



September 21, 2018

Greg Pedersen  
Halo Car wash Inc.  
18 Adelaide Street, PO Box 100  
Maxville, Ontario,  
K0C 1T0

Dear Mr. Pedersen

Re: Traffic Impact Assessment for Proposed Automatic Car Wash Development  
at SW Quadrant, Innes Road and Boyer Road Intersection, City of Ottawa

Tranplan Associates, through BICORP DESIGN GROUP LTD., was retained to review the traffic impact of the proposed Automatic Car Wash Development at SW Quadrant, Innes Road and Boyer Road Intersection, City of Ottawa. This assessment follows the general process outlined in the City of Ottawa, Traffic Impact Assessment Guidelines, including Screening, Scoping, Forecasting and Analysis.

## 1. Screening

The Traffic Impact Assessment (TIA) Screening form was filled out and submitted to City of Ottawa (see Appendix "A"). It was determined that the proposed development also required Scoping of the proposed Car Wash Development.

## 2. Scoping

### 2.1 Proposed Development

The proposed development is an automatic car wash development, approximately 4,500 sq. ft., to be located at the southwest quadrant of Innes Road and Boyer Road signalized intersection (see Exhibit 1.1). The study site has an IL (Light Industrial) Zoning which allows the "car wash" as the permitted use on the study site. The estimated completion of the

# Exhibit 1.1: Key Map





proposed development is in 2019. The proposed development will have a driveway on Boyer Road and all site traffic will be accessed through the Innes Road and Boyer Road signalized intersection. The proposed development requires 5 parking spaces per wash bay and stacking requirement for ten vehicles. The proposed development is providing stacking for approximately 30 vehicles into the car wash bay, and 26 parking spaces on site (see Exhibit 1.2).

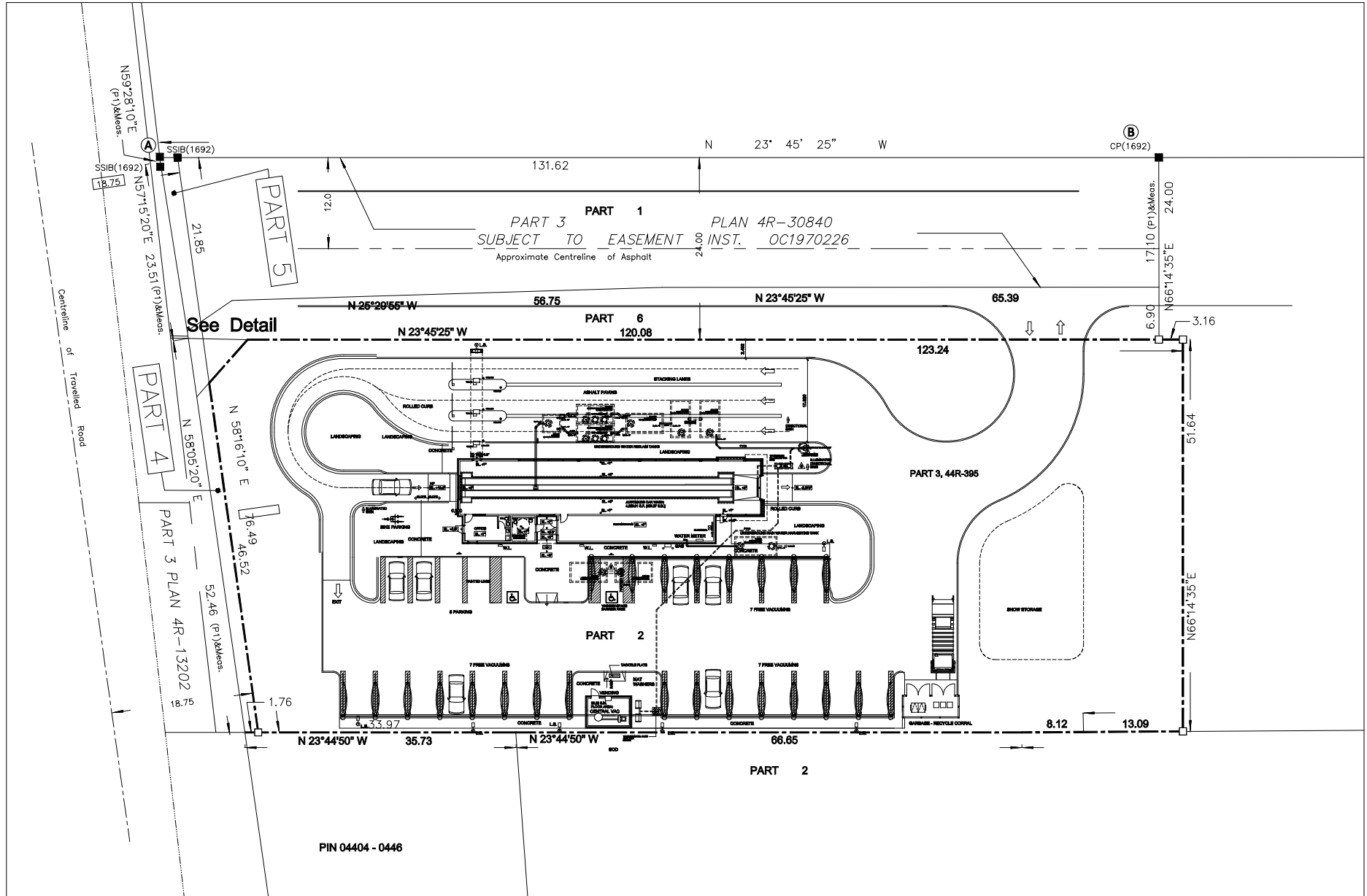
## 2.2 Existing Conditions

Existing conditions of the study area is provided in Exhibit 2.1. The study site is currently vacant/undeveloped. Main access to the study site is provided by Innes Road. In the vicinity of the study site, Innes Road is a four-lane major east-west arterial road. It is served by OC Transpo Route 94 and is a transit priority route with 60 km/h posted speed limit. Sidewalks are provided on both sides of the street and a marked bike lane is also provided on both direction of Innes Road. At the Boyer Road intersection, it is signalized with dedicated left turn lanes on Innes Road. The north approach is a small commercial plaza single lane driveway and the south approach (Boyer Road) is a single lane serving light industrial buildings. City of Ottawa provided the intersection turning movement counts and the traffic signal timing for the Innes Road and Boyer Road intersection, see Appendix "A".

## 2.3 Planned Conditions

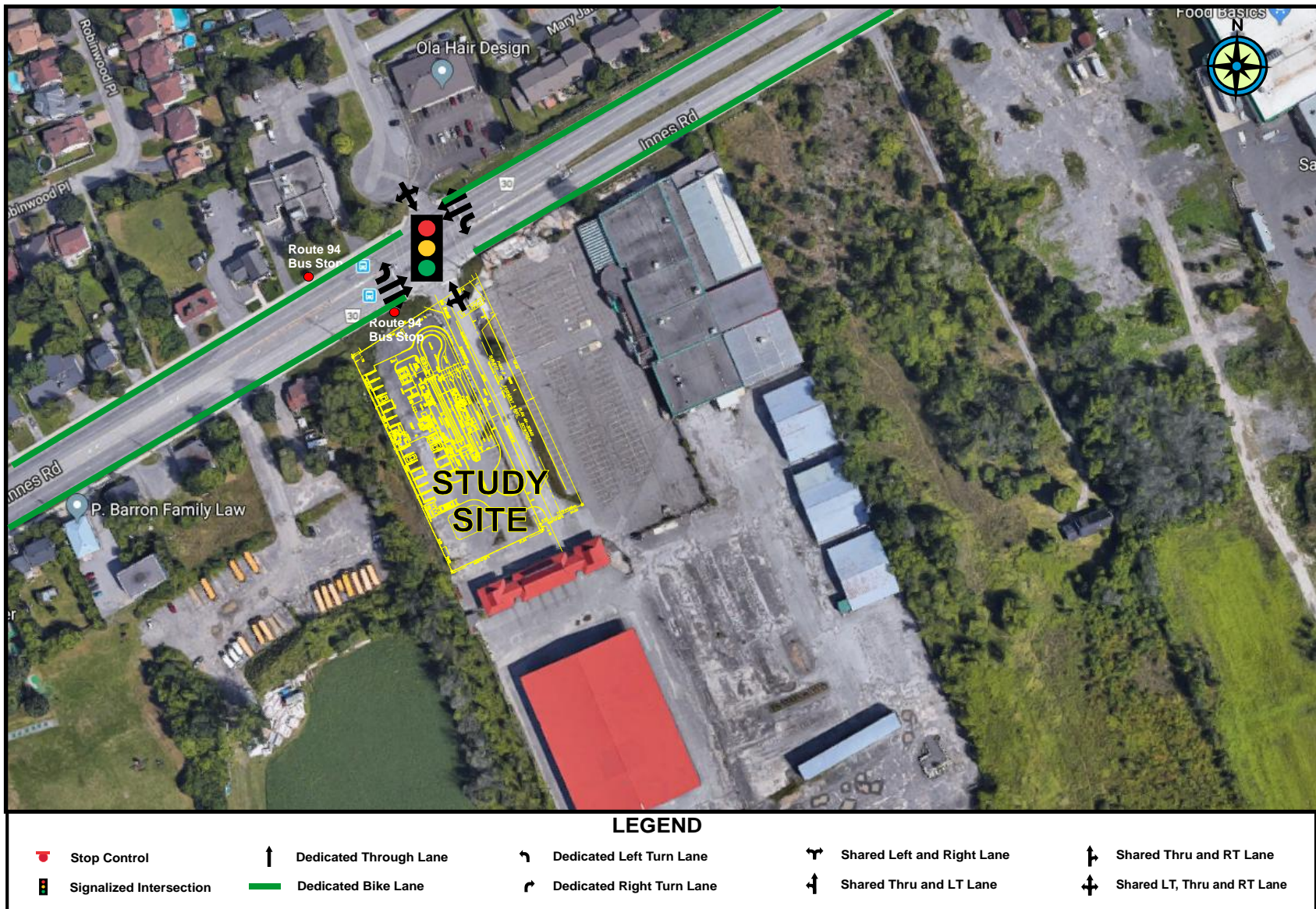
The City of Ottawa's Official Plan and the Transportation Master Plan (2013) indicates no changes in the Innes Road in the vicinity of the study site to 2031. No transit network improvements are expected with the 2031 planning horizon. Continuation (construction of) of Blackburn Bypass is being considered as part of the "Affordable 2031 Road Network" to south of the study site. The completion of the Blackburn Bypass will divert some of the existing traffic on Innes Road between the Bypass and Mer-Bleue Road. No other significant developments have been identified in the City of Ottawa planning documents.

# Exhibit 1.2: Proposed Site Plan





## Exhibit 2.1: Existing Traffic Control and Lane Configurations





## 2.4 Study Area

The study area and the impact of the proposed development is limited to the study site and the Innes Road and Boyer Road signalized intersection.

## 2.5 Study Peak Hours

The proposed Automatic Car Wash operation peak hours are weekday PM peak and Saturday Mid-day peak hours.

## 2.6 Study Planning Horizon

The proposed Automatic Car Wash development is expected to be fully developed and operating by end of 2019. Planning horizons to 2019 and 2024 (five years after the full build-out) are considered for study analysis.

# 3. Traffic Demand Forecast

## 3.1 Site Traffic Generation

Since the nature of the proposed automatic car wash development only involves passenger vehicles to/from the study site, only the vehicle trip calculations are provided as part of the traffic forecasts.

A summary of the trip generation calculations is provided in Table 3.1.

### 3.1.1 Trip Generation from ITE Trip Generation Manual<sup>1</sup>

Forecasts of future site trip generation were developed using the trip generation relationships taken from the current Institute of Transportation Engineers (ITE) Trip Generation Manual. The forecast site

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<sup>1</sup> The Institute of Transportation Engineers, based in the United States, is an international association for traffic engineers and transportation planners. The organization publishes a number of handbooks and manuals, including the Trip Generation Manual which is based on American and Canadian experience. The 10<sup>th</sup> edition of this publication was used.



trip generation for car wash use was based on the ITE land use category Car Wash (LU 948), using the size of the car wash building to calculate the trip generation of an automatic car wash land use. Based on ITE rates, the PM peak hour trips are estimated to be 64 trips (32 in; 32 out) and the Saturday Mid-day peak hour traffic is estimated to be approximately 140 trips (70 in; 70 out). The ITE rates, however, is based on small sample size and should be used with caution.

### 3.1.2 First Principles Calculations

The capacity of the automatic car wash unit (the number of vehicles a car wash can wash per hour) is based on the length of tunnel and the time it takes a vehicle to travel through the tunnel, assuming certain speed of the conveyor using (certain assumptions about) the average vehicle length and the average spacing between the vehicles. The car wash units come equipped with adjustable setting control system where a car wash unit setting for the conveyor speed can be adjusted to process up to 120 cars per hour (CPH). In the Canadian winter automatic car wash industry, (based on the information provided by the developer) it is likely that a processing speed of 60 CPH is a realistic estimation. As such, during the peak hour, under the “worst case” scenario, the proposed development could generate between 120 and 240 vehicle trips solely based on the capacity of the car wash unit settings. However, based on the proponent’s experiences and the forecasting of the proposed car wash for business plan purposes, an average winter day/weekend, the proposed car wash unit is projected to have car wash volume of approximately 275 vehicles per day, with 50 vehicles going through the car wash unit during the peak period.

### 3.3 Site Traffic Distribution/Assignment

The proposed development is expected to have a similar pattern to the existing traffic patterns observed at the study intersection and consistent with population distribution within commuting distance. The directional



distribution of the site traffic is described in Exhibit 3.1. Since all site traffic must be travelling on Innes Road to get to the site and the residential/commercial land use distribution seems to indicate even distribution, in all directions surrounding the study site, the study assumed 50% of the new trips would be from the west on Innes Road and 50% from the east of the study site on Innes Road for the PM and Saturday Mid-day peak periods.

### 3.3 Background Traffic

Background traffic is defined as all traffic within the study area that is not related to the proposed development. As per City of Ottawa Guidelines, a build-out year to 2019 and a five-year planning horizon after the build-out to 2024 was assumed for use in the study analysis.

#### 3.3.1 Transportation Network Plans

The City of Ottawa's Official Plan and the Transportation Master Plan (2013) indicates no changes in the Innes Road in the vicinity of the study site to 2031. No transit network improvements are expected with the 2031 planning horizon. Continuation (construction of) of Blackburn Bypass is being considered as part of the "Affordable 2031 Road Network" to south of the study site. The completion of the Blackburn Bypass will divert some of the existing traffic on Innes Road between the Bypass and Mer-Bleue Road. However, the study assumed no background increase in traffic resulting from possible any long-range network improvement plans.

#### 3.3.2 Background Growth

The City of Ottawa's website provides a link to an open data page providing Transportation intersection volumes for 2015, 2016 and 2017 which provides, among other things, Annual Average Daily Traffic (AADT) volumes for a certain section of a roadway. In





examining the posted database, there section of Innes Road relevant to the study site is not reported/collected and that there is no consistency in reported locations to perform any regression analysis to determine a reasonable historical pattern in traffic growth in the vicinity of the study site. For planning purposes, the study assumed a growth of 2.0% per annum to 2019 and 2024 planning horizons for the traffic passing through the study intersection on Innes Road (see Exhibit 2.2).

### 3.4 Total Traffic Demand

The total traffic demand resulting from site traffic, background traffic and total traffic are provided in Exhibit 3.1.

