70 Richmond Road and 376 Island Park Drive

Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Forecasting Report

Step 4 Strategy Report (Revision #9– SPA)

Prepared for:

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March 2023

PN: 2022-072

Table of Contents

List of Figures

Table of Tables

List of Appendices

1 Screening

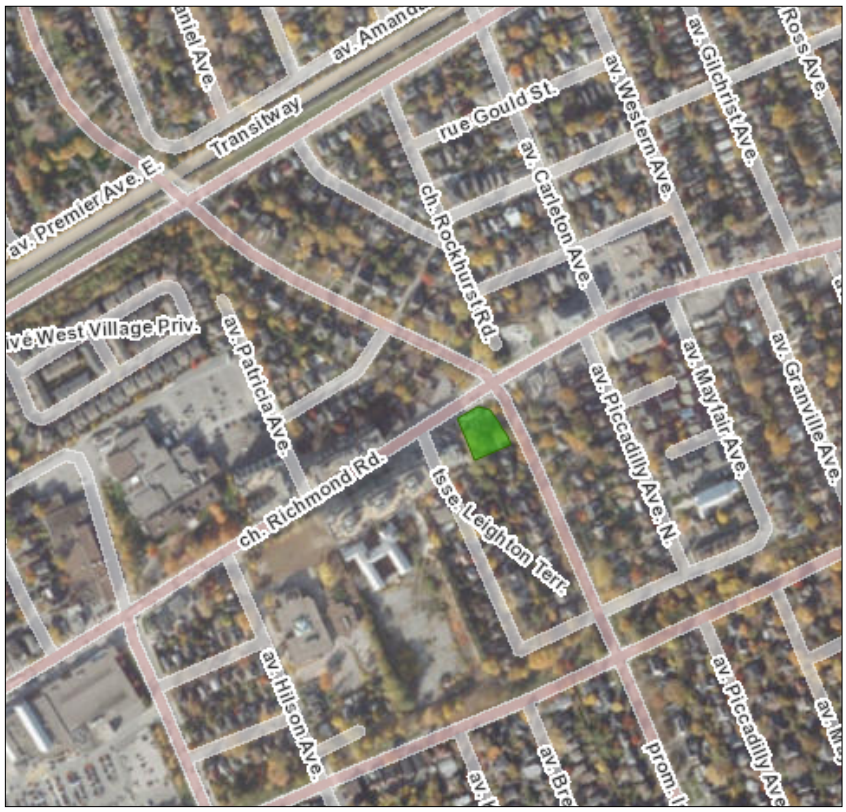
This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for the TIA Study PM. As shown in the Screening Form, a TIA is required based on the Location and Safety triggers and will only include the Design Review component. This report is in support of a site plan application.

2 Existing and Planned Conditions

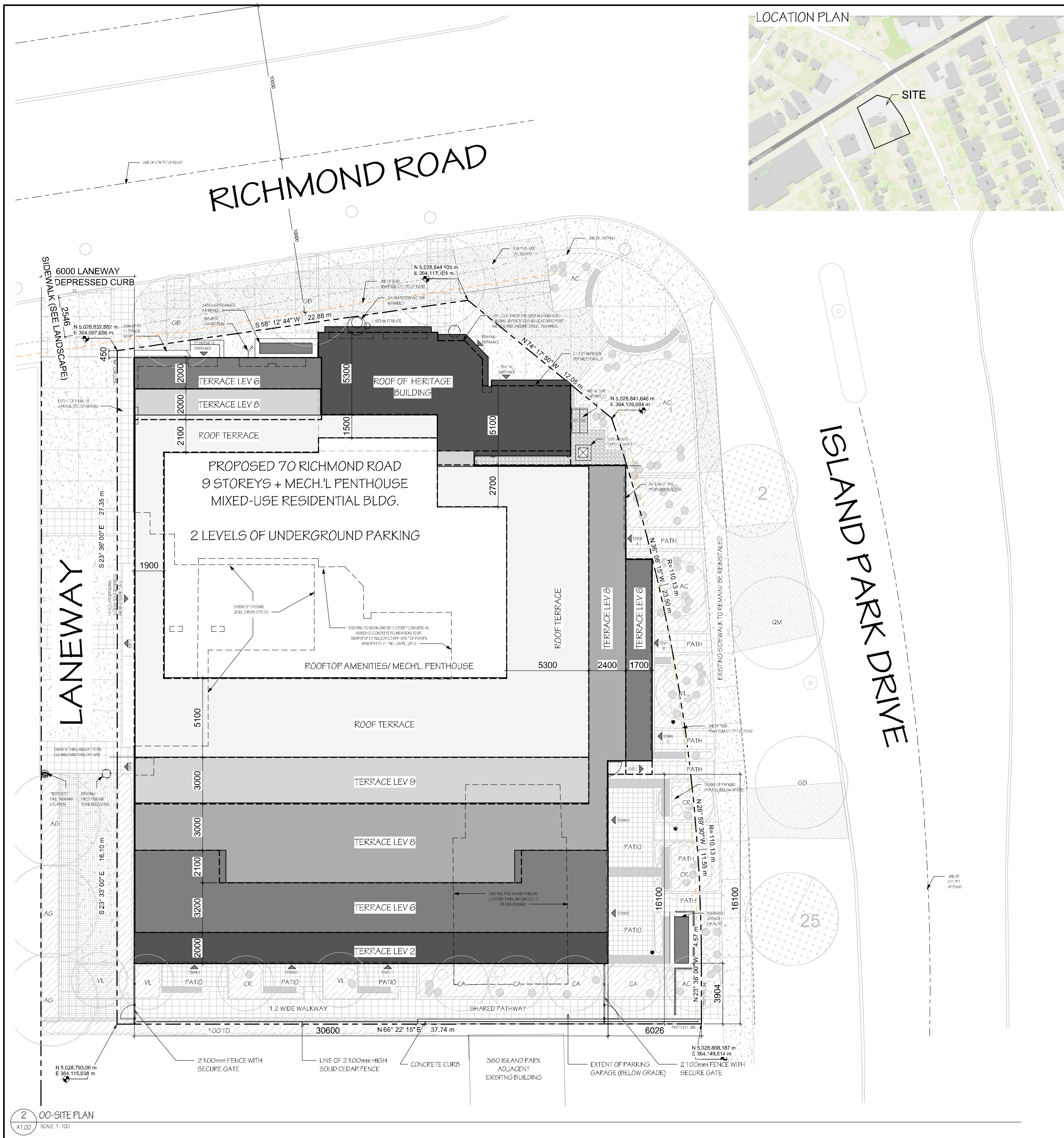
2.1 Proposed Development

The proposed development, designated and zoned as Traditional Mainstreet, is planned as a nine-storey, 96-unit mixed-use (residential and commercial) building with 1,455 sq. ft. of ground floor retail. The site is also located within the Richmond Road/Westboro Secondary Plan area ("Secondary Plan") which is the statutory implementation of the Richmond Road/Westboro Community Design Plan ("CDP"). The site is to be built out in a single phase by 2023. The development includes 63 resident and eight visitor vehicular parking stalls across two underground parking levels and 96 bicycle parking stalls. Access is to be provided via an existing municipal laneway on Richmond Road permitting all but the outbound left-turn movement. The study area will include the intersections of Island Park Drive at Scott Street, Island Park Drive at Richmond Road/Wellington Street West, Island Park Drive at Byron Avenue, Richmond Road at Kirkwood Avenue, Richmond Road at Patricia Avenue, Richmond Road at Future Site Access, and Wellington Street West at Western Avenue. Figure 1 illustrates the study area context. Figure 2 illustrates the proposed concept plan.

Figure 1: Area Context Plan



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: August 6, 2021



SURVEY INFORMATION TAKEN FROM:

PART OF LOT 33 CONCESSION 3 (OTTAWA FRONT)
(GEOGRAPHIC TOWNSHIP OF NEPEAN)
LOT 36 REGISTERED PLAN 449
CITY OF OTTAWA

SITE SUMMARY:

PROPERTY ADDRESS: ZONING:	70 RICHMOND RD. TM [83] H(15)
SITE AREA (SURVEY)	1587 m^2
PROPOSED USE:	MIXED-USE RESIDENTIAL MIDRISE APARTMENT BUILDING 9 FLOORS + ROOFTOP AMENITY
BUILDING FOOTPRINT: (GRND FLOOR PLAN)	1131 m^2
TOTAL FLOORS	9
TOTAL RESIDENTIAL UNITS	96 UNITS
TOTAL GROSS BUILDING AREA TOTAL GROSS FLOOR AREA (CITY DEFINITION)	9,190 m^2 - m^2
TOTAL RETAIL GFA	135 m^2

ZONING SUMMARY: EXISTING

TM[XXXX] SYYY - SUBJECT TO ZBLA D02-02-20-0102

YARDS:	REQUIRED	PROVIDED
SUBJECT TO ZONING SCHEDULE		
RICHMOND RD (FRONT)	-	0 m
ISLAND PARK DRIVE (CORNER SIDE)	-	0 m
LANEWAY (CORNER SIDE)	-	0 m
SIDE YARD (REAR YARD)	3.93m	3.93m
MIN WIDTH OF LANDSCAPE ABUTTING A RESIDENTIAL ZONE	3m	3m
TRANSPARENT WINDOWS & ACTIVE ENTRANCES	50% OF GROUND FLOOR MEASURED TO 4.5m HIGH	>50%

VEHICULAR PARKING:	REQUIRED	PROVIDED
RESIDENTIAL PARKING 96 UNITS (- 12UNITS)	0.5 / UNIT 42 SPACES	0.76 / UNIT 63 SPACES
VISITOR PARKING 96 UNITS (- 12UNITS)	0.1 / UNITS 8 SPACES	0.1 / UNITS 8 SPACES
TOTAL PARKING	50 SPACES	71 SPACES
PARKING DISTRIBUTION		
LEVEL P1		32 SPACES
LEVEL P2		39 SPACES
TOTAL		71 SPACES

BICYCLE PARKING	REQUIRED	PROVIDED
BICYCLE PARKING	1 /UNIT	1 / UNIT
96 UNITS x 1	96 SPACES	96 SPACES (HORIZONTAL CITY STNDS. W/ MIN. 1200mm AISLE)
PARKING DISTRIBUTION		
GROUND LEVEL		
LEVEL P1		46 SPACES
LEVEL P2		50 SPACES
TOTAL		96 SPACES

AMENITY	REQUIRED	PROVIDED
MINIMUM AMENITY SPACE $6m^2$ / UNIT (96 UNITS X $6m^2$)	576 m^2	1, 344 m^2
PRIVATE AMENITY (MIN. OF 50 % OF REQ'D)	288 m^2	962 m^2
COMMON AMENITY SUMMARY		
GROUND FLOOR RES. LOBBY LOUNGE		39 m^2
ROOF AMENITY (INDOOR)		154 m^2
ROOF AMENITY (OUTDOOR)		189 m^2
COMMON AMENITY 50 % OF REQ'D	288 m^2	382 m^2
TOTAL AMENITY	558 m^2	1, 344 m^2

BUILDING SUMMARY	GBA (Gross bldg area)	GFA (city definition)
LEVEL 10 (MECH & ROOF AMENITY)	313.45 m^2	-
LEVEL 9	607.96 m^2	521.19 m^2
LEVEL 8	696.31 m^2	607.21 m^2
LEVEL 7	857.50 m^2	751.03 m^2
LEVEL 6	895.68 m^2	790.60 m^2
LEVEL 5	987.93 m^2	837.61 m^2
LEVEL 4	987.93 m^2	837.61 m^2
LEVEL 3	1,042.74 m^2	893.54 m^2
LEVEL 2	1,018.12 m^2	868.83 m^2
MEZ	678.56 m^2	678.56 m^2
GROUND LEVEL RES	1,104.34 m^2	571.63 m^2
TOTAL	9,190.53 m^2	7,493 m^2
LEVEL P1	1,481.61 m^2	-
LEVEL P2	1,481.61 m^2	-

TRINITY

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND REPORT ALL ERRORS AND/OR OMISSIONS TO THE ARCHITECT.

ALL CONTRACTORS MUST COMPLY WITH ALL PERTINENT CODES AND BY-LAWS.

DO NOT SCALE DRAWINGS.

THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION UNTIL SIGNED.

Hobin Architecture Incorporated
hobinarc.com
HOBIN ARCHITECTURE

PROJECT	70 RICHMOND 70 RICHMOND RD & 376 ISLAND PARK DR.
DRAWING TITLE	SITE PLAN
DRAWN	Author
DATE	XX/XX/XXXX
SCALE	As indicated
PROJECT	1909
DRAWING NO.	A1.00
REVISION NO.	4

PLAN NO. #18851
FILE NO. D07-12-22-0082
A1.00- R4- SITE PLAN

2.2 Existing Conditions

2.2.1 Area Road Network

Richmond Road: Richmond Road is a City of Ottawa arterial road with a two-lane urban cross-section with sidewalks on both sides of the road and on-street parking permitted on the north side of the road (no stopping 3:30 PM – 5:30 PM) and on the south side of the road (no restrictions) west of a point 20 metres west of Leighton Terrace. The posted speed limit is 50 km/h and the existing right of way within the study area varies from 20.0 metres to 21.0 metres. Richmond Road is a truck route.

Wellington Street West: Wellington Street West is a City of Ottawa arterial road with a four-lane urban cross-section west of Western Avenue where on-street parking is permitted on the north side of a the road (no stopping 3:30 PM – 5:30 PM) and on the south side of the road east of the Esso property (no restrictions), and a four-lane urban cross-section east of Western Avenue where on-street parking is permitted in parking lanes on both sides of the road. The posted speed limit is 50 km/h and the City-protected right of way is 20.0 metres. Wellington Street West is a truck route.

Island Park Drive: Island Park Drive is a federally owned arterial road with a two-lane urban cross-section with curbside bike lanes and sidewalks on both sides of the road. The posted speed limit is 40 km/h and the existing right of way within the study area is 30.5 metres.

Scott Street: Scott Street is a City of Ottawa arterial road with a two-lane urban cross-section with curbside bike lanes on both sides of the road, a mixed-use path on the north side of the road, and a sidewalk on the south side of the road. The posted speed limit is 50 km/h and the City-protected right of way is 26.0 metres. Scott Street is a truck route.

Kirkwood Avenue: Kirkwood Avenue is a City of Ottawa arterial road with a four-lane urban cross-section with sidewalks on both sides of the road south of Richmond Road within the study area, and a local road with a two-lane urban cross-section and angle parking on the east side of the road and bay parking on the west side of the road north of Richmond Road. The posted speed limit is 50 km/h and the City-protected right of way is 26.0 metres south of Richmond Road, and the existing right of way is 19.5 metres north of Richmond Road. Kirkwood Avenue is a truck route.

Byron Avenue: Byron Avenue is a City of Ottawa collector road with a two-lane urban cross-section with a sidewalk on the south side of the road. West of Island Park Drive, curbside bike lanes are on both sides of the road. The unposted speed limit is 50 km/h and the existing right of way within the study area is 20.0 metres west of Island Park Drive and 15.0 metres east of Island Park Drive.

Patricia Avenue: Patricia Avenue is a City of Ottawa local road with a two-lane urban cross-section with a sidewalk on the east side of the road. North of Mailes Avenue, Patricia Avenue is no exit. The unposted speed limit is 50 km/h and the existing right of way is 15.5 metres.

Western Avenue: Western Avenue is a City of Ottawa local road with a two-lane urban cross-section with on-street parking permitted and sidewalks on both sides of the road. The unposted speed limit is 50 km/h and the existing right of way is 20.0 metres within the study area.

2.2.2 Existing Intersections

The existing signalized area intersections within 400 metres of the site have been summarized below:

Richmond Road/Wellington Street W at Island Park Drive	The intersection of Richmond Road/Wellington Street West at Island Park Drive is a signalized intersection. The northbound and southbound approaches each consists of an auxiliary left-turn lane, a shared through/right-turn lane, and a bike lane. The eastbound and westbound approaches each consist of a shared left-turn/through lane and a shared through/right-turn lane. Commercial vehicles are restricted from turning onto Island Park Drive.
Richmond Road at Kirkwood Avenue	The intersection of Richmond Road at Kirkwood Avenue is a signalized intersection. The northbound approach consists of a left-turn lane and a shared through/right-turn lane, and the southbound approach consists of shared all-movements lane. The eastbound and westbound approaches each consist of a shared left-turn/through lane and a shared through/right-turn lane, although on-street parking is permitted in the curbside lanes. No turn restrictions were noted.
Richmond Road at Patricia Avenue	The intersection of Richmond Road at Patricia Avenue is a signalized intersection. The private northbound approach and the southbound approach each consist of a shared all-movements lane. The eastbound and westbound approaches each consist of a shared left-turn/through lane and a shared through/right turn lane, although on-street parking is permitted in the curbside lanes. No turn restrictions were noted.
Wellington Street West at Western Avenue	The intersection of Wellington Street West at Western Avenue is a signalized intersection. The southbound approach consist of a shared all-movements lane and the northbound approach consists of two private driveways. The eastbound approach consists of a shared left-turn/through lane and a shared through/right-turn lane, which stops at the intersection and acts as a bypass for any left-turning vehicles. The westbound approach consists of a shared all-movements lane. A parking lane is provided on the north side of Wellington Street on the east side of the intersection and on-street parking is permitted on the west side of the intersection. A taxi parking lane is provided on the south side of Wellington Street to the east of the intersection. Northbound right turns on red are restricted from the private driveways.
Scott Street at Island Park Drive	The intersection of Scott Street at Island Park Drive is a signalized intersection. The northbound approach consists of a shared all-movements lane, and the southbound approach consists of an auxiliary left-turn lane and a shared through/right-turn lane. The eastbound approach consists of an auxiliary left-turn lane, a through lane, and an auxiliary right-turn lane and the westbound approach consists of an auxiliary left-turn lane and a shared through/right-turn lane. Bike lanes are provided on all approaches. No turn restrictions were noted.

Byron Avenue at Island Park Drive

The intersection of Byron Avenue at Island Park Drive is a signalized intersection. The northbound, southbound, eastbound, and westbound approaches each consist of a shared all-movements lane and the northbound and southbound approaches each have a bike lane. Left-turn bike boxes are provided on the northbound and southbound approaches. Northbound and southbound right turns on red are restricted.

2.2.3 Existing Driveways

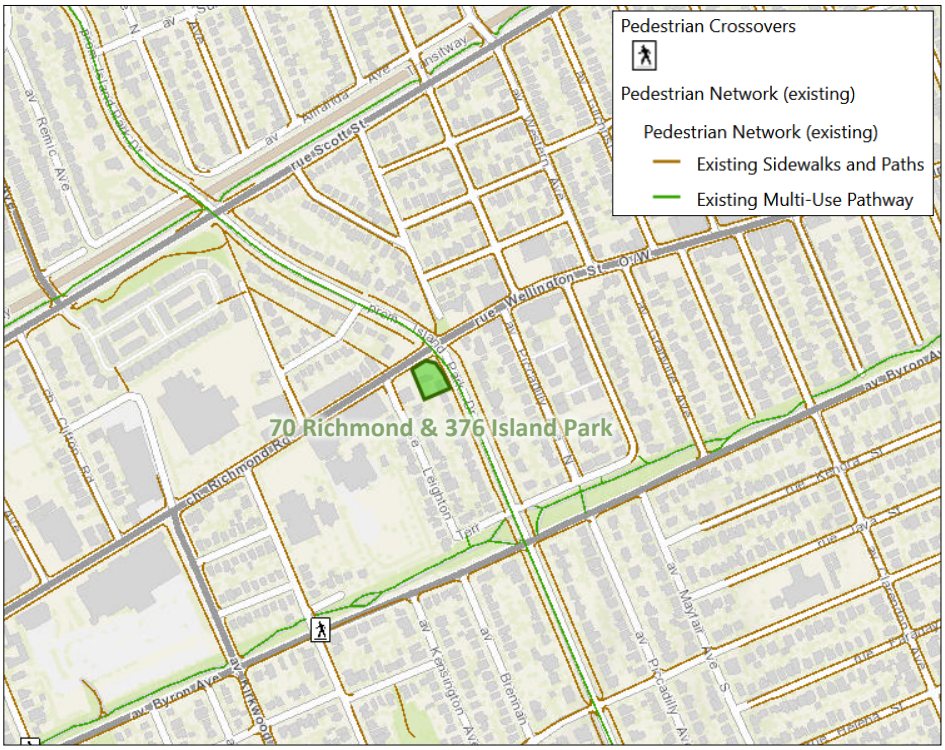
Driveways to low and medium-density residential and commercial land uses exist on both sides of Richmond Road and to low density residential land uses on both sides of Island Park Drive, and a gas station on the east side, within 200 metres of the proposed site access.

2.2.4 Cycling and Pedestrian Facilities

Figure 3 illustrates the pedestrian facilities in the study area and Figure 4 illustrates the cycling facilities.

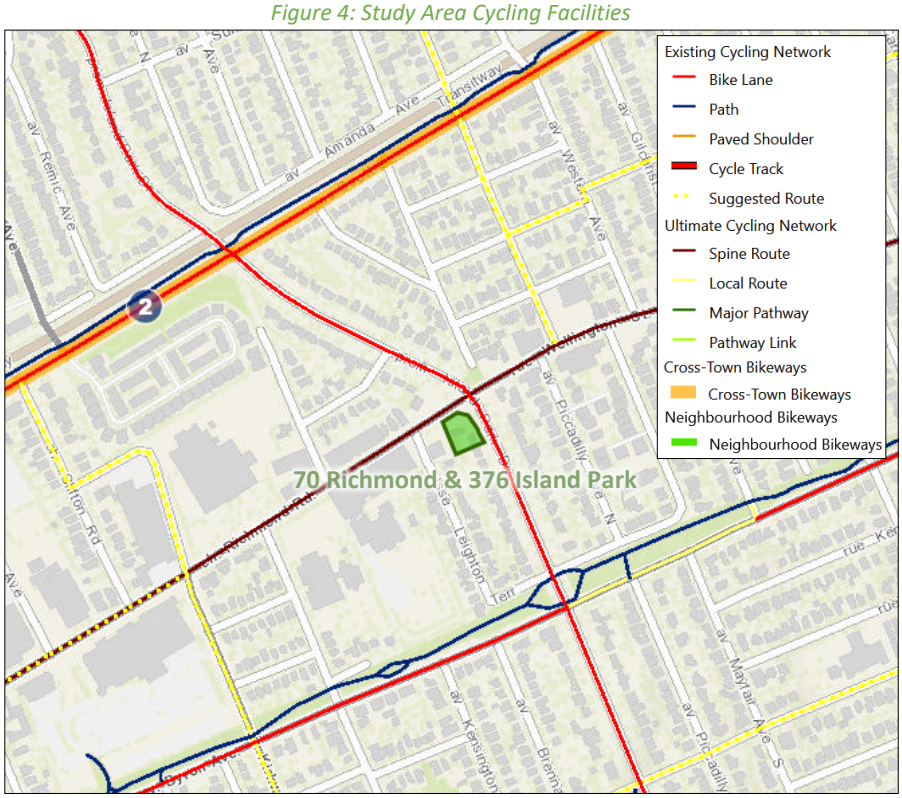
Sidewalks are provided along both sides of arterial roads within the study area, with the exception of Scott Street. Scott Street and Byron Avenue each have a mixed-use path on their north side and a sidewalk on their south side, and Patricia Avenue has a sidewalk on its east side. Cycling facilities include curbside bike lanes on Island Park Drive, Scott Street, and Byron Avenue excepting the segment between Island Park Drive and Granville Avenue. Mixed-use paths are on the north side of Scott Street and on the north side of Byron Avenue. Island Park Drive, Scott Street, and Richmond Road are cycling spine routes and Kirkwood Avenue, Carleton Avenue, and Byron Avenue are local routes.

Figure 3: Study Area Pedestrian Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: May 4, 2022

Figure 4: Study Area Cycling Facilities



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: May 4, 2022

Pedestrian and cyclist volumes included in study area intersection counts, presented in Section 2.2.7, have been compiled and are illustrated in Figure 5 and Figure 6 respectively.

Figure 5: Existing Pedestrian Volumes

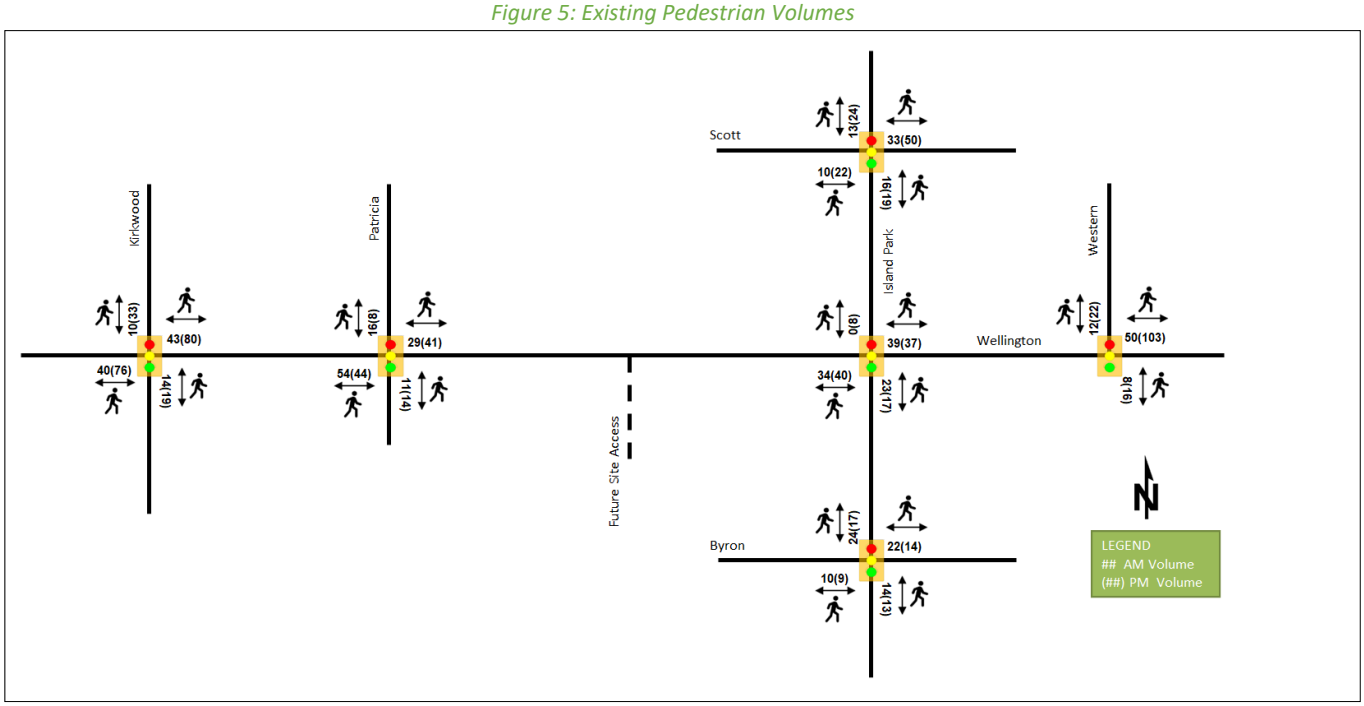
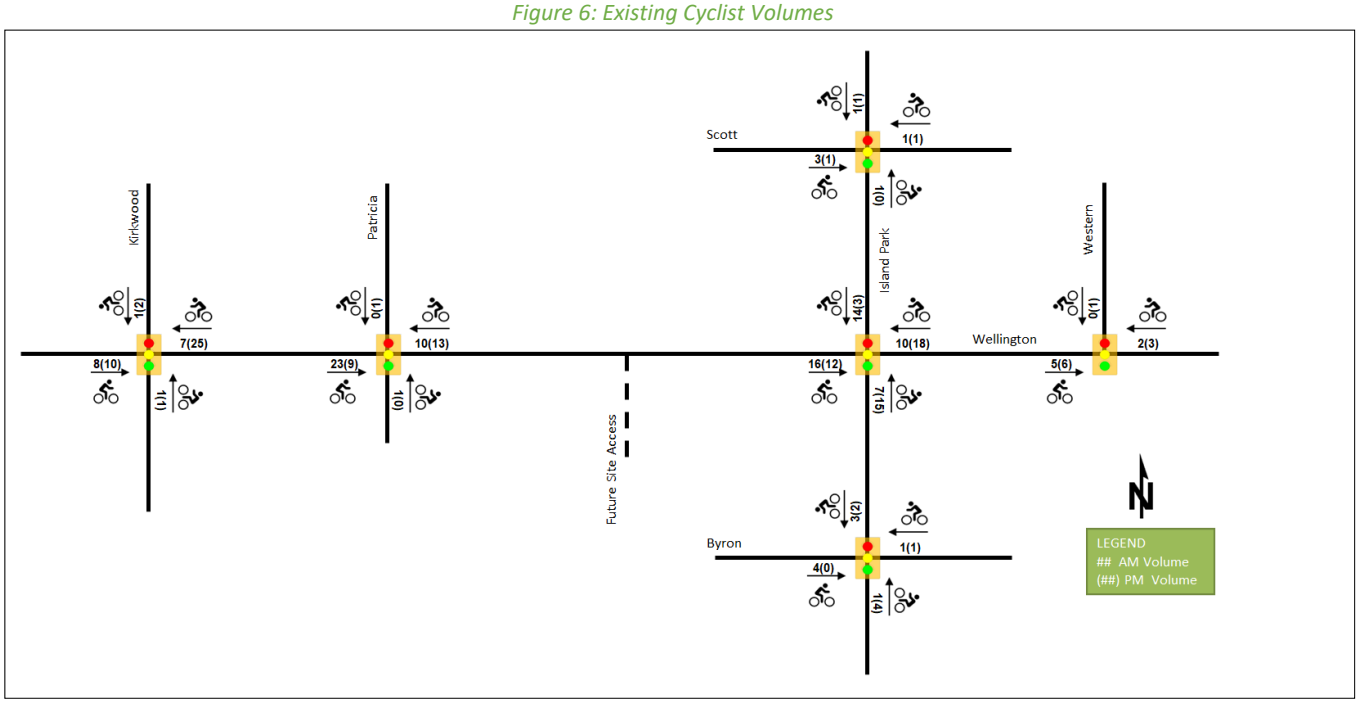


Figure 6: Existing Cyclist Volumes



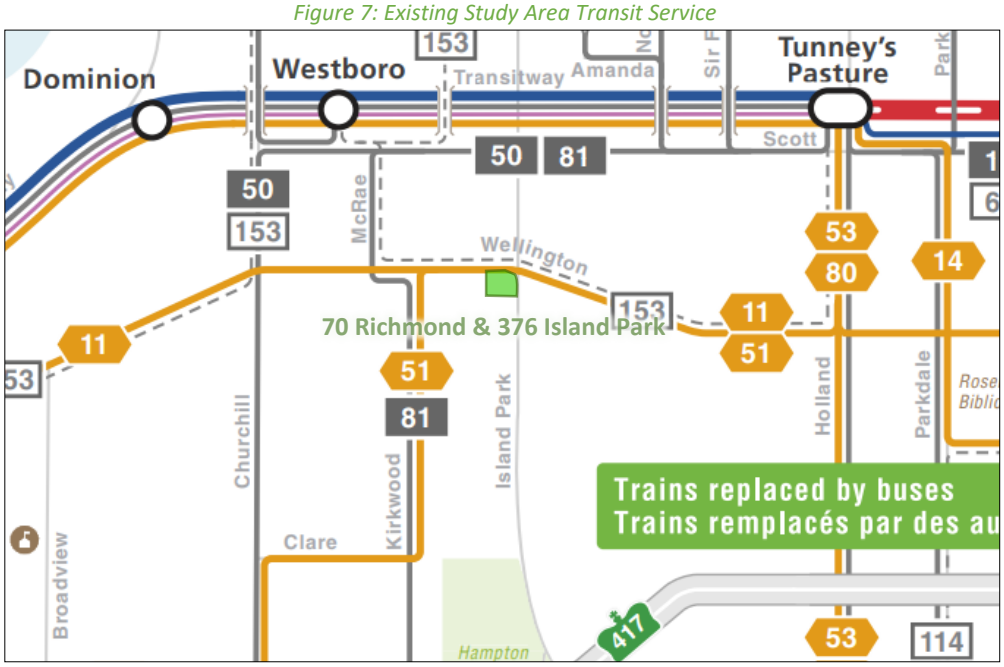
2.2.5 Existing Transit

The study area is served by the following transit routes: #11, #51, #153 travel along Richmond Road and Wellington Street West; Routes #50, #81 travel along Scott Street. Routes #51 and #81 continue along Kirkwood Avenue. As of July 2020, the frequency of these routes within proximity of the proposed site, are:

- Route # 11 – 15-minute service all day, 30-minute service after 9:00pm
- Route # 50 – 30-minute service all day
- Route # 51 – 15-minute service all day, 30-minute service after 7:00pm
- Route # 81 – 30-minute service all day
- Route # 153 – Five buses per day per direction

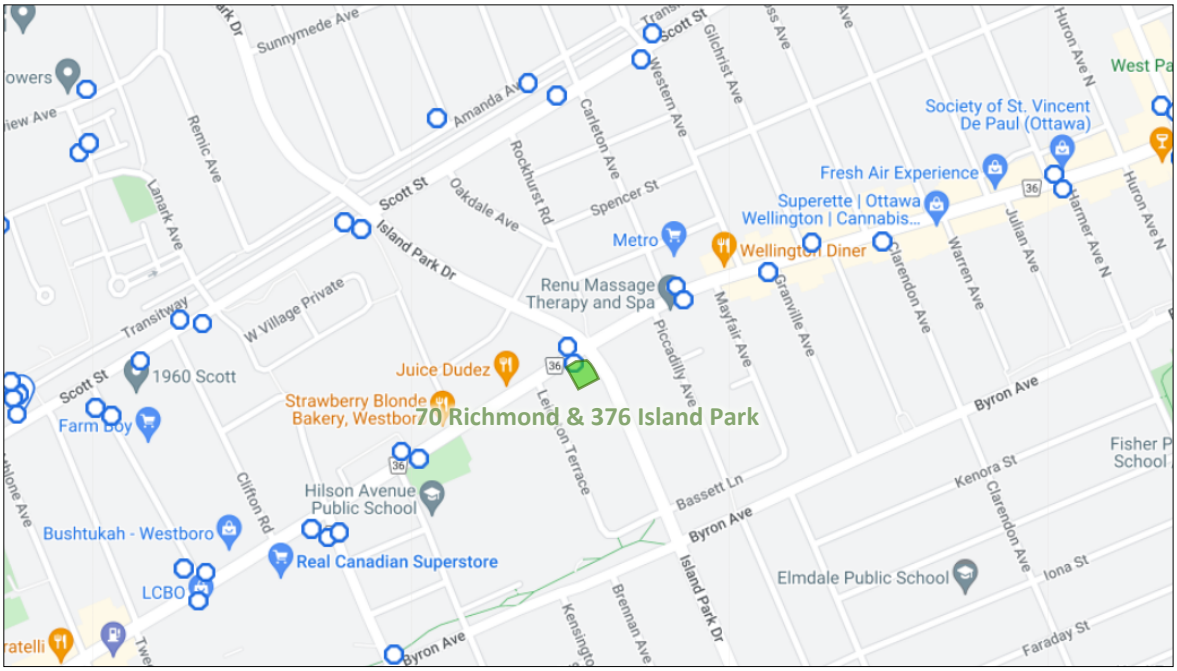
Figure 7 illustrates the transit system map in the study area and Figure 8 illustrates nearby transit stops.

Figure 7: Existing Study Area Transit Service



Source: http://www.octranspo.com/ Accessed: May 4, 2022

Figure 8: Existing Study Area Transit Stops



Source: http://www.octranspo.com/ Accessed: May 4, 2022

2.2.6 Existing Area Traffic Management Measures

Within the study area, traffic calming measures consist of on-street parking on Richmond Road and Wellington Street West and curb extensions on Wellington Street West framing parking lanes, and on Western Avenue.

2.2.7 Existing Peak Hour Travel Demand

Existing turning movement counts were acquired from the City of Ottawa for the existing Study Area intersections. Counts conducted within the past three years are considered to be representatively valid in the modelling of existing conditions. Table 1 summarizes the intersection count dates.

Table 1: Intersection Count Date

Intersection	Count Date
Scott Street & Island Park Drive	Tuesday, March 28, 2017
Richmond Road & Kirkwood Avenue	Thursday, April 20, 2017
Richmond Road & Patricia Avenue	Tuesday, April 25, 2017
Richmond Road/Wellington Street & Island Park Drive	Tuesday, April 25, 2017
Wellington Street & Western Avenue	Thursday, February 22, 2018
Byron Avenue & Island Park Drive	Thursday, January 23, 2020

Figure 9 illustrates the existing traffic counts and Table 2 summarizes the existing intersection operations. The level of service for signalized intersections is based on volume to capacity ratio (v/c) calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection. Detailed turning movement count data is included in Appendix B and the Synchro worksheets are provided in Appendix C.

Figure 9: Existing Traffic Counts

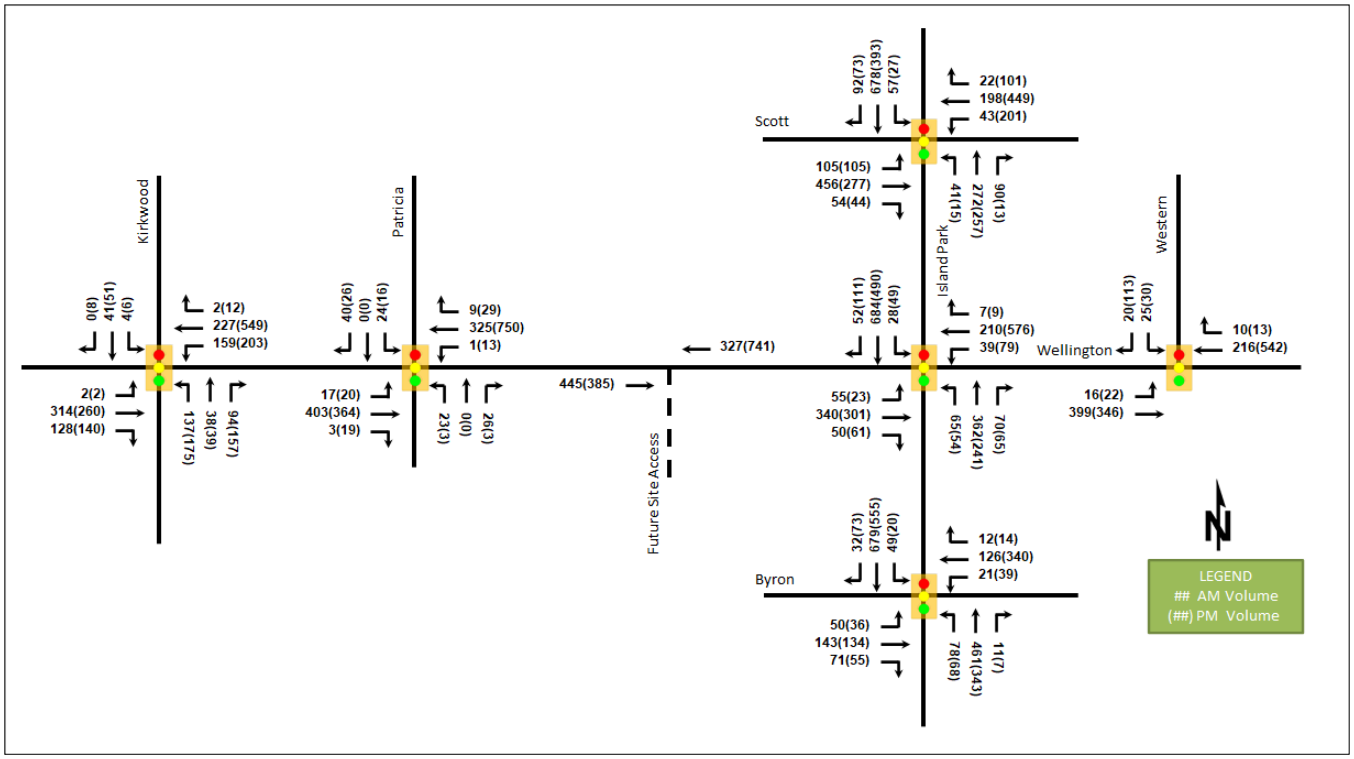


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Richmond Road/Wellington Street W & Island Park Drive ***Signalized***	EB	A	0.59	30.7	55.4	A	0.45	22.3	39.1
	WB	A	0.35	27.2	32.2	D	0.83	35.9	**#87.1**
	NBL	E	0.99	**122.9**	**m#26.4**	C	0.71	59.5	**m#19.9**
	NBT/R	B	0.61	26.0	94.2	A	0.50	18.2	m47.3
	SBL	A	0.11	6.8	m1.3	A	0.17	18.2	13.4
	SBT/R	**F**	**1.02**	**37.6**	**m#100.0**	E	0.97	55.0	**#172.8**
	Overall	**C**	**0.78**	**34.5**	-	**D**	**0.83**	**36.5**	-
Richmond Road & Kirkwood Avenue ***Signalized***	EB	A	0.41	14.6	32.4	A	0.29	9.7	28.6
	WB	A	0.54	20.9	37.5	B	0.69	21.6	**#105.9**
	NBL	A	0.37	22.8	31.5	B	0.64	38.2	44.3
	NBT/R	A	0.26	8.1	15.9	A	0.45	9.6	20.4
	SB	A	0.09	18.2	12.0	A	0.20	23.0	16.6
	Overall	**A**	**0.41**	**17.1**	-	**B**	**0.63**	**19.0**	-
Richmond Road & Patricia Avenue ***Signalized***	EB	A	0.19	3.7	19.2	A	0.18	3.0	17.6
	WB	A	0.15	3.5	15.0	A	0.34	3.7	38.6
	NB	A	0.22	13.9	10.1	A	0.03	0.2	0.0
	SB	A	0.29	16.2	12.8	A	0.22	16.8	10.2
	Overall	**A**	**0.21**	**5.1**	-	**A**	**0.34**	**3.9**	-
Wellington Street & Western Avenue ***Signalized***	EB	A	0.18	3.5	19.5	A	0.22	6.6	17.7
	WB	A	0.18	3.9	23.1	A	0.57	11.1	72.0
	NB	-	-	-	-	-	-	-	-
	SB	A	0.15	1.0	0.2	A	0.37	10.2	17.8
	Overall	**A**	**0.19**	**3.5**	-	**A**	**0.51**	**9.4**	-
Scott Street & Island Park Drive ***Signalized***	EBL	A	0.33	24.4	29.3	A	0.52	27.5	34.3
	EBT	C	0.77	35.1	**#119.7**	A	0.35	16.6	53.6
	EBR	A	0.11	9.7	10.0	A	0.07	4.1	5.5
	WBL	A	0.29	26.7	15.7	A	0.50	21.6	49.5
	WBT/R	A	0.38	22.8	50.3	C	0.73	25.4	130.2
	NB	**F**	**1.33**	**192.9**	**#170.7**	A	0.56	29.0	74.3
	SBL	A	0.16	15.0	13.9	A	0.10	21.4	10.0
	SBT/R	**F**	**1.02**	**61.5**	**#237.5**	D	0.81	39.2	**#140.4**
	Overall	**F**	**1.09**	**71.7**	-	**C**	**0.76**	**27.2**	-
Byron Avenue & Island Park Drive ***Signalized***	EB	D	0.86	56.6	**#83.6**	A	0.57	27.5	51.3
	WB	A	0.50	35.5	45.3	D	0.87	45.9	**#107.8**
	NB	B	0.68	16.1	113.1	A	0.59	17.4	82.4
	SB	D	0.81	12.4	m44.1	C	0.78	29.2	m117.0
	Overall	**D**	**0.82**	**22.4**	-	**D**	**0.81**	**29.9**	-

Notes: Saturation flow rate of 1800 veh/h/lane
Peak Hour Factor = 0.90
Queue is measured in metres
Delay is measured in seconds
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

At the intersection of Scott Street at Island Park Drive during the AM peak hour, the northbound movement and southbound shared through/right-turn movement are over theoretical capacity and may be subject to high delays and extended queues. The overall intersection is over capacity due to these movements, and the eastbound through movement is also noted to have extended queues. During the PM peak hour at this intersection, the southbound shared through/right-turn lane will have extended queues. A northbound left-turn lane would improve the intersection operations to a LOS E, with the northbound lane operations to LOS B or better. Due to

the BRT/LRT underpass, the southbound approach cannot be improved through the introduction of a right-turn lane.

