular parking was calculated in accordance with the Town of East Gwillimbury's Zoning By-law 2018-043 and is summarized in **Table 7-1**. The site plan includes 213 spaces which is 49 parking space deficiency in comparison with the By-law requirement of 262.

The number of accessible parking spaces required is also summarized in **Table 7-1**. The site proposes a total of 10 accessible parking spaces which exceeds the By-law requirement of 7 spaces by 3 spaces.

Table 7-1 Parking Requirements per By-law 2018-043

Use	Rate per By-law	Parking Required
Motor Vehicle Gas Bar (140.4 m ²)	1 space / 30 m ²	5
Motor Vehicle Washing Establishment (154.52 m ²)	1 space / 30 m ²	6
Restaurant (321.87 m ²)	1 space / 15 m ²	22
Business Office (6,868.71 m ²)	1 space / 30 m ²	229
Total		262
Accessible Spaces	2 + 2% of the total number of parking spaces provided	7

1. Parking requirements have been rounded up to the nearest whole number in accordance with Town of East Gwillimbury Zoning By-law 2018-043 Section 5.2.2.
2. Per Table 5C of Town of East Gwillimbury Zoning By-law 2018-043. Rate is for sites where the total number of parking spaces required per the by-law is between 201 and 1000.

While the proposed development does not meet the required parking supply per the by-law, it is WSP's opinion that the proposed supply will meet the demands of the development. As part of the proposed transportation demand management strategy, five carpool spaces will be provided on-site. This will reduce the parking demands, in particular for the general employment offices on the site. Other TDM measures (which are further detailed in Section 8.0), are proposed to reduce single-occupancy vehicle trips to the site (which will then also reduce the required parking supply).

The six spaces required for the car wash can be accommodated within the queuing space provided as the vehicles enter and exit through the car-wash facility. The queueing space includes enough room for five passenger vehicles ahead of the car wash, one vehicle exiting the car wash, and one vehicle within the car wash, for a total of six spaces, which meets the six-space requirement.

The restaurant is intended to be primarily servicing drive thru patrons, who will not require parking spaces. The Town of East Gwillimbury's by-law does not differentiate between restaurants by type. A review of zoning by-law from other municipalities found that required parking rates are often reduced for take-out restaurants or restaurants where a drive-thru is present, as summarized in **Table 7-2**. Considering these other rates the parking requirements for the restaurant with a drive-thru are significantly lower (ranging from 11 to 16). Moreover, it should also be noted that the restaurant's drive thru provides enough space for 16 vehicles to queue. Similarly to the car wash, many of the patrons of the restaurant are likely not to require actual parking spaces as they will be using the drive through facility.

Additionally, the by-law parking rate for the office use reflect conditions when the remote work option was not available to the office employees. In the post Covid-19 conditions, the majority of companies continue to allow employees to work remotely two to three days per week, and this has resulted in a significant reduction in the

parking demand compared to the by-law parking rates. Hence, it is anticipated that the proposed parking supply will be sufficient to accommodate the future parking demand on the site.

Table 7-2 Parking Rates for Similar Restaurant Types in Other Zoning By-laws

Municipality	Parking Rate	Requirement Based on Rate
Grimsby Bylaw 14-45	Take-Out or Drive-Thru: 1 space / 30 m ²	11
Brampton By-law 270-2004	Take-Out Restaurant: 1 space / 20 m ² GFA	16
Whitchurch-Stouffville By-law 2010-001-ZO	Does not provide a different rate but does indicate that the required number of parking spaces may be reduced by a factor of 20% where a drive thru facility is present.	18

7.2 BICYCLE PARKING REQUIREMENTS

The Town of East Gwillimbury Zoning By-law 2018-043 does not include bicycle parking requirements for the proposed land uses. However, bicycle parking will be considered as part of the final proposed site plan.

8 SITE PLAN REVIEW

8.1 SITE DIMENSIONS & SPECIFICATIONS

As illustrated in **Figure 8-1**, the following geometric requirements have been satisfied per the Town of East Gwillimbury Zoning By-law 2018-043:

- Parking spaces are 2.75 metres wide by 5.8 metres long (Section 5.2.6);
 - Parking areas are set back a minimum of 1.5 metres from the buildings (Section 5.2.7);
 - The minimum width of all parking aisles is 6.0 metres (Section 5.2.8a);
 - Type A accessible parking spaces have a minimum width of 3.4 metres and length of 5.8 metres. Type B accessible parking spaces have minimum widths of 2.4 metres and lengths of 5.8 metres. All accessible spaces have adjacent access aisles that are a minimum of 1.5 metres wide and extend the entire length of the space (Section 5.12b and 5.12c).
-

8.2 SITE ACCESS REVIEW

Figure 8-2 shows the site access review and dimensions.

Corner Clearance: As shown in **Figure 8-2**, the corner clearances at the intersection closest to Highway 11 meet TAC Geometric Design Guidelines Figure 8.8.2.

- Crimson King Way is classified as a local road. Per TAC, regardless of whether the intersections of these streets are stop-controlled or signal-controlled, the minimum required corner clearance is 15 metres. The corner clearance to Highway 11 is 79.30 metres and Cloverrick Avenue is 73.81 metres, both of which meet requirements.
- Highway 11 is classified as an arterial road. Per TAC, for a signalized intersection, the minimum clearance is 70 metres. The access on Highway 11 has a corner clearance of 86.85 metres to the Crimson King Way/Highway 11 intersection, which meets requirements.

Driveway Spacing: As shown in **Figure 8-2**, the driveway spacing for the two driveways meet TAC Geometric Design Guidelines Figure 8.9.2. For a commercial driveway, the suggested minimum spacing between the tangents of the driveway and intersection radii is 5.0 metres.

- The spacing between the north access to the Crimson King Way and Cloverrick Avenue is 58.89 metres and 56.72 metres, respectively.
- The spacing to the Crimson King Way/Highway 11 intersection is 54.26 metres.

Intersection Spacing: Typically entrances to gas stations are exempt of the spacing requirements stated in Region of York's *Access Guidelines for Regional Roads*, dated November 2020 at the corners of intersections.

Angle of Intersection: Per the Section 6.2 of the Region of York's *Access Guidelines for Regional Roads*, dated November 2020, the angle of intersection between the centrelines of the proposed driveway and Highway 11 is 90°.

Driveway: Both accesses meet requirements set by Region of York and Town of East Gwillimbury, as shown in **Figure 8-1** and **Figure 8-2**.

- The clear throat distance of the proposed driveway intersecting Highway 11 meets the minimum requirement of 15 metres (per Section 6.5) and is enough to contain the anticipated inbound and outbound vehicle queues.

- The driveway intersecting Highway 11 meets the minimum requirement of 9-metre radii and driveway width of 9 metres, per Region of York's standard drawing DS-200.
- The driveway intersecting Crimson King Way meets minimum Town of East Gwillimbury standards of a 7.50 metre radius and Zoning by-law minimum driveway width of 6.5 metres (Section 5.2.9a).

8.3 SITE CIRCULATION ASSESSMENT

8.3.1 FIRE TRUCK

WSP reviewed the maneuvering simulations of a Smeal Aerial RM 105ft fire truck. The fire truck was tested maneuvering through the site as shown in **Figure 8-3**. No issues were identified.

8.3.2 GARBAGE TRUCK

WSP reviewed maneuvering simulations with a custom 9.14m front-loading GFL Garbage Truck entering the site, maneuvering through the proposed internal roadways, towards the loading bays, fronting in and then reversing out of four separate loading bays (one at each building proposed as part of Phase 2), and then exiting the site. Maneuvers are illustrated in **Figure 8-4** and **Figure 8-5**. No issues were identified.

8.3.3 TRACTOR-TRAILER (WB-19)

WSP reviewed maneuvering simulations with a TAC WB-19, entering the site through Crimson King Way and exiting through Highway 11, **Figure 8-6**. The complete the outbound maneuver onto Highway 11, the WB-20 will need to encroach onto the adjacent travel lane.

WB-19 maneuvers at critical loading bays proposed as part of Phase 2 of the development were also tested reversing into the loading bays, and then exiting in a forward motion. The maneuvers are illustrated in **Figure 8-7**. No issues were identified.

8.3.4 GAS STATION FUEL TRUCK

An LWA truck was tested as a fuel truck, entering the site through Highway 11, and exiting through Crimson King Way as shown in **Figure 8-8**. No issues were identified. The outbound-right movement will need to encroach on the adjacent lane. The vehicle can avoid conflicts by conducting an outbound-left movement.

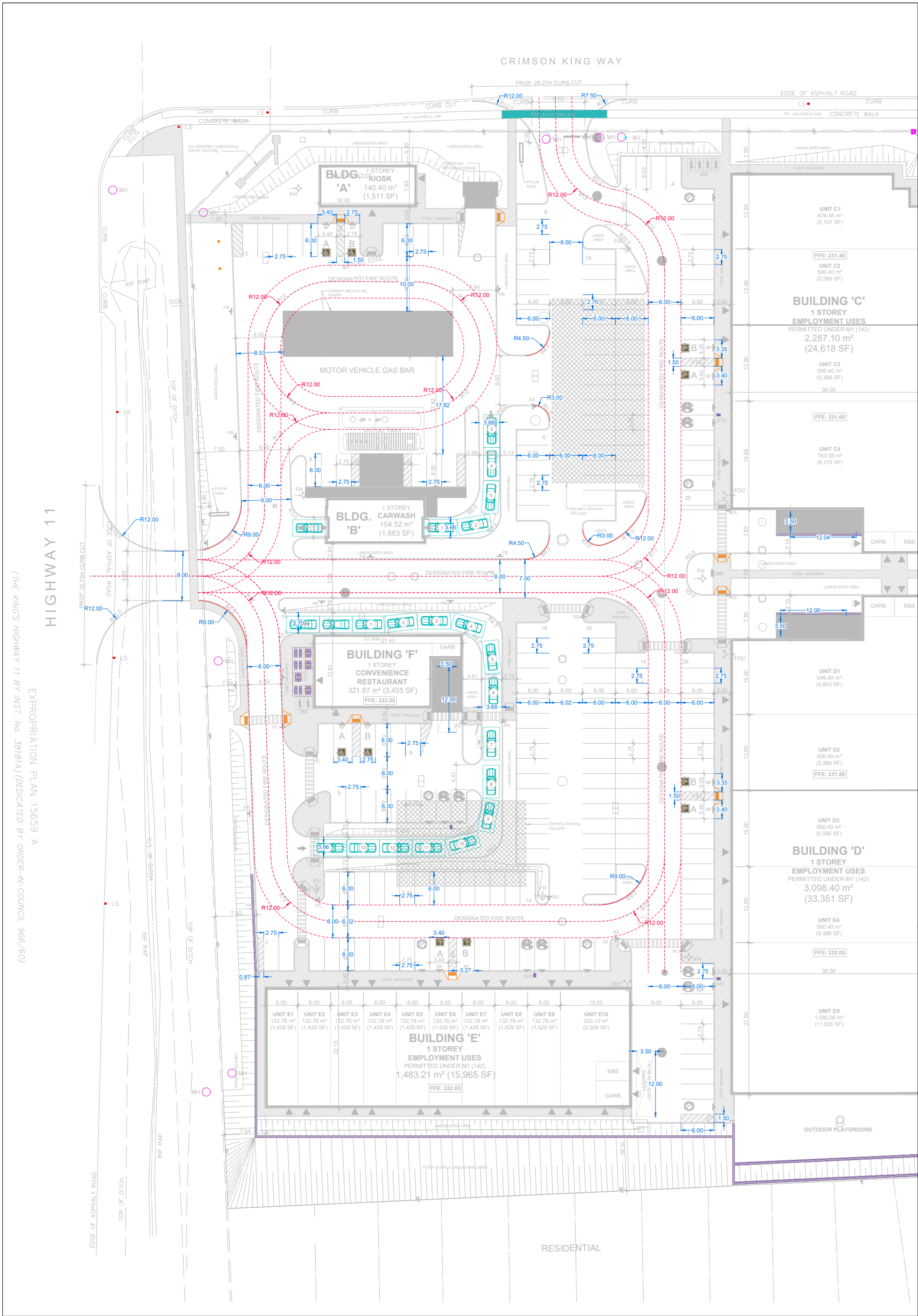
8.3.5 PASSENGER VEHICLES

WSP reviewed TAC passenger vehicle (PTAC) maneuvers at all the proposed site driveways as shown in **Figure 8-9**, PTACs can maneuver without issue through the site. Critical parking spots tested are shown in **Figure 8-10**.

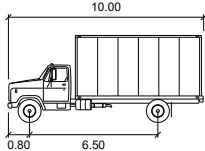
8.4 PAVEMENT MARKING AND SIGNAGE PLAN

A pavement marking and signage plan has been prepared for the proposed development as shown in **Figure 8-11**. It includes stop signs and stop bars at site driveways and at key internal intersections, accessible parking signage, and no-parking signage along key portions of the fire route.

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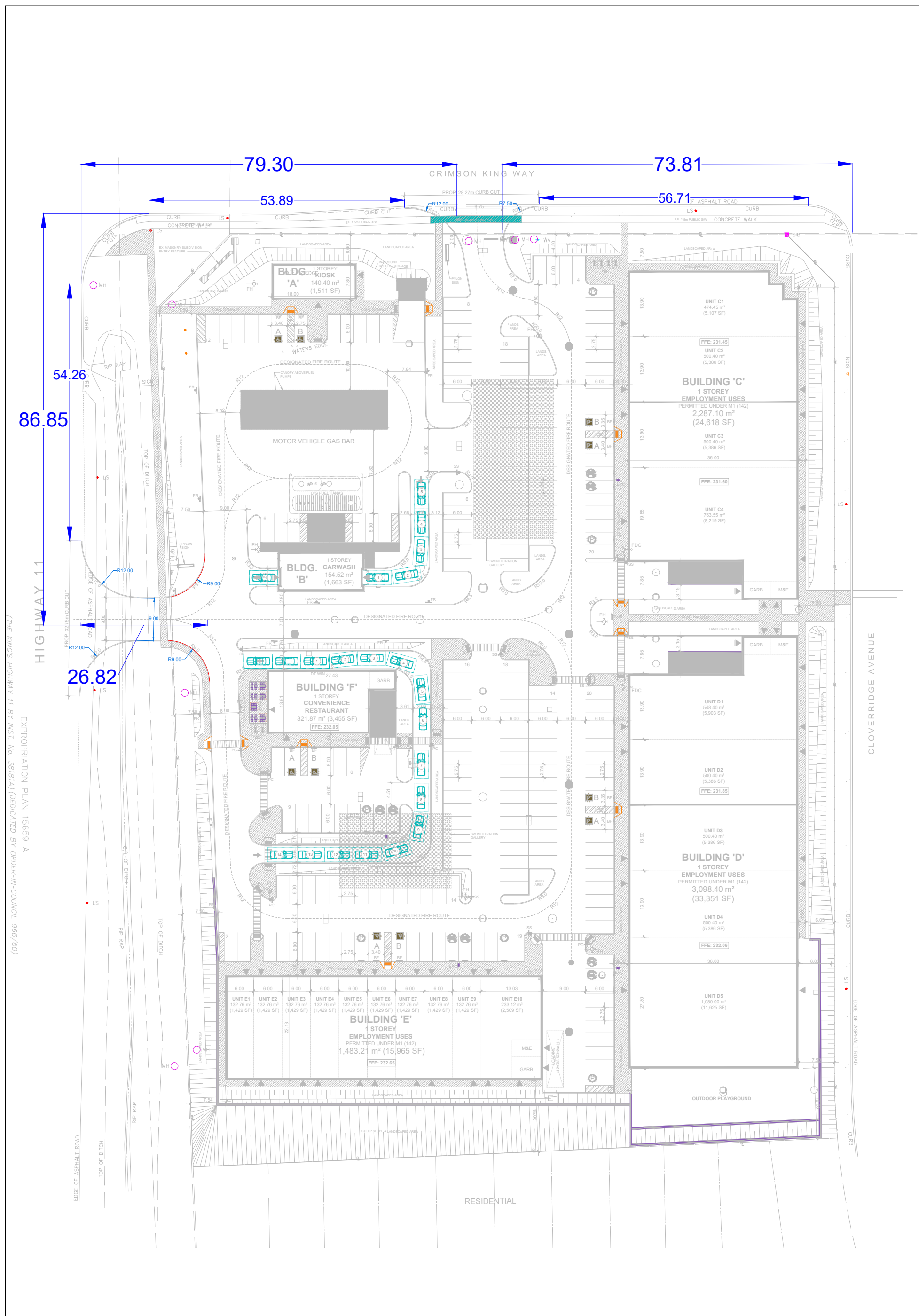
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MSU

meters
: 2.60
: 2.60
: 6.0
: 40.2

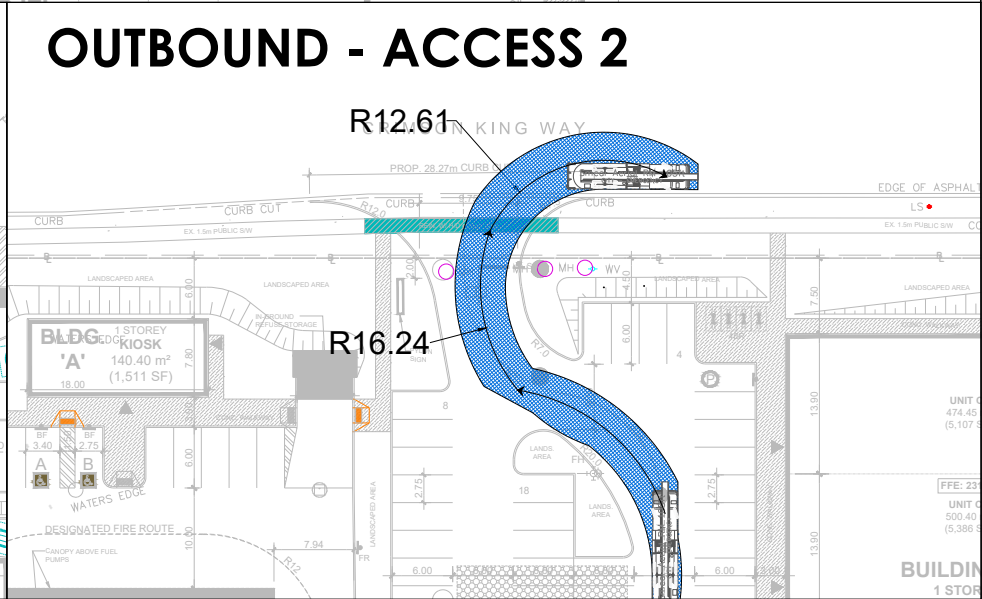
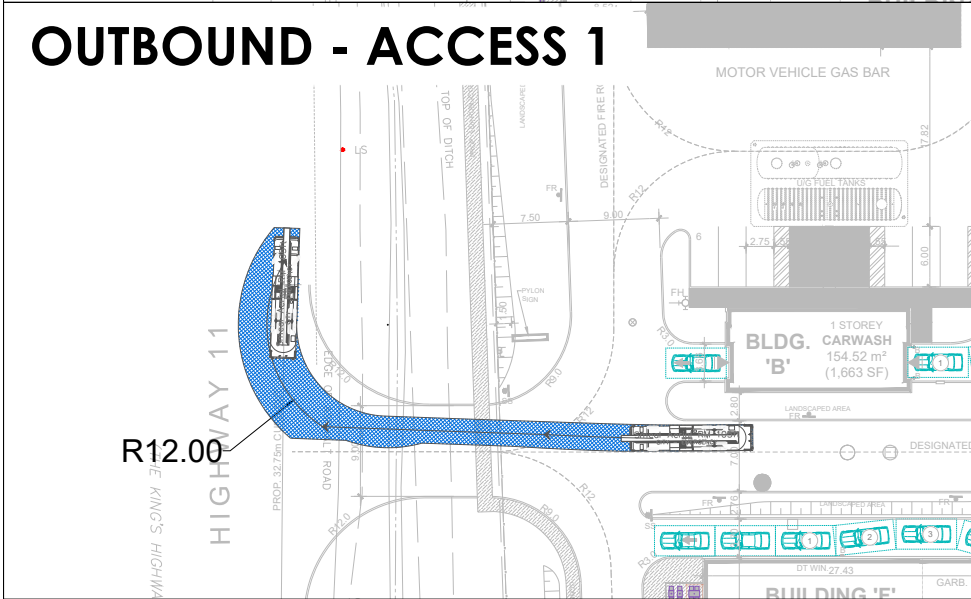
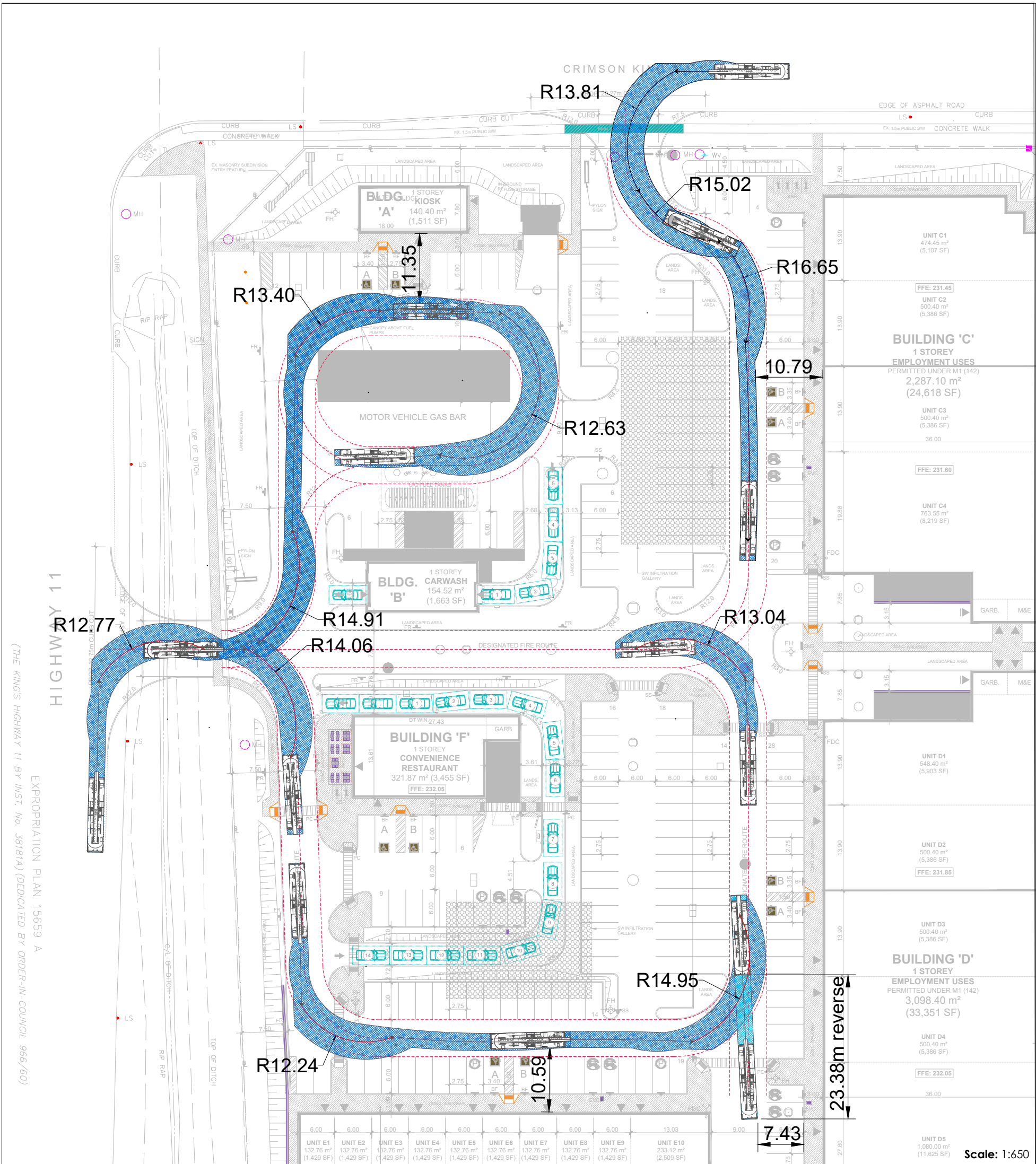
Figure 8-1
Site Dimensions and Specifications
Kerbel WHL Employment Lands TIS



Source: Hwy11-Crimson A-1.0_2025-03-24.zip

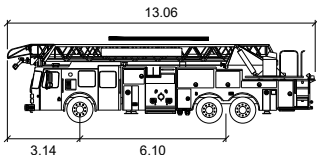
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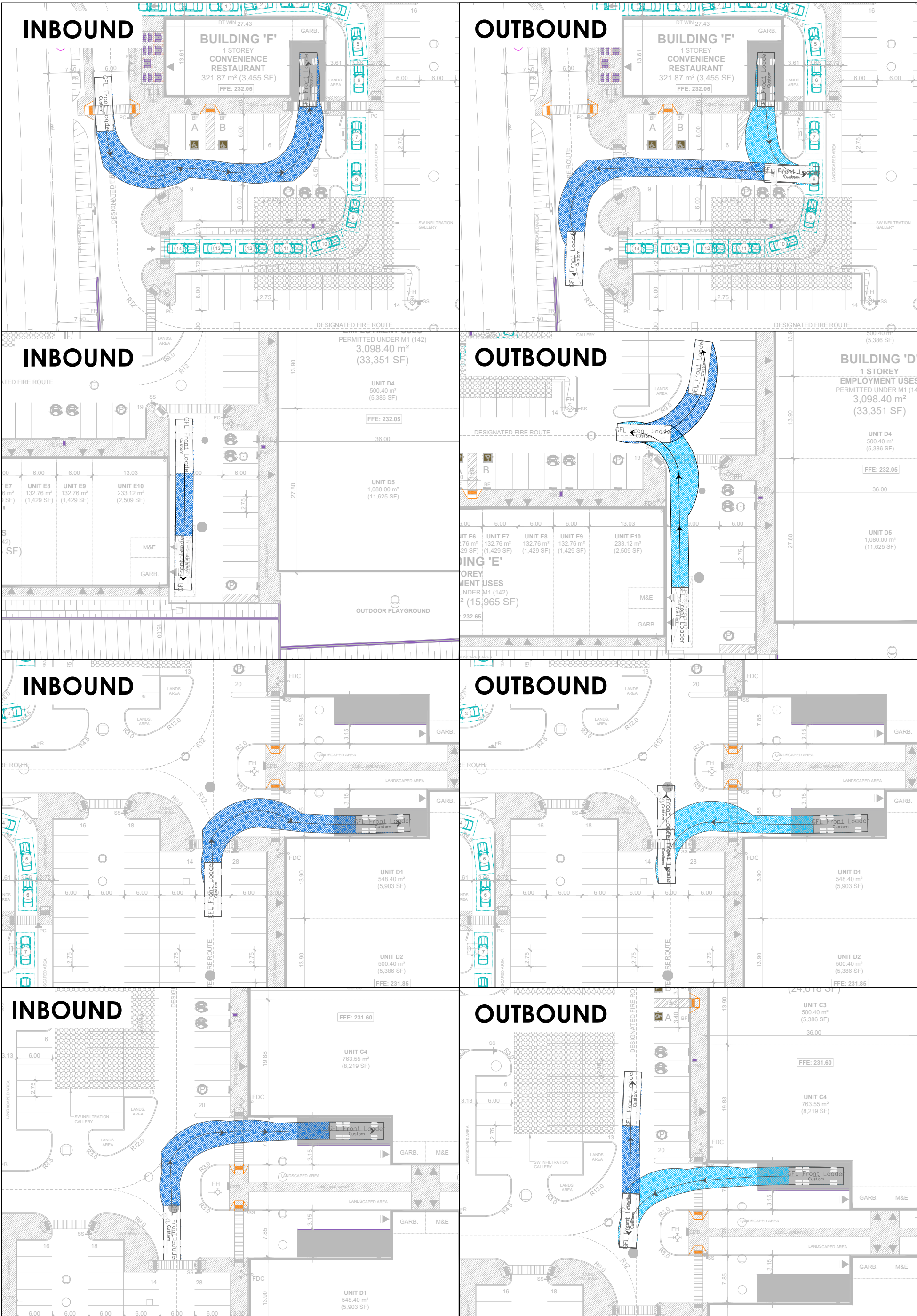


Smeal Aerial RM 105ft

Width	: 2.54
Track	: 2.41
Lock to Lock Time	: 6.0
Steering Angle	: 32.0

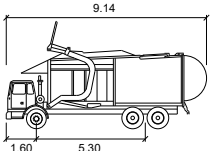
Figure 8-3
Fire Truck Circulation
Kerbel WHL Employment Lands TIS

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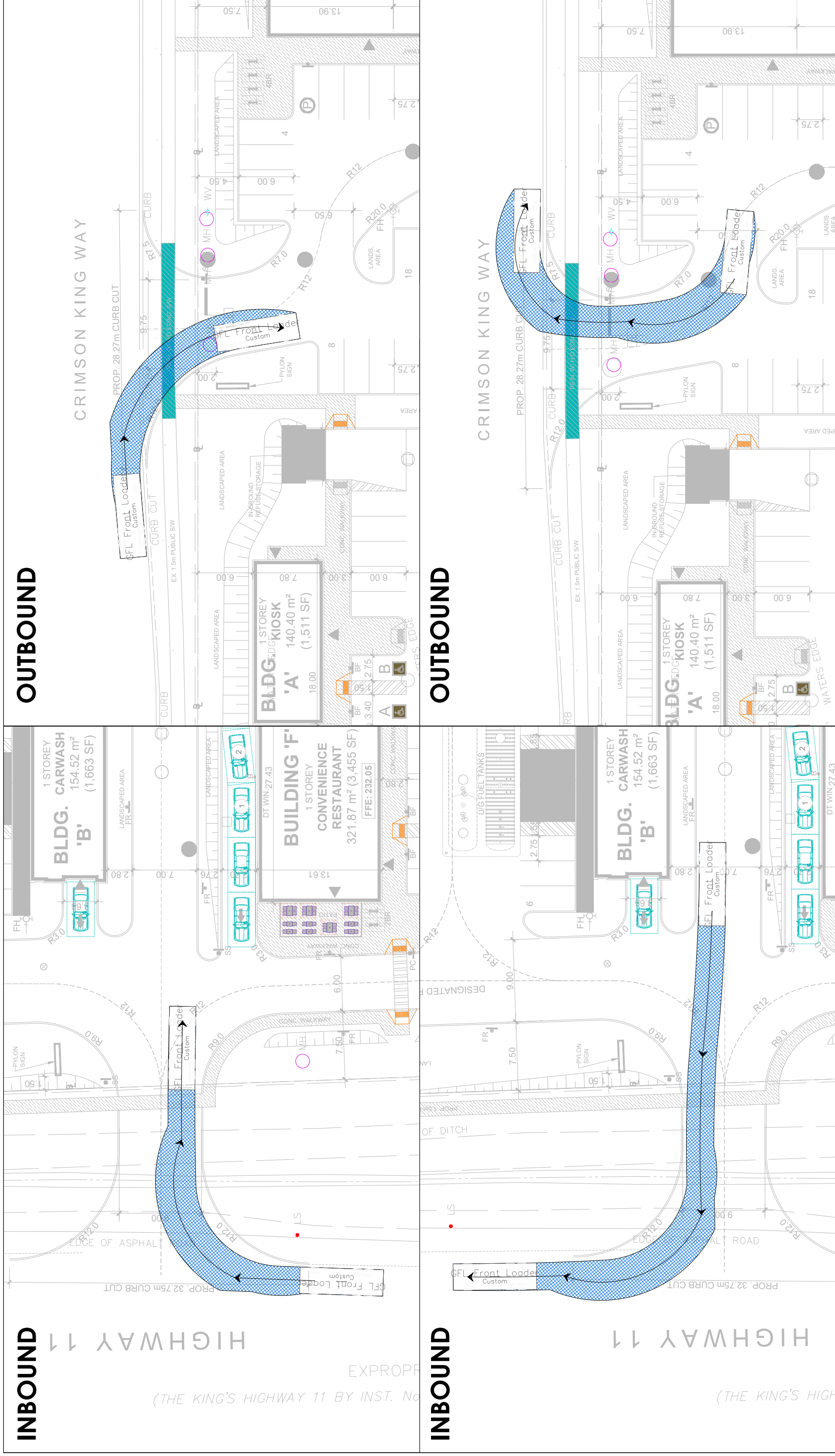
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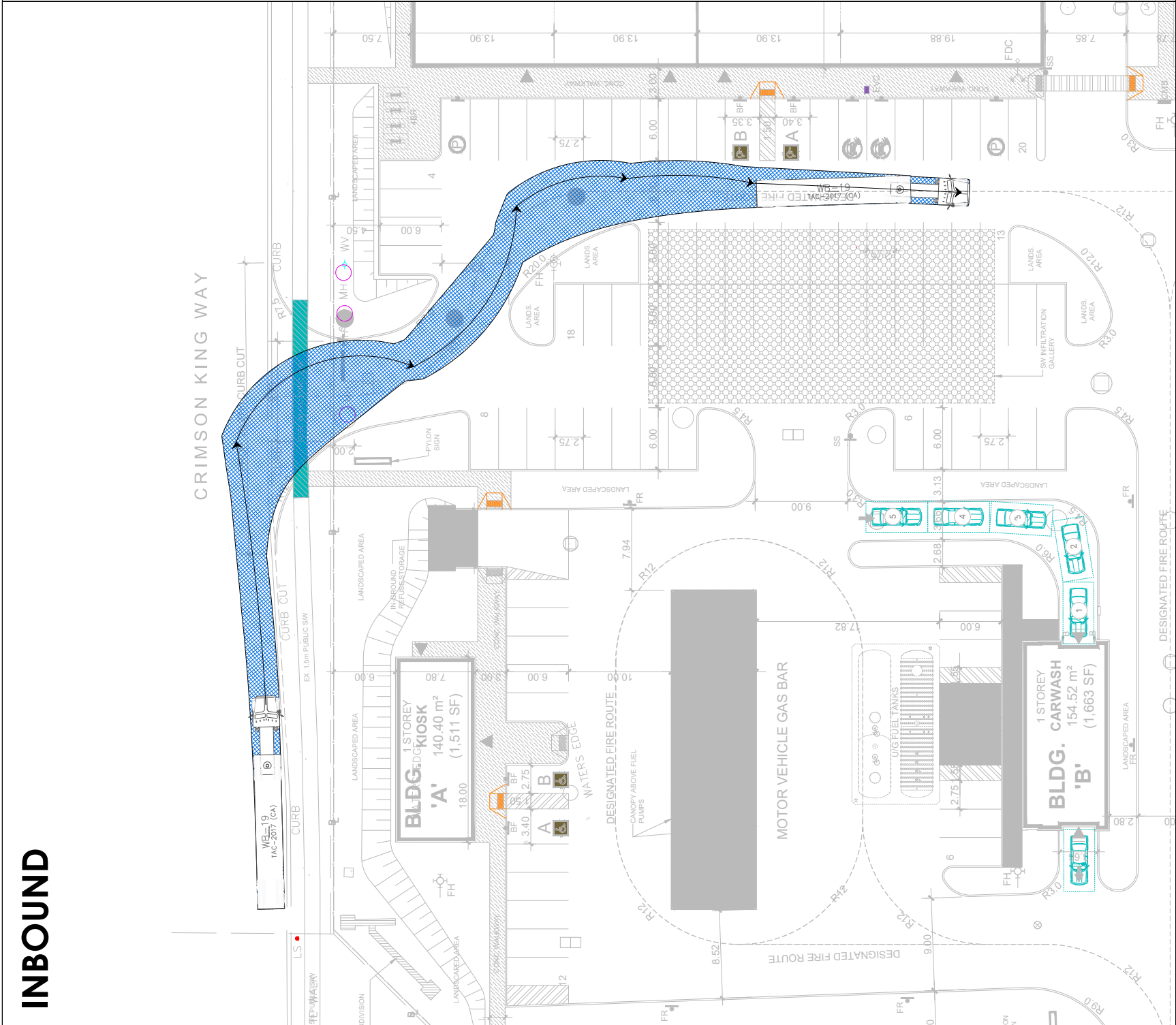


GFL Front Loader	
	meters
Width	: 2.89
Track	: 2.89
Lock to Lock Time	: 6.0
Steering Angle	: 30.6

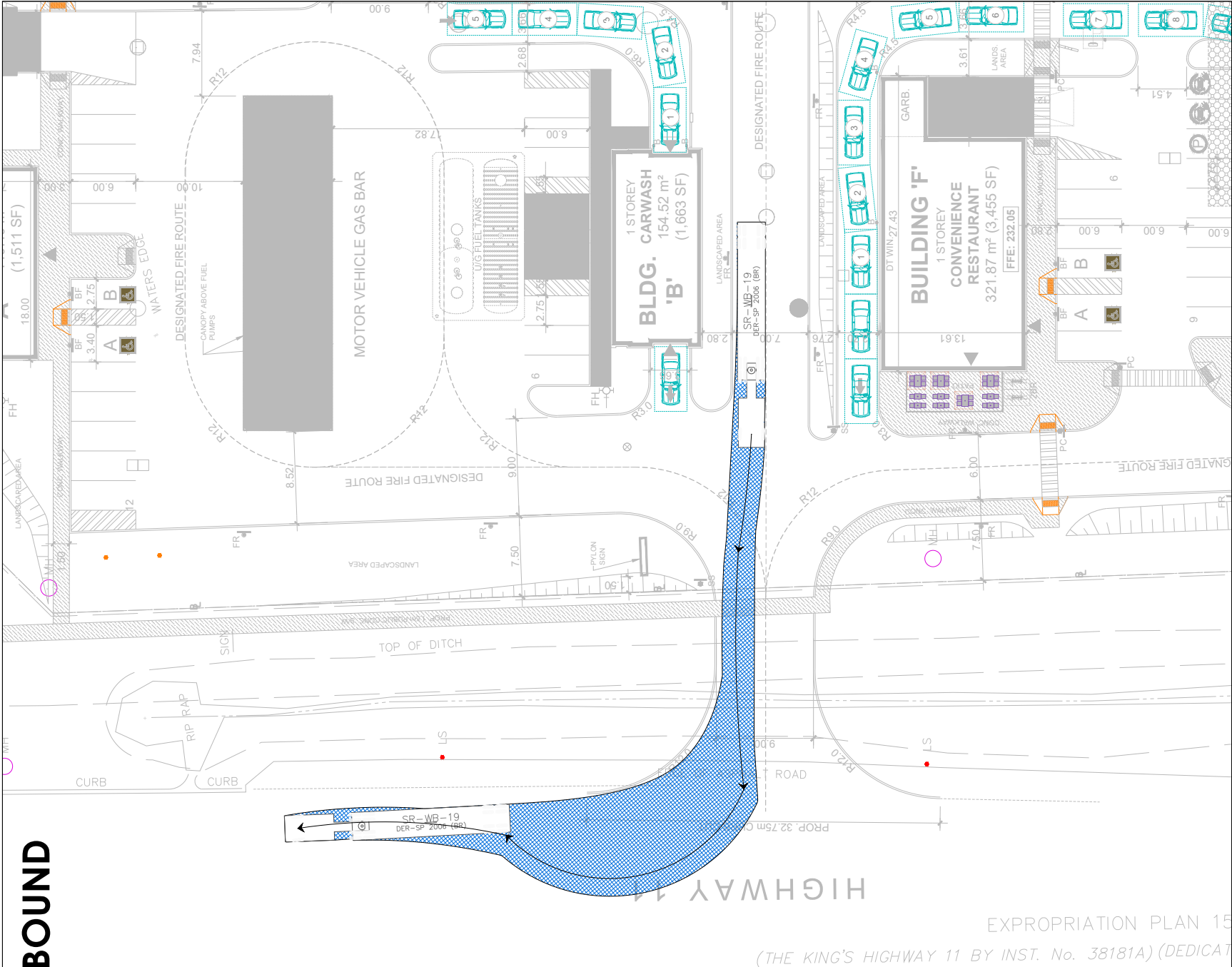
Figure 8-4
GFL Front Loader Private Garbage Truck Maneuvers
Kerbel WHL Employment Lands TIS



INBOUND

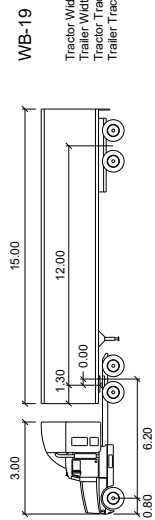
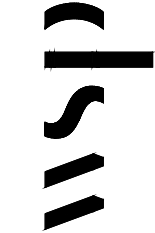


OUTBOUND



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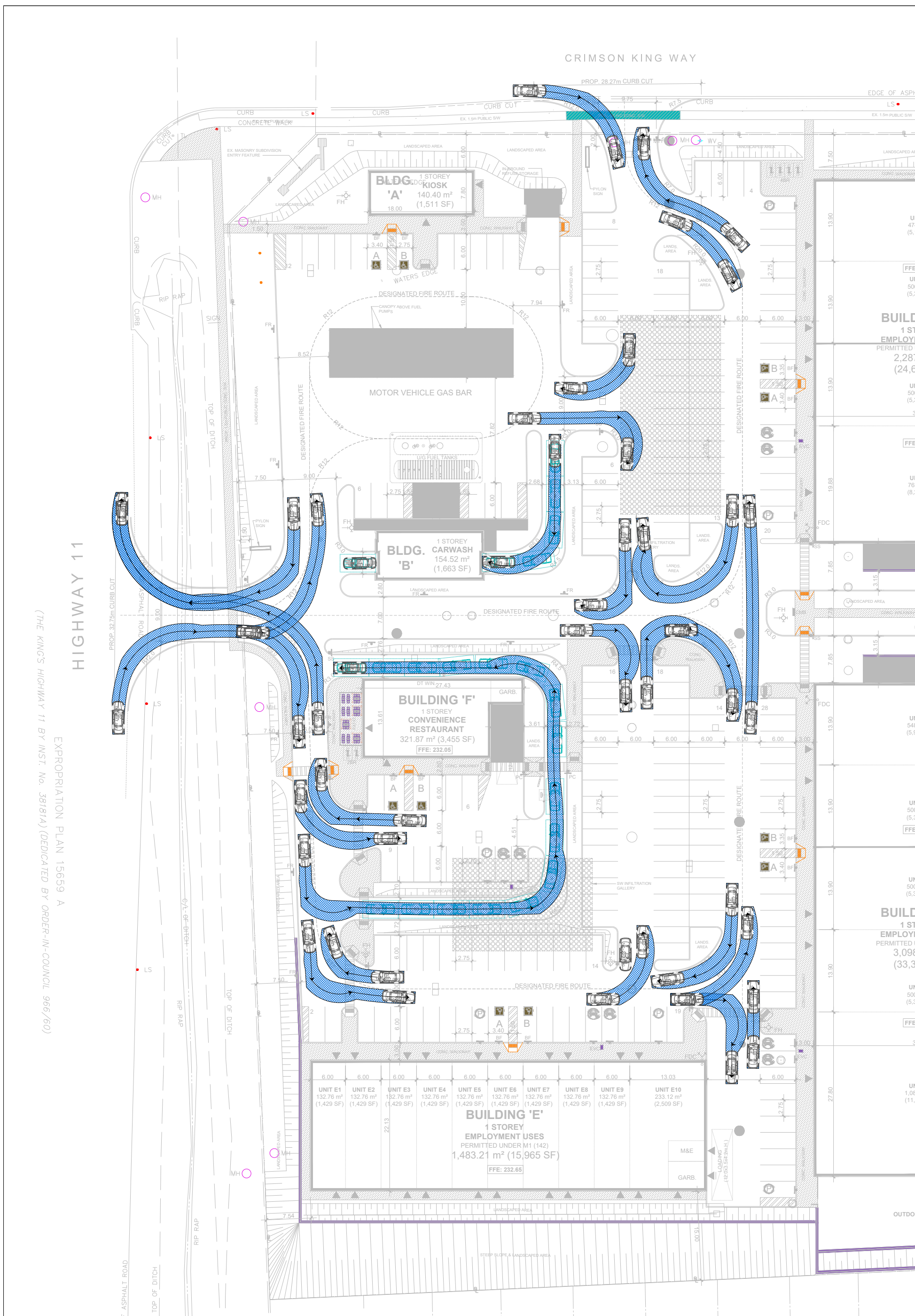
Scale: 1:500



Lock to Lock, Time	Steering Angle	Articulating Angle
2.80	28.9	28.9
2.80	28.9	28.9
2.80	28.9	28.9

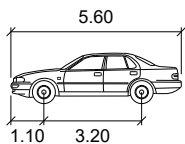
WB-19
Tractor Width
Trailer Width
Tractor Track
Trailer Track

Figure 8-6
Loading WB-19 Truck - Driveway Entrances
Kerbel WHL Employment Lands TIS



Source: Hwy11-Crimson A-1.0_2025-03-24.zip

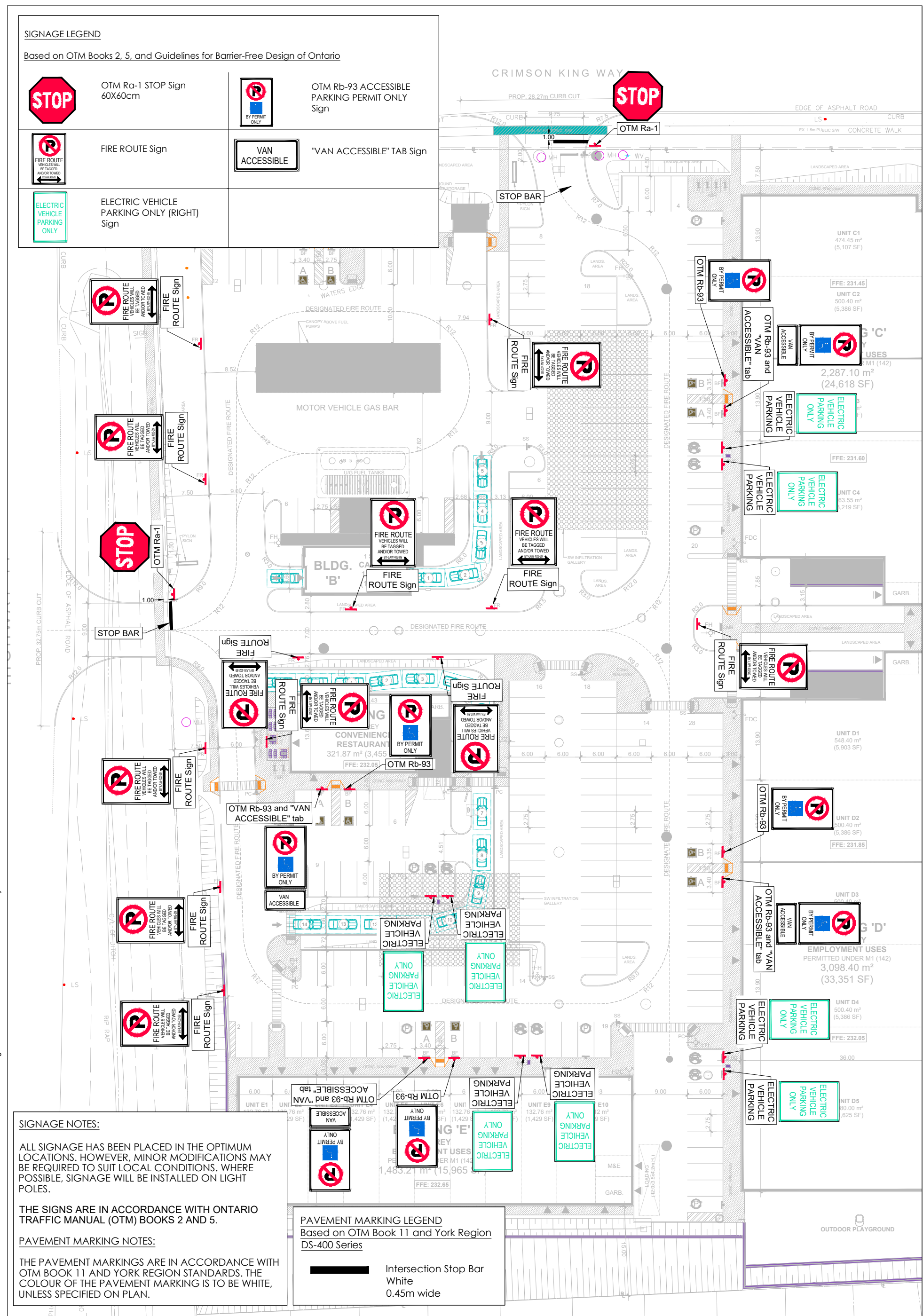
Scale: 1:650



P

	meters
Width	: 2.00
Track	: 2.00
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

Figure 8-9
Passenger Vehicle Circulation
Kerbel WHL Employment Lands TIS



9 TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) is a general concept that includes various strategies that manage the demand of travel to increase transportation system efficiency. Generally, single-occupant vehicle travel is discouraged, and alternate modes of transportation are encouraged in congested conditions. These modes include walking, cycling, ridesharing, public transit, and teleworking. In the context of an urban environment, TDM elements are an essential part of any progressive transportation and traffic plan for a proposed development.

The objective of the proposed TDM strategy is to inform, encourage, and facilitate the utilization of alternate modes of travel opportunities within the study area. It is recommended that a marketing strategy for the proposed development highlight key characteristics based on the below items to achieve the goals of the TDM strategy. This strategy should be communicated to employees via knowledgeable sales staff and information packages. These actions would ensure the success of the TDM strategy, thereby minimizing the need for automobile usage. The following TDM strategies are recommended for consideration.

9.1 INFORMATION PACKAGES PROVIDED TO NEW EMPLOYEES

It is important to provide transportation information to new employees to help facilitate non-auto trips. This information should help them view and understand their travel options before establishing new travel habits. In turn, this will increase the chance that these alternatives are included in the employees' travel patterns after the build out of the development.

The developer should provide information about transportation options to employees in an information package that will include items such as:

- Existing transit services, including a YRT Guide and a GO System Map. Information should include route navigators for each area transit route (including GO bus and rail), seven-day schedules for nearby stops for each of these routes, relevant fares, and incentive-based information such as GO Transit's Ride-to-GO option.
- Maps of surrounding active transportation facilities outlining available sidewalk and cycling facilities. Information should include a copy of the city's cycling network map, cycling and pedestrian safety tips, and information on active transportation events (i.e. "Bike to Work" Day or CAN-BIKE cycling lessons)
- Carpooling options, including information on Smart Commute and how one can join through their employer. Providing carpool spaces on-site, clearly signed for employees, should be located conveniently near the main entrances to provide more incentive for carpooling.
- Smart Commute offers support for staff to use sustainable mode and provides incentives on an on-going basis. The benefits of this program include:
 - Reduced commuting times and cost; and
 - Guaranteed Ride Home program that provides alternative modes of travel if an emergency arises.

The developer will be responsible for coordinating the information packages with information obtained from the Town. The information package will be provided to employers at the time of opening or at a joint information session with a Town. Costs associated with the information package would be the responsibility of the developer.

9.2 SUMMARY OF PROPOSED TDM MEASURES

A summary of the proposed TDM measures and their associated costs is shown in **Table 9-1**.