Table 3.1: Projected Trip Generation by Proposed Development

LAND USE Car Wash	PM PEAK HOUR				Saturday Mid-Day PEAK HOUR			
	SOURCE	Vehicle Trips			SOURCE	Vehicle Trips		
		Total	In	Out		Total	In	Out
Automatic Car Wash 4,524 ft <sup>2</sup>	ITE Land Use 948 rate 14.2/1000 ft <sup>2</sup>	64	50% 32	50% 32	ITE Land Use 948 rate 30.4/1000 ft <sup>2</sup>	138	50% 69	50% 69
Automatic Car Wash 4,524 ft <sup>2</sup>	First Principles 50 Cars/Hour	100	50	50	First Principles 60 Cars/Hour	120	60	60
For Study Analysis	Use First Principles 50 Cars/Hour	100	50	50	Use ITE Land Use 948 rate 30.4/1000 ft <sup>2</sup>	138	69	69

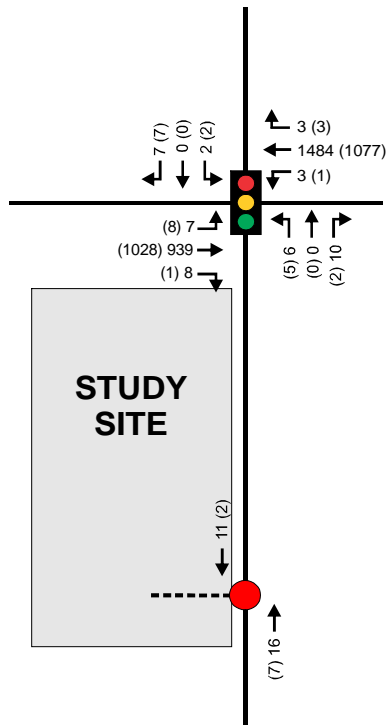
## 4. Traffic Analysis

### 4.1 Development Design

The proposed development will be served by a single site access driveway on Boyer Road, approximately 120 m south of Innes Road. Boyer Road currently terminates just south of the study site. The design of the proposed development is largely divided into two sections with the car was unit located in the middle. The eastern part of the study site has three

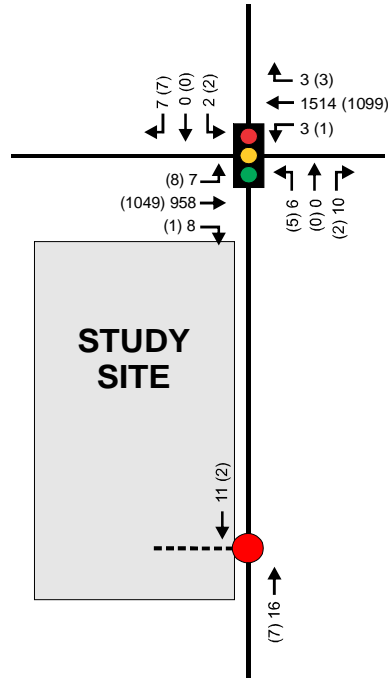
## Exhibit 2.2: Background Traffic Volumes

**A) 2018 Existing Traffic Volumes**



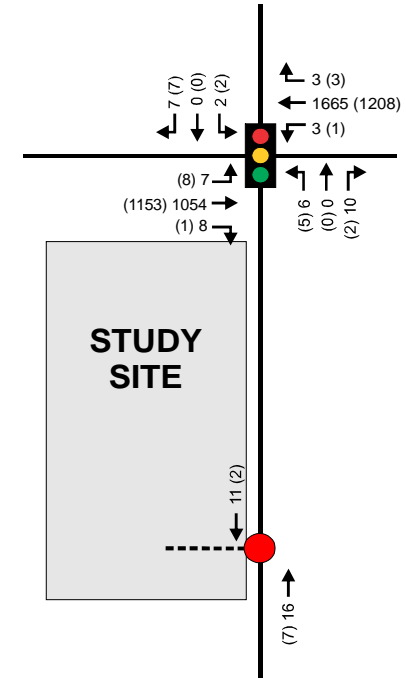
**B) 2019 Traffic Volumes  
(Build-Out year 2% per annum increase)**

\*Only the through traffic on Innes Road are increase using 2% growth factor



**C) 2024 Traffic Volumes  
( 2% per annum increase)**

\*Only the through traffic on Innes Road are increase using 2% growth factor



NOTE: Not to scale

**LEGEND**

128 (336) : PM (SAT)



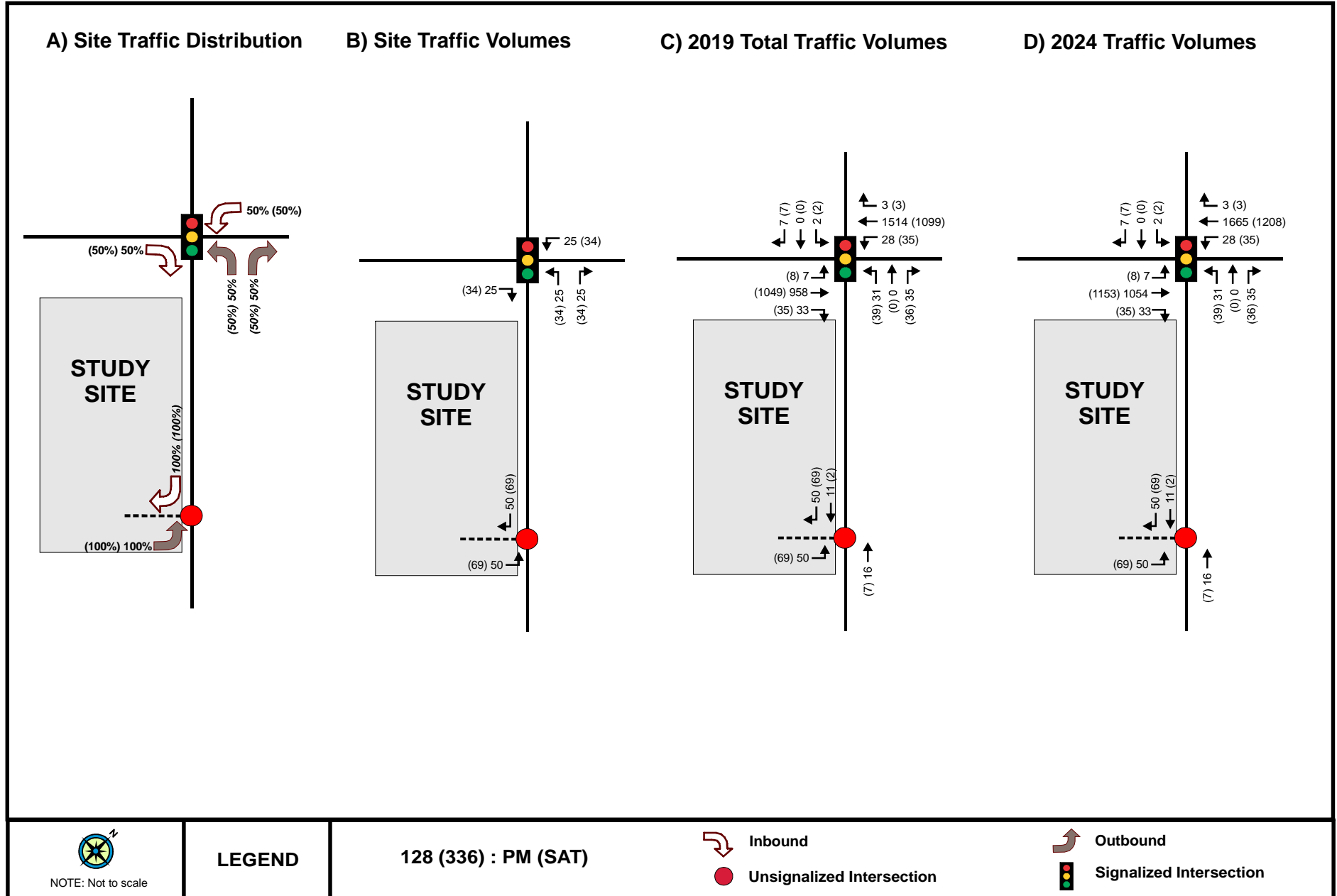
Unsignalized Intersection



Signalized Intersection



# Exhibit 3.1: Site and Total Traffic Volumes







stacking lanes, which lead to a single lane into the car wash unit. The total number of vehicles that could be contained in the stacking area is approximately 30 vehicles. The western half of the study site is mainly general parking area, equipped with the car detailing equipment such as vacuums, mat washers and an area with vending machines.

## 4.2 Parking Supply

Under the City's Zoning By-Law, five parking spaces per wash bay is required for the proposed development. The proposed development is providing 26 parking spaces.

## 4.3 Intersection Capacity Analysis

Detailed intersection capacity analysis was carried out to assess the 2018 existing traffic, 2019 background traffic, 2024 background traffic as well as future 2019 and 2024 total traffic conditions in terms of Level of Service (LOS)<sup>2</sup> and volume/capacity ratios using the reports produced by the Trafficware Software -Synchro Version 9.0. The City of Ottawa also provides input numbers for certain variables to be used in Synchro analysis. These variable numbers have been changed from the default Synchro numbers to reflect the City of Ottawa guidelines, all except the peak hour factor for future conditions. The peak hour factor was kept consistent at 0.90 to keep the comparisons of intersection capacity analysis consistent between the existing, future background and future total conditions. The results of these analysis are summarized in Table 4.1: Summary of Intersection Capacity Analysis and detailed calculation sheets are provided in Appendix "B".

### 4.3.1 Intersection Capacity Analysis: Existing Conditions

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<sup>2</sup> Level of Service (LOS) is commonly used in traffic engineering to describe the level of congestion along a roadway or at an intersection. Levels from "A" to "F" denote increasing amounts of congestion with "F" representing a complete breakdown in traffic flow. Level of Service "C" and "D" are commonly used as design standards. However, many individual turning movements at TWSC intersections and commercial entrances along urban arterial corridors operate at LOS "F" during peak periods.

**Table 4.1: Summary of Intersection Capacity Analysis**

	2018 Existing Conditions				2019 Future Background				2024 Future Background				2019 Total Conditions				2024 Total Conditions			
Intersection	Weekday PM Peak				Weekday PM Peak				Weekday PM Peak				Weekday PM Peak				Weekday PM Peak			
Innes Road/Boyer Road (Sig)	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
EB - L	A	1.7	1.0	0.04	A	1.7	1.0	0.04	A	2.0	1.1	0.05	A	3.1	1.6	0.04	A	3.4	1.6	0.05
EB - TR	A	1.4	30.0	0.34	A	1.4	30.6	0.34	A	1.5	35.3	0.38	A	3.2	45.8	0.39	A	3.4	52.8	0.43
WB - L	A	1.3	0.5	0.01	A	1.3	0.5	0.01	A	1.3	0.5	0.01	A	3.1	3.9	0.08	A	3.2	3.9	0.09
WB - TR	A	2.1	62.7	0.53	A	2.2	65.4	0.54	A	2.6	80.3	0.59	A	4.7	94.4	0.59	A	5.5	115.5	0.65
NB - LTR	B	17.2	5.8	0.17	B	17.2	5.8	0.17	B	17.2	5.8	0.17	D	41.0	22.7	0.53	D	41.0	22.7	0.53
SB - LTR	A	7.1	1.9	0.10	A	7.1	1.9	0.10	A	7.1	1.9	0.10	A	6.2	2.0	0.08	A	6.2	2.0	0.08
Intersection Avg.	A	2.0			A	2.0			A	2.3			A	5.0			A	5.5		
Boyer Road/Site Entrance (TWSC)	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
EB - LR													A	9.0	0.2	0.06	A	9.0	0.2	0.06
	2018 Existing Conditions				2019 Future Background				2024 Future Background				2019 Total Conditions				2024 Total Conditions			
Intersection	Saturday Mid-Day Peak				Saturday Mid-Day Peak				Saturday Mid-Day Peak				Saturday Mid-Day Peak				Saturday Mid-Day Peak			
Innes Road/Boyer Road (Sig)	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
EB - L	A	1.2	1.1	0.02	A	1.2	1.1	0.02	A	1.2	1.1	0.03	A	3.9	1.8	0.03	A	4.1	1.8	0.04
EB - TR	A	1.1	31.7	0.36	A	1.2	32.7	0.36	A	1.3	37.7	0.40	A	4.8	53.4	0.46	A	5.2	61.7	0.51
WB - L	A	1.0	0.3	0.00	A	1.0	0.3	0.00	A	1.0	0.3	0.00	A	4.9	5.4	0.13	A	5.5	5.7	0.15
WB - TR	A	1.2	34.1	0.37	A	1.2	35.1	0.38	A	1.3	40.8	0.42	A	4.9	54.8	0.47	A	5.3	63.8	0.51
NB - LTR	A	0.6	0.0	0.05	A	0.6	0.0	0.05	A	0.6	0.0	0.05	C	27.2	18.1	0.46	C	27.2	18.1	0.46
SB - LTR	A	0.9	0.3	0.07	A	0.9	0.3	0.07	A	0.9	0.3	0.07	A	0.6	0.4	0.05	A	0.6	0.4	0.05
Intersection Avg.	A	1.2			A	1.2			A	1.3			A	5.6			A	5.9		
Boyer Road/Site Entrance (TWSC)	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
EB - LR													A	9.1	0.3	0.08	A	9.1	0.3	0.08



Under the existing conditions, the Innes Road/Boyer Road signalized intersection currently operates at an overall intersection average of LOS "A" with delays of approximately 2.0 and 1.2 seconds per vehicle during PM peak hour and Saturday Mid-day peak hour, respectively. No individual movements are at critical levels and all movements are currently operating well with good levels of service during the study peak hours.

#### 4.3.2 Intersection Capacity Analysis: Background Conditions

Under the 2019 background conditions, the Innes Road/Boyer Road signalized intersection currently operates at an overall intersection average of LOS "A" with delays of approximately 2.0 and 1.2 seconds per vehicle during PM peak hour and Saturday Mid-day peak hour, respectively. No individual movements are at critical levels and all movements are currently operating well with good levels of service during the study peak hours.

Under the 2024 background conditions, the Innes Road/Boyer Road signalized intersection currently operates at an overall intersection average of LOS "A" with delays of approximately 2.3 and 1.3 seconds per vehicle during PM peak hour and Saturday Mid-day peak hour, respectively. No individual movements are at critical levels and all movements are currently operating well with good levels of service during the study peak hours.

#### 4.3.3 Intersection Capacity Analysis: Total Conditions

Under the 2019 total conditions, the Innes Road/Boyer Road signalized intersection currently operates at an overall intersection average of LOS "A" with delays of approximately 5.0 and 5.6 seconds per vehicle during PM peak hour and Saturday Mid-day peak hour, respectively. No individual movements are at critical levels



and all movements are currently operating well with good levels of service during the study peak hours.

Under the 2024 total conditions, the Innes Road/Boyer Road signalized intersection currently operates at an overall intersection average of LOS "A" with delays of approximately 5.5 and 5.9 seconds per vehicle during PM peak hour and Saturday Mid-day peak hour, respectively. No individual movements are at critical levels and all movements are currently operating well with good levels of service during the study peak hours.

The site traffic added to the Innes Road/Boyer Road signalized intersection will have some impact on the outbound movements from the study site (northbound movements/south approach) when site traffic volumes are added to the intersection. The south approach is forecast to operate at LOS "D" with delay of approximately 41 seconds, 95<sup>th</sup> percentile queue length of approximately three vehicles and v/c ratio at 0.53 and LOS "C" with delay of approximately 27 seconds, 95<sup>th</sup> percentile queue length of approximately three vehicles and v/c ratio at 0.46, during the PM and Saturday Mid-day peak hour, respectively.

In assessing the three principal components of intersection measures of effectiveness (MOE's - delay, queue length and v/c ratio), it can be concluded that the increase in the Levels of Service as a result of additional traffic from the study site will have some increase in delay but the 95<sup>th</sup> percentile queue length of approximately three vehicles and the slight increase in volume to capacity ratio are well within the acceptable conditions under the urban peak hour conditions and no mitigation measure is required to support the traffic to/from the proposed car wash development.