At the intersection of Richmond Road/Wellington Street West at Island Park Drive during the AM peak hour, the southbound through/right movement is over theoretical capacity and may exhibit extended, and the northbound left movement is approaching theoretical capacity and may be subject to high delays and extended queues. Shifting two seconds of split from the east-west phase to the north-south phase would reduce the v/c of all movements to 0.99 or below at this intersection during the AM peak hour. During the PM peak hour at this intersection, the westbound movement, the northbound left movement, and the southbound through/right movement may exhibit extended queues, where the southbound through/right movement is approaching theoretical capacity.

Extended queues are noted at the Byron Avenue and Island Park Drive intersection during the AM peak on the eastbound approach and on the westbound approach during the PM peak, and at the intersection of Richmond Road at Kirkwood Avenue during the PM peak on the southbound westbound movement.

The remaining study area intersections operate satisfactorily during the peak hours.

2.2.8 Collision Analysis

Collision data have been acquired from the City of Ottawa open data website (data.ottawa.ca) for five years prior to the commencement of this TIA for the surrounding study area road network. Table 3 summarizes the collisions types and conditions in the study area, Figure 10 illustrates the intersections and segments analyzed, and Table 4 summarizes the total collisions for each of these locations. Collision data are included in Appendix D.

Table 3: Study Area Collision Summary, 2016-2020

		Number	%
Total Collisions		**51**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	8	15%
	Property Damage Only	44	85%
Initial Impact Type	**Angled**	6	12%
	Rear end	11	21%
	Sideswipe	15	29%
	Turning Movement	11	21%
	SMV Unattended	7	13%
	SMV Other	2	4%
Road Surface Condition	**Dry**	29	56%
	Wet	18	35%
	Loose Snow	2	4%
	Slush	2	4%
	Ice	1	2%
Pedestrian Involved		1	2%
Cyclists Involved		2	4%

Figure 10: Study Area Collision Records – Representation of Study Area Collisions

Table 4: Summary of Collision Locations, 2016-2020

	Number	%
Intersections / Segments	**51**	**100%**
Leighton Ter @ Richmond Rd	3	2%
Island Park Dr @ Richmond Rd/Wellington St W	41	23%
Richmond Rd btwn Patricia Ave & Leighton Ter	4	2%
Richmond Rd btwn Leighton Ter & Island Park Dr	4	2%

Collisions within the study area generally follow a pattern representative of typical Ottawa urban areas. High congestion during peak periods is correlated with the collision types of rear end, sideswipe, and turning movement. The collision types at the intersection of Richmond Road/Wellington Street West at Island Park Drive are summarized in Table 5.

Table 5: Richmond Road/Wellington St W at Island Park Drive Collision Summary

		Number	%
Total Collisions		**41**	**100%**
Classification	**Fatality**	0	0%
	Non-Fatal Injury	7	17%
	Property Damage Only	34	83%
Initial Impact Type	**Angled**	4	10%
	Rear end	11	27%
	Sideswipe	12	29%
	Turning Movement	11	27%
	SMV Unattended	1	2%
	SMV Other	2	5%

		Number	%
Total Collisions		**41**	**100%**
Road Surface Condition	**Dry**	22	54%
	Wet	15	37%
	Loose Snow	1	2%
	Slush	2	5%
	Ice	1	2%
Pedestrian Involved		1	2%
Cyclists Involved		2	5%

The of Richmond Road/Wellington Street West at Island Park Drive intersection had a total of 41 collisions during the 2016-2020 time period, with 34 involving property damage only and the remaining seven having non-fatal injuries. The three primary collision types were sideswipe with 12 collisions, and turning movement and rear end with 11 collisions each. The City has completed a review of this intersection through the Cycling Safety Review of High-Volume Intersections Report (2020) detailing a recommended plan to address the collision frequency and examine both pedestrian and cycling safety improvements. The recommendations include separated facilities along Richmond Road for cycling, reduced turning radii as no truck movements are permitted along Island Park Drive, signal timing improvements and no right-turn on red, and additional considerations such as reducing Richmond Road to 3 travel lanes to reduce side swipes. The City is currently planning the functional design and implementation.

2.3 Planned Conditions

2.3.1 Changes to the Area Transportation Network

The subject development is within the Richmond Road/Westboro Secondary Plan and related CDP area. Both contemplate an additional 3970 dwelling units by 2021 within the Secondary Plan area. A Transportation Management Implementation Plan ("TMP") was produced in 2011, and is to be implemented over 15 years, with a view to lowering auto modal share to accommodate anticipated development. The portion of the TMP covering the study area is illustrated in Figure 11. Treatments within the vicinity of the site include a proposed bicycle lane on Richmond Road, new bus stop shelters (which have not yet been constructed), and pedestrian countdown signals, which have since been installed. It should be noted that the proposed bicycle lane along Richmond Road does not appear in the Ottawa Cycling Plan produced in 2013.

Within the TMP, the Rapid Transit and Transit Priority Network – Affordable Network diagram shows isolated transit priority measures along Richmond Road/Wellington Street West. No other changes are outlined in the TMP, nor are any outlined in the Ottawa Planned Construction Projects portal.

Figure 11: Richmond Road/Westboro Transportation Management Implementation Plan

Source: Richmond Road/Westboro Transportation Management Implementation Plan, Accessed: July 22, 2020

As noted in Section 2.2.8, the City is currently planning the improvement of the Richmond Road and Island Park Drive intersection. No plans are currently available at this time.

2.3.2 Other Study Area Developments

190 Richmond Road

The proposed development application proposes a 187-dwelling unit apartment building. The development is anticipated to generate 82 new two-way AM peak hour auto trips and 97 new two-way PM peak hour auto trips (LEA, 2017).

175 Richmond Road

The proposed development application proposes a nine-storey mixed-use building with 675 m^2 of ground floor retail and 241 residential dwelling units. The redevelopment of the site is anticipated to generate a net increase of 40 two-way AM peak hour auto trips and 23 two-way PM peak hour auto trips (Novatech, 2011).

114 Richmond Road

The proposed development application proposes the conversion of an existing structure to a mixed-use building and the addition of nine storeys of apartment dwellings. No TIA is included as part of this application.

89 Richmond Road

The proposed development application proposes a six-storey mixed-use building with a spa and health centre and 14 residential dwelling units. A TIA screening form determined no TIA was required for this site.

1445-1451 Wellington Street W

The proposed development application proposes to permit the construction of a 12-storey mixed-use building with 2740 sq. ft. ground floor retail and 114 residential dwelling units. It is anticipated that 50 new two-way AM peak hour auto trips and 53 new two-way PM peak hour auto trips (Delcan, 2013).

1391 Wellington Street W

The proposed development application proposes to permit a "broadcasting studio". No TIA is included as part of this application.

3 Study Area and Time Periods

3.1 Study Area

The study area will include the intersections of:

- Island Park Drive at:
  - Scott Street
  - Richmond Road/Wellington Street West
  - Byron Avenue
- Richmond Road at:
  - Kirkwood Avenue
  - Patricia Avenue
  - Future Site Access
- Wellington Street West at Western Avenue

The boundary roads will be Richmond Road and Island Park Drive, and no screenlines are present within proximity to the site.

3.2 Time Periods

As the proposed development is composed of residential units and has only a small ground-floor retail component, the AM and PM peak hours will be examined.

3.3 Horizon Years

The anticipated build-out year is 2023. As a result, the full build-out plus five years horizon year is 2028.

4 Exemption Review

Table 6 summarizes the exemptions for this TIA.

Table 6: Exemption Review

Module	Element	Explanation	Exempt/Required
Design Review Component			
4.1 Development Design	4.1.2 Circulation and Access	Only required for site plans	Required
	4.1.3 New Street Networks	Only required for plans of subdivision	Exempt
4.2 Parking	4.2.1 Parking Supply	Only required for site plans	Required
	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Exempt
Network Impact Component			

Module	Element	Explanation	Exempt/Required
4.5 Transportation Demand Management	All Elements	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Exempt (No network impact components required due to trip generation trigger) A TDM worksheet will be provided and summarized
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Exempt (No network impact components required due to trip generation trigger)
4.8 Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of equivalent volume permitted by established zoning	Exempt (No network impact components required due to trip generation trigger)

As the Screening Form does not identify the need for a full TIA, Table 7 outlines the additional exemptions recommended for this TIA.

Table 7: Recommended Additional Exemptions

Module	Element	Explanation
Forecasting		
3.1 Development-Generated Travel Demand	All Elements	Trip generation trigger was not met
3.3 Demand Rationalization	All Elements	As trip generation trigger was not met, no demand rationalization is required
Design Review Component		
4.4 Access Intersection Design	4.4.2 Access Intersection Control	Private approach does not require review for a roundabout, signal warrant or transit priority impacts
	4.4.3 Access Intersection Design	Access is not provided through a signalized intersection
Network Impact Component		
4.7 Transit	All Elements	No network impact components required due to trip generation trigger
4.9 Network Intersection Design	All Elements	No network impact components required due to trip generation trigger

5 Background Network Travel Demands

5.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3. The transit signal priority on Richmond Road/Wellington Street is the only confirmed project within the study horizons and is not considered to have any notable impact on the study area traffic volumes and travel patterns.

5.2 Background Growth

A review of the background projections from the City's TRANS Regional Model for the 2011 and 2031 horizons was completed to determine the background growth for each of the study area roadways. Table 8 summarizes the results of the model, and the projections are provided in Appendix E.

Table 8: TRANS Regional Model Projections – Study Area Growth Rates

Street	Direction Growth Percentage	
	Eastbound	**Westbound**
Scott	**-1.12%**	**1.55%**
Richmond	**0.31%**	**1.27%**
Wellington	**0.35%**	**1.42%**
Byron	**1.95%**	**0.15%**
	Northbound	**Southbound**
Kirkwood	**-0.39%**	**1.83%**
Patricia	**-6.87%**	**-0.73%**
Island Park	**1.53%**	**-0.24%**
Western	**0.66%**	**5.17%**

In general, the TRANS projections identify a growth rate range of -1.12% and 1.95%, with low-volume outliers excluded. Appropriate growth rates rounded to the nearest 0.25% will be peak-directionally applied to the mainline volumes and major turning movements of identified links with negative growth rates being applied at zero.

5.3 Other Developments

The background developments were described in Section 2.3.2. Those development applications with traffic studies have been explicitly considered in the background volumes.

5.4 2023 Future Background Intersection Operations

Figure 12 illustrates the 2023 background volumes and Table 9 summarizes the background intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection. The Synchro worksheets are provided in Appendix F.

Figure 12: 2023 Future Background Volumes

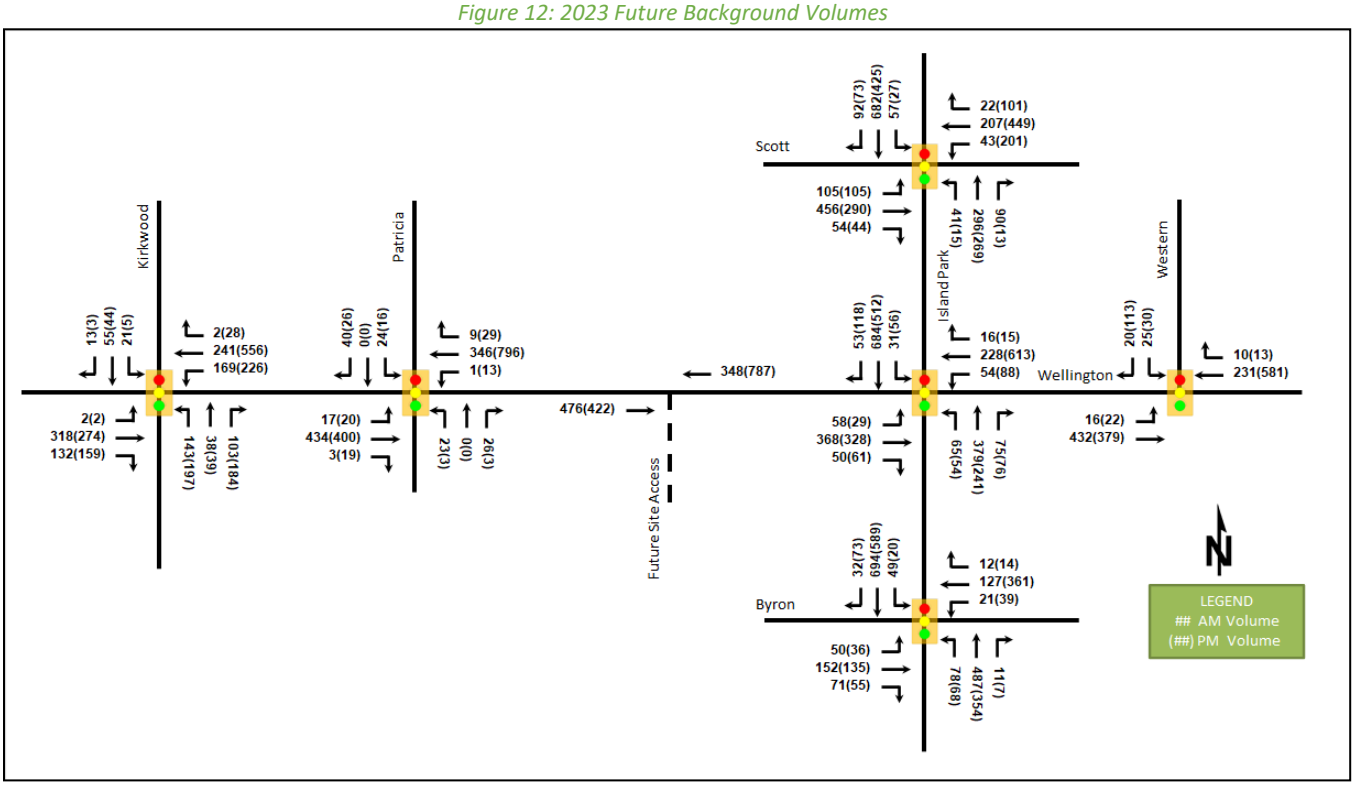


Table 9: 2023 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Richmond Road/Wellington Street W & Island Park Drive *Signalized*	EB	A	0.57	30.2	53.1	A	0.44	22.3	38.4
	WB	A	0.39	27.6	33.8	D	0.81	34.2	**#78.8**
	NBL	B	0.62	49.7	**m#17.0**	A	0.50	32.1	m10.0
	NBT/R	A	0.58	24.4	86.9	A	0.47	16.5	m40.4
	SBL	A	0.10	6.6	m1.4	A	0.17	18.1	13.6
	SBT/R	E	0.92	20.6	**m#65.8**	E	0.92	44.9	**#158.8**
	Overall	**C**	**0.72**	**25.4**	-	**C**	**0.79**	**32.0**	-
Richmond Road & Kirkwood Avenue *Signalized*	EB	A	0.36	13.2	29.1	A	0.36	12.0	26.2
	WB	A	0.47	18.8	35.3	D	0.90	39.2	**#100.1**
	NBL	A	0.31	19.5	29.9	C	0.74	46.5	46.5
	NBT/R	A	0.22	7.1	15.1	A	0.47	9.5	20.0
	SB	A	0.15	15.0	17.4	A	0.14	23.3	13.3
	Overall	**A**	**0.39**	**15.2**	-	**B**	**0.65**	**28.8**	-
Richmond Road & Patricia Avenue *Signalized*	EB	A	0.18	3.7	18.6	A	0.18	3.0	17.3
	WB	A	0.14	3.5	14.3	A	0.32	3.6	36.3
	NB	A	0.20	12.8	8.8	A	0.03	0.3	0.0
	SB	A	0.26	15.7	11.9	A	0.20	15.2	9.0
	Overall	**A**	**0.20**	**4.9**	-	**A**	**0.32**	**3.7**	-
Wellington Street & Western Avenue *Signalized*	EB	A	0.18	3.5	18.8	A	0.21	6.6	17.3
	WB	A	0.17	3.9	22.1	A	0.55	10.7	68.3
	NB	-	-	-	-	-	-	-	-
	SB	A	0.14	0.8	0.0	A	0.34	9.9	16.2
	Overall	**A**	**0.19**	**3.5**	-	**A**	**0.49**	**9.1**	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Scott Street & Island Park Drive ***Signalized***	EBL	A	0.29	23.4	26.2	A	0.40	21.3	26.5
	EBT	B	0.69	31.4	103.7	A	0.33	16.3	50.1
	EBR	A	0.10	9.0	8.9	A	0.06	4.2	5.2
	WBL	A	0.21	23.6	13.5	A	0.44	19.8	42.9
	WBT/R	A	0.35	22.5	47.3	B	0.66	22.7	110.3
	NB	E	0.91	51.0	**#132.7**	A	0.49	27.0	67.0
	SBL	A	0.14	14.6	12.7	A	0.08	21.2	9.1
	SBT/R	E	0.92	40.9	**#203.7**	C	0.78	37.0	**#124.6**
	Overall	**D**	**0.82**	**36.2**	-	**C**	**0.71**	**25.2**	-
Byron Avenue & Island Park Drive ***Signalized***	EB	D	0.83	53.3	69.5	A	0.52	26.3	45.5
	WB	A	0.47	35.6	41.3	D	0.84	44.1	**#92.9**
	NB	B	0.61	13.6	98.9	A	0.52	15.3	72.2
	SB	C	0.72	9.4	m46.4	C	0.72	27.2	m116.1
	Overall	**C**	**0.75**	**19.8**	-	**C**	**0.76**	**28.2**	-

Notes: Saturation flow rate of 1800 veh/h/lane
Peak Hour Factor = 1.00
Queue is measured in metres
Delay is measured in seconds
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

The study area intersection operations for the 2023 future background horizon generally operate similarly to existing operations at peak hours. The peak hour factor increasing from 0.90 to 1.00 improves the operations for all study area intersections when compared to the existing conditions, and in the case of the northbound approach at the Scot Street and Island Park Drive intersection during the AM peak, this effect is significant. This effect illustrates that the northbound approach along Island Park Drive is extremely sensitive to any changes in the analysis parameters and network volumes.

5.5 2028 Future Background Intersection Operations

Figure 13 illustrates the 2028 background volumes and Table 10 summarizes the background intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and HCM 2000 v/c calculations for the overall intersection. The Synchro worksheets are provided in Appendix G.

Figure 13: 2028 Future Background Volumes

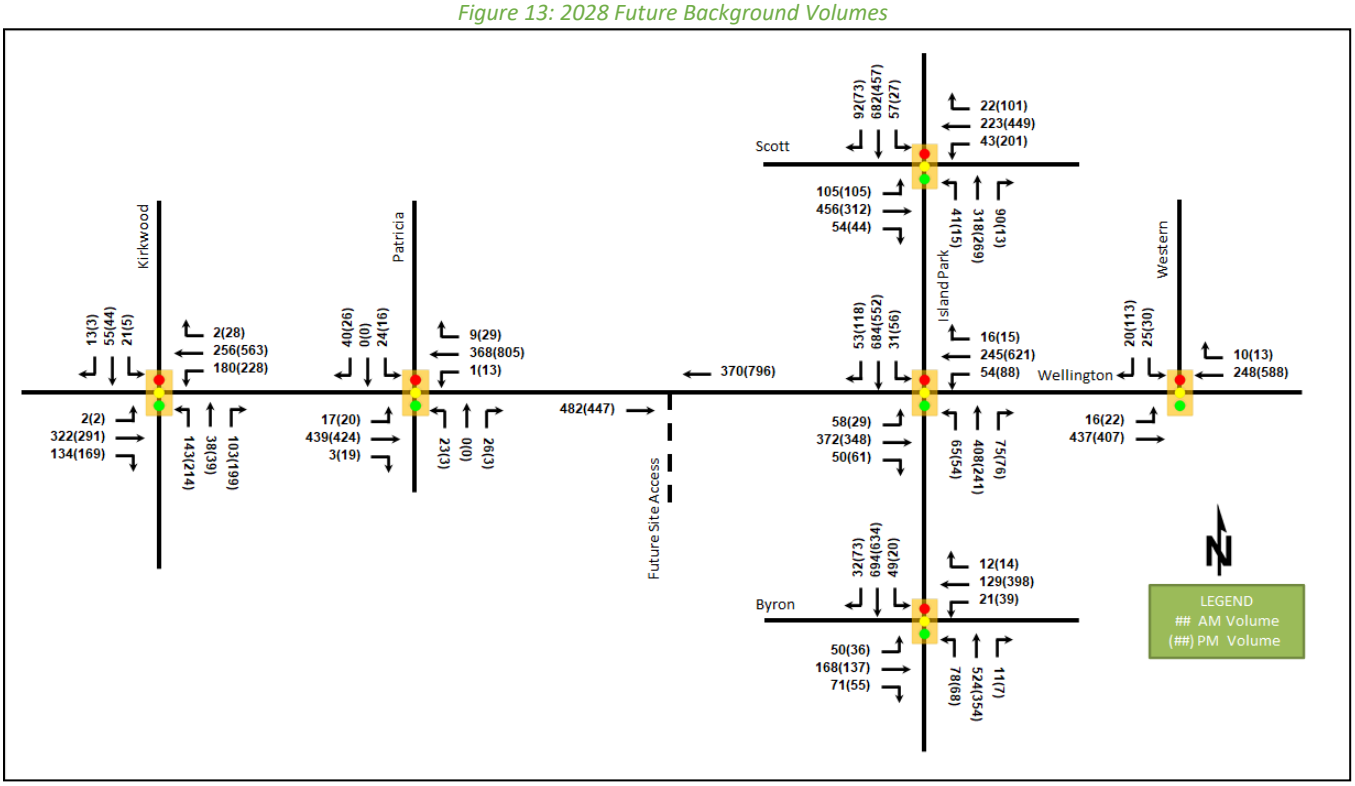


Table 10: 2028 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Richmond Road/Wellington Street W & Island Park Drive ***Signalized***	EB	A	0.57	30.4	53.7	A	0.46	22.8	40.7
	WB	A	0.42	28.0	35.7	D	0.83	35.5	**#85.1**
	NBL	B	0.62	49.8	m15.7	B	0.66	53.1	**m#19.2**
	NBT/R	B	0.61	25.9	94.0	A	0.47	16.6	m40.9
	SBL	A	0.11	6.7	m1.4	A	0.17	18.1	13.6
	SBT/R	E	0.92	20.6	**m#65.8**	E	0.98	55.7	**#173.8**
	Overall	**C**	**0.72**	**25.8**	-	**D**	**0.83**	**36.3**	-
Richmond Road & Kirkwood Avenue ***Signalized***	EB	A	0.36	13.2	29.5	A	0.38	12.5	28.4
	WB	A	0.50	19.3	37.9	E	0.93	43.0	**#103.2**
	NBL	A	0.31	19.5	29.9	C	0.76	46.6	49.3
	NBT/R	A	0.22	7.1	15.1	A	0.47	8.8	19.6
	SB	A	0.15	15.0	17.4	A	0.13	22.1	12.8
	Overall	**A**	**0.41**	**15.5**	-	**B**	**0.68**	**30.4**	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95th)	LOS	V/C	Delay	Q (95th)
Richmond Road & Patricia Avenue *Signalized*	EB	A	0.18	3.7	18.7	A	0.19	3.0	18.3
	WB	A	0.15	3.5	15.2	A	0.32	3.6	36.7
	NB	A	0.20	12.8	8.8	A	0.03	0.3	0.0
	SB	A	0.26	15.7	11.9	A	0.20	15.2	9.0
	Overall	**A**	**0.20**	**4.9**	**-**	**A**	**0.32**	**3.7**	**-**
Wellington Street & Western Avenue *Signalized*	EB	A	0.18	3.5	19.1	A	0.23	6.7	18.6
	WB	A	0.18	3.9	23.6	A	0.56	10.8	69.4
	NB	-	-	-	-	-	-	-	-
	SB	A	0.14	0.8	0.0	A	0.34	9.9	16.2
	Overall	**A**	**0.19**	**3.5**	**-**	**A**	**0.49**	**9.2**	**-**
Scott Street & Island Park Drive *Signalized*	EBL	A	0.30	23.7	26.5	A	0.40	21.3	26.5
	EBT	B	0.69	31.4	103.7	A	0.36	16.7	54.2
	EBR	A	0.10	9.0	8.9	A	0.06	4.2	5.2
	WBL	A	0.21	23.6	13.5	A	0.45	20.4	43.7
	WBT/R	A	0.38	22.9	50.8	B	0.66	22.7	110.3
	NB	E	0.95	57.5	**#126.3**	A	0.52	27.9	68.6
	SBL	A	0.15	14.8	12.7	A	0.08	21.2	9.1
	SBT/R	E	0.92	40.9	**#203.7**	D	0.83	40.7	**#145.4**
	Overall	**D**	**0.83**	**37.7**	**-**	**C**	**0.73**	**26.4**	**-**
Byron Avenue & Island Park Drive *Signalized*	EB	D	0.84	54.0	**#76.7**	A	0.51	25.5	46.3
	WB	A	0.47	34.9	41.9	D	0.88	46.7	**#112.2**
	NB	B	0.65	15.0	109.8	A	0.54	16.3	72.7
	SB	C	0.73	9.7	m46.4	C	0.78	29.7	m117.6
	Overall	**C**	**0.76**	**20.6**	**-**	**D**	**0.82**	**30.2**	**-**

Notes: Saturation flow rate of 1800 veh/h/lane
Peak Hour Factor = 1.00
Queue is measured in metres
Delay is measured in seconds
m = metered queue
# = volume for the 95th %ile cycle exceeds capacity

The study area intersection operations for the 2028 future background horizon operate similarly to the 2023 future background horizon.

6 Development Design

6.1 Design for Sustainable Modes

Bicycle and auto parking are located across two underground parking levels, and hard surface connections are provided from the building entrances to existing area pedestrian facilities.

Area transit route stops are within 400 metres walking distance to the building entrances.

6.2 Circulation and Access

Access to the site is provided via a public lane to Richmond Road. The right of way of the public laneway is 4.9 metres, and a 1.1-metre-wide building setback is provided the east side to permit the lane to function with a width of 6.0 metres. The loading area and parking garage have been recessed from the laneway. Emergency services are able to access the site via the two public road frontages.

7 Parking

7.1 Parking Supply

The site provides 63 resident vehicle parking spaces and eight visitor vehicle parking spaces across two underground parking levels and 96 total bicycle parking stalls.

Required parking from the zoning by-law is 38 vehicle spaces for tenants (at a rate of 0.5 spaces per unit after the first 12, reduced by 10% as all spaces are located underground), eight vehicle spaces for visitors (at a rate of 0.1 spaces per unit after the first 12 units), and 48 bicycle spaces (at a rate of 0.5 spaces per unit). No vehicle spaces are required for the retail component, given it is on the main floor and its gross floor area is less than 500 m^2.

The proposed parking meets the minimum requirements including the minimum visitor parking and bicycle parking requirements.

8 Boundary Street Design

Table 11 summarizes the MMLOS analysis for the boundary streets of Richmond Road and Island Park. The existing and future conditions for both intersections will be the same and are considered in one row. The boundary street analysis is based on the policy area of "Within 300m of a school" where both site frontages are within the specified distance of Hilson Avenue Public School. The MMLOS worksheet has been provided in Appendix H.

Table 11: Boundary Street MMLOS Analysis

Segment	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TkLOS	Target
Richmond Road	A	A	**E**	C	D	D	C	D
Island Park Drive	**C**	A	**F**	D	N/A	D	N/A	E

Island Park Drive does not meet pedestrian LOS targets and both Richmond Road and Island Park Drive do not meet the cycling LOS targets. The traffic volumes on Island Park Drive are above MMLOS thresholds. Bicycle LOS was limited on Richmond Road by mixed traffic conditions, operating speeds, and cross-sectional width and was limited on Island Park Drive by the taper width for the development of the bike lane beyond the intersection limits. Richmond Road would require curbside bike lanes at a minimum to meet its BLOS targets and would require a corridor level study by the City to determine how and where a cycling facility could be implemented. The planned protected intersection implementation at the intersection of Richmond Road/Wellington Street West at Island Park Drive may improve the cycling conditions along the site frontage in future. Transit and truck LOS targets are met on boundary roads.

Crowding PLOS is not considered in the PLOS due to the high-volume threshold. At the lowest threshold given, of 250 pedestrians per hour, the minimum effective sidewalk width required to achieve LOS A would be 3.0 metres, whereby nearly any sidewalk considered for installation in the City would not be able to meet this target.

9 Access Intersections Design

9.1 Location and Design of Access

The residential access will be the public laneway onto Richmond Road, in the existing location of the laneway's right of way. This laneway is located approximately 30 metres west of the signalized intersection of Richmond Road at Island Park Drive. The access is proposed as restricting outbound left-turns through signage, being 6.0 metres in width, and with a throat length of approximately 16.5 metres. The access meets the minimum width

from the zoning by-law's parking queueing and loading provisions. The proposed signage plan is provided in Appendix I.

The proposed access generally meets the Private Approach By-Law (PABL) requirement for a site access. The utilization of the public laneway right-of-way on the western edge of the property removes the access requirements regarding adjacent property limit offset. Within the laneway right-of-way itself, no laneway can sufficiently be located to meet an offset of 3.0 metres, or potential 0.3 metre offset from the adjacent property line. Further to this, the limited site frontage along both Island Park Drive and Richmond Road would not meet the PABL preferred distance requirements for an access to be located 30.0 metres from an adjacent access. The laneway is situated approximately in a midblock location, approximately 24.6 metres from Leighton Terrace and approximately 27.9 metres from Island Park Drive.

Overall, the unique nature of the public laneway is considered to meet the intent of the PABL for the geometry requirements and is located in the optimal location to limit additional accesses within close proximity to the Richmond and Island Park Drive intersection.

10 Transportation Demand Management

10.1 TDM Program

The "suite of post occupancy TDM measures" has been summarized in the TDM checklists for the residential land uses. The checklist is provided in Appendix J. The key TDM measures recommended include:

- Display local area maps with walking and cycling routes, and transit route information and schedules at major entrances
- Provide online links to OC Transpo and STO information
- Inclusion of a 1-month Presto card for first time new townhome purchase and apartment rental, with a set time frame for this offer (e.g. 6-months) from the initial opening of the site
- Unbundle parking cost from purchase or rental costs

11 Summary of Improvements Indicated and Modifications Options

The following summarizes the analysis and results presented in this TIA report:

Proposed Site and Screening

- The proposal for a nine-storey, 96-residential dwelling unit building with 1,455 sq. ft. of ground floor retail uses
- Accesses will be provided along via a public laneway onto Richmond Road, west of its intersection with Island Park Drive
- The development is proposed to be completed as a single phase by 2023
- Only the Location and Safety triggers were met for the TIA Screening

Existing Conditions

- Richmond Road, Wellington Street West, Island Park Drive, Scott Street, and Kirkwood Avenue are arterial roads, and Byron Avenue is a collector road in the study area
- Sidewalks/MUPs are generally provided on both sides of the study area roadways, and on-street bike lanes on both sides of the roadway on Island Park Drive and on the south side of Scott Street and the north side of Byron Avenue

- The high-volume roadways have produced a high number of collisions at the study area intersections, typical of urban areas in Ottawa
- The collisions are predominantly rear end, sideswipe, and turning movement collisions indicating that they are generally lower speed and a result of congestion, and the City completed a review of the intersection and detailed a recommended plan to address collisions including lane reductions, separated cycling facilities, and radii reduction
- Queueing, capacity issues and delays are noted on the northbound and southbound movements of the intersections of Scott Street and Island Park Drive and Richmond Road/Wellington Street West at Island Park Drive during the AM peak hour, extended queuing is noted on various additional peak direction movements scattered throughout the study area, but generally the intersections operate well

Background Conditions

- The background developments with traffic studies were explicitly included in the background conditions, along with a total background growth of rounded TRANS rates along appropriate links' mainline volumes and major turning movements
- All study area intersections at will operate similar to the existing conditions with improvements due to the increase in peak hour factor

Development Design

- The bike and auto parking areas are to be located internal to the building
- Pedestrian connections will be made from the building entrance to the sidewalk along Richmond Road and Island Park Drive
- A loading area and garage ramp have been recessed from the laneway, and emergency services are to access the site via the two public road frontages

Parking

- A total of 63 parking stalls are provided for resident, eight visitor parking stalls and 96 bike stalls are provided, all of which are within the underground garage
- The above parking numbers meet the minimum parking requirements for the site

Boundary Street Design

- The boundary streets will not meet pedestrian MMLOS targets along Island Park Drive and bicycle MMLOS targets along Richmond Road and Island Park Drive
- No improvements are recommended on the federally owned Island Park Drive to address pedestrian LOS which cannot be met given the auto volumes
- No bike lane improvements are recommended for the development recognizing its limited frontage along Richmond Road which would require study by the City for the coordination of facilities along the corridor
- The City's improvement of the Richmond Road and Island Park Drive intersection may improve the cycling and pedestrian levels of service one upgraded to a protected intersection
- Transit and truck LOS targets are met on boundary streets

Access Intersections Design

- A single 6.0-metre-wide access restricting outbound left-turns through signage, approximately 30 metres west of the intersection of Richmond Road at Island Park Drive, with a throat length of approximately 16.5 metres is proposed
- The access is within a public laneway right-of-way, generally meeting PABL requirements, but given location constraints, is not able to provide an offset from the laneway property line, and is mid-block between Island Park Drive and Leighton Terrace slightly below the required 30 metres distance from each

TDM

- Supportive TDM measures to be included within the proposed development should include:
  - Display local area maps with walking and cycling routes, and transit route information and schedules at major entrances
  - Provide online links to OC Transpo and STO information
  - Inclusion of a 1-month Presto card for first time new townhome purchase and apartment rental, with a set time frame for this offer (e.g. 6-months) from the initial opening of the site
  - Unbundle parking cost from purchase or rental costs

12 Conclusion

It is recommended that, from a transportation perspective, the proposed development application proceed.

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A. J. HARTE
100149314
March 10, 2023
PROVINCE OF ONTARIO

Andrew Harte, P.Eng.
Senior Transportation Engineer

Appendix A

TIA Screening Form and PM Certification Form

CGH TRANSPORTATION

6 Plaza Court
Ottawa, ON K2H 7W1

City of Ottawa 2017 TIA Guidelines
Step 1 - Screening Form

Date: 19-Oct-22
Project Number: 2022-072
Project Reference: 70 Richmond Road

1.1 Description of Proposed Development	
Municipal Address	70 Richmond Road
Description of Location	SW corner of Island Park Dr @ Richmond Rd/Wellington St W Intersection
Land Use Classification	TM[2792] S 461
Development Size	96 dwelling units, 1,318 sq. ft. retail
Accesses	Access via an existing rear laneway
Phase of Development	One
Buildout Year	2023
TIA Requirement	Design Review Component

1.2 Trip Generation Trigger		
Land Use Type	Townhomes or apartments	
Development Size	96	Units
Trip Generation Trigger	No	See TRANS Trip Generation Manual (2020) site trip generation attached

1.3 Location Triggers	
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?	Yes
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?	Yes
Location Trigger	Yes

1.4. Safety Triggers	
Are posted speed limits on a boundary street 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)?	Yes
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?	Yes
Does the development include a drive-thru facility?	No
Safety Trigger	Yes

Table 1: Trip Generation Person Trip Rates by Peak Period

Land Use	Land Use Code	Peak Period	Vehicle Trip Rate	Person Trip Rates
Multi-Unit High-Rise	221 & 222 (TRANS)	AM	-	0.80
		PM	-	0.90
Land Use	**Land Use Code**	**Peak Hour**	**Vehicle Trip Rate**	**Person Trip Rates**
Retail (<40k sq. ft.)	820 (ITE)	AM	2.36	3.02
		PM	6.59	8.44

Table 2: Total Residential Person Trip Generation by Peak Period

Land Use	Units	AM Peak Period			PM Peak Period		
		In	Out	Total	In	Out	Total
Multi-Unit High-Rise	96	24	53	77	50	36	86
Land Use	**GFA (sq. ft.)**	**AM Peak Hour**			**PM Peak Hour**		
		In	**Out**	**Total**	**In**	**Out**	**Total**
Retail (<40k sq. ft.)	1,455	2	2	4	6	6	12

Table 3: Trip Generation by Mode

Travel Mode		AM Peak Hour				PM Peak Hour			
		Mode Share	In	Out	Total	Mode Share	In	Out	Total
Multi-Unit (High-Rise)	Auto Driver	**28%**	3	7	11	**33%**	7	5	12
	Auto Passenger	**11%**	1	3	4	**11%**	3	2	4
	Transit	**41%**	6	12	18	**26%**	6	4	10
	Cycling	**3%**	1	1	1	**7%**	2	1	3
	Walking	**16%**	2	5	7	**23%**	6	4	10
	Total	**100%**	**13**	**28**	**41**	**100%**	**24**	**16**	**39**
Retail (<40k sq. ft.)	Auto Driver	**55%**	0	0	0	**50%**	1	1	1
	Auto Passenger	**11%**	0	0	0	**16%**	1	1	2
	Transit	**11%**	0	0	0	**11%**	1	1	1
	Cycling	**0%**	0	0	0	**5%**	0	0	1
	Walking	**23%**	0	0	1	**18%**	1	1	2
	Pass-by	*40%*	*-1*	*-1*	*-2*	*40%*	*-2*	*-2*	*-4*
	Internal Capture	*varies*	*0*	*0*	*0*	*varies*	*0*	*-1*	*-1*
	Total	**100%**	**0**	**0**	**1**	**100%**	**4**	**4**	**7**
Total	Auto Driver	-	3	7	11	-	8	6	13
	Auto Passenger	-	1	3	4	-	4	3	6
	Transit	-	6	12	18	-	7	5	11
	Cycling	-	1	1	1	-	2	1	4
	Walking	-	2	5	8	-	7	5	12
	Total	-	**13**	**28**	**42**	-	**28**	**20**	**46**

As shown above, a total of 43 AM and 46 PM new peak hour two-way person trips are projected as a result of the proposed development.

