1489338 Ontario Inc.

924 King Street
Town of Midland, Ontario

Transportation Impact Study – Revised Final Report

February 17, 2026

924 King Street,
Town of Midland, Ontario

Transportation Impact Study – Revised Draft Report

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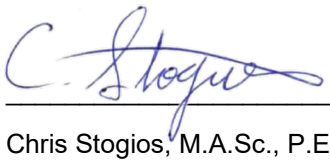
Prepared By:
Arcadis Professional Services (Canada) Inc.
55 St. Clair Avenue West, 7th Floor
Toronto, Ontario M4V 2Y7
Canada
Phone: 416 596 1930

Prepared For:
Mr. Andy Sahota
1489338 Ontario Inc.
924 King Street
Midland, ON L4R 0B8

Our Ref:
30294034 - 141453

Ken Li
Transportation Systems Analyst

Arash Bagher Ghanbari, M.A.Sc., P.Eng.
Senior Transportation Engineer



Chris Stogios, M.A.Sc., P.Eng.
Discipline Lead - Transportation Operations

Version Control

Issue	Date Issued	Page No.	Description	Reviewed By
1.0	March 2023	38	Draft Report	Hugo Chan
2.0	August 2023	132	Final Report	Hugo Chan
3.0	October 2025	97	Revised Draft Report	Ken Li
4.0	February 2026	300	Revised Final Report	Chris Stogios

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Acronyms and Abbreviations

GFA Gross Floor Area

HCM Highway Capacity Manual

ITE Institute of Transportation Engineers

LOS Level of Service

MTO Ministry of Transportation Ontario

PHF Peak Hour Factor

SPA Site Plan Application

STP Signal Timing Plan

TAC Transportation Association of Canada

TIS Transportation Impact Study

TMP Transportation Master Plan

TMC Traffic Movement Count

v/c Volume to Capacity

1 Introduction

924 King Street (the 'Development Site') is located at the northwest quadrant of King Street and Heritage Drive intersection in the Town of Midland. The Development Site currently contains a Quality Inn hotel with conference centre amenities. The proponent proposes to intensify the lands by converting a portion of the hotel's surface parking lot into fast-food drive-through use.

Quality Inn (the 'Proponent') proposes to construct a McDonald restaurant with drive-thru amenities, containing 46 dining seats in 376m^2 indoor area (the 'Proposed Development'). A total of 16 parking spaces is proposed for the restaurant. These parking spaces are repurposed from their original hotel designated supply due to an existing oversupply of parking on hotel lands. The site is accessible via the existing driveway fronting King Street.

The purpose of this report is to assess the potential impact of the Proposed development on the surrounding transportation network. The analysis considers future road configuration, background traffic growth, and other planned developments in the area. In addition, the study evaluates on-site circulation and parking requirements in accordance with the Town of Midland Zoning By-law.

A Transportation Impact Study (TIS) was completed in August 2023 based on a previous site plan that included two drive-through fast-food restaurants at the same location. This report updates the previously completed TIS, maintaining the original assumptions and analysis approach while incorporating the revised 2025 site plan. The updated analysis has been completed in accordance with the *General Guidelines for the Preparation of Traffic Impact Studies* published by the Ministry of Transportation (MTO) in March 2023 (the "MTO TIS Guidelines")

1.1 Study Area Intersections and Analysis Time Periods

The following intersections within the study area were included in the analysis:

1. Heritage Road (Highway 12) and King Street (Signalized)
2. King Street and the Existing Site Access (Unsignalized)

The site is bounded by a mix of residential, commercial, and retail developments to the north, east, south, and west. The study area is illustrated in **Figure 1-1**.

Based on the proposed development 's land use and study area characteristics, the Town's busiest traffic conditions occur during the summer vacation and the following analysis periods were used in this study:

- **AM Peak Period**: 7:00 a.m. to 9:00 a.m. on a typical summer Saturday.
- **Mid-day Peak Period**: 11:00 a.m. to 2:00 p.m. on a typical summer Saturday.
- **PM Peak Period**: 4:00 p.m. to 6:00 p.m. on a typical summer Saturday.

Figure 1-1 Study Area (Base Map Source: Google maps. Retrieved: September 5, 2025, https://www.google.ca/maps/)

1.2 Proposed Development

The proposed development will consist of a 376 m2 GFA quick-service restaurant with drive-thru facility, providing a total of 66 dining seats (46 indoor and 20 outdoor). The restaurant is proposed to be constructed on a portion of the existing surface parking lot that currently serving the Quality Inn hotel, which is also owned by the Proponent.

A total of 17 parking spaces and drive-thru stacking capacity of 14 vehicles are proposed to accommodate all uses on the property. Vehicular access to the adjacent road network will be provided via the existing full-movement site access fronting King Street. These site details are based on the latest site plan (October 2025) and illustrated in **Figure 1-2**.

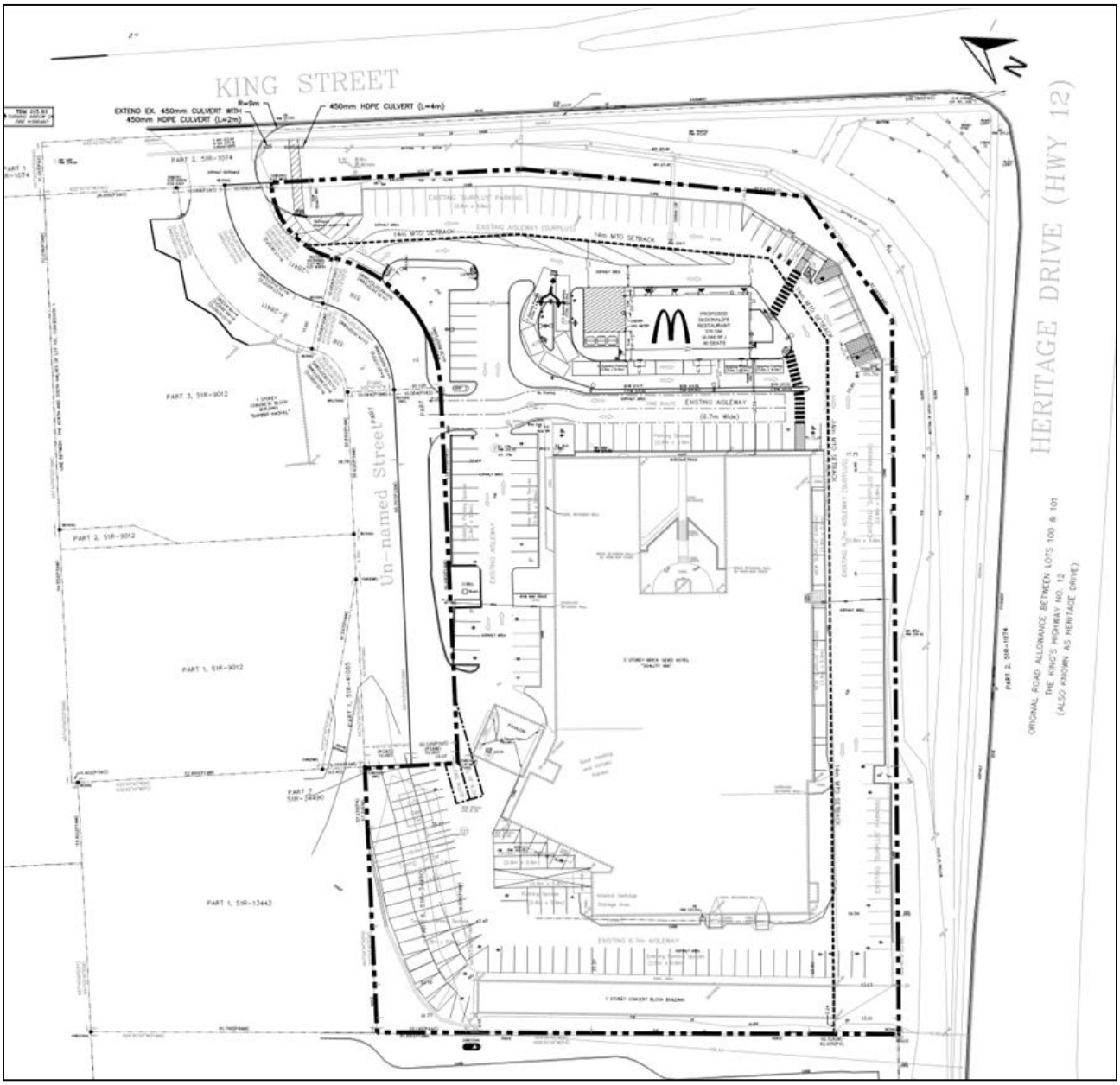

Figure 1-2 Site Plan

2 Existing Conditions

This section describes 2025 existing transportation conditions within the study area including existing roadways, transit services, and active transportation facilities, and assess existing traffic operations at the study area intersections.

2.1 Transportation Network

Existing Road Network: The characteristics of the study area roadway network are summarized in **Table 2-1.**

Table 2-1 Study Area Roadway Characteristics

Street Name	From	To	Class.	Orientation	Width (# of lanes)	Traffic Direction	On-Street Parking	Speed Limit
King Street	Bayshore Drive	-	Arterial Road	North / South	2	Two-way	Prohibited	50 km/h
Heritage Drive	Angela Schmid Foster Road	Wye River	Major Arterial Road	East / West	2	Two-way	Prohibited	50 km/h

Lane configuration and control type for study area intersections are illustrated in **Figure 2-1** below:

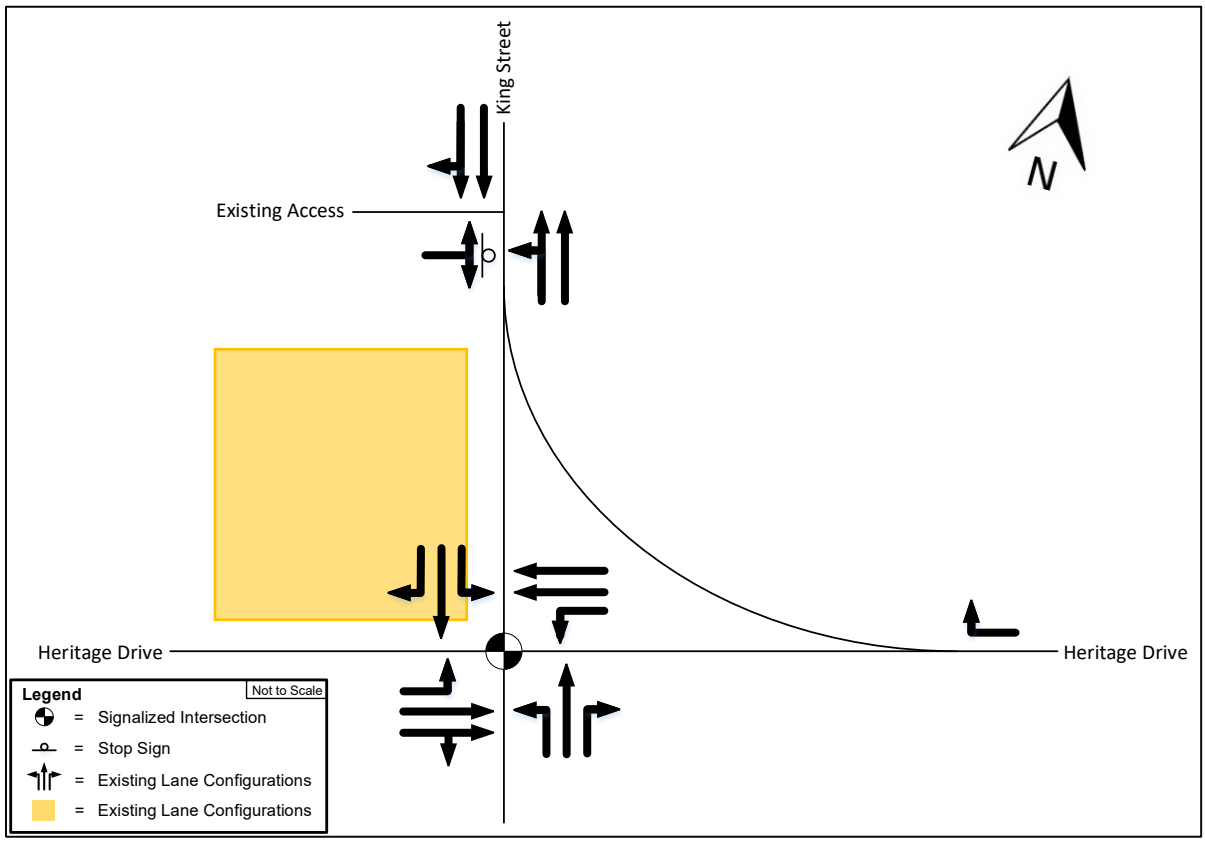

Figure 2-1 Existing Lane Configuration and Intersection Control

Existing Transit Network: Midland-Penetanguishene Transit Service is the public transit system in Midland, Ontario. Currently, the site is serviced by one bus route along King Street. The Midland South route travels between Hugel Avenue and Prospect Boulevard, generally in north–south direction. Service is provided Monday to Friday from 6:45 a.m. to 5:45 p.m., and on Saturdays from 8:45 a.m. to 4:45 p.m., with no service offered on Sundays or statutory holidays. The nearest bus stop to the subject development is located west of Heritage Drive

and Jones Road outside a Walmart. This bus stop is approximately 700 metres west of the development site. Transit Services in the development area are illustrated in **Figure 2-2**.

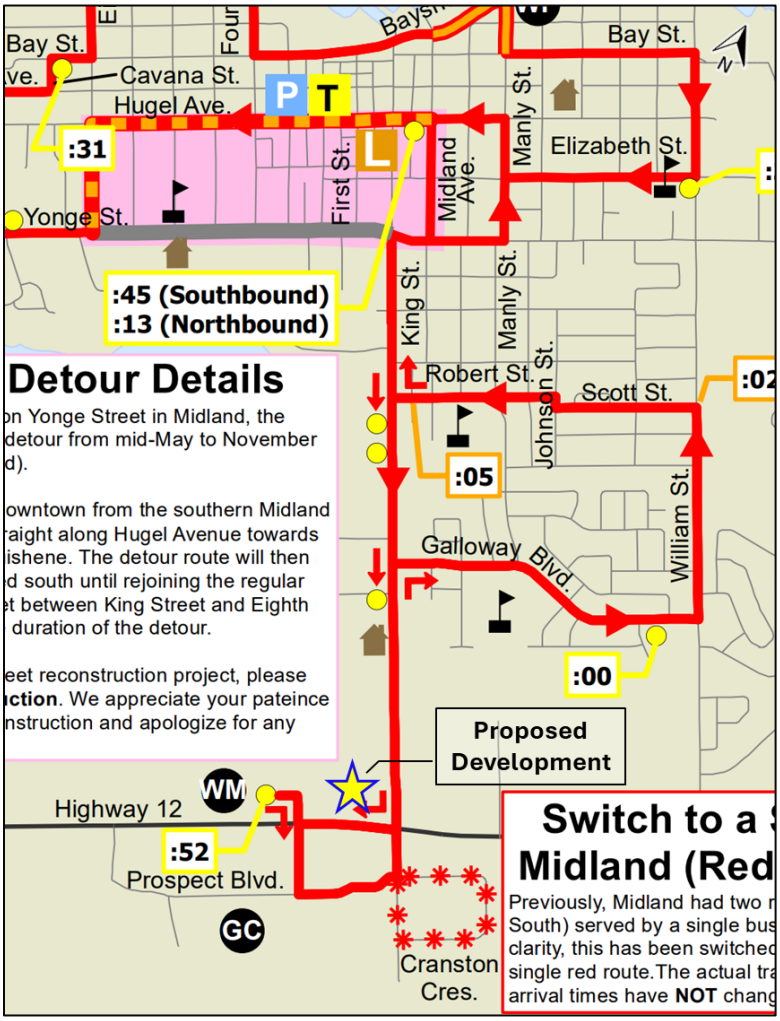

Figure 2-2 Town of Midland Transit Map (Source: Midland-Penetanguishene Transit Service, Retrieved September 5, 2025 Routes and Schedules - Town of Midland)

Existing Active Transportation Facilities: Pedestrian sidewalks are provided throughout the study area. On Heritage Street a sidewalk is provided on the north side of the road, and on King Street a sidewalk is provided on the west side of the roadway. There are no bicycle lanes in any of the roadways in the study area.

2.2 Traffic Volume

Turning movements counts (TMC) at the study area intersections during the AM, Mid-day, and PM Peak Periods were collected by Horizon Data Services Ltd. The peak hour for each individual intersection was used in this study. A summary of the TMCs collected at the study area intersections are provided in **Table 2-2**. The raw TMC data for each study area intersection is provided in **Appendix A**.

Table 2-2 TMC Data Summary

INTERSECTION	DATA SOURCE	DATE	PEAK HOUR		
			AM	Mid-day	PM
King Street and Heritage Drive	Horizon Data Services Ltd.	Saturday, August 16th, 2025	7:00 AM – 9:00 AM	11:00 AM – 2:00 PM	4:00 PM – 6:00 PM
King Street and Existing Access			7:00 AM – 9:00 AM	11:00 AM – 2:00 PM	4:00 PM – 6:00 PM

Figure 2-3 illustrates the existing AM, Mid-day, and PM peak hour traffic volumes observed on Saturday, August 16th, 2025.

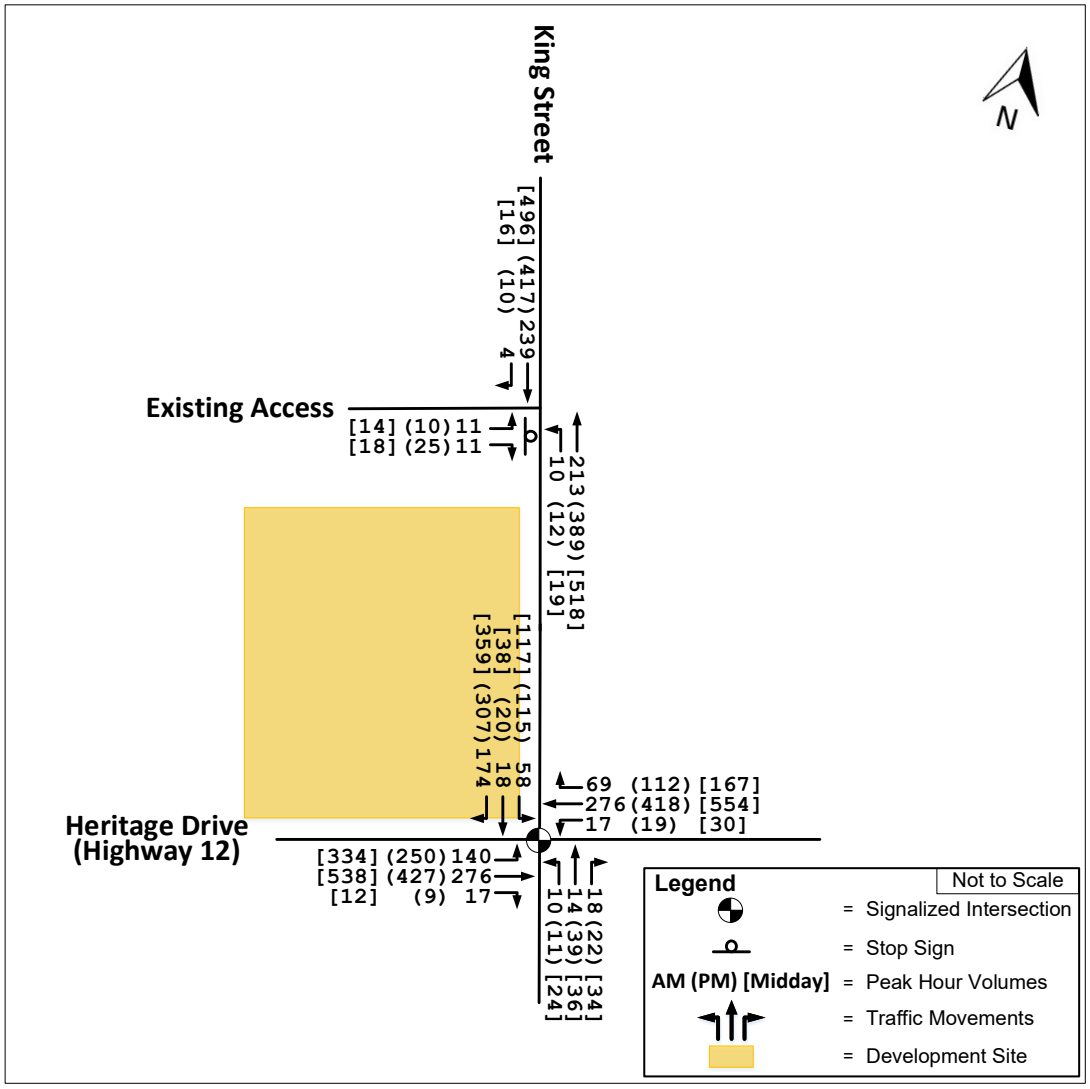

Figure 2-3 Existing Traffic Volumes

Peak Hour Factor: The Peak Hour Factor (PHF) for each intersection movement was calculated using the 15-minute interval turning movement count data. For each location, the peak hour was identified, and the PHF was determined by comparing the total volume during that hour to the highest 15-minute flow within the same period. This measure captures the variability and concentration of traffic demand within the hour. The resulting PHFs for each movement were applied in both the existing and future traffic operations analyses.

2.3 Traffic Operations Assessment

Signal timing plans for Heritage Road (Highway 12) and King Street intersection were provided by MTO on Wednesday May 6th, 2022, and are provided in **Appendix B**.

Study area intersections were analyzed using Synchro version 12, which applies methodologies consistent with the Highway Capacity Manual. The Town of Midland does not specify criteria for identifying critical movements at signalized or unsignalized intersections. In accordance with the MTO TIS Guidelines, movements at signalized intersections with a volume-to-capacity (v/c) ratio greater than 0.85 are considered critical.

Existing AM, Mid-day, and PM peak hour traffic operations including key measures of effectiveness such as delay, Level-of-Service (LOS), volume-to-capacity (v/c) ratio, and 95th Percentile queue for King Street and Heritage Drive (Highway 12) intersection are summarized in **Table 2-4** and in **Table 2-3** for the King Street and the Existing Site Access intersection. Synchro output reports are provided in **Appendix C**.

Table 2-4 Existing Traffic Operations- King Street and Heritage Drive (Highway 12) Intersection

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
AM Peak Hour								
B	12.6	0.28	EBL	A	5.2	0.25	11.3	125
			EBTR	A	7.1	0.18	18.7	-
			WBL	A	8.3	0.04	2.3	125
			WBT	A	9.9	0.19	18.0	-
			WBR	A	9.2	0.05	4.8	120
			NBL	C	24.9	0.07	4.7	55
			NBT	C	24.8	0.07	5.7	-
			NBR	C	24.5	0.01	-	-
			SBL	C	26.6	0.33	16.2	80
			SBT	C	24.8	0.07	6.8	-

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
			SBR	C	25.2	0.14	11.2	-
Mid-day Peak Hour								
B	14.6	0.63	EBL	A	9.4	0.64	36.0	125
			EBTR	A	9.4	0.30	41.2	-
			WBL	A	8.8	0.07	4.6	125
			WBT	B	12.1	0.35	41.7	-
			WBR	B	10.6	0.11	10.1	120
			NBL	C	24.1	0.10	8.7	55
			NBT	C	24.1	0.11	11.0	-
			NBR	C	23.6	0.02	0.9	-
			SBL	C	27.2	0.48	29.1	80
			SBT	C	24.1	0.11	11.5	-
			SBR	C	25.8	0.35	26.6	-
PM Peak Hour								
B	13.8	0.45	EBL	A	6.4	0.41	23.8	125
			EBTR	A	7.9	0.22	30.2	-
			WBL	A	9.0	0.04	3.1	125
			WBT	B	11.0	0.25	29.1	-
			WBR	A	10.0	0.07	8.2	120
			NBL	C	24.1	0.04	4.7	55
			NBT	C	24.6	0.13	11.5	-
			NBR	C	23.9	0.01	-	-

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
			SBL	C	27.6	0.49	27.5	80
			SBT	C	24.2	0.07	7.3	-
			SBR	C	25.0	0.20	17.7	-

Table 2-5 Existing Traffic Operations - King Street and the Existing Site Access

Intersection Delay (s)	Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Capacity
AM Peak Hour						
0.6	EBLR	B	10.6	0.04	0.9	-
	NBL	A	1.0	N/A	0.2	-
Midday Peak Hour						
0.6	EBLR	B	14.5	0.09	2.2	-
	NBL	A	1.0	0.02	0.5	-
PM Peak Hour						
0.6	EBLR	B	11.5	0.06	1.5	-
	NBL	A	0.8	0.01	0.3	-

Note: Red font represents a critical movement.

The results indicate that 2025 existing traffic operations for all movements at both study area intersections are within acceptable thresholds during all the analysis time periods.

3 Future Background Traffic Operations

This section discusses the methodology and parameter used to establish future background traffic volume in each study horizon years and assess traffic operations at the study area intersections under the future background conditions. In accordance with the MTO TIS Guidelines, the horizon years 2027, 2032, and 2037 were selected, representing the development's opening year, five years after opening, and ten years after opening, respectively. An annual growth rate of 2% was applied to all through movements within the study area. This growth rate was obtained through consultation with the MTO staff.

3.1 Background Developments

The following background developments in the vicinity of the study area that may contribute additional traffic were identified based on the review carried out by Arcadis in September 2025:

- **823 King Street:** the plan of subdivision consists of 138 lots for single-detached dwellings, and 129 townhouse units. It is anticipated that ultimate build-out will occur by 2025.
- **16821 Highway 12:** A multi-phased development in which Phase 1 is expected to be fully built and occupied by 2030. Phase 1 includes 431 residential townhouse units, 97 semi-detached single-family homes, 35,000 ft^2. retail shopping centre, and 162 apartment units. (Therein 85 townhouses and 22 semi-detached houses are already constructed till September 10, 2025)
- **16928 Highway 12:** Phase One involves the development of the southern portion of the site with a five-storey hotel offering 93 guest rooms, a conference centre with a Gross Floor Area (GFA) of 33,782 square foot (ft^2) and a surface parking lot with 331 spaces. Phase Two involves the development of the northern portion of the site with approximately 76,169 ft^2 of retail/commercial GFA, a 4,152 ft^2 restaurant, a 2,220 ft^2 drive-thru coffee shop and 450 surface parking spaces.
- **16621 Highway 12:** A 2,792 m^2 gas station including 4 refueling pumps, a quick service restaurant and 12 parking spaces which is expected to be fully built out by 2021.
- **16533 Highway 12:** The proposed development will include the construction of 5 industrial blocks with a total area of 12.33 hectares and a new roadway spanning between William Street and Brandon Street.
- **16728 Highway 12:** The proposed development will consist of two self-storage buildings (A & B) and an external storage unit area configured as four distinct groupings of storage units (C, D, E and F). Development will have an overall gross floor area (GFA) of 12,010 m^2 (129,275 ft^2).

Figure 3-1 illustrates the planned background developments identified in the vicinity of the study area. Site-generated trips associated with each background development were obtained from their respective TIS report and incorporated into this analysis to establish future background traffic conditions. Copies of these TIS reports are provided in **Appendix D**.

Table 3-1 provides the peak-hour site-generated inbound and outbound traffic for each background development. Because the background development studies only provide weekday AM and PM peak-hour traffic volumes—and given that these land-use types typically generate higher weekday peak-hour volumes than Saturday volumes—the weekday conditions were used as a conservative basis for assessing background traffic operations in this study. The average of the AM and PM peak-hour volumes was applied as a proxy for the Midday peak hour. The additional traffic volumes from the background developments for the 2027, 2032, and 2037 horizon years are presented in **Figure 3-2**, **Figure 3-3**, and **Figure 3-4**, respectively.

3.2 Transportation Network

Based on a review of plans of Town of Midland, Simcoe County and Ministry of Transportation, no road network improvements in the study area are anticipated within the future horizon years.

Figure 3-1 Background Developments (Base Map Source: Google maps. Retrieved: September 5, 2025, https://www.google.ca/maps/)

Table 3-1 Background Developments Peak Hour Trips Summary

DATA SOURCE	Build-Out Year	Vehicle Trips			
		AM Peak Hour		PM Peak Hour	
		Inbound	Outbound	Inbound	Outbound
823 King Street (JDE, November 2022)	2032	38	114	126	74
16821 Highway 12 (WSP, August 2016)	2032	111	291	364	250
	2037	207	652	734	433
16928 Highway 12 (WSP, September 2021)	2027	144	58	238	189

16621 Highway 12 (Frontop Engineering Limited, May 2021)	2027	22	21	30	29
16533 Highway 12 (JDE, November 2022)	2027	254	97	158	259
16728 Highway 12 (TATHAM, April 2025)	2027	7	5	9	10

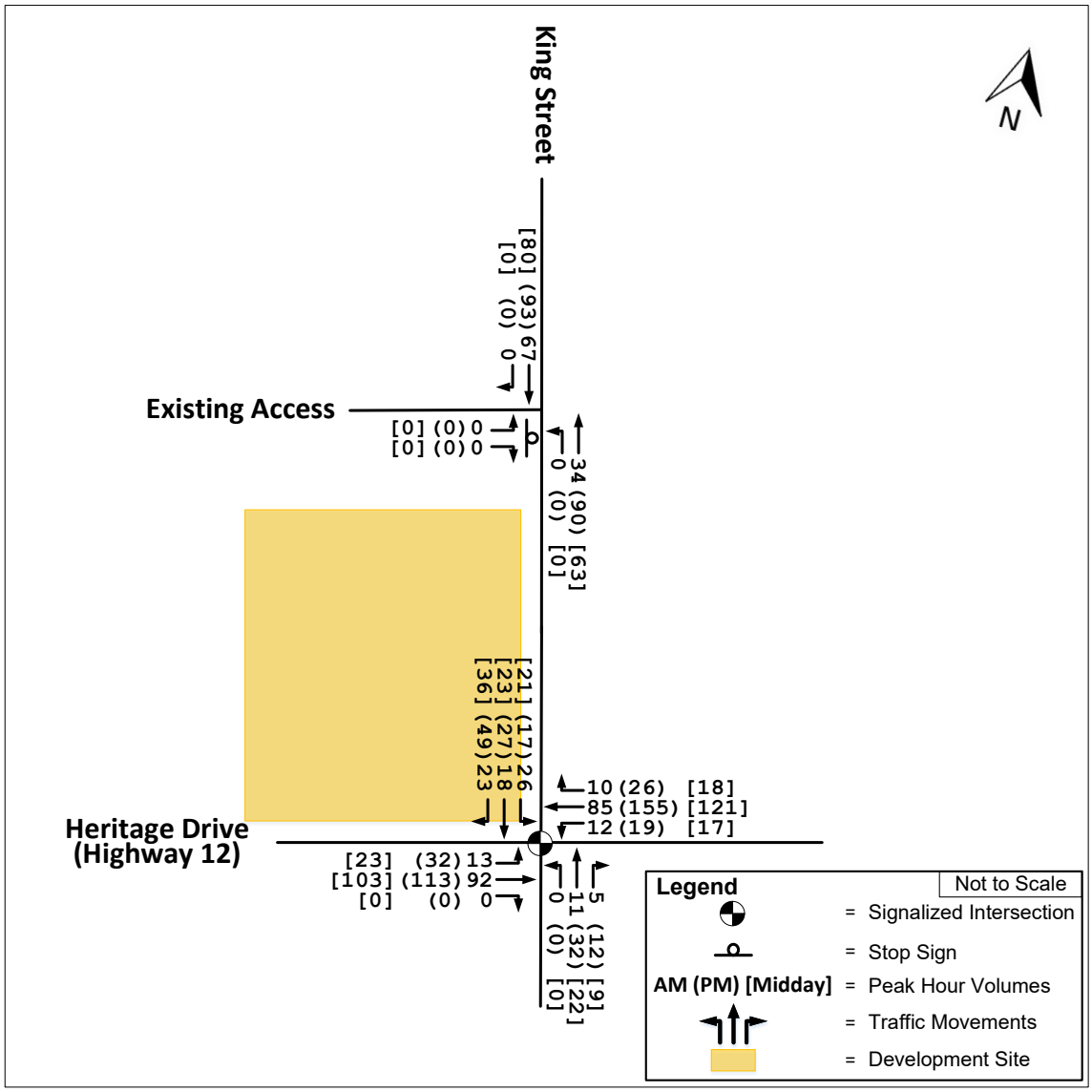

Figure 3-2 2027 Background Developments Peak Hour Trips

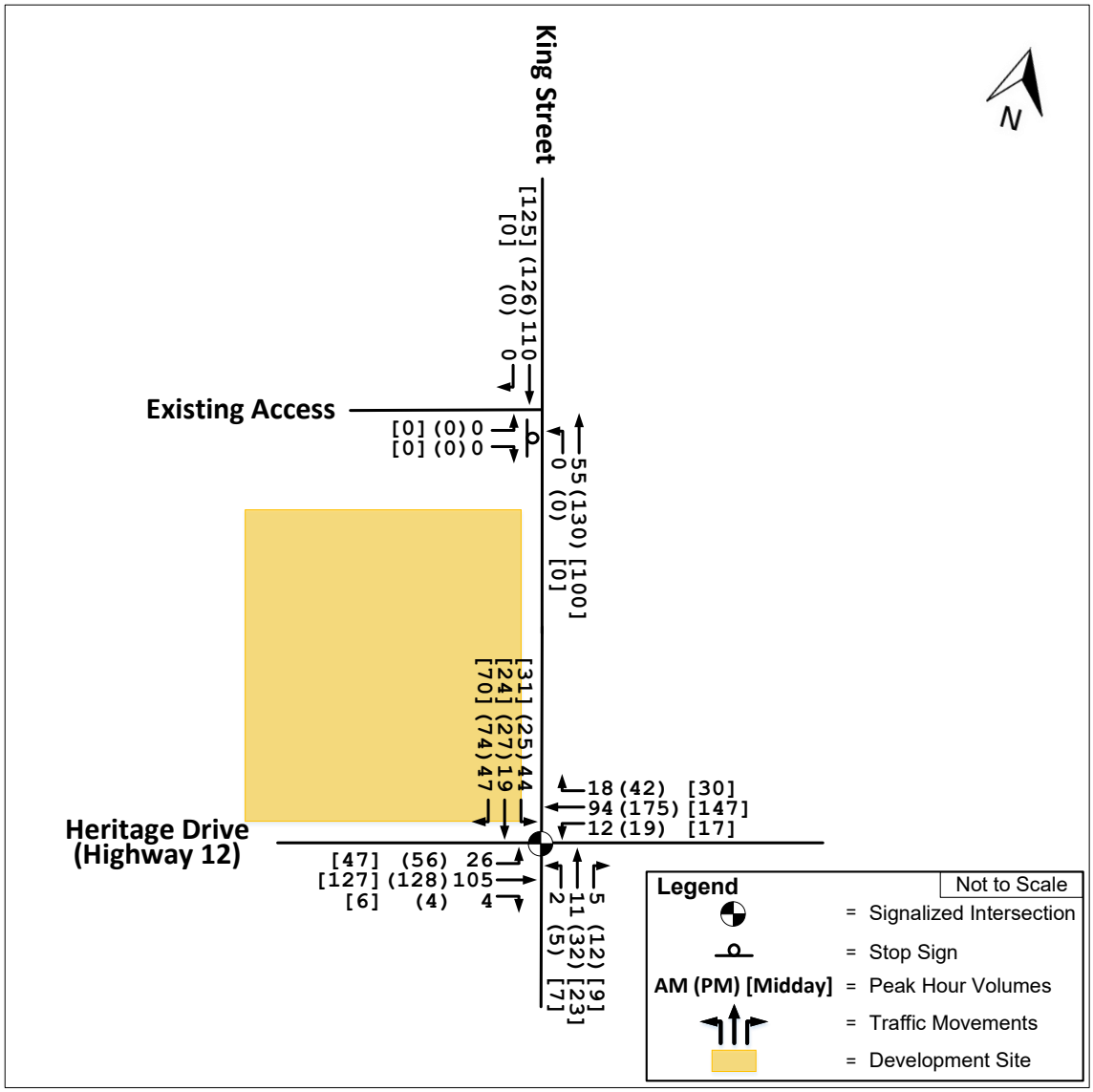

Figure 3-3 2032 Background Developments Peak Hour Trips

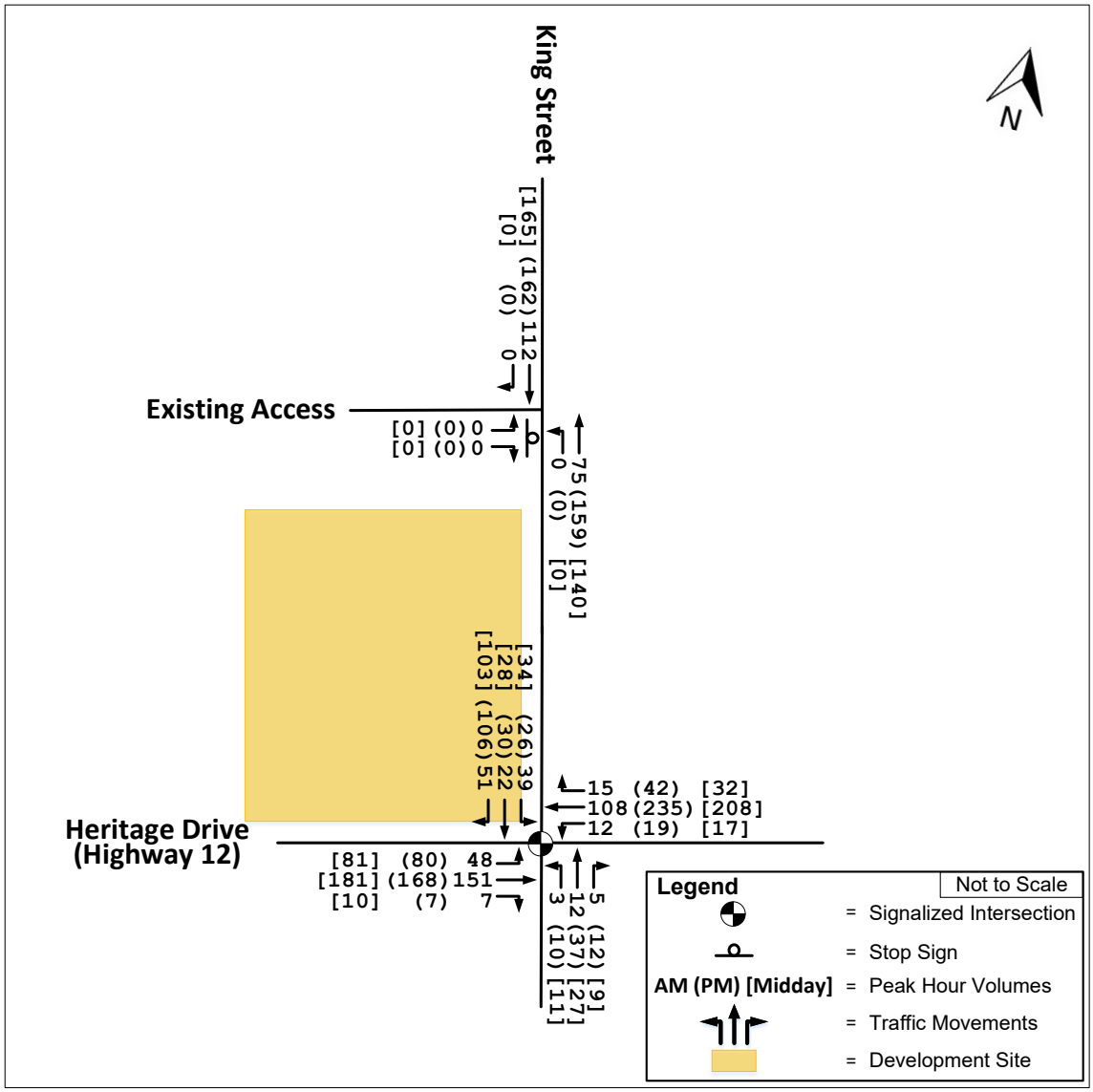

Figure 3-4 2037 Background Developments Peak Hour Trips

3.3 Traffic Volume

To establish the future background traffic volumes, existing corridor volumes were increased using an annual growth rate of 2% and then combined with the traffic generated by the identified background developments. The resulting 2027, 2032, and 2037 future background traffic volumes for all analysis time periods are presented in **Figure 3-7**, **Figure 3-5**, and **Figure 3-6** respectively.

Figure 3-7 2027 Future Background Traffic Volumes

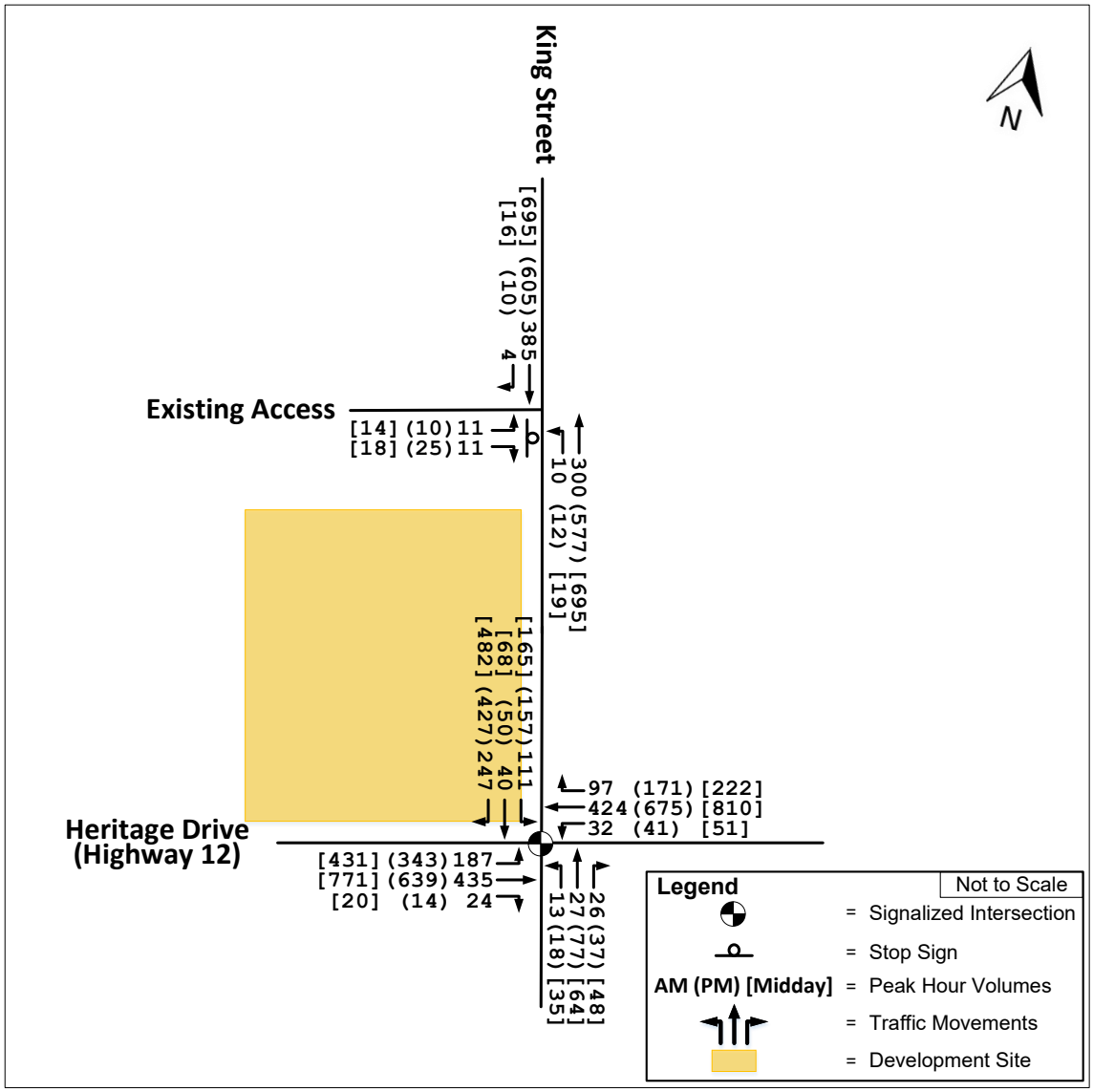

Figure 3-8 2032 Future Background Traffic Volumes

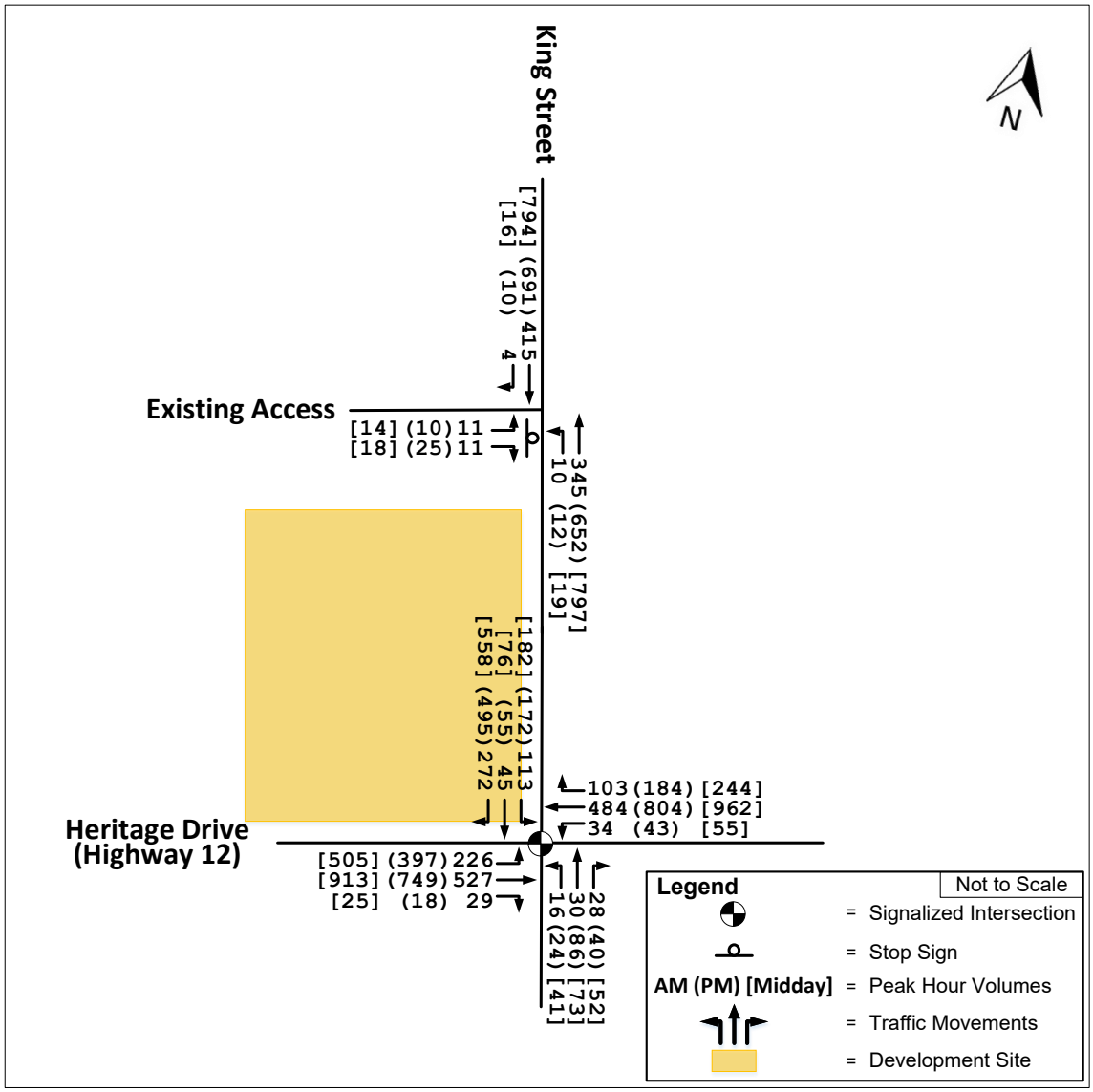

Figure 3-9 2037 Future Background Traffic Volumes

3.4 Traffic Operations Assessment

Using the future background traffic volumes and the existing signal timing plans, a traffic operations assessment for the 2027, 2032, and 2037 background horizon years was completed using Synchro Version 12.

2027 AM, Mid-day, and PM peak hour traffic operations including key measures of effectiveness such as delay, Level-of-Service (LOS), volume-to-capacity (v/c) ratio, and 95th percentile queue for King Street and Heritage Drive (Highway 12) intersection are summarized in **Table 3-2** and **Table 3-3** for the King Street and the Existing Site Access intersection. Synchro output reports are provided in **Appendix E**.

Table 3-2 2027 Future Background Traffic Operations - King Street and Heritage Drive (Highway 12)

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
AM Peak Hour								
B	13.5	0.36	EBL	A	5.9	0.31	15.1	125
			EBTR	A	8.7	0.26	28.1	-
			WBL	A	8.3	0.07	4.0	125
			WBT	B	11.0	0.27	26.5	-
			WBR	A	9.8	0.06	5.9	120
			NBL	C	24.1	0.06	4.6	55
			NBT	C	24.4	0.12	8.7	-
			NBR	C	23.8	0.02	-	-
			SBL	C	26.9	0.44	21.9	80
			SBT	C	24.5	0.14	11.1	-
			SBR	C	24.6	0.16	11.3	-
Mid-day Peak Hour								
B	18.8	0.84	EBL	C	24.1	**0.86**	66.3	125
			EBTR	B	11.8	0.40	55.3	-
			WBL	A	9.2	0.12	6.9	125
			WBT	B	14.0	0.44	57.1	-
			WBR	B	11.6	0.13	10.6	120
			NBL	C	24.4	0.11	10.1	55
			NBT	C	24.9	0.19	18.5	-
			NBR	C	23.8	0.03	2.8	-
			SBL	C	28.3	0.53	39.9	80

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
			SBT	C	24.7	0.17	19.1	-
			SBR	C	32.4	0.66	59.5	-
PM Peak Hour								
B	15.3	0.59	EBL	A	8.4	0.57	32.3	125
			EBTR	B	10.7	0.33	43.8	-
			WBL	A	8.5	0.09	5.9	125
			WBT	B	12.7	0.37	45.9	-
			WBR	B	10.9	0.09	9.6	120
			NBL	C	23.4	0.05	5.0	55
			NBT	C	24.6	0.24	19.1	-
			NBR	C	23.2	0.02	0.8	-
			SBL	C	27.9	0.54	33.8	80
			SBT	C	23.9	0.13	13.6	-
			SBR	C	25.8	0.39	30.1	-

Table 3-3 2027 Future Background Traffic Operations - King Street and the Existing Site Access

Intersection Delay (s)	Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Capacity
AM Peak Hour						
0.5	EBLR	B	11.5	0.04	1.1	-
	NBL	A	0.9	0.01	0.2	-
Mid-day Peak Hour						
0.6	EBLR	C	16.7	0.10	2.6	-

Intersection Delay (s)	Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Capacity
	NBL	A	1.0	0.02	0.5	-
PM Peak Hour						
0.5	EBLR	B	12.7	0.08	1.8	-
	NBL	A	0.7	0.01	0.3	-

Note: Red font represents a critical movement.

- At King Street and Heritage Drive (Highway 12) intersection:
  - During the Mid-day peak hour, the eastbound left-turn movement is predicted to exceed the critical v/c threshold, with a v/c ratio of 0.86. Despite this, the 95th percentile queue remains within the available storage, with capacity for approximately 10 additional vehicles.
  - All other movements are expected to operate within acceptable thresholds during the analysis time periods.
- At King Street and the Existing Site Access intersection:
  - No operational or queuing issues are anticipated during any of the analysis time periods.

2032 AM, Mid-day, and PM peak hour traffic operations including key measures of effectiveness such as delay, Level-of-Service (LOS), volume-to-capacity (v/c) ratio, and 95th percentile queue for King Street and Heritage Drive (Highway 12) intersection are summarized in **Table 3-4** and **Table 3-5** for the King Street and the Existing Site Access intersection. Synchro output reports are provided in Appendix F.

Table 3-4 2032 Future Background Traffic Operations - King Street and Heritage Drive (Highway 12)

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
AM Peak Hour								
B	14.4	0.44	EBL	A	6.7	0.39	19.5	125
			EBTR	B	10.4	0.32	35.1	-
			WBL	A	8.2	0.08	4.7	125
			WBT	B	12.0	0.31	32.1	-
			WBR	B	10.5	0.07	6.6	120

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
			NBL	C	23.5	0.07	6.3	55
			NBT	C	23.7	0.11	10.3	-
			NBR	C	23.2	0.02	-	-
			SBL	C	27.2	0.52	27.1	80
			SBT	C	23.8	0.14	11.5	-
			SBR	C	24.2	0.19	11.7	-
Mid-day Peak Hour								
D	35.5	1.13	EBL	F	119.9	**1.18**	107.0	125
			EBTR	B	14.0	0.48	67.5	-
			WBL	B	10.5	0.15	7.1	125
			WBT	B	16.3	0.52	68.0	-
			WBR	B	13.0	0.15	11.3	120
			NBL	C	24.6	0.14	14.7	55
			NBT	C	24.9	0.18	23.0	-
			NBR	C	23.8	0.03	4.0	-
			SBL	C	28.7	0.53	46.2	80
			SBT	C	24.7	0.15	20.2	-
			SBR	D	48.0	**0.87**	107.5	-
PM Peak Hour								
B	17.6	0.75	EBL	B	14.5	0.75	48.3	125
			EBTR	B	11.8	0.38	52.8	-
			WBL	A	9.1	0.10	6.1	125

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
			WBT	B	13.9	0.42	53.8	-
			WBR	B	11.6	0.11	10.2	120
			NBL	C	23.7	0.08	9.0	55
			NBT	C	24.7	0.24	25.4	-
			NBR	C	23.3	0.03	1.4	-
			SBL	C	28.9	0.57	41.8	80
			SBT	C	23.9	0.13	15.2	-
			SBR	C	31.0	0.65	57.0	-

Table 3-5 2032 Future Background Traffic Operations - King Street and the Existing Site Access

Intersection Delay (s)	Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Capacity
AM Peak Hour						
0.7	EBLR	B	13.2	0.08	2.1	-
	NBL	A	0.8	0.01	0.2	-
Mid-day Peak Hour						
0.6	EBLR	C	19.6	0.13	3.3	-
	NBL	A	1.0	0.03	0.6	-
PM Peak Hour						
0.5	EBLR	B	13.8	0.09	2.1	-
	NBL	A	0.7	0.01	0.3	-

Note: Red font represents a critical movement.

- At King Street and Heritage Drive (Highway 12) intersection:

- During the Mid-day peak hour, the eastbound left-turn movement is forecasted to operate at LOS F (based on delay) and exceed critical v/c thresholds (v/c = 1.18). However, queue lengths remain within available storage, with capacity for approximately 10 additional vehicles. The southbound right-turn movement is forecasted to exceed critical v/c thresholds (v/c = 0.87).
- All the other movements are expected to operate within acceptable thresholds during the analysis time periods.

- At King Street and the Existing Site Access intersection:
  - No operational or queuing issues are anticipated during any of the analysis time periods.

2037 AM, Mid-day, and PM peak hour traffic operations including key measures of effectiveness such as delay, Level-of-Service (LOS), volume-to-capacity (v/c) ratio, and 95th percentile queue for King Street and Heritage Drive (Highway 12) intersection are summarized in **Table 3-6** and **Table 3-7** for the King Street and the Existing Site Access intersection. Synchro output reports are provided in **Appendix G.**

Table 3-6 2037 Future Background Traffic Operations - King Street and Heritage Drive (Highway 12)

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
AM Peak Hour								
B	14.6	0.54	EBL	A	7.4	0.51	25.0	125
			EBTR	B	11.0	0.38	44.8	-
			WBL	A	8.4	0.09	5.1	125
			WBT	B	12.5	0.36	38.1	-
			WBR	B	10.7	0.08	6.8	120
			NBL	C	23.6	0.09	7.5	55
			NBT	C	23.7	0.12	11.3	-
			NBR	C	23.2	0.02	-	-
			SBL	C	27.2	0.52	28.3	80
			SBT	C	23.9	0.15	12.9	-
			SBR	C	24.4	0.21	12.1	-
Mid-day Peak Hour								

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
E	76.2	1.54	EBL	F	353.0	**1.72**	**159.6**	125
			EBTR	B	17.5	0.59	83.8	-
			WBL	B	11.2	0.19	7.7	125
			WBT	B	18.8	0.62	84.6	-
			WBR	B	14.0	0.16	11.8	120
			NBL	C	25.0	0.15	16.9	55
			NBT	C	25.2	0.19	25.6	-
			NBR	C	24.1	0.04	4.9	-
			SBL	C	29.5	0.55	51.0	80
			SBT	C	25.0	0.16	22.3	-
			SBR	F	94.6	**1.06**	150.0	-
PM Peak Hour								
C	28.7	1.03	EBL	E	72.6	**1.05**	85.1	125
			EBTR	B	13.8	0.46	63.4	-
			WBL	B	10.4	0.12	6.3	125
			WBT	B	16.3	0.51	65.7	-
			WBR	B	12.9	0.12	10.3	120
			NBL	C	23.9	0.09	11.0	55
			NBT	C	24.9	0.23	28.8	-
			NBR	C	23.4	0.03	1.9	-
			SBL	C	28.7	0.55	47.1	80
			SBT	C	24.0	0.12	16.9	-

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
			SBR	D	45.9	0.85	106.7	-

Table 3-7 2037 Future Background Traffic Operations - King Street and the Existing Site Access

Intersection Delay (s)	Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Capacity
AM Peak Hour						
0.5	EBLR	B	13.0	0.05	1.3	-
	NBL	A	0.8	0.01	0.3	-
Mid-day Peak Hour						
0.6	EBLR	C	23.7	0.16	4.2	-
	NBL	A	1.0	0.03	0.7	-
PM Peak Hour						
0.5	EBLR	C	15.3	0.10	2.4	-
	NBL	A	0.6	0.01	0.3	-

Note: Red font represents a critical movement.

- At King Street and Heritage Drive (Highway 12) intersection:
  - During the Mid-day peak hour, the eastbound left-turn movement is expected to exceed critical v/c thresholds, with a v/c ratio of 1.72. The 95th percentile queue is projected to exceed available storage by approximately 34.6 m (equivalent to about six vehicles). the southbound right-turn movement is also forecasted to exceed critical v/c thresholds, with a v/c ratio of 0.87.
  - During the PM peak hour, the eastbound left-turn movement is projected to exceed critical v/c thresholds, with a v/c ratio of 1.05.
  - All the other movements are expected to operate within acceptable thresholds during the analysis time periods.
- At King Street and the Existing Site Access intersection:
  - No operational or queuing issues are anticipated during any of the analysis time periods.

4 Future Total Traffic Operations

4.1 Site Traffic

The proposed development will consist of a 376 m2 GFA quick-service restaurant with drive-thru facility, providing a total of 66 dining seats (46 indoor and 20 outdoor). The restaurant is proposed to be constructed on a portion of the existing surface parking lot that currently serving the Quality Inn hotel, which is also owned by the Proponent.

A total of 17 parking spaces and drive-thru stacking capacity of 14 vehicles are proposed to accommodate all uses on the property. Vehicular access to the adjacent road network will be provided via the existing full-movement site access fronting King Street.

Trip generation estimates for the proposed development were derived using the **Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition (September 2021)**. Both new vehicle trips and pass-by trips were quantified. New trips represent trips that would not occur without the proposed development, while pass-by trips are associated with vehicles already traveling on the adjacent roadway network that divert into the site.

The existing site is currently occupied by a parking lot and therefore generates no existing trips. Given the type and context of the proposed development, Land Use Code (LUC) 934 – Fast-Food Restaurant with Drive-Through was selected as the most appropriate land-use category for estimating trip generation. Estimated new inbound and outbound trips are summarized in **Table 4-1** and **Table 4-2**, using seating capacity and gross floor area (GFA), respectively. The trip estimates based on GFA result in higher trip generation and were therefore adopted conservatively for subsequent analysis in this study.

Table 4-1 Proposed Development Trip Generation (Seats)

Proposed Site Trip Generation - 924 King Street, Midland										
LUC 934: Fast Food Restaurant with Drive-Through – General Urban/Suburban – 66 Seats										
Term	**Unit**	**AM Peak Hour**			**PM Peak Hour**			**Midday Peak Hour**		
		In	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Trip Generation Rate	Vehicle trips / Seat	0.67	0.64	1.31	0.50	0.47	0.97	1.22	1.17	2.39
Directional Distribution		51%	49%	100%	52%	48%	100%	51%	49%	100%
Vehicle Trip Generation	Vehicle Trips / hour	44	42	86	33	31	64	80	77	157
Internal Capture Reduction	Vehicle Trips / hour	-3	-3	-6	-7	-7	-14	-14	-14	-28
Pass-by Reduction	Vehicle Trips / hour	-21	-20	-41	-14	-13	-27	-36	-35	-71

Proposed Site Trip Generation - 924 King Street, Midland									
LUC 934: Fast Food Restaurant with Drive-Through – General Urban/Suburban – 66 Seats									
Term	**Unit**	**AM Peak Hour**			**PM Peak Hour**			**Midday Peak Hour**	
		In	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Net Trips	**Vehicle Trips / hour**	**20**	**19**	**39**	**12**	**11**	**23**	**30**	**28**	**58**

Table 4-2 Proposed Development Trip Generation (GFA)

Proposed Site Trip Generation - 924 King Street, Midland									
LUC 934: Fast Food Restaurant with Drive-Through – General Urban/Suburban – 376 Sq. M. (4,048 Sq. Ft.)									
Term	**Unit**	**AM Peak Hour**			**PM Peak Hour**			**Mid-day Peak Hour**	
		In	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Trip Generation Rate	Vehicle trips / 1,000 Sq. Ft. GFA	22.75	21.86	44.61	17.18	15.85	33.03	28.18	27.07	55.25
Directional Distribution		51%	49%	100%	52%	48%	100%	51%	49%	100%
Vehicle Trip Generation	Vehicle Trips / hour	91	87	178	69	63	132	113	108	221
Internal Capture Reduction	Vehicle Trips / hour	-3	-3	-6	-7	-7	-14	-14	-14	-28
Pass-by Reduction	Vehicle Trips / hour	-44	-42	-86	-34	-31	-65	-54	-52	-106
Net Trips	**Vehicle Trips / hour**	**44**	**42**	**86**	**28**	**25**	**53**	**45**	**42**	**87**

Based on the number of units of the proposed development, the proposed development is expected to generate:

- 86 new vehicle trips during the AM peak hour (44 inbound trips and 42 outbound trips).
- 53 new vehicle trips during the PM peak hour (28 inbound trips and 25 outbound trips).
- 87 new vehicle trips during the Mid-day peak hour (45 inbound trips and 42 outbound trips).

The trip distribution for the proposed development was determined through a review of existing traffic patterns within the area bounded by the existing access to the north, Heritage Drive to the south, and King Street to the east and west.

For the peak hours, directional traffic patterns observed at key intersections within the study area were used to establish the distribution of site-generated trips. These existing travel patterns form the basis for assigning inbound and outbound trips to the surrounding roadway network.

The existing traffic patterns at study area intersections used to inform the trip distribution are presented in **Table 4-3**.

Table 4-3 Site Trip Distribution

FROM / TO	AM PEAK HOUR		PM PEAK HOUR		MIDDAY PEAK HOUR	
	IN	OUT	IN	OUT	IN	OUT
Heritage Drive (West)	61%	65%	58%	68%	59%	66%
Heritage Drive (East)	30%	22%	26%	26%	29%	22%
King Street (North)	2%	7%	7%	2%	5%	5%
King Street (South)	6%	7%	9%	4%	6%	7%
TOTAL	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Based on the above distributions, Pass-by trips are illustrated in **Figure 4-1**, and the net site trips are illustrated in **Figure 4-2**.