#### 4.3.4 Intersection Capacity Analysis: Site Entrance

The proposed site entrance will be located approximately 120 m south of the signalized intersection (greater than the minimum 15 m of corner clearance based on TAC standards) and will operate with a stop sign facing the outbound traffic from the study site. The intersection capacity indicates that site entrance driveway on Boyer Road is forecast to operate at (almost) free flowing conditions, LOS "A", no queuing at the site entrance and very low volume/capacity ratio.

#### 4.4 Transportation Demand Strategies

Usually, travel demand management presents a number of strategies to encourage the reduction of overall travel to urban trip attractors. While many of the strategies are focused on employee travel, there are opportunities for trip reduction for other trip purposes. In the case of the proposed development, employees could be encouraged to rideshare, take transit or make use of bicycles to travel to work. Given that proposed development's business model solely relies on auto traffic passing through the site, the opportunities for the transportation demand management are limited and not likely to be effective for the customers visiting the site.

### 5. Summary

In summary, the study analysis indicates that the site generated traffic will have no significant impact on the adjacent road network, including on the Innes Road/Boyer Road signalized intersection and the site entrance driveway on Boyer Road. The proposed site entrance driveway on Boyer Road will support the proposed car wash development and associated uses based on projected volumes.



If you should require further information on the study, please do not hesitate to contact us at your convenience.

Yours truly,

Seo-Woon (Swan) Im, B.E.S  
Tranplan Associates  
Senior Transportation Planner

Report Reviewed By:

William Copeland, P.Eng.  
Tranplan Associates, *Principal*



## TECHNICAL APPENDIX



## APPENDIX A: Screening Form and Traffic Data

## City of Ottawa 2017 TIA Guidelines Screening Form

### 1. Description of Proposed Development

Municipal Address	3604 Innes Rd, Orleans
Description of Location	SW corner of Innes Road & Boyer Road
Land Use Classification	IL Zoning - Commercial
Development Size (units)	1 Building
Development Size (m <sup>2</sup> )	5,2886.56 S.M. [1.31 ac]
Number of Accesses and Locations	1 off side street
Phase of Development	
Buildout Year	2018

If available, please attach a sketch of the development or site plan to this form.

### 2. Trip Generation Trigger

Considering the Development's Land Use type and Size (as filled out in the previous section), please refer to the Trip Generation Trigger checks below.

Land Use Type	Minimum Development Size
Single-family homes	40 units
Townhomes or apartments	90 units
Office	3,500 m <sup>2</sup>
Industrial	5,000 m <sup>2</sup>
Fast-food restaurant or coffee shop	100 m <sup>2</sup>
Destination retail	1,000 m <sup>2</sup>
Gas station or convenience market	75 m <sup>2</sup>

*\* If the development has a land use type other than what is presented in the table above, estimates of person-trip generation may be made based on average trip generation characteristics represented in the current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.*

**If the proposed development size is greater than the sizes identified above, the Trip Generation Trigger is satisfied.**

### 3. Location Triggers

	Yes	No
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?		No
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?*		

\*DPA and TOD are identified in the City of Ottawa Official Plan (DPA in Section 2.5.1 and Schedules A and B; TOD in Annex 6). See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA).

**If any of the above questions were answered with 'Yes,' the Location Trigger is satisfied.**

### 4. Safety Triggers

	Yes	No
Are posted speed limits on a boundary street are 80 km/hr or greater?		No
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?		No
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?		
Is the proposed driveway within auxiliary lanes of an intersection?		No
Does the proposed driveway make use of an existing median break that serves an existing site?		No
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		
Does the development include a drive-thru facility?	Yes	

**If any of the above questions were answered with 'Yes,' the Safety Trigger is satisfied.**

### 5. Summary

	Yes	No
Does the development satisfy the Trip Generation Trigger?		
Does the development satisfy the Location Trigger?		
Does the development satisfy the Safety Trigger?		

**If none of the triggers are satisfied, the TIA Study is complete. If one or more of the triggers is satisfied, the TIA Study must continue into the next stage (Screening and Scoping).**

# Traffic Signal Timing

City of Ottawa, Transportation Services Department

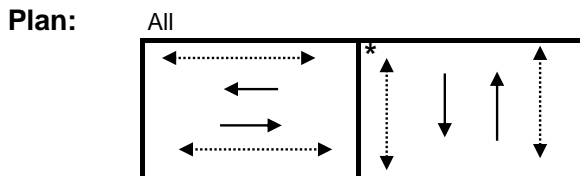
## Traffic Signal Operations Unit

<b>Intersection:</b>	<b>Main:</b> Innes	<b>Side:</b>	Boyer/Builders Warehouse
<b>Controller:</b>	<b>MS-3200</b>	<b>TSD:</b>	<b>6370</b>
<b>Author:</b>	Sarah Saade	<b>Date:</b>	06-Jul-2018

## Existing Timing Plans†

	Plan						Ped Minimum Time		
	AM Peak 1	Off Peak 2	PM Peak 3	Night 4	Weekend 5	AM Rush 11	Walk	DW	A+R
<b>Cycle</b>	110	90	110	70	90	120			
<b>Offset</b>	0	43	36	X	43	0			
EB Thru	77	57	77	37	57	87	12	14	3.7 + 2.4
WB Thru	77	57	77	37	57	87	12	14	3.7 + 2.4
NB Thru	33	33	33	33	33	33	7	19	3.3 + 3.0
SB Thru	33	33	33	33	33	33	7	19	3.3 + 3.0

## Phasing Sequence‡



## Schedule

### Weekday

Time	Plan
0:10	4
6:00	11
9:00	1
9:30	2
15:00	3
18:30	2
22:00	4

### Saturday

Time	Plan
0:10	4
7:00	2
9:00	5
20:00	2
22:00	4

### Sunday

Time	Plan
0:10	4
7:00	2
10:00	5
19:00	2
22:00	4

## Notes

†: Time for each direction includes amber and all red intervals

‡: Start of first phase should be used as reference point for offset

Asterisk (\*) Indicates actuated phase

(fp): Fully Protected Left Turn

←.....→ Pedestrian signal

Cost is \$56.50 (\$50 + HST)

# 5384457 -Innes and Boyer - July 13th - TMC

Fri Jul 13, 2018

Full Length (7AM-10AM, 3PM-6PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 546602, Location: 45.44883, -75.522024



Provided by: City of Ottawa  
100 Constellation Dr, Nepean, ON, K2G 5J9, CA

Leg Direction	North Southbound						East Westbound						South Northbound						West Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2018-07-13 7:00AM	0	0	0	0	0	1	0	82	0	0	82	0	1	0	1	0	2	0	2	288	2	0	292	0	376
7:15AM	0	0	4	0	4	1	1	88	3	0	92	0	0	1	1	0	2	2	1	283	2	0	286	0	384
7:30AM	2	0	0	0	2	0	0	113	2	0	115	0	1	0	3	0	4	1	0	261	1	0	262	0	383
7:45AM	0	0	1	0	1	3	2	155	0	0	157	1	0	0	2	0	2	2	0	244	1	0	245	0	405
Hourly Total	2	0	5	0	7	5	3	438	5	0	446	1	2	1	7	0	10	5	3	1076	6	0	1085	0	1548
8:00AM	1	0	0	0	1	3	0	128	3	0	131	0	2	0	0	0	2	0	1	241	2	1	245	1	379
8:15AM	0	0	1	0	1	1	1	152	3	0	156	0	0	0	0	0	0	0	3	266	1	0	270	0	427
8:30AM	3	0	0	0	3	3	1	175	0	0	176	0	2	0	1	0	3	3	0	249	0	0	249	1	431
8:45AM	2	0	3	0	5	1	2	178	2	1	183	1	4	0	1	0	5	0	0	216	2	2	220	0	413
Hourly Total	6	0	4	0	10	8	4	633	8	1	646	1	8	0	2	0	10	3	4	972	5	3	984	2	1650
9:00AM	1	0	2	0	3	0	0	141	1	0	142	0	4	0	0	0	4	3	1	161	2	0	164	0	313
9:15AM	1	0	0	0	1	2	1	182	2	0	185	0	1	0	1	0	2	1	1	199	1	0	201	0	389
9:30AM	0	0	5	0	5	1	2	201	0	0	203	0	0	0	0	0	0	3	3	229	2	0	234	3	442
9:45AM	2	0	0	0	2	3	1	193	0	0	194	0	1	0	0	0	1	1	2	219	0	1	222	0	419
Hourly Total	4	0	7	0	11	6	4	717	3	0	724	0	6	0	1	0	7	8	7	808	5	1	821	3	1563
3:00PM	0	0	3	0	3	0	1	318	1	0	320	1	1	0	1	0	2	1	3	237	3	0	243	0	568
3:15PM	0	0	3	0	3	3	1	355	0	0	356	1	2	0	1	0	3	2	1	225	0	0	226	0	588
3:30PM	0	0	1	0	1	3	1	364	2	1	368	7	2	0	1	0	3	0	1	230	1	0	232	0	604
3:45PM	3	0	1	0	4	2	1	362	1	0	364	4	0	0	0	0	0	1	3	257	1	1	262	1	630
Hourly Total	3	0	8	0	11	8	4	1399	4	1	1408	13	5	0	3	0	8	4	8	949	5	1	963	1	2390
4:00PM	2	0	1	0	3	3	0	370	1	0	371	3	5	0	1	0	6	1	3	236	1	0	240	0	620
4:15PM	2	0	1	0	3	1	0	350	0	0	350	1	2	0	3	0	5	1	0	253	1	0	254	0	612
4:30PM	2	0	0	0	2	2	1	372	1	0	374	3	2	0	1	0	3	2	4	219	1	1	225	0	604
4:45PM	1	0	0	0	1	1	2	392	1	0	395	2	1	0	1	0	2	0	1	231	4	0	236	1	634
Hourly Total	7	0	2	0	9	7	3	1484	3	0	1490	9	10	0	6	0	16	4	8	939	7	1	955	1	2470
5:00PM	2	0	2	0	4	0	3	339	1	1	344	0	1	0	0	0	1	0	2	236	0	0	238	0	587
5:15PM	1	0	2	0	3	0	1	342	0	0	343	2	2	0	1	0	3	2	2	262	2	0	266	2	615
5:30PM	1	0	1	0	2	1	1	292	3	0	296	4	2	0	1	0	3	1	4	211	0	2	217	0	518
5:45PM	0	0	0	0	0	0	1	305	0	0	306	3	4	0	3	0	7	0	5	223	0	0	228	0	541
Hourly Total	4	0	5	0	9	1	6	1278	4	1	1289	9	9	0	5	0	14	3	13	932	2	2	949	2	2261
<b>Total</b>	26	0	31	0	57	35	24	5949	27	3	6003	33	40	1	24	0	65	27	43	5676	30	8	5757	9	11882
<b>% Approach</b>	45.6%	0%	54.4%	0%	-	-	0.4%	99.1%	0.4%	0%	-	-	61.5%	1.5%	36.9%	0%	-	-	0.7%	98.6%	0.5%	0.1%	-	-	-
<b>% Total</b>	0.2%	0%	0.3%	0%	0.5%	-	0.2%	50.1%	0.2%	0%	50.5%	-	0.3%	0%	0.2%	0%	0.5%	-	0.4%	47.8%	0.3%	0.1%	48.5%	-	-
<b>Lights and Motorcycles</b>	20	0	26	0	46	-	20	5716	26	3	5765	-	39	1	23	0	63	-	42	5467	26	8	5543	-	11417
<b>% Lights and Motorcycles</b>	76.9%	0%	83.9%	0%	80.7%	-	83.3%	96.1%	96.3%	100%	96.0%	-	97.5%	100%	95.8%	0%	96.9%	-	97.7%	96.3%	86.7%	100%	96.3%	-	96.1%
<b>Heavy</b>	6	0	5	0	11	-	4	207	1	0	212	-	0	0	1	0	1	-	0	186	4	0	190	-	414
<b>% Heavy</b>	23.1%	0%	16.1%	0%	19.3%	-	16.7%	3.5%	3.7%	0%	3.5%	-	0%	0%	4.2%	0%	1.5%	-	0%	3.3%	13.3%	0%	3.3%	-	3.5%
<b>Bicycles on Road</b>	0	0	0	0	0	-	0	26	0	0	26	-	1	0	0	0	1	-	1	23	0	0	24	-	51
<b>% Bicycles on Road</b>	0%	0%	0%	0%	0%	-	0%	0.4%	0%	0%	0.4%	-	2.5%	0%	0%	0%	1.5%	-	2.3%	0.4%	0%	0%	0.4%	-	0.4%
<b>Pedestrians</b>	-	-	-	-	-	34	-	-	-	-	-	33	-	-	-	-	-	21	-	-	-	-	-	7	-
<b>% Pedestrians</b>	-	-	-	-	-	97.1%	-	-	-	-	-	100%	-	-	-	-	-	77.8%	-	-	-	-	-	77.8%	-
<b>Bicycles on Crosswalk</b>	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	6	-	-	-	-	-	2	-
<b>% Bicycles on Crosswalk</b>	-	-	-	-	-	2.9%	-	-	-	-	-	0%	-	-	-	-	-	22.2%	-	-	-	-	-	22.2%	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

# 5384457 -Innes and Boyer - July 13th - TMC

Fri Jul 13, 2018

Full Length (7AM-10AM, 3PM-6PM)

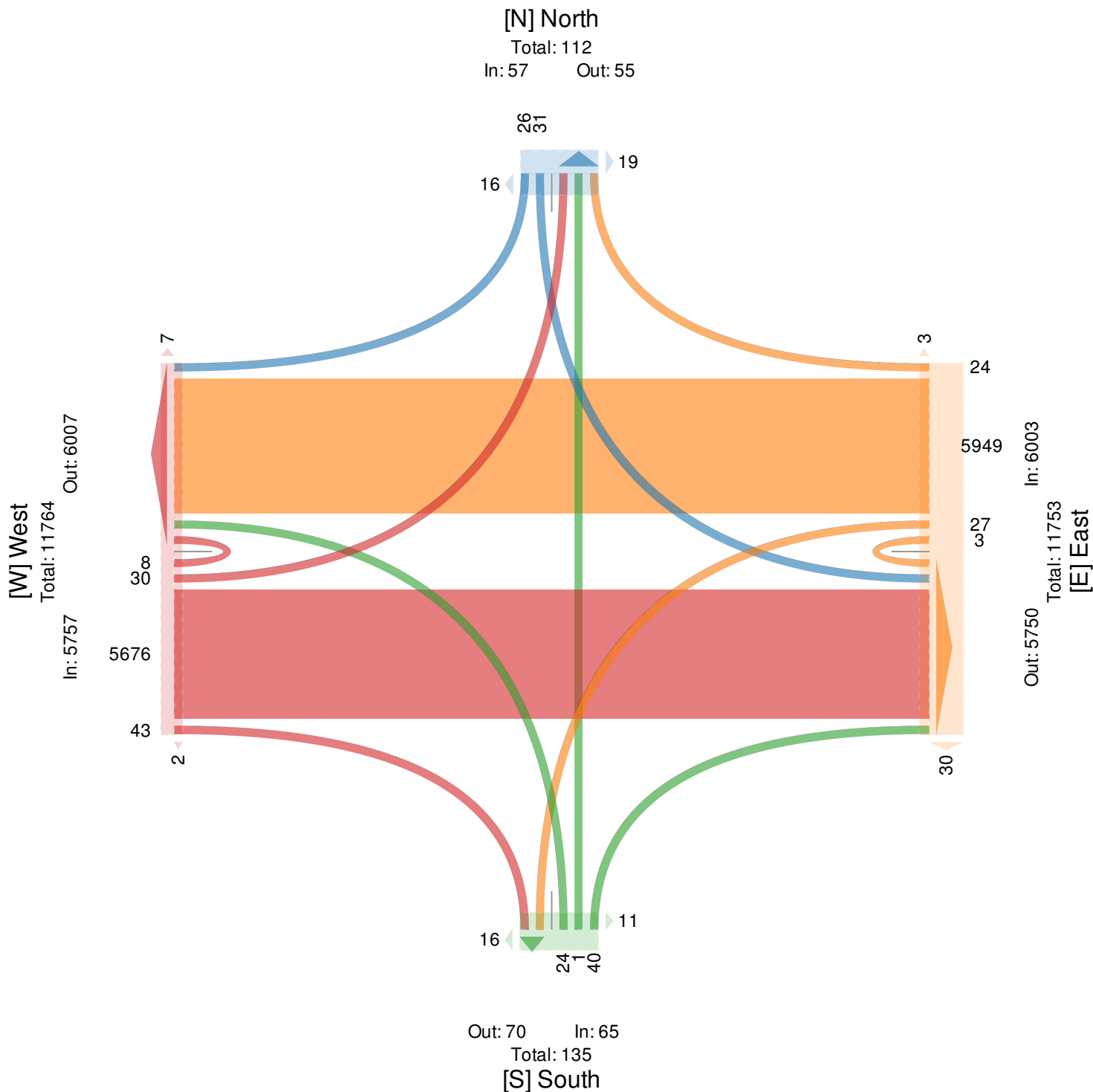
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 546602, Location: 45.44883, -75.522024