TIA Plan Reports

On 14 June 2017, the Council of the City of Ottawa adopted new Transportation Impact Assessment (TIA) Guidelines. In adopting the guidelines, Council established a requirement for those preparing and delivering transportation impact assessments and reports to sign a letter of certification.

Individuals submitting TIA reports will be responsible for all aspects of development-related transportation assessment and reporting, and undertaking such work, in accordance and compliance with the City of Ottawa's Official Plan, the Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines.

By submitting the attached TIA report (and any associated documents) and signing this document, the individual acknowledges that s/he meets the four criteria listed below.

CERTIFICATION

1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
4. I am either a licensed[1] or registered[2] professional in good standing, whose field of expertise [check √ appropriate field(s)] is either transportation engineering √ or transportation planning □.

[1,2] License of registration body that oversees the profession is required to have a code of conduct and ethics guidelines that will ensure appropriate conduct and representation for transportation planning and/or transportation engineering works.

City Of Ottawa
Infrastructure Services and Community Sustainability
Planning and Growth Management
110 Laurier Avenue West, 4th fl.
Ottawa, ON K1P 1J1
Tel. : 613-580-2424
Fax: 613-560-6006

Ville d'Ottawa
Services d 'infrastructure et Viabilité des collectivités
Urbanisme et Gestion de la croissance
110, avenue Laurier Ouest
Ottawa (Ontario) K1P 1J1
Tél. : 613-580-2424
Télécopieur: 613-560-6006

Dated at ___Ottawa_____ this __20__ day of _____September_____, 2018.
(City)

Name: _____Andrew Harte_____
(Please Print)

Professional Title: _____Professional Engineer_____

_____
Signature of Individual certifier that s/he meets the above four criteria

Office Contact Information (Please Print)
Address: 6 Plaza Court
City / Postal Code: Ottawa / K2H 7W1
Telephone / Extension: (613) 697-3797
E-Mail Address: Andrew.Harte@CGHTransportation.com

Appendix B

Turning Movement Counts

CGH TRANSPORTATION

Transportation Services - Traffic Services

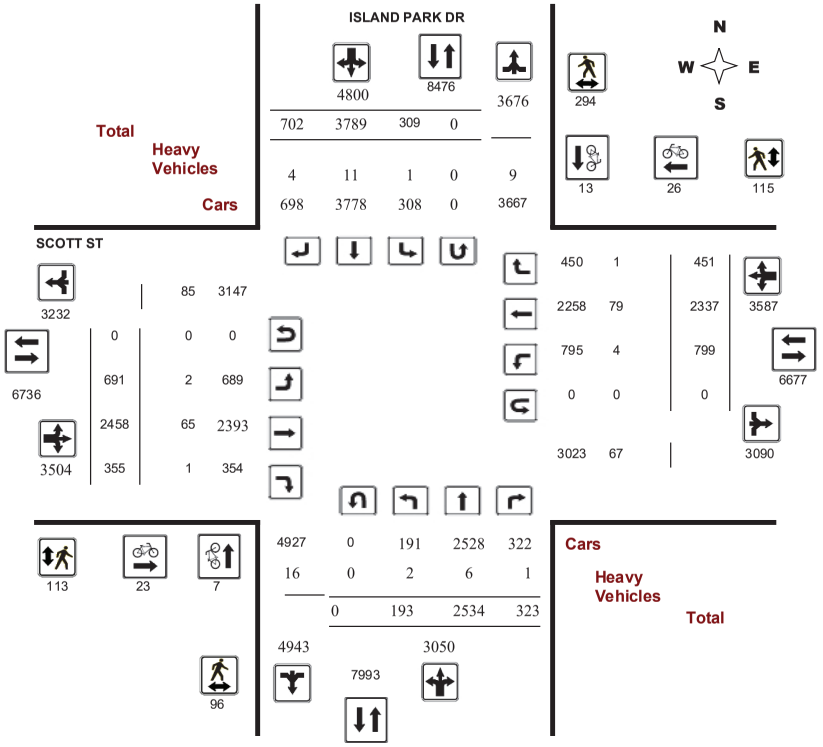
Turning Movement Count - Study Results

ISLAND PARK DR @ SCOTT ST

Survey Date: Tuesday, March 28, 2017 **WO No:** 36808

Start Time: 07:00 **Device:** Miovision

Full Study Diagram



Transportation Services - Traffic Services

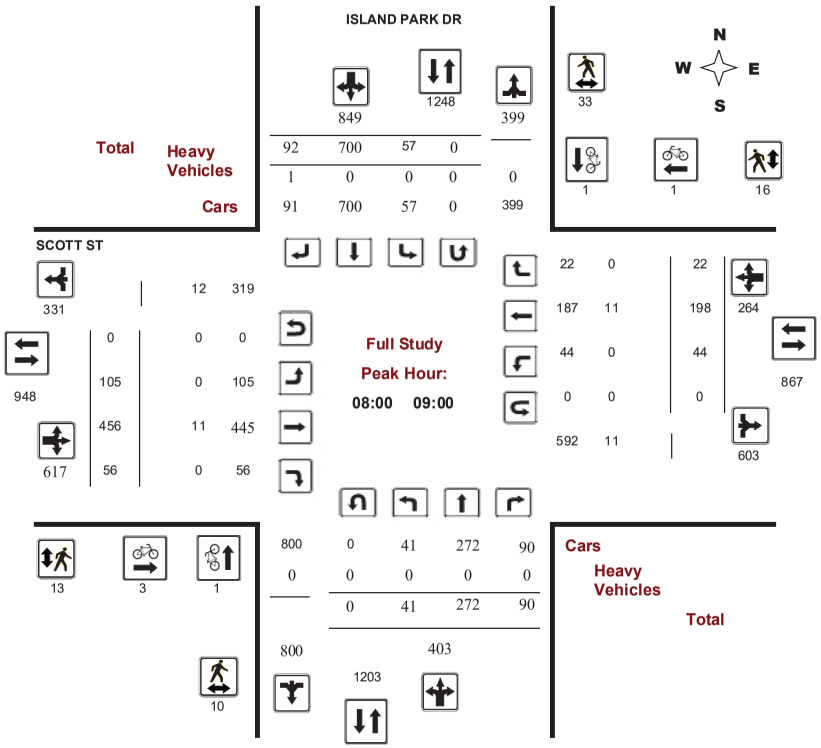
Turning Movement Count - Study Results

ISLAND PARK DR @ SCOTT ST

Survey Date: Tuesday, March 28, 2017 **WO No:** 36808

Start Time: 07:00 **Device:** Miovision

Full Study Peak Hour Diagram



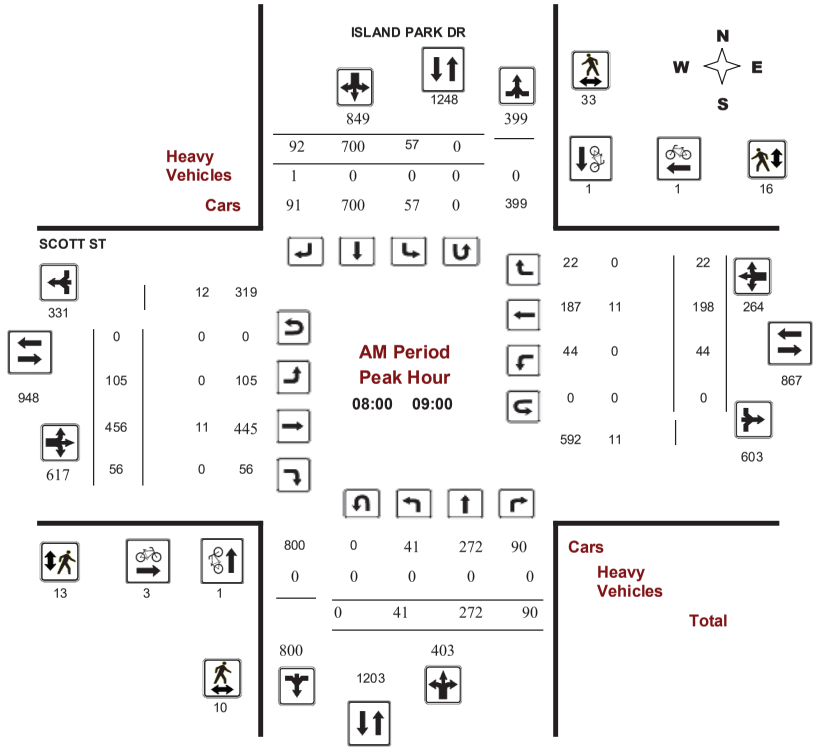
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ISLAND PARK DR @ SCOTT ST

Survey Date: Tuesday, March 28, 2017 **WO No:** 36808

Start Time: 07:00 **Device:** Miovision



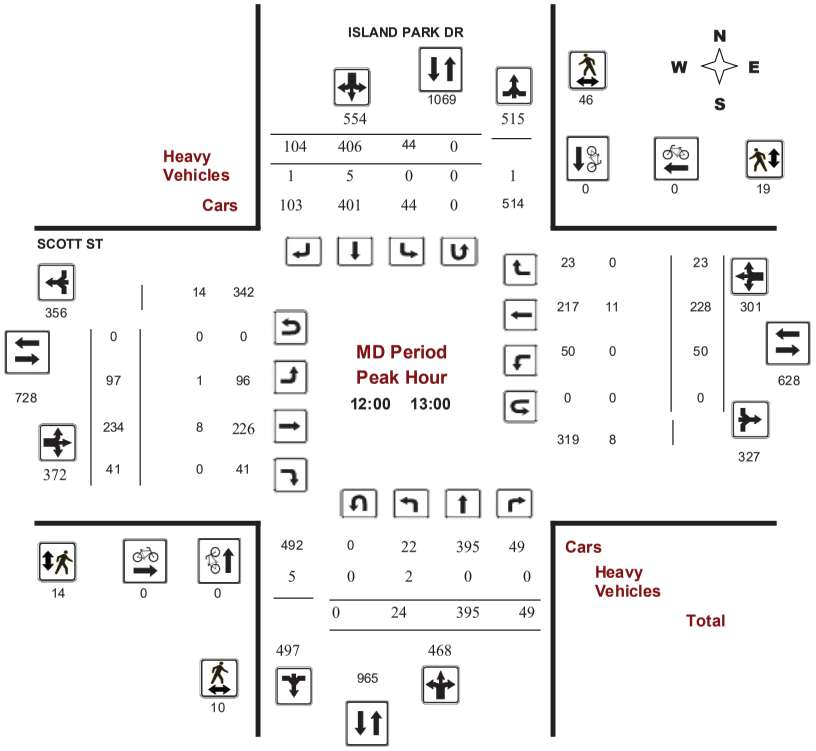
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ISLAND PARK DR @ SCOTT ST

Survey Date: Tuesday, March 28, 2017 **WO No:** 36808

Start Time: 07:00 **Device:** Miovision



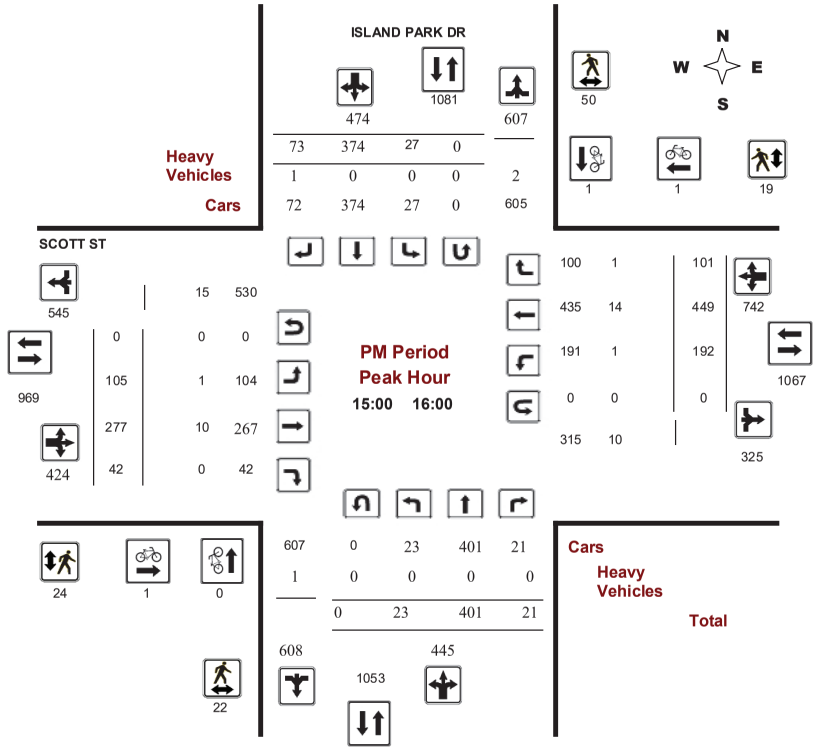
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ISLAND PARK DR @ SCOTT ST

Survey Date: Tuesday, March 28, 2017 **WO No:** 36808

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ISLAND PARK DR @ SCOTT ST

Survey Date: Tuesday, March 28, 2017 **WO No:** 36808

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, March 28, 2017

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor 1.00

	ISLAND PARK DR								SCOTT ST									
	Northbound				Southbound				Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	20	242	79	**341**	32	696	66	**794**	**1135**	48	373	40	**461**	24	149	6	**179**	**640**	**1775**
08:00 09:00	41	272	90	**403**	57	700	92	**849**	**1252**	105	456	56	**617**	44	198	22	**264**	**881**	**2133**
09:00 10:00	37	313	34	**384**	42	542	107	**691**	**1075**	69	270	32	**371**	37	196	14	**247**	**618**	**1693**
11:30 12:30	24	378	36	**438**	27	397	100	**524**	**962**	81	223	46	**350**	54	238	22	**314**	**664**	**1626**
12:30 13:30	34	408	38	**480**	40	387	83	**510**	**990**	107	222	27	**356**	51	207	30	**288**	**644**	**1634**
15:00 16:00	23	401	21	**445**	27	374	73	**474**	**919**	105	277	42	**424**	192	449	101	**742**	**1166**	**2085**
16:00 17:00	5	204	9	**218**	38	330	84	**452**	**670**	80	309	56	**445**	244	449	150	**843**	**1288**	**1958**
17:00 18:00	9	316	16	**341**	46	363	97	**506**	**847**	96	328	56	**480**	153	451	106	**710**	**1190**	**2037**
Sub Total	193	2534	323	**3050**	309	3789	702	**4800**	**7850**	691	2458	355	**3504**	799	2337	451	**3587**	**7091**	**14941**
U Turns				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	193	2534	323	**3050**	309	3789	702	**4800**	**7850**	691	2458	355	**3504**	799	2337	451	**3587**	**7091**	**14941**
EQ 12Hr	268	3522	449	**4240**	430	5267	976	**6672**	**10912**	960	3417	493	**4871**	1111	3248	627	**4986**	**9856**	**20768**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	253	3320	423	**3996**	405	4964	920	**6288**	**10912**	905	3220	465	**4590**	1047	3061	591	**4699**	**9856**	**20768**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**1**					
AVG 24Hr	331	4349	554	**5234**	530	6502	1205	**8237**	**13471**	1186	4218	609	**6013**	1371	4011	774	**6156**	**12169**	**25640**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ISLAND PARK DR @ SCOTT ST

Survey Date: Tuesday, March 28, 2017 **WO No:** 36808

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

		ISLAND PARK DR									SCOTT ST									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	66	13	79	7	197	16	220	0	8	64	6	78	5	27	0	32	0	409
07:15	07:30	7	45	17	69	9	166	13	188	1	9	80	12	101	3	40	0	43	1	401
07:30	07:45	6	64	25	95	7	177	19	203	1	15	89	8	112	5	28	2	35	1	445
07:45	08:00	7	67	24	98	9	156	18	183	1	16	140	14	170	11	54	4	69	1	520
08:00	08:15	9	64	27	100	8	200	16	224	0	21	105	12	138	7	37	5	49	0	511
08:15	08:30	13	71	24	108	18	164	18	200	1	25	117	11	153	13	46	7	66	1	527
08:30	08:45	10	79	17	106	12	171	28	211	0	33	116	20	169	14	51	2	67	0	553
08:45	09:00	9	58	22	89	19	165	30	214	0	26	118	13	157	10	64	8	82	0	542
09:00	09:15	13	104	12	129	13	154	23	190	2	26	89	7	122	12	51	1	64	2	505
09:15	09:30	9	75	6	90	13	135	28	176	0	20	66	8	94	11	59	6	76	0	436
09:30	09:45	8	75	10	93	8	133	29	170	0	15	72	7	94	10	41	4	55	0	412
09:45	10:00	7	59	6	72	8	120	27	155	1	8	43	10	61	4	45	3	52	1	340
11:30	11:45	10	89	6	105	1	100	25	126	3	18	54	5	77	16	55	9	80	3	388
11:45	12:00	6	102	3	111	4	98	20	122	1	20	56	11	87	16	59	6	81	1	401
12:00	12:15	6	102	12	120	11	83	27	121	1	26	49	13	88	9	78	6	93	1	422
12:15	12:30	2	85	15	102	11	116	28	155	2	17	64	17	98	13	46	1	60	2	415
12:30	12:45	8	109	12	129	5	101	24	130	4	25	64	5	94	17	51	10	78	4	431
12:45	13:00	8	99	10	117	17	106	25	148	1	29	57	6	92	11	53	6	70	1	427
13:00	13:15	11	101	7	119	9	105	14	128	1	23	57	7	87	7	57	6	70	1	404
13:15	13:30	7	99	9	115	9	75	20	104	1	30	44	9	83	16	46	8	70	1	372
15:00	15:15	10	124	2	136	3	85	19	107	0	37	70	9	116	48	102	17	167	0	526
15:15	15:30	8	101	4	113	10	88	8	106	0	19	62	13	94	43	109	25	177	0	490
15:30	15:45	3	96	8	107	6	107	21	134	0	27	78	12	117	51	113	28	192	0	550
15:45	16:00	2	80	7	89	8	94	25	127	1	22	67	8	97	50	125	31	206	1	519
16:00	16:15	4	43	5	52	9	75	36	120	0	27	83	17	127	54	118	28	200	0	499
16:15	16:30	1	50	0	51	11	82	13	106	0	12	82	9	103	61	103	44	208	0	468
16:30	16:45	0	50	0	50	12	88	13	113	1	22	73	18	113	65	113	36	214	1	490
16:45	17:00	0	61	4	65	6	85	22	113	1	19	71	12	102	64	115	42	221	1	501
17:00	17:15	3	59	2	64	7	91	22	120	0	19	94	24	137	53	127	42	222	0	543
17:15	17:30	0	79	3	82	14	95	30	139	1	28	81	10	119	39	136	20	195	1	535
17:30	17:45	4	66	4	74	11	96	25	132	0	27	83	10	120	30	101	25	156	0	482
17:45	18:00	2	112	7	121	14	81	20	115	0	22	70	12	104	31	87	19	137	0	477
Total:		193	2534	323	3050	309	3789	702	4800	25	691	2458	355	3504	799	2337	451	3587	25	14,941

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ISLAND PARK DR @ SCOTT ST

Survey Date: Tuesday, March 28, 2017 **WO No:** 36808

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

		ISLAND PARK DR			SCOTT ST			
Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	2	2	0	0	0	2
07:15	07:30	0	2	2	2	0	2	4
07:30	07:45	1	0	1	4	0	4	5
07:45	08:00	0	1	1	5	1	6	7
08:00	08:15	0	1	1	0	1	1	2
08:15	08:30	1	0	1	0	0	0	1
08:30	08:45	0	0	0	2	0	2	2
08:45	09:00	0	0	0	1	0	1	1
09:00	09:15	0	0	0	1	1	2	2
09:15	09:30	0	0	0	2	2	4	4
09:30	09:45	0	0	0	0	0	0	0
09:45	10:00	1	3	4	1	0	1	5
11:30	11:45	0	0	0	1	0	1	1
11:45	12:00	0	0	0	0	0	0	0
12:00	12:15	0	0	0	0	0	0	0
12:15	12:30	0	0	0	0	0	0	0
12:30	12:45	0	0	0	0	0	0	0
12:45	13:00	0	0	0	0	0	0	0
13:00	13:15	0	0	0	0	0	0	0
13:15	13:30	0	0	0	0	1	1	1
15:00	15:15	0	0	0	0	0	0	0
15:15	15:30	0	1	1	0	0	0	1
15:30	15:45	0	0	0	0	1	1	1
15:45	16:00	0	0	0	1	0	1	1
16:00	16:15	0	0	0	0	1	1	1
16:15	16:30	1	0	1	2	0	2	3
16:30	16:45	1	0	1	0	1	1	2
16:45	17:00	2	0	2	0	1	1	3
17:00	17:15	0	1	1	0	8	8	9
17:15	17:30	0	1	1	1	4	5	6
17:30	17:45	0	0	0	0	3	3	3
17:45	18:00	0	1	1	0	1	1	2
Total		7	13	**20**	23	26	49	69

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ISLAND PARK DR @ SCOTT ST

Survey Date: Tuesday, March 28, 2017 **WO No:** 36808

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

		ISLAND PARK DR			SCOTT ST			
Time Period		NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00	07:15	3	3	**6**	1	2	**3**	**9**
07:15	07:30	3	11	**14**	5	4	**9**	**23**
07:30	07:45	2	13	**15**	6	5	**11**	**26**
07:45	08:00	0	5	**5**	1	0	**1**	**6**
08:00	08:15	2	7	**9**	7	1	**8**	**17**
08:15	08:30	4	7	**11**	3	2	**5**	**16**
08:30	08:45	2	13	**15**	2	12	**14**	**29**
08:45	09:00	2	6	**8**	1	1	**2**	**10**
09:00	09:15	1	3	**4**	0	1	**1**	**5**
09:15	09:30	1	1	**2**	0	2	**2**	**4**
09:30	09:45	0	1	**1**	2	0	**2**	**3**
09:45	10:00	2	1	**3**	0	1	**1**	**4**
11:30	11:45	0	9	**9**	0	1	**1**	**10**
11:45	12:00	0	8	**8**	0	5	**5**	**13**
12:00	12:15	6	13	**19**	2	2	**4**	**23**
12:15	12:30	2	15	**17**	6	4	**10**	**27**
12:30	12:45	1	13	**14**	2	11	**13**	**27**
12:45	13:00	1	5	**6**	4	2	**6**	**12**
13:00	13:15	0	8	**8**	4	2	**6**	**14**
13:15	13:30	3	2	**5**	1	1	**2**	**7**
15:00	15:15	5	10	**15**	2	1	**3**	**18**
15:15	15:30	4	8	**12**	3	7	**10**	**22**
15:30	15:45	3	21	**24**	12	2	**14**	**38**
15:45	16:00	10	11	**21**	7	9	**16**	**37**
16:00	16:15	6	3	**9**	5	2	**7**	**16**
16:15	16:30	1	13	**14**	7	2	**9**	**23**
16:30	16:45	6	10	**16**	4	4	**8**	**24**
16:45	17:00	7	10	**17**	4	4	**8**	**25**
17:00	17:15	7	20	**27**	7	7	**14**	**41**
17:15	17:30	5	17	**22**	3	6	**9**	**31**
17:30	17:45	6	19	**25**	6	7	**13**	**38**
17:45	18:00	1	8	**9**	6	5	**11**	**20**
Total	.....	96	294	**390**	113	115	**228**	**618**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ISLAND PARK DR @ SCOTT ST

Survey Date: Tuesday, March 28, 2017 **WO No:** 36808

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

		ISLAND PARK DR									SCOTT ST									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	0	0	**0**	0	0	0	**0**	**0**	0	2	1	**3**	0	3	0	**3**	**6**	**6**
07:15	07:30	0	0	1	**1**	0	0	0	**0**	**1**	0	3	0	**3**	0	1	0	**1**	**4**	**5**
07:30	07:45	0	1	0	**1**	0	0	0	**0**	**1**	0	1	0	**1**	1	2	0	**3**	**4**	**5**
07:45	08:00	0	0	0	**0**	0	0	1	**1**	**1**	0	4	0	**4**	1	2	0	**3**	**7**	**8**
08:00	08:15	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	4	0	**4**	**5**	**5**
08:15	08:30	0	0	0	**0**	0	0	1	**1**	**1**	0	3	0	**3**	0	3	0	**3**	**6**	**7**
08:30	08:45	0	0	0	**0**	0	0	0	**0**	**0**	0	4	0	**4**	0	4	0	**4**	**8**	**8**
08:45	09:00	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	0	0	**0**	**3**	**3**
09:00	09:15	0	2	0	**2**	0	0	0	**0**	**2**	0	2	0	**2**	1	4	0	**5**	**7**	**9**
09:15	09:30	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	2	0	**2**	**2**	**2**
09:30	09:45	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	1	0	**1**	**3**	**3**
09:45	10:00	0	0	0	**0**	1	0	0	**1**	**1**	0	4	0	**4**	0	1	0	**1**	**5**	**6**
11:30	11:45	0	2	0	**2**	0	1	0	**1**	**3**	0	3	0	**3**	0	5	0	**5**	**8**	**11**
11:45	12:00	0	1	0	**1**	0	0	0	**0**	**1**	0	3	0	**3**	0	1	0	**1**	**4**	**5**
12:00	12:15	0	0	0	**0**	0	1	0	**1**	**1**	1	1	0	**2**	0	2	0	**2**	**4**	**5**
12:15	12:30	0	0	0	**0**	0	2	0	**2**	**2**	0	2	0	**2**	0	4	0	**4**	**6**	**8**
12:30	12:45	2	0	0	**2**	0	2	0	**2**	**4**	0	2	0	**2**	0	3	0	**3**	**5**	**9**
12:45	13:00	0	0	0	**0**	0	0	1	**1**	**1**	0	3	0	**3**	0	2	0	**2**	**5**	**6**
13:00	13:15	0	0	0	**0**	0	1	0	**1**	**1**	0	2	0	**2**	0	4	0	**4**	**6**	**7**
13:15	13:30	0	0	0	**0**	0	1	0	**1**	**1**	0	2	0	**2**	0	1	0	**1**	**3**	**4**
15:00	15:15	0	0	0	**0**	0	0	0	**0**	**0**	0	5	0	**5**	0	5	0	**5**	**10**	**10**
15:15	15:30	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	1	0	**1**	**3**	**3**
15:30	15:45	0	0	0	**0**	0	0	0	**0**	**0**	1	1	0	**2**	0	5	1	**6**	**8**	**8**
15:45	16:00	0	0	0	**0**	0	0	1	**1**	**1**	0	2	0	**2**	1	3	0	**4**	**6**	**7**
16:00	16:15	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	4	0	**4**	**5**	**5**
16:15	16:30	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	1	0	**1**	**2**	**2**
16:30	16:45	0	0	0	**0**	0	1	0	**1**	**1**	0	0	0	**0**	0	3	0	**3**	**3**	**4**
16:45	17:00	0	0	0	**0**	0	1	0	**1**	**1**	0	0	0	**0**	0	3	0	**3**	**3**	**4**
17:00	17:15	0	0	0	**0**	0	0	0	**0**	**0**	0	4	0	**4**	0	2	0	**2**	**6**	**6**
17:15	17:30	0	0	0	**0**	0	1	0	**1**	**1**	0	0	0	**0**	0	1	0	**1**	**1**	**2**
17:30	17:45	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	1	0	**1**	**2**	**2**
17:45	18:00	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	1	0	**1**	**2**	**2**
Total:	None	2	6	1	**9**	1	11	4	**16**	**25**	2	65	1	**68**	4	79	1	**84**	**152**	**177**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ISLAND PARK DR @ SCOTT ST

Survey Date: Tuesday, March 28, 2017 **WO No:** 36808

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

Time Period		ISLAND PARK DR Northbound U-Turn Total	ISLAND PARK DR Southbound U-Turn Total	SCOTT ST Eastbound U-Turn Total	SCOTT ST Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		0	0	0	0	0

Transportation Services - Traffic Services

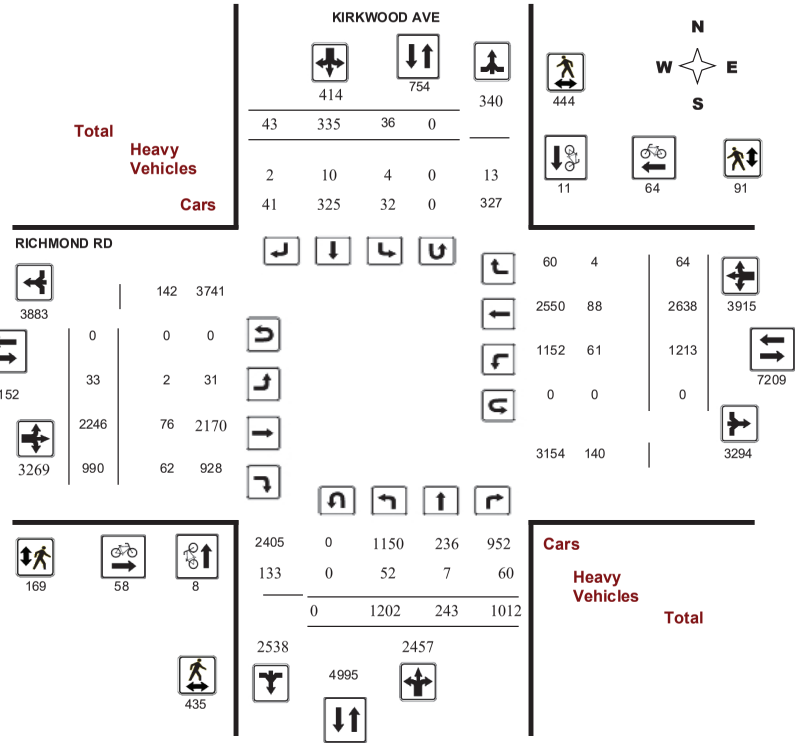
Turning Movement Count - Study Results

KIRKWOOD AVE @ RICHMOND RD

Survey Date: Thursday, April 20, 2017 **WO No:** 36956

Start Time: 07:00 **Device:** Miovision

Full Study Diagram



Transportation Services - Traffic Services

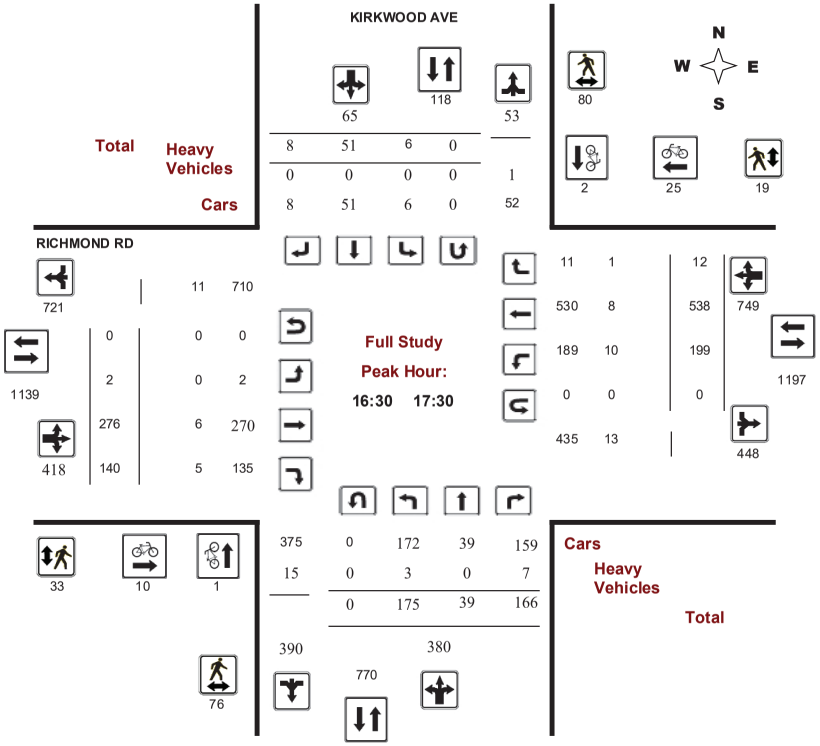
Turning Movement Count - Study Results

KIRKWOOD AVE @ RICHMOND RD

Survey Date: Thursday, April 20, 2017 **WO No:** 36956

Start Time: 07:00 **Device:** Miovision

Full Study Peak Hour Diagram



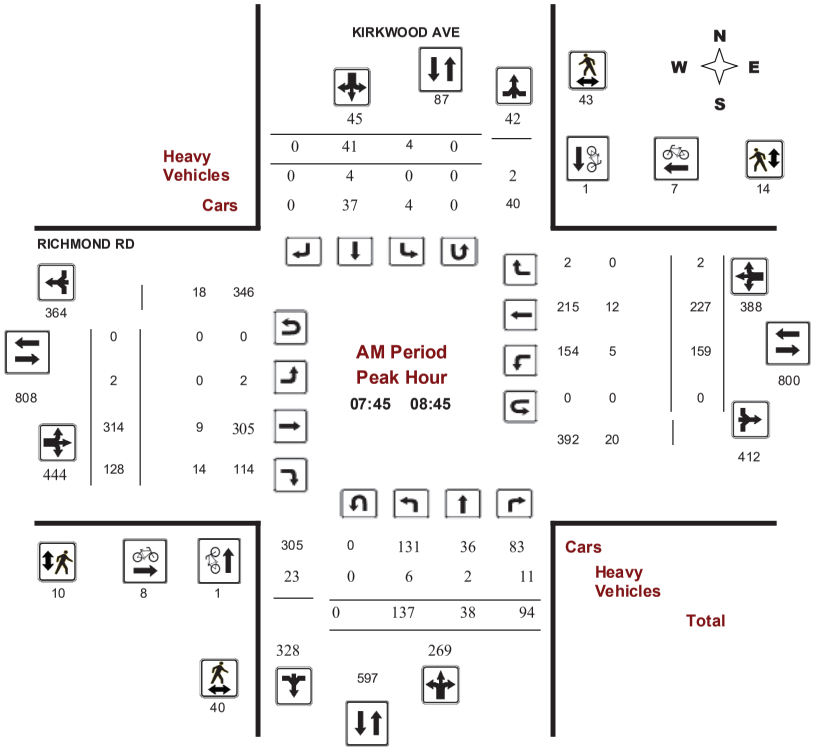
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

KIRKWOOD AVE @ RICHMOND RD

Survey Date: Thursday, April 20, 2017 **WO No:** 36956

Start Time: 07:00 **Device:** Miovision



Comments

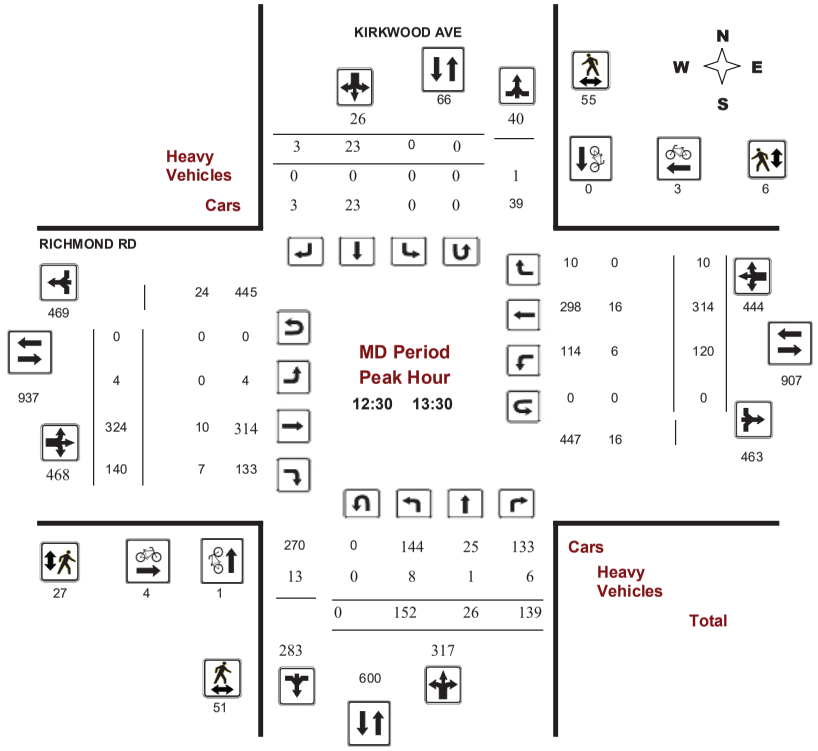
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

KIRKWOOD AVE @ RICHMOND RD

Survey Date: Thursday, April 20, 2017 **WO No:** 36956

Start Time: 07:00 **Device:** Miovision



Comments

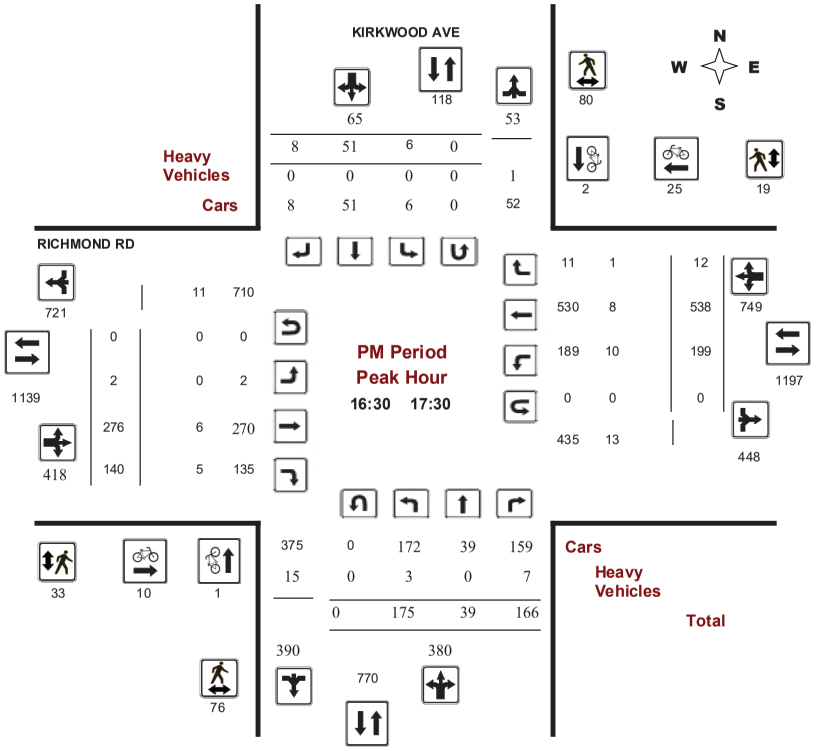
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

KIRKWOOD AVE @ RICHMOND RD

Survey Date: Thursday, April 20, 2017 **WO No:** 36956

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

KIRKWOOD AVE @ RICHMOND RD

Survey Date: Thursday, April 20, 2017 **WO No:** 36956

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Thursday, April 20, 2017

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor .90

	KIRKWOOD AVE									RICHMOND RD									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	126	33	70	**229**	3	38	1	**42**	**271**	8	274	106	**388**	135	139	2	**276**	**664**	**935**
08:00 09:00	135	34	98	**267**	3	39	0	**42**	**309**	2	294	127	**423**	160	217	3	**380**	**803**	**1112**
09:00 10:00	129	30	109	**268**	6	37	6	**49**	**317**	5	242	87	**334**	126	235	5	**366**	**700**	**1017**
11:30 12:30	137	20	121	**278**	5	31	10	**46**	**324**	6	287	138	**431**	115	339	13	**467**	**898**	**1222**
12:30 13:30	152	26	139	**317**	0	23	3	**26**	**343**	4	324	140	**468**	120	314	10	**444**	**912**	**1255**
15:00 16:00	146	30	143	**319**	10	74	5	**89**	**408**	2	281	128	**411**	165	394	5	**564**	**975**	**1383**
16:00 17:00	191	27	171	**389**	3	47	9	**59**	**448**	2	263	121	**386**	201	511	15	**727**	**1113**	**1561**
17:00 18:00	186	43	161	**390**	6	46	9	**61**	**451**	4	281	143	**428**	191	489	11	**691**	**1119**	**1570**
Sub Total	1202	243	1012	**2457**	36	335	43	**414**	**2871**	33	2246	990	**3269**	1213	2638	64	**3915**	**7184**	**10055**
U Turns				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	1202	243	1012	**2457**	36	335	43	**414**	**2871**	33	2246	990	**3269**	1213	2638	64	**3915**	**7184**	**10055**
EQ 12Hr	1671	338	1407	**3415**	50	466	60	**575**	**3991**	46	3122	1376	**4544**	1686	3667	89	**5442**	**9986**	**13976**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	1417	286	1193	**2897**	42	395	51	**488**	**3592**	39	2648	1167	**3854**	1430	3110	75	**4616**	**8987**	**12578**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**0.9**					
AVG 24Hr	1856	375	1563	**3795**	56	517	66	**639**	**4434**	51	3469	1529	**5049**	1873	4074	99	**6047**	**11096**	**15530**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