Figure 4-1 Pass-by Trips

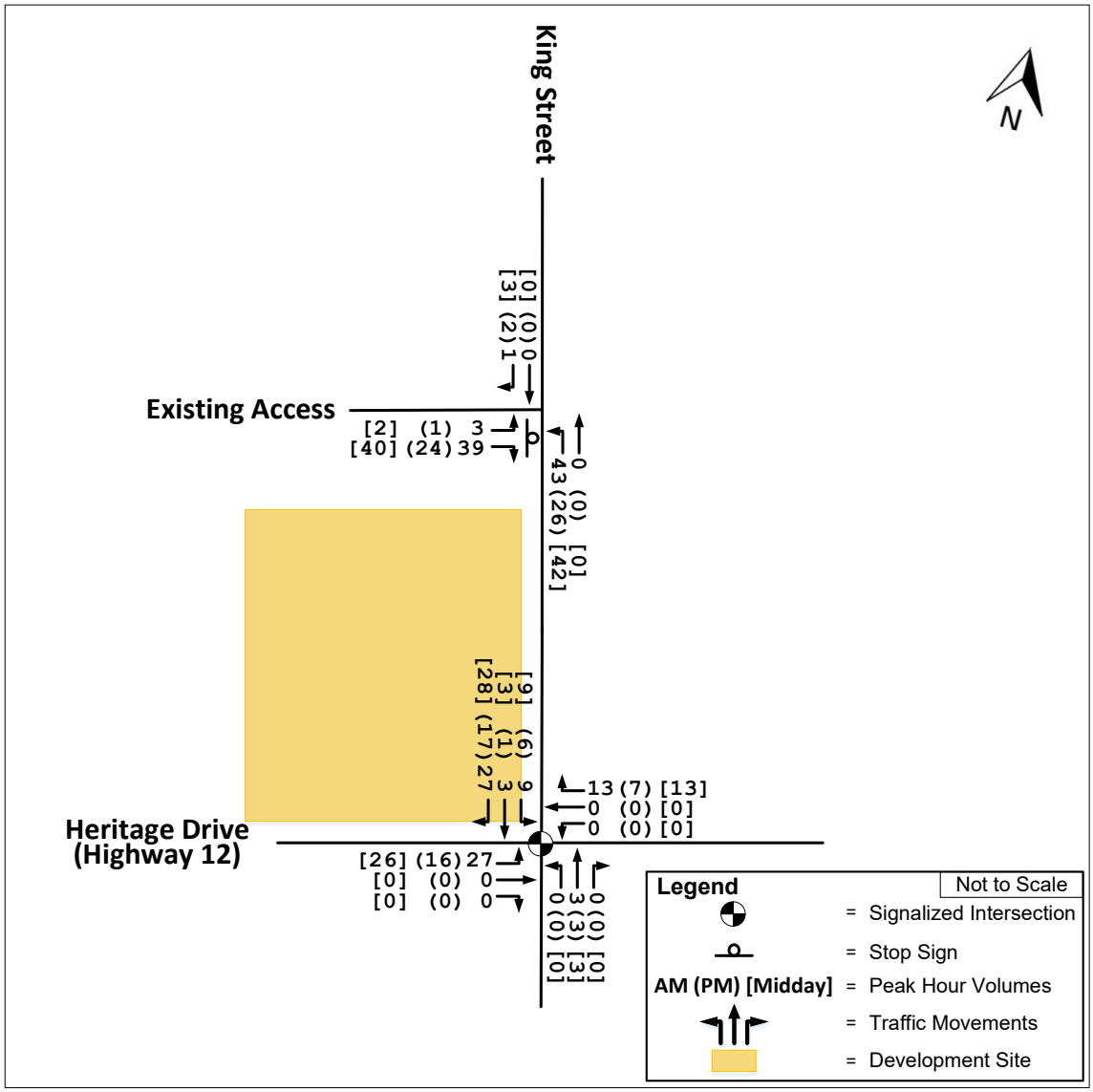

Figure 4-2 Site Net Trips

4.2 Traffic Volume

Site-generated traffic volumes (shown in Figure 6-2) were added to the future background traffic for each horizon year to establish the future total traffic volumes. The resulting 2027, 2032, and 2037 future total traffic volumes for the respective analysis periods are presented in in **Figure 4-3**, **Figure 4-4,** and **Figure 4-5** respectively.

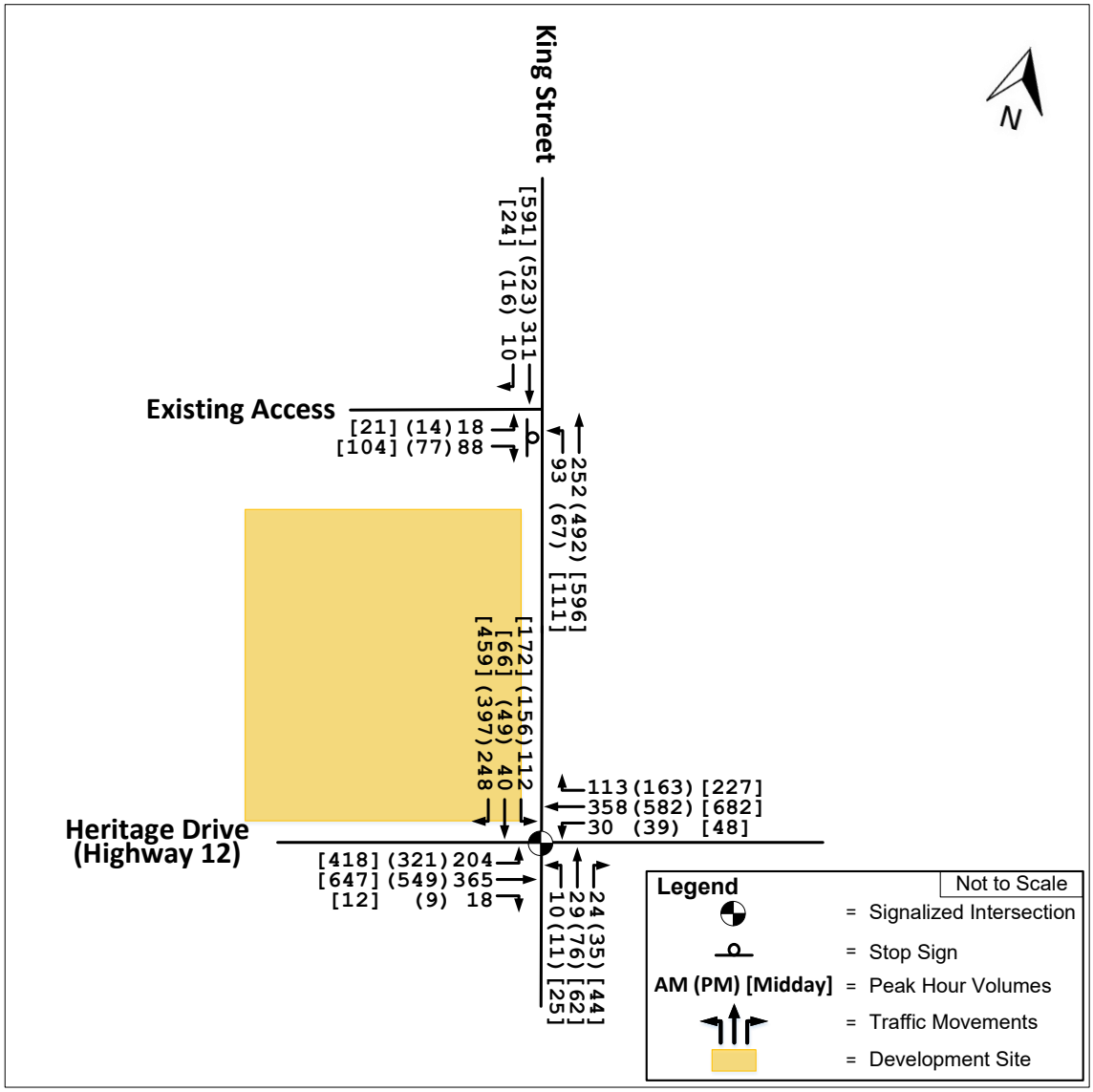

Figure 4-3 2027 Future Total Traffic Volumes

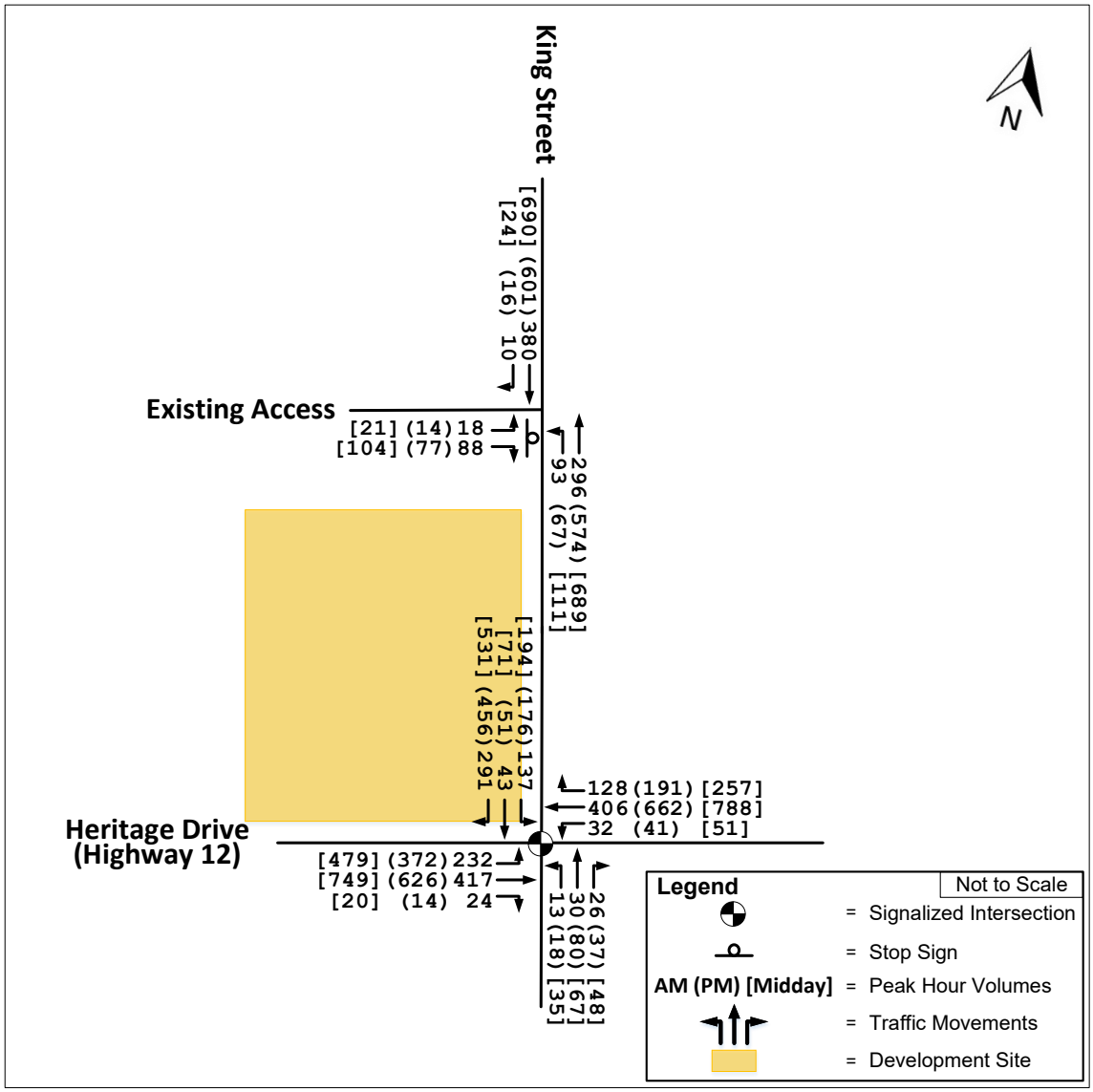

Figure 4-4 2032 Future Total Traffic Volumes

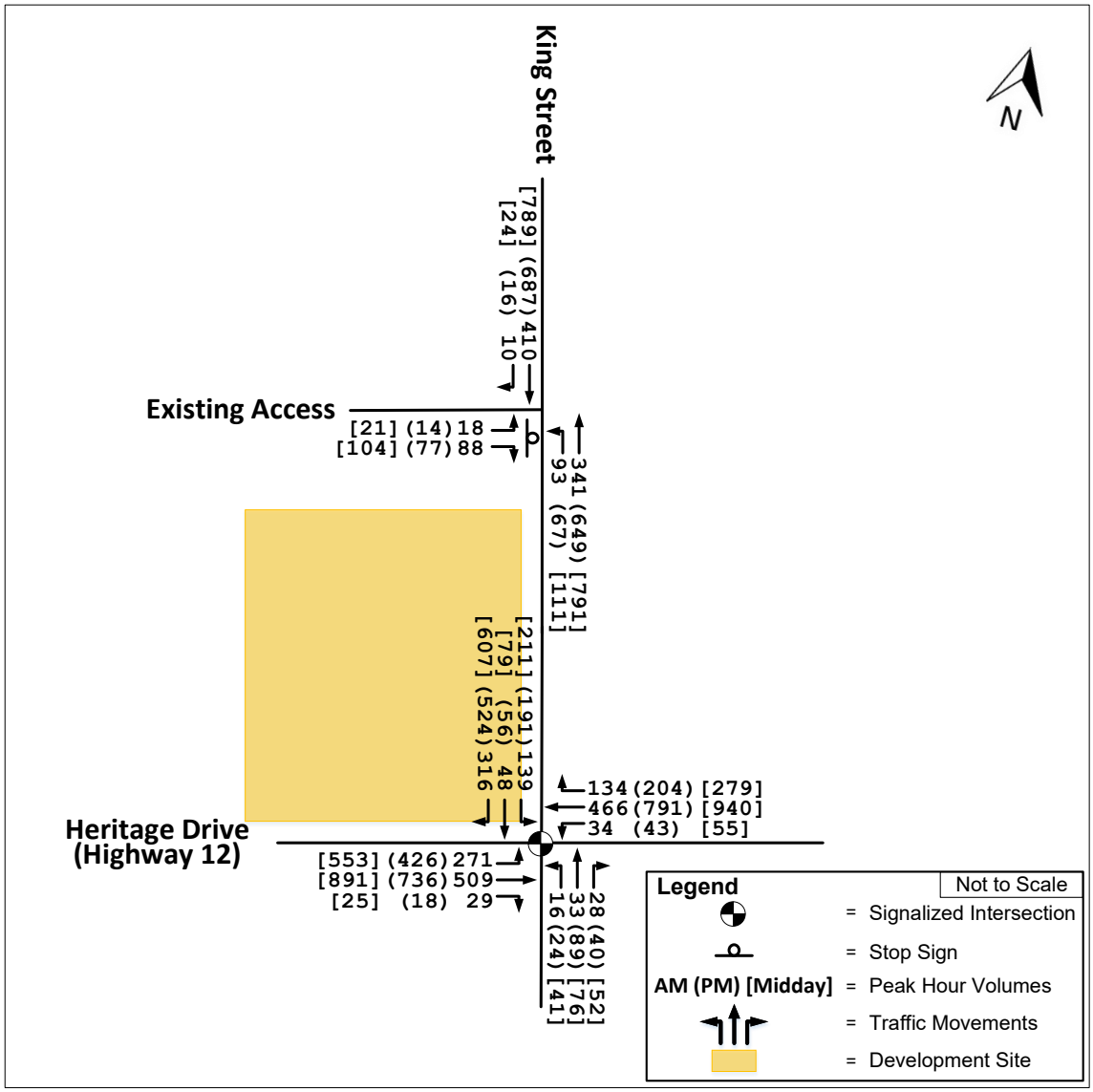

Figure 4-5 2037 Future Total Traffic Volumes

4.3 Traffic Operations Assessment

Using the future total traffic volumes and the existing signal timing plans, a traffic operations assessment for the 2027, 2032, and 2037 future total conditions was completed using Synchro V12.

2027 AM, Mid-day, and PM peak hour traffic operations including key measures of effectiveness such as delay, Level-of-Service (LOS), volume-to-capacity (v/c) ratio, and 95th percentile queue for King Street and Heritage Drive (Highway 12) intersection are summarized in **Table 4-4** and **Table 4-5** for the King Street and the Existing Site Access intersection. Synchro output reports are provided in **Appendix I**.

Table 4-4 2027 Future Total Traffic Operations - King Street and Heritage Drive (Highway 12)

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
AM Peak Hour								
B	14.2	0.45	EBL	A	6.7	0.40	21.4	125
			EBTR	A	9.2	0.25	28.6	-
			WBL	A	8.8	0.07	4.5	125
			WBT	B	11.5	0.26	27.0	-
			WBR	B	10.5	0.09	7.0	120
			NBL	C	23.7	0.06	4.6	55
			NBT	C	24.0	0.12	9.4	-
			NBR	C	23.4	0.02	-	-
			SBL	C	27.8	0.53	27.3	80
			SBT	C	24.1	0.14	11.5	-
			SBR	C	24.5	0.19	11.6	-
Mid-day Peak Hour								
C	23.8	0.95	EBL	D	47.3	**0.97**	85.6	125
			EBTR	B	12.4	0.40	53.0	-
			WBL	A	9.7	0.12	6.9	125

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
			WBT	B	14.6	0.44	55.0	-
			WBR	B	12.4	0.15	11.4	120
			NBL	C	24.0	0.11	10.1	55
			NBT	C	24.5	0.18	19.2	-
			NBR	C	23.4	0.03	2.8	-
			SBL	C	29.8	0.59	48.0	80
			SBT	C	24.3	0.16	19.7	-
			SBR	D	36.9	0.76	84.3	-
PM Peak Hour								
B	16	0.65	EBL	B	10.0	0.63	37.3	125
			EBTR	B	11.2	0.33	44.1	-
			WBL	A	8.9	0.09	6.1	125
			WBT	B	13.2	0.37	45.9	-
			WBR	B	11.4	0.11	10.4	120
			NBL	C	23.0	0.05	4.8	55
			NBT	C	24.2	0.24	19.4	-
			NBR	C	22.8	0.02	0.8	-
			SBL	C	28.6	0.58	37.8	80
			SBT	C	23.4	0.13	13.7	-
			SBR	C	26.1	0.46	35.4	-

Table 4-5 2027 Future Total Traffic Operations - King Street and the Existing Site Access

Intersection Delay (s)	Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Capacity
AM Peak Hour						
2.8	EBLR	B	12.1	0.20	5.7	-
	NBL	A	4.8	0.10	2.4	-
Mid-day Peak Hour						
2.6	EBLR	C	18.6	0.35	11.7	-
	NBL	A	4.4	0.14	3.6	-
PM Peak Hour						
1.6	EBLR	B	13.1	0.18	4.9	-
	NBL	A	3.1	0.07	1.7	-

Note: Red font represents a critical movement.

- At King Street and Heritage Drive (Highway 12) intersection:
  - During the Mid-day peak hour, the eastbound left-turn movement is expected to exceed critical v/c thresholds (v/c = 0.97); however, queues remain within available storage, with capacity for approximately seven additional vehicles.
  - All the other movements are expected to operate within acceptable thresholds during the analysis time periods.
- At King Street and the Existing Site Access intersection:
  - No operational or queuing issues are anticipated during any of the analysis time periods.

2032 AM, Mid-day, and PM peak hour traffic operations including key measures of effectiveness such as delay, Level-of-Service (LOS), volume-to-capacity (v/c) ratio, and 95th percentile queue for King Street and Heritage Drive (Highway 12) intersection are summarized in **Table 4-6** and **Table 4-7** for the King Street and the Existing Site Access intersection. Synchro output reports are provided in **Appendix J**.

Table 4-6 2032 Future Total Traffic Operations - King Street and Heritage Drive (Highway 12)

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
AM Peak Hour								
B	15.2	0.54	EBL	A	7.8	0.49	27.5	125
			EBTR	B	11.1	0.31	36.5	-
			WBL	A	8.9	0.08	5.3	125
			WBT	B	12.7	0.31	33.3	-
			WBR	B	11.4	0.10	7.7	120
			NBL	C	22.9	0.07	6.2	55
			NBT	C	23.1	0.11	10.9	-
			NBR	C	22.6	0.02	-	-
			SBL	C	28.3	0.58	32.5	80
			SBT	C	23.2	0.13	12.0	-
			SBR	C	23.9	0.23	11.7	-
Mid-day Peak Hour								
D	48.5	1.26	EBL	F	187.7	**1.35**	**130.3**	125
			EBTR	B	15.1	0.48	65.2	-
			WBL	B	11.3	0.15	7.1	125
			WBT	B	17.3	0.52	65.7	-
			WBR	B	14.1	0.17	12.2	120
			NBL	C	23.9	0.13	14.7	55
			NBT	C	24.2	0.17	23.8	-
			NBR	C	23.2	0.03	4.0	-
			SBL	C	29.2	0.57	54.1	80

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
			SBT	C	24.0	0.15	21.1	-
			SBR	E	55.2	**0.92**	126.9	-
PM Peak Hour								
B	19.2	0.82	EBL	C	20.1	0.82	59.4	125
			EBTR	B	12.2	0.38	51.6	-
			WBL	A	9.5	0.10	6.1	125
			WBT	B	14.3	0.42	52.6	-
			WBR	B	12.1	0.12	10.7	120
			NBL	C	23.3	0.07	8.9	55
			NBT	C	24.4	0.23	25.9	-
			NBR	C	23.0	0.03	1.4	-
			SBL	C	29.9	0.61	46.3	80
			SBT	C	23.6	0.12	15.4	-
			SBR	C	33.0	0.70	66.4	-

Table 4-7 2032 Future Total Traffic Operations - King Street and the Existing Site Access

Intersection Delay (s)	Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Capacity
AM Peak Hour						
2.6	EBLR	B	13.0	0.22	6.5	-
	NBL	A	4.7	0.10	2.6	-
Mid-day Peak Hour						
2.7	EBLR	C	22.9	0.42	15.0	-

Intersection Delay (s)	Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Capacity
	NBL	A	4.5	0.15	4.0	-
PM Peak Hour						
1.5	EBLR	B	14.2	0.20	5.6	-
	NBL	A	3.0	0.08	1.9	-

Note: Red font represents a critical movement.

- At King Street and Heritage Drive (Highway 12) intersection:
  - During the Mid-day peak hour, the eastbound left-turn movement is expected to exceed critical v/c thresholds (v/c = 1.35). The 95th percentile queue is projected to exceed available storage by approximately 5.3 m (equivalent to about one vehicle). the southbound right-turn movement is also forecasted to exceed critical v/c thresholds, with a v/c ratio of 0.92.
  - All the other movements are expected to operate within acceptable thresholds during the analysis time periods.
- At King Street and the Existing Site Access intersection:
  - No operational or queuing issues are anticipated during any of the analysis time periods.

2032 AM, Mid-day, and PM peak hour traffic operations including key measures of effectiveness such as delay, Level-of-Service (LOS), volume-to-capacity (v/c) ratio, and 95th percentile queue for King Street and Heritage Drive (Highway 12) intersection are summarized in **Table 4-8** and **Table 4-9** for the King Street and the Existing Site Access intersection. Synchro output reports are provided in **Appendix K**.

Table 4-8 2037 Future Total Traffic Operations - King Street and Heritage Drive (Highway 12)

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
AM Peak Hour								
B	15.6	0.64	EBL	A	9.7	0.62	32.7	125
			EBTR	B	11.8	0.38	45.3	-
			WBL	A	9.1	0.09	5.5	125
			WBT	B	13.2	0.35	38.5	-
			WBR	B	11.5	0.10	7.7	120

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
			NBL	C	23.0	0.08	7.4	55
			NBT	C	23.2	0.12	12.0	-
			NBR	C	22.6	0.02	-	-
			SBL	C	28.3	0.58	33.6	80
			SBT	C	23.3	0.14	13.3	-
			SBR	C	24.8	0.34	17.2	-
Mid-day Peak Hour								
F	93.4	1.66	EBL	F	401.8	**1.83**	**189.7**	125
			EBTR	B	17.3	0.58	81.4	-
			WBL	B	11.1	0.19	7.7	125
			WBT	B	18.6	0.60	82.2	-
			WBR	B	14.2	0.18	12.5	120
			NBL	C	25.0	0.15	16.9	55
			NBT	C	25.3	0.20	26.5	-
			NBR	C	24.1	0.04	4.9	-
			SBL	C	32.3	0.63	59.6	80
			SBT	C	25.1	0.17	22.8	-
			SBR	F	136.6	**1.18**	169.9	-
PM Peak Hour								
C	34.7	1.1	EBL	F	106.2	**1.14**	97.5	125
			EBTR	B	14.6	0.46	62.1	-
			WBL	B	10.9	0.12	6.3	125

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
			WBT	B	16.9	0.51	64.4	-
			WBR	B	13.6	0.13	10.9	120
			NBL	C	23.3	0.08	11.0	55
			NBT	C	24.4	0.23	29.6	-
			NBR	C	22.9	0.03	1.9	-
			SBL	C	29.0	0.58	52.4	80
			SBT	C	23.5	0.12	17.0	-
			SBR	D	48.9	**0.88**	118.2	-

Table 4-9 2037 Future Total Traffic Operations - King Street and the Existing Site Access

Intersection Delay (s)	Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Capacity
AM Peak Hour						
2.5	EBLR	B	13.6	0.24	6.9	-
	NBL	A	4.5	0.11	2.7	-
Mid-day Peak Hour						
3.0	EBLR	D	30.1	0.50	20.0	-
	NBL	A	4.7	0.17	4.5	-
PM Peak Hour						
1.5	EBLR	C	15.8	0.23	6.5	-
	NBL	A	2.9	0.08	2.0	-

Note: Red font represents a critical movement.

- At King Street and Heritage Drive (Highway 12) intersection:

- During the Saturday Mid-day peak hour, the eastbound left-turn movement is projected to exceed critical v/c thresholds, with a v/c ratio of 1.83. The 95th percentile queue is expected to exceed the available storage capacity by approximately 64.7 m (equivalent to about 11 vehicles). The southbound right-turn movement is also forecasted to exceed critical v/c thresholds, with a v/c ratio of 1.18.
- During the PM peak hour, the eastbound left-turn movement is predicted to exceed critical v/c thresholds, with a v/c ratio of 1.14, while the southbound right-turn movement is also expected to exceed critical thresholds, operating at a v/c ratio of 0.88.
- All the other movements are expected to operate within acceptable thresholds during the analysis time periods.

- At King Street and the Existing Site Access intersection:
  - No operational or queuing issues are anticipated during any of the analysis time periods.

5 Mitigation Measures

This section of the report evaluates potential mitigation measures to address high delays and movements exceeding capacity thresholds, as well as opportunities to enhance traffic circulation through additional traffic control measures appropriate for a low-density suburban context.

Based on the 2037 future total traffic conditions, several signal timing modifications for the King Street and Heritage Drive (Highway 12) intersection were identified and provided in **Table 5-1**. These recommendations were developed to mitigate the forecasted operational deficiencies and improve traffic operations at the intersection.

Table 5-1 Proposed Mitigation Measures at King Street and Heritage Drive (Highway 12) Intersection

PEAK PERIOD	IMPROVEMENT
Midday peak hour	• The cycle length increased from 90 seconds to 120 seconds • EBT increased from 50 seconds to 74 seconds • EBL increased from 10 seconds to 38 seconds • WBT decreased from 50 seconds to 46 seconds • SBT increased from 30 seconds to 36 seconds • SBL permitted phase was converted to a 13-second protected and permitted phase • NBT decreased from 30 seconds to 23 seconds

PM peak hour	• The existing cycle length was maintained. • SBT increased from 30 seconds to 31 seconds • NBT increased from 30 seconds to 31 seconds • EBT decreased from 50 seconds to 49 seconds • WBT decreased from 50 seconds to 38 seconds • WBL increased from 10 seconds to 21 seconds

A traffic operations assessment for the King Street and Heritage Drive (Highway 12) intersection was completed in Synchro 12 using the proposed signal timing modifications and the 2027, 2032, and 2037 future background and future total traffic volumes. The analysis evaluated AM, midday, and PM peak hour conditions and included key measures of effectiveness such as delay, Level of Service (LOS), volume-to-capacity (v/c) ratio, and 95th-percentile queue lengths for the King Street and Heritage Drive (Highway 12) intersection.

The operational results are summarized as follows:

- **Table 5-2:** 2027 Future Total Conditions
- **Table 5-3:** 2032 Future Total Conditions
- **Table 5-4:** 2037 Future Total Conditions
- **Table 5-5:** 2027 Future Background Conditions
- **Table 5-6:** 2032 Future Background Conditions
- **Table 5-7:** 2037 Future Background Conditions

Detailed Synchro output reports are provided in **Appendix L**.

Table 5-2 Mitigated 2027 Future Total Conditions Traffic Operations - King Street and Heritage Drive (Highway 12)

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
AM Peak Hour								
B	13.5	0.45	EBL	A	6.7	0.40	21.4	125
			EBTR	A	9.2	0.25	29.3	-
			WBL	A	8.8	0.07	4.5	125
			WBT	B	11.5	0.26	27.2	-
			WBR	A	0.1	0.09	-	120

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
			NBL	C	23.7	0.06	5.3	55
			NBT	C	24.0	0.12	10.9	-
			NBR	C	23.4	0.02	-	-
			SBL	C	27.8	0.53	27.3	80
			SBT	C	24.1	0.14	11.5	-
			SBR	C	24.5	0.19	11.7	-
Mid-day Peak Hour								
C	21.7	0.75	EBL	B	15.9	0.73	68.8	125
			EBTR	B	12.5	0.36	57.3	-
			WBL	B	18.6	0.15	7.3	125
			WBT	C	26.3	0.56	94.5	-
			WBR	A	0.2	0.15	-	120
			NBL	D	43.6	0.28	17.2	55
			NBT	D	45.6	0.49	33.2	-
			NBR	D	41.2	0.03	-	-
			SBL	D	35.7	0.61	56.4	80
			SBT	C	30.2	0.16	25.3	-
			SBR	C	31.6	0.31	28.8	-
PM Peak Hour								
B	16.5	0.58	EBL	A	8.4	0.54	37.6	125
			EBTR	B	10.6	0.31	45.2	-
			WBL	B	11.8	0.09	6.1	125

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
			WBT	B	16.8	0.41	58.7	-
			WBR	A	0.1	0.11	-	120
			NBL	C	25.7	0.05	6.3	55
			NBT	C	27.1	0.25	25.4	-
			NBR	C	25.5	0.02	-	-
			SBL	C	32.6	0.60	42.2	80
			SBT	C	26.2	0.13	15.3	-
			SBR	C	27.2	0.26	21.5	-

Table 5-3 Mitigated 2032 Future Total Conditions Traffic Operations - King Street and Heritage Drive (Highway 12)

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
AM Peak Hour								
B	14.4	0.54	EBL	A	7.8	0.49	27.5	125
			EBTR	B	11.1	0.31	36.5	-
			WBL	A	8.9	0.08	5.3	125
			WBT	B	12.7	0.31	33.3	-
			WBR	A	0.1	0.10	-	120
			NBL	C	22.9	0.07	6.2	55
			NBT	C	23.1	0.11	10.9	-
			NBR	C	22.6	0.02	-	-
			SBL	C	28.3	0.58	32.5	80
			SBT	C	23.2	0.13	12.0	-

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
			SBR	C	23.9	0.23	11.7	-
Mid-day Peak Hour								
C	26.8	0.85	EBL	C	29.4	0.82	113.7	125
			EBTR	B	13.4	0.41	71.1	-
			WBL	C	20.2	0.17	8.0	125
			WBT	C	31.5	0.67	114.4	-
			WBR	A	0.2	0.17	-	120
			NBL	D	48.6	0.39	21.6	55
			NBT	D	50.5	0.53	34.9	-
			NBR	D	44.6	0.03	-	-
			SBL	D	44.7	0.72	63.0	80
			SBT	C	33.6	0.18	27.2	-
			SBR	D	36.9	0.48	50.5	-
PM Peak Hour								
B	18.1	0.69	EBL	B	11.5	0.67	44.6	125
			EBTR	B	11.3	0.35	52.5	-
			WBL	B	13.1	0.11	6.3	125
			WBT	B	19.0	0.48	67.7	-
			WBR	A	0.2	0.12	-	120
			NBL	C	26.3	0.08	9.0	55
			NBT	C	27.5	0.25	26.5	-
			NBR	C	25.9	0.03	-	-

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
			SBL	D	35.0	0.65	47.4	80
			SBT	C	26.6	0.13	15.7	-
			SBR	C	29.4	0.46	39.4	-

Table 5-4 Mitigated 2037 Future Total Conditions Traffic Operations - King Street and Heritage Drive (Highway 12)

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
AM Peak Hour								
B	14.9	0.64	EBL	A	9.7	0.62	32.8	125
			EBTR	B	11.8	0.38	45.4	-
			WBL	A	9.1	0.09	5.5	125
			WBT	B	13.3	0.35	38.6	-
			WBR	A	0.1	0.10	-	120
			NBL	C	22.9	0.08	7.3	55
			NBT	C	23.1	0.12	11.9	-
			NBR	C	22.5	0.02	-	-
			SBL	C	28.1	0.58	33.0	80
			SBT	C	23.2	0.14	13.0	-
			SBR	C	24.7	0.34	17.0	-
Mid-day Peak Hour								
D	36.3	0.97	EBL	D	53.5	**0.94**	**190.3**	125
			EBTR	B	13.6	0.47	88.5	-
			WBL	C	23.2	0.22	8.6	125

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
			WBT	D	41.1	0.83	143.0	-
			WBR	A	0.3	0.18	-	120
			NBL	D	53.3	0.46	24.8	55
			NBT	E	56.7	0.59	39.0	-
			NBR	D	48.1	0.04	-	-
			SBL	E	60.7	0.83	72.7	80
			SBT	D	37.7	0.21	29.3	-
			SBR	D	51.7	0.75	104.1	-
PM Peak Hour								
C	22.2	0.82	EBL	C	22.1	0.82	85.0	125
			EBTR	B	12.3	0.42	63.6	-
			WBL	B	14.5	0.13	6.5	125
			WBT	C	22.4	0.60	83.4	-
			WBR	A	0.2	0.13	-	120
			NBL	C	27.0	0.10	10.9	55
			NBT	C	28.3	0.27	29.1	-
			NBR	C	26.5	0.03	-	-
			SBL	D	37.5	0.69	51.6	80
			SBT	C	27.2	0.14	16.7	-
			SBR	D	37.9	0.71	69.3	-

Table 5-5 Mitigated 2027 Future Background Conditions Traffic Operations - King Street and Heritage Drive (Highway 12)

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
AM Peak Hour								
B	12.9	0.36	EBL	A	5.9	0.31	15.1	125
			EBTR	A	8.7	0.26	28.8	-
			WBL	A	8.3	0.07	4.0	125
			WBT	B	11.0	0.27	26.8	-
			WBR	A	0.1	0.06	-	120
			NBL	C	24.1	0.06	5.3	55
			NBT	C	24.4	0.12	10.1	-
			NBR	C	23.8	0.02	-	-
			SBL	C	26.9	0.44	21.9	80
			SBT	C	24.5	0.14	11.1	-
			SBR	C	24.6	0.16	11.4	-
Mid-day Peak Hour								
C	20.7	0.69	EBL	B	14.5	0.69	53.8	125
			EBTR	B	13.0	0.38	59.1	-
			WBL	B	17.3	0.15	7.1	125
			WBT	C	25.0	0.56	95.6	-
			WBR	A	0.2	0.13	-	120
			NBL	D	42.2	0.28	17.2	55
			NBT	D	43.7	0.46	31.6	-
			NBR	D	39.9	0.03	-	-
			SBL	C	31.6	0.50	47.1	80

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
			SBT	C	28.8	0.15	24.3	-
			SBR	C	30.0	0.27	26.8	-
PM Peak Hour								
B	15.8	0.54	EBL	A	7.5	0.50	33.0	125
			EBTR	B	10.3	0.31	45.5	-
			WBL	B	10.9	0.09	5.9	125
			WBT	B	15.8	0.40	59.3	-
			WBR	A	0.1	0.09	-	120
			NBL	C	25.6	0.05	6.3	55
			NBT	C	27.0	0.25	24.7	-
			NBR	C	25.4	0.02	-	-
			SBL	C	30.9	0.56	37.3	80
			SBT	C	26.1	0.14	15.1	-
			SBR	C	26.9	0.24	20.8	-

Table 5-6 Mitigated 2032 Future Background Conditions Traffic Operations - King Street and Heritage Drive (Highway 12)

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
AM Peak Hour								
B	13.7	0.44	EBL	A	6.7	0.39	19.5	125
			EBTR	B	10.4	0.32	35.1	-
			WBL	A	8.2	0.08	4.7	125
			WBT	B	12.0	0.31	32.1	-

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
			WBR	A	0.1	0.07	-	120
			NBL	C	23.5	0.07	6.3	55
			NBT	C	23.7	0.11	10.3	-
			NBR	C	23.2	0.02	-	-
			SBL	C	27.2	0.52	27.1	80
			SBT	C	23.8	0.14	11.5	-
			SBR	C	24.2	0.19	11.7	-
Mid-day Peak Hour								
C	24.9	0.79	EBL	C	25.3	0.78	94.2	125
			EBTR	B	13.7	0.43	72.2	-
			WBL	B	18.9	0.17	7.8	125
			WBT	C	30.0	0.67	117.0	-
			WBR	A	0.2	0.15	-	120
			NBL	D	47.6	0.40	21.6	55
			NBT	D	48.6	0.52	34.1	-
			NBR	D	43.6	0.03	-	-
			SBL	D	38.0	0.60	54.3	80
			SBT	C	32.4	0.17	26.0	-
			SBR	C	34.1	0.33	31.4	-
PM Peak Hour								
B	17.2	0.64	EBL	B	10.2	0.63	40.6	125
			EBTR	B	11.1	0.36	53.8	-

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
			WBL	B	12.4	0.11	6.3	125
			WBT	B	18.2	0.48	69.2	-
			WBR	A	0.1	0.11	-	120
			NBL	C	26.1	0.08	9.0	55
			NBT	C	27.3	0.25	25.8	-
			NBR	C	25.7	0.03	-	-
			SBL	C	32.5	0.60	42.4	80
			SBT	C	26.4	0.13	15.4	-
			SBR	C	28.4	0.38	31.6	-

Table 5-7 Mitigated 2037 Future Background Conditions Traffic Operations - King Street and Heritage Drive (Highway 12)

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
AM Peak Hour								
B	14	0.54	EBL	A	7.4	0.51	25.0	125
			EBTR	B	11.0	0.38	44.8	-
			WBL	A	8.4	0.09	5.1	125
			WBT	B	12.5	0.36	38.1	-
			WBR	A	0.1	0.08	-	120
			NBL	C	23.6	0.09	7.5	55
			NBT	C	23.7	0.12	11.3	-
			NBR	C	23.2	0.02	-	-
			SBL	C	27.2	0.52	28.3	80

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
			SBT	C	23.9	0.15	12.9	-
			SBR	C	24.4	0.21	12.1	-
Mid-day Peak Hour								
C	32.3	0.91	EBL	D	45.8	**0.89**	**163.4**	125
			EBTR	B	13.7	0.48	91.5	-
			WBL	C	21.9	0.21	8.6	125
			WBT	D	39.0	0.83	148.3	-
			WBR	A	0.2	0.16	-	120
			NBL	D	52.9	0.48	24.7	55
			NBT	E	56.6	0.60	37.8	-
			NBR	D	47.4	0.04	-	-
			SBL	D	48.0	0.71	59.4	80
			SBT	D	36.7	0.20	28.5	-
			SBR	D	42.8	0.60	66.7	-
PM Peak Hour								
C	20.4	0.77	EBL	B	17.3	0.78	72.7	125
			EBTR	B	11.8	0.42	64.8	-
			WBL	B	13.7	0.13	6.5	125
			WBT	C	21.3	0.59	85.0	-
			WBR	A	0.1	0.12	-	120
			NBL	C	27.0	0.11	10.9	55
			NBT	C	28.3	0.27	28.3	-

Intersection			Movement	LOS	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Storage Length (m)
LOS	Delay (s)	v/c Ratio						
			NBR	C	26.4	0.03	-	-
			SBL	D	35.3	0.64	46.3	80
			SBT	C	27.2	0.14	16.6	-
			SBR	C	34.6	0.65	57.3	-

Note: Red font represents a critical movement.

The results of the traffic operations assessment indicate that the proposed signal timing modifications are expected to improve overall traffic operations at the King Street and Heritage Drive (Highway 12) intersection under both future background and future total conditions. However, under the 2037 future background and 2037 future total scenarios, the eastbound left-turn movement is still forecasted to exceed critical v/c thresholds, with the 95th percentile queue length surpassing the available storage capacity.

6 Traffic Operations Summary

A comparison of the future background and future total traffic conditions for the 2027, 2032, and 2037 horizon years was completed for the King Street and Heritage Drive (Highway 12) intersection to assess the incremental impacts of site-generated traffic. The assessment focused on changes in delay, v/c ratios, and 95th percentile queue lengths resulting from the addition of the site traffic. The comparison results for the 2027, 2032, and 2037 horizon years are presented in **Table 6-1**, **Table 6-2** and **Table 6-3** respectively.

As shown in **Table 6-1**, **Table 6-2** and **Table 6-3**, the addition of site-generated traffic from the Proposed Development is expected to have a minimal impact on traffic operations within the study area. Importantly, the development is not anticipated to introduce any new critical movements or cause movements to exceed operational thresholds that were not already constrained.

Based on the analysis, the primary contributors to the observed instances of high delay and elevated v/c ratios are the cumulative impacts of other background developments and the general growth of traffic volumes within the network, rather than the traffic associated with the Proposed Development. As indicated in **Section 5**, the proposed signal timing modifications are expected to eliminate all critical movements under both future background and future total conditions for all horizon years, with one exception. The eastbound left-turn movement in the 2037 future background and future total scenarios is forecasted to remain over capacity, even after the recommended mitigation measures are applied.

Table 6-1 Mitigated 2027 Traffic Operations Assessment Comparison – King Street & Heritage Drive (Highway 12)

Movement	Future Background Conditions			Future Total Conditions			Comparison (Future Total - Future Background)		
	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Delay (s)	v/c Ratio	95th Percentile Queue (m)
AM Peak Hour									
EBL	5.9	0.31	15.1	6.7	0.40	21.4	0.8	0.09	6.3
EBTR	8.7	0.26	28.8	9.2	0.25	29.3	0.5	-0.01	0.5
WBL	8.3	0.07	4.0	8.8	0.07	4.5	0.5	0.00	0.5
WBT	11.0	0.27	26.8	11.5	0.26	27.2	0.5	-0.01	0.4
WBR	0.1	0.06	-	0.1	0.09	-	0.0	0.03	-
NBL	24.1	0.06	5.3	23.7	0.06	5.3	-0.4	0.00	0.0
NBT	24.4	0.12	10.1	24.0	0.12	10.9	-0.4	0.00	0.8
NBR	23.8	0.02	-	23.4	0.02	-	-0.4	0.00	-
SBL	26.9	0.44	21.9	27.8	0.53	27.3	0.9	0.09	5.4
SBT	24.5	0.14	11.1	24.1	0.14	11.5	-0.4	0.00	0.4
SBR	24.6	0.16	11.4	24.5	0.19	11.7	-0.1	0.03	0.3
Mid-day Peak Hour									
EBL	14.5	0.69	53.8	15.9	0.73	68.8	1.4	0.04	15.0
EBTR	13.0	0.38	59.1	12.5	0.36	57.3	-0.5	-0.02	-1.8

Movement	Future Background Conditions			Future Total Conditions			Comparison (Future Total - Future Background)		
	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Delay (s)	v/c Ratio	95th Percentile Queue (m)
WBL	17.3	0.15	7.1	18.6	0.15	7.3	1.3	0.00	0.2
WBT	25.0	0.56	95.6	26.3	0.56	94.5	1.3	0.00	-1.1
WBR	0.2	0.13	-	0.2	0.15	-	0.0	0.02	-
NBL	42.2	0.28	17.2	43.6	0.28	17.2	1.4	0.00	0.0
NBT	43.7	0.46	31.6	45.6	0.49	33.2	1.9	0.03	1.6
NBR	39.9	0.03	-	41.2	0.03	-	1.3	0.00	-
SBL	31.6	0.50	47.1	35.7	0.61	56.4	4.1	0.11	9.3
SBT	28.8	0.15	24.3	30.2	0.16	25.3	1.4	0.01	1.0
SBR	30.0	0.27	26.8	31.6	0.31	28.8	1.6	0.04	2.0
PM Peak Hour									
EBL	7.5	0.50	33.0	8.4	0.54	37.6	0.9	0.04	4.6
EBTR	10.3	0.31	45.5	10.6	0.31	45.2	0.3	0.00	-0.3
WBL	10.9	0.09	5.9	11.8	0.09	6.1	0.9	0.00	0.2
WBT	15.8	0.40	59.3	16.8	0.41	58.7	1.0	0.01	-0.6
WBR	0.1	0.09	-	0.1	0.11	-	0.0	0.02	-

Movement	Future Background Conditions			Future Total Conditions			Comparison (Future Total - Future Background)		
	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Delay (s)	v/c Ratio	95th Percentile Queue (m)
NBL	25.6	0.05	6.3	25.7	0.05	6.3	0.1	0.00	0.0
NBT	27.0	0.25	24.7	27.1	0.25	25.4	0.1	0.00	0.7
NBR	25.4	0.02	-	25.5	0.02	-	0.1	0.00	-
SBL	30.9	0.56	37.3	32.6	0.60	42.2	1.7	0.04	4.9
SBT	26.1	0.14	15.1	26.2	0.13	15.3	0.1	-0.01	0.2
SBR	26.9	0.24	20.8	27.2	0.26	21.5	0.3	0.02	0.7

Table 6-2 Mitigated 2032 Traffic Operations Assessment Comparison – King Street & Heritage Drive (Highway 12)

Movement	Future Background Conditions			Future Total Conditions			Comparison (Future Total - Future Background)		
	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Delay (s)	v/c Ratio	95th Percentile Queue (m)
AM Peak Hour									
EBL	6.7	0.39	19.5	7.8	0.49	27.5	1.1	0.10	8.0
EBTR	10.4	0.32	35.1	11.1	0.31	36.5	0.7	-0.01	1.4
WBL	8.2	0.08	4.7	8.9	0.08	5.3	0.7	0.00	0.6
WBT	12.0	0.31	32.1	12.7	0.31	33.3	0.7	0.00	1.2

Movement	Future Background Conditions			Future Total Conditions			Comparison (Future Total - Future Background)		
	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Delay (s)	v/c Ratio	95th Percentile Queue (m)
WBR	0.1	0.07	-	0.1	0.10	-	0.0	0.03	-
NBL	23.5	0.07	6.3	22.9	0.07	6.2	-0.6	0.00	-0.1
NBT	23.7	0.11	10.3	23.1	0.11	10.9	-0.6	0.00	0.6
NBR	23.2	0.02	-	22.6	0.02	-	-0.6	0.00	-
SBL	27.2	0.52	27.1	28.3	0.58	32.5	1.1	0.06	5.4
SBT	23.8	0.14	11.5	23.2	0.13	12.0	-0.6	-0.01	0.5
SBR	24.2	0.19	11.7	23.9	0.23	11.7	-0.3	0.04	0.0
Mid-day Peak Hour									
EBL	25.3	0.78	94.2	29.4	0.82	113.7	4.1	0.04	19.5
EBTR	13.7	0.43	72.2	13.4	0.41	71.1	-0.3	-0.02	-1.1
WBL	18.9	0.17	7.8	20.2	0.17	8.0	1.3	0.00	0.2
WBT	30.0	0.67	117.0	31.5	0.67	114.4	1.5	0.00	-2.6
WBR	0.2	0.15	-	0.2	0.17	-	0.0	0.02	-
NBL	47.6	0.40	21.6	48.6	0.39	21.6	1.0	-0.01	0.0
NBT	48.6	0.52	34.1	50.5	0.53	34.9	1.9	0.01	0.8

Movement	Future Background Conditions			Future Total Conditions			Comparison (Future Total - Future Background)		
	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Delay (s)	v/c Ratio	95th Percentile Queue (m)
NBR	43.6	0.03	-	44.6	0.03	-	1.0	0.00	-
SBL	38.0	0.60	54.3	44.7	0.72	63.0	6.7	0.12	8.7
SBT	32.4	0.17	26.0	33.6	0.18	27.2	1.2	0.01	1.2
SBR	34.1	0.33	31.4	36.9	0.48	50.5	2.8	0.15	19.1
PM Peak Hour									
EBL	10.2	0.63	40.6	11.5	0.67	44.6	1.3	0.04	4.0
EBTR	11.1	0.36	53.8	11.3	0.35	52.5	0.2	-0.01	-1.3
WBL	12.4	0.11	6.3	13.1	0.11	6.3	0.7	0.00	0.0
WBT	18.2	0.48	69.2	19.0	0.48	67.7	0.8	0.00	-1.5
WBR	0.1	0.11	-	0.2	0.12	-	0.1	0.01	-
NBL	26.1	0.08	9.0	26.3	0.08	9.0	0.2	0.00	0.0
NBT	27.3	0.25	25.8	27.5	0.25	26.5	0.2	0.00	0.7
NBR	25.7	0.03	-	25.9	0.03	-	0.2	0.00	-
SBL	32.5	0.60	42.4	35.0	0.65	47.4	2.5	0.05	5.0
SBT	26.4	0.13	15.4	26.6	0.13	15.7	0.2	0.00	0.3

Movement	Future Background Conditions			Future Total Conditions			Comparison (Future Total - Future Background)		
	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Delay (s)	v/c Ratio	95th Percentile Queue (m)
SBR	28.4	0.38	31.6	29.4	0.46	39.4	1.0	0.08	7.8

Table 6-3 Mitigated 2037 Traffic Operations Assessment Comparison – King Street & Heritage Drive (Highway 12)

Movement	Future Background Conditions			Future Total Conditions			Comparison (Future Total - Future Background)		
	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Delay (s)	v/c Ratio	95th Percentile Queue (m)
AM Peak Hour									
EBL	7.4	0.51	25.0	9.7	0.62	32.8	2.3	0.11	7.8
EBTR	11.0	0.38	44.8	11.8	0.38	45.4	0.8	0.00	0.6
WBL	8.4	0.09	5.1	9.1	0.09	5.5	0.7	0.00	0.4
WBT	12.5	0.36	38.1	13.3	0.35	38.6	0.8	-0.01	0.5
WBR	0.1	0.08	-	0.1	0.10	-	0.0	0.02	-
NBL	23.6	0.09	7.5	22.9	0.08	7.3	-0.7	-0.01	-0.2
NBT	23.7	0.12	11.3	23.1	0.12	11.9	-0.6	0.00	0.6
NBR	23.2	0.02	-	22.5	0.02	-	-0.7	0.00	-
SBL	27.2	0.52	28.3	28.1	0.58	33.0	0.9	0.06	4.7

Movement	Future Background Conditions			Future Total Conditions			Comparison (Future Total - Future Background)		
	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Delay (s)	v/c Ratio	95th Percentile Queue (m)
SBT	23.9	0.15	12.9	23.2	0.14	13.0	-0.7	-0.01	0.1
SBR	24.4	0.21	12.1	24.7	0.34	17.0	0.3	0.13	4.9
Mid-day Peak Hour									
EBL	45.8	**0.89**	163.4	53.5	**0.94**	190.3	7.7	0.05	26.9
EBTR	13.7	0.48	91.5	13.6	0.47	88.5	-0.1	-0.01	-3.0
WBL	21.9	0.21	8.6	23.2	0.22	8.6	1.3	0.01	0.0
WBT	39.0	0.83	148.3	41.1	0.83	143.0	2.1	0.00	-5.3
WBR	0.2	0.16	-	0.3	0.18	-	0.1	0.02	-
NBL	52.9	0.48	24.7	53.3	0.46	24.8	0.4	-0.02	0.1
NBT	56.6	0.60	37.8	56.7	0.59	39.0	0.1	-0.01	1.2
NBR	47.4	0.04	-	48.1	0.04	-	0.7	0.00	-
SBL	48.0	0.71	59.4	60.7	0.83	72.7	12.7	0.12	13.3
SBT	36.7	0.20	28.5	37.7	0.21	29.3	1.0	0.01	0.8
SBR	42.8	0.60	66.7	51.7	0.75	104.1	8.9	0.15	37.4

Movement	Future Background Conditions			Future Total Conditions			Comparison (Future Total - Future Background)		
	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Delay (s)	v/c Ratio	95th Percentile Queue (m)	Delay (s)	v/c Ratio	95th Percentile Queue (m)
PM Peak Hour									
EBL	17.3	0.78	72.7	22.1	0.82	85.0	4.8	0.04	12.3
EBTR	11.8	0.42	64.8	12.3	0.42	63.6	0.5	0.00	-1.2
WBL	13.7	0.13	6.5	14.5	0.13	6.5	0.8	0.00	0.0
WBT	21.3	0.59	85.0	22.4	0.60	83.4	1.1	0.01	-1.6
WBR	0.1	0.12	-	0.2	0.13	-	0.1	0.01	-
NBL	27.0	0.11	10.9	27.0	0.10	10.9	0.0	-0.01	0.0
NBT	28.3	0.27	28.3	28.3	0.27	29.1	0.0	0.00	0.8
NBR	26.4	0.03	-	26.5	0.03	-	0.1	0.00	-
SBL	35.3	0.64	46.3	37.5	0.69	51.6	2.2	0.05	5.3
SBT	27.2	0.14	16.6	27.2	0.14	16.7	0.0	0.00	0.1
SBR	34.6	0.65	57.3	37.9	0.71	69.3	3.3	0.06	12.0

Note: Red font represents a critical movement.

7 Parking Review

The existing parking provides 231 spots for the hotel and conference centre. The proposed future site plan removes some parking spots to facilitate the fast-food restaurants with drive-thru amenity, which is mitigated by repainting and reorganizing the remaining parking space layout, and introducing tandem parking operated by via hotel valet services.

The existing and proposed parking supply is illustrated and tabulated below in **Figure 7-1** and **Table 7-1**, respectively. It should be noted that a portion of the existing parking spaces lay within the designated MTO setback (14 metres from both King Street and Heritage Drive right of way). The portion of parking spaces in the southwest corner of the lands will be the tandem designated spaces.

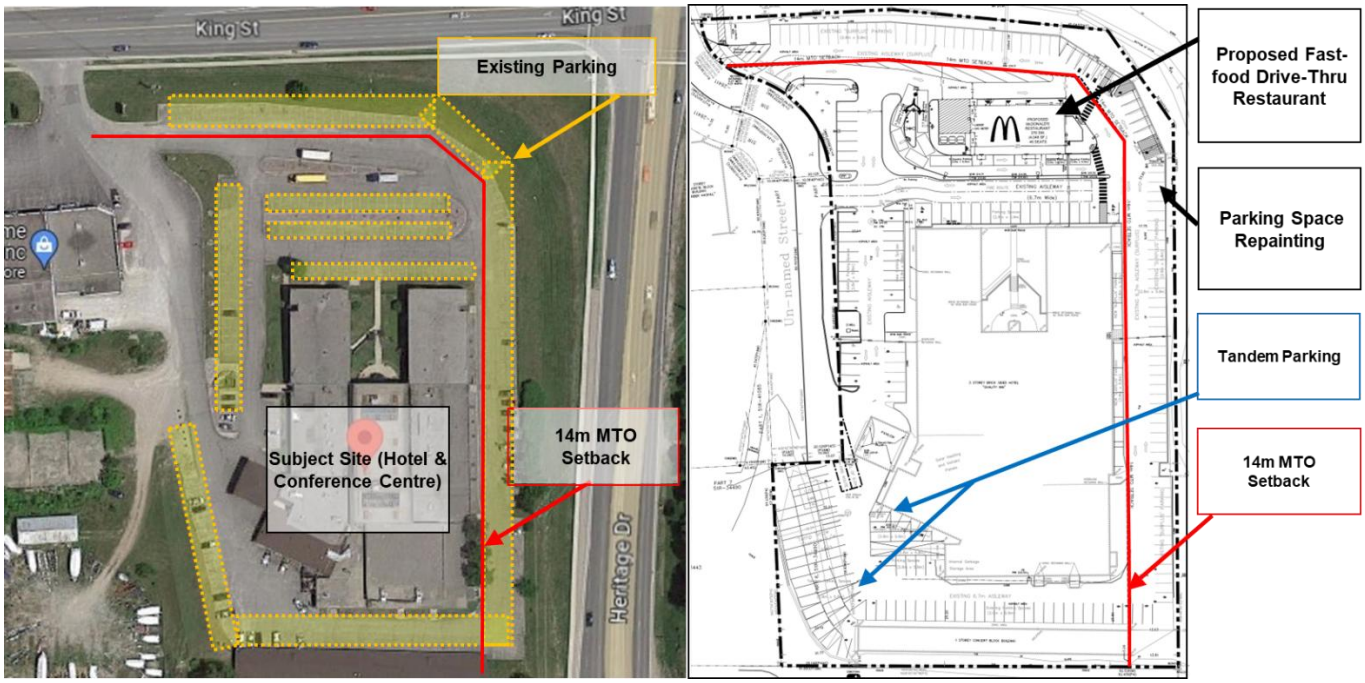

Figure 7-1 Parking Lot Changes

Table 7-1 Parking Supply Comparison

SCENARIO	LAND USE			
	HOTEL	CONFERENCE CENTRE	RESTAURANT	TOTAL
Existing	231 spaces (91 within MTO setback)		-	231 spaces (140 if excluding MTO setback)
Proposed	225 spaces including: 89 spaces within MTO setback 70 standard spaces 14 stacking spaces		17	242 spaces (153 if excluding MTO setback)

SCENARIO	LAND USE			
	HOTEL	CONFERENCE CENTRE	RESTAURANT	TOTAL
	48 valet/tandem spaces 4 Accessible spaces			
Difference	-6		+17	+11

To accommodate the proposed restaurant additions, the existing hotel / conference centre parking supply will be reduced by 1 space which is less than 3% of its original capacity.

Per Section 4 of the Town of Midland's Zoning By-law (ZBL), the relevant vehicle parking requirements for the existing hotel, conference centre, and proposed eating establishment as stipulated in the ZBL are summarized in **Table 7-2** to demonstrate ZBL compliance.

Based on the automobile parking rates referenced from the Town of Midland By-law 2004-90 (July 22, 2025), the required parking supply is 17 parking spaces for the proposed restaurant. Since 66 seats are proposed for the restaurant, this results in a ratio of 0.25 spaces / seat, which meets ZBL requirements.

According to the ZBL, the hotel/conference center has a parking space deficiency of 36. Considering the existing parking supply is already deficient by 30 spaces, and the internal capture between the hotel and conference center within the site, the actual parking demand for the hotel and conference center is estimated to be lower than the ZBL's required number of spaces.

Table 7-2 Existing and Proposed Automobile Parking Supply Compared to ZBL Requirements

ZBL Building Use	Quantity	ZBL Parking Rate	Required Spaces	Proposed Spaces	Surplus / Deficiency
Existing Hotel	106 rooms	1.25 spaces / room	133 spaces	225	-36
Existing Conference Room	512 seats	1 space / 4 persons	128 spaces		
Existing Total	**231 spaces**		**261 spaces**		
Proposed Drive-Thru Restaurant	46 seats	1.25 spaces / seat	12 spaces	17	0

The ITE Parking Generation Manual (6th Edition, October 2023) is reviewed for the hotel (LUC 310). The estimated 85th percentile parking demand is 92 spaces, which is 41 spaces less than the ZBL requirement. The reference is provided in **Appendix M**.

A comparison of the ZBL requirements suggests that these requirements are excessive and would lead to an oversupply of parking for the subject site, as there currently are not any observed parking supply constraints

reported by the proponent. Furthermore, site-specific trends show that the existing hotel is never fully occupied. This is illustrated below in **Figure 7-2**.

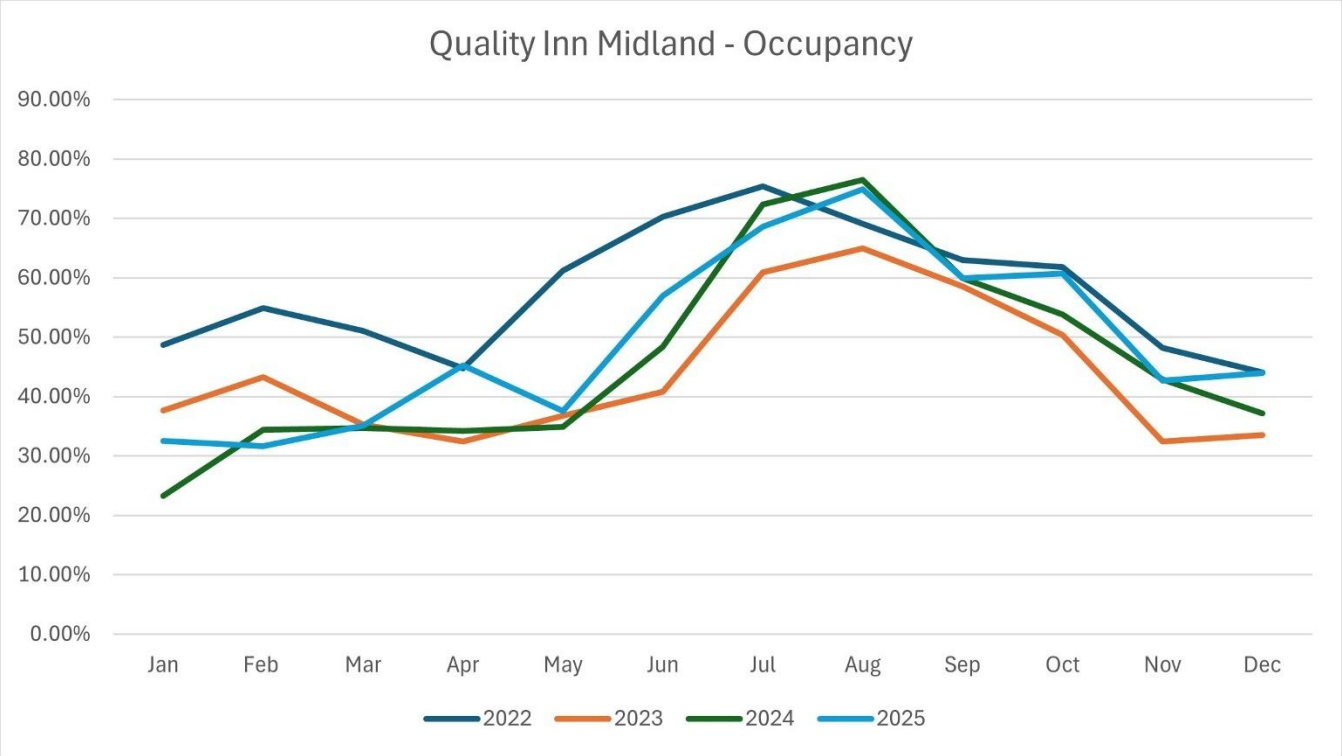

Figure 7-2 Hotel Occupancy Trends (2022-2025)

Based on the historical monthly hotel room occupancy trends, hotel room bookings never exceeded 76% (in peak months of July and August).

The existing parking supply currently supports the hotel and conference centre users with no constraints reported by the proponent. The proponent will be converting some of the hotel / conference centre parking in the southwest corner of the lot to tandem valet parking to make up for the spots lost to the restaurant space.

Overall, it is therefore deemed reasonable to presume that the hotel average occupancy of 76% can have its parking supply reduced to 97% of its current capacity, with the excess parking space repurposed for restaurant land uses, which has a parking supply that meets ZBL parking requirements.

The proposed future site plan provides four barrier free parking spaces, one of which is surplus based on ZBL requirements.

8 Vehicle Swept Path Analysis

A vehicle swept path analysis was conducted using AutoTURN to demonstrate that vehicles can enter and exit the site and that access to the loading and waste collection are functional. The following vehicles and their respective paths were analyzed:

- Front-loading waste collection trucks accessing the garbage storage area;
- Rear-loading delivery trucks (MSU) accessing the loading space;
- Fire truck circulating the fire route; and
- Passenger vehicles circulating the development.

Based on a review of the analysis, there are no concerns with site circulation for the passenger vehicles, MSU delivery trucks, waste collection vehicles, and fire trucks. The vehicle swept path analysis is presented in **Appendix N**. The vehicle swept path analysis was completed on the October 2025 site plan.

9 Conclusion and Recommendations

This section summarizes the key findings of this transportation Impact Study (TIS).

9.1 Traffic Operations Assessment

Existing Conditions

- The study area includes the signalized intersection of Heritage Road (Highway 12) and King Street, as well as the unsignalized intersection of King Street and the existing site access.
- Based on the Proposed Development's land use and area characteristics, a summer Saturday was identified as the busiest period, and three corresponding analysis periods were selected: the AM peak (7:00 a.m. to 9:00 a.m.), Mid-day peak (11:00 a.m. to 2:00 p.m.), and PM peak (4:00 p.m. to 6:00 p.m.).
- The 2025 existing conditions traffic operations assessment indicates that all movements at both study area intersections operate within acceptable thresholds during all three analysis periods.

Future Background Conditions

- In accordance with the MTO TIS Guidelines, the full build-out year (2027), 5-year horizon (2032), and 10-year horizon (2037) were selected for analysis
- Existing corridor traffic volumes were increased using an annual growth rate of 2%, after which the traffic generated by the six identified background developments was added to establish the future background traffic volumes for each horizon year. No roadway network improvements were identified or incorporated into this study.
- The results of the traffic operations assessment indicate that the eastbound left-turn movement at the King Street and Heritage Drive (Highway 12) intersection is expected to exceed critical volume-to-capacity (v/c) thresholds (v/c > 0.85) during the Mid-day peak hour in all three horizon years. This movement is also forecasted to exceed critical v/c thresholds during the PM peak hour in the 2037 horizon year. Furthermore, the 95th percentile queue for the eastbound left-turn movement during the Mid-day peak

period is projected to exceed available storage by approximately 34.6 m, equivalent to about six vehicles, in 2037.

- The southbound right-turn movement is also forecasted to exceed critical v/c thresholds during the Mid-day peak hour in both the 2032 and 2037 horizon years.
- At the King Street and Existing Site Access intersection, no operational or queuing issues are anticipated in any of the analysis periods across all horizon years.

Future Total Conditions

- The Proponent is proposing a fast-food restaurant with drive-through containing 46 seats. The Proposed Development is estimated to generate 86 vehicle trips during the AM peak hour (44 inbound and 42 outbound), 87 vehicle trips during the Mid-day peak hour (45 inbound and 42 outbound), and 53 vehicle trips during the PM peak hour (28 inbound and 25 outbound).
- The traffic operations assessment shows that critical movements under future total conditions remain the same as in the future background conditions, indicating that the Proposed Development's site-generated traffic has minimal impact and does not create any new critical movements (v/c > 0.85).
- The only notable difference is a slight increase in the 95th percentile queue for the eastbound left-turn movement at King Street and Heritage Drive (Highway 12) during the Mid-day peak hour, which is expected to exceed storage by approximately one vehicle in 2032, in addition to the exceedance already forecasted for 2037.
- Several signal timing modifications were identified as potential mitigations measure. These proposed signal timing modifications is forecasted to improve overall operations at the King Street and Heritage Drive (Highway 12) intersection under all scenarios; however, the eastbound left-turn movement remains over capacity in 2037, with the 95tth percentile queue continuing to exceed available storage.

9.2 Vehicle Swept Path Analysis

A vehicle swept path analysis was conducted using AutoTURN to demonstrate that access to the loading and waste collection areas are functional, and that passenger vehicles can circulate the site in one forward motion. Based on the analysis, passenger vehicles, the medium single unit delivery trucks, fire trucks, and waste collection trucks at the loading area will not have any issues.