Provided by: City of Ottawa  
100 Constellation Dr,  
Nepean, ON, K2G 5J9, CA



# 5384457 -Innes and Boyer - July 13th - TMC

Fri Jul 13, 2018

AM Peak (8AM - 9AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 546602, Location: 45.44883, -75.522024



Provided by: City of Ottawa  
100 Constellation Dr, Nepean, ON, K2G 5J9, CA

Leg Direction	North Southbound						East Westbound						South Northbound						West Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2018-07-13 8:00AM	1	0	0	0	1	3	0	128	3	0	131	0	2	0	0	0	2	0	1	241	2	1	245	1	379
8:15AM	0	0	1	0	1	1	1	152	3	0	156	0	0	0	0	0	0	0	3	266	1	0	270	0	427
8:30AM	3	0	0	0	3	3	1	175	0	0	176	0	2	0	1	0	3	3	0	249	0	0	249	1	431
8:45AM	2	0	3	0	5	1	2	178	2	1	183	1	4	0	1	0	5	0	0	216	2	2	220	0	413
<b>Total</b>	6	0	4	0	10	8	4	633	8	1	646	1	8	0	2	0	10	3	4	972	5	3	984	2	1650
<b>% Approach</b>	60.0%	0%	40.0%	0%	-	-	0.6%	98.0%	1.2%	0.2%	-	-	80.0%	0%	20.0%	0%	-	-	0.4%	98.8%	0.5%	0.3%	-	-	-
<b>% Total</b>	0.4%	0%	0.2%	0%	0.6%	-	0.2%	38.4%	0.5%	0.1%	39.2%	-	0.5%	0%	0.1%	0%	0.6%	-	0.2%	58.9%	0.3%	0.2%	59.6%	-	-
<b>PHF</b>	0.500	-	0.333	-	0.500	-	0.500	0.889	0.667	0.250	0.883	-	0.500	-	0.500	-	0.500	-	0.333	0.914	0.625	0.375	0.911	-	0.957
<b>Lights and Motorcycles</b>	4	0	4	0	8	-	4	578	8	1	591	-	8	0	2	0	10	-	4	931	3	3	941	-	1550
<b>% Lights and Motorcycles</b>	66.7%	0%	100%	0%	80.0%	-	100%	91.3%	100%	100%	91.5%	-	100%	0%	100%	0%	100%	-	100%	95.8%	60.0%	100%	95.6%	-	93.9%
<b>Heavy</b>	2	0	0	0	2	-	0	55	0	0	55	-	0	0	0	0	0	-	0	39	2	0	41	-	98
<b>% Heavy</b>	33.3%	0%	0%	0%	20.0%	-	0%	8.7%	0%	0%	8.5%	-	0%	0%	0%	0%	0%	-	0%	4.0%	40.0%	0%	4.2%	-	5.9%
<b>Bicycles on Road</b>	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	2	0	0	2	-	2
<b>% Bicycles on Road</b>	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0.2%	0%	0%	0.2%	-	0.1%
Pedestrians	-	-	-	-	-	8	-	-	-	-	-	1	-	-	-	-	-	3	-	-	-	-	-	1	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	-	50.0%
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	-	50.0%

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



# 5384457 -Innes and Boyer - July 13th - TMC

Fri Jul 13, 2018

AM Peak (8AM - 9AM)

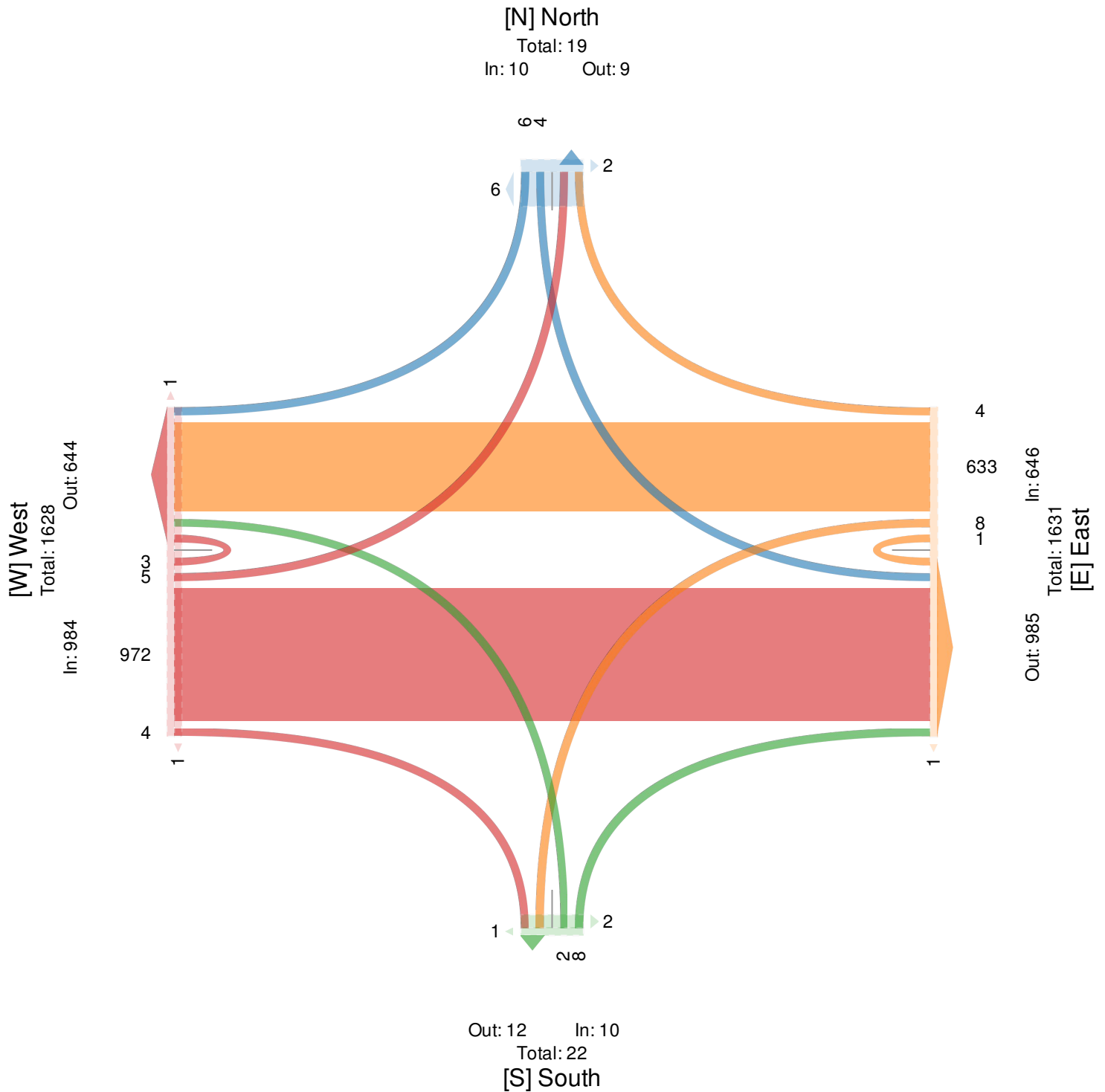
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 546602, Location: 45.44883, -75.522024



Provided by: City of Ottawa  
100 Constellation Dr,  
Nepean, ON, K2G 5J9, CA



# 5384457 -Innes and Boyer - July 13th - TMC

Fri Jul 13, 2018

PM Peak (4PM - 5PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 546602, Location: 45.44883, -75.522024



Provided by: City of Ottawa  
100 Constellation Dr, Nepean, ON, K2G 5J9, CA

Leg Direction	North Southbound						East Westbound						South Northbound						West Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2018-07-13 4:00PM	2	0	1	0	3	3	0	370	1	0	371	3	5	0	1	0	6	1	3	236	1	0	240	0	620
4:15PM	2	0	1	0	3	1	0	350	0	0	350	1	2	0	3	0	5	1	0	253	1	0	254	0	612
4:30PM	2	0	0	0	2	2	1	372	1	0	374	3	2	0	1	0	3	2	4	219	1	1	225	0	604
4:45PM	1	0	0	0	1	1	2	392	1	0	395	2	1	0	1	0	2	0	1	231	4	0	236	1	634
Total	7	0	2	0	9	7	3	1484	3	0	1490	9	10	0	6	0	16	4	8	939	7	1	955	1	2470
% Approach	77.8%	0%	22.2%	0%	-	-	0.2%	99.6%	0.2%	0%	-	-	62.5%	0%	37.5%	0%	-	-	0.8%	98.3%	0.7%	0.1%	-	-	-
% Total	0.3%	0%	0.1%	0%	0.4%	-	0.1%	60.1%	0.1%	0%	60.3%	-	0.4%	0%	0.2%	0%	0.6%	-	0.3%	38.0%	0.3%	0%	38.7%	-	-
PHF	0.875	-	0.500	-	0.750	-	0.375	0.946	0.750	-	0.943	-	0.500	-	0.500	-	0.667	-	0.500	0.928	0.438	0.250	0.940	-	0.974
Lights and Motorcycles	7	0	2	0	9	-	3	1466	3	0	1472	-	10	0	6	0	16	-	8	904	6	1	919	-	2416
% Lights and Motorcycles	100%	0%	100%	0%	100%	-	100%	98.8%	100%	0%	98.8%	-	100%	0%	100%	0%	100%	-	100%	96.3%	85.7%	100%	96.2%	-	97.8%
Heavy	0	0	0	0	0	-	0	15	0	0	15	-	0	0	0	0	0	-	0	31	1	0	32	-	47
% Heavy	0%	0%	0%	0%	0%	-	0%	1.0%	0%	0%	1.0%	-	0%	0%	0%	0%	0%	-	0%	3.3%	14.3%	0%	3.4%	-	1.9%
Bicycles on Road	0	0	0	0	0	-	0	3	0	0	3	-	0	0	0	0	0	-	0	4	0	0	4	-	7
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0.2%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	-	0%	0.4%	0%	0%	0.4%	-	0.3%
Pedestrians	-	-	-	-	-	6	-	-	-	-	-	9	-	-	-	-	-	1	-	-	-	-	-	1	
% Pedestrians	-	-	-	-	-	85.7%	-	-	-	-	-	100%	-	-	-	-	-	25.0%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	14.3%	-	-	-	-	-	0%	-	-	-	-	-	75.0%	-	-	-	-	-	0%	-

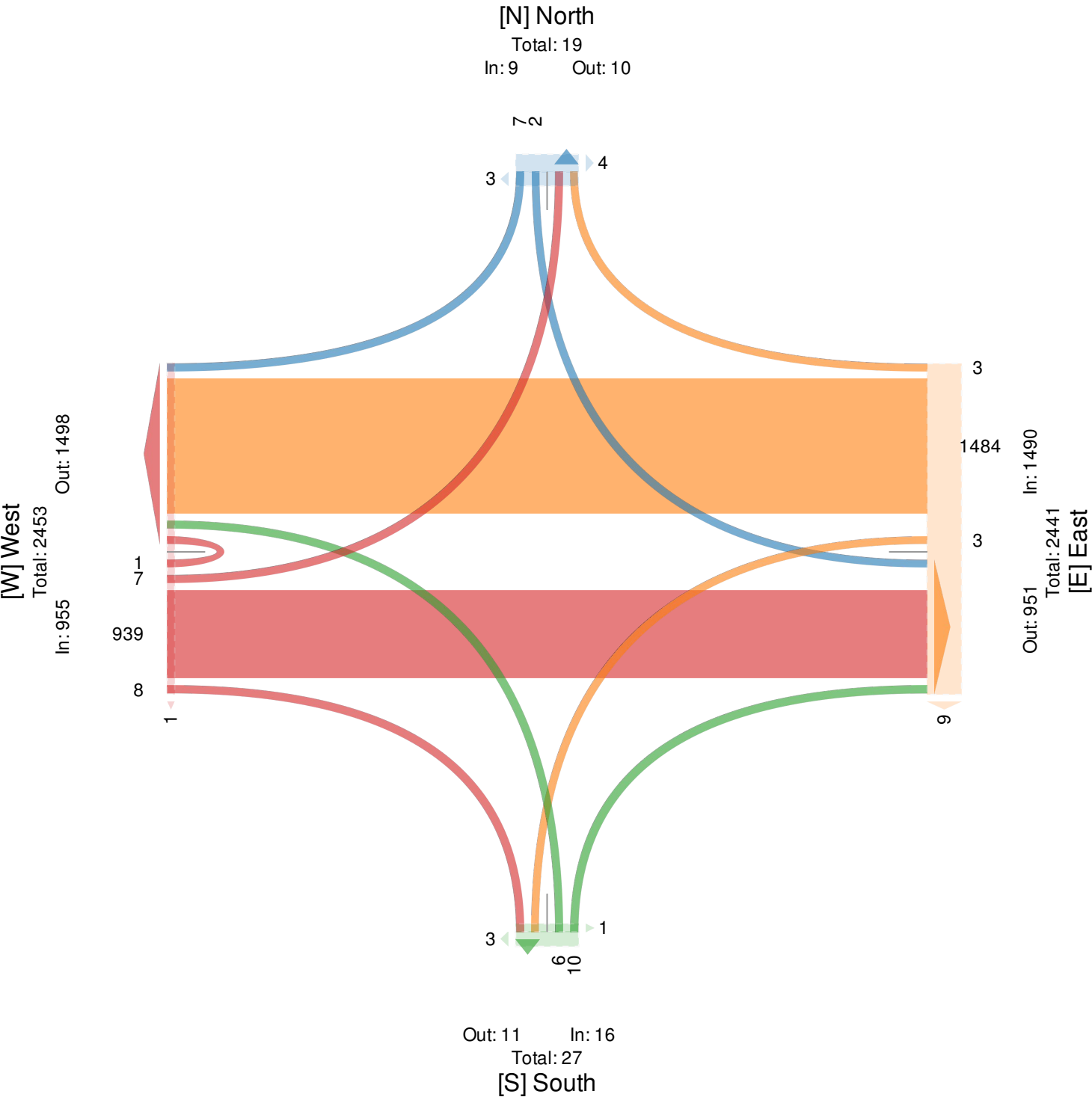
\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5384457 -Innes and Boyer - July 13th - TMC

Fri Jul 13, 2018  
PM Peak (4PM - 5PM) - Overall Peak Hour  
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)  
All Movements  
ID: 546602, Location: 45.44883, -75.522024



Provided by: City of Ottawa  
100 Constellation Dr,  
Nepean, ON, K2G 5J9, CA



# 5384457 - Innes and Boyer - July 14th - TMC

Sat Jul 14, 2018

Full Length (10AM-3PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 546605, Location: 45.44883, -75.522024