Table 9-1 TDM Cost Summary

TDM Measure / Description		Quantity	Unit Cost	Total Cost	Comment / Assumption
Pedestrian Connections	Applicant to provide connections to pedestrian infrastructure in the area	N/A	N/A	N/A	Included in construction costs
Bike Parking	Applicant to provide bike parking spaces	TBD	N/A	N/A	Included in construction costs
Information Packages	To be provided by York Region staff via information sessions	N/A	N/A	N/A	Included in construction costs
Carpool Spaces	Carpool spaces will be provided	5	N/A	N/A	Included in construction costs

10 CONCLUSIONS

This study has evaluated the impact of the proposed industrial development located southeast of the intersection of Highway 11 and Crimson King Way in the Town of Easy Gwillimbury. The development will include a gas station kiosk, a carwash, a restaurant with a drive thru, and three employment use buildings (Buildings C, D, and E) with a total GFA of 80,194 ft². The proposed development will be served by a right in/right out access on Highway 11 and a full movement access Crimson King Way. Based on the analysis contained in this report, our conclusions and recommendations are as follows:

- Under the existing conditions, all of the study intersections are operating at an acceptable LOS 'C' or better during all peak hours after calibration with the exception of the intersection of Highway 11 and Bathurst Street during the p.m. peak hour which is operating at an LOS 'D'. All movements are projected to operate within capacity;
- A review of historical TMC data found no applicable background growth along Highway 11;
- Under future background conditions for all horizon years all the study intersections are operating at an acceptable LOS 'C' or better during all peak hours after minor signal adjustments were applied. All movements are projected to operate within capacity after split optimizations with the exception of Highway 11 and Bathurst Street where the northbound-through, and southbound-left movements are projected to exceed capacity during the afternoon peak hour under both horizon years. These movements were already considered critical under existing conditions. Moreover, it is anticipated that the implementation of the Bradford Bypass would result in the significant traffic diversion from this intersection, and that future traffic conditions at this intersection will be much better than reflected in the analysis results;
- The proposed development is expected to generate 162 new inbound auto trips and 61 new outbound auto trips during the a.m. peak hour, 63 new inbound auto trips and 144 new outbound auto trips during the p.m. peak hour, and 85 new inbound auto trips and 78 new outbound auto trips during the Saturday peak hour;
- Based on the future total evaluations, the incremental increases in delay and v/c ratios relative to the future background conditions because of the addition of the site-generated traffic associated with the proposed development are minor. The signalized study intersections continue to operate at the same LOS as under future background conditions after split optimizations. All movements are projected to operate within capacity after split optimizations with the continued exception of Highway 11 and Bathurst Street. Similar to the future background conditions, the same movements are projected to exceed capacity with a slight increase to the v/c ratio at the northbound-through movements during the afternoon peak hour under both horizon years;
- The evaluation of the transit, cycling, and pedestrian level of service criteria indicates that there are minimal changes anticipated between existing and future conditions;
- The proposed parking supply includes 213 parking spaces, 10 of which are accessible spaces, but is 47 parking spaces deficient compared to the parking requirements per the Town of East Gwillimbury's Zoning By-law 2018-04. It is anticipated that due to the remote work option offered to the office employees, the parking demand for the office use will be significantly lower than the by-law parking rates, and that the proposed parking supply will be sufficient;
- Per Zoning By-law 2018-043, no bicycle parking spaces are required for the proposed land uses. The applicant will consider including bicycle parking spaces in the final proposed site plan.
- The proposed driveway spacing for the two driveways meet TAC Geometric Design Guidelines Figure 8.9.2.
- The site plan review of the ground floor plans indicate that the various design vehicles can be adequately;
- All loading spaces can be adequately accessed and egressed without having to back on to the public right-of-way; and

- The proposed TDM measures, when implemented, are expected to discourage single-occupant vehicle trips, and encourage travel by other modes such as cycling, walking, transit and carpooling.

APPENDIX

A TERMS OF REFERENCE

TIS – TERMS OF REFERENCE

TO: Town of East Gwillimbury and Region of York
FROM: Ismet Medic and Rebekah Clarke Robinson, WSP
SUBJECT: Kerbel WHL Employment Lands - Transportation Impact Study
DATE: October 23, 2024

WSP Canada Inc. is undertaking a Transportation Impact Study (TIS) in support of a Site Plan Application for the proposed development located southeast of the intersection of Crimson King Way and Highway 11 in the Town of East Gwillimbury. It is our understanding that the proposed development will contain a gas station with a kiosk, a carwash, a convenience restaurant with a drive-thru, and three employment use buildings (Buildings C, D, and E) with a combined GFA of 80,194 sq.ft. Based on the concept site plan provided, the site will be served by a right-in/right-out access on Highway 11 and a full movement access on Crimson King Way. The site location context is shown in **Figure 1** and the proposed site plan is shown in **Figure 2**.

We will be following York Region's Transportation Mobility Plan Guidelines (dated 2016) for the study. The work program related to the proposed development is outlined herein.



Figure 1 - Site Location



Figure 2 - Proposed Site Plan

TRAFFIC DATA

Based on the location and magnitude of the proposed development, we have included the following study intersections for the TIS:

- Highway 11 & Bathurst Street
- Highway 11 & Crimson King Way;
- Highway 11 & Dog Wood Blvd./Sherwood Glen;
- Crimson King Way & Cloverridge Avenue;
- Highway 11 & Site Access; and
- Crimson King Way & Site Access.

We will analyze the a.m. and p.m. peak period traffic conditions. The Saturday peak period will also be analyzed. WSP has already obtained the TMCs for the listed intersections during a typical weekday a.m. and p.m. peak hours and during the Saturday peak period from 11:00 a.m. – 3:00 p.m.

EXISTING TRAFFIC ANALYSIS

The existing conditions will be analyzed using the Synchro 11.0 Traffic Software, which is the software implementation of the Highway Capacity Manual 2010, the recognized standard for traffic operations analysis in North America. The existing conditions will be modelled based on the existing transportation network and the current peak hour traffic volumes. This will be the baseline scenario to which all subsequent scenarios will be compared with.

FUTURE BACKGROUND TRAFFIC ANALYSIS

It is WSP's understanding that the proposed development will be built-out within five years. Accordingly, we will develop future background traffic volumes for the study intersections to correspond with horizon years of 2030 (full build-out), and 2035 (five years after full build-out).

WSP will include background developments confirmed by the Town and the Region, as well as general background growth along the boundary road network based on the review of historical data or input from the review agencies.

Based on the future background traffic evaluation, improvements that are identified and not related to the development will be distinguished.

The future background volumes for each of the horizon years will be development on the basis of the existing traffic volumes, applicable traffic growth rate, and anticipated future traffic related to other developments in the vicinity of the site. These volumes will then be used analyze future background traffic operations, and any necessary improvements will be identified.

BACKGROUND DEVELOPMENTS

Based on a review of the Town of East Gwillimbury's Interactive Mapping Tool for active planning applications and knowledge of other projects WSP has completed nearby, the included developments are found in **Table 1**.

Table 1 - Background Developments

Background Development	Description	Traffic Volume Source
West Holland Landing Subdivision (Multiple Owners, File No: 19T-88085, 19T-94036, 19T-89112, 19T-90015, and 19T-09001.)	1289 residential units, 7 part lots, and blocks dedicated to business park, commercial, and school uses	Transportation Impact Study, dated February 2015, prepared by MMM Group. ¹
Holland Green Village (OLV Developments Inc.)	522 residential units, 3,618 m ² of retail, 567 m ² of community centre, and 1,682 m ² of church space.	Transportation Study, dated December 10 th , 2021, prepared by WSP. Addendum #1 – Response to Regional and Municipal Transportation Comments, dated December 20 th , 2022, prepared by WSP.
Kerbel WHL Employment Lands (Kerbel Group Inc.)	9,327.47 m ² of self-storage facility space, and 29,515.85 m ² of industrial space.	Transportation Impact study, dated June 2023, prepared by WSP.

Background Development	Description	Traffic Volume Source
19820 Holland Landing Road inc. (Six Development Inc.)	Commercial office development, 2 three-storey buildings, 2 single-storey buildings	Transportation Impact Study, dated July 2024, prepared by Nexttrans Consulting Group. (Under review)

BACKGROUND TRAFFIC GROWTH

The general background growth rate applicable to Highway 11 was determined in previous studies based on a review of historical TMC data. A summary of the average annual growth rates at the two intersections examined is shown in **Table 2**. The analysis found that along Highway 11, growth rates were either negative or almost 0%. Therefore, no background growth rates were applied at the intersection.

Table 2 - Background Growth Rates

Intersection	Average Annual Growth Rate (%)	
	A.M. Peak Hour	P.M. Peak Hour
Highway 11 and Dog Wood Boulevard / Sherwood Glen	-0.48%	-3.37%
Highway 11 and Bathurst Street	-0.08%	-2.57%

Please confirm the appropriate background growth rate to apply to the boundary road network.

TRIP GENERATION AND ASSIGNMENT

WSP will develop the weekday a.m. and p.m. peak hour and Saturday peak hour site trip generation for the development on the basis of the trip generation rates in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition. The site-generated traffic volume will be distributed and assigned to the study road network based on the existing traffic patterns, as well as the TTS distribution information.

The proposed development has horizon years of 2030 (full build-out), and 2035 (five years after full build-out) and will include a gas station with a kiosk, a carwash, and three employment use buildings. The land use codes 944 (Gasoline/Service Station), 710 (General Office Building), and 934 (Restaurant with Drive Through) will be applied.

FUTURE TOTAL TRAFFIC ANALYSIS

The site-generated traffic will be superimposed onto the future background volumes to develop the future total traffic volumes on the basis of the projected a.m. and p.m. peak hour and Saturday peak hour volumes for each horizon year. The future study intersection performances will be evaluated in accordance with the requirements in the Region's Transportation Mobility Plan Guidelines.

The study will focus on demonstrating the level of impact on intersection operations due to the addition of the traffic generated by the proposed development. If required, improvements to facilitate the additional site-generated traffic will be identified and discussed as needed. evaluated as part of sensitivity scenarios. The future assessment includes review of queuing relative to existing, future background conditions and future total traffic conditions.



WSP will undertake a turning lane assessment to identify if exclusive left- and right-turning lanes will need to be provided at the Highway 11 Site Access, per York Region requirements.

MULTI-MODAL ASSESSMENT

In accordance with York Region's Transportation Mobility Plan Guidelines, WSP will assess transit, pedestrian, and cycling levels of service under existing and future conditions.

TRANSPORTATION DEMAND MANAGEMENT PLAN

WSP will use a TDM matrix to group TDM initiatives into categories and prescribe different TDM initiatives based on the type of development. WSP will provide applicable Transportation Demand Management (TDM) strategies in the report that accounts for the site context and traffic conditions.

PARKING REVIEW

WSP will review the applicable by-law parking requirements and compare them to the proposed parking supply.

SITE PLAN REVIEW

WSP will evaluate the feasibility of the proposed site plan from a transportation perspective, particularly the site access arrangement. WSP will undertake a sightline analysis for the proposed site driveways. The site access and circulation movement of various vehicles including fire, garbage and loading trucks will be completed using AutoTURN to ensure that automobile and truck manoeuvres can be adequately accommodated. WSP will also review zoning by-law requirements to determine if the minimum dimensions for parking spaces, loading spaces, driveways, and access aisles are met. Finally, WSP will prepare a pavement marking and signage plan based on the final site plan.

RECOMMENDATIONS AND CONCLUSIONS

The findings of the above-noted evaluation will be documented in a TIS and submitted to York Region and the Town for review.

Please provide your input on the above noted terms of reference at your earliest convenience. Thank you so much.

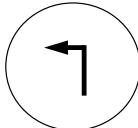
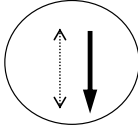
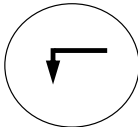
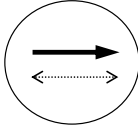
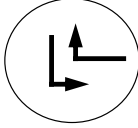
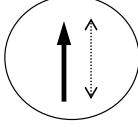
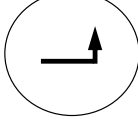
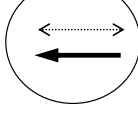
Yours sincerely,

Ismet Medic
Senior Project Manager

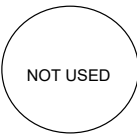
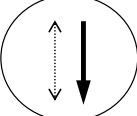
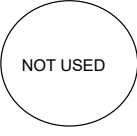
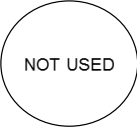
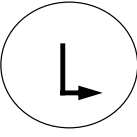
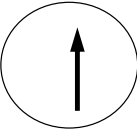
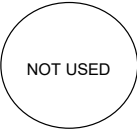
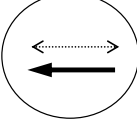
APPENDIX

B TRAFFIC DATA

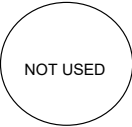
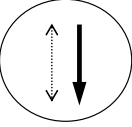
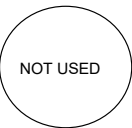
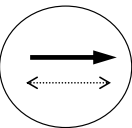
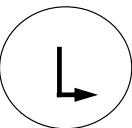
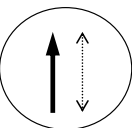
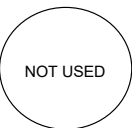
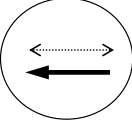


LOCATION: Hwy 11 (YR 1) & Bathurst St (YR 38) CTCS: 305 MODE/COMMENT: SA PREPARED/CHECKED BY: MQL PREPARATION DATE: January 19, 2023 IMPLEMENTATION DATE: January 19, 2023		MUNICIPALITY: East Gwillimbury COMPUTER SYSTEM: Centraccs CONTROLLER/CABINET TYPE: Econolite Cobalt / TS2 T1 CONFLICT FLASH: Red & Red DESIGN WALK SPEED: 1.0 m/s (FDW based on full crossing at 1.2 m/s) CHANNEL/DROP:		N 	
NEMA Phase (York)		AM & Pre-PM & Post-PM 7:00-10:00 & 15:00-16:00, 17:00-18:00 M-F	Free All Other Times	Phase Mode (Fixed/Callable)	Remarks
	Local Plan		Pattern 99		
	Action Plan	Plan 1	Plan 99		
1. N/B Left Turn Arrow 	WLK FDW MIN 7 EXT 3 MAX1 20 MAX2 20 AMB 3 ALR 1 SPLIT	20 0	0	Callable/Extendable by Setback Loop	Pedestrian Minimums: NSWK = 7 secs; NSFD = 27 secs EWWK = 7 secs; EWFD = 30 secs Emergency vehicle pre-emption 3: Serve NSG/NSDW min 20 secs and up to 100 secs if there are continuous emergency calls in NS direction.
2. Southbound  Hwy 11 (YR 1)	WLK 7 FDW 27 MIN 20 EXT 5 MAX1 50 MAX2 50 AMB 5.0 ALR 2.5 SPLIT	50 0	0	Ped recall MAX VI = 26 S/A=2.0	Emergency vehicle pre-emption 4: Serve EWG/EWDW min 20 secs and up to 100 secs if there are continuous emergency calls in EW direction. EW phase is callable by vehicle or pedestrian actuation. If a vehicle call is received, the minimum EWG will be served. If ongoing vehicle demand exists on the stopbar loop, the EWG is capable of providing vehicle extensions up to the maximum green split during coordinated operation or serve MAX1 during Free operation. If a pedestrian call is received, the pedestrian minimum will be served. The EWWK & EWFD are only displayed on the pedestrian signal heads if a pedestrian call is received. Extension time is based on vehicle demand. Unused extension time is given to the NSG.
3. W/B Left Turn Arrow 	WLK FDW MIN 7 EXT 3 MAX1 20 MAX2 20 AMB 3 ALR 1 SPLIT	20 0	0	Callable/Extendable by Setback Loop	During free plan, signal rests in NSWK and does not cycle through NSFD unless there is side street vehicle or pedestrian demand. NSFD reverts to NSWK if there is no side street demand at the end of the NSFD.
4. Eastbound  Bathurst St (YR 38)	WLK 7 FDW 30 MIN 10 EXT 3 MAX1 20 MAX2 20 AMB 5.5 ALR 3.0 SPLIT	20 0	0	Callable by Stopbar Loop and/or Pushbutton; Extendable by Stopbar Loop	During free plan, signal rests in NSWK and does not cycle through NSFD unless there is side street vehicle or pedestrian demand. NSFD reverts to NSWK if there is no side street demand at the end of the NSFD.
5. S/B Left Turn Arrow 	WLK FDW MIN 7 EXT 3 MAX1 20 MAX2 30 AMB 3 ALR 1 SPLIT	30 0	0	Callable/Extendable by Setback Loop WBRT installed	EBLT increased to address delay
6. Northbound  Hwy 11 (YR 1)	WLK 7 FDW 27 MIN 20 EXT 5 MAX1 50 MAX2 50 AMB 5.0 ALR 2.5 SPLIT	50 0	0	Ped recall MAX VI = 26 S/A=2.0	LEGEND: SA - Semi-Actuated signal WLK - Walk time FDW - Flashing Don't Walk time MIN - Minimum green time EXT - Extension time MAX1 - Maximum green time 1 MAX2 - Maximum green time 2 AMB - Amber ALR - All Red CL - Cycle Length OF - Offset VP - Vehicle Permissive NSWK - North/South Walk EWWK - East/West Walk NSG - North/South Green EWG - East/West Green NSFD - North/South Flashing Don't Walk EWFD - East/West Flashing Don't Walk TSP - Transit Priority APS - Audible Pedestrian Signal RLC - Red Light Camera
7. E/B Left Turn Arrow 	WLK FDW MIN 7 EXT 3 MAX1 25 MAX2 25 AMB 3 ALR 1 SPLIT	25 0	0	Callable/Extendable by Setback Loop	
8. Westbound  Bathurst St (YR 38)	WLK 7 FDW 30 MIN 10 EXT 3 MAX1 20 MAX2 20 AMB 5.5 ALR 3.0 SPLIT	20 0	0	Callable by Stopbar Loop and/or Pushbutton; Extendable by Stopbar Loop	
	CL OF VP	0 (FREE) 0 (FREE) 0 (FREE)	0 (FREE) 0 (FREE) 0 (FREE)		

NOTES:

LOCATION: Hwy 11 (YR 1) & Crimson King Way CTCS: 882 MODE/COMMENT: SA with APS PREPARED/CHECKED BY: MQL PREPARATION DATE: August 12, 2021 IMPLEMENTATION DATE: September 27, 2021		MUNICIPALITY: East Gwillimbury COMPUTER SYSTEM: Centraacs CONTROLLER/CABINET TYPE: Econolite Cobalt / TS2T1 CONFLICT FLASH: Red & Red DESIGN WALK SPEED: 1.0 m/s (FDW based on full crossing at 1.2 m/s) CHANNEL/DROP:				
NEMA Phase (York)		AM 6:30-9:00 M-F	PM 15:30-19:30 M-F	Free 9:00-15:30, 19:30-6:30 M-F 24 hrs Sat & Sun	Phase Mode (Fixed/Demanded/Callable)	Remarks
	Local Plan System Plan	Pattern 1 Plan 1	Pattern 2 Plan 2	Pattern 99 Plan 99		
1.	 WLK FDW MIN EXT MAX1 MAX2 AMB ALR SPLIT					Pedestrian Minimums: NSWK = 7 sec., NSFD = 14 sec. EWWK = 7 sec., EWFD = 21 sec. Emergency vehicle pre-emption 3: Serve NSG/NSDW min 20 secs and up to 100 secs if there are continuous emergency calls in NS direction.
2. Southbound	 Yonge St/Hwy 11 WLK 7 FDW 14 MIN 40 EXT 0 MAX1 40 MAX2 0 AMB 5.0 ALR 2.5 SPLIT				Fixed	EW phase is callable by vehicle or pedestrian actuation. If a vehicle call is received, the minimum EWG is 10 seconds. If ongoing vehicle demand exists on the stopbar loop, the EWG is capable of providing vehicle extensions up to the maximum green split during coordinated operation or 19 secs during Free operation. If a pedestrian call is received, the
3.	 WLK FDW MIN EXT MAX1 MAX2 AMB ALR SPLIT					pedestrian minimum will be served. The EWWK & EWFD are only displayed on the pedestrian signal heads if a pedestrian call is received. Extension time is based on vehicle demand. Unused extension time is given to the NSG.
4. Eastbound	 WLK FDW MIN EXT MAX1 MAX2 AMB ALR SPLIT				Callable by pushbutton	During coordinated operation, the signal constantly cycles through main street FDW to improve response time to side street vehicle and pedestrian demand.
5. S/B Left Turn Arrow	 WLK FDW MIN 7 EXT 3 MAX1 7 MAX2 0 AMB 3.0 ALR 1.0 SPLIT				Callable/Extendable by Setback Loop	NSFD reverts to NSWK if there is no side street demand at the end of the NSFD. APS Extended Push Activation = 3 sec When activated, APS is on for 7 seconds. APS installed on 2017-06-12 Clearances changes due to speed limit revision.
6. Northbound	 Yonge St/Hwy 11 WLK 7 FDW 14 MIN 40 EXT 0 MAX1 40 MAX2 0 AMB 5.0 ALR 2.5 SPLIT				Fixed	
7.	 WLK FDW MIN EXT MAX1 MAX2 AMB ALR SPLIT					LEGEND: SA - Semi-Actuated signal WLK - Walk time FDW - Flashing Don't Walk time MIN - Minimum green time EXT - Extension time MAX1 - Maximum green time 1 MAX2 - Maximum green time 2 AMB - Amber ALR - All Red CL - Cycle Length OF - Offset VP - Vehicle Permissive NSWK - North/South Walk EWWK - East/West Walk NSG - North/South Green EWG - East/West Green NSFD - North/South Flashing Don't Walk EWFD - East/West Flashing Don't Walk TSP - Transit Priority APS - Audible Pedestrian Signal RLC - Red Light Camera
8. Westbound	 Crimson King Way WLK 7 FDW 21 MIN 10 EXT 3 MAX1 19 MAX2 0 AMB 4.0 ALR 3.0 SPLIT				Callable by stopbar loop and/or pushbutton; Extendable by stopbar loop.	
	CL OF VP	130 0 14	120 0 14	0 (FREE) 0 (FREE) 0 (FREE)		

NOTES:

LOCATION: Hwy 11 (YR 1) & Sherwood Glen/ Dog Wood Blvd CTCS: 893 MODE/COMMENT: SA with APS PREPARED/CHECKED BY: MQL PREPARATION DATE: August 12, 2021 IMPLEMENTATION DATE: September 27, 2021		MUNICIPALITY: East Gwillimbury COMPUTER SYSTEM: Centrac CONTROLLER/CABINET TYPE: Econolite Cobalt / TS2T1 CONFLICT FLASH: Red & Red DESIGN WALK SPEED: 1.0 m/s (FDW based on full crossing at 1.2 m/s) CHANNEL/DROP:				
NEMA Phase (York)		AM	PM	Free	Phase Mode (Fixed/Demanded/Callable)	Remarks
		6:30-9:00 M-F	15:30-19:30 M-F	9:00-15:30, 19:30-6:30 M-F 24 hrs Sat & Sun		
		Local Plan	Pattern 1	Pattern 2	Pattern 99	
		System Plan	Plan 1	Plan 2	Plan 99	
1.		WLK FDW MIN EXT MAX1 MAX2 AMB ALR SPLIT				Emergency vehicle pre-emption 3: Serve NSG/NSDW min 20 secs and up to 100 secs if there are continuous emergency calls in NS direction.
2. Southbound	 Hwy 11	WLK 7 FDW 16 MIN 40 EXT 0 MAX1 40 MAX2 0 AMB 5.0 ALR 2.5 SPLIT	88	78	0	Fixed EW phase is callable by vehicle or pedestrian actuation. If a vehicle call is received, the minimum EWG is 10 seconds. If ongoing vehicle demand exists on the stopbar loop, the EWG is capable of providing vehicle extensions up to the maximum green. If a pedestrian call is received, the pedestrian minimum will be served. The EWVK & EWFD are only displayed on the pedestrian signal heads if a pedestrian call is received. Extension time is based on vehicle demand. Unused extension time is given to the NSG.
3.		WLK FDW MIN EXT MAX1 MAX2 AMB ALR SPLIT				During coordinated operation, the signal constantly cycles through main street FDW to improve response time to side street vehicle and pedestrian demand.
4. Eastbound	 Sherwood Glen	WLK 7 FDW 26 MIN 10 EXT 3 MAX1 19 MAX2 0 AMB 4.0 ALR 3.5 SPLIT	42	42	0	Callable by stopbar loop and/or pushbutton; Extendable by stopbar loop. During free plan, signal rests in NSWK and does not cycle through NSFD unless there is side street vehicle or pedestrian demand. NSFD reverts to NSWK if there is no side street demand at the end of the NSFD. APS Extended Push Activation = 3 sec When activated, APS is on for 7 seconds.
5. S/B Left Turn Arrow	 Hwy 11	WLK FDW MIN 7 EXT 3 MAX1 7 MAX2 0 AMB 3.0 ALR 1.0 SPLIT	12	12	0	Callable/Extendable by Setback Loop APS installed on 2018-04-11 Clearances changes due to speed limit revision.
6. Northbound	 Hwy 11	WLK 7 FDW 16 MIN 40 EXT 0 MAX1 40 MAX2 0 AMB 5.0 ALR 2.5 SPLIT	76	66	0	Fixed
7.		WLK FDW MIN EXT MAX1 MAX2 AMB ALR SPLIT				LEGEND: SA - Semi-Actuated signal WLK - Walk time FDW - Flashing Don't Walk time MIN - Minimum green time EXT - Extension time MAX1 - Maximum green time 1 MAX2 - Maximum green time 2 AMB - Amber ALR - All Red CL - Cycle Length OF - Offset VP - Vehicle Permissive NSWK - North/South Walk EWVK - East/West Walk NSG - North/South Green EWG - East/West Green NSFD - North/South Flashing Don't Walk EWFD - East/West Flashing Don't Walk TSP - Transit Priority APS - Audible Pedestrian Signal RLC - Red Light Camera
8. Westbound	 Dog Wood Blvd	WLK 7 FDW 26 MIN 10 EXT 3 MAX1 19 MAX2 0 AMB 4.0 ALR 3.5 SPLIT	42	42	0	Callable by stopbar loop and/or pushbutton; Extendable by stopbar loop.
		CL OF VP	130 92 16	120 50 16	0 (FREE) 0 (FREE) 0 (FREE)	

NOTES:

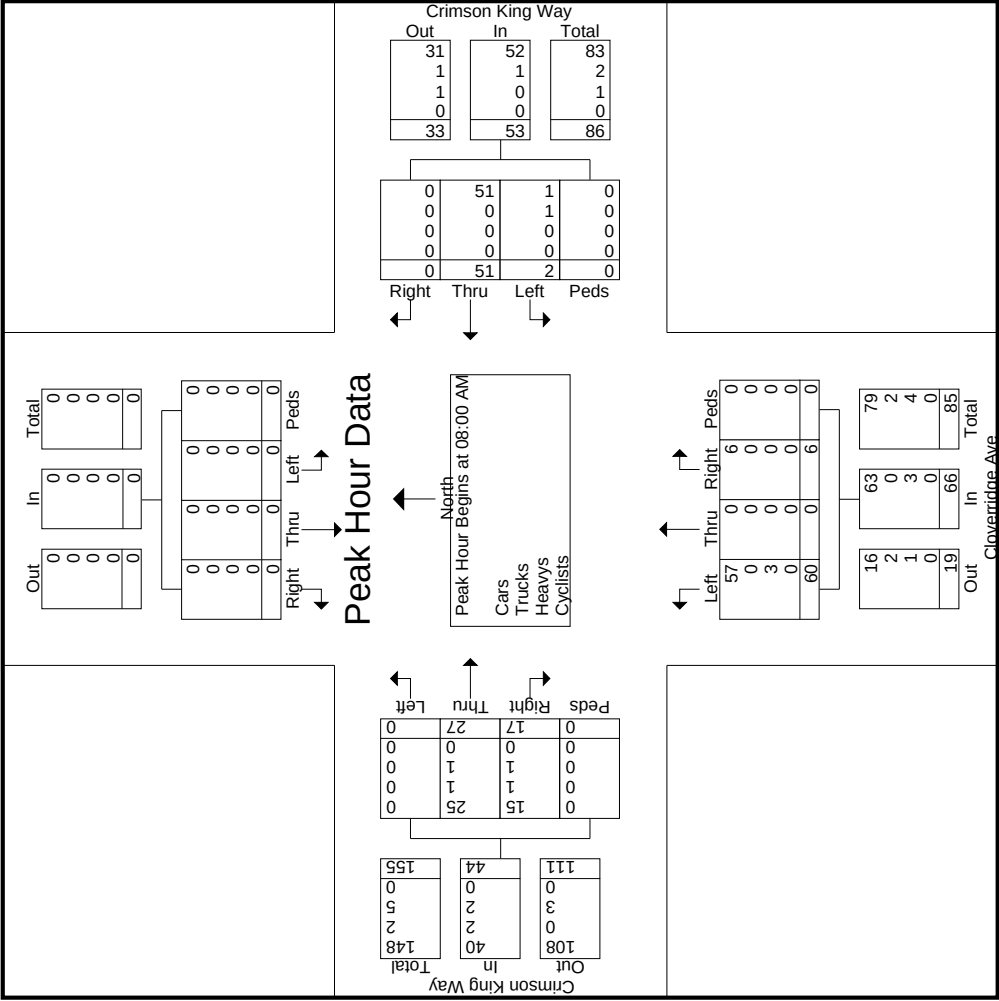
Horizon Data Services Ltd

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"Your Traffic Count Specialist"

File Name : Crimson King Way at Cloverridge Avenue
Site Code : 00000000
Start Date : 02/21/2023
Page No : 4



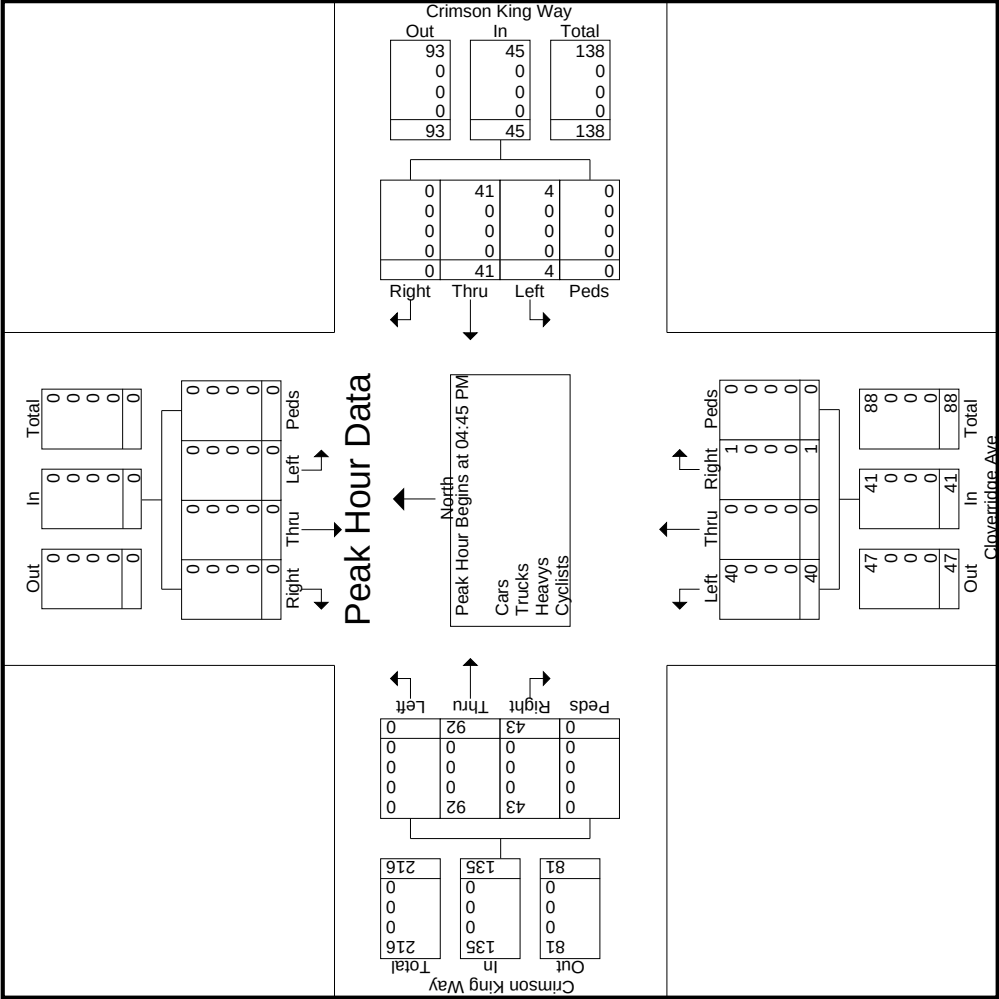
Horizon Data Services Ltd

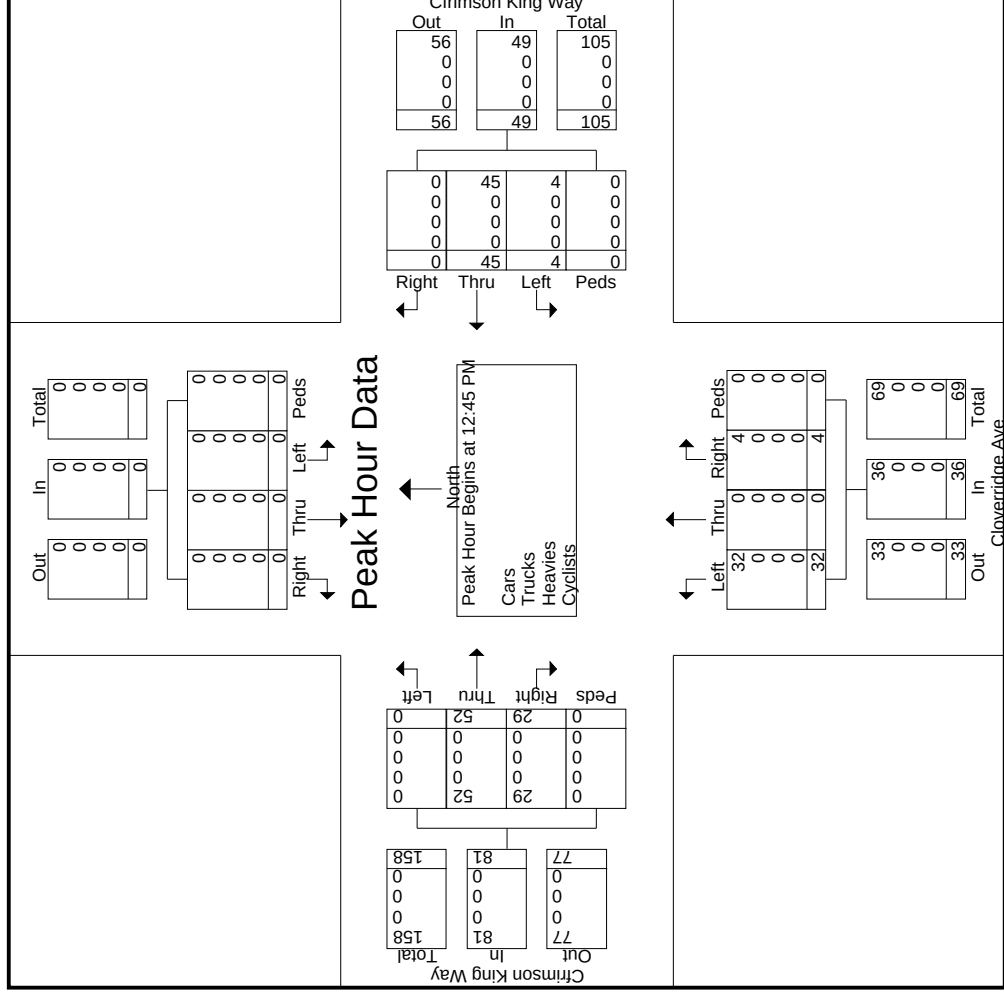
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File Name : Crimson King Way at Cloverridge Avenue
Site Code : 00000000
Start Date : 02/21/2023
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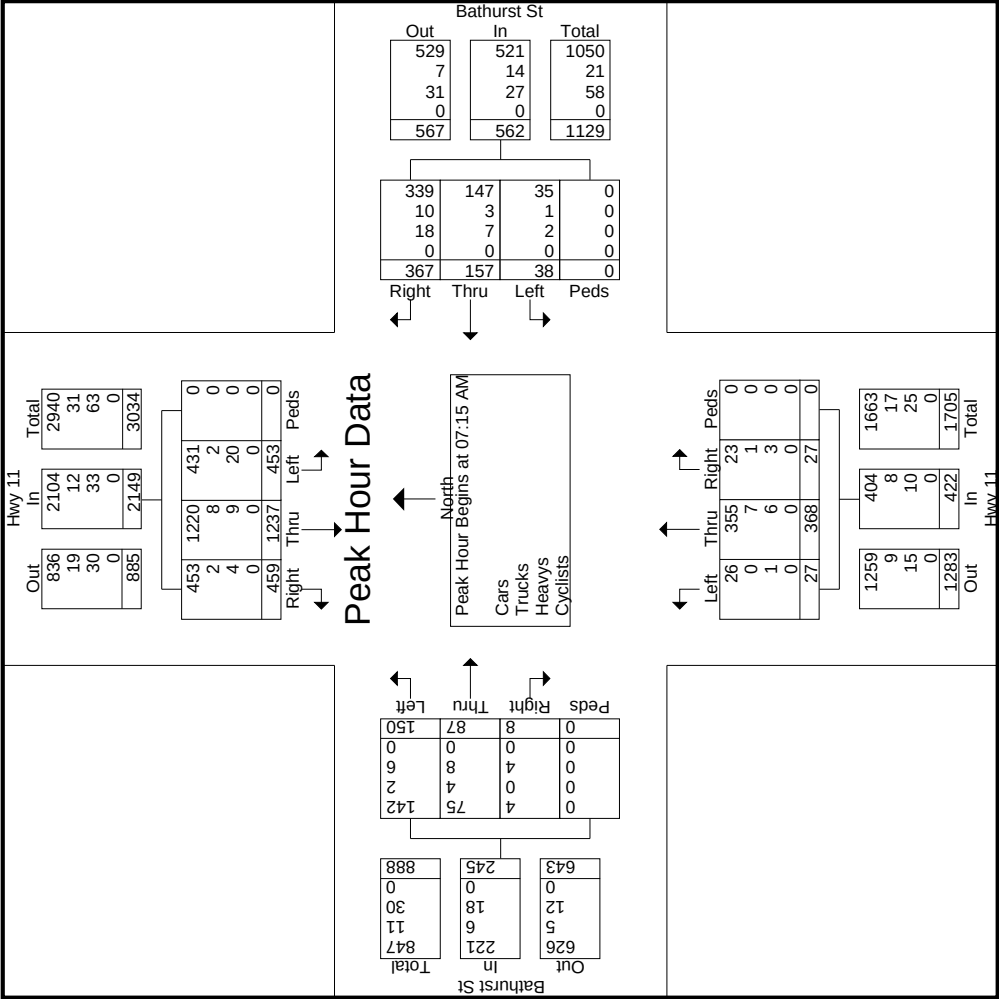
Horizon Data Services Ltd

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"Your Traffic Count Specialist"

File Name : Highway 11 at Bathurst Street
Site Code : 00000000
Start Date : 03/07/2023
Page No : 4



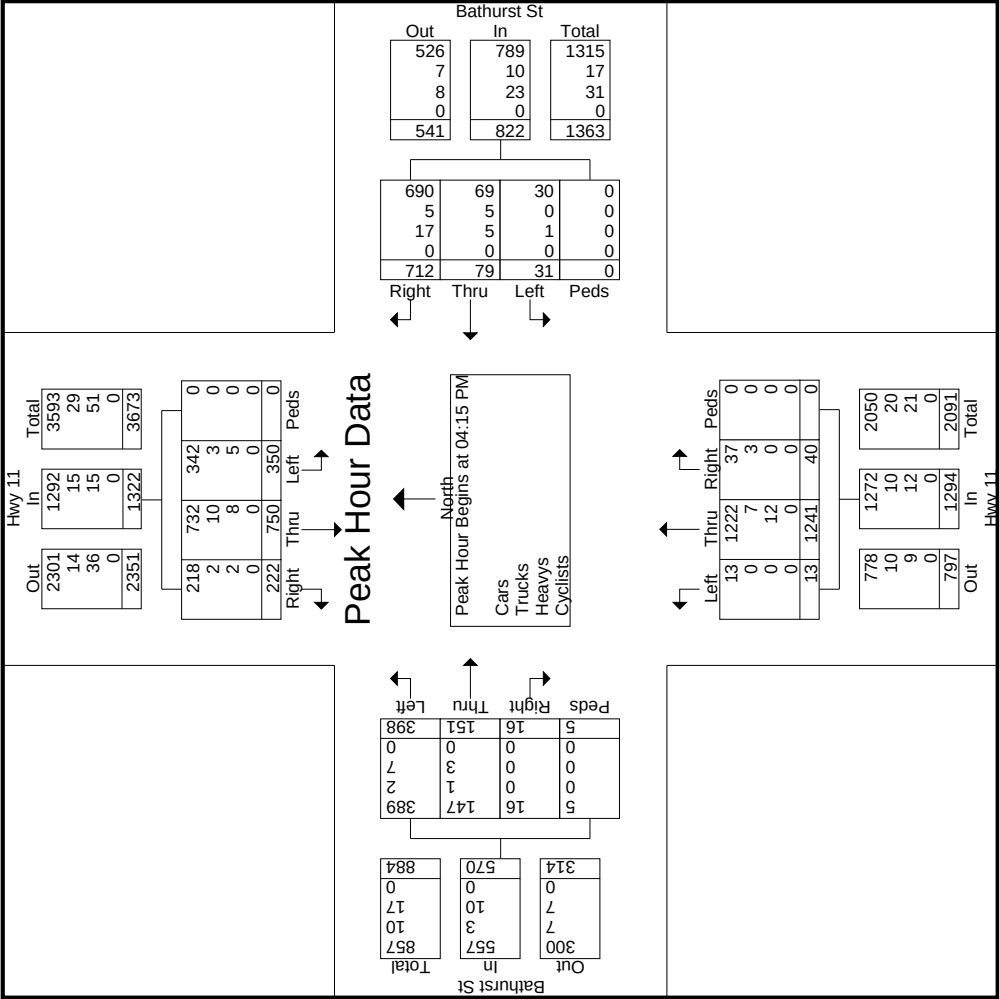
Horizon Data Services Ltd

Email: nhyree@gmail.com

Phone: (416) 840-6619 Fax: (416) 840-5297

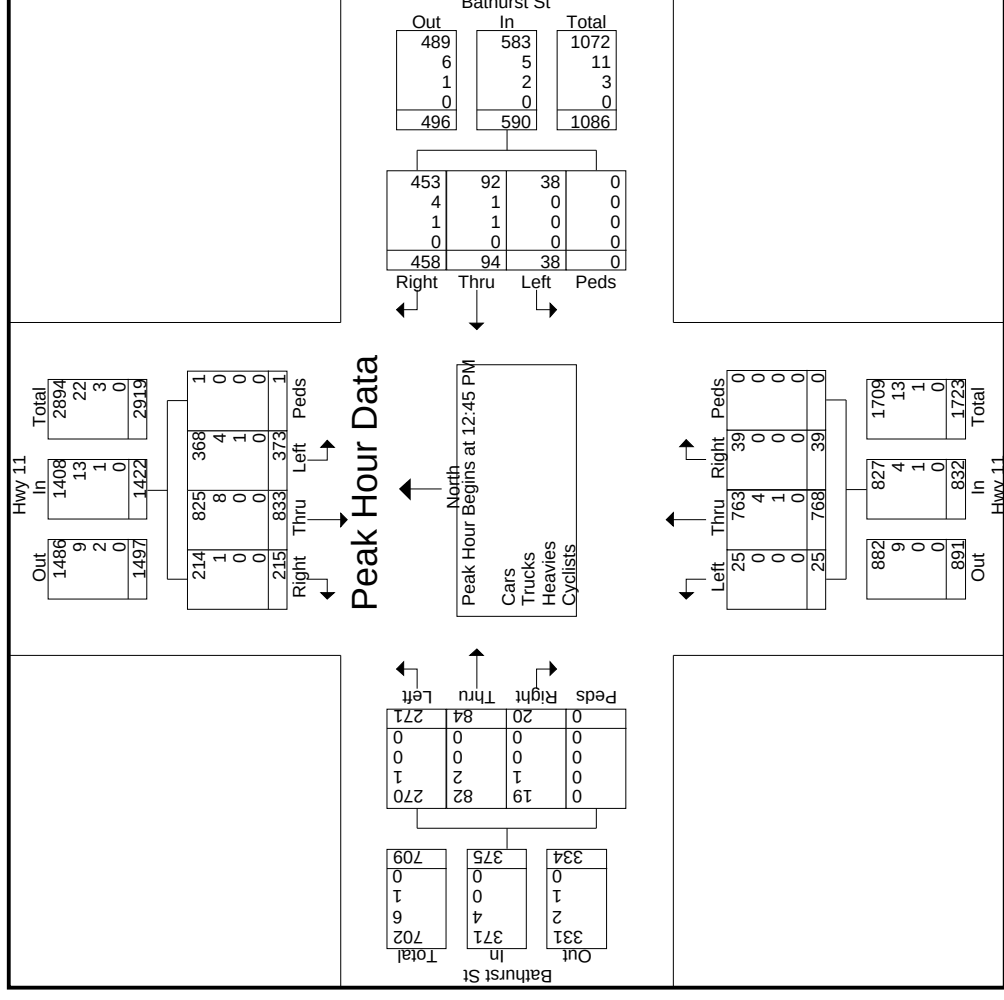
"Your Traffic Count Specialist"

File Name : Highway 11 at Bathurst Street
Site Code : 00000000
Start Date : 03/07/2023
Page No : 7



Your Traffic Count Specialist

File Name : Highway 11 at Bathurst Street
Site Code : 00000000
Start Date : 2024-11-16
Page No : 4



The diagram illustrates the flow of traffic data from a central 'Peak Hour Data' node to three specific locations: Hwy 11, Crimmon King Way, and Hwy 11. Each location has a set of tables representing traffic counts for different directions and vehicle types.

Central Node: Peak Hour Data

Right	Thru	Left	Peds
0	1349	5	0
0	6	0	0
0	17	2	0
0	0	0	0
0	1372	7	0

Arrows point from the central node to the three locations.

Location 1: Hwy 11 (Left)

Out	In	Total
424	1354	1778
10	6	16
17	19	36
0	0	0
451	1379	1830

Location 2: Crimmon King Way (Top)

Out	In	Total
18	93	111
0	0	0
2	3	5
0	0	0
20	96	116

Below the table is a detailed breakdown of traffic counts for different directions and vehicle types:

Right	Thru	Left	Peds
18	0	75	0
0	0	0	0
2	0	1	0
0	0	0	0
0	0	0	0
20	0	76	0

Location 3: Hwy 11 (Right)

Left	Thru	Right	Peds
0	406	13	0
0	10	0	0
0	15	0	0
0	0	0	0
0	0	0	0
0	431	13	0

Below the table is a detailed breakdown of traffic counts for different directions and vehicle types:

Left	Thru	Right	Peds
1424	419	1843	
6	10	16	
18	15	33	
0	0	0	
1448	444	1892	
Out	In	Total	

The diagram illustrates the data collection system for Highway 11 during the peak hour. A central box labeled "Peak Hour Data" is connected to four main data sources: "Hwy 11", "North", "South", and "Hwy 11" (repeated). Each source provides data for "Cars", "Trucks", "Heavys", and "Cyclists".

Hwy 11 (Top Left): Data is collected from "Out" and "In" sensors. The "Out" sensor shows 1347 cars, 8 trucks, 8 heavys, and 0 cyclists. The "In" sensor shows 771 cars, 4 trucks, 16 heavys, and 0 cyclists. The total is 2118 cars, 12 trucks, 24 heavys, and 0 cyclists.

North (Top Right): Data is collected from "Out", "In", and "Total" sensors. The "Out" sensor shows 125 cars, 0 trucks, 1 heavys, and 0 cyclists. The "In" sensor shows 69 cars, 1 trucks, 0 heavys, and 70 cyclists. The total is 194 cars, 1 trucks, 1 heavys, and 70 cyclists.

South (Bottom Left): Data is collected from "Out", "In", and "Total" sensors. The "Out" sensor shows 1363 cars, 0 trucks, 0 heavys, and 0 cyclists. The "In" sensor shows 783 cars, 0 trucks, 0 heavys, and 0 cyclists. The total is 2146 cars, 0 trucks, 0 heavys, and 0 cyclists.

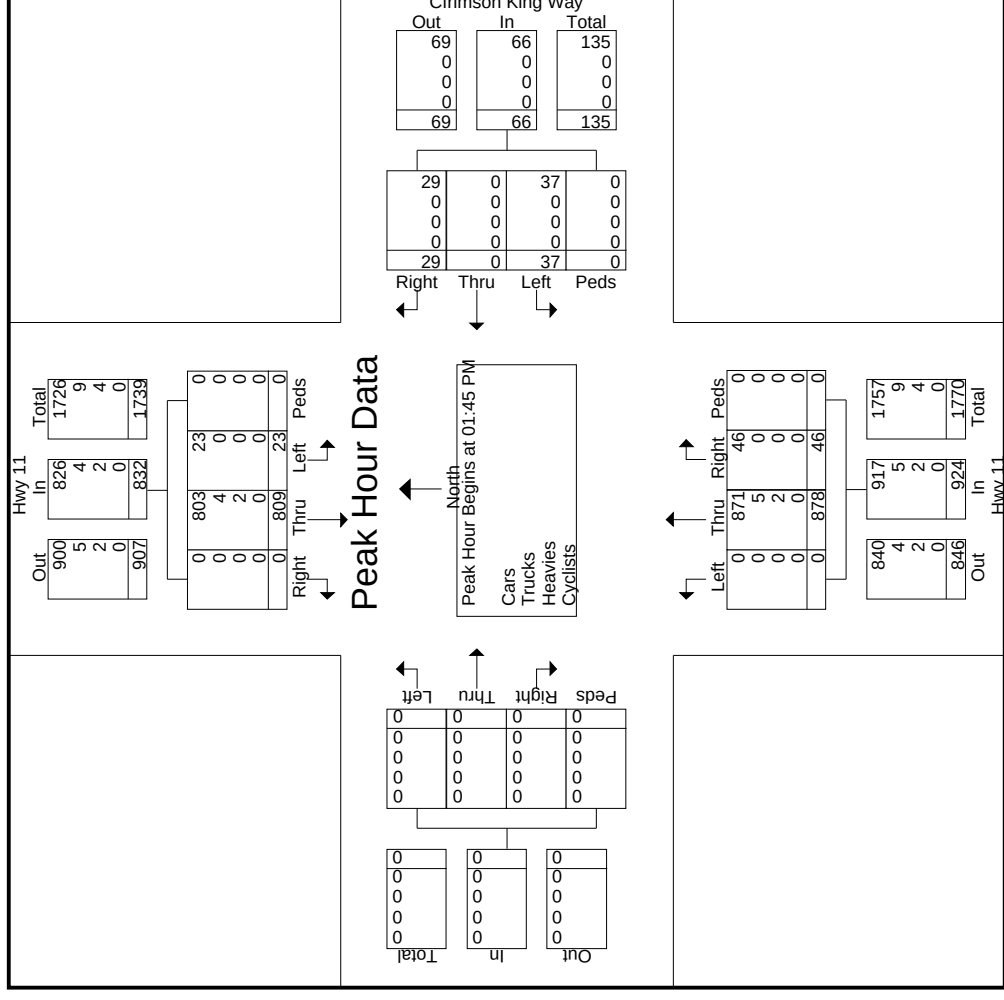
Hwy 11 (Bottom Right): Data is collected from "Out" and "In" sensors. The "Out" sensor shows 767 cars, 5 trucks, 7 heavys, and 0 cyclists. The "In" sensor shows 1399 cars, 8 trucks, 15 heavys, and 0 cyclists. The total is 2166 cars, 13 trucks, 22 heavys, and 0 cyclists.

The central "Peak Hour Data" box is connected to four main data sources: "Hwy 11", "North", "South", and "Hwy 11" (repeated). Each source provides data for "Cars", "Trucks", "Heavys", and "Cyclists".

North (Bottom Right): Data is collected from "Out", "In", and "Total" sensors. The "Out" sensor shows 125 cars, 0 trucks, 1 heavys, and 0 cyclists. The "In" sensor shows 69 cars, 1 trucks, 0 heavys, and 70 cyclists. The total is 194 cars, 1 trucks, 1 heavys, and 70 cyclists.

South (Top Left): Data is collected from "Out", "In", and "Total" sensors. The "Out" sensor shows 1363 cars, 0 trucks, 0 heavys, and 0 cyclists. The "In" sensor shows 783 cars, 0 trucks, 0 heavys, and 0 cyclists. The total is 2146 cars, 0 trucks, 0 heavys, and 0 cyclists.