9.3 Parking Analysis

Based on automobile parking rates referenced from Town of Midland By-law 2004-90, the required parking supply is 12 parking spaces for the proposed restaurant. This analysis indicates that the 12 parking spaces per restaurant will be sufficient for the development.

The existing parking supply currently supports the hotel and conference centre users with no constraints reported by the proponent. The proponent will be converting some of the hotel / conference centre parking in the southwest corner of the lot to tandem valet parking to make up for the spots lost to the restaurant space.

Overall, it is therefore deemed reasonable to presume that the current hotel average occupancy of 72% can have its parking supply reduced to 94% of its current capacity, with the excearacsyhss parking space repurposed for restaurant land uses, which has a parking supply that meets ZBL parking requirements.

Appendix A

Turning Movement Counts

Horizon Data Services Ltd

(416) 840-6619

Your Traffic Count Specialist

File Name : Heritage Drive at King Street
Site Code : Loc-1
Start Date : 2025-08-16
Page No : 1

Groups Printed- Cars - Trucks - Heavies - Cyclists

	King St From North					Heritage Dr From East					King St From South					Heritage dr From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	15	2	7	0	24	6	44	0	0	50	3	3	3	0	9	2	23	10	1	36	119
07:15 AM	18	2	2	0	22	6	44	1	0	51	0	2	1	0	3	2	33	10	0	45	121
07:30 AM	32	0	5	0	37	8	60	2	0	70	1	1	1	0	3	3	36	16	0	55	165
07:45 AM	46	5	7	0	58	10	71	7	0	88	0	2	1	0	3	7	57	28	0	92	241
Total	111	9	21	0	141	30	219	10	0	259	4	8	6	0	18	14	149	64	1	228	646
08:00 AM	34	2	11	0	47	10	59	6	0	75	2	3	3	0	8	0	53	24	0	77	207
08:15 AM	38	5	13	0	56	16	55	2	0	73	4	3	1	0	8	9	76	25	0	110	247
08:30 AM	43	4	22	0	69	22	74	3	0	99	7	2	2	0	11	4	68	46	4	122	301
08:45 AM	58	7	12	0	77	21	88	6	0	115	5	6	4	0	15	4	79	47	0	130	337
Total	173	18	58	0	249	69	276	17	0	362	18	14	10	0	42	17	276	142	4	439	1092
11:00 AM	72	11	27	0	110	36	128	6	0	170	12	11	4	0	27	6	139	84	0	229	536
11:15 AM	74	5	27	0	106	27	137	4	0	168	9	10	6	0	25	3	145	77	0	225	524
11:30 AM	97	6	33	0	136	25	125	10	0	160	4	7	5	0	16	1	160	79	0	240	552
11:45 AM	95	9	32	0	136	36	150	4	0	190	7	10	4	0	21	1	138	83	0	222	569
Total	338	31	119	0	488	124	540	24	0	688	32	38	19	0	89	11	582	323	0	916	2181
12:00 PM	84	12	27	0	123	41	144	11	0	196	9	8	6	0	23	1	131	74	0	206	548
12:15 PM	84	7	32	0	123	44	120	9	0	173	12	7	8	0	27	5	129	88	0	222	545
12:30 PM	96	11	26	0	133	46	140	6	0	192	6	11	6	0	23	5	140	89	0	234	582
12:45 PM	87	6	34	2	129	29	127	9	0	165	6	10	8	0	24	4	143	94	0	241	559
Total	351	36	119	2	508	160	531	35	0	726	33	36	28	0	97	15	543	345	0	903	2234
01:00 PM	83	8	33	0	124	35	138	6	0	179	8	11	5	0	24	2	133	71	0	206	533
01:15 PM	79	4	26	0	109	51	139	3	0	193	5	6	2	0	13	3	137	78	0	218	533
01:30 PM	81	11	36	0	128	38	118	4	0	160	5	12	3	0	20	3	120	89	0	212	520
01:45 PM	75	14	21	0	110	39	126	5	0	170	9	10	2	0	21	3	153	78	0	234	535
Total	318	37	116	0	471	163	521	18	0	702	27	39	12	0	78	11	543	316	0	870	2121
04:00 PM	87	7	35	0	129	23	103	8	0	134	8	17	5	0	30	2	102	66	0	170	463
04:15 PM	81	5	33	0	119	29	99	3	0	131	4	10	1	0	15	3	116	63	1	183	448

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Your Traffic Count Specialist

File Name : Heritage Drive at King Street
Site Code : Loc-1
Start Date : 2025-08-16
Page No : 2

Groups Printed- Cars - Trucks - Heavies - Cyclists

	King St From North					Heritage Dr From East					King St From South					Heritage dr From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:30 PM	74	2	24	1	101	32	123	6	0	161	8	6	3	0	17	2	99	51	0	152	431
04:45 PM	62	6	22	0	90	28	93	2	0	123	2	6	3	0	11	2	111	70	0	183	407
Total	304	20	114	1	439	112	418	19	0	549	22	39	12	0	73	9	428	250	1	688	1749
05:00 PM	70	12	26	0	108	26	107	2	0	135	6	5	3	0	14	1	121	49	0	171	428
05:15 PM	80	6	26	0	112	20	77	2	0	99	3	1	1	0	5	2	81	54	0	137	353
05:30 PM	52	2	19	0	73	28	95	3	0	126	4	2	1	0	7	5	90	54	0	149	355
05:45 PM	58	3	22	0	83	21	58	4	0	83	5	9	4	0	18	5	96	63	0	164	348
Total	260	23	93	0	376	95	337	11	0	443	18	17	9	0	44	13	388	220	0	621	1484
Grand Total	1855	174	640	3	2672	753	2842	134	0	3729	154	191	96	0	441	90	2909	1660	6	4665	11507
Apprch %	69.4	6.5	24	0.1		20.2	76.2	3.6	0		34.9	43.3	21.8	0		1.9	62.4	35.6	0.1		
Total %	16.1	1.5	5.6	0	23.2	6.5	24.7	1.2	0	32.4	1.3	1.7	0.8	0	3.8	0.8	25.3	14.4	0.1	40.5	
Cars	1843	165	637	3	2648	748	2817	129	0	3694	145	181	88	0	414	81	2885	1653	6	4625	11381
% Cars	99.4	94.8	99.5	100	99.1	99.3	99.1	96.3	0	99.1	94.2	94.8	91.7	0	93.9	90	99.2	99.6	100	99.1	98.9
Trucks	5	7	0	0	12	3	8	5	0	16	9	4	7	0	20	9	7	4	0	20	68
% Trucks	0.3	4	0	0	0.4	0.4	0.3	3.7	0	0.4	5.8	2.1	7.3	0	4.5	10	0.2	0.2	0	0.4	0.6
Heavies	6	1	3	0	10	2	13	0	0	15	0	6	0	0	6	0	16	1	0	17	48
% Heavies	0.3	0.6	0.5	0	0.4	0.3	0.5	0	0	0.4	0	3.1	0	0	1.4	0	0.6	0.1	0	0.4	0.4
Cyclists	1	1	0	0	2	0	4	0	0	4	0	0	1	0	1	0	1	2	0	3	10
% Cyclists	0.1	0.6	0	0	0.1	0	0.1	0	0	0.1	0	0	1	0	0.2	0	0	0.1	0	0.1	0.1

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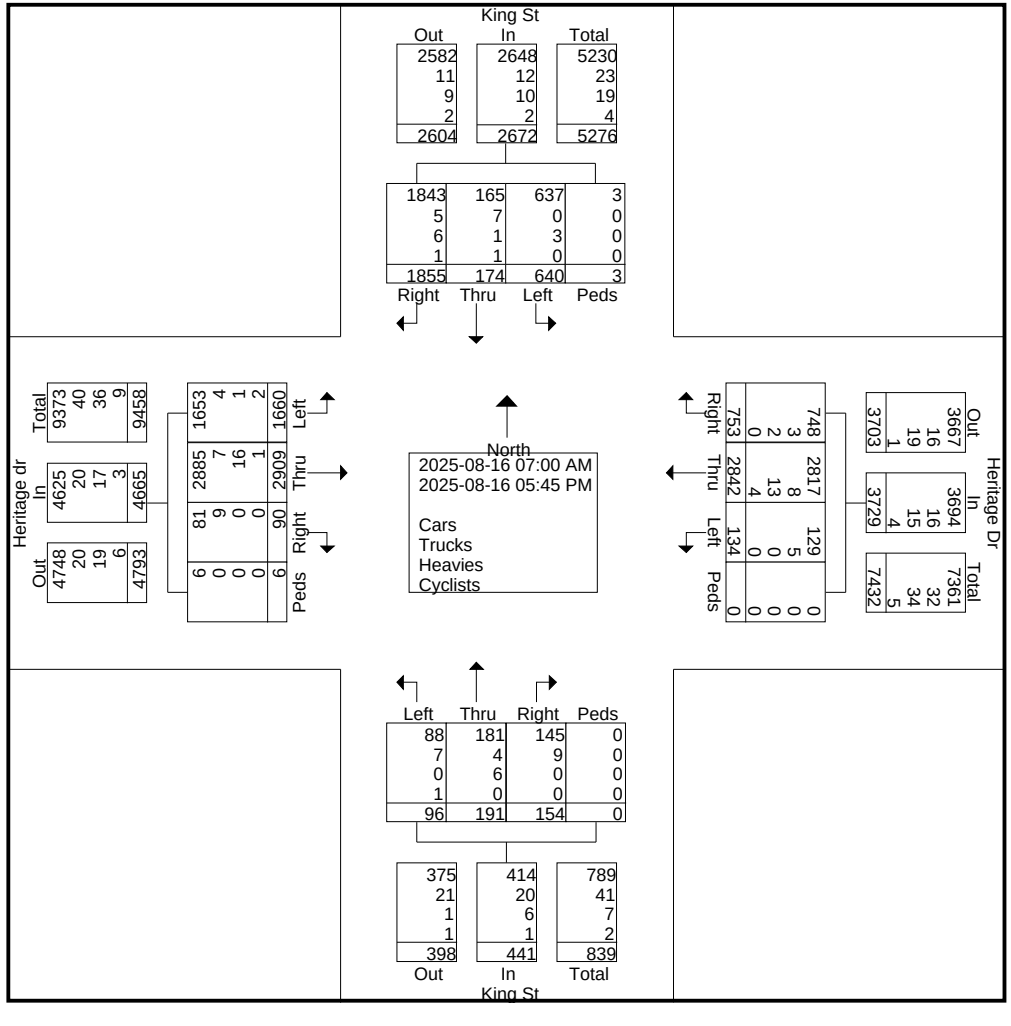
Your Traffic Count Specialist

File Name : Heritage Drive at King Street
Site Code : Loc-1
Start Date : 2025-08-16
Page No : 3



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Your Traffic Count Specialist

File Name : Heritage Drive at King Street
Site Code : Loc-1
Start Date : 2025-08-16
Page No : 4

	King St From North					Heritage Dr From East					King St From South					Heritage dr From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	34	2	11	0	47	10	59	**6**	0	75	2	3	3	0	8	0	53	24	0	77	207
08:15 AM	38	5	13	0	56	16	55	2	0	73	4	3	1	0	8	**9**	76	25	0	110	247
08:30 AM	43	4	**22**	0	69	**22**	74	3	0	99	**7**	2	2	0	11	4	68	46	**4**	122	301
08:45 AM	**58**	**7**	12	0	**77**	21	**88**	6	0	**115**	5	**6**	**4**	0	**15**	4	**79**	**47**	0	**130**	**337**
Total Volume	173	18	58	0	249	69	276	17	0	362	18	14	10	0	42	17	276	142	4	439	1092
% App. Total	69.5	7.2	23.3	0		19.1	76.2	4.7	0		42.9	33.3	23.8	0		3.9	62.9	32.3	0.9		
PHF	.746	.643	.659	.000	.808	.784	.784	.708	.000	.787	.643	.583	.625	.000	.700	.472	.873	.755	.250	.844	.810
Cars	172	18	58	0	248	68	273	16	0	357	16	11	8	0	35	16	269	140	4	429	1069
% Cars	99.4	100	100	0	99.6	98.6	98.9	94.1	0	98.6	88.9	78.6	80.0	0	83.3	94.1	97.5	98.6	100	97.7	97.9
Trucks	0	0	0	0	0	0	1	1	0	2	2	1	2	0	5	1	3	0	0	4	11
% Trucks	0	0	0	0	0	0	0.4	5.9	0	0.6	11.1	7.1	20.0	0	11.9	5.9	1.1	0	0	0.9	1.0
Heavies	1	0	0	0	1	1	2	0	0	3	0	2	0	0	2	0	4	0	0	4	10
% Heavies	0.6	0	0	0	0.4	1.4	0.7	0	0	0.8	0	14.3	0	0	4.8	0	1.4	0	0	0.9	0.9
Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
% Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.4	0	0.5	0.2

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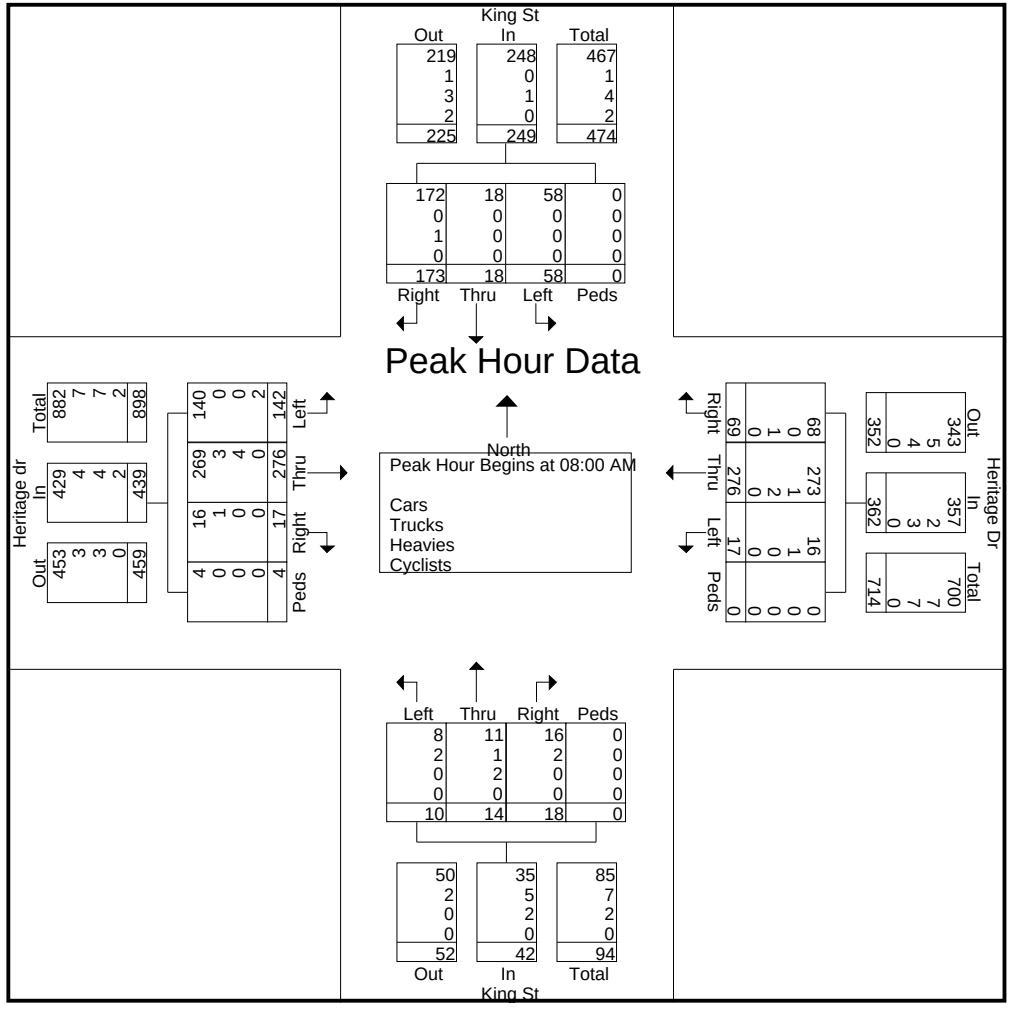
Your Traffic Count Specialist

File Name : Heritage Drive at King Street
Site Code : Loc-1
Start Date : 2025-08-16
Page No : 5



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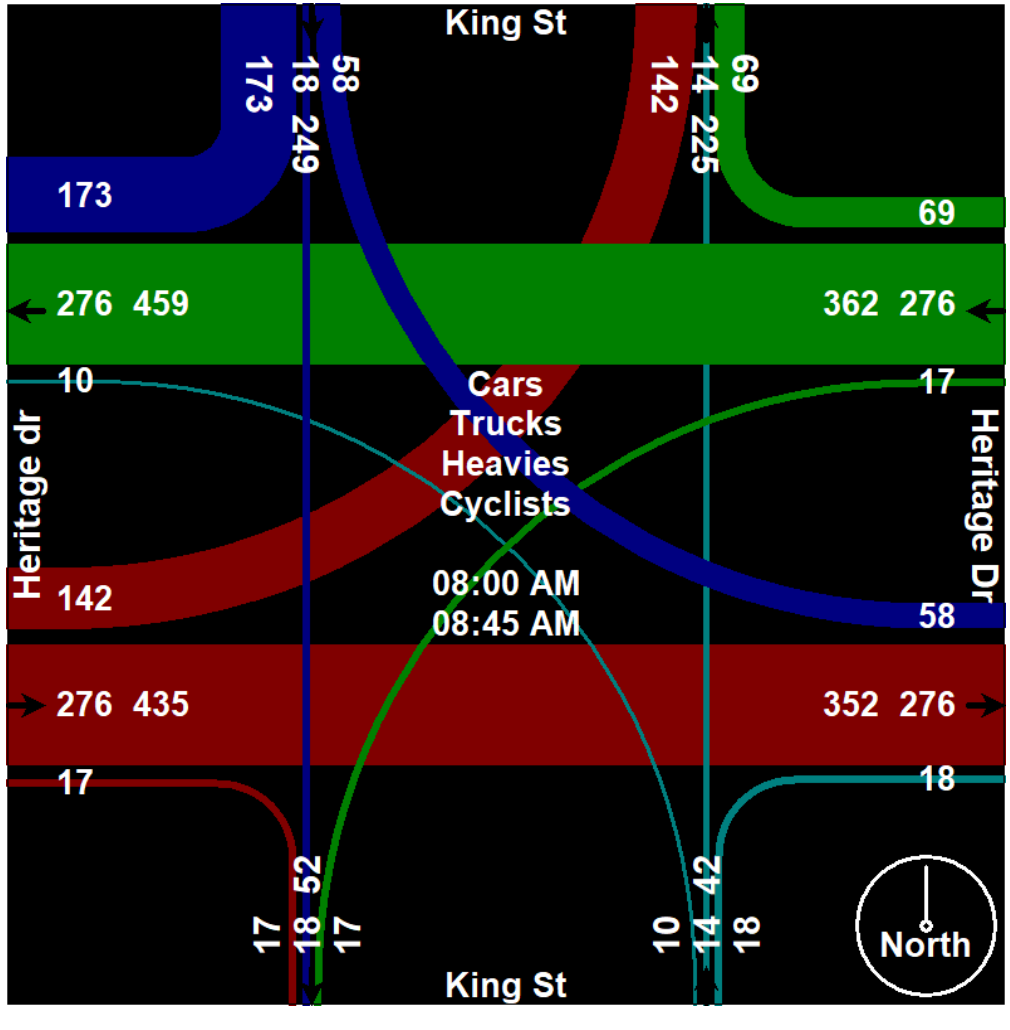
Your Traffic Count Specialist

File Name : Heritage Drive at King Street
Site Code : Loc-1
Start Date : 2025-08-16
Page No : 6



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Your Traffic Count Specialist

File Name : Heritage Drive at King Street
Site Code : Loc-1
Start Date : 2025-08-16
Page No : 7

	King St From North					Heritage Dr From East					King St From South					Heritage dr From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 10:45 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:45 AM																					
11:45 AM	95	9	**32**	0	**136**	36	**150**	4	0	190	7	10	4	0	21	1	138	83	0	222	569
12:00 PM	84	**12**	27	0	123	41	144	**11**	0	**196**	9	8	6	0	23	1	131	74	0	206	548
12:15 PM	84	7	32	0	123	44	120	9	0	173	**12**	7	**8**	0	**27**	**5**	129	88	0	222	545
12:30 PM	**96**	11	26	0	133	**46**	140	6	0	192	6	**11**	6	0	23	5	**140**	**89**	0	**234**	**582**
Total Volume	359	39	117	0	515	167	554	30	0	751	34	36	24	0	94	12	538	334	0	884	2244
% App. Total	69.7	7.6	22.7	0		22.2	73.8	4	0		36.2	38.3	25.5	0		1.4	60.9	37.8	0		
PHF	.935	.813	.914	.000	.947	.908	.923	.682	.000	.958	.708	.818	.750	.000	.870	.600	.961	.938	.000	.944	.964
Cars	356	38	117	0	511	165	550	29	0	744	33	35	22	0	90	11	536	334	0	881	2226
% Cars	99.2	97.4	100	0	99.2	98.8	99.3	96.7	0	99.1	97.1	97.2	91.7	0	95.7	91.7	99.6	100	0	99.7	99.2
Trucks	2	0	0	0	2	2	0	1	0	3	1	0	2	0	3	1	1	0	0	2	10
% Trucks	0.6	0	0	0	0.4	1.2	0	3.3	0	0.4	2.9	0	8.3	0	3.2	8.3	0.2	0	0	0.2	0.4
Heavies	1	0	0	0	1	0	4	0	0	4	0	1	0	0	1	0	1	0	0	1	7
% Heavies	0.3	0	0	0	0.2	0	0.7	0	0	0.5	0	2.8	0	0	1.1	0	0.2	0	0	0.1	0.3
Cyclists	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Cyclists	0	2.6	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0

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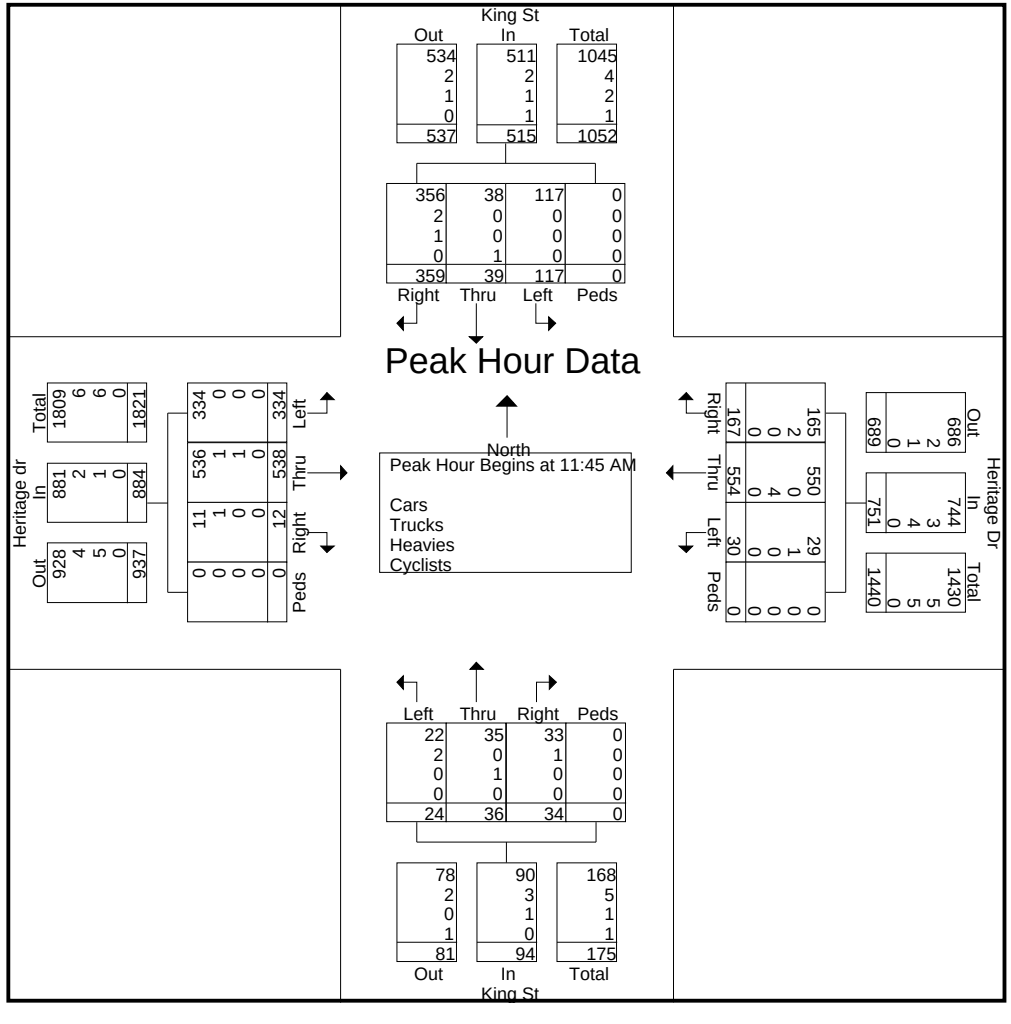
Your Traffic Count Specialist

File Name : Heritage Drive at King Street
Site Code : Loc-1
Start Date : 2025-08-16
Page No : 8



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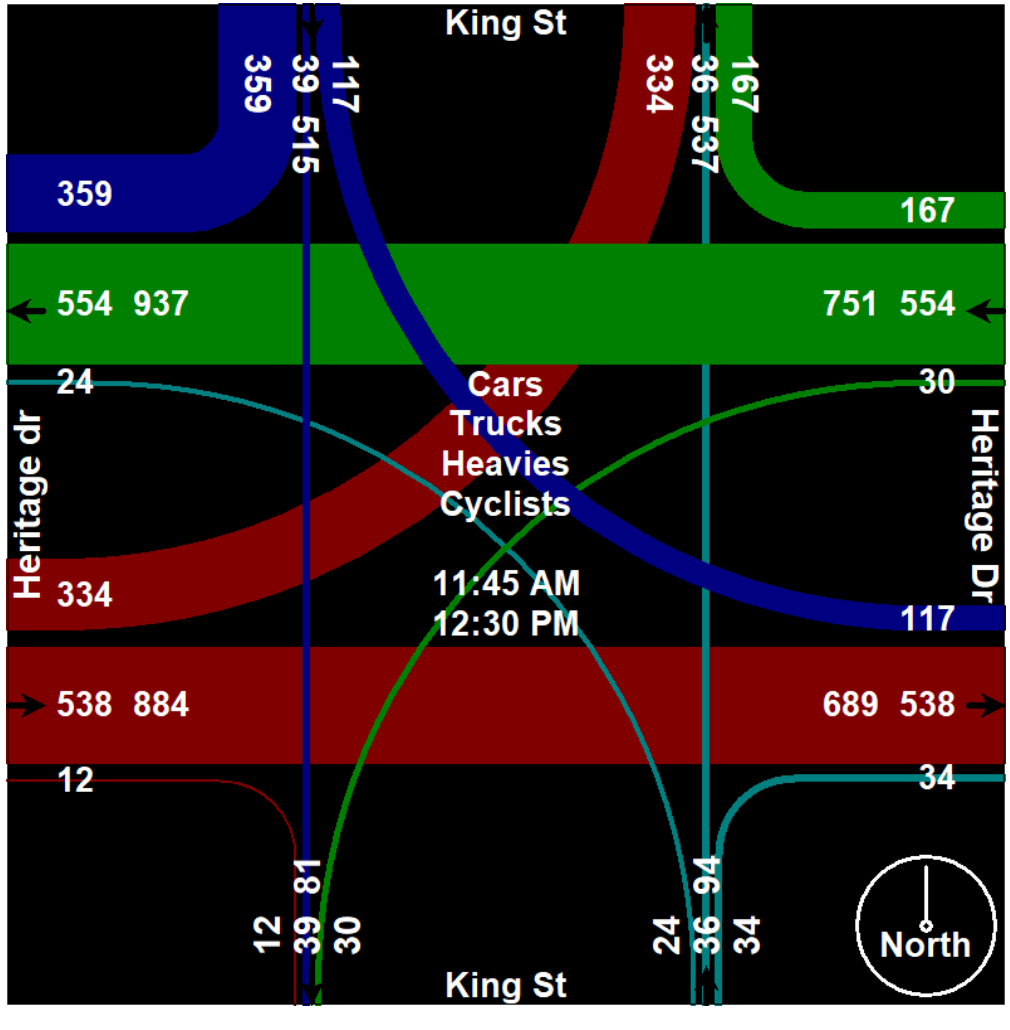
Your Traffic Count Specialist

File Name : Heritage Drive at King Street
Site Code : Loc-1
Start Date : 2025-08-16
Page No : 9



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Your Traffic Count Specialist

File Name : Heritage Drive at King Street
Site Code : Loc-1
Start Date : 2025-08-16
Page No : 10

	King St From North					Heritage Dr From East					King St From South					Heritage dr From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:45 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	**87**	**7**	**35**	0	**129**	23	103	**8**	0	134	**8**	**17**	**5**	0	**30**	2	102	66	0	170	**463**
04:15 PM	81	5	33	0	119	29	99	3	0	131	4	10	1	0	15	**3**	**116**	63	**1**	**183**	448
04:30 PM	74	2	24	**1**	101	**32**	**123**	6	0	**161**	8	6	3	0	17	2	99	51	0	152	431
04:45 PM	62	6	22	0	90	28	93	2	0	123	2	6	3	0	11	2	111	**70**	0	183	407
Total Volume	304	20	114	1	439	112	418	19	0	549	22	39	12	0	73	9	428	250	1	688	1749
% App. Total	69.2	4.6	26	0.2		20.4	76.1	3.5	0		30.1	53.4	16.4	0		1.3	62.2	36.3	0.1		
PHF	.874	.714	.814	.250	.851	.875	.850	.594	.000	.852	.688	.574	.600	.000	.608	.750	.922	.893	.250	.940	.944
Cars	303	18	114	1	436	112	417	18	0	547	21	37	10	0	68	8	427	250	1	686	1737
% Cars	99.7	90.0	100	100	99.3	100	99.8	94.7	0	99.6	95.5	94.9	83.3	0	93.2	88.9	99.8	100	100	99.7	99.3
Trucks	0	2	0	0	2	0	1	1	0	2	1	1	1	0	3	1	0	0	0	1	8
% Trucks	0	10.0	0	0	0.5	0	0.2	5.3	0	0.4	4.5	2.6	8.3	0	4.1	11.1	0	0	0	0.1	0.5
Heavies	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
% Heavies	0.3	0	0	0	0.2	0	0	0	0	0	0	2.6	0	0	1.4	0	0	0	0	0	0.1
Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	1	2
% Cyclists	0	0	0	0	0	0	0	0	0	0	0	0	8.3	0	1.4	0	0.2	0	0	0.1	0.1

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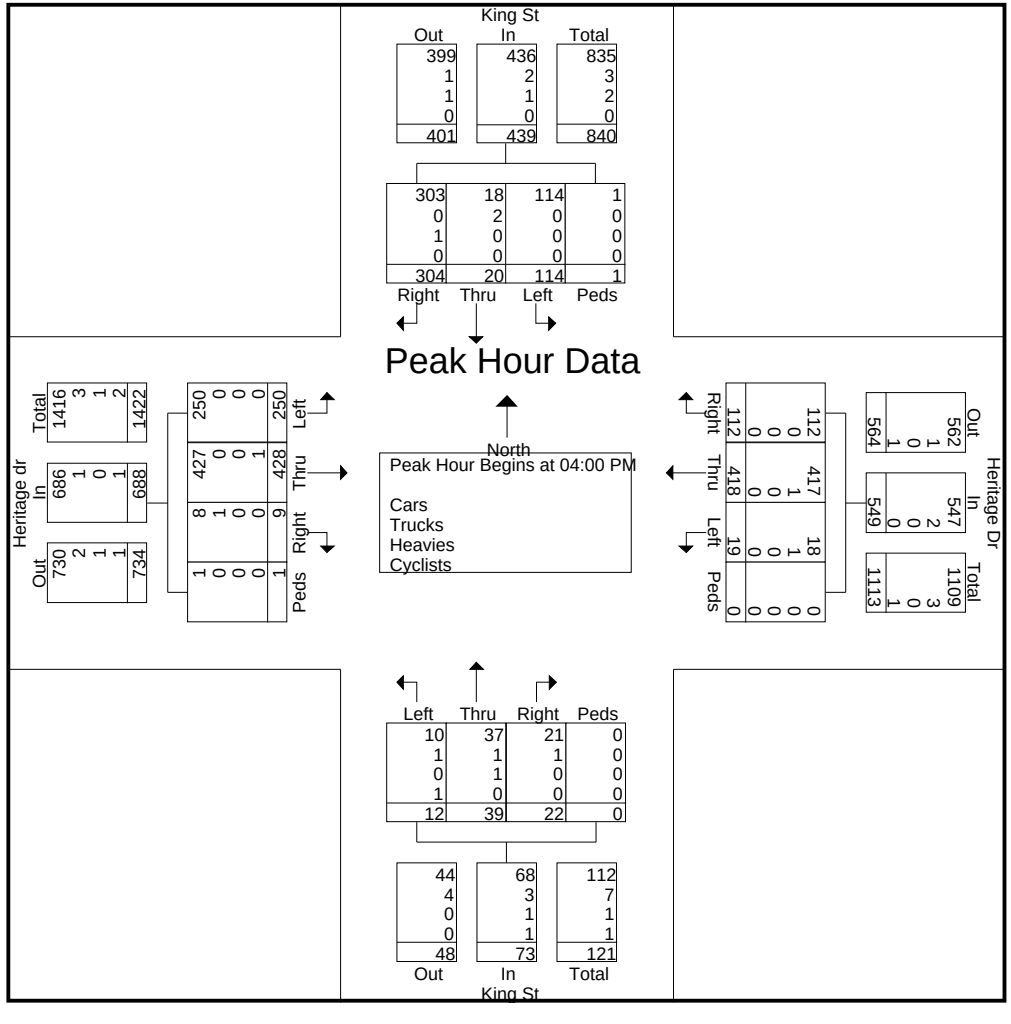
Your Traffic Count Specialist

File Name : Heritage Drive at King Street
Site Code : Loc-1
Start Date : 2025-08-16
Page No : 11



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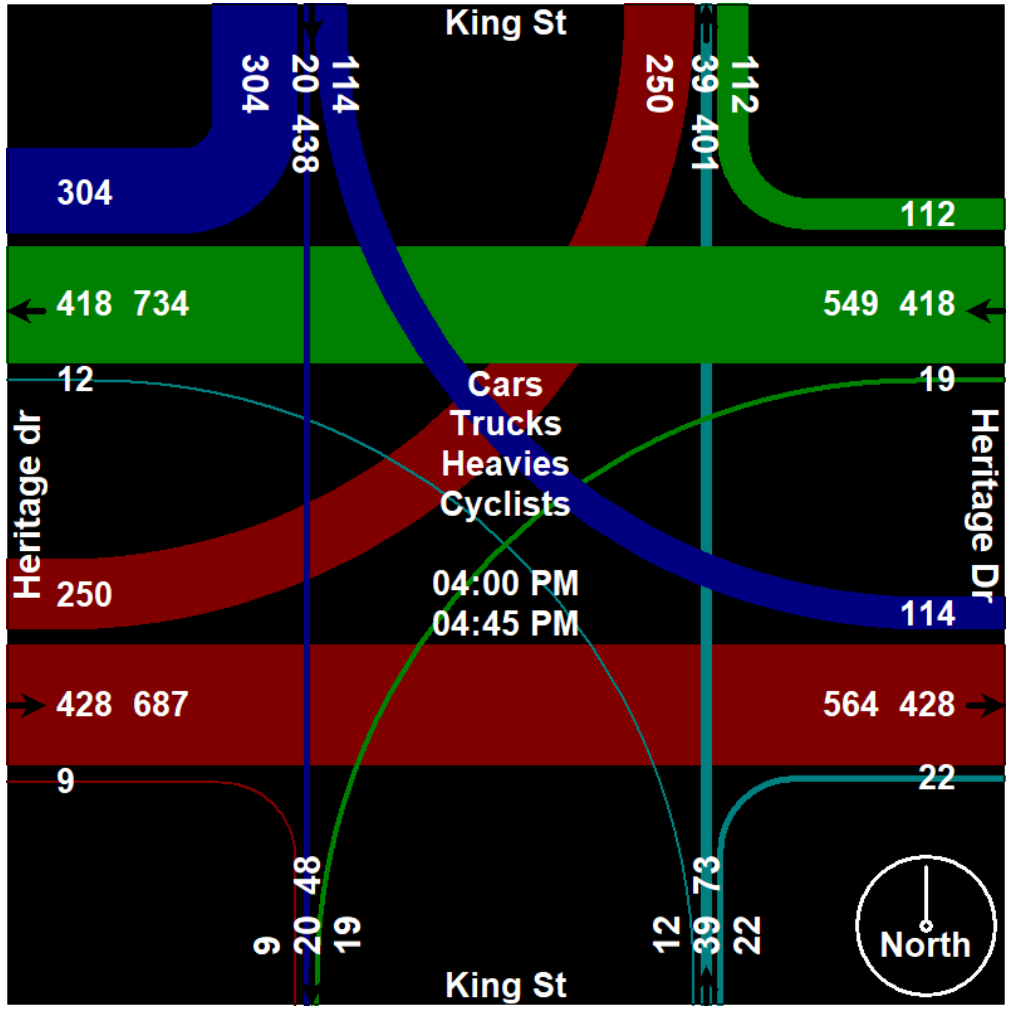
Your Traffic Count Specialist

File Name : Heritage Drive at King Street
Site Code : Loc-1
Start Date : 2025-08-16
Page No : 12



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(416) 840-6619

Your Traffic Count Specialist

File Name : King Street at Quality Inn Access
Site Code : Loc-2
Start Date : 2025-08-16
Page No : 1

Groups Printed- Cars - Trucks - Heavies - Cyclists

	King St From North					From East					King St From South					Quality Inn Access From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	22	0	0	22	0	0	0	0	0	0	19	0	0	19	1	0	1	1	3	44
07:15 AM	1	23	0	0	24	0	0	0	0	0	0	16	1	0	17	0	0	1	0	1	42
07:30 AM	0	34	0	0	34	0	0	0	0	0	0	25	1	0	26	3	0	1	0	4	64
07:45 AM	1	52	0	0	53	0	0	0	0	0	0	37	3	0	40	4	0	2	0	6	99
Total	2	131	0	0	133	0	0	0	0	0	0	97	5	0	102	8	0	5	1	14	249
08:00 AM	1	44	0	0	45	0	0	0	0	0	0	33	3	0	36	2	0	1	1	4	85
08:15 AM	0	60	0	0	60	0	0	0	0	0	0	44	2	0	46	1	0	3	0	4	110
08:30 AM	1	65	0	0	66	0	0	0	0	0	0	66	3	0	69	4	0	6	1	11	146
08:45 AM	2	70	0	0	72	0	0	0	0	0	0	71	2	0	73	4	0	1	0	5	150
Total	4	239	0	0	243	0	0	0	0	0	0	214	10	0	224	11	0	11	2	24	491
11:00 AM	0	107	0	0	107	0	0	0	0	0	0	132	3	0	135	5	0	0	1	6	248
11:15 AM	0	104	0	0	104	0	0	0	0	0	0	110	5	0	115	2	0	5	2	9	228
11:30 AM	1	134	0	0	135	0	0	0	0	0	0	106	3	0	109	5	0	1	0	6	250
11:45 AM	2	137	0	0	139	0	0	0	0	0	0	124	3	0	127	2	0	1	1	4	270
Total	3	482	0	0	485	0	0	0	0	0	0	472	14	0	486	14	0	7	4	25	996
12:00 PM	3	117	0	0	120	0	0	0	0	0	0	121	4	0	125	3	0	7	0	10	255
12:15 PM	3	118	0	0	121	0	0	0	0	0	0	132	7	0	139	6	0	2	1	9	269
12:30 PM	8	121	0	0	129	0	0	0	0	0	0	140	5	0	145	7	0	4	1	12	286
12:45 PM	2	128	0	0	130	0	0	0	0	0	0	127	7	0	134	8	0	6	2	16	280
Total	16	484	0	0	500	0	0	0	0	0	0	520	23	0	543	24	0	19	4	47	1090
01:00 PM	0	110	0	0	110	0	0	0	0	0	0	117	0	0	117	3	0	5	2	10	237
01:15 PM	0	110	0	0	110	0	0	0	0	0	0	130	4	0	134	5	0	3	3	11	255
01:30 PM	2	117	0	0	119	0	0	0	0	0	0	128	9	0	137	9	0	4	0	13	269
01:45 PM	2	100	0	0	102	0	0	0	0	0	0	124	3	0	127	4	0	0	1	5	234
Total	4	437	0	0	441	0	0	0	0	0	0	499	16	0	515	21	0	12	6	39	995
04:00 PM	3	127	0	0	130	0	0	0	0	0	0	103	3	1	107	2	0	4	0	6	243
04:15 PM	6	109	0	0	115	0	0	0	0	0	0	95	2	0	97	13	0	1	2	16	228

Horizon Data Services Ltd

(416) 840-6619

Your Traffic Count Specialist

File Name : King Street at Quality Inn Access
Site Code : Loc-2
Start Date : 2025-08-16
Page No : 2

Groups Printed- Cars - Trucks - Heavies - Cyclists

	King St From North					From East					King St From South					Quality Inn Access From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:30 PM	1	97	0	0	98	0	0	0	0	0	0	85	5	0	90	4	0	3	0	7	195
04:45 PM	1	84	0	0	85	0	0	0	0	0	0	105	2	0	107	6	0	2	1	9	201
Total	11	417	0	0	428	0	0	0	0	0	0	388	12	1	401	25	0	10	3	38	867
05:00 PM	3	98	0	0	101	0	0	0	0	0	0	76	3	0	79	7	0	0	1	8	188
05:15 PM	1	110	0	0	111	0	0	0	0	0	0	74	1	0	75	1	0	4	0	5	191
05:30 PM	2	71	0	0	73	0	0	0	0	0	0	82	3	0	85	3	0	1	0	4	162
05:45 PM	0	79	0	0	79	0	0	0	0	0	0	90	1	0	91	1	0	1	0	2	172
Total	6	358	0	0	364	0	0	0	0	0	0	322	8	0	330	12	0	6	1	19	713
Grand Total	46	2548	0	0	2594	0	0	0	0	0	0	2512	88	1	2601	115	0	70	21	206	5401
Apprch %	1.8	98.2	0	0		0	0	0	0		0	96.6	3.4	0		55.8	0	34	10.2		
Total %	0.9	47.2	0	0	48	0	0	0	0	0	0	46.5	1.6	0	48.2	2.1	0	1.3	0.4	3.8	
Cars	44	2524	0	0	2568	0	0	0	0	0	0	2489	88	1	2578	115	0	67	21	203	5349
% Cars	95.7	99.1	0	0	99	0	0	0	0	0	0	99.1	100	100	99.1	100	0	95.7	100	98.5	99
Trucks	0	12	0	0	12	0	0	0	0	0	0	11	0	0	11	0	0	1	0	1	24
% Trucks	0	0.5	0	0	0.5	0	0	0	0	0	0	0.4	0	0	0.4	0	0	1.4	0	0.5	0.4
Heavies	0	10	0	0	10	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	19
% Heavies	0	0.4	0	0	0.4	0	0	0	0	0	0	0.4	0	0	0.3	0	0	0	0	0	0.4
Cyclists	2	2	0	0	4	0	0	0	0	0	0	3	0	0	3	0	0	2	0	2	9
% Cyclists	4.3	0.1	0	0	0.2	0	0	0	0	0	0	0.1	0	0	0.1	0	0	2.9	0	1	0.2

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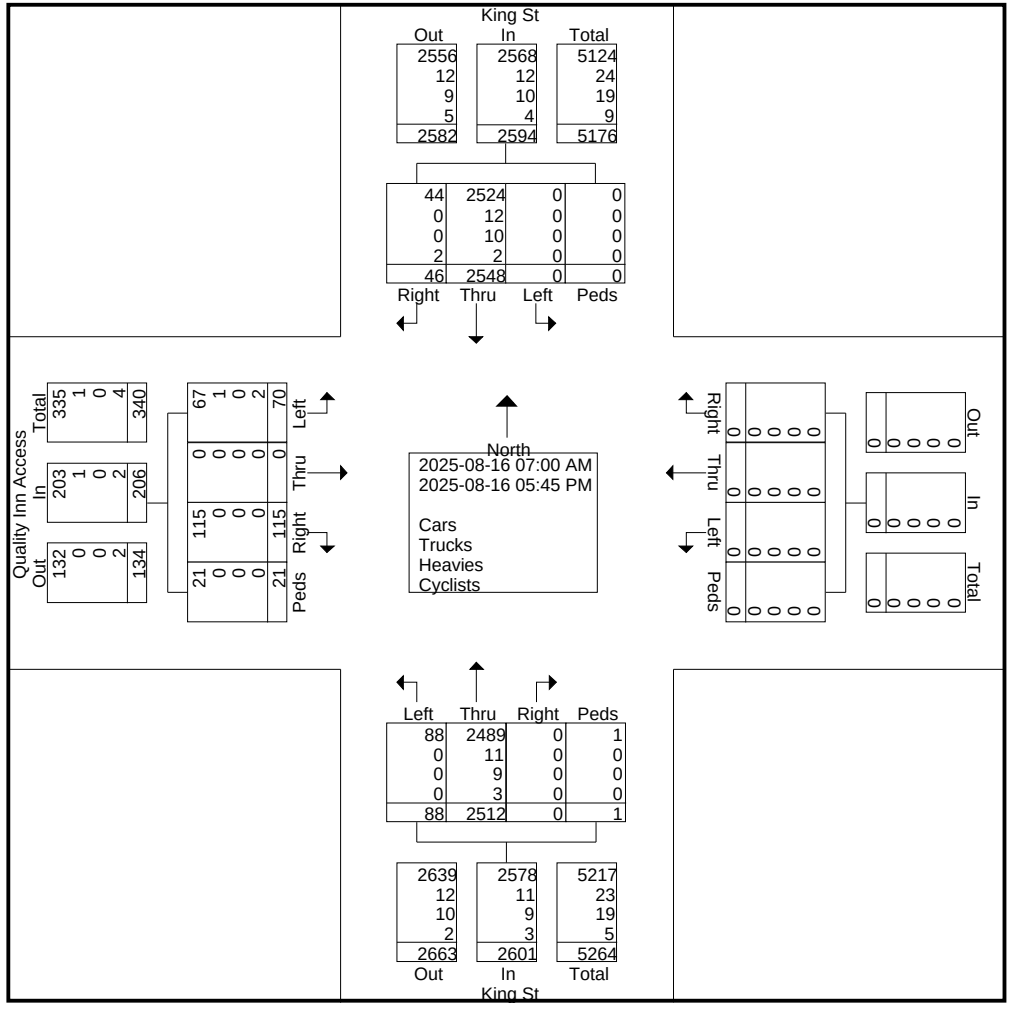
Your Traffic Count Specialist

File Name : King Street at Quality Inn Access
Site Code : Loc-2
Start Date : 2025-08-16
Page No : 3



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Your Traffic Count Specialist

File Name : King Street at Quality Inn Access
Site Code : Loc-2
Start Date : 2025-08-16
Page No : 4

	King St From North					From East					King St From South					Quality Inn Access From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	1	44	0	0	45	0	0	0	0	0	0	33	**3**	0	36	2	0	1	**1**	4	85
08:15 AM	0	60	0	0	60	0	0	0	0	0	0	44	2	0	46	1	0	3	0	4	110
08:30 AM	1	65	0	0	66	0	0	0	0	0	0	66	3	0	69	**4**	0	**6**	1	**11**	146
08:45 AM	**2**	**70**	0	0	**72**	0	0	0	0	0	0	**71**	2	0	**73**	4	0	1	0	5	**150**
Total Volume	4	239	0	0	243	0	0	0	0	0	0	214	10	0	224	11	0	11	2	24	491
% App. Total	1.6	98.4	0	0		0	0	0	0		0	95.5	4.5	0		45.8	0	45.8	8.3		
PHF	.500	.854	.000	.000	.844	.000	.000	.000	.000	.000	.000	.754	.833	.000	.767	.688	.000	.458	.500	.545	.818
Cars	4	238	0	0	242	0	0	0	0	0	0	208	10	0	218	11	0	11	2	24	484
% Cars	100	99.6	0	0	99.6	0	0	0	0	0	0	97.2	100	0	97.3	100	0	100	100	100	98.6
Trucks	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0.4	0	0	0	0	0	0.2
Heavies	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
% Heavies	0	0.4	0	0	0.4	0	0	0	0	0	0	1.4	0	0	1.3	0	0	0	0	0	0.8
Cyclists	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
% Cyclists	0	0	0	0	0	0	0	0	0	0	0	0.9	0	0	0.9	0	0	0	0	0	0.4

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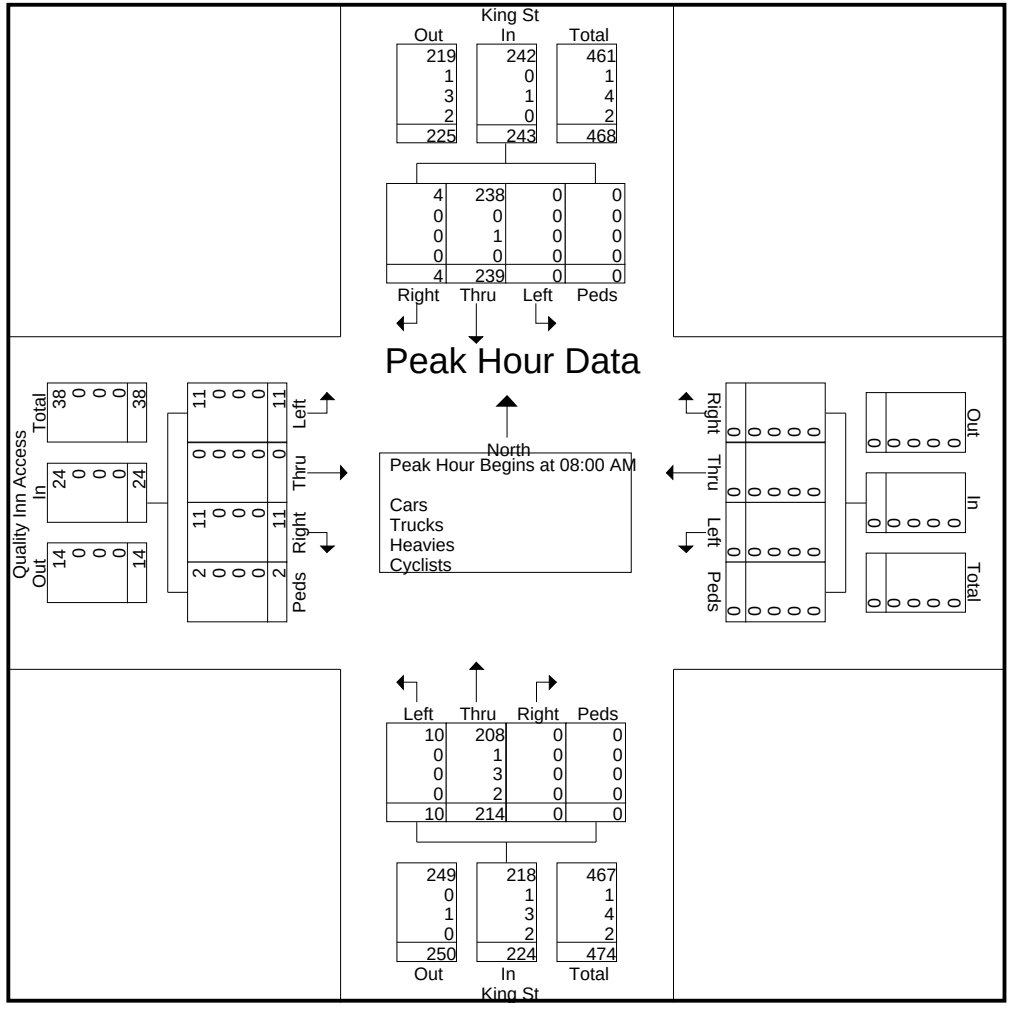
Your Traffic Count Specialist

File Name : King Street at Quality Inn Access
Site Code : Loc-2
Start Date : 2025-08-16
Page No : 5



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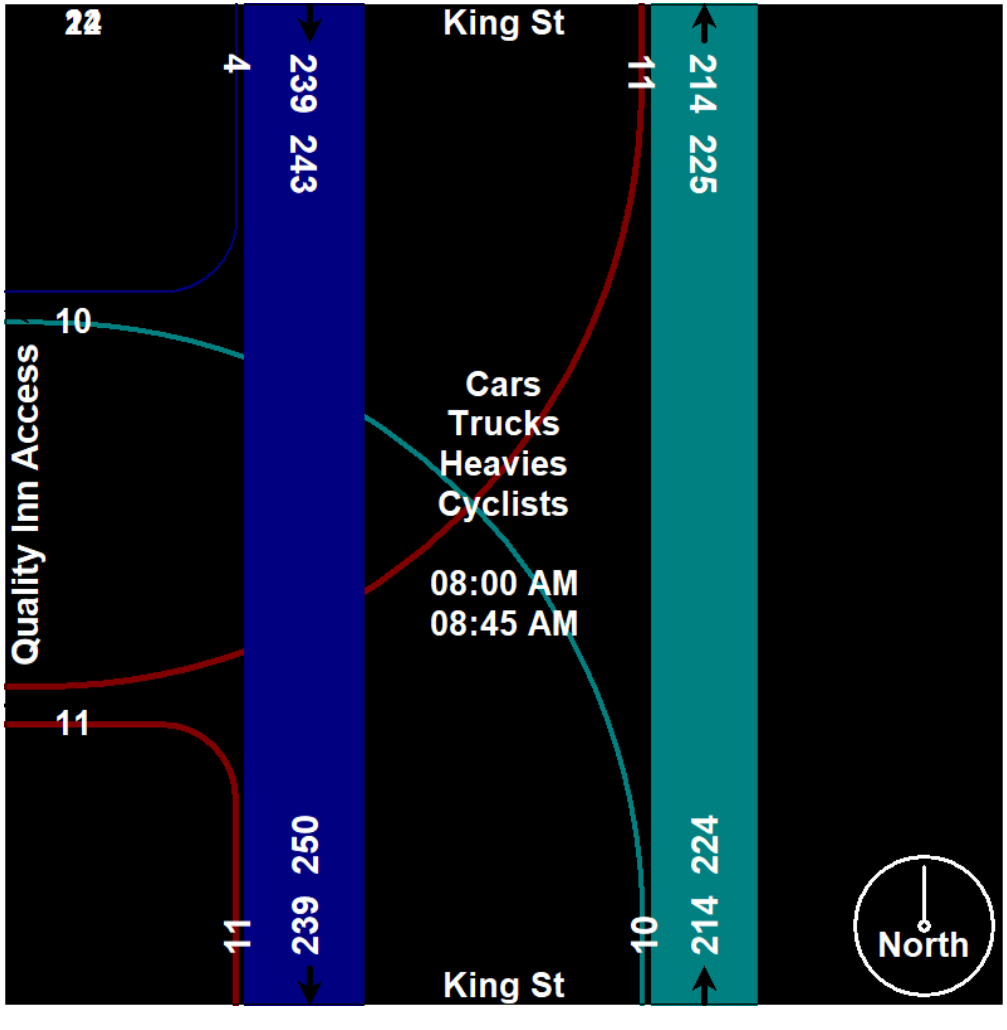
Your Traffic Count Specialist

File Name : King Street at Quality Inn Access
Site Code : Loc-2
Start Date : 2025-08-16
Page No : 6



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Your Traffic Count Specialist

File Name : King Street at Quality Inn Access
Site Code : Loc-2
Start Date : 2025-08-16
Page No : 7

	King St From North					From East					King St From South					Quality Inn Access From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 10:45 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	3	117	0	0	120	0	0	0	0	0	0	121	4	0	125	3	0	**7**	0	10	255
12:15 PM	3	118	0	0	121	0	0	0	0	0	0	132	**7**	0	139	6	0	2	1	9	269
12:30 PM	**8**	121	0	0	129	0	0	0	0	0	0	**140**	5	0	**145**	7	0	4	1	12	**286**
12:45 PM	2	**128**	0	0	**130**	0	0	0	0	0	0	127	7	0	134	**8**	0	6	**2**	**16**	280
Total Volume	16	484	0	0	500	0	0	0	0	0	0	520	23	0	543	24	0	19	4	47	1090
% App. Total	3.2	96.8	0	0		0	0	0	0		0	95.8	4.2	0		51.1	0	40.4	8.5		
PHF	.500	.945	.000	.000	.962	.000	.000	.000	.000	.000	.000	.929	.821	.000	.936	.750	.000	.679	.500	.734	.953
Cars	15	480	0	0	495	0	0	0	0	0	0	516	23	0	539	24	0	19	4	47	1081
% Cars	93.8	99.2	0	0	99.0	0	0	0	0	0	0	99.2	100	0	99.3	100	0	100	100	100	99.2
Trucks	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	5
% Trucks	0	0.4	0	0	0.4	0	0	0	0	0	0	0.6	0	0	0.6	0	0	0	0	0	0.5
Heavies	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
% Heavies	0	0.2	0	0	0.2	0	0	0	0	0	0	0.2	0	0	0.2	0	0	0	0	0	0.2
Cyclists	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
% Cyclists	6.3	0.2	0	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2

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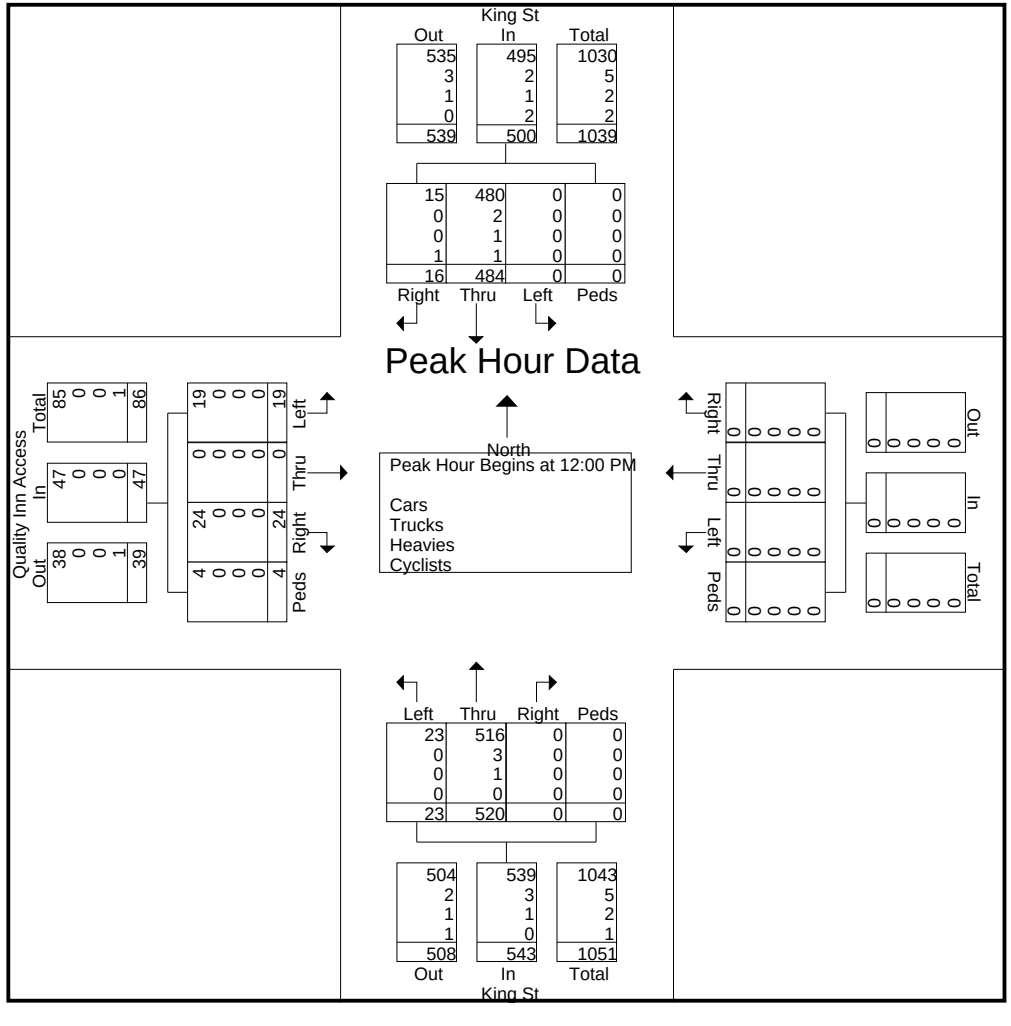
Your Traffic Count Specialist

File Name : King Street at Quality Inn Access
Site Code : Loc-2
Start Date : 2025-08-16
Page No : 8



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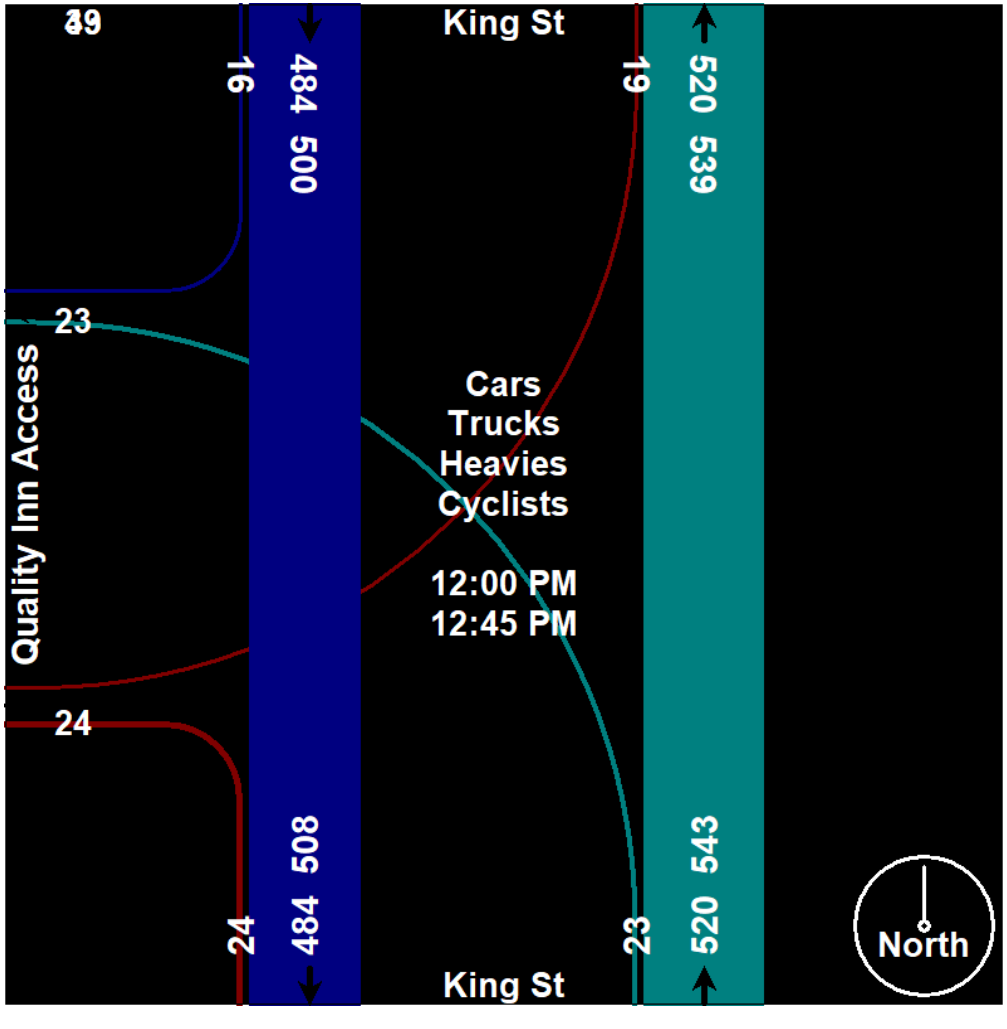
Your Traffic Count Specialist

File Name : King Street at Quality Inn Access
Site Code : Loc-2
Start Date : 2025-08-16
Page No : 9



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Your Traffic Count Specialist

File Name : King Street at Quality Inn Access
Site Code : Loc-2
Start Date : 2025-08-16

	King St From North					From East					King St From South					Quality Inn Access From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:45 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	3	**127**	0	0	**130**	0	0	0	0	0	0	103	3	**1**	**107**	2	0	**4**	0	6	**243**
04:15 PM	**6**	109	0	0	115	0	0	0	0	0	0	95	2	0	97	**13**	0	1	**2**	**16**	228
04:30 PM	1	97	0	0	98	0	0	0	0	0	0	85	**5**	0	90	4	0	3	0	7	195
04:45 PM	1	84	0	0	85	0	0	0	0	0	0	**105**	2	0	107	6	0	2	1	9	201
Total Volume	11	417	0	0	428	0	0	0	0	0	0	388	12	1	401	25	0	10	3	38	867
% App. Total	2.6	97.4	0	0		0	0	0	0		0	96.8	3	0.2		65.8	0	26.3	7.9		
PHF	.458	.821	.000	.000	.823	.000	.000	.000	.000	.000	.000	.924	.600	.250	.937	.481	.000	.625	.375	.594	.892
Cars	10	414	0	0	424	0	0	0	0	0	0	386	12	1	399	25	0	10	3	38	861
% Cars	90.9	99.3	0	0	99.1	0	0	0	0	0	0	99.5	100	100	99.5	100	0	100	100	100	99.3
Trucks	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
% Trucks	0	0.5	0	0	0.5	0	0	0	0	0	0	0.3	0	0	0.2	0	0	0	0	0	0.3
Heavies	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
% Heavies	0	0.2	0	0	0.2	0	0	0	0	0	0	0.3	0	0	0.2	0	0	0	0	0	0.2
Cyclists	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Cyclists	9.1	0	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1