Provided by: City of Ottawa  
100 Constellation Dr, Nepean, ON, K2G 5J9, CA

Leg Direction	North Southbound						East Westbound						South Northbound						West Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2018-07-14 10:00AM	3	0	2	0	5	1	1	190	1	0	192	0	1	0	0	0	1	1	2	185	0	1	188	0	386
10:15AM	1	0	3	0	4	1	0	235	0	1	236	1	1	0	3	0	4	1	2	207	1	0	210	0	454
10:30AM	3	0	0	0	3	1	0	219	0	0	219	0	0	0	1	0	1	1	1	240	1	0	242	0	465
10:45AM	0	0	1	0	1	1	1	256	3	0	260	1	2	0	2	0	4	0	2	191	2	0	195	2	460
Hourly Total	7	0	6	0	13	4	2	900	4	1	907	2	4	0	6	0	10	3	7	823	4	1	835	2	1765
11:00AM	3	0	0	0	3	2	0	243	3	1	247	3	0	0	2	0	2	1	1	225	2	0	228	0	480
11:15AM	1	0	3	0	4	3	0	229	3	0	232	0	2	0	0	0	2	0	2	254	3	1	260	0	498
11:30AM	0	0	0	0	0	2	0	245	1	0	246	0	0	0	2	0	2	2	1	247	0	1	249	0	497
11:45AM	2	0	2	0	4	1	0	220	2	0	222	0	5	0	2	0	7	2	4	262	4	0	270	2	503
Hourly Total	6	0	5	0	11	8	0	937	9	1	947	3	7	0	6	0	13	5	8	988	9	2	1007	2	1978
12:00PM	3	0	1	0	4	0	1	254	0	0	255	0	3	0	3	0	6	5	0	259	0	0	259	0	524
12:15PM	1	0	0	0	1	0	2	250	5	1	258	0	0	0	0	0	0	0	2	233	1	1	237	3	496
12:30PM	1	0	1	0	2	5	1	282	1	0	284	2	0	0	3	1	4	2	3	211	0	3	217	0	507
12:45PM	2	0	0	0	2	2	2	246	2	0	250	0	4	0	3	0	7	0	3	244	3	0	250	0	509
Hourly Total	7	0	2	0	9	7	6	1032	8	1	1047	2	7	0	9	1	17	7	8	947	4	4	963	3	2036
1:00PM	1	0	1	0	2	0	0	280	0	0	280	0	1	0	2	0	3	1	0	274	1	0	275	0	560
1:15PM	2	0	1	0	3	1	1	263	1	1	266	0	1	0	2	0	3	1	0	254	3	2	259	1	531
1:30PM	2	0	0	0	2	4	0	272	0	0	272	2	0	0	0	0	0	0	0	237	2	0	239	0	513
1:45PM	2	0	0	0	2	0	2	262	0	0	264	0	0	0	1	0	1	0	1	263	2	1	267	1	534
Hourly Total	7	0	2	0	9	5	3	1077	1	1	1082	2	2	0	5	0	7	2	1	1028	8	3	1040	2	2138
2:00PM	2	1	0	0	3	1	2	263	1	1	267	0	2	0	1	0	3	1	0	237	4	1	242	0	515
2:15PM	4	0	1	0	5	1	2	271	1	0	274	0	1	0	3	0	4	6	3	254	1	2	260	3	543
2:30PM	1	0	1	0	2	1	1	240	1	0	242	0	0	0	1	0	1	1	0	240	1	0	241	0	486
2:45PM	3	0	3	0	6	3	3	241	0	0	244	1	0	0	0	0	0	4	0	262	5	1	268	0	518
Hourly Total	10	1	5	0	16	6	8	1015	3	1	1027	1	3	0	5	0	8	12	3	993	11	4	1011	3	2062
<b>Total</b>	37	1	20	0	58	30	19	4961	25	5	5010	10	23	0	31	1	55	29	27	4779	36	14	4856	12	9979
<b>% Approach</b>	63.8%	1.7%	34.5%	0%	-	-	0.4%	99.0%	0.5%	0.1%	-	-	41.8%	0%	56.4%	1.8%	-	-	0.6%	98.4%	0.7%	0.3%	-	-	-
<b>% Total</b>	0.4%	0%	0.2%	0%	0.6%	-	0.2%	49.7%	0.3%	0.1%	50.2%	-	0.2%	0%	0.3%	0%	0.6%	-	0.3%	47.9%	0.4%	0.1%	48.7%	-	-
<b>Lights and Motorcycles</b>	29	1	15	0	45	-	15	4903	22	5	4945	-	23	0	31	1	55	-	27	4702	33	14	4776	-	9821
<b>% Lights and Motorcycles</b>	78.4%	100%	75.0%	0%	77.6%	-	78.9%	98.8%	88.0%	100%	98.7%	-	100%	0%	100%	100%	100%	-	100%	98.4%	91.7%	100%	98.4%	-	98.4%
<b>Heavy</b>	8	0	5	0	13	-	3	49	0	0	52	-	0	0	0	0	0	-	0	58	3	0	61	-	126
<b>% Heavy</b>	21.6%	0%	25.0%	0%	22.4%	-	15.8%	1.0%	0%	0%	1.0%	-	0%	0%	0%	0%	0%	-	0%	1.2%	8.3%	0%	1.3%	-	1.3%
<b>Bicycles on Road</b>	0	0	0	0	0	-	1	9	3	0	13	-	0	0	0	0	0	-	0	19	0	0	19	-	32
<b>% Bicycles on Road</b>	0%	0%	0%	0%	0%	-	5.3%	0.2%	12.0%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0%	0.4%	0%	0%	0.4%	-	0.3%
<b>Pedestrians</b>	-	-	-	-	-	28	-	-	-	-	-	9	-	-	-	-	-	22	-	-	-	-	-	9	-
<b>% Pedestrians</b>	-	-	-	-	-	93.3%	-	-	-	-	-	90.0%	-	-	-	-	-	75.9%	-	-	-	-	-	75.0%	-
<b>Bicycles on Crosswalk</b>	-	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	7	-	-	-	-	-	3	-
<b>% Bicycles on Crosswalk</b>	-	-	-	-	-	6.7%	-	-	-	-	-	10.0%	-	-	-	-	-	24.1%	-	-	-	-	-	25.0%	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

# 5384457 - Innes and Boyer - July 14th - TMC

Sat Jul 14, 2018

Full Length (10AM-3PM)

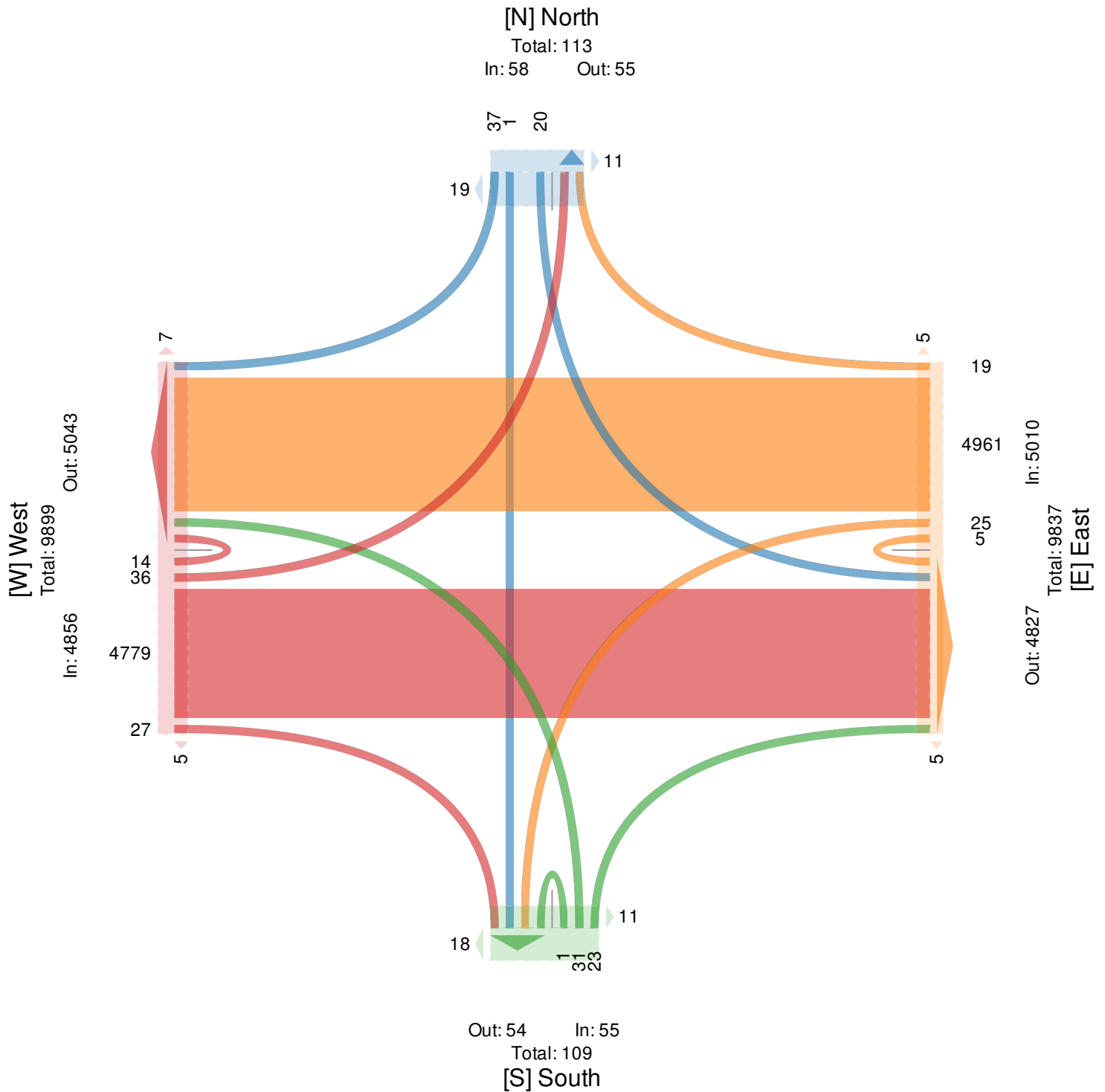
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 546605, Location: 45.44883, -75.522024



Provided by: City of Ottawa  
100 Constellation Dr,  
Nepean, ON, K2G 5J9, CA



# 5384457 - Innes and Boyer - July 14th - TMC

Sat Jul 14, 2018

AM Peak (WKND) (10:45AM - 11:45AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 546605, Location: 45.44883, -75.522024



Provided by: City of Ottawa  
100 Constellation Dr, Nepean, ON, K2G 5J9, CA

Leg Direction	North Southbound						East Westbound						South Northbound						West Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2018-07-14 10:45AM	0	0	1	0	1	1	1	256	3	0	260	1	2	0	2	0	4	0	2	191	2	0	195	2	460
11:00AM	3	0	0	0	3	2	0	243	3	1	247	3	0	0	2	0	2	1	1	225	2	0	228	0	480
11:15AM	1	0	3	0	4	3	0	229	3	0	232	0	2	0	0	0	2	0	2	254	3	1	260	0	498
11:30AM	0	0	0	0	0	2	0	245	1	0	246	0	0	0	2	0	2	2	1	247	0	1	249	0	497
<b>Total</b>	4	0	4	0	8	8	1	973	10	1	985	4	4	0	6	0	10	3	6	917	7	2	932	2	1935
<b>% Approach</b>	50.0%	0%	50.0%	0%	-	-	0.1%	98.8%	1.0%	0.1%	-	-	40.0%	0%	60.0%	0%	-	-	0.6%	98.4%	0.8%	0.2%	-	-	-
<b>% Total</b>	0.2%	0%	0.2%	0%	0.4%	-	0.1%	50.3%	0.5%	0.1%	50.9%	-	0.2%	0%	0.3%	0%	0.5%	-	0.3%	47.4%	0.4%	0.1%	48.2%	-	-
<b>PHF</b>	0.333	-	0.333	-	0.500	-	0.250	0.950	0.833	0.250	0.947	-	0.500	-	0.750	-	0.625	-	0.750	0.903	0.583	0.500	0.896	-	0.971
<b>Lights and Motorcycles</b>	3	0	2	0	5	-	1	960	10	1	972	-	4	0	6	0	10	-	6	901	7	2	916	-	1903
<b>% Lights and Motorcycles</b>	75.0%	0%	50.0%	0%	62.5%	-	100%	98.7%	100%	100%	98.7%	-	100%	0%	100%	0%	100%	-	100%	98.3%	100%	100%	98.3%	-	98.3%
<b>Heavy</b>	1	0	2	0	3	-	0	12	0	0	12	-	0	0	0	0	0	-	0	14	0	0	14	-	29
<b>% Heavy</b>	25.0%	0%	50.0%	0%	37.5%	-	0%	1.2%	0%	0%	1.2%	-	0%	0%	0%	0%	0%	-	0%	1.5%	0%	0%	1.5%	-	1.5%
<b>Bicycles on Road</b>	0	0	0	0	0	-	0	1	0	0	1	-	0	0	0	0	0	-	0	2	0	0	2	-	3
<b>% Bicycles on Road</b>	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%	0.2%	0%	0%	0.2%	-	0.2%
Pedestrians	-	-	-	-	-	8	-	-	-	-	-	3	-	-	-	-	-	3	-	-	-	-	-	2	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	75.0%	-	-	-	-	-	100%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	25.0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-

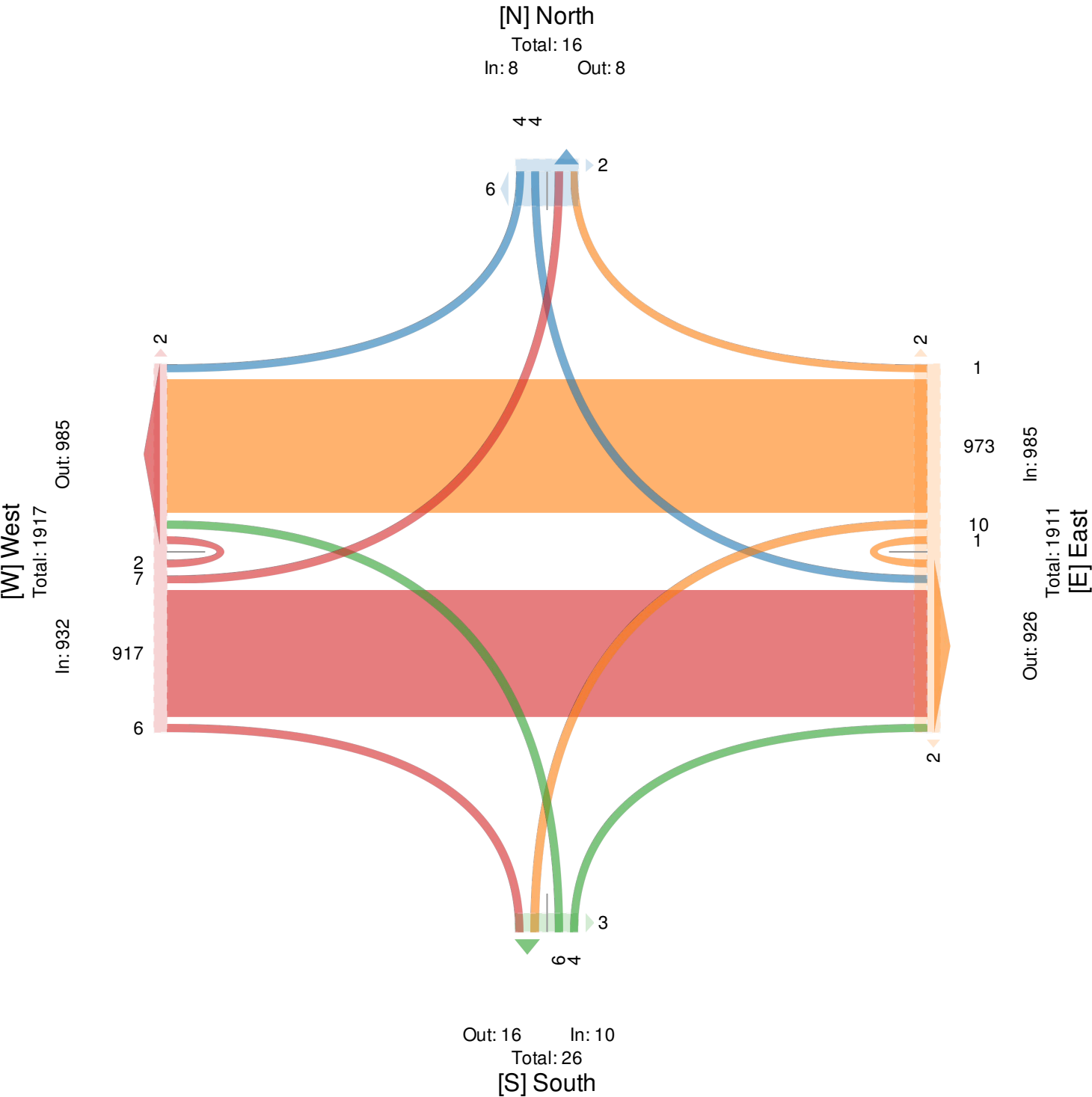
\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5384457 - Innes and Boyer - July 14th - TMC