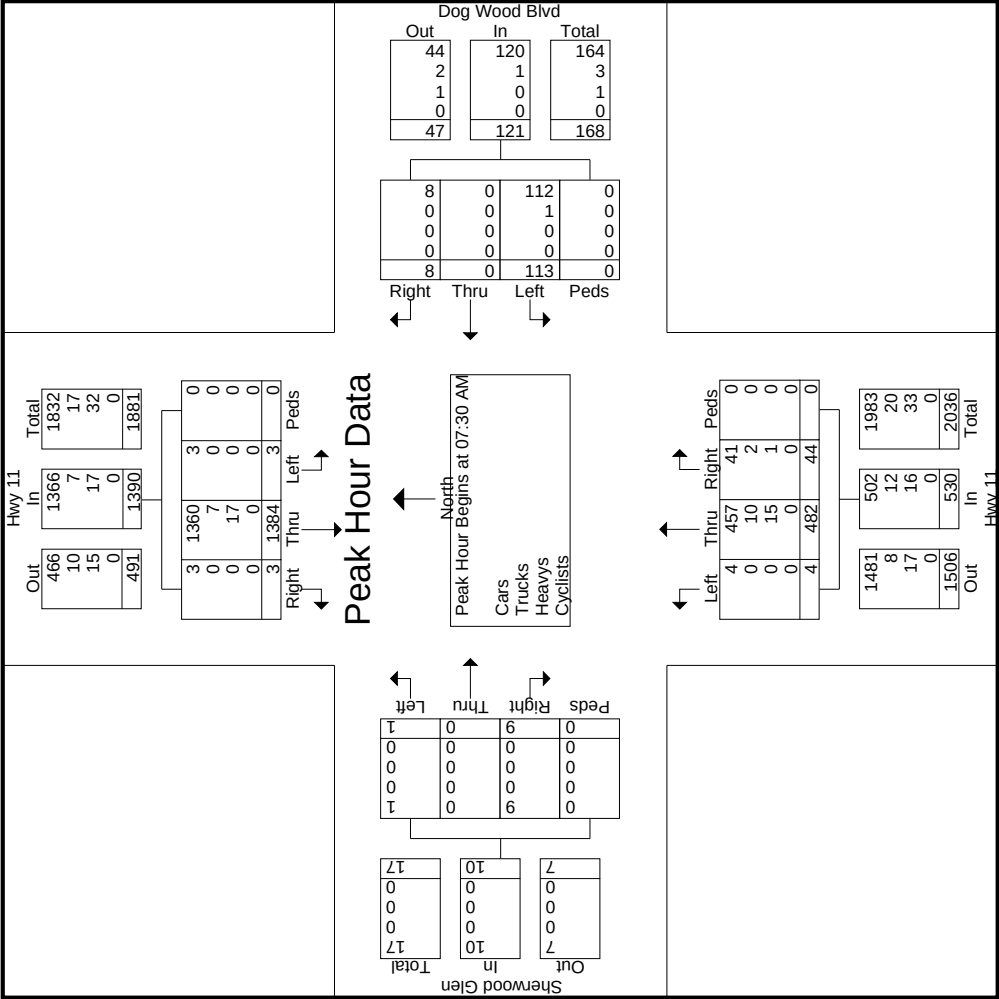
Hwy 11 (Top Right): Data is collected from "Out" and "In" sensors. The "Out" sensor shows 767 cars, 5 trucks, 7 heavys, and 0 cyclists. The "In" sensor shows 1399 cars, 8 trucks, 15 heavys, and 0 cyclists. The total is 2166 cars, 13 trucks, 22 heavys, and 0 cyclists.



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File Name : Highway 11 at Dog Wood Boulevard
Site Code : 00000000
Start Date : 02/21/2023
Page No : 4



"Your Traffic Count Specialist"

Peak Hour Data

North Peak Hour Begins at 04:15 PM

Dogwood Blvd

Hwy 11

Flow Data:

- Dogwood Blvd (Top):**
 - Out: 92, 1, 0, 0, 93
 - In: 74, 1, 1, 0, 76
 - Total: 166, 2, 1, 0, 169
- Dogwood Blvd (Bottom):**
 - Right: 11, 1, 1, 0, 13
 - Thru: 2, 0, 0, 0, 2
 - Left: 61, 0, 0, 0, 61
 - Peds: 0, 0, 0, 0, 0
- Hwy 11 (Left):**
 - Out: 1405, 7, 7, 0, 1419
 - In: 758, 5, 12, 7, 770
 - Total: 2163, 12, 14, 0, 2189
- Hwy 11 (Right):**
 - Out: 815, 5, 7, 0, 827
 - In: 1483, 7, 12, 6, 1496
 - Total: 2298, 12, 13, 0, 2323
- Intersection (Center):**
 - Right: 10, 0, 0, 0, 10
 - Thru: 1392, 6, 6, 0, 1404
 - Left: 81, 1, 0, 0, 82
 - Peds: 0, 0, 0, 0, 0
- Shenwood Glen (Bottom Left):**
 - Out: 13, 0, 0, 0, 13
 - In: 10, 0, 0, 0, 10
 - Total: 23, 0, 0, 0, 23
- Shenwood Glen (Bottom Right):**
 - Right: 5, 0, 0, 0, 5
 - Thru: 3, 0, 0, 0, 3
 - Left: 2, 0, 0, 0, 2
 - Peds: 0, 0, 0, 0, 0

File Name : Highway 11 at Dog Wood Boulevard
Site Code : 0000000
Start Date : 2024-11-16
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APPENDIX

C LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE DEFINITIONS AT SIGNALIZED INTERSECTIONS⁽¹⁾

Level of service for signalized intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average control delay per vehicle, typically for a 15-min analysis period. The criteria are given in the table below. Delay may be measured in the field or estimated using software such as Highway Capacity Software. Delay is a complex measure and is dependent upon a number of variables, including quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group in question.

Level of Service	Features	Control Delay per vehicle (sec)
A	LOS A describes operations with very low delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favourable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	≤ 10
B	LOS B describes operations with delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.	$> 10 \text{ and } \leq 20$
C	LOS C describes operations with delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.	$> 20 \text{ and } \leq 35$
D	LOS D describes operations with delay greater than 35 and up to 55 sec per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavourable progression, long cycle lengths, of high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	$> 35 \text{ and } \leq 55$
E	LOS E describes operations with delay greater than 55 and up to 80 sec per vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.	$> 55 \text{ and } \leq 80$
F	LOS F describes operations with delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	> 80

(1) Highway Capacity Manual 2000

LEVEL OF SERVICE DEFINITIONS AT UNSIGNALIZED INTERSECTIONS⁽¹⁾

The level of service criteria for unsignalized intersections are given in the table below. As used here, total delay is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position. The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation.

Level of Service	Features	Average Total Delay (sec/veh)
A	Little or no traffic delay occurs. Approaches appear open, turning movements are easily made, and drivers have freedom of operation.	≤ 10
B	Short traffic delays occur. Many drivers begin to feel somewhat restricted in terms of freedom of operation.	> 10 and ≤ 15
C	Average traffic delays occur. Operations are generally stable, but drivers emerging from the minor street may experience difficulty in completing their movement. This may occasionally impact on the stability of flow on the major street.	> 15 and ≤ 25
D	Long traffic delays occur. Motorists emerging from the minor street experience significant restriction and frustration. Drivers on the major street will experience congestion and delay as drivers emerging from the minor street interfere with the major through movements.	> 25 and ≤ 35
E	Very long traffic delays occur. Operations approach the capacity of the intersection.	> 35 and ≤ 50
F	Saturation occurs, with vehicle demand exceeding the available capacity. Very long traffic delays occur.	> 50

(1) Highway Capacity Manual 2000.

APPENDIX

D EXISTING TRAFFIC CONDITIONS

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2025 Existing (AM Peak Hour)
03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	76	20	431	13	7	1372
Future Volume (vph)	76	20	431	13	7	1372
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	45.0		92.0	84.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	7.5				50.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1863	1545	3585	1700	1473	3725
Flt Permitted	0.950				0.457	
Satd. Flow (perm)	1863	1545	3585	1700	709	3725
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		22		15		
Link Speed (k/h)	40		70			70
Link Distance (m)	181.0		972.2			1205.7
Travel Time (s)	16.3		50.0			62.0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	2%	10%	6%	0%	29%	2%
Adj. Flow (vph)	85	22	484	15	8	1542
Shared Lane Traffic (%)						
Lane Group Flow (vph)	85	22	484	15	8	1542
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	2.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		6		5	2

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2025 Existing (AM Peak Hour)
03/28/2025

	↙ ↘		↑		↗ ↘	
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		8		6	2	
Detector Phase	8	8	6	6	5	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	40.0	40.0	7.0	40.0
Minimum Split (s)	35.0	35.0	47.5	47.5	11.0	47.5
Total Split (s)	36.0	36.0	82.0	82.0	12.0	94.0
Total Split (%)	27.7%	27.7%	63.1%	63.1%	9.2%	72.3%
Maximum Green (s)	29.0	29.0	74.5	74.5	8.0	86.5
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	3.0	3.0	2.5	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.5	7.5	4.0	7.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Don't Walk (s)	21.0	21.0	14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effect Green (s)	12.0	12.0	101.3	101.3	107.0	103.5
Actuated g/C Ratio	0.09	0.09	0.78	0.78	0.82	0.80
v/c Ratio	0.50	0.14	0.17	0.01	0.01	0.52
Control Delay (s/veh)	65.8	21.2	1.4	0.2	2.6	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	65.8	21.2	1.4	0.2	2.6	5.5
LOS	E	C	A	A	A	A
Approach Delay (s/veh)	56.6		1.4			5.5
Approach LOS	E		A			A

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay (s/veh): 7.1

Intersection LOS: A

Intersection Capacity Utilization 56.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Highway 11 & Crimson King Way



Queues

2025 Existing (AM Peak Hour)

1: Highway 11 & Crimson King Way

03/28/2025



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	85	22	484	15	8	1542
v/c Ratio	0.50	0.14	0.17	0.01	0.01	0.52
Control Delay (s/veh)	65.8	21.2	1.4	0.2	2.6	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	65.8	21.2	1.4	0.2	2.6	5.5
Queue Length 50th (m)	22.3	0.0	3.5	0.0	0.3	61.0
Queue Length 95th (m)	38.4	8.4	4.6	0.0	1.3	85.8
Internal Link Dist (m)	157.0		948.2			1181.7
Turn Bay Length (m)		45.0		92.0	84.0	
Base Capacity (vph)	415	361	2794	1328	630	2966
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.06	0.17	0.01	0.01	0.52
Intersection Summary						

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	9	113	0	8	4	482	44	3	1384	3
Future Volume (vph)	1	0	9	113	0	8	4	482	44	3	1384	3
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0		0.0	0.0		65.0	71.0		45.0	70.0		90.0
Storage Lanes	0		0	0		1	1		1	1		1
Taper Length (m)	7.5			7.5			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.877				0.850			0.850			0.850
Flt Protected		0.995			0.950		0.950			0.950		
Satd. Flow (prot)	0	1745	0	0	1881	1700	1900	3585	1589	1900	3725	1700
Flt Permitted		0.972			0.750		0.140			0.431		
Satd. Flow (perm)	0	1705	0	0	1485	1700	280	3585	1589	862	3725	1700
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		71				71			71			38
Link Speed (k/h)		40			40			70			70	
Link Distance (m)		288.1			294.1			681.3			972.2	
Travel Time (s)		25.9			26.5			35.0			50.0	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	6%	7%	0%	2%	0%
Adj. Flow (vph)	1	0	10	127	0	9	4	542	49	3	1555	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	11	0	0	127	9	4	542	49	3	1555	3
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			6		5	2	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	40.0	40.0	40.0	7.0	40.0	40.0
Minimum Split (s)	40.5	40.5		40.5	40.5	40.5	47.5	47.5	47.5	11.0	47.5	47.5
Total Split (s)	42.0	42.0		42.0	42.0	42.0	76.0	76.0	76.0	12.0	88.0	88.0
Total Split (%)	32.3%	32.3%		32.3%	32.3%	32.3%	58.5%	58.5%	58.5%	9.2%	67.7%	67.7%
Maximum Green (s)	34.5	34.5		34.5	34.5	34.5	68.5	68.5	68.5	8.0	80.5	80.5
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.5	3.5		3.5	3.5	3.5	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5			7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	0.2	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Don't Walk (s)	26.0	26.0		26.0	26.0	26.0	16.0	16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0	0		0	0
Act Effect Green (s)		16.5			16.5	16.5	96.3	96.3	96.3	102.0	98.5	98.5
Actuated g/C Ratio		0.13			0.13	0.13	0.74	0.74	0.74	0.78	0.76	0.76
v/c Ratio		0.04			0.68	0.03	0.02	0.20	0.04	0.00	0.55	0.00
Control Delay (s/veh)		0.3			70.9	0.3	7.5	6.3	1.0	7.3	12.9	0.0
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		0.3			70.9	0.3	7.5	6.3	1.0	7.3	12.9	0.0
LOS		A			E	A	A	A	A	A	B	A
Approach Delay (s/veh)		0.3			66.3			5.9			12.9	
Approach LOS		A			E			A			B	

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 92 (71%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay (s/veh): 14.2

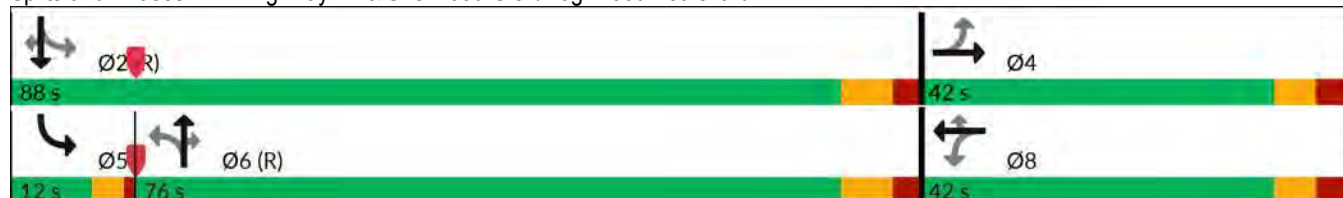
Intersection LOS: B

Intersection Capacity Utilization 93.8%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 2: Highway 11 & Sherwood Glen/Dog Wood Boulevard



Queues

2025 Existing (AM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025



Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	11	127	9	4	542	49	3	1555	3
v/c Ratio	0.04	0.68	0.03	0.02	0.20	0.04	0.00	0.55	0.00
Control Delay (s/veh)	0.3	70.9	0.3	7.5	6.3	1.0	7.3	12.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	0.3	70.9	0.3	7.5	6.3	1.0	7.3	12.9	0.0
Queue Length 50th (m)	0.0	33.2	0.0	0.2	19.0	0.0	0.2	105.2	0.0
Queue Length 95th (m)	0.0	51.8	0.0	2.0	41.0	2.7	m0.6	183.2	m0.0
Internal Link Dist (m)	264.1	270.1			657.3			948.2	
Turn Bay Length (m)			65.0	71.0		45.0	70.0		90.0
Base Capacity (vph)	504	394	503	207	2654	1195	740	2821	1296
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.32	0.02	0.02	0.20	0.04	0.00	0.55	0.00

Intersection Summary

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

Lanes, Volumes, Timings
3: Cloverridge Avenue & Crimson King Way

2025 Existing (AM Peak Hour)
03/28/2025

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	27	17	2	51	60	6
Future Volume (vph)	27	17	2	51	60	6
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.948				0.987	
Flt Protected				0.998	0.957	
Satd. Flow (prot)	1731	0	0	1962	1807	0
Flt Permitted				0.998	0.957	
Satd. Flow (perm)	1731	0	0	1962	1807	0
Link Speed (k/h)	40			40	40	
Link Distance (m)	181.0			280.7	206.8	
Travel Time (s)	16.3			25.3	18.6	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	8%	12%	50%	0%	5%	0%
Adj. Flow (vph)	30	19	2	56	66	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	49	0	0	58	73	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)		15	25		25	15
Sign Control	Stop			Stop	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	14.3%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 3: Cloverridge Avenue & Crimson King Way

2025 Existing (AM Peak Hour)
03/28/2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	27	17	2	51	60	6
Future Volume (vph)	27	17	2	51	60	6
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	30	19	2	56	66	7
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	49	58	73			
Volume Left (vph)	0	2	66			
Volume Right (vph)	19	0	7			
Hadj (s)	-0.07	0.04	0.20			
Departure Headway (s)	4.1	4.2	4.3			
Degree Utilization, x	0.06	0.07	0.09			
Capacity (veh/h)	864	846	803			
Control Delay (s/veh)	7.3	7.5	7.7			
Approach Delay (s/veh)	7.3	7.5	7.7			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.5			
Level of Service			A			
Intersection Capacity Utilization			14.3%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2025 Existing (AM Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	87	8	38	157	367	27	368	27	453	1237	459
Future Volume (vph)	150	87	8	38	157	367	27	368	27	453	1237	459
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	35.0			33.0			48.0			72.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1792	1754	1133	1759	1869	1574	1827	3654	1478	1810	3725	1667
Flt Permitted	0.444			0.695			0.141			0.455		
Satd. Flow (perm)	838	1754	1133	1287	1869	1574	271	3654	1478	867	3725	1667
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98			332			141			499
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		97.6			105.0			1205.7			393.8	
Travel Time (s)		5.9			6.3			62.0			20.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	14%	50%	8%	7%	8%	4%	4%	15%	5%	2%	2%
Adj. Flow (vph)	163	95	9	41	171	399	29	400	29	492	1345	499
Shared Lane Traffic (%)												
Lane Group Flow (vph)	163	95	9	41	171	399	29	400	29	492	1345	499
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	1	6		5	2	

2025 Existing (AM Peak Hour) 3:04 pm 03/27/2025 Baseline

Synchro 11 Report

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Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2025 Existing (AM Peak Hour)
03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	28.5	28.5	11.0	28.5	11.0	11.0	41.5	41.5	11.0	41.5	41.5
Total Split (s)	29.0	33.5	33.5	24.0	28.5	24.0	24.0	57.5	57.5	24.0	57.5	57.5
Total Split (%)	20.9%	24.1%	24.1%	17.3%	20.5%	17.3%	17.3%	41.4%	41.4%	17.3%	41.4%	41.4%
Maximum Green (s)	25.0	25.0	25.0	20.0	19.5	20.0	20.0	50.0	50.0	20.0	50.0	50.0
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.5	1.0	1.0	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	8.5	8.5	4.0	9.0	4.0	4.0	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		30.0	30.0		30.0			27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effect Green (s)	40.2	26.2	26.2	28.8	15.9	45.0	60.8	50.2	50.2	77.8	67.8	67.8
Actuated g/C Ratio	0.32	0.21	0.21	0.23	0.13	0.36	0.48	0.40	0.40	0.62	0.54	0.54
v/c Ratio	0.43	0.26	0.03	0.13	0.73	0.51	0.13	0.28	0.04	0.72	0.67	0.44
Control Delay (s/veh)	35.1	44.6	0.1	30.5	71.7	8.6	13.9	27.3	0.1	21.5	25.4	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	35.1	44.6	0.1	30.5	71.7	8.6	13.9	27.3	0.1	21.5	25.4	3.1
LOS	D	D	A	C	E	A	B	C	A	C	C	A
Approach Delay (s/veh)		37.3			27.7			24.7			19.8	
Approach LOS		D			C			C			B	

Intersection Summary

Area Type: Other

Cycle Length: 139

Actuated Cycle Length: 126

Natural Cycle: 95

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.73

Intersection Signal Delay (s/veh): 23.0

Intersection LOS: C

Intersection Capacity Utilization 77.2%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: Highway 11 & Bathurst Street



Queues
4: Highway 11 & Bathurst Street

2025 Existing (AM Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	163	95	9	41	171	399	29	400	29	492	1345	499
v/c Ratio	0.43	0.26	0.03	0.13	0.73	0.51	0.13	0.28	0.04	0.72	0.67	0.44
Control Delay (s/veh)	35.1	44.6	0.1	30.5	71.7	8.6	13.9	27.3	0.1	21.5	25.4	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	35.1	44.6	0.1	30.5	71.7	8.6	13.9	27.3	0.1	21.5	25.4	3.1
Queue Length 50th (m)	31.7	21.3	0.0	7.4	43.4	11.6	2.8	37.0	0.0	64.5	141.5	0.0
Queue Length 95th (m)	49.9	38.3	0.0	16.0	71.7	41.4	8.1	55.3	0.0	106.3	193.6	19.4
Internal Link Dist (m)		73.6			81.0			1181.7			369.8	
Turn Bay Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Base Capacity (vph)	457	378	321	472	290	775	406	1454	673	685	2004	1127
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.25	0.03	0.09	0.59	0.51	0.07	0.28	0.04	0.72	0.67	0.44
Intersection Summary												

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2025 Existing (PM Peak Hour)
03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	49	21	1342	73	53	730
Future Volume (vph)	49	21	1342	73	53	730
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	45.0		92.0	84.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	7.5				50.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1845	1700	3725	1700	1863	3725
Flt Permitted	0.950				0.155	
Satd. Flow (perm)	1845	1700	3725	1700	304	3725
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		22		75		
Link Speed (k/h)	40		70			70
Link Distance (m)	181.0		972.2			1205.7
Travel Time (s)	16.3		50.0			62.0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	0%	2%	0%	2%	2%
Adj. Flow (vph)	51	22	1384	75	55	753
Shared Lane Traffic (%)						
Lane Group Flow (vph)	51	22	1384	75	55	753
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	2.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		6		5	2

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2025 Existing (PM Peak Hour)
03/28/2025

	←		↑		→	
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8		6		2	
Detector Phase	8	8	6	6	5	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	40.0	40.0	7.0	40.0
Minimum Split (s)	35.0	35.0	47.5	47.5	11.0	47.5
Total Split (s)	36.0	36.0	72.0	72.0	12.0	84.0
Total Split (%)	30.0%	30.0%	60.0%	60.0%	10.0%	70.0%
Maximum Green (s)	29.0	29.0	64.5	64.5	8.0	76.5
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	3.0	3.0	2.5	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.5	7.5	4.0	7.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Don't Walk (s)	21.0	21.0	14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effect Green (s)	10.4	10.4	91.2	91.2	102.0	100.0
Actuated g/C Ratio	0.09	0.09	0.76	0.76	0.85	0.83
v/c Ratio	0.32	0.13	0.49	0.06	0.16	0.24
Control Delay (s/veh)	57.1	20.6	16.3	4.8	3.0	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	57.1	20.6	16.3	4.8	3.0	3.0
LOS	E	C	B	A	A	A
Approach Delay (s/veh)	46.1		15.7			3.0
Approach LOS	D		B			A

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.49

Intersection Signal Delay (s/veh): 12.3

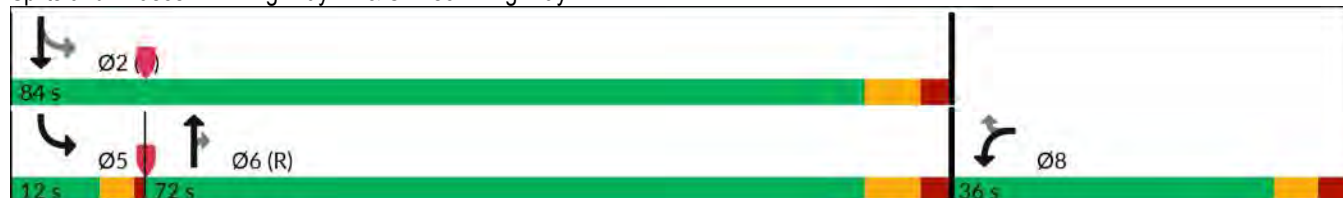
Intersection LOS: B

Intersection Capacity Utilization 62.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Highway 11 & Crimson King Way



Queues

2025 Existing (PM Peak Hour)

1: Highway 11 & Crimson King Way

03/28/2025



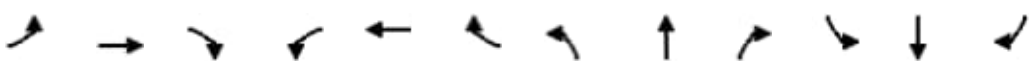
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	51	22	1384	75	55	753
v/c Ratio	0.32	0.13	0.49	0.06	0.16	0.24
Control Delay (s/veh)	57.1	20.6	16.3	4.8	3.0	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	57.1	20.6	16.3	4.8	3.0	3.0
Queue Length 50th (m)	12.1	0.0	140.4	4.2	1.9	20.4
Queue Length 95th (m)	25.0	8.3	177.0	9.0	4.4	28.3
Internal Link Dist (m)	157.0		948.2			1181.7
Turn Bay Length (m)		45.0		92.0	84.0	
Base Capacity (vph)	445	427	2832	1310	362	3104
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.05	0.49	0.06	0.15	0.24
Intersection Summary						

Lanes, Volumes, Timings

2025 Existing (PM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	2	3	5	61	2	13	10	1404	82	8	761	1
Future Volume (vph)	2	3	5	61	2	13	10	1404	82	8	761	1
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0		0.0	0.0		65.0	71.0		45.0	70.0		90.0
Storage Lanes	0		0	0		1	1		1	1		1
Taper Length (m)	7.5			7.5			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.932				0.850			0.850			0.850
Flt Protected		0.990			0.954		0.950			0.950		
Satd. Flow (prot)	0	1845	0	0	1908	1466	1900	3762	1667	1900	3725	1700
Flt Permitted		0.920			0.726		0.349			0.141		
Satd. Flow (perm)	0	1715	0	0	1452	1466	698	3762	1667	282	3725	1700
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				77			77			41
Link Speed (k/h)		40			40			70			70	
Link Distance (m)		288.1			294.1			681.3			972.2	
Travel Time (s)		25.9			26.5			35.0			50.0	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	16%	0%	1%	2%	0%	2%	0%
Adj. Flow (vph)	2	3	5	64	2	14	11	1478	86	8	801	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	10	0	0	66	14	11	1478	86	8	801	1
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			6		5	2	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	40.0	40.0	40.0	7.0	40.0	40.0
Minimum Split (s)	40.5	40.5		40.5	40.5	40.5	47.5	47.5	47.5	11.0	47.5	47.5
Total Split (s)	42.0	42.0		42.0	42.0	42.0	66.0	66.0	66.0	12.0	78.0	78.0
Total Split (%)	35.0%	35.0%		35.0%	35.0%	35.0%	55.0%	55.0%	55.0%	10.0%	65.0%	65.0%
Maximum Green (s)	34.5	34.5		34.5	34.5	34.5	58.5	58.5	58.5	8.0	70.5	70.5
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.5	3.5		3.5	3.5	3.5	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5			7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	0.2	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Don't Walk (s)	26.0	26.0		26.0	26.0	26.0	16.0	16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0	0		0	0
Act Effect Green (s)		11.7			11.7	11.7	96.1	96.1	96.1	100.3	98.3	98.3
Actuated g/C Ratio		0.10			0.10	0.10	0.80	0.80	0.80	0.84	0.82	0.82
v/c Ratio		0.06			0.46	0.07	0.02	0.49	0.06	0.02	0.26	0.00
Control Delay (s/veh)		35.8			61.5	0.6	5.4	6.6	1.7	1.5	2.1	0.0
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		35.8			61.5	0.6	5.4	6.6	1.7	1.5	2.1	0.0
LOS		D			E	A	A	A	A	A	A	A
Approach Delay (s/veh)		35.8			50.9			6.3			2.1	
Approach LOS		D			D			A			A	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 50 (42%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.49

Intersection Signal Delay (s/veh): 6.5

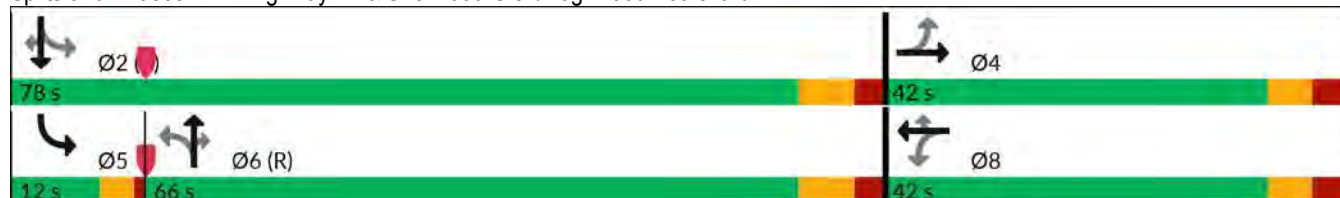
Intersection LOS: A

Intersection Capacity Utilization 93.8%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 2: Highway 11 & Sherwood Glen/Dog Wood Boulevard



Queues

2025 Existing (PM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025



Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	10	66	14	11	1478	86	8	801	1
v/c Ratio	0.06	0.46	0.07	0.02	0.49	0.06	0.02	0.26	0.00
Control Delay (s/veh)	35.8	61.5	0.6	5.4	6.6	1.7	1.5	2.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	35.8	61.5	0.6	5.4	6.6	1.7	1.5	2.1	0.0
Queue Length 50th (m)	1.2	15.9	0.0	0.5	56.2	0.4	0.2	12.5	0.0
Queue Length 95th (m)	6.5	30.0	0.0	3.1	120.6	6.3	0.7	14.8	m0.0
Internal Link Dist (m)	264.1	270.1			657.3			948.2	
Turn Bay Length (m)			65.0	71.0		45.0	70.0		90.0
Base Capacity (vph)	496	417	476	558	3011	1349	343	3050	1399
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.16	0.03	0.02	0.49	0.06	0.02	0.26	0.00

Intersection Summary

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

Lanes, Volumes, Timings
3: Cloverrick Avenue & Crimson King Way

2025 Existing (PM Peak Hour)
03/28/2025

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	92	43	4	41	40	1
Future Volume (vph)	92	43	4	41	40	1
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.957				0.997	
Flt Protected				0.995	0.953	
Satd. Flow (prot)	1914	0	0	1990	1900	0
Flt Permitted				0.995	0.953	
Satd. Flow (perm)	1914	0	0	1990	1900	0
Link Speed (k/h)	40			40	40	
Link Distance (m)	181.0			280.7	206.8	
Travel Time (s)	16.3			25.3	18.6	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	112	52	5	50	49	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	164	0	0	55	50	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)		15	25		25	15
Sign Control	Stop			Stop	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	17.1%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 3: Cloverridge Avenue & Crimson King Way

2025 Existing (PM Peak Hour)
03/28/2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	92	43	4	41	40	1
Future Volume (vph)	92	43	4	41	40	1
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	112	52	5	50	49	1
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	164	55	50			
Volume Left (vph)	0	5	49			
Volume Right (vph)	52	0	1			
Hadj (s)	-0.19	0.02	0.18			
Departure Headway (s)	3.9	4.2	4.5			
Degree Utilization, x	0.18	0.06	0.06			
Capacity (veh/h)	908	839	751			
Control Delay (s/veh)	7.7	7.5	7.8			
Approach Delay (s/veh)	7.7	7.5	7.8			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.7			
Level of Service			A			
Intersection Capacity Utilization			17.1%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2025 Existing (PM Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	398	151	16	31	79	712	13	1241	40	350	750	222
Future Volume (vph)	398	151	16	31	79	712	13	1241	40	350	750	222
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	35.0			33.0			48.0			72.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00					0.97
Fr't			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1845	1942	1700	1827	1770	1635	1900	3725	1574	1845	3689	1667
Flt Permitted	0.549			0.654			0.347			0.071		
Satd. Flow (perm)	1066	1942	1700	1258	1770	1635	692	3725	1574	138	3689	1617
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98			98			141			239
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		97.6			105.0			1205.7			393.8	
Travel Time (s)		5.9			6.3			62.0			20.3	
Confl. Peds. (#/hr)							5					5
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	0%	4%	13%	4%	0%	2%	8%	3%	3%	2%
Adj. Flow (vph)	428	162	17	33	85	766	14	1334	43	376	806	239
Shared Lane Traffic (%)												
Lane Group Flow (vph)	428	162	17	33	85	766	14	1334	43	376	806	239
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2025 Existing (PM Peak Hour)
03/28/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	1	6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	28.5	28.5	11.0	28.5	11.0	11.0	41.5	41.5	11.0	41.5	41.5
Total Split (s)	29.0	33.5	33.5	24.0	28.5	24.0	24.0	57.5	57.5	24.0	57.5	57.5
Total Split (%)	20.9%	24.1%	24.1%	17.3%	20.5%	17.3%	17.3%	41.4%	41.4%	17.3%	41.4%	41.4%
Maximum Green (s)	25.0	25.0	25.0	20.0	19.5	20.0	20.0	50.0	50.0	20.0	50.0	50.0
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.5	1.0	1.0	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	8.5	8.5	4.0	9.0	4.0	4.0	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		30.0	30.0		30.0			27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0			5	5		5	5
Act Effect Green (s)	46.3	34.7	34.7	24.8	12.2	41.3	60.5	50.0	50.0	77.5	69.7	69.7
Actuated g/C Ratio	0.35	0.26	0.26	0.19	0.09	0.31	0.46	0.38	0.38	0.59	0.53	0.53
v/c Ratio	0.82	0.32	0.03	0.12	0.52	1.33	0.04	0.94	0.06	1.11	0.41	0.25
Control Delay (s/veh)	50.7	42.6	0.1	30.8	68.4	190.2	13.3	53.7	0.2	117.7	20.6	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	50.7	42.6	0.1	30.8	68.4	190.2	13.3	53.7	0.2	117.7	20.6	3.1
LOS	D	D	A	C	E	F	B	D	A	F	C	A
Approach Delay (s/veh)		47.1			172.5			51.6			43.3	
Approach LOS		D			F			D			D	

Intersection Summary

Area Type: Other

Cycle Length: 139

Actuated Cycle Length: 131.8

Natural Cycle: 125

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.33

Intersection Signal Delay (s/veh): 73.1

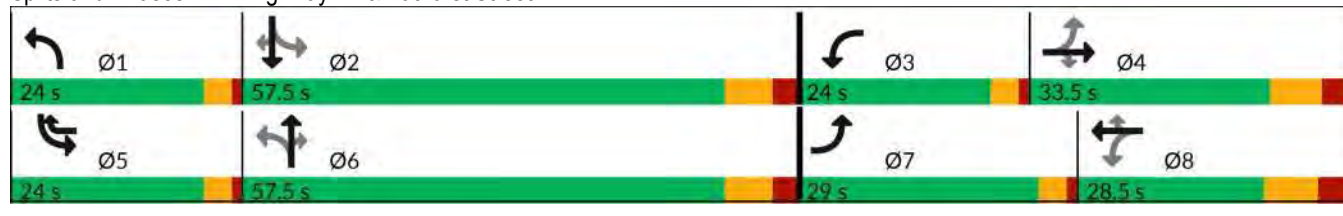
Intersection LOS: E

Intersection Capacity Utilization 108.3%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 4: Highway 11 & Bathurst Street



Queues
4: Highway 11 & Bathurst Street

2025 Existing (PM Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	428	162	17	33	85	766	14	1334	43	376	806	239
v/c Ratio	0.82	0.32	0.03	0.12	0.52	1.33	0.04	0.94	0.06	1.11	0.41	0.25
Control Delay (s/veh)	50.7	42.6	0.1	30.8	68.4	190.2	13.3	53.7	0.2	117.7	20.6	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	50.7	42.6	0.1	30.8	68.4	190.2	13.3	53.7	0.2	117.7	20.6	3.1
Queue Length 50th (m)	98.5	37.3	0.0	6.0	22.5	~252.7	1.5	182.6	0.0	~98.5	61.6	0.0
Queue Length 95th (m)	#137.9	59.9	0.0	13.6	40.5	#331.3	4.9	#244.6	0.0	#171.8	98.7	14.8
Internal Link Dist (m)		73.6			81.0			1181.7			369.8	
Turn Bay Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Base Capacity (vph)	522	511	519	441	262	578	569	1413	684	340	1951	967
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.32	0.03	0.07	0.32	1.33	0.02	0.94	0.06	1.11	0.41	0.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2025 Existing (PM Peak Hour) - Calibrated
03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	398	151	16	31	79	712	13	1241	40	350	750	222
Future Volume (vph)	398	151	16	31	79	712	13	1241	40	350	750	222
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	35.0			33.0			48.0			72.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00					0.97
Fr't			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1845	1942	1700	1827	1770	1635	1900	3725	1574	1845	3689	1667
Flt Permitted	0.549			0.654			0.347			0.071		
Satd. Flow (perm)	1066	1942	1700	1258	1770	1635	692	3725	1574	138	3689	1617
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98			*360			141			239
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		97.6			105.0			1205.7			393.8	
Travel Time (s)		5.9			6.3			62.0			20.3	
Confl. Peds. (#/hr)							5					5
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	1.00	0.93	0.93	0.93	1.00	0.93	0.93
Heavy Vehicles (%)	3%	3%	0%	4%	13%	4%	0%	2%	8%	3%	3%	2%
Adj. Flow (vph)	428	162	17	33	85	712	14	1334	43	350	806	239
Shared Lane Traffic (%)												
Lane Group Flow (vph)	428	162	17	33	85	712	14	1334	43	350	806	239
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2025 Existing (PM Peak Hour) - Calibrated
03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	1	6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	28.5	28.5	11.0	28.5	11.0	11.0	41.5	41.5	11.0	41.5	41.5
Total Split (s)	29.0	33.5	33.5	24.0	28.5	24.0	24.0	57.5	57.5	24.0	57.5	57.5
Total Split (%)	20.9%	24.1%	24.1%	17.3%	20.5%	17.3%	17.3%	41.4%	41.4%	17.3%	41.4%	41.4%
Maximum Green (s)	25.0	25.0	25.0	20.0	19.5	20.0	20.0	50.0	50.0	20.0	50.0	50.0
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.5	1.0	1.0	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	4.0	8.5	8.5	4.0	9.0	2.0	4.0	7.5	7.5	3.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		30.0	30.0		30.0			27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0			5	5		5	5
Act Effct Green (s)	46.3	34.7	34.7	24.8	12.2	43.3	60.5	50.0	50.0	78.5	69.7	69.7
Actuated g/C Ratio	0.35	0.26	0.26	0.19	0.09	0.33	0.46	0.38	0.38	0.60	0.53	0.53
v/c Ratio	0.82	0.32	0.03	0.12	0.52	0.92	0.04	0.94	0.06	0.99	0.41	0.25
Control Delay (s/veh)	50.7	42.6	0.1	30.8	68.4	38.2	13.3	53.7	0.2	84.5	20.6	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	50.7	42.6	0.1	30.8	68.4	38.2	13.3	53.7	0.2	84.5	20.6	3.1
LOS	D	D	A	C	E	D	B	D	A	F	C	A
Approach Delay (s/veh)		47.1			41.0			51.6			33.6	
Approach LOS		D			D			D			C	

Intersection Summary

Area Type: Other

Cycle Length: 139

Actuated Cycle Length: 131.8

Natural Cycle: 95

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.99

Intersection Signal Delay (s/veh): 42.9

Intersection LOS: D

Intersection Capacity Utilization 108.3%

ICU Level of Service G

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 4: Highway 11 & Bathurst Street



Queues
4: Highway 11 & Bathurst Street

2025 Existing (PM Peak Hour) - Calibrated
03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	428	162	17	33	85	712	14	1334	43	350	806	239
v/c Ratio	0.82	0.32	0.03	0.12	0.52	0.92	0.04	0.94	0.06	0.99	0.41	0.25
Control Delay (s/veh)	50.7	42.6	0.1	30.8	68.4	38.2	13.3	53.7	0.2	84.5	20.6	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	50.7	42.6	0.1	30.8	68.4	38.2	13.3	53.7	0.2	84.5	20.6	3.1
Queue Length 50th (m)	98.5	37.3	0.0	6.0	22.5	105.9	1.5	182.6	0.0	78.2	61.6	0.0
Queue Length 95th (m)	#137.9	59.9	0.0	13.6	40.5	#188.5	4.9	#244.6	0.0	#150.5	98.7	14.8
Internal Link Dist (m)		73.6			81.0			1181.7			369.8	
Turn Bay Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Base Capacity (vph)	522	511	519	441	262	778	569	1413	684	354	1951	967
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.32	0.03	0.07	0.32	0.92	0.02	0.94	0.06	0.99	0.41	0.25

Intersection Summary

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

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2025 Existing (SAT Peak Hour)
03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	37	29	878	46	23	809
Future Volume (vph)	37	29	878	46	23	809
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	45.0		92.0	84.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	7.5				50.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1900	1700	3762	1700	1900	3762
Flt Permitted	0.950				0.261	
Satd. Flow (perm)	1900	1700	3762	1700	522	3762
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		32		51		
Link Speed (k/h)	40		70			70
Link Distance (m)	181.0		972.2			1205.7
Travel Time (s)	16.3		50.0			62.0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	41	32	965	51	25	889
Shared Lane Traffic (%)						
Lane Group Flow (vph)	41	32	965	51	25	889
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	2.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		6		5	2

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2025 Existing (SAT Peak Hour)
03/28/2025

	↙ ↘		↑		↗ ↘	
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		8		6	2	
Detector Phase	8	8	6	6	5	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	40.0	40.0	7.0	40.0
Minimum Split (s)	26.0	26.0	47.5	47.5	11.0	47.5
Total Split (s)	26.0	26.0	47.5	47.5	11.0	58.5
Total Split (%)	30.8%	30.8%	56.2%	56.2%	13.0%	69.2%
Maximum Green (s)	19.0	19.0	40.0	40.0	7.0	51.0
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	3.0	3.0	2.5	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.5	7.5	4.0	7.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	Max	Max	None	Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Don't Walk (s)	21.0	21.0	14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effect Green (s)	10.1	10.1	58.5	58.5	63.3	63.0
Actuated g/C Ratio	0.13	0.13	0.76	0.76	0.82	0.82
v/c Ratio	0.17	0.13	0.34	0.04	0.05	0.29
Control Delay (s/veh)	32.1	12.7	7.1	2.9	2.9	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	32.1	12.7	7.1	2.9	2.9	3.8
LOS	C	B	A	A	A	A
Approach Delay (s/veh)	23.6		6.8			3.8
Approach LOS	C		A			A

Intersection Summary

Area Type: Other

Cycle Length: 84.5

Actuated Cycle Length: 77.3

Natural Cycle: 85

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.34

Intersection Signal Delay (s/veh): 6.1

Intersection LOS: A

Intersection Capacity Utilization 53.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Highway 11 & Crimson King Way



Queues

2025 Existing (SAT Peak Hour)

1: Highway 11 & Crimson King Way

03/28/2025



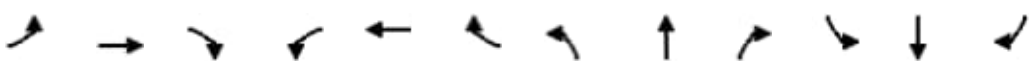
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	41	32	965	51	25	889
v/c Ratio	0.17	0.13	0.34	0.04	0.05	0.29
Control Delay (s/veh)	32.1	12.7	7.1	2.9	2.9	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	32.1	12.7	7.1	2.9	2.9	3.8
Queue Length 50th (m)	6.8	0.0	28.1	0.0	0.8	25.2
Queue Length 95th (m)	14.4	7.4	59.8	4.6	2.6	33.9
Internal Link Dist (m)	157.0		948.2			1181.7
Turn Bay Length (m)		45.0		92.0	84.0	
Base Capacity (vph)	469	444	2846	1298	553	3065
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.07	0.34	0.04	0.05	0.29
Intersection Summary						

Lanes, Volumes, Timings

2025 Existing (SAT Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	3	0	9	75	0	8	15	907	66	2	858	0
Future Volume (vph)	3	0	9	75	0	8	15	907	66	2	858	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0		0.0	0.0		65.0	71.0		45.0	70.0		90.0
Storage Lanes	0		0	0		1	1		1	1		1
Taper Length (m)	7.5			7.5			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		0.99			1.00	0.99						
Frt		0.896				0.850			0.850			
Flt Protected		0.989			0.950		0.950			0.950		
Satd. Flow (prot)	0	1755	0	0	1900	1700	1900	3762	1700	1900	3762	2000
Flt Permitted		0.897			0.749		0.312			0.258		
Satd. Flow (perm)	0	1591	0	0	1497	1678	624	3762	1700	516	3762	2000
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		109				109			109			
Link Speed (k/h)		40			40			70			70	
Link Distance (m)		288.1			294.1			681.3			972.2	
Travel Time (s)		25.9			26.5			35.0			50.0	
Confl. Peds. (#/hr)	1		1	1		1						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Adj. Flow (vph)	3	0	10	80	0	9	16	965	70	2	913	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	13	0	0	80	9	16	965	70	2	913	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

2025 Existing (SAT Peak Hour) 3:12 pm 03/27/2025

Synchro 11 Report

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Lanes, Volumes, Timings

2025 Existing (SAT Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			6		5	2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	40.0	40.0	40.0	7.0	40.0	40.0
Minimum Split (s)	26.5	26.5		26.5	26.5	26.5	47.5	47.5	47.5	11.0	47.5	47.5
Total Split (s)	26.5	26.5		26.5	26.5	26.5	47.5	47.5	47.5	11.0	58.5	58.5
Total Split (%)	31.2%	31.2%		31.2%	31.2%	31.2%	55.9%	55.9%	55.9%	12.9%	68.8%	68.8%
Maximum Green (s)	19.0	19.0		19.0	19.0	19.0	40.0	40.0	40.0	7.0	51.0	51.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.5	3.5		3.5	3.5	3.5	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5			7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	0.2	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None		None	None	None	Max	Max	Max	None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Don't Walk (s)	26.0	26.0		26.0	26.0	26.0	16.0	16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0	0		0	0
Act Effect Green (s)		11.0			11.0	11.0	58.4	58.4	58.4	62.5	60.7	
Actuated g/C Ratio		0.14			0.14	0.14	0.72	0.72	0.72	0.77	0.75	
v/c Ratio		0.04			0.40	0.03	0.04	0.36	0.06	0.00	0.32	
Control Delay (s/veh)		0.3			38.1	0.1	7.7	7.2	1.0	3.5	5.3	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)		0.3			38.1	0.1	7.7	7.2	1.0	3.5	5.3	
LOS		A			D	A	A	A	A	A	A	
Approach Delay (s/veh)		0.3			34.2			6.8			5.3	
Approach LOS		A			C			A			A	

Intersection Summary

Area Type: Other

Cycle Length: 85

Actuated Cycle Length: 81.2

Natural Cycle: 85

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.40

Intersection Signal Delay (s/veh): 7.3

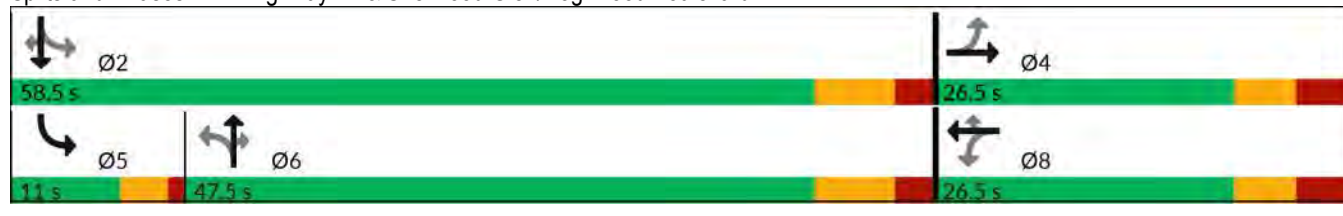
Intersection LOS: A

Intersection Capacity Utilization 70.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 2: Highway 11 & Sherwood Glen/Dog Wood Boulevard



2025 Existing (SAT Peak Hour) 3:12 pm 03/27/2025

Synchro 11 Report

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Queues

2025 Existing (SAT Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025



Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	13	80	9	16	965	70	2	913
v/c Ratio	0.04	0.40	0.03	0.04	0.36	0.06	0.00	0.32
Control Delay (s/veh)	0.3	38.1	0.1	7.7	7.2	1.0	3.5	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	0.3	38.1	0.1	7.7	7.2	1.0	3.5	5.3
Queue Length 50th (m)	0.0	12.9	0.0	0.7	28.9	0.0	0.1	26.8
Queue Length 95th (m)	0.0	24.1	0.0	4.4	67.0	2.9	0.7	42.0
Internal Link Dist (m)	264.1	270.1			657.3			948.2
Turn Bay Length (m)			65.0	71.0		45.0	70.0	
Base Capacity (vph)	457	352	478	449	2706	1253	517	2811
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.23	0.02	0.04	0.36	0.06	0.00	0.32
Intersection Summary								

Lanes, Volumes, Timings
3: Cloverridge Avenue & Crimson King Way

2025 Existing (SAT Peak Hour)
03/28/2025

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	52	29	4	45	32	4
Future Volume (vph)	52	29	4	45	32	4
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.951				0.986	
Flt Protected				0.996	0.957	
Satd. Flow (prot)	1902	0	0	1992	1887	0
Flt Permitted				0.996	0.957	
Satd. Flow (perm)	1902	0	0	1992	1887	0
Link Speed (k/h)	40			40	40	
Link Distance (m)	181.0			280.7	206.8	
Travel Time (s)	16.3			25.3	18.6	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	69	39	5	60	43	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	108	0	0	65	48	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)		15	25		25	15
Sign Control	Stop			Stop	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	15.4%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 3: Cloverridge Avenue & Crimson King Way

2025 Existing (SAT Peak Hour)
03/28/2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	52	29	4	45	32	4
Future Volume (vph)	52	29	4	45	32	4
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	69	39	5	60	43	5
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	108	65	48			
Volume Left (vph)	0	5	43			
Volume Right (vph)	39	0	5			
Hadj (s)	-0.22	0.02	0.12			
Departure Headway (s)	3.9	4.1	4.4			
Degree Utilization, x	0.12	0.07	0.06			
Capacity (veh/h)	914	854	785			
Control Delay (s/veh)	7.4	7.5	7.6			
Approach Delay (s/veh)	7.4	7.5	7.6			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.5			
Level of Service			A			
Intersection Capacity Utilization			15.4%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2025 Existing (SAT Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	271	84	20	38	94	458	25	768	39	373	833	215
Future Volume (vph)	271	84	20	38	94	458	25	768	39	373	833	215
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	35.0			33.0			48.0			72.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00					0.99						
Fr't			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1881	1942	1619	1900	1942	1667	1900	3762	1700	1863	3762	1683
Flt Permitted	0.536			0.699			0.321			0.211		
Satd. Flow (perm)	1060	1942	1619	1398	1942	1645	642	3762	1700	414	3762	1683
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98			127			141			229
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		97.6			105.0			1205.7			393.8	
Travel Time (s)		5.9			6.3			62.0			20.3	
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	1%	3%	5%	0%	3%	2%	0%	1%	0%	2%	1%	1%
Adj. Flow (vph)	288	89	21	40	100	487	27	817	41	397	886	229
Shared Lane Traffic (%)												
Lane Group Flow (vph)	288	89	21	40	100	487	27	817	41	397	886	229
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

2025 Existing (SAT Peak Hour) 3:12 pm 03/27/2025

Synchro 11 Report
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Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2025 Existing (SAT Peak Hour)
03/28/2025

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	1	6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	28.5	28.5	11.0	28.5	11.0	11.0	41.5	41.5	11.0	41.5	41.5
Total Split (s)	29.0	33.5	33.5	24.0	28.5	24.0	24.0	57.5	57.5	24.0	57.5	57.5
Total Split (%)	20.9%	24.1%	24.1%	17.3%	20.5%	17.3%	17.3%	41.4%	41.4%	17.3%	41.4%	41.4%
Maximum Green (s)	25.0	25.0	25.0	20.0	19.5	20.0	20.0	50.0	50.0	20.0	50.0	50.0
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.5	1.0	1.0	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	8.5	8.5	4.0	9.0	4.0	4.0	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		30.0	30.0		30.0			27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0			5	5		5	5
Act Effect Green (s)	43.4	29.5	29.5	25.2	12.4	37.5	60.7	50.1	50.1	77.7	67.7	67.7
Actuated g/C Ratio	0.34	0.23	0.23	0.20	0.10	0.29	0.47	0.39	0.39	0.60	0.52	0.52
v/c Ratio	0.58	0.20	0.05	0.13	0.53	0.85	0.07	0.56	0.06	0.84	0.45	0.23
Control Delay (s/veh)	38.4	42.5	0.2	30.9	67.0	45.8	13.5	33.4	0.1	33.3	21.7	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	38.4	42.5	0.2	30.9	67.0	45.8	13.5	33.4	0.1	33.3	21.7	3.1
LOS	D	D	A	C	E	D	B	C	A	C	C	A
Approach Delay (s/veh)		37.3			48.2			31.2			21.9	
Approach LOS		D			D			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 139

Actuated Cycle Length: 129.1

Natural Cycle: 95

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.85

Intersection Signal Delay (s/veh): 30.9

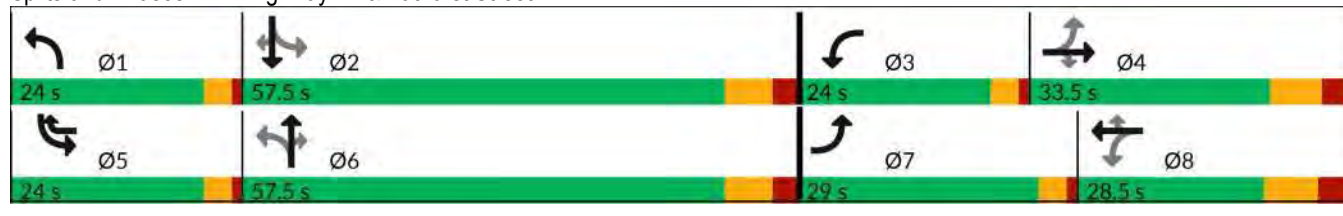
Intersection LOS: C

Intersection Capacity Utilization 77.4%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: Highway 11 & Bathurst Street