KIRKWOOD AVE @ RICHMOND RD

Survey Date: Thursday, April 20, 2017 **WO No:** 36956

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

		KIRKWOOD AVE									RICHMOND RD									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	22	9	12	43	0	6	1	7	2	3	47	21	71	37	33	1	71	2	192
07:15	07:30	32	6	18	56	0	5	0	5	9	1	59	26	86	18	21	0	39	9	186
07:30	07:45	34	8	23	65	2	11	0	13	6	2	79	33	114	46	38	1	85	6	277
07:45	08:00	38	10	17	65	1	16	0	17	8	2	89	26	117	34	47	0	81	8	280
08:00	08:15	27	9	26	62	0	7	0	7	5	0	76	35	111	43	56	1	100	5	280
08:15	08:30	38	10	21	69	0	2	0	2	6	0	74	32	106	34	64	1	99	6	276
08:30	08:45	34	9	30	73	3	16	0	19	4	0	75	35	110	48	60	0	108	4	310
08:45	09:00	36	6	21	63	0	14	0	14	7	2	69	25	96	35	37	1	73	7	246
09:00	09:15	30	7	26	63	2	7	1	10	2	0	62	25	87	32	52	2	86	2	246
09:15	09:30	27	11	31	69	2	11	2	15	4	0	65	19	84	30	67	0	97	4	265
09:30	09:45	32	7	29	68	1	9	1	11	5	2	53	25	80	27	61	2	90	5	249
09:45	10:00	40	5	23	68	1	10	2	13	4	3	62	18	83	37	55	1	93	4	257
11:30	11:45	34	4	29	67	1	12	2	15	8	0	74	36	110	26	80	4	110	8	302
11:45	12:00	30	5	22	57	3	8	0	11	2	4	74	30	108	30	92	4	126	2	302
12:00	12:15	45	6	34	85	0	5	4	9	5	1	72	41	114	34	77	4	115	5	323
12:15	12:30	28	5	36	69	1	6	4	11	5	1	67	31	99	25	90	1	116	5	295
12:30	12:45	43	6	34	83	0	4	2	6	5	1	77	32	110	29	74	3	106	5	305
12:45	13:00	34	8	37	79	0	10	0	10	6	1	80	37	118	27	83	1	111	6	318
13:00	13:15	32	7	30	69	0	3	1	4	0	0	82	32	114	31	81	4	116	0	303
13:15	13:30	43	5	38	86	0	6	0	6	4	2	85	39	126	33	76	2	111	4	329
15:00	15:15	33	8	32	73	3	22	1	26	2	0	77	32	109	33	74	2	109	2	317
15:15	15:30	32	5	38	75	3	9	1	13	4	0	69	30	99	51	101	0	152	4	339
15:30	15:45	45	10	39	94	1	24	1	26	5	2	66	26	94	36	103	0	139	5	353
15:45	16:00	36	7	34	77	3	19	2	24	1	0	69	40	109	45	116	3	164	1	374
16:00	16:15	52	8	52	112	3	12	2	17	4	2	74	30	106	38	118	5	161	4	396
16:15	16:30	58	5	38	101	0	10	3	13	7	0	56	25	81	57	134	2	193	7	388
16:30	16:45	32	7	42	81	0	14	4	18	1	0	67	26	93	61	132	6	199	1	391
16:45	17:00	49	7	39	95	0	11	0	11	4	0	66	40	106	45	127	2	174	4	386
17:00	17:15	41	13	44	98	4	13	4	21	1	0	62	44	106	56	162	2	220	1	445
17:15	17:30	53	12	41	106	2	13	0	15	4	2	81	30	113	37	117	2	156	4	390
17:30	17:45	37	5	35	77	0	9	2	11	0	0	67	37	104	60	122	5	187	0	379
17:45	18:00	55	13	41	109	0	11	3	14	5	2	71	32	105	38	88	2	128	5	356
Total:		1202	243	1012	2457	36	335	43	414	135	33	2246	990	3269	1213	2638	64	3915	135	10,055

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

KIRKWOOD AVE @ RICHMOND RD

Survey Date: Thursday, April 20, 2017 **WO No:** 36956

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

Time Period		KIRKWOOD AVE			RICHMOND RD			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	0	0	4	1	5	5
07:15	07:30	0	0	0	2	2	4	4
07:30	07:45	1	0	1	5	1	6	7
07:45	08:00	0	0	0	2	1	3	3
08:00	08:15	0	0	0	1	3	4	4
08:15	08:30	1	0	1	2	1	3	4
08:30	08:45	0	1	1	3	2	5	6
08:45	09:00	0	0	0	2	2	4	4
09:00	09:15	0	0	0	0	1	1	1
09:15	09:30	0	1	1	3	2	5	6
09:30	09:45	0	0	0	1	1	2	2
09:45	10:00	0	0	0	0	0	0	0
11:30	11:45	1	0	1	0	3	3	4
11:45	12:00	1	1	2	1	1	2	4
12:00	12:15	1	0	1	0	0	0	1
12:15	12:30	0	0	0	1	0	1	1
12:30	12:45	1	0	1	1	1	2	3
12:45	13:00	0	0	0	1	1	2	2
13:00	13:15	0	0	0	2	0	2	2
13:15	13:30	0	0	0	0	1	1	1
15:00	15:15	0	0	0	1	1	2	2
15:15	15:30	0	0	0	2	0	2	2
15:30	15:45	0	0	0	0	2	2	2
15:45	16:00	0	1	1	2	2	4	5
16:00	16:15	0	4	4	2	0	2	6
16:15	16:30	0	0	0	0	2	2	2
16:30	16:45	0	0	0	3	5	8	8
16:45	17:00	0	2	2	4	8	12	14
17:00	17:15	0	0	0	1	3	4	4
17:15	17:30	1	0	1	2	9	11	12
17:30	17:45	0	1	1	5	5	10	11
17:45	18:00	1	0	1	5	3	8	9
Total		8	11	**19**	58	64	122	141

Transportation Services - Traffic Services

Turning Movement Count - Study Results

KIRKWOOD AVE @ RICHMOND RD

Survey Date: Thursday, April 20, 2017 **WO No:** 36956

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

Time Period		KIRKWOOD AVE			RICHMOND RD			
		NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00	07:15	0	3	**3**	1	0	**1**	**4**
07:15	07:30	3	7	**10**	1	2	**3**	**13**
07:30	07:45	9	7	**16**	6	4	**10**	**26**
07:45	08:00	16	14	**30**	1	4	**5**	**35**
08:00	08:15	14	9	**23**	1	5	**6**	**29**
08:15	08:30	7	11	**18**	3	4	**7**	**25**
08:30	08:45	3	9	**12**	5	1	**6**	**18**
08:45	09:00	10	11	**21**	1	0	**1**	**22**
09:00	09:15	8	3	**11**	3	1	**4**	**15**
09:15	09:30	13	6	**19**	1	1	**2**	**21**
09:30	09:45	8	15	**23**	6	2	**8**	**31**
09:45	10:00	14	14	**28**	1	0	**1**	**29**
11:30	11:45	16	17	**33**	2	1	**3**	**36**
11:45	12:00	13	14	**27**	2	1	**3**	**30**
12:00	12:15	13	19	**32**	10	3	**13**	**45**
12:15	12:30	11	19	**30**	2	2	**4**	**34**
12:30	12:45	11	11	**22**	5	2	**7**	**29**
12:45	13:00	8	17	**25**	8	1	**9**	**34**
13:00	13:15	16	14	**30**	7	2	**9**	**39**
13:15	13:30	16	13	**29**	7	1	**8**	**37**
15:00	15:15	15	22	**37**	11	3	**14**	**51**
15:15	15:30	21	12	**33**	1	1	**2**	**35**
15:30	15:45	22	13	**35**	10	6	**16**	**51**
15:45	16:00	13	20	**33**	5	4	**9**	**42**
16:00	16:15	25	15	**40**	14	5	**19**	**59**
16:15	16:30	13	11	**24**	7	3	**10**	**34**
16:30	16:45	22	19	**41**	2	5	**7**	**48**
16:45	17:00	18	17	**35**	5	6	**11**	**46**
17:00	17:15	16	23	**39**	8	2	**10**	**49**
17:15	17:30	20	21	**41**	18	6	**24**	**65**
17:30	17:45	21	20	**41**	9	9	**18**	**59**
17:45	18:00	20	18	**38**	6	4	**10**	**48**
Total		435	444	**879**	169	91	**260**	**1139**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

KIRKWOOD AVE @ RICHMOND RD

Survey Date: Thursday, April 20, 2017 **WO No:** 36956

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

		KIRKWOOD AVE									RICHMOND RD									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	1	0	1	**2**	0	0	0	**0**	**2**	0	1	0	**1**	0	3	0	**3**	**4**	**6**
07:15	07:30	5	0	4	**9**	0	0	0	**0**	**9**	0	4	2	**6**	2	2	0	**4**	**10**	**19**
07:30	07:45	3	0	2	**5**	0	1	0	**1**	**6**	0	4	2	**6**	2	2	0	**4**	**10**	**16**
07:45	08:00	2	1	3	**6**	0	2	0	**2**	**8**	0	3	3	**6**	0	3	0	**3**	**9**	**17**
08:00	08:15	1	0	3	**4**	0	1	0	**1**	**5**	0	2	1	**3**	1	3	0	**4**	**7**	**12**
08:15	08:30	3	1	2	**6**	0	0	0	**0**	**6**	0	1	5	**6**	2	5	0	**7**	**13**	**19**
08:30	08:45	0	0	3	**3**	0	1	0	**1**	**4**	0	3	5	**8**	2	1	0	**3**	**11**	**15**
08:45	09:00	4	0	2	**6**	0	1	0	**1**	**7**	0	4	2	**6**	2	3	0	**5**	**11**	**18**
09:00	09:15	0	0	2	**2**	0	0	0	**0**	**2**	0	4	2	**6**	1	3	0	**4**	**10**	**12**
09:15	09:30	1	1	2	**4**	0	0	0	**0**	**4**	0	2	1	**3**	1	2	0	**3**	**6**	**10**
09:30	09:45	0	0	4	**4**	1	0	0	**1**	**5**	1	2	1	**4**	3	5	0	**8**	**12**	**17**
09:45	10:00	2	0	2	**4**	0	0	0	**0**	**4**	0	5	1	**6**	4	4	0	**8**	**14**	**18**
11:30	11:45	4	0	1	**5**	1	1	1	**3**	**8**	0	5	2	**7**	1	3	0	**4**	**11**	**19**
11:45	12:00	0	0	1	**1**	1	0	0	**1**	**2**	1	4	2	**7**	2	3	2	**7**	**14**	**16**
12:00	12:15	1	1	2	**4**	0	0	1	**1**	**5**	0	3	0	**3**	1	3	0	**4**	**7**	**12**
12:15	12:30	2	1	1	**4**	0	1	0	**1**	**5**	0	1	6	**7**	5	3	0	**8**	**15**	**20**
12:30	12:45	3	1	1	**5**	0	0	0	**0**	**5**	0	2	1	**3**	1	5	0	**6**	**9**	**14**
12:45	13:00	4	0	2	**6**	0	0	0	**0**	**6**	0	4	2	**6**	3	5	0	**8**	**14**	**20**
13:00	13:15	0	0	0	**0**	0	0	0	**0**	**0**	0	3	3	**6**	1	4	0	**5**	**11**	**11**
13:15	13:30	1	0	3	**4**	0	0	0	**0**	**4**	0	1	1	**2**	1	2	0	**3**	**5**	**9**
15:00	15:15	0	0	2	**2**	0	0	0	**0**	**2**	0	2	4	**6**	2	2	0	**4**	**10**	**12**
15:15	15:30	2	1	1	**4**	0	0	0	**0**	**4**	0	3	2	**5**	4	2	0	**6**	**11**	**15**
15:30	15:45	2	0	2	**4**	0	1	0	**1**	**5**	0	2	1	**3**	0	3	0	**3**	**6**	**11**
15:45	16:00	0	0	1	**1**	0	0	0	**0**	**1**	0	1	2	**3**	3	4	1	**8**	**11**	**12**
16:00	16:15	0	0	2	**2**	1	1	0	**2**	**4**	0	1	1	**2**	3	1	0	**4**	**6**	**10**
16:15	16:30	4	0	3	**7**	0	0	0	**0**	**7**	0	1	1	**2**	0	2	0	**2**	**4**	**11**
16:30	16:45	0	0	1	**1**	0	0	0	**0**	**1**	0	2	1	**3**	4	1	0	**5**	**8**	**9**
16:45	17:00	1	0	3	**4**	0	0	0	**0**	**4**	0	1	1	**2**	2	2	0	**4**	**6**	**10**
17:00	17:15	0	0	1	**1**	0	0	0	**0**	**1**	0	2	3	**5**	4	3	1	**8**	**13**	**14**
17:15	17:30	2	0	2	**4**	0	0	0	**0**	**4**	0	1	0	**1**	0	2	0	**2**	**3**	**7**
17:30	17:45	0	0	0	**0**	0	0	0	**0**	**0**	0	1	2	**3**	2	1	0	**3**	**6**	**6**
17:45	18:00	4	0	1	**5**	0	0	0	**0**	**5**	0	1	2	**3**	2	1	0	**3**	**6**	**11**
Total:	None	52	7	60	**119**	4	10	2	**16**	**135**	2	76	62	**140**	61	88	4	**153**	**293**	**428**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

KIRKWOOD AVE @ RICHMOND RD

Survey Date: Thursday, April 20, 2017 **WO No:** 36956

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

		KIRKWOOD AVE	KIRKWOOD AVE	RICHMOND RD	RICHMOND RD	
Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		0	0	0	0	0

Transportation Services - Traffic Services

W.O. 36949

Turning Movement Count - 15 Minute Summary Report

PATRICIA AVE @ RICHMOND RD

Survey Date: Tuesday, April 25, 2017

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 4 Westbound: 1

		PATRICIA AVE									RICHMOND RD									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	2	0	1	**3**	4	0	8	**12**	**15**	8	40	1	**49**	1	52	4	**57**	**106**	**121**
07:15	07:30	2	0	8	**10**	6	0	7	**13**	**23**	2	60	0	**62**	0	52	0	**52**	**114**	**137**
07:30	07:45	3	0	5	**8**	0	0	10	**10**	**18**	5	71	1	**78**	1	62	2	**65**	**143**	**161**
07:45	08:00	3	0	11	**14**	8	0	9	**17**	**31**	4	125	1	**130**	0	82	3	**85**	**215**	**246**
08:00	08:15	13	0	4	**17**	7	0	7	**14**	**31**	3	99	1	**103**	1	76	4	**81**	**184**	**215**
08:15	08:30	6	0	6	**12**	4	0	11	**15**	**27**	7	89	1	**97**	0	76	2	**78**	**175**	**202**
08:30	08:45	1	0	5	**6**	5	0	13	**18**	**24**	3	96	0	**99**	0	85	0	**85**	**184**	**208**
08:45	09:00	4	0	3	**7**	3	0	3	**6**	**13**	2	95	2	**99**	0	83	3	**86**	**185**	**198**
09:00	09:15	1	0	2	**3**	1	0	2	**3**	**6**	5	92	0	**97**	0	89	6	**95**	**192**	**198**
09:15	09:30	1	0	2	**3**	5	0	5	**10**	**13**	1	77	2	**80**	0	95	0	**95**	**175**	**188**
09:30	09:45	1	0	2	**3**	5	0	10	**15**	**18**	2	92	1	**95**	0	91	1	**92**	**187**	**205**
09:45	10:00	1	0	4	**5**	2	0	2	**4**	**9**	2	79	0	**81**	1	102	1	**104**	**185**	**194**
11:30	11:45	3	0	2	**5**	3	0	5	**8**	**13**	4	92	2	**98**	0	103	2	**105**	**203**	**216**
11:45	12:00	2	0	0	**2**	2	0	6	**8**	**10**	7	89	1	**98**	0	117	6	**123**	**221**	**231**
12:00	12:15	1	0	0	**1**	3	0	6	**9**	**10**	8	101	2	**111**	0	109	7	**116**	**227**	**237**
12:15	12:30	1	0	2	**3**	1	0	4	**5**	**8**	2	108	2	**112**	0	103	4	**107**	**219**	**227**
12:30	12:45	1	0	0	**1**	5	0	6	**11**	**12**	4	119	2	**125**	1	111	1	**113**	**238**	**250**
12:45	13:00	0	0	1	**1**	3	0	5	**8**	**9**	6	108	1	**115**	1	103	3	**107**	**222**	**231**
13:00	13:15	1	0	0	**1**	2	0	3	**5**	**6**	7	104	3	**114**	1	88	1	**90**	**204**	**210**
13:15	13:30	1	0	3	**4**	0	0	6	**6**	**10**	5	97	2	**104**	2	92	1	**95**	**199**	**209**
15:00	15:15	0	0	1	**1**	2	0	8	**10**	**11**	7	111	2	**120**	0	115	5	**120**	**240**	**251**
15:15	15:30	2	0	4	**6**	3	0	2	**5**	**11**	6	104	2	**112**	1	153	3	**157**	**269**	**280**
15:30	15:45	0	0	1	**1**	6	0	6	**12**	**13**	2	107	1	**110**	0	134	1	**135**	**245**	**258**
15:45	16:00	0	0	0	**0**	6	0	7	**13**	**13**	4	91	4	**99**	2	141	6	**149**	**248**	**261**
16:00	16:15	0	0	1	**1**	1	0	1	**2**	**3**	5	107	3	**115**	2	188	2	**192**	**307**	**310**
16:15	16:30	1	0	1	**2**	1	0	4	**5**	**7**	6	99	3	**108**	2	192	5	**199**	**307**	**314**
16:30	16:45	0	0	1	**1**	4	0	7	**11**	**12**	4	108	7	**120**	1	238	4	**244**	**364**	**376**
16:45	17:00	0	0	1	**1**	5	0	8	**13**	**14**	6	109	4	**119**	2	230	9	**241**	**360**	**374**
17:00	17:15	1	0	1	**2**	5	0	5	**10**	**12**	4	131	3	**138**	4	194	8	**206**	**344**	**356**
17:15	17:30	2	0	0	**2**	2	0	6	**8**	**10**	5	112	5	**122**	5	208	8	**221**	**343**	**353**
17:30	17:45	0	0	3	**3**	4	0	7	**11**	**14**	4	119	9	**133**	1	194	5	**200**	**333**	**347**
17:45	18:00	1	0	1	**2**	3	0	8	**11**	**13**	5	95	4	**104**	3	203	3	**209**	**313**	**326**
TOTAL:		55	0	76	**131**	111	0	197	**308**	**439**	145	3126	72	**3347**	32	3961	110	**4104**	**7451**	**7890**

Note: U-Turns are included in Totals.

Comment:

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order 36949

PATRICIA AVE @ RICHMOND RD

Count Date: Tuesday, April 25, 2017 **Start Time:** 07:00

	PATRICIA AVE			RICHMOND RD			
Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 08:00	3	2	**5**	17	6	**23**	**28**
08:00 09:00	1	0	**1**	15	7	**22**	**23**
09:00 10:00	1	2	**3**	11	3	**14**	**17**
11:30 12:30	0	1	**1**	9	12	**21**	**22**
12:30 13:30	0	2	**2**	13	6	**19**	**21**
15:00 16:00	0	1	**1**	6	6	**12**	**13**
16:00 17:00	0	2	**2**	12	10	**22**	**24**
17:00 18:00	0	3	**3**	12	16	**28**	**31**
Total	5	13	**18**	95	66	**161**	**179**

Comment:

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

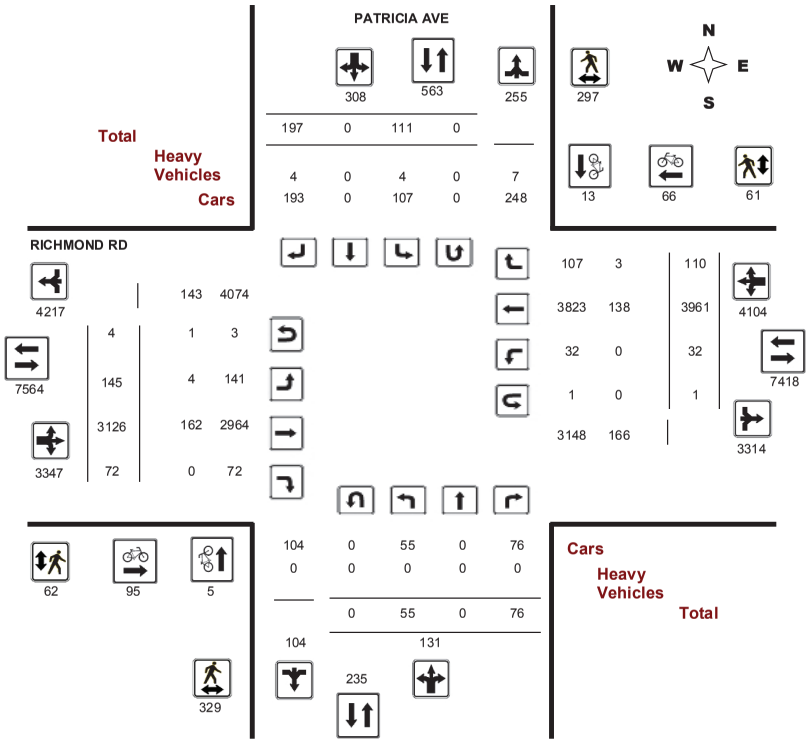
Turning Movement Count - Full Study Diagram

PATRICIA AVE @ RICHMOND RD

Survey Date: Tuesday, April 25, 2017

WO#: 36949

Device: Miovision



Comments

Transportation Services - Traffic Services

W.O. 36949

Turning Movement Count - Heavy Vehicle Report

PATRICIA AVE @ RICHMOND RD

Survey Date: Tuesday, April 25, 2017

		PATRICIA AVE									RICHMOND RD									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	08:00	0	0	0	**0**	0	0	1	**1**	**1**	1	22	0	**23**	0	8	0	**8**	**31**	**32**
08:00	09:00	0	0	0	**0**	0	0	1	**1**	**1**	0	23	0	**23**	0	16	0	**16**	**39**	**40**
09:00	10:00	0	0	0	**0**	2	0	0	**2**	**2**	1	28	0	**29**	0	20	0	**20**	**49**	**51**
11:30	12:30	0	0	0	**0**	1	0	0	**1**	**1**	1	23	0	**24**	0	23	3	**26**	**50**	**51**
12:30	13:30	0	0	0	**0**	0	0	1	**1**	**1**	1	28	0	**29**	0	27	0	**27**	**56**	**57**
15:00	16:00	0	0	0	**0**	1	0	1	**2**	**2**	0	14	0	**14**	0	15	0	**15**	**29**	**31**
16:00	17:00	0	0	0	**0**	0	0	0	**0**	**0**	0	14	0	**15**	0	14	0	**14**	**29**	**29**
17:00	18:00	0	0	0	**0**	0	0	0	**0**	**0**	0	10	0	**10**	0	15	0	**15**	**25**	**25**
Sub Total		0	0	0	**0**	4	0	4	**8**	**8**	4	162	0	**167**	0	138	3	**141**	**308**	**316**
U-Turns (Heavy Vehicles)					**0**				**0**	**0**				**1**				**0**	**1**	**1**
Total		0	0	0	**0**	4	0	4	**8**	**8**	4	162	0	**168**	0	138	3	**141**	**309**	**317**

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

Work Order 36949

Turning Movement Count - Pedestrian Volume Report

PATRICIA AVE @ RICHMOND RD

Count Date: Tuesday, April 25, 2017 **Start Time:** 07:00

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	3	2	**5**	1	1	**2**	**7**
07:15 07:30	7	3	**10**	3	1	**4**	**14**
07:30 07:45	10	4	**14**	1	1	**2**	**16**
07:45 08:00	19	9	**28**	5	3	**8**	**36**
07:00 08:00	39	18	**57**	10	6	**16**	**73**
08:00 08:15	13	9	**22**	4	3	**7**	**29**
08:15 08:30	15	3	**18**	5	0	**5**	**23**
08:30 08:45	7	8	**15**	2	5	**7**	**22**
08:45 09:00	0	7	**7**	0	2	**2**	**9**
08:00 09:00	35	27	**62**	11	10	**21**	**83**
09:00 09:15	4	9	**13**	2	1	**3**	**16**
09:15 09:30	15	4	**19**	2	0	**2**	**21**
09:30 09:45	9	6	**15**	2	0	**2**	**17**
09:45 10:00	3	8	**11**	1	0	**1**	**12**
09:00 10:00	31	27	**58**	7	1	**8**	**66**
11:30 11:45	8	15	**23**	2	1	**3**	**26**
11:45 12:00	8	26	**34**	6	4	**10**	**44**
12:00 12:15	15	11	**26**	3	1	**4**	**30**
12:15 12:30	22	19	**41**	2	2	**4**	**45**
11:30 12:30	53	71	**124**	13	8	**21**	**145**
12:30 12:45	12	15	**27**	0	0	**0**	**27**
12:45 13:00	18	19	**37**	4	0	**4**	**41**
13:00 13:15	17	12	**29**	1	1	**2**	**31**
13:15 13:30	9	4	**13**	2	0	**2**	**15**
12:30 13:30	56	50	**106**	7	1	**8**	**114**
15:00 15:15	5	11	**16**	0	5	**5**	**21**
15:15 15:30	9	9	**18**	2	4	**6**	**24**
15:30 15:45	8	9	**17**	0	0	**0**	**17**
15:45 16:00	9	7	**16**	1	4	**5**	**21**
15:00 16:00	31	36	**67**	3	13	**16**	**83**
16:00 16:15	8	12	**20**	1	0	**1**	**21**
16:15 16:30	8	3	**11**	2	5	**7**	**18**
16:30 16:45	6	11	**17**	4	3	**7**	**24**
16:45 17:00	10	12	**22**	3	3	**6**	**28**
16:00 17:00	32	38	**70**	10	11	**21**	**91**
17:00 17:15	14	10	**24**	1	3	**4**	**28**
17:15 17:30	14	8	**22**	0	5	**5**	**27**
17:30 17:45	17	7	**24**	0	1	**1**	**25**
17:45 18:00	7	5	**12**	0	2	**2**	**14**
17:00 18:00	52	30	**82**	1	11	**12**	**94**
Total	329	297	**626**	62	61	**123**	**749**

Comment:

Transportation Services - Traffic Services

Work Order 36949

Turning Movement Count - Full Study Summary Report

PATRICIA AVE @ RICHMOND RD

Survey Date: Tuesday, April 25, 2017

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 4 Westbound: 1

AADT Factor .90

Full Study

	PATRICIA AVE									RICHMOND RD									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	10	0	25	**35**	18	0	34	**52**	**87**	19	296	3	**318**	2	248	9	**259**	**577**	**664**
08:00 09:00	24	0	18	**42**	19	0	34	**53**	**95**	15	379	4	**398**	1	320	9	**330**	**728**	**823**
09:00 10:00	4	0	10	**14**	13	0	19	**32**	**46**	10	340	3	**353**	1	377	8	**386**	**739**	**785**
11:30 12:30	7	0	4	**11**	9	0	21	**30**	**41**	21	390	7	**418**	0	432	19	**451**	**869**	**910**
12:30 13:30	3	0	4	**7**	10	0	20	**30**	**37**	22	428	8	**458**	5	394	6	**405**	**863**	**900**
15:00 16:00	2	0	6	**8**	17	0	23	**40**	**48**	19	413	9	**441**	3	543	15	**561**	**1002**	**1050**
16:00 17:00	1	0	4	**5**	11	0	20	**31**	**36**	21	423	17	**461**	7	848	20	**875**	**1336**	**1372**
17:00 18:00	4	0	5	**9**	14	0	26	**40**	**49**	18	457	21	**496**	13	799	24	**836**	**1332**	**1381**
Sub Total	55	0	76	**131**	111	0	197	**308**	**439**	145	3126	72	**3343**	32	3961	110	**4103**	**7446**	**7885**
U Turns				**0**				**0**	**0**				**4**				**1**	**5**	**5**
Total	55	0	76	**131**	111	0	197	**308**	**439**	145	3126	72	**3347**	32	3961	110	**4104**	**7451**	**7890**
EQ 12Hr	76	0	106	**182**	154	0	274	**428**	**610**	202	4345	100	**4652**	44	5506	153	**5705**	**10357**	**10967**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													**1.39**						
AVG 12Hr	69	0	95	**164**	139	0	246	**385**	**549**	181	3911	90	**4187**	40	4955	138	**5134**	**9321**	**9870**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													**.90**						
AVG 24Hr	90	0	125	**215**	182	0	323	**505**	**720**	238	5123	118	**5485**	52	6491	180	**6726**	**12211**	**12931**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.													**1.31**						

Comments:

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

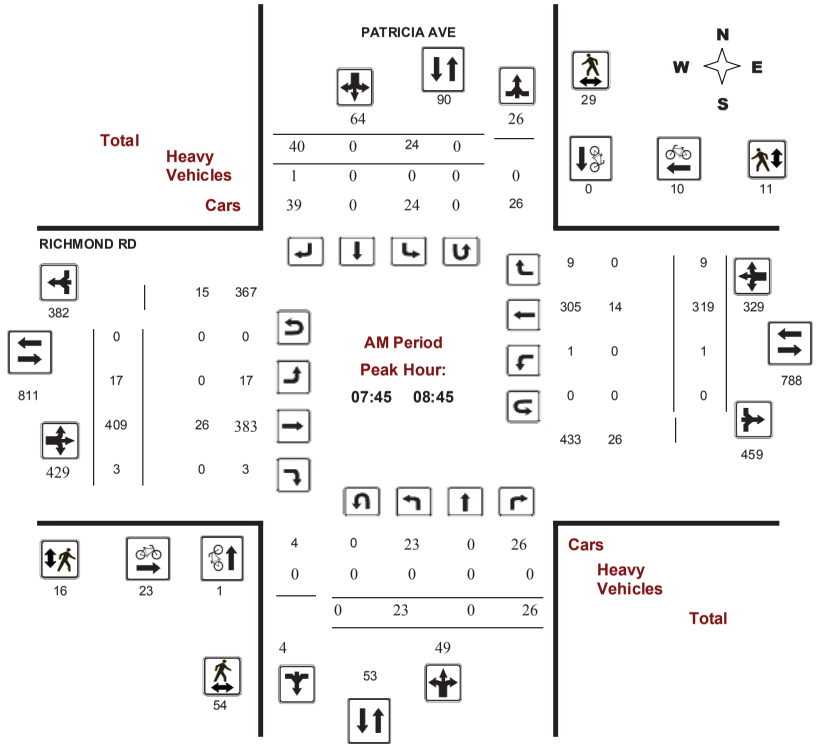
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

PATRICIA AVE @ RICHMOND RD

Survey Date: Tuesday, April 25, 2017 **WO No:** 36949

Start Time: 07:00 **Device:** Miovision



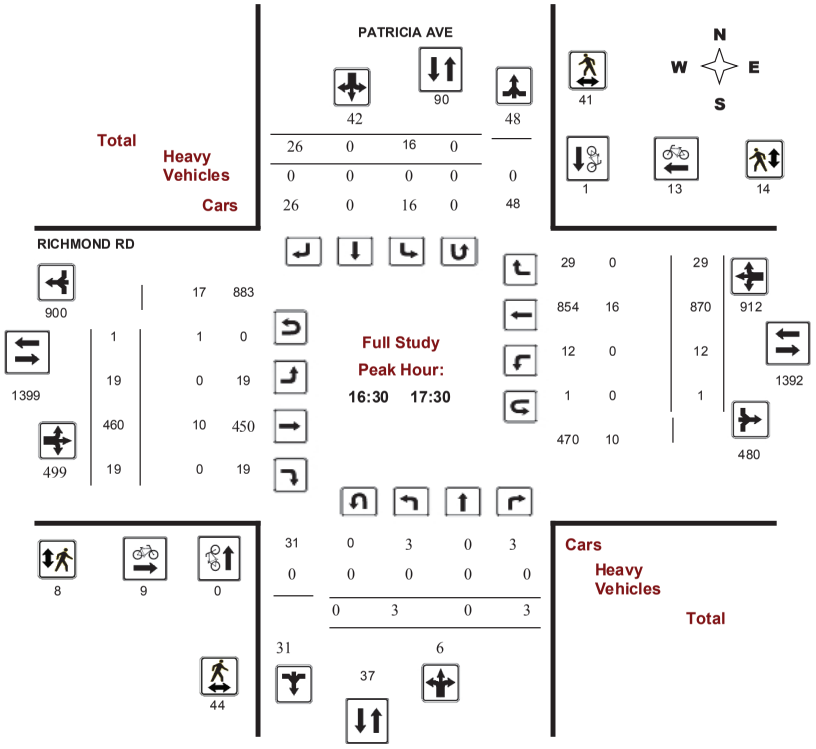
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

PATRICIA AVE @ RICHMOND RD

Survey Date: Tuesday, April 25, 2017 **WO No:** 36949

Start Time: 07:00 **Device:** Miovision


PATRICIA AVE
RICHMOND RD
N
W
E
S
Total
Heavy Vehicles
Cars
Full Study
Peak Hour:
16:30 17:30
42
90
48
26 0 16 0
0 0 0 0 0
26 0 16 0 48
41
1
13
14
900
1399
499
17 883
1 0
0 19
10 450
0 19
1
19
460
19
29 0
854 16
12 0
1 0
470 10
29
870
12
1
912
1392
480
8
9
0
44
31 0 3 0 3
0 0 0 0 0
0 3 0 3
31
37
6
Cars
Heavy Vehicles
Total
Comments

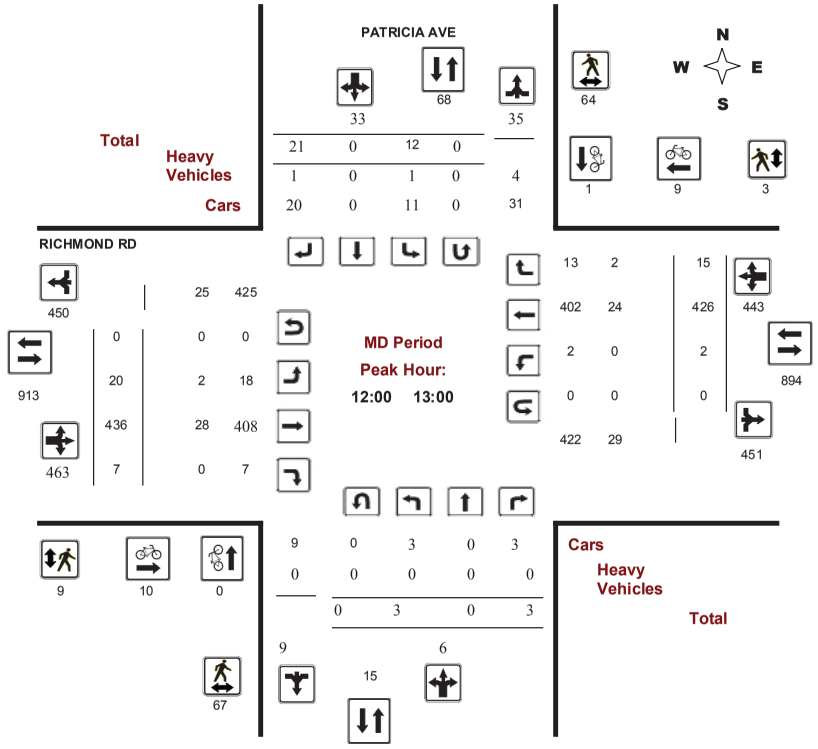
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

PATRICIA AVE @ RICHMOND RD

Survey Date: Tuesday, April 25, 2017 **WO No:** 36949

Start Time: 07:00 **Device:** Miovision



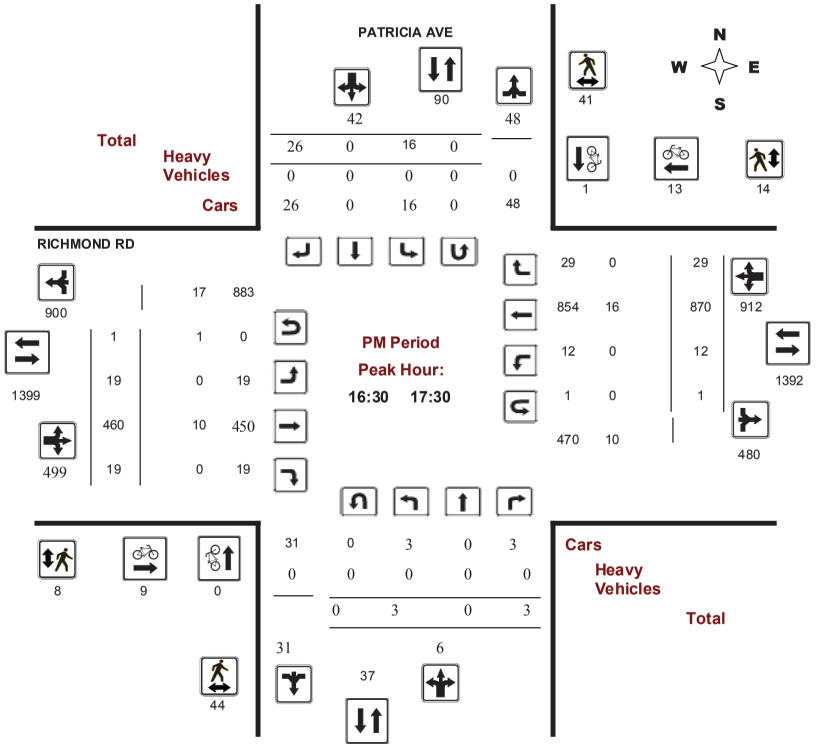
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

PATRICIA AVE @ RICHMOND RD

Survey Date: Tuesday, April 25, 2017 **WO No:** 36949

Start Time: 07:00 **Device:** Miovision



Transportation Services - Traffic Services

Work Order 36949

Turning Movement Count - 15 Min U-Turn Total Report

PATRICIA AVE @ RICHMOND RD

Survey Date: Tuesday, April 25, 2017

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	1	0	1
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	1	0	1
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	1	1	2
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	1	0	1
17:45	18:00	0	0	0	0	0
Total		0	0	4	1	5

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ISLAND PARK DR @ RICHMOND RD

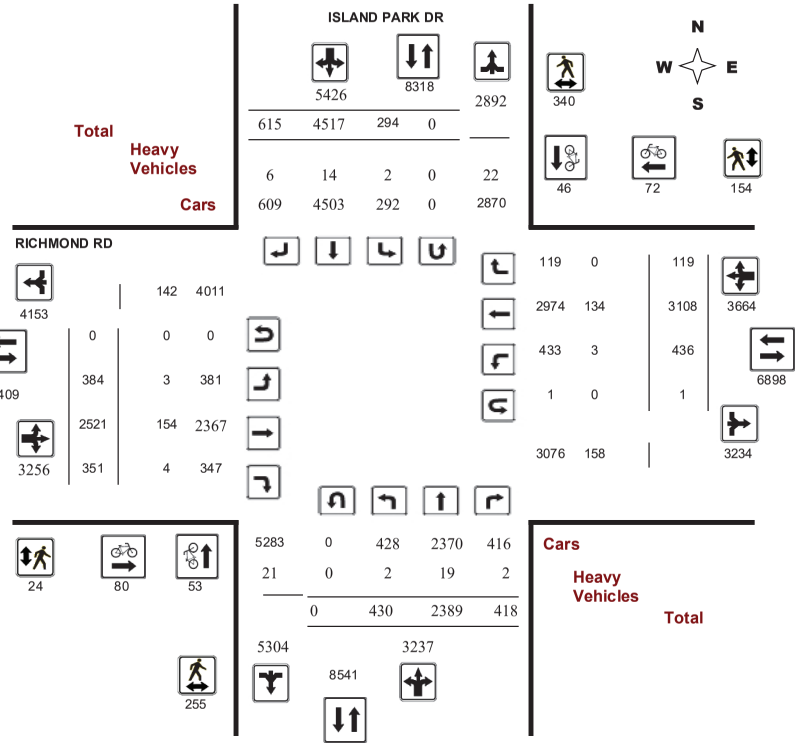
Survey Date: Tuesday, April 25, 2017

Start Time: 07:00

WO No: 36954

Device: Miovision

Full Study Diagram



Transportation Services - Traffic Services

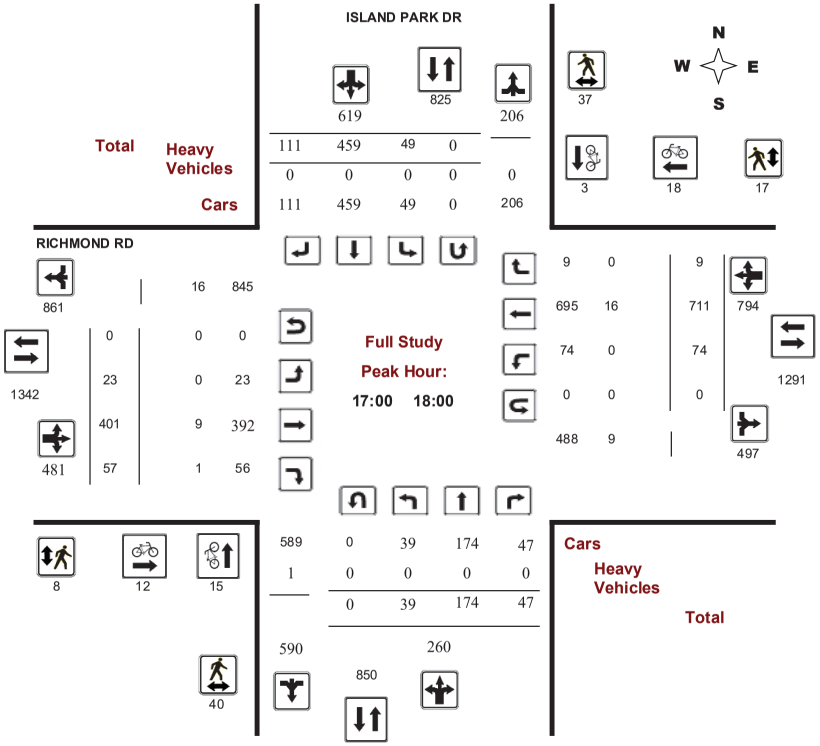
Turning Movement Count - Study Results

ISLAND PARK DR @ RICHMOND RD

Survey Date: Tuesday, April 25, 2017 **WO No:** 36954

Start Time: 07:00 **Device:** Miovision

Full Study Peak Hour Diagram



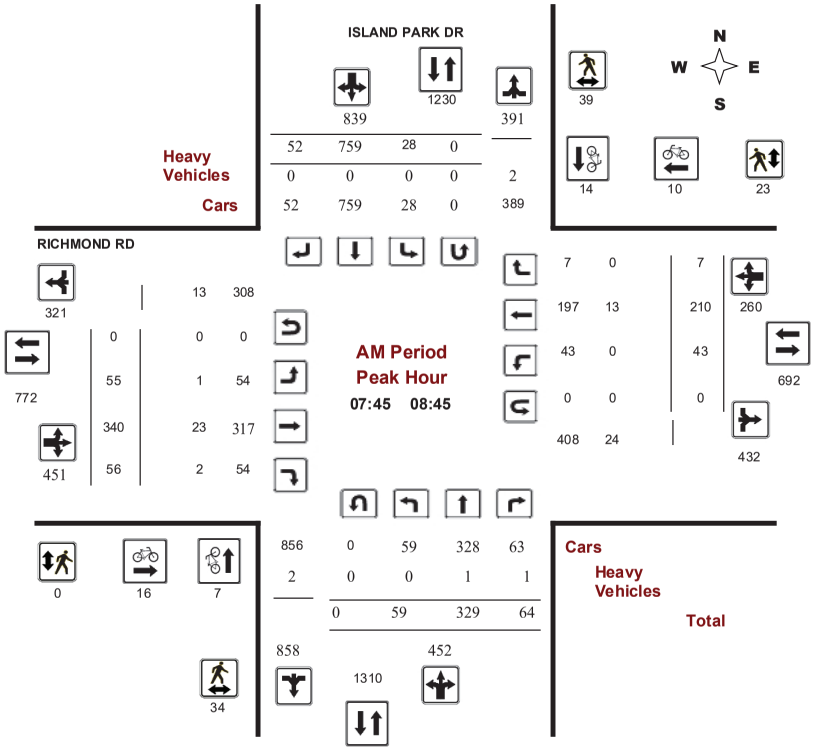
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ISLAND PARK DR @ RICHMOND RD