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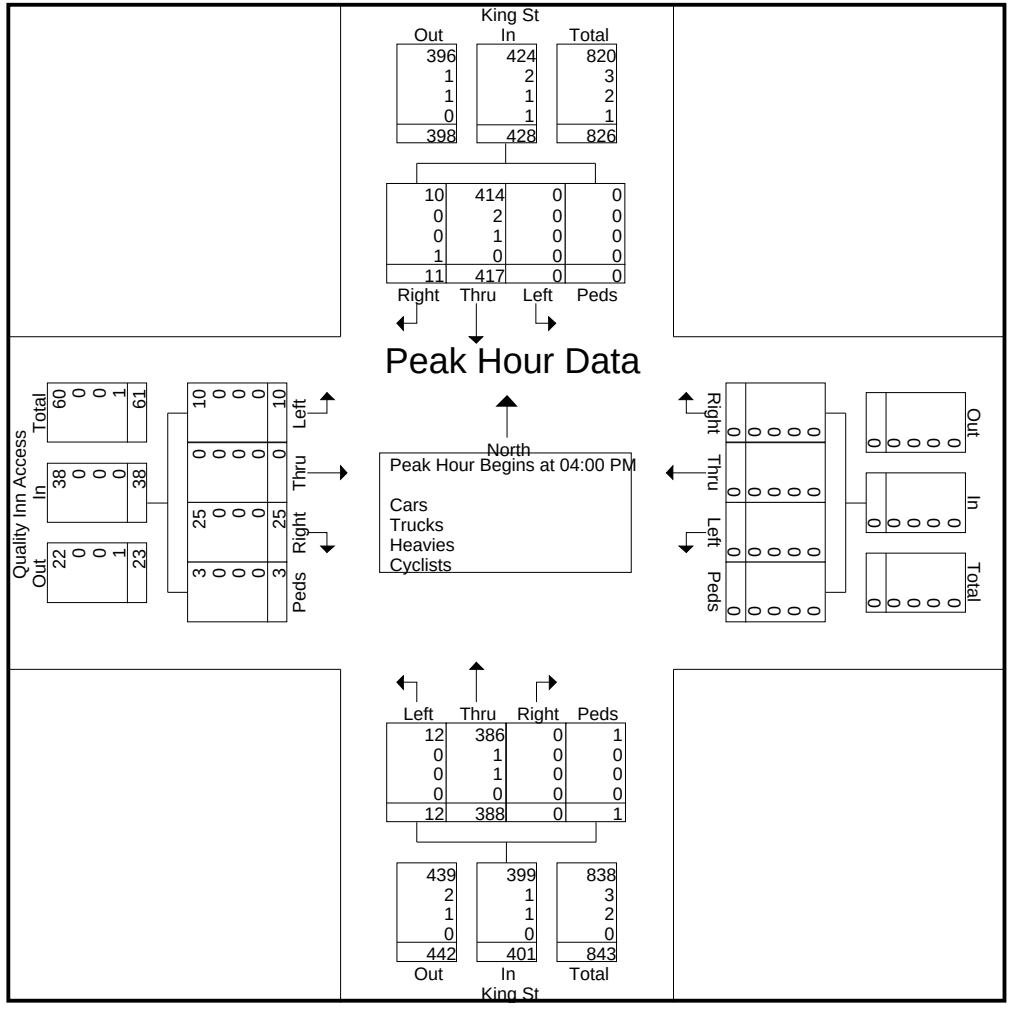
File Name : King Street at Quality Inn Access
Site Code : Loc-2
Start Date : 2025-08-16
Page No : 11



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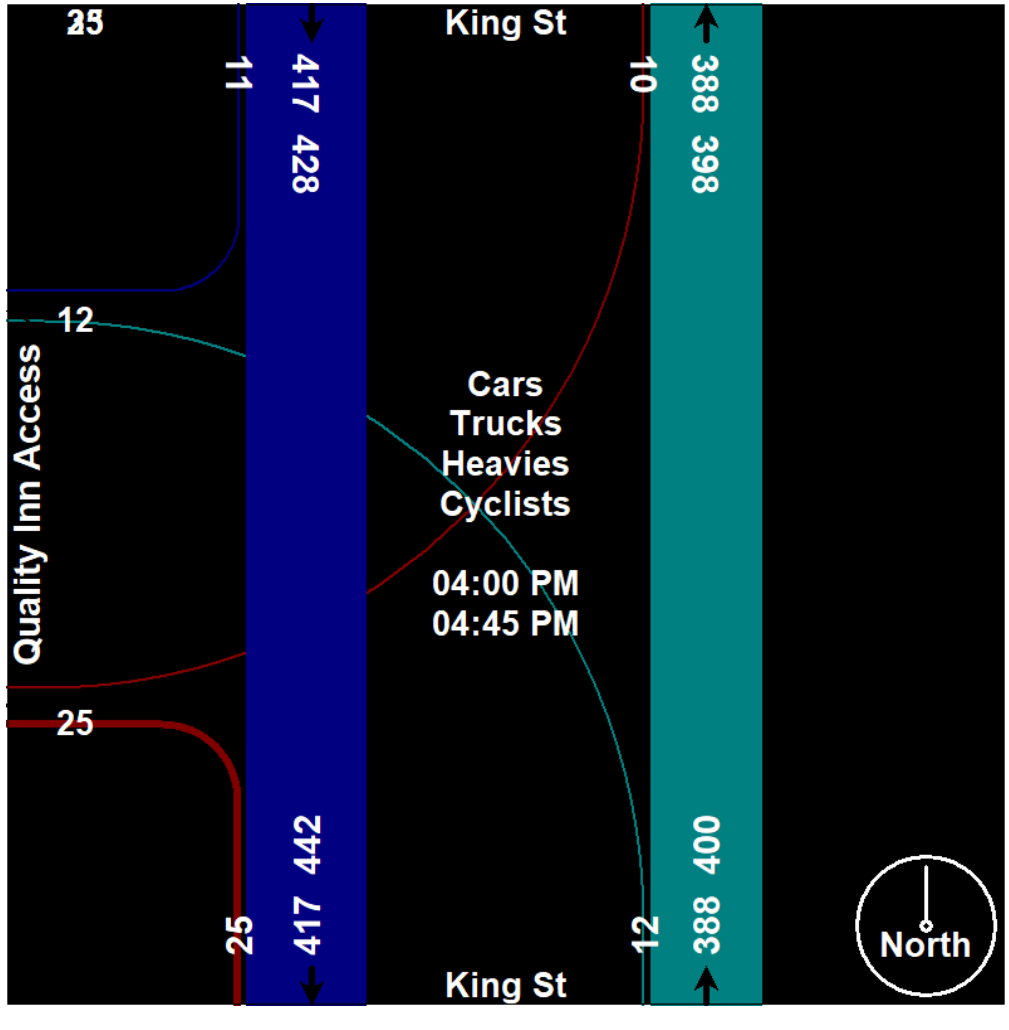
Your Traffic Count Specialist

File Name : King Street at Quality Inn Access
Site Code : Loc-2
Start Date : 2025-08-16
Page No : 12



Appendix B

Signal Timing Plans

Pretimed

Ontario

PHASE	1	2	3	4	5	6	7	8
WALK	-	12	-	7	-	12	-	7
DON'T WALK	-	19	-	27	-	19	-	27
MIN INTIAL	7	45		15	7	45		15
TYPE 3 LIMIT	-		-		-		-	
ADD PER VEH	-	1.0	-		-	1.0	-	
VEH EXT	3.0	5.4		3.0	3.0	5.4		3.0
MAX GAP	3.0	5.4		3.0	3.0	5.4		3.0
MIN GAP	3.0	5.4		3.0	3.0	5.4		3.0
MAX LIMIT	10	50		30	10	50		30
MAXIMUM 2	-		-		-		-	
ADV / DLY WALK	-		-		-		-	
SEQUENCE TO	4	-		-	8	-		-
COND SRV MIN	-		-		-		-	
REDUCE EVERY	-		-		-		-	
YELLOW	3.0	5.0		4.5	3.0	5.0		4.5
RED CLEAR		2.0		2.8		2.0		2.8

PHASE BANK # < C + O + F = 1 >

Column F

		PHASES 1	2	3	4	5	6	7	8
0	PERMIT	X	X		X	X	X		X
1	RED LOCK								
2	YELLOW LOCK								
3	VEH MIN CALL	X			X	X			X
4	PED RECALL		X				X		
5	PEDESTRIANS								
6	REST IN WALK								
7	RED REST								
8	DOUBLE ENTRY		X		X		X		X
9	VEH MAX CALL								
A	SOFT RECALL								
B	MAXIMUM 2								
C	CORD SERVICE								
D	MAN CONT CALL								
E	YELLOW START		X				X		
F	FIRST PHASES				X				X

< C + O + F = 1 >

LOCATION: Highway 12 & King Street

Issued Date: 06-May-20

Installed Date:

BI Tran Systems, Inc.
510 Bercut Dr., Sacremento, Calif. 95814
916/441-0260

Traffic Signal Program ***233*** *Ontario*
Timing Sheet #2
Revised (02/95)

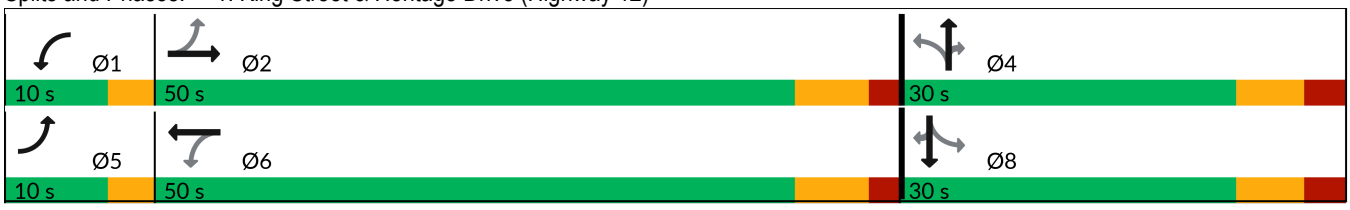
Appendix C

Existing (2025) Traffic Conditions – Synchro Reports

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	140	276	17	276	69	10	14	18	58	18	174
Future Volume (vph)	140	276	17	276	69	10	14	18	58	18	174
Turn Type	pm+pt	NA	pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		Free	4		4	8		8
Detector Phase	5	2	1	6		4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0		17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0		30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%		33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0		2.8	2.8	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes							
Recall Mode	None	Ped	None	Ped		None	None	None	None	None	None
Act Effct Green (s)	44.5	39.1	42.0	31.0	65.9	10.6	10.6	10.6	10.6	10.6	10.6
Actuated g/C Ratio	0.68	0.59	0.64	0.47	1.00	0.16	0.16	0.16	0.16	0.16	0.16
v/c Ratio	0.23	0.17	0.03	0.20	0.05	0.06	0.07	0.07	0.31	0.07	0.49
Control Delay (s/veh)	4.7	7.1	3.8	10.7	0.1	24.2	24.0	0.4	28.5	23.9	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	4.7	7.1	3.8	10.7	0.1	24.2	24.0	0.4	28.5	23.9	8.5
LOS	A	A	A	B	A	C	C	A	C	C	A
Approach Delay (s/veh)		6.3		8.4			13.9			14.2	
Approach LOS		A		A			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 65.9	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay (s/veh): 9.1	Intersection LOS: A
Intersection Capacity Utilization 54.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	173	362	21	341	85	12	17	22	72	22	215
v/c Ratio	0.23	0.17	0.03	0.20	0.05	0.06	0.07	0.07	0.31	0.07	0.49
Control Delay (s/veh)	4.7	7.1	3.8	10.7	0.1	24.2	24.0	0.4	28.5	23.9	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	4.7	7.1	3.8	10.7	0.1	24.2	24.0	0.4	28.5	23.9	8.5
Queue Length 50th (m)	5.8	8.1	0.7	11.9	0.0	1.5	2.1	0.0	7.9	2.3	0.0
Queue Length 95th (m)	11.3	19.2	2.3	18.1	0.0	5.4	6.7	0.0	16.2	6.8	11.3
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	741	2292	741	2359	1617	408	547	562	494	662	688
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.16	0.03	0.14	0.05	0.03	0.03	0.04	0.15	0.03	0.31

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	276	17	17	276	69	10	14	18	58	18	174
Future Volume (vph)	140	276	17	17	276	69	10	14	18	58	18	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	4.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3507		1825	3614	1617	1509	1588	1471	1825	1921	1585
Flt Permitted	0.50	1.00		0.54	1.00	1.00	0.74	1.00	1.00	0.75	1.00	1.00
Satd. Flow (perm)	964	3507		1029	3614	1617	1180	1588	1471	1434	1921	1585
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	173	341	21	21	341	85	12	17	22	72	22	215
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	19	0	0	182
Lane Group Flow (vph)	173	358	0	21	341	85	12	17	3	72	22	33
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		Free	4		4	8		8
Actuated Green, G (s)	43.5	39.1		34.9	33.5	68.3	10.5	10.5	10.5	10.5	10.5	10.5
Effective Green, g (s)	43.5	39.1		34.9	33.5	68.3	10.5	10.5	10.5	10.5	10.5	10.5
Actuated g/C Ratio	0.64	0.57		0.51	0.49	1.00	0.15	0.15	0.15	0.15	0.15	0.15
Clearance Time (s)	3.0	7.0		3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	702	2007		542	1772	1617	181	244	226	220	295	243
v/s Ratio Prot	c0.03	0.10		0.00	0.09			0.01			0.01	
v/s Ratio Perm	c0.13			0.02		0.05	0.01		0.00	c0.05		0.02
v/c Ratio	0.25	0.18		0.04	0.19	0.05	0.07	0.07	0.01	0.33	0.07	0.14
Uniform Delay, d1	5.1	7.0		8.3	9.8	0.0	24.7	24.7	24.5	25.8	24.7	25.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1		0.0	0.1	0.1	0.2	0.1	0.0	0.9	0.1	0.3
Delay (s)	5.2	7.1		8.3	9.9	0.1	24.9	24.8	24.5	26.6	24.8	25.2
Level of Service	A	A		A	A	A	C	C	C	C	C	C
Approach Delay (s/veh)		6.5			8.0			24.7			25.5	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	68.3	Sum of lost time (s)	17.3
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	11	10	213	239	4
Future Volume (Veh/h)	11	11	10	213	239	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	13	13	12	260	291	5
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	450	150	298			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	450	150	298			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	99			
cM capacity (veh/h)	537	874	1272			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	26	99	173	194	102
Volume Left	13	12	0	0	0
Volume Right	13	0	0	0	5
cSH	665	1272	1700	1700	1700
Volume to Capacity	0.04	0.00*	0.10	0.11	0.06
Queue Length 95th (m)	0.9	0.2	0.0	0.0	0.0
Control Delay (s/veh)	10.6	1.0	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	10.6	0.4		0.0	
Approach LOS	B				

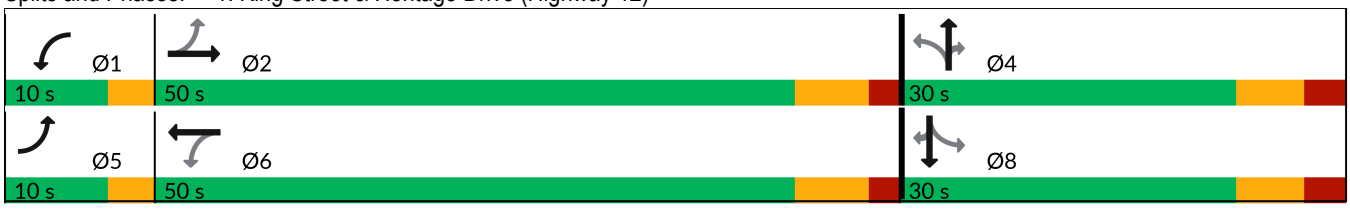
Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	23.3%	ICU Level of Service	A
Analysis Period (min)	15		

* Value less than 0.01.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	334	538	30	554	167	24	36	34	117	38	359
Future Volume (vph)	334	538	30	554	167	24	36	34	117	38	359
Turn Type	pm+pt	NA	pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		Free	4		4	8		8
Detector Phase	5	2	1	6		4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0		17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0		30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%		33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0		2.8	2.8	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes							
Recall Mode	None	Ped	None	Ped		None	None	None	None	None	None
Act Effct Green (s)	44.0	37.3	42.1	31.1	68.6	13.1	13.1	13.1	13.1	13.1	13.1
Actuated g/C Ratio	0.64	0.54	0.61	0.45	1.00	0.19	0.19	0.19	0.19	0.19	0.19
v/c Ratio	0.61	0.30	0.05	0.36	0.11	0.10	0.11	0.10	0.47	0.11	0.65
Control Delay (s/veh)	12.0	10.7	5.3	13.6	0.1	23.0	22.9	0.9	30.4	22.9	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	12.0	10.7	5.3	13.6	0.1	23.0	22.9	0.9	30.4	22.9	10.4
LOS	B	B	A	B	A	C	C	A	C	C	B
Approach Delay (s/veh)		11.2		10.3			15.0			15.9	
Approach LOS		B		B			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 68.6	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay (s/veh): 12.1	Intersection LOS: B
Intersection Capacity Utilization 65.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	355	585	32	589	178	26	38	36	124	40	382
v/c Ratio	0.61	0.30	0.05	0.36	0.11	0.10	0.11	0.10	0.47	0.11	0.65
Control Delay (s/veh)	12.0	10.7	5.3	13.6	0.1	23.0	22.9	0.9	30.4	22.9	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	12.0	10.7	5.3	13.6	0.1	23.0	22.9	0.9	30.4	22.9	10.4
Queue Length 50th (m)	15.5	15.8	1.1	23.8	0.0	2.9	4.2	0.0	14.3	4.3	4.5
Queue Length 95th (m)	35.9	41.3	4.5	41.7	0.0	8.7	10.9	1.1	28.4	11.3	25.9
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	579	2267	610	2272	1633	443	619	573	461	625	763
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.26	0.05	0.26	0.11	0.06	0.06	0.06	0.27	0.06	0.50

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	334	538	12	30	554	167	24	36	34	117	38	359
Future Volume (vph)	334	538	12	30	554	167	24	36	34	117	38	359
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	4.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1807	3603		1825	3614	1633	1738	1865	1555	1807	1883	1617
Flt Permitted	0.38	1.00		0.43	1.00	1.00	0.73	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	731	3603		829	3614	1633	1337	1865	1555	1393	1883	1617
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	355	572	13	32	589	178	26	38	36	124	40	382
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	29	0	0	277
Lane Group Flow (vph)	355	584	0	32	589	178	26	38	7	124	40	105
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	5%	3%	5%	1%	2%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		Free	4		4	8		8
Actuated Green, G (s)	43.0	37.3		35.7	33.0	70.4	13.1	13.1	13.1	13.1	13.1	13.1
Effective Green, g (s)	43.0	37.3		35.7	33.0	70.4	13.1	13.1	13.1	13.1	13.1	13.1
Actuated g/C Ratio	0.61	0.53		0.51	0.47	1.00	0.19	0.19	0.19	0.19	0.19	0.19
Clearance Time (s)	3.0	7.0		3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	553	1908		458	1694	1633	248	347	289	259	350	300
v/s Ratio Prot	c0.06	0.16		0.00	0.16			0.02			0.02	
v/s Ratio Perm	c0.33			0.03		0.11	0.02		0.00	c0.09		0.07
v/c Ratio	0.64	0.31		0.07	0.35	0.11	0.10	0.11	0.02	0.48	0.11	0.35
Uniform Delay, d1	6.8	9.3		8.7	11.9	0.0	23.8	23.8	23.4	25.6	23.8	24.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	0.2		0.1	0.3	0.1	0.2	0.1	0.0	1.4	0.1	0.7
Delay (s)	9.4	9.5		8.8	12.2	0.1	24.0	23.9	23.5	27.0	24.0	25.7
Level of Service	A	A		A	B	A	C	C	C	C	C	C
Approach Delay (s/veh)		9.5			9.3			23.8			25.8	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	70.4	Sum of lost time (s)	17.3
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	18	19	518	496	16
Future Volume (Veh/h)	14	18	19	518	496	16
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	16	20	21	582	557	18
Pedestrians	4					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	903	292	579			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	903	292	579			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	97	98			
cM capacity (veh/h)	274	708	1001			

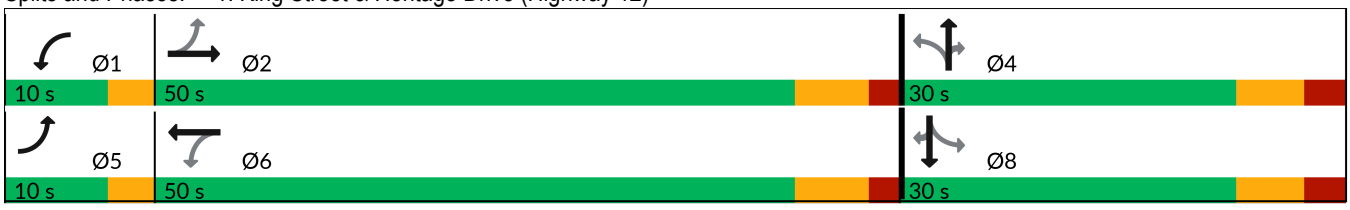
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	36	215	388	371	204
Volume Left	16	21	0	0	0
Volume Right	20	0	0	0	18
cSH	415	1001	1700	1700	1700
Volume to Capacity	0.09	0.02	0.23	0.22	0.12
Queue Length 95th (m)	2.2	0.5	0.0	0.0	0.0
Control Delay (s/veh)	14.5	1.0	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	14.5	0.4		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	38.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	250	427	19	418	112	11	39	22	115	20	307
Future Volume (vph)	250	427	19	418	112	11	39	22	115	20	307
Turn Type	pm+pt	NA	pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		Free	4		4	8		8
Detector Phase	5	2	1	6		4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0		17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0		30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%		33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0		2.8	2.8	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes							
Recall Mode	None	Ped	None	Ped		None	None	None	None	None	None
Act Effct Green (s)	44.5	39.2	42.1	31.0	67.7	12.3	12.3	12.3	12.3	12.3	12.3
Actuated g/C Ratio	0.66	0.58	0.62	0.46	1.00	0.18	0.18	0.18	0.18	0.18	0.18
v/c Ratio	0.39	0.22	0.03	0.26	0.07	0.04	0.12	0.06	0.47	0.07	0.58
Control Delay (s/veh)	6.8	8.4	4.9	12.3	0.1	22.5	23.5	0.3	31.1	22.7	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	6.8	8.4	4.9	12.3	0.1	22.5	23.5	0.3	31.1	22.7	7.8
LOS	A	A	A	B	A	C	C	A	C	C	A
Approach Delay (s/veh)		7.8		9.5			16.2			14.5	
Approach LOS		A		A			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 67.7	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay (s/veh): 10.4	Intersection LOS: B
Intersection Capacity Utilization 71.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	260	454	20	435	117	11	41	23	120	21	320
v/c Ratio	0.39	0.22	0.03	0.26	0.07	0.04	0.12	0.06	0.47	0.07	0.58
Control Delay (s/veh)	6.8	8.4	4.9	12.3	0.1	22.5	23.5	0.3	31.1	22.7	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	6.8	8.4	4.9	12.3	0.1	22.5	23.5	0.3	31.1	22.7	7.8
Queue Length 50th (m)	9.8	11.0	0.7	16.0	0.0	1.2	4.6	0.0	13.7	2.4	0.0
Queue Length 95th (m)	23.8	30.2	3.3	29.1	0.0	4.7	11.9	0.0	27.5	7.8	17.7
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	675	2315	644	2320	1613	479	614	604	470	585	753
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.20	0.03	0.19	0.07	0.02	0.07	0.04	0.26	0.04	0.42

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	427	9	19	418	112	11	39	22	115	20	307
Future Volume (vph)	250	427	9	19	418	112	11	39	22	115	20	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	4.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3639		1738	3650	1613	1822	1830	1633	1825	1746	1611
Flt Permitted	0.46	1.00		0.49	1.00	1.00	0.74	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	880	3639		897	3650	1613	1426	1830	1633	1403	1746	1611
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	260	445	9	20	435	117	11	41	23	120	21	320
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	19	0	0	264
Lane Group Flow (vph)	260	453	0	20	435	117	11	41	4	120	21	56
Confl. Peds. (#/hr)	1					1	1					1
Heavy Vehicles (%)	0%	0%	0%	5%	0%	0%	0%	5%	0%	0%	10%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		Free	4		4	8		8
Actuated Green, G (s)	43.5	39.2		34.8	33.5	70.1	12.3	12.3	12.3	12.3	12.3	12.3
Effective Green, g (s)	43.5	39.2		34.8	33.5	70.1	12.3	12.3	12.3	12.3	12.3	12.3
Actuated g/C Ratio	0.62	0.56		0.50	0.48	1.00	0.18	0.18	0.18	0.18	0.18	0.18
Clearance Time (s)	3.0	7.0		3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	640	2034		460	1744	1613	250	321	286	246	306	282
v/s Ratio Prot	c0.04	0.12		0.00	0.12			0.02			0.01	
v/s Ratio Perm	c0.21			0.02		0.07	0.01		0.00	c0.09		0.03
v/c Ratio	0.41	0.22		0.04	0.25	0.07	0.04	0.13	0.01	0.49	0.07	0.20
Uniform Delay, d1	6.0	7.8		9.0	10.8	0.0	24.0	24.4	23.9	26.1	24.1	24.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.1		0.0	0.2	0.1	0.1	0.2	0.0	1.5	0.1	0.3
Delay (s)	6.4	7.9		9.0	11.0	0.1	24.1	24.6	23.9	27.6	24.2	25.0
Level of Service	A	A		A	B	A	C	C	C	C	C	C
Approach Delay (s/veh)		7.4			8.7			24.3			25.7	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	70.1	Sum of lost time (s)	17.3
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	25	12	389	417	10
Future Volume (Veh/h)	10	25	12	389	417	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	11	27	13	414	444	11
Pedestrians	3			1		
Lane Width (m)	3.7			3.7		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	686	232	458			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	686	232	458			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	97	99			
cM capacity (veh/h)	380	774	1110			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	38	151	276	296	159
Volume Left	11	13	0	0	0
Volume Right	27	0	0	0	11
cSH	596	1110	1700	1700	1700
Volume to Capacity	0.06	0.01	0.16	0.17	0.09
Queue Length 95th (m)	1.5	0.3	0.0	0.0	0.0
Control Delay (s/veh)	11.5	0.8	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	11.5	0.3		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	29.8%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix D

Background Development Trip Reference

823 King Street
Town of Midland

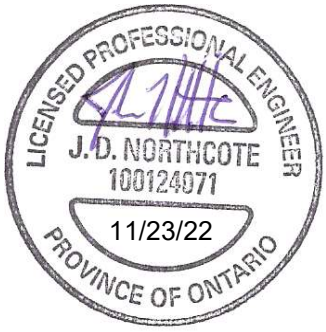
Traffic Impact Study for
Pratt Development Inc.

Type of Document:
Final Report

Project Number:
JDE – 22041

Date Submitted:
November 23rd, 2022

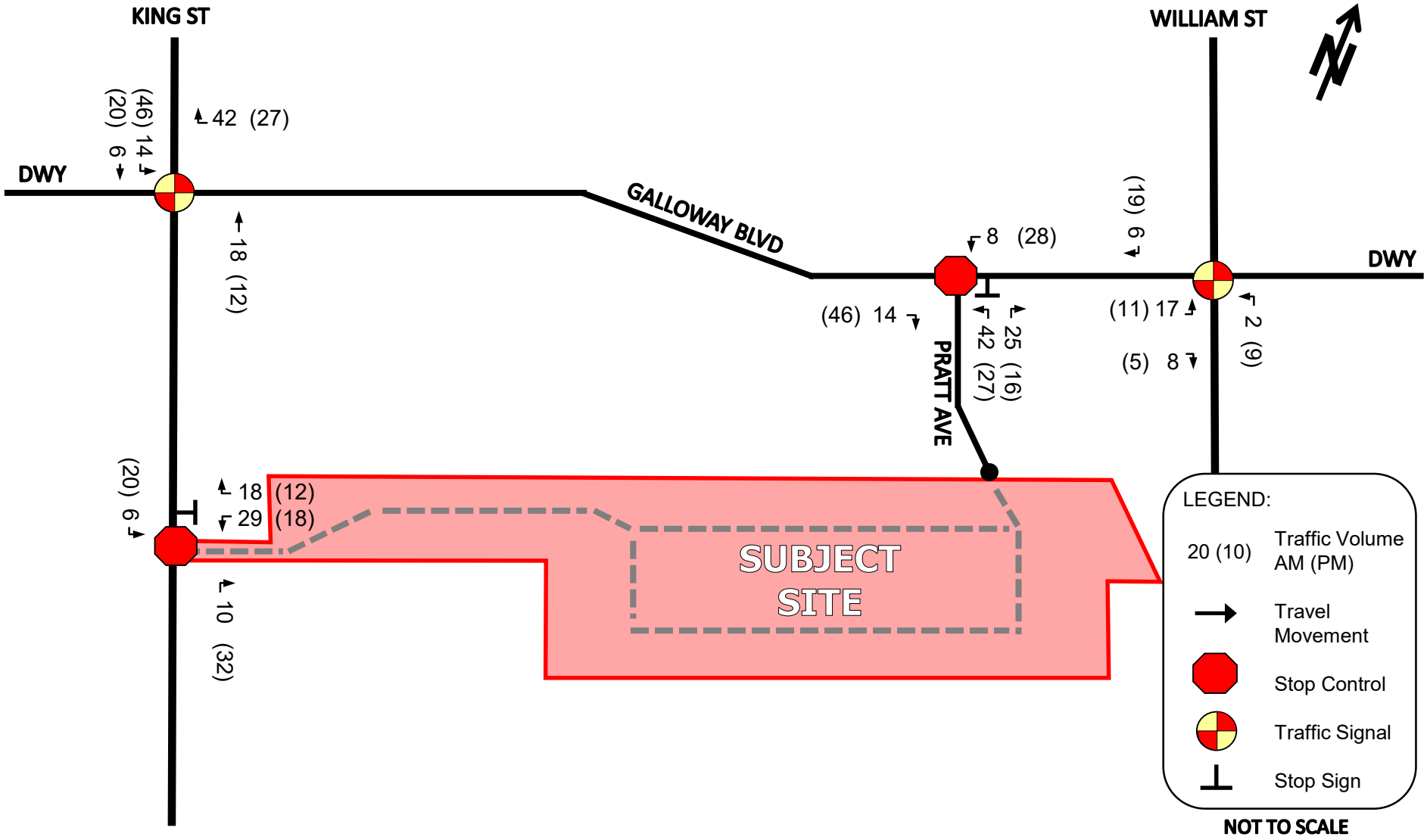
John Northcote, P.Eng.
Professional License #: 100124071



ENGINEERING

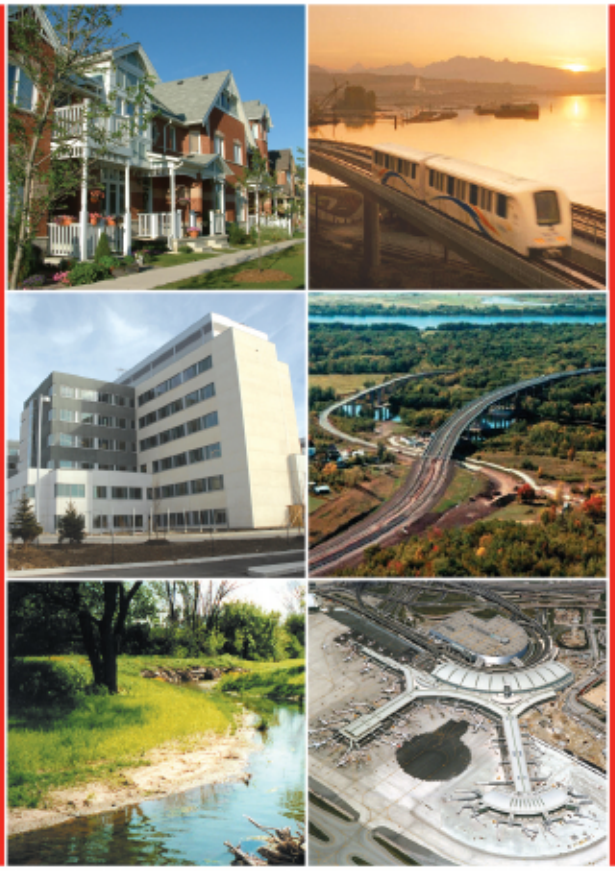
JD Northcote Engineering Inc.
86 Cumberland Street
Barrie, ON
705.725.4035
www.JDEngineering.ca

Figure 19: Site Traffic Assignment



ENGINEERING

MMM Group Limited



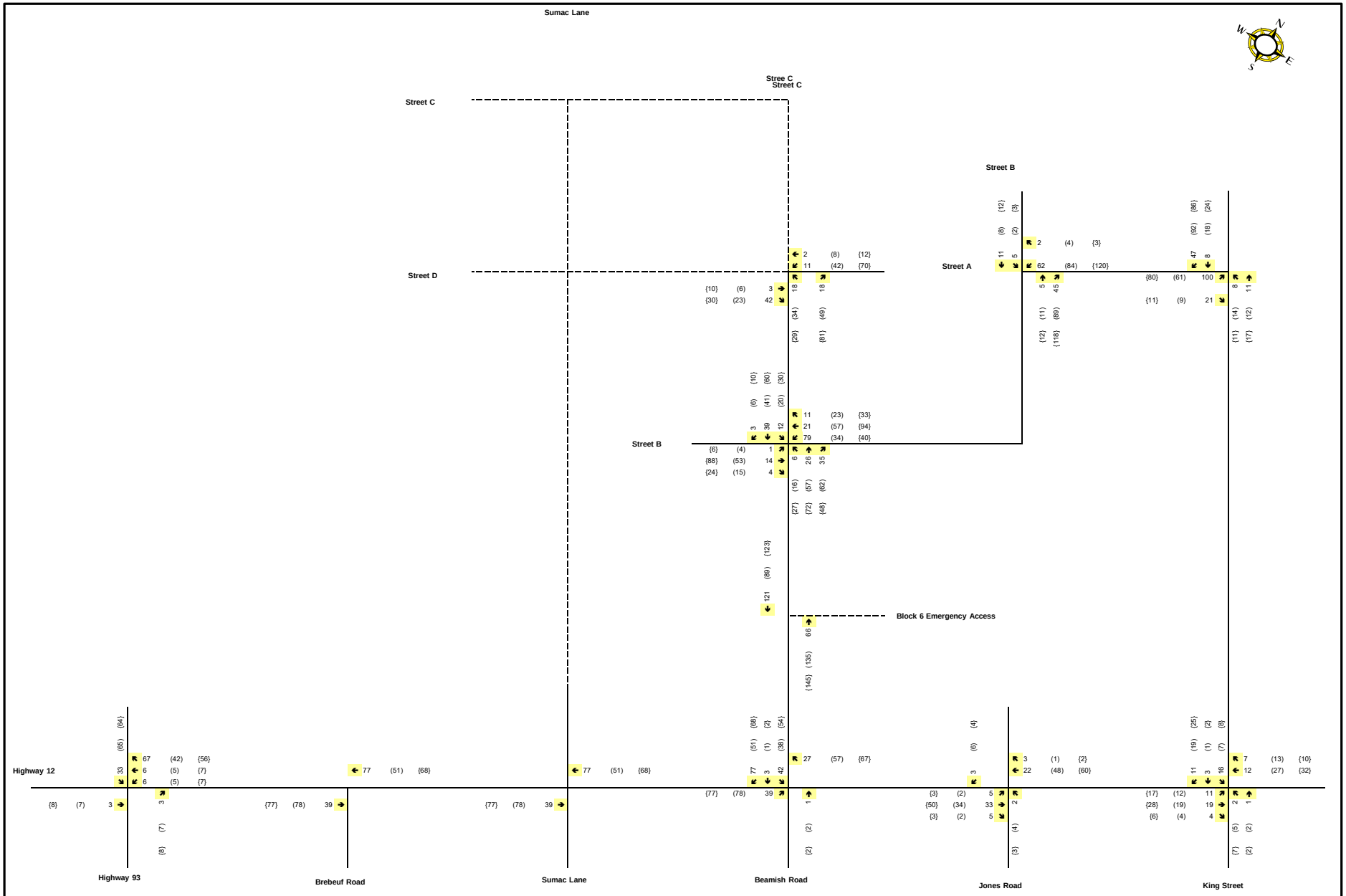
Hanson Development, Town of Midland

Traffic Impact Study

COMMUNITIES
TRANSPORTATION
BUILDINGS
INFRASTRUCTURE

MMM GROUP

August 2016 | 10-04062



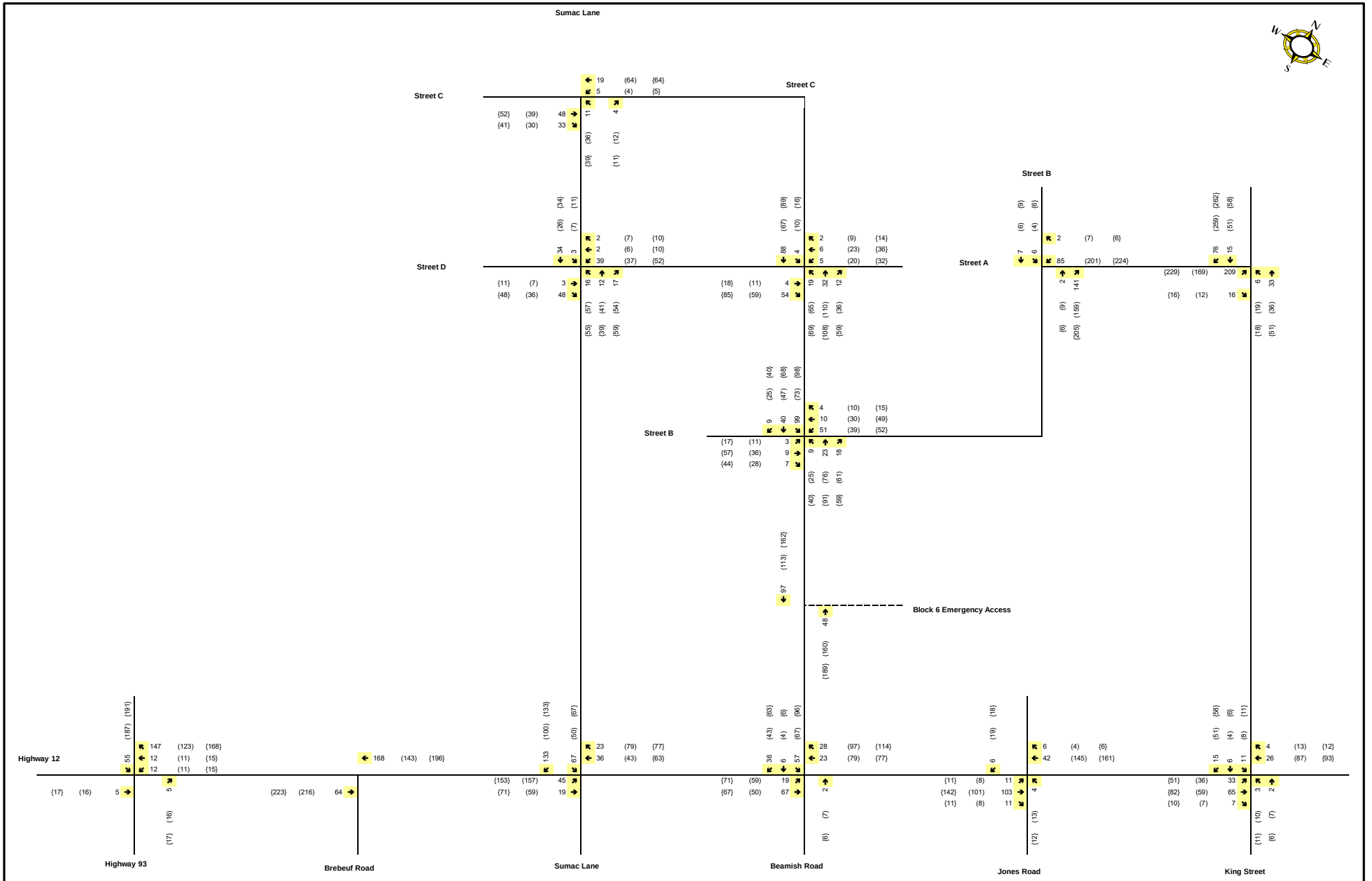
MMM GROUP

LEGEND

XX AM Peak Hour Volumes
(XX) PM Peak Hour Volumes
{XX} Saturday Peak Hour Volumes

FIGURE 9

Trip Assignment for Phase 1



MMM GROUP

LEGEND

XX AM Peak Hour Volumes
(XX) PM Peak Hour Volumes
{XX} Saturday Peak Hour Volumes

FIGURE 10
Trip Assignment for Phases 1, 2 and 3

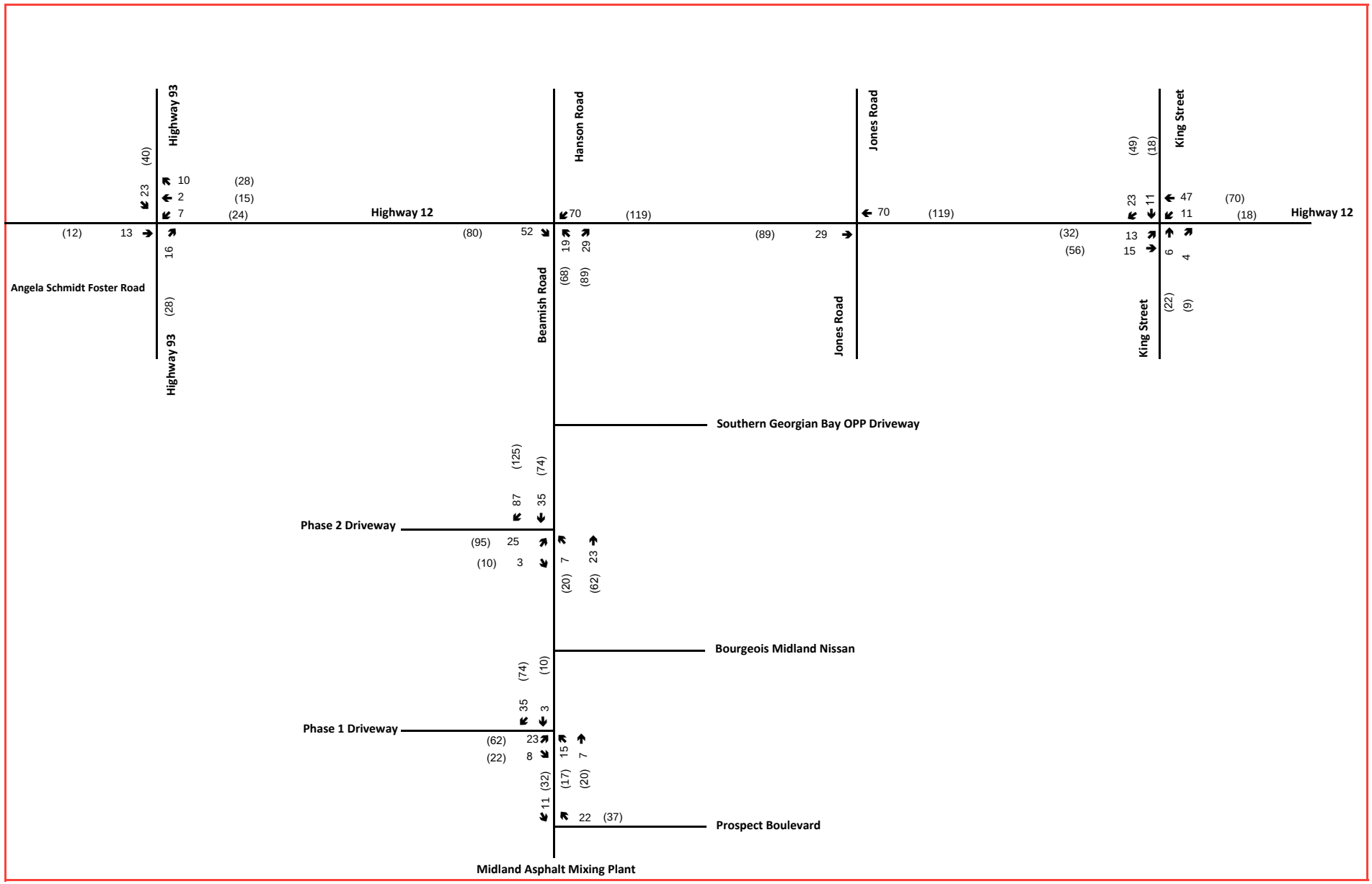
COLAND DEVELOPMENT CORPORATION

PROPOSED MIXED-USE DEVELOPMENT - 16928 HERITAGE DRIVE (HIGHWAY 12), TOWN OF MIDLAND

TRAFFIC IMPACT STUDY UPDATE

SEPTEMBER 29, 2021

FINAL



Legend

xx A.M. Peak Hour Traffic Volumes

(xx) P.M. Peak Hour Traffic Volumes

→ Movement

Figure 3.4
Total Net Site Traffic Volumes

Transportation Impact Assessment for

Proposed Gas Station

16621 ON HWY12, Midland, ON

Ref. No: DES21-03-13A
May 15, 2021

Prepared for: 2825951 ONTARIO Ltd.

By: Frontop Engineering Limited

3. TRAVEL DEMAND FORCASTING

3.1 Development-Generated Traffic

The trip generation for this development was computed based on the 10th edition of the ITE Trip Generation Manual. The expected trips generated by the site were computed based on peak hour traffic on adjacent streets, and considering the existing neighbor gas station along the HWY 12. The trip generation calculations are provided in Table 4 below.

Table 3 Trip Generation Calculations

Land Use	Code	1000sq-ft GFA	Period	Trips/h
Gas Station	945	5.737	AM	43
			PM	59

The total adjusted trips that have impacts to adjacent streets are summarized in Table 4.

Table 4 Volume Added to Adjacent Streets Inbound / Outbound Tip Distribution

Period	Total	Inbound	Outbound
AM	43	22	21
PM	59	30	29

3.2 Background Traffic

A review of historic traffic counts, as well as Master Plan of town of Midland was reviewed to determine an appropriate background growth rate along the study area roadways.

Based on the historic traffic counts (2020 at HWY12), traffic volumes generally had a growth of 1.25% annually along the study area roadways. This is consistent with the prediction of 2025 Transportation Master Plan.

16533 Highway 12
Town of Midland

Traffic Impact Study for
Pratt Development Inc.

Type of Document:
Final Report

Project Number:
JDE – 20066

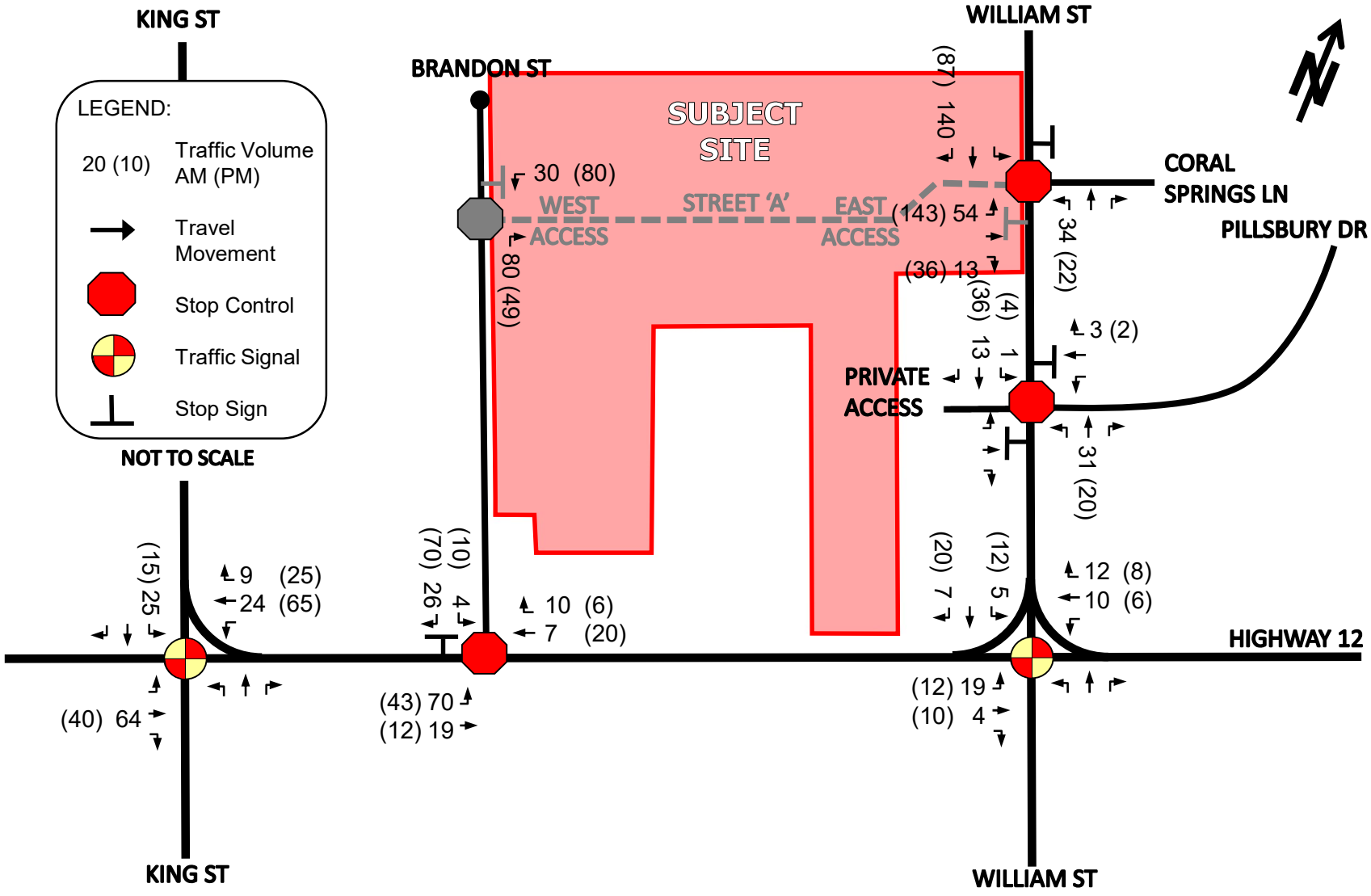
Date Submitted:
October 16th, 2020
Revised November 23rd, 2022

John Northcote, P.Eng.
Professional License #: 100124071

ENGINEERING

JD Northcote Engineering Inc.
86 Cumberland Street
Barrie, ON
705.725.4035
www.JDEngineering.ca

Figure 17: Site Traffic Assignment



ENGINEERING

TATHAM ENGINEERING

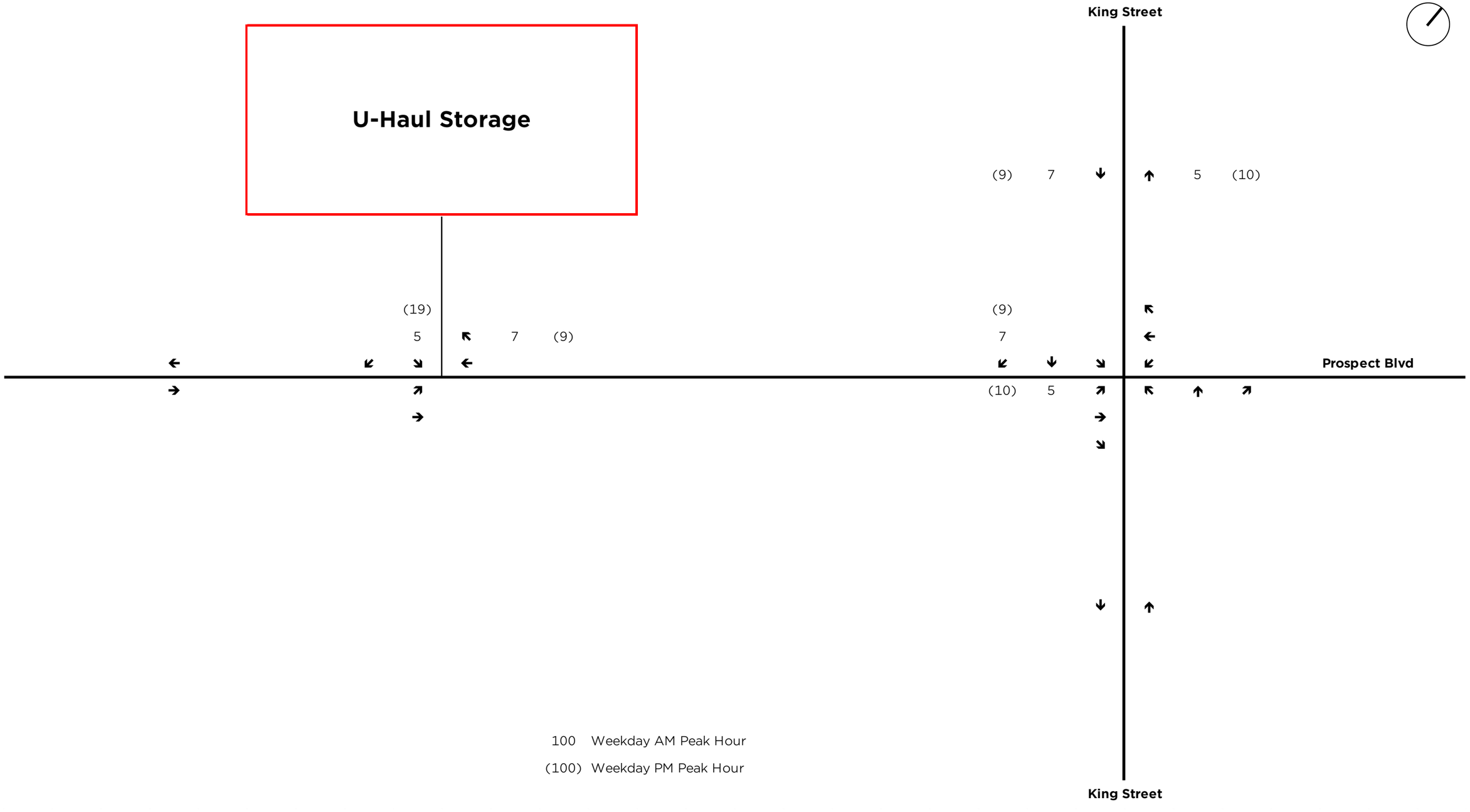
Enhancing our communities

16728 Highway 12

TRANSPORTATION IMPACT BRIEF

U-Haul Moving & Storage

File 324816 | April 14, 2025



16728 HIGHWAY 12 – TRANSPORTATION IMPACT BRIEF

Figure 7: Site Generated Traffic

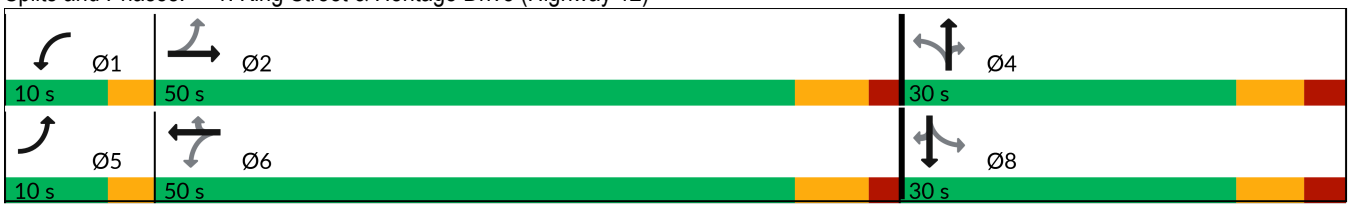
Appendix E

Future Background (2027) Traffic Conditions – Synchro Reports

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	159	383	30	376	82	10	26	24	86	37	204
Future Volume (vph)	159	383	30	376	82	10	26	24	86	37	204
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		6	4		4	8		8
Detector Phase	5	2	1	6	6	4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0	38.0	17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0	50.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%	55.6%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0	2.0	2.8	2.8	2.8	2.8	2.8	2.8
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
Total Lost Time (s)	3.0	7.0	3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Ped	None	Ped	Ped	None	None	None	None	None	None
Act Effct Green (s)	43.9	37.2	42.1	31.1	31.1	11.8	11.8	11.8	11.8	11.8	11.8
Actuated g/C Ratio	0.65	0.55	0.63	0.46	0.46	0.18	0.18	0.18	0.18	0.18	0.18
v/c Ratio	0.30	0.25	0.06	0.28	0.13	0.06	0.12	0.09	0.43	0.14	0.52
Control Delay (s/veh)	5.8	9.6	4.6	12.1	3.4	23.2	23.8	0.5	30.2	24.0	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	5.8	9.6	4.6	12.1	3.4	23.2	23.8	0.5	30.2	24.0	7.8
LOS	A	A	A	B	A	C	C	A	C	C	A
Approach Delay (s/veh)		8.5		10.2			14.3			15.5	
Approach LOS		A		B			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 67.2	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay (s/veh): 10.9	Intersection LOS: B
Intersection Capacity Utilization 56.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	196	495	37	464	101	12	32	30	106	46	252
v/c Ratio	0.30	0.25	0.06	0.28	0.13	0.06	0.12	0.09	0.43	0.14	0.52
Control Delay (s/veh)	5.8	9.6	4.6	12.1	3.4	23.2	23.8	0.5	30.2	24.0	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	5.8	9.6	4.6	12.1	3.4	23.2	23.8	0.5	30.2	24.0	7.8
Queue Length 50th (m)	6.7	11.8	1.2	16.9	0.0	1.5	4.0	0.0	11.9	4.9	0.0
Queue Length 95th (m)	15.1	28.8	4.0	26.8	5.9	5.3	10.1	0.0	21.9	11.1	11.4
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	660	2255	662	2316	1073	392	537	554	478	650	705
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.22	0.06	0.20	0.09	0.03	0.06	0.05	0.22	0.07	0.36

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	383	18	30	376	82	10	26	24	86	37	204
Future Volume (vph)	159	383	18	30	376	82	10	26	24	86	37	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3516		1825	3614	1617	1511	1588	1471	1825	1921	1586
Flt Permitted	0.44	1.00		0.47	1.00	1.00	0.73	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	854	3516		905	3614	1617	1156	1588	1471	1415	1921	1586
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	196	473	22	37	464	101	12	32	30	106	46	252
RTOR Reduction (vph)	0	3	0	0	0	53	0	0	25	0	0	209
Lane Group Flow (vph)	196	492	0	37	464	48	12	32	5	106	46	43
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)	42.9	37.2		35.6	32.9	32.9	11.8	11.8	11.8	11.8	11.8	11.8
Effective Green, g (s)	42.9	37.2		35.6	32.9	32.9	11.8	11.8	11.8	11.8	11.8	11.8
Actuated g/C Ratio	0.62	0.54		0.52	0.48	0.48	0.17	0.17	0.17	0.17	0.17	0.17
Clearance Time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	629	1895		502	1723	771	197	271	251	241	328	271
v/s Ratio Prot	c0.03	0.14		0.00	0.13			0.02			0.02	
v/s Ratio Perm	c0.16			0.04		0.03	0.01		0.00	c0.07		0.03
v/c Ratio	0.31	0.26		0.07	0.27	0.06	0.06	0.12	0.02	0.44	0.14	0.16
Uniform Delay, d1	5.6	8.5		8.3	10.8	9.7	24.0	24.2	23.8	25.6	24.3	24.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.2		0.1	0.2	0.1	0.1	0.2	0.0	1.3	0.2	0.3
Delay (s)	5.9	8.7		8.3	11.0	9.8	24.1	24.4	23.8	26.9	24.5	24.6
Level of Service	A	A		A	B	A	C	C	C	C	C	C
Approach Delay (s/veh)		7.9			10.7			24.1			25.2	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	69.0	Sum of lost time (s)	17.3
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	11	10	256	316	4
Future Volume (Veh/h)	11	11	10	256	316	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	13	13	12	312	385	5
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	570	197	392			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	570	197	392			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	98	99			
cM capacity (veh/h)	451	816	1175			

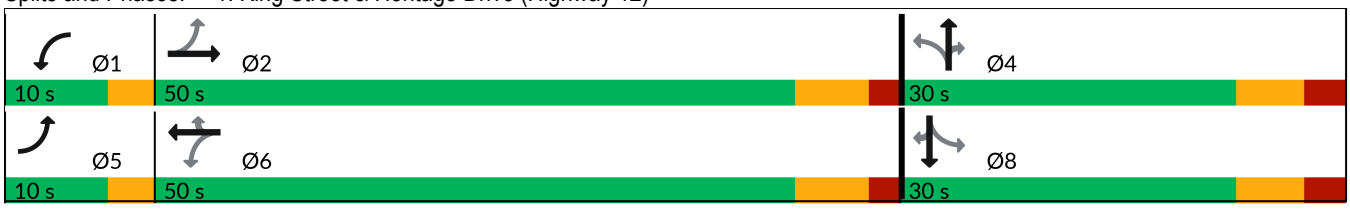
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	26	116	208	257	133
Volume Left	13	12	0	0	0
Volume Right	13	0	0	0	5
cSH	581	1175	1700	1700	1700
Volume to Capacity	0.04	0.01	0.12	0.15	0.08
Queue Length 95th (m)	1.1	0.2	0.0	0.0	0.0
Control Delay (s/veh)	11.5	0.9	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	11.5	0.3		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	24.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	370	669	48	704	192	25	59	44	143	63	410
Future Volume (vph)	370	669	48	704	192	25	59	44	143	63	410
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		6	4		4	8		8
Detector Phase	5	2	1	6	6	4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0	38.0	17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0	50.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%	55.6%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0	2.0	2.8	2.8	2.8	2.8	2.8	2.8
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
Total Lost Time (s)	3.0	7.0	3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Ped	None	Ped	Ped	None	None	None	None	None	None
Act Effct Green (s)	46.7	38.7	45.3	34.2	34.2	16.0	16.0	16.0	16.0	16.0	16.0
Actuated g/C Ratio	0.62	0.52	0.61	0.46	0.46	0.21	0.21	0.21	0.21	0.21	0.21
v/c Ratio	0.83	0.40	0.09	0.45	0.24	0.11	0.19	0.12	0.52	0.16	0.79
Control Delay (s/veh)	27.5	13.5	6.3	15.5	2.9	25.4	25.8	2.6	33.2	25.3	21.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	27.5	13.5	6.3	15.5	2.9	25.4	25.8	2.6	33.2	25.3	21.9
LOS	C	B	A	B	A	C	C	A	C	C	C
Approach Delay (s/veh)		18.4		12.5			17.8			24.9	
Approach LOS		B		B			B			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 74.8	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay (s/veh): 17.8	Intersection LOS: B
Intersection Capacity Utilization 71.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	394	725	51	749	204	27	63	47	152	67	436
v/c Ratio	0.83	0.40	0.09	0.45	0.24	0.11	0.19	0.12	0.52	0.16	0.79
Control Delay (s/veh)	27.5	13.5	6.3	15.5	2.9	25.4	25.8	2.6	33.2	25.3	21.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	27.5	13.5	6.3	15.5	2.9	25.4	25.8	2.6	33.2	25.3	21.9
Queue Length 50th (m)	21.3	35.1	2.2	36.0	0.0	3.4	8.0	0.0	17.8	7.2	19.2
Queue Length 95th (m)	#66.3	56.6	6.9	57.6	10.7	11.7	21.6	3.0	39.9	19.1	60.0
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	475	2061	542	2108	1028	350	489	511	423	591	678
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.35	0.09	0.36	0.20	0.08	0.13	0.09	0.36	0.11	0.64

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	370	669	12	48	704	192	25	59	44	143	63	410
Future Volume (vph)	370	669	12	48	704	192	25	59	44	143	63	410
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3532		1825	3614	1617	1513	1588	1471	1825	1921	1588
Flt Permitted	0.30	1.00		0.38	1.00	1.00	0.71	1.00	1.00	0.72	1.00	1.00
Satd. Flow (perm)	571	3532		723	3614	1617	1136	1588	1471	1375	1921	1588
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	394	712	13	51	749	204	27	63	47	152	67	436
RTOR Reduction (vph)	0	1	0	0	0	109	0	0	37	0	0	215
Lane Group Flow (vph)	394	724	0	51	749	95	27	63	10	152	67	221
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)	45.6	38.7		39.4	35.5	35.5	16.0	16.0	16.0	16.0	16.0	16.0
Effective Green, g (s)	45.6	38.7		39.4	35.5	35.5	16.0	16.0	16.0	16.0	16.0	16.0
Actuated g/C Ratio	0.60	0.51		0.52	0.47	0.47	0.21	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	460	1800		431	1690	756	239	334	310	289	404	334
v/s Ratio Prot	c0.08	0.20		0.01	0.21			0.04			0.03	
v/s Ratio Perm	c0.43			0.06		0.06	0.02		0.01	0.11		c0.14
v/c Ratio	0.86	0.40		0.12	0.44	0.13	0.11	0.19	0.03	0.53	0.17	0.66
Uniform Delay, d1	9.6	11.5		9.0	13.6	11.4	24.2	24.6	23.8	26.6	24.5	27.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.5	0.4		0.1	0.4	0.2	0.2	0.3	0.0	1.7	0.2	4.9
Delay (s)	24.1	11.8		9.2	14.0	11.6	24.4	24.9	23.8	28.3	24.7	32.4
Level of Service	C	B		A	B	B	C	C	C	C	C	C
Approach Delay (s/veh)		16.2			13.3			24.4			30.6	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	75.9	Sum of lost time (s)	17.3
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	18	19	602	596	16
Future Volume (Veh/h)	14	18	19	602	596	16
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	16	20	21	676	670	18
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	1061	346	690			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1061	346	690			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	97	98			
cM capacity (veh/h)	217	655	912			