2025 Existing (SAT Peak Hour) 3:12 pm 03/27/2025

Synchro 11 Report
Page 10

Queues
4: Highway 11 & Bathurst Street

2025 Existing (SAT Peak Hour)
03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	288	89	21	40	100	487	27	817	41	397	886	229
v/c Ratio	0.58	0.20	0.05	0.13	0.53	0.85	0.07	0.56	0.06	0.84	0.45	0.23
Control Delay (s/veh)	38.4	42.5	0.2	30.9	67.0	45.8	13.5	33.4	0.1	33.3	21.7	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	38.4	42.5	0.2	30.9	67.0	45.8	13.5	33.4	0.1	33.3	21.7	3.1
Queue Length 50th (m)	60.1	19.8	0.0	7.2	26.3	91.9	2.8	90.6	0.0	52.4	83.0	0.0
Queue Length 95th (m)	86.4	35.7	0.0	15.5	46.1	#144.5	7.8	119.8	0.0	#115.3	111.4	14.6
Internal Link Dist (m)	73.6				81.0			1181.7			369.8	
Turn Bay Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Base Capacity (vph)	515	449	449	483	293	571	561	1460	745	474	1972	991
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.20	0.05	0.08	0.34	0.85	0.05	0.56	0.06	0.84	0.45	0.23

Intersection Summary

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

APPENDIX

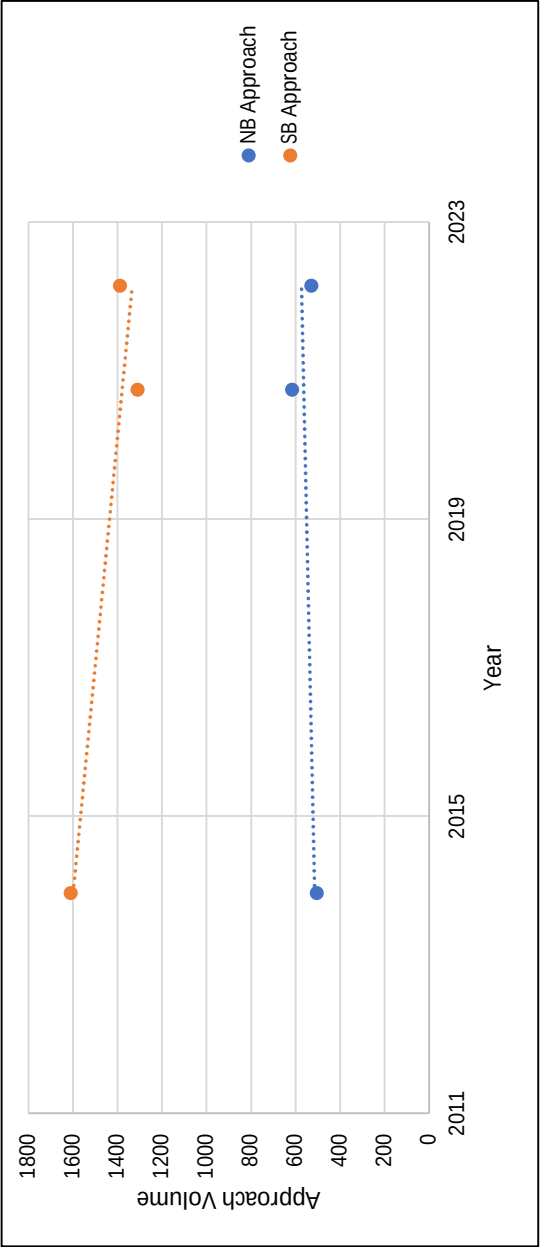
E BACKGROUND GROWTH RATE



Corridor Growth

Intersection Highway 11 and Dog Wood Boulevard / Sherwood Glen
Period AM Peak Hour

Date	NBL	NBT	NBR	SBL	SBT	SBR	NB Approach	SB Approach
2014-12-18	5	500	0	0	1606	5	505	1611
2021-09-28	5	571	40	6	1304	1	616	1311
2023-02-21	4	482	44	3	1384	3	530	1390
Slope							0.020	-0.089
Rate							1.38%	-2.34%

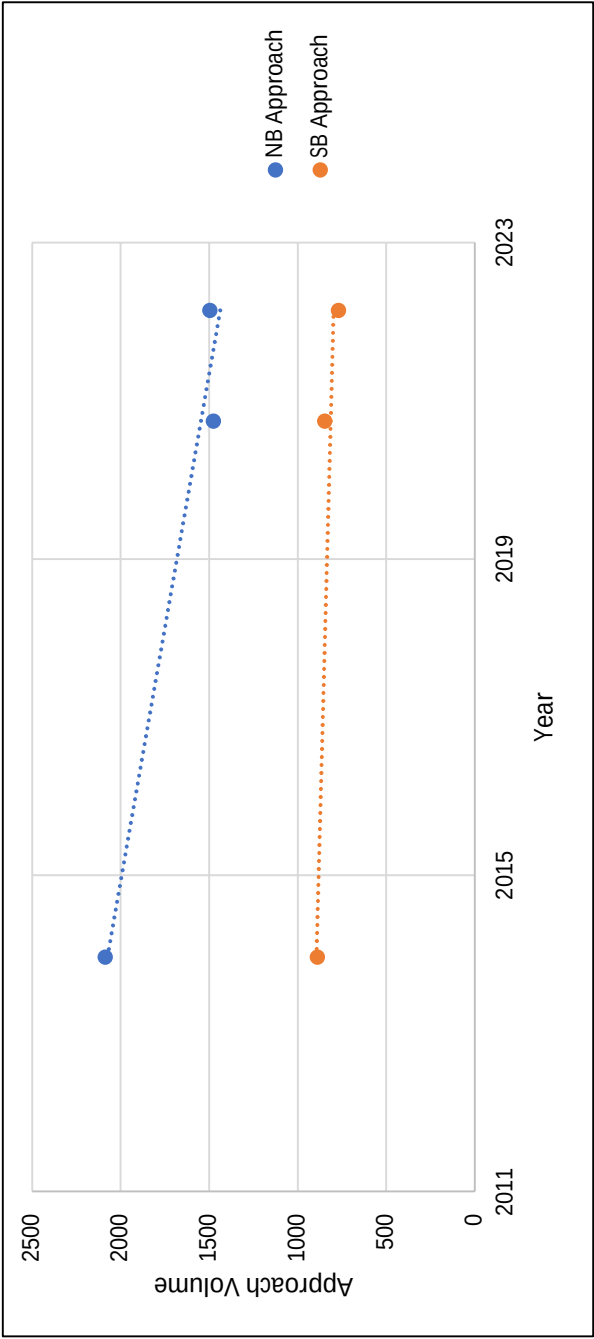




Corridor Growth

Intersection Highway 11 and Dog Wood Boulevard / Sherwood Glen
Period PM Peak Hour

Date	NBL	NBT	NBR	SBL	SBT	SBR	NB Approach	SB Approach
2014-12-18	10	2077	0	0	888	1	2087	889
2021-09-28	16	1387	74	12	834	2	1477	848
2023-02-21	10	1404	82	8	761	1	1496	770
Slope							-0.213	-0.032
Rate							-5.21%	-1.54%



Highway 11 & Bathurst Street

	Date	NBL	NBT	NBR	SBL	SBT	SBR	South Approach	North Approach
AM	2014-03-04	10	390	35	409	1610	18	435	834
	2023-03-07	27	368	27	453	1237	459	422	848
	Growth Rates							-0.34%	0.19%
PM								-0.08%	
	2014-11-06	22	1662	51	230	784	101	1735	1943
	2023-03-07	13	1241	40	350	750	222	1294	1631
	Growth Rates							-3.21%	-1.93%
							-2.57%		

APPENDIX

F

FUTURE

BACKGROUND

TRAFFIC

CONDITIONS

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2030 Future Background (AM Peak Hour)

03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	88	23	579	29	15	1443
Future Volume (vph)	88	23	579	29	15	1443
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	45.0		92.0	84.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	55.0				50.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1863	1545	3585	1700	1473	3725
Flt Permitted	0.950				0.386	
Satd. Flow (perm)	1863	1545	3585	1700	598	3725
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		26		33		
Link Speed (k/h)	40		70			70
Link Distance (m)	181.0		964.7			264.3
Travel Time (s)	16.3		49.6			13.6
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	2%	10%	6%	0%	29%	2%
Adj. Flow (vph)	99	26	651	33	17	1621
Shared Lane Traffic (%)						
Lane Group Flow (vph)	99	26	651	33	17	1621
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	2.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		6		5	2

2030 Future Background (AM Peak Hour) 3:13 pm 03/27/2025

Synchro 11 Report
Page 1

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2030 Future Background (AM Peak Hour)

03/28/2025

	↙ ↖ ↑ ↗ ↘ ↓					
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		8		6	2	
Detector Phase	8	8	6	6	5	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	40.0	40.0	7.0	40.0
Minimum Split (s)	35.0	35.0	47.5	47.5	11.0	47.5
Total Split (s)	36.0	36.0	82.0	82.0	12.0	94.0
Total Split (%)	27.7%	27.7%	63.1%	63.1%	9.2%	72.3%
Maximum Green (s)	29.0	29.0	74.5	74.5	8.0	86.5
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	3.0	3.0	2.5	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.5	7.5	4.0	7.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Don't Walk (s)	21.0	21.0	14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effect Green (s)	12.7	12.7	98.4	98.4	106.3	102.8
Actuated g/C Ratio	0.10	0.10	0.76	0.76	0.82	0.79
v/c Ratio	0.54	0.15	0.24	0.03	0.03	0.55
Control Delay (s/veh)	66.5	19.5	1.9	0.1	2.7	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	66.5	19.5	1.9	0.1	2.7	5.5
LOS	E	B	A	A	A	A
Approach Delay (s/veh)	56.8		1.8			5.5
Approach LOS	E		A			A

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.55

Intersection Signal Delay (s/veh): 7.1

Intersection LOS: A

Intersection Capacity Utilization 58.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Highway 11 & Crimson King Way



Queues

2030 Future Background (AM Peak Hour)

1: Highway 11 & Crimson King Way

03/28/2025



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	99	26	651	33	17	1621
v/c Ratio	0.54	0.15	0.24	0.03	0.03	0.55
Control Delay (s/veh)	66.5	19.5	1.9	0.1	2.7	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	66.5	19.5	1.9	0.1	2.7	5.5
Queue Length 50th (m)	26.0	0.0	5.2	0.0	0.7	69.8
Queue Length 95th (m)	43.1	8.8	9.0	0.2	m2.1	55.1
Internal Link Dist (m)	157.0		940.7			240.3
Turn Bay Length (m)		45.0		92.0	84.0	
Base Capacity (vph)	415	364	2712	1294	542	2944
Starvation Cap Reductn	0	0	0	0	0	151
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.07	0.24	0.03	0.03	0.58

Intersection Summary

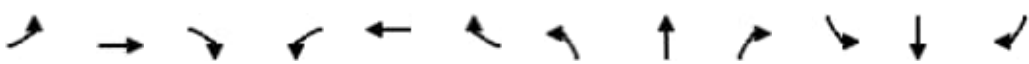
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings

2030 Future Background (AM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	1	0	9	281	0	47	4	591	141	47	1411	3
Future Volume (vph)	1	0	9	281	0	47	4	591	141	47	1411	3
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0		0.0	0.0		65.0	71.0		45.0	70.0		90.0
Storage Lanes	0		0	0		1	1		1	1		1
Taper Length (m)	7.5			7.5			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.877				0.850			0.850			0.850
Flt Protected		0.995			0.950		0.950			0.950		
Satd. Flow (prot)	0	1745	0	0	1881	1700	1900	3585	1589	1900	3725	1700
Flt Permitted		0.974			0.750		0.111			0.348		
Satd. Flow (perm)	0	1708	0	0	1485	1700	222	3585	1589	696	3725	1700
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		71				71			158			38
Link Speed (k/h)		40			40			70			70	
Link Distance (m)		288.1			294.1			681.3			964.7	
Travel Time (s)		25.9			26.5			35.0			49.6	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	6%	7%	0%	2%	0%
Adj. Flow (vph)	1	0	10	316	0	53	4	664	158	53	1585	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	11	0	0	316	53	4	664	158	53	1585	3
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			6		5		2

2030 Future Background (AM Peak Hour) 3:13 pm 03/27/2025

Synchro 11 Report

Page 4

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	40.0	40.0	40.0	7.0	40.0	40.0
Minimum Split (s)	40.5	40.5		40.5	40.5	40.5	47.5	47.5	47.5	11.0	47.5	47.5
Total Split (s)	42.0	42.0		42.0	42.0	42.0	76.0	76.0	76.0	12.0	88.0	88.0
Total Split (%)	32.3%	32.3%		32.3%	32.3%	32.3%	58.5%	58.5%	58.5%	9.2%	67.7%	67.7%
Maximum Green (s)	34.5	34.5		34.5	34.5	34.5	68.5	68.5	68.5	8.0	80.5	80.5
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.5	3.5		3.5	3.5	3.5	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5			7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	0.2	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Don't Walk (s)	26.0	26.0		26.0	26.0	26.0	16.0	16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0	0		0	0
Act Effect Green (s)		31.1			31.1	31.1	74.9	74.9	74.9	87.4	83.9	83.9
Actuated g/C Ratio		0.24			0.24	0.24	0.58	0.58	0.58	0.67	0.65	0.65
v/c Ratio		0.02			0.89	0.12	0.03	0.32	0.16	0.10	0.66	0.00
Control Delay (s/veh)		0.1			74.4	5.0	15.8	16.0	2.7	11.9	23.6	0.0
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		0.1			74.4	5.0	15.8	16.0	2.7	11.9	23.6	0.0
LOS		A			E	A	B	B	A	B	C	A
Approach Delay (s/veh)		0.1			64.4			13.4			23.2	
Approach LOS		A			E			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 92 (71%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay (s/veh): 25.6

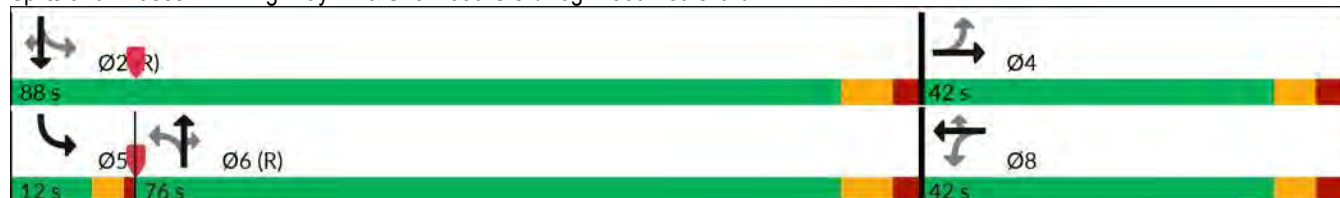
Intersection LOS: C

Intersection Capacity Utilization 100.2%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 2: Highway 11 & Sherwood Glen/Dog Wood Boulevard



Queues

2030 Future Background (AM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025



Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	11	316	53	4	664	158	53	1585	3
v/c Ratio	0.02	0.89	0.12	0.03	0.32	0.16	0.10	0.66	0.00
Control Delay (s/veh)	0.1	74.4	5.0	15.8	16.0	2.7	11.9	23.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	0.1	74.4	5.0	15.8	16.0	2.7	11.9	23.6	0.0
Queue Length 50th (m)	0.0	80.7	0.0	0.5	51.0	0.0	5.6	165.7	0.0
Queue Length 95th (m)	0.0	#123.8	6.5	2.6	65.6	10.4	m13.5	227.5	m0.0
Internal Link Dist (m)	264.1	270.1			657.3			940.7	
Turn Bay Length (m)			65.0	71.0		45.0	70.0		90.0
Base Capacity (vph)	505	394	503	127	2064	982	542	2404	1111
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.80	0.11	0.03	0.32	0.16	0.10	0.66	0.00

Intersection Summary

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

Queue shown is maximum after two cycles.

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

Lanes, Volumes, Timings
3: Cloverridge Avenue & Crimson King Way

2030 Future Background (AM Peak Hour)

03/28/2025

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	27	17	2	51	60	6
Future Volume (vph)	27	17	2	51	60	6
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.948				0.987	
Flt Protected				0.998	0.957	
Satd. Flow (prot)	1731	0	0	1962	1807	0
Flt Permitted				0.998	0.957	
Satd. Flow (perm)	1731	0	0	1962	1807	0
Link Speed (k/h)	40			40	40	
Link Distance (m)	181.0			280.7	206.8	
Travel Time (s)	16.3			25.3	18.6	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	8%	12%	50%	0%	5%	0%
Adj. Flow (vph)	30	19	2	56	66	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	49	0	0	58	73	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)		15	25		25	15
Sign Control	Stop			Stop	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	14.3%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 3: Cloverridge Avenue & Crimson King Way

2030 Future Background (AM Peak Hour)

03/28/2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	27	17	2	51	60	6
Future Volume (vph)	27	17	2	51	60	6
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	30	19	2	56	66	7
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	49	58	73			
Volume Left (vph)	0	2	66			
Volume Right (vph)	19	0	7			
Hadj (s)	-0.07	0.04	0.20			
Departure Headway (s)	4.1	4.2	4.3			
Degree Utilization, x	0.06	0.07	0.09			
Capacity (veh/h)	864	846	803			
Control Delay (s/veh)	7.3	7.5	7.7			
Approach Delay (s/veh)	7.3	7.5	7.7			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.5			
Level of Service			A			
Intersection Capacity Utilization			14.3%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2030 Future Background (AM Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	110	8	38	157	367	27	474	34	505	1307	459
Future Volume (vph)	150	110	8	38	157	367	27	474	34	505	1307	459
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	35.0			33.0			48.0			72.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1792	1754	1133	1759	1869	1574	1827	3654	1478	1810	3725	1667
Flt Permitted	0.445			0.680			0.117			0.379		
Satd. Flow (perm)	840	1754	1133	1259	1869	1574	225	3654	1478	722	3725	1667
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98			268			141			499
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		97.6			105.0			941.4			393.8	
Travel Time (s)		5.9			6.3			48.4			20.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	14%	50%	8%	7%	8%	4%	4%	15%	5%	2%	2%
Adj. Flow (vph)	163	120	9	41	171	399	29	515	37	549	1421	499
Shared Lane Traffic (%)												
Lane Group Flow (vph)	163	120	9	41	171	399	29	515	37	549	1421	499
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	1	6		5	2	

2030 Future Background (AM Peak Hour) 3:13 pm 03/27/2025

Synchro 11 Report
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Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2030 Future Background (AM Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	28.5	28.5	11.0	28.5	11.0	11.0	41.5	41.5	11.0	41.5	41.5
Total Split (s)	29.0	33.5	33.5	24.0	28.5	24.0	24.0	57.5	57.5	24.0	57.5	57.5
Total Split (%)	20.9%	24.1%	24.1%	17.3%	20.5%	17.3%	17.3%	41.4%	41.4%	17.3%	41.4%	41.4%
Maximum Green (s)	25.0	25.0	25.0	20.0	19.5	20.0	20.0	50.0	50.0	20.0	50.0	50.0
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.5	1.0	1.0	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	8.5	8.5	4.0	9.0	4.0	4.0	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		30.0	30.0		30.0			27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effect Green (s)	40.0	26.0	26.0	28.8	15.9	45.0	60.8	50.1	50.1	77.7	67.8	67.8
Actuated g/C Ratio	0.32	0.21	0.21	0.23	0.13	0.36	0.48	0.40	0.40	0.62	0.54	0.54
v/c Ratio	0.43	0.33	0.03	0.13	0.73	0.54	0.15	0.35	0.05	0.89	0.71	0.44
Control Delay (s/veh)	35.2	46.0	0.1	30.6	71.5	13.2	14.1	28.3	0.1	34.5	26.5	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	35.2	46.0	0.1	30.6	71.5	13.2	14.1	28.3	0.1	34.5	26.5	3.0
LOS	D	D	A	C	E	B	B	C	A	C	C	A
Approach Delay (s/veh)		38.6			30.7			25.8			23.5	
Approach LOS		D			C			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 139

Actuated Cycle Length: 125.8

Natural Cycle: 95

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.89

Intersection Signal Delay (s/veh): 26.1

Intersection LOS: C

Intersection Capacity Utilization 79.9%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: Highway 11 & Bathurst Street



Queues

2030 Future Background (AM Peak Hour)

4: Highway 11 & Bathurst Street

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	163	120	9	41	171	399	29	515	37	549	1421	499
v/c Ratio	0.43	0.33	0.03	0.13	0.73	0.54	0.15	0.35	0.05	0.89	0.71	0.44
Control Delay (s/veh)	35.2	46.0	0.1	30.6	71.5	13.2	14.1	28.3	0.1	34.5	26.5	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	35.2	46.0	0.1	30.6	71.5	13.2	14.1	28.3	0.1	34.5	26.5	3.0
Queue Length 50th (m)	31.7	27.4	0.0	7.4	43.4	24.3	2.8	49.3	0.0	75.1	154.1	0.0
Queue Length 95th (m)	50.2	46.8	0.0	16.0	71.5	59.3	8.1	71.1	0.0	#163.4	209.7	19.3
Internal Link Dist (m)		73.6			81.0			917.4			369.8	
Turn Bay Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Base Capacity (vph)	457	377	320	468	290	734	387	1456	673	619	2006	1128
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.32	0.03	0.09	0.59	0.54	0.07	0.35	0.05	0.89	0.71	0.44

Intersection Summary

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

Queue shown is maximum after two cycles.

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	3	1	597	5	2	1351
Future Volume (vph)	3	1	597	5	2	1351
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	0.0		30.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	0.966			0.850		
Flt Protected	0.964				0.950	
Satd. Flow (prot)	1862	0	3585	1700	1900	3725
Flt Permitted	0.964				0.405	
Satd. Flow (perm)	1862	0	3585	1700	810	3725
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	1			5		
Link Speed (k/h)	30		70			70
Link Distance (m)	73.1		264.3			941.4
Travel Time (s)	8.8		13.6			48.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	6%	0%	0%	2%
Adj. Flow (vph)	3	1	649	5	2	1468
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	0	649	5	2	1468
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (m)	2.0		10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0		0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA	Perm	Perm	NA
Protected Phases	8		6			2

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases				6	2	
Detector Phase	8		6	6	2	2
Switch Phase						
Minimum Initial (s)	10.0		40.0	40.0	40.0	40.0
Minimum Split (s)	35.0		47.5	47.5	47.5	47.5
Total Split (s)	36.0		94.0	94.0	94.0	94.0
Total Split (%)	27.7%		72.3%	72.3%	72.3%	72.3%
Maximum Green (s)	29.0		86.5	86.5	86.5	86.5
Yellow Time (s)	4.0		5.0	5.0	5.0	5.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		7.5	7.5	7.5	7.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Don't Walk (s)	21.0		14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effect Green (s)	10.0		125.1	125.1	125.1	125.1
Actuated g/C Ratio	0.08		0.96	0.96	0.96	0.96
v/c Ratio	0.03		0.19	0.00	0.00	0.41
Control Delay (s/veh)	50.8		0.3	0.0	1.5	1.4
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay (s/veh)	50.8		0.3	0.0	1.5	1.4
LOS	D		A	A	A	A
Approach Delay (s/veh)	50.8		0.3			1.4
Approach LOS	D		A			A

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.41

Intersection Signal Delay (s/veh): 1.1

Intersection LOS: A

Intersection Capacity Utilization 79.2%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access



Queues

2030 Future Background (AM Peak Hour)

100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access

03/28/2025



Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	4	649	5	2	1468
v/c Ratio	0.03	0.19	0.00	0.00	0.41
Control Delay (s/veh)	50.8	0.3	0.0	1.5	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	50.8	0.3	0.0	1.5	1.4
Queue Length 50th (m)	0.8	0.0	0.0	0.0	0.0
Queue Length 95th (m)	4.6	4.1	m0.1	0.6	62.0
Internal Link Dist (m)	49.1	240.3			917.4
Turn Bay Length (m)			30.0	15.0	
Base Capacity (vph)	416	3450	1636	779	3584
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.19	0.00	0.00	0.41

Intersection Summary

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

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2030 Future Background (PM Peak Hour)

03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	57	24	1400	78	57	830
Future Volume (vph)	57	24	1400	78	57	830
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	45.0		92.0	84.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	7.5				50.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1845	1700	3725	1700	1863	3725
Flt Permitted	0.950				0.143	
Satd. Flow (perm)	1845	1700	3725	1700	280	3725
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		25		80		
Link Speed (k/h)	40		70			70
Link Distance (m)	181.0		964.2			262.5
Travel Time (s)	16.3		49.6			13.5
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	0%	2%	0%	2%	2%
Adj. Flow (vph)	59	25	1443	80	59	856
Shared Lane Traffic (%)						
Lane Group Flow (vph)	59	25	1443	80	59	856
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	2.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		6		5	2

2030 Future Background (PM Peak Hour) 3:22 pm 03/27/2025

Synchro 11 Report
Page 1

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2030 Future Background (PM Peak Hour)

03/28/2025

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		8		6	2	
Detector Phase	8	8	6	6	5	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	40.0	40.0	7.0	40.0
Minimum Split (s)	35.0	35.0	47.5	47.5	11.0	47.5
Total Split (s)	36.0	36.0	72.0	72.0	12.0	84.0
Total Split (%)	30.0%	30.0%	60.0%	60.0%	10.0%	70.0%
Maximum Green (s)	29.0	29.0	64.5	64.5	8.0	76.5
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	3.0	3.0	2.5	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.5	7.5	4.0	7.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Don't Walk (s)	21.0	21.0	14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effect Green (s)	10.7	10.7	90.9	90.9	101.7	99.7
Actuated g/C Ratio	0.09	0.09	0.76	0.76	0.85	0.83
v/c Ratio	0.36	0.14	0.51	0.06	0.18	0.28
Control Delay (s/veh)	57.7	19.7	6.8	0.6	3.5	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	57.7	19.7	6.8	0.6	3.5	3.2
LOS	E	B	A	A	A	A
Approach Delay (s/veh)	46.4		6.5			3.2
Approach LOS	D		A			A

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.51

Intersection Signal Delay (s/veh): 6.6

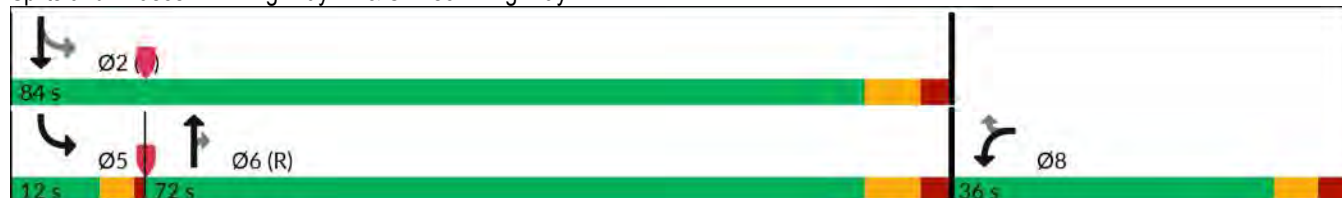
Intersection LOS: A

Intersection Capacity Utilization 65.4%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Highway 11 & Crimson King Way



Queues

2030 Future Background (PM Peak Hour)

1: Highway 11 & Crimson King Way

03/28/2025



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	59	25	1443	80	59	856
v/c Ratio	0.36	0.14	0.51	0.06	0.18	0.28
Control Delay (s/veh)	57.7	19.7	6.8	0.6	3.5	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	57.7	19.7	6.8	0.6	3.5	3.2
Queue Length 50th (m)	14.1	0.0	158.3	1.8	2.0	24.1
Queue Length 95th (m)	27.6	8.8	2.2	m0.0	4.8	30.1
Internal Link Dist (m)	157.0		940.2			238.5
Turn Bay Length (m)		45.0		92.0	84.0	
Base Capacity (vph)	445	429	2823	1307	343	3096
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.06	0.51	0.06	0.17	0.28

Intersection Summary

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

Lanes, Volumes, Timings

2030 Future Background (PM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	3	5	236	2	72	10	1434	271	72	797	1
Future Volume (vph)	2	3	5	236	2	72	10	1434	271	72	797	1
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0		0.0	0.0		65.0	71.0		45.0	70.0		90.0
Storage Lanes	0		0	0		1	1		1	1		1
Taper Length (m)	7.5			7.5			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.932				0.850			0.850			0.850
Flt Protected		0.990			0.953		0.950			0.950		
Satd. Flow (prot)	0	1845	0	0	1906	1466	1900	3762	1667	1900	3725	1700
Flt Permitted		0.941			0.721		0.336			0.085		
Satd. Flow (perm)	0	1754	0	0	1442	1466	672	3762	1667	170	3725	1700
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				77			133			41
Link Speed (k/h)		40			40			70			70	
Link Distance (m)		288.1			294.1			681.3			964.2	
Travel Time (s)		25.9			26.5			35.0			49.6	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	16%	0%	1%	2%	0%	2%	0%
Adj. Flow (vph)	2	3	5	248	2	76	11	1509	285	76	839	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	10	0	0	250	76	11	1509	285	76	839	1
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			6		5	2	

2030 Future Background (PM Peak Hour) 3:22 pm 03/27/2025

Synchro 11 Report

Page 4

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	40.0	40.0	40.0	7.0	40.0	40.0
Minimum Split (s)	40.5	40.5		40.5	40.5	40.5	47.5	47.5	47.5	11.0	47.5	47.5
Total Split (s)	43.0	43.0		43.0	43.0	43.0	63.0	63.0	63.0	14.0	77.0	77.0
Total Split (%)	35.8%	35.8%		35.8%	35.8%	35.8%	52.5%	52.5%	52.5%	11.7%	64.2%	64.2%
Maximum Green (s)	35.5	35.5		35.5	35.5	35.5	55.5	55.5	55.5	10.0	69.5	69.5
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.5	3.5		3.5	3.5	3.5	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5			7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	0.2	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Don't Walk (s)	26.0	26.0		26.0	26.0	26.0	16.0	16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0	0		0	0
Act Effect Green (s)		26.0			26.0	26.0	69.6	69.6	69.6	82.5	79.0	79.0
Actuated g/C Ratio		0.22			0.22	0.22	0.58	0.58	0.58	0.69	0.66	0.66
v/c Ratio		0.03			0.80	0.20	0.03	0.69	0.28	0.34	0.34	0.00
Control Delay (s/veh)		24.2			62.6	8.4	15.3	22.0	8.9	11.4	8.3	0.0
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		24.2			62.6	8.4	15.3	22.0	8.9	11.4	8.3	0.0
LOS		C			E	A	B	C	A	B	A	A
Approach Delay (s/veh)		24.2			49.9			19.9			8.5	
Approach LOS		C			D			B			A	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 50 (42%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay (s/veh): 19.7

Intersection LOS: B

Intersection Capacity Utilization 97.9%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 2: Highway 11 & Sherwood Glen/Dog Wood Boulevard



Queues

2030 Future Background (PM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025



Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	10	250	76	11	1509	285	76	839	1
v/c Ratio	0.03	0.80	0.20	0.03	0.69	0.28	0.34	0.34	0.00
Control Delay (s/veh)	24.2	62.6	8.4	15.3	22.0	8.9	11.4	8.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	24.2	62.6	8.4	15.3	22.0	8.9	11.4	8.3	0.0
Queue Length 50th (m)	1.0	59.0	0.0	1.2	136.1	17.2	4.3	50.6	0.0
Queue Length 95th (m)	5.2	82.3	11.6	5.0	201.0	40.8	12.5	46.0	m0.0
Internal Link Dist (m)	264.1	270.1			657.3			940.2	
Turn Bay Length (m)			65.0	71.0		45.0	70.0		90.0
Base Capacity (vph)	522	426	487	389	2180	1022	260	2451	1132
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.59	0.16	0.03	0.69	0.28	0.29	0.34	0.00

Intersection Summary

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

Lanes, Volumes, Timings
3: Cloverridge Avenue & Crimson King Way

2030 Future Background (PM Peak Hour)

03/28/2025

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	92	43	4	41	40	1
Future Volume (vph)	92	43	4	41	40	1
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.957				0.997	
Flt Protected				0.995	0.953	
Satd. Flow (prot)	1914	0	0	1990	1900	0
Flt Permitted				0.995	0.953	
Satd. Flow (perm)	1914	0	0	1990	1900	0
Link Speed (k/h)	40			40	40	
Link Distance (m)	181.0			280.7	206.8	
Travel Time (s)	16.3			25.3	18.6	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	112	52	5	50	49	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	164	0	0	55	50	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)		15	25		25	15
Sign Control	Stop			Stop	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	17.1%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 3: Cloverridge Avenue & Crimson King Way

2030 Future Background (PM Peak Hour)

03/28/2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	92	43	4	41	40	1
Future Volume (vph)	92	43	4	41	40	1
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	112	52	5	50	49	1
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	164	55	50			
Volume Left (vph)	0	5	49			
Volume Right (vph)	52	0	1			
Hadj (s)	-0.19	0.02	0.18			
Departure Headway (s)	3.9	4.2	4.5			
Degree Utilization, x	0.18	0.06	0.06			
Capacity (veh/h)	908	839	751			
Control Delay (s/veh)	7.7	7.5	7.8			
Approach Delay (s/veh)	7.7	7.5	7.8			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.7			
Level of Service			A			
Intersection Capacity Utilization			17.1%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2030 Future Background (PM Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	398	171	16	31	79	712	22	1513	59	423	845	222
Future Volume (vph)	398	171	16	31	79	712	22	1513	59	423	845	222
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	35.0			33.0			48.0			72.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00					0.97
Fr't			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1845	1942	1700	1827	1770	1635	1900	3725	1574	1845	3689	1667
Flt Permitted	0.549			0.641			0.307			0.072		
Satd. Flow (perm)	1066	1942	1700	1233	1770	1635	613	3725	1574	140	3689	1617
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98			*360			141			239
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		97.6			105.0			943.2			393.8	
Travel Time (s)		5.9			6.3			48.5			20.3	
Confl. Peds. (#/hr)							5					5
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	1.00	0.93	0.93	0.93	1.00	0.93	0.93
Heavy Vehicles (%)	3%	3%	0%	4%	13%	4%	0%	2%	8%	3%	3%	2%
Adj. Flow (vph)	428	184	17	33	85	712	24	1627	63	423	909	239
Shared Lane Traffic (%)												
Lane Group Flow (vph)	428	184	17	33	85	712	24	1627	63	423	909	239
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

2030 Future Background (PM Peak Hour) 3:22 pm 03/27/2025

Synchro 11 Report
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Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2030 Future Background (PM Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	1	6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	28.5	28.5	11.0	28.5	11.0	11.0	41.5	41.5	11.0	41.5	41.5
Total Split (s)	29.0	33.5	33.5	24.0	28.5	24.0	24.0	57.5	57.5	24.0	57.5	57.5
Total Split (%)	20.9%	24.1%	24.1%	17.3%	20.5%	17.3%	17.3%	41.4%	41.4%	17.3%	41.4%	41.4%
Maximum Green (s)	25.0	25.0	25.0	20.0	19.5	20.0	20.0	50.0	50.0	20.0	50.0	50.0
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.5	1.0	1.0	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	4.0	8.5	8.5	4.0	9.0	2.0	4.0	7.5	7.5	3.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		30.0	30.0		30.0			27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0			5	5		5	5
Act Effect Green (s)	46.3	34.7	34.7	24.8	12.2	43.3	60.6	50.0	50.0	78.5	67.5	67.5
Actuated g/C Ratio	0.35	0.26	0.26	0.19	0.09	0.33	0.46	0.38	0.38	0.60	0.51	0.51
v/c Ratio	0.82	0.36	0.03	0.12	0.52	0.92	0.07	1.15	0.09	1.19	0.48	0.25
Control Delay (s/veh)	50.7	43.4	0.1	30.9	68.4	38.2	13.5	114.2	0.3	147.0	23.0	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	50.7	43.4	0.1	30.9	68.4	38.2	13.5	114.2	0.3	147.0	23.0	3.1
LOS	D	D	A	C	E	D	B	F	A	F	C	A
Approach Delay (s/veh)		47.2			41.0			108.6			53.4	
Approach LOS		D			D			F			D	

Intersection Summary

Area Type: Other

Cycle Length: 139

Actuated Cycle Length: 131.8

Natural Cycle: 145

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.19

Intersection Signal Delay (s/veh): 70.4

Intersection LOS: E

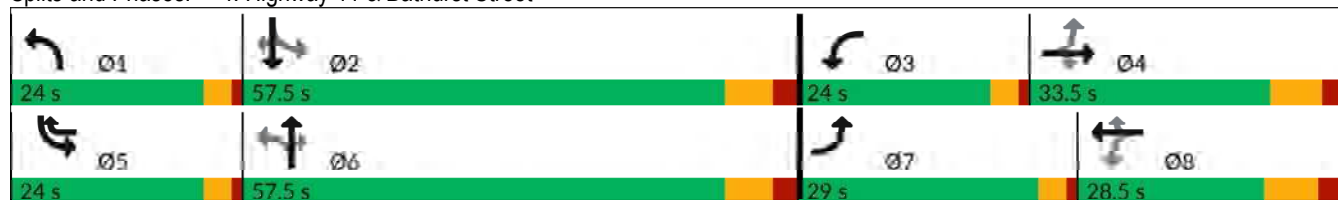
Intersection Capacity Utilization 115.5%

ICU Level of Service H

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 4: Highway 11 & Bathurst Street



2030 Future Background (PM Peak Hour) 3:22 pm 03/27/2025

Synchro 11 Report

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Queues
4: Highway 11 & Bathurst Street

2030 Future Background (PM Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	428	184	17	33	85	712	24	1627	63	423	909	239
v/c Ratio	0.82	0.36	0.03	0.12	0.52	0.92	0.07	1.15	0.09	1.19	0.48	0.25
Control Delay (s/veh)	50.7	43.4	0.1	30.9	68.4	38.2	13.5	114.2	0.3	147.0	23.0	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	50.7	43.4	0.1	30.9	68.4	38.2	13.5	114.2	0.3	147.0	23.0	3.1
Queue Length 50th (m)	98.5	42.9	0.0	6.0	22.5	105.9	2.6	~272.6	0.0	~120.9	87.6	0.0
Queue Length 95th (m)	#137.9	67.2	0.0	13.6	40.5	#188.5	7.1	#335.0	0.0	#197.5	114.7	14.9
Internal Link Dist (m)		73.6			81.0			919.2			369.8	
Turn Bay Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Base Capacity (vph)	522	511	519	438	262	778	537	1413	684	355	1888	944
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.36	0.03	0.08	0.32	0.92	0.04	1.15	0.09	1.19	0.48	0.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	7	3	1418	6	2	890
Future Volume (vph)	7	3	1418	6	2	890
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	0.0		30.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	0.963			0.850		
Flt Protected	0.965				0.950	
Satd. Flow (prot)	1822	0	3725	1667	1863	3689
Flt Permitted	0.965				0.157	
Satd. Flow (perm)	1822	0	3725	1667	308	3689
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	3			3		
Link Speed (k/h)	30		70			70
Link Distance (m)	61.4		262.5			943.2
Travel Time (s)	7.4		13.5			48.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%
Adj. Flow (vph)	8	3	1541	7	2	967
Shared Lane Traffic (%)						
Lane Group Flow (vph)	11	0	1541	7	2	967
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	100	100		100	100	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (m)	2.0		10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0		0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA	Perm	Perm	NA
Protected Phases	8		6			2

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases				6	2	
Detector Phase	8		6	6	2	2
Switch Phase						
Minimum Initial (s)	10.0		40.0	40.0	40.0	40.0
Minimum Split (s)	35.0		47.5	47.5	47.5	47.5
Total Split (s)	36.0		84.0	84.0	84.0	84.0
Total Split (%)	30.0%		70.0%	70.0%	70.0%	70.0%
Maximum Green (s)	29.0		76.5	76.5	76.5	76.5
Yellow Time (s)	4.0		5.0	5.0	5.0	5.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		7.5	7.5	7.5	7.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Don't Walk (s)	21.0		14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	10.0		115.1	115.1	115.1	115.1
Actuated g/C Ratio	0.08		0.96	0.96	0.96	0.96
v/c Ratio	0.07		0.43	0.00	0.01	0.27
Control Delay (s/veh)	44.3		0.8	0.0	1.5	1.1
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay (s/veh)	44.3		0.8	0.0	1.5	1.1
LOS	D		A	A	A	A
Approach Delay (s/veh)	44.3		0.8			1.1
Approach LOS	D		A			A
Intersection Summary						
Area Type:	Other					
Cycle Length: 120						
Actuated Cycle Length: 120						
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green						
Natural Cycle: 85						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.43						
Intersection Signal Delay (s/veh): 1.1				Intersection LOS: A		
Intersection Capacity Utilization 79.2%				ICU Level of Service D		
Analysis Period (min) 15						

Splits and Phases: 100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access



Queues

2030 Future Background (PM Peak Hour)

100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access

03/28/2025



Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	11	1541	7	2	967
v/c Ratio	0.07	0.43	0.00	0.01	0.27
Control Delay (s/veh)	44.3	0.8	0.0	1.5	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	44.3	0.8	0.0	1.5	1.1
Queue Length 50th (m)	1.9	3.7	0.0	0.0	0.0
Queue Length 95th (m)	8.0	4.6	m0.0	0.6	35.0
Internal Link Dist (m)	37.4	238.5			919.2
Turn Bay Length (m)			30.0	15.0	
Base Capacity (vph)	442	3573	1599	295	3538
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.02	0.43	0.00	0.01	0.27

Intersection Summary

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

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2030 Future Background (PM Peak Hour) - Optimized
03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	398	171	16	31	79	712	22	1513	59	423	845	222
Future Volume (vph)	398	171	16	31	79	712	22	1513	59	423	845	222
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	35.0			33.0			48.0			72.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00					0.97
Fr't			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1845	1942	1700	1827	1770	1635	1900	3725	1574	1845	3689	1667
Flt Permitted	0.549			0.641			0.314			0.068		
Satd. Flow (perm)	1066	1942	1700	1233	1770	1635	627	3725	1574	132	3689	1617
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98			*360			141			239
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		97.6			105.0			943.2			393.8	
Travel Time (s)		5.9			6.3			48.5			20.3	
Confl. Peds. (#/hr)							5					5
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	1.00	0.93	0.93	0.93	1.00	0.93	0.93
Heavy Vehicles (%)	3%	3%	0%	4%	13%	4%	0%	2%	8%	3%	3%	2%
Adj. Flow (vph)	428	184	17	33	85	712	24	1627	63	423	909	239
Shared Lane Traffic (%)												
Lane Group Flow (vph)	428	184	17	33	85	712	24	1627	63	423	909	239
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2030 Future Background (PM Peak Hour) - Optimized
03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	1	6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	28.5	28.5	11.0	28.5	11.0	11.0	41.5	41.5	11.0	41.5	41.5
Total Split (s)	23.5	33.5	33.5	18.5	28.5	26.0	24.0	61.0	61.0	26.0	63.0	63.0
Total Split (%)	16.9%	24.1%	24.1%	13.3%	20.5%	18.7%	17.3%	43.9%	43.9%	18.7%	45.3%	45.3%
Maximum Green (s)	19.5	25.0	25.0	14.5	19.5	22.0	20.0	53.5	53.5	22.0	55.5	55.5
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.5	1.0	1.0	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	4.0	8.5	8.5	4.0	9.0	2.0	4.0	7.5	7.5	3.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		30.0	30.0		30.0			27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0			5	5		5	5
Act Effect Green (s)	40.8	29.1	29.1	24.9	12.2	45.3	64.0	53.5	53.5	84.0	73.0	73.0
Actuated g/C Ratio	0.31	0.22	0.22	0.19	0.09	0.34	0.49	0.41	0.41	0.64	0.55	0.55
v/c Ratio	0.96	0.43	0.04	0.12	0.52	0.89	0.06	1.08	0.09	1.10	0.45	0.24
Control Delay (s/veh)	76.9	49.4	0.1	33.8	68.4	34.7	11.6	84.2	0.2	115.5	19.3	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	76.9	49.4	0.1	33.8	68.4	34.7	11.6	84.2	0.2	115.5	19.3	2.7
LOS	E	D	A	C	E	C	B	F	A	F	B	A
Approach Delay (s/veh)		66.8			38.1			80.1			42.7	
Approach LOS		E			D			F			D	

Intersection Summary

Area Type: Other

Cycle Length: 139

Actuated Cycle Length: 131.8

Natural Cycle: 145

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.10

Intersection Signal Delay (s/veh): 58.6

Intersection LOS: E

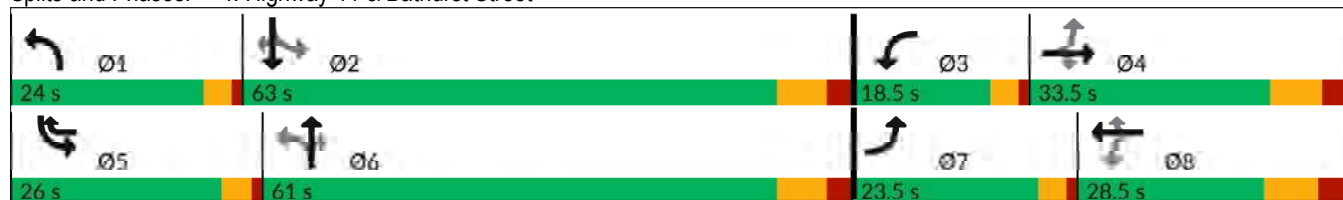
Intersection Capacity Utilization 115.5%

ICU Level of Service H

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 4: Highway 11 & Bathurst Street



2030 Future Background (PM Peak Hour) - Optimized 3:22 pm 03/27/2025 Synchro 11 Report

Queues
4: Highway 11 & Bathurst Street

2030 Future Background (PM Peak Hour) - Optimized
03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	428	184	17	33	85	712	24	1627	63	423	909	239
v/c Ratio	0.96	0.43	0.04	0.12	0.52	0.89	0.06	1.08	0.09	1.10	0.45	0.24
Control Delay (s/veh)	76.9	49.4	0.1	33.8	68.4	34.7	11.6	84.2	0.2	115.5	19.3	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	76.9	49.4	0.1	33.8	68.4	34.7	11.6	84.2	0.2	115.5	19.3	2.7
Queue Length 50th (m)	105.3	45.5	0.0	6.4	22.5	103.2	2.3	~257.8	0.0	~112.7	79.8	0.0
Queue Length 95th (m)	#177.6	71.2	0.0	14.6	40.5	#184.5	6.3	#320.2	0.0	#189.3	105.2	13.6
Internal Link Dist (m)		73.6			81.0			919.2			369.8	
Turn Bay Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Base Capacity (vph)	444	430	453	362	262	797	559	1512	723	383	2042	1002
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.43	0.04	0.09	0.32	0.89	0.04	1.08	0.09	1.10	0.45	0.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2030 Future Background (SAT Peak Hour)

03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	43	34	912	54	27	809
Future Volume (vph)	43	34	912	54	27	809
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	45.0		92.0	84.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	7.5				50.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1900	1700	3762	1700	1900	3762
Flt Permitted	0.950				0.244	
Satd. Flow (perm)	1900	1700	3762	1700	488	3762
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		37		59		
Link Speed (k/h)	40		70			70
Link Distance (m)	181.0		968.7			263.6
Travel Time (s)	16.3		49.8			13.6
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	47	37	1002	59	30	889
Shared Lane Traffic (%)						
Lane Group Flow (vph)	47	37	1002	59	30	889
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	2.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		6		5	2

2030 Future Background (SAT Peak Hour) 3:28 pm 03/27/2025

Synchro 11 Report
Page 1

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2030 Future Background (SAT Peak Hour)
03/28/2025

	←		↑		→	
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases	8		6		2	
Detector Phase	8	8	6	6	5	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	40.0	40.0	7.0	40.0
Minimum Split (s)	26.0	26.0	47.5	47.5	11.0	47.5
Total Split (s)	26.0	26.0	47.5	47.5	11.0	58.5
Total Split (%)	30.8%	30.8%	56.2%	56.2%	13.0%	69.2%
Maximum Green (s)	19.0	19.0	40.0	40.0	7.0	51.0
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	3.0	3.0	2.5	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.5	7.5	4.0	7.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	Max	Max	None	Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Don't Walk (s)	21.0	21.0	14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effect Green (s)	10.1	10.1	56.0	56.0	62.6	60.7
Actuated g/C Ratio	0.13	0.13	0.70	0.70	0.78	0.76
v/c Ratio	0.20	0.15	0.38	0.05	0.06	0.31
Control Delay (s/veh)	33.1	12.1	8.0	2.8	3.1	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	33.1	12.1	8.0	2.8	3.1	4.6
LOS	C	B	A	A	A	A
Approach Delay (s/veh)	23.9		7.7			4.6
Approach LOS	C		A			A

Intersection Summary

Area Type: Other

Cycle Length: 84.5

Actuated Cycle Length: 80

Natural Cycle: 85

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.38

Intersection Signal Delay (s/veh): 7.0

Intersection LOS: A

Intersection Capacity Utilization 53.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Highway 11 & Crimson King Way



Queues

2030 Future Background (SAT Peak Hour)

1: Highway 11 & Crimson King Way

03/28/2025



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	47	37	1002	59	30	889
v/c Ratio	0.20	0.15	0.38	0.05	0.06	0.31
Control Delay (s/veh)	33.1	12.1	8.0	2.8	3.1	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	33.1	12.1	8.0	2.8	3.1	4.6
Queue Length 50th (m)	7.4	0.0	29.5	0.0	1.0	25.2
Queue Length 95th (m)	15.9	7.9	62.7	4.9	2.9	33.9
Internal Link Dist (m)	157.0		944.7			239.6
Turn Bay Length (m)		45.0		92.0	84.0	
Base Capacity (vph)	454	434	2633	1207	505	2853
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.09	0.38	0.05	0.06	0.31
Intersection Summary						

Lanes, Volumes, Timings

2030 Future Background (SAT Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	0	9	75	0	8	15	941	66	2	858	0
Future Volume (vph)	3	0	9	75	0	8	15	941	66	2	858	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0		0.0	0.0		65.0	71.0		45.0	70.0		90.0
Storage Lanes	0		0	0		1	1		1	1		1
Taper Length (m)	7.5			7.5			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		0.99			1.00	0.99						
Frt		0.896				0.850			0.850			
Flt Protected		0.989			0.950		0.950			0.950		
Satd. Flow (prot)	0	1755	0	0	1900	1700	1900	3762	1700	1900	3762	2000
Flt Permitted		0.897			0.749		0.312			0.246		
Satd. Flow (perm)	0	1591	0	0	1497	1678	624	3762	1700	492	3762	2000
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		109				109			109			
Link Speed (k/h)		40			40			70			70	
Link Distance (m)		288.1			294.1			681.3			968.7	
Travel Time (s)		25.9			26.5			35.0			49.8	
Confl. Peds. (#/hr)	1		1	1		1						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Adj. Flow (vph)	3	0	10	80	0	9	16	1001	70	2	913	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	13	0	0	80	9	16	1001	70	2	913	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

2030 Future Background (SAT Peak Hour) 3:28 pm 03/27/2025

Synchro 11 Report

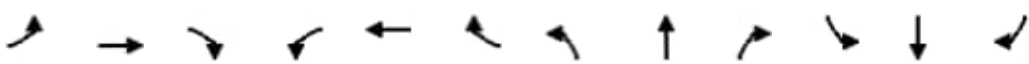
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Lanes, Volumes, Timings

2030 Future Background (SAT Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			6		5	2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	40.0	40.0	40.0	7.0	40.0	40.0
Minimum Split (s)	26.5	26.5		26.5	26.5	26.5	47.5	47.5	47.5	11.0	47.5	47.5
Total Split (s)	26.5	26.5		26.5	26.5	26.5	47.5	47.5	47.5	11.0	58.5	58.5
Total Split (%)	31.2%	31.2%		31.2%	31.2%	31.2%	55.9%	55.9%	55.9%	12.9%	68.8%	68.8%
Maximum Green (s)	19.0	19.0		19.0	19.0	19.0	40.0	40.0	40.0	7.0	51.0	51.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.5	3.5		3.5	3.5	3.5	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5			7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	0.2	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None		None	None	None	Max	Max	Max	None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Don't Walk (s)	26.0	26.0		26.0	26.0	26.0	16.0	16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0	0		0	0
Act Effect Green (s)		11.0			11.0	11.0	58.4	58.4	58.4	62.5	60.7	
Actuated g/C Ratio		0.14			0.14	0.14	0.72	0.72	0.72	0.77	0.75	
v/c Ratio		0.04			0.40	0.03	0.04	0.37	0.06	0.00	0.32	
Control Delay (s/veh)		0.3			38.1	0.1	7.7	7.3	1.0	3.5	5.3	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)		0.3			38.1	0.1	7.7	7.3	1.0	3.5	5.3	
LOS		A			D	A	A	A	A	A	A	
Approach Delay (s/veh)		0.3			34.2			6.9			5.3	
Approach LOS		A			C			A			A	