Survey Date: Tuesday, April 25, 2017 **WO No:** 36954

Start Time: 07:00 **Device:** Miovision



Comments

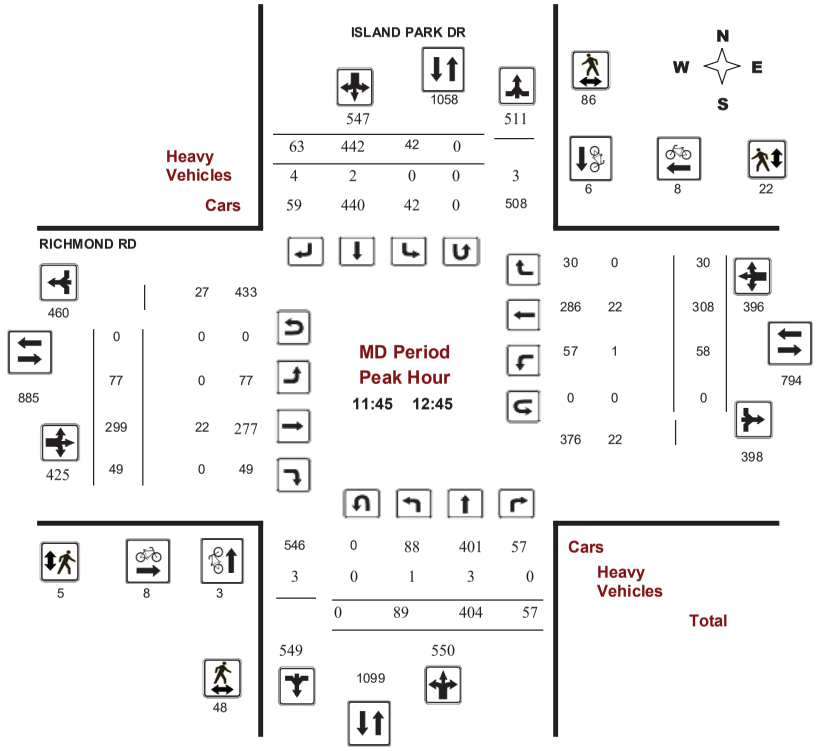
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ISLAND PARK DR @ RICHMOND RD

Survey Date: Tuesday, April 25, 2017 **WO No:** 36954

Start Time: 07:00 **Device:** Miovision



Comments

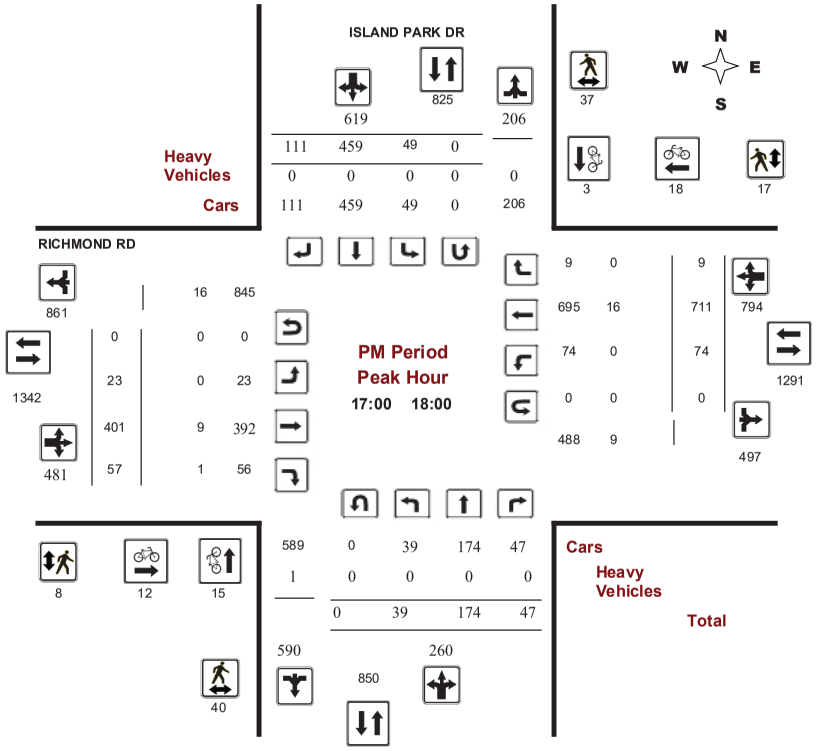
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

ISLAND PARK DR @ RICHMOND RD

Survey Date: Tuesday, April 25, 2017 **WO No:** 36954

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ISLAND PARK DR @ RICHMOND RD

Survey Date: Tuesday, April 25, 2017 **WO No:** 36954

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, April 25, 2017

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 1

AADT Factor .90

	ISLAND PARK DR									RICHMOND RD									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	47	266	36	**349**	31	766	52	**849**	**1198**	34	230	49	**313**	34	160	9	**203**	**516**	**1714**
08:00 09:00	60	331	63	**454**	35	764	54	**853**	**1307**	48	331	40	**419**	43	213	10	**266**	**685**	**1992**
09:00 10:00	62	340	55	**457**	31	626	80	**737**	**1194**	49	281	42	**372**	32	250	18	**300**	**672**	**1866**
11:30 12:30	95	380	57	**532**	41	459	71	**571**	**1103**	72	276	45	**393**	57	291	31	**379**	**772**	**1875**
12:30 13:30	53	444	68	**565**	39	403	62	**504**	**1069**	80	312	35	**427**	54	297	21	**372**	**799**	**1868**
15:00 16:00	40	341	57	**438**	29	524	83	**636**	**1074**	57	327	47	**431**	60	446	12	**518**	**949**	**2023**
16:00 17:00	34	113	35	**182**	39	516	102	**657**	**839**	21	363	36	**420**	82	740	9	**831**	**1251**	**2090**
17:00 18:00	39	174	47	**260**	49	459	111	**619**	**879**	23	401	57	**481**	74	711	9	**794**	**1275**	**2154**
Sub Total	430	2389	418	**3237**	294	4517	615	**5426**	**8663**	384	2521	351	**3256**	436	3108	119	**3663**	**6919**	**15582**
U Turns				**0**				**0**	**0**				**0**				**1**	**1**	**1**
Total	430	2389	418	**3237**	294	4517	615	**5426**	**8663**	384	2521	351	**3256**	436	3108	119	**3664**	**6920**	**15583**
EQ 12Hr	598	3321	581	**4499**	409	6279	855	**7542**	**12042**	534	3504	488	**4526**	606	4320	165	**5093**	**9619**	**21660**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	507	2817	493	**3816**	347	5326	725	**6397**	**10838**	453	2972	414	**3839**	514	3664	140	**4320**	**8657**	**19494**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**0.9**					
AVG 24Hr	664	3690	646	**5000**	454	6976	950	**8380**	**13380**	593	3894	542	**5029**	673	4800	184	**5659**	**10688**	**24068**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ISLAND PARK DR @ RICHMOND RD

Survey Date: Tuesday, April 25, 2017 **WO No:** 36954

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

		ISLAND PARK DR									RICHMOND RD									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	10	57	9	76	9	201	9	219	1	3	32	8	43	3	35	1	39	1	377
07:15	07:30	9	53	9	71	10	188	14	212	1	9	54	14	77	7	33	4	44	1	404
07:30	07:45	11	68	5	84	7	188	15	210	3	8	53	7	68	13	36	3	52	3	414
07:45	08:00	17	88	13	118	5	189	14	208	0	14	91	20	125	11	56	1	68	0	519
08:00	08:15	13	80	26	119	8	198	11	217	1	16	91	12	119	6	48	2	56	1	511
08:15	08:30	15	79	10	104	10	197	11	218	0	8	78	13	99	12	54	2	68	0	489
08:30	08:45	14	82	15	111	5	175	16	196	1	17	80	11	108	14	52	2	68	1	483
08:45	09:00	18	90	12	120	12	194	16	222	3	7	82	4	93	11	59	4	74	3	509
09:00	09:15	14	101	14	129	8	175	10	193	2	14	73	11	98	9	67	6	82	2	502
09:15	09:30	14	93	13	120	8	170	23	201	4	17	64	4	85	8	61	3	72	4	478
09:30	09:45	12	80	16	108	4	147	23	174	1	11	77	14	102	11	59	7	78	1	462
09:45	10:00	22	66	12	100	11	134	24	169	0	7	67	13	87	4	63	2	69	0	425
11:30	11:45	23	87	12	122	9	112	22	143	3	15	70	8	93	10	66	8	84	3	442
11:45	12:00	23	106	23	152	16	114	18	148	2	21	62	7	90	13	80	12	105	2	495
12:00	12:15	24	81	8	113	10	111	17	138	2	19	72	18	109	16	73	7	96	2	456
12:15	12:30	25	106	14	145	6	122	14	142	3	17	72	12	101	18	72	4	94	3	482
12:30	12:45	17	111	12	140	10	95	14	119	3	20	93	12	125	11	83	7	101	3	485
12:45	13:00	15	106	26	147	8	111	21	140	4	20	79	10	109	14	69	2	85	4	481
13:00	13:15	9	117	18	144	13	97	11	121	1	22	71	7	100	18	69	5	92	1	457
13:15	13:30	12	110	12	134	8	100	16	124	2	18	69	6	93	11	76	7	94	2	445
15:00	15:15	15	125	16	156	4	125	16	145	1	19	79	13	111	14	92	2	108	1	520
15:15	15:30	13	109	15	137	13	134	26	173	1	17	75	11	103	17	120	4	141	1	554
15:30	15:45	2	63	19	84	9	129	19	157	0	14	91	11	116	12	110	2	124	0	481
15:45	16:00	10	44	7	61	3	136	22	161	2	7	82	12	101	17	124	4	145	2	468
16:00	16:15	12	35	12	59	12	149	28	189	3	4	87	11	102	20	142	0	162	3	512
16:15	16:30	10	22	7	39	6	129	26	161	1	3	86	10	99	26	188	4	218	1	517
16:30	16:45	6	30	5	41	8	134	24	166	0	8	96	9	113	16	204	2	222	0	542
16:45	17:00	6	26	11	43	13	104	24	141	0	6	94	6	106	20	206	3	229	0	519
17:00	17:15	7	37	0	44	4	119	20	143	0	6	110	13	129	17	185	1	203	0	519
17:15	17:30	6	37	6	49	14	113	27	154	0	8	100	14	122	24	184	5	213	0	538
17:30	17:45	10	44	13	67	14	114	27	155	0	6	98	16	120	14	190	0	204	0	546
17:45	18:00	16	56	28	100	17	113	37	167	0	3	93	14	110	19	152	3	174	0	551
Total:		430	2389	418	3237	294	4517	615	5426	45	384	2521	351	3256	436	3108	119	3664	45	15,583

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ISLAND PARK DR @ RICHMOND RD

Survey Date: Tuesday, April 25, 2017 **WO No:** 36954

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

Time Period		ISLAND PARK DR Northbound	ISLAND PARK DR Southbound	ISLAND PARK DR Street Total	RICHMOND RD Eastbound	RICHMOND RD Westbound	RICHMOND RD Street Total	Grand Total
07:00	07:15	3	1	4	6	1	7	11
07:15	07:30	1	3	4	4	0	4	8
07:30	07:45	3	6	9	4	3	7	16
07:45	08:00	3	1	4	8	4	12	16
08:00	08:15	1	8	9	5	4	9	18
08:15	08:30	2	2	4	2	1	3	7
08:30	08:45	1	3	4	1	1	2	6
08:45	09:00	2	2	4	0	0	0	4
09:00	09:15	1	1	2	2	1	3	5
09:15	09:30	1	1	2	4	0	4	6
09:30	09:45	2	1	3	4	2	6	9
09:45	10:00	0	0	0	2	1	3	3
11:30	11:45	1	1	2	1	3	4	6
11:45	12:00	1	3	4	3	1	4	8
12:00	12:15	1	1	2	1	2	3	5
12:15	12:30	1	2	3	3	2	5	8
12:30	12:45	0	0	0	1	3	4	4
12:45	13:00	0	0	0	0	1	1	1
13:00	13:15	0	1	1	0	0	0	1
13:15	13:30	0	0	0	0	3	3	3
15:00	15:15	2	0	2	2	2	4	6
15:15	15:30	1	0	1	2	3	5	6
15:30	15:45	1	0	1	1	3	4	5
15:45	16:00	2	0	2	1	0	1	3
16:00	16:15	2	2	4	0	2	2	6
16:15	16:30	3	2	5	8	5	13	18
16:30	16:45	2	1	3	1	2	3	6
16:45	17:00	1	1	2	2	4	6	8
17:00	17:15	5	2	7	5	5	10	17
17:15	17:30	3	1	4	3	5	8	12
17:30	17:45	3	0	3	3	2	5	8
17:45	18:00	4	0	4	1	6	7	11
Total		53	46	**99**	80	72	152	251

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ISLAND PARK DR @ RICHMOND RD

Survey Date: Tuesday, April 25, 2017 **WO No:** 36954

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

Time Period	ISLAND PARK DR NB Approach (E or W Crossing)	ISLAND PARK DR SB Approach (E or W Crossing)	ISLAND PARK DR Total	RICHMOND RD EB Approach (N or S Crossing)	RICHMOND RD WB Approach (N or S Crossing)	RICHMOND RD Total	Grand Total
07:00 07:15	3	3	**6**	0	3	**3**	**9**
07:15 07:30	4	4	**8**	2	0	**2**	**10**
07:30 07:45	5	13	**18**	0	7	**7**	**25**
07:45 08:00	15	12	**27**	0	5	**5**	**32**
08:00 08:15	5	12	**17**	0	4	**4**	**21**
08:15 08:30	10	8	**18**	0	6	**6**	**24**
08:30 08:45	4	7	**11**	0	8	**8**	**19**
08:45 09:00	0	11	**11**	0	11	**11**	**22**
09:00 09:15	3	10	**13**	0	0	**0**	**13**
09:15 09:30	11	9	**20**	1	5	**6**	**26**
09:30 09:45	8	7	**15**	0	4	**4**	**19**
09:45 10:00	3	11	**14**	0	2	**2**	**16**
11:30 11:45	4	17	**21**	0	8	**8**	**29**
11:45 12:00	6	28	**34**	0	5	**5**	**39**
12:00 12:15	7	14	**21**	1	3	**4**	**25**
12:15 12:30	23	28	**51**	2	11	**13**	**64**
12:30 12:45	12	16	**28**	2	3	**5**	**33**
12:45 13:00	15	16	**31**	1	7	**8**	**39**
13:00 13:15	10	13	**23**	0	6	**6**	**29**
13:15 13:30	9	9	**18**	0	1	**1**	**19**
15:00 15:15	7	3	**10**	1	3	**4**	**14**
15:15 15:30	6	9	**15**	4	5	**9**	**24**
15:30 15:45	14	6	**20**	1	15	**16**	**36**
15:45 16:00	7	6	**13**	1	5	**6**	**19**
16:00 16:15	8	7	**15**	0	2	**2**	**17**
16:15 16:30	9	6	**15**	0	3	**3**	**18**
16:30 16:45	3	9	**12**	0	3	**3**	**15**
16:45 17:00	4	9	**13**	0	2	**2**	**15**
17:00 17:15	15	6	**21**	2	2	**4**	**25**
17:15 17:30	10	14	**24**	4	6	**10**	**34**
17:30 17:45	9	8	**17**	0	5	**5**	**22**
17:45 18:00	6	9	**15**	2	4	**6**	**21**
Total	255	340	**595**	24	154	**178**	**773**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ISLAND PARK DR @ RICHMOND RD

Survey Date: Tuesday, April 25, 2017 **WO No:** 36954

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

		ISLAND PARK DR									RICHMOND RD									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	0	0	**0**	1	0	0	**1**	**1**	0	3	0	**3**	0	1	0	**1**	**4**	**5**
07:15	07:30	0	0	0	**0**	0	1	0	**1**	**1**	0	6	0	**6**	0	3	0	**3**	**9**	**10**
07:30	07:45	0	2	0	**2**	0	1	0	**1**	**3**	0	3	0	**3**	0	2	0	**2**	**5**	**8**
07:45	08:00	0	0	0	**0**	0	0	0	**0**	**0**	0	9	2	**11**	0	2	0	**2**	**13**	**13**
08:00	08:15	0	0	1	**1**	0	0	0	**0**	**1**	0	5	0	**5**	0	2	0	**2**	**7**	**8**
08:15	08:30	0	0	0	**0**	0	0	0	**0**	**0**	0	4	0	**4**	0	5	0	**5**	**9**	**9**
08:30	08:45	0	1	0	**1**	0	0	0	**0**	**1**	1	5	0	**6**	0	4	0	**4**	**10**	**11**
08:45	09:00	0	2	1	**3**	0	0	0	**0**	**3**	0	6	0	**6**	1	4	0	**5**	**11**	**14**
09:00	09:15	0	0	0	**0**	0	2	0	**2**	**2**	0	7	0	**7**	0	4	0	**4**	**11**	**13**
09:15	09:30	0	3	0	**3**	0	1	0	**1**	**4**	0	4	0	**4**	0	4	0	**4**	**8**	**12**
09:30	09:45	0	0	0	**0**	0	0	1	**1**	**1**	0	10	1	**11**	0	8	0	**8**	**19**	**20**
09:45	10:00	0	0	0	**0**	0	0	0	**0**	**0**	1	5	0	**6**	0	7	0	**7**	**13**	**13**
11:30	11:45	0	2	0	**2**	0	1	0	**1**	**3**	0	6	0	**6**	1	7	0	**8**	**14**	**17**
11:45	12:00	0	1	0	**1**	0	0	1	**1**	**2**	0	6	0	**6**	0	9	0	**9**	**15**	**17**
12:00	12:15	0	1	0	**1**	0	1	0	**1**	**2**	0	4	0	**4**	0	5	0	**5**	**9**	**11**
12:15	12:30	1	1	0	**2**	0	1	0	**1**	**3**	0	5	0	**5**	1	2	0	**3**	**8**	**11**
12:30	12:45	0	0	0	**0**	0	0	3	**3**	**3**	0	7	0	**7**	0	6	0	**6**	**13**	**16**
12:45	13:00	0	3	0	**3**	0	1	0	**1**	**4**	0	9	0	**9**	0	7	0	**7**	**16**	**20**
13:00	13:15	0	1	0	**1**	0	0	0	**0**	**1**	0	7	0	**7**	0	5	0	**5**	**12**	**13**
13:15	13:30	1	0	0	**1**	1	0	0	**1**	**2**	0	7	0	**7**	0	4	0	**4**	**11**	**13**
15:00	15:15	0	1	0	**1**	0	0	0	**0**	**1**	0	4	0	**4**	0	2	0	**2**	**6**	**7**
15:15	15:30	0	0	0	**0**	0	1	0	**1**	**1**	1	4	0	**5**	0	6	0	**6**	**11**	**12**
15:30	15:45	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	1	0	**1**	**4**	**4**
15:45	16:00	0	0	0	**0**	0	1	1	**2**	**2**	0	3	0	**3**	0	4	0	**4**	**7**	**9**
16:00	16:15	0	0	0	**0**	0	3	0	**3**	**3**	0	5	0	**5**	0	2	0	**2**	**7**	**10**
16:15	16:30	0	1	0	**1**	0	0	0	**0**	**1**	0	2	0	**2**	0	3	0	**3**	**5**	**6**
16:30	16:45	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	6	0	**6**	**8**	**8**
16:45	17:00	0	0	0	**0**	0	0	0	**0**	**0**	0	4	0	**4**	0	3	0	**3**	**7**	**7**
17:00	17:15	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	3	0	**3**	**6**	**6**
17:15	17:30	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	4	0	**4**	**5**	**5**
17:30	17:45	0	0	0	**0**	0	0	0	**0**	**0**	0	3	1	**4**	0	5	0	**5**	**9**	**9**
17:45	18:00	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	4	0	**4**	**6**	**6**
Total:	None	2	19	2	**23**	2	14	6	**22**	**45**	3	154	4	**161**	3	134	0	**137**	**298**	**343**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

ISLAND PARK DR @ RICHMOND RD

Survey Date: Tuesday, April 25, 2017 **WO No:** 36954

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

		ISLAND PARK DR		RICHMOND RD		
Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	1	1
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		0	0	0	1	1

Transportation Services - Traffic Services

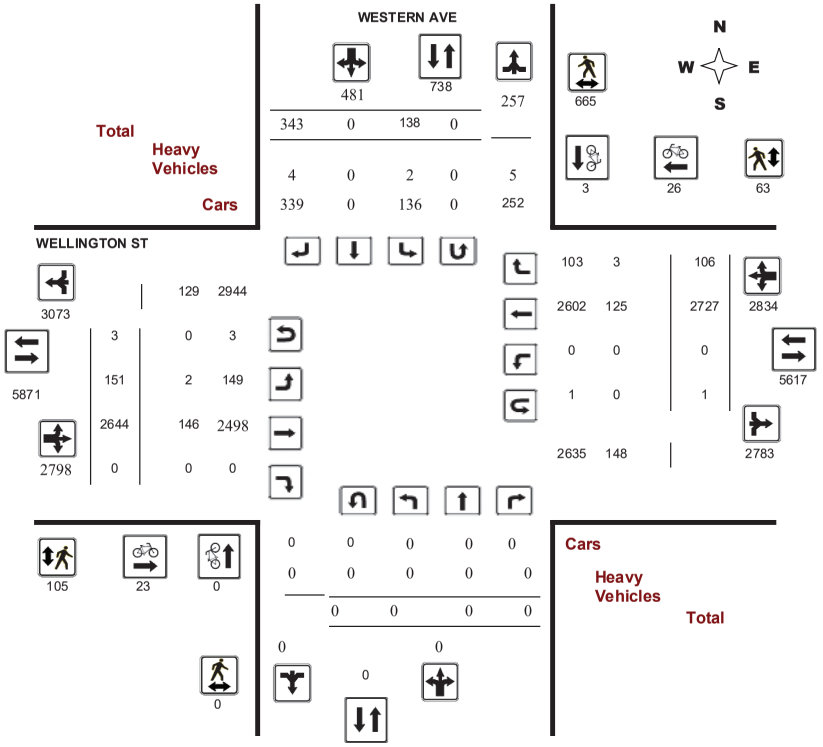
Turning Movement Count - Study Results

WESTERN AVE @ WELLINGTON ST

Survey Date: Thursday, February 22, 2018 **WO No:** 37567

Start Time: 07:00 **Device:** Miovision

Full Study Diagram



Transportation Services - Traffic Services

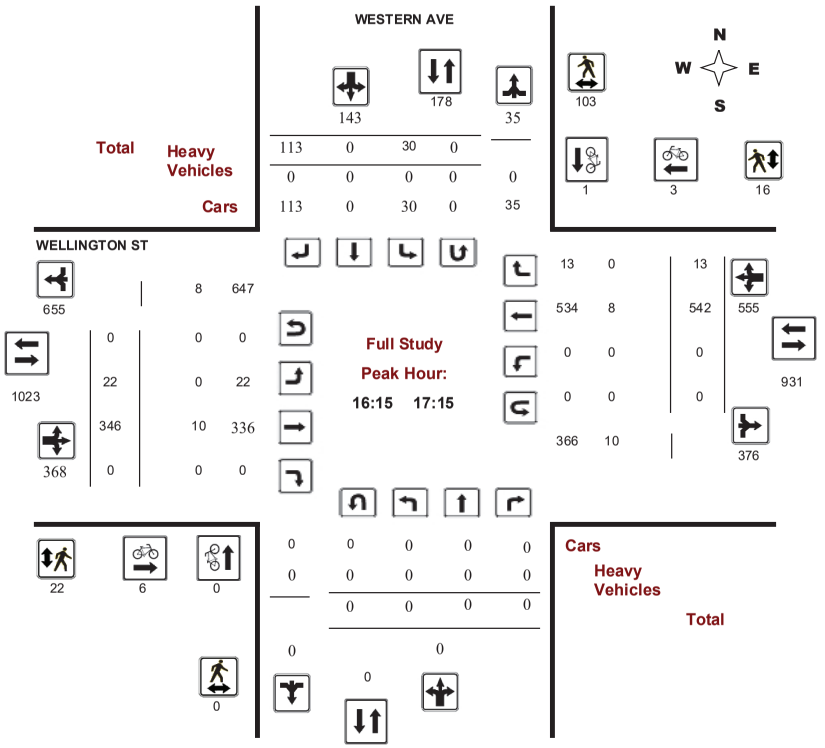
Turning Movement Count - Study Results

WESTERN AVE @ WELLINGTON ST

Survey Date: Thursday, February 22, 2018 **WO No:** 37567

Start Time: 07:00 **Device:** Miovision

Full Study Peak Hour Diagram



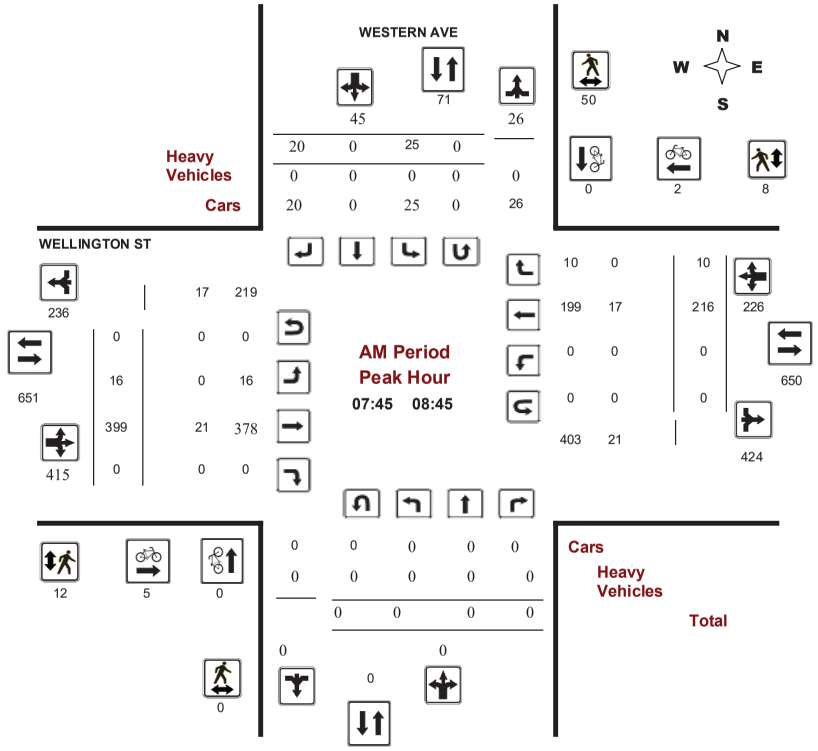
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

WESTERN AVE @ WELLINGTON ST

Survey Date: Thursday, February 22, 2018 **WO No:** 37567

Start Time: 07:00 **Device:** Miovision



Comments

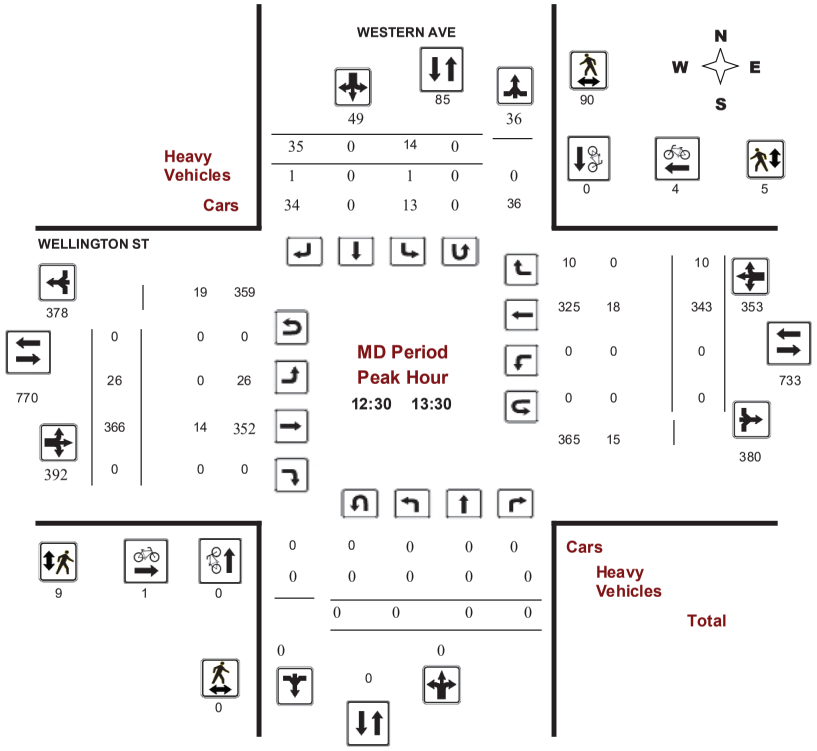
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

WESTERN AVE @ WELLINGTON ST

Survey Date: Thursday, February 22, 2018 **WO No:** 37567

Start Time: 07:00 **Device:** Miovision



Comments

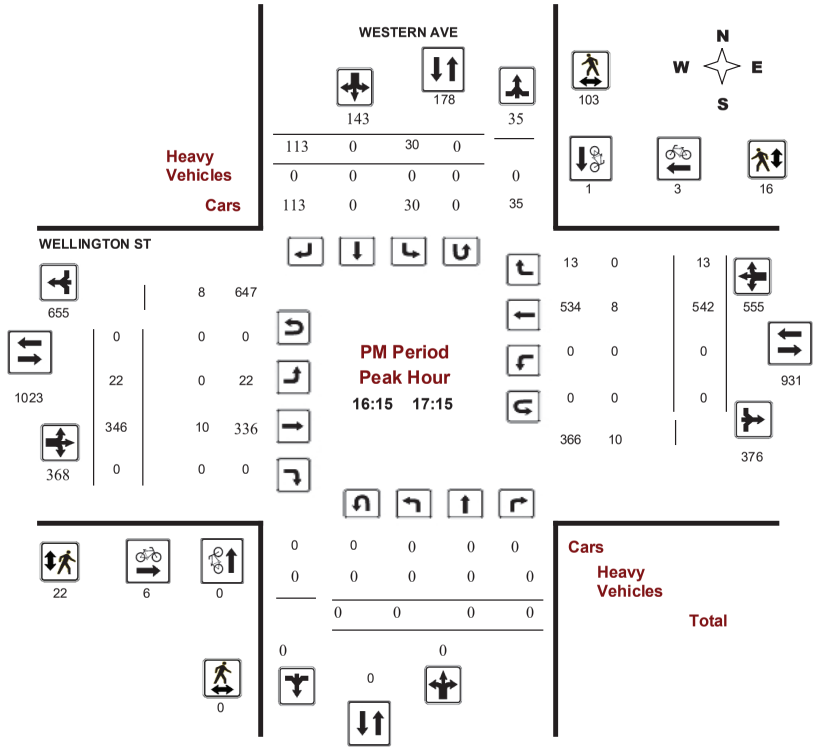
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

WESTERN AVE @ WELLINGTON ST

Survey Date: Thursday, February 22, 2018 **WO No:** 37567

Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

WESTERN AVE @ WELLINGTON ST

Survey Date: Thursday, February 22, 2018 **WO No:** 37567

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Thursday, February 22, 2018

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 3 Westbound: 1

AADT Factor .90

	WESTERN AVE									WELLINGTON ST									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	0	0	0	**0**	5	0	17	**22**	**22**	14	269	0	**283**	0	166	9	**175**	**458**	**480**
08:00 09:00	0	0	0	**0**	29	0	19	**48**	**48**	13	373	0	**386**	0	235	10	**245**	**631**	**679**
09:00 10:00	0	0	0	**0**	12	0	13	**25**	**25**	13	272	0	**285**	0	231	10	**241**	**526**	**551**
11:30 12:30	0	0	0	**0**	12	0	31	**43**	**43**	25	382	0	**407**	0	306	21	**327**	**734**	**777**
12:30 13:30	0	0	0	**0**	14	0	35	**49**	**49**	26	366	0	**392**	0	343	10	**353**	**745**	**794**
15:00 16:00	0	0	0	**0**	16	0	48	**64**	**64**	20	302	0	**322**	0	422	14	**436**	**758**	**822**
16:00 17:00	0	0	0	**0**	33	0	110	**143**	**143**	20	328	0	**348**	0	549	9	**558**	**906**	**1049**
17:00 18:00	0	0	0	**0**	17	0	70	**87**	**87**	20	352	0	**372**	0	475	23	**498**	**870**	**957**
Sub Total	0	0	0	**0**	138	0	343	**481**	**481**	151	2644	0	**2795**	0	2727	106	**2833**	**5628**	**6109**
U Turns				**0**				**0**	**0**				**3**				**1**	**4**	**4**
Total	0	0	0	**0**	138	0	343	**481**	**481**	151	2644	0	**2798**	0	2727	106	**2834**	**5632**	**6113**
EQ 12Hr	0	0	0	**0**	192	0	477	**669**	**669**	210	3675	0	**3889**	0	3791	147	**3939**	**7828**	**8497**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																	**1.39**		
AVG 12Hr	0	0	0	**0**	163	0	404	**567**	**602**	178	3117	0	**3299**	0	3215	125	**3341**	**7045**	**7647**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																	**0.9**		
AVG 24Hr	0	0	0	**0**	213	0	530	**743**	**743**	233	4084	0	**4321**	0	4212	164	**4377**	**8698**	**9441**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.																	**1.31**		

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

WESTERN AVE @ WELLINGTON ST

Survey Date: Thursday, February 22, 2018 **WO No:** 37567

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

		WESTERN AVE									WELLINGTON ST									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	0	0	0	0	0	8	8	0	2	43	0	45	0	40	3	43	0	96
07:15	07:30	0	0	0	0	0	0	1	1	0	2	54	0	56	0	42	1	43	0	100
07:30	07:45	0	0	0	0	2	0	5	7	1	5	60	0	65	0	39	0	39	1	111
07:45	08:00	0	0	0	0	3	0	3	6	0	5	112	0	117	0	45	5	50	0	173
08:00	08:15	0	0	0	0	7	0	4	11	0	4	96	0	100	0	45	3	48	0	159
08:15	08:30	0	0	0	0	7	0	7	14	0	3	94	0	97	0	61	1	62	0	173
08:30	08:45	0	0	0	0	8	0	6	14	0	4	97	0	101	0	65	1	66	0	181
08:45	09:00	0	0	0	0	7	0	2	9	0	2	86	0	88	0	64	5	70	0	167
09:00	09:15	0	0	0	0	2	0	2	4	0	3	67	0	71	0	48	5	53	0	128
09:15	09:30	0	0	0	0	3	0	4	7	0	0	72	0	72	0	54	1	55	0	134
09:30	09:45	0	0	0	0	4	0	3	7	1	5	79	0	84	0	75	1	76	1	167
09:45	10:00	0	0	0	0	3	0	4	7	0	5	54	0	59	0	54	3	57	0	123
11:30	11:45	0	0	0	0	5	0	8	13	1	2	100	0	102	0	66	2	68	1	183
11:45	12:00	0	0	0	0	3	0	7	10	0	13	103	0	116	0	88	5	93	0	219
12:00	12:15	0	0	0	0	2	0	8	10	0	6	83	0	90	0	81	10	91	0	191
12:15	12:30	0	0	0	0	2	0	8	10	0	4	96	0	100	0	71	4	75	0	185
12:30	12:45	0	0	0	0	4	0	7	11	1	3	99	0	102	0	75	3	78	1	191
12:45	13:00	0	0	0	0	5	0	7	12	0	11	94	0	105	0	73	4	77	0	194
13:00	13:15	0	0	0	0	4	0	11	15	1	9	83	0	92	0	99	1	100	1	207
13:15	13:30	0	0	0	0	1	0	10	11	0	3	90	0	93	0	96	2	98	0	202
15:00	15:15	0	0	0	0	5	0	7	12	0	4	75	0	79	0	93	6	99	0	190
15:15	15:30	0	0	0	0	4	0	13	17	1	10	84	0	94	0	103	3	106	1	217
15:30	15:45	0	0	0	0	4	0	15	19	0	3	76	0	79	0	98	2	100	0	198
15:45	16:00	0	0	0	0	3	0	13	16	0	3	67	0	70	0	128	3	131	0	217
16:00	16:15	0	0	0	0	6	0	18	24	0	7	69	0	77	0	143	1	144	0	245
16:15	16:30	0	0	0	0	9	0	36	45	0	7	81	0	88	0	144	2	146	0	279
16:30	16:45	0	0	0	0	6	0	28	34	0	3	89	0	92	0	142	3	145	0	271
16:45	17:00	0	0	0	0	12	0	28	40	0	3	89	0	92	0	120	3	123	0	255
17:00	17:15	0	0	0	0	3	0	21	24	0	9	87	0	96	0	136	5	141	0	261
17:45	18:00	0	0	0	0	10	0	11	21	0	5	90	0	95	0	123	7	130	0	246
17:15	17:30	0	0	0	0	3	0	23	26	0	4	95	0	99	0	109	7	116	0	241
17:30	17:45	0	0	0	0	1	0	15	16	0	2	80	0	82	0	107	4	111	0	209
Total:		0	0	0	0	138	0	343	481	6	151	2644	0	2798	0	2727	106	2834	6	6,113

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

WESTERN AVE @ WELLINGTON ST

Survey Date: Thursday, February 22, 2018 **WO No:** 37567

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

		WESTERN AVE			WELLINGTON ST			
Time Period		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	1	1	2	0	2	3
07:15	07:30	0	0	0	1	0	1	1
07:30	07:45	0	0	0	0	1	1	1
07:45	08:00	0	0	0	2	0	2	2
08:00	08:15	0	0	0	3	1	4	4
08:15	08:30	0	0	0	0	1	1	1
08:30	08:45	0	0	0	0	0	0	0
08:45	09:00	0	0	0	0	0	0	0
09:00	09:15	0	0	0	1	0	1	1
09:15	09:30	0	0	0	2	2	4	4
09:30	09:45	0	0	0	1	0	1	1
09:45	10:00	0	0	0	0	0	0	0
11:30	11:45	0	0	0	0	0	0	0
11:45	12:00	0	0	0	0	1	1	1
12:00	12:15	0	0	0	0	0	0	0
12:15	12:30	0	0	0	0	0	0	0
12:30	12:45	0	0	0	0	0	0	0
12:45	13:00	0	0	0	0	1	1	1
13:00	13:15	0	0	0	0	1	1	1
13:15	13:30	0	0	0	1	2	3	3
15:00	15:15	0	0	0	0	1	1	1
15:15	15:30	0	0	0	1	3	4	4
15:30	15:45	0	0	0	0	1	1	1
15:45	16:00	0	0	0	0	2	2	2
16:00	16:15	0	1	1	1	1	2	3
16:15	16:30	0	0	0	2	1	3	3
16:30	16:45	0	0	0	1	0	1	1
16:45	17:00	0	0	0	1	1	2	2
17:00	17:15	0	1	1	2	1	3	4
17:45	18:00	0	0	0	1	0	1	1
17:15	17:30	0	0	0	0	3	3	3
17:30	17:45	0	0	0	1	2	3	3
Total		0	3	**3**	23	26	49	52