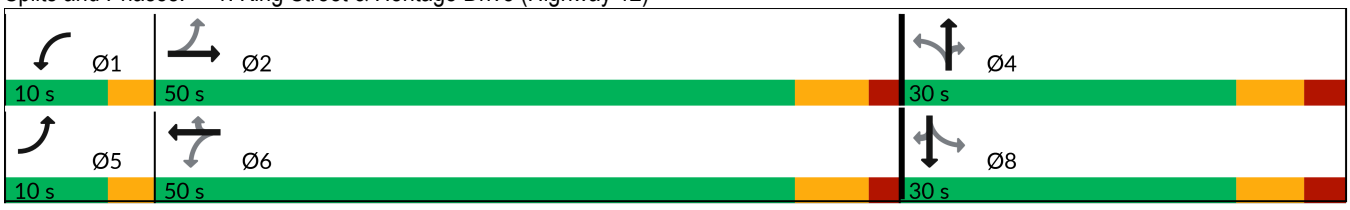
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	36	246	451	447	241
Volume Left	16	21	0	0	0
Volume Right	20	0	0	0	18
cSH	345	912	1700	1700	1700
Volume to Capacity	0.10	0.02	0.27	0.26	0.14
Queue Length 95th (m)	2.6	0.5	0.0	0.0	0.0
Control Delay (s/veh)	16.7	1.0	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s/veh)	16.7	0.3		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	40.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	292	562	39	595	143	11	73	35	137	48	368
Future Volume (vph)	292	562	39	595	143	11	73	35	137	48	368
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		6	4		4	8		8
Detector Phase	5	2	1	6	6	4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0	38.0	17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0	50.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%	55.6%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0	2.0	2.8	2.8	2.8	2.8	2.8	2.8
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
Total Lost Time (s)	3.0	7.0	3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Ped	None	Ped	Ped	None	None	None	None	None	None
Act Effct Green (s)	44.2	36.1	42.9	31.8	31.8	14.0	14.0	14.0	14.0	14.0	14.0
Actuated g/C Ratio	0.63	0.51	0.61	0.45	0.45	0.20	0.20	0.20	0.20	0.20	0.20
v/c Ratio	0.55	0.33	0.07	0.38	0.18	0.05	0.24	0.10	0.53	0.13	0.66
Control Delay (s/veh)	10.6	12.4	5.8	14.2	3.3	22.5	25.2	0.9	32.4	23.4	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	10.6	12.4	5.8	14.2	3.3	22.5	25.2	0.9	32.4	23.4	11.5
LOS	B	B	A	B	A	C	C	A	C	C	B
Approach Delay (s/veh)		11.8		11.8			17.8			17.7	
Approach LOS		B		B			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 70.3	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay (s/veh): 13.5	Intersection LOS: B
Intersection Capacity Utilization 66.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	304	594	41	620	149	11	76	36	143	50	383
v/c Ratio	0.55	0.33	0.07	0.38	0.18	0.05	0.24	0.10	0.53	0.13	0.66
Control Delay (s/veh)	10.6	12.4	5.8	14.2	3.3	22.5	25.2	0.9	32.4	23.4	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	10.6	12.4	5.8	14.2	3.3	22.5	25.2	0.9	32.4	23.4	11.5
Queue Length 50th (m)	13.5	25.5	1.6	26.4	0.0	1.4	9.7	0.0	16.6	5.4	6.4
Queue Length 95th (m)	32.3	45.0	5.9	46.3	9.7	5.8	22.4	0.9	33.8	13.6	30.4
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	552	2176	601	2224	1052	375	516	535	441	624	735
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.27	0.07	0.28	0.14	0.03	0.15	0.07	0.32	0.08	0.52

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	292	562	9	39	595	143	11	73	35	137	48	368
Future Volume (vph)	292	562	9	39	595	143	11	73	35	137	48	368
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3534		1825	3614	1617	1512	1588	1471	1825	1921	1588
Flt Permitted	0.37	1.00		0.43	1.00	1.00	0.72	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	701	3534		821	3614	1617	1153	1588	1471	1359	1921	1588
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	304	585	9	41	620	149	11	76	36	143	50	383
RTOR Reduction (vph)	0	1	0	0	0	80	0	0	29	0	0	260
Lane Group Flow (vph)	304	593	0	41	620	69	11	76	7	143	50	123
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)	43.1	36.1		37.1	33.1	33.1	14.0	14.0	14.0	14.0	14.0	14.0
Effective Green, g (s)	43.1	36.1		37.1	33.1	33.1	14.0	14.0	14.0	14.0	14.0	14.0
Actuated g/C Ratio	0.60	0.51		0.52	0.46	0.46	0.20	0.20	0.20	0.20	0.20	0.20
Clearance Time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	533	1786		482	1675	749	226	311	288	266	376	311
v/s Ratio Prot	c0.06	0.17		0.00	0.17			0.05			0.03	
v/s Ratio Perm	c0.29			0.04		0.04	0.01		0.00	c0.11		0.08
v/c Ratio	0.57	0.33		0.09	0.37	0.09	0.05	0.24	0.02	0.54	0.13	0.39
Uniform Delay, d1	7.0	10.5		8.4	12.4	10.7	23.3	24.2	23.2	25.8	23.7	25.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	0.3		0.1	0.3	0.1	0.1	0.4	0.0	2.1	0.2	0.8
Delay (s)	8.4	10.7		8.5	12.7	10.9	23.4	24.6	23.2	27.9	23.9	25.8
Level of Service	A	B		A	B	B	C	C	C	C	C	C
Approach Delay (s/veh)		10.0			12.2			24.1			26.2	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	71.4	Sum of lost time (s)	17.3
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	25	12	495	527	10
Future Volume (Veh/h)	10	25	12	495	527	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	11	27	13	527	561	11
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	858	288	574			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	858	288	574			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	96	99			
cM capacity (veh/h)	295	713	1007			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	38	189	351	374	198
Volume Left	11	13	0	0	0
Volume Right	27	0	0	0	11
cSH	506	1007	1700	1700	1700
Volume to Capacity	0.08	0.01	0.21	0.22	0.12
Queue Length 95th (m)	1.8	0.3	0.0	0.0	0.0
Control Delay (s/veh)	12.7	0.7	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	12.7	0.2		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	32.3%	ICU Level of Service	A
Analysis Period (min)	15		

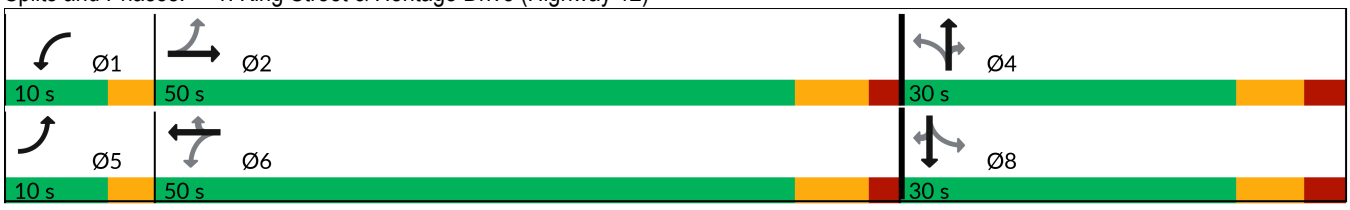
Appendix F

Future Background (2032) Traffic Conditions – Synchro Reports

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	187	435	32	424	97	13	27	26	111	40	247
Future Volume (vph)	187	435	32	424	97	13	27	26	111	40	247
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		6	4		4	8		8
Detector Phase	5	2	1	6	6	4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0	38.0	17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0	50.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%	55.6%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0	2.0	2.8	2.8	2.8	2.8	2.8	2.8
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
Total Lost Time (s)	3.0	7.0	3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Ped	None	Ped	Ped	None	None	None	None	None	None
Act Effct Green (s)	43.3	35.2	42.1	31.1	31.1	13.1	13.1	13.1	13.1	13.1	13.1
Actuated g/C Ratio	0.63	0.51	0.61	0.45	0.45	0.19	0.19	0.19	0.19	0.19	0.19
v/c Ratio	0.38	0.31	0.06	0.32	0.15	0.07	0.11	0.09	0.51	0.13	0.55
Control Delay (s/veh)	7.2	11.7	5.3	13.2	3.4	22.7	23.0	0.5	31.6	23.3	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	7.2	11.7	5.3	13.2	3.4	22.7	23.0	0.5	31.6	23.3	7.4
LOS	A	B	A	B	A	C	C	A	C	C	A
Approach Delay (s/veh)		10.4		11.0			14.1			15.7	
Approach LOS		B		B			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 68.5	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay (s/veh): 12.0	Intersection LOS: B
Intersection Capacity Utilization 58.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	231	567	40	523	120	16	33	32	137	49	305
v/c Ratio	0.38	0.31	0.06	0.32	0.15	0.07	0.11	0.09	0.51	0.13	0.55
Control Delay (s/veh)	7.2	11.7	5.3	13.2	3.4	22.7	23.0	0.5	31.6	23.3	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	7.2	11.7	5.3	13.2	3.4	22.7	23.0	0.5	31.6	23.3	7.4
Queue Length 50th (m)	9.6	23.4	1.5	21.2	0.0	2.0	4.1	0.0	15.8	5.2	0.0
Queue Length 95th (m)	19.5	35.1	4.7	32.1	6.6	6.3	10.3	0.0	27.1	11.5	11.7
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	615	2210	618	2272	1061	383	527	544	469	637	731
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.26	0.06	0.23	0.11	0.04	0.06	0.06	0.29	0.08	0.42

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	435	24	32	424	97	13	27	26	111	40	247
Future Volume (vph)	187	435	24	32	424	97	13	27	26	111	40	247
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3510		1825	3614	1617	1512	1588	1471	1825	1921	1587
Flt Permitted	0.42	1.00		0.44	1.00	1.00	0.73	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	808	3510		843	3614	1617	1154	1588	1471	1413	1921	1587
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	231	537	30	40	523	120	16	33	32	137	49	305
RTOR Reduction (vph)	0	4	0	0	0	64	0	0	26	0	0	248
Lane Group Flow (vph)	231	563	0	40	523	56	16	33	6	137	49	57
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)	42.3	35.3		36.5	32.4	32.4	13.1	13.1	13.1	13.1	13.1	13.1
Effective Green, g (s)	42.3	35.3		36.5	32.4	32.4	13.1	13.1	13.1	13.1	13.1	13.1
Actuated g/C Ratio	0.61	0.51		0.52	0.46	0.46	0.19	0.19	0.19	0.19	0.19	0.19
Clearance Time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	591	1775		498	1677	750	216	298	276	265	360	297
v/s Ratio Prot	c0.04	0.16		0.00	0.14			0.02			0.03	
v/s Ratio Perm	c0.20			0.04		0.03	0.01		0.00	c0.10		0.04
v/c Ratio	0.39	0.32		0.08	0.31	0.07	0.07	0.11	0.02	0.52	0.14	0.19
Uniform Delay, d1	6.3	10.2		8.1	11.7	10.4	23.4	23.5	23.1	25.5	23.6	23.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.2		0.1	0.3	0.1	0.1	0.2	0.0	1.7	0.2	0.3
Delay (s)	6.7	10.4		8.2	12.0	10.5	23.5	23.7	23.2	27.2	23.8	24.2
Level of Service	A	B		A	B	B	C	C	C	C	C	C
Approach Delay (s/veh)		9.3			11.5			23.4			25.0	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	69.8	Sum of lost time (s)	17.3
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	11	10	300	385	4
Future Volume (Veh/h)	11	11	10	300	385	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.46	0.69	0.83	0.75	0.85	0.50
Hourly flow rate (vph)	24	16	12	400	453	8
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	683	233	463			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	683	233	463			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	98	99			
cM capacity (veh/h)	382	774	1107			

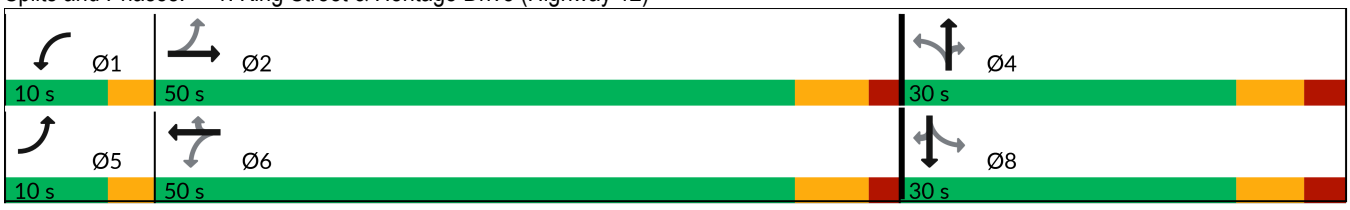
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	40	145	267	302	159
Volume Left	24	12	0	0	0
Volume Right	16	0	0	0	8
cSH	480	1107	1700	1700	1700
Volume to Capacity	0.08	0.01	0.16	0.18	0.09
Queue Length 95th (m)	2.1	0.2	0.0	0.0	0.0
Control Delay (s/veh)	13.2	0.8	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	13.2	0.3		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	25.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	431	771	51	810	222	35	64	48	165	68	482
Future Volume (vph)	431	771	51	810	222	35	64	48	165	68	482
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		6	4		4	8		8
Detector Phase	5	2	1	6	6	4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0	38.0	17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0	50.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%	55.6%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0	2.0	2.8	2.8	2.8	2.8	2.8	2.8
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
Total Lost Time (s)	3.0	7.0	3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Ped	None	Ped	Ped	None	None	None	None	None	None
Act Effct Green (s)	49.1	41.1	47.7	36.6	36.6	19.9	19.9	19.9	19.9	19.9	19.9
Actuated g/C Ratio	0.61	0.51	0.59	0.45	0.45	0.25	0.25	0.25	0.25	0.25	0.25
v/c Ratio	1.15	0.47	0.12	0.53	0.28	0.13	0.17	0.12	0.52	0.15	0.90
Control Delay (s/veh)	110.5	15.3	7.0	17.6	2.8	26.6	26.5	2.9	33.7	26.0	37.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	110.5	15.3	7.0	17.6	2.8	26.6	26.5	2.9	33.7	26.0	37.2
LOS	F	B	A	B	A	C	C	A	C	C	D
Approach Delay (s/veh)		48.9		14.1			18.8			35.3	
Approach LOS		D		B			B			D	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 81.1	
Natural Cycle: 80	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay (s/veh): 32.5	Intersection LOS: C
Intersection Capacity Utilization 79.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	459	841	54	862	236	37	68	51	176	72	513
v/c Ratio	1.15	0.47	0.12	0.53	0.28	0.13	0.17	0.12	0.52	0.15	0.90
Control Delay (s/veh)	110.5	15.3	7.0	17.6	2.8	26.6	26.5	2.9	33.7	26.0	37.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	110.5	15.3	7.0	17.6	2.8	26.6	26.5	2.9	33.7	26.0	37.2
Queue Length 50th (m)	~50.7	51.2	3.2	52.0	0.0	5.1	9.4	0.0	22.9	8.5	42.0
Queue Length 95th (m)	#107.0	67.5	7.1	68.0	11.3	14.7	23.0	4.0	46.2	20.2	#107.5
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	399	1894	455	1939	976	320	449	477	388	544	621
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.15	0.44	0.12	0.44	0.24	0.12	0.15	0.11	0.45	0.13	0.83

Intersection Summary

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	431	771	20	51	810	222	35	64	48	165	68	482
Future Volume (vph)	431	771	20	51	810	222	35	64	48	165	68	482
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3528		1825	3614	1617	1514	1588	1471	1825	1921	1590
Flt Permitted	0.24	1.00		0.31	1.00	1.00	0.71	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	463	3528		590	3614	1617	1132	1588	1471	1369	1921	1590
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	459	820	21	54	862	236	37	68	51	176	72	513
RTOR Reduction (vph)	0	2	0	0	0	127	0	0	39	0	0	180
Lane Group Flow (vph)	459	839	0	54	862	109	37	68	12	176	72	333
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)	48.0	41.1		41.8	37.9	37.9	19.9	19.9	19.9	19.9	19.9	19.9
Effective Green, g (s)	48.0	41.1		41.8	37.9	37.9	19.9	19.9	19.9	19.9	19.9	19.9
Actuated g/C Ratio	0.58	0.50		0.51	0.46	0.46	0.24	0.24	0.24	0.24	0.24	0.24
Clearance Time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	388	1764		358	1666	745	274	384	356	331	465	384
v/s Ratio Prot	c0.10	0.24		0.01	0.24			0.04			0.04	
v/s Ratio Perm	c0.59			0.07		0.07	0.03		0.01	0.13		c0.21
v/c Ratio	1.18	0.48		0.15	0.52	0.15	0.14	0.18	0.03	0.53	0.15	0.87
Uniform Delay, d1	14.1	13.5		10.3	15.7	12.8	24.4	24.7	23.8	27.1	24.5	29.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	105.7	0.5		0.2	0.6	0.2	0.2	0.2	0.0	1.6	0.2	18.1
Delay (s)	119.9	14.0		10.5	16.3	13.0	24.6	24.9	23.8	28.7	24.7	48.0
Level of Service	F	B		B	B	B	C	C	C	C	C	D
Approach Delay (s/veh)		51.4			15.3			24.5			41.3	
Approach LOS		D			B			C			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	35.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	82.2	Sum of lost time (s)	17.3
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	18	19	695	695	16
Future Volume (Veh/h)	14	18	19	695	695	16
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	16	20	21	781	781	18
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	1225	402	801			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1225	402	801			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	97	97			
cM capacity (veh/h)	169	603	829			

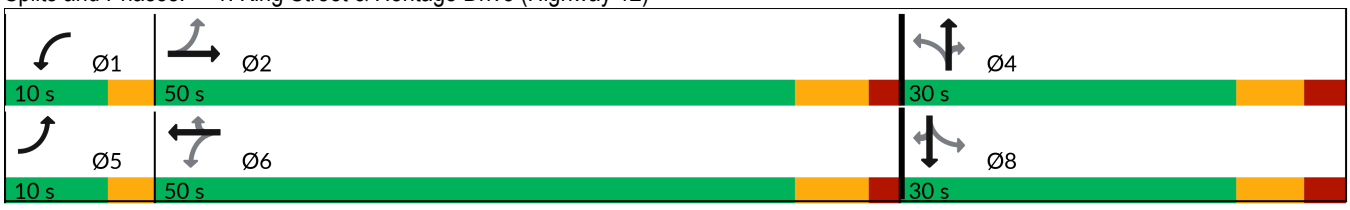
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	36	281	521	521	278
Volume Left	16	21	0	0	0
Volume Right	20	0	0	0	18
cSH	282	829	1700	1700	1700
Volume to Capacity	0.13	0.03	0.31	0.31	0.16
Queue Length 95th (m)	3.3	0.6	0.0	0.0	0.0
Control Delay (s/veh)	19.6	1.0	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s/veh)	19.6	0.3		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	343	639	41	675	171	18	77	37	157	50	427
Future Volume (vph)	343	639	41	675	171	18	77	37	157	50	427
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		6	4		4	8		8
Detector Phase	5	2	1	6	6	4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0	38.0	17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0	50.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%	55.6%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0	2.0	2.8	2.8	2.8	2.8	2.8	2.8
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
Total Lost Time (s)	3.0	7.0	3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Ped	None	Ped	Ped	None	None	None	None	None	None
Act Effct Green (s)	45.6	37.6	44.2	33.1	33.1	15.9	15.9	15.9	15.9	15.9	15.9
Actuated g/C Ratio	0.62	0.51	0.60	0.45	0.45	0.22	0.22	0.22	0.22	0.22	0.22
v/c Ratio	0.72	0.38	0.08	0.43	0.22	0.08	0.23	0.10	0.56	0.13	0.78
Control Delay (s/veh)	18.6	13.5	6.3	15.4	3.1	23.9	25.7	1.1	33.9	24.0	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	18.6	13.5	6.3	15.4	3.1	23.9	25.7	1.1	33.9	24.0	20.4
LOS	B	B	A	B	A	C	C	A	C	C	C
Approach Delay (s/veh)		15.2		12.6			18.5			24.0	
Approach LOS		B		B			B			C	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 73.6		
Natural Cycle: 70		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 0.78		
Intersection Signal Delay (s/veh): 16.6	Intersection LOS: B	
Intersection Capacity Utilization 71.9%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	357	681	43	703	178	19	80	39	164	52	445
v/c Ratio	0.72	0.38	0.08	0.43	0.22	0.08	0.23	0.10	0.56	0.13	0.78
Control Delay (s/veh)	18.6	13.5	6.3	15.4	3.1	23.9	25.7	1.1	33.9	24.0	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	18.6	13.5	6.3	15.4	3.1	23.9	25.7	1.1	33.9	24.0	20.4
Queue Length 50th (m)	18.5	32.2	1.9	32.9	0.0	2.3	10.3	0.0	19.5	5.6	18.3
Queue Length 95th (m)	#48.3	52.8	6.1	53.8	10.2	9.0	25.4	1.4	41.8	15.2	57.0
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	495	2087	556	2135	1028	359	495	517	422	599	694
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.33	0.08	0.33	0.17	0.05	0.16	0.08	0.39	0.09	0.64

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	343	639	14	41	675	171	18	77	37	157	50	427
Future Volume (vph)	343	639	14	41	675	171	18	77	37	157	50	427
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3530		1825	3614	1617	1513	1588	1471	1825	1921	1588
Flt Permitted	0.32	1.00		0.39	1.00	1.00	0.72	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	611	3530		754	3614	1617	1152	1588	1471	1354	1921	1588
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	357	666	15	43	703	178	19	80	39	164	52	445
RTOR Reduction (vph)	0	1	0	0	0	96	0	0	31	0	0	227
Lane Group Flow (vph)	357	680	0	43	703	82	19	80	8	164	52	218
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)	44.5	37.5		38.4	34.4	34.4	15.9	15.9	15.9	15.9	15.9	15.9
Effective Green, g (s)	44.5	37.5		38.4	34.4	34.4	15.9	15.9	15.9	15.9	15.9	15.9
Actuated g/C Ratio	0.60	0.50		0.51	0.46	0.46	0.21	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	479	1772		444	1664	744	245	338	313	288	408	338
v/s Ratio Prot	c0.07	0.19		0.01	0.19			0.05			0.03	
v/s Ratio Perm	c0.37			0.04		0.05	0.02		0.01	0.12		c0.14
v/c Ratio	0.75	0.38		0.10	0.42	0.11	0.08	0.24	0.03	0.57	0.13	0.65
Uniform Delay, d1	8.3	11.5		9.0	13.5	11.5	23.5	24.4	23.3	26.3	23.8	26.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.2	0.3		0.1	0.4	0.2	0.1	0.4	0.0	2.6	0.1	4.2
Delay (s)	14.5	11.8		9.1	13.9	11.6	23.7	24.7	23.3	28.9	23.9	31.0
Level of Service	B	B		A	B	B	C	C	C	C	C	C
Approach Delay (s/veh)		12.7			13.2			24.2			29.9	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	74.7	Sum of lost time (s)	17.3
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	25	12	577	605	10
Future Volume (Veh/h)	10	25	12	577	605	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	11	27	13	614	644	11
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	985	330	657			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	985	330	657			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	96	99			
cM capacity (veh/h)	245	671	938			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	38	218	409	429	226
Volume Left	11	13	0	0	0
Volume Right	27	0	0	0	11
cSH	446	938	1700	1700	1700
Volume to Capacity	0.09	0.01	0.24	0.25	0.13
Queue Length 95th (m)	2.1	0.3	0.0	0.0	0.0
Control Delay (s/veh)	13.8	0.7	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	13.8	0.2		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	34.5%	ICU Level of Service	A
Analysis Period (min)	15		

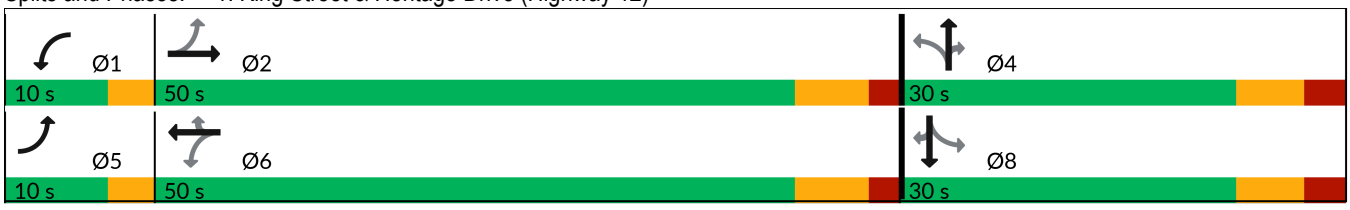
Appendix G

Future Background (2037) Traffic Conditions – Synchro Reports

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	226	527	34	484	103	16	30	28	113	45	272
Future Volume (vph)	226	527	34	484	103	16	30	28	113	45	272
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		6	4		4	8		8
Detector Phase	5	2	1	6	6	4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0	38.0	17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0	50.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%	55.6%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0	2.0	2.8	2.8	2.8	2.8	2.8	2.8
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
Total Lost Time (s)	3.0	7.0	3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Ped	None	Ped	Ped	None	None	None	None	None	None
Act Effct Green (s)	43.8	35.7	42.5	31.4	31.4	13.7	13.7	13.7	13.7	13.7	13.7
Actuated g/C Ratio	0.63	0.51	0.61	0.45	0.45	0.20	0.20	0.20	0.20	0.20	0.20
v/c Ratio	0.49	0.38	0.07	0.37	0.16	0.09	0.12	0.10	0.51	0.15	0.58
Control Delay (s/veh)	9.2	12.6	5.6	13.9	3.4	23.1	23.2	0.8	31.5	23.5	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	9.2	12.6	5.6	13.9	3.4	23.1	23.2	0.8	31.5	23.5	7.4
LOS	A	B	A	B	A	C	C	A	C	C	A
Approach Delay (s/veh)		11.6		11.7			14.6			15.5	
Approach LOS		B		B			B			B	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 69.5		
Natural Cycle: 70		
Control Type: Semi Act-Uncoord		
Maximum v/c Ratio: 0.58		
Intersection Signal Delay (s/veh): 12.6	Intersection LOS: B	
Intersection Capacity Utilization 60.3%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	279	687	42	598	127	20	37	35	140	56	336
v/c Ratio	0.49	0.38	0.07	0.37	0.16	0.09	0.12	0.10	0.51	0.15	0.58
Control Delay (s/veh)	9.2	12.6	5.6	13.9	3.4	23.1	23.2	0.8	31.5	23.5	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	9.2	12.6	5.6	13.9	3.4	23.1	23.2	0.8	31.5	23.5	7.4
Queue Length 50th (m)	11.9	29.8	1.6	24.9	0.0	2.5	4.6	0.0	16.2	6.0	0.1
Queue Length 95th (m)	25.0	44.8	5.1	38.1	6.8	7.5	11.3	0.0	28.3	12.9	12.1
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	568	2184	566	2245	1052	376	521	539	461	630	746
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.31	0.07	0.27	0.12	0.05	0.07	0.06	0.30	0.09	0.45

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	226	527	29	34	484	103	16	30	28	113	45	272
Future Volume (vph)	226	527	29	34	484	103	16	30	28	113	45	272
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3511		1825	3614	1617	1512	1588	1471	1825	1921	1588
Flt Permitted	0.38	1.00		0.39	1.00	1.00	0.72	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	726	3511		750	3614	1617	1147	1588	1471	1408	1921	1588
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	279	651	36	42	598	127	20	37	35	140	56	336
RTOR Reduction (vph)	0	4	0	0	0	68	0	0	28	0	0	270
Lane Group Flow (vph)	279	683	0	42	598	59	20	37	7	140	56	66
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)	42.7	35.7		36.7	32.7	32.7	13.6	13.6	13.6	13.6	13.6	13.6
Effective Green, g (s)	42.7	35.7		36.7	32.7	32.7	13.6	13.6	13.6	13.6	13.6	13.6
Actuated g/C Ratio	0.60	0.51		0.52	0.46	0.46	0.19	0.19	0.19	0.19	0.19	0.19
Clearance Time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	548	1775		450	1673	748	220	305	283	271	370	305
v/s Ratio Prot	c0.05	0.19		0.01	0.17			0.02			0.03	
v/s Ratio Perm	c0.26			0.04		0.04	0.02		0.00	c0.10		0.04
v/c Ratio	0.51	0.38		0.09	0.36	0.08	0.09	0.12	0.02	0.52	0.15	0.21
Uniform Delay, d1	6.7	10.7		8.3	12.2	10.6	23.4	23.6	23.1	25.6	23.7	24.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.3		0.1	0.3	0.1	0.2	0.2	0.0	1.7	0.2	0.4
Delay (s)	7.4	11.0		8.4	12.5	10.7	23.6	23.7	23.2	27.2	23.9	24.4
Level of Service	A	B		A	B	B	C	C	C	C	C	C
Approach Delay (s/veh)		10.0			12.0			23.5			25.1	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	70.6	Sum of lost time (s)	17.3
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	11	10	345	415	4
Future Volume (Veh/h)	11	11	10	345	415	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	13	13	12	421	506	5
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	745	258	513			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	745	258	513			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	98	99			
cM capacity (veh/h)	349	746	1061			

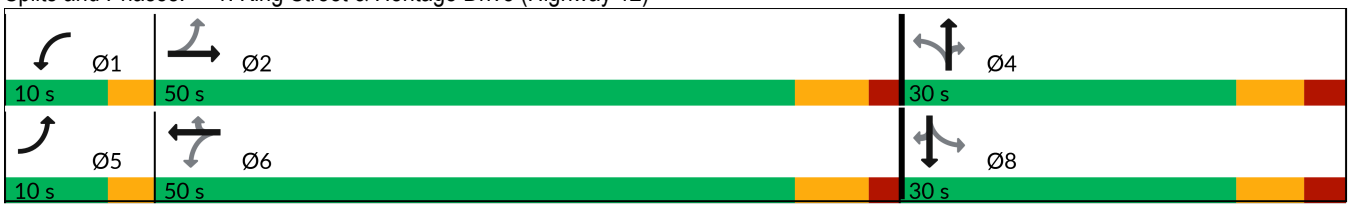
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	26	152	281	337	174
Volume Left	13	12	0	0	0
Volume Right	13	0	0	0	5
cSH	476	1061	1700	1700	1700
Volume to Capacity	0.05	0.01	0.17	0.20	0.10
Queue Length 95th (m)	1.3	0.3	0.0	0.0	0.0
Control Delay (s/veh)	13.0	0.8	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	13.0	0.3		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	26.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	505	913	55	962	244	41	73	52	182	76	558
Future Volume (vph)	505	913	55	962	244	41	73	52	182	76	558
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		6	4		4	8		8
Detector Phase	5	2	1	6	6	4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0	38.0	17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0	50.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%	55.6%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0	2.0	2.8	2.8	2.8	2.8	2.8	2.8
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
Total Lost Time (s)	3.0	7.0	3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Ped	None	Ped	Ped	None	None	None	None	None	None
Act Effct Green (s)	51.1	41.6	50.4	39.4	39.4	22.8	22.8	22.8	22.8	22.8	22.8
Actuated g/C Ratio	0.59	0.48	0.58	0.46	0.46	0.26	0.26	0.26	0.26	0.26	0.26
v/c Ratio	1.65	0.59	0.17	0.62	0.30	0.15	0.19	0.12	0.54	0.16	1.04
Control Delay (s/veh)	322.5	18.3	7.5	19.7	2.8	27.7	27.7	3.3	35.3	27.1	72.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	322.5	18.3	7.5	19.7	2.8	27.7	27.7	3.3	35.3	27.1	72.5
LOS	F	B	A	B	A	C	C	A	D	C	E
Approach Delay (s/veh)		124.7		15.9			20.1			60.0	
Approach LOS		F		B			C			E	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 86.5	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.65	
Intersection Signal Delay (s/veh): 68.4	Intersection LOS: E
Intersection Capacity Utilization 87.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	537	998	59	1023	260	44	78	55	194	81	594
v/c Ratio	1.65	0.59	0.17	0.62	0.30	0.15	0.19	0.12	0.54	0.16	1.04
Control Delay (s/veh)	322.5	18.3	7.5	19.7	2.8	27.7	27.7	3.3	35.3	27.1	72.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	322.5	18.3	7.5	19.7	2.8	27.7	27.7	3.3	35.3	27.1	72.5
Queue Length 50th (m)	~90.3	64.6	3.5	65.6	0.0	6.9	12.4	0.0	29.3	10.9	~86.7
Queue Length 95th (m)	#159.6	83.8	7.7	84.6	11.8	16.9	25.6	4.9	51.0	22.3	#150.0
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	326	1760	353	1801	936	294	417	449	357	505	570
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.65	0.57	0.17	0.57	0.28	0.15	0.19	0.12	0.54	0.16	1.04

Intersection Summary

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	505	913	25	55	962	244	41	73	52	182	76	558
Future Volume (vph)	505	913	25	55	962	244	41	73	52	182	76	558
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3527		1825	3614	1617	1515	1588	1471	1825	1921	1590
Flt Permitted	0.18	1.00		0.21	1.00	1.00	0.70	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	349	3527		410	3614	1617	1123	1588	1471	1357	1921	1590
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	537	971	27	59	1023	260	44	78	55	194	81	594
RTOR Reduction (vph)	0	2	0	0	0	140	0	0	41	0	0	152
Lane Group Flow (vph)	537	996	0	59	1023	120	44	78	14	194	81	442
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)	48.6	41.6		45.6	40.1	40.1	22.8	22.8	22.8	22.8	22.8	22.8
Effective Green, g (s)	48.6	41.6		45.6	40.1	40.1	22.8	22.8	22.8	22.8	22.8	22.8
Actuated g/C Ratio	0.56	0.48		0.52	0.46	0.46	0.26	0.26	0.26	0.26	0.26	0.26
Clearance Time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	312	1682		303	1661	743	293	415	384	354	502	415
v/s Ratio Prot	c0.14	0.28		0.01	0.28			0.05			0.04	
v/s Ratio Perm	c0.82			0.09		0.07	0.04		0.01	0.14		c0.28
v/c Ratio	1.72	0.59		0.19	0.62	0.16	0.15	0.19	0.04	0.55	0.16	1.06
Uniform Delay, d1	15.2	16.6		10.9	17.7	13.7	24.8	25.0	24.0	27.8	24.8	32.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	337.7	0.9		0.3	1.1	0.2	0.2	0.2	0.0	1.7	0.2	62.4
Delay (s)	353.0	17.5		11.2	18.8	14.0	25.0	25.2	24.1	29.5	25.0	94.6
Level of Service	F	B		B	B	B	C	C	C	C	C	F
Approach Delay (s/veh)		134.9			17.5			24.8			73.6	
Approach LOS		F			B			C			E	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	76.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.54		
Actuated Cycle Length (s)	87.2	Sum of lost time (s)	17.3
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	18	19	797	794	16
Future Volume (Veh/h)	14	18	19	797	794	16
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	16	20	21	896	892	18
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	1393	457	912			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1393	457	912			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	96	97			
cM capacity (veh/h)	131	555	754			

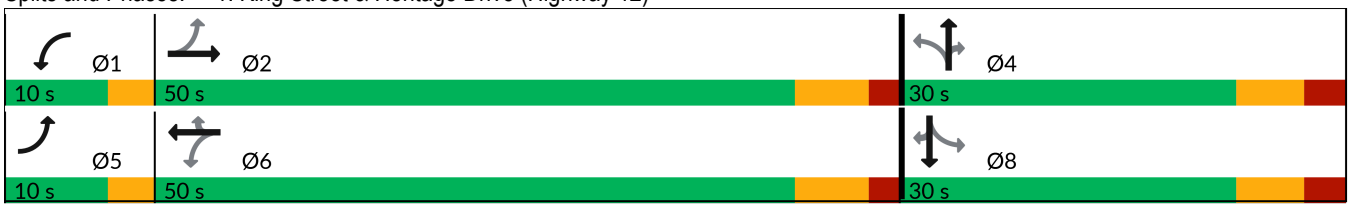
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	36	320	597	595	315
Volume Left	16	21	0	0	0
Volume Right	20	0	0	0	18
cSH	228	754	1700	1700	1700
Volume to Capacity	0.16	0.03	0.35	0.35	0.19
Queue Length 95th (m)	4.2	0.7	0.0	0.0	0.0
Control Delay (s/veh)	23.7	1.0	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s/veh)	23.7	0.3		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	397	749	43	804	184	24	86	40	172	55	495
Future Volume (vph)	397	749	43	804	184	24	86	40	172	55	495
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		6	4		4	8		8
Detector Phase	5	2	1	6	6	4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0	38.0	17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0	50.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%	55.6%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0	2.0	2.8	2.8	2.8	2.8	2.8	2.8
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
Total Lost Time (s)	3.0	7.0	3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Ped	None	Ped	Ped	None	None	None	None	None	None
Act Effct Green (s)	48.2	40.2	46.8	35.7	35.7	19.8	19.8	19.8	19.8	19.8	19.8
Actuated g/C Ratio	0.60	0.50	0.58	0.45	0.45	0.25	0.25	0.25	0.25	0.25	0.25
v/c Ratio	1.02	0.45	0.10	0.52	0.23	0.09	0.23	0.10	0.54	0.12	0.89
Control Delay (s/veh)	66.5	15.2	6.9	17.6	2.9	25.5	26.7	1.6	33.7	25.1	35.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	66.5	15.2	6.9	17.6	2.9	25.5	26.7	1.6	33.7	25.1	35.5
LOS	E	B	A	B	A	C	C	A	C	C	D
Approach Delay (s/veh)		32.7		14.5			19.8			34.3	
Approach LOS		C		B			B			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 80.1	
Natural Cycle: 75	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay (s/veh): 26.3	Intersection LOS: C
Intersection Capacity Utilization 79.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	414	799	45	838	192	25	90	42	179	57	516
v/c Ratio	1.02	0.45	0.10	0.52	0.23	0.09	0.23	0.10	0.54	0.12	0.89
Control Delay (s/veh)	66.5	15.2	6.9	17.6	2.9	25.5	26.7	1.6	33.7	25.1	35.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	66.5	15.2	6.9	17.6	2.9	25.5	26.7	1.6	33.7	25.1	35.5
Queue Length 50th (m)	~36.4	47.9	2.6	50.0	0.0	3.3	12.2	0.0	22.7	6.5	39.8
Queue Length 95th (m)	#85.1	63.4	6.3	65.7	10.3	11.0	28.8	1.9	47.1	16.9	#106.7
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	406	1916	473	1961	965	328	454	482	384	550	630
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.42	0.10	0.43	0.20	0.08	0.20	0.09	0.47	0.10	0.82

Intersection Summary

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	397	749	18	43	804	184	24	86	40	172	55	495
Future Volume (vph)	397	749	18	43	804	184	24	86	40	172	55	495
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3529		1825	3614	1617	1514	1588	1471	1825	1921	1590
Flt Permitted	0.25	1.00		0.33	1.00	1.00	0.72	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	479	3529		630	3614	1617	1147	1588	1471	1342	1921	1590
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	414	780	19	45	838	192	25	90	42	179	57	516
RTOR Reduction (vph)	0	2	0	0	0	105	0	0	32	0	0	185
Lane Group Flow (vph)	414	797	0	45	838	87	25	90	10	179	57	331
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)	47.1	40.2		40.9	37.0	37.0	19.8	19.8	19.8	19.8	19.8	19.8
Effective Green, g (s)	47.1	40.2		40.9	37.0	37.0	19.8	19.8	19.8	19.8	19.8	19.8
Actuated g/C Ratio	0.58	0.50		0.50	0.46	0.46	0.24	0.24	0.24	0.24	0.24	0.24
Clearance Time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	395	1747		374	1646	736	279	387	358	327	468	387
v/s Ratio Prot	c0.09	0.23		0.01	0.23			0.06			0.03	
v/s Ratio Perm	c0.52			0.05		0.05	0.02		0.01	0.13		c0.21
v/c Ratio	1.05	0.46		0.12	0.51	0.12	0.09	0.23	0.03	0.55	0.12	0.85
Uniform Delay, d1	14.1	13.4		10.3	15.7	12.7	23.7	24.6	23.4	26.8	23.9	29.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	58.4	0.5		0.1	0.6	0.2	0.1	0.3	0.0	1.9	0.1	16.6
Delay (s)	72.6	13.8		10.4	16.3	12.9	23.9	24.9	23.4	28.7	24.0	45.9
Level of Service	E	B		B	B	B	C	C	C	C	C	D
Approach Delay (s/veh)		33.9			15.4			24.3			40.1	
Approach LOS		C			B			C			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	28.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	81.2	Sum of lost time (s)	17.3
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	25	12	652	691	10
Future Volume (Veh/h)	10	25	12	652	691	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	11	27	13	694	735	11
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	1116	375	748			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1116	375	748			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	96	99			
cM capacity (veh/h)	201	627	868			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	38	244	463	490	256
Volume Left	11	13	0	0	0
Volume Right	27	0	0	0	11
cSH	389	868	1700	1700	1700
Volume to Capacity	0.10	0.01	0.27	0.29	0.15
Queue Length 95th (m)	2.4	0.3	0.0	0.0	0.0
Control Delay (s/veh)	15.3	0.6	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s/veh)	15.3	0.2		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix H

ITE Trip Generation Manual Source Data

Land Use: 934
Fast-Food Restaurant with Drive-Through Window

Description

This land use includes any fast-food restaurant with a drive-through window. This type of restaurant is characterized by a large drive-through and large carry-out clientele, long hours of service (some are open for breakfast, all are open for lunch and dinner, some are open late at night or 24 hours a day) and high turnover rates for eat-in customers. The restaurant does not provide table service. A patron generally orders from a menu board and pays before receiving the meal. A typical duration of stay for an eat-in patron is less than 30 minutes. Fast casual restaurant (Land Use 930), high-turnover (sit-down) restaurant (Land Use 932), fast-food restaurant without drive-through window (Land Use 933), and fast-food restaurant with drive-through window and no indoor seating (Land Use 935) are related uses.

Additional Data

Users should exercise caution when applying statistics during the AM peak periods, as the sites contained in the database for this land use may or may not be open for breakfast. In cases where it was confirmed that the sites were not open for breakfast, data for the AM peak hour of the adjacent street traffic were removed from the database.

If the restaurant has outdoor seating, its area is not included in the overall gross floor area. For a restaurant that has significant outdoor seating, the number of seats may be more reliable than GFA as an independent variable on which to establish a trip generation rate.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alaska, Alberta (CAN), California, Colorado, Florida, Indiana, Kentucky, Maryland, Massachusetts, Minnesota, Montana, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Dakota, Texas, Vermont, Virginia, Washington, and Wisconsin.

Source Numbers

163, 164, 168, 180, 181, 241, 245, 278, 294, 300, 301, 319, 338, 340, 342, 358, 389, 438, 502, 552, 577, 583, 584, 617, 640, 641, 704, 715, 728, 810, 866, 867, 869, 885, 886, 927, 935, 962, 977, 1050, 1053, 1054

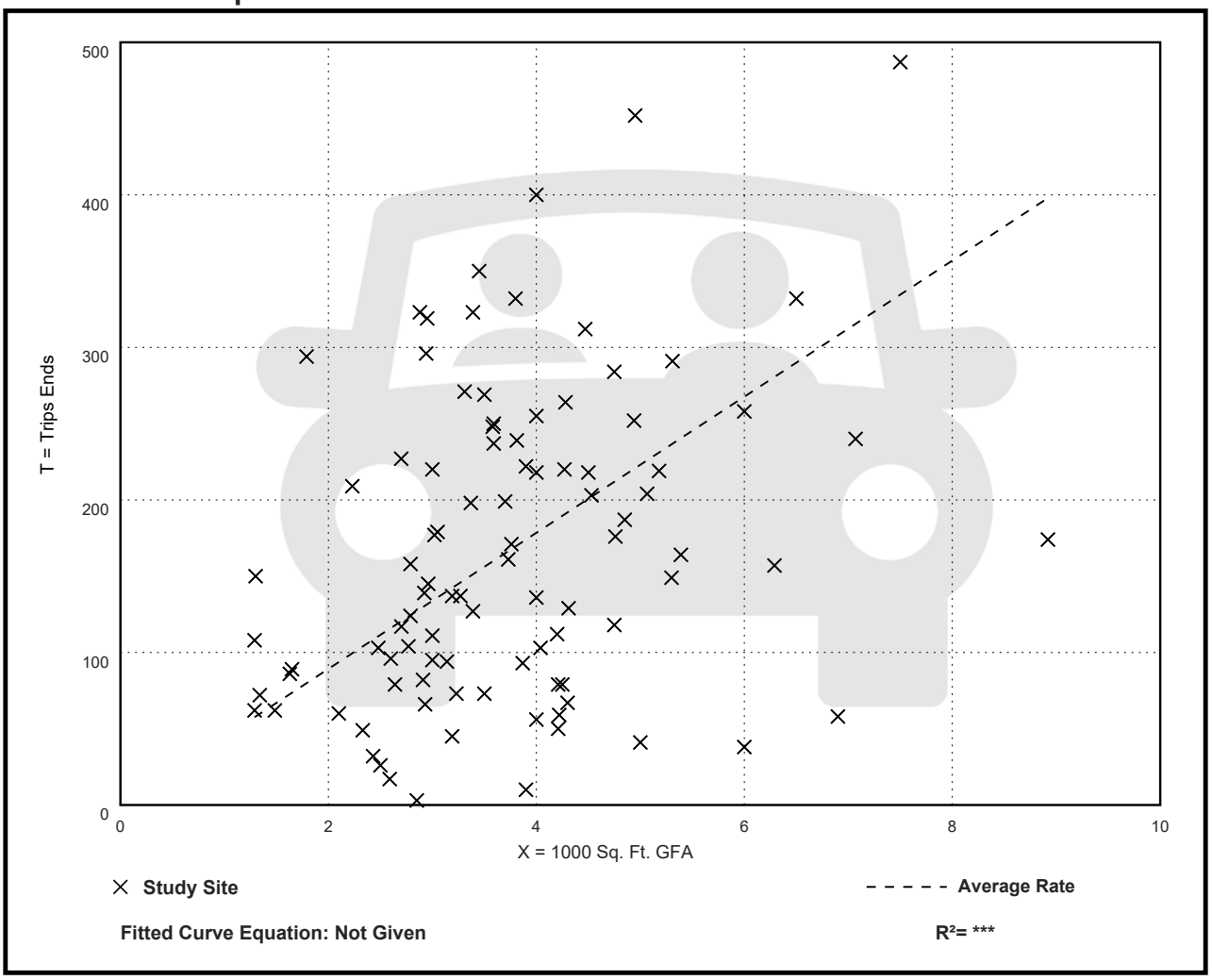
Fast-Food Restaurant with Drive-Through Window (934)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 96
Avg. 1000 Sq. Ft. GFA: 4
Directional Distribution: 51% entering, 49% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
44.61	1.05 - 164.25	27.14

Data Plot and Equation



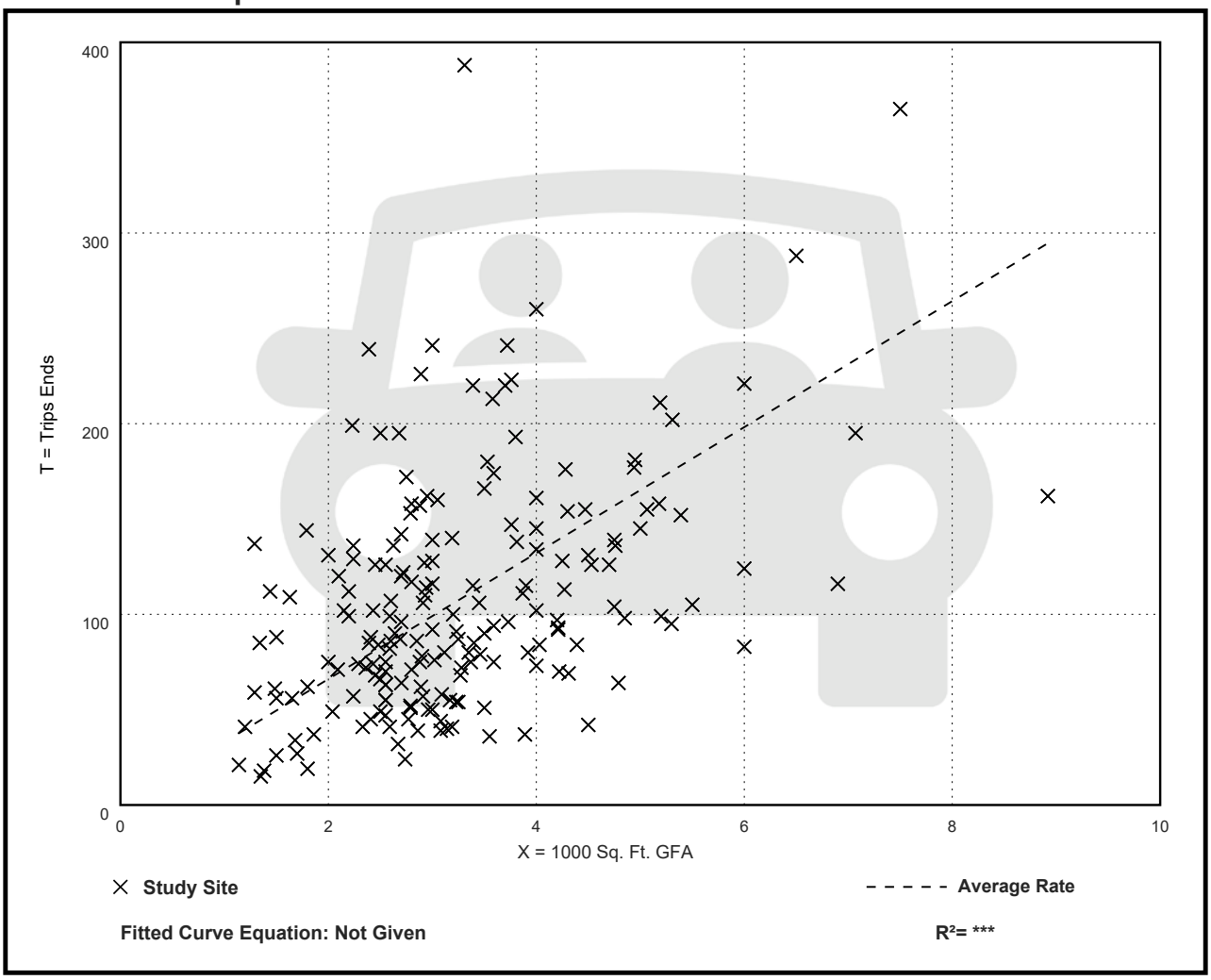
Fast-Food Restaurant with Drive-Through Window (934)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 190
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 52% entering, 48% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
33.03	8.77 - 117.22	17.59

Data Plot and Equation



Fast-Food Restaurant with Drive-Through Window (934)

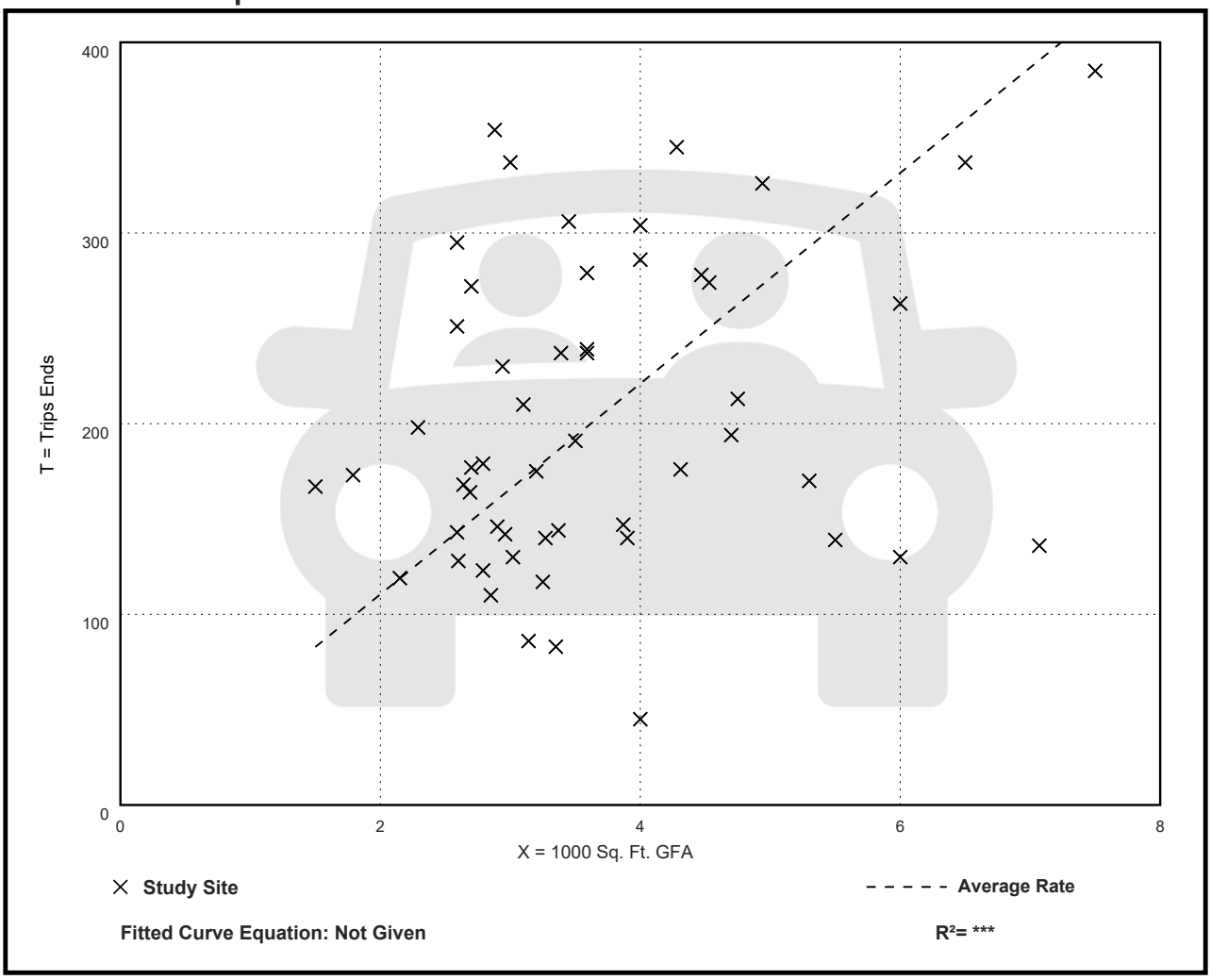
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 53
Avg. 1000 Sq. Ft. GFA: 4
Directional Distribution: 51% entering, 49% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
55.25	11.25 - 122.92	24.62

Data Plot and Equation



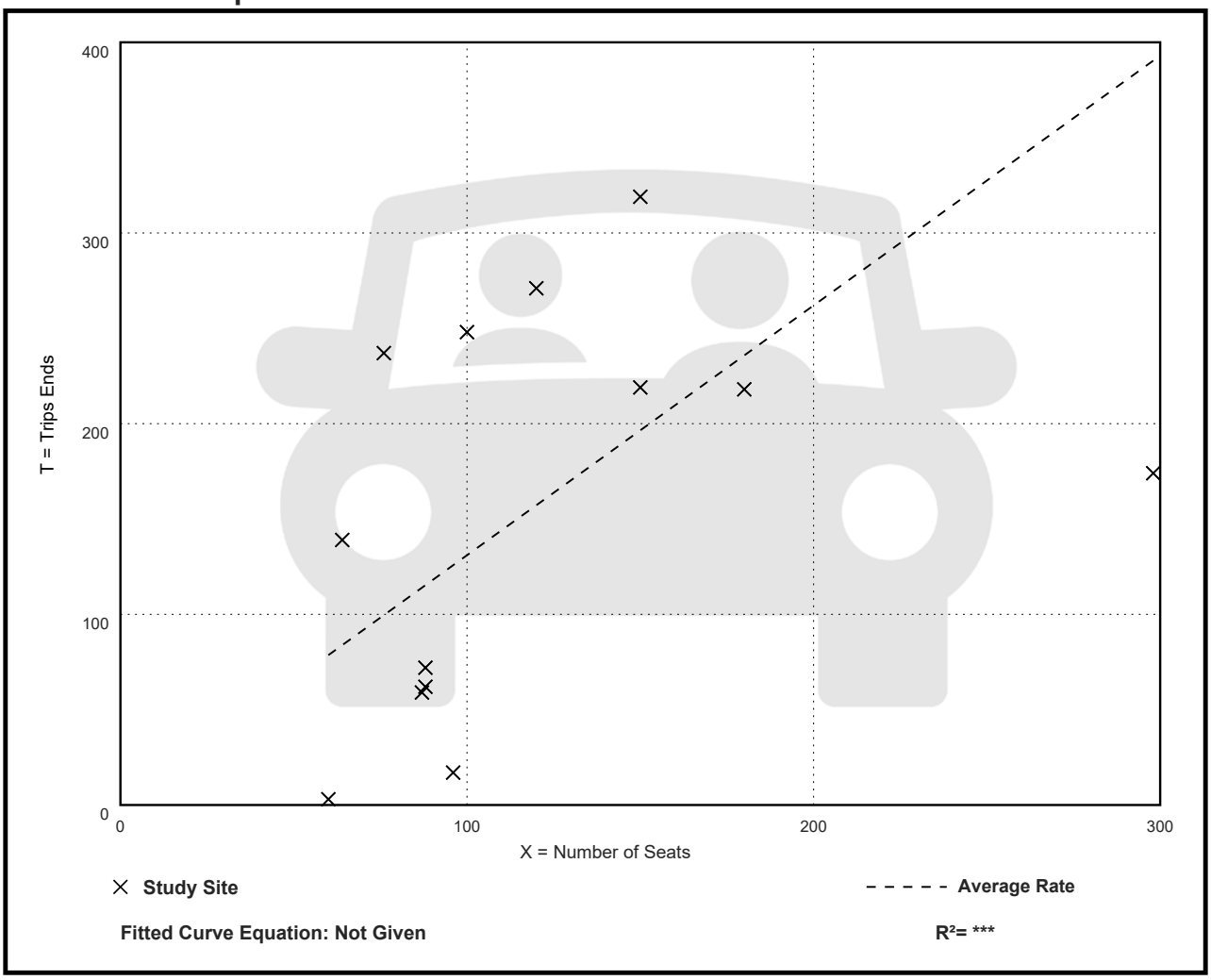
Fast-Food Restaurant with Drive-Through Window (934)

Vehicle Trip Ends vs: Seats
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 13
Avg. Num. of Seats: 120
Directional Distribution: 53% entering, 47% exiting

Vehicle Trip Generation per Seat

Average Rate	Range of Rates	Standard Deviation
1.31	0.05 - 3.12	0.88

Data Plot and Equation



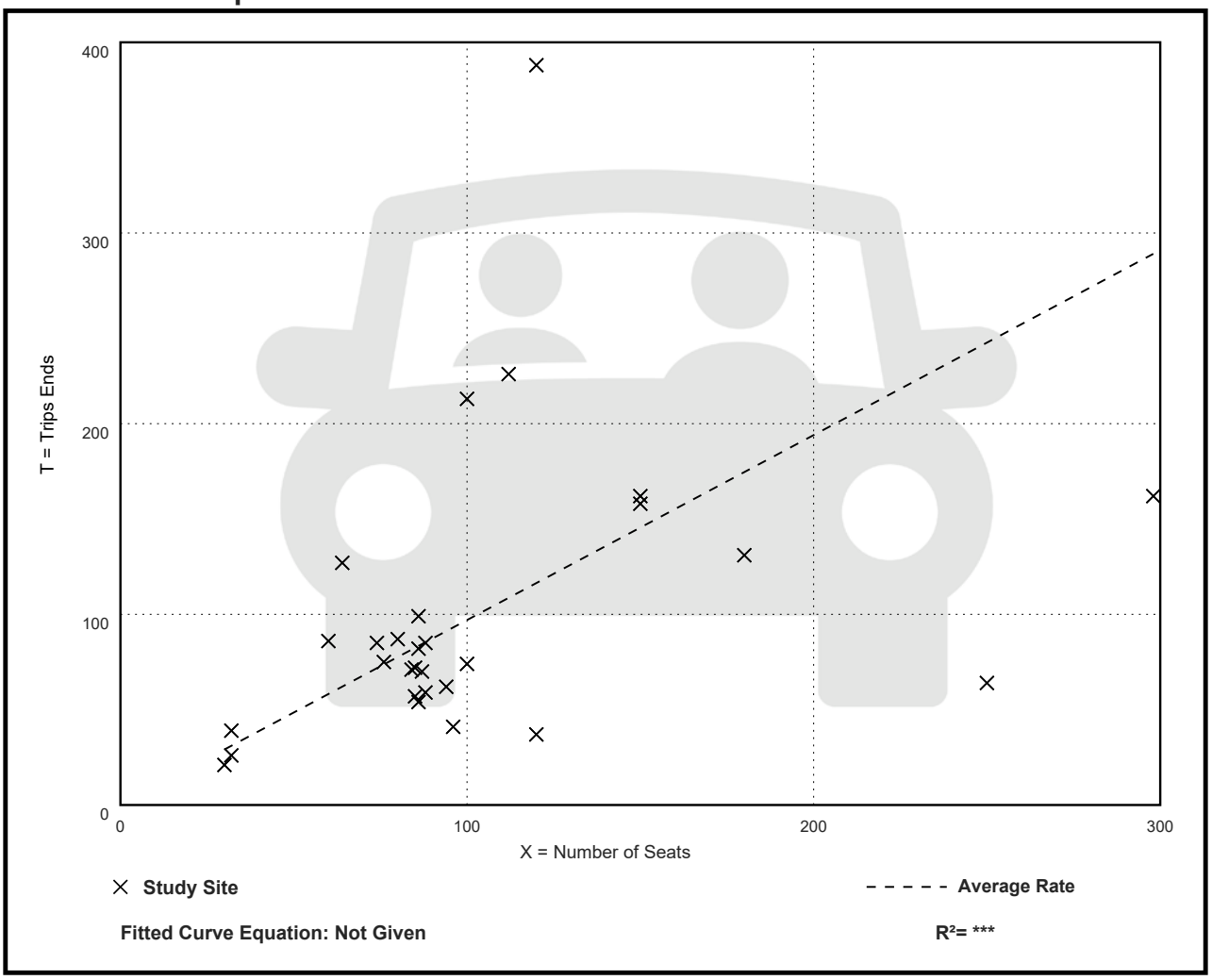
Fast-Food Restaurant with Drive-Through Window (934)

Vehicle Trip Ends vs: Seats
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 29
Avg. Num. of Seats: 103
Directional Distribution: 53% entering, 47% exiting

Vehicle Trip Generation per Seat

Average Rate	Range of Rates	Standard Deviation
0.97	0.26 - 3.23	0.67

Data Plot and Equation



Fast-Food Restaurant with Drive-Through Window (934)

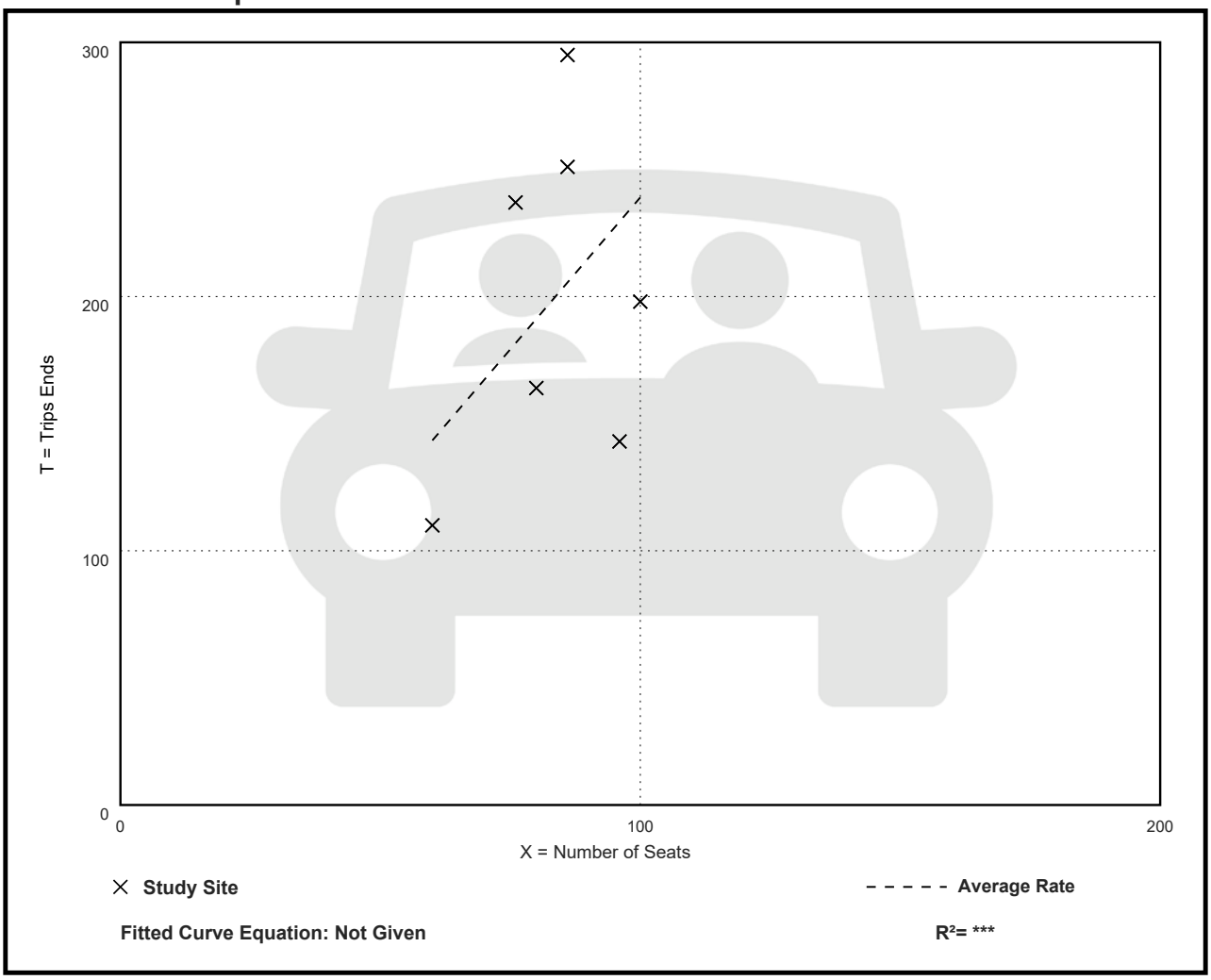
Vehicle Trip Ends vs: Seats
On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 7
Avg. Num. of Seats: 83
Directional Distribution: 51% entering, 49% exiting