Intersection Summary

Area Type: Other

Cycle Length: 85

Actuated Cycle Length: 81.2

Natural Cycle: 85

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.40

Intersection Signal Delay (s/veh): 7.3

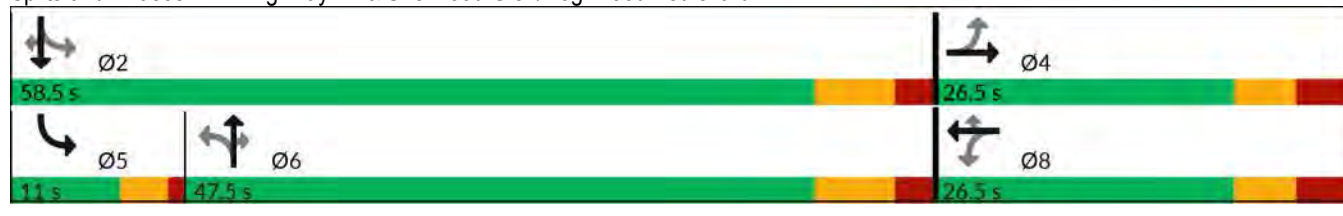
Intersection LOS: A

Intersection Capacity Utilization 70.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 2: Highway 11 & Sherwood Glen/Dog Wood Boulevard



2030 Future Background (SAT Peak Hour) 3:28 pm 03/27/2025

Synchro 11 Report

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Queues

2030 Future Background (SAT Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025



Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	13	80	9	16	1001	70	2	913
v/c Ratio	0.04	0.40	0.03	0.04	0.37	0.06	0.00	0.32
Control Delay (s/veh)	0.3	38.1	0.1	7.7	7.3	1.0	3.5	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	0.3	38.1	0.1	7.7	7.3	1.0	3.5	5.3
Queue Length 50th (m)	0.0	12.9	0.0	0.7	30.3	0.0	0.1	26.8
Queue Length 95th (m)	0.0	24.1	0.0	4.4	70.3	2.9	0.7	42.0
Internal Link Dist (m)	264.1	270.1			657.3			944.7
Turn Bay Length (m)			65.0	71.0		45.0	70.0	
Base Capacity (vph)	457	352	478	449	2706	1253	501	2811
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.23	0.02	0.04	0.37	0.06	0.00	0.32
Intersection Summary								

Lanes, Volumes, Timings
3: Cloverridge Avenue & Crimson King Way

2030 Future Background (SAT Peak Hour)

03/28/2025

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	52	29	4	45	32	4
Future Volume (vph)	52	29	4	45	32	4
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.951				0.986	
Flt Protected				0.996	0.957	
Satd. Flow (prot)	1902	0	0	1992	1887	0
Flt Permitted				0.996	0.957	
Satd. Flow (perm)	1902	0	0	1992	1887	0
Link Speed (k/h)	40			40	40	
Link Distance (m)	181.0			280.7	206.8	
Travel Time (s)	16.3			25.3	18.6	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	69	39	5	60	43	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	108	0	0	65	48	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)		15	25		25	15
Sign Control	Stop			Stop	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	15.4%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 2030 Future Background (SAT Peak Hour)
 3: Cloverridge Avenue & Crimson King Way 03/28/2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	52	29	4	45	32	4
Future Volume (vph)	52	29	4	45	32	4
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	69	39	5	60	43	5
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	108	65	48			
Volume Left (vph)	0	5	43			
Volume Right (vph)	39	0	5			
Hadj (s)	-0.22	0.02	0.12			
Departure Headway (s)	3.9	4.1	4.4			
Degree Utilization, x	0.12	0.07	0.06			
Capacity (veh/h)	914	854	785			
Control Delay (s/veh)	7.4	7.5	7.6			
Approach Delay (s/veh)	7.4	7.5	7.6			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.5			
Level of Service			A			
Intersection Capacity Utilization			15.4%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2030 Future Background (SAT Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	271	113	20	38	94	458	25	879	50	373	833	215
Future Volume (vph)	271	113	20	38	94	458	25	879	50	373	833	215
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	35.0			33.0			48.0			72.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00					0.99						
Fr't			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1881	1942	1619	1900	1942	1667	1900	3762	1700	1863	3762	1683
Flt Permitted	0.537			0.680			0.321			0.161		
Satd. Flow (perm)	1062	1942	1619	1360	1942	1645	642	3762	1700	316	3762	1683
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98			114			141			229
Link Speed (k/h)		60			60			70				70
Link Distance (m)		97.6			105.0			942.1				393.8
Travel Time (s)		5.9			6.3			48.5				20.3
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	1%	3%	5%	0%	3%	2%	0%	1%	0%	2%	1%	1%
Adj. Flow (vph)	288	120	21	40	100	487	27	935	53	397	886	229
Shared Lane Traffic (%)												
Lane Group Flow (vph)	288	120	21	40	100	487	27	935	53	397	886	229
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

2030 Future Background (SAT Peak Hour) 3:28 pm 03/27/2025

Synchro 11 Report
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Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2030 Future Background (SAT Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	1	6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	28.5	28.5	11.0	28.5	11.0	11.0	41.5	41.5	11.0	41.5	41.5
Total Split (s)	29.0	33.5	33.5	24.0	28.5	24.0	24.0	57.5	57.5	24.0	57.5	57.5
Total Split (%)	20.9%	24.1%	24.1%	17.3%	20.5%	17.3%	17.3%	41.4%	41.4%	17.3%	41.4%	41.4%
Maximum Green (s)	25.0	25.0	25.0	20.0	19.5	20.0	20.0	50.0	50.0	20.0	50.0	50.0
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.5	1.0	1.0	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	8.5	8.5	4.0	9.0	4.0	4.0	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		30.0	30.0		30.0			27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0			5	5		5	5
Act Effect Green (s)	43.2	29.4	29.4	25.2	12.4	37.5	60.7	50.1	50.1	77.6	67.7	67.7
Actuated g/C Ratio	0.34	0.23	0.23	0.20	0.10	0.29	0.47	0.39	0.39	0.60	0.53	0.53
v/c Ratio	0.58	0.27	0.05	0.13	0.53	0.87	0.07	0.64	0.07	0.92	0.45	0.23
Control Delay (s/veh)	38.5	43.7	0.2	30.9	66.9	48.5	13.5	35.2	0.2	51.3	21.6	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	38.5	43.7	0.2	30.9	66.9	48.5	13.5	35.2	0.2	51.3	21.6	3.1
LOS	D	D	A	C	E	D	B	D	A	D	C	A
Approach Delay (s/veh)		38.1			50.3			32.8			26.6	
Approach LOS		D			D			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 139

Actuated Cycle Length: 128.9

Natural Cycle: 95

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.92

Intersection Signal Delay (s/veh): 33.9

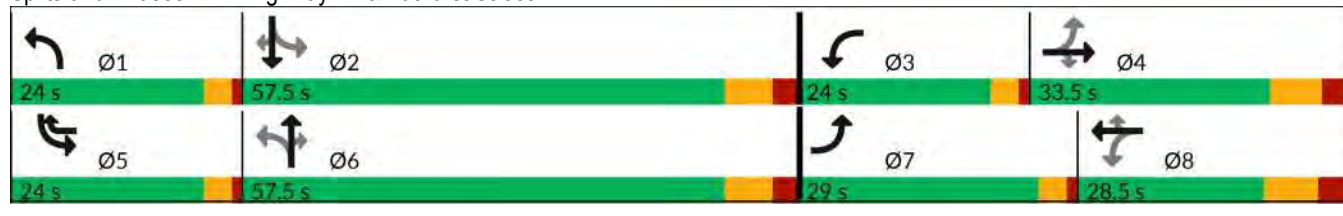
Intersection LOS: C

Intersection Capacity Utilization 80.3%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: Highway 11 & Bathurst Street



2030 Future Background (SAT Peak Hour) 3:28 pm 03/27/2025

Synchro 11 Report

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Queues

2030 Future Background (SAT Peak Hour)

4: Highway 11 & Bathurst Street

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	288	120	21	40	100	487	27	935	53	397	886	229
v/c Ratio	0.58	0.27	0.05	0.13	0.53	0.87	0.07	0.64	0.07	0.92	0.45	0.23
Control Delay (s/veh)	38.5	43.7	0.2	30.9	66.9	48.5	13.5	35.2	0.2	51.3	21.6	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	38.5	43.7	0.2	30.9	66.9	48.5	13.5	35.2	0.2	51.3	21.6	3.1
Queue Length 50th (m)	60.1	27.1	0.0	7.2	26.2	95.0	2.8	107.3	0.0	65.1	82.4	0.0
Queue Length 95th (m)	86.4	46.1	0.0	15.5	46.1	#152.8	7.8	141.3	0.0	#140.3	111.4	14.6
Internal Link Dist (m)		73.6			81.0			918.1			369.8	
Turn Bay Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Base Capacity (vph)	515	447	448	479	294	562	562	1462	746	430	1974	992
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.27	0.05	0.08	0.34	0.87	0.05	0.64	0.07	0.92	0.45	0.23

Intersection Summary

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

Queue shown is maximum after two cycles.

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	946	0	0	891
Future Volume (vph)	0	0	946	0	0	891
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	0.0		30.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt						
Flt Protected						
Satd. Flow (prot)	1961	0	3725	1961	1961	3725
Flt Permitted						
Satd. Flow (perm)	1961	0	3725	1961	1961	3725
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	30		70			70
Link Distance (m)	50.2		263.6			942.1
Travel Time (s)	6.0		13.6			48.5
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	0	0	1140	0	0	1073
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1140	0	0	1073
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (m)	2.0		10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0		0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA	Perm	Perm	NA
Protected Phases	8		6			2
Permitted Phases				6	2	

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8		6	6	2	2
Switch Phase						
Minimum Initial (s)	10.0		40.0	40.0	40.0	40.0
Minimum Split (s)	35.0		47.5	47.5	47.5	47.5
Total Split (s)	36.0		84.0	84.0	84.0	84.0
Total Split (%)	30.0%		70.0%	70.0%	70.0%	70.0%
Maximum Green (s)	29.0		76.5	76.5	76.5	76.5
Yellow Time (s)	4.0		5.0	5.0	5.0	5.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		7.5	7.5	7.5	7.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Don't Walk (s)	21.0		14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)			120.0			120.0
Actuated g/C Ratio			1.00			1.00
v/c Ratio			0.31			0.29
Control Delay (s/veh)			0.2			0.2
Queue Delay			0.0			0.0
Total Delay (s/veh)			0.2			0.2
LOS			A			A
Approach Delay (s/veh)			0.2			0.2
Approach LOS			A			A
Intersection Summary						
Area Type:	Other					
Cycle Length: 120						
Actuated Cycle Length: 120						
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green						
Natural Cycle: 85						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.31						
Intersection Signal Delay (s/veh): 0.2				Intersection LOS: A		
Intersection Capacity Utilization 39.6%				ICU Level of Service A		
Analysis Period (min) 15						

Splits and Phases: 100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access



Queues

2030 Future Background (SAT Peak Hour)

100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access

03/28/2025



Lane Group	NBT	SBT
Lane Group Flow (vph)	1140	1073
v/c Ratio	0.31	0.29
Control Delay (s/veh)	0.2	0.2
Queue Delay	0.0	0.0
Total Delay (s/veh)	0.2	0.2
Queue Length 50th (m)	0.0	0.0
Queue Length 95th (m)	0.0	0.0
Internal Link Dist (m)	239.6	918.1
Turn Bay Length (m)		
Base Capacity (vph)	3725	3725
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.31	0.29
Intersection Summary		

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2035 Future Background (AM Peak Hour)

03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	97	23	580	62	21	1444
Future Volume (vph)	97	23	580	62	21	1444
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	45.0		92.0	84.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	55.0				50.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1863	1545	3585	1700	1473	3725
Flt Permitted	0.950				0.384	
Satd. Flow (perm)	1863	1545	3585	1700	595	3725
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		26		70		
Link Speed (k/h)	40		70			70
Link Distance (m)	77.1		967.6			266.3
Travel Time (s)	6.9		49.8			13.7
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	2%	10%	6%	0%	29%	2%
Adj. Flow (vph)	109	26	652	70	24	1622
Shared Lane Traffic (%)						
Lane Group Flow (vph)	109	26	652	70	24	1622
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	2.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		6		5	2

2035 Future Background (AM Peak Hour) 3:52 pm 03/27/2025

Synchro 11 Report
Page 1

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2035 Future Background (AM Peak Hour)

03/28/2025

	↙ ↖ ↑ ↗ ↘ ↓					
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		8		6	2	
Detector Phase	8	8	6	6	5	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	40.0	40.0	7.0	40.0
Minimum Split (s)	35.0	35.0	47.5	47.5	11.0	47.5
Total Split (s)	36.0	36.0	82.0	82.0	12.0	94.0
Total Split (%)	27.7%	27.7%	63.1%	63.1%	9.2%	72.3%
Maximum Green (s)	29.0	29.0	74.5	74.5	8.0	86.5
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	3.0	3.0	2.5	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.5	7.5	4.0	7.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Don't Walk (s)	21.0	21.0	14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effect Green (s)	13.3	13.3	95.6	95.6	105.7	102.2
Actuated g/C Ratio	0.10	0.10	0.74	0.74	0.81	0.79
v/c Ratio	0.57	0.14	0.25	0.06	0.05	0.55
Control Delay (s/veh)	67.0	19.0	2.1	0.1	2.9	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	67.0	19.0	2.1	0.1	2.9	5.8
LOS	E	B	A	A	A	A
Approach Delay (s/veh)	57.8		1.9			5.7
Approach LOS	E		A			A

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.57

Intersection Signal Delay (s/veh): 7.4

Intersection LOS: A

Intersection Capacity Utilization 58.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Highway 11 & Crimson King Way



Queues

2035 Future Background (AM Peak Hour)

1: Highway 11 & Crimson King Way

03/28/2025



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	109	26	652	70	24	1622
v/c Ratio	0.57	0.14	0.25	0.06	0.05	0.55
Control Delay (s/veh)	67.0	19.0	2.1	0.1	2.9	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	67.0	19.0	2.1	0.1	2.9	5.8
Queue Length 50th (m)	28.6	0.0	6.0	0.0	1.0	72.0
Queue Length 95th (m)	46.2	8.7	9.0	0.3	m2.9	55.5
Internal Link Dist (m)	53.1		943.6			242.3
Turn Bay Length (m)		45.0		92.0	84.0	
Base Capacity (vph)	415	364	2635	1268	537	2927
Starvation Cap Reductn	0	0	0	0	0	148
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.07	0.25	0.06	0.04	0.58

Intersection Summary

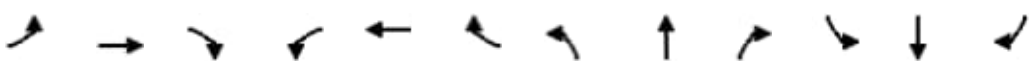
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings

2035 Future Background (AM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	1	0	9	281	0	47	4	625	141	47	1421	3
Future Volume (vph)	1	0	9	281	0	47	4	625	141	47	1421	3
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0		0.0	0.0		65.0	71.0		45.0	70.0		90.0
Storage Lanes	0		0	0		1	1		1	1		1
Taper Length (m)	7.5			7.5			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.877				0.850			0.850			0.850
Flt Protected		0.995			0.950		0.950			0.950		
Satd. Flow (prot)	0	1745	0	0	1881	1700	1900	3585	1589	1900	3725	1700
Flt Permitted		0.974			0.750		0.108			0.331		
Satd. Flow (perm)	0	1708	0	0	1485	1700	216	3585	1589	662	3725	1700
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		71				71			158			38
Link Speed (k/h)		40			40			70			70	
Link Distance (m)		288.1			294.1			681.3			967.6	
Travel Time (s)		25.9			26.5			35.0			49.8	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	6%	7%	0%	2%	0%
Adj. Flow (vph)	1	0	10	316	0	53	4	702	158	53	1597	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	11	0	0	316	53	4	702	158	53	1597	3
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			6		5	2	

2035 Future Background (AM Peak Hour) 3:52 pm 03/27/2025

Synchro 11 Report

Page 4

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	40.0	40.0	40.0	7.0	40.0	40.0
Minimum Split (s)	40.5	40.5		40.5	40.5	40.5	47.5	47.5	47.5	11.0	47.5	47.5
Total Split (s)	42.0	42.0		42.0	42.0	42.0	76.0	76.0	76.0	12.0	88.0	88.0
Total Split (%)	32.3%	32.3%		32.3%	32.3%	32.3%	58.5%	58.5%	58.5%	9.2%	67.7%	67.7%
Maximum Green (s)	34.5	34.5		34.5	34.5	34.5	68.5	68.5	68.5	8.0	80.5	80.5
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.5	3.5		3.5	3.5	3.5	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5			7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	0.2	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Don't Walk (s)	26.0	26.0		26.0	26.0	26.0	16.0	16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0	0		0	0
Act Effect Green (s)		31.1			31.1	31.1	74.9	74.9	74.9	87.4	83.9	83.9
Actuated g/C Ratio		0.24			0.24	0.24	0.58	0.58	0.58	0.67	0.65	0.65
v/c Ratio		0.02			0.89	0.12	0.03	0.34	0.16	0.10	0.66	0.00
Control Delay (s/veh)		0.1			74.4	5.0	15.8	16.2	2.7	12.3	24.5	0.0
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		0.1			74.4	5.0	15.8	16.2	2.7	12.3	24.5	0.0
LOS		A			E	A	B	B	A	B	C	A
Approach Delay (s/veh)		0.1			64.4			13.7			24.0	
Approach LOS		A			E			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 92 (71%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay (s/veh): 26.0

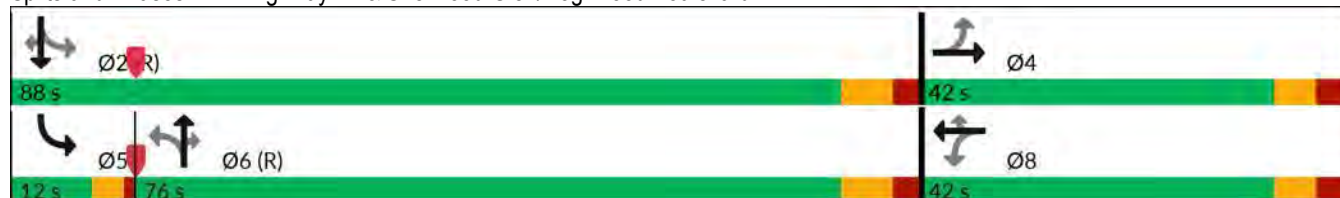
Intersection LOS: C

Intersection Capacity Utilization 100.2%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 2: Highway 11 & Sherwood Glen/Dog Wood Boulevard



Queues

2035 Future Background (AM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025



Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	11	316	53	4	702	158	53	1597	3
v/c Ratio	0.02	0.89	0.12	0.03	0.34	0.16	0.10	0.66	0.00
Control Delay (s/veh)	0.1	74.4	5.0	15.8	16.2	2.7	12.3	24.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	0.1	74.4	5.0	15.8	16.2	2.7	12.3	24.5	0.0
Queue Length 50th (m)	0.0	80.7	0.0	0.5	54.6	0.0	5.8	171.2	0.0
Queue Length 95th (m)	0.0	#123.8	6.5	2.6	69.9	10.4	m13.6	231.7	m0.0
Internal Link Dist (m)	264.1	270.1			657.3			943.6	
Turn Bay Length (m)			65.0	71.0		45.0	70.0		90.0
Base Capacity (vph)	505	394	503	124	2064	982	521	2404	1111
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.80	0.11	0.03	0.34	0.16	0.10	0.66	0.00

Intersection Summary

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

Queue shown is maximum after two cycles.

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	23	27	17	2	51	0	60	0	6	0	0	6
Future Volume (vph)	23	27	17	2	51	0	60	0	6	0	0	6
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Util. 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
Frt		0.965						0.987			0.865	
Flt Protected		0.983			0.998			0.957				
Satd. Flow (prot)	0	1784	0	0	1962	0	0	1807	0	0	1730	0
Flt Permitted		0.983			0.998			0.957				
Satd. Flow (perm)	0	1784	0	0	1962	0	0	1807	0	0	1730	0
Link Speed (k/h)		40			40			40			30	
Link Distance (m)		103.9			280.7			206.8			69.6	
Travel Time (s)		9.4			25.3			18.6			8.4	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	8%	12%	50%	0%	0%	5%	0%	0%	0%	0%	0%
Adj. Flow (vph)	25	30	19	2	56	0	66	0	7	0	0	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	74	0	0	58	0	0	73	0	0	7	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 27.0%

ICU Level of Service A

Analysis Period (min) 15

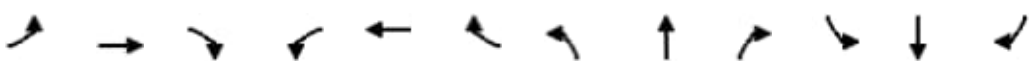
HCM Unsignalized Intersection Capacity Analysis 2035 Future Background (AM Peak Hour) 3: Cloverrick Avenue/Kerbel WHL Employment Phase 2 Site Access & Crimson King Way

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	23	27	17	2	51	0	60	0	6	0	0	6
Future Volume (vph)	23	27	17	2	51	0	60	0	6	0	0	6
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	25	30	19	2	56	0	66	0	7	0	0	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	74	58	73	7								
Volume Left (vph)	25	2	66	0								
Volume Right (vph)	19	0	7	7								
Hadj (s)	0.02	0.04	0.20	-0.60								
Departure Headway (s)	4.2	4.2	4.4	3.7								
Degree Utilization, x	0.09	0.07	0.09	0.01								
Capacity (veh/h)	842	836	788	937								
Control Delay (s/veh)	7.6	7.5	7.8	6.7								
Approach Delay (s/veh)	7.6	7.5	7.8	6.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.6								
Level of Service				A								
Intersection Capacity Utilization				27.0%	ICU Level of Service	A						
Analysis Period (min)				15								

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2035 Future Background (AM Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	110	8	38	157	367	27	478	34	505	1321	459
Future Volume (vph)	150	110	8	38	157	367	27	478	34	505	1321	459
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	35.0			33.0			48.0			72.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1792	1754	1133	1759	1869	1574	1827	3654	1478	1810	3725	1667
Flt Permitted	0.445			0.680			0.113			0.375		
Satd. Flow (perm)	840	1754	1133	1259	1869	1574	217	3654	1478	714	3725	1667
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98			266			141			499
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		97.6			105.0			939.3			393.8	
Travel Time (s)		5.9			6.3			48.3			20.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	14%	50%	8%	7%	8%	4%	4%	15%	5%	2%	2%
Adj. Flow (vph)	163	120	9	41	171	399	29	520	37	549	1436	499
Shared Lane Traffic (%)												
Lane Group Flow (vph)	163	120	9	41	171	399	29	520	37	549	1436	499
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	1	6		5	2	

2035 Future Background (AM Peak Hour) 3:52 pm 03/27/2025

Synchro 11 Report
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Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2035 Future Background (AM Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	28.5	28.5	11.0	28.5	11.0	11.0	41.5	41.5	11.0	41.5	41.5
Total Split (s)	29.0	33.5	33.5	24.0	28.5	24.0	24.0	57.5	57.5	24.0	57.5	57.5
Total Split (%)	20.9%	24.1%	24.1%	17.3%	20.5%	17.3%	17.3%	41.4%	41.4%	17.3%	41.4%	41.4%
Maximum Green (s)	25.0	25.0	25.0	20.0	19.5	20.0	20.0	50.0	50.0	20.0	50.0	50.0
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.5	1.0	1.0	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	8.5	8.5	4.0	9.0	4.0	4.0	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		30.0	30.0		30.0			27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effect Green (s)	40.0	26.0	26.0	28.8	15.9	45.0	60.8	50.1	50.1	77.7	67.8	67.8
Actuated g/C Ratio	0.32	0.21	0.21	0.23	0.13	0.36	0.48	0.40	0.40	0.62	0.54	0.54
v/c Ratio	0.43	0.33	0.03	0.13	0.73	0.54	0.15	0.36	0.05	0.89	0.72	0.44
Control Delay (s/veh)	35.2	46.0	0.1	30.6	71.5	13.4	14.2	28.4	0.1	35.2	26.7	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	35.2	46.0	0.1	30.6	71.5	13.4	14.2	28.4	0.1	35.2	26.7	3.0
LOS	D	D	A	C	E	B	B	C	A	D	C	A
Approach Delay (s/veh)		38.6			30.8			25.9			23.8	
Approach LOS		D			C			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 139

Actuated Cycle Length: 125.8

Natural Cycle: 95

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.89

Intersection Signal Delay (s/veh): 26.3

Intersection LOS: C

Intersection Capacity Utilization 79.9%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: Highway 11 & Bathurst Street



Queues

2035 Future Background (AM Peak Hour)

4: Highway 11 & Bathurst Street

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	163	120	9	41	171	399	29	520	37	549	1436	499
v/c Ratio	0.43	0.33	0.03	0.13	0.73	0.54	0.15	0.36	0.05	0.89	0.72	0.44
Control Delay (s/veh)	35.2	46.0	0.1	30.6	71.5	13.4	14.2	28.4	0.1	35.2	26.7	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	35.2	46.0	0.1	30.6	71.5	13.4	14.2	28.4	0.1	35.2	26.7	3.0
Queue Length 50th (m)	31.7	27.4	0.0	7.4	43.4	24.9	2.8	49.8	0.0	75.1	156.6	0.0
Queue Length 95th (m)	50.2	46.8	0.0	16.0	71.5	59.7	8.1	71.9	0.0	#165.0	213.2	19.3
Internal Link Dist (m)		73.6			81.0			915.3			369.8	
Turn Bay Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Base Capacity (vph)	457	377	320	468	290	733	383	1456	673	615	2006	1128
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.32	0.03	0.09	0.59	0.54	0.08	0.36	0.05	0.89	0.72	0.44

Intersection Summary

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

Queue shown is maximum after two cycles.

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	3	3	597	5	9	1357
Future Volume (vph)	3	3	597	5	9	1357
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	0.0		30.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	0.932			0.850		
Flt Protected	0.976				0.950	
Satd. Flow (prot)	1819	0	3585	1700	1900	3725
Flt Permitted	0.976				0.405	
Satd. Flow (perm)	1819	0	3585	1700	810	3725
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	3			5		
Link Speed (k/h)	30		70			70
Link Distance (m)	50.5		266.3			939.3
Travel Time (s)	6.1		13.7			48.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	6%	0%	0%	2%
Adj. Flow (vph)	3	3	649	5	10	1475
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	0	649	5	10	1475
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	100	100		100	100	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (m)	2.0		10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0		0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA	Perm	Perm	NA
Protected Phases	8		6			2

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases				6	2	
Detector Phase	8		6	6	2	2
Switch Phase						
Minimum Initial (s)	10.0		40.0	40.0	40.0	40.0
Minimum Split (s)	35.0		47.5	47.5	47.5	47.5
Total Split (s)	36.0		94.0	94.0	94.0	94.0
Total Split (%)	27.7%		72.3%	72.3%	72.3%	72.3%
Maximum Green (s)	29.0		86.5	86.5	86.5	86.5
Yellow Time (s)	4.0		5.0	5.0	5.0	5.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		7.5	7.5	7.5	7.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Don't Walk (s)	21.0		14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effect Green (s)	10.0		125.1	125.1	125.1	125.1
Actuated g/C Ratio	0.08		0.96	0.96	0.96	0.96
v/c Ratio	0.04		0.19	0.00	0.01	0.41
Control Delay (s/veh)	44.5		0.3	0.0	1.2	1.4
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay (s/veh)	44.5		0.3	0.0	1.2	1.4
LOS	D		A	A	A	A
Approach Delay (s/veh)	44.5		0.3			1.4
Approach LOS	D		A			A

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.41

Intersection Signal Delay (s/veh): 1.2

Intersection LOS: A

Intersection Capacity Utilization 79.2%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access



Queues

2035 Future Background (AM Peak Hour)

100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access

03/28/2025



Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	6	649	5	10	1475
v/c Ratio	0.04	0.19	0.00	0.01	0.41
Control Delay (s/veh)	44.5	0.3	0.0	1.2	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	44.5	0.3	0.0	1.2	1.4
Queue Length 50th (m)	0.8	0.0	0.0	0.0	0.0
Queue Length 95th (m)	5.4	4.2	m0.1	1.4	62.4
Internal Link Dist (m)	26.5	242.3			915.3
Turn Bay Length (m)			30.0	15.0	
Base Capacity (vph)	408	3450	1636	779	3584
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.19	0.00	0.01	0.41

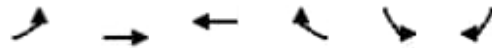
Intersection Summary

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



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	16	51	112	0	0	4
Future Volume (vph)	16	51	112	0	0	4
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t					0.865	
Fl _t Protected		0.988				
Satd. Flow (prot)	0	1976	2000	0	1730	0
Fl _t Permitted		0.988				
Satd. Flow (perm)	0	1976	2000	0	1730	0
Link Speed (k/h)		50	50		30	
Link Distance (m)		77.1	103.9		38.6	
Travel Time (s)		5.6	7.5		4.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	17	55	122	0	0	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	72	122	0	4	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	100			100	100	100
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	20.1%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 2035 Future Background (AM Peak Hour)
 102: Crimson King Way & Kerbel WHL Employment Phase 2 Site Access 03/28/2025



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	51	112	0	0	4
Future Volume (Veh/h)	16	51	112	0	0	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	55	122	0	0	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)		77				
pX, platoon unblocked						
vC, conflicting volume	122				211	122
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	122				211	122
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	100
cM capacity (veh/h)	1478				773	935
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	72	122	4			
Volume Left	17	0	0			
Volume Right	0	0	4			
cSH	1478	1700	935			
Volume to Capacity	0.01	0.07	0.00			
Queue Length 95th (m)	0.3	0.0	0.1			
Control Delay (s/veh)	1.8	0.0	8.9			
Lane LOS	A		A			
Approach Delay (s/veh)	1.8	0.0	8.9			
Approach LOS			A			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			20.1%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2035 Future Background (PM Peak Hour)

03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	87	24	1403	88	59	833
Future Volume (vph)	87	24	1403	88	59	833
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	45.0		92.0	84.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	7.5				50.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1845	1700	3725	1700	1863	3725
Flt Permitted	0.950				0.136	
Satd. Flow (perm)	1845	1700	3725	1700	267	3725
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		25		91		
Link Speed (k/h)	40		70			70
Link Distance (m)	77.7		970.2			266.2
Travel Time (s)	7.0		49.9			13.7
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	0%	2%	0%	2%	2%
Adj. Flow (vph)	90	25	1446	91	61	859
Shared Lane Traffic (%)						
Lane Group Flow (vph)	90	25	1446	91	61	859
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	2.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		6		5	2

2035 Future Background (PM Peak Hour) 3:54 pm 03/27/2025

Synchro 11 Report
Page 1

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2035 Future Background (PM Peak Hour)

03/28/2025

	←		↑		→	
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		8		6	2	
Detector Phase	8	8	6	6	5	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	40.0	40.0	7.0	40.0
Minimum Split (s)	35.0	35.0	47.5	47.5	11.0	47.5
Total Split (s)	36.0	36.0	72.0	72.0	12.0	84.0
Total Split (%)	30.0%	30.0%	60.0%	60.0%	10.0%	70.0%
Maximum Green (s)	29.0	29.0	64.5	64.5	8.0	76.5
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	3.0	3.0	2.5	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.5	7.5	4.0	7.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Don't Walk (s)	21.0	21.0	14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effect Green (s)	11.9	11.9	84.7	84.7	97.1	93.6
Actuated g/C Ratio	0.10	0.10	0.71	0.71	0.81	0.78
v/c Ratio	0.49	0.13	0.55	0.07	0.20	0.30
Control Delay (s/veh)	60.1	18.5	9.8	0.8	4.2	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	60.1	18.5	9.8	0.8	4.2	3.9
LOS	E	B	A	A	A	A
Approach Delay (s/veh)	51.0		9.3			4.0
Approach LOS	D		A			A

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.55

Intersection Signal Delay (s/veh): 9.2

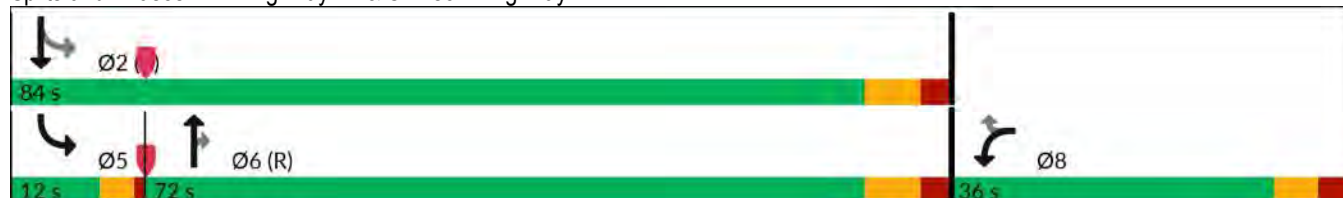
Intersection LOS: A

Intersection Capacity Utilization 66.4%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Highway 11 & Crimson King Way



Queues

2035 Future Background (PM Peak Hour)

1: Highway 11 & Crimson King Way

03/28/2025



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	90	25	1446	91	61	859
v/c Ratio	0.49	0.13	0.55	0.07	0.20	0.30
Control Delay (s/veh)	60.1	18.5	9.8	0.8	4.2	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	60.1	18.5	9.8	0.8	4.2	3.9
Queue Length 50th (m)	21.6	0.0	161.6	2.3	2.3	25.7
Queue Length 95th (m)	37.9	8.5	61.4	m0.6	5.8	30.4
Internal Link Dist (m)	53.7		946.2			242.2
Turn Bay Length (m)		45.0		92.0	84.0	
Base Capacity (vph)	445	429	2630	1227	322	2904
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.06	0.55	0.07	0.19	0.30

Intersection Summary

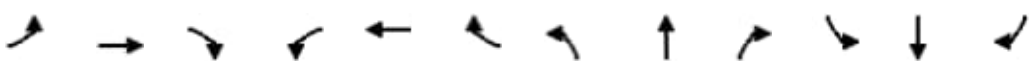
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings

2035 Future Background (PM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	2	3	5	236	2	72	10	1447	271	72	830	1
Future Volume (vph)	2	3	5	236	2	72	10	1447	271	72	830	1
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0		0.0	0.0		65.0	71.0		45.0	70.0		90.0
Storage Lanes	0		0	0		1	1		1	1		1
Taper Length (m)	7.5			7.5			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.932				0.850			0.850			0.850
Flt Protected		0.990			0.953		0.950			0.950		
Satd. Flow (prot)	0	1845	0	0	1906	1466	1900	3762	1667	1900	3725	1700
Flt Permitted		0.941			0.721		0.325			0.082		
Satd. Flow (perm)	0	1754	0	0	1442	1466	650	3762	1667	164	3725	1700
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				77			131			41
Link Speed (k/h)		40			40			70			70	
Link Distance (m)		288.1			294.1			681.3			970.2	
Travel Time (s)		25.9			26.5			35.0			49.9	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	16%	0%	1%	2%	0%	2%	0%
Adj. Flow (vph)	2	3	5	248	2	76	11	1523	285	76	874	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	10	0	0	250	76	11	1523	285	76	874	1
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			6		5	2	

2035 Future Background (PM Peak Hour) 3:54 pm 03/27/2025

Synchro 11 Report

Page 4

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	40.0	40.0	40.0	7.0	40.0	40.0
Minimum Split (s)	40.5	40.5		40.5	40.5	40.5	47.5	47.5	47.5	11.0	47.5	47.5
Total Split (s)	43.0	43.0		43.0	43.0	43.0	63.0	63.0	63.0	14.0	77.0	77.0
Total Split (%)	35.8%	35.8%		35.8%	35.8%	35.8%	52.5%	52.5%	52.5%	11.7%	64.2%	64.2%
Maximum Green (s)	35.5	35.5		35.5	35.5	35.5	55.5	55.5	55.5	10.0	69.5	69.5
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.5	3.5		3.5	3.5	3.5	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5			7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	0.2	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Don't Walk (s)	26.0	26.0		26.0	26.0	26.0	16.0	16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0	0		0	0
Act Effect Green (s)		26.0			26.0	26.0	69.6	69.6	69.6	82.5	79.0	79.0
Actuated g/C Ratio		0.22			0.22	0.22	0.58	0.58	0.58	0.69	0.66	0.66
v/c Ratio		0.03			0.80	0.20	0.03	0.70	0.28	0.34	0.36	0.00
Control Delay (s/veh)		24.2			62.6	8.4	15.4	22.2	9.0	12.3	8.0	0.0
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		24.2			62.6	8.4	15.4	22.2	9.0	12.3	8.0	0.0
LOS		C			E	A	B	C	A	B	A	A
Approach Delay (s/veh)		24.2			49.9			20.1			8.4	
Approach LOS		C			D			C			A	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 50 (42%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay (s/veh): 19.6

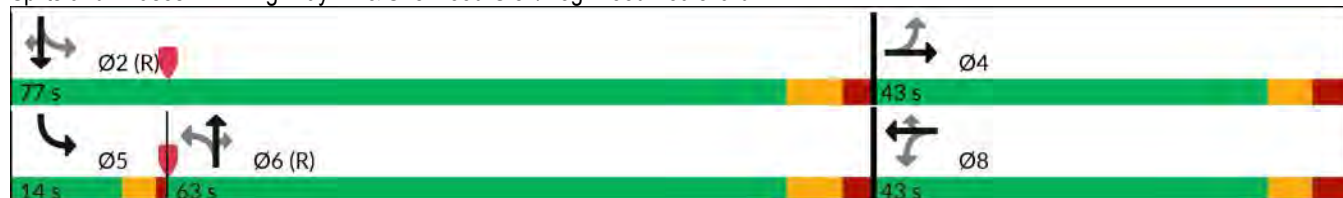
Intersection LOS: B

Intersection Capacity Utilization 97.9%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 2: Highway 11 & Sherwood Glen/Dog Wood Boulevard



Queues

2035 Future Background (PM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025



Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	10	250	76	11	1523	285	76	874	1
v/c Ratio	0.03	0.80	0.20	0.03	0.70	0.28	0.34	0.36	0.00
Control Delay (s/veh)	24.2	62.6	8.4	15.4	22.2	9.0	12.3	8.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	24.2	62.6	8.4	15.4	22.2	9.0	12.3	8.0	0.0
Queue Length 50th (m)	1.0	59.0	0.0	1.2	138.4	17.4	3.7	56.3	0.0
Queue Length 95th (m)	5.2	82.3	11.6	5.0	204.2	41.2	13.5	51.3	m0.0
Internal Link Dist (m)	264.1	270.1			657.3			946.2	
Turn Bay Length (m)			65.0	71.0		45.0	70.0		90.0
Base Capacity (vph)	522	426	487	376	2180	1021	257	2451	1132
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.59	0.16	0.03	0.70	0.28	0.30	0.36	0.00

Intersection Summary

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	7	92	43	4	41	0	40	0	1	0	0	21
Future Volume (vph)	7	92	43	4	41	0	40	0	1	0	0	21
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Util. 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
Frt		0.959						0.997			0.865	
Flt Protected		0.997			0.995			0.953				
Satd. Flow (prot)	0	1910	0	0	1990	0	0	1900	0	0	1696	0
Flt Permitted		0.997			0.995			0.953				
Satd. Flow (perm)	0	1910	0	0	1990	0	0	1900	0	0	1696	0
Link Speed (k/h)		40			40			40			30	
Link Distance (m)		103.3			280.7			206.8			59.0	
Travel Time (s)		9.3			25.3			18.6			7.1	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	2%	0%	0%	0%	0%	2%	0%	0%	0%	2%	0%	2%
Adj. Flow (vph)	9	112	52	5	50	0	49	0	1	0	0	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	173	0	0	55	0	0	50	0	0	26	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 24.2%

ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis 2035 Future Background (PM Peak Hour) 3: Cloverridge Avenue/Kerbel WHL Employment Phase 2 Site Access & Crimson King Way

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	7	92	43	4	41	0	40	0	1	0	0	21
Future Volume (vph)	7	92	43	4	41	0	40	0	1	0	0	21
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	9	112	52	5	50	0	49	0	1	0	0	26
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	173	55	50	26								
Volume Left (vph)	9	5	49	0								
Volume Right (vph)	52	0	1	26								
Hadj (s)	-0.17	0.02	0.18	-0.57								
Departure Headway (s)	4.0	4.3	4.6	3.9								
Degree Utilization, x	0.19	0.07	0.06	0.03								
Capacity (veh/h)	887	821	739	870								
Control Delay (s/veh)	7.9	7.6	7.9	7.0								
Approach Delay (s/veh)	7.9	7.6	7.9	7.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.8								
Level of Service				A								
Intersection Capacity Utilization				24.2%	ICU Level of Service	A						
Analysis Period (min)				15								

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2035 Future Background (PM Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	398	171	16	31	79	712	22	1527	59	423	850	222
Future Volume (vph)	398	171	16	31	79	712	22	1527	59	423	850	222
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	35.0			33.0			48.0			72.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00					0.97
Fr't			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1845	1942	1700	1827	1770	1635	1900	3725	1574	1845	3689	1667
Flt Permitted	0.549			0.641			0.304			0.072		
Satd. Flow (perm)	1066	1942	1700	1233	1770	1635	607	3725	1574	140	3689	1617
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98			*360			141			239
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		97.6			105.0			939.5			393.8	
Travel Time (s)		5.9			6.3			48.3			20.3	
Confl. Peds. (#/hr)							5					5
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	1.00	0.93	0.93	0.93	1.00	0.93	0.93
Heavy Vehicles (%)	3%	3%	0%	4%	13%	4%	0%	2%	8%	3%	3%	2%
Adj. Flow (vph)	428	184	17	33	85	712	24	1642	63	423	914	239
Shared Lane Traffic (%)												
Lane Group Flow (vph)	428	184	17	33	85	712	24	1642	63	423	914	239
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

2035 Future Background (PM Peak Hour) 3:54 pm 03/27/2025

Synchro 11 Report
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Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2035 Future Background (PM Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	1	6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	28.5	28.5	11.0	28.5	11.0	11.0	41.5	41.5	11.0	41.5	41.5
Total Split (s)	29.0	33.5	33.5	24.0	28.5	24.0	24.0	57.5	57.5	24.0	57.5	57.5
Total Split (%)	20.9%	24.1%	24.1%	17.3%	20.5%	17.3%	17.3%	41.4%	41.4%	17.3%	41.4%	41.4%
Maximum Green (s)	25.0	25.0	25.0	20.0	19.5	20.0	20.0	50.0	50.0	20.0	50.0	50.0
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.5	1.0	1.0	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	4.0	8.5	8.5	4.0	9.0	2.0	4.0	7.5	7.5	3.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		30.0	30.0		30.0			27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0			5	5		5	5
Act Effect Green (s)	46.3	34.7	34.7	24.8	12.2	43.3	60.6	50.0	50.0	78.5	67.5	67.5
Actuated g/C Ratio	0.35	0.26	0.26	0.19	0.09	0.33	0.46	0.38	0.38	0.60	0.51	0.51
v/c Ratio	0.82	0.36	0.03	0.12	0.52	0.92	0.07	1.16	0.09	1.19	0.48	0.25
Control Delay (s/veh)	50.7	43.4	0.1	30.9	68.4	38.2	13.5	118.4	0.3	147.0	23.0	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	50.7	43.4	0.1	30.9	68.4	38.2	13.5	118.4	0.3	147.0	23.0	3.1
LOS	D	D	A	C	E	D	B	F	A	F	C	A
Approach Delay (s/veh)		47.2			41.0			112.7			53.3	
Approach LOS		D			D			F			D	

Intersection Summary

Area Type: Other

Cycle Length: 139

Actuated Cycle Length: 131.8

Natural Cycle: 145

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.19

Intersection Signal Delay (s/veh): 71.9

Intersection LOS: E

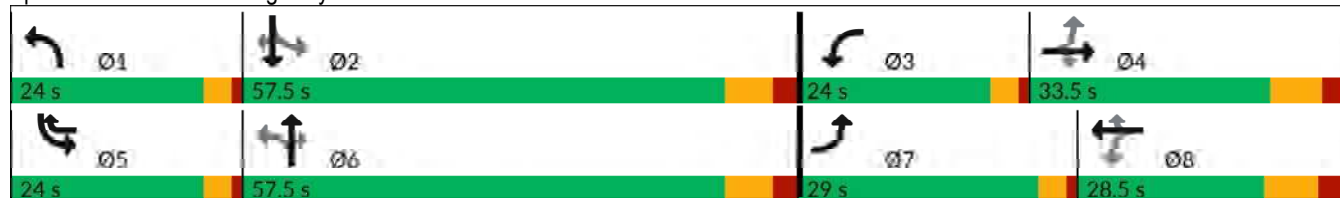
Intersection Capacity Utilization 115.8%

ICU Level of Service H

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 4: Highway 11 & Bathurst Street



2035 Future Background (PM Peak Hour) 3:54 pm 03/27/2025

Synchro 11 Report

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Queues
4: Highway 11 & Bathurst Street

2035 Future Background (PM Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	428	184	17	33	85	712	24	1642	63	423	914	239
v/c Ratio	0.82	0.36	0.03	0.12	0.52	0.92	0.07	1.16	0.09	1.19	0.48	0.25
Control Delay (s/veh)	50.7	43.4	0.1	30.9	68.4	38.2	13.5	118.4	0.3	147.0	23.0	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	50.7	43.4	0.1	30.9	68.4	38.2	13.5	118.4	0.3	147.0	23.0	3.1
Queue Length 50th (m)	98.5	42.9	0.0	6.0	22.5	105.9	2.6	~277.1	0.0	~120.9	88.3	0.0
Queue Length 95th (m)	#137.9	67.2	0.0	13.6	40.5	#188.5	7.1	#339.6	0.0	#197.5	115.4	14.9
Internal Link Dist (m)	73.6				81.0		915.5				369.8	
Turn Bay Length (m)	67.0			54.0	31.0			28.0	137.0			162.0
Base Capacity (vph)	522	511	519	438	262	778	534	1413	684	355	1888	944
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.36	0.03	0.08	0.32	0.92	0.04	1.16	0.09	1.19	0.48	0.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	7	10	1418	6	4	892
Future Volume (vph)	7	10	1418	6	4	892
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	0.0		30.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	0.922			0.850		
Flt Protected	0.979				0.950	
Satd. Flow (prot)	1770	0	3725	1667	1863	3689
Flt Permitted	0.979				0.154	
Satd. Flow (perm)	1770	0	3725	1667	302	3689
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	11			3		
Link Speed (k/h)	30		70			70
Link Distance (m)	44.5		266.2			939.5
Travel Time (s)	5.3		13.7			48.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%
Adj. Flow (vph)	8	11	1541	7	4	970
Shared Lane Traffic (%)						
Lane Group Flow (vph)	19	0	1541	7	4	970
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (m)	2.0		10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0		0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA	Perm	Perm	NA
Protected Phases	8		6			2

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases			6		2	
Detector Phase	8		6	6	2	2
Switch Phase						
Minimum Initial (s)	10.0		40.0	40.0	40.0	40.0
Minimum Split (s)	35.0		47.5	47.5	47.5	47.5
Total Split (s)	36.0		84.0	84.0	84.0	84.0
Total Split (%)	30.0%		70.0%	70.0%	70.0%	70.0%
Maximum Green (s)	29.0		76.5	76.5	76.5	76.5
Yellow Time (s)	4.0		5.0	5.0	5.0	5.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		7.5	7.5	7.5	7.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Don't Walk (s)	21.0		14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	10.0		110.2	110.2	110.2	110.2
Actuated g/C Ratio	0.08		0.92	0.92	0.92	0.92
v/c Ratio	0.12		0.45	0.00	0.01	0.29
Control Delay (s/veh)	34.1		0.9	0.0	2.5	1.9
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay (s/veh)	34.1		0.9	0.0	2.5	1.9
LOS	C		A	A	A	A
Approach Delay (s/veh)	34.1		0.9			1.9
Approach LOS	C		A			A
Intersection Summary						
Area Type:	Other					
Cycle Length: 120						
Actuated Cycle Length: 120						
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green						
Natural Cycle: 85						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.45						
Intersection Signal Delay (s/veh): 1.5				Intersection LOS: A		
Intersection Capacity Utilization 79.2%				ICU Level of Service D		
Analysis Period (min) 15						

Splits and Phases: 100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access



Queues

2035 Future Background (PM Peak Hour)

100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access

03/28/2025



Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	19	1541	7	4	970
v/c Ratio	0.12	0.45	0.00	0.01	0.29
Control Delay (s/veh)	34.1	0.9	0.0	2.5	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	34.1	0.9	0.0	2.5	1.9
Queue Length 50th (m)	1.9	3.4	0.0	0.0	0.0
Queue Length 95th (m)	9.7	4.5	m0.0	0.9	35.1
Internal Link Dist (m)	20.5	242.2			915.5
Turn Bay Length (m)			30.0	15.0	
Base Capacity (vph)	436	3421	1531	277	3387
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.04	0.45	0.00	0.01	0.29

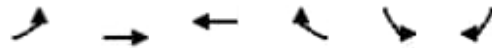
Intersection Summary

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



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	138	82	0	0	15
Future Volume (vph)	5	138	82	0	0	15
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t	0.865					
Fl _t Protected	0.998					
Satd. Flow (prot)	0	1996	2000	0	1730	0
Fl _t Permitted	0.998					
Satd. Flow (perm)	0	1996	2000	0	1730	0
Link Speed (k/h)	40		40	30		
Link Distance (m)	77.7		103.3	48.1		
Travel Time (s)	7.0		9.3	5.8		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	5	150	89	0	0	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	155	89	0	16	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)	0.0		0.0	3.6		
Link Offset(m)	0.0		0.0	0.0		
Crosswalk Width(m)	4.8		4.8	4.8		
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25			15	25	15
Sign Control	Free		Free	Stop		
Intersection Summary						
Area Type: Other						
Control Type: Unsignalized						
Intersection Capacity Utilization 20.7%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis 2035 Future Background (PM Peak Hour)
 102: Crimson King Way & Kerbel WHL Employment Phase 2 Site Access 03/28/2025



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	138	82	0	0	15
Future Volume (Veh/h)	5	138	82	0	0	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	150	89	0	0	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)		78				
pX, platoon unblocked						
vC, conflicting volume	89				249	89
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	89				249	89
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	98
cM capacity (veh/h)	1519				741	975
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	155	89	16			
Volume Left	5	0	0			
Volume Right	0	0	16			
cSH	1519	1700	975			
Volume to Capacity	0.00	0.05	0.02			
Queue Length 95th (m)	0.1	0.0	0.4			
Control Delay (s/veh)	0.3	0.0	8.8			
Lane LOS	A		A			
Approach Delay (s/veh)	0.3	0.0	8.8			
Approach LOS			A			
Intersection Summary						
Average Delay		0.7				
Intersection Capacity Utilization		20.7%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2035 Future Background (PM Peak Hour) - Optimized
03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	398	171	16	31	79	712	22	1527	59	423	850	222
Future Volume (vph)	398	171	16	31	79	712	22	1527	59	423	850	222
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	35.0			33.0			48.0			72.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00					0.97
Fr't			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1845	1942	1700	1827	1770	1635	1900	3725	1574	1845	3689	1667
Flt Permitted	0.549			0.641			0.312			0.068		
Satd. Flow (perm)	1066	1942	1700	1233	1770	1635	623	3725	1574	132	3689	1617
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98			*360			141			239
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		97.6			105.0			943.2			393.8	
Travel Time (s)		5.9			6.3			48.5			20.3	
Confl. Peds. (#/hr)							5					5
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	1.00	0.93	0.93	0.93	1.00	0.93	0.93
Heavy Vehicles (%)	3%	3%	0%	4%	13%	4%	0%	2%	8%	3%	3%	2%
Adj. Flow (vph)	428	184	17	33	85	712	24	1642	63	423	914	239
Shared Lane Traffic (%)												
Lane Group Flow (vph)	428	184	17	33	85	712	24	1642	63	423	914	239
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2035 Future Background (PM Peak Hour) - Optimized
03/28/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	1	6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	28.5	28.5	11.0	28.5	11.0	11.0	41.5	41.5	11.0	41.5	41.5
Total Split (s)	23.5	33.5	33.5	18.5	28.5	26.0	24.0	61.0	61.0	26.0	63.0	63.0
Total Split (%)	16.9%	24.1%	24.1%	13.3%	20.5%	18.7%	17.3%	43.9%	43.9%	18.7%	45.3%	45.3%
Maximum Green (s)	19.5	25.0	25.0	14.5	19.5	22.0	20.0	53.5	53.5	22.0	55.5	55.5
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.5	1.0	1.0	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	4.0	8.5	8.5	4.0	9.0	2.0	4.0	7.5	7.5	3.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		30.0	30.0		30.0			27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0			5	5		5	5
Act Effect Green (s)	40.8	29.1	29.1	24.9	12.2	45.3	64.0	53.5	53.5	84.0	73.0	73.0
Actuated g/C Ratio	0.31	0.22	0.22	0.19	0.09	0.34	0.49	0.41	0.41	0.64	0.55	0.55
v/c Ratio	0.96	0.43	0.04	0.12	0.52	0.89	0.06	1.09	0.09	1.10	0.45	0.24
Control Delay (s/veh)	76.9	49.4	0.1	33.8	68.4	34.7	11.6	87.7	0.2	115.5	19.3	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	76.9	49.4	0.1	33.8	68.4	34.7	11.6	87.7	0.2	115.5	19.3	2.7
LOS	E	D	A	C	E	C	B	F	A	F	B	A
Approach Delay (s/veh)		66.8			38.1			83.5			42.6	
Approach LOS		E			D			F			D	