Transportation Services - Traffic Services

Turning Movement Count - Study Results

WESTERN AVE @ WELLINGTON ST

Survey Date: Thursday, February 22, 2018 **WO No:** 37567

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

		WESTERN AVE			WELLINGTON ST			
Time Period		NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00	07:15	0	3	**3**	0	0	**0**	**3**
07:15	07:30	0	13	**13**	0	0	**0**	**13**
07:30	07:45	0	11	**11**	3	5	**8**	**19**
07:45	08:00	0	11	**11**	2	1	**3**	**14**
08:00	08:15	0	11	**11**	3	0	**3**	**14**
08:15	08:30	0	12	**12**	5	1	**6**	**18**
08:30	08:45	0	16	**16**	2	6	**8**	**24**
08:45	09:00	0	12	**12**	1	2	**3**	**15**
09:00	09:15	0	12	**12**	3	1	**4**	**16**
09:15	09:30	0	7	**7**	0	0	**0**	**7**
09:30	09:45	0	16	**16**	1	1	**2**	**18**
09:45	10:00	0	10	**10**	4	0	**4**	**14**
11:30	11:45	0	22	**22**	5	2	**7**	**29**
11:45	12:00	0	9	**9**	1	1	**2**	**11**
12:00	12:15	0	23	**23**	0	1	**1**	**24**
12:15	12:30	0	52	**52**	3	3	**6**	**58**
12:30	12:45	0	27	**27**	3	1	**4**	**31**
12:45	13:00	0	19	**19**	3	3	**6**	**25**
13:00	13:15	0	27	**27**	2	0	**2**	**29**
13:15	13:30	0	17	**17**	1	1	**2**	**19**
15:00	15:15	0	25	**25**	3	1	**4**	**29**
15:15	15:30	0	29	**29**	3	1	**4**	**33**
15:30	15:45	0	44	**44**	10	0	**10**	**54**
15:45	16:00	0	28	**28**	4	2	**6**	**34**
16:00	16:15	0	35	**35**	4	6	**10**	**45**
16:15	16:30	0	19	**19**	7	2	**9**	**28**
16:30	16:45	0	37	**37**	10	4	**14**	**51**
16:45	17:00	0	26	**26**	4	6	**10**	**36**
17:00	17:15	0	21	**21**	1	4	**5**	**26**
17:45	18:00	0	18	**18**	2	4	**6**	**24**
17:15	17:30	0	28	**28**	6	3	**9**	**37**
17:30	17:45	0	25	**25**	9	1	**10**	**35**
Total	.....	0	665	**665**	105	63	**168**	**833**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

WESTERN AVE @ WELLINGTON ST

Survey Date: Thursday, February 22, 2018 **WO No:** 37567

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

		WESTERN AVE									WELLINGTON ST									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	0	0	**0**	**2**	**2**
07:15	07:30	0	0	0	**0**	0	0	0	**0**	**0**	0	6	0	**6**	0	5	0	**5**	**11**	**11**
07:30	07:45	0	0	0	**0**	0	0	1	**1**	**1**	0	5	0	**5**	0	4	0	**4**	**9**	**10**
07:45	08:00	0	0	0	**0**	0	0	0	**0**	**0**	0	7	0	**7**	0	2	0	**2**	**9**	**9**
08:00	08:15	0	0	0	**0**	0	0	0	**0**	**0**	0	6	0	**6**	0	3	0	**3**	**9**	**9**
08:15	08:30	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	7	0	**7**	**10**	**10**
08:30	08:45	0	0	0	**0**	0	0	0	**0**	**0**	0	5	0	**5**	0	5	0	**5**	**10**	**10**
08:45	09:00	0	0	0	**0**	0	0	0	**0**	**0**	0	8	0	**8**	0	6	1	**7**	**15**	**15**
09:00	09:15	0	0	0	**0**	0	0	0	**0**	**0**	0	7	0	**7**	0	4	0	**4**	**11**	**11**
09:15	09:30	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	4	0	**4**	**6**	**6**
09:30	09:45	0	0	0	**0**	1	0	0	**1**	**1**	0	8	0	**8**	0	7	0	**7**	**15**	**16**
09:45	10:00	0	0	0	**0**	0	0	0	**0**	**0**	0	5	0	**5**	0	7	0	**7**	**12**	**12**
11:30	11:45	0	0	0	**0**	0	0	1	**1**	**1**	0	6	0	**6**	0	6	1	**7**	**13**	**14**
11:45	12:00	0	0	0	**0**	0	0	0	**0**	**0**	0	7	0	**7**	0	2	0	**2**	**9**	**9**
12:00	12:15	0	0	0	**0**	0	0	0	**0**	**0**	0	6	0	**6**	0	5	0	**5**	**11**	**11**
12:15	12:30	0	0	0	**0**	0	0	0	**0**	**0**	0	9	0	**9**	0	4	0	**4**	**13**	**13**
12:30	12:45	0	0	0	**0**	0	0	1	**1**	**1**	0	4	0	**4**	0	5	0	**5**	**9**	**10**
12:45	13:00	0	0	0	**0**	0	0	0	**0**	**0**	0	5	0	**5**	0	2	0	**2**	**7**	**7**
13:00	13:15	0	0	0	**0**	1	0	0	**1**	**1**	0	4	0	**4**	0	3	0	**3**	**7**	**8**
13:15	13:30	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	8	0	**8**	**9**	**9**
15:00	15:15	0	0	0	**0**	0	0	0	**0**	**0**	0	3	0	**3**	0	4	0	**4**	**7**	**7**
15:15	15:30	0	0	0	**0**	0	0	1	**1**	**1**	1	3	0	**4**	0	4	1	**5**	**9**	**10**
15:30	15:45	0	0	0	**0**	0	0	0	**0**	**0**	0	4	0	**4**	0	1	0	**1**	**5**	**5**
15:45	16:00	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	4	0	**4**	**6**	**6**
16:00	16:15	0	0	0	**0**	0	0	0	**0**	**0**	1	6	0	**7**	0	4	0	**4**	**11**	**11**
16:15	16:30	0	0	0	**0**	0	0	0	**0**	**0**	0	4	0	**4**	0	1	0	**1**	**5**	**5**
16:30	16:45	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	3	0	**3**	**5**	**5**
16:45	17:00	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	3	0	**3**	**5**	**5**
17:00	17:15	0	0	0	**0**	0	0	0	**0**	**0**	0	2	0	**2**	0	1	0	**1**	**3**	**3**
17:45	18:00	0	0	0	**0**	0	0	0	**0**	**0**	0	4	0	**4**	0	5	0	**5**	**9**	**9**
17:15	17:30	0	0	0	**0**	0	0	0	**0**	**0**	0	7	0	**7**	0	3	0	**3**	**10**	**10**
17:30	17:45	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	3	0	**3**	**4**	**4**
Total:	None	0	0	0	**0**	2	0	4	**6**	**6**	2	146	0	**148**	0	125	3	**128**	**276**	**282**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

WESTERN AVE @ WELLINGTON ST

Survey Date: Thursday, February 22, 2018 **WO No:** 37567

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

Time Period		WESTERN AVE Northbound U-Turn Total	WESTERN AVE Southbound U-Turn Total	WELLINGTON ST Eastbound U-Turn Total	WELLINGTON ST Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	1	1
09:00	09:15	0	0	1	0	1
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	1	0	1
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	1	0	1
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:45	18:00	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
Total		0	0	3	1	4

Transportation Services - Traffic Services

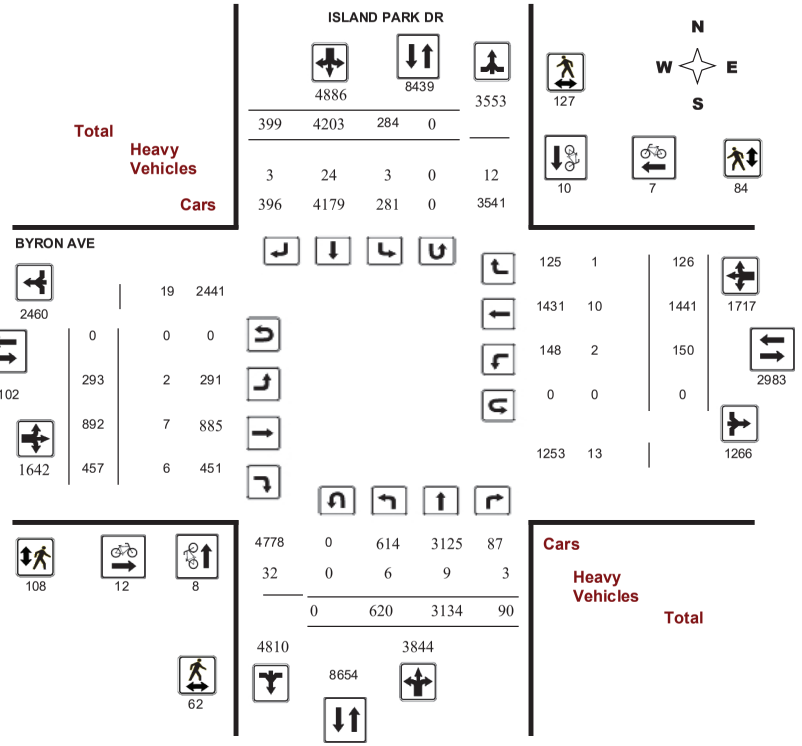
Turning Movement Count - Study Results

BYRON AVE @ ISLAND PARK DR

Survey Date: Thursday, January 23, 2020 **WO No:** 39390

Start Time: 07:00 **Device:** Miovision

Full Study Diagram



5472208 - THU JAN 23, 2020 - 8HRS - LORETTA

Transportation Services - Traffic Services

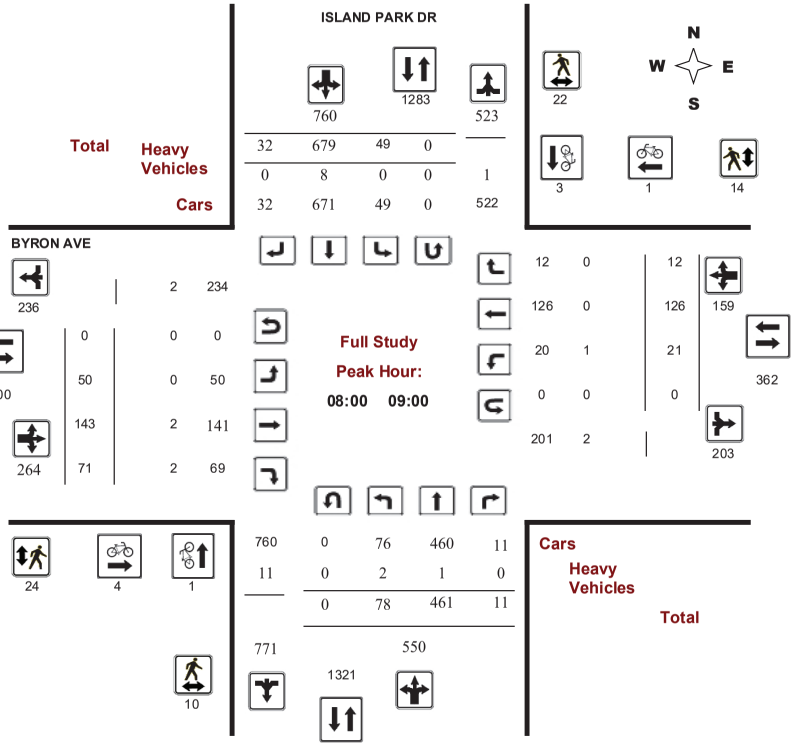
Turning Movement Count - Study Results

BYRON AVE @ ISLAND PARK DR

Survey Date: Thursday, January 23, 2020 **WO No:** 39390

Start Time: 07:00 **Device:** Miovision

Full Study Peak Hour Diagram



5472208 - THU JAN 23, 2020 - 8HRS - LORETTA

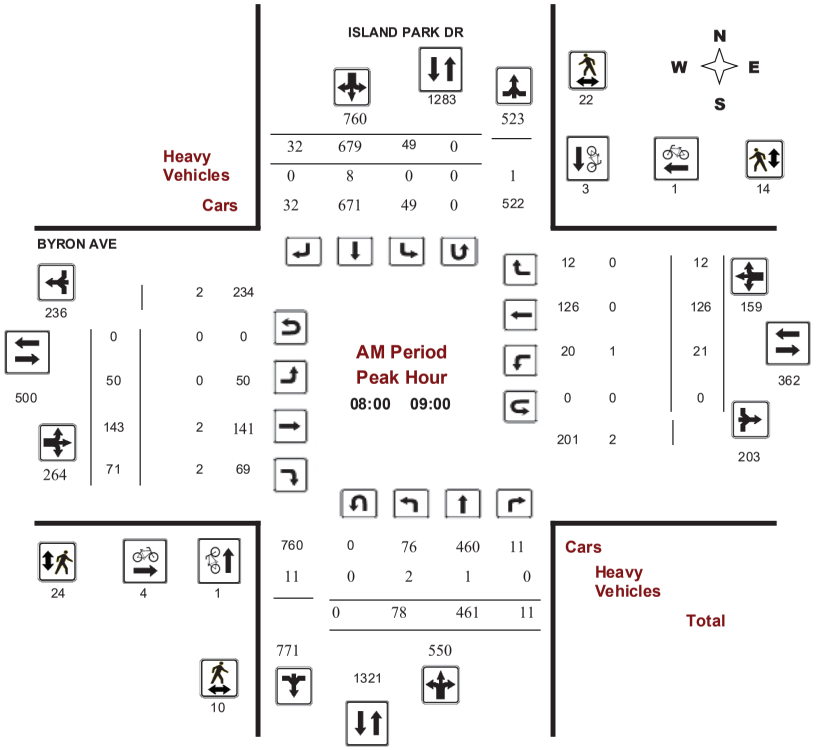
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BYRON AVE @ ISLAND PARK DR

Survey Date: Thursday, January 23, 2020 **WO No:** 39390

Start Time: 07:00 **Device:** Miovision



Comments 5472208 - THU JAN 23, 2020 - 8HRS - LORETTA

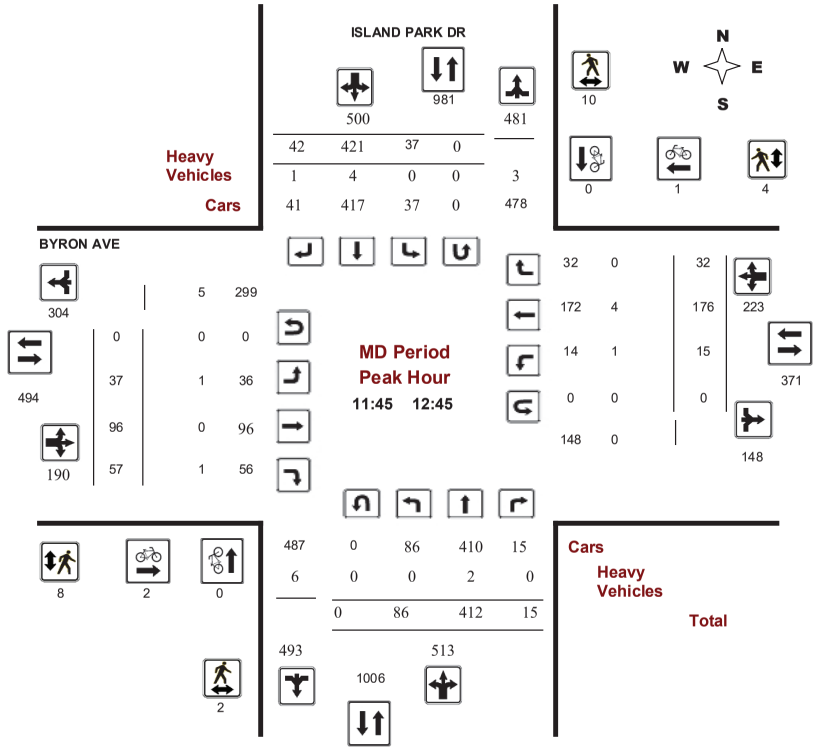
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BYRON AVE @ ISLAND PARK DR

Survey Date: Thursday, January 23, 2020 **WO No:** 39390

Start Time: 07:00 **Device:** Miovision



Comments 5472208 - THU JAN 23, 2020 - 8HRS - LORETTA

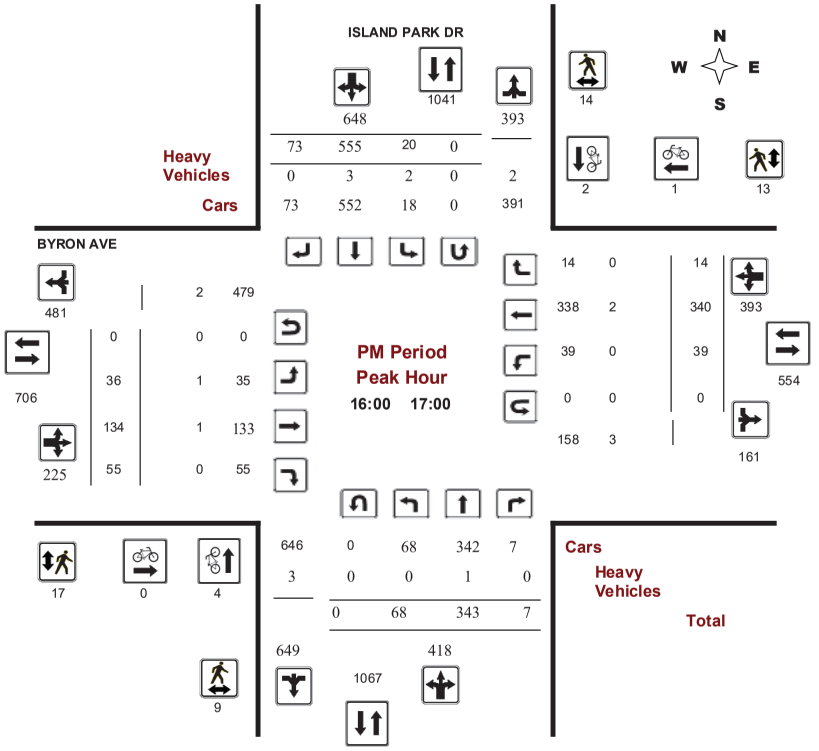
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BYRON AVE @ ISLAND PARK DR

Survey Date: Thursday, January 23, 2020 **WO No:** 39390

Start Time: 07:00 **Device:** Miovision



Comments 5472208 - THU JAN 23, 2020 - 8HRS - LORETTA

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BYRON AVE @ ISLAND PARK DR

Survey Date: Thursday, January 23, 2020 **WO No:** 39390

Start Time: 07:00 **Device:** Miovision

Full Study Summary (8 HR Standard)

Survey Date: Thursday, January 23, 2020

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor 1.00

	ISLAND PARK DR									BYRON AVE									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	71	335	5	**411**	64	654	30	**748**	**1159**	31	72	34	**137**	7	71	6	**84**	**221**	**1380**
08:00 09:00	78	461	11	**550**	49	679	32	**760**	**1310**	50	143	71	**264**	21	126	12	**159**	**423**	**1733**
09:00 10:00	87	404	8	**499**	41	551	30	**622**	**1121**	39	101	37	**177**	8	75	14	**97**	**274**	**1395**
11:30 12:30	94	432	10	**536**	36	405	40	**481**	**1017**	40	91	49	**180**	17	168	27	**212**	**392**	**1409**
12:30 13:30	80	408	15	**503**	33	392	37	**462**	**965**	31	100	65	**196**	12	178	21	**211**	**407**	**1372**
15:00 16:00	64	403	12	**479**	19	494	88	**601**	**1080**	32	102	84	**218**	26	242	20	**288**	**506**	**1586**
16:00 17:00	68	343	7	**418**	20	555	73	**648**	**1066**	36	134	55	**225**	39	340	14	**393**	**618**	**1684**
17:00 18:00	78	348	22	**448**	22	473	69	**564**	**1012**	34	149	62	**245**	20	241	12	**273**	**518**	**1530**
Sub Total	620	3134	90	**3844**	284	4203	399	**4886**	**8730**	293	892	457	**1642**	150	1441	126	**1717**	**3359**	**12089**
U Turns				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	620	3134	90	**3844**	284	4203	399	**4886**	**8730**	293	892	457	**1642**	150	1441	126	**1717**	**3359**	**12089**
EQ 12Hr	862	4356	125	**5343**	395	5842	555	**6792**	**12135**	407	1240	635	**2282**	208	2003	175	**2387**	**4669**	**16804**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	812	4106	118	**5036**	372	5506	523	**6401**	**12135**	384	1169	599	**2151**	196	1888	165	**2249**	**4669**	**16804**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**1**					
AVG 24Hr	1064	5378	154	**6597**	487	7213	685	**8385**	**14982**	503	1531	784	**2818**	257	2473	216	**2947**	**5765**	**20747**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BYRON AVE @ ISLAND PARK DR

Survey Date: Thursday, January 23, 2020 **WO No:** 39390

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute Increments

		ISLAND PARK DR									BYRON AVE									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	10	84	0	94	13	165	5	183	0	2	13	5	20	0	7	1	8	0	305
07:15	07:30	13	65	1	79	13	165	7	185	1	5	15	10	30	3	11	0	14	1	308
07:30	07:45	24	81	2	107	16	162	6	184	2	14	13	8	35	3	23	1	27	2	353
07:45	08:00	24	105	2	131	22	162	12	196	2	10	31	11	52	1	30	4	35	2	414
08:00	08:15	17	80	3	100	15	168	6	189	3	12	40	21	73	1	22	2	25	3	387
08:15	08:30	26	105	1	132	12	178	4	194	2	11	26	20	57	5	27	3	35	2	418
08:30	08:45	12	134	3	149	9	147	11	167	4	18	38	20	76	7	33	5	45	4	437
08:45	09:00	23	142	4	169	13	186	11	210	2	9	39	10	58	8	44	2	54	2	491
09:00	09:15	24	74	3	101	12	137	6	155	0	13	35	11	59	2	27	3	32	0	347
09:15	09:30	15	123	3	141	11	149	7	167	1	12	25	11	48	2	9	1	12	1	368
09:30	09:45	18	98	0	116	11	141	9	161	1	9	19	6	34	1	24	3	28	1	339
09:45	10:00	30	109	2	141	7	124	8	139	0	5	22	9	36	3	15	7	25	0	341
11:30	11:45	25	130	0	155	8	97	10	115	2	11	17	9	37	3	31	3	37	2	344
11:45	12:00	27	103	6	136	10	98	3	111	1	9	26	14	49	4	40	8	52	1	348
12:00	12:15	24	96	1	121	8	106	16	130	3	11	27	13	51	3	45	6	54	3	356
12:15	12:30	18	103	3	124	10	104	11	125	0	9	21	13	43	7	52	10	69	0	361
12:30	12:45	17	110	5	132	9	113	12	134	3	8	22	17	47	1	39	8	48	3	361
12:45	13:00	16	87	3	106	9	100	6	115	2	10	24	12	46	3	43	4	50	2	317
13:00	13:15	24	108	5	137	7	87	9	103	0	8	32	14	54	4	55	3	62	0	356
13:15	13:30	23	103	2	128	8	92	10	110	2	5	22	22	49	4	41	6	51	2	338
15:00	15:15	16	135	3	154	7	112	25	144	2	9	24	25	58	5	48	2	55	2	411
15:15	15:30	13	104	3	120	6	128	23	157	0	9	35	21	65	6	63	6	75	0	417
15:30	15:45	12	83	3	98	3	131	16	150	3	7	26	19	52	6	59	7	72	3	372
15:45	16:00	23	81	3	107	3	123	24	150	4	7	17	19	43	9	72	5	86	4	386
16:00	16:15	16	99	2	117	4	156	17	177	4	6	26	16	48	5	87	2	94	4	436
16:15	16:30	16	89	1	106	7	140	20	167	2	14	37	12	63	14	77	4	95	2	431
16:30	16:45	14	90	3	107	6	130	16	152	0	8	33	13	54	6	85	3	94	0	407
16:45	17:00	22	65	1	88	3	129	20	152	0	8	38	14	60	14	91	5	110	0	410
17:00	17:15	19	66	6	91	7	107	14	128	0	10	33	21	64	7	80	2	89	0	372
17:15	17:30	15	86	3	104	7	121	25	153	0	7	39	13	59	7	60	5	72	0	388
17:30	17:45	25	102	8	135	4	104	15	123	2	8	44	17	69	4	53	2	59	2	386
17:45	18:00	19	94	5	118	4	141	15	160	0	9	33	11	53	2	48	3	53	0	384
Total:		620	3134	90	3844	284	4203	399	4886	48	293	892	457	1642	150	1441	126	1717	48	12,089

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BYRON AVE @ ISLAND PARK DR

Survey Date: Thursday, January 23, 2020 **WO No:** 39390

Start Time: 07:00 **Device:** Miovision

Full Study Cyclist Volume

Time Period		ISLAND PARK DR Northbound	ISLAND PARK DR Southbound	ISLAND PARK DR Street Total	BYRON AVE Eastbound	BYRON AVE Westbound	BYRON AVE Street Total	Grand Total
07:00	07:15	0	0	0	0	0	0	0
07:15	07:30	1	1	2	1	0	1	3
07:30	07:45	0	0	0	1	1	2	2
07:45	08:00	0	0	0	2	0	2	2
08:00	08:15	0	0	0	1	1	2	2
08:15	08:30	1	1	2	0	0	0	2
08:30	08:45	0	1	1	3	0	3	4
08:45	09:00	0	1	1	0	0	0	1
09:00	09:15	1	0	1	1	0	1	2
09:15	09:30	0	2	2	0	0	0	2
09:30	09:45	0	0	0	0	0	0	0
09:45	10:00	0	0	0	0	0	0	0
11:30	11:45	0	0	0	0	0	0	0
11:45	12:00	0	0	0	1	1	2	2
12:00	12:15	0	0	0	1	0	1	1
12:15	12:30	0	0	0	0	0	0	0
12:30	12:45	0	0	0	0	0	0	0
12:45	13:00	0	0	0	0	1	1	1
13:00	13:15	0	0	0	0	0	0	0
13:15	13:30	0	0	0	0	0	0	0
15:00	15:15	0	0	0	0	0	0	0
15:15	15:30	0	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0
15:45	16:00	1	0	1	0	0	0	1
16:00	16:15	1	0	1	0	0	0	1
16:15	16:30	1	0	1	0	1	1	2
16:30	16:45	2	2	4	0	0	0	4
16:45	17:00	0	0	0	0	0	0	0
17:00	17:15	0	0	0	1	1	2	2
17:15	17:30	0	1	1	0	0	0	1
17:30	17:45	0	0	0	0	1	1	1
17:45	18:00	0	1	1	0	0	0	1
Total		8	10	**18**	12	7	19	37

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BYRON AVE @ ISLAND PARK DR

Survey Date: Thursday, January 23, 2020 **WO No:** 39390

Start Time: 07:00 **Device:** Miovision

Full Study Pedestrian Volume

Time Period		ISLAND PARK DR NB Approach (E or W Crossing)	ISLAND PARK DR SB Approach (E or W Crossing)	ISLAND PARK DR Total	BYRON AVE EB Approach (N or S Crossing)	BYRON AVE WB Approach (N or S Crossing)	BYRON AVE Total	Grand Total
07:00	07:15	0	0	**0**	2	1	**3**	**3**
07:15	07:30	2	7	**9**	3	6	**9**	**18**
07:30	07:45	0	5	**5**	5	1	**6**	**11**
07:45	08:00	2	8	**10**	6	3	**9**	**19**
08:00	08:15	3	5	**8**	6	3	**9**	**17**
08:15	08:30	1	8	**9**	1	5	**6**	**15**
08:30	08:45	3	6	**9**	12	5	**17**	**26**
08:45	09:00	3	3	**6**	5	1	**6**	**12**
09:00	09:15	1	3	**4**	1	2	**3**	**7**
09:15	09:30	0	1	**1**	3	5	**8**	**9**
09:30	09:45	0	4	**4**	1	1	**2**	**6**
09:45	10:00	1	1	**2**	1	1	**2**	**4**
11:30	11:45	2	3	**5**	1	0	**1**	**6**
11:45	12:00	0	0	**0**	0	0	**0**	**0**
12:00	12:15	0	3	**3**	4	1	**5**	**8**
12:15	12:30	2	2	**4**	3	2	**5**	**9**
12:30	12:45	0	5	**5**	1	1	**2**	**7**
12:45	13:00	0	3	**3**	3	1	**4**	**7**
13:00	13:15	2	1	**3**	4	1	**5**	**8**
13:15	13:30	2	2	**4**	1	2	**3**	**7**
15:00	15:15	3	3	**6**	4	1	**5**	**11**
15:15	15:30	5	2	**7**	2	6	**8**	**15**
15:30	15:45	3	7	**10**	3	4	**7**	**17**
15:45	16:00	7	7	**14**	4	8	**12**	**26**
16:00	16:15	5	2	**7**	7	2	**9**	**16**
16:15	16:30	3	4	**7**	5	4	**9**	**16**
16:30	16:45	1	4	**5**	4	5	**9**	**14**
16:45	17:00	0	4	**4**	1	2	**3**	**7**
17:00	17:15	4	5	**9**	2	6	**8**	**17**
17:15	17:30	4	8	**12**	9	3	**12**	**24**
17:30	17:45	1	3	**4**	1	1	**2**	**6**
17:45	18:00	2	8	**10**	3	0	**3**	**13**
Total		62	127	**189**	108	84	**192**	**381**

5472208 - THU JAN 23, 2020 - 8HRS - LORETTA

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BYRON AVE @ ISLAND PARK DR

Survey Date: Thursday, January 23, 2020 **WO No:** 39390

Start Time: 07:00 **Device:** Miovision

Full Study Heavy Vehicles

		ISLAND PARK DR									BYRON AVE									
		Northbound				Southbound					Eastbound				Westbound					
Time Period		LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00	07:15	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
07:15	07:30	1	0	0	**1**	0	0	0	**0**	**1**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
07:30	07:45	0	0	1	**1**	0	1	0	**1**	**2**	0	0	0	**0**	0	1	0	**1**	**1**	**3**
07:45	08:00	1	0	0	**1**	0	1	0	**1**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
08:00	08:15	0	1	0	**1**	0	2	0	**2**	**3**	0	0	0	**0**	0	0	0	**0**	**0**	**3**
08:15	08:30	2	0	0	**2**	0	0	0	**0**	**2**	0	1	0	**1**	0	0	0	**0**	**1**	**3**
08:30	08:45	0	0	0	**0**	0	4	0	**4**	**4**	0	1	2	**3**	1	0	0	**1**	**4**	**8**
08:45	09:00	0	0	0	**0**	0	2	0	**2**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
09:00	09:15	0	0	0	**0**	0	0	0	**0**	**0**	0	0	1	**1**	0	0	0	**0**	**1**	**1**
09:15	09:30	0	0	0	**0**	0	1	0	**1**	**1**	0	0	0	**0**	0	0	0	**0**	**0**	**1**
09:30	09:45	0	1	0	**1**	0	0	0	**0**	**1**	0	0	0	**0**	0	0	1	**1**	**1**	**2**
09:45	10:00	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
11:30	11:45	0	2	0	**2**	0	0	0	**0**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
11:45	12:00	0	1	0	**1**	0	0	0	**0**	**1**	0	0	0	**0**	0	1	0	**1**	**1**	**2**
12:00	12:15	0	1	0	**1**	0	1	1	**2**	**3**	0	0	0	**0**	1	2	0	**3**	**3**	**6**
12:15	12:30	0	0	0	**0**	0	0	0	**0**	**0**	0	0	1	**1**	0	0	0	**0**	**1**	**1**
12:30	12:45	0	0	0	**0**	0	3	0	**3**	**3**	1	0	0	**1**	0	1	0	**1**	**2**	**5**
12:45	13:00	0	0	1	**1**	1	0	0	**1**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
13:00	13:15	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	0	0	**0**	**1**	**1**
13:15	13:30	0	1	0	**1**	0	0	1	**1**	**2**	0	0	1	**1**	0	1	0	**1**	**2**	**4**
15:00	15:15	0	0	0	**0**	0	2	0	**2**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
15:15	15:30	0	0	0	**0**	0	0	0	**0**	**0**	0	2	1	**3**	0	1	0	**1**	**4**	**4**
15:30	15:45	0	0	0	**0**	0	2	1	**3**	**3**	0	0	0	**0**	0	0	0	**0**	**0**	**3**
15:45	16:00	2	1	1	**4**	0	0	0	**0**	**4**	0	1	0	**1**	0	0	0	**0**	**1**	**5**
16:00	16:15	0	0	0	**0**	1	3	0	**4**	**4**	1	0	0	**1**	0	1	0	**1**	**2**	**6**
16:15	16:30	0	1	0	**1**	1	0	0	**1**	**2**	0	0	0	**0**	0	1	0	**1**	**1**	**3**
16:30	16:45	0	0	0	**0**	0	0	0	**0**	**0**	0	1	0	**1**	0	0	0	**0**	**1**	**1**
16:45	17:00	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
17:00	17:15	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
17:15	17:30	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	1	0	**1**	**1**	**1**
17:30	17:45	0	0	0	**0**	0	2	0	**2**	**2**	0	0	0	**0**	0	0	0	**0**	**0**	**2**
17:45	18:00	0	0	0	**0**	0	0	0	**0**	**0**	0	0	0	**0**	0	0	0	**0**	**0**	**0**
Total:	None	6	9	3	**18**	3	24	3	**30**	**48**	2	7	6	**15**	2	10	1	**13**	**28**	**76**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

BYRON AVE @ ISLAND PARK DR

Survey Date: Thursday, January 23, 2020 **WO No:** 39390

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

		ISLAND PARK DR		BYRON AVE		
Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	0	0	0	0
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	0	0	0
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	0	0	0	0
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		0	0	0	0	0

Appendix C

Synchro Intersection Worksheets – Existing Conditions

CGH TRANSPORTATION

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	456	54	43	198	22	41	272	90	57	678	92
Future Volume (vph)	105	456	54	43	198	22	41	272	90	57	678	92
Satd. Flow (prot)	1658	1745	1483	1658	1705	0	0	1666	0	1658	1705	0
Flt Permitted	0.552			0.250				0.398		0.454		
Satd. Flow (perm)	924	1745	1423	434	1705	0	0	667	0	783	1705	0
Satd. Flow (RTOR)			40		7			21			10	
Lane Group Flow (vph)	117	507	60	48	244	0	0	448	0	63	855	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		34.5	34.5		34.5	34.5	
Total Split (s)	42.0	42.0	42.0	42.0	42.0		53.0	53.0		53.0	53.0	
Total Split (%)	44.2%	44.2%	44.2%	44.2%	44.2%		55.8%	55.8%		55.8%	55.8%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0			6.5		6.5	6.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max	Max	Max	Max		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	36.0	36.0	36.0	36.0	36.0			46.5		46.5	46.5	
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38			0.49		0.49	0.49	
v/c Ratio	0.33	0.77	0.11	0.29	0.38			1.33		0.16	1.02	
Control Delay	24.4	35.1	9.7	26.7	22.8			192.9		15.0	61.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0		0.0	0.0	
Total Delay	24.4	35.1	9.7	26.7	22.8			192.9		15.0	61.5	
LOS	C	D	A	C	C			F		B	E	
Approach Delay		31.0			23.5			192.9			58.3	
Approach LOS		C			C			F			E	
Queue Length 50th (m)	15.0	80.0	2.3	6.1	30.8			~99.1		6.2	~158.3	
Queue Length 95th (m)	29.3	#119.7	10.0	15.7	50.3			#170.7		13.9	#237.5	
Internal Link Dist (m)		206.8			289.3			318.7			431.8	
Turn Bay Length (m)	50.0		25.0	245.0						25.0		
Base Capacity (vph)	350	661	564	164	650			337		383	839	
Starvation Cap Reductn	0	0	0	0	0			0		0	0	
Spillback Cap Reductn	0	0	0	0	0			0		0	0	
Storage Cap Reductn	0	0	0	0	0			0		0	0	
Reduced v/c Ratio	0.33	0.77	0.11	0.29	0.38			1.33		0.16	1.02	

Intersection Summary
Cycle Length: 95
Actuated Cycle Length: 95
Offset: 38 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.33

Intersection Signal Delay: 71.7	Intersection LOS: E
Intersection Capacity Utilization 107.7%	ICU Level of Service G
Analysis Period (min) 15	

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

Splits and Phases: 1: Island Park & Scott

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	314	128	159	227	2	137	38	94	4	41	0
Future Volume (vph)	2	314	128	159	227	2	137	38	94	4	41	0
Satd. Flow (prot)	0	3081	0	0	3245	0	1658	1524	0	0	1738	0
Flt Permitted		0.954			0.639		0.724				0.982	
Satd. Flow (perm)	0	2939	0	0	2084	0	1248	1524	0	0	1712	0
Satd. Flow (RTOR)		95			1			104				
Lane Group Flow (vph)	0	493	0	0	431	0	152	146	0	0	50	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	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.1	31.1		31.1	31.1		27.6	27.6		27.6	27.6	
Total Split (s)	35.0	35.0		35.0	35.0		30.0	30.0		30.0	30.0	
Total Split (%)	46.7%	46.7%		46.7%	46.7%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.8	2.8		2.8	2.8		2.3	2.3		2.3	2.3	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0			0.0	
Total Lost Time (s)		6.1			6.1		5.6	5.6			5.6	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effct Green (s)		28.9			28.9		24.4	24.4			24.4	
Actuated g/C Ratio		0.39			0.39		0.33	0.33			0.33	
v/c Ratio		0.41			0.54		0.37	0.26			0.09	
Control Delay		14.6			20.9		22.8	8.1			18.2	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		14.6			20.9		22.8	8.1			18.2	
LOS		B			C		C	A			B	
Approach Delay		14.6			20.9			15.6			18.2	
Approach LOS		B			C			B			B	
Queue Length 50th (m)		20.5			24.1		16.3	4.1			4.9	
Queue Length 95th (m)		32.4			37.5		31.5	15.9			12.0	
Internal Link Dist (m)		282.3			180.4			201.3			128.2	
Turn Bay Length (m)												
Base Capacity (vph)		1190			803		406	565			556	
Starvation Cap Reductn		0			0		0	0			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.41			0.54		0.37	0.26			0.09	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 25 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	1.0	1.0	1.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

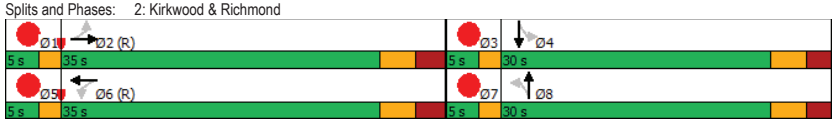
Lanes, Volumes, Timings
2: Kirkwood & Richmond

01-23-2023

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 17.1	Intersection LOS: B
Intersection Capacity Utilization 62.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: Kirkwood & Richmond



Lanes, Volumes, Timings
3: Private/Patricia & Richmond

01-23-2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	403	3	1	325	9	23	0	26	24	0	40
Future Volume (vph)	17	403	3	1	325	9	23	0	26	24	0	40
Satd. Flow (prot)	0	3304	0	0	3297	0	0	1560	0	0	1535	0
Flt Permitted		0.935			0.954			0.846			0.852	
Satd. Flow (perm)	0	3092	0	0	3145	0	0	1338	0	0	1326	0
Satd. Flow (RTOR)		2			7			41			44	
Lane Group Flow (vph)	0	470	0	0	372	0	0	55	0	0	71	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	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	33.8	33.8		33.8	33.8		21.5	21.5		21.5	21.5	
Total Split (s)	53.0	53.0		53.0	53.0		22.0	22.0		22.0	22.0	
Total Split (%)	70.7%	70.7%		70.7%	70.7%		29.3%	29.3%		29.3%	29.3%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.8			5.8			5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Act Effct Green (s)		55.8			55.8			11.1			11.1	
Actuated g/C Ratio		0.80			0.80			0.16			0.16	
v/c Ratio		0.19			0.15			0.22			0.29	
Control Delay		3.7			3.5			13.9			16.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		3.7			3.5			13.9			16.2	
LOS		A			A			B			B	
Approach Delay		3.7			3.5			13.9			16.2	
Approach LOS		A			A			B			B	
Queue Length 50th (m)		9.3			7.0			1.6			3.1	
Queue Length 95th (m)		19.2			15.0			10.1			12.8	
Internal Link Dist (m)		180.4			177.6			16.2			168.6	
Turn Bay Length (m)												
Base Capacity (vph)		2481			2525			349			348	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.19			0.15			0.16			0.20	