Sat Jul 14, 2018  
AM Peak (WKND) (10:45AM - 11:45AM)  
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)  
All Movements  
ID: 546605, Location: 45.44883, -75.522024



Provided by: City of Ottawa  
100 Constellation Dr,  
Nepean, ON, K2G 5J9, CA





# 5384457 - Innes and Boyer - July 14th - TMC

Sat Jul 14, 2018

Midday Peak (WKND) (1PM - 2PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 546605, Location: 45.44883, -75.522024



Provided by: City of Ottawa  
100 Constellation Dr, Nepean, ON, K2G 5J9, CA

Leg Direction	North Southbound						East Westbound						South Northbound						West Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2018-07-14 1:00PM	1	0	1	0	2	0	0	280	0	0	280	0	1	0	2	0	3	1	0	274	1	0	275	0	560
1:15PM	2	0	1	0	3	1	1	263	1	1	266	0	1	0	2	0	3	1	0	254	3	2	259	1	531
1:30PM	2	0	0	0	2	4	0	272	0	0	272	2	0	0	0	0	0	0	0	237	2	0	239	0	513
1:45PM	2	0	0	0	2	0	2	262	0	0	264	0	0	0	1	0	1	0	1	263	2	1	267	1	534
Total	7	0	2	0	9	5	3	1077	1	1	1082	2	2	0	5	0	7	2	1	1028	8	3	1040	2	2138
% Approach	77.8%	0%	22.2%	0%	-	-	0.3%	99.5%	0.1%	0.1%	-	-	28.6%	0%	71.4%	0%	-	-	0.1%	98.8%	0.8%	0.3%	-	-	-
% Total	0.3%	0%	0.1%	0%	0.4%	-	0.1%	50.4%	0%	0%	50.6%	-	0.1%	0%	0.2%	0%	0.3%	-	0%	48.1%	0.4%	0.1%	48.6%	-	-
PHF	0.875	-	0.500	-	0.750	-	0.375	0.962	0.250	0.250	0.966	-	0.500	-	0.625	-	0.583	-	0.250	0.938	0.667	0.375	0.945	-	0.954
Lights and Motorcycles	7	0	2	0	9	-	3	1064	1	1	1069	-	2	0	5	0	7	-	1	1013	8	3	1025	-	2110
% Lights and Motorcycles	100%	0%	100%	0%	100%	-	100%	98.8%	100%	100%	98.8%	-	100%	0%	100%	0%	100%	-	100%	98.5%	100%	100%	98.6%	-	98.7%
Heavy	0	0	0	0	0	-	0	10	0	0	10	-	0	0	0	0	0	-	0	8	0	0	8	-	18
% Heavy	0%	0%	0%	0%	0%	-	0%	0.9%	0%	0%	0.9%	-	0%	0%	0%	0%	0%	-	0%	0.8%	0%	0%	0.8%	-	0.8%
Bicycles on Road	0	0	0	0	0	-	0	3	0	0	3	-	0	0	0	0	0	-	0	7	0	0	7	-	10
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0.3%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0%	0.7%	0%	0%	0.7%	-	0.5%
Pedestrians	-	-	-	-	-	4	-	-	-	-	-	2	-	-	-	-	-	2	-	-	-	-	-	1	
% Pedestrians	-	-	-	-	-	80.0%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	50.0%	-
Bicycles on Crosswalk	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	
% Bicycles on Crosswalk	-	-	-	-	-	20.0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	50.0%	-

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

# 5384457 - Innes and Boyer - July 14th - TMC

Sat Jul 14, 2018

Midday Peak (WKND) (1PM - 2PM) - Overall Peak Hour

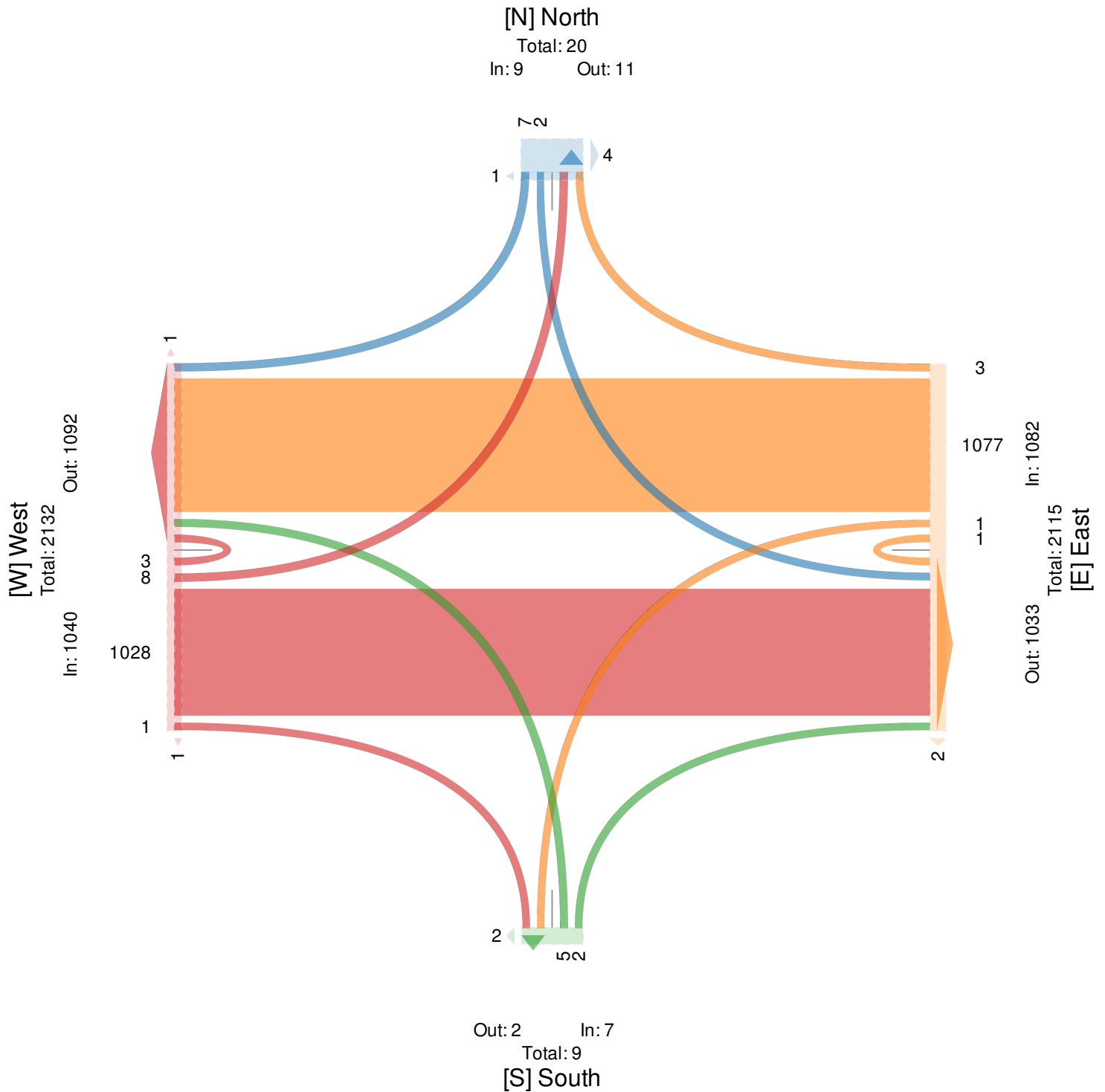
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 546605, Location: 45.44883, -75.522024



Provided by: City of Ottawa  
100 Constellation Dr,  
Nepean, ON, K2G 5J9, CA



# 5384457 - Innes and Boyer - July 14th - TMC

Sat Jul 14, 2018

PM Peak (WKND) (2PM - 3PM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 546605, Location: 45.44883, -75.522024



Provided by: City of Ottawa  
100 Constellation Dr, Nepean, ON, K2G 5J9, CA

Leg Direction	North Southbound						East Westbound						South Northbound						West Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2018-07-14 2:00PM	2	1	0	0	3	1	2	263	1	1	267	0	2	0	1	0	3	1	0	237	4	1	242	0	515
2:15PM	4	0	1	0	5	1	2	271	1	0	274	0	1	0	3	0	4	6	3	254	1	2	260	3	543
2:30PM	1	0	1	0	2	1	1	240	1	0	242	0	0	0	1	0	1	1	0	240	1	0	241	0	486
2:45PM	3	0	3	0	6	3	3	241	0	0	244	1	0	0	0	0	0	4	0	262	5	1	268	0	518
Total	10	1	5	0	16	6	8	1015	3	1	1027	1	3	0	5	0	8	12	3	993	11	4	1011	3	2062
% Approach	62.5%	6.3%	31.3%	0%	-	-	0.8%	98.8%	0.3%	0.1%	-	-	37.5%	0%	62.5%	0%	-	-	0.3%	98.2%	1.1%	0.4%	-	-	-
% Total	0.5%	0%	0.2%	0%	0.8%	-	0.4%	49.2%	0.1%	0%	49.8%	-	0.1%	0%	0.2%	0%	0.4%	-	0.1%	48.2%	0.5%	0.2%	49.0%	-	-
PHF	0.625	0.250	0.417	-	0.667	-	0.667	0.936	0.750	0.250	0.937	-	0.375	-	0.417	-	0.500	-	0.250	0.948	0.550	0.500	0.943	-	0.949
Lights and Motorcycles	8	1	4	0	13	-	6	1005	3	1	1015	-	3	0	5	0	8	-	3	980	9	4	996	-	2032
% Lights and Motorcycles	80.0%	100%	80.0%	0%	81.3%	-	75.0%	99.0%	100%	100%	98.8%	-	100%	0%	100%	0%	100%	-	100%	98.7%	81.8%	100%	98.5%	-	98.5%
Heavy	2	0	1	0	3	-	2	9	0	0	11	-	0	0	0	0	0	-	0	10	2	0	12	-	26
% Heavy	20.0%	0%	20.0%	0%	18.8%	-	25.0%	0.9%	0%	0%	1.1%	-	0%	0%	0%	0%	0%	-	0%	1.0%	18.2%	0%	1.2%	-	1.3%
Bicycles on Road	0	0	0	0	0	-	0	1	0	0	1	-	0	0	0	0	0	-	0	3	0	0	3	-	4
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%	0.3%	0%	0%	0.3%	-	0.2%
Pedestrians	-	-	-	-	-	6	-	-	-	-	-	1	-	-	-	-	-	8	-	-	-	-	-	1	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	66.7%	-	-	-	-	-	33.3%	
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	4	-	-	-	-	-	2	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	33.3%	-	-	-	-	-	66.7%	

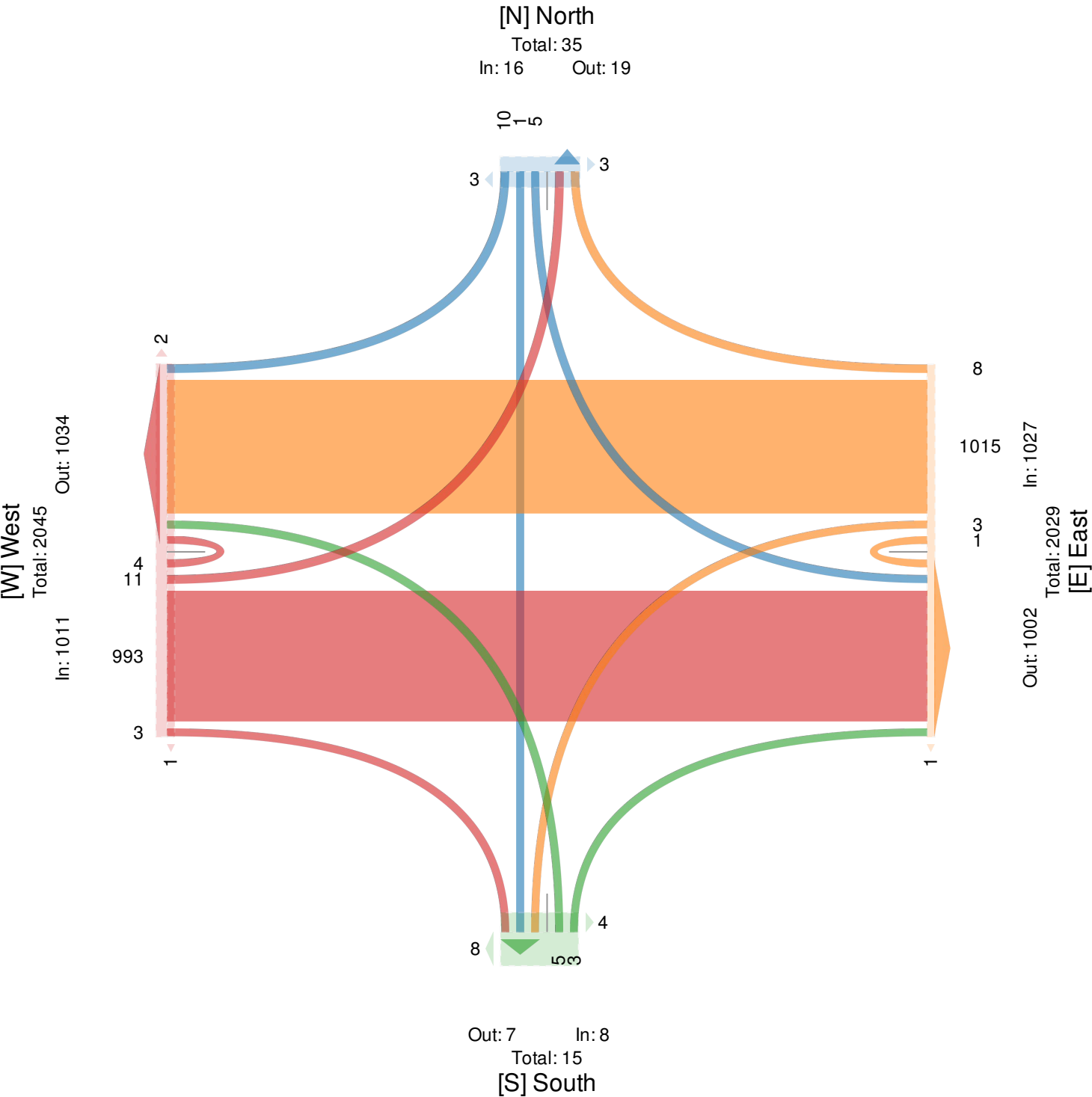
\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5384457 - Innes and Boyer - July 14th - TMC

Sat Jul 14, 2018  
PM Peak (WKND) (2PM - 3PM)  
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)  
All Movements  
ID: 546605, Location: 45.44883, -75.522024