Intersection Summary

Area Type: Other

Cycle Length: 139

Actuated Cycle Length: 131.8

Natural Cycle: 145

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.10

Intersection Signal Delay (s/veh): 59.8

Intersection LOS: E

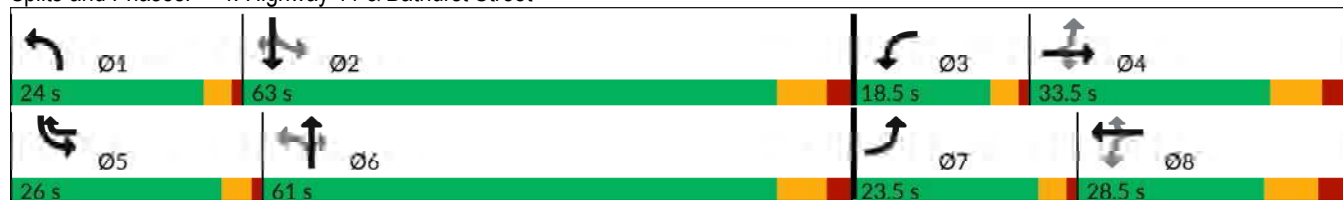
Intersection Capacity Utilization 115.8%

ICU Level of Service H

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 4: Highway 11 & Bathurst Street



2035 Future Background (PM Peak Hour) - Optimized 3:22 pm 03/27/2025 Synchro 11 Report

Queues
4: Highway 11 & Bathurst Street

2035 Future Background (PM Peak Hour) - Optimized
03/28/2025

														
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Group Flow (vph)	428	184	17	33	85	712	24	1642	63	423	914	239		
v/c Ratio	0.96	0.43	0.04	0.12	0.52	0.89	0.06	1.09	0.09	1.10	0.45	0.24		
Control Delay (s/veh)	76.9	49.4	0.1	33.8	68.4	34.7	11.6	87.7	0.2	115.5	19.3	2.7		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay (s/veh)	76.9	49.4	0.1	33.8	68.4	34.7	11.6	87.7	0.2	115.5	19.3	2.7		
Queue Length 50th (m)	105.3	45.5	0.0	6.4	22.5	103.2	2.3	~262.3	0.0	~112.7	80.4	0.0		
Queue Length 95th (m)	#177.6	71.2	0.0	14.6	40.5	#184.5	6.3	#324.8	0.0	#189.3	105.8	13.6		
Internal Link Dist (m)	73.6				81.0		919.2				369.8			
Turn Bay Length (m)	67.0			54.0	31.0			28.0	137.0			162.0	148.0	154.0
Base Capacity (vph)	444	430	453	362	262	797	557	1512	723	383	2042	1002		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.96	0.43	0.04	0.09	0.32	0.89	0.04	1.09	0.09	1.10	0.45	0.24		

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2035 Future Background (SAT Peak Hour)

03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	43	34	912	54	27	809
Future Volume (vph)	43	34	912	54	27	809
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	45.0		92.0	84.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	7.5				50.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1900	1700	3762	1700	1900	3762
Flt Permitted	0.950				0.244	
Satd. Flow (perm)	1900	1700	3762	1700	488	3762
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		37		59		
Link Speed (k/h)	40		70			70
Link Distance (m)	74.0		968.7			261.6
Travel Time (s)	6.7		49.8			13.5
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	47	37	1002	59	30	889
Shared Lane Traffic (%)						
Lane Group Flow (vph)	47	37	1002	59	30	889
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	2.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		6		5	2

2035 Future Background (SAT Peak Hour) 3:55 pm 03/27/2025

Synchro 11 Report
Page 1

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2035 Future Background (SAT Peak Hour)
03/28/2025

	↙ ↘		↑		↗ ↘	
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		8		6	2	
Detector Phase	8	8	6	6	5	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	40.0	40.0	7.0	40.0
Minimum Split (s)	26.0	26.0	47.5	47.5	11.0	47.5
Total Split (s)	26.0	26.0	47.5	47.5	11.0	58.5
Total Split (%)	30.8%	30.8%	56.2%	56.2%	13.0%	69.2%
Maximum Green (s)	19.0	19.0	40.0	40.0	7.0	51.0
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	3.0	3.0	2.5	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.5	7.5	4.0	7.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	Max	Max	None	Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Don't Walk (s)	21.0	21.0	14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effect Green (s)	10.1	10.1	56.0	56.0	62.6	60.7
Actuated g/C Ratio	0.13	0.13	0.70	0.70	0.78	0.76
v/c Ratio	0.20	0.15	0.38	0.05	0.06	0.31
Control Delay (s/veh)	33.1	12.1	8.0	2.8	3.1	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	33.1	12.1	8.0	2.8	3.1	4.6
LOS	C	B	A	A	A	A
Approach Delay (s/veh)	23.9		7.7			4.6
Approach LOS	C		A			A

Intersection Summary

Area Type: Other

Cycle Length: 84.5

Actuated Cycle Length: 80

Natural Cycle: 85

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.38

Intersection Signal Delay (s/veh): 7.0

Intersection LOS: A

Intersection Capacity Utilization 53.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Highway 11 & Crimson King Way



Queues

2035 Future Background (SAT Peak Hour)

1: Highway 11 & Crimson King Way

03/28/2025



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	47	37	1002	59	30	889
v/c Ratio	0.20	0.15	0.38	0.05	0.06	0.31
Control Delay (s/veh)	33.1	12.1	8.0	2.8	3.1	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	33.1	12.1	8.0	2.8	3.1	4.6
Queue Length 50th (m)	7.4	0.0	29.5	0.0	1.0	25.2
Queue Length 95th (m)	15.9	7.9	62.7	4.9	2.9	33.9
Internal Link Dist (m)	50.0		944.7			237.6
Turn Bay Length (m)		45.0		92.0	84.0	
Base Capacity (vph)	454	434	2633	1207	505	2853
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.09	0.38	0.05	0.06	0.31
Intersection Summary						

Lanes, Volumes, Timings

2035 Future Background (SAT Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	0	9	75	0	8	15	941	66	2	858	0
Future Volume (vph)	3	0	9	75	0	8	15	941	66	2	858	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0		0.0	0.0		65.0	71.0		45.0	70.0		90.0
Storage Lanes	0		0	0		1	1		1	1		1
Taper Length (m)	7.5			7.5			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		0.99			1.00	0.99						
Frt		0.896				0.850			0.850			
Flt Protected		0.989			0.950		0.950			0.950		
Satd. Flow (prot)	0	1755	0	0	1900	1700	1900	3762	1700	1900	3762	2000
Flt Permitted		0.897			0.749		0.312			0.246		
Satd. Flow (perm)	0	1591	0	0	1497	1678	624	3762	1700	492	3762	2000
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		109				109			109			
Link Speed (k/h)		40			40			70			70	
Link Distance (m)		288.1			294.1			681.3			968.7	
Travel Time (s)		25.9			26.5			35.0			49.8	
Confl. Peds. (#/hr)	1		1	1		1						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Adj. Flow (vph)	3	0	10	80	0	9	16	1001	70	2	913	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	13	0	0	80	9	16	1001	70	2	913	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

2035 Future Background (SAT Peak Hour) 3:55 pm 03/27/2025

Synchro 11 Report

Page 4

Lanes, Volumes, Timings

2035 Future Background (SAT Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			6		5	2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	40.0	40.0	40.0	7.0	40.0	40.0
Minimum Split (s)	26.5	26.5		26.5	26.5	26.5	47.5	47.5	47.5	11.0	47.5	47.5
Total Split (s)	26.5	26.5		26.5	26.5	26.5	47.5	47.5	47.5	11.0	58.5	58.5
Total Split (%)	31.2%	31.2%		31.2%	31.2%	31.2%	55.9%	55.9%	55.9%	12.9%	68.8%	68.8%
Maximum Green (s)	19.0	19.0		19.0	19.0	19.0	40.0	40.0	40.0	7.0	51.0	51.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.5	3.5		3.5	3.5	3.5	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5			7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	0.2	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None		None	None	None	Max	Max	Max	None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Don't Walk (s)	26.0	26.0		26.0	26.0	26.0	16.0	16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0	0		0	0
Act Effect Green (s)		11.0			11.0	11.0	58.4	58.4	58.4	62.5	60.7	
Actuated g/C Ratio		0.14			0.14	0.14	0.72	0.72	0.72	0.77	0.75	
v/c Ratio		0.04			0.40	0.03	0.04	0.37	0.06	0.00	0.32	
Control Delay (s/veh)		0.3			38.1	0.1	7.7	7.3	1.0	3.5	5.3	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)		0.3			38.1	0.1	7.7	7.3	1.0	3.5	5.3	
LOS		A			D	A	A	A	A	A	A	
Approach Delay (s/veh)		0.3			34.2			6.9			5.3	
Approach LOS		A			C			A			A	

Intersection Summary

Area Type: Other

Cycle Length: 85

Actuated Cycle Length: 81.2

Natural Cycle: 85

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.40

Intersection Signal Delay (s/veh): 7.3

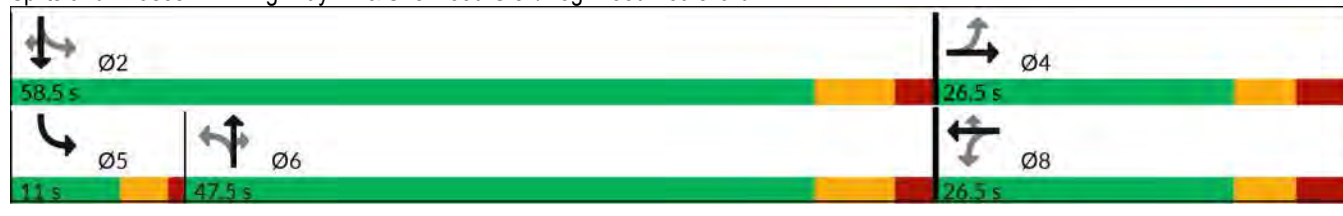
Intersection LOS: A

Intersection Capacity Utilization 70.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 2: Highway 11 & Sherwood Glen/Dog Wood Boulevard



2035 Future Background (SAT Peak Hour) 3:55 pm 03/27/2025

Synchro 11 Report

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Queues

2035 Future Background (SAT Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025



Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	13	80	9	16	1001	70	2	913
v/c Ratio	0.04	0.40	0.03	0.04	0.37	0.06	0.00	0.32
Control Delay (s/veh)	0.3	38.1	0.1	7.7	7.3	1.0	3.5	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	0.3	38.1	0.1	7.7	7.3	1.0	3.5	5.3
Queue Length 50th (m)	0.0	12.9	0.0	0.7	30.3	0.0	0.1	26.8
Queue Length 95th (m)	0.0	24.1	0.0	4.4	70.3	2.9	0.7	42.0
Internal Link Dist (m)	264.1	270.1			657.3			944.7
Turn Bay Length (m)			65.0	71.0		45.0	70.0	
Base Capacity (vph)	457	352	478	449	2706	1253	501	2811
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.23	0.02	0.04	0.37	0.06	0.00	0.32
Intersection Summary								

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	52	29	4	45	0	32	0	4	0	0	0
Future Volume (vph)	0	52	29	4	45	0	32	0	4	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Util. 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
Frt	0.951						0.986					
Flt Protected				0.996			0.957					
Satd. Flow (prot)	0	1902	0	0	1992	0	0	1887	0	0	1961	0
Flt Permitted				0.996			0.957					
Satd. Flow (perm)	0	1902	0	0	1992	0	0	1887	0	0	1961	0
Link Speed (k/h)	40			40			40			30		
Link Distance (m)	107.0			280.7			206.8			54.3		
Travel Time (s)	9.6			25.3			18.6			6.5		
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles (%)	2%	0%	0%	0%	0%	2%	0%	2%	0%	2%	2%	2%
Adj. Flow (vph)	0	69	39	5	60	0	43	0	5	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	108	0	0	65	0	0	48	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0			0.0			0.0			0.0		
Link Offset(m)	0.0			0.0			0.0			0.0		
Crosswalk Width(m)	4.8			4.8			4.8			4.8		
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		25	15		25	15		25	15	
Sign Control	Stop			Stop			Stop			Stop		
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	15.4%			ICU Level of Service A								
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis 2035 Future Background (SAT Peak Hour) 3: Cloverridge Avenue/Kerbel WHL Employment Phase 2 Site Access & Crimson King 03/28/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	52	29	4	45	0	32	0	4	0	0	0
Future Volume (vph)	0	52	29	4	45	0	32	0	4	0	0	0
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	0	69	39	5	60	0	43	0	5	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	108	65	48	0								
Volume Left (vph)	0	5	43	0								
Volume Right (vph)	39	0	5	0								
Hadj (s)	-0.22	0.02	0.12	0.00								
Departure Headway (s)	3.9	4.1	4.4	4.3								
Degree Utilization, x	0.12	0.07	0.06	0.00								
Capacity (veh/h)	914	854	785	805								
Control Delay (s/veh)	7.4	7.5	7.6	7.3								
Approach Delay (s/veh)	7.4	7.5	7.6	0.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.5								
Level of Service				A								
Intersection Capacity Utilization				15.4%	ICU Level of Service	A						
Analysis Period (min)				15								

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2035 Future Background (SAT Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	271	113	20	38	94	458	25	879	50	373	833	215
Future Volume (vph)	271	113	20	38	94	458	25	879	50	373	833	215
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	35.0			33.0			48.0			72.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00					0.99						
Fr't			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1881	1942	1619	1900	1942	1667	1900	3762	1700	1863	3762	1683
Flt Permitted	0.537			0.680			0.321			0.161		
Satd. Flow (perm)	1062	1942	1619	1360	1942	1645	642	3762	1700	316	3762	1683
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98			114			141			229
Link Speed (k/h)		60			60			70				70
Link Distance (m)		97.6			105.0			944.1				393.8
Travel Time (s)		5.9			6.3			48.6				20.3
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	1%	3%	5%	0%	3%	2%	0%	1%	0%	2%	1%	1%
Adj. Flow (vph)	288	120	21	40	100	487	27	935	53	397	886	229
Shared Lane Traffic (%)												
Lane Group Flow (vph)	288	120	21	40	100	487	27	935	53	397	886	229
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

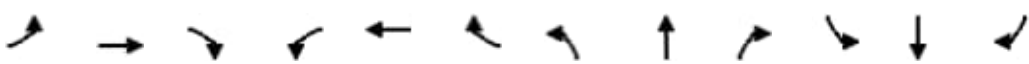
2035 Future Background (SAT Peak Hour) 3:55 pm 03/27/2025

Synchro 11 Report
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Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2035 Future Background (SAT Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	1	6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	28.5	28.5	11.0	28.5	11.0	11.0	41.5	41.5	11.0	41.5	41.5
Total Split (s)	29.0	33.5	33.5	24.0	28.5	24.0	24.0	57.5	57.5	24.0	57.5	57.5
Total Split (%)	20.9%	24.1%	24.1%	17.3%	20.5%	17.3%	17.3%	41.4%	41.4%	17.3%	41.4%	41.4%
Maximum Green (s)	25.0	25.0	25.0	20.0	19.5	20.0	20.0	50.0	50.0	20.0	50.0	50.0
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.5	1.0	1.0	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	8.5	8.5	4.0	9.0	4.0	4.0	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		30.0	30.0		30.0			27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0			5	5		5	5
Act Effect Green (s)	43.2	29.4	29.4	25.2	12.4	37.5	60.7	50.1	50.1	77.6	67.7	67.7
Actuated g/C Ratio	0.34	0.23	0.23	0.20	0.10	0.29	0.47	0.39	0.39	0.60	0.53	0.53
v/c Ratio	0.58	0.27	0.05	0.13	0.53	0.87	0.07	0.64	0.07	0.92	0.45	0.23
Control Delay (s/veh)	38.5	43.7	0.2	30.9	66.9	48.5	13.5	35.2	0.2	51.3	21.6	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	38.5	43.7	0.2	30.9	66.9	48.5	13.5	35.2	0.2	51.3	21.6	3.1
LOS	D	D	A	C	E	D	B	D	A	D	C	A
Approach Delay (s/veh)		38.1			50.3			32.8			26.6	
Approach LOS		D			D			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 139

Actuated Cycle Length: 128.9

Natural Cycle: 95

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.92

Intersection Signal Delay (s/veh): 33.9

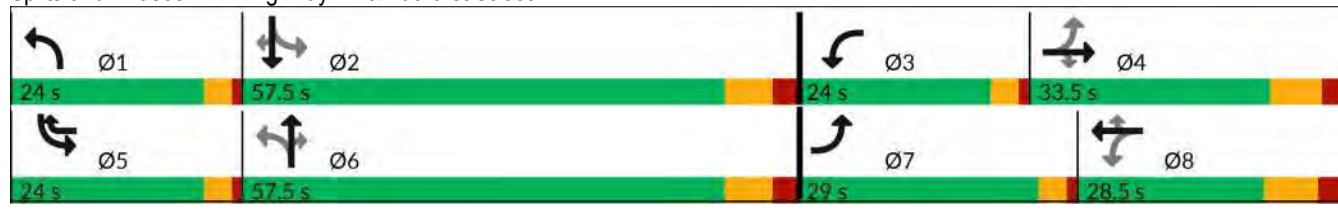
Intersection LOS: C

Intersection Capacity Utilization 80.3%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: Highway 11 & Bathurst Street



2035 Future Background (SAT Peak Hour) 3:55 pm 03/27/2025

Synchro 11 Report

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Queues

2035 Future Background (SAT Peak Hour)

4: Highway 11 & Bathurst Street

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	288	120	21	40	100	487	27	935	53	397	886	229
v/c Ratio	0.58	0.27	0.05	0.13	0.53	0.87	0.07	0.64	0.07	0.92	0.45	0.23
Control Delay (s/veh)	38.5	43.7	0.2	30.9	66.9	48.5	13.5	35.2	0.2	51.3	21.6	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	38.5	43.7	0.2	30.9	66.9	48.5	13.5	35.2	0.2	51.3	21.6	3.1
Queue Length 50th (m)	60.1	27.1	0.0	7.2	26.2	95.0	2.8	107.3	0.0	65.1	82.4	0.0
Queue Length 95th (m)	86.4	46.1	0.0	15.5	46.1	#152.8	7.8	141.3	0.0	#140.3	111.4	14.6
Internal Link Dist (m)		73.6			81.0			920.1			369.8	
Turn Bay Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Base Capacity (vph)	515	447	448	479	294	562	562	1462	746	430	1974	992
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.27	0.05	0.08	0.34	0.87	0.05	0.64	0.07	0.92	0.45	0.23

Intersection Summary

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

Queue shown is maximum after two cycles.

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	946	0	0	891
Future Volume (vph)	0	0	946	0	0	891
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	0.0		30.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt						
Flt Protected						
Satd. Flow (prot)	1961	0	3725	1961	1961	3725
Flt Permitted						
Satd. Flow (perm)	1961	0	3725	1961	1961	3725
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	30		70			70
Link Distance (m)	49.4		261.6			944.1
Travel Time (s)	5.9		13.5			48.6
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	0	0	1140	0	0	1073
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1140	0	0	1073
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (m)	2.0		10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0		0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA	Perm	Perm	NA
Protected Phases	8		6			2
Permitted Phases				6	2	

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8		6	6	2	2
Switch Phase						
Minimum Initial (s)	10.0		40.0	40.0	40.0	40.0
Minimum Split (s)	35.0		47.5	47.5	47.5	47.5
Total Split (s)	36.0		84.0	84.0	84.0	84.0
Total Split (%)	30.0%		70.0%	70.0%	70.0%	70.0%
Maximum Green (s)	29.0		76.5	76.5	76.5	76.5
Yellow Time (s)	4.0		5.0	5.0	5.0	5.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		7.5	7.5	7.5	7.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Don't Walk (s)	21.0		14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)			120.0			120.0
Actuated g/C Ratio			1.00			1.00
v/c Ratio			0.31			0.29
Control Delay (s/veh)			0.2			0.2
Queue Delay			0.0			0.0
Total Delay (s/veh)			0.2			0.2
LOS			A			A
Approach Delay (s/veh)			0.2			0.2
Approach LOS			A			A
Intersection Summary						
Area Type:	Other					
Cycle Length: 120						
Actuated Cycle Length: 120						
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green						
Natural Cycle: 85						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.31						
Intersection Signal Delay (s/veh): 0.2				Intersection LOS: A		
Intersection Capacity Utilization 39.6%				ICU Level of Service A		
Analysis Period (min) 15						

Splits and Phases: 100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access



Queues

2035 Future Background (SAT Peak Hour)

100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access

03/28/2025

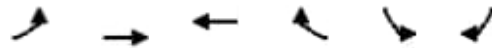


Lane Group	NBT	SBT
Lane Group Flow (vph)	1140	1073
v/c Ratio	0.31	0.29
Control Delay (s/veh)	0.2	0.2
Queue Delay	0.0	0.0
Total Delay (s/veh)	0.2	0.2
Queue Length 50th (m)	0.0	0.0
Queue Length 95th (m)	0.0	0.0
Internal Link Dist (m)	237.6	920.1
Turn Bay Length (m)		
Base Capacity (vph)	3725	3725
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.31	0.29
Intersection Summary		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	81	77	0	0	0
Future Volume (vph)	0	81	77	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frts						
Flt Protected						
Satd. Flow (prot)	0	1961	1961	0	1961	0
Flt Permitted						
Satd. Flow (perm)	0	1961	1961	0	1961	0
Link Speed (k/h)		40	40		30	
Link Distance (m)		74.0	107.0		45.2	
Travel Time (s)		6.7	9.6		5.4	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	0	98	93	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	98	93	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						
Intersection Capacity Utilization 7.4%				ICU Level of Service A		
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis 2035 Future Background (SAT Peak Hour)
 102: Crimson King Way & Kerbel WHL Employment Phase 2 Site Access 03/28/2025



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	81	77	0	0	0
Future Volume (Veh/h)	0	81	77	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	0	98	93	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)		74				
pX, platoon unblocked						
vC, conflicting volume	93				191	93
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	93				191	93
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1501				798	964
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	98	93	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1501	1700	1700			
Volume to Capacity	0.00	0.05	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s/veh)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s/veh)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			7.4%	ICU Level of Service		A
Analysis Period (min)			15			

APPENDIX

G FUTURE TOTAL TRAFFIC CONDITIONS

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2030 Future Total (AM Peak Hour)
03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	148	23	597	29	83	1423
Future Volume (vph)	148	23	597	29	83	1423
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	45.0		92.0	84.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	55.0				50.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1863	1545	3585	1700	1473	3725
Flt Permitted	0.950				0.366	
Satd. Flow (perm)	1863	1545	3585	1700	567	3725
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		26		33		
Link Speed (k/h)	40		70			70
Link Distance (m)	78.0		99.3			264.4
Travel Time (s)	7.0		5.1			13.6
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	2%	10%	6%	0%	29%	2%
Adj. Flow (vph)	166	26	671	33	93	1599
Shared Lane Traffic (%)						
Lane Group Flow (vph)	166	26	671	33	93	1599
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	2.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		6		5	2

2030 Future Total (AM Peak Hour) 3:55 pm 03/27/2025

Synchro 11 Report
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Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2030 Future Total (AM Peak Hour)
03/28/2025

	↙ ↘		↑		↗ ↘	
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		8		6	2	
Detector Phase	8	8	6	6	5	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	40.0	40.0	7.0	40.0
Minimum Split (s)	35.0	35.0	47.5	47.5	11.0	47.5
Total Split (s)	36.0	36.0	82.0	82.0	12.0	94.0
Total Split (%)	27.7%	27.7%	63.1%	63.1%	9.2%	72.3%
Maximum Green (s)	29.0	29.0	74.5	74.5	8.0	86.5
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	3.0	3.0	2.5	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.5	7.5	4.0	7.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Don't Walk (s)	21.0	21.0	14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effect Green (s)	16.9	16.9	86.8	86.8	102.1	98.6
Actuated g/C Ratio	0.13	0.13	0.67	0.67	0.79	0.76
v/c Ratio	0.69	0.12	0.28	0.03	0.19	0.57
Control Delay (s/veh)	68.0	17.0	2.1	0.1	4.3	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	68.0	17.0	2.1	0.1	4.3	7.1
LOS	E	B	A	A	A	A
Approach Delay (s/veh)	61.1		2.0			7.0
Approach LOS	E		A			A

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay (s/veh): 9.6

Intersection LOS: A

Intersection Capacity Utilization 62.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Highway 11 & Crimson King Way



Queues

2030 Future Total (AM Peak Hour)

1: Highway 11 & Crimson King Way

03/28/2025

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	166	26	671	33	93	1599
v/c Ratio	0.69	0.12	0.28	0.03	0.19	0.57
Control Delay (s/veh)	68.0	17.0	2.1	0.1	4.3	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	68.0	17.0	2.1	0.1	4.3	7.1
Queue Length 50th (m)	43.4	0.0	6.2	0.0	4.8	83.3
Queue Length 95th (m)	64.0	8.3	10.3	0.2	8.0	55.6
Internal Link Dist (m)	54.0		75.3			240.4
Turn Bay Length (m)		45.0		92.0	84.0	
Base Capacity (vph)	415	364	2394	1146	503	2825
Starvation Cap Reductn	0	0	0	0	0	146
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.07	0.28	0.03	0.18	0.60
Intersection Summary						

Lanes, Volumes, Timings

2030 Future Total (AM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	9	281	0	47	4	698	141	47	1451	3
Future Volume (vph)	1	0	9	281	0	47	4	698	141	47	1451	3
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0		0.0	0.0		65.0	71.0		45.0	70.0		90.0
Storage Lanes	0		0	0		1	1		1	1		1
Taper Length (m)	7.5			7.5			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.877				0.850			0.850			0.850
Flt Protected		0.995			0.950		0.950			0.950		
Satd. Flow (prot)	0	1745	0	0	1881	1700	1900	3585	1589	1900	3725	1700
Flt Permitted		0.975			0.750		0.097			0.292		
Satd. Flow (perm)	0	1710	0	0	1485	1700	194	3585	1589	584	3725	1700
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		71				71			133			38
Link Speed (k/h)		40			40			70			70	
Link Distance (m)		288.1			294.1			681.3			870.6	
Travel Time (s)		25.9			26.5			35.0			44.8	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	6%	7%	0%	2%	0%
Adj. Flow (vph)	1	0	10	316	0	53	4	784	158	53	1630	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	11	0	0	316	53	4	784	158	53	1630	3
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			6		5	2	

2030 Future Total (AM Peak Hour) 3:55 pm 03/27/2025

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Lanes, Volumes, Timings

2030 Future Total (AM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	40.0	40.0	40.0	7.0	40.0	40.0
Minimum Split (s)	40.5	40.5		40.5	40.5	40.5	47.5	47.5	47.5	11.0	47.5	47.5
Total Split (s)	49.0	49.0		49.0	49.0	49.0	69.0	69.0	69.0	12.0	81.0	81.0
Total Split (%)	37.7%	37.7%		37.7%	37.7%	37.7%	53.1%	53.1%	53.1%	9.2%	62.3%	62.3%
Maximum Green (s)	41.5	41.5		41.5	41.5	41.5	61.5	61.5	61.5	8.0	73.5	73.5
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.5	3.5		3.5	3.5	3.5	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5			7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	0.2	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Don't Walk (s)	26.0	26.0		26.0	26.0	26.0	16.0	16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0	0		0	0
Act Effect Green (s)		32.7			32.7	32.7	73.2	73.2	73.2	85.8	82.3	82.3
Actuated g/C Ratio		0.25			0.25	0.25	0.56	0.56	0.56	0.66	0.63	0.63
v/c Ratio		0.02			0.85	0.11	0.04	0.39	0.17	0.12	0.69	0.00
Control Delay (s/veh)		0.1			66.0	4.3	18.5	18.3	4.8	15.9	29.2	0.0
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		0.1			66.0	4.3	18.5	18.3	4.8	15.9	29.2	0.0
LOS		A			E	A	B	B	A	B	C	A
Approach Delay (s/veh)		0.1			57.1			16.0			28.7	
Approach LOS		A			E			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 92 (71%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay (s/veh): 28.1

Intersection LOS: C

Intersection Capacity Utilization 100.2%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 2: Highway 11 & Sherwood Glen/Dog Wood Boulevard



2030 Future Total (AM Peak Hour) 3:55 pm 03/27/2025

Synchro 11 Report

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Queues

2030 Future Total (AM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025



Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	11	316	53	4	784	158	53	1630	3
v/c Ratio	0.02	0.85	0.11	0.04	0.39	0.17	0.12	0.69	0.00
Control Delay (s/veh)	0.1	66.0	4.3	18.5	18.3	4.8	15.9	29.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	0.1	66.0	4.3	18.5	18.3	4.8	15.9	29.2	0.0
Queue Length 50th (m)	0.0	81.0	0.0	0.5	62.4	3.0	7.4	202.3	0.0
Queue Length 95th (m)	0.0	106.7	6.0	2.9	89.6	15.6	m15.6	241.9	m0.0
Internal Link Dist (m)	264.1	270.1			657.3			846.6	
Turn Bay Length (m)			65.0	71.0		45.0	70.0		90.0
Base Capacity (vph)	594	474	591	109	2019	952	466	2358	1090
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.67	0.09	0.04	0.39	0.17	0.11	0.69	0.00

Intersection Summary

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

Lanes, Volumes, Timings
3: Cloverridge Avenue & Crimson King Way

2030 Future Total (AM Peak Hour)
03/28/2025

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	30	17	2	59	60	6
Future Volume (vph)	30	17	2	59	60	6
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.951				0.987	
Flt Protected				0.999	0.957	
Satd. Flow (prot)	1738	0	0	1969	1807	0
Flt Permitted				0.999	0.957	
Satd. Flow (perm)	1738	0	0	1969	1807	0
Link Speed (k/h)	40			40	40	
Link Distance (m)	103.0			280.7	206.8	
Travel Time (s)	9.3			25.3	18.6	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	8%	12%	50%	0%	5%	0%
Adj. Flow (vph)	33	19	2	65	66	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	52	0	0	67	73	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)		15	25		25	15
Sign Control	Stop			Stop	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	14.7%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 3: Cloverridge Avenue & Crimson King Way

2030 Future Total (AM Peak Hour)
03/28/2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	30	17	2	59	60	6
Future Volume (vph)	30	17	2	59	60	6
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	33	19	2	65	66	7
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	52	67	73			
Volume Left (vph)	0	2	66			
Volume Right (vph)	19	0	7			
Hadj (s)	-0.06	0.03	0.20			
Departure Headway (s)	4.1	4.2	4.4			
Degree Utilization, x	0.06	0.08	0.09			
Capacity (veh/h)	859	846	797			
Control Delay (s/veh)	7.3	7.5	7.8			
Approach Delay (s/veh)	7.3	7.5	7.8			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.6			
Level of Service			A			
Intersection Capacity Utilization			14.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2030 Future Total (AM Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	110	8	38	157	367	27	492	34	505	1355	459
Future Volume (vph)	150	110	8	38	157	367	27	492	34	505	1355	459
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	35.0			33.0			48.0			72.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1792	1754	1133	1759	1869	1574	1827	3654	1478	1810	3725	1667
Flt Permitted	0.445			0.680			0.102			0.366		
Satd. Flow (perm)	840	1754	1133	1259	1869	1574	196	3654	1478	697	3725	1667
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98			260			141			499
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		97.6			105.0			941.3			393.8	
Travel Time (s)		5.9			6.3			48.4			20.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	14%	50%	8%	7%	8%	4%	4%	15%	5%	2%	2%
Adj. Flow (vph)	163	120	9	41	171	399	29	535	37	549	1473	499
Shared Lane Traffic (%)												
Lane Group Flow (vph)	163	120	9	41	171	399	29	535	37	549	1473	499
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	1	6		5	2	

2030 Future Total (AM Peak Hour) 3:55 pm 03/27/2025

Synchro 11 Report
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Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2030 Future Total (AM Peak Hour)
03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	28.5	28.5	11.0	28.5	11.0	11.0	41.5	41.5	11.0	41.5	41.5
Total Split (s)	29.0	33.5	33.5	24.0	28.5	24.0	24.0	57.5	57.5	24.0	57.5	57.5
Total Split (%)	20.9%	24.1%	24.1%	17.3%	20.5%	17.3%	17.3%	41.4%	41.4%	17.3%	41.4%	41.4%
Maximum Green (s)	25.0	25.0	25.0	20.0	19.5	20.0	20.0	50.0	50.0	20.0	50.0	50.0
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.5	1.0	1.0	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	8.5	8.5	4.0	9.0	4.0	4.0	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		30.0	30.0		30.0			27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effect Green (s)	40.0	26.0	26.0	28.8	15.9	45.0	60.8	50.1	50.1	77.7	67.8	67.8
Actuated g/C Ratio	0.32	0.21	0.21	0.23	0.13	0.36	0.48	0.40	0.40	0.62	0.54	0.54
v/c Ratio	0.43	0.33	0.03	0.13	0.73	0.55	0.16	0.37	0.05	0.90	0.73	0.44
Control Delay (s/veh)	35.2	46.0	0.1	30.6	71.5	13.8	14.4	28.5	0.1	36.9	27.3	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	35.2	46.0	0.1	30.6	71.5	13.8	14.4	28.5	0.1	36.9	27.3	3.0
LOS	D	D	A	C	E	B	B	C	A	D	C	A
Approach Delay (s/veh)		38.6			31.1			26.1			24.6	
Approach LOS		D			C			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 139

Actuated Cycle Length: 125.8

Natural Cycle: 95

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.90

Intersection Signal Delay (s/veh): 26.8

Intersection LOS: C

Intersection Capacity Utilization 79.9%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: Highway 11 & Bathurst Street



Queues
4: Highway 11 & Bathurst Street

2030 Future Total (AM Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	163	120	9	41	171	399	29	535	37	549	1473	499
v/c Ratio	0.43	0.33	0.03	0.13	0.73	0.55	0.16	0.37	0.05	0.90	0.73	0.44
Control Delay (s/veh)	35.2	46.0	0.1	30.6	71.5	13.8	14.4	28.5	0.1	36.9	27.3	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	35.2	46.0	0.1	30.6	71.5	13.8	14.4	28.5	0.1	36.9	27.3	3.0
Queue Length 50th (m)	31.7	27.4	0.0	7.4	43.4	26.3	2.8	51.5	0.0	75.1	163.4	0.0
Queue Length 95th (m)	50.2	46.8	0.0	16.0	71.5	61.5	8.1	74.1	0.0	#167.9	222.0	19.3
Internal Link Dist (m)		73.6			81.0			917.3			369.8	
Turn Bay Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Base Capacity (vph)	457	377	320	468	290	729	374	1456	673	607	2006	1128
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.32	0.03	0.09	0.59	0.55	0.08	0.37	0.05	0.90	0.73	0.44

Intersection Summary

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

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	3	1	615	5	2	1399
Future Volume (vph)	3	1	615	5	2	1399
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	0.0		30.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	0.966			0.850		
Flt Protected	0.964				0.950	
Satd. Flow (prot)	1862	0	3585	1700	1900	3725
Flt Permitted	0.964				0.398	
Satd. Flow (perm)	1862	0	3585	1700	796	3725
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	1			5		
Link Speed (k/h)	30		70			70
Link Distance (m)	49.8		264.4			941.3
Travel Time (s)	6.0		13.6			48.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	6%	0%	0%	2%
Adj. Flow (vph)	3	1	668	5	2	1521
Shared Lane Traffic (%)						
Lane Group Flow (vph)	4	0	668	5	2	1521
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (m)	2.0		10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0		0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA	Perm	Perm	NA
Protected Phases	8		6			2

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases				6	2	
Detector Phase	8		6	6	2	2
Switch Phase						
Minimum Initial (s)	10.0		40.0	40.0	40.0	40.0
Minimum Split (s)	35.0		47.5	47.5	47.5	47.5
Total Split (s)	36.0		94.0	94.0	94.0	94.0
Total Split (%)	27.7%		72.3%	72.3%	72.3%	72.3%
Maximum Green (s)	29.0		86.5	86.5	86.5	86.5
Yellow Time (s)	4.0		5.0	5.0	5.0	5.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		7.5	7.5	7.5	7.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Don't Walk (s)	21.0		14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	10.0		125.1	125.1	125.1	125.1
Actuated g/C Ratio	0.08		0.96	0.96	0.96	0.96
v/c Ratio	0.03		0.19	0.00	0.00	0.42
Control Delay (s/veh)	50.8		0.2	0.0	1.5	1.4
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay (s/veh)	50.8		0.2	0.0	1.5	1.4
LOS	D		A	A	A	A
Approach Delay (s/veh)	50.8		0.2			1.4
Approach LOS	D		A			A
Intersection Summary						
Area Type:	Other					
Cycle Length: 130						
Actuated Cycle Length: 130						
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green						
Natural Cycle: 85						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.42						
Intersection Signal Delay (s/veh): 1.1				Intersection LOS: A		
Intersection Capacity Utilization 79.2%				ICU Level of Service D		
Analysis Period (min) 15						

Splits and Phases: 100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access



Queues

2030 Future Total (AM Peak Hour)

100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access

03/28/2025



Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	4	668	5	2	1521
v/c Ratio	0.03	0.19	0.00	0.00	0.42
Control Delay (s/veh)	50.8	0.2	0.0	1.5	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	50.8	0.2	0.0	1.5	1.4
Queue Length 50th (m)	0.8	0.0	0.0	0.0	0.0
Queue Length 95th (m)	4.6	3.2	m0.1	0.6	65.8
Internal Link Dist (m)	25.8	240.4			917.3
Turn Bay Length (m)			30.0	15.0	
Base Capacity (vph)	416	3450	1636	766	3584
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.19	0.00	0.00	0.42

Intersection Summary

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

Lanes, Volumes, Timings
101: Highway 11 & Site Access 1

2030 Future Total (AM Peak Hour)
03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	100	557	189	0	1501
Future Volume (vph)	0	100	557	189	0	1501
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.865	0.962			
Flt Protected						
Satd. Flow (prot)	0	1730	3656	0	0	3800
Flt Permitted						
Satd. Flow (perm)	0	1730	3656	0	0	3800
Link Speed (k/h)	30		70			70
Link Distance (m)	46.9		870.6			99.3
Travel Time (s)	5.6		44.8			5.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	109	605	205	0	1632
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	109	810	0	0	1632
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	42.8%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 101: Highway 11 & Site Access 1

2030 Future Total (AM Peak Hour)
03/28/2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	100	557	189	0	1501
Future Volume (Veh/h)	0	100	557	189	0	1501
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	109	605	205	0	1632
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						99
pX, platoon unblocked	0.81					
vC, conflicting volume	1524	405			810	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1182	405			810	
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	82			100	
cM capacity (veh/h)	151	601			825	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	109	403	407	816	816	
Volume Left	0	0	0	0	0	
Volume Right	109	0	205	0	0	
cSH	601	1700	1700	1700	1700	
Volume to Capacity	0.18	0.24	0.24	0.48	0.48	
Queue Length 95th (m)	5.3	0.0	0.0	0.0	0.0	
Control Delay (s/veh)	12.3	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s/veh)	12.3	0.0		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			42.8%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings
102: Site Access 2 & Crimson King Way

2030 Future Total (AM Peak Hour)
03/28/2025

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	51	68	8	112	60	3
Future Volume (vph)	51	68	8	112	60	3
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.923				0.994	
Flt Protected				0.997	0.954	
Satd. Flow (prot)	1846	0	0	1994	1897	0
Flt Permitted				0.997	0.954	
Satd. Flow (perm)	1846	0	0	1994	1897	0
Link Speed (k/h)	40			40	30	
Link Distance (m)	78.0			103.0	35.3	
Travel Time (s)	7.0			9.3	4.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	55	74	9	122	65	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	129	0	0	131	68	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	21.8%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
102: Site Access 2 & Crimson King Way

2030 Future Total (AM Peak Hour)
03/28/2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	51	68	8	112	60	3
Future Volume (Veh/h)	51	68	8	112	60	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	74	9	122	65	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)	78					
pX, platoon unblocked						
vC, conflicting volume			129		232	92
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			129		232	92
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		91	100
cM capacity (veh/h)			1469		756	971
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	129	131	68			
Volume Left	0	9	65			
Volume Right	74	0	3			
cSH	1700	1469	763			
Volume to Capacity	0.08	0.01	0.09			
Queue Length 95th (m)	0.0	0.1	2.3			
Control Delay (s/veh)	0.0	0.6	10.2			
Lane LOS		A	B			
Approach Delay (s/veh)	0.0	0.6	10.2			
Approach LOS			B			
Intersection Summary						
Average Delay		2.3				
Intersection Capacity Utilization		21.8%	ICU Level of Service		A	
Analysis Period (min)		15				

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2030 Future Total (PM Peak Hour)
03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	169	24	1443	78	94	812
Future Volume (vph)	169	24	1443	78	94	812
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	45.0		92.0	84.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	7.5				50.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1845	1700	3725	1700	1863	3725
Flt Permitted	0.950				0.112	
Satd. Flow (perm)	1845	1700	3725	1700	220	3725
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		25		80		
Link Speed (k/h)	40		70			70
Link Distance (m)	100.4		102.7			261.0
Travel Time (s)	9.0		5.3			13.4
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	0%	2%	0%	2%	2%
Adj. Flow (vph)	174	25	1488	80	97	837
Shared Lane Traffic (%)						
Lane Group Flow (vph)	174	25	1488	80	97	837
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	2.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		6		5	2

2030 Future Total (PM Peak Hour) 3:56 pm 03/27/2025

Synchro 11 Report
Page 1

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2030 Future Total (PM Peak Hour)
03/28/2025

	↙ ↖ ↑ ↗ ↘ ↓					
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		8		6	2	
Detector Phase	8	8	6	6	5	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	40.0	40.0	7.0	40.0
Minimum Split (s)	35.0	35.0	47.5	47.5	11.0	47.5
Total Split (s)	36.0	36.0	72.0	72.0	12.0	84.0
Total Split (%)	30.0%	30.0%	60.0%	60.0%	10.0%	70.0%
Maximum Green (s)	29.0	29.0	64.5	64.5	8.0	76.5
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	3.0	3.0	2.5	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.5	7.5	4.0	7.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Don't Walk (s)	21.0	21.0	14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effect Green (s)	16.6	16.6	77.2	77.2	92.4	88.9
Actuated g/C Ratio	0.14	0.14	0.64	0.64	0.77	0.74
v/c Ratio	0.68	0.10	0.62	0.07	0.36	0.30
Control Delay (s/veh)	62.2	15.7	16.8	1.9	9.4	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	62.2	15.7	16.8	1.9	9.4	5.4
LOS	E	B	B	A	A	A
Approach Delay (s/veh)	56.4		16.1			5.8
Approach LOS	E		B			A

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay (s/veh): 15.5

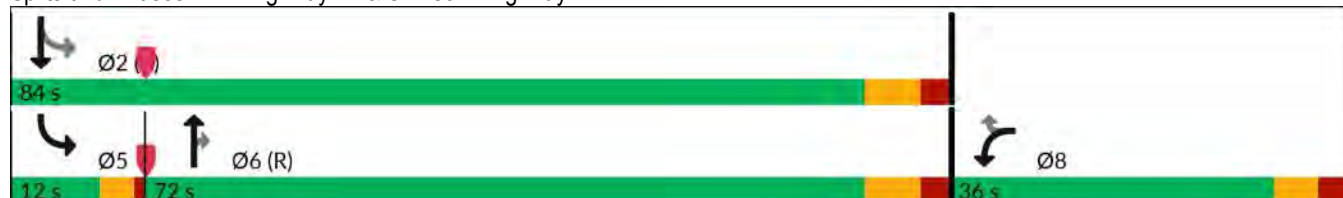
Intersection LOS: B

Intersection Capacity Utilization 68.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Highway 11 & Crimson King Way



Queues

2030 Future Total (PM Peak Hour)

1: Highway 11 & Crimson King Way

03/28/2025



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	174	25	1488	80	97	837
v/c Ratio	0.68	0.10	0.62	0.07	0.36	0.30
Control Delay (s/veh)	62.2	15.7	16.8	1.9	9.4	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	62.2	15.7	16.8	1.9	9.4	5.4
Queue Length 50th (m)	41.6	0.0	177.9	3.1	4.9	31.7
Queue Length 95th (m)	62.6	7.9	222.7	m3.9	8.5	29.5
Internal Link Dist (m)	76.4		78.7			237.0
Turn Bay Length (m)		45.0		92.0	84.0	
Base Capacity (vph)	445	429	2397	1122	283	2759
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.06	0.62	0.07	0.34	0.30

Intersection Summary

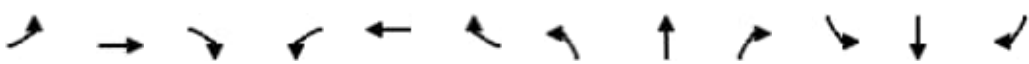
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings

2030 Future Total (PM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	2	3	5	236	2	72	10	1475	271	72	891	1
Future Volume (vph)	2	3	5	236	2	72	10	1475	271	72	891	1
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0		0.0	0.0		65.0	71.0		45.0	70.0		90.0
Storage Lanes	0		0	0		1	1		1	1		1
Taper Length (m)	7.5			7.5			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.932				0.850			0.850			0.850
Flt Protected		0.990			0.953		0.950			0.950		
Satd. Flow (prot)	0	1845	0	0	1906	1466	1900	3762	1667	1900	3725	1700
Flt Permitted		0.941			0.721		0.305			0.076		
Satd. Flow (perm)	0	1754	0	0	1442	1466	610	3762	1667	152	3725	1700
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				77			129			41
Link Speed (k/h)		40			40			70			70	
Link Distance (m)		288.1			294.1			681.3			866.5	
Travel Time (s)		25.9			26.5			35.0			44.6	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	16%	0%	1%	2%	0%	2%	0%
Adj. Flow (vph)	2	3	5	248	2	76	11	1553	285	76	938	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	10	0	0	250	76	11	1553	285	76	938	1
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			6		5		2

2030 Future Total (PM Peak Hour) 3:56 pm 03/27/2025

Synchro 11 Report

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	40.0	40.0	40.0	7.0	40.0	40.0
Minimum Split (s)	40.5	40.5		40.5	40.5	40.5	47.5	47.5	47.5	11.0	47.5	47.5
Total Split (s)	43.0	43.0		43.0	43.0	43.0	63.0	63.0	63.0	14.0	77.0	77.0
Total Split (%)	35.8%	35.8%		35.8%	35.8%	35.8%	52.5%	52.5%	52.5%	11.7%	64.2%	64.2%
Maximum Green (s)	35.5	35.5		35.5	35.5	35.5	55.5	55.5	55.5	10.0	69.5	69.5
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.5	3.5		3.5	3.5	3.5	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5			7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	0.2	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Don't Walk (s)	26.0	26.0		26.0	26.0	26.0	16.0	16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0	0		0	0
Act Effect Green (s)		26.0			26.0	26.0	69.6	69.6	69.6	82.5	79.0	79.0
Actuated g/C Ratio		0.22			0.22	0.22	0.58	0.58	0.58	0.69	0.66	0.66
v/c Ratio		0.03			0.80	0.20	0.03	0.71	0.28	0.35	0.38	0.00
Control Delay (s/veh)		24.2			62.6	8.4	15.4	22.6	9.1	11.9	9.5	0.0
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		24.2			62.6	8.4	15.4	22.6	9.1	11.9	9.5	0.0
LOS		C			E	A	B	C	A	B	A	A
Approach Delay (s/veh)		24.2			49.9			20.5			9.6	
Approach LOS		C			D			C			A	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 50 (42%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay (s/veh): 20.0

Intersection LOS: C

Intersection Capacity Utilization 97.9%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 2: Highway 11 & Sherwood Glen/Dog Wood Boulevard



Queues

2030 Future Total (PM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025



Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	10	250	76	11	1553	285	76	938	1
v/c Ratio	0.03	0.80	0.20	0.03	0.71	0.28	0.35	0.38	0.00
Control Delay (s/veh)	24.2	62.6	8.4	15.4	22.6	9.1	11.9	9.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	24.2	62.6	8.4	15.4	22.6	9.1	11.9	9.5	0.0
Queue Length 50th (m)	1.0	59.0	0.0	1.2	142.8	17.7	4.3	68.4	0.0
Queue Length 95th (m)	5.2	82.3	11.6	5.0	210.5	41.6	8.9	63.4	m0.0
Internal Link Dist (m)	264.1	270.1			657.3			842.5	
Turn Bay Length (m)			65.0	71.0		45.0	70.0		90.0
Base Capacity (vph)	522	426	487	353	2180	1020	250	2451	1132
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.59	0.16	0.03	0.71	0.28	0.30	0.38	0.00

Intersection Summary

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

Lanes, Volumes, Timings
3: Cloverrick Avenue & Crimson King Way

2030 Future Total (PM Peak Hour)
03/28/2025

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	99	43	4	44	40	1
Future Volume (vph)	99	43	4	44	40	1
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.959				0.997	
Flt Protected				0.996	0.953	
Satd. Flow (prot)	1918	0	0	1992	1900	0
Flt Permitted				0.996	0.953	
Satd. Flow (perm)	1918	0	0	1992	1900	0
Link Speed (k/h)	40			40	40	
Link Distance (m)	80.6			280.7	206.8	
Travel Time (s)	7.3			25.3	18.6	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	121	52	5	54	49	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	173	0	0	59	50	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)		15	25		25	15
Sign Control	Stop			Stop	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	17.4%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 3: Cloverridge Avenue & Crimson King Way

2030 Future Total (PM Peak Hour)
03/28/2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	99	43	4	44	40	1
Future Volume (vph)	99	43	4	44	40	1
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	121	52	5	54	49	1
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	173	59	50			
Volume Left (vph)	0	5	49			
Volume Right (vph)	52	0	1			
Hadj (s)	-0.18	0.02	0.18			
Departure Headway (s)	3.9	4.2	4.6			
Degree Utilization, x	0.19	0.07	0.06			
Capacity (veh/h)	905	837	745			
Control Delay (s/veh)	7.8	7.5	7.9			
Approach Delay (s/veh)	7.8	7.5	7.9			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.7			
Level of Service			A			
Intersection Capacity Utilization			17.4%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2030 Future Total (PM Peak Hour)
03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	398	171	16	31	79	712	22	1556	59	423	864	222
Future Volume (vph)	398	171	16	31	79	712	22	1556	59	423	864	222
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	35.0			33.0			48.0			72.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00					0.97
Fr't			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1845	1942	1700	1827	1770	1635	1900	3725	1574	1845	3689	1667
Flt Permitted	0.549			0.641			0.308			0.068		
Satd. Flow (perm)	1066	1942	1700	1233	1770	1635	615	3725	1574	132	3689	1617
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98			*360			141			239
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		97.6			105.0			944.7			393.8	
Travel Time (s)		5.9			6.3			48.6			20.3	
Confl. Peds. (#/hr)							5					5
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	1.00	0.93	0.93	0.93	1.00	0.93	0.93
Heavy Vehicles (%)	3%	3%	0%	4%	13%	4%	0%	2%	8%	3%	3%	2%
Adj. Flow (vph)	428	184	17	33	85	712	24	1673	63	423	929	239
Shared Lane Traffic (%)												
Lane Group Flow (vph)	428	184	17	33	85	712	24	1673	63	423	929	239
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