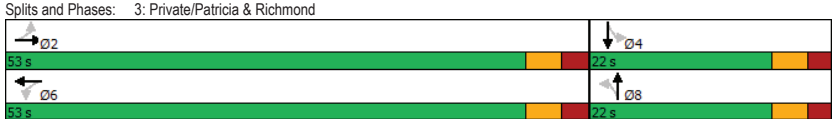
Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 69.5
Natural Cycle: 60
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.29

Lanes, Volumes, Timings
3: Private/Patricia & Richmond

01-23-2023

Intersection Signal Delay: 5.1	Intersection LOS: A
Intersection Capacity Utilization 44.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Private/Patricia & Richmond



Lanes, Volumes, Timings
4: Island Park & Richmond/Wellington

01-23-2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	340	50	39	210	7	65	362	70	28	684	52
Future Volume (vph)	55	340	50	39	210	7	65	362	70	28	684	52
Satd. Flow (prot)	0	3197	0	0	3265	0	1658	1683	0	1658	1724	0
Flt Permitted		0.859			0.810		0.091			0.349		
Satd. Flow (perm)	0	2741	0	0	2651	0	159	1683	0	609	1724	0
Satd. Flow (RTOR)		15			3			14			5	
Lane Group Flow (vph)	0	495	0	0	284	0	72	480	0	31	818	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	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.3	31.3		31.3	31.3		21.9	21.9		21.9	21.9	
Total Split (s)	35.0	35.0		35.0	35.0		50.0	50.0		50.0	50.0	
Total Split (%)	36.8%	36.8%		36.8%	36.8%		52.6%	52.6%		52.6%	52.6%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.9	2.9		2.9	2.9	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.3			6.3		5.9	5.9		5.9	5.9	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effct Green (s)		28.7			28.7		44.1	44.1		44.1	44.1	
Actuated g/C Ratio		0.30			0.30		0.46	0.46		0.46	0.46	
v/c Ratio		0.59			0.35		0.99	0.61		0.11	1.02	
Control Delay		30.7			27.2		122.9	26.0		6.8	37.6	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		30.7			27.2		122.9	26.0		6.8	37.6	
LOS		C			C		F	C		A	D	
Approach Delay		30.7			27.2			38.6			36.5	
Approach LOS		C			C			D			D	
Queue Length 50th (m)		39.1			21.0		9.9	57.2		1.0	~72.4	
Queue Length 95th (m)		55.4			32.2		m#26.4	94.2		m1.3	m#100.0	
Internal Link Dist (m)		177.6			213.6			268.0			318.7	
Turn Bay Length (m)							15.0			10.0		
Base Capacity (vph)		838			802		73	788		282	802	
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		0.59			0.35		0.99	0.61		0.11	1.02	

Intersection Summary
Cycle Length: 95
Actuated Cycle Length: 95
Offset: 28 (29%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	1.0	1.0	1.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	5%	5%	5%	5%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Maximum v/c Ratio: 1.02

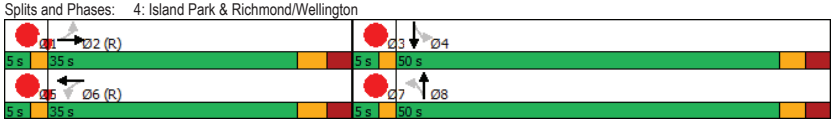
Intersection Signal Delay: 34.5	Intersection LOS: C
Intersection Capacity Utilization 103.3%	ICU Level of Service G
Analysis Period (min) 15	

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

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

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

Splits and Phases: 4: Island Park & Richmond/Wellington



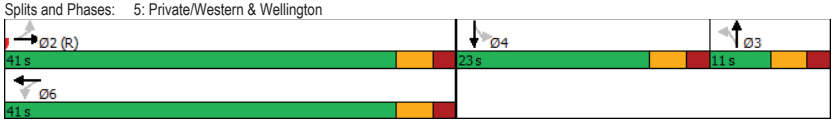
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	399	0	0	216	10	0	0	0	25	0	20
Future Volume (vph)	16	399	0	0	216	10	0	0	0	25	0	20
Satd. Flow (prot)	0	3309	0	0	1724	0	0	1745	0	0	1578	0
Flt Permitted		0.941									0.950	
Satd. Flow (perm)	0	3110	0	0	1724	0	0	1745	0	0	1541	0
Satd. Flow (RTOR)					4						116	
Lane Group Flow (vph)	0	461	0	0	251	0	0	0	0	0	50	0
Turn Type	Perm	NA			NA					Perm	NA	
Protected Phases		2			6			3			4	
Permitted Phases	2			6			3			4		
Detector Phase	2	2		6	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	5.0		10.0	10.0	
Minimum Split (s)	20.5	20.5		20.5	20.5		10.5	10.5		22.5	22.5	
Total Split (s)	41.0	41.0		41.0	41.0		11.0	11.0		23.0	23.0	
Total Split (%)	54.7%	54.7%		54.7%	54.7%		14.7%	14.7%		30.7%	30.7%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2		2.2	2.2		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.5			5.5			5.5			5.5	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Act Effct Green (s)		61.0			61.0						11.4	
Actuated g/C Ratio		0.81			0.81						0.15	
v/c Ratio		0.18			0.18						0.15	
Control Delay		3.5			3.9						1.0	
Queue Delay		0.0			0.0						0.0	
Total Delay		3.5			3.9						1.0	
LOS		A			A						A	
Approach Delay		3.5			3.9						1.0	
Approach LOS		A			A						A	
Queue Length 50th (m)		9.0			9.2						0.0	
Queue Length 95th (m)		19.5			23.1						0.2	
Internal Link Dist (m)		213.6			167.2			9.8			311.8	
Turn Bay Length (m)												
Base Capacity (vph)		2529			1403						448	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.18			0.18						0.11	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 27 (36%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.18

Intersection Signal Delay: 3.5	Intersection LOS: A
Intersection Capacity Utilization 43.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Private/Western & Wellington



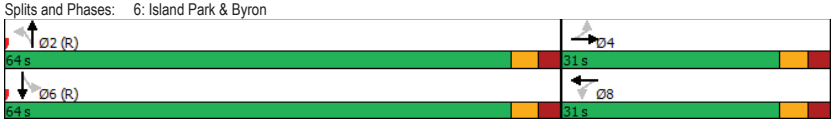
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (vph)	50	143	71	21	126	12	78	461	11	49	679	32
Future Volume (vph)	50	143	71	21	126	12	78	461	11	49	679	32
Satd. Flow (prot)	0	1643	0	0	1707	0	0	1726	0	0	1725	0
Flt Permitted		0.877			0.904			0.803			0.932	
Satd. Flow (perm)	0	1443	0	0	1550	0	0	1394	0	0	1611	0
Satd. Flow (RTOR)		19			4							
Lane Group Flow (vph)	0	294	0	0	176	0	0	611	0	0	844	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		32.7	32.7		32.7	32.7	
Total Split (s)	31.0	31.0		31.0	31.0		64.0	64.0		64.0	64.0	
Total Split (%)	32.6%	32.6%		32.6%	32.6%		67.4%	67.4%		67.4%	67.4%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.7	2.7		2.7	2.7		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			5.7			5.7	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)		21.6			21.6			61.7			61.7	
Actuated g/C Ratio		0.23			0.23			0.65			0.65	
v/c Ratio		0.86			0.50			0.68			0.81	
Control Delay		56.6			35.5			16.1			12.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		56.6			35.5			16.1			12.4	
LOS		E			D			B			B	
Approach Delay		56.6			35.5			16.1			12.4	
Approach LOS		E			D			B			B	
Queue Length 50th (m)		47.7			26.9			66.5			42.7	
Queue Length 95th (m)		#83.6			45.3			113.1			m44.1	
Internal Link Dist (m)		377.2			388.4			224.9			268.0	
Turn Bay Length (m)												
Base Capacity (vph)		393			410			905			1046	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.75			0.43			0.68			0.81	

Intersection Summary

Cycle Length: 95
Actuated Cycle Length: 95
Offset: 73 (77%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86
Intersection Signal Delay: 22.4 Intersection LOS: C
Intersection Capacity Utilization 85.9% ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Island Park & Byron

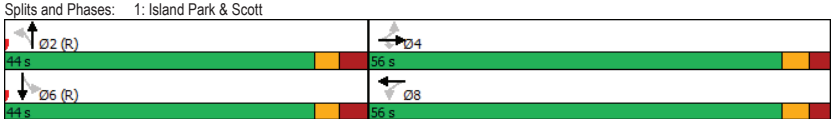


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	277	44	201	449	101	15	257	13	27	393	73
Future Volume (vph)	105	277	44	201	449	101	15	257	13	27	393	73
Satd. Flow (prot)	1658	1745	1483	1658	1662	0	0	1725	0	1658	1688	0
Flt Permitted	0.263			0.523				0.878		0.487		
Satd. Flow (perm)	447	1745	1391	890	1662	0	0	1518	0	834	1688	0
Satd. Flow (RTOR)			49		16			3			11	
Lane Group Flow (vph)	117	308	49	223	611	0	0	317	0	30	518	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		34.5	34.5		34.5	34.5	
Total Split (s)	56.0	56.0	56.0	56.0	56.0		44.0	44.0		44.0	44.0	
Total Split (%)	56.0%	56.0%	56.0%	56.0%	56.0%		44.0%	44.0%		44.0%	44.0%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0			6.5		6.5	6.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max	Max	Max	Max		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	50.0	50.0	50.0	50.0	50.0			37.5		37.5	37.5	
Actuated g/C Ratio	0.50	0.50	0.50	0.50	0.50			0.38		0.38	0.38	
v/c Ratio	0.52	0.35	0.07	0.50	0.73			0.56		0.10	0.81	
Control Delay	27.5	16.6	4.1	21.6	25.4			29.0		21.4	39.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0		0.0	0.0	
Total Delay	27.5	16.6	4.1	21.6	25.4			29.0		21.4	39.2	
LOS	C	B	A	C	C			C		C	D	
Approach Delay		18.0			24.4			29.0			38.2	
Approach LOS		B			C			C			D	
Queue Length 50th (m)	14.7	34.8	0.0	27.7	87.1			47.3		3.7	87.1	
Queue Length 95th (m)	34.3	53.6	5.5	49.5	130.2			74.3		10.0	#140.4	
Internal Link Dist (m)		206.8			289.3			318.7			431.8	
Turn Bay Length (m)	50.0		25.0	245.0						25.0		
Base Capacity (vph)	223	872	720	445	839			571		312	639	
Starvation Cap Reductn	0	0	0	0	0			0		0	0	
Spillback Cap Reductn	0	0	0	0	0			0		0	0	
Storage Cap Reductn	0	0	0	0	0			0		0	0	
Reduced v/c Ratio	0.52	0.35	0.07	0.50	0.73			0.56		0.10	0.81	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 2 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81
Intersection Signal Delay: 27.2 Intersection LOS: C
Intersection Capacity Utilization 84.1% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Island Park & Scott



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	260	140	203	549	12	175	39	157	6	51	8
Future Volume (vph)	2	260	140	203	549	12	175	39	157	6	51	8
Satd. Flow (prot)	0	2939	0	0	3256	0	1658	1486	0	0	1694	0
Flt Permitted		0.952			0.713		0.782				0.965	
Satd. Flow (perm)	0	2798	0	0	2300	0	1304	1486	0	0	1640	0
Satd. Flow (RTOR)		139			2			174			9	
Lane Group Flow (vph)	0	447	0	0	849	0	194	217	0	0	73	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	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.1	31.1		31.1	31.1		27.6	27.6		27.6	27.6	
Total Split (s)	40.0	40.0		40.0	40.0		35.0	35.0		35.0	35.0	
Total Split (%)	47.1%	47.1%		47.1%	47.1%		41.2%	41.2%		41.2%	41.2%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.8	2.8		2.8	2.8		2.3	2.3		2.3	2.3	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0			0.0	
Total Lost Time (s)		6.1			6.1		5.6	5.6			5.6	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)		45.6			45.6		19.8	19.8			18.8	
Actuated g/C Ratio		0.54			0.54		0.23	0.23			0.22	
v/c Ratio		0.29			0.69		0.64	0.45			0.20	
Control Delay		9.7			21.6		38.2	9.6			23.0	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		9.7			21.6		38.2	9.6			23.0	
LOS		A			C		D	A			C	
Approach Delay		9.7			21.6			23.1			23.0	
Approach LOS		A			C			C			C	
Queue Length 50th (m)		13.5			52.5		27.5	5.3			8.7	
Queue Length 95th (m)		28.6			#105.9		44.3	20.4			16.6	
Internal Link Dist (m)		282.3			180.4			201.3			128.2	
Turn Bay Length (m)												
Base Capacity (vph)		1566			1235		451	627			573	
Starvation Cap Reductn		0			0		0	0			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.29			0.69		0.43	0.35			0.13	

Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 79 (93%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	1.0	1.0	1.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	6%	6%	6%	6%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

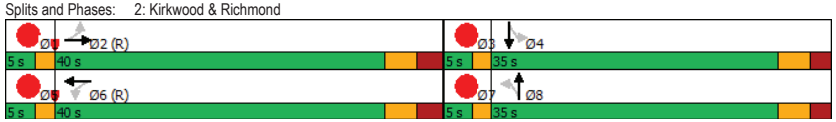
Intersection Summary

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 19.0	Intersection LOS: B
Intersection Capacity Utilization 71.1%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 2: Kirkwood & Richmond



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	364	19	13	750	29	3	0	3	16	0	26
Future Volume (vph)	20	364	19	13	750	29	3	0	3	16	0	26
Satd. Flow (prot)	0	3272	0	0	3285	0	0	1561	0	0	1545	0
Flt Permitted		0.897			0.946			0.829			0.872	
Satd. Flow (perm)	0	2938	0	0	3109	0	0	1318	0	0	1362	0
Satd. Flow (RTOR)		13			10			36			36	
Lane Group Flow (vph)	0	447	0	0	879	0	0	6	0	0	47	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	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	33.8	33.8		33.8	33.8		21.5	21.5		21.5	21.5	
Total Split (s)	63.0	63.0		63.0	63.0		22.0	22.0		22.0	22.0	
Total Split (%)	74.1%	74.1%		74.1%	74.1%		25.9%	25.9%		25.9%	25.9%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.8			5.8			5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Act Effct Green (s)		69.7			69.7			11.2			11.2	
Actuated g/C Ratio		0.84			0.84			0.13			0.13	
v/c Ratio		0.18			0.34			0.03			0.22	
Control Delay		3.0			3.7			0.2			16.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		3.0			3.7			0.2			16.8	
LOS		A			A			A			B	
Approach Delay		3.0			3.7			0.2			16.8	
Approach LOS		A			A			A			B	
Queue Length 50th (m)		8.6			20.6			0.0			1.8	
Queue Length 95th (m)		17.6			38.6			0.0			10.2	
Internal Link Dist (m)		180.4			177.6			16.2			168.6	
Turn Bay Length (m)												
Base Capacity (vph)		2463			2606			291			300	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.18			0.34			0.02			0.16	

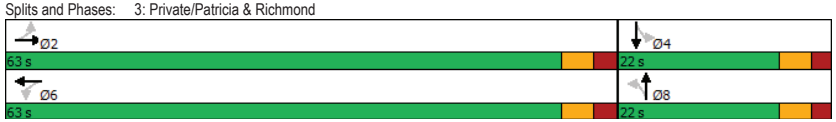
Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 83.2
Natural Cycle: 60
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.34

Lanes, Volumes, Timings
3: Private/Patricia & Richmond

01-23-2023

Intersection Signal Delay: 3.9	Intersection LOS: A
Intersection Capacity Utilization 52.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Private/Patricia & Richmond



Lanes, Volumes, Timings
4: Island Park & Richmond/Wellington

01-23-2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	301	61	79	576	9	54	241	65	49	490	111
Future Volume (vph)	23	301	61	79	576	9	54	241	65	49	490	111
Satd. Flow (prot)	0	3167	0	0	3284	0	1658	1668	0	1658	1686	0
Flt Permitted		0.875			0.797		0.121			0.459		
Satd. Flow (perm)	0	2776	0	0	2619	0	211	1668	0	787	1686	0
Satd. Flow (RTOR)		28			2			19			16	
Lane Group Flow (vph)	0	428	0	0	738	0	60	340	0	54	667	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	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.3	31.3		31.3	31.3		21.9	21.9		21.9	21.9	
Total Split (s)	35.0	35.0		35.0	35.0		40.0	40.0		40.0	40.0	
Total Split (%)	41.2%	41.2%		41.2%	41.2%		47.1%	47.1%		47.1%	47.1%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.9	2.9		2.9	2.9	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.3			6.3		5.9	5.9		5.9	5.9	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effct Green (s)		28.7			28.7		34.1	34.1		34.1	34.1	
Actuated g/C Ratio		0.34			0.34		0.40	0.40		0.40	0.40	
v/c Ratio		0.45			0.83		0.71	0.50		0.17	0.97	
Control Delay		22.3			35.9		59.5	18.2		18.2	55.0	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		22.3			35.9		59.5	18.2		18.2	55.0	
LOS		C			D		E	B		B	D	
Approach Delay		22.3			35.9			24.4			52.2	
Approach LOS		C			D			C			D	
Queue Length 50th (m)		26.2			57.3		4.0	20.8		5.5	101.9	
Queue Length 95th (m)		39.1			#87.1		m#19.9	m47.3		13.4	#172.8	
Internal Link Dist (m)		177.6			213.6			268.0			318.7	
Turn Bay Length (m)							15.0			10.0		
Base Capacity (vph)		955			885		84	680		315	685	
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		0.45			0.83		0.71	0.50		0.17	0.97	

Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 53 (62%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	1.0	1.0	1.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	6%	6%	6%	6%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

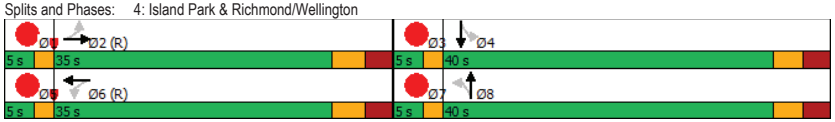
Intersection Summary

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 36.5	Intersection LOS: D
Intersection Capacity Utilization 99.0%	ICU Level of Service F
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Island Park & Richmond/Wellington



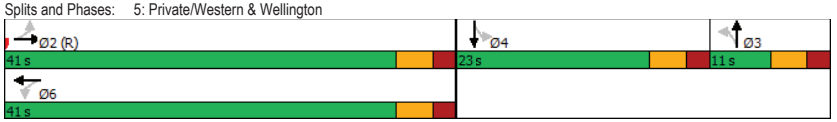
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	346	0	0	542	13	0	0	0	30	0	113
Future Volume (vph)	22	346	0	0	542	13	0	0	0	30	0	113
Satd. Flow (prot)	0	3306	0	0	1729	0	0	1745	0	0	1492	0
Flt Permitted		0.908									0.950	
Satd. Flow (perm)	0	3011	0	0	1729	0	0	1745	0	0	1432	0
Satd. Flow (RTOR)					2						126	
Lane Group Flow (vph)	0	408	0	0	616	0	0	0	0	0	159	0
Turn Type	Perm	NA			NA					Perm	NA	
Protected Phases		2			6			3			4	
Permitted Phases	2			6			3			4		
Detector Phase	2	2		6	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	5.0		10.0	10.0	
Minimum Split (s)	20.5	20.5		20.5	20.5		10.5	10.5		22.5	22.5	
Total Split (s)	41.0	41.0		41.0	41.0		11.0	11.0		23.0	23.0	
Total Split (%)	54.7%	54.7%		54.7%	54.7%		14.7%	14.7%		30.7%	30.7%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2		2.2	2.2		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.5			5.5			5.5			5.5	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Act Effct Green (s)		46.5			46.5						17.5	
Actuated g/C Ratio		0.62			0.62						0.23	
v/c Ratio		0.22			0.57						0.37	
Control Delay		6.6			11.1						10.2	
Queue Delay		0.0			0.0						0.0	
Total Delay		6.6			11.1						10.2	
LOS		A			B						B	
Approach Delay		6.6			11.1						10.2	
Approach LOS		A			B						B	
Queue Length 50th (m)		11.7			45.3						3.7	
Queue Length 95th (m)		17.7			72.0						17.8	
Internal Link Dist (m)		213.6			167.2			9.8			311.8	
Turn Bay Length (m)												
Base Capacity (vph)		1866			1072						430	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.22			0.57						0.37	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.57

Intersection Signal Delay: 9.4	Intersection LOS: A
Intersection Capacity Utilization 53.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Private/Western & Wellington



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	134	55	39	340	14	68	343	7	20	555	73
Future Volume (vph)	36	134	55	39	340	14	68	343	7	20	555	73
Satd. Flow (prot)	0	1657	0	0	1724	0	0	1726	0	0	1706	0
Flt Permitted		0.831			0.947			0.813			0.980	
Satd. Flow (perm)	0	1385	0	0	1639	0	0	1413	0	0	1675	0
Satd. Flow (RTOR)		21			2							
Lane Group Flow (vph)	0	250	0	0	437	0	0	465	0	0	720	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		32.7	32.7		32.7	32.7	
Total Split (s)	35.0	35.0		35.0	35.0		50.0	50.0		50.0	50.0	
Total Split (%)	41.2%	41.2%		41.2%	41.2%		58.8%	58.8%		58.8%	58.8%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.7	2.7		2.7	2.7		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			5.7			5.7	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)		26.1			26.1			47.2			47.2	
Actuated g/C Ratio		0.31			0.31			0.56			0.56	
v/c Ratio		0.57			0.87			0.59			0.78	
Control Delay		27.5			45.9			17.4			29.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		27.5			45.9			17.4			29.2	
LOS		C			D			B			C	
Approach Delay		27.5			45.9			17.4			29.2	
Approach LOS		C			D			B			C	
Queue Length 50th (m)		29.7			63.6			49.5			106.5	
Queue Length 95th (m)		51.3			#107.8			82.4			m117.0	
Internal Link Dist (m)		377.2			388.4			224.9			268.0	
Turn Bay Length (m)												
Base Capacity (vph)		486			560			784			929	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.51			0.78			0.59			0.78	

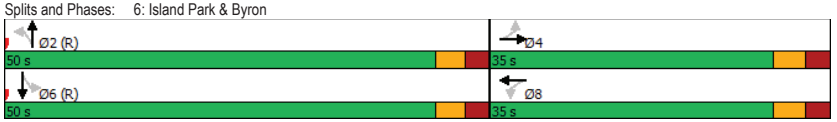
Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 82 (96%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 29.9	Intersection LOS: C
Intersection Capacity Utilization 89.9%	ICU Level of Service E
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Island Park & Byron



Appendix D

Collision Data

CGH TRANSPORTATION

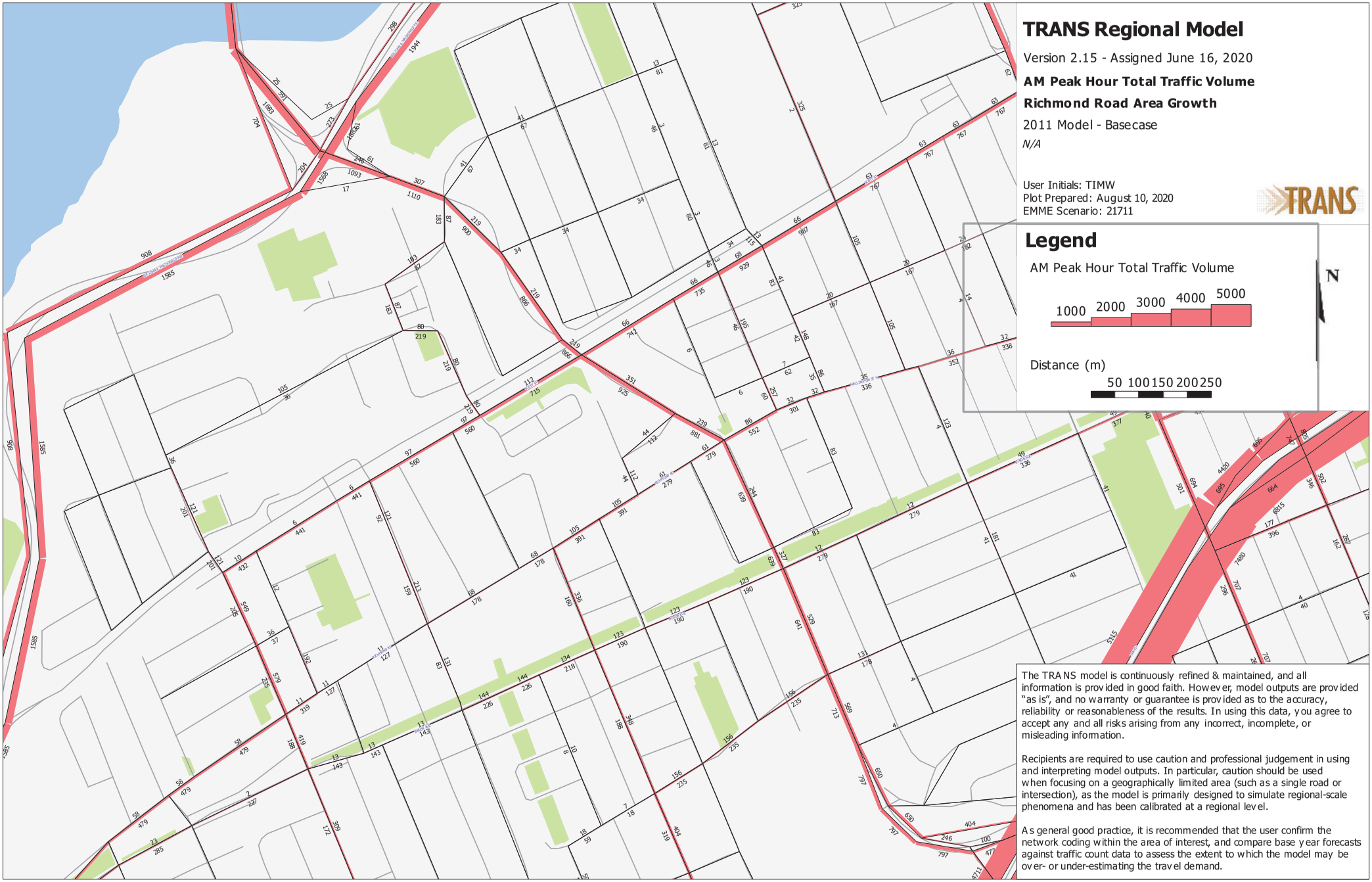
Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Traffic Control Condition	Classification Of Accident	Initial Impact Type	Road Surface Condition
2015-01-29	2015	16:12	BASSETT LANE @ ISLAND PARK DR	03 - Snow	05 - Dusk	02 - Stop sign		03 - P.D. only	07 - SMV other	03 - Loose snow
2016-12-03	2016	20:33	BASSETT LANE @ ISLAND PARK DR	01 - Clear	07 - Dark	02 - Stop sign		02 - Non-fatal injury	03 - Rear end	01 - Dry
2014-01-16	2014	20:12	BYRON AVE @ ISLAND PARK DR	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2014-08-22	2014	17:30	BYRON AVE @ ISLAND PARK DR	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2015-01-05	2015	7:45	BYRON AVE @ ISLAND PARK DR	01 - Clear	03 - Dawn	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2015-02-02	2015	15:15	BYRON AVE @ ISLAND PARK DR	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	07 - SMV other	03 - Loose snow
2015-03-22	2015	0:48	BYRON AVE @ ISLAND PARK DR	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2015-05-30	2015	9:12	BYRON AVE @ ISLAND PARK DR	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2015-08-24	2015	12:00	BYRON AVE @ ISLAND PARK DR	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2015-11-19	2015	15:04	BYRON AVE @ ISLAND PARK DR	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	02 - Wet
2015-11-27	2015	17:46	BYRON AVE @ ISLAND PARK DR	02 - Rain	07 - Dark	01 - Traffic signal		03 - P.D. only	03 - Rear end	02 - Wet
2016-11-22	2016	12:49	BYRON AVE @ ISLAND PARK DR	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2017-02-12	2017	18:02	BYRON AVE @ ISLAND PARK DR	03 - Snow	07 - Dark	01 - Traffic signal		03 - P.D. only	05 - Turning movement	03 - Loose snow
2017-03-08	2017	8:01	BYRON AVE @ ISLAND PARK DR	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	05 - Turning movement	02 - Wet
2017-08-14	2017	15:09	BYRON AVE @ ISLAND PARK DR	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	03 - Rear end	01 - Dry
2017-09-01	2017	9:40	BYRON AVE @ ISLAND PARK DR	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2017-10-30	2017	9:17	BYRON AVE @ ISLAND PARK DR	02 - Rain	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	02 - Wet
2017-12-10	2017	11:19	BYRON AVE @ ISLAND PARK DR	03 - Snow	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	02 - Wet
2017-12-11	2017	10:10	BYRON AVE @ ISLAND PARK DR	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2018-01-05	2018	17:50	BYRON AVE @ ISLAND PARK DR (0006365)	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	03 - Rear end	02 - Wet
2018-07-20	2018	15:00	BYRON AVE @ ISLAND PARK DR (0006365)	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2018-08-15	2018	10:49	BYRON AVE @ ISLAND PARK DR (0006365)	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2018-08-19	2018	16:00	BYRON AVE @ ISLAND PARK DR (0006365)	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2014-01-05	2014	11:42	HILSON AVE @ RICHMOND RD	03 - Snow	01 - Daylight	02 - Stop sign		02 - Non-fatal injury	03 - Rear end	03 - Loose snow
2017-03-05	2017	3:40	ISLAND PARK DR @ MAILES AVE	01 - Clear	07 - Dark	02 - Stop sign		03 - P.D. only	07 - SMV other	01 - Dry
2014-01-07	2014	16:30	ISLAND PARK DR @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	02 - Angle	03 - Loose snow
2014-01-20	2014	12:15	ISLAND PARK DR @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2014-07-08	2014	16:44	ISLAND PARK DR @ RICHMOND RD	02 - Rain	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	05 - Turning movement	02 - Wet
2014-07-11	2014	17:48	ISLAND PARK DR @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2014-08-02	2014	15:11	ISLAND PARK DR @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2014-08-24	2014	12:19	ISLAND PARK DR @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
2014-09-17	2014	8:40	ISLAND PARK DR @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2014-10-04	2014	11:50	ISLAND PARK DR @ RICHMOND RD	02 - Rain	01 - Daylight	01 - Traffic signal		03 - P.D. only	02 - Angle	02 - Wet
2014-10-04	2014	13:00	ISLAND PARK DR @ RICHMOND RD	02 - Rain	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	02 - Wet
2014-10-18	2014	13:40	ISLAND PARK DR @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	07 - SMV other	02 - Wet
2014-11-02	2014	19:05	ISLAND PARK DR @ RICHMOND RD	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2015-02-01	2015	16:45	ISLAND PARK DR @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2015-02-14	2015	14:00	ISLAND PARK DR @ RICHMOND RD	03 - Snow	01 - Daylight	01 - Traffic signal		03 - P.D. only	99 - Other	04 - Slush
2015-02-28	2015	11:31	ISLAND PARK DR @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	02 - Wet
2015-03-18	2015	10:27	ISLAND PARK DR @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
2015-04-21	2015	22:30	ISLAND PARK DR @ RICHMOND RD	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2015-04-28	2015	18:26	ISLAND PARK DR @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2015-05-23	2015	16:30	ISLAND PARK DR @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2015-05-26	2015	21:33	ISLAND PARK DR @ RICHMOND RD	01 - Clear	07 - Dark	01 - Traffic signal		02 - Non-fatal injury	02 - Angle	01 - Dry
2015-07-17	2015	13:40	ISLAND PARK DR @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2015-07-31	2015	15:29	ISLAND PARK DR @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
2015-10-14	2015	12:46	ISLAND PARK DR @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2015-10-20	2015	21:56	ISLAND PARK DR @ RICHMOND RD	01 - Clear	07 - Dark	01 - Traffic signal		02 - Non-fatal injury	02 - Angle	01 - Dry
2015-10-27	2015	9:40	ISLAND PARK DR @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2016-01-09	2016	12:37	ISLAND PARK DR @ RICHMOND RD	02 - Rain	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	02 - Wet
2016-06-04	2016	14:00	ISLAND PARK DR @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2016-06-07	2016	18:37	ISLAND PARK DR @ RICHMOND RD	02 - Rain	01 - Daylight	01 - Traffic signal		03 - P.D. only	05 - Turning movement	02 - Wet
2016-08-31	2016	15:30	ISLAND PARK DR @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2016-09-02	2016	7:27	ISLAND PARK DR @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	02 - Angle	01 - Dry
2016-10-13	2016	20:10	ISLAND PARK DR @ RICHMOND RD	01 - Clear	07 - Dark	01 - Traffic signal		02 - Non-fatal injury	05 - Turning movement	01 - Dry
2016-10-28	2016	17:30	ISLAND PARK DR @ RICHMOND RD	02 - Rain	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	02 - Wet
2016-12-11	2016	3:04	ISLAND PARK DR @ RICHMOND RD	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	07 - SMV other	06 - Ice
2017-01-03	2017	13:29	ISLAND PARK DR @ RICHMOND RD	04 - Freezing Rain	01 - Daylight	01 - Traffic signal		03 - P.D. only	05 - Turning movement	04 - Slush
2017-01-20	2017	12:54	ISLAND PARK DR @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2017-03-28	2017	17:56	ISLAND PARK DR @ RICHMOND RD	02 - Rain	01 - Daylight	01 - Traffic signal		03 - P.D. only	05 - Turning movement	02 - Wet
2017-04-30	2017	11:15	ISLAND PARK DR @ RICHMOND RD	02 - Rain	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	02 - Wet
2017-09-26	2017	15:26	ISLAND PARK DR @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
2018-02-03	2018	15:04	ISLAND PARK DR @ RICHMOND RD (0002125)	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	05 - Turning movement	01 - Dry
2018-04-10	2018	14:40	ISLAND PARK DR @ RICHMOND RD (0002125)	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	01 - Dry
2018-05-29	2018	14:56	ISLAND PARK DR @ RICHMOND RD (0002125)	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2018-06-23	2018	20:51	ISLAND PARK DR @ RICHMOND RD (0002125)	02 - Rain	05 - Dusk	01 - Traffic signal		03 - P.D. only	05 - Turning movement	02 - Wet
2018-09-28	2018	21:55	ISLAND PARK DR @ RICHMOND RD (0002125)	02 - Rain	07 - Dark	01 - Traffic signal		03 - P.D. only	03 - Rear end	02 - Wet
2018-10-09	2018	12:02	ISLAND PARK DR @ RICHMOND RD (0002125)	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2018-10-27	2018	18:11	ISLAND PARK DR @ RICHMOND RD (0002125)	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2018-11-26	2018	17:25	ISLAND PARK DR @ RICHMOND RD (0002125)	02 - Rain	07 - Dark	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	02 - Wet
2018-12-27	2018	20:23	ISLAND PARK DR @ RICHMOND RD (0002125)	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	05 - Turning movement	01 - Dry
2014-04-01	2014	20:20	ISLAND PARK DR @ SCOTT ST	01 - Clear	07 - Dark	01 - Traffic signal		02 - Non-fatal injury	07 - SMV other	01 - Dry
2015-01-31	2015	12:54	ISLAND PARK DR @ SCOTT ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2015-02-19	2015	16:45	ISLAND PARK DR @ SCOTT ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	06 - Ice
2015-06-13	2015	11:18	ISLAND PARK DR @ SCOTT ST	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	04 - Sideswipe	01 - Dry
2015-08-25	2015	17:33	ISLAND PARK DR @ SCOTT ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2015-10-29	2015	6:15	ISLAND PARK DR @ SCOTT ST	02 - Rain	03 - Dawn	01 - Traffic signal		03 - P.D. only	05 - Turning movement	02 - Wet
2015-11-23	2015	8:31	ISLAND PARK DR @ SCOTT ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2016-01-21	2016	16:43	ISLAND PARK DR @ SCOTT ST	01 - Clear	05 - Dusk	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2016-03-14	2016	16:39	ISLAND PARK DR @ SCOTT ST	02 - Rain	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	02 - Wet
2016-06-04	2016	16:20	ISLAND PARK DR @ SCOTT ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2016-07-15	2016	16:00	ISLAND PARK DR @ SCOTT ST	02 - Rain	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	02 - Wet
2016-07-15	2016	16:04	ISLAND PARK DR @ SCOTT ST	02 - Rain	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	02 - Wet
2016-08-25	2016	11:53	ISLAND PARK DR @ SCOTT ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
2016-08-31	2016	15:25	ISLAND PARK DR @ SCOTT ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2016-09-07	2016	17:45	ISLAND PARK DR @ SCOTT ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	01 - Dry
2016-09-21	2016	16:00	ISLAND PARK DR @ SCOTT ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2016-12-26	2016	18:39	ISLAND PARK DR @ SCOTT ST	01 - Clear	07 - Dark	01 - Traffic signal		02 - Non-fatal injury	02 - Angle	04 - Slush
2017-01-20	2017	17:25	ISLAND PARK DR @ SCOTT ST	02 - Rain	05 - Dusk	01 - Traffic signal		03 - P.D. only	04 - Sideswipe	02 - Wet
2017-06-09	2017	17:27	ISLAND PARK DR @ SCOTT ST	01 - Clear	01 - Daylight	01 - Traffic signal		02 - Non-fatal injury	03 - Rear end	01 - Dry
2017-06-19	2017	17:39	ISLAND PARK DR @ SCOTT ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	01 - Approaching	01 - Dry
2017-08-27	2017	10:35	ISLAND PARK DR @ SCOTT ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
2017-10-20	2017	9:50	ISLAND PARK DR @ SCOTT ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	03 - Rear end	01 - Dry
2017-11-26	2017	0:37	ISLAND PARK DR @ SCOTT ST	01 - Clear	07 - Dark	01 - Traffic signal		03 - P.D. only	02 - Angle	01 - Dry
2017-11-26	2017	12:30	ISLAND PARK DR @ SCOTT ST	01 - Clear	01 - Daylight	01 - Traffic signal		03 - P.D. only	01 - Approaching	01 - Dry