Vehicle Trip Generation per Seat

Average Rate	Range of Rates	Standard Deviation
2.39	1.49 - 3.43	0.75

Data Plot and Equation



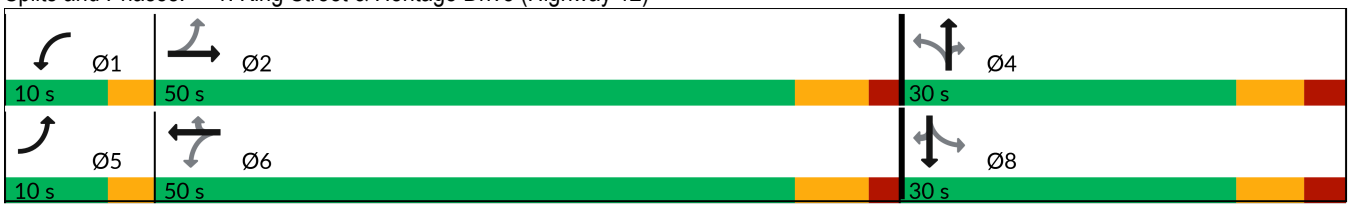
Appendix I

Future Total (2027) Traffic Conditions – Synchro Reports

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	204	365	30	358	113	10	29	24	112	40	248
Future Volume (vph)	204	365	30	358	113	10	29	24	112	40	248
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		6	4		4	8		8
Detector Phase	5	2	1	6	6	4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0	38.0	17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0	50.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%	55.6%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0	2.0	2.8	2.8	2.8	2.8	2.8	2.8
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
Total Lost Time (s)	3.0	7.0	3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Ped	None	Ped	Ped	None	None	None	None	None	None
Act Effct Green (s)	44.0	37.3	42.1	31.1	31.1	13.1	13.1	13.1	13.1	13.1	13.1
Actuated g/C Ratio	0.64	0.54	0.61	0.45	0.45	0.19	0.19	0.19	0.19	0.19	0.19
v/c Ratio	0.38	0.25	0.06	0.27	0.17	0.05	0.12	0.09	0.51	0.13	0.56
Control Delay (s/veh)	7.2	10.2	5.3	12.8	3.3	22.3	23.2	0.5	31.7	23.3	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	7.2	10.2	5.3	12.8	3.3	22.3	23.2	0.5	31.7	23.3	7.4
LOS	A	B	A	B	A	C	C	A	C	C	A
Approach Delay (s/veh)		9.2		10.2			14.3			15.8	
Approach LOS		A		B			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 68.6	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay (s/veh): 11.4	Intersection LOS: B
Intersection Capacity Utilization 58.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	252	473	37	442	140	12	36	30	138	49	306
v/c Ratio	0.38	0.25	0.06	0.27	0.17	0.05	0.12	0.09	0.51	0.13	0.56
Control Delay (s/veh)	7.2	10.2	5.3	12.8	3.3	22.3	23.2	0.5	31.7	23.3	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	7.2	10.2	5.3	12.8	3.3	22.3	23.2	0.5	31.7	23.3	7.4
Queue Length 50th (m)	10.5	12.8	1.4	17.5	0.0	1.5	4.5	0.0	15.9	5.2	0.0
Queue Length 95th (m)	21.4	29.3	4.5	27.2	7.0	5.3	10.9	0.0	27.3	11.5	11.7
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	656	2211	659	2271	1068	383	527	544	468	637	732
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.21	0.06	0.19	0.13	0.03	0.07	0.06	0.29	0.08	0.42

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	204	365	18	30	358	113	10	29	24	112	40	248
Future Volume (vph)	204	365	18	30	358	113	10	29	24	112	40	248
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3514		1825	3614	1617	1512	1588	1471	1825	1921	1587
Flt Permitted	0.45	1.00		0.48	1.00	1.00	0.73	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	873	3514		924	3614	1617	1154	1588	1471	1409	1921	1587
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	252	451	22	37	442	140	12	36	30	138	49	306
RTOR Reduction (vph)	0	3	0	0	0	74	0	0	24	0	0	249
Lane Group Flow (vph)	252	470	0	37	442	66	12	36	6	138	49	57
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)	43.0	37.3		35.7	33.0	33.0	13.1	13.1	13.1	13.1	13.1	13.1
Effective Green, g (s)	43.0	37.3		35.7	33.0	33.0	13.1	13.1	13.1	13.1	13.1	13.1
Actuated g/C Ratio	0.61	0.53		0.51	0.47	0.47	0.19	0.19	0.19	0.19	0.19	0.19
Clearance Time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	627	1861		503	1694	757	214	295	273	262	357	295
v/s Ratio Prot	c0.04	0.13		0.00	0.12			0.02			0.03	
v/s Ratio Perm	c0.21			0.03		0.04	0.01		0.00	c0.10		0.04
v/c Ratio	0.40	0.25		0.07	0.26	0.09	0.06	0.12	0.02	0.53	0.14	0.19
Uniform Delay, d1	6.3	9.0		8.7	11.3	10.4	23.6	23.9	23.4	25.9	23.9	24.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.2		0.1	0.2	0.1	0.1	0.2	0.0	1.9	0.2	0.3
Delay (s)	6.7	9.2		8.8	11.5	10.5	23.7	24.0	23.4	27.8	24.1	24.5
Level of Service	A	A		A	B	B	C	C	C	C	C	C
Approach Delay (s/veh)		8.3			11.1			23.8			25.4	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	70.4	Sum of lost time (s)	17.3
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	88	93	252	311	10
Future Volume (Veh/h)	18	88	93	252	311	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	22	107	113	307	379	12
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	767	198	393			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	767	198	393			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	87	90			
cM capacity (veh/h)	309	815	1174			

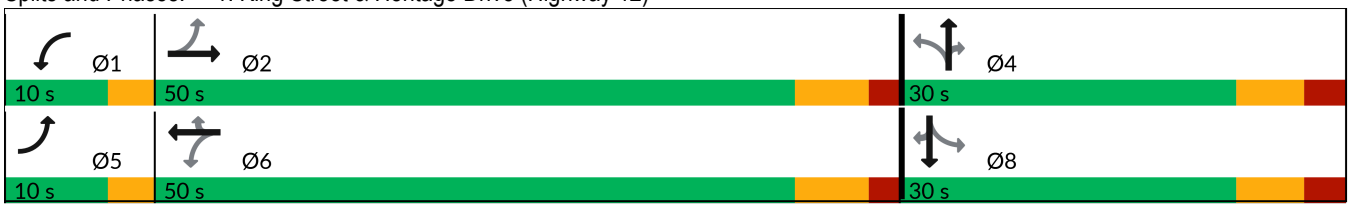
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	129	215	205	253	138
Volume Left	22	113	0	0	0
Volume Right	107	0	0	0	12
cSH	637	1174	1700	1700	1700
Volume to Capacity	0.20	0.10	0.12	0.15	0.08
Queue Length 95th (m)	5.7	2.4	0.0	0.0	0.0
Control Delay (s/veh)	12.1	4.8	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	12.1	2.5		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	418	647	48	682	227	25	62	44	172	66	459
Future Volume (vph)	418	647	48	682	227	25	62	44	172	66	459
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		6	4		4	8		8
Detector Phase	5	2	1	6	6	4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0	38.0	17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0	50.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%	55.6%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0	2.0	2.8	2.8	2.8	2.8	2.8	2.8
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
Total Lost Time (s)	3.0	7.0	3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Ped	None	Ped	Ped	None	None	None	None	None	None
Act Effct Green (s)	46.8	38.8	45.4	34.3	34.3	17.5	17.5	17.5	17.5	17.5	17.5
Actuated g/C Ratio	0.61	0.51	0.59	0.45	0.45	0.23	0.23	0.23	0.23	0.23	0.23
v/c Ratio	0.94	0.39	0.09	0.45	0.28	0.10	0.18	0.12	0.58	0.16	0.84
Control Delay (s/veh)	44.1	14.1	6.7	16.1	2.9	25.0	25.5	2.5	34.8	24.9	26.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	44.1	14.1	6.7	16.1	2.9	25.0	25.5	2.5	34.8	24.9	26.5
LOS	D	B	A	B	A	C	C	A	C	C	C
Approach Delay (s/veh)		25.7		12.5			17.7			28.4	
Approach LOS		C		B			B			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 76.4	
Natural Cycle: 80	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay (s/veh): 21.6	Intersection LOS: C
Intersection Capacity Utilization 74.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	445	701	51	726	241	27	66	47	183	70	488
v/c Ratio	0.94	0.39	0.09	0.45	0.28	0.10	0.18	0.12	0.58	0.16	0.84
Control Delay (s/veh)	44.1	14.1	6.7	16.1	2.9	25.0	25.5	2.5	34.8	24.9	26.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	44.1	14.1	6.7	16.1	2.9	25.0	25.5	2.5	34.8	24.9	26.5
Queue Length 50th (m)	~29.6	37.4	2.6	38.5	0.0	3.4	8.4	0.0	22.0	7.6	26.4
Queue Length 95th (m)	#85.6	54.3	6.9	55.5	11.5	11.7	22.5	3.0	48.0	19.7	#85.0
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	473	2015	540	2061	1026	341	478	502	413	578	674
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.35	0.09	0.35	0.23	0.08	0.14	0.09	0.44	0.12	0.72

Intersection Summary

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	418	647	12	48	682	227	25	62	44	172	66	459
Future Volume (vph)	418	647	12	48	682	227	25	62	44	172	66	459
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3532		1825	3614	1617	1514	1588	1471	1825	1921	1589
Flt Permitted	0.30	1.00		0.39	1.00	1.00	0.71	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	585	3532		740	3614	1617	1133	1588	1471	1372	1921	1589
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	445	688	13	51	726	241	27	66	47	183	70	488
RTOR Reduction (vph)	0	1	0	0	0	130	0	0	36	0	0	217
Lane Group Flow (vph)	445	700	0	51	726	111	27	66	11	183	70	271
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)	45.7	38.8		39.5	35.6	35.6	17.5	17.5	17.5	17.5	17.5	17.5
Effective Green, g (s)	45.7	38.8		39.5	35.6	35.6	17.5	17.5	17.5	17.5	17.5	17.5
Actuated g/C Ratio	0.59	0.50		0.51	0.46	0.46	0.23	0.23	0.23	0.23	0.23	0.23
Clearance Time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	458	1768		431	1660	742	255	358	332	309	433	358
v/s Ratio Prot	c0.09	0.20		0.01	0.20			0.04			0.04	
v/s Ratio Perm	c0.48			0.05		0.07	0.02		0.01	0.13		c0.17
v/c Ratio	0.97	0.40		0.12	0.44	0.15	0.11	0.18	0.03	0.59	0.16	0.76
Uniform Delay, d1	12.7	12.0		9.6	14.2	12.2	23.8	24.2	23.4	26.8	24.1	28.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	34.6	0.3		0.1	0.4	0.2	0.2	0.2	0.0	3.0	0.2	8.9
Delay (s)	47.3	12.4		9.7	14.6	12.4	24.0	24.5	23.4	29.8	24.3	36.9
Level of Service	D	B		A	B	B	C	C	C	C	C	D
Approach Delay (s/veh)		25.9			13.8			24.0			34.0	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	77.5	Sum of lost time (s)	17.3
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	104	111	596	591	24
Future Volume (Veh/h)	21	104	111	596	591	24
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	24	117	125	670	664	27
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	1265	348	693			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1265	348	693			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	83	82	86			
cM capacity (veh/h)	141	653	910			

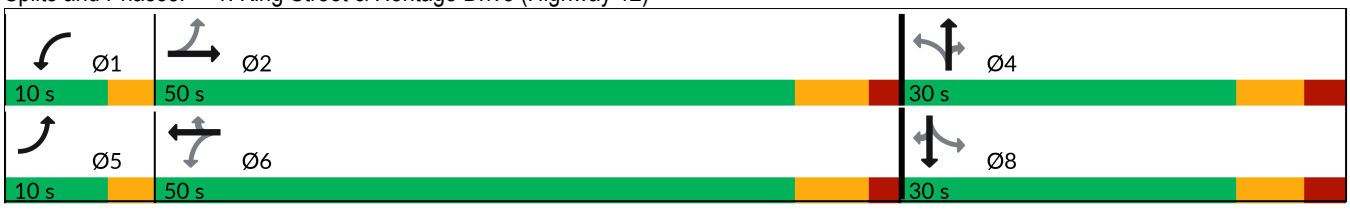
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	141	348	447	443	248
Volume Left	24	125	0	0	0
Volume Right	117	0	0	0	27
cSH	404	910	1700	1700	1700
Volume to Capacity	0.35	0.14	0.26	0.26	0.15
Queue Length 95th (m)	11.7	3.6	0.0	0.0	0.0
Control Delay (s/veh)	18.6	4.4	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s/veh)	18.6	1.9		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	321	549	39	582	163	11	76	35	156	49	397
Future Volume (vph)	321	549	39	582	163	11	76	35	156	49	397
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		6	4		4	8		8
Detector Phase	5	2	1	6	6	4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0	38.0	17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0	50.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%	55.6%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0	2.0	2.8	2.8	2.8	2.8	2.8	2.8
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
Total Lost Time (s)	3.0	7.0	3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Ped	None	Ped	Ped	None	None	None	None	None	None
Act Effct Green (s)	44.1	36.0	42.8	31.7	31.7	15.1	15.1	15.1	15.1	15.1	15.1
Actuated g/C Ratio	0.62	0.50	0.60	0.44	0.44	0.21	0.21	0.21	0.21	0.21	0.21
v/c Ratio	0.61	0.33	0.07	0.38	0.21	0.05	0.23	0.10	0.57	0.13	0.69
Control Delay (s/veh)	12.8	12.9	6.2	14.7	3.3	22.0	24.7	0.7	33.2	22.9	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	12.8	12.9	6.2	14.7	3.3	22.0	24.7	0.7	33.2	22.9	12.7
LOS	B	B	A	B	A	C	C	A	C	C	B
Approach Delay (s/veh)		12.9		11.9			17.6			18.8	
Approach LOS		B		B			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 71.3	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay (s/veh): 14.3	Intersection LOS: B
Intersection Capacity Utilization 68.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	334	581	41	606	170	11	79	36	163	51	414
v/c Ratio	0.61	0.33	0.07	0.38	0.21	0.05	0.23	0.10	0.57	0.13	0.69
Control Delay (s/veh)	12.8	12.9	6.2	14.7	3.3	22.0	24.7	0.7	33.2	22.9	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	12.8	12.9	6.2	14.7	3.3	22.0	24.7	0.7	33.2	22.9	12.7
Queue Length 50th (m)	16.1	25.6	1.7	26.5	0.0	1.4	10.1	0.0	19.3	5.5	9.2
Queue Length 95th (m)	37.3	45.1	6.1	46.3	10.5	5.6	22.7	0.9	37.8	13.7	35.6
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	549	2145	597	2192	1047	369	508	528	434	615	734
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.27	0.07	0.28	0.16	0.03	0.16	0.07	0.38	0.08	0.56

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	321	549	9	39	582	163	11	76	35	156	49	397
Future Volume (vph)	321	549	9	39	582	163	11	76	35	156	49	397
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3534		1825	3614	1617	1513	1588	1471	1825	1921	1588
Flt Permitted	0.37	1.00		0.43	1.00	1.00	0.72	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	711	3534		832	3614	1617	1152	1588	1471	1356	1921	1588
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	334	572	9	41	606	170	11	79	36	162	51	414
RTOR Reduction (vph)	0	1	0	0	0	93	0	0	28	0	0	262
Lane Group Flow (vph)	334	580	0	41	606	77	11	79	8	163	51	152
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)	43.0	36.0		37.0	33.0	33.0	15.1	15.1	15.1	15.1	15.1	15.1
Effective Green, g (s)	43.0	36.0		37.0	33.0	33.0	15.1	15.1	15.1	15.1	15.1	15.1
Actuated g/C Ratio	0.59	0.50		0.51	0.46	0.46	0.21	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	529	1757		480	1647	737	240	331	306	282	400	331
v/s Ratio Prot	c0.06	0.16		0.00	0.17			0.05			0.03	
v/s Ratio Perm	c0.31			0.04		0.05	0.01		0.01	c0.12		0.10
v/c Ratio	0.63	0.33		0.09	0.37	0.11	0.05	0.24	0.02	0.58	0.13	0.46
Uniform Delay, d1	7.5	10.9		8.9	12.9	11.3	22.9	23.9	22.8	25.8	23.3	25.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	0.3		0.1	0.3	0.2	0.1	0.4	0.0	2.9	0.1	1.0
Delay (s)	10.0	11.2		8.9	13.2	11.4	23.0	24.2	22.8	28.6	23.4	26.1
Level of Service	B	B		A	B	B	C	C	C	C	C	C
Approach Delay (s/veh)		10.8			12.6			23.7			26.5	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	72.4	Sum of lost time (s)	17.3
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	77	67	492	523	16
Future Volume (Veh/h)	14	77	67	492	523	16
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	15	82	71	523	556	17
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	970	289	575			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	970	289	575			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	88	93			
cM capacity (veh/h)	236	713	1006			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	97	245	349	371	202
Volume Left	15	71	0	0	0
Volume Right	82	0	0	0	17
cSH	543	1006	1700	1700	1700
Volume to Capacity	0.18	0.07	0.21	0.22	0.12
Queue Length 95th (m)	4.9	1.7	0.0	0.0	0.0
Control Delay (s/veh)	13.1	3.1	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	13.1	1.3		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		

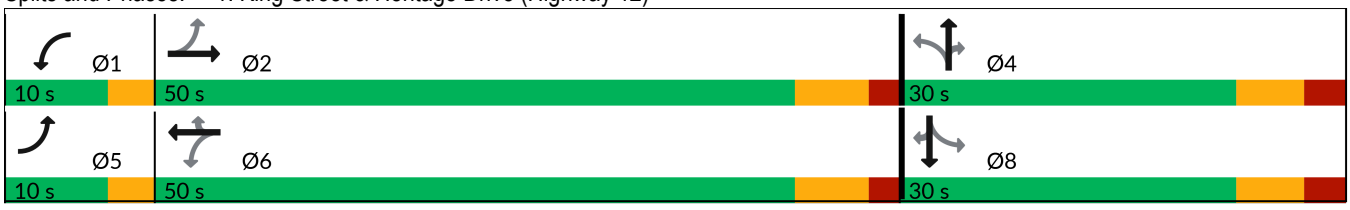
Appendix J

Future Total (2032) Traffic Conditions – Synchro Reports

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	232	417	32	406	128	13	30	26	137	43	291
Future Volume (vph)	232	417	32	406	128	13	30	26	137	43	291
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		6	4		4	8		8
Detector Phase	5	2	1	6	6	4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0	38.0	17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0	50.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%	55.6%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0	2.0	2.8	2.8	2.8	2.8	2.8	2.8
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
Total Lost Time (s)	3.0	7.0	3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Ped	None	Ped	Ped	None	None	None	None	None	None
Act Effct Green (s)	43.5	35.4	42.2	31.1	31.1	14.9	14.9	14.9	14.9	14.9	14.9
Actuated g/C Ratio	0.62	0.50	0.60	0.44	0.44	0.21	0.21	0.21	0.21	0.21	0.21
v/c Ratio	0.47	0.31	0.07	0.31	0.20	0.07	0.11	0.08	0.57	0.13	0.58
Control Delay (s/veh)	9.5	12.7	6.2	14.2	3.4	21.7	22.2	0.4	32.5	22.4	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	9.5	12.7	6.2	14.2	3.4	21.7	22.2	0.4	32.5	22.4	6.9
LOS	A	B	A	B	A	C	C	A	C	C	A
Approach Delay (s/veh)		11.6		11.3			13.9			15.8	
Approach LOS		B		B			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 70.4	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay (s/veh): 12.7	Intersection LOS: B
Intersection Capacity Utilization 61.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	286	545	40	501	158	16	37	32	169	53	359
v/c Ratio	0.47	0.31	0.07	0.31	0.20	0.07	0.11	0.08	0.57	0.13	0.58
Control Delay (s/veh)	9.5	12.7	6.2	14.2	3.4	21.7	22.2	0.4	32.5	22.4	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	9.5	12.7	6.2	14.2	3.4	21.7	22.2	0.4	32.5	22.4	6.9
Queue Length 50th (m)	13.3	23.4	1.6	21.2	0.0	2.0	4.6	0.0	20.0	5.7	0.0
Queue Length 95th (m)	27.5	36.5	5.3	33.3	7.7	6.2	10.9	0.0	32.5	12.0	11.7
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	608	2156	613	2216	1052	372	513	533	455	621	757
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.25	0.07	0.23	0.15	0.04	0.07	0.06	0.37	0.09	0.47

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	232	417	24	32	406	128	13	30	26	137	43	291
Future Volume (vph)	232	417	24	32	406	128	13	30	26	137	43	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3509		1825	3614	1617	1513	1588	1471	1825	1921	1588
Flt Permitted	0.43	1.00		0.45	1.00	1.00	0.72	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	823	3509		862	3614	1617	1150	1588	1471	1408	1921	1588
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	286	515	30	40	501	158	16	37	32	169	53	359
RTOR Reduction (vph)	0	5	0	0	0	87	0	0	25	0	0	284
Lane Group Flow (vph)	286	540	0	40	501	71	16	37	7	169	53	75
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)	42.4	35.4		36.4	32.4	32.4	14.9	14.9	14.9	14.9	14.9	14.9
Effective Green, g (s)	42.4	35.4		36.4	32.4	32.4	14.9	14.9	14.9	14.9	14.9	14.9
Actuated g/C Ratio	0.59	0.49		0.51	0.45	0.45	0.21	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	585	1734		492	1635	731	239	330	306	293	399	330
v/s Ratio Prot	c0.05	0.15		0.00	0.14			0.02			0.03	
v/s Ratio Perm	c0.24			0.04		0.04	0.01		0.00	c0.12		0.05
v/c Ratio	0.49	0.31		0.08	0.31	0.10	0.07	0.11	0.02	0.58	0.13	0.23
Uniform Delay, d1	7.2	10.8		8.8	12.5	11.2	22.8	23.0	22.6	25.5	23.1	23.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.2		0.1	0.3	0.1	0.1	0.2	0.0	2.7	0.2	0.4
Delay (s)	7.8	11.1		8.9	12.7	11.4	22.9	23.1	22.6	28.3	23.2	23.9
Level of Service	A	B		A	B	B	C	C	C	C	C	C
Approach Delay (s/veh)		9.9			12.2			22.9			25.1	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	71.6	Sum of lost time (s)	17.3
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	88	93	296	380	10
Future Volume (Veh/h)	18	88	93	296	380	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	22	107	113	361	463	12
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	878	240	477			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	878	240	477			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	86	90			
cM capacity (veh/h)	261	766	1094			

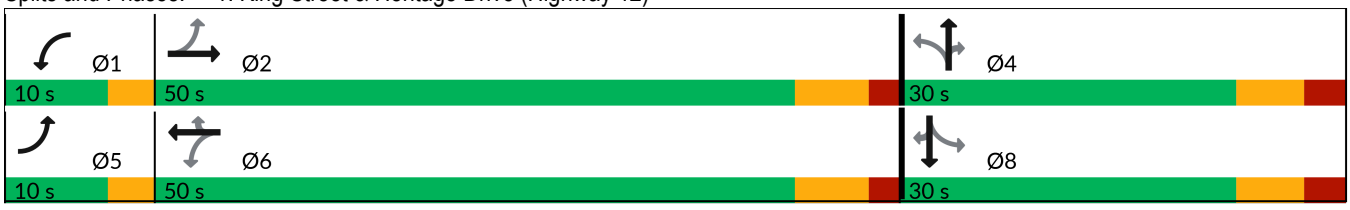
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	129	233	241	309	166
Volume Left	22	113	0	0	0
Volume Right	107	0	0	0	12
cSH	576	1094	1700	1700	1700
Volume to Capacity	0.22	0.10	0.14	0.18	0.10
Queue Length 95th (m)	6.5	2.6	0.0	0.0	0.0
Control Delay (s/veh)	13.0	4.7	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	13.0	2.3		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	479	749	51	788	257	35	67	48	194	71	531
Future Volume (vph)	479	749	51	788	257	35	67	48	194	71	531
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		6	4		4	8		8
Detector Phase	5	2	1	6	6	4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0	38.0	17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0	50.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%	55.6%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0	2.0	2.8	2.8	2.8	2.8	2.8	2.8
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
Total Lost Time (s)	3.0	7.0	3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Ped	None	Ped	Ped	None	None	None	None	None	None
Act Effct Green (s)	48.9	40.9	47.6	36.5	36.5	22.2	22.2	22.2	22.2	22.2	22.2
Actuated g/C Ratio	0.59	0.49	0.57	0.44	0.44	0.27	0.27	0.27	0.27	0.27	0.27
v/c Ratio	1.30	0.47	0.12	0.53	0.32	0.12	0.17	0.11	0.56	0.15	0.94
Control Delay (s/veh)	172.8	15.8	7.2	18.3	2.8	26.4	26.4	2.9	34.6	25.9	43.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	172.8	15.8	7.2	18.3	2.8	26.4	26.4	2.9	34.6	25.9	43.0
LOS	F	B	A	B	A	C	C	A	C	C	D
Approach Delay (s/veh)		76.1		14.1			18.8			39.4	
Approach LOS		E		B			B			D	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 83.2	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.30	
Intersection Signal Delay (s/veh): 44.0	Intersection LOS: D
Intersection Capacity Utilization 81.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	510	818	54	838	273	37	71	51	206	76	565
v/c Ratio	1.30	0.47	0.12	0.53	0.32	0.12	0.17	0.11	0.56	0.15	0.94
Control Delay (s/veh)	172.8	15.8	7.2	18.3	2.8	26.4	26.4	2.9	34.6	25.9	43.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	172.8	15.8	7.2	18.3	2.8	26.4	26.4	2.9	34.6	25.9	43.0
Queue Length 50th (m)	~66.2	49.4	3.2	50.0	0.0	5.1	9.9	0.0	27.7	9.1	52.3
Queue Length 95th (m)	#130.3	65.2	7.1	65.7	12.2	14.7	23.8	4.0	54.1	21.1	#126.9
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	391	1833	445	1876	970	309	435	464	374	526	613
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.30	0.45	0.12	0.45	0.28	0.12	0.16	0.11	0.55	0.14	0.92

Intersection Summary

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	479	749	20	51	788	257	35	67	48	194	71	531
Future Volume (vph)	479	749	20	51	788	257	35	67	48	194	71	531
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3528		1825	3614	1617	1515	1588	1471	1825	1921	1590
Flt Permitted	0.25	1.00		0.31	1.00	1.00	0.71	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	471	3528		595	3614	1617	1128	1588	1471	1365	1921	1590
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	510	797	21	54	838	273	37	71	51	206	76	565
RTOR Reduction (vph)	0	2	0	0	0	150	0	0	38	0	0	181
Lane Group Flow (vph)	510	816	0	54	838	123	37	71	13	206	76	384
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)	47.9	40.9		41.9	37.9	37.9	22.2	22.2	22.2	22.2	22.2	22.2
Effective Green, g (s)	47.9	40.9		41.9	37.9	37.9	22.2	22.2	22.2	22.2	22.2	22.2
Actuated g/C Ratio	0.57	0.48		0.50	0.45	0.45	0.26	0.26	0.26	0.26	0.26	0.26
Clearance Time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	379	1709		353	1622	726	296	417	386	359	505	418
v/s Ratio Prot	c0.11	0.23		0.01	0.23			0.04			0.04	
v/s Ratio Perm	c0.65			0.07		0.08	0.03		0.01	0.15		c0.24
v/c Ratio	1.35	0.48		0.15	0.52	0.17	0.13	0.17	0.03	0.57	0.15	0.92
Uniform Delay, d1	15.5	14.6		11.1	16.7	13.9	23.7	24.0	23.1	27.0	23.9	30.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	172.2	0.5		0.2	0.6	0.3	0.2	0.2	0.0	2.2	0.1	25.0
Delay (s)	187.7	15.1		11.3	17.3	14.1	23.9	24.2	23.2	29.2	24.0	55.2
Level of Service	F	B		B	B	B	C	C	C	C	C	E
Approach Delay (s/veh)		81.4			16.3			23.8			46.1	
Approach LOS		F			B			C			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	48.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.26		
Actuated Cycle Length (s)	84.4	Sum of lost time (s)	17.3
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	104	111	689	690	24
Future Volume (Veh/h)	21	104	111	689	690	24
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	24	117	125	774	775	27
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	1428	403	804			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1428	403	804			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	78	81	85			
cM capacity (veh/h)	109	601	827			

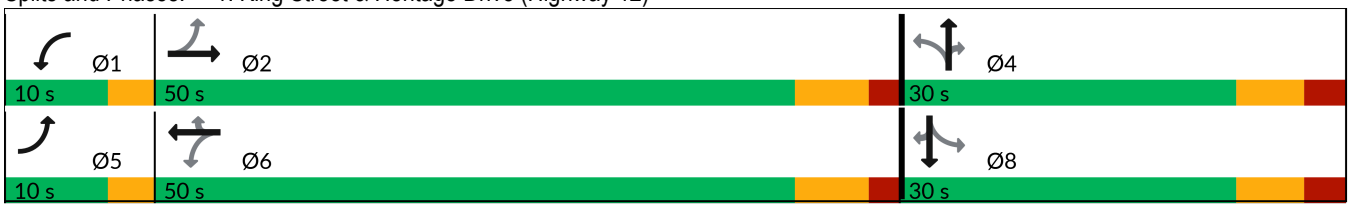
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	141	383	516	517	285
Volume Left	24	125	0	0	0
Volume Right	117	0	0	0	27
cSH	340	827	1700	1700	1700
Volume to Capacity	0.42	0.15	0.30	0.30	0.17
Queue Length 95th (m)	15.0	4.0	0.0	0.0	0.0
Control Delay (s/veh)	22.9	4.5	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s/veh)	22.9	1.9		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	372	626	41	662	191	18	80	37	176	51	456
Future Volume (vph)	372	626	41	662	191	18	80	37	176	51	456
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		6	4		4	8		8
Detector Phase	5	2	1	6	6	4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0	38.0	17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0	50.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%	55.6%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0	2.0	2.8	2.8	2.8	2.8	2.8	2.8
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
Total Lost Time (s)	3.0	7.0	3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Ped	None	Ped	Ped	None	None	None	None	None	None
Act Effct Green (s)	45.4	37.4	44.1	33.0	33.0	16.9	16.9	16.9	16.9	16.9	16.9
Actuated g/C Ratio	0.61	0.50	0.59	0.44	0.44	0.23	0.23	0.23	0.23	0.23	0.23
v/c Ratio	0.79	0.38	0.08	0.43	0.24	0.07	0.23	0.10	0.60	0.12	0.81
Control Delay (s/veh)	23.9	13.9	6.7	15.9	3.1	23.4	25.2	1.1	34.7	23.5	22.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	23.9	13.9	6.7	15.9	3.1	23.4	25.2	1.1	34.7	23.5	22.5
LOS	C	B	A	B	A	C	C	A	C	C	C
Approach Delay (s/veh)		17.6		12.7			18.3			25.7	
Approach LOS		B		B			B			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 74.4	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay (s/veh): 18.1	Intersection LOS: B
Intersection Capacity Utilization 73.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	388	667	43	690	199	19	83	39	183	53	475
v/c Ratio	0.79	0.38	0.08	0.43	0.24	0.07	0.23	0.10	0.60	0.12	0.81
Control Delay (s/veh)	23.9	13.9	6.7	15.9	3.1	23.4	25.2	1.1	34.7	23.5	22.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	23.9	13.9	6.7	15.9	3.1	23.4	25.2	1.1	34.7	23.5	22.5
Queue Length 50th (m)	22.7	33.3	2.0	34.2	0.0	2.3	10.7	0.0	22.0	5.7	22.0
Queue Length 95th (m)	#59.4	51.6	6.1	52.6	10.7	8.9	25.9	1.4	46.3	15.4	#66.4
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	492	2063	554	2110	1026	354	489	512	416	592	692
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.32	0.08	0.33	0.19	0.05	0.17	0.08	0.44	0.09	0.69

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	372	626	14	41	662	191	18	80	37	176	51	456
Future Volume (vph)	372	626	14	41	662	191	18	80	37	176	51	456
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3530		1825	3614	1617	1513	1588	1471	1825	1921	1589
Flt Permitted	0.32	1.00		0.40	1.00	1.00	0.72	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	619	3530		765	3614	1617	1151	1588	1471	1351	1921	1589
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	388	652	15	43	690	199	19	83	39	183	53	475
RTOR Reduction (vph)	0	2	0	0	0	109	0	0	30	0	0	228
Lane Group Flow (vph)	388	665	0	43	690	90	19	83	9	183	53	247
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)	44.5	37.5		38.4	34.4	34.4	16.9	16.9	16.9	16.9	16.9	16.9
Effective Green, g (s)	44.5	37.5		38.4	34.4	34.4	16.9	16.9	16.9	16.9	16.9	16.9
Actuated g/C Ratio	0.59	0.50		0.51	0.45	0.45	0.22	0.22	0.22	0.22	0.22	0.22
Clearance Time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	476	1748		444	1642	734	256	354	328	301	428	354
v/s Ratio Prot	c0.08	0.19		0.01	0.19			0.05			0.03	
v/s Ratio Perm	c0.40			0.04		0.06	0.02		0.01	0.14		c0.16
v/c Ratio	0.82	0.38		0.10	0.42	0.12	0.07	0.23	0.03	0.61	0.12	0.70
Uniform Delay, d1	9.7	11.9		9.4	13.9	11.9	23.2	24.1	23.0	26.4	23.5	27.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.3	0.3		0.1	0.4	0.2	0.1	0.3	0.0	3.5	0.1	5.9
Delay (s)	20.1	12.2		9.5	14.3	12.1	23.3	24.4	23.0	29.9	23.6	33.0
Level of Service	C	B		A	B	B	C	C	C	C	C	C
Approach Delay (s/veh)		15.1			13.6			23.9			31.5	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	75.7	Sum of lost time (s)	17.3
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	77	67	574	601	16
Future Volume (Veh/h)	14	77	67	574	601	16
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	15	82	71	611	639	17
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	1097	330	658			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1097	330	658			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	88	92			
cM capacity (veh/h)	194	670	937			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	97	275	407	426	230
Volume Left	15	71	0	0	0
Volume Right	82	0	0	0	17
cSH	486	937	1700	1700	1700
Volume to Capacity	0.20	0.08	0.24	0.25	0.14
Queue Length 95th (m)	5.6	1.9	0.0	0.0	0.0
Control Delay (s/veh)	14.2	3.0	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	14.2	1.2		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		

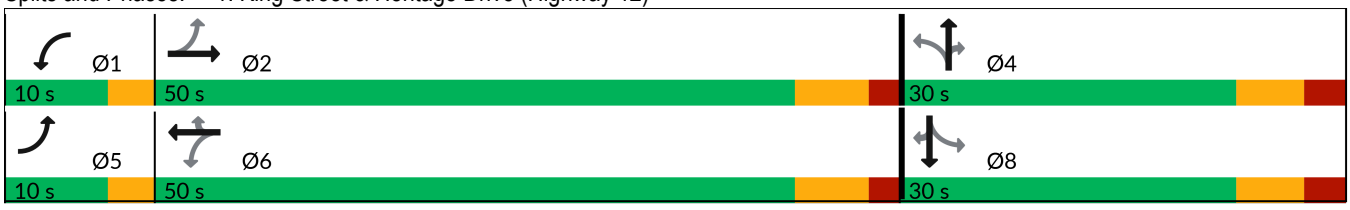
Appendix K

Future Total (2037) Traffic Conditions – Synchro Reports

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	271	509	34	466	134	16	33	28	139	48	316
Future Volume (vph)	271	509	34	466	134	16	33	28	139	48	316
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		6	4		4	8		8
Detector Phase	5	2	1	6	6	4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0	38.0	17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0	50.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%	55.6%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0	2.0	2.8	2.8	2.8	2.8	2.8	2.8
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
Total Lost Time (s)	3.0	7.0	3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Ped	None	Ped	Ped	None	None	None	None	None	None
Act Effct Green (s)	43.7	35.6	42.4	31.3	31.3	15.3	15.3	15.3	15.3	15.3	15.3
Actuated g/C Ratio	0.62	0.50	0.60	0.44	0.44	0.22	0.22	0.22	0.22	0.22	0.22
v/c Ratio	0.59	0.38	0.07	0.36	0.20	0.08	0.12	0.09	0.57	0.14	0.64
Control Delay (s/veh)	12.5	13.4	6.3	14.7	3.4	22.2	22.5	0.6	32.6	22.7	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	12.5	13.4	6.3	14.7	3.4	22.2	22.5	0.6	32.6	22.7	9.5
LOS	B	B	A	B	A	C	C	A	C	C	A
Approach Delay (s/veh)		13.1		11.9			14.5			17.1	
Approach LOS		B		B			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 71	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay (s/veh): 13.8	Intersection LOS: B
Intersection Capacity Utilization 63.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	335	664	42	575	165	20	41	35	172	59	390
v/c Ratio	0.59	0.38	0.07	0.36	0.20	0.08	0.12	0.09	0.57	0.14	0.64
Control Delay (s/veh)	12.5	13.4	6.3	14.7	3.4	22.2	22.5	0.6	32.6	22.7	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	12.5	13.4	6.3	14.7	3.4	22.2	22.5	0.6	32.6	22.7	9.5
Queue Length 50th (m)	16.3	30.1	1.7	25.1	0.0	2.5	5.1	0.0	20.4	6.3	4.5
Queue Length 95th (m)	32.7	45.3	5.5	38.5	7.7	7.4	12.0	0.0	33.6	13.3	17.2
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	564	2137	562	2197	1047	367	509	529	449	616	746
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.31	0.07	0.26	0.16	0.05	0.08	0.07	0.38	0.10	0.52

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	271	509	29	34	466	134	16	33	28	139	48	316
Future Volume (vph)	271	509	29	34	466	134	16	33	28	139	48	316
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3509		1825	3614	1617	1513	1588	1471	1825	1921	1588
Flt Permitted	0.39	1.00		0.40	1.00	1.00	0.72	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	743	3509		767	3614	1617	1144	1588	1471	1403	1921	1588
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	335	628	36	42	575	165	20	41	35	172	59	390
RTOR Reduction (vph)	0	5	0	0	0	90	0	0	28	0	0	274
Lane Group Flow (vph)	335	659	0	42	575	75	20	41	7	172	59	116
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)	42.6	35.6		36.6	32.6	32.6	15.3	15.3	15.3	15.3	15.3	15.3
Effective Green, g (s)	42.6	35.6		36.6	32.6	32.6	15.3	15.3	15.3	15.3	15.3	15.3
Actuated g/C Ratio	0.59	0.49		0.51	0.45	0.45	0.21	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	543	1730		447	1631	730	242	336	311	297	407	336
v/s Ratio Prot	c0.06	0.19		0.01	0.16			0.03			0.03	
v/s Ratio Perm	c0.30			0.04		0.05	0.02		0.01	c0.12		0.07
v/c Ratio	0.62	0.38		0.09	0.35	0.10	0.08	0.12	0.02	0.58	0.14	0.34
Uniform Delay, d1	7.6	11.4		9.0	12.9	11.4	22.8	23.0	22.5	25.6	23.1	24.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.3		0.1	0.3	0.1	0.1	0.2	0.0	2.7	0.2	0.6
Delay (s)	9.7	11.8		9.1	13.2	11.5	23.0	23.2	22.6	28.3	23.3	24.8
Level of Service	A	B		A	B	B	C	C	C	C	C	C
Approach Delay (s/veh)		11.1			12.6			22.9			25.6	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	72.2	Sum of lost time (s)	17.3
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	88	93	341	410	10
Future Volume (Veh/h)	18	88	93	341	410	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	22	107	113	416	500	12
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	942	258	514			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	942	258	514			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	86	89			
cM capacity (veh/h)	236	746	1060			

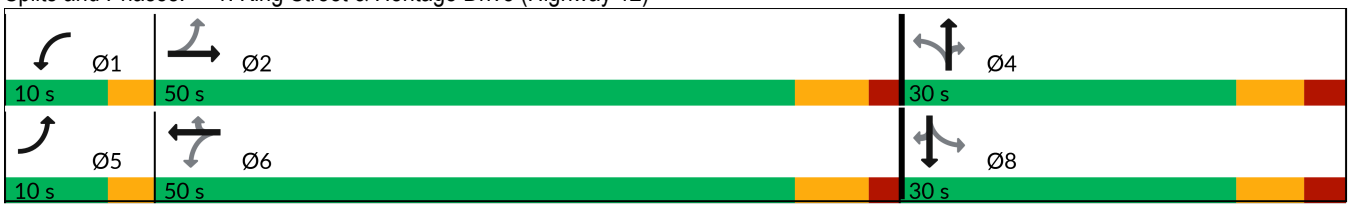
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	129	252	277	333	179
Volume Left	22	113	0	0	0
Volume Right	107	0	0	0	12
cSH	545	1060	1700	1700	1700
Volume to Capacity	0.24	0.11	0.16	0.20	0.11
Queue Length 95th (m)	6.9	2.7	0.0	0.0	0.0
Control Delay (s/veh)	13.6	4.5	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	13.6	2.1		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	553	891	55	940	279	41	76	52	211	79	607
Future Volume (vph)	553	891	55	940	279	41	76	52	211	79	607
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		6	4		4	8		8
Detector Phase	5	2	1	6	6	4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0	38.0	17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0	50.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%	55.6%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0	2.0	2.8	2.8	2.8	2.8	2.8	2.8
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
Total Lost Time (s)	3.0	7.0	3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Ped	None	Ped	Ped	None	None	None	None	None	None
Act Effct Green (s)	51.2	41.7	50.5	39.5	39.5	22.8	22.8	22.8	22.8	22.8	22.8
Actuated g/C Ratio	0.59	0.48	0.58	0.46	0.46	0.26	0.26	0.26	0.26	0.26	0.26
v/c Ratio	1.76	0.57	0.16	0.61	0.33	0.15	0.19	0.12	0.63	0.17	1.13
Control Delay (s/veh)	370.8	18.1	7.4	19.4	2.8	27.7	27.8	3.3	38.5	27.1	101.3
Queue Delay	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)	370.8	18.1	7.4	19.4	2.8	27.7	27.8	3.3	38.5	27.1	101.3
LOS	F	B	A	B	A	C	C	A	D	C	F
Approach Delay (s/veh)		150.8		15.2			20.3			80.0	
Approach LOS		F		B			C			F	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 86.6	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.76	
Intersection Signal Delay (s/veh): 83.0	Intersection LOS: F
Intersection Capacity Utilization 90.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	588	975	59	1000	297	44	81	55	224	84	646
v/c Ratio	1.76	0.57	0.16	0.61	0.33	0.15	0.19	0.12	0.63	0.17	1.13
Control Delay (s/veh)	370.8	18.1	7.4	19.4	2.8	27.7	27.8	3.3	38.5	27.1	101.3
Queue Delay	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)	370.8	18.1	7.4	19.4	2.8	27.7	27.8	3.3	38.5	27.1	101.3
Queue Length 50th (m)	~108.0	62.5	3.5	63.4	0.0	6.9	12.9	0.0	34.7	11.4	~105.1
Queue Length 95th (m)	#189.7	81.4	7.7	82.2	12.5	16.9	26.5	4.9	#59.6	22.8	#169.9
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	334	1758	362	1799	954	294	417	449	355	505	573
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.76	0.55	0.16	0.56	0.31	0.15	0.19	0.12	0.63	0.17	1.13

Intersection Summary

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	553	891	25	55	940	279	41	76	52	211	79	607
Future Volume (vph)	553	891	25	55	940	279	41	76	52	211	79	607
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3526		1825	3614	1617	1515	1588	1471	1825	1921	1590
Flt Permitted	0.19	1.00		0.22	1.00	1.00	0.70	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	366	3526		428	3614	1617	1120	1588	1471	1353	1921	1590
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	588	948	27	59	1000	297	44	81	55	224	84	646
RTOR Reduction (vph)	0	2	0	0	0	160	0	0	41	0	0	155
Lane Group Flow (vph)	588	973	0	59	1000	137	44	81	14	224	84	491
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)	48.7	41.7		45.7	40.2	40.2	22.8	22.8	22.8	22.8	22.8	22.8
Effective Green, g (s)	48.7	41.7		45.7	40.2	40.2	22.8	22.8	22.8	22.8	22.8	22.8
Actuated g/C Ratio	0.56	0.48		0.52	0.46	0.46	0.26	0.26	0.26	0.26	0.26	0.26
Clearance Time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	321	1684		312	1664	744	292	414	384	353	501	415
v/s Ratio Prot	c0.15	0.28		0.01	0.28			0.05			0.04	
v/s Ratio Perm	c0.87			0.09		0.08	0.04		0.01	0.17		c0.31
v/c Ratio	1.83	0.58		0.19	0.60	0.18	0.15	0.20	0.04	0.63	0.17	1.18
Uniform Delay, d1	15.5	16.4		10.8	17.6	13.9	24.8	25.1	24.1	28.6	24.9	32.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	386.3	0.8		0.3	1.0	0.3	0.2	0.2	0.0	3.7	0.2	104.4
Delay (s)	401.8	17.3		11.1	18.6	14.2	25.0	25.3	24.1	32.3	25.1	136.6
Level of Service	F	B		B	B	B	C	C	C	C	C	F
Approach Delay (s/veh)		161.9			17.3			24.9			102.3	
Approach LOS		F			B			C			F	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	93.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.66		
Actuated Cycle Length (s)	87.3	Sum of lost time (s)	17.3
Intersection Capacity Utilization	90.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	104	111	791	789	24
Future Volume (Veh/h)	21	104	111	791	789	24
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	24	117	125	889	887	27
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	1597	459	916			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1597	459	916			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	71	79	83			
cM capacity (veh/h)	83	553	751			

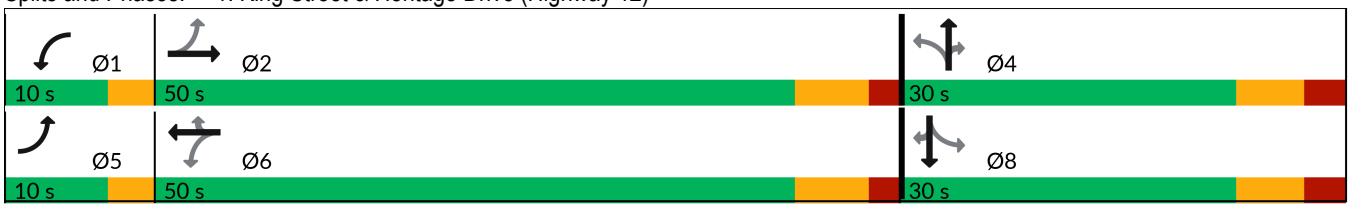
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	141	421	593	591	323
Volume Left	24	125	0	0	0
Volume Right	117	0	0	0	27
cSH	281	751	1700	1700	1700
Volume to Capacity	0.50	0.17	0.35	0.35	0.19
Queue Length 95th (m)	20.0	4.5	0.0	0.0	0.0
Control Delay (s/veh)	30.1	4.7	0.0	0.0	0.0
Lane LOS	D	A			
Approach Delay (s/veh)	30.1	2.0		0.0	
Approach LOS	D				

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	426	736	43	791	204	24	89	40	191	56	524
Future Volume (vph)	426	736	43	791	204	24	89	40	191	56	524
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		6	4		4	8		8
Detector Phase	5	2	1	6	6	4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0	20.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0	38.0	17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0	50.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%	55.6%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0	2.0	2.8	2.8	2.8	2.8	2.8	2.8
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
Total Lost Time (s)	3.0	7.0	3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	Ped	None	Ped	Ped	None	None	None	None	None	None
Act Effct Green (s)	47.9	39.9	46.6	35.5	35.5	21.3	21.3	21.3	21.3	21.3	21.3
Actuated g/C Ratio	0.59	0.49	0.57	0.44	0.44	0.26	0.26	0.26	0.26	0.26	0.26
v/c Ratio	1.11	0.45	0.10	0.52	0.26	0.08	0.22	0.09	0.57	0.12	0.91
Control Delay (s/veh)	94.4	15.6	7.0	18.1	2.9	25.3	26.4	1.6	34.3	24.9	38.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	94.4	15.6	7.0	18.1	2.9	25.3	26.4	1.6	34.3	24.9	38.2
LOS	F	B	A	B	A	C	C	A	C	C	D
Approach Delay (s/veh)		44.0		14.7			19.7			36.2	
Approach LOS		D		B			B			D	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 81.3	
Natural Cycle: 80	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 1.11	
Intersection Signal Delay (s/veh): 31.2	Intersection LOS: C
Intersection Capacity Utilization 81.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	444	786	45	824	213	25	93	42	199	58	546
v/c Ratio	1.11	0.45	0.10	0.52	0.26	0.08	0.22	0.09	0.57	0.12	0.91
Control Delay (s/veh)	94.4	15.6	7.0	18.1	2.9	25.3	26.4	1.6	34.3	24.9	38.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	94.4	15.6	7.0	18.1	2.9	25.3	26.4	1.6	34.3	24.9	38.2
Queue Length 50th (m)	~44.5	46.9	2.6	49.0	0.0	3.2	12.6	0.0	25.6	6.5	45.2
Queue Length 95th (m)	#97.5	62.1	6.3	64.4	10.9	11.0	29.6	1.9	52.4	17.0	#118.2
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	401	1880	464	1924	960	322	446	474	376	540	625
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.42	0.10	0.43	0.22	0.08	0.21	0.09	0.53	0.11	0.87

Intersection Summary

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	426	736	18	43	791	204	24	89	40	191	56	524
Future Volume (vph)	426	736	18	43	791	204	24	89	40	191	56	524
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3528		1825	3614	1617	1514	1588	1471	1825	1921	1590
Flt Permitted	0.25	1.00		0.33	1.00	1.00	0.72	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	483	3528		630	3614	1617	1146	1588	1471	1339	1921	1590
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	444	767	19	45	824	213	25	93	42	199	58	546
RTOR Reduction (vph)	0	2	0	0	0	118	0	0	31	0	0	184
Lane Group Flow (vph)	444	784	0	45	824	95	25	93	11	199	58	362
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)	46.9	39.9		40.9	36.9	36.9	21.3	21.3	21.3	21.3	21.3	21.3
Effective Green, g (s)	46.9	39.9		40.9	36.9	36.9	21.3	21.3	21.3	21.3	21.3	21.3
Actuated g/C Ratio	0.57	0.48		0.50	0.45	0.45	0.26	0.26	0.26	0.26	0.26	0.26
Clearance Time (s)	3.0	7.0		3.0	7.0	7.0	7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4	5.4	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	388	1706		370	1616	723	295	409	379	345	495	410
v/s Ratio Prot	c0.10	0.22		0.01	0.23			0.06			0.03	
v/s Ratio Perm	c0.55			0.05		0.06	0.02		0.01	0.15		c0.23
v/c Ratio	1.14	0.46		0.12	0.51	0.13	0.08	0.23	0.03	0.58	0.12	0.88
Uniform Delay, d1	15.1	14.1		10.8	16.3	13.4	23.2	24.1	22.9	26.7	23.4	29.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	91.2	0.5		0.1	0.6	0.2	0.1	0.3	0.0	2.3	0.1	19.5
Delay (s)	106.2	14.6		10.9	16.9	13.6	23.3	24.4	22.9	29.0	23.5	48.9
Level of Service	F	B		B	B	B	C	C	C	C	C	D
Approach Delay (s/veh)		47.7			16.0			23.8			42.2	
Approach LOS		D			B			C			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	34.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	82.5	Sum of lost time (s)	17.3
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	77	67	649	687	16
Future Volume (Veh/h)	14	77	67	649	687	16
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	15	82	71	690	731	17
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	1229	376	750			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1229	376	750			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	87	92			
cM capacity (veh/h)	159	626	867			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	97	301	460	487	261
Volume Left	15	71	0	0	0
Volume Right	82	0	0	0	17
cSH	430	867	1700	1700	1700
Volume to Capacity	0.23	0.08	0.27	0.29	0.15
Queue Length 95th (m)	6.5	2.0	0.0	0.0	0.0
Control Delay (s/veh)	15.8	2.9	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s/veh)	15.8	1.2		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

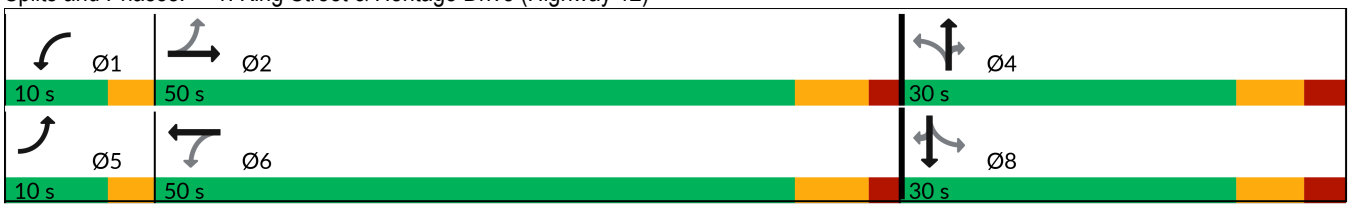
Appendix L

Traffic Operations Mitigations Measures - Synchro HCM Reports

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	159	383	30	376	82	10	26	24	86	37	204
Future Volume (vph)	159	383	30	376	82	10	26	24	86	37	204
Turn Type	pm+pt	NA	pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		Free	4		4	8		8
Detector Phase	5	2	1	6		4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0		17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0		30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%		33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0		2.8	2.8	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes							
Recall Mode	None	Ped	None	Ped		None	None	None	None	None	None
Act Effct Green (s)	43.9	37.2	42.1	31.1	67.2	11.8	11.8	11.8	11.8	11.8	11.8
Actuated g/C Ratio	0.65	0.55	0.63	0.46	1.00	0.18	0.18	0.18	0.18	0.18	0.18
v/c Ratio	0.30	0.25	0.06	0.28	0.06	0.06	0.12	0.09	0.43	0.14	0.52
Control Delay (s/veh)	5.8	9.6	4.6	12.1	0.1	23.2	23.8	0.5	30.2	24.0	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	5.8	9.6	4.6	12.1	0.1	23.2	23.8	0.5	30.2	24.0	7.8
LOS	A	A	A	B	A	C	C	A	C	C	A
Approach Delay (s/veh)		8.5		9.6			14.3			15.5	
Approach LOS		A		A			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 67.2	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay (s/veh): 10.7	Intersection LOS: B
Intersection Capacity Utilization 56.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	196	495	37	464	101	12	32	30	106	46	252
v/c Ratio	0.30	0.25	0.06	0.28	0.06	0.06	0.12	0.09	0.43	0.14	0.52
Control Delay (s/veh)	5.8	9.6	4.6	12.1	0.1	23.2	23.8	0.5	30.2	24.0	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	5.8	9.6	4.6	12.1	0.1	23.2	23.8	0.5	30.2	24.0	7.8
Queue Length 50th (m)	6.7	11.8	1.2	16.9	0.0	1.5	4.0	0.0	11.9	4.9	0.0
Queue Length 95th (m)	15.1	28.8	4.0	26.8	0.0	5.3	10.1	0.0	21.9	11.1	11.4
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	660	2255	662	2316	1617	392	537	554	478	650	705
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.22	0.06	0.20	0.06	0.03	0.06	0.05	0.22	0.07	0.36

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	383	18	30	376	82	10	26	24	86	37	204
Future Volume (vph)	159	383	18	30	376	82	10	26	24	86	37	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	4.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3516		1825	3614	1617	1511	1588	1471	1825	1921	1586
Flt Permitted	0.44	1.00		0.47	1.00	1.00	0.73	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	854	3516		905	3614	1617	1156	1588	1471	1415	1921	1586
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	196	473	22	37	464	101	12	32	30	106	46	252
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	25	0	0	209
Lane Group Flow (vph)	196	492	0	37	464	101	12	32	5	106	46	43
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		Free	4		4	8		8
Actuated Green, G (s)	42.9	37.2		35.6	32.9	69.0	11.8	11.8	11.8	11.8	11.8	11.8
Effective Green, g (s)	42.9	37.2		35.6	32.9	69.0	11.8	11.8	11.8	11.8	11.8	11.8
Actuated g/C Ratio	0.62	0.54		0.52	0.48	1.00	0.17	0.17	0.17	0.17	0.17	0.17
Clearance Time (s)	3.0	7.0		3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	629	1895		502	1723	1617	197	271	251	241	328	271
v/s Ratio Prot	c0.03	0.14		0.00	0.13			0.02			0.02	
v/s Ratio Perm	c0.16			0.04		0.06	0.01		0.00	c0.07		0.03
v/c Ratio	0.31	0.26		0.07	0.27	0.06	0.06	0.12	0.02	0.44	0.14	0.16
Uniform Delay, d1	5.6	8.5		8.3	10.8	0.0	24.0	24.2	23.8	25.6	24.3	24.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.2		0.1	0.2	0.1	0.1	0.2	0.0	1.3	0.2	0.3
Delay (s)	5.9	8.7		8.3	11.0	0.1	24.1	24.4	23.8	26.9	24.5	24.6
Level of Service	A	A		A	B	A	C	C	C	C	C	C
Approach Delay (s/veh)		7.9			9.0			24.1			25.2	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	69.0	Sum of lost time (s)	17.3
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	11	10	256	316	4
Future Volume (Veh/h)	11	11	10	256	316	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	13	13	12	312	385	5
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	570	197	392			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	570	197	392			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	98	99			
cM capacity (veh/h)	451	816	1175			

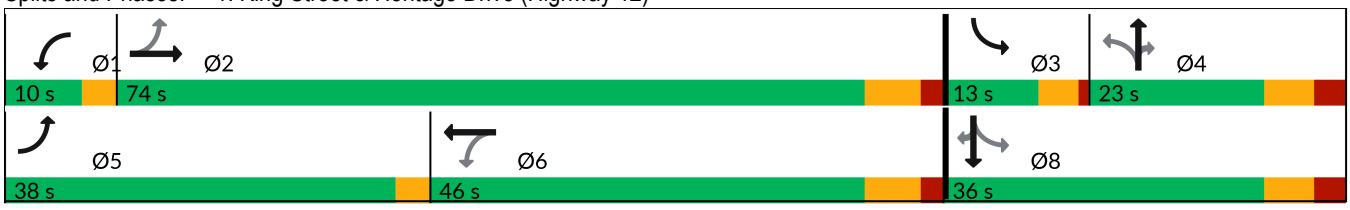
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	26	116	208	257	133
Volume Left	13	12	0	0	0
Volume Right	13	0	0	0	5
cSH	581	1175	1700	1700	1700
Volume to Capacity	0.04	0.01	0.12	0.15	0.08
Queue Length 95th (m)	1.1	0.2	0.0	0.0	0.0
Control Delay (s/veh)	11.5	0.9	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	11.5	0.3		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	24.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	370	669	48	704	192	25	59	44	143	63	410
Future Volume (vph)	370	669	48	704	192	25	59	44	143	63	410
Turn Type	pm+pt	NA	pm+pt	NA	Free	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2	1	6			4		3	8	
Permitted Phases	2		6		Free	4		4	8		8
Detector Phase	5	2	1	6		4	4	4	3	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0		10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0		17.3	17.3	17.3	9.5	17.3	17.3
Total Split (s)	38.0	74.0	10.0	46.0		23.0	23.0	23.0	13.0	36.0	36.0
Total Split (%)	31.7%	61.7%	8.3%	38.3%		19.2%	19.2%	19.2%	10.8%	30.0%	30.0%
Yellow Time (s)	3.0	5.0	3.0	5.0		4.5	4.5	4.5	3.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0		2.8	2.8	2.8	1.0	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0		7.3	7.3	7.3	4.5	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes		
Recall Mode	None	Ped	None	Ped		None	None	None	None	None	None
Act Effct Green (s)	61.0	51.4	44.9	33.5	92.4	11.0	11.0	11.0	23.7	20.8	20.8
Actuated g/C Ratio	0.66	0.56	0.49	0.36	1.00	0.12	0.12	0.12	0.26	0.23	0.23
v/c Ratio	0.65	0.37	0.12	0.57	0.13	0.20	0.34	0.16	0.46	0.16	0.63
Control Delay (s/veh)	13.8	13.3	9.5	27.8	0.2	46.2	47.6	1.2	35.0	32.0	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	13.8	13.3	9.5	27.8	0.2	46.2	47.6	1.2	35.0	32.0	8.0
LOS	B	B	A	C	A	D	D	A	C	C	A
Approach Delay (s/veh)		13.5		21.2			31.4			16.7	
Approach LOS		B		C			C			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 92.4	
Natural Cycle: 75	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay (s/veh): 17.7	Intersection LOS: B
Intersection Capacity Utilization 71.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	394	725	51	749	204	27	63	47	152	67	436
v/c Ratio	0.65	0.37	0.12	0.57	0.13	0.20	0.34	0.16	0.46	0.16	0.63
Control Delay (s/veh)	13.8	13.3	9.5	27.8	0.2	46.2	47.6	1.2	35.0	32.0	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	13.8	13.3	9.5	27.8	0.2	46.2	47.6	1.2	35.0	32.0	8.0
Queue Length 50th (m)	29.0	42.7	3.0	55.5	0.0	5.0	11.9	0.0	20.2	8.9	0.0
Queue Length 95th (m)	53.8	59.1	7.1	95.6	0.0	17.2	31.6	0.0	47.1	24.3	26.8
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	837	2633	436	1568	1617	197	277	365	328	613	804
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.28	0.12	0.48	0.13	0.14	0.23	0.13	0.46	0.11	0.54

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	370	669	12	48	704	192	25	59	44	143	63	410
Future Volume (vph)	370	669	12	48	704	192	25	59	44	143	63	410
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	4.0	7.3	7.3	7.3	4.5	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3532		1825	3614	1617	1502	1588	1471	1825	1921	1589
Flt Permitted	0.24	1.00		0.38	1.00	1.00	0.71	1.00	1.00	0.46	1.00	1.00
Satd. Flow (perm)	466	3532		723	3614	1617	1128	1588	1471	892	1921	1589
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	394	712	13	51	749	204	27	63	47	152	67	436
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	43	0	0	332
Lane Group Flow (vph)	394	724	0	51	749	204	27	63	4	152	67	104
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6			4		3	8	
Permitted Phases	2			6		Free	4		4	8		8
Actuated Green, G (s)	58.3	51.4		38.9	35.0	95.2	8.3	8.3	8.3	22.6	22.6	22.6
Effective Green, g (s)	58.3	51.4		38.9	35.0	95.2	8.3	8.3	8.3	22.6	22.6	22.6
Actuated g/C Ratio	0.61	0.54		0.41	0.37	1.00	0.09	0.09	0.09	0.24	0.24	0.24
Clearance Time (s)	3.0	7.0		3.0	7.0		7.3	7.3	7.3	4.5	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	575	1906		340	1328	1617	98	138	128	307	456	377
v/s Ratio Prot	c0.15	0.20		0.01	0.21			0.04		c0.05	0.03	
v/s Ratio Perm	c0.27			0.06		0.13	0.02		0.00	c0.07		0.07
v/c Ratio	0.69	0.38		0.15	0.56	0.13	0.28	0.46	0.03	0.50	0.15	0.27
Uniform Delay, d1	11.1	12.7		17.1	24.0	0.0	40.6	41.3	39.8	30.3	28.7	29.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.4	0.3		0.2	1.0	0.2	1.5	2.4	0.1	1.3	0.1	0.4
Delay (s)	14.5	13.0		17.3	25.0	0.2	42.2	43.7	39.9	31.6	28.8	30.0
Level of Service	B	B		B	C	A	D	D	D	C	C	C
Approach Delay (s/veh)		13.5			19.6			42.1			30.3	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	95.2	Sum of lost time (s)	21.8
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	18	19	602	596	16
Future Volume (Veh/h)	14	18	19	602	596	16
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	16	20	21	676	670	18
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	1061	346	690			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1061	346	690			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	97	98			
cM capacity (veh/h)	217	655	912			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	36	246	451	447	241
Volume Left	16	21	0	0	0
Volume Right	20	0	0	0	18
cSH	345	912	1700	1700	1700
Volume to Capacity	0.10	0.02	0.27	0.26	0.14
Queue Length 95th (m)	2.6	0.5	0.0	0.0	0.0
Control Delay (s/veh)	16.7	1.0	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s/veh)	16.7	0.3		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	40.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	292	562	39	595	143	11	73	35	137	48	368
Future Volume (vph)	292	562	39	595	143	11	73	35	137	48	368
Turn Type	pm+pt	NA	pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		Free	4		4	8		8
Detector Phase	5	2	1	6		4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0		17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	21.0	49.0	10.0	38.0		31.0	31.0	31.0	31.0	31.0	31.0
Total Split (%)	23.3%	54.4%	11.1%	42.2%		34.4%	34.4%	34.4%	34.4%	34.4%	34.4%
Yellow Time (s)	3.0	5.0	3.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0		2.8	2.8	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes							
Recall Mode	None	Ped	None	Ped		None	None	None	None	None	None
Act Effct Green (s)	50.8	41.1	42.5	31.3	75.9	14.6	14.6	14.6	14.6	14.6	14.6
Actuated g/C Ratio	0.67	0.54	0.56	0.41	1.00	0.19	0.19	0.19	0.19	0.19	0.19
v/c Ratio	0.48	0.31	0.07	0.42	0.09	0.05	0.25	0.09	0.55	0.14	0.62
Control Delay (s/veh)	8.3	11.7	6.4	18.3	0.1	25.5	28.3	0.5	36.2	26.3	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	8.3	11.7	6.4	18.3	0.1	25.5	28.3	0.5	36.2	26.3	8.0
LOS	A	B	A	B	A	C	C	A	D	C	A
Approach Delay (s/veh)		10.6		14.3			19.9			16.6	
Approach LOS		B		B			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 75.9	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay (s/veh): 13.8	Intersection LOS: B
Intersection Capacity Utilization 66.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	304	594	41	620	149	11	76	36	143	50	383
v/c Ratio	0.48	0.31	0.07	0.42	0.09	0.05	0.25	0.09	0.55	0.14	0.62
Control Delay (s/veh)	8.3	11.7	6.4	18.3	0.1	25.5	28.3	0.5	36.2	26.3	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	8.3	11.7	6.4	18.3	0.1	25.5	28.3	0.5	36.2	26.3	8.0
Queue Length 50th (m)	14.0	26.0	1.6	30.7	0.0	1.5	10.6	0.0	18.1	5.8	0.0
Queue Length 95th (m)	33.0	45.5	5.9	59.3	0.0	6.3	24.7	0.0	37.3	15.1	20.8
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	725	2013	553	1492	1617	364	501	547	429	606	763
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.30	0.07	0.42	0.09	0.03	0.15	0.07	0.33	0.08	0.50