2030 Future Total (PM Peak Hour) 3:56 pm 03/27/2025

Synchro 11 Report
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Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2030 Future Total (PM Peak Hour)
03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	1	6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	28.5	28.5	11.0	28.5	11.0	11.0	41.5	41.5	11.0	41.5	41.5
Total Split (s)	23.5	33.5	33.5	18.5	28.5	26.0	24.0	61.0	61.0	26.0	63.0	63.0
Total Split (%)	16.9%	24.1%	24.1%	13.3%	20.5%	18.7%	17.3%	43.9%	43.9%	18.7%	45.3%	45.3%
Maximum Green (s)	19.5	25.0	25.0	14.5	19.5	22.0	20.0	53.5	53.5	22.0	55.5	55.5
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.5	1.0	1.0	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	4.0	8.5	8.5	4.0	9.0	2.0	4.0	7.5	7.5	3.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		30.0	30.0		30.0			27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0			5	5		5	5
Act Effect Green (s)	40.8	29.1	29.1	24.9	12.2	45.3	64.0	53.5	53.5	84.0	73.0	73.0
Actuated g/C Ratio	0.31	0.22	0.22	0.19	0.09	0.34	0.49	0.41	0.41	0.64	0.55	0.55
v/c Ratio	0.96	0.43	0.04	0.12	0.52	0.89	0.07	1.11	0.09	1.10	0.45	0.24
Control Delay (s/veh)	76.9	49.4	0.1	33.8	68.4	34.7	11.6	95.2	0.2	115.5	19.4	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	76.9	49.4	0.1	33.8	68.4	34.7	11.6	95.2	0.2	115.5	19.4	2.7
LOS	E	D	A	C	E	C	B	F	A	F	B	A
Approach Delay (s/veh)		66.8			38.1			90.6			42.5	
Approach LOS		E			D			F			D	

Intersection Summary

Area Type: Other

Cycle Length: 139

Actuated Cycle Length: 131.8

Natural Cycle: 135

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.11

Intersection Signal Delay (s/veh): 62.5

Intersection LOS: E

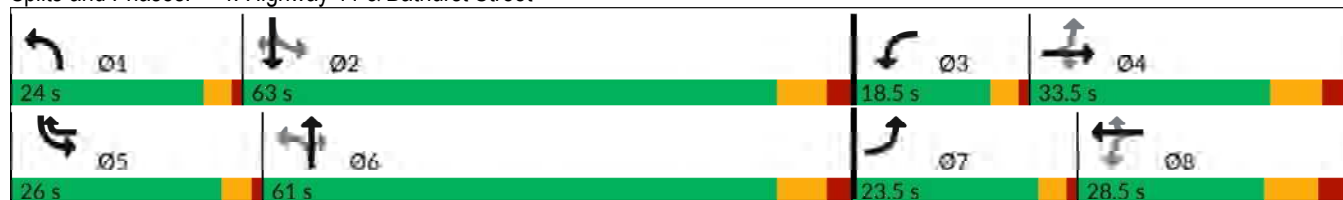
Intersection Capacity Utilization 116.6%

ICU Level of Service H

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 4: Highway 11 & Bathurst Street



2030 Future Total (PM Peak Hour) 3:56 pm 03/27/2025

Synchro 11 Report
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Queues

2030 Future Total (PM Peak Hour)

4: Highway 11 & Bathurst Street

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	428	184	17	33	85	712	24	1673	63	423	929	239
v/c Ratio	0.96	0.43	0.04	0.12	0.52	0.89	0.07	1.11	0.09	1.10	0.45	0.24
Control Delay (s/veh)	76.9	49.4	0.1	33.8	68.4	34.7	11.6	95.2	0.2	115.5	19.4	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	76.9	49.4	0.1	33.8	68.4	34.7	11.6	95.2	0.2	115.5	19.4	2.7
Queue Length 50th (m)	105.3	45.5	0.0	6.4	22.5	103.2	2.3	~271.5	0.0	~112.7	82.2	0.0
Queue Length 95th (m)	#177.6	71.2	0.0	14.6	40.5	#184.5	6.3	#334.1	0.0	#189.3	108.0	13.6
Internal Link Dist (m)		73.6			81.0			920.7			369.8	
Turn Bay Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Base Capacity (vph)	444	430	453	362	262	797	554	1512	723	383	2042	1002
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.43	0.04	0.09	0.32	0.89	0.04	1.11	0.09	1.10	0.45	0.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	7	3	1461	6	2	909
Future Volume (vph)	7	3	1461	6	2	909
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	0.0		30.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	0.963			0.850		
Flt Protected	0.965				0.950	
Satd. Flow (prot)	1822	0	3725	1667	1863	3689
Flt Permitted	0.965				0.148	
Satd. Flow (perm)	1822	0	3725	1667	290	3689
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	3			3		
Link Speed (k/h)	30		70			70
Link Distance (m)	48.4		261.0			944.7
Travel Time (s)	5.8		13.4			48.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%
Adj. Flow (vph)	8	3	1588	7	2	988
Shared Lane Traffic (%)						
Lane Group Flow (vph)	11	0	1588	7	2	988
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	100	100		100	100	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (m)	2.0		10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0		0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA	Perm	Perm	NA
Protected Phases	8		6			2

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases				6	2	
Detector Phase	8		6	6	2	2
Switch Phase						
Minimum Initial (s)	10.0		40.0	40.0	40.0	40.0
Minimum Split (s)	35.0		47.5	47.5	47.5	47.5
Total Split (s)	36.0		84.0	84.0	84.0	84.0
Total Split (%)	30.0%		70.0%	70.0%	70.0%	70.0%
Maximum Green (s)	29.0		76.5	76.5	76.5	76.5
Yellow Time (s)	4.0		5.0	5.0	5.0	5.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		7.5	7.5	7.5	7.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Don't Walk (s)	21.0		14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	10.0		115.1	115.1	115.1	115.1
Actuated g/C Ratio	0.08		0.96	0.96	0.96	0.96
v/c Ratio	0.07		0.44	0.00	0.01	0.28
Control Delay (s/veh)	44.3		0.9	0.0	1.5	1.1
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay (s/veh)	44.3		0.9	0.0	1.5	1.1
LOS	D		A	A	A	A
Approach Delay (s/veh)	44.3		0.9			1.1
Approach LOS	D		A			A
Intersection Summary						
Area Type:	Other					
Cycle Length: 120						
Actuated Cycle Length: 120						
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green						
Natural Cycle: 85						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.44						
Intersection Signal Delay (s/veh): 1.1				Intersection LOS: A		
Intersection Capacity Utilization 79.2%				ICU Level of Service D		
Analysis Period (min) 15						

Splits and Phases: 100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access



Queues

2030 Future Total (PM Peak Hour)

100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access

03/28/2025



Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	11	1588	7	2	988
v/c Ratio	0.07	0.44	0.00	0.01	0.28
Control Delay (s/veh)	44.3	0.9	0.0	1.5	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	44.3	0.9	0.0	1.5	1.1
Queue Length 50th (m)	1.9	4.3	0.0	0.0	0.0
Queue Length 95th (m)	8.0	4.6	m0.0	0.6	35.9
Internal Link Dist (m)	24.4	237.0			920.7
Turn Bay Length (m)			30.0	15.0	
Base Capacity (vph)	442	3573	1599	278	3538
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.02	0.44	0.00	0.01	0.28

Intersection Summary

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

Lanes, Volumes, Timings
101: Highway 11 & Site Access 1

2030 Future Total (PM Peak Hour)
03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	117	1403	115	0	964
Future Volume (vph)	0	117	1403	115	0	964
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.865	0.989			
Flt Protected						
Satd. Flow (prot)	0	1696	3758	0	0	3800
Flt Permitted						
Satd. Flow (perm)	0	1696	3758	0	0	3800
Link Speed (k/h)	30		70			70
Link Distance (m)	57.0		866.5			102.7
Travel Time (s)	6.8		44.6			5.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%
Adj. Flow (vph)	0	127	1525	125	0	1048
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	127	1650	0	0	1048
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	53.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

101: Highway 11 & Site Access 1

2030 Future Total (PM Peak Hour)
03/28/2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	117	1403	115	0	964
Future Volume (Veh/h)	0	117	1403	115	0	964
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	127	1525	125	0	1048
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						103
pX, platoon unblocked	0.92					
vC, conflicting volume	2112	825			1650	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2037	825			1650	
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	60			100	
cM capacity (veh/h)	46	316			387	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	127	1017	633	524	524	
Volume Left	0	0	0	0	0	
Volume Right	127	0	125	0	0	
cSH	316	1700	1700	1700	1700	
Volume to Capacity	0.40	0.60	0.37	0.31	0.31	
Queue Length 95th (m)	15.0	0.0	0.0	0.0	0.0	
Control Delay (s/veh)	23.9	0.0	0.0	0.0	0.0	
Lane LOS	C					
Approach Delay (s/veh)	23.9	0.0		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			53.9%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
102: Site Access 2 & Crimson King Way

2030 Future Total (PM Peak Hour)
03/28/2025

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	138	37	3	82	112	7
Future Volume (vph)	138	37	3	82	112	7
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.972				0.992	
Flt Protected				0.998	0.955	
Satd. Flow (prot)	1944	0	0	1996	1895	0
Flt Permitted				0.998	0.955	
Satd. Flow (perm)	1944	0	0	1996	1895	0
Link Speed (k/h)	40			40	30	
Link Distance (m)	100.4			80.6	51.1	
Travel Time (s)	9.0			7.3	6.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	150	40	3	89	122	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	190	0	0	92	130	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	22.0%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
102: Site Access 2 & Crimson King Way

2030 Future Total (PM Peak Hour)
03/28/2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	138	37	3	82	112	7
Future Volume (Veh/h)	138	37	3	82	112	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	150	40	3	89	122	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	100					
pX, platoon unblocked						
vC, conflicting volume			190	265		170
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			190	265		170
tC, single (s)			4.1	6.4		6.2
tC, 2 stage (s)						
tF (s)			2.2	3.5		3.3
p0 queue free %			100	83		99
cM capacity (veh/h)			1396	727		879
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	190	92	130			
Volume Left	0	3	122			
Volume Right	40	0	8			
cSH	1700	1396	735			
Volume to Capacity	0.11	0.00	0.18			
Queue Length 95th (m)	0.0	0.1	5.1			
Control Delay (s/veh)	0.0	0.3	11.0			
Lane LOS	A		B			
Approach Delay (s/veh)	0.0	0.3	11.0			
Approach LOS			B			
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			22.0%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2030 Future Total (SAT Peak Hour)
03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	116	34	933	54	74	785
Future Volume (vph)	116	34	933	54	74	785
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	45.0		92.0	84.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	7.5				50.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1900	1700	3762	1700	1900	3762
Flt Permitted	0.950				0.219	
Satd. Flow (perm)	1900	1700	3762	1700	438	3762
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		37		59		
Link Speed (k/h)	40		70			70
Link Distance (m)	99.5		108.6			260.8
Travel Time (s)	9.0		5.6			13.4
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	127	37	1025	59	81	863
Shared Lane Traffic (%)						
Lane Group Flow (vph)	127	37	1025	59	81	863
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	2.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		6		5	2

2030 Future Total (SAT Peak Hour) 3:58 pm 12/20/2024

Synchro 11 Report
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Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2030 Future Total (SAT Peak Hour)
03/28/2025

	↙ ↘		↑		↗ ↘	
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		8		6	2	
Detector Phase	8	8	6	6	5	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	40.0	40.0	7.0	40.0
Minimum Split (s)	26.0	26.0	47.5	47.5	11.0	47.5
Total Split (s)	26.0	26.0	47.5	47.5	11.0	58.5
Total Split (%)	30.8%	30.8%	56.2%	56.2%	13.0%	69.2%
Maximum Green (s)	19.0	19.0	40.0	40.0	7.0	51.0
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	3.0	3.0	2.5	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.5	7.5	4.0	7.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	Max	Max	None	Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Don't Walk (s)	21.0	21.0	14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effect Green (s)	11.3	11.3	47.0	47.0	57.6	55.7
Actuated g/C Ratio	0.15	0.15	0.62	0.62	0.75	0.73
v/c Ratio	0.45	0.13	0.44	0.06	0.17	0.31
Control Delay (s/veh)	35.4	11.2	11.7	3.2	4.6	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	35.4	11.2	11.7	3.2	4.6	5.5
LOS	D	B	B	A	A	A
Approach Delay (s/veh)	29.9		11.2			5.4
Approach LOS	C		B			A

Intersection Summary

Area Type: Other

Cycle Length: 84.5

Actuated Cycle Length: 76.4

Natural Cycle: 85

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.45

Intersection Signal Delay (s/veh): 10.1

Intersection LOS: B

Intersection Capacity Utilization 62.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Highway 11 & Crimson King Way



Queues

2030 Future Total (SAT Peak Hour)

1: Highway 11 & Crimson King Way

03/28/2025

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	127	37	1025	59	81	863
v/c Ratio	0.45	0.13	0.44	0.06	0.17	0.31
Control Delay (s/veh)	35.4	11.2	11.7	3.2	4.6	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	35.4	11.2	11.7	3.2	4.6	5.5
Queue Length 50th (m)	18.0	0.0	49.2	0.0	2.9	24.5
Queue Length 95th (m)	33.9	7.8	73.5	5.6	7.7	40.0
Internal Link Dist (m)	75.5		84.6			236.8
Turn Bay Length (m)		45.0		92.0	84.0	
Base Capacity (vph)	472	450	2313	1067	464	2742
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.08	0.44	0.06	0.17	0.31
Intersection Summary						

Lanes, Volumes, Timings

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

2030 Future Total (SAT Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	0	9	75	0	8	15	994	66	2	907	0
Future Volume (vph)	3	0	9	75	0	8	15	994	66	2	907	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0		0.0	0.0		65.0	71.0		45.0	70.0		90.0
Storage Lanes	0		0	0		1	1		1	1		1
Taper Length (m)	7.5			7.5			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		0.99			1.00	0.99						
Frt		0.896				0.850			0.850			
Flt Protected		0.989			0.950		0.950			0.950		
Satd. Flow (prot)	0	1755	0	0	1900	1700	1900	3762	1700	1900	3762	2000
Flt Permitted		0.897			0.749		0.297			0.228		
Satd. Flow (perm)	0	1591	0	0	1497	1678	594	3762	1700	456	3762	2000
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		109				109			109			
Link Speed (k/h)		40			40			70			70	
Link Distance (m)		288.1			294.1			681.3			859.0	
Travel Time (s)		25.9			26.5			35.0			44.2	
Confl. Peds. (#/hr)	1		1	1		1						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Adj. Flow (vph)	3	0	10	80	0	9	16	1057	70	2	965	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	13	0	0	80	9	16	1057	70	2	965	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

2030 Future Total (SAT Peak Hour) 3:58 pm 12/20/2024

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Lanes, Volumes, Timings

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

2030 Future Total (SAT Peak Hour)

03/28/2025

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			6		5	2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	40.0	40.0	40.0	7.0	40.0	40.0
Minimum Split (s)	26.5	26.5		26.5	26.5	26.5	47.5	47.5	47.5	11.0	47.5	47.5
Total Split (s)	26.5	26.5		26.5	26.5	26.5	47.5	47.5	47.5	11.0	58.5	58.5
Total Split (%)	31.2%	31.2%		31.2%	31.2%	31.2%	55.9%	55.9%	55.9%	12.9%	68.8%	68.8%
Maximum Green (s)	19.0	19.0		19.0	19.0	19.0	40.0	40.0	40.0	7.0	51.0	51.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.5	3.5		3.5	3.5	3.5	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5			7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	0.2	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None		None	None	None	Max	Max	Max	None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Don't Walk (s)	26.0	26.0		26.0	26.0	26.0	16.0	16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0	0		0	0
Act Effect Green (s)		11.0			11.0	11.0	58.4	58.4	58.4	62.5	60.7	
Actuated g/C Ratio		0.14			0.14	0.14	0.72	0.72	0.72	0.77	0.75	
v/c Ratio		0.04			0.40	0.03	0.04	0.39	0.06	0.00	0.34	
Control Delay (s/veh)		0.3			38.1	0.1	7.7	7.5	1.0	3.5	5.4	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)		0.3			38.1	0.1	7.7	7.5	1.0	3.5	5.4	
LOS		A			D	A	A	A	A	A	A	
Approach Delay (s/veh)		0.3			34.2			7.1			5.4	
Approach LOS		A			C			A			A	

Intersection Summary

Area Type: Other

Cycle Length: 85

Actuated Cycle Length: 81.2

Natural Cycle: 85

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.40

Intersection Signal Delay (s/veh): 7.4

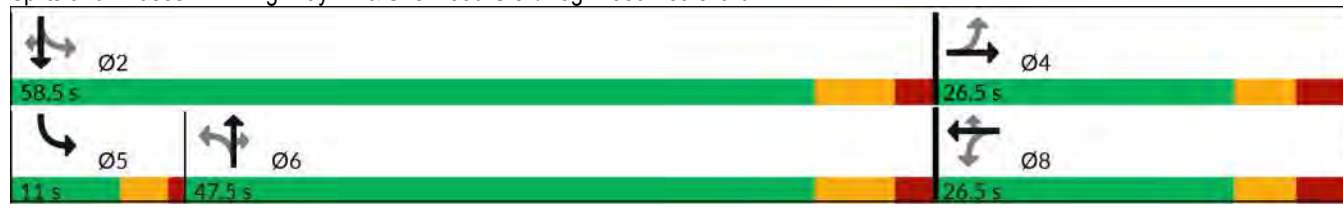
Intersection LOS: A

Intersection Capacity Utilization 70.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 2: Highway 11 & Sherwood Glen/Dog Wood Boulevard



2030 Future Total (SAT Peak Hour) 3:58 pm 12/20/2024

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Queues

2030 Future Total (SAT Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025



Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	13	80	9	16	1057	70	2	965
v/c Ratio	0.04	0.40	0.03	0.04	0.39	0.06	0.00	0.34
Control Delay (s/veh)	0.3	38.1	0.1	7.7	7.5	1.0	3.5	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	0.3	38.1	0.1	7.7	7.5	1.0	3.5	5.4
Queue Length 50th (m)	0.0	12.9	0.0	0.7	32.6	0.0	0.1	28.9
Queue Length 95th (m)	0.0	24.1	0.0	4.4	75.3	2.9	0.7	45.0
Internal Link Dist (m)	264.1	270.1			657.3			835.0
Turn Bay Length (m)			65.0	71.0		45.0	70.0	
Base Capacity (vph)	457	352	478	427	2706	1253	476	2811
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.23	0.02	0.04	0.39	0.06	0.00	0.34

Intersection Summary

Lanes, Volumes, Timings
3: Cloverridge Avenue & Crimson King Way

2030 Future Total (SAT Peak Hour)
03/28/2025

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	55	29	4	49	32	4
Future Volume (vph)	55	29	4	49	32	4
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.953				0.986	
Flt Protected				0.996	0.957	
Satd. Flow (prot)	1906	0	0	1992	1887	0
Flt Permitted				0.996	0.957	
Satd. Flow (perm)	1906	0	0	1992	1887	0
Link Speed (k/h)	40			40	40	
Link Distance (m)	81.5			280.7	206.8	
Travel Time (s)	7.3			25.3	18.6	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	73	39	5	65	43	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	112	0	0	70	48	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)		15	25		25	15
Sign Control	Stop			Stop	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	15.6%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 3: Cloverridge Avenue & Crimson King Way

2030 Future Total (SAT Peak Hour)
03/28/2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	55	29	4	49	32	4
Future Volume (vph)	55	29	4	49	32	4
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	73	39	5	65	43	5
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	112	70	48			
Volume Left (vph)	0	5	43			
Volume Right (vph)	39	0	5			
Hadj (s)	-0.21	0.01	0.12			
Departure Headway (s)	3.9	4.1	4.4			
Degree Utilization, x	0.12	0.08	0.06			
Capacity (veh/h)	910	854	781			
Control Delay (s/veh)	7.4	7.5	7.7			
Approach Delay (s/veh)	7.4	7.5	7.7			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.5			
Level of Service			A			
Intersection Capacity Utilization			15.6%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2030 Future Total (SAT Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	271	113	20	38	94	458	25	900	50	373	856	215
Future Volume (vph)	271	113	20	38	94	458	25	900	50	373	856	215
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	35.0			33.0			48.0			72.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00					0.99						
Fr't			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1881	1942	1619	1900	1942	1667	1900	3762	1700	1863	3762	1683
Flt Permitted	0.537			0.680			0.313			0.152		
Satd. Flow (perm)	1062	1942	1619	1360	1942	1645	626	3762	1700	298	3762	1683
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98			112			141			229
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		97.6			105.0			944.8			393.8	
Travel Time (s)		5.9			6.3			48.6			20.3	
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	1%	3%	5%	0%	3%	2%	0%	1%	0%	2%	1%	1%
Adj. Flow (vph)	288	120	21	40	100	487	27	957	53	397	911	229
Shared Lane Traffic (%)												
Lane Group Flow (vph)	288	120	21	40	100	487	27	957	53	397	911	229
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

2030 Future Total (SAT Peak Hour) 3:58 pm 12/20/2024

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Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2030 Future Total (SAT Peak Hour)
03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	1	6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	28.5	28.5	11.0	28.5	11.0	11.0	41.5	41.5	11.0	41.5	41.5
Total Split (s)	29.0	33.5	33.5	24.0	28.5	24.0	24.0	57.5	57.5	24.0	57.5	57.5
Total Split (%)	20.9%	24.1%	24.1%	17.3%	20.5%	17.3%	17.3%	41.4%	41.4%	17.3%	41.4%	41.4%
Maximum Green (s)	25.0	25.0	25.0	20.0	19.5	20.0	20.0	50.0	50.0	20.0	50.0	50.0
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.5	1.0	1.0	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	8.5	8.5	4.0	9.0	4.0	4.0	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		30.0	30.0		30.0			27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0			5	5		5	5
Act Effect Green (s)	43.2	29.4	29.4	25.2	12.4	37.5	60.7	50.1	50.1	77.6	67.7	67.7
Actuated g/C Ratio	0.34	0.23	0.23	0.20	0.10	0.29	0.47	0.39	0.39	0.60	0.53	0.53
v/c Ratio	0.58	0.27	0.05	0.13	0.53	0.87	0.07	0.65	0.07	0.94	0.46	0.23
Control Delay (s/veh)	38.5	43.7	0.2	30.9	66.9	48.9	13.5	35.7	0.2	56.1	21.8	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	38.5	43.7	0.2	30.9	66.9	48.9	13.5	35.7	0.2	56.1	21.8	3.1
LOS	D	D	A	C	E	D	B	D	A	E	C	A
Approach Delay (s/veh)		38.1			50.6			33.3			27.9	
Approach LOS		D			D			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 139

Actuated Cycle Length: 128.9

Natural Cycle: 95

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.94

Intersection Signal Delay (s/veh): 34.6

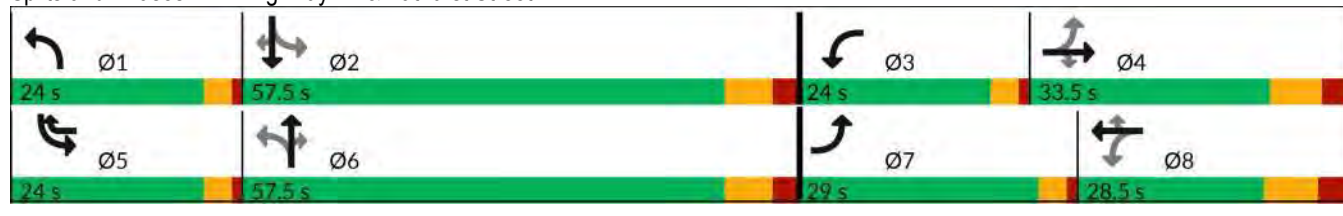
Intersection LOS: C

Intersection Capacity Utilization 80.9%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: Highway 11 & Bathurst Street



2030 Future Total (SAT Peak Hour) 3:58 pm 12/20/2024

Synchro 11 Report
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Queues

2030 Future Total (SAT Peak Hour)

4: Highway 11 & Bathurst Street

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	288	120	21	40	100	487	27	957	53	397	911	229
v/c Ratio	0.58	0.27	0.05	0.13	0.53	0.87	0.07	0.65	0.07	0.94	0.46	0.23
Control Delay (s/veh)	38.5	43.7	0.2	30.9	66.9	48.9	13.5	35.7	0.2	56.1	21.8	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	38.5	43.7	0.2	30.9	66.9	48.9	13.5	35.7	0.2	56.1	21.8	3.1
Queue Length 50th (m)	60.1	27.1	0.0	7.2	26.2	95.6	2.8	110.8	0.0	68.0	85.5	0.0
Queue Length 95th (m)	86.4	46.1	0.0	15.5	46.1	#154.2	7.8	145.5	0.0	#144.9	115.1	14.6
Internal Link Dist (m)		73.6			81.0			920.8			369.8	
Turn Bay Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Base Capacity (vph)	515	447	448	479	294	561	555	1462	746	422	1974	992
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.27	0.05	0.08	0.34	0.87	0.05	0.65	0.07	0.94	0.46	0.23

Intersection Summary

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

Queue shown is maximum after two cycles.

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	967	0	0	914
Future Volume (vph)	0	0	967	0	0	914
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	0.0		30.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt						
Flt Protected						
Satd. Flow (prot)	1961	0	3725	1961	1961	3725
Flt Permitted						
Satd. Flow (perm)	1961	0	3725	1961	1961	3725
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	30		70			70
Link Distance (m)	47.4		260.8			944.8
Travel Time (s)	5.7		13.4			48.6
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	0	0	1165	0	0	1101
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1165	0	0	1101
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (m)	2.0		10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0		0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA	Perm	Perm	NA
Protected Phases	8		6			2
Permitted Phases				6	2	

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8		6	6	2	2
Switch Phase						
Minimum Initial (s)	10.0		40.0	40.0	40.0	40.0
Minimum Split (s)	35.0		47.5	47.5	47.5	47.5
Total Split (s)	36.0		84.0	84.0	84.0	84.0
Total Split (%)	30.0%		70.0%	70.0%	70.0%	70.0%
Maximum Green (s)	29.0		76.5	76.5	76.5	76.5
Yellow Time (s)	4.0		5.0	5.0	5.0	5.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		7.5	7.5	7.5	7.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Don't Walk (s)	21.0		14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)			120.0			120.0
Actuated g/C Ratio			1.00			1.00
v/c Ratio			0.31			0.30
Control Delay (s/veh)			0.2			0.2
Queue Delay			0.0			0.0
Total Delay (s/veh)			0.2			0.2
LOS			A			A
Approach Delay (s/veh)			0.2			0.2
Approach LOS			A			A
Intersection Summary						
Area Type:	Other					
Cycle Length: 120						
Actuated Cycle Length: 120						
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green						
Natural Cycle: 85						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.31						
Intersection Signal Delay (s/veh): 0.2				Intersection LOS: A		
Intersection Capacity Utilization 39.6%				ICU Level of Service A		
Analysis Period (min) 15						

Splits and Phases: 100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access



Queues

2030 Future Total (SAT Peak Hour)

100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access

03/28/2025



Lane Group	NBT	SBT
Lane Group Flow (vph)	1165	1101
v/c Ratio	0.31	0.30
Control Delay (s/veh)	0.2	0.2
Queue Delay	0.0	0.0
Total Delay (s/veh)	0.2	0.2
Queue Length 50th (m)	0.0	0.0
Queue Length 95th (m)	0.0	0.0
Internal Link Dist (m)	236.8	920.8
Turn Bay Length (m)		
Base Capacity (vph)	3725	3725
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.31	0.30
Intersection Summary		

Lanes, Volumes, Timings
101: Highway 11 & Site Access 1

2030 Future Total (SAT Peak Hour)
03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	117	856	149	0	909
Future Volume (vph)	0	117	856	149	0	909
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.865	0.978			
Flt Protected						
Satd. Flow (prot)	0	1696	3644	0	0	3725
Flt Permitted						
Satd. Flow (perm)	0	1696	3644	0	0	3725
Link Speed (k/h)	30		70			70
Link Distance (m)	47.8		859.0			108.6
Travel Time (s)	5.7		44.2			5.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	127	930	162	0	988
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	127	1092	0	0	988
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	40.5%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 101: Highway 11 & Site Access 1

2030 Future Total (SAT Peak Hour)
03/28/2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	117	856	149	0	909
Future Volume (Veh/h)	0	117	856	149	0	909
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	127	930	162	0	988
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						109
pX, platoon unblocked	0.91					
vC, conflicting volume	1505	546			1092	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1351	546			1092	
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	74			100	
cM capacity (veh/h)	128	482			635	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	127	620	472	494	494	
Volume Left	0	0	0	0	0	
Volume Right	127	0	162	0	0	
cSH	482	1700	1700	1700	1700	
Volume to Capacity	0.26	0.36	0.28	0.29	0.29	
Queue Length 95th (m)	8.4	0.0	0.0	0.0	0.0	
Control Delay (s/veh)	15.1	0.0	0.0	0.0	0.0	
Lane LOS	C					
Approach Delay (s/veh)	15.1	0.0		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			40.5%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings
102: Site Access 2 & Crimson King Way

2030 Future Total (SAT Peak Hour)
03/28/2025

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	81	47	4	77	73	3
Future Volume (vph)	81	47	4	77	73	3
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.950				0.995	
Flt Protected				0.998	0.954	
Satd. Flow (prot)	1863	0	0	1957	1861	0
Flt Permitted				0.998	0.954	
Satd. Flow (perm)	1863	0	0	1957	1861	0
Link Speed (k/h)	40			40	30	
Link Distance (m)	99.5			81.5	36.3	
Travel Time (s)	9.0			7.3	4.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	88	51	4	84	79	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	139	0	0	88	82	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	17.6%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
102: Site Access 2 & Crimson King Way

2030 Future Total (SAT Peak Hour)
03/28/2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	81	47	4	77	73	3
Future Volume (Veh/h)	81	47	4	77	73	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	88	51	4	84	79	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)	99					
pX, platoon unblocked						
vC, conflicting volume			139		206	114
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			139		206	114
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		90	100
cM capacity (veh/h)			1445		781	939
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	139	88	82			
Volume Left	0	4	79			
Volume Right	51	0	3			
cSH	1700	1445	786			
Volume to Capacity	0.08	0.00	0.10			
Queue Length 95th (m)	0.0	0.1	2.8			
Control Delay (s/veh)	0.0	0.4	10.1			
Lane LOS		A	B			
Approach Delay (s/veh)	0.0	0.4	10.1			
Approach LOS			B			
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization			17.6%	ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2035 Future Total (AM Peak Hour)
03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	157	23	598	62	89	1424
Future Volume (vph)	157	23	598	62	89	1424
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	45.0		92.0	84.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	55.0				50.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1863	1545	3585	1700	1473	3725
Flt Permitted	0.950				0.364	
Satd. Flow (perm)	1863	1545	3585	1700	564	3725
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		26		70		
Link Speed (k/h)	40		70			70
Link Distance (m)	74.7		99.3			264.9
Travel Time (s)	6.7		5.1			13.6
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	2%	10%	6%	0%	29%	2%
Adj. Flow (vph)	176	26	672	70	100	1600
Shared Lane Traffic (%)						
Lane Group Flow (vph)	176	26	672	70	100	1600
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	2.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		6		5	2

2035 Future Total (AM Peak Hour) 3:58 pm 03/27/2025

Synchro 11 Report
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Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2035 Future Total (AM Peak Hour)
03/28/2025

	↙ ↘		↑		↗ ↘	
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		8		6	2	
Detector Phase	8	8	6	6	5	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	40.0	40.0	7.0	40.0
Minimum Split (s)	35.0	35.0	47.5	47.5	11.0	47.5
Total Split (s)	36.0	36.0	82.0	82.0	12.0	94.0
Total Split (%)	27.7%	27.7%	63.1%	63.1%	9.2%	72.3%
Maximum Green (s)	29.0	29.0	74.5	74.5	8.0	86.5
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	3.0	3.0	2.5	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.5	7.5	4.0	7.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Don't Walk (s)	21.0	21.0	14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effect Green (s)	17.6	17.6	86.0	86.0	101.4	97.9
Actuated g/C Ratio	0.14	0.14	0.66	0.66	0.78	0.75
v/c Ratio	0.70	0.11	0.28	0.06	0.20	0.57
Control Delay (s/veh)	68.0	16.7	2.1	0.1	4.9	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.4
Total Delay (s/veh)	68.0	16.7	2.1	0.1	4.9	8.8
LOS	E	B	A	A	A	A
Approach Delay (s/veh)	61.4		1.9			8.5
Approach LOS	E		A			A

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay (s/veh): 10.7

Intersection LOS: B

Intersection Capacity Utilization 62.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Highway 11 & Crimson King Way



Queues

2035 Future Total (AM Peak Hour)

1: Highway 11 & Crimson King Way

03/28/2025

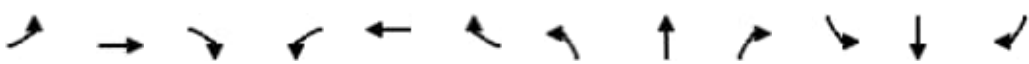
						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	176	26	672	70	100	1600
v/c Ratio	0.70	0.11	0.28	0.06	0.20	0.57
Control Delay (s/veh)	68.0	16.7	2.1	0.1	4.9	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.4
Total Delay (s/veh)	68.0	16.7	2.1	0.1	4.9	8.8
Queue Length 50th (m)	46.0	0.0	6.1	0.0	5.4	85.7
Queue Length 95th (m)	67.0	8.2	10.1	0.2	11.9	122.0
Internal Link Dist (m)	50.7		75.3			240.9
Turn Bay Length (m)		45.0		92.0	84.0	
Base Capacity (vph)	415	364	2371	1148	499	2806
Starvation Cap Reductn	0	0	0	0	0	595
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.07	0.28	0.06	0.20	0.72
Intersection Summary						

Lanes, Volumes, Timings

2035 Future Total (AM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	1	0	9	281	0	47	4	732	141	47	1461	3
Future Volume (vph)	1	0	9	281	0	47	4	732	141	47	1461	3
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0		0.0	0.0		65.0	71.0		45.0	70.0		90.0
Storage Lanes	0		0	0		1	1		1	1		1
Taper Length (m)	7.5			7.5			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.877				0.850			0.850			0.850
Flt Protected		0.995			0.950		0.950			0.950		
Satd. Flow (prot)	0	1745	0	0	1881	1700	1900	3585	1589	1900	3725	1700
Flt Permitted		0.975			0.750		0.095			0.276		
Satd. Flow (perm)	0	1710	0	0	1485	1700	190	3585	1589	552	3725	1700
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		71				71			127			38
Link Speed (k/h)		40			40			70			70	
Link Distance (m)		288.1			294.1			681.3			870.6	
Travel Time (s)		25.9			26.5			35.0			44.8	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	6%	7%	0%	2%	0%
Adj. Flow (vph)	1	0	10	316	0	53	4	822	158	53	1642	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	11	0	0	316	53	4	822	158	53	1642	3
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			6		5	2	

2035 Future Total (AM Peak Hour) 3:58 pm 03/27/2025

Synchro 11 Report

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Lanes, Volumes, Timings

2035 Future Total (AM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025

	↖	→	↗	↖	←	↗	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	40.0	40.0	40.0	7.0	40.0	40.0
Minimum Split (s)	40.5	40.5		40.5	40.5	40.5	47.5	47.5	47.5	11.0	47.5	47.5
Total Split (s)	49.0	49.0		49.0	49.0	49.0	69.0	69.0	69.0	12.0	81.0	81.0
Total Split (%)	37.7%	37.7%		37.7%	37.7%	37.7%	53.1%	53.1%	53.1%	9.2%	62.3%	62.3%
Maximum Green (s)	41.5	41.5		41.5	41.5	41.5	61.5	61.5	61.5	8.0	73.5	73.5
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.5	3.5		3.5	3.5	3.5	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5			7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	0.2	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Don't Walk (s)	26.0	26.0		26.0	26.0	26.0	16.0	16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0	0		0	0
Act Effct Green (s)		32.7			32.7	32.7	73.2	73.2	73.2	85.8	82.3	82.3
Actuated g/C Ratio		0.25			0.25	0.25	0.56	0.56	0.56	0.66	0.63	0.63
v/c Ratio		0.02			0.85	0.11	0.04	0.41	0.17	0.12	0.70	0.00
Control Delay (s/veh)		0.1			66.0	4.3	18.5	18.5	5.2	15.7	29.0	0.0
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		0.1			66.0	4.3	18.5	18.5	5.2	15.7	29.0	0.0
LOS		A			E	A	B	B	A	B	C	A
Approach Delay (s/veh)		0.1			57.1			16.4			28.5	
Approach LOS		A			E			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 92 (71%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay (s/veh): 28.0

Intersection LOS: C

Intersection Capacity Utilization 100.2%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 2: Highway 11 & Sherwood Glen/Dog Wood Boulevard



2035 Future Total (AM Peak Hour) 3:58 pm 03/27/2025

Synchro 11 Report

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Queues

2035 Future Total (AM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025



Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	11	316	53	4	822	158	53	1642	3
v/c Ratio	0.02	0.85	0.11	0.04	0.41	0.17	0.12	0.70	0.00
Control Delay (s/veh)	0.1	66.0	4.3	18.5	18.5	5.2	15.7	29.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	0.1	66.0	4.3	18.5	18.5	5.2	15.7	29.0	0.0
Queue Length 50th (m)	0.0	81.0	0.0	0.5	66.3	3.7	7.6	203.0	0.0
Queue Length 95th (m)	0.0	106.7	6.0	2.9	94.7	16.6	m15.5	243.0	m0.0
Internal Link Dist (m)	264.1	270.1			657.3			846.6	
Turn Bay Length (m)			65.0	71.0		45.0	70.0		90.0
Base Capacity (vph)	594	474	591	106	2019	950	447	2358	1090
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.67	0.09	0.04	0.41	0.17	0.12	0.70	0.00

Intersection Summary

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

3: Cloverridge Avenue/Kerbel WHL Employment Phase 2 Site Access & Crimson King Way

03/28/2025



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	23	30	17	2	59	0	60	0	6	0	0	6
Future Volume (vph)	23	30	17	2	59	0	60	0	6	0	0	6
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Util. 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
Fr _t		0.967						0.987			0.865	
Fl _t Protected		0.984			0.999			0.957				
Satd. Flow (prot)	0	1789	0	0	1969	0	0	1807	0	0	1730	0
Fl _t Permitted		0.984			0.999			0.957				
Satd. Flow (perm)	0	1789	0	0	1969	0	0	1807	0	0	1730	0
Link Speed (k/h)		40			40			40			30	
Link Distance (m)		106.3			280.7			206.8			43.5	
Travel Time (s)		9.6			25.3			18.6			5.2	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	8%	12%	50%	0%	0%	5%	0%	0%	0%	0%	0%
Adj. Flow (vph)	25	33	19	2	65	0	66	0	7	0	0	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	77	0	0	67	0	0	73	0	0	7	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 27.2%

ICU Level of Service A

Analysis Period (min) 15

2035 Future Total (AM Peak Hour)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	23	30	17	2	59	0	60	0	6	0	0	6
Future Volume (vph)	23	30	17	2	59	0	60	0	6	0	0	6
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	25	33	19	2	65	0	66	0	7	0	0	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	77	67	73	7								
Volume Left (vph)	25	2	66	0								
Volume Right (vph)	19	0	7	7								
Hadj (s)	0.03	0.03	0.20	-0.60								
Departure Headway (s)	4.2	4.2	4.4	3.7								
Degree Utilization, x	0.09	0.08	0.09	0.01								
Capacity (veh/h)	839	836	781	927								
Control Delay (s/veh)	7.6	7.5	7.9	6.7								
Approach Delay (s/veh)	7.6	7.5	7.9	6.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			27.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2035 Future Total (AM Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	110	8	38	157	367	27	496	34	505	1369	459
Future Volume (vph)	150	110	8	38	157	367	27	496	34	505	1369	459
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	35.0			33.0			48.0			72.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1792	1754	1133	1759	1869	1574	1827	3654	1478	1810	3725	1667
Flt Permitted	0.445			0.680			0.097			0.364		
Satd. Flow (perm)	840	1754	1133	1259	1869	1574	187	3654	1478	693	3725	1667
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98			258			141			499
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		97.6			105.0			940.8			393.8	
Travel Time (s)		5.9			6.3			48.4			20.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	14%	50%	8%	7%	8%	4%	4%	15%	5%	2%	2%
Adj. Flow (vph)	163	120	9	41	171	399	29	539	37	549	1488	499
Shared Lane Traffic (%)												
Lane Group Flow (vph)	163	120	9	41	171	399	29	539	37	549	1488	499
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	1	6		5	2	

2035 Future Total (AM Peak Hour) 3:58 pm 03/27/2025

Synchro 11 Report
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Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2035 Future Total (AM Peak Hour)
03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	28.5	28.5	11.0	28.5	11.0	11.0	41.5	41.5	11.0	41.5	41.5
Total Split (s)	29.0	33.5	33.5	24.0	28.5	24.0	24.0	57.5	57.5	24.0	57.5	57.5
Total Split (%)	20.9%	24.1%	24.1%	17.3%	20.5%	17.3%	17.3%	41.4%	41.4%	17.3%	41.4%	41.4%
Maximum Green (s)	25.0	25.0	25.0	20.0	19.5	20.0	20.0	50.0	50.0	20.0	50.0	50.0
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.5	1.0	1.0	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	8.5	8.5	4.0	9.0	4.0	4.0	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		30.0	30.0		30.0			27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0			0	0		0	0
Act Effect Green (s)	40.0	26.0	26.0	28.8	15.9	45.0	60.8	50.1	50.1	77.7	67.8	67.8
Actuated g/C Ratio	0.32	0.21	0.21	0.23	0.13	0.36	0.48	0.40	0.40	0.62	0.54	0.54
v/c Ratio	0.43	0.33	0.03	0.13	0.73	0.55	0.16	0.37	0.05	0.91	0.74	0.44
Control Delay (s/veh)	35.2	46.0	0.1	30.6	71.5	14.0	14.6	28.6	0.1	37.3	27.6	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	35.2	46.0	0.1	30.6	71.5	14.0	14.6	28.6	0.1	37.3	27.6	3.0
LOS	D	D	A	C	E	B	B	C	A	D	C	A
Approach Delay (s/veh)		38.6			31.2			26.2			24.8	
Approach LOS		D			C			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 139

Actuated Cycle Length: 125.8

Natural Cycle: 95

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.91

Intersection Signal Delay (s/veh): 27.0

Intersection LOS: C

Intersection Capacity Utilization 79.9%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: Highway 11 & Bathurst Street



Queues

2035 Future Total (AM Peak Hour)

4: Highway 11 & Bathurst Street

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	163	120	9	41	171	399	29	539	37	549	1488	499
v/c Ratio	0.43	0.33	0.03	0.13	0.73	0.55	0.16	0.37	0.05	0.91	0.74	0.44
Control Delay (s/veh)	35.2	46.0	0.1	30.6	71.5	14.0	14.6	28.6	0.1	37.3	27.6	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	35.2	46.0	0.1	30.6	71.5	14.0	14.6	28.6	0.1	37.3	27.6	3.0
Queue Length 50th (m)	31.7	27.4	0.0	7.4	43.4	26.8	2.8	52.0	0.0	75.1	166.1	0.0
Queue Length 95th (m)	50.2	46.8	0.0	16.0	71.5	62.1	8.1	74.5	0.0	#168.7	225.6	19.3
Internal Link Dist (m)		73.6			81.0			916.8			369.8	
Turn Bay Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Base Capacity (vph)	457	377	320	468	290	728	371	1456	673	606	2006	1128
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.32	0.03	0.09	0.59	0.55	0.08	0.37	0.05	0.91	0.74	0.44

Intersection Summary

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

Queue shown is maximum after two cycles.

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	3	3	615	5	9	1405
Future Volume (vph)	3	3	615	5	9	1405
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	0.0		30.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	0.932			0.850		
Flt Protected	0.976				0.950	
Satd. Flow (prot)	1819	0	3585	1700	1900	3725
Flt Permitted	0.976				0.398	
Satd. Flow (perm)	1819	0	3585	1700	796	3725
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	3			5		
Link Speed (k/h)	30		70			70
Link Distance (m)	53.4		264.9			940.8
Travel Time (s)	6.4		13.6			48.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	6%	0%	0%	2%
Adj. Flow (vph)	3	3	668	5	10	1527
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	0	668	5	10	1527
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	100	100		100	100	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (m)	2.0		10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0		0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA	Perm	Perm	NA
Protected Phases	8		6			2

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases				6	2	
Detector Phase	8		6	6	2	2
Switch Phase						
Minimum Initial (s)	10.0		40.0	40.0	40.0	40.0
Minimum Split (s)	35.0		47.5	47.5	47.5	47.5
Total Split (s)	36.0		84.0	84.0	84.0	84.0
Total Split (%)	30.0%		70.0%	70.0%	70.0%	70.0%
Maximum Green (s)	29.0		76.5	76.5	76.5	76.5
Yellow Time (s)	4.0		5.0	5.0	5.0	5.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		7.5	7.5	7.5	7.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Don't Walk (s)	21.0		14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	10.0		115.1	115.1	115.1	115.1
Actuated g/C Ratio	0.08		0.96	0.96	0.96	0.96
v/c Ratio	0.04		0.19	0.00	0.01	0.43
Control Delay (s/veh)	40.3		1.0	1.0	1.3	1.5
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay (s/veh)	40.3		1.0	1.0	1.3	1.5
LOS	D		A	A	A	A
Approach Delay (s/veh)	40.3		1.0			1.5
Approach LOS	D		A			A
Intersection Summary						
Area Type:	Other					
Cycle Length: 120						
Actuated Cycle Length: 120						
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green						
Natural Cycle: 85						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.43						
Intersection Signal Delay (s/veh): 1.5				Intersection LOS: A		
Intersection Capacity Utilization 79.2%				ICU Level of Service D		
Analysis Period (min) 15						

Splits and Phases: 100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access



Queues

2035 Future Total (AM Peak Hour)

100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access

03/28/2025



Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	6	668	5	10	1527
v/c Ratio	0.04	0.19	0.00	0.01	0.43
Control Delay (s/veh)	40.3	1.0	1.0	1.3	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	40.3	1.0	1.0	1.3	1.5
Queue Length 50th (m)	0.7	0.0	0.0	0.0	0.0
Queue Length 95th (m)	5.2	22.7	0.8	1.5	67.1
Internal Link Dist (m)	29.4	240.9			916.8
Turn Bay Length (m)			30.0	15.0	
Base Capacity (vph)	441	3439	1631	763	3573
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.19	0.00	0.01	0.43
Intersection Summary					

Lanes, Volumes, Timings
101: Highway 11 & Site Access 1

2035 Future Total (AM Peak Hour)
03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	100	591	189	0	1511
Future Volume (vph)	0	100	591	189	0	1511
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.865	0.964			
Flt Protected						
Satd. Flow (prot)	0	1730	3663	0	0	3800
Flt Permitted						
Satd. Flow (perm)	0	1730	3663	0	0	3800
Link Speed (k/h)	30		70			70
Link Distance (m)	46.9		870.6			99.3
Travel Time (s)	5.6		44.8			5.1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	109	642	205	0	1642
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	109	847	0	0	1642
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	43.0%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 101: Highway 11 & Site Access 1

2035 Future Total (AM Peak Hour)
03/28/2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	100	591	189	0	1511
Future Volume (Veh/h)	0	100	591	189	0	1511
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	109	642	205	0	1642
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						99
pX, platoon unblocked	0.81					
vC, conflicting volume	1566	424			847	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1224	424			847	
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	81			100	
cM capacity (veh/h)	141	585			799	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	109	428	419	821	821	
Volume Left	0	0	0	0	0	
Volume Right	109	0	205	0	0	
cSH	585	1700	1700	1700	1700	
Volume to Capacity	0.19	0.25	0.25	0.48	0.48	
Queue Length 95th (m)	5.4	0.0	0.0	0.0	0.0	
Control Delay (s/veh)	12.6	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s/veh)	12.6	0.0		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			43.0%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings

2035 Future Total (AM Peak Hour)

102: Site Access 2/Kerbel WHL Employment Phase 2 Site Access & Crimson King Way 03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	51	68	8	112	0	60	0	3	0	0	4
Future Volume (vph)	16	51	68	8	112	0	60	0	3	0	0	4
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Util. 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
Frt		0.932						0.994			0.865	
Flt Protected		0.994			0.997			0.954				
Satd. Flow (prot)	0	1853	0	0	1994	0	0	1897	0	0	1730	0
Flt Permitted		0.994			0.997			0.954				
Satd. Flow (perm)	0	1853	0	0	1994	0	0	1897	0	0	1730	0
Link Speed (k/h)		40			40			30			30	
Link Distance (m)		74.7			106.3			35.3			45.9	
Travel Time (s)		6.7			9.6			4.2			5.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	17	55	74	9	122	0	65	0	3	0	0	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	146	0	0	131	0	0	68	0	0	4	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	28.1%											
Analysis Period (min)	15											
	ICU Level of Service A											

HCM Unsignalized Intersection Capacity Analysis

2035 Future Total (AM Peak Hour)

102: Site Access 2/Kerbel WHL Employment Phase 2 Site Access & Crimson King Way 03/28/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	16	51	68	8	112	0	60	0	3	0	0	4
Future Volume (vph)	16	51	68	8	112	0	60	0	3	0	0	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	55	74	9	122	0	65	0	3	0	0	4
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	146	131	68	4								
Volume Left (vph)	17	9	65	0								
Volume Right (vph)	74	0	3	4								
Hadj (s)	-0.28	0.01	0.16	-0.60								
Departure Headway (s)	3.9	4.2	4.7	4.0								
Degree Utilization, x	0.16	0.15	0.09	0.00								
Capacity (veh/h)	892	830	726	827								
Control Delay (s/veh)	7.7	8.0	8.1	7.0								
Approach Delay (s/veh)	7.7	8.0	8.1	7.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.9								
Level of Service				A								
Intersection Capacity Utilization				28.1%	ICU Level of Service		A					
Analysis Period (min)				15								

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2035 Future Total (PM Peak Hour)
03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	199	24	1446	88	96	815
Future Volume (vph)	199	24	1446	88	96	815
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	45.0		92.0	84.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	7.5				50.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1845	1700	3725	1700	1863	3725
Flt Permitted	0.950				0.106	
Satd. Flow (perm)	1845	1700	3725	1700	208	3725
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		25		91		
Link Speed (k/h)	40		70			70
Link Distance (m)	74.0		102.7			265.3
Travel Time (s)	6.7		5.3			13.6
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	0%	2%	0%	2%	2%
Adj. Flow (vph)	205	25	1491	91	99	840
Shared Lane Traffic (%)						
Lane Group Flow (vph)	205	25	1491	91	99	840
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	2.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		6		5	2

2035 Future Total (PM Peak Hour) 3:58 pm 03/27/2025

Synchro 11 Report
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Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2035 Future Total (PM Peak Hour)
03/28/2025

	↙ ↘		↑		↗ ↘	
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		8		6	2	
Detector Phase	8	8	6	6	5	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	40.0	40.0	7.0	40.0
Minimum Split (s)	35.0	35.0	47.5	47.5	11.0	47.5
Total Split (s)	36.0	36.0	71.0	71.0	13.0	84.0
Total Split (%)	30.0%	30.0%	59.2%	59.2%	10.8%	70.0%
Maximum Green (s)	29.0	29.0	63.5	63.5	9.0	76.5
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	3.0	3.0	2.5	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.5	7.5	4.0	7.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Don't Walk (s)	21.0	21.0	14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effect Green (s)	18.6	18.6	75.0	75.0	90.4	86.9
Actuated g/C Ratio	0.16	0.16	0.63	0.63	0.75	0.72
v/c Ratio	0.72	0.09	0.64	0.08	0.37	0.31
Control Delay (s/veh)	61.8	14.8	18.2	2.2	12.4	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	61.8	14.8	18.2	2.2	12.4	5.8
LOS	E	B	B	A	B	A
Approach Delay (s/veh)	56.7		17.3			6.5
Approach LOS	E		B			A

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay (s/veh): 16.9

Intersection LOS: B

Intersection Capacity Utilization 69.7%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Highway 11 & Crimson King Way



Queues

2035 Future Total (PM Peak Hour)

1: Highway 11 & Crimson King Way

03/28/2025



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	205	25	1491	91	99	840
v/c Ratio	0.72	0.09	0.64	0.08	0.37	0.31
Control Delay (s/veh)	61.8	14.8	18.2	2.2	12.4	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	61.8	14.8	18.2	2.2	12.4	5.8
Queue Length 50th (m)	48.9	0.0	182.2	3.7	5.5	34.4
Queue Length 95th (m)	71.1	7.7	224.2	m5.3	11.8	31.0
Internal Link Dist (m)	50.0		78.7			241.3
Turn Bay Length (m)		45.0		92.0	84.0	
Base Capacity (vph)	445	429	2329	1097	284	2697
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.06	0.64	0.08	0.35	0.31

Intersection Summary

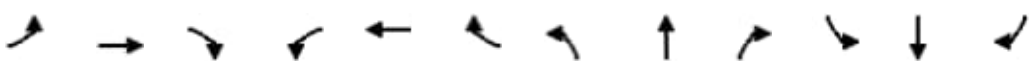
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings