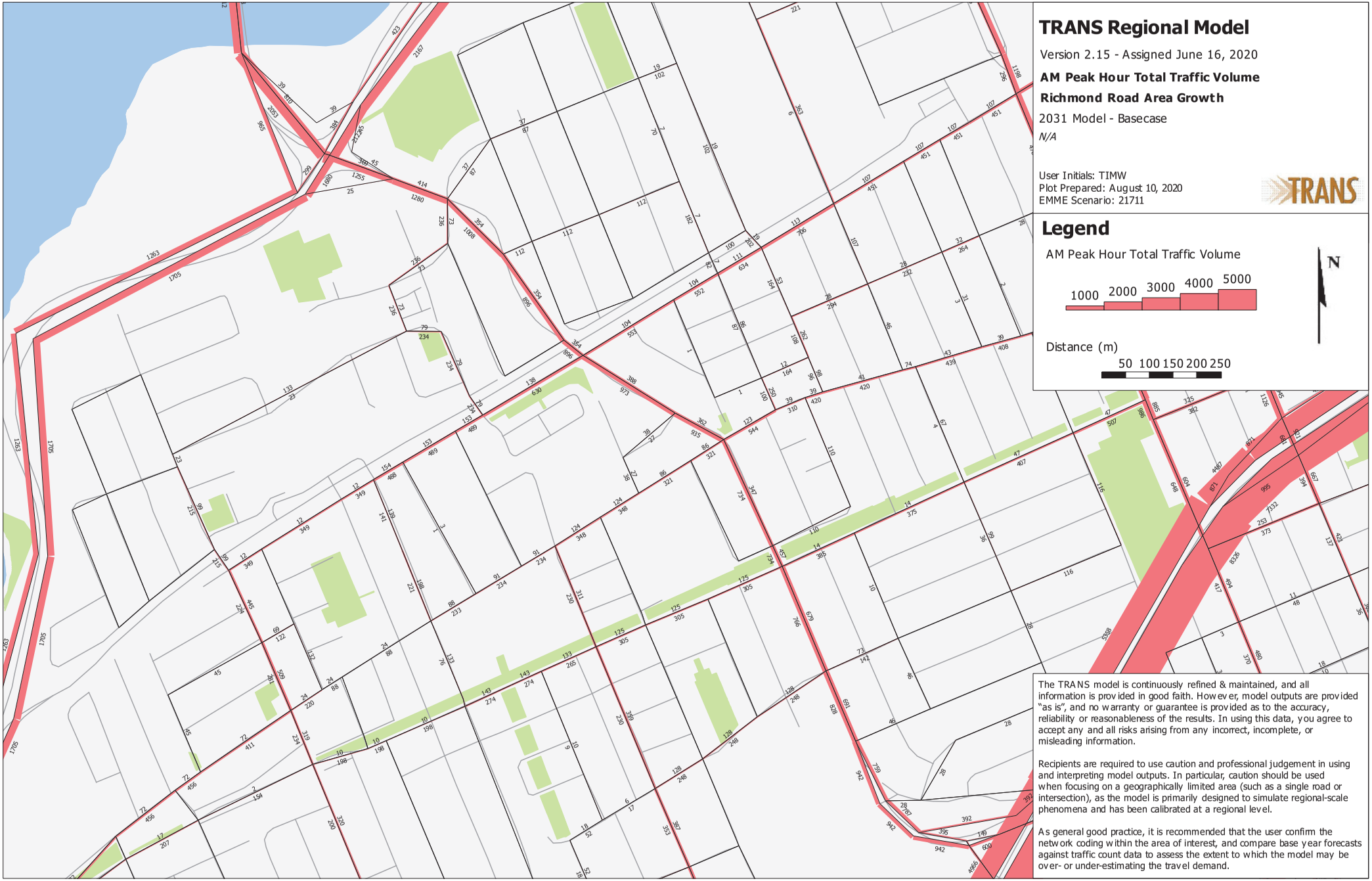
2018-09-27	2018	20:33	ISLAND PARK DR @ SCOTT ST (0002126)	01 - Clear	07 - Dark	01 - Traffic signal	03 - P.D. only	05 - Turning movement	01 - Dry
2018-10-17	2018	19:08	ISLAND PARK DR @ SCOTT ST (0002126)	01 - Clear	07 - Dark	01 - Traffic signal	02 - Non-fatal injury	05 - Turning movement	01 - Dry
2018-11-11	2018	17:15	ISLAND PARK DR @ SCOTT ST (0002126)	01 - Clear	05 - Dusk	01 - Traffic signal	03 - P.D. only	03 - Rear end	01 - Dry
2018-12-17	2018	15:30	ISLAND PARK DR @ SCOTT ST (0002126)	01 - Clear	01 - Daylight	01 - Traffic signal	03 - P.D. only	04 - Sideswipe	02 - Wet
2016-07-23	2016	11:15	ISLAND PARK DR btwn BASSETT LANE & BYRON AVE	01 - Clear	01 - Daylight	10 - No control	02 - Non-fatal injury	03 - Rear end	01 - Dry
2018-03-29	2018	9:45	ISLAND PARK DR btwn BASSETT LANE & BYRON AVE (__3ZA234)	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	03 - Rear end	01 - Dry
2014-03-12	2014	15:45	ISLAND PARK DR btwn MAILES AVE & RICHMOND RD	03 - Snow	01 - Daylight	10 - No control	03 - P.D. only	03 - Rear end	04 - Slush
2015-10-16	2015	17:00	ISLAND PARK DR btwn MAILES AVE & RICHMOND RD	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	04 - Sideswipe	01 - Dry
2016-05-18	2016	9:57	ISLAND PARK DR btwn MAILES AVE & RICHMOND RD	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	03 - Rear end	01 - Dry
2018-01-07	2018	18:35	ISLAND PARK DR btwn MAILES AVE & RICHMOND RD (__3ZA236)	03 - Snow	07 - Dark	10 - No control	03 - P.D. only	07 - SMV other	03 - Loose snow
2018-01-31	2018	15:00	ISLAND PARK DR btwn MAILES AVE & RICHMOND RD (__3ZA236)	03 - Snow	01 - Daylight	10 - No control	03 - P.D. only	03 - Rear end	03 - Loose snow
2018-10-29	2018	20:15	ISLAND PARK DR btwn MAILES AVE & RICHMOND RD (__3ZA236)	02 - Rain	07 - Dark	10 - No control	03 - P.D. only	01 - Approaching	02 - Wet
2014-10-04	2014	16:00	ISLAND PARK DR btwn RICHMOND RD & BASSETT LANE	02 - Rain	01 - Daylight	10 - No control	03 - P.D. only	03 - Rear end	02 - Wet
2014-10-28	2014	18:30	ISLAND PARK DR btwn RICHMOND RD & BASSETT LANE	02 - Rain	07 - Dark	10 - No control	03 - P.D. only	03 - Rear end	02 - Wet
2015-07-10	2015	13:04	ISLAND PARK DR btwn RICHMOND RD & BASSETT LANE	01 - Clear	01 - Daylight	10 - No control	02 - Non-fatal injury	03 - Rear end	01 - Dry
2015-10-13	2015	13:18	ISLAND PARK DR btwn RICHMOND RD & BASSETT LANE	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	03 - Rear end	01 - Dry
2016-01-30	2016	17:30	ISLAND PARK DR btwn RICHMOND RD & BASSETT LANE	01 - Clear	05 - Dusk	10 - No control	03 - P.D. only	03 - Rear end	02 - Wet
2016-05-17	2016	15:10	ISLAND PARK DR btwn RICHMOND RD & BASSETT LANE	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	03 - Rear end	01 - Dry
2016-06-15	2016	16:49	ISLAND PARK DR btwn RICHMOND RD & BASSETT LANE	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	03 - Rear end	01 - Dry
2016-06-19	2016	14:02	ISLAND PARK DR btwn RICHMOND RD & BASSETT LANE	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	03 - Rear end	01 - Dry
2017-12-26	2017	18:05	ISLAND PARK DR btwn RICHMOND RD & BASSETT LANE	03 - Snow	07 - Dark	10 - No control	03 - P.D. only	07 - SMV other	03 - Loose snow
2018-02-12	2018	9:17	ISLAND PARK DR btwn RICHMOND RD & BASSETT LANE (__3ZA235)	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	03 - Rear end	01 - Dry
2018-03-18	2018	6:45	ISLAND PARK DR btwn RICHMOND RD & BASSETT LANE (__3ZA235)	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	03 - Rear end	01 - Dry
2018-06-29	2018	14:55	ISLAND PARK DR btwn RICHMOND RD & BASSETT LANE (__3ZA235)	01 - Clear	01 - Daylight	10 - No control	02 - Non-fatal injury	05 - Turning movement	01 - Dry
2014-11-14	2014	16:00	ISLAND PARK DR btwn SCOTT ST & MAILES AVE	01 - Clear	05 - Dusk	10 - No control	03 - P.D. only	02 - Angle	01 - Dry
2018-01-25	2018	15:19	ISLAND PARK DR btwn SCOTT ST & MAILES AVE (__3ZA237)	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	03 - Rear end	01 - Dry
2014-02-18	2014	17:20	KIRKWOOD AVE @ RICHMOND RD	01 - Clear	07 - Dark	01 - Traffic signal	03 - P.D. only	02 - Angle	04 - Slush
2014-02-21	2014	13:00	KIRKWOOD AVE @ RICHMOND RD	02 - Rain	01 - Daylight	01 - Traffic signal	03 - P.D. only	03 - Rear end	02 - Wet
2014-03-18	2014	12:42	KIRKWOOD AVE @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal	03 - P.D. only	03 - Rear end	01 - Dry
2014-09-08	2014	15:42	KIRKWOOD AVE @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal	03 - P.D. only	05 - Turning movement	01 - Dry
2014-09-08	2014	17:53	KIRKWOOD AVE @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal	03 - P.D. only	02 - Angle	01 - Dry
2014-09-15	2014	0:34	KIRKWOOD AVE @ RICHMOND RD	02 - Rain	07 - Dark	01 - Traffic signal	03 - P.D. only	07 - SMV other	02 - Wet
2014-09-18	2014	17:32	KIRKWOOD AVE @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal	03 - P.D. only	05 - Turning movement	01 - Dry
2014-12-08	2014	14:44	KIRKWOOD AVE @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal	03 - P.D. only	04 - Sideswipe	01 - Dry
2015-01-31	2015	10:40	KIRKWOOD AVE @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal	03 - P.D. only	05 - Turning movement	02 - Wet
2015-06-18	2015	15:29	KIRKWOOD AVE @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal	03 - P.D. only	04 - Sideswipe	01 - Dry
2015-10-28	2015	13:51	KIRKWOOD AVE @ RICHMOND RD	02 - Rain	01 - Daylight	01 - Traffic signal	02 - Non-fatal injury	03 - Rear end	02 - Wet
2016-02-12	2016	14:42	KIRKWOOD AVE @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal	03 - P.D. only	02 - Angle	02 - Wet
2016-06-11	2016	20:41	KIRKWOOD AVE @ RICHMOND RD	01 - Clear	05 - Dusk	01 - Traffic signal	02 - Non-fatal injury	07 - SMV other	01 - Dry
2016-07-19	2016	16:21	KIRKWOOD AVE @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal	03 - P.D. only	04 - Sideswipe	01 - Dry
2016-10-08	2016	19:37	KIRKWOOD AVE @ RICHMOND RD	01 - Clear	07 - Dark	01 - Traffic signal	02 - Non-fatal injury	03 - Rear end	01 - Dry
2016-12-18	2016	18:00	KIRKWOOD AVE @ RICHMOND RD	03 - Snow	07 - Dark	01 - Traffic signal	03 - P.D. only	05 - Turning movement	04 - Slush
2017-01-04	2017	15:00	KIRKWOOD AVE @ RICHMOND RD	03 - Snow	01 - Daylight	01 - Traffic signal	03 - P.D. only	03 - Rear end	04 - Slush
2017-06-14	2017	21:35	KIRKWOOD AVE @ RICHMOND RD	01 - Clear	07 - Dark	01 - Traffic signal	03 - P.D. only	03 - Rear end	01 - Dry
2017-08-16	2017	16:18	KIRKWOOD AVE @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal	02 - Non-fatal injury	05 - Turning movement	01 - Dry
2017-09-20	2017	15:49	KIRKWOOD AVE @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal	03 - P.D. only	05 - Turning movement	01 - Dry
2017-11-06	2017	20:00	KIRKWOOD AVE @ RICHMOND RD	01 - Clear	07 - Dark	01 - Traffic signal	03 - P.D. only	04 - Sideswipe	01 - Dry
2018-05-22	2018	14:59	KIRKWOOD AVE @ RICHMOND RD (0002080)	01 - Clear	01 - Daylight	01 - Traffic signal	03 - P.D. only	05 - Turning movement	01 - Dry
2018-06-09	2018	13:17	KIRKWOOD AVE @ RICHMOND RD (0002080)	01 - Clear	01 - Daylight	01 - Traffic signal	03 - P.D. only	02 - Angle	01 - Dry
2018-06-09	2018	14:46	KIRKWOOD AVE @ RICHMOND RD (0002080)	01 - Clear	01 - Daylight	01 - Traffic signal	03 - P.D. only	05 - Turning movement	01 - Dry
2018-08-11	2018	10:30	KIRKWOOD AVE @ RICHMOND RD (0002080)	01 - Clear	01 - Daylight	01 - Traffic signal	03 - P.D. only	04 - Sideswipe	01 - Dry
2018-08-31	2018	10:07	KIRKWOOD AVE @ RICHMOND RD (0002080)	01 - Clear	01 - Daylight	01 - Traffic signal	02 - Non-fatal injury	02 - Angle	01 - Dry
2018-09-10	2018	20:00	KIRKWOOD AVE @ RICHMOND RD (0002080)	01 - Clear	07 - Dark	01 - Traffic signal	02 - Non-fatal injury	07 - SMV other	02 - Wet
2018-09-12	2018	16:25	KIRKWOOD AVE @ RICHMOND RD (0002080)	01 - Clear	01 - Daylight	01 - Traffic signal	03 - P.D. only	05 - Turning movement	01 - Dry
2018-09-13	2018	18:05	KIRKWOOD AVE @ RICHMOND RD (0002080)	01 - Clear	01 - Daylight	01 - Traffic signal	03 - P.D. only	05 - Turning movement	01 - Dry
2014-12-27	2014	21:50	LEIGHTON TER @ RICHMOND RD	01 - Clear	07 - Dark	02 - Stop sign	03 - P.D. only	06 - SMV unattended vehicle	02 - Wet
2015-07-24	2015	14:36	LEIGHTON TER @ RICHMOND RD	01 - Clear	01 - Daylight	02 - Stop sign	02 - Non-fatal injury	02 - Angle	01 - Dry
2018-01-27	2018	21:30	LEIGHTON TER @ RICHMOND RD (0002037)	01 - Clear	07 - Dark	02 - Stop sign	02 - Non-fatal injury	02 - Angle	02 - Wet
2018-10-26	2018	15:10	LEIGHTON TER @ RICHMOND RD (0002037)	01 - Clear	01 - Daylight	02 - Stop sign	03 - P.D. only	02 - Angle	01 - Dry
2018-11-18	2018	15:35	LEIGHTON TER @ RICHMOND RD (0002037)	01 - Clear	01 - Daylight	02 - Stop sign	03 - P.D. only	04 - Sideswipe	03 - Loose snow
2014-04-06	2014	2:05	PATRICIA AVE @ RICHMOND RD	01 - Clear	07 - Dark	01 - Traffic signal	03 - P.D. only	07 - SMV other	01 - Dry
2016-01-31	2016	15:34	PATRICIA AVE @ RICHMOND RD	01 - Clear	01 - Daylight	01 - Traffic signal	03 - P.D. only	03 - Rear end	02 - Wet
2018-06-13	2018	10:47	PATRICIA AVE @ RICHMOND RD (0005608)	01 - Clear	01 - Daylight	01 - Traffic signal	02 - Non-fatal injury	07 - SMV other	01 - Dry
2014-09-03	2014	16:32	RICHMOND RD btwn HILSON AVE & PATRICIA AVE	01 - Clear	01 - Daylight	10 - No control	02 - Non-fatal injury	03 - Rear end	01 - Dry
2017-11-20	2017	15:13	RICHMOND RD btwn HILSON AVE & PATRICIA AVE	01 - Clear	01 - Daylight	10 - No control	02 - Non-fatal injury	04 - Sideswipe	01 - Dry
2016-08-10	2016	8:45	RICHMOND RD btwn KIRKWOOD AVE & HILSON AVE	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	01 - Approaching	01 - Dry
2018-04-19	2018	10:06	RICHMOND RD btwn KIRKWOOD AVE & HILSON AVE (__3ZA4OG)	01 - Clear	01 - Daylight	10 - No control	02 - Non-fatal injury	04 - Sideswipe	01 - Dry
2014-11-24	2014	15:58	RICHMOND RD btwn LEIGHTON TER & ISLAND PARK DR	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	05 - Turning movement	01 - Dry
2016-07-06	2016	21:30	RICHMOND RD btwn LEIGHTON TER & ISLAND PARK DR	02 - Rain	07 - Dark	10 - No control	03 - P.D. only	06 - SMV unattended vehicle	02 - Wet
2014-01-09	2014	22:22	RICHMOND RD btwn PATRICIA AVE & LEIGHTON TER	01 - Clear	07 - Dark	10 - No control	03 - P.D. only	06 - SMV unattended vehicle	02 - Wet
2014-07-16	2014	14:15	RICHMOND RD btwn PATRICIA AVE & LEIGHTON TER	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	04 - Sideswipe	01 - Dry
2014-11-24	2014	15:01	RICHMOND RD btwn PATRICIA AVE & LEIGHTON TER	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
2015-07-22	2015	19:00	RICHMOND RD btwn PATRICIA AVE & LEIGHTON TER	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
2016-05-09	2016	16:00	RICHMOND RD btwn PATRICIA AVE & LEIGHTON TER	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
2018-02-14	2018	10:10	RICHMOND RD btwn PATRICIA AVE & LEIGHTON TER (__3ZA4PL)	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
2018-11-21	2018	12:32	RICHMOND RD btwn PATRICIA AVE & LEIGHTON TER (__3ZA4PL)	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	06 - SMV unattended vehicle	01 - Dry
2014-08-20	2014	17:30	WELLINGTON ST W btwn ISLAND PARK DR & PICCADILLY AVE	01 - Clear	01 - Daylight	10 - No control	03 - P.D. only	05 - Turning movement	01 - Dry
2016-03-22	2016	20:05	WELLINGTON ST W btwn ISLAND PARK DR & PICCADILLY AVE	03 - Snow	07 - Dark	10 - No control	03 - P.D. only	04 - Sideswipe	02 - Wet
2016-10-28	2016	14:25	WELLINGTON ST W btwn ISLAND PARK DR & PICCADILLY AVE	02 - Rain	01 - Daylight	10 - No control	03 - P.D. only	02 - Angle	02 - Wet

Appendix E

TRANS Model Plots

CGH TRANSPORTATION


TRANS Regional Model
Version 2.15 - Assigned June 16, 2020
AM Peak Hour Total Traffic Volume
Richmond Road Area Growth
2011 Model - Basecase
N/A
User Initials: TIMW
Plot Prepared: August 10, 2020
EMME Scenario: 21711
TRANS
Legend
AM Peak Hour Total Traffic Volume
1000 2000 3000 4000 5000
N
Distance (m)
50 100 150 200 250
The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and all risks arising from any incorrect, incomplete, or misleading information.
Recipients are required to use caution and professional judgement in using and interpreting model outputs. In particular, caution should be used when focusing on a geographically limited area (such as a single road or intersection), as the model is primarily designed to simulate regional-scale phenomena and has been calibrated at a regional level.
As general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.



TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

Richmond Road Area Growth

2031 Model - Basecase

N/A

User Initials: TIMW
Plot Prepared: August 10, 2020
EMME Scenario: 21711

TRANS

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

N

Distance (m)

50 100 150 200 250

Appendix F

Synchro Intersection Worksheets – 2022 Future Background Conditions

CGH TRANSPORTATION

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	456	54	43	207	22	41	296	90	57	682	92
Future Volume (vph)	105	456	54	43	207	22	41	296	90	57	682	92
Satd. Flow (prot)	1658	1745	1483	1658	1707	0	0	1671	0	1658	1705	0
Flt Permitted	0.571			0.305				0.561		0.467		
Satd. Flow (perm)	955	1745	1423	528	1707	0	0	942	0	805	1705	0
Satd. Flow (RTOR)			40		6			20			10	
Lane Group Flow (vph)	105	456	54	43	229	0	0	427	0	57	774	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		34.5	34.5		34.5	34.5	
Total Split (s)	42.0	42.0	42.0	42.0	42.0		53.0	53.0		53.0	53.0	
Total Split (%)	44.2%	44.2%	44.2%	44.2%	44.2%		55.8%	55.8%		55.8%	55.8%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0			6.5		6.5	6.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max	Max	Max	Max		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	36.0	36.0	36.0	36.0	36.0			46.5		46.5	46.5	
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38			0.49		0.49	0.49	
v/c Ratio	0.29	0.69	0.10	0.21	0.35			0.91		0.14	0.92	
Control Delay	23.4	31.4	9.0	23.6	22.5			51.0		14.6	40.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0		0.0	0.0	
Total Delay	23.4	31.4	9.0	23.6	22.5			51.0		14.6	40.9	
LOS	C	C	A	C	C			D		B	D	
Approach Delay		28.0			22.7			51.0			39.1	
Approach LOS		C			C			D			D	
Queue Length 50th (m)	13.2	69.1	1.6	5.3	28.8			70.2		5.5	125.5	
Queue Length 95th (m)	26.2	103.7	8.9	13.5	47.3			#132.7		12.7	#203.7	
Internal Link Dist (m)		206.8			289.3			318.7			431.8	
Turn Bay Length (m)	50.0		25.0	245.0						25.0		
Base Capacity (vph)	361	661	564	200	650			471		394	839	
Starvation Cap Reductn	0	0	0	0	0			0		0	0	
Spillback Cap Reductn	0	0	0	0	0			0		0	0	
Storage Cap Reductn	0	0	0	0	0			0		0	0	
Reduced v/c Ratio	0.29	0.69	0.10	0.21	0.35			0.91		0.14	0.92	

Intersection Summary

Cycle Length: 95
Actuated Cycle Length: 95
Offset: 38 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92
Intersection Signal Delay: 36.2 Intersection LOS: D
Intersection Capacity Utilization 108.8% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Island Park & Scott

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	318	132	169	241	2	143	38	103	21	55	13
Future Volume (vph)	2	318	132	169	241	2	143	38	103	21	55	13
Satd. Flow (prot)	0	3077	0	0	3244	0	1658	1518	0	0	1683	0
Flt Permitted		0.953			0.657		0.699				0.926	
Satd. Flow (perm)	0	2931	0	0	2140	0	1206	1518	0	0	1572	0
Satd. Flow (RTOR)		97			1			103			12	
Lane Group Flow (vph)	0	452	0	0	412	0	143	141	0	0	89	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	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.1	31.1		31.1	31.1		27.6	27.6		27.6	27.6	
Total Split (s)	35.0	35.0		35.0	35.0		30.0	30.0		30.0	30.0	
Total Split (%)	46.7%	46.7%		46.7%	46.7%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.8	2.8		2.8	2.8		2.3	2.3		2.3	2.3	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0			0.0	
Total Lost Time (s)		6.1			6.1		5.6	5.6			5.6	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effct Green (s)		30.9			30.9		28.4	28.4			28.4	
Actuated g/C Ratio		0.41			0.41		0.38	0.38			0.38	
v/c Ratio		0.36			0.47		0.31	0.22			0.15	
Control Delay		13.2			18.8		19.5	7.1			15.0	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		13.2			18.8		19.5	7.1			15.0	
LOS		B			B		B	A			B	
Approach Delay		13.2			18.8			13.4			15.0	
Approach LOS		B			B			B			B	
Queue Length 50th (m)		18.0			22.6		13.6	3.3			6.8	
Queue Length 95th (m)		29.1			35.3		29.9	15.1			17.4	
Internal Link Dist (m)		282.3			180.4			201.3			128.2	
Turn Bay Length (m)												
Base Capacity (vph)		1264			882		456	638			602	
Starvation Cap Reductn		0			0		0	0			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.36			0.47		0.31	0.22			0.15	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 25 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

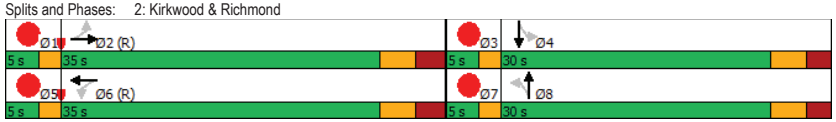
Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	1.0	1.0	1.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 15.2	Intersection LOS: B
Intersection Capacity Utilization 71.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Kirkwood & Richmond

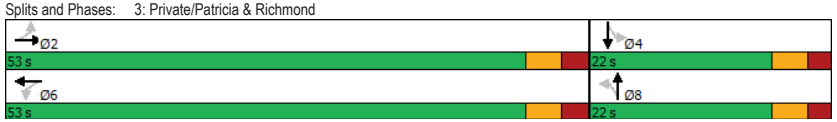


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	434	3	1	346	9	23	0	26	24	0	40
Future Volume (vph)	17	434	3	1	346	9	23	0	26	24	0	40
Satd. Flow (prot)	0	3303	0	0	3297	0	0	1559	0	0	1536	0
Flt Permitted		0.938			0.954			0.818			0.856	
Satd. Flow (perm)	0	3102	0	0	3145	0	0	1292	0	0	1332	0
Satd. Flow (RTOR)		2			7			41			41	
Lane Group Flow (vph)	0	454	0	0	356	0	0	49	0	0	64	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	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	33.8	33.8		33.8	33.8		21.5	21.5		21.5	21.5	
Total Split (s)	53.0	53.0		53.0	53.0		22.0	22.0		22.0	22.0	
Total Split (%)	70.7%	70.7%		70.7%	70.7%		29.3%	29.3%		29.3%	29.3%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.8			5.8			5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Act Effct Green (s)		55.8			55.8			11.1			11.1	
Actuated g/C Ratio		0.80			0.80			0.16			0.16	
v/c Ratio		0.18			0.14			0.20			0.26	
Control Delay		3.7			3.5			12.8			15.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		3.7			3.5			12.8			15.7	
LOS		A			A			B			B	
Approach Delay		3.7			3.5			12.8			15.7	
Approach LOS		A			A			B			B	
Queue Length 50th (m)		9.0			6.6			0.9			2.6	
Queue Length 95th (m)		18.6			14.3			8.8			11.9	
Internal Link Dist (m)		180.4			177.6			16.2			168.6	
Turn Bay Length (m)												
Base Capacity (vph)		2489			2525			338			347	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.18			0.14			0.14			0.18	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 69.5
Natural Cycle: 60
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.26

Intersection Signal Delay: 4.9	Intersection LOS: A
Intersection Capacity Utilization 45.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Private/Patricia & Richmond



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	368	50	54	228	16	65	379	75	31	684	53
Future Volume (vph)	58	368	50	54	228	16	65	379	75	31	684	53
Satd. Flow (prot)	0	3203	0	0	3238	0	1658	1681	0	1658	1724	0
Flt Permitted		0.859			0.767		0.129			0.373		
Satd. Flow (perm)	0	2747	0	0	2489	0	225	1681	0	651	1724	0
Satd. Flow (RTOR)		14			6			14			5	
Lane Group Flow (vph)	0	476	0	0	298	0	65	454	0	31	737	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	31.3	31.3		31.3	31.3		21.9	21.9		21.9	21.9	
Total Split (s)	35.0	35.0		35.0	35.0		50.0	50.0		50.0	50.0	
Total Split (%)	36.8%	36.8%		36.8%	36.8%		52.6%	52.6%		52.6%	52.6%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.9	2.9		2.9	2.9	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.3			6.3		5.9	5.9		5.9	5.9	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Act Effct Green (s)		28.7			28.7		44.1	44.1		44.1	44.1	
Actuated g/C Ratio		0.30			0.30		0.46	0.46		0.46	0.46	
v/c Ratio		0.57			0.39		0.62	0.58		0.10	0.92	
Control Delay		30.2			27.6		49.7	24.4		6.6	20.6	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		30.2			27.6		49.7	24.4		6.6	20.6	
LOS		C			C		D	C		A	C	
Approach Delay		30.2			27.6			27.5			20.0	
Approach LOS		C			C			C			C	
Queue Length 50th (m)		37.3			22.2		7.5	45.9		0.8	19.8	
Queue Length 95th (m)		53.1			33.8		m#17.0	86.9		m1.4	m#65.8	
Internal Link Dist (m)		177.6			213.6			268.0			318.7	
Turn Bay Length (m)							15.0			10.0		
Base Capacity (vph)		839			756		104	787		302	802	
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		0.57			0.39		0.63	0.58		0.10	0.92	

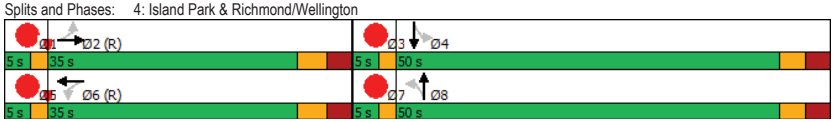
Intersection Summary	
Cycle Length: 95	
Actuated Cycle Length: 95	
Offset: 28 (29%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 25.4	Intersection LOS: C
Intersection Capacity Utilization 103.4%	ICU Level of Service G
Analysis Period (min) 15	

Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	3	5	7
Permitted Phases				
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	5%	5%	5%	5%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Island Park & Richmond/Wellington



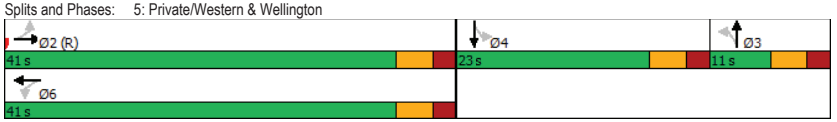
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	432	0	0	231	10	0	0	0	25	0	20
Future Volume (vph)	16	432	0	0	231	10	0	0	0	25	0	20
Satd. Flow (prot)	0	3309	0	0	1724	0	0	1745	0	0	1577	0
Flt Permitted		0.943									0.950	
Satd. Flow (perm)	0	3117	0	0	1724	0	0	1745	0	0	1539	0
Satd. Flow (RTOR)					4						116	
Lane Group Flow (vph)	0	448	0	0	241	0	0	0	0	0	45	0
Turn Type	Perm	NA			NA					Perm	NA	
Protected Phases		2			6			3			4	
Permitted Phases	2			6			3			4		
Detector Phase	2	2		6	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	5.0		10.0	10.0	
Minimum Split (s)	20.5	20.5		20.5	20.5		10.5	10.5		22.5	22.5	
Total Split (s)	41.0	41.0		41.0	41.0		11.0	11.0		23.0	23.0	
Total Split (%)	54.7%	54.7%		54.7%	54.7%		14.7%	14.7%		30.7%	30.7%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2		2.2	2.2		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.5			5.5			5.5			5.5	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Act Effct Green (s)		61.0			61.0						11.4	
Actuated g/C Ratio		0.81			0.81						0.15	
v/c Ratio		0.18			0.17						0.14	
Control Delay		3.5			3.9						0.8	
Queue Delay		0.0			0.0						0.0	
Total Delay		3.5			3.9						0.8	
LOS		A			A						A	
Approach Delay		3.5			3.9						0.8	
Approach LOS		A			A						A	
Queue Length 50th (m)		8.7			8.7						0.0	
Queue Length 95th (m)		18.8			22.1						0.0	
Internal Link Dist (m)		213.6			167.2			9.8			311.8	
Turn Bay Length (m)												
Base Capacity (vph)		2535			1403						448	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.18			0.17						0.10	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 27 (36%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.18

Intersection Signal Delay: 3.5	Intersection LOS: A
Intersection Capacity Utilization 44.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Private/Western & Wellington



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (vph)	50	152	71	21	127	12	78	487	11	49	694	32
Future Volume (vph)	50	152	71	21	127	12	78	487	11	49	694	32
Satd. Flow (prot)	0	1646	0	0	1705	0	0	1726	0	0	1725	0
Flt Permitted		0.895			0.909			0.822			0.938	
Satd. Flow (perm)	0	1475	0	0	1558	0	0	1427	0	0	1622	0
Satd. Flow (RTOR)		18			4							
Lane Group Flow (vph)	0	273	0	0	160	0	0	576	0	0	775	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		32.7	32.7		32.7	32.7	
Total Split (s)	31.0	31.0		31.0	31.0		64.0	64.0		64.0	64.0	
Total Split (%)	32.6%	32.6%		32.6%	32.6%		67.4%	67.4%		67.4%	67.4%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.7	2.7		2.7	2.7		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			5.7			5.7	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)		20.4			20.4			62.9			62.9	
Actuated g/C Ratio		0.21			0.21			0.66			0.66	
v/c Ratio		0.83			0.47			0.61			0.72	
Control Delay		53.3			35.6			13.6			9.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		53.3			35.6			13.6			9.4	
LOS		D			D			B			A	
Approach Delay		53.3			35.6			13.6			9.4	
Approach LOS		D			D			B			A	
Queue Length 50th (m)		44.4			24.8			55.1			33.2	
Queue Length 95th (m)		69.5			41.3			98.9			m46.4	
Internal Link Dist (m)		377.2			388.4			224.9			268.0	
Turn Bay Length (m)												
Base Capacity (vph)		401			412			944			1073	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.68			0.39			0.61			0.72	

Intersection Summary
Cycle Length: 95
Actuated Cycle Length: 95
Offset: 73 (77%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 19.8	Intersection LOS: B
Intersection Capacity Utilization 88.0%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 6: Island Park & Byron

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	290	44	201	449	101	15	269	13	27	425	73
Future Volume (vph)	105	290	44	201	449	101	15	269	13	27	425	73
Satd. Flow (prot)	1658	1745	1483	1658	1660	0	0	1725	0	1658	1691	0
Flt Permitted	0.312			0.540				0.939		0.506		
Satd. Flow (perm)	528	1745	1391	918	1660	0	0	1624	0	866	1691	0
Satd. Flow (RTOR)			44		16			3			10	
Lane Group Flow (vph)	105	290	44	201	550	0	0	297	0	27	498	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		34.5	34.5		34.5	34.5	
Total Split (s)	56.0	56.0	56.0	56.0	56.0		44.0	44.0		44.0	44.0	
Total Split (%)	56.0%	56.0%	56.0%	56.0%	56.0%		44.0%	44.0%		44.0%	44.0%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0			6.5		6.5	6.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max	Max	Max	Max		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	50.0	50.0	50.0	50.0	50.0			37.5		37.5	37.5	
Actuated g/C Ratio	0.50	0.50	0.50	0.50	0.50			0.38		0.38	0.38	
v/c Ratio	0.40	0.33	0.06	0.44	0.66			0.49		0.08	0.78	
Control Delay	21.3	16.3	4.2	19.8	22.7			27.0		21.2	37.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0		0.0	0.0	
Total Delay	21.3	16.3	4.2	19.8	22.7			27.0		21.2	37.0	
LOS	C	B	A	B	C			C		C	D	
Approach Delay		16.3			21.9			27.0			36.2	
Approach LOS		B			C			C			D	
Queue Length 50th (m)	12.2	32.3	0.0	23.9	74.0			42.9		3.3	82.3	
Queue Length 95th (m)	26.5	50.1	5.2	42.9	110.3			67.0		9.1	#124.6	
Internal Link Dist (m)		206.8			289.3			318.7			431.8	
Turn Bay Length (m)	50.0		25.0	245.0						25.0		
Base Capacity (vph)	264	872	717	459	838			610		324	640	
Starvation Cap Reductn	0	0	0	0	0			0		0	0	
Spillback Cap Reductn	0	0	0	0	0			0		0	0	
Storage Cap Reductn	0	0	0	0	0			0		0	0	
Reduced v/c Ratio	0.40	0.33	0.06	0.44	0.66			0.49		0.08	0.78	

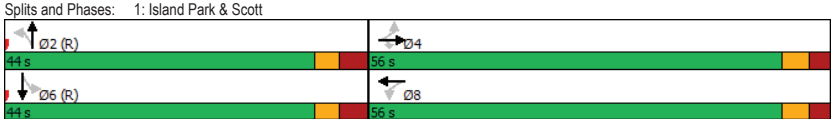
Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 2 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 25.2	Intersection LOS: C
Intersection Capacity Utilization 84.8%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 1: Island Park & Scott



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	274	159	226	556	28	197	39	184	5	44	3
Future Volume (vph)	2	274	159	226	556	28	197	39	184	5	44	3
Satd. Flow (prot)	0	2920	0	0	3230	0	1658	1478	0	0	1716	0
Flt Permitted		0.952			0.702		0.707				0.965	
Satd. Flow (perm)	0	2780	0	0	2245	0	1177	1478	0	0	1661	0
Satd. Flow (RTOR)		159			5			184			3	
Lane Group Flow (vph)	0	435	0	0	810	0	197	223	0	0	52	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	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.1	31.1		31.1	31.1		27.6	27.6		27.6	27.6	
Total Split (s)	40.0	40.0		40.0	40.0		35.0	35.0		35.0	35.0	
Total Split (%)	47.1%	47.1%		47.1%	47.1%		41.2%	41.2%		41.2%	41.2%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.8	2.8		2.8	2.8		2.3	2.3		2.3	2.3	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0			0.0	
Total Lost Time (s)		6.1			6.1		5.6	5.6			5.6	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)		33.9			33.9		19.2	19.2			19.0	
Actuated g/C Ratio		0.40			0.40		0.23	0.23			0.22	
v/c Ratio		0.36			0.90		0.74	0.47			0.14	
Control Delay		12.0			39.2		46.5	9.5			23.3	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		12.0			39.2		46.5	9.5			23.3	
LOS		B			D		D	A			C	
Approach Delay		12.0			39.2			26.9			23.3	
Approach LOS		B			D			C			C	
Queue Length 50th (m)		15.3			63.1		29.9	5.1			6.4	
Queue Length 95th (m)		26.2			#100.1		46.5	20.0			13.3	
Internal Link Dist (m)		282.3			180.4			201.3			128.2	
Turn Bay Length (m)												
Base Capacity (vph)		1204			898		407	631			576	
Starvation Cap Reductn		0			0		0	0			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.36			0.90		0.48	0.35			0.09	

Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 79 (93%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	1.0	1.0	1.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	6%	6%	6%	6%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

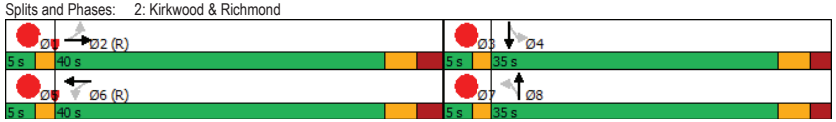
Intersection Summary

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 28.8	Intersection LOS: C
Intersection Capacity Utilization 74.0%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 2: Kirkwood & Richmond



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	400	19	13	796	29	3	0	3	16	0	26
Future Volume (vph)	20	400	19	13	796	29	3	0	3	16	0	26
Satd. Flow (prot)	0	3276	0	0	3286	0	0	1561	0	0	1543	0
Flt Permitted		0.905			0.947			0.830			0.872	
Satd. Flow (perm)	0	2969	0	0	3113	0	0	1319	0	0	1360	0
Satd. Flow (RTOR)		12			9			36			36	
Lane Group Flow (vph)	0	439	0	0	838	0	0	6	0	0	42	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	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	33.8	33.8		33.8	33.8		21.5	21.5		21.5	21.5	
Total Split (s)	63.0	63.0		63.0	63.0		22.0	22.0		22.0	22.0	
Total Split (%)	74.1%	74.1%		74.1%	74.1%		25.9%	25.9%		25.9%	25.9%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.8			5.8			5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Act Effct Green (s)		70.2			70.2			11.2			11.2	
Actuated g/C Ratio		0.84			0.84			0.13			0.13	
v/c Ratio		0.18			0.32			0.03			0.20	
Control Delay		3.0			3.6			0.3			15.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		3.0			3.6			0.3			15.2	
LOS		A			A			A			B	
Approach Delay		3.0			3.6			0.3			15.2	
Approach LOS		A			A			A			B	
Queue Length 50th (m)		8.4			19.2			0.0			1.0	
Queue Length 95th (m)		17.3			36.3			0.0			9.0	
Internal Link Dist (m)		180.4			177.6			16.2			168.6	
Turn Bay Length (m)												
Base Capacity (vph)		2493			2613			290			298	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.18			0.32			0.02			0.14	

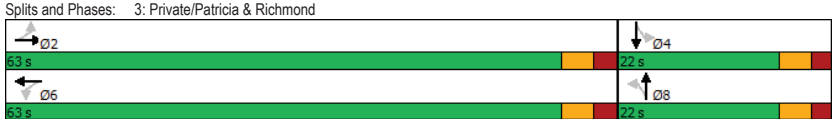
Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 83.6
Natural Cycle: 60
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.32

Lanes, Volumes, Timings
3: Private/Patricia & Richmond

01-23-2023

Intersection Signal Delay: 3.7	Intersection LOS: A
Intersection Capacity Utilization 53.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Private/Patricia & Richmond



Lanes, Volumes, Timings
4: Island Park & Richmond/Wellington

01-23-2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	328	61	88	613	15	54	241	76	56	512	118
Future Volume (vph)	29	328	61	88	613	15	54	241	76	56	512	118
Satd. Flow (prot)	0	3179	0	0	3278	0	1658	1659	0	1658	1686	0
Flt Permitted		0.863			0.799		0.157			0.485		
Satd. Flow (perm)	0	2747	0	0	2620	0	274	1659	0	830	1686	0
Satd. Flow (RTOR)		25			3			22			16	
Lane Group Flow (vph)	0	418	0	0	716	0	54	317	0	56	630	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	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.3	31.3		31.3	31.3		21.9	21.9		21.9	21.9	
Total Split (s)	35.0	35.0		35.0	35.0		40.0	40.0		40.0	40.0	
Total Split (%)	41.2%	41.2%		41.2%	41.2%		47.1%	47.1%		47.1%	47.1%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.9	2.9		2.9	2.9	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.3			6.3		5.9	5.9		5.9	5.9	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effct Green (s)		28.7			28.7		34.1	34.1		34.1	34.1	
Actuated g/C Ratio		0.34			0.34		0.40	0.40		0.40	0.40	
v/c Ratio		0.44			0.81		0.50	0.47		0.17	0.92	
Control Delay		22.3			34.2		32.1	16.5		18.1	44.9	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		22.3			34.2		32.1	16.5		18.1	44.9	
LOS		C			C		C	B		B	D	
Approach Delay		22.3			34.2			18.8			42.7	
Approach LOS		C			C			B			D	
Queue Length 50th (m)		25.7			54.8		3.6	19.0		5.7	92.5	
Queue Length 95th (m)		38.4			#78.8		m10.0	m40.4		13.6	#158.8	
Internal Link Dist (m)		177.6			213.6			268.0			318.7	
Turn Bay Length (m)							15.0			10.0		
Base Capacity (vph)		944			886		109	678		332	685	
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		0.44			0.81		0.50	0.47		0.17	0.92	

Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 53 (62%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	1.0	1.0	1.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	6%	6%	6%	6%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

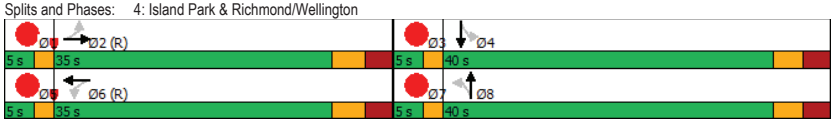
Intersection Summary

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 32.0	Intersection LOS: C
Intersection Capacity Utilization 102.4%	ICU Level of Service G
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Island Park & Richmond/Wellington



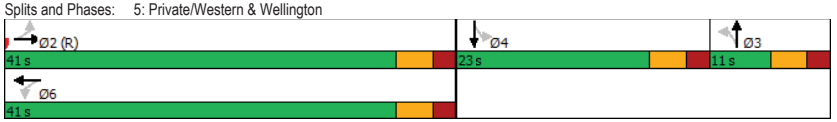
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	379	0	0	581	13	0	0	0	30	0	113
Future Volume (vph)	22	379	0	0	581	13	0	0	0	30	0	113
Satd. Flow (prot)	0	3306	0	0	1729	0	0	1745	0	0	1492	0
Flt