Provided by: City of Ottawa  
100 Constellation Dr,  
Nepean, ON, K2G 5J9, CA





















## APPENDIX B: Intersection Analysis Summaries

Innes Road Car Wash Development  
3: Boyer Road/Plaza Entrance & Innes Road

Traffic Volumes

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	939	8	3	1484	3	6	0	10	2	0	7
Future Volume (vph)	7	939	8	3	1484	3	6	0	10	2	0	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00			1.00			1.00	
Frt		0.999						0.917			0.892	
Flt Protected	0.950			0.950				0.981			0.990	
Satd. Flow (prot)	1676	3349	0	1676	3353	0	0	1587	0	0	1558	0
Flt Permitted	0.137			0.271							0.960	
Satd. Flow (perm)	242	3349	0	477	3353	0	0	1617	0	0	1511	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2						26			26	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		141.0			220.6			54.0			37.0	
Travel Time (s)		10.2			15.9			3.9			2.7	
Confl. Peds. (#/hr)	7		4	4		7	1			1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	8	1043	9	3	1649	3	7	0	11	2	0	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	1052	0	3	1652	0	0	18	0	0	10	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	

# Innes Road Car Wash Development

## 3: Boyer Road/Plaza Entrance & Innes Road

Traffic Volumes

PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	97.0	97.0		97.0	97.0		32.3	32.3		32.3	32.3	
Total Split (%)	75.0%	75.0%		75.0%	75.0%		25.0%	25.0%		25.0%	25.0%	
Maximum Green (s)	90.9	90.9		90.9	90.9		26.0	26.0		26.0	26.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1			6.3			6.3	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	12.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)	108.0	108.0		108.0	108.0			5.9			5.9	
Actuated g/C Ratio	0.94	0.94		0.94	0.94			0.05			0.05	
v/c Ratio	0.04	0.34		0.01	0.53			0.17			0.10	
Control Delay	1.7	1.4		1.3	2.1			17.2			7.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	1.7	1.4		1.3	2.1			17.2			7.1	
LOS	A	A		A	A			B			A	
Approach Delay		1.4			2.1			17.3			7.1	
Approach LOS		A			A			B			A	
Queue Length 50th (m)	0.0	0.0		0.0	0.0			0.0			0.0	
Queue Length 95th (m)	1.0	30.0		0.5	62.7			5.8			1.9	
Internal Link Dist (m)		117.0			196.6			30.0			13.0	
Turn Bay Length (m)												
Base Capacity (vph)	227	3139		447	3142			385			361	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.04	0.34		0.01	0.53			0.05			0.03	

### Intersection Summary

Area Type: Other

Cycle Length: 129.3

Actuated Cycle Length: 115.2

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 2.0

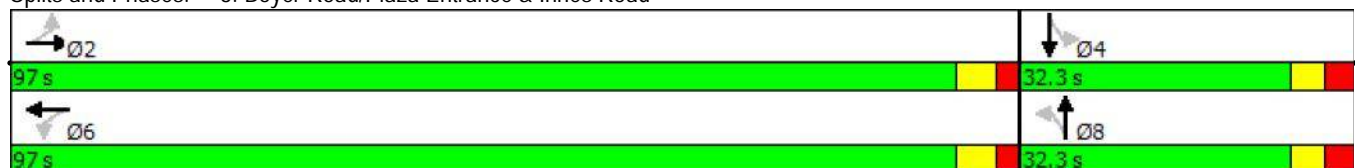
Intersection LOS: A

Intersection Capacity Utilization 57.9%

ICU Level of Service B

Analysis Period (min) 15



















Splits and Phases: 3: Boyer Road/Plaza Entrance & Innes Road



# Innes Road Car Wash Development

## 3: Boyer Road/Plaza Entrance & Innes Road

Traffic Volumes  
Saturday Mid-Day Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	1028	1	1	1077	3	5	0	2	2	0	7
Future Volume (vph)	8	1028	1	1	1077	3	5	0	2	2	0	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00			0.99			0.99	
Frt								0.966			0.892	
Flt Protected	0.950			0.950				0.964			0.990	
Satd. Flow (prot)	1676	3353	0	1676	3353	0	0	1638	0	0	1541	0
Flt Permitted	0.231			0.246								
Satd. Flow (perm)	407	3353	0	434	3353	0	0	1696	0	0	1556	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)								38			38	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		141.0			220.6			54.0			37.0	
Travel Time (s)		10.2			15.9			3.9			2.7	
Confl. Peds. (#/hr)	5		2	2		5	2		2	2		2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	9	1142	1	1	1197	3	6	0	2	2	0	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	1143	0	1	1200	0	0	8	0	0	10	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	



# Innes Road Car Wash Development

## 3: Boyer Road/Plaza Entrance & Innes Road

Traffic Volumes  
Saturday Mid-Day Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	57.7	57.7		57.7	57.7		32.3	32.3		32.3	32.3	
Total Split (%)	64.1%	64.1%		64.1%	64.1%		35.9%	35.9%		35.9%	35.9%	
Maximum Green (s)	51.6	51.6		51.6	51.6		26.0	26.0		26.0	26.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1			6.3			6.3	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	12.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Efect Green (s)	71.9	71.9		71.9	71.9			5.5			5.5	
Actuated g/C Ratio	0.96	0.96		0.96	0.96			0.07			0.07	
v/c Ratio	0.02	0.36		0.00	0.37			0.05			0.07	
Control Delay	1.2	1.1		1.0	1.2			0.6			0.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	1.2	1.1		1.0	1.2			0.6			0.9	
LOS	A	A		A	A			A			A	
Approach Delay		1.1			1.2			0.6			0.9	
Approach LOS		A			A			A			A	
Queue Length 50th (m)	0.0	0.0		0.0	0.0			0.0			0.0	
Queue Length 95th (m)	1.1	31.7		0.3	34.1			0.0			0.3	
Internal Link Dist (m)		117.0			196.6			30.0			13.0	
Turn Bay Length (m)												
Base Capacity (vph)	390	3211		416	3211			614			565	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.02	0.36		0.00	0.37			0.01			0.02	

### Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 75.1

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.37

Intersection Signal Delay: 1.2

Intersection LOS: A

Intersection Capacity Utilization 47.2%

ICU Level of Service A

Analysis Period (min) 15



















Splits and Phases: 3: Boyer Road/Plaza Entrance & Innes Road



Innes Road Car Wash Development  
3: Boyer Road/Plaza Entrance & Innes Road

2019 Background Traffic Volumes













PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	958	8	3	1514	3	6	0	10	2	0	7
Future Volume (vph)	7	958	8	3	1514	3	6	0	10	2	0	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00			1.00			1.00	
Frt		0.999						0.917			0.892	
Flt Protected	0.950			0.950				0.981			0.990	
Satd. Flow (prot)	1676	3349	0	1676	3353	0	0	1587	0	0	1558	0
Flt Permitted	0.132			0.265							0.960	
Satd. Flow (perm)	233	3349	0	467	3353	0	0	1617	0	0	1511	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2						26			26	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		141.0			220.6			126.5			37.0	
Travel Time (s)		10.2			15.9			9.1			2.7	
Confl. Peds. (#/hr)	7		4	4		7	1			1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	8	1064	9	3	1682	3	7	0	11	2	0	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	1073	0	3	1685	0	0	18	0	0	10	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	

Innes Road Car Wash Development  
3: Boyer Road/Plaza Entrance & Innes Road

2019 Background Traffic Volumes

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	97.0	97.0		97.0	97.0		32.3	32.3		32.3	32.3	
Total Split (%)	75.0%	75.0%		75.0%	75.0%		25.0%	25.0%		25.0%	25.0%	
Maximum Green (s)	90.9	90.9		90.9	90.9		26.0	26.0		26.0	26.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1			6.3			6.3	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	12.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	108.0	108.0		108.0	108.0			5.9			5.9	
Actuated g/C Ratio	0.94	0.94		0.94	0.94			0.05			0.05	
v/c Ratio	0.04	0.34		0.01	0.54			0.17			0.10	
Control Delay	1.7	1.4		1.3	2.2			17.2			7.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	1.7	1.4		1.3	2.2			17.2			7.1	
LOS	A	A		A	A			B			A	
Approach Delay		1.4			2.2			17.3			7.1	
Approach LOS		A			A			B			A	
Queue Length 50th (m)	0.0	0.0		0.0	0.0			0.0			0.0	
Queue Length 95th (m)	1.0	30.6		0.5	65.4			5.8			1.9	
Internal Link Dist (m)		117.0			196.6			102.5			13.0	
Turn Bay Length (m)												
Base Capacity (vph)	218	3139		438	3142			385			361	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.04	0.34		0.01	0.54			0.05			0.03	
Intersection Summary												
Area Type: Other												
Cycle Length: 129.3												
Actuated Cycle Length: 115.2												
Natural Cycle: 80												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.54												
Intersection Signal Delay: 2.0												
Intersection LOS: A												
Intersection Capacity Utilization 58.8%												
ICU Level of Service B												
Analysis Period (min) 15												








Splits and Phases: 3: Boyer Road/Plaza Entrance & Innes Road



Innes Road Car Wash Development  
3: Boyer Road/Plaza Entrance & Innes Road

2019 Background Traffic Volumes

Saturday Mid-Day Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	1049	1	1	1099	3	5	0	2	2	0	7
Future Volume (vph)	8	1049	1	1	1099	3	5	0	2	2	0	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00			0.99			0.99	
Frt								0.966			0.892	
Flt Protected	0.950			0.950				0.964			0.990	
Satd. Flow (prot)	1676	3353	0	1676	3353	0	0	1638	0	0	1541	0
Flt Permitted	0.224			0.240								
Satd. Flow (perm)	395	3353	0	423	3353	0	0	1696	0	0	1556	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)								38			38	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		141.0			220.6			126.9			37.0	
Travel Time (s)		10.2			15.9			9.1			2.7	
Confl. Peds. (#/hr)	5		2	2		5	2		2	2		2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	9	1166	1	1	1221	3	6	0	2	2	0	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	1167	0	1	1224	0	0	8	0	0	10	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	

Innes Road Car Wash Development  
3: Boyer Road/Plaza Entrance & Innes Road

2019 Background Traffic Volumes

Saturday Mid-Day Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	57.7	57.7		57.7	57.7		32.3	32.3		32.3	32.3	
Total Split (%)	64.1%	64.1%		64.1%	64.1%		35.9%	35.9%		35.9%	35.9%	
Maximum Green (s)	51.6	51.6		51.6	51.6		26.0	26.0		26.0	26.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1			6.3			6.3	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	12.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	71.9	71.9		71.9	71.9			5.5			5.5	
Actuated g/C Ratio	0.96	0.96		0.96	0.96			0.07			0.07	
v/c Ratio	0.02	0.36		0.00	0.38			0.05			0.07	
Control Delay	1.2	1.2		1.0	1.2			0.6			0.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	1.2	1.2		1.0	1.2			0.6			0.9	
LOS	A	A		A	A			A			A	
Approach Delay		1.2			1.2			0.6			0.9	
Approach LOS		A			A			A			A	
Queue Length 50th (m)	0.0	0.0		0.0	0.0			0.0			0.0	
Queue Length 95th (m)	1.1	32.7		0.3	35.1			0.0			0.3	
Internal Link Dist (m)		117.0			196.6			102.9			13.0	
Turn Bay Length (m)												
Base Capacity (vph)	378	3211		405	3211			614			565	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.02	0.36		0.00	0.38			0.01			0.02	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 75.1

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.38

Intersection Signal Delay: 1.2

Intersection LOS: A

Intersection Capacity Utilization 47.8%

ICU Level of Service A

Analysis Period (min) 15



















Splits and Phases: 3: Boyer Road/Plaza Entrance & Innes Road



Innes Road Car Wash Development  
3: Boyer Road/Plaza Entrance & Innes Road

2024 Background Traffic Volumes













PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	1054	8	3	1665	3	6	0	10	2	0	7
Future Volume (vph)	7	1054	8	3	1665	3	6	0	10	2	0	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00			1.00			1.00	
Frt		0.999						0.917			0.892	
Flt Protected	0.950			0.950				0.981			0.990	
Satd. Flow (prot)	1676	3349	0	1676	3353	0	0	1587	0	0	1558	0
Flt Permitted	0.107			0.235							0.960	
Satd. Flow (perm)	189	3349	0	414	3353	0	0	1617	0	0	1511	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1						26			26	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		141.0			220.6			54.0			37.0	
Travel Time (s)		10.2			15.9			3.9			2.7	
Confl. Peds. (#/hr)	7		4	4		7	1			1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	8	1171	9	3	1850	3	7	0	11	2	0	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	1180	0	3	1853	0	0	18	0	0	10	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	

Innes Road Car Wash Development  
3: Boyer Road/Plaza Entrance & Innes Road

2024 Background Traffic Volumes

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	97.0	97.0		97.0	97.0		32.3	32.3		32.3	32.3	
Total Split (%)	75.0%	75.0%		75.0%	75.0%		25.0%	25.0%		25.0%	25.0%	
Maximum Green (s)	90.9	90.9		90.9	90.9		26.0	26.0		26.0	26.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1			6.3			6.3	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	12.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	108.0	108.0		108.0	108.0			5.9			5.9	
Actuated g/C Ratio	0.94	0.94		0.94	0.94			0.05			0.05	
v/c Ratio	0.05	0.38		0.01	0.59			0.17			0.10	
Control Delay	2.0	1.5		1.3	2.6			17.2			7.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	2.0	1.5		1.3	2.6			17.2			7.1	
LOS	A	A		A	A			B			A	
Approach Delay		1.5			2.6			17.3			7.1	
Approach LOS		A			A			B			A	
Queue Length 50th (m)	0.0	0.0		0.0	0.0			0.0			0.0	
Queue Length 95th (m)	1.1	35.3		0.5	80.3			5.8			1.9	
Internal Link Dist (m)		117.0			196.6			30.0			13.0	
Turn Bay Length (m)												
Base Capacity (vph)	177	3138		388	3142			385			361	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.05	0.38		0.01	0.59			0.05			0.03	
Intersection Summary												
Area Type: Other												
Cycle Length: 129.3												
Actuated Cycle Length: 115.2												
Natural Cycle: 90												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.59												
Intersection Signal Delay: 2.3												
Intersection LOS: A												
Intersection Capacity Utilization 63.2%												
ICU Level of Service B												
Analysis Period (min) 15												


Splits and Phases: 3: Boyer Road/Plaza Entrance & Innes Road

 Ø2	 Ø4
97 s	32.3 s
 Ø6	 Ø8
97 s	32.3 s

Innes Road Car Wash Development  
3: Boyer Road/Plaza Entrance & Innes Road

2024 Background Traffic Volumes

Saturday Mid-Day Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	1153	1	1	1208	3	5	0	2	2	0	7
Future Volume (vph)	8	1153	1	1	1208	3	5	0	2	2	0	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00			0.99			0.99	
Frt								0.966			0.892	
Flt Protected	0.950			0.950				0.964			0.990	
Satd. Flow (prot)	1676	3353	0	1676	3353	0	0	1638	0	0	1541	0
Flt Permitted	0.195			0.210								
Satd. Flow (perm)	344	3353	0	370	3353	0	0	1696	0	0	1556	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)								38			38	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		141.0			220.6			126.9			37.0	
Travel Time (s)		10.2			15.9			9.1			2.7	
Confl. Peds. (#/hr)	5		2	2		5	2		2	2		2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	9	1281	1	1	1342	3	6	0	2	2	0	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	1282	0	1	1345	0	0	8	0	0	10	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	