2035 Future Total (PM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	2	3	5	236	2	72	10	1488	271	72	924	1
Future Volume (vph)	2	3	5	236	2	72	10	1488	271	72	924	1
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0		0.0	0.0		65.0	71.0		45.0	70.0		90.0
Storage Lanes	0		0	0		1	1		1	1		1
Taper Length (m)	7.5			7.5			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.932				0.850			0.850			0.850
Flt Protected		0.990			0.953		0.950			0.950		
Satd. Flow (prot)	0	1845	0	0	1906	1466	1900	3762	1667	1900	3725	1700
Flt Permitted		0.941			0.721		0.294			0.074		
Satd. Flow (perm)	0	1754	0	0	1442	1466	588	3762	1667	148	3725	1700
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				77			128			41
Link Speed (k/h)		40			40			70			70	
Link Distance (m)		288.1			294.1			681.3			866.5	
Travel Time (s)		25.9			26.5			35.0			44.6	
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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	16%	0%	1%	2%	0%	2%	0%
Adj. Flow (vph)	2	3	5	248	2	76	11	1566	285	76	973	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	10	0	0	250	76	11	1566	285	76	973	1
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			6		5	2	

2035 Future Total (PM Peak Hour) 3:58 pm 03/27/2025

Synchro 11 Report

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Lanes, Volumes, Timings

2035 Future Total (PM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	40.0	40.0	40.0	7.0	40.0	40.0
Minimum Split (s)	40.5	40.5		40.5	40.5	40.5	47.5	47.5	47.5	11.0	47.5	47.5
Total Split (s)	43.0	43.0		43.0	43.0	43.0	63.0	63.0	63.0	14.0	77.0	77.0
Total Split (%)	35.8%	35.8%		35.8%	35.8%	35.8%	52.5%	52.5%	52.5%	11.7%	64.2%	64.2%
Maximum Green (s)	35.5	35.5		35.5	35.5	35.5	55.5	55.5	55.5	10.0	69.5	69.5
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.5	3.5		3.5	3.5	3.5	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5			7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	0.2	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Don't Walk (s)	26.0	26.0		26.0	26.0	26.0	16.0	16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0	0		0	0
Act Effect Green (s)		26.0			26.0	26.0	69.6	69.6	69.6	82.5	79.0	79.0
Actuated g/C Ratio		0.22			0.22	0.22	0.58	0.58	0.58	0.69	0.66	0.66
v/c Ratio		0.03			0.80	0.20	0.03	0.72	0.28	0.36	0.40	0.00
Control Delay (s/veh)		24.2			62.6	8.4	15.4	22.8	9.1	12.4	9.5	0.0
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)		24.2			62.6	8.4	15.4	22.8	9.1	12.4	9.5	0.0
LOS		C			E	A	B	C	A	B	A	A
Approach Delay (s/veh)		24.2			49.9			20.6			9.7	
Approach LOS		C			D			C			A	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 50 (42%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay (s/veh): 20.1

Intersection LOS: C

Intersection Capacity Utilization 97.9%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 2: Highway 11 & Sherwood Glen/Dog Wood Boulevard



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Synchro 11 Report

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Queues

2035 Future Total (PM Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025



Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	10	250	76	11	1566	285	76	973	1
v/c Ratio	0.03	0.80	0.20	0.03	0.72	0.28	0.36	0.40	0.00
Control Delay (s/veh)	24.2	62.6	8.4	15.4	22.8	9.1	12.4	9.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	24.2	62.6	8.4	15.4	22.8	9.1	12.4	9.5	0.0
Queue Length 50th (m)	1.0	59.0	0.0	1.2	144.9	17.8	4.7	74.1	0.0
Queue Length 95th (m)	5.2	82.3	11.6	5.0	213.8	41.8	9.4	74.5	m0.0
Internal Link Dist (m)	264.1	270.1			657.3			842.5	
Turn Bay Length (m)			65.0	71.0		45.0	70.0		90.0
Base Capacity (vph)	522	426	487	340	2180	1020	247	2451	1132
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.59	0.16	0.03	0.72	0.28	0.31	0.40	0.00

Intersection Summary

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

3: Cloverridge Avenue/Kerbel WHL Employment Phase 2 Site Access & Crimson King Way

03/28/2025



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	7	99	43	4	44	0	40	0	1	0	0	21
Future Volume (vph)	7	99	43	4	44	0	40	0	1	0	0	21
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Util. 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
Frt		0.961						0.997			0.865	
Flt Protected		0.998			0.996			0.953				
Satd. Flow (prot)	0	1916	0	0	1992	0	0	1900	0	0	1696	0
Flt Permitted		0.998			0.996			0.953				
Satd. Flow (perm)	0	1916	0	0	1992	0	0	1900	0	0	1696	0
Link Speed (k/h)		40			40			40			30	
Link Distance (m)		107.0			280.7			206.8			48.2	
Travel Time (s)		9.6			25.3			18.6			5.8	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	2%	0%	0%	0%	0%	2%	0%	0%	0%	2%	0%	2%
Adj. Flow (vph)	9	121	52	5	54	0	49	0	1	0	0	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	182	0	0	59	0	0	50	0	0	26	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 24.6%

ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

2035 Future Total (PM Peak Hour)

3: Cloverridge Avenue/Kerbel WHL Employment Phase 2 Site Access & Crimson King Way

03/28/2025



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	7	99	43	4	44	0	40	0	1	0	0	21
Future Volume (vph)	7	99	43	4	44	0	40	0	1	0	0	21
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	9	121	52	5	54	0	49	0	1	0	0	26

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	182	59	50	26
Volume Left (vph)	9	5	49	0
Volume Right (vph)	52	0	1	26
Hadj (s)	-0.16	0.02	0.18	-0.57
Departure Headway (s)	4.0	4.3	4.6	3.9
Degree Utilization, x	0.20	0.07	0.06	0.03
Capacity (veh/h)	884	819	733	861
Control Delay (s/veh)	8.0	7.6	7.9	7.0
Approach Delay (s/veh)	8.0	7.6	7.9	7.0
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.8		
Level of Service	A		
Intersection Capacity Utilization	24.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2035 Future Total (PM Peak Hour)
03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	398	171	16	31	79	712	22	1570	59	423	869	222
Future Volume (vph)	398	171	16	31	79	712	22	1570	59	423	869	222
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	35.0			33.0			48.0			72.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00					0.97
Fr't			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1845	1942	1700	1827	1770	1635	1900	3725	1574	1845	3689	1667
Flt Permitted	0.549			0.641			0.306			0.068		
Satd. Flow (perm)	1066	1942	1700	1233	1770	1635	611	3725	1574	132	3689	1617
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98			*360			141			239
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		97.6			105.0			940.3			393.8	
Travel Time (s)		5.9			6.3			48.4			20.3	
Confl. Peds. (#/hr)							5					5
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	1.00	0.93	0.93	0.93	1.00	0.93	0.93
Heavy Vehicles (%)	3%	3%	0%	4%	13%	4%	0%	2%	8%	3%	3%	2%
Adj. Flow (vph)	428	184	17	33	85	712	24	1688	63	423	934	239
Shared Lane Traffic (%)												
Lane Group Flow (vph)	428	184	17	33	85	712	24	1688	63	423	934	239
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

2035 Future Total (PM Peak Hour) 3:58 pm 03/27/2025

Synchro 11 Report
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Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2035 Future Total (PM Peak Hour)
03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	1	6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	28.5	28.5	11.0	28.5	11.0	11.0	41.5	41.5	11.0	41.5	41.5
Total Split (s)	23.5	33.5	33.5	18.5	28.5	26.0	24.0	61.0	61.0	26.0	63.0	63.0
Total Split (%)	16.9%	24.1%	24.1%	13.3%	20.5%	18.7%	17.3%	43.9%	43.9%	18.7%	45.3%	45.3%
Maximum Green (s)	19.5	25.0	25.0	14.5	19.5	22.0	20.0	53.5	53.5	22.0	55.5	55.5
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.5	1.0	1.0	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	0.0	-1.0	0.0	0.0
Total Lost Time (s)	4.0	8.5	8.5	4.0	9.0	2.0	4.0	7.5	7.5	3.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		30.0	30.0		30.0			27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0			5	5		5	5
Act Effect Green (s)	40.8	29.1	29.1	24.9	12.2	45.3	64.0	53.5	53.5	84.0	73.0	73.0
Actuated g/C Ratio	0.31	0.22	0.22	0.19	0.09	0.34	0.49	0.41	0.41	0.64	0.55	0.55
v/c Ratio	0.96	0.43	0.04	0.12	0.52	0.89	0.07	1.12	0.09	1.10	0.46	0.24
Control Delay (s/veh)	76.9	49.4	0.1	33.8	68.4	34.7	11.6	98.9	0.2	115.5	19.5	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	76.9	49.4	0.1	33.8	68.4	34.7	11.6	98.9	0.2	115.5	19.5	2.7
LOS	E	D	A	C	E	C	B	F	A	F	B	A
Approach Delay (s/veh)		66.8			38.1			94.2			42.4	
Approach LOS		E			D			F			D	

Intersection Summary

Area Type: Other

Cycle Length: 139

Actuated Cycle Length: 131.8

Natural Cycle: 135

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.12

Intersection Signal Delay (s/veh): 63.9

Intersection LOS: E

Intersection Capacity Utilization 117.0%

ICU Level of Service H

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 4: Highway 11 & Bathurst Street



2035 Future Total (PM Peak Hour) 3:58 pm 03/27/2025

Synchro 11 Report
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Queues

2035 Future Total (PM Peak Hour)

4: Highway 11 & Bathurst Street

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	428	184	17	33	85	712	24	1688	63	423	934	239
v/c Ratio	0.96	0.43	0.04	0.12	0.52	0.89	0.07	1.12	0.09	1.10	0.46	0.24
Control Delay (s/veh)	76.9	49.4	0.1	33.8	68.4	34.7	11.6	98.9	0.2	115.5	19.5	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	76.9	49.4	0.1	33.8	68.4	34.7	11.6	98.9	0.2	115.5	19.5	2.7
Queue Length 50th (m)	105.3	45.5	0.0	6.4	22.5	103.2	2.3	~276.0	0.0	~112.7	82.8	0.0
Queue Length 95th (m)	#177.6	71.2	0.0	14.6	40.5	#184.5	6.3	#338.7	0.0	#189.3	108.8	13.6
Internal Link Dist (m)		73.6			81.0			916.3			369.8	
Turn Bay Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Base Capacity (vph)	444	430	453	362	262	797	552	1512	723	383	2042	1002
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.43	0.04	0.09	0.32	0.89	0.04	1.12	0.09	1.10	0.46	0.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	7	10	1461	6	4	911
Future Volume (vph)	7	10	1461	6	4	911
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	0.0		30.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	0.922			0.850		
Flt Protected	0.979				0.950	
Satd. Flow (prot)	1770	0	3725	1667	1863	3689
Flt Permitted	0.979				0.145	
Satd. Flow (perm)	1770	0	3725	1667	284	3689
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	11			3		
Link Speed (k/h)	30		70			70
Link Distance (m)	51.0		265.3			940.3
Travel Time (s)	6.1		13.6			48.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%
Adj. Flow (vph)	8	11	1588	7	4	990
Shared Lane Traffic (%)						
Lane Group Flow (vph)	19	0	1588	7	4	990
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	100	100		100	100	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (m)	2.0		10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0		0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA	Perm	Perm	NA
Protected Phases	8		6			2

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases				6	2	
Detector Phase	8		6	6	2	2
Switch Phase						
Minimum Initial (s)	10.0		40.0	40.0	40.0	40.0
Minimum Split (s)	35.0		47.5	47.5	47.5	47.5
Total Split (s)	36.0		84.0	84.0	84.0	84.0
Total Split (%)	30.0%		70.0%	70.0%	70.0%	70.0%
Maximum Green (s)	29.0		76.5	76.5	76.5	76.5
Yellow Time (s)	4.0		5.0	5.0	5.0	5.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		7.5	7.5	7.5	7.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Don't Walk (s)	21.0		14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	10.0		110.2	110.2	110.2	110.2
Actuated g/C Ratio	0.08		0.92	0.92	0.92	0.92
v/c Ratio	0.12		0.46	0.00	0.02	0.29
Control Delay (s/veh)	34.1		0.9	0.0	2.5	1.9
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay (s/veh)	34.1		0.9	0.0	2.5	1.9
LOS	C		A	A	A	A
Approach Delay (s/veh)	34.1		0.9			1.9
Approach LOS	C		A			A
Intersection Summary						
Area Type:	Other					
Cycle Length: 120						
Actuated Cycle Length: 120						
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green						
Natural Cycle: 85						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.46						
Intersection Signal Delay (s/veh): 1.6				Intersection LOS: A		
Intersection Capacity Utilization 79.2%				ICU Level of Service D		
Analysis Period (min) 15						

Splits and Phases: 100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access



Queues

2035 Future Total (PM Peak Hour)

100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access

03/28/2025



Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	19	1588	7	4	990
v/c Ratio	0.12	0.46	0.00	0.02	0.29
Control Delay (s/veh)	34.1	0.9	0.0	2.5	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	34.1	0.9	0.0	2.5	1.9
Queue Length 50th (m)	1.9	4.3	0.0	0.0	0.0
Queue Length 95th (m)	9.7	4.4	m0.0	0.9	36.1
Internal Link Dist (m)	27.0	241.3			916.3
Turn Bay Length (m)			30.0	15.0	
Base Capacity (vph)	436	3421	1531	261	3387
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.04	0.46	0.00	0.02	0.29

Intersection Summary

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

Lanes, Volumes, Timings
101: Highway 11 & Site Access 1

2035 Future Total (PM Peak Hour)
03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	117	1416	115	0	997
Future Volume (vph)	0	117	1416	115	0	997
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.865	0.989			
Flt Protected						
Satd. Flow (prot)	0	1696	3758	0	0	3800
Flt Permitted						
Satd. Flow (perm)	0	1696	3758	0	0	3800
Link Speed (k/h)	30		70			70
Link Distance (m)	57.0		866.5			102.7
Travel Time (s)	6.8		44.6			5.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	0%	0%	2%	0%
Adj. Flow (vph)	0	127	1539	125	0	1084
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	127	1664	0	0	1084
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	54.2%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 101: Highway 11 & Site Access 1

2035 Future Total (PM Peak Hour)
03/28/2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	117	1416	115	0	997
Future Volume (Veh/h)	0	117	1416	115	0	997
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	127	1539	125	0	1084
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						103
pX, platoon unblocked	0.92					
vC, conflicting volume	2144	832			1664	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2067	832			1664	
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	59			100	
cM capacity (veh/h)	44	312			383	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	127	1026	638	542	542	
Volume Left	0	0	0	0	0	
Volume Right	127	0	125	0	0	
cSH	312	1700	1700	1700	1700	
Volume to Capacity	0.41	0.60	0.38	0.32	0.32	
Queue Length 95th (m)	15.2	0.0	0.0	0.0	0.0	
Control Delay (s/veh)	24.2	0.0	0.0	0.0	0.0	
Lane LOS	C					
Approach Delay (s/veh)	24.2	0.0		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			54.2%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings

2035 Future Total (PM Peak Hour)

102: Site Access 2/Kerbel WHL Employment Phase 2 Site Access & Crimson King Way 03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	138	37	3	82	0	112	0	7	0	0	15
Future Volume (vph)	5	138	37	3	82	0	112	0	7	0	0	15
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Util. 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
Frt		0.972						0.992			0.865	
Flt Protected		0.999			0.998			0.955				
Satd. Flow (prot)	0	1942	0	0	1996	0	0	1895	0	0	1730	0
Flt Permitted		0.999			0.998			0.955				
Satd. Flow (perm)	0	1942	0	0	1996	0	0	1895	0	0	1730	0
Link Speed (k/h)		40			40			40			30	
Link Distance (m)		74.0			107.0			51.1			50.0	
Travel Time (s)		6.7			9.6			4.6			6.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	5	150	40	3	89	0	122	0	8	0	0	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	195	0	0	92	0	0	130	0	0	16	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	30.6%											
Analysis Period (min)	15											
	ICU Level of Service A											

HCM Unsignalized Intersection Capacity Analysis

2035 Future Total (PM Peak Hour)

102: Site Access 2/Kerbel WHL Employment Phase 2 Site Access & Crimson King Way 03/28/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	138	37	3	82	0	112	0	7	0	0	15
Future Volume (vph)	5	138	37	3	82	0	112	0	7	0	0	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	150	40	3	89	0	122	0	8	0	0	16
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	195	92	130	16								
Volume Left (vph)	5	3	122	0								
Volume Right (vph)	40	0	8	16								
Hadj (s)	-0.12	0.01	0.15	-0.60								
Departure Headway (s)	4.2	4.5	4.7	4.1								
Degree Utilization, x	0.23	0.11	0.17	0.02								
Capacity (veh/h)	817	761	719	796								
Control Delay (s/veh)	8.5	8.1	8.7	7.2								
Approach Delay (s/veh)	8.5	8.1	8.7	7.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.4								
Level of Service				A								
Intersection Capacity Utilization				30.6%	ICU Level of Service	A						
Analysis Period (min)				15								

Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2035 Future Total (SAT Peak Hour)
03/28/2025

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	116	34	933	54	74	785
Future Volume (vph)	116	34	933	54	74	785
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	45.0		92.0	84.0	
Storage Lanes	1	1		1	1	
Taper Length (m)	7.5				50.0	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1900	1700	3762	1700	1900	3762
Flt Permitted	0.950				0.219	
Satd. Flow (perm)	1900	1700	3762	1700	438	3762
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		37		59		
Link Speed (k/h)	40		70			70
Link Distance (m)	73.0		103.1			261.6
Travel Time (s)	6.6		5.3			13.5
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	1%	0%	0%	1%
Adj. Flow (vph)	127	37	1025	59	81	863
Shared Lane Traffic (%)						
Lane Group Flow (vph)	127	37	1025	59	81	863
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (m)	2.0	2.0	10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	2.0	0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		6		5	2

2035 Future Total (SAT Peak Hour) 3:59 pm 12/20/2024

Synchro 11 Report
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Lanes, Volumes, Timings
1: Highway 11 & Crimson King Way

2035 Future Total (SAT Peak Hour)
03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Permitted Phases		8		6	2	
Detector Phase	8	8	6	6	5	2
Switch Phase						
Minimum Initial (s)	10.0	10.0	40.0	40.0	7.0	40.0
Minimum Split (s)	26.0	26.0	47.5	47.5	11.0	47.5
Total Split (s)	26.0	26.0	47.5	47.5	11.0	58.5
Total Split (%)	30.8%	30.8%	56.2%	56.2%	13.0%	69.2%
Maximum Green (s)	19.0	19.0	40.0	40.0	7.0	51.0
Yellow Time (s)	4.0	4.0	5.0	5.0	3.0	5.0
All-Red Time (s)	3.0	3.0	2.5	2.5	1.0	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.5	7.5	4.0	7.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	0.2	0.2	3.0	0.2
Recall Mode	None	None	Max	Max	None	Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Don't Walk (s)	21.0	21.0	14.0	14.0		14.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effct Green (s)	11.3	11.3	47.0	47.0	57.6	55.7
Actuated g/C Ratio	0.15	0.15	0.62	0.62	0.75	0.73
v/c Ratio	0.45	0.13	0.44	0.06	0.17	0.31
Control Delay (s/veh)	35.4	11.2	11.7	3.2	4.6	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	35.4	11.2	11.7	3.2	4.6	5.5
LOS	D	B	B	A	A	A
Approach Delay (s/veh)	29.9		11.2			5.4
Approach LOS	C		B			A

Intersection Summary

Area Type: Other

Cycle Length: 84.5

Actuated Cycle Length: 76.4

Natural Cycle: 85

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.45

Intersection Signal Delay (s/veh): 10.1

Intersection LOS: B

Intersection Capacity Utilization 62.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Highway 11 & Crimson King Way



Queues

2035 Future Total (SAT Peak Hour)

1: Highway 11 & Crimson King Way

03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	127	37	1025	59	81	863
v/c Ratio	0.45	0.13	0.44	0.06	0.17	0.31
Control Delay (s/veh)	35.4	11.2	11.7	3.2	4.6	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	35.4	11.2	11.7	3.2	4.6	5.5
Queue Length 50th (m)	18.0	0.0	49.2	0.0	2.9	24.5
Queue Length 95th (m)	33.9	7.8	73.5	5.6	7.7	40.0
Internal Link Dist (m)	49.0		79.1			237.6
Turn Bay Length (m)		45.0		92.0	84.0	
Base Capacity (vph)	472	450	2313	1067	464	2742
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.08	0.44	0.06	0.17	0.31
Intersection Summary						

Lanes, Volumes, Timings

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

2035 Future Total (SAT Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	0	9	75	0	8	15	994	66	2	907	0
Future Volume (vph)	3	0	9	75	0	8	15	994	66	2	907	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0		0.0	0.0		65.0	71.0		45.0	70.0		90.0
Storage Lanes	0		0	0		1	1		1	1		1
Taper Length (m)	7.5			7.5			100.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		0.99			1.00	0.99						
Frt		0.896				0.850			0.850			
Flt Protected		0.989			0.950		0.950			0.950		
Satd. Flow (prot)	0	1755	0	0	1900	1700	1900	3762	1700	1900	3762	2000
Flt Permitted		0.897			0.749		0.297			0.228		
Satd. Flow (perm)	0	1591	0	0	1497	1678	594	3762	1700	456	3762	2000
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		109				109			109			
Link Speed (k/h)		40			40			70			70	
Link Distance (m)		288.1			294.1			681.3			864.7	
Travel Time (s)		25.9			26.5			35.0			44.5	
Confl. Peds. (#/hr)	1		1	1		1						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Adj. Flow (vph)	3	0	10	80	0	9	16	1057	70	2	965	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	13	0	0	80	9	16	1057	70	2	965	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

2035 Future Total (SAT Peak Hour) 3:59 pm 12/20/2024

Synchro 11 Report

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Lanes, Volumes, Timings

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

2035 Future Total (SAT Peak Hour)

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			6		5	2	
Permitted Phases	4			8		8	6		6	2		2
Detector Phase	4	4		8	8	8	6	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0	10.0	40.0	40.0	40.0	7.0	40.0	40.0
Minimum Split (s)	26.5	26.5		26.5	26.5	26.5	47.5	47.5	47.5	11.0	47.5	47.5
Total Split (s)	26.5	26.5		26.5	26.5	26.5	47.5	47.5	47.5	11.0	58.5	58.5
Total Split (%)	31.2%	31.2%		31.2%	31.2%	31.2%	55.9%	55.9%	55.9%	12.9%	68.8%	68.8%
Maximum Green (s)	19.0	19.0		19.0	19.0	19.0	40.0	40.0	40.0	7.0	51.0	51.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.5	3.5		3.5	3.5	3.5	2.5	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		7.5			7.5	7.5	7.5	7.5	7.5	4.0	7.5	7.5
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	0.2	0.2	0.2	3.0	0.2	0.2
Recall Mode	None	None		None	None	None	Max	Max	Max	None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Don't Walk (s)	26.0	26.0		26.0	26.0	26.0	16.0	16.0	16.0		16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0	0		0	0
Act Effect Green (s)		11.0			11.0	11.0	58.4	58.4	58.4	62.5	60.7	
Actuated g/C Ratio		0.14			0.14	0.14	0.72	0.72	0.72	0.77	0.75	
v/c Ratio		0.04			0.40	0.03	0.04	0.39	0.06	0.00	0.34	
Control Delay (s/veh)		0.3			38.1	0.1	7.7	7.5	1.0	3.5	5.4	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)		0.3			38.1	0.1	7.7	7.5	1.0	3.5	5.4	
LOS		A			D	A	A	A	A	A	A	
Approach Delay (s/veh)		0.3			34.2			7.1			5.4	
Approach LOS		A			C			A			A	

Intersection Summary

Area Type: Other

Cycle Length: 85

Actuated Cycle Length: 81.2

Natural Cycle: 85

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.40

Intersection Signal Delay (s/veh): 7.4

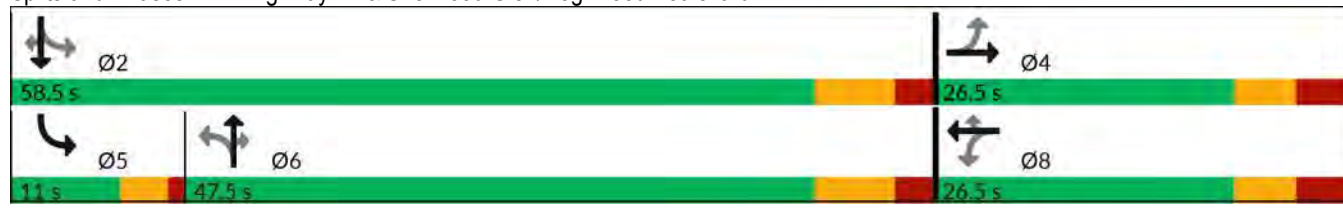
Intersection LOS: A

Intersection Capacity Utilization 70.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 2: Highway 11 & Sherwood Glen/Dog Wood Boulevard



2035 Future Total (SAT Peak Hour) 3:59 pm 12/20/2024

Synchro 11 Report

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Queues

2035 Future Total (SAT Peak Hour)

2: Highway 11 & Sherwood Glen/Dog Wood Boulevard

03/28/2025



Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	13	80	9	16	1057	70	2	965
v/c Ratio	0.04	0.40	0.03	0.04	0.39	0.06	0.00	0.34
Control Delay (s/veh)	0.3	38.1	0.1	7.7	7.5	1.0	3.5	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	0.3	38.1	0.1	7.7	7.5	1.0	3.5	5.4
Queue Length 50th (m)	0.0	12.9	0.0	0.7	32.6	0.0	0.1	28.9
Queue Length 95th (m)	0.0	24.1	0.0	4.4	75.3	2.9	0.7	45.0
Internal Link Dist (m)	264.1	270.1			657.3			840.7
Turn Bay Length (m)			65.0	71.0		45.0	70.0	
Base Capacity (vph)	457	352	478	427	2706	1253	476	2811
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.23	0.02	0.04	0.39	0.06	0.00	0.34
Intersection Summary								

Lanes, Volumes, Timings

2035 Future Total (SAT Peak Hour)

3: Cloverridge Avenue/Kerbel WHL Employment Phase 2 Site Access & Crimson King

03/28/2025



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	0	55	29	4	49	0	32	0	4	0	0	0
Future Volume (vph)	0	55	29	4	49	0	32	0	4	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Util. 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
Fr _t		0.953						0.986				
Fl _t Protected					0.996			0.957				
Satd. Flow (prot)	0	1906	0	0	1992	0	0	1887	0	0	1961	0
Fl _t Permitted					0.996			0.957				
Satd. Flow (perm)	0	1906	0	0	1992	0	0	1887	0	0	1961	0
Link Speed (k/h)		40			40			40			30	
Link Distance (m)		108.1			280.7			206.8			51.3	
Travel Time (s)		9.7			25.3			18.6			6.2	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles (%)	2%	0%	0%	0%	0%	2%	0%	2%	0%	2%	2%	2%
Adj. Flow (vph)	0	73	39	5	65	0	43	0	5	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	112	0	0	70	0	0	48	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 15.6%

ICU Level of Service A

Analysis Period (min) 15

2035 Future Total (SAT Peak Hour)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	55	29	4	49	0	32	0	4	0	0	0
Future Volume (vph)	0	55	29	4	49	0	32	0	4	0	0	0
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	0	73	39	5	65	0	43	0	5	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	112	70	48	0								
Volume Left (vph)	0	5	43	0								
Volume Right (vph)	39	0	5	0								
Hadj (s)	-0.21	0.01	0.12	0.00								
Departure Headway (s)	3.9	4.1	4.4	4.3								
Degree Utilization, x	0.12	0.08	0.06	0.00								
Capacity (veh/h)	910	854	779	800								
Control Delay (s/veh)	7.4	7.5	7.7	7.3								
Approach Delay (s/veh)	7.4	7.5	7.7	0.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.5								
Level of Service				A								
Intersection Capacity Utilization				15.6%	ICU Level of Service	A						
Analysis Period (min)				15								

Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2035 Future Total (SAT Peak Hour)
03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	271	113	20	38	94	458	25	900	50	373	856	215
Future Volume (vph)	271	113	20	38	94	458	25	900	50	373	856	215
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Storage Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	35.0			33.0			48.0			72.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00					0.99						
Fr't			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1881	1942	1619	1900	1942	1667	1900	3762	1700	1863	3762	1683
Flt Permitted	0.537			0.680			0.313			0.152		
Satd. Flow (perm)	1062	1942	1619	1360	1942	1645	626	3762	1700	298	3762	1683
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98			112			141			229
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		97.6			105.0			944.1			393.8	
Travel Time (s)		5.9			6.3			48.6			20.3	
Confl. Peds. (#/hr)	1					1						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	1%	3%	5%	0%	3%	2%	0%	1%	0%	2%	1%	1%
Adj. Flow (vph)	288	120	21	40	100	487	27	957	53	397	911	229
Shared Lane Traffic (%)												
Lane Group Flow (vph)	288	120	21	40	100	487	27	957	53	397	911	229
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

2035 Future Total (SAT Peak Hour) 3:59 pm 12/20/2024

Synchro 11 Report
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Lanes, Volumes, Timings
4: Highway 11 & Bathurst Street

2035 Future Total (SAT Peak Hour)
03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	1	6		5	2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	5	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	28.5	28.5	11.0	28.5	11.0	11.0	41.5	41.5	11.0	41.5	41.5
Total Split (s)	29.0	33.5	33.5	24.0	28.5	24.0	24.0	57.5	57.5	24.0	57.5	57.5
Total Split (%)	20.9%	24.1%	24.1%	17.3%	20.5%	17.3%	17.3%	41.4%	41.4%	17.3%	41.4%	41.4%
Maximum Green (s)	25.0	25.0	25.0	20.0	19.5	20.0	20.0	50.0	50.0	20.0	50.0	50.0
Yellow Time (s)	3.0	5.5	5.5	3.0	5.5	3.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.5	1.0	1.0	2.5	2.5	1.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	8.5	8.5	4.0	9.0	4.0	4.0	7.5	7.5	4.0	7.5	7.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0			7.0	7.0		7.0	7.0
Flash Don't Walk (s)		30.0	30.0		30.0			27.0	27.0		27.0	27.0
Pedestrian Calls (#/hr)		0	0		0			5	5		5	5
Act Effect Green (s)	43.2	29.4	29.4	25.2	12.4	37.5	60.7	50.1	50.1	77.6	67.7	67.7
Actuated g/C Ratio	0.34	0.23	0.23	0.20	0.10	0.29	0.47	0.39	0.39	0.60	0.53	0.53
v/c Ratio	0.58	0.27	0.05	0.13	0.53	0.87	0.07	0.65	0.07	0.94	0.46	0.23
Control Delay (s/veh)	38.5	43.7	0.2	30.9	66.9	48.9	13.5	35.7	0.2	56.1	21.8	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	38.5	43.7	0.2	30.9	66.9	48.9	13.5	35.7	0.2	56.1	21.8	3.1
LOS	D	D	A	C	E	D	B	D	A	E	C	A
Approach Delay (s/veh)		38.1			50.6			33.3			27.9	
Approach LOS		D			D			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 139

Actuated Cycle Length: 128.9

Natural Cycle: 95

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.94

Intersection Signal Delay (s/veh): 34.6

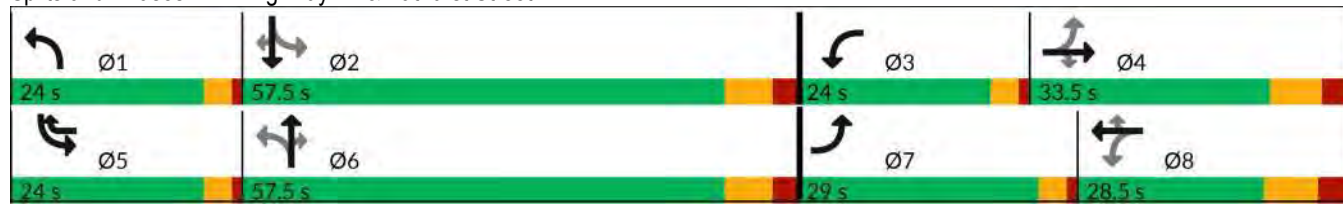
Intersection LOS: C

Intersection Capacity Utilization 80.9%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: Highway 11 & Bathurst Street



2035 Future Total (SAT Peak Hour) 3:59 pm 12/20/2024

Synchro 11 Report
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Queues

2035 Future Total (SAT Peak Hour)

4: Highway 11 & Bathurst Street

03/28/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	288	120	21	40	100	487	27	957	53	397	911	229
v/c Ratio	0.58	0.27	0.05	0.13	0.53	0.87	0.07	0.65	0.07	0.94	0.46	0.23
Control Delay (s/veh)	38.5	43.7	0.2	30.9	66.9	48.9	13.5	35.7	0.2	56.1	21.8	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	38.5	43.7	0.2	30.9	66.9	48.9	13.5	35.7	0.2	56.1	21.8	3.1
Queue Length 50th (m)	60.1	27.1	0.0	7.2	26.2	95.6	2.8	110.8	0.0	68.0	85.5	0.0
Queue Length 95th (m)	86.4	46.1	0.0	15.5	46.1	#154.2	7.8	145.5	0.0	#144.9	115.1	14.6
Internal Link Dist (m)		73.6			81.0			920.1			369.8	
Turn Bay Length (m)	67.0		54.0	31.0		28.0	137.0		162.0	148.0		154.0
Base Capacity (vph)	515	447	448	479	294	561	555	1462	746	422	1974	992
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.27	0.05	0.08	0.34	0.87	0.05	0.65	0.07	0.94	0.46	0.23

Intersection Summary

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

Queue shown is maximum after two cycles.

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	0	967	0	0	914
Future Volume (vph)	0	0	967	0	0	914
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Storage Length (m)	0.0	0.0		30.0	15.0	
Storage Lanes	1	0		1	1	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt						
Flt Protected						
Satd. Flow (prot)	1961	0	3725	1961	1961	3725
Flt Permitted						
Satd. Flow (perm)	1961	0	3725	1961	1961	3725
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (k/h)	30		70			70
Link Distance (m)	51.5		261.6			944.1
Travel Time (s)	6.2		13.5			48.6
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	0	0	1165	0	0	1101
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1165	0	0	1101
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (m)	2.0		10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0		0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			Cl+Ex			Cl+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA	Perm	Perm	NA
Protected Phases	8		6			2
Permitted Phases				6	2	

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	8		6	6	2	2
Switch Phase						
Minimum Initial (s)	10.0		40.0	40.0	40.0	40.0
Minimum Split (s)	35.0		47.5	47.5	47.5	47.5
Total Split (s)	36.0		84.0	84.0	84.0	84.0
Total Split (%)	30.0%		70.0%	70.0%	70.0%	70.0%
Maximum Green (s)	29.0		76.5	76.5	76.5	76.5
Yellow Time (s)	4.0		5.0	5.0	5.0	5.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0		7.5	7.5	7.5	7.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		C-Max	C-Max	C-Max	C-Max
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Don't Walk (s)	21.0		14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)			120.0			120.0
Actuated g/C Ratio			1.00			1.00
v/c Ratio			0.31			0.30
Control Delay (s/veh)			0.2			0.2
Queue Delay			0.0			0.0
Total Delay (s/veh)			0.2			0.2
LOS			A			A
Approach Delay (s/veh)			0.2			0.2
Approach LOS			A			A
Intersection Summary						
Area Type:	Other					
Cycle Length: 120						
Actuated Cycle Length: 120						
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green						
Natural Cycle: 85						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.31						
Intersection Signal Delay (s/veh): 0.2				Intersection LOS: A		
Intersection Capacity Utilization 39.6%				ICU Level of Service A		
Analysis Period (min) 15						

Splits and Phases: 100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access



Queues

2035 Future Total (SAT Peak Hour)

100: Highway 11 & Kerbel WHL Employment Phase 1 Site Access

03/28/2025



Lane Group	NBT	SBT
Lane Group Flow (vph)	1165	1101
v/c Ratio	0.31	0.30
Control Delay (s/veh)	0.2	0.2
Queue Delay	0.0	0.0
Total Delay (s/veh)	0.2	0.2
Queue Length 50th (m)	0.0	0.0
Queue Length 95th (m)	0.0	0.0
Internal Link Dist (m)	237.6	920.1
Turn Bay Length (m)		
Base Capacity (vph)	3725	3725
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.31	0.30
Intersection Summary		

Lanes, Volumes, Timings
101: Highway 11 & Site Access 1

2035 Future Total (SAT Peak Hour)
03/28/2025

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	117	856	149	0	909
Future Volume (vph)	0	117	856	149	0	909
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Frt		0.865	0.978			
Flt Protected						
Satd. Flow (prot)	0	1696	3644	0	0	3725
Flt Permitted						
Satd. Flow (perm)	0	1696	3644	0	0	3725
Link Speed (k/h)	30		70			70
Link Distance (m)	40.5		864.7			103.1
Travel Time (s)	4.9		44.5			5.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	127	930	162	0	988
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	127	1092	0	0	988
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	0.0		3.6			3.6
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	40.5%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis 101: Highway 11 & Site Access 1

2035 Future Total (SAT Peak Hour)
03/28/2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	117	856	149	0	909
Future Volume (Veh/h)	0	117	856	149	0	909
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	127	930	162	0	988
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						103
pX, platoon unblocked	0.91					
vC, conflicting volume	1505	546			1092	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1352	546			1092	
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	74			100	
cM capacity (veh/h)	128	482			635	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	127	620	472	494	494	
Volume Left	0	0	0	0	0	
Volume Right	127	0	162	0	0	
cSH	482	1700	1700	1700	1700	
Volume to Capacity	0.26	0.36	0.28	0.29	0.29	
Queue Length 95th (m)	8.4	0.0	0.0	0.0	0.0	
Control Delay (s/veh)	15.1	0.0	0.0	0.0	0.0	
Lane LOS	C					
Approach Delay (s/veh)	15.1	0.0		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			40.5%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings

2035 Future Total (SAT Peak Hour)

102: Site Access 2/Kerbel WHL Employment Phase 2 Site Access & Crimson King Way

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	81	47	4	77	0	73	0	3	0	0	0
Future Volume (vph)	0	81	47	4	77	0	73	0	3	0	0	0
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Util. 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
Frt	0.950						0.995					
Flt Protected				0.998			0.954					
Satd. Flow (prot)	0	1863	0	0	1957	0	0	1861	0	0	1961	0
Flt Permitted				0.998			0.954					
Satd. Flow (perm)	0	1863	0	0	1957	0	0	1861	0	0	1961	0
Link Speed (k/h)	40			40			30			30		
Link Distance (m)	73.0			108.1			41.5			52.2		
Travel Time (s)	6.6			9.7			5.0			6.3		
Peak Hour Factor	0.83	0.92	0.92	0.92	0.92	0.83	0.92	0.83	0.92	0.83	0.83	0.83
Adj. Flow (vph)	0	88	51	4	84	0	79	0	3	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	139	0	0	88	0	0	82	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0			0.0			0.0			0.0		
Link Offset(m)	0.0			0.0			0.0			0.0		
Crosswalk Width(m)	4.8			4.8			4.8			4.8		
Two way Left Turn Lane												
Headway Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control	Stop			Stop			Stop			Stop		
Intersection Summary												
Area Type:	Other											
Control Type: Unsignalized												
Intersection Capacity Utilization 17.6%												
ICU Level of Service A												
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis

2035 Future Total (SAT Peak Hour)

102: Site Access 2/Kerbel WHL Employment Phase 2 Site Access & Crimson King Way/28/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	81	47	4	77	0	73	0	3	0	0	0
Future Volume (vph)	0	81	47	4	77	0	73	0	3	0	0	0
Peak Hour Factor	0.83	0.92	0.92	0.92	0.92	0.83	0.92	0.83	0.92	0.83	0.83	0.83
Hourly flow rate (vph)	0	88	51	4	84	0	79	0	3	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	139	88	82	0								
Volume Left (vph)	0	4	79	0								
Volume Right (vph)	51	0	3	0								
Hadj (s)	-0.19	0.04	0.20	0.00								
Departure Headway (s)	4.0	4.3	4.6	4.5								
Degree Utilization, x	0.15	0.10	0.10	0.00								
Capacity (veh/h)	874	817	743	767								
Control Delay (s/veh)	7.7	7.8	8.1	7.5								
Approach Delay (s/veh)	7.7	7.8	8.1	0.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.9								
Level of Service				A								
Intersection Capacity Utilization				17.6%	ICU Level of Service	A						
Analysis Period (min)				15								

APPENDIX

H MULTIMODAL ANALYSIS BACKGROUND INFORMATION

Pedestrian Network

Pedestrian facilities can include the following:

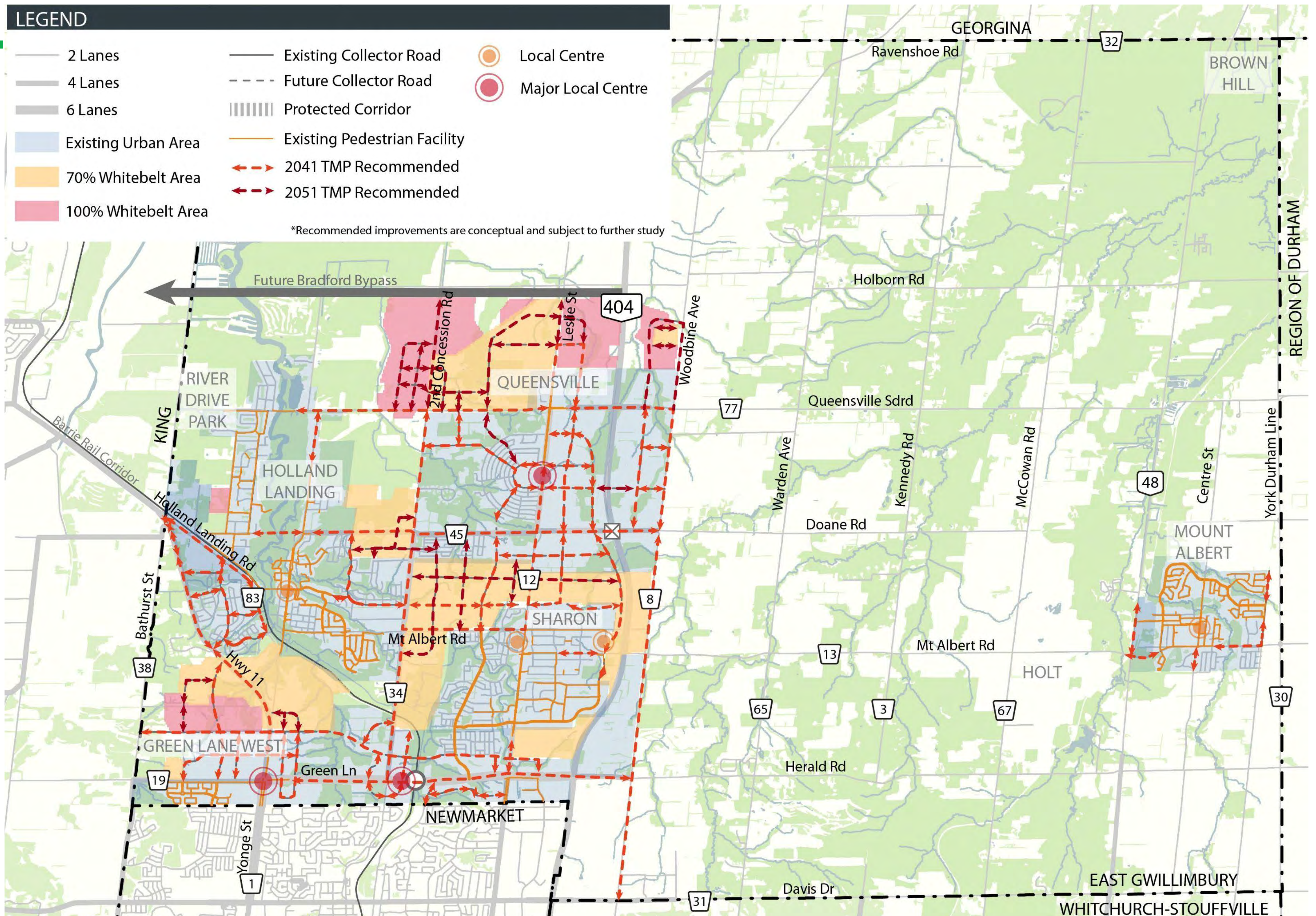
Sidewalks



Multi-use Path



Streetlights are typically provided with sidewalks and multi-use paths within urban boundary roadways.



Cycling Network

There are many types of cycling facilities and can include the following:

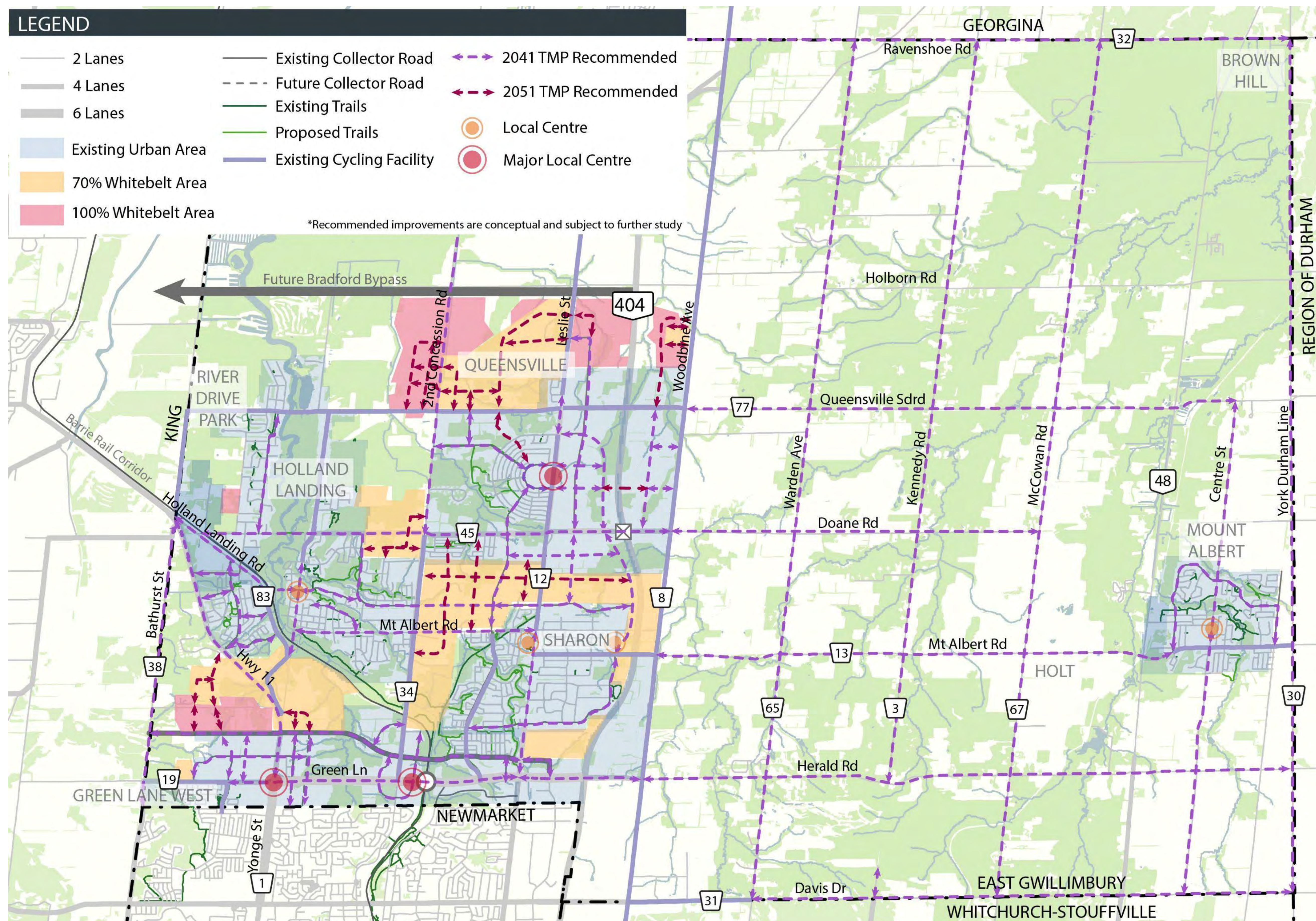
Sharrows

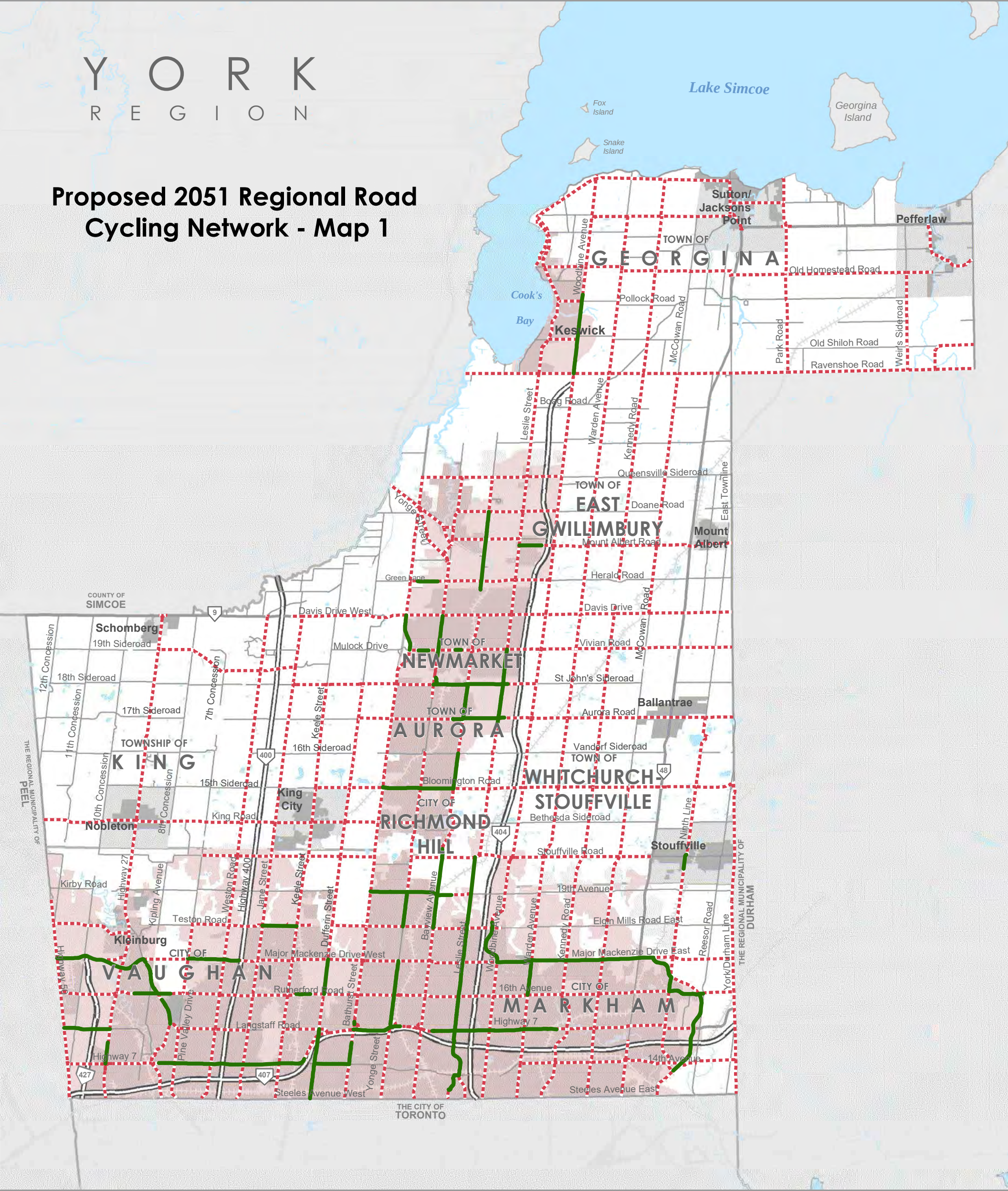


Bike Lane



Multi-use Path





Existing Network*

Dedicated/Separated Facilities (Protected Bike Lane, Shared Pathway, Bike Lane)

Proposed Cycling Facilities

Cycling facility to be determined in consultation with Pedestrian and Cycling Planning and Design Guidelines

BASE MAP INFORMATION

- Provincial Freeway
- Provincial Highway
- Road
- Railway
- Urban Boundary
- Built-up Area
- Designated Urban Area



Maps are considered preliminary and subject to change through the TMP Update

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Day Month, Year: 9 February 2022

*Wherever possible, existing cycling network is subject to infrastructure improvements in order to algin with the Pedestrian and Cycling Planning and Design Guidelines.