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	292	562	9	39	595	143	11	73	35	137	48	368
Future Volume (vph)	292	562	9	39	595	143	11	73	35	137	48	368
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	4.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3534		1825	3614	1617	1512	1588	1471	1825	1921	1587
Flt Permitted	0.35	1.00		0.43	1.00	1.00	0.72	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	671	3534		821	3614	1617	1153	1588	1471	1359	1921	1587
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	304	585	9	41	620	149	11	76	36	143	50	383
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	29	0	0	310
Lane Group Flow (vph)	304	593	0	41	620	149	11	76	7	143	50	73
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		Free	4		4	8		8
Actuated Green, G (s)	48.1	41.1		36.7	32.7	77.0	14.6	14.6	14.6	14.6	14.6	14.6
Effective Green, g (s)	48.1	41.1		36.7	32.7	77.0	14.6	14.6	14.6	14.6	14.6	14.6
Actuated g/C Ratio	0.62	0.53		0.48	0.42	1.00	0.19	0.19	0.19	0.19	0.19	0.19
Clearance Time (s)	3.0	7.0		3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	604	1886		443	1534	1617	218	301	278	257	364	300
v/s Ratio Prot	c0.08	0.17		0.00	0.17			0.05			0.03	
v/s Ratio Perm	c0.23			0.04		0.09	0.01		0.00	c0.11		0.05
v/c Ratio	0.50	0.31		0.09	0.40	0.09	0.05	0.25	0.02	0.56	0.14	0.24
Uniform Delay, d1	6.9	10.1		10.8	15.4	0.0	25.5	26.6	25.4	28.3	26.0	26.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.2		0.1	0.4	0.1	0.1	0.4	0.0	2.6	0.2	0.4
Delay (s)	7.5	10.3		10.9	15.8	0.1	25.6	27.0	25.4	30.9	26.1	26.9
Level of Service	A	B		B	B	A	C	C	C	C	C	C
Approach Delay (s/veh)		9.4			12.7			26.4			27.8	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	77.0	Sum of lost time (s)	17.3
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	25	12	495	527	10
Future Volume (Veh/h)	10	25	12	495	527	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	11	27	13	527	561	11
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	858	288	574			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	858	288	574			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	96	99			
cM capacity (veh/h)	295	713	1007			

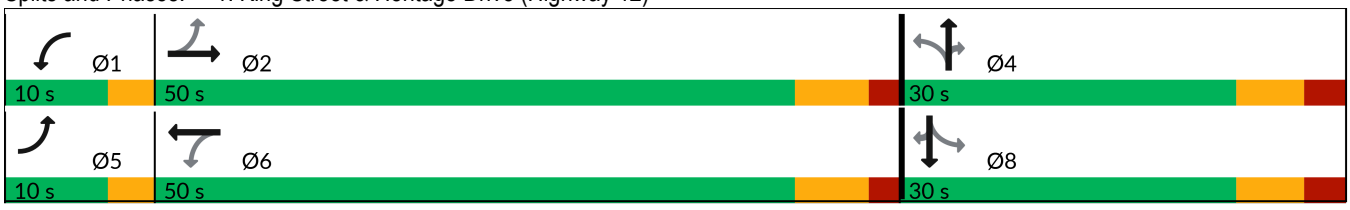
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	38	189	351	374	198
Volume Left	11	13	0	0	0
Volume Right	27	0	0	0	11
cSH	506	1007	1700	1700	1700
Volume to Capacity	0.08	0.01	0.21	0.22	0.12
Queue Length 95th (m)	1.8	0.3	0.0	0.0	0.0
Control Delay (s/veh)	12.7	0.7	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	12.7	0.2		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	32.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	187	435	32	424	97	13	27	26	111	40	247
Future Volume (vph)	187	435	32	424	97	13	27	26	111	40	247
Turn Type	pm+pt	NA	pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		Free	4		4	8		8
Detector Phase	5	2	1	6		4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0		17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0		30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%		33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0		2.8	2.8	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes							
Recall Mode	None	Ped	None	Ped		None	None	None	None	None	None
Act Effct Green (s)	43.3	35.2	42.1	31.1	68.5	13.1	13.1	13.1	13.1	13.1	13.1
Actuated g/C Ratio	0.63	0.51	0.61	0.45	1.00	0.19	0.19	0.19	0.19	0.19	0.19
v/c Ratio	0.38	0.31	0.06	0.32	0.07	0.07	0.11	0.09	0.51	0.13	0.55
Control Delay (s/veh)	7.2	11.7	5.3	13.2	0.1	22.7	23.0	0.5	31.6	23.3	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	7.2	11.7	5.3	13.2	0.1	22.7	23.0	0.5	31.6	23.3	7.4
LOS	A	B	A	B	A	C	C	A	C	C	A
Approach Delay (s/veh)		10.4		10.4			14.1			15.7	
Approach LOS		B		B			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 68.5	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay (s/veh): 11.8	Intersection LOS: B
Intersection Capacity Utilization 58.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	231	567	40	523	120	16	33	32	137	49	305
v/c Ratio	0.38	0.31	0.06	0.32	0.07	0.07	0.11	0.09	0.51	0.13	0.55
Control Delay (s/veh)	7.2	11.7	5.3	13.2	0.1	22.7	23.0	0.5	31.6	23.3	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	7.2	11.7	5.3	13.2	0.1	22.7	23.0	0.5	31.6	23.3	7.4
Queue Length 50th (m)	9.6	23.4	1.5	21.2	0.0	2.0	4.1	0.0	15.8	5.2	0.0
Queue Length 95th (m)	19.5	35.1	4.7	32.1	0.0	6.3	10.3	0.0	27.1	11.5	11.7
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	615	2210	618	2272	1617	383	527	544	469	637	731
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.26	0.06	0.23	0.07	0.04	0.06	0.06	0.29	0.08	0.42

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	435	24	32	424	97	13	27	26	111	40	247
Future Volume (vph)	187	435	24	32	424	97	13	27	26	111	40	247
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	4.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3510		1825	3614	1617	1512	1588	1471	1825	1921	1587
Flt Permitted	0.42	1.00		0.44	1.00	1.00	0.73	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	808	3510		843	3614	1617	1154	1588	1471	1413	1921	1587
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	231	537	30	40	523	120	16	33	32	137	49	305
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	26	0	0	248
Lane Group Flow (vph)	231	563	0	40	523	120	16	33	6	137	49	57
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		Free	4		4	8		8
Actuated Green, G (s)	42.3	35.3		36.5	32.4	69.8	13.1	13.1	13.1	13.1	13.1	13.1
Effective Green, g (s)	42.3	35.3		36.5	32.4	69.8	13.1	13.1	13.1	13.1	13.1	13.1
Actuated g/C Ratio	0.61	0.51		0.52	0.46	1.00	0.19	0.19	0.19	0.19	0.19	0.19
Clearance Time (s)	3.0	7.0		3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	591	1775		498	1677	1617	216	298	276	265	360	297
v/s Ratio Prot	c0.04	0.16		0.00	0.14			0.02			0.03	
v/s Ratio Perm	c0.20			0.04		0.07	0.01		0.00	c0.10		0.04
v/c Ratio	0.39	0.32		0.08	0.31	0.07	0.07	0.11	0.02	0.52	0.14	0.19
Uniform Delay, d1	6.3	10.2		8.1	11.7	0.0	23.4	23.5	23.1	25.5	23.6	23.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.2		0.1	0.3	0.1	0.1	0.2	0.0	1.7	0.2	0.3
Delay (s)	6.7	10.4		8.2	12.0	0.1	23.5	23.7	23.2	27.2	23.8	24.2
Level of Service	A	B		A	B	A	C	C	C	C	C	C
Approach Delay (s/veh)		9.3			9.7			23.4			25.0	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	69.8	Sum of lost time (s)	17.3
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	11	10	300	385	4
Future Volume (Veh/h)	11	11	10	300	385	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.46	0.69	0.83	0.75	0.85	0.50
Hourly flow rate (vph)	24	16	12	400	453	8
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	683	233	463			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	683	233	463			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	98	99			
cM capacity (veh/h)	382	774	1107			

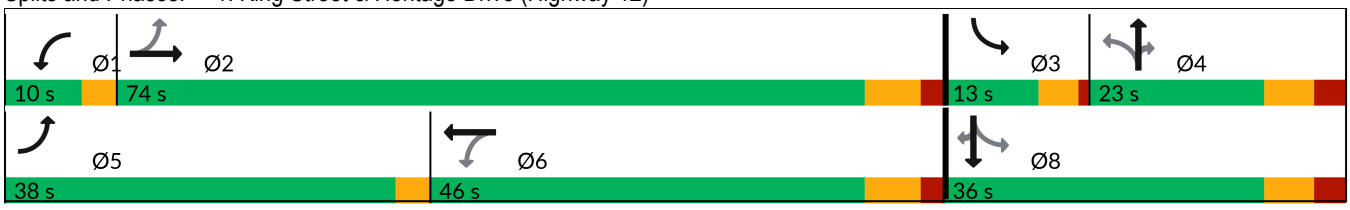
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	40	145	267	302	159
Volume Left	24	12	0	0	0
Volume Right	16	0	0	0	8
cSH	480	1107	1700	1700	1700
Volume to Capacity	0.08	0.01	0.16	0.18	0.09
Queue Length 95th (m)	2.1	0.2	0.0	0.0	0.0
Control Delay (s/veh)	13.2	0.8	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	13.2	0.3		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	25.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	431	771	51	810	222	35	64	48	165	68	482
Future Volume (vph)	431	771	51	810	222	35	64	48	165	68	482
Turn Type	pm+pt	NA	pm+pt	NA	Free	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2	1	6			4		3	8	
Permitted Phases	2		6		Free	4		4	8		8
Detector Phase	5	2	1	6		4	4	4	3	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0		10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0		17.3	17.3	17.3	9.5	17.3	17.3
Total Split (s)	38.0	74.0	10.0	46.0		23.0	23.0	23.0	13.0	36.0	36.0
Total Split (%)	31.7%	61.7%	8.3%	38.3%		19.2%	19.2%	19.2%	10.8%	30.0%	30.0%
Yellow Time (s)	3.0	5.0	3.0	5.0		4.5	4.5	4.5	3.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0		2.8	2.8	2.8	1.0	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0		7.3	7.3	7.3	4.5	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes		
Recall Mode	None	Ped	None	Ped		None	None	None	None	None	None
Act Effct Green (s)	69.0	57.4	47.2	35.8	100.9	11.4	11.4	11.4	24.1	21.2	21.2
Actuated g/C Ratio	0.68	0.57	0.47	0.35	1.00	0.11	0.11	0.11	0.24	0.21	0.21
v/c Ratio	0.75	0.42	0.14	0.67	0.15	0.29	0.38	0.18	0.58	0.18	0.70
Control Delay (s/veh)	23.8	14.1	10.7	32.9	0.2	52.9	53.1	1.4	42.8	36.3	9.3
Queue Delay	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)	23.8	14.1	10.7	32.9	0.2	52.9	53.1	1.4	42.8	36.3	9.3
LOS	C	B	B	C	A	D	D	A	D	D	A
Approach Delay (s/veh)		17.5		25.1			36.2			19.6	
Approach LOS		B		C			D			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 100.9	
Natural Cycle: 80	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay (s/veh): 21.5	Intersection LOS: C
Intersection Capacity Utilization 79.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	459	841	54	862	236	37	68	51	176	72	513
v/c Ratio	0.75	0.42	0.14	0.67	0.15	0.29	0.38	0.18	0.58	0.18	0.70
Control Delay (s/veh)	23.8	14.1	10.7	32.9	0.2	52.9	53.1	1.4	42.8	36.3	9.3
Queue Delay	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)	23.8	14.1	10.7	32.9	0.2	52.9	53.1	1.4	42.8	36.3	9.3
Queue Length 50th (m)	49.8	51.6	3.2	79.5	0.0	8.3	15.6	0.0	30.0	12.0	0.8
Queue Length 95th (m)	94.2	72.2	7.8	117.0	0.0	21.6	34.1	0.0	54.3	26.0	31.4
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	764	2422	385	1444	1617	181	255	347	306	564	825
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.35	0.14	0.60	0.15	0.20	0.27	0.15	0.58	0.13	0.62

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	431	771	20	51	810	222	35	64	48	165	68	482
Future Volume (vph)	431	771	20	51	810	222	35	64	48	165	68	482
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	4.0	7.3	7.3	7.3	4.5	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3528		1825	3614	1617	1501	1588	1471	1825	1921	1589
Flt Permitted	0.18	1.00		0.34	1.00	1.00	0.71	1.00	1.00	0.47	1.00	1.00
Satd. Flow (perm)	339	3528		645	3614	1617	1122	1588	1471	899	1921	1589
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	459	820	21	54	862	236	37	68	51	176	72	513
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	47	0	0	394
Lane Group Flow (vph)	459	840	0	54	862	236	37	68	4	176	72	119
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6			4		3	8	
Permitted Phases	2			6		Free	4		4	8		8
Actuated Green, G (s)	65.7	57.4		42.0	36.7	103.1	8.6	8.6	8.6	23.1	23.1	23.1
Effective Green, g (s)	65.7	57.4		42.0	36.7	103.1	8.6	8.6	8.6	23.1	23.1	23.1
Actuated g/C Ratio	0.64	0.56		0.41	0.36	1.00	0.08	0.08	0.08	0.22	0.22	0.22
Clearance Time (s)	3.0	7.0		3.0	7.0		7.3	7.3	7.3	4.5	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	590	1964		323	1286	1617	93	132	122	291	430	356
v/s Ratio Prot	c0.20	0.24		0.01	0.24			0.04		c0.06	0.04	
v/s Ratio Perm	c0.30			0.06		0.15	0.03		0.00	c0.08		0.07
v/c Ratio	0.78	0.43		0.17	0.67	0.15	0.40	0.52	0.03	0.60	0.17	0.33
Uniform Delay, d1	18.9	13.3		18.7	28.1	0.0	44.8	45.3	43.4	34.5	32.2	33.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.4	0.4		0.2	1.9	0.2	2.8	3.4	0.1	3.5	0.2	0.6
Delay (s)	25.3	13.7		18.9	30.0	0.2	47.6	48.6	43.6	38.0	32.4	34.1
Level of Service	C	B		B	C	A	D	D	D	D	C	C
Approach Delay (s/veh)		17.8			23.4			46.7			34.8	
Approach LOS		B			C			D			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	103.1	Sum of lost time (s)	21.8
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	18	19	695	695	16
Future Volume (Veh/h)	14	18	19	695	695	16
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	16	20	21	781	781	18
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	1225	402	801			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1225	402	801			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	97	97			
cM capacity (veh/h)	169	603	829			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	36	281	521	521	278
Volume Left	16	21	0	0	0
Volume Right	20	0	0	0	18
cSH	282	829	1700	1700	1700
Volume to Capacity	0.13	0.03	0.31	0.31	0.16
Queue Length 95th (m)	3.3	0.6	0.0	0.0	0.0
Control Delay (s/veh)	19.6	1.0	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s/veh)	19.6	0.3		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	343	639	41	675	171	18	77	37	157	50	427
Future Volume (vph)	343	639	41	675	171	18	77	37	157	50	427
Turn Type	pm+pt	NA	pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		Free	4		4	8		8
Detector Phase	5	2	1	6		4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0		17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	21.0	49.0	10.0	38.0		31.0	31.0	31.0	31.0	31.0	31.0
Total Split (%)	23.3%	54.4%	11.1%	42.2%		34.4%	34.4%	34.4%	34.4%	34.4%	34.4%
Yellow Time (s)	3.0	5.0	3.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0		2.8	2.8	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes							
Recall Mode	None	Ped	None	Ped		None	None	None	None	None	None
Act Effct Green (s)	52.5	42.9	42.4	31.3	79.2	16.3	16.3	16.3	16.3	16.3	16.3
Actuated g/C Ratio	0.66	0.54	0.54	0.40	1.00	0.21	0.21	0.21	0.21	0.21	0.21
v/c Ratio	0.60	0.36	0.09	0.49	0.11	0.08	0.25	0.10	0.59	0.13	0.69
Control Delay (s/veh)	10.8	12.7	7.1	20.9	0.1	26.2	28.4	0.5	37.9	26.5	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	10.8	12.7	7.1	20.9	0.1	26.2	28.4	0.5	37.9	26.5	10.7
LOS	B	B	A	C	A	C	C	A	D	C	B
Approach Delay (s/veh)		12.0		16.2			20.2			18.7	
Approach LOS		B		B			C			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 79.2	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay (s/veh): 15.4	Intersection LOS: B
Intersection Capacity Utilization 71.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	357	681	43	703	178	19	80	39	164	52	445
v/c Ratio	0.60	0.36	0.09	0.49	0.11	0.08	0.25	0.10	0.59	0.13	0.69
Control Delay (s/veh)	10.8	12.7	7.1	20.9	0.1	26.2	28.4	0.5	37.9	26.5	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	10.8	12.7	7.1	20.9	0.1	26.2	28.4	0.5	37.9	26.5	10.7
Queue Length 50th (m)	19.3	33.0	1.9	40.4	0.0	2.7	11.6	0.0	22.1	6.3	5.0
Queue Length 95th (m)	40.6	53.8	6.3	69.2	0.0	9.0	25.8	0.0	42.4	15.4	31.6
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	664	1956	500	1429	1617	348	480	529	409	580	762
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.35	0.09	0.49	0.11	0.05	0.17	0.07	0.40	0.09	0.58

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	343	639	14	41	675	171	18	77	37	157	50	427
Future Volume (vph)	343	639	14	41	675	171	18	77	37	157	50	427
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	4.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3530		1825	3614	1617	1513	1588	1471	1825	1921	1588
Flt Permitted	0.29	1.00		0.39	1.00	1.00	0.72	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	565	3530		754	3614	1617	1151	1588	1471	1354	1921	1588
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	357	666	15	43	703	178	19	80	39	164	52	445
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	31	0	0	322
Lane Group Flow (vph)	357	680	0	43	703	178	19	80	8	164	52	123
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		Free	4		4	8		8
Actuated Green, G (s)	49.7	42.8		36.5	32.6	80.3	16.3	16.3	16.3	16.3	16.3	16.3
Effective Green, g (s)	49.7	42.8		36.5	32.6	80.3	16.3	16.3	16.3	16.3	16.3	16.3
Actuated g/C Ratio	0.62	0.53		0.45	0.41	1.00	0.20	0.20	0.20	0.20	0.20	0.20
Clearance Time (s)	3.0	7.0		3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	570	1881		394	1467	1617	233	322	298	274	389	322
v/s Ratio Prot	c0.11	0.19		0.01	0.19			0.05			0.03	
v/s Ratio Perm	c0.28			0.04		0.11	0.02		0.01	c0.12		0.08
v/c Ratio	0.63	0.36		0.11	0.48	0.11	0.08	0.25	0.03	0.60	0.13	0.38
Uniform Delay, d1	8.1	10.8		12.2	17.6	0.0	25.9	26.9	25.6	29.0	26.2	27.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	0.3		0.1	0.6	0.1	0.2	0.4	0.0	3.5	0.2	0.8
Delay (s)	10.2	11.1		12.4	18.2	0.1	26.1	27.3	25.7	32.5	26.4	28.4
Level of Service	B	B		B	B	A	C	C	C	C	C	C
Approach Delay (s/veh)		10.8			14.4			26.7			29.3	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	80.3	Sum of lost time (s)	17.3
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	25	12	577	605	10
Future Volume (Veh/h)	10	25	12	577	605	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	11	27	13	614	644	11
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	985	330	657			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	985	330	657			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	96	99			
cM capacity (veh/h)	245	671	938			

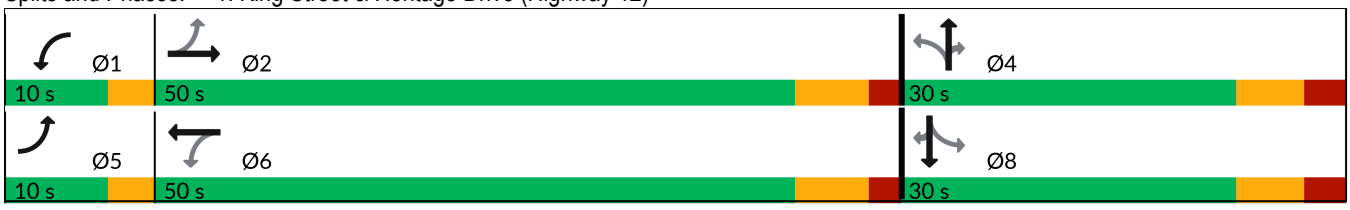
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	38	218	409	429	226
Volume Left	11	13	0	0	0
Volume Right	27	0	0	0	11
cSH	446	938	1700	1700	1700
Volume to Capacity	0.09	0.01	0.24	0.25	0.13
Queue Length 95th (m)	2.1	0.3	0.0	0.0	0.0
Control Delay (s/veh)	13.8	0.7	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	13.8	0.2		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	34.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	226	527	34	484	103	16	30	28	113	45	272
Future Volume (vph)	226	527	34	484	103	16	30	28	113	45	272
Turn Type	pm+pt	NA	pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		Free	4		4	8		8
Detector Phase	5	2	1	6		4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0		17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0		30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%		33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0		2.8	2.8	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes							
Recall Mode	None	Ped	None	Ped		None	None	None	None	None	None
Act Effct Green (s)	43.8	35.7	42.5	31.4	69.5	13.7	13.7	13.7	13.7	13.7	13.7
Actuated g/C Ratio	0.63	0.51	0.61	0.45	1.00	0.20	0.20	0.20	0.20	0.20	0.20
v/c Ratio	0.49	0.38	0.07	0.37	0.08	0.09	0.12	0.10	0.51	0.15	0.58
Control Delay (s/veh)	9.2	12.6	5.6	13.9	0.1	23.1	23.2	0.8	31.5	23.5	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	9.2	12.6	5.6	13.9	0.1	23.1	23.2	0.8	31.5	23.5	7.4
LOS	A	B	A	B	A	C	C	A	C	C	A
Approach Delay (s/veh)		11.6		11.2			14.6			15.5	
Approach LOS		B		B			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 69.5	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay (s/veh): 12.5	Intersection LOS: B
Intersection Capacity Utilization 60.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	279	687	42	598	127	20	37	35	140	56	336
v/c Ratio	0.49	0.38	0.07	0.37	0.08	0.09	0.12	0.10	0.51	0.15	0.58
Control Delay (s/veh)	9.2	12.6	5.6	13.9	0.1	23.1	23.2	0.8	31.5	23.5	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	9.2	12.6	5.6	13.9	0.1	23.1	23.2	0.8	31.5	23.5	7.4
Queue Length 50th (m)	11.9	29.8	1.6	24.9	0.0	2.5	4.6	0.0	16.2	6.0	0.1
Queue Length 95th (m)	25.0	44.8	5.1	38.1	0.0	7.5	11.3	0.0	28.3	12.9	12.1
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	568	2184	566	2245	1617	376	521	539	461	630	746
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.31	0.07	0.27	0.08	0.05	0.07	0.06	0.30	0.09	0.45

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	226	527	29	34	484	103	16	30	28	113	45	272
Future Volume (vph)	226	527	29	34	484	103	16	30	28	113	45	272
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	4.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3511		1825	3614	1617	1512	1588	1471	1825	1921	1588
Flt Permitted	0.38	1.00		0.39	1.00	1.00	0.72	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	726	3511		750	3614	1617	1147	1588	1471	1408	1921	1588
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	279	651	36	42	598	127	20	37	35	140	56	336
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	28	0	0	270
Lane Group Flow (vph)	279	683	0	42	598	127	20	37	7	140	56	66
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		Free	4		4	8		8
Actuated Green, G (s)	42.7	35.7		36.7	32.7	70.6	13.6	13.6	13.6	13.6	13.6	13.6
Effective Green, g (s)	42.7	35.7		36.7	32.7	70.6	13.6	13.6	13.6	13.6	13.6	13.6
Actuated g/C Ratio	0.60	0.51		0.52	0.46	1.00	0.19	0.19	0.19	0.19	0.19	0.19
Clearance Time (s)	3.0	7.0		3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	548	1775		450	1673	1617	220	305	283	271	370	305
v/s Ratio Prot	c0.05	0.19		0.01	0.17			0.02			0.03	
v/s Ratio Perm	c0.26			0.04		0.08	0.02		0.00	c0.10		0.04
v/c Ratio	0.51	0.38		0.09	0.36	0.08	0.09	0.12	0.02	0.52	0.15	0.21
Uniform Delay, d1	6.7	10.7		8.3	12.2	0.0	23.4	23.6	23.1	25.6	23.7	24.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.3		0.1	0.3	0.1	0.2	0.2	0.0	1.7	0.2	0.4
Delay (s)	7.4	11.0		8.4	12.5	0.1	23.6	23.7	23.2	27.2	23.9	24.4
Level of Service	A	B		A	B	A	C	C	C	C	C	C
Approach Delay (s/veh)		10.0			10.2			23.5			25.1	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	70.6	Sum of lost time (s)	17.3
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	11	10	345	415	4
Future Volume (Veh/h)	11	11	10	345	415	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	13	13	12	421	506	5
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	745	258	513			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	745	258	513			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	98	99			
cM capacity (veh/h)	349	746	1061			

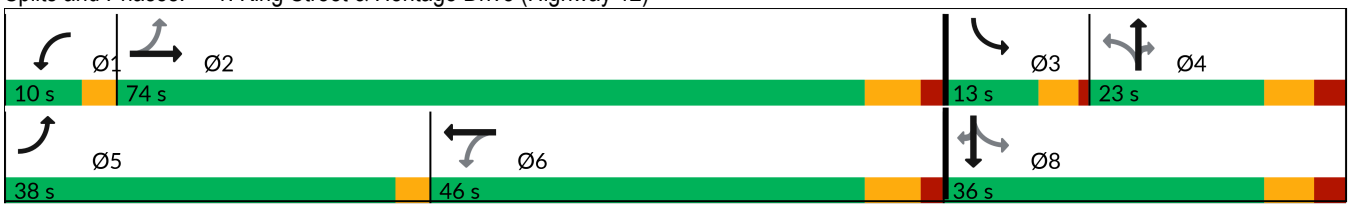
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	26	152	281	337	174
Volume Left	13	12	0	0	0
Volume Right	13	0	0	0	5
cSH	476	1061	1700	1700	1700
Volume to Capacity	0.05	0.01	0.17	0.20	0.10
Queue Length 95th (m)	1.3	0.3	0.0	0.0	0.0
Control Delay (s/veh)	13.0	0.8	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	13.0	0.3		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	26.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	505	913	55	962	244	41	73	52	182	76	558
Future Volume (vph)	505	913	55	962	244	41	73	52	182	76	558
Turn Type	pm+pt	NA	pm+pt	NA	Free	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2	1	6			4		3	8	
Permitted Phases	2		6		Free	4		4	8		8
Detector Phase	5	2	1	6		4	4	4	3	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0		10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0		17.3	17.3	17.3	9.5	17.3	17.3
Total Split (s)	38.0	74.0	10.0	46.0		23.0	23.0	23.0	13.0	36.0	36.0
Total Split (%)	31.7%	61.7%	8.3%	38.3%		19.2%	19.2%	19.2%	10.8%	30.0%	30.0%
Yellow Time (s)	3.0	5.0	3.0	5.0		4.5	4.5	4.5	3.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0		2.8	2.8	2.8	1.0	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0		7.3	7.3	7.3	4.5	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes		
Recall Mode	None	Ped	None	Ped		None	None	None	None	None	None
Act Effct Green (s)	77.4	65.8	48.8	37.6	109.7	12.0	12.0	12.0	24.6	21.8	21.8
Actuated g/C Ratio	0.71	0.60	0.44	0.34	1.00	0.11	0.11	0.11	0.22	0.20	0.20
v/c Ratio	0.87	0.47	0.18	0.83	0.16	0.36	0.45	0.20	0.68	0.21	0.83
Control Delay (s/veh)	43.6	14.5	12.0	41.1	0.2	57.3	57.7	1.6	50.8	38.8	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	43.6	14.5	12.0	41.1	0.2	57.3	57.7	1.6	50.8	38.8	18.8
LOS	D	B	B	D	A	E	E	A	D	D	B
Approach Delay (s/veh)		24.6		31.9			40.2			27.8	
Approach LOS		C		C			D			C	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 109.7	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay (s/veh): 28.5	Intersection LOS: C
Intersection Capacity Utilization 87.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	537	998	59	1023	260	44	78	55	194	81	594
v/c Ratio	0.87	0.47	0.18	0.83	0.16	0.36	0.45	0.20	0.68	0.21	0.83
Control Delay (s/veh)	43.6	14.5	12.0	41.1	0.2	57.3	57.7	1.6	50.8	38.8	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	43.6	14.5	12.0	41.1	0.2	57.3	57.7	1.6	50.8	38.8	18.8
Queue Length 50th (m)	93.8	66.7	3.6	112.4	0.0	11.0	19.9	0.0	37.8	15.2	18.2
Queue Length 95th (m)	#163.4	91.5	8.6	#148.3	0.0	24.7	37.8	0.0	59.4	28.5	66.7
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	664	2197	328	1309	1617	163	231	327	286	512	790
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.45	0.18	0.78	0.16	0.27	0.34	0.17	0.68	0.16	0.75

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	505	913	25	55	962	244	41	73	52	182	76	558
Future Volume (vph)	505	913	25	55	962	244	41	73	52	182	76	558
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	4.0	7.3	7.3	7.3	4.5	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3527		1825	3614	1617	1501	1588	1471	1825	1921	1588
Flt Permitted	0.10	1.00		0.29	1.00	1.00	0.70	1.00	1.00	0.48	1.00	1.00
Satd. Flow (perm)	186	3527		552	3614	1617	1113	1588	1471	914	1921	1588
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	537	971	27	59	1023	260	44	78	55	194	81	594
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	50	0	0	395
Lane Group Flow (vph)	537	996	0	59	1023	260	44	78	5	194	81	199
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6			4		3	8	
Permitted Phases	2			6		Free	4		4	8		8
Actuated Green, G (s)	74.1	65.8		43.7	38.4	112.0	9.3	9.3	9.3	23.6	23.6	23.6
Effective Green, g (s)	74.1	65.8		43.7	38.4	112.0	9.3	9.3	9.3	23.6	23.6	23.6
Actuated g/C Ratio	0.66	0.59		0.39	0.34	1.00	0.08	0.08	0.08	0.21	0.21	0.21
Clearance Time (s)	3.0	7.0		3.0	7.0		7.3	7.3	7.3	4.5	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	601	2072		275	1239	1617	92	131	122	272	404	334
v/s Ratio Prot	c0.26	0.28		0.01	0.28			0.05		c0.06	0.04	
v/s Ratio Perm	c0.33			0.07		0.16	0.04		0.00	c0.09		0.13
v/c Ratio	0.89	0.48		0.21	0.83	0.16	0.48	0.60	0.04	0.71	0.20	0.60
Uniform Delay, d1	30.2	13.3		21.5	33.7	0.0	49.0	49.5	47.2	39.4	36.4	39.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.6	0.4		0.4	5.3	0.2	3.9	7.1	0.1	8.6	0.2	2.9
Delay (s)	45.8	13.7		21.9	39.0	0.2	52.9	56.6	47.4	48.0	36.7	42.8
Level of Service	D	B		C	D	A	D	E	D	D	D	D
Approach Delay (s/veh)		24.9			30.7			52.8			43.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	21.8
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	18	19	797	794	16
Future Volume (Veh/h)	14	18	19	797	794	16
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	16	20	21	896	892	18
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	1393	457	912			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1393	457	912			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	96	97			
cM capacity (veh/h)	131	555	754			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	36	320	597	595	315
Volume Left	16	21	0	0	0
Volume Right	20	0	0	0	18
cSH	228	754	1700	1700	1700
Volume to Capacity	0.16	0.03	0.35	0.35	0.19
Queue Length 95th (m)	4.2	0.7	0.0	0.0	0.0
Control Delay (s/veh)	23.7	1.0	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s/veh)	23.7	0.3		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	397	749	43	804	184	24	86	40	172	55	495
Future Volume (vph)	397	749	43	804	184	24	86	40	172	55	495
Turn Type	pm+pt	NA	pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		Free	4		4	8		8
Detector Phase	5	2	1	6		4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0		17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	21.0	49.0	10.0	38.0		31.0	31.0	31.0	31.0	31.0	31.0
Total Split (%)	23.3%	54.4%	11.1%	42.2%		34.4%	34.4%	34.4%	34.4%	34.4%	34.4%
Yellow Time (s)	3.0	5.0	3.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0		2.8	2.8	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes							
Recall Mode	None	Ped	None	Ped		None	None	None	None	None	None
Act Effct Green (s)	54.7	45.0	42.4	31.3	82.4	17.3	17.3	17.3	17.3	17.3	17.3
Actuated g/C Ratio	0.66	0.55	0.51	0.38	1.00	0.21	0.21	0.21	0.21	0.21	0.21
v/c Ratio	0.74	0.41	0.10	0.61	0.12	0.10	0.27	0.10	0.63	0.14	0.81
Control Delay (s/veh)	19.2	13.6	7.7	24.3	0.2	26.8	29.2	0.5	40.4	26.9	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	19.2	13.6	7.7	24.3	0.2	26.8	29.2	0.5	40.4	26.9	19.5
LOS	B	B	A	C	A	C	C	A	D	C	B
Approach Delay (s/veh)		15.5		19.3			21.1			25.0	
Approach LOS		B		B			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 82.4	
Natural Cycle: 75	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay (s/veh): 19.3	Intersection LOS: B
Intersection Capacity Utilization 79.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	414	799	45	838	192	25	90	42	179	57	516
v/c Ratio	0.74	0.41	0.10	0.61	0.12	0.10	0.27	0.10	0.63	0.14	0.81
Control Delay (s/veh)	19.2	13.6	7.7	24.3	0.2	26.8	29.2	0.5	40.4	26.9	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	19.2	13.6	7.7	24.3	0.2	26.8	29.2	0.5	40.4	26.9	19.5
Queue Length 50th (m)	25.2	42.4	2.2	57.7	0.0	3.8	14.2	0.0	26.3	7.5	18.6
Queue Length 95th (m)	#72.7	64.8	6.5	85.0	0.0	10.9	28.3	0.0	46.3	16.6	57.3
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	588	1929	444	1371	1617	333	461	512	389	557	733
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.41	0.10	0.61	0.12	0.08	0.20	0.08	0.46	0.10	0.70

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	397	749	18	43	804	184	24	86	40	172	55	495
Future Volume (vph)	397	749	18	43	804	184	24	86	40	172	55	495
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	4.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3529		1825	3614	1617	1513	1588	1471	1825	1921	1588
Flt Permitted	0.22	1.00		0.35	1.00	1.00	0.72	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	419	3529		672	3614	1617	1146	1588	1471	1342	1921	1588
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	414	780	19	45	838	192	25	90	42	179	57	516
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	33	0	0	304
Lane Group Flow (vph)	414	797	0	45	838	192	25	90	9	179	57	212
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		Free	4		4	8		8
Actuated Green, G (s)	51.9	45.0		36.5	32.6	83.5	17.3	17.3	17.3	17.3	17.3	17.3
Effective Green, g (s)	51.9	45.0		36.5	32.6	83.5	17.3	17.3	17.3	17.3	17.3	17.3
Actuated g/C Ratio	0.62	0.54		0.44	0.39	1.00	0.21	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	3.0	7.0		3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	534	1901		347	1410	1617	237	329	304	278	398	329
v/s Ratio Prot	c0.15	0.23		0.01	0.23			0.06			0.03	
v/s Ratio Perm	c0.33			0.05		0.12	0.02		0.01	0.13		c0.13
v/c Ratio	0.78	0.42		0.13	0.59	0.12	0.11	0.27	0.03	0.64	0.14	0.65
Uniform Delay, d1	10.3	11.5		13.6	20.2	0.0	26.8	27.8	26.4	30.3	27.0	30.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.9	0.4		0.2	1.1	0.1	0.2	0.5	0.0	5.0	0.2	4.3
Delay (s)	17.3	11.8		13.7	21.3	0.1	27.0	28.3	26.4	35.3	27.2	34.6
Level of Service	B	B		B	C	A	C	C	C	D	C	C
Approach Delay (s/veh)		13.7			17.2			27.6			34.2	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	83.5	Sum of lost time (s)	17.3
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	25	12	652	691	10
Future Volume (Veh/h)	10	25	12	652	691	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	11	27	13	694	735	11
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	1116	375	748			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1116	375	748			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	96	99			
cM capacity (veh/h)	201	627	868			

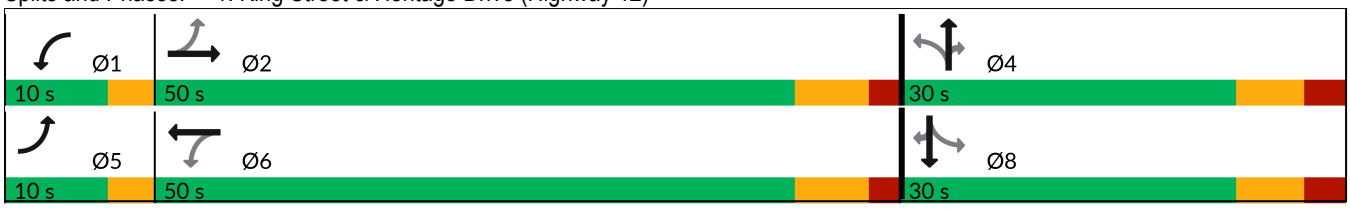
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	38	244	463	490	256
Volume Left	11	13	0	0	0
Volume Right	27	0	0	0	11
cSH	389	868	1700	1700	1700
Volume to Capacity	0.10	0.01	0.27	0.29	0.15
Queue Length 95th (m)	2.4	0.3	0.0	0.0	0.0
Control Delay (s/veh)	15.3	0.6	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s/veh)	15.3	0.2		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	204	365	30	358	113	10	29	24	112	40	248
Future Volume (vph)	204	365	30	358	113	10	29	24	112	40	248
Turn Type	pm+pt	NA	pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		Free	4		4	8		8
Detector Phase	5	2	1	6		4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0		17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0		30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%		33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0		2.8	2.8	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes							
Recall Mode	None	Ped	None	Ped		None	None	None	None	None	None
Act Effct Green (s)	44.0	37.3	42.1	31.1	68.6	13.1	13.1	13.1	13.1	13.1	13.1
Actuated g/C Ratio	0.64	0.54	0.61	0.45	1.00	0.19	0.19	0.19	0.19	0.19	0.19
v/c Ratio	0.38	0.25	0.06	0.27	0.09	0.05	0.12	0.09	0.51	0.13	0.56
Control Delay (s/veh)	7.2	10.2	5.3	12.8	0.1	22.3	23.2	0.5	31.7	23.3	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	7.2	10.2	5.3	12.8	0.1	22.3	23.2	0.5	31.7	23.3	7.4
LOS	A	B	A	B	A	C	C	A	C	C	A
Approach Delay (s/veh)		9.2		9.5			14.3			15.8	
Approach LOS		A		A			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 68.6	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay (s/veh): 11.2	Intersection LOS: B
Intersection Capacity Utilization 58.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	252	473	37	442	140	12	36	30	138	49	306
v/c Ratio	0.38	0.25	0.06	0.27	0.09	0.05	0.12	0.09	0.51	0.13	0.56
Control Delay (s/veh)	7.2	10.2	5.3	12.8	0.1	22.3	23.2	0.5	31.7	23.3	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	7.2	10.2	5.3	12.8	0.1	22.3	23.2	0.5	31.7	23.3	7.4
Queue Length 50th (m)	10.5	12.8	1.4	17.5	0.0	1.5	4.5	0.0	15.9	5.2	0.0
Queue Length 95th (m)	21.4	29.3	4.5	27.2	0.0	5.3	10.9	0.0	27.3	11.5	11.7
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	656	2211	659	2271	1617	383	527	544	468	637	732
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.21	0.06	0.19	0.09	0.03	0.07	0.06	0.29	0.08	0.42

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	204	365	18	30	358	113	10	29	24	112	40	248
Future Volume (vph)	204	365	18	30	358	113	10	29	24	112	40	248
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	4.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3514		1825	3614	1617	1512	1588	1471	1825	1921	1587
Flt Permitted	0.45	1.00		0.48	1.00	1.00	0.73	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	873	3514		924	3614	1617	1154	1588	1471	1409	1921	1587
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	252	451	22	37	442	140	12	36	30	138	49	306
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	24	0	0	249
Lane Group Flow (vph)	252	470	0	37	442	140	12	36	6	138	49	57
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		Free	4		4	8		8
Actuated Green, G (s)	43.0	37.3		35.7	33.0	70.4	13.1	13.1	13.1	13.1	13.1	13.1
Effective Green, g (s)	43.0	37.3		35.7	33.0	70.4	13.1	13.1	13.1	13.1	13.1	13.1
Actuated g/C Ratio	0.61	0.53		0.51	0.47	1.00	0.19	0.19	0.19	0.19	0.19	0.19
Clearance Time (s)	3.0	7.0		3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	627	1861		503	1694	1617	214	295	273	262	357	295
v/s Ratio Prot	c0.04	0.13		0.00	0.12			0.02			0.03	
v/s Ratio Perm	c0.21			0.03		0.09	0.01		0.00	c0.10		0.04
v/c Ratio	0.40	0.25		0.07	0.26	0.09	0.06	0.12	0.02	0.53	0.14	0.19
Uniform Delay, d1	6.3	9.0		8.7	11.3	0.0	23.6	23.9	23.4	25.9	23.9	24.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.2		0.1	0.2	0.1	0.1	0.2	0.0	1.9	0.2	0.3
Delay (s)	6.7	9.2		8.8	11.5	0.1	23.7	24.0	23.4	27.8	24.1	24.5
Level of Service	A	A		A	B	A	C	C	C	C	C	C
Approach Delay (s/veh)		8.3			8.8			23.8			25.4	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	70.4	Sum of lost time (s)	17.3
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	88	93	252	311	10
Future Volume (Veh/h)	18	88	93	252	311	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	22	107	113	307	379	12
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	767	198	393			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	767	198	393			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	87	90			
cM capacity (veh/h)	309	815	1174			

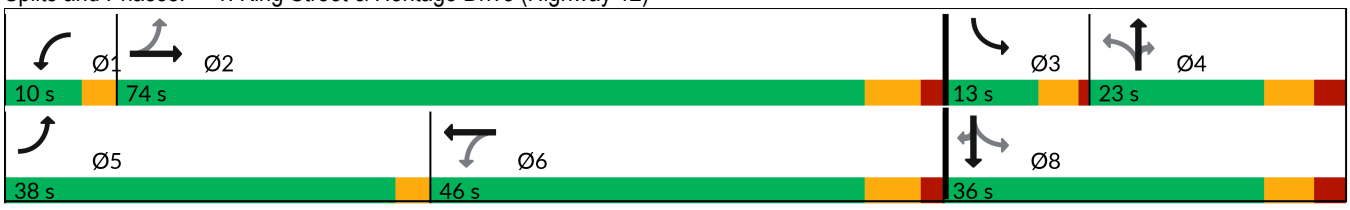
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	129	215	205	253	138
Volume Left	22	113	0	0	0
Volume Right	107	0	0	0	12
cSH	637	1174	1700	1700	1700
Volume to Capacity	0.20	0.10	0.12	0.15	0.08
Queue Length 95th (m)	5.7	2.4	0.0	0.0	0.0
Control Delay (s/veh)	12.1	4.8	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	12.1	2.5		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	418	647	48	682	227	25	62	44	172	66	459
Future Volume (vph)	418	647	48	682	227	25	62	44	172	66	459
Turn Type	pm+pt	NA	pm+pt	NA	Free	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2	1	6			4		3	8	
Permitted Phases	2		6		Free	4		4	8		8
Detector Phase	5	2	1	6		4	4	4	3	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0		10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0		17.3	17.3	17.3	9.5	17.3	17.3
Total Split (s)	38.0	74.0	10.0	46.0		23.0	23.0	23.0	13.0	36.0	36.0
Total Split (%)	31.7%	61.7%	8.3%	38.3%		19.2%	19.2%	19.2%	10.8%	30.0%	30.0%
Yellow Time (s)	3.0	5.0	3.0	5.0		4.5	4.5	4.5	3.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0		2.8	2.8	2.8	1.0	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0		7.3	7.3	7.3	4.5	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes		
Recall Mode	None	Ped	None	Ped		None	None	None	None	None	None
Act Effct Green (s)	63.8	54.2	45.0	33.6	95.4	11.1	11.1	11.1	23.9	21.0	21.0
Actuated g/C Ratio	0.67	0.57	0.47	0.35	1.00	0.12	0.12	0.12	0.25	0.22	0.22
v/c Ratio	0.69	0.35	0.12	0.57	0.15	0.21	0.36	0.16	0.57	0.17	0.67
Control Delay (s/veh)	15.7	12.9	10.1	29.3	0.2	47.7	49.6	1.2	39.7	33.4	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	15.7	12.9	10.1	29.3	0.2	47.7	49.6	1.2	39.7	33.4	8.4
LOS	B	B	B	C	A	D	D	A	D	C	A
Approach Delay (s/veh)		14.0		21.4			33.0			18.5	
Approach LOS		B		C			C			B	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 95.4	
Natural Cycle: 80	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay (s/veh): 18.5	Intersection LOS: B
Intersection Capacity Utilization 74.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	445	701	51	726	241	27	66	47	183	70	488
v/c Ratio	0.69	0.35	0.12	0.57	0.15	0.21	0.36	0.16	0.57	0.17	0.67
Control Delay (s/veh)	15.7	12.9	10.1	29.3	0.2	47.7	49.6	1.2	39.7	33.4	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	15.7	12.9	10.1	29.3	0.2	47.7	49.6	1.2	39.7	33.4	8.4
Queue Length 50th (m)	34.0	40.9	3.0	56.8	0.0	5.2	13.1	0.0	26.2	9.8	0.0
Queue Length 95th (m)	68.8	57.3	7.3	94.5	0.0	17.2	33.2	0.0	56.4	25.3	28.8
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	827	2553	430	1521	1617	191	269	358	320	594	828
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.27	0.12	0.48	0.15	0.14	0.25	0.13	0.57	0.12	0.59

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	418	647	12	48	682	227	25	62	44	172	66	459
Future Volume (vph)	418	647	12	48	682	227	25	62	44	172	66	459
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	4.0	7.3	7.3	7.3	4.5	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3532		1825	3614	1617	1502	1588	1471	1825	1921	1589
Flt Permitted	0.25	1.00		0.39	1.00	1.00	0.71	1.00	1.00	0.46	1.00	1.00
Satd. Flow (perm)	476	3532		740	3614	1617	1124	1588	1471	893	1921	1589
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	445	688	13	51	726	241	27	66	47	183	70	488
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	43	0	0	375
Lane Group Flow (vph)	445	700	0	51	726	241	27	66	4	183	70	113
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6			4		3	8	
Permitted Phases	2			6		Free	4		4	8		8
Actuated Green, G (s)	61.0	54.2		38.9	35.1	98.1	8.4	8.4	8.4	22.8	22.8	22.8
Effective Green, g (s)	61.0	54.2		38.9	35.1	98.1	8.4	8.4	8.4	22.8	22.8	22.8
Actuated g/C Ratio	0.62	0.55		0.40	0.36	1.00	0.09	0.09	0.09	0.23	0.23	0.23
Clearance Time (s)	3.0	7.0		3.0	7.0		7.3	7.3	7.3	4.5	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	610	1951		335	1293	1617	96	135	125	301	446	369
v/s Ratio Prot	c0.17	0.20		0.01	0.20			0.04		c0.06	0.04	
v/s Ratio Perm	c0.28			0.05		0.15	0.02		0.00	c0.08		0.07
v/c Ratio	0.73	0.36		0.15	0.56	0.15	0.28	0.49	0.03	0.61	0.16	0.31
Uniform Delay, d1	11.5	12.3		18.4	25.3	0.0	42.0	42.8	41.1	32.2	30.0	31.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.4	0.3		0.2	1.0	0.2	1.6	2.8	0.1	3.5	0.2	0.5
Delay (s)	15.9	12.5		18.6	26.3	0.2	43.6	45.6	41.2	35.7	30.2	31.6
Level of Service	B	B		B	C	A	D	D	D	D	C	C
Approach Delay (s/veh)		13.8			19.8			43.7			32.5	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	98.1	Sum of lost time (s)	21.8
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	104	111	596	591	24
Future Volume (Veh/h)	21	104	111	596	591	24
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	24	117	125	670	664	27
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	1265	348	693			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1265	348	693			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	83	82	86			
cM capacity (veh/h)	141	653	910			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	141	348	447	443	248
Volume Left	24	125	0	0	0
Volume Right	117	0	0	0	27
cSH	404	910	1700	1700	1700
Volume to Capacity	0.35	0.14	0.26	0.26	0.15
Queue Length 95th (m)	11.7	3.6	0.0	0.0	0.0
Control Delay (s/veh)	18.6	4.4	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s/veh)	18.6	1.9		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	321	549	39	582	163	11	76	35	156	49	397
Future Volume (vph)	321	549	39	582	163	11	76	35	156	49	397
Turn Type	pm+pt	NA	pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		Free	4		4	8		8
Detector Phase	5	2	1	6		4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0		17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	21.0	49.0	10.0	38.0		31.0	31.0	31.0	31.0	31.0	31.0
Total Split (%)	23.3%	54.4%	11.1%	42.2%		34.4%	34.4%	34.4%	34.4%	34.4%	34.4%
Yellow Time (s)	3.0	5.0	3.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0		2.8	2.8	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes							
Recall Mode	None	Ped	None	Ped		None	None	None	None	None	None
Act Effct Green (s)	51.8	42.1	42.5	31.3	78.0	15.8	15.8	15.8	15.8	15.8	15.8
Actuated g/C Ratio	0.66	0.54	0.54	0.40	1.00	0.20	0.20	0.20	0.20	0.20	0.20
v/c Ratio	0.52	0.30	0.08	0.42	0.11	0.05	0.25	0.09	0.59	0.13	0.64
Control Delay (s/veh)	9.2	12.1	6.8	19.3	0.1	25.5	28.3	0.5	38.0	26.3	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	9.2	12.1	6.8	19.3	0.1	25.5	28.3	0.5	38.0	26.3	7.9
LOS	A	B	A	B	A	C	C	A	D	C	A
Approach Delay (s/veh)		11.0		14.7			20.1			17.2	
Approach LOS		B		B			C			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 78	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay (s/veh): 14.2	Intersection LOS: B
Intersection Capacity Utilization 68.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	334	581	41	606	170	11	79	36	163	51	414
v/c Ratio	0.52	0.30	0.08	0.42	0.11	0.05	0.25	0.09	0.59	0.13	0.64
Control Delay (s/veh)	9.2	12.1	6.8	19.3	0.1	25.5	28.3	0.5	38.0	26.3	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	9.2	12.1	6.8	19.3	0.1	25.5	28.3	0.5	38.0	26.3	7.9
Queue Length 50th (m)	16.9	26.3	1.7	32.0	0.0	1.5	11.3	0.0	21.5	6.1	0.0
Queue Length 95th (m)	37.6	45.2	6.1	58.7	0.0	6.3	25.4	0.0	42.2	15.3	21.5
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	716	1976	542	1451	1617	354	487	535	416	589	775
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.29	0.08	0.42	0.11	0.03	0.16	0.07	0.39	0.09	0.53

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	321	549	9	39	582	163	11	76	35	156	49	397
Future Volume (vph)	321	549	9	39	582	163	11	76	35	156	49	397
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	4.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3534		1825	3614	1617	1512	1588	1471	1825	1921	1588
Flt Permitted	0.35	1.00		0.43	1.00	1.00	0.72	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	675	3534		832	3614	1617	1152	1588	1471	1356	1921	1588
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	334	572	9	41	606	170	11	79	36	162	51	414
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	29	0	0	331
Lane Group Flow (vph)	334	580	0	41	606	170	11	79	7	163	51	83
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		Free	4		4	8		8
Actuated Green, G (s)	49.1	42.1		36.7	32.7	79.2	15.8	15.8	15.8	15.8	15.8	15.8
Effective Green, g (s)	49.1	42.1		36.7	32.7	79.2	15.8	15.8	15.8	15.8	15.8	15.8
Actuated g/C Ratio	0.62	0.53		0.46	0.41	1.00	0.20	0.20	0.20	0.20	0.20	0.20
Clearance Time (s)	3.0	7.0		3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	613	1878		435	1492	1617	229	316	293	270	383	316
v/s Ratio Prot	c0.09	0.16		0.00	0.17			0.05			0.03	
v/s Ratio Perm	c0.25			0.04		0.11	0.01		0.00	c0.12		0.05
v/c Ratio	0.54	0.31		0.09	0.41	0.11	0.05	0.25	0.02	0.60	0.13	0.26
Uniform Delay, d1	7.4	10.4		11.7	16.4	0.0	25.6	26.7	25.5	28.9	26.1	26.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.2		0.1	0.4	0.1	0.1	0.4	0.0	3.8	0.2	0.4
Delay (s)	8.4	10.6		11.8	16.8	0.1	25.7	27.1	25.5	32.6	26.2	27.2
Level of Service	A	B		B	B	A	C	C	C	C	C	C
Approach Delay (s/veh)		9.8			13.1			26.5			28.5	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	79.2	Sum of lost time (s)	17.3
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	77	67	492	523	16
Future Volume (Veh/h)	14	77	67	492	523	16
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	15	82	71	523	556	17
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	970	289	575			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	970	289	575			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	88	93			
cM capacity (veh/h)	236	713	1006			

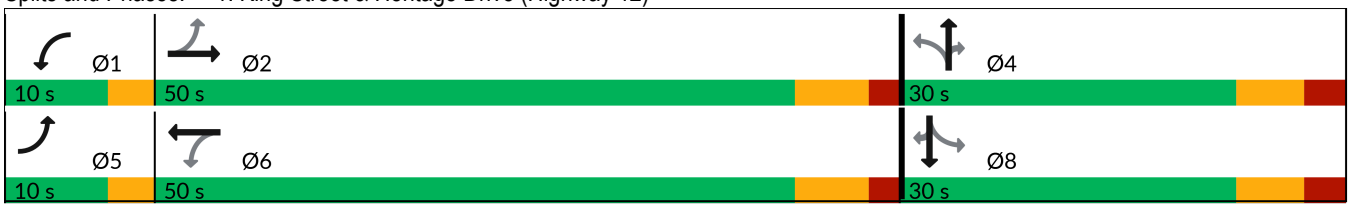
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	97	245	349	371	202
Volume Left	15	71	0	0	0
Volume Right	82	0	0	0	17
cSH	543	1006	1700	1700	1700
Volume to Capacity	0.18	0.07	0.21	0.22	0.12
Queue Length 95th (m)	4.9	1.7	0.0	0.0	0.0
Control Delay (s/veh)	13.1	3.1	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	13.1	1.3		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	232	417	32	406	128	13	30	26	137	43	291
Future Volume (vph)	232	417	32	406	128	13	30	26	137	43	291
Turn Type	pm+pt	NA	pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		Free	4		4	8		8
Detector Phase	5	2	1	6		4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0		17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0		30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%		33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0		2.8	2.8	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes							
Recall Mode	None	Ped	None	Ped		None	None	None	None	None	None
Act Effct Green (s)	43.5	35.4	42.2	31.1	70.4	14.9	14.9	14.9	14.9	14.9	14.9
Actuated g/C Ratio	0.62	0.50	0.60	0.44	1.00	0.21	0.21	0.21	0.21	0.21	0.21
v/c Ratio	0.47	0.31	0.07	0.31	0.10	0.07	0.11	0.08	0.57	0.13	0.58
Control Delay (s/veh)	9.5	12.7	6.2	14.2	0.1	21.7	22.2	0.4	32.5	22.4	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	9.5	12.7	6.2	14.2	0.1	21.7	22.2	0.4	32.5	22.4	6.9
LOS	A	B	A	B	A	C	C	A	C	C	A
Approach Delay (s/veh)		11.6		10.5			13.9			15.8	
Approach LOS		B		B			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 70.4	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay (s/veh): 12.4	Intersection LOS: B
Intersection Capacity Utilization 61.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	286	545	40	501	158	16	37	32	169	53	359
v/c Ratio	0.47	0.31	0.07	0.31	0.10	0.07	0.11	0.08	0.57	0.13	0.58
Control Delay (s/veh)	9.5	12.7	6.2	14.2	0.1	21.7	22.2	0.4	32.5	22.4	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	9.5	12.7	6.2	14.2	0.1	21.7	22.2	0.4	32.5	22.4	6.9
Queue Length 50th (m)	13.3	23.4	1.6	21.2	0.0	2.0	4.6	0.0	20.0	5.7	0.0
Queue Length 95th (m)	27.5	36.5	5.3	33.3	0.0	6.2	10.9	0.0	32.5	12.0	11.7
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	608	2156	613	2216	1617	372	513	533	455	621	757
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.25	0.07	0.23	0.10	0.04	0.07	0.06	0.37	0.09	0.47

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	232	417	24	32	406	128	13	30	26	137	43	291
Future Volume (vph)	232	417	24	32	406	128	13	30	26	137	43	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	4.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3509		1825	3614	1617	1513	1588	1471	1825	1921	1588
Flt Permitted	0.43	1.00		0.45	1.00	1.00	0.72	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	823	3509		862	3614	1617	1150	1588	1471	1408	1921	1588
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	286	515	30	40	501	158	16	37	32	169	53	359
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	25	0	0	284
Lane Group Flow (vph)	286	540	0	40	501	158	16	37	7	169	53	75
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		Free	4		4	8		8
Actuated Green, G (s)	42.4	35.4		36.4	32.4	71.6	14.9	14.9	14.9	14.9	14.9	14.9
Effective Green, g (s)	42.4	35.4		36.4	32.4	71.6	14.9	14.9	14.9	14.9	14.9	14.9
Actuated g/C Ratio	0.59	0.49		0.51	0.45	1.00	0.21	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	3.0	7.0		3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	585	1734		492	1635	1617	239	330	306	293	399	330
v/s Ratio Prot	c0.05	0.15		0.00	0.14			0.02			0.03	
v/s Ratio Perm	c0.24			0.04		0.10	0.01		0.00	c0.12		0.05
v/c Ratio	0.49	0.31		0.08	0.31	0.10	0.07	0.11	0.02	0.58	0.13	0.23
Uniform Delay, d1	7.2	10.8		8.8	12.5	0.0	22.8	23.0	22.6	25.5	23.1	23.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.2		0.1	0.3	0.1	0.1	0.2	0.0	2.7	0.2	0.4
Delay (s)	7.8	11.1		8.9	12.7	0.1	22.9	23.1	22.6	28.3	23.2	23.9
Level of Service	A	B		A	B	A	C	C	C	C	C	C
Approach Delay (s/veh)		9.9			9.6			22.9			25.1	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	71.6	Sum of lost time (s)	17.3
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	88	93	296	380	10
Future Volume (Veh/h)	18	88	93	296	380	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	22	107	113	361	463	12
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	878	240	477			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	878	240	477			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	86	90			
cM capacity (veh/h)	261	766	1094			

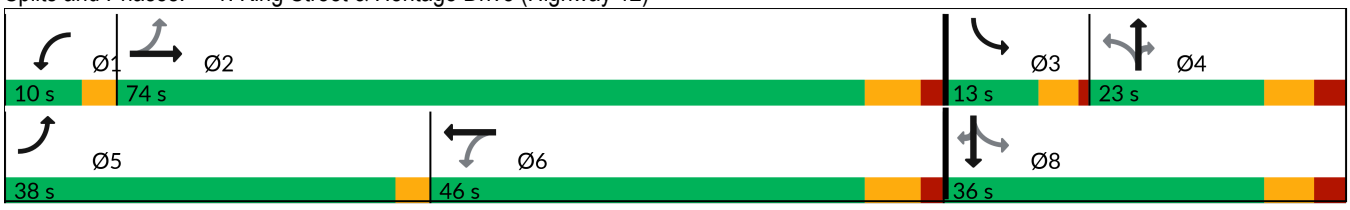
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	129	233	241	309	166
Volume Left	22	113	0	0	0
Volume Right	107	0	0	0	12
cSH	576	1094	1700	1700	1700
Volume to Capacity	0.22	0.10	0.14	0.18	0.10
Queue Length 95th (m)	6.5	2.6	0.0	0.0	0.0
Control Delay (s/veh)	13.0	4.7	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	13.0	2.3		0.0	
Approach LOS	B				

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	38.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	479	749	51	788	257	35	67	48	194	71	531
Future Volume (vph)	479	749	51	788	257	35	67	48	194	71	531
Turn Type	pm+pt	NA	pm+pt	NA	Free	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2	1	6			4		3	8	
Permitted Phases	2		6		Free	4		4	8		8
Detector Phase	5	2	1	6		4	4	4	3	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0		10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0		17.3	17.3	17.3	9.5	17.3	17.3
Total Split (s)	38.0	74.0	10.0	46.0		23.0	23.0	23.0	13.0	36.0	36.0
Total Split (%)	31.7%	61.7%	8.3%	38.3%		19.2%	19.2%	19.2%	10.8%	30.0%	30.0%
Yellow Time (s)	3.0	5.0	3.0	5.0		4.5	4.5	4.5	3.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0		2.8	2.8	2.8	1.0	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0		7.3	7.3	7.3	4.5	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes		
Recall Mode	None	Ped	None	Ped		None	None	None	None	None	None
Act Effct Green (s)	71.4	59.7	47.0	35.6	103.5	11.7	11.7	11.7	24.4	21.5	21.5
Actuated g/C Ratio	0.69	0.58	0.45	0.34	1.00	0.11	0.11	0.11	0.24	0.21	0.21
v/c Ratio	0.79	0.40	0.14	0.67	0.17	0.29	0.40	0.18	0.68	0.19	0.77
Control Delay (s/veh)	27.4	13.8	11.2	34.2	0.2	53.3	54.2	1.4	48.9	37.0	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	27.4	13.8	11.2	34.2	0.2	53.3	54.2	1.4	48.9	37.0	13.7
LOS	C	B	B	C	A	D	D	A	D	D	B
Approach Delay (s/veh)		19.0		25.2			37.1			24.3	
Approach LOS		B		C			D			C	

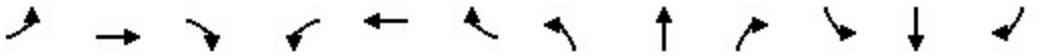
Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 103.5	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay (s/veh): 23.2	Intersection LOS: C
Intersection Capacity Utilization 81.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	510	818	54	838	273	37	71	51	206	76	565
v/c Ratio	0.79	0.40	0.14	0.67	0.17	0.29	0.40	0.18	0.68	0.19	0.77
Control Delay (s/veh)	27.4	13.8	11.2	34.2	0.2	53.3	54.2	1.4	48.9	37.0	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	27.4	13.8	11.2	34.2	0.2	53.3	54.2	1.4	48.9	37.0	13.7
Queue Length 50th (m)	61.8	50.0	3.2	83.1	0.0	8.8	17.1	0.0	38.1	13.5	9.8
Queue Length 95th (m)	113.7	71.1	8.0	114.4	0.0	21.6	34.9	0.0	63.0	27.2	50.5
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	753	2354	380	1403	1617	175	248	341	301	549	818
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.35	0.14	0.60	0.17	0.21	0.29	0.15	0.68	0.14	0.69