Innes Road Car Wash Development  
3: Boyer Road/Plaza Entrance & Innes Road

2024 Background Traffic Volumes

Saturday Mid-Day Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	57.7	57.7		57.7	57.7		32.3	32.3		32.3	32.3	
Total Split (%)	64.1%	64.1%		64.1%	64.1%		35.9%	35.9%		35.9%	35.9%	
Maximum Green (s)	51.6	51.6		51.6	51.6		26.0	26.0		26.0	26.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1			6.3			6.3	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	12.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	71.9	71.9		71.9	71.9			5.5			5.5	
Actuated g/C Ratio	0.96	0.96		0.96	0.96			0.07			0.07	
v/c Ratio	0.03	0.40		0.00	0.42			0.05			0.07	
Control Delay	1.2	1.3		1.0	1.3			0.6			0.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	1.2	1.3		1.0	1.3			0.6			0.9	
LOS	A	A		A	A			A			A	
Approach Delay		1.3			1.3			0.6			0.9	
Approach LOS		A			A			A			A	
Queue Length 50th (m)	0.0	0.0		0.0	0.0			0.0			0.0	
Queue Length 95th (m)	1.1	37.7		0.3	40.8			0.0			0.3	
Internal Link Dist (m)		117.0			196.6			102.9			13.0	
Turn Bay Length (m)												
Base Capacity (vph)	329	3211		354	3211			614			565	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.03	0.40		0.00	0.42			0.01			0.02	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 75.1

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 1.3

Intersection LOS: A

Intersection Capacity Utilization 51.0%

ICU Level of Service A

Analysis Period (min) 15



















Splits and Phases: 3: Boyer Road/Plaza Entrance & Innes Road



Innes Road Car Wash Development  
3: Boyer Road/Plaza Entrance & Innes Road

2019 Total Traffic Volumes

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	958	33	28	1514	3	31	0	35	2	0	7
Future Volume (vph)	7	958	33	28	1514	3	31	0	35	2	0	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00			1.00			1.00	
Frt		0.995						0.928			0.892	
Flt Protected	0.950			0.950				0.977			0.990	
Satd. Flow (prot)	1676	3333	0	1676	3353	0	0	1600	0	0	1558	0
Flt Permitted	0.124			0.250				0.846			0.931	
Satd. Flow (perm)	219	3333	0	440	3353	0	0	1384	0	0	1465	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6						39			26	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		141.0			220.6			126.5			37.0	
Travel Time (s)		10.2			15.9			9.1			2.7	
Confl. Peds. (#/hr)	7		4	4		7	1			1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	8	1064	37	31	1682	3	34	0	39	2	0	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	1101	0	31	1685	0	0	73	0	0	10	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	

Innes Road Car Wash Development  
3: Boyer Road/Plaza Entrance & Innes Road

2019 Total Traffic Volumes

PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	97.0	97.0		97.0	97.0		32.3	32.3		32.3	32.3	
Total Split (%)	75.0%	75.0%		75.0%	75.0%		25.0%	25.0%		25.0%	25.0%	
Maximum Green (s)	90.9	90.9		90.9	90.9		26.0	26.0		26.0	26.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1			6.3			6.3	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	12.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effect Green (s)	99.5	99.5		99.5	99.5			8.7			8.7	
Actuated g/C Ratio	0.85	0.85		0.85	0.85			0.07			0.07	
v/c Ratio	0.04	0.39		0.08	0.59			0.53			0.08	
Control Delay	3.1	3.2		3.1	4.7			41.0			6.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	3.1	3.2		3.1	4.7			41.0			6.2	
LOS	A	A		A	A			D			A	
Approach Delay		3.2			4.7			41.0			6.2	
Approach LOS		A			A			D			A	
Queue Length 50th (m)	0.3	28.1		1.1	58.4			8.2			0.0	
Queue Length 95th (m)	1.6	45.8		3.9	94.4			22.7			2.0	
Internal Link Dist (m)		117.0			196.6			102.5			13.0	
Turn Bay Length (m)												
Base Capacity (vph)	186	2839		374	2855			338			346	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.04	0.39		0.08	0.59			0.22			0.03	

Intersection Summary

Area Type: Other

Cycle Length: 129.3

Actuated Cycle Length: 116.8

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 5.0

Intersection LOS: A

Intersection Capacity Utilization 62.5%

ICU Level of Service B




Analysis Period (min) 15

Splits and Phases: 3: Boyer Road/Plaza Entrance & Innes Road



Innes Road Car Wash Development  
6: Boyer Road & Site Entrance



















2019 Total Traffic Volumes  
PM Peak Hour

Intersection						
Int Delay, s/veh	3.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	50	0	0	16	11	50
Future Vol, veh/h	50	0	0	16	11	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	56	0	0	18	12	56
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	58	40	68	0	-	0
Stage 1	40	-	-	-	-	-
Stage 2	18	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	949	1031	1533	-	-	-
Stage 1	982	-	-	-	-	-
Stage 2	1005	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	949	1031	1533	-	-	-
Mov Cap-2 Maneuver	949	-	-	-	-	-
Stage 1	982	-	-	-	-	-
Stage 2	1005	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1533	-	949	-	-	
HCM Lane V/C Ratio	-	-	0.059	-	-	
HCM Control Delay (s)	0	-	9	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

Innes Road Car Wash Development  
3: Boyer Road/Plaza Entrance & Innes Road

2019 Total Traffic Volumes

Saturday Mid-Day Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	1049	35	35	1099	3	39	0	36	2	0	7
Future Volume (vph)	8	1049	35	35	1099	3	39	0	36	2	0	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00			0.99			0.99	
Frt		0.995						0.935			0.892	
Flt Protected	0.950			0.950				0.975			0.990	
Satd. Flow (prot)	1676	3334	0	1676	3353	0	0	1598	0	0	1541	0
Flt Permitted	0.211			0.216				0.832			0.931	
Satd. Flow (perm)	372	3334	0	381	3353	0	0	1362	0	0	1449	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6						40			38	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		141.0			220.6			126.9			37.0	
Travel Time (s)		10.2			15.9			9.1			2.7	
Confl. Peds. (#/hr)	5		2	2		5	2		2	2		2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	9	1166	39	39	1221	3	43	0	40	2	0	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	1205	0	39	1224	0	0	83	0	0	10	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	

Innes Road Car Wash Development  
3: Boyer Road/Plaza Entrance & Innes Road

2019 Total Traffic Volumes

Saturday Mid-Day Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	57.7	57.7		57.7	57.7		32.3	32.3		32.3	32.3	
Total Split (%)	64.1%	64.1%		64.1%	64.1%		35.9%	35.9%		35.9%	35.9%	
Maximum Green (s)	51.6	51.6		51.6	51.6		26.0	26.0		26.0	26.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1			6.3			6.3	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	12.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	60.5	60.5		60.5	60.5			8.2			8.2	
Actuated g/C Ratio	0.78	0.78		0.78	0.78			0.11			0.11	
v/c Ratio	0.03	0.46		0.13	0.47			0.46			0.05	
Control Delay	3.9	4.8		4.9	4.9			27.2			0.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	3.9	4.8		4.9	4.9			27.2			0.6	
LOS	A	A		A	A			C			A	
Approach Delay		4.8			4.9			27.2			0.6	
Approach LOS		A			A			C			A	
Queue Length 50th (m)	0.3	31.3		1.4	32.2			6.5			0.0	
Queue Length 95th (m)	1.8	53.4		5.4	54.8			18.1			0.4	
Internal Link Dist (m)		117.0			196.6			102.9			13.0	
Turn Bay Length (m)												
Base Capacity (vph)	291	2610		298	2624			486			514	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.03	0.46		0.13	0.47			0.17			0.02	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 77.3

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 5.6

Intersection LOS: A

Intersection Capacity Utilization 52.9%

ICU Level of Service A




Analysis Period (min) 15

Splits and Phases: 3: Boyer Road/Plaza Entrance & Innes Road



Innes Road Car Wash Development  
6: Boyer Road & Site Entrance



















2019 Total Traffic Volumes  
Saturday Mid-Day Peak Hour

Intersection						
Int Delay, s/veh	4.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	69	0	0	7	2	69
Future Vol, veh/h	69	0	0	7	2	69
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	77	0	0	8	2	77
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	49	41	79	0	-	0
Stage 1	41	-	-	-	-	-
Stage 2	8	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	960	1030	1519	-	-	-
Stage 1	981	-	-	-	-	-
Stage 2	1015	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	960	1030	1519	-	-	-
Mov Cap-2 Maneuver	960	-	-	-	-	-
Stage 1	981	-	-	-	-	-
Stage 2	1015	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.1	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1519	-	960	-	-	
HCM Lane V/C Ratio	-	-	0.08	-	-	
HCM Control Delay (s)	0	-	9.1	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.3	-	-	

Innes Road Car Wash Development  
3: Boyer Road/Plaza Entrance & Innes Road

2024 Total Traffic Volumes

PM Peak Hour













												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	1054	33	28	1665	3	31	0	35	2	0	7
Future Volume (vph)	7	1054	33	28	1665	3	31	0	35	2	0	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00			1.00			1.00	
Frt		0.995						0.928			0.892	
Flt Protected	0.950			0.950				0.977			0.990	
Satd. Flow (prot)	1676	3333	0	1676	3353	0	0	1600	0	0	1558	0
Flt Permitted	0.099			0.222				0.846			0.931	
Satd. Flow (perm)	175	3333	0	391	3353	0	0	1384	0	0	1465	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6						39			26	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		141.0			220.6			126.5			37.0	
Travel Time (s)		10.2			15.9			9.1			2.7	
Confl. Peds. (#/hr)	7		4	4		7	1			1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	8	1171	37	31	1850	3	34	0	39	2	0	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	1208	0	31	1853	0	0	73	0	0	10	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	



Innes Road Car Wash Development  
3: Boyer Road/Plaza Entrance & Innes Road

2024 Total Traffic Volumes

PM Peak Hour




												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	97.0	97.0		97.0	97.0		32.3	32.3		32.3	32.3	
Total Split (%)	75.0%	75.0%		75.0%	75.0%		25.0%	25.0%		25.0%	25.0%	
Maximum Green (s)	90.9	90.9		90.9	90.9		26.0	26.0		26.0	26.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1			6.3			6.3	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	12.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	99.5	99.5		99.5	99.5			8.7			8.7	
Actuated g/C Ratio	0.85	0.85		0.85	0.85			0.07			0.07	
v/c Ratio	0.05	0.43		0.09	0.65			0.53			0.08	
Control Delay	3.4	3.4		3.2	5.5			41.0			6.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	3.4	3.4		3.2	5.5			41.0			6.2	
LOS	A	A		A	A			D			A	
Approach Delay		3.4			5.4			41.0			6.2	
Approach LOS		A			A			D			A	
Queue Length 50th (m)	0.3	32.4		1.1	71.4			8.2			0.0	
Queue Length 95th (m)	1.6	52.8		3.9	115.5			22.7			2.0	
Internal Link Dist (m)		117.0			196.6			102.5			13.0	
Turn Bay Length (m)												
Base Capacity (vph)	148	2839		333	2855			338			346	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.05	0.43		0.09	0.65			0.22			0.03	
Intersection Summary												
Area Type: Other												
Cycle Length: 129.3												
Actuated Cycle Length: 116.8												
Natural Cycle: 90												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.65												
Intersection Signal Delay: 5.5 Intersection LOS: A												
Intersection Capacity Utilization 66.9% ICU Level of Service C												
Analysis Period (min) 15												

Splits and Phases: 3: Boyer Road/Plaza Entrance & Innes Road



Innes Road Car Wash Development  
6: Boyer Road & Site Entrance



















2024 Total Traffic Volumes  
PM Peak Hour

Intersection						
Int Delay, s/veh	3.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	50	0	0	16	11	50
Future Vol, veh/h	50	0	0	16	11	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	56	0	0	18	12	56
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	58	40	68	0	-	0
Stage 1	40	-	-	-	-	-
Stage 2	18	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	949	1031	1533	-	-	-
Stage 1	982	-	-	-	-	-
Stage 2	1005	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	949	1031	1533	-	-	-
Mov Cap-2 Maneuver	949	-	-	-	-	-
Stage 1	982	-	-	-	-	-
Stage 2	1005	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1533	-	949	-	-	
HCM Lane V/C Ratio	-	-	0.059	-	-	
HCM Control Delay (s)	0	-	9	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

Innes Road Car Wash Development  
3: Boyer Road/Plaza Entrance & Innes Road

2024 Total Traffic Volumes

Saturday Mid-Day Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	1153	35	35	1208	3	39	0	36	2	0	7
Future Volume (vph)	8	1153	35	35	1208	3	39	0	36	2	0	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00			0.99			0.99	
Frt		0.996						0.935			0.892	
Flt Protected	0.950			0.950				0.975			0.990	
Satd. Flow (prot)	1676	3337	0	1676	3353	0	0	1598	0	0	1541	0
Flt Permitted	0.181			0.187				0.832			0.931	
Satd. Flow (perm)	319	3337	0	330	3353	0	0	1362	0	0	1449	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6						40			38	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		141.0			220.6			126.9			37.0	
Travel Time (s)		10.2			15.9			9.1			2.7	
Confl. Peds. (#/hr)	5		2	2		5	2		2	2		2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	9	1281	39	39	1342	3	43	0	40	2	0	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	1320	0	39	1345	0	0	83	0	0	10	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	

Innes Road Car Wash Development  
3: Boyer Road/Plaza Entrance & Innes Road

2024 Total Traffic Volumes

Saturday Mid-Day Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	32.1	32.1		32.1	32.1		32.3	32.3		32.3	32.3	
Total Split (s)	57.7	57.7		57.7	57.7		32.3	32.3		32.3	32.3	
Total Split (%)	64.1%	64.1%		64.1%	64.1%		35.9%	35.9%		35.9%	35.9%	
Maximum Green (s)	51.6	51.6		51.6	51.6		26.0	26.0		26.0	26.0	
Yellow Time (s)	3.7	3.7		3.7	3.7		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.4	2.4		2.4	2.4		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.1	6.1		6.1	6.1			6.3			6.3	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Walk Time (s)	12.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	14.0	14.0		14.0	14.0		19.0	19.0		19.0	19.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	60.5	60.5		60.5	60.5			8.2			8.2	
Actuated g/C Ratio	0.78	0.78		0.78	0.78			0.11			0.11	
v/c Ratio	0.04	0.51		0.15	0.51			0.46			0.05	
Control Delay	4.1	5.2		5.5	5.3			27.2			0.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	4.1	5.2		5.5	5.3			27.2			0.6	
LOS	A	A		A	A			C			A	
Approach Delay		5.2			5.3			27.2			0.6	
Approach LOS		A			A			C			A	
Queue Length 50th (m)	0.3	36.3		1.4	37.6			6.5			0.0	
Queue Length 95th (m)	1.8	61.7		5.7	63.8			18.1			0.4	
Internal Link Dist (m)		117.0			196.6			102.9			13.0	
Turn Bay Length (m)												
Base Capacity (vph)	249	2613		258	2624			486			514	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.04	0.51		0.15	0.51			0.17			0.02	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 77.3

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 5.9

Intersection LOS: A

Intersection Capacity Utilization 56.1%

ICU Level of Service B




Analysis Period (min) 15

Splits and Phases: 3: Boyer Road/Plaza Entrance & Innes Road



Innes Road Car Wash Development  
6: Boyer Road & Site Entrance

2024 Total Traffic Volumes  
Saturday Mid-Day Peak Hour

Intersection						
Int Delay, s/veh	4.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	69	0	0	7	2	69
Future Vol, veh/h	69	0	0	7	2	69
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	77	0	0	8	2	77
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	49	41	79	0	-	0
Stage 1	41	-	-	-	-	-
Stage 2	8	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	960	1030	1519	-	-	-
Stage 1	981	-	-	-	-	-
Stage 2	1015	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	960	1030	1519	-	-	-
Mov Cap-2 Maneuver	960	-	-	-	-	-
Stage 1	981	-	-	-	-	-
Stage 2	1015	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.1	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1519	-	960	-	-	
HCM Lane V/C Ratio	-	-	0.08	-	-	
HCM Control Delay (s)	0	-	9.1	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.3	-	-	