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	479	749	20	51	788	257	35	67	48	194	71	531
Future Volume (vph)	479	749	20	51	788	257	35	67	48	194	71	531
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	4.0	7.3	7.3	7.3	4.5	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3528		1825	3614	1617	1501	1588	1471	1825	1921	1589
Flt Permitted	0.18	1.00		0.34	1.00	1.00	0.71	1.00	1.00	0.47	1.00	1.00
Satd. Flow (perm)	344	3528		659	3614	1617	1118	1588	1471	907	1921	1589
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	510	797	21	54	838	273	37	71	51	206	76	565
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	47	0	0	397
Lane Group Flow (vph)	510	817	0	54	838	273	37	71	4	206	76	168
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6			4		3	8	
Permitted Phases	2			6		Free	4		4	8		8
Actuated Green, G (s)	68.0	59.7		41.8	36.5	105.7	8.9	8.9	8.9	23.4	23.4	23.4
Effective Green, g (s)	68.0	59.7		41.8	36.5	105.7	8.9	8.9	8.9	23.4	23.4	23.4
Actuated g/C Ratio	0.64	0.56		0.40	0.35	1.00	0.08	0.08	0.08	0.22	0.22	0.22
Clearance Time (s)	3.0	7.0		3.0	7.0		7.3	7.3	7.3	4.5	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	620	1992		319	1247	1617	94	133	123	287	425	351
v/s Ratio Prot	c0.22	0.23		0.01	0.23			0.04		c0.07	0.04	
v/s Ratio Perm	c0.31			0.06		0.17	0.03		0.00	c0.09		0.11
v/c Ratio	0.82	0.41		0.17	0.67	0.17	0.39	0.53	0.03	0.72	0.18	0.48
Uniform Delay, d1	20.7	13.0		19.9	29.5	0.0	45.8	46.4	44.5	36.4	33.4	35.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.6	0.3		0.3	2.0	0.2	2.7	4.1	0.1	8.3	0.2	1.0
Delay (s)	29.4	13.4		20.2	31.5	0.2	48.6	50.5	44.6	44.7	33.6	36.9
Level of Service	C	B		C	C	A	D	D	D	D	C	D
Approach Delay (s/veh)		19.5			23.7			48.1			38.5	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	26.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	105.7	Sum of lost time (s)	21.8
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	104	111	689	690	24
Future Volume (Veh/h)	21	104	111	689	690	24
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	24	117	125	774	775	27
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	1428	403	804			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1428	403	804			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	78	81	85			
cM capacity (veh/h)	109	601	827			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	141	383	516	517	285
Volume Left	24	125	0	0	0
Volume Right	117	0	0	0	27
cSH	340	827	1700	1700	1700
Volume to Capacity	0.42	0.15	0.30	0.30	0.17
Queue Length 95th (m)	15.0	4.0	0.0	0.0	0.0
Control Delay (s/veh)	22.9	4.5	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s/veh)	22.9	1.9		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	372	626	41	662	191	18	80	37	176	51	456
Future Volume (vph)	372	626	41	662	191	18	80	37	176	51	456
Turn Type	pm+pt	NA	pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		Free	4		4	8		8
Detector Phase	5	2	1	6		4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0		17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	21.0	49.0	10.0	38.0		31.0	31.0	31.0	31.0	31.0	31.0
Total Split (%)	23.3%	54.4%	11.1%	42.2%		34.4%	34.4%	34.4%	34.4%	34.4%	34.4%
Yellow Time (s)	3.0	5.0	3.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0		2.8	2.8	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes							
Recall Mode	None	Ped	None	Ped		None	None	None	None	None	None
Act Effct Green (s)	53.4	43.7	42.4	31.3	80.9	17.1	17.1	17.1	17.1	17.1	17.1
Actuated g/C Ratio	0.66	0.54	0.52	0.39	1.00	0.21	0.21	0.21	0.21	0.21	0.21
v/c Ratio	0.64	0.35	0.09	0.49	0.12	0.08	0.25	0.10	0.64	0.13	0.72
Control Delay (s/veh)	12.0	12.9	7.4	21.7	0.2	26.2	28.5	0.5	40.2	26.5	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	12.0	12.9	7.4	21.7	0.2	26.2	28.5	0.5	40.2	26.5	12.5
LOS	B	B	A	C	A	C	C	A	D	C	B
Approach Delay (s/veh)		12.6		16.4			20.4			20.6	
Approach LOS		B		B			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 80.9	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay (s/veh): 16.2	Intersection LOS: B
Intersection Capacity Utilization 73.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	388	667	43	690	199	19	83	39	183	53	475
v/c Ratio	0.64	0.35	0.09	0.49	0.12	0.08	0.25	0.10	0.64	0.13	0.72
Control Delay (s/veh)	12.0	12.9	7.4	21.7	0.2	26.2	28.5	0.5	40.2	26.5	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	12.0	12.9	7.4	21.7	0.2	26.2	28.5	0.5	40.2	26.5	12.5
Queue Length 50th (m)	22.9	33.5	2.1	42.2	0.0	2.7	12.5	0.0	25.7	6.6	8.7
Queue Length 95th (m)	44.6	52.5	6.3	67.7	0.0	9.0	26.5	0.0	47.4	15.7	39.4
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	657	1933	494	1399	1617	340	470	520	399	568	757
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.35	0.09	0.49	0.12	0.06	0.18	0.08	0.46	0.09	0.63

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	372	626	14	41	662	191	18	80	37	176	51	456
Future Volume (vph)	372	626	14	41	662	191	18	80	37	176	51	456
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	4.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3530		1825	3614	1617	1513	1588	1471	1825	1921	1588
Flt Permitted	0.30	1.00		0.40	1.00	1.00	0.72	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	570	3530		765	3614	1617	1150	1588	1471	1351	1921	1588
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	388	652	15	43	690	199	19	83	39	183	53	475
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	31	0	0	322
Lane Group Flow (vph)	388	666	0	43	690	199	19	83	8	183	53	153
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		Free	4		4	8		8
Actuated Green, G (s)	50.6	43.7		36.5	32.6	82.0	17.1	17.1	17.1	17.1	17.1	17.1
Effective Green, g (s)	50.6	43.7		36.5	32.6	82.0	17.1	17.1	17.1	17.1	17.1	17.1
Actuated g/C Ratio	0.62	0.53		0.45	0.40	1.00	0.21	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	3.0	7.0		3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	581	1881		390	1436	1617	239	331	306	281	400	331
v/s Ratio Prot	c0.12	0.19		0.01	0.19			0.05			0.03	
v/s Ratio Perm	c0.29			0.04		0.12	0.02		0.01	c0.14		0.10
v/c Ratio	0.67	0.35		0.11	0.48	0.12	0.08	0.25	0.03	0.65	0.13	0.46
Uniform Delay, d1	8.5	11.0		12.9	18.4	0.0	26.1	27.1	25.8	29.7	26.4	28.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9	0.3		0.1	0.6	0.2	0.1	0.4	0.0	5.3	0.2	1.0
Delay (s)	11.5	11.3		13.1	19.0	0.2	26.3	27.5	25.9	35.0	26.6	29.4
Level of Service	B	B		B	B	A	C	C	C	D	C	C
Approach Delay (s/veh)		11.4			14.7			26.9			30.7	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	82.0	Sum of lost time (s)	17.3
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	77	67	574	601	16
Future Volume (Veh/h)	14	77	67	574	601	16
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	15	82	71	611	639	17
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	1097	330	658			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1097	330	658			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	88	92			
cM capacity (veh/h)	194	670	937			

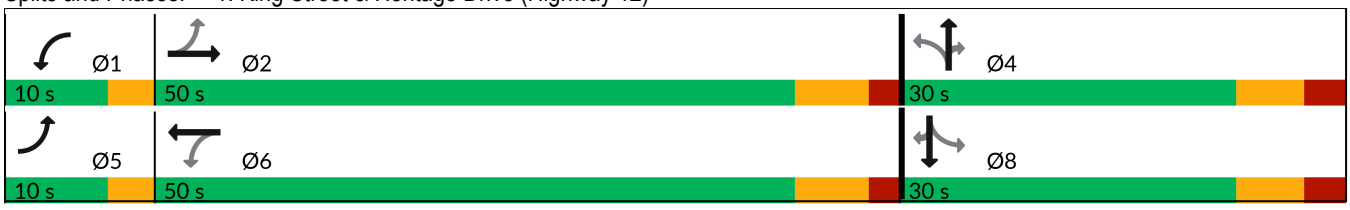
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	97	275	407	426	230
Volume Left	15	71	0	0	0
Volume Right	82	0	0	0	17
cSH	486	937	1700	1700	1700
Volume to Capacity	0.20	0.08	0.24	0.25	0.14
Queue Length 95th (m)	5.6	1.9	0.0	0.0	0.0
Control Delay (s/veh)	14.2	3.0	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	14.2	1.2		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	271	509	34	466	134	16	33	28	139	48	316
Future Volume (vph)	271	509	34	466	134	16	33	28	139	48	316
Turn Type	pm+pt	NA	pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		Free	4		4	8		8
Detector Phase	5	2	1	6		4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0		17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	10.0	50.0	10.0	50.0		30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	11.1%	55.6%	11.1%	55.6%		33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.0	5.0	3.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0		2.8	2.8	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes							
Recall Mode	None	Ped	None	Ped		None	None	None	None	None	None
Act Effct Green (s)	43.5	35.4	42.2	31.1	70.8	15.3	15.3	15.3	15.3	15.3	15.3
Actuated g/C Ratio	0.61	0.50	0.60	0.44	1.00	0.22	0.22	0.22	0.22	0.22	0.22
v/c Ratio	0.60	0.38	0.07	0.36	0.10	0.08	0.12	0.09	0.57	0.14	0.63
Control Delay (s/veh)	12.6	13.5	6.4	14.8	0.1	21.9	22.3	0.6	32.3	22.5	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	12.6	13.5	6.4	14.8	0.1	21.9	22.3	0.6	32.3	22.5	9.4
LOS	B	B	A	B	A	C	C	A	C	C	A
Approach Delay (s/veh)		13.2		11.3			14.3			17.0	
Approach LOS		B		B			B			B	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 70.8	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay (s/veh): 13.6	Intersection LOS: B
Intersection Capacity Utilization 63.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	335	664	42	575	165	20	41	35	172	59	390
v/c Ratio	0.60	0.38	0.07	0.36	0.10	0.08	0.12	0.09	0.57	0.14	0.63
Control Delay (s/veh)	12.6	13.5	6.4	14.8	0.1	21.9	22.3	0.6	32.3	22.5	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	12.6	13.5	6.4	14.8	0.1	21.9	22.3	0.6	32.3	22.5	9.4
Queue Length 50th (m)	16.3	30.1	1.7	25.1	0.0	2.5	5.1	0.0	20.4	6.3	4.5
Queue Length 95th (m)	32.8	45.4	5.5	38.6	0.0	7.3	11.9	0.0	33.0	13.0	17.0
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	563	2142	561	2202	1617	368	511	530	451	618	747
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.31	0.07	0.26	0.10	0.05	0.08	0.07	0.38	0.10	0.52

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	271	509	29	34	466	134	16	33	28	139	48	316
Future Volume (vph)	271	509	29	34	466	134	16	33	28	139	48	316
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	4.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3509		1825	3614	1617	1513	1588	1471	1825	1921	1588
Flt Permitted	0.39	1.00		0.40	1.00	1.00	0.72	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	742	3509		767	3614	1617	1144	1588	1471	1403	1921	1588
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	335	628	36	42	575	165	20	41	35	172	59	390
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	28	0	0	274
Lane Group Flow (vph)	335	659	0	42	575	165	20	41	7	172	59	116
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		Free	4		4	8		8
Actuated Green, G (s)	42.4	35.4		36.4	32.4	72.0	15.3	15.3	15.3	15.3	15.3	15.3
Effective Green, g (s)	42.4	35.4		36.4	32.4	72.0	15.3	15.3	15.3	15.3	15.3	15.3
Actuated g/C Ratio	0.59	0.49		0.51	0.45	1.00	0.21	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	3.0	7.0		3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	542	1725		446	1626	1617	243	337	312	298	408	337
v/s Ratio Prot	c0.06	0.19		0.01	0.16			0.03			0.03	
v/s Ratio Perm	c0.30			0.04		0.10	0.02		0.01	c0.12		0.07
v/c Ratio	0.62	0.38		0.09	0.35	0.10	0.08	0.12	0.02	0.58	0.14	0.34
Uniform Delay, d1	7.6	11.5		9.0	13.0	0.0	22.7	22.9	22.4	25.4	23.0	24.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.3		0.1	0.3	0.1	0.1	0.2	0.0	2.7	0.2	0.6
Delay (s)	9.7	11.8		9.1	13.3	0.1	22.9	23.1	22.5	28.1	23.2	24.7
Level of Service	A	B		A	B	A	C	C	C	C	C	C
Approach Delay (s/veh)		11.1			10.3			22.8			25.5	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	17.3
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	88	93	341	410	10
Future Volume (Veh/h)	18	88	93	341	410	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	22	107	113	416	500	12
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	942	258	514			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	942	258	514			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	86	89			
cM capacity (veh/h)	236	746	1060			

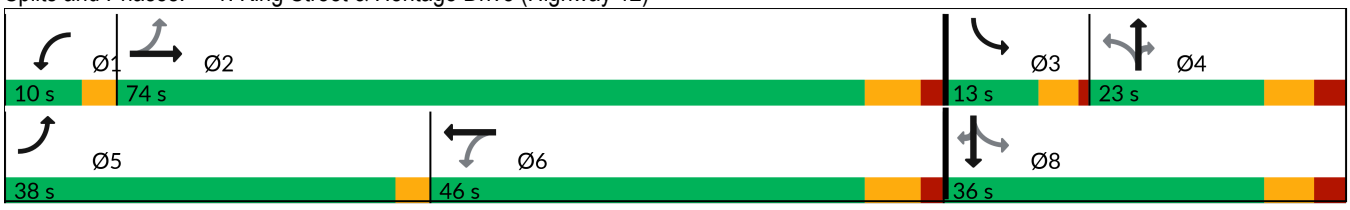
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	129	252	277	333	179
Volume Left	22	113	0	0	0
Volume Right	107	0	0	0	12
cSH	545	1060	1700	1700	1700
Volume to Capacity	0.24	0.11	0.16	0.20	0.11
Queue Length 95th (m)	6.9	2.7	0.0	0.0	0.0
Control Delay (s/veh)	13.6	4.5	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s/veh)	13.6	2.1		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	553	891	55	940	279	41	76	52	211	79	607
Future Volume (vph)	553	891	55	940	279	41	76	52	211	79	607
Turn Type	pm+pt	NA	pm+pt	NA	Free	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2	1	6			4		3	8	
Permitted Phases	2		6		Free	4		4	8		8
Detector Phase	5	2	1	6		4	4	4	3	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0		10.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0		17.3	17.3	17.3	9.5	17.3	17.3
Total Split (s)	38.0	74.0	10.0	46.0		23.0	23.0	23.0	13.0	36.0	36.0
Total Split (%)	31.7%	61.7%	8.3%	38.3%		19.2%	19.2%	19.2%	10.8%	30.0%	30.0%
Yellow Time (s)	3.0	5.0	3.0	5.0		4.5	4.5	4.5	3.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0		2.8	2.8	2.8	1.0	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0		7.3	7.3	7.3	4.5	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes		
Recall Mode	None	Ped	None	Ped		None	None	None	None	None	None
Act Effct Green (s)	79.7	68.0	48.5	37.4	112.5	12.5	12.5	12.5	25.3	22.4	22.4
Actuated g/C Ratio	0.71	0.60	0.43	0.33	1.00	0.11	0.11	0.11	0.22	0.20	0.20
v/c Ratio	0.91	0.46	0.18	0.83	0.18	0.36	0.46	0.20	0.79	0.22	0.90
Control Delay (s/veh)	50.0	14.5	12.2	42.5	0.3	56.7	57.6	1.6	59.2	38.7	27.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	50.0	14.5	12.2	42.5	0.3	56.7	57.6	1.6	59.2	38.7	27.1
LOS	D	B	B	D	A	E	E	A	E	D	C
Approach Delay (s/veh)		27.8		32.0			40.3			35.7	
Approach LOS		C		C			D			D	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 112.5	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay (s/veh): 31.6	Intersection LOS: C
Intersection Capacity Utilization 90.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	588	975	59	1000	297	44	81	55	224	84	646
v/c Ratio	0.91	0.46	0.18	0.83	0.18	0.36	0.46	0.20	0.79	0.22	0.90
Control Delay (s/veh)	50.0	14.5	12.2	42.5	0.3	56.7	57.6	1.6	59.2	38.7	27.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	50.0	14.5	12.2	42.5	0.3	56.7	57.6	1.6	59.2	38.7	27.1
Queue Length 50th (m)	109.9	64.8	3.7	109.1	0.0	11.0	20.7	0.0	44.5	15.8	33.6
Queue Length 95th (m)	#190.3	88.5	8.6	143.0	0.0	24.8	39.0	0.0	#72.7	29.3	#104.1
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	646	2133	322	1264	1617	156	223	320	285	494	781
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.46	0.18	0.79	0.18	0.28	0.36	0.17	0.79	0.17	0.83

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	553	891	25	55	940	279	41	76	52	211	79	607
Future Volume (vph)	553	891	25	55	940	279	41	76	52	211	79	607
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	4.0	7.3	7.3	7.3	4.5	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3526		1825	3614	1617	1502	1588	1471	1825	1921	1588
Flt Permitted	0.10	1.00		0.29	1.00	1.00	0.70	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)	187	3526		564	3614	1617	1111	1588	1471	933	1921	1588
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	588	948	27	59	1000	297	44	81	55	224	84	646
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	50	0	0	396
Lane Group Flow (vph)	588	973	0	59	1000	297	44	81	5	224	84	250
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6			4		3	8	
Permitted Phases	2			6		Free	4		4	8		8
Actuated Green, G (s)	76.4	68.0		43.6	38.2	114.8	10.0	10.0	10.0	24.1	24.1	24.1
Effective Green, g (s)	76.4	68.0		43.6	38.2	114.8	10.0	10.0	10.0	24.1	24.1	24.1
Actuated g/C Ratio	0.67	0.59		0.38	0.33	1.00	0.09	0.09	0.09	0.21	0.21	0.21
Clearance Time (s)	3.0	7.0		3.0	7.0		7.3	7.3	7.3	4.5	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	626	2088		273	1202	1617	96	138	128	270	403	333
v/s Ratio Prot	c0.29	0.28		0.01	0.28			0.05		c0.07	0.04	
v/s Ratio Perm	c0.34			0.07		0.18	0.04		0.00	c0.10		0.16
v/c Ratio	0.94	0.47		0.22	0.83	0.18	0.46	0.59	0.04	0.83	0.21	0.75
Uniform Delay, d1	31.6	13.2		22.8	35.3	0.0	49.8	50.4	48.0	42.1	37.5	42.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	21.9	0.4		0.4	5.7	0.3	3.4	6.2	0.1	18.6	0.3	9.2
Delay (s)	53.5	13.6		23.2	41.1	0.3	53.3	56.7	48.1	60.7	37.7	51.7
Level of Service	D	B		C	D	A	D	E	D	E	D	D
Approach Delay (s/veh)		28.6			31.4			53.2			52.6	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	36.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	114.8	Sum of lost time (s)	21.8
Intersection Capacity Utilization	90.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	104	111	791	789	24
Future Volume (Veh/h)	21	104	111	791	789	24
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	24	117	125	889	887	27
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	1597	459	916			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1597	459	916			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	71	79	83			
cM capacity (veh/h)	83	553	751			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	141	421	593	591	323
Volume Left	24	125	0	0	0
Volume Right	117	0	0	0	27
cSH	281	751	1700	1700	1700
Volume to Capacity	0.50	0.17	0.35	0.35	0.19
Queue Length 95th (m)	20.0	4.5	0.0	0.0	0.0
Control Delay (s/veh)	30.1	4.7	0.0	0.0	0.0
Lane LOS	D	A			
Approach Delay (s/veh)	30.1	2.0		0.0	
Approach LOS	D				

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	426	736	43	791	204	24	89	40	191	56	524
Future Volume (vph)	426	736	43	791	204	24	89	40	191	56	524
Turn Type	pm+pt	NA	pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2	1	6			4			8	
Permitted Phases	2		6		Free	4		4	8		8
Detector Phase	5	2	1	6		4	4	4	8	8	8
Switch Phase											
Minimum Initial (s)	7.0	20.0	7.0	20.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	38.0	10.0	38.0		17.3	17.3	17.3	17.3	17.3	17.3
Total Split (s)	21.0	49.0	10.0	38.0		31.0	31.0	31.0	31.0	31.0	31.0
Total Split (%)	23.3%	54.4%	11.1%	42.2%		34.4%	34.4%	34.4%	34.4%	34.4%	34.4%
Yellow Time (s)	3.0	5.0	3.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.0	2.0	0.0	2.0		2.8	2.8	2.8	2.8	2.8	2.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Lead/Lag	Lead	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes							
Recall Mode	None	Ped	None	Ped		None	None	None	None	None	None
Act Effct Green (s)	55.4	45.7	42.3	31.2	84.2	18.5	18.5	18.5	18.5	18.5	18.5
Actuated g/C Ratio	0.66	0.54	0.50	0.37	1.00	0.22	0.22	0.22	0.22	0.22	0.22
v/c Ratio	0.79	0.41	0.10	0.62	0.13	0.10	0.27	0.10	0.68	0.14	0.84
Control Delay (s/veh)	23.0	14.0	8.0	25.1	0.2	26.6	28.9	0.5	42.4	26.7	22.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	23.0	14.0	8.0	25.1	0.2	26.6	28.9	0.5	42.4	26.7	22.4
LOS	C	B	A	C	A	C	C	A	D	C	C
Approach Delay (s/veh)		17.2		19.5			21.1			27.7	
Approach LOS		B		B			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 84.2	
Natural Cycle: 80	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay (s/veh): 20.7	Intersection LOS: C
Intersection Capacity Utilization 81.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: King Street & Heritage Drive (Highway 12)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	444	786	45	824	213	25	93	42	199	58	546
v/c Ratio	0.79	0.41	0.10	0.62	0.13	0.10	0.27	0.10	0.68	0.14	0.84
Control Delay (s/veh)	23.0	14.0	8.0	25.1	0.2	26.6	28.9	0.5	42.4	26.7	22.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	23.0	14.0	8.0	25.1	0.2	26.6	28.9	0.5	42.4	26.7	22.4
Queue Length 50th (m)	33.2	44.3	2.4	59.4	0.0	3.8	14.7	0.0	29.8	7.6	24.1
Queue Length 95th (m)	#85.0	63.6	6.5	83.4	0.0	10.9	29.1	0.0	51.6	16.7	#69.3
Internal Link Dist (m)		301.0		324.8			122.4			164.0	
Turn Bay Length (m)	125.0		125.0		120.0	55.0			80.0		
Base Capacity (vph)	578	1914	437	1339	1617	324	450	503	379	544	726
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.41	0.10	0.62	0.13	0.08	0.21	0.08	0.53	0.11	0.75

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	426	736	18	43	791	204	24	89	40	191	56	524
Future Volume (vph)	426	736	18	43	791	204	24	89	40	191	56	524
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	7.0		3.0	7.0	4.0	7.3	7.3	7.3	7.3	7.3	7.3
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1825	3528		1825	3614	1617	1513	1588	1471	1825	1921	1589
Flt Permitted	0.22	1.00		0.35	1.00	1.00	0.72	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	420	3528		680	3614	1617	1145	1588	1471	1339	1921	1589
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	444	767	19	45	824	213	25	93	42	199	58	546
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	33	0	0	302
Lane Group Flow (vph)	444	784	0	45	824	213	25	93	9	199	58	244
Confl. Peds. (#/hr)							4					4
Heavy Vehicles (%)	0%	3%	6%	0%	1%	1%	20%	21%	11%	0%	0%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Free	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		Free	4		4	8		8
Actuated Green, G (s)	52.7	45.7		36.6	32.6	85.5	18.5	18.5	18.5	18.5	18.5	18.5
Effective Green, g (s)	52.7	45.7		36.6	32.6	85.5	18.5	18.5	18.5	18.5	18.5	18.5
Actuated g/C Ratio	0.62	0.53		0.43	0.38	1.00	0.22	0.22	0.22	0.22	0.22	0.22
Clearance Time (s)	3.0	7.0		3.0	7.0		7.3	7.3	7.3	7.3	7.3	7.3
Vehicle Extension (s)	3.0	5.4		3.0	5.4		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	539	1885		344	1377	1617	247	343	318	289	415	343
v/s Ratio Prot	c0.16	0.22		0.01	0.23			0.06			0.03	
v/s Ratio Perm	c0.34			0.05		0.13	0.02		0.01	0.15		c0.15
v/c Ratio	0.82	0.42		0.13	0.60	0.13	0.10	0.27	0.03	0.69	0.14	0.71
Uniform Delay, d1	12.2	11.9		14.3	21.2	0.0	26.8	27.9	26.4	30.8	27.1	31.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.9	0.4		0.2	1.2	0.2	0.2	0.4	0.0	6.7	0.2	6.8
Delay (s)	22.1	12.3		14.5	22.4	0.2	27.0	28.3	26.5	37.5	27.2	37.9
Level of Service	C	B		B	C	A	C	C	C	D	C	D
Approach Delay (s/veh)		15.8			17.7			27.6			37.0	
Approach LOS		B			B			C			D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	22.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	85.5	Sum of lost time (s)	17.3
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	77	67	649	687	16
Future Volume (Veh/h)	14	77	67	649	687	16
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	15	82	71	690	731	17
Pedestrians	2					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				188		
pX, platoon unblocked						
vC, conflicting volume	1229	376	750			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1229	376	750			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	87	92			
cM capacity (veh/h)	159	626	867			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	97	301	460	487	261
Volume Left	15	71	0	0	0
Volume Right	82	0	0	0	17
cSH	430	867	1700	1700	1700
Volume to Capacity	0.23	0.08	0.27	0.29	0.15
Queue Length 95th (m)	6.5	2.0	0.0	0.0	0.0
Control Delay (s/veh)	15.8	2.9	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s/veh)	15.8	1.2		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix M

ITE Parking Generation Manual Source Data

Land Use: 310 Hotel

Description

A hotel is a place of lodging that provides sleeping accommodations and supporting facilities such as a full-service restaurant, concierge service, valet parking, cocktail lounge, meeting rooms, banquet room, and convention facilities. A hotel typically provides a swimming pool or another recreational facility such as a fitness room.

Time-of-Day Distribution for Parking Demand

The following table presents a time-of-day distribution of parking demand on a weekday (four study sites) and a Saturday (three study sites) in a general urban/suburban setting.

Hour Beginning	Percent of Peak Parking Demand	
	Weekday	Saturday
12:00–4:00 a.m.	100	100
5:00 a.m.	—	—
6:00 a.m.	90	80
7:00 a.m.	90	81
8:00 a.m.	90	80
9:00 a.m.	80	79
10:00 a.m.	74	70
11:00 a.m.	67	65
12:00 p.m.	65	61
1:00 p.m.	61	57
2:00 p.m.	59	48
3:00 p.m.	58	50
4:00 p.m.	61	55
5:00 p.m.	60	59
6:00 p.m.	62	66
7:00 p.m.	65	76
8:00 p.m.	70	76
9:00 p.m.	75	78
10:00 p.m.	88	87
11:00 p.m.	97	95

Additional Data

Parking demand at a hotel is related to the presence of supporting facilities. A hotel with a convention facility, meeting rooms, restaurant, or banquet space, may include parking demand generated by event attendees who are not hotel guests. As a result, peak parking demand for the hotel may occur during the afternoon or evening instead of the typical hotel peak parking demand that occurs overnight. To illustrate, for four of the 12 study sites in the database, the time-of-day parking demand distribution clearly demonstrates that an event took place during the evening of the study period. The peak parking demand at these four sites ranged between 50 and 100 percent greater than that of the peak overnight parking demand for hotel guests.

The database for this land use does not include information on potential independent variables for the generation of event-related parking demand (such as meeting facility GFA or event attendees) during the count period. For that reason, the peak parking demand displayed in the data plots only includes a site's overnight peak parking demand (i.e., parking demand associated with overnight guests and hotel staff). The plots do not contain peak parking demands generated by other supporting facilities or events that occur outside of the typical overnight peak parking period.

Parking demand at all lodging land uses may be related to the recent emergence of transportation network companies (TNCs) (also referred to as ride-share or ride-hailing companies). Hotel parking demand may be reduced if a hotel guest uses a TNC service for hotel drop-off or pick-up rather than using a rental car and parking on-site. Additional data are needed in order to measure and understand the potential impact of TNCs on lodging land use parking demand.

The average parking supply ratio for the nine study sites with parking supply information is 1.1 spaces per room. The average peak parking occupancy at the four sites with event parking is 69 percent. For the nine sites with overnight parking demand counted, the average peak parking occupancy is 54 percent.

The sites were surveyed in the 1990s, the 2000s, and the 2020s in California, and Washington.

For all lodging uses, it is important to collect data on occupied rooms as well as total rooms. Future data submissions should indicate the presence of supporting facilities and the level of activity/event taking place during the count period (e.g., full, empty, partially active; number of people attending a meeting/banquet). Data on the presence and usage of TNC service should be documented for all lodging land uses for future analysis purposes.

Source Numbers

217, 315, 401, 438, 603

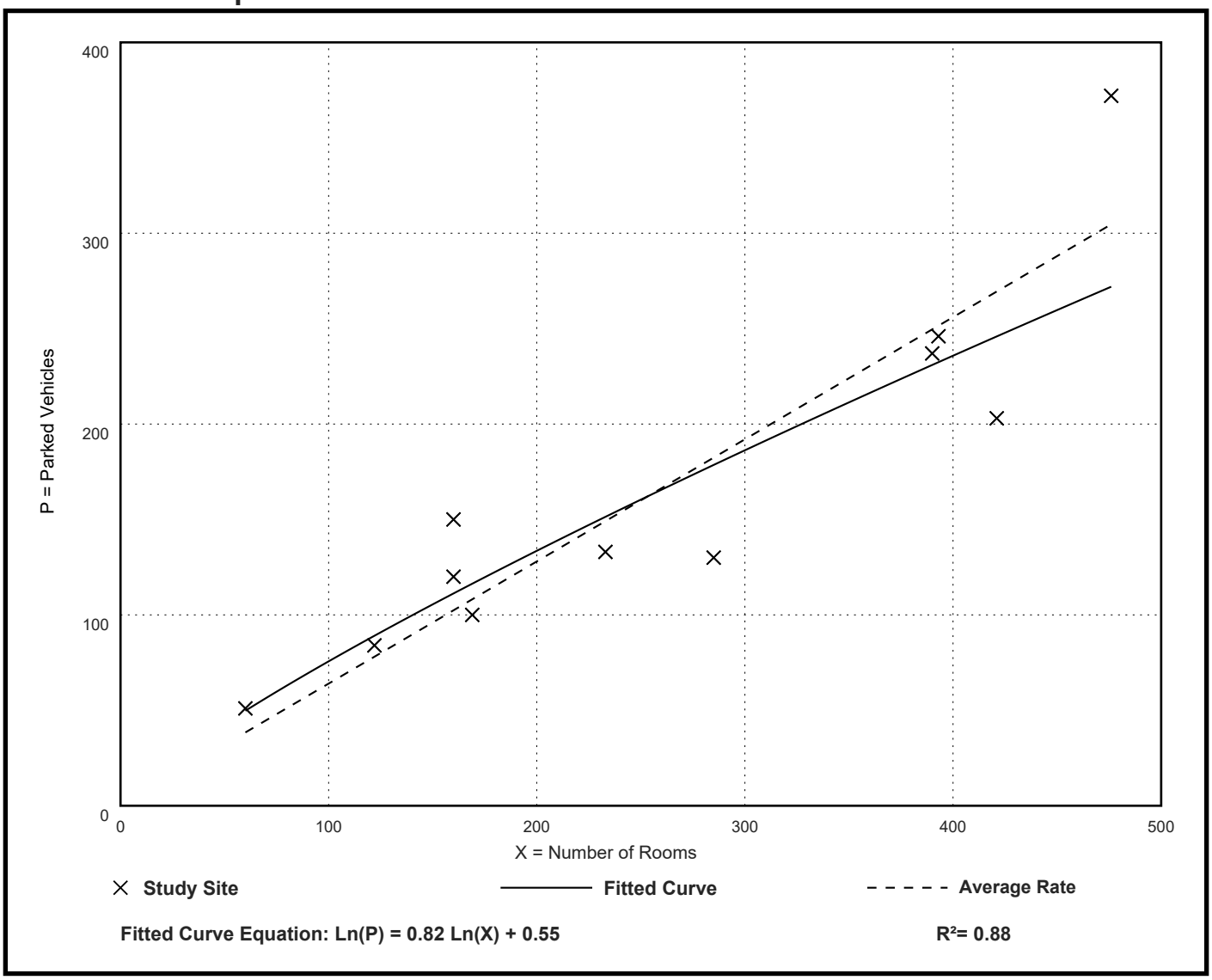
Hotel
(310)

Peak Period Parking Demand vs: Rooms
On a: Weekday (Monday - Friday)
Setting/Location: General Urban/Suburban
Number of Studies: 11
Avg. Num. of Rooms: 261

Peak Period Parking Demand per Room

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
0.64	0.46 - 0.94	0.59 / 0.87	***	0.14 (22%)

Data Plot and Equation



Fitted Curve Equation: Ln(P) = 0.82 Ln(X) + 0.55

R^2= 0.88

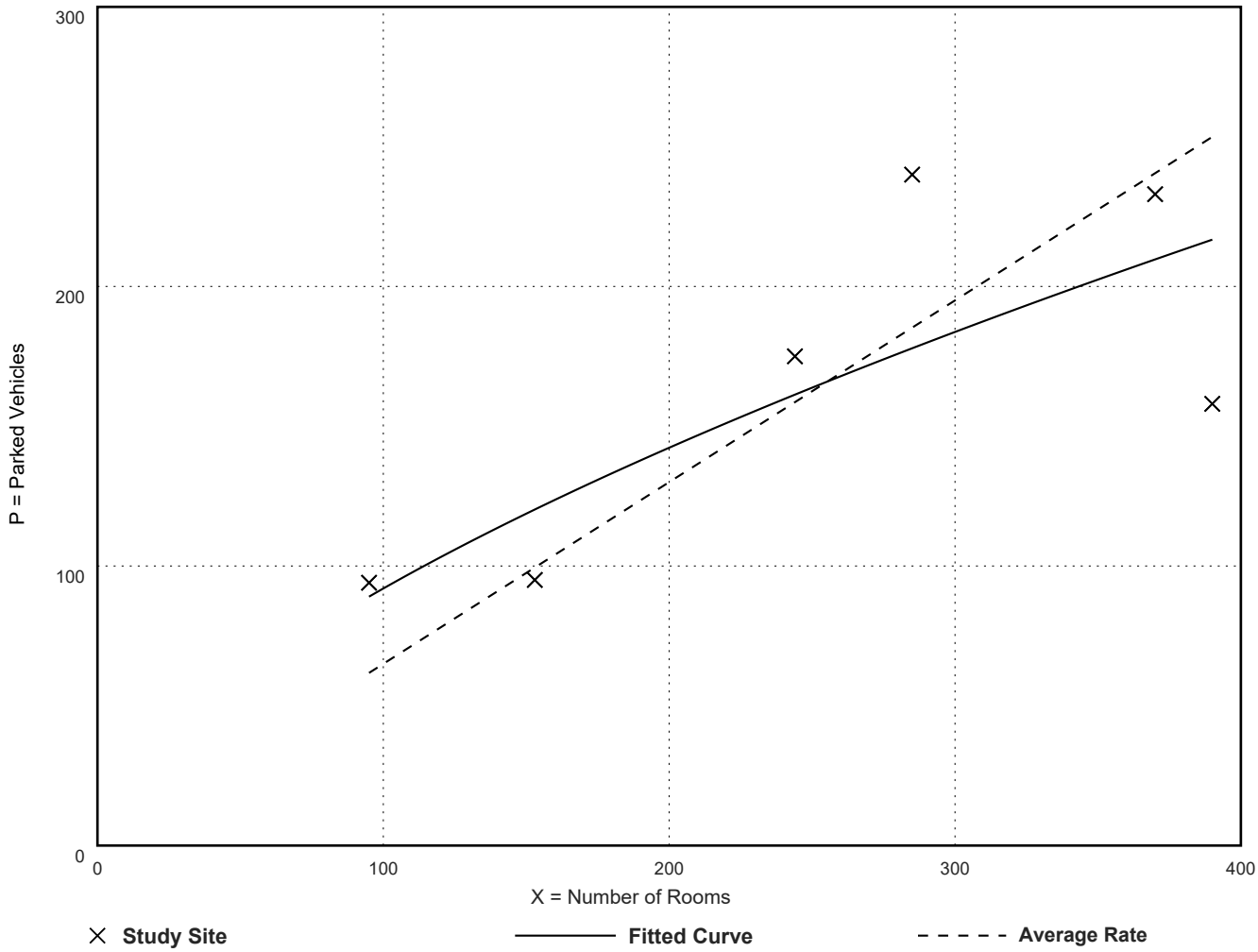
Hotel
(310)

Peak Period Parking Demand vs: Rooms
On a: Saturday
Setting/Location: General Urban/Suburban
Number of Studies: 6
Avg. Num. of Rooms: 256

Peak Period Parking Demand per Room

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
0.65	0.41 - 0.99	0.62 / 0.98	***	0.19 (29%)

Data Plot and Equation

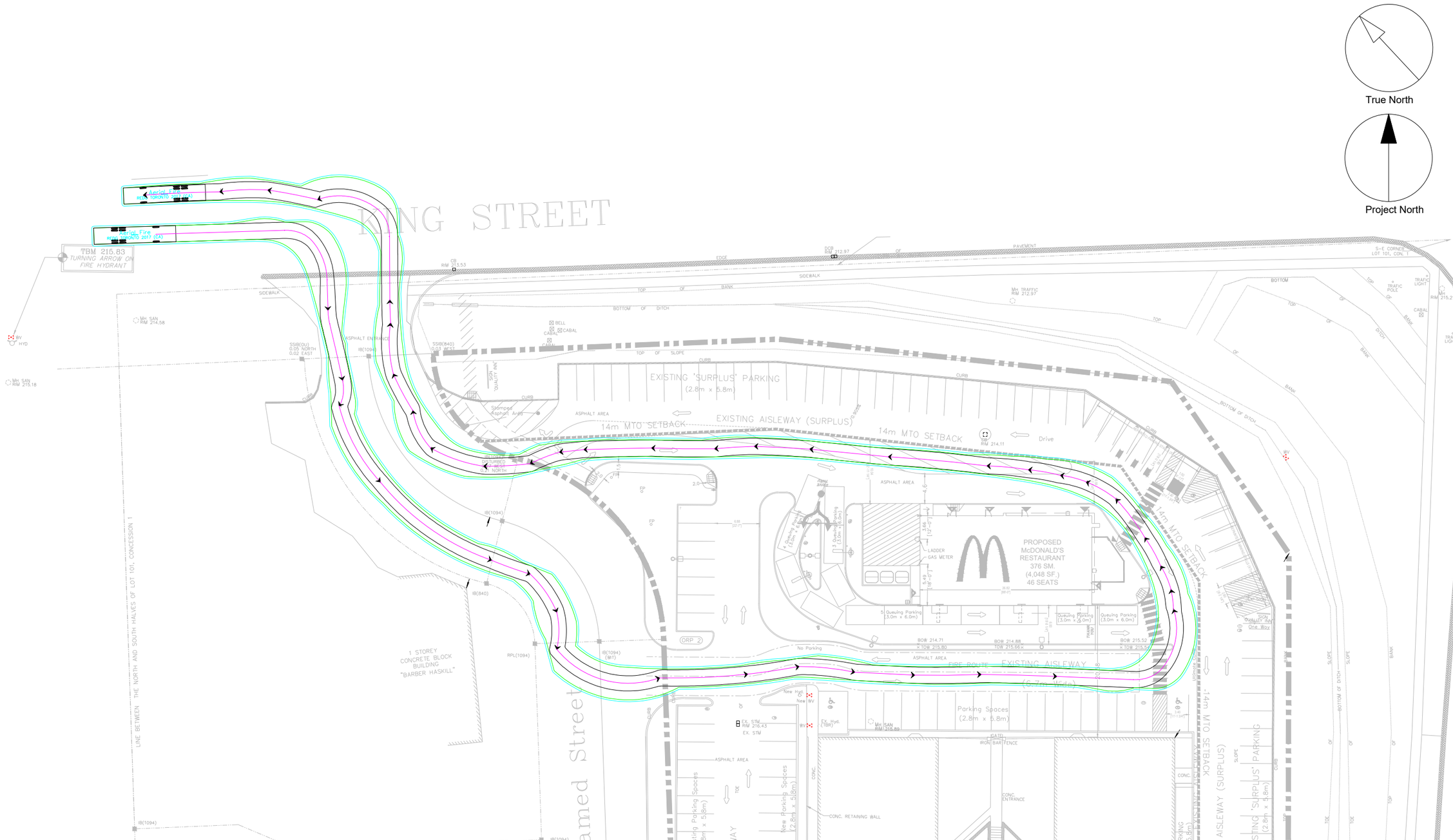


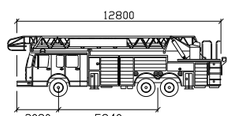
Fitted Curve Equation: Ln(P) = 0.63 Ln(X) + 1.62

R^2= 0.69

Appendix N

Vehicle Swept Path Analysis





Aerial Fire

	mm
Width	2540
Track	2540
Lock to Lock Time	6.0
Steering Angle	37.0

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www.arcadis.com

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1489338 Ontario Inc.

924 King Street
Midland, ON L4R 0B8

PROJECT NAME
McDonalds - 924 King Street, Midland, Ontario
924 King Street, Midland, Ontario
L4R 0B8

SCALE:	DATE:
1:600	2025-10-28
PROJECT ENG:	DRAWN BY: GJ
CHECKED BY: KL	APPROVED BY: CS
PROJECT NO: 30294034	

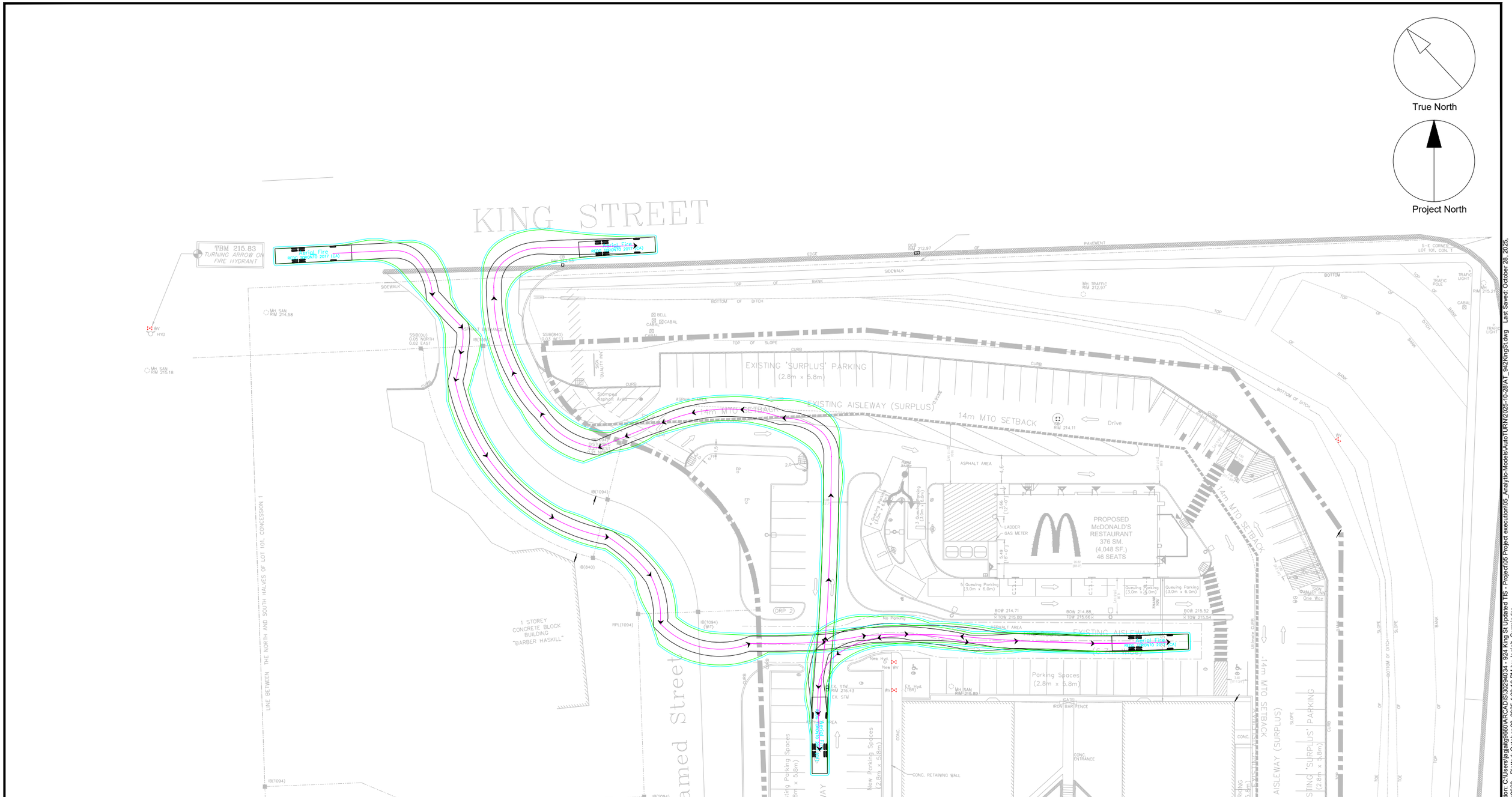
FIGURE NAME
Transportation Maneuverability Diagram - Fire Truck Route - REDG Toronto 2017 - Custom 1

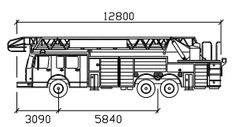
FIGURE NO. 01

REVISION 01

SCALE CHECK 1 in 10mm

File Location: C:\Users\jagialg9660\ARCADIS\30294034 - 924 King St Updated TIS - Project\05 Project execution\05_Analytic-Models\AutoTURN\2025-10-28\AT_942KingSt.dwg Last Saved: October 28, 2025. by jagialg9660 Plotted: October 28, 2025 4:02:19 PM by jagial, Guminder





Aerial Fire

	mm
Width	2540
Track	2540
Lock to Lock Time	6.0
Steering Angle	37.0

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CLIENT
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Midland, ON L4R 0B8

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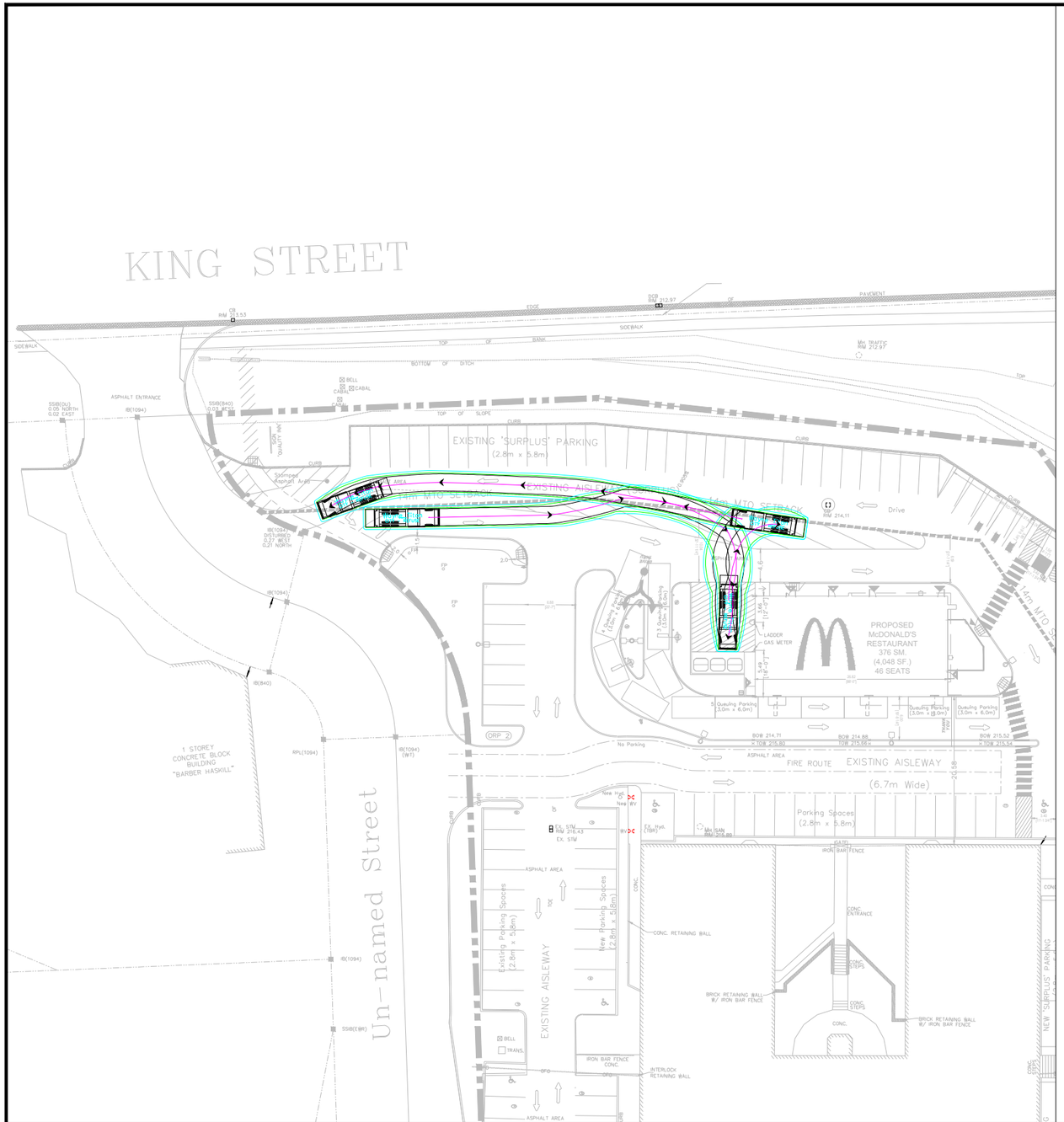
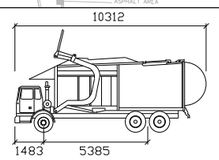
FIGURE NAME
Transcription Maneuverability Diagram - Fire Truck Route - REDG Toronto 2017 - Custom 2

FIGURE NO. 02

REVISION 01

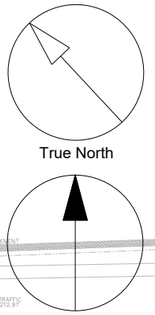
SCALE CHECK
10mm
1 in





Wayne Titan

	mm
Width	: 2578
Track	: 2438
Lock to Lock Time	6.0
Steering Angle	: 45.0



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Midland, ON L4R 0B8

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924 King Street, Midland, Ontario
L4R 0B8

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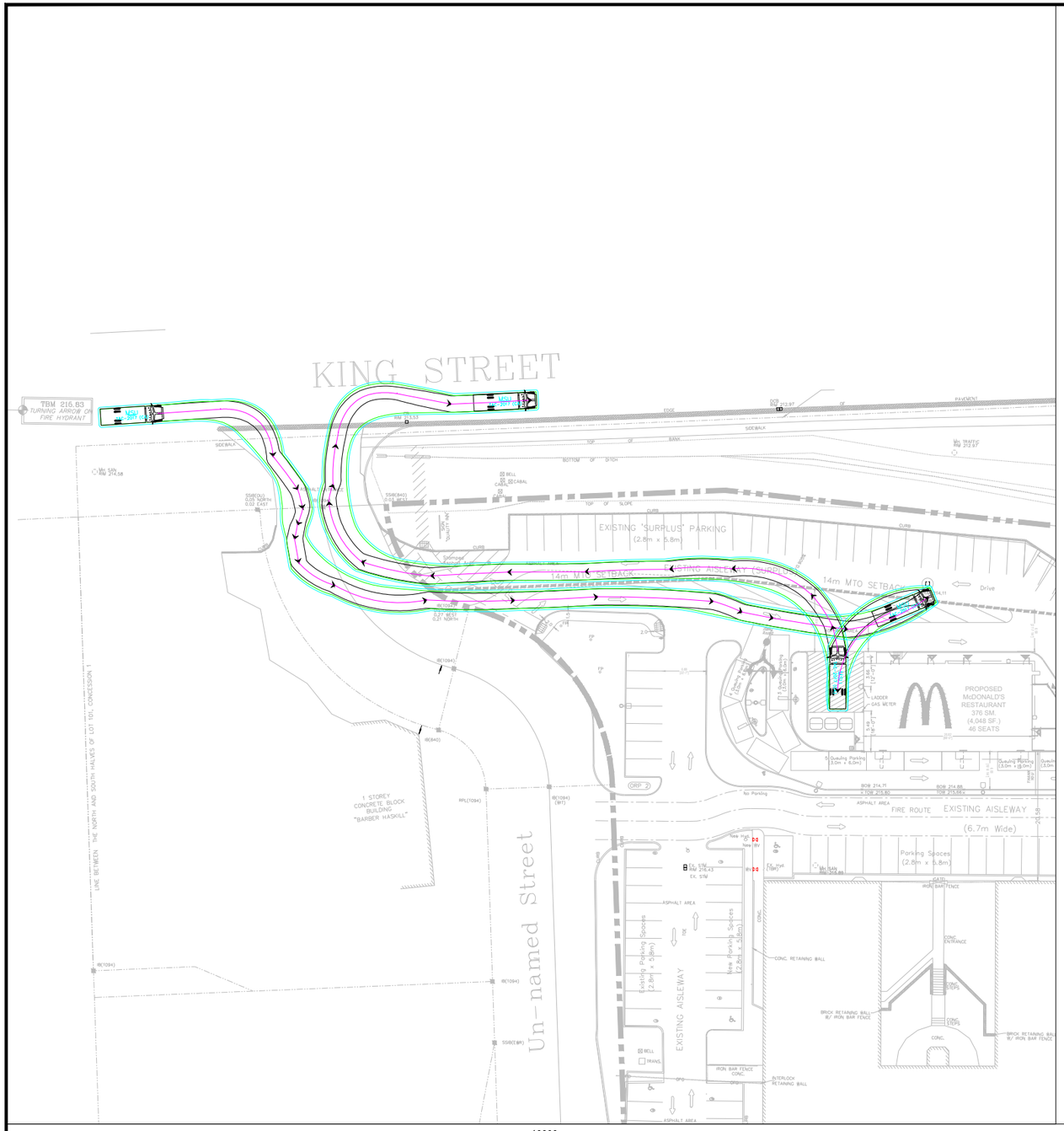
PROJECT NO: 30294034	

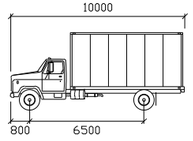
FIGURE NAME
Transportation Maneuverability Diagram - Waste Collection - Wayne Titan

FIGURE NO. 03

REVISION 01

SCALE CHECK
10mm
1 in





MSU

	mm
Width	: 2600
Track	: 2600
Lock to Lock Time	6.0
Steering Angle	: 40.2

True North

Project North

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924 King Street, Midland, Ontario
L4R 0B8

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PROJECT NO: 30294034	

FIGURE NAME
Transportation Maneuverability Diagram - Delivery Vehicle - MSU

FIGURE NO. 04

REVISION 01

SCALE CHECK
1 in
10mm

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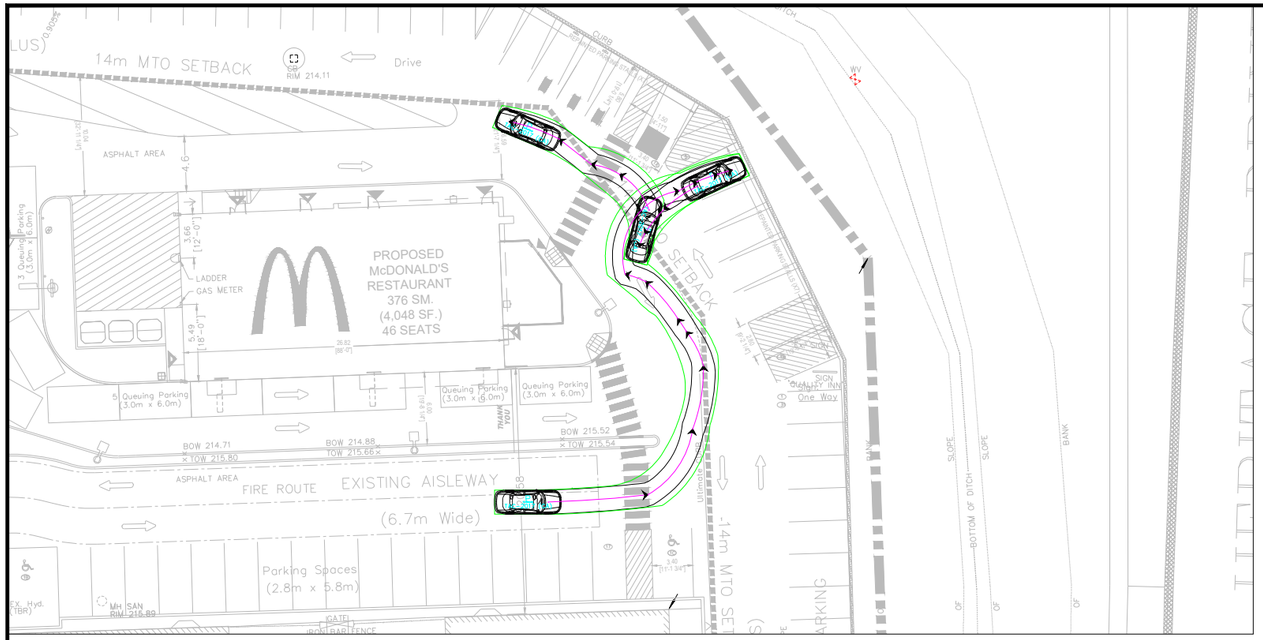
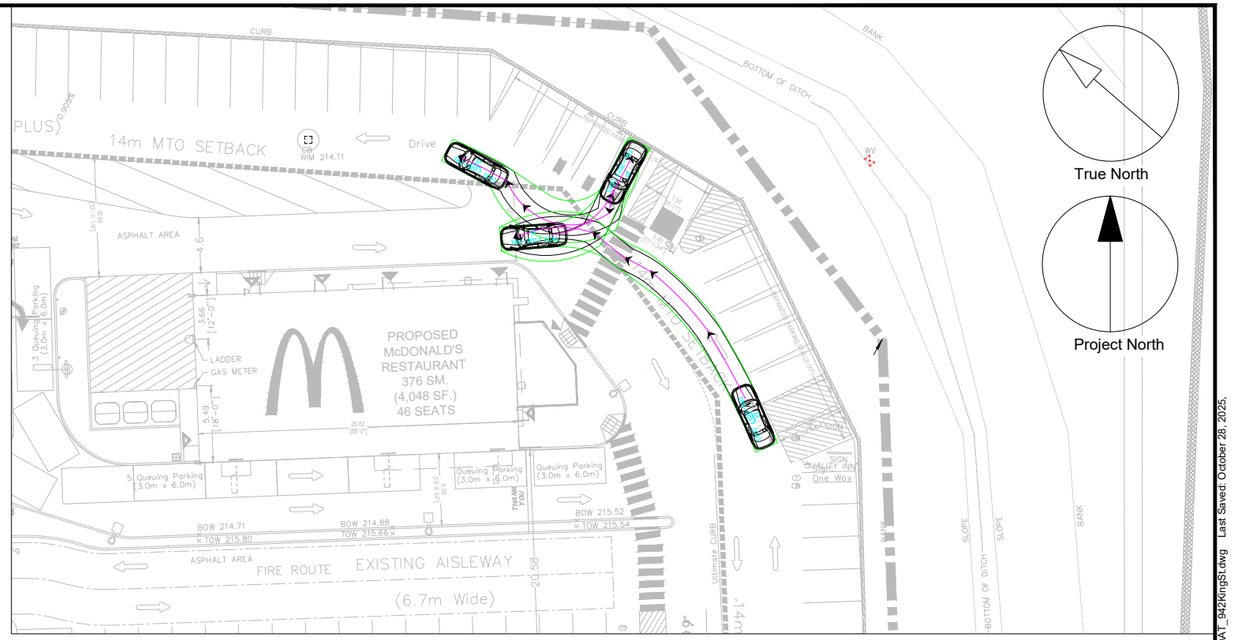
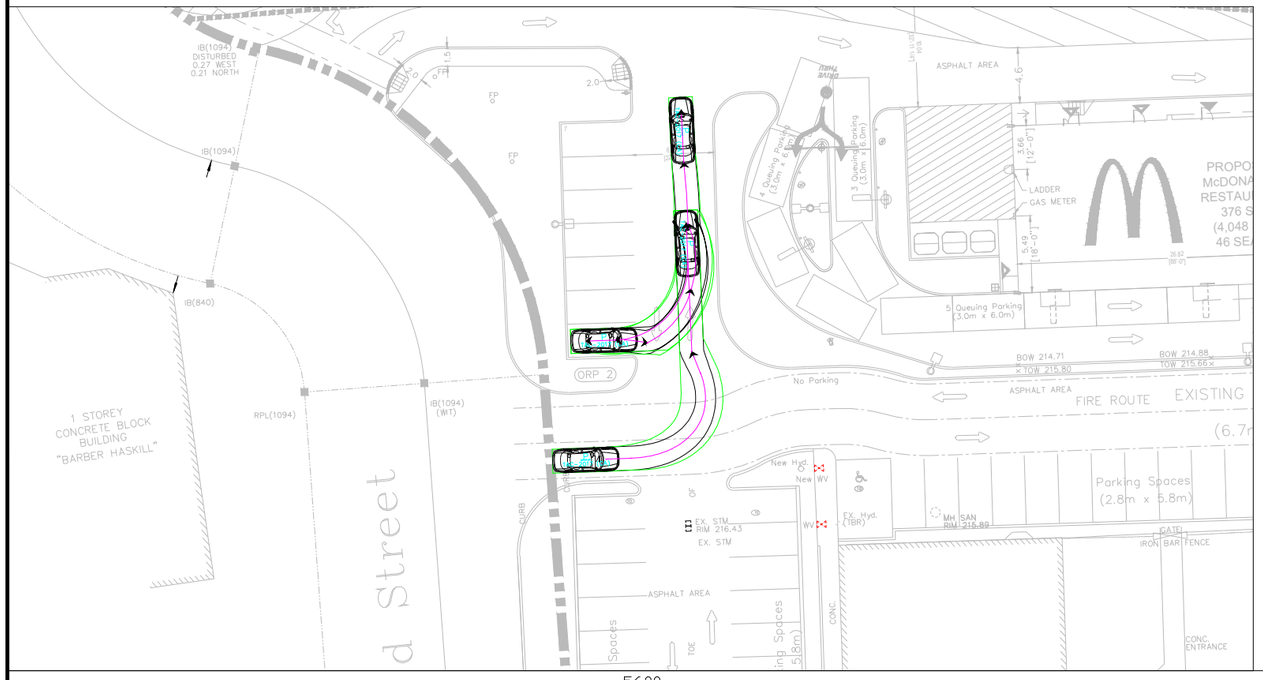
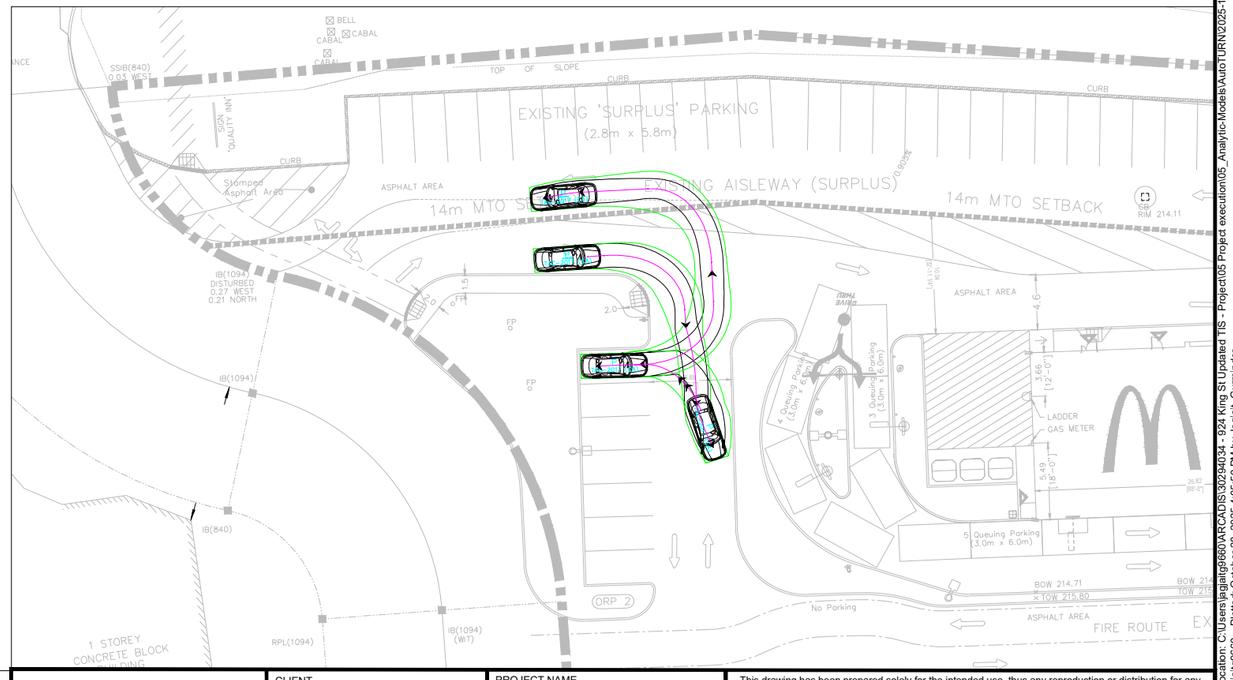
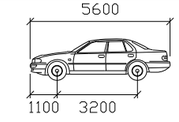
by jagjaitg9660 Plotted: October 28, 2025 4:04:00 PM by Jagjait, Gurminder











P

	mm
Width	: 2000
Track	: 2000
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

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Toronto ON M4V 2Y7 Canada
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FIGURE NAME
Transcription Maneuverability Diagram - Critical Parking Spaces - PTAC

FIGURE NO. 05

REVISION 01

SCALE CHECK
1 in
10mm

Arcadis Professional Services (Canada) Inc.
55 St. Clair Avenue West, 7th Floor
Toronto, Ontario M4V 2Y7
Canada
Phone: 416 596 1930
Fax:
www.arcadis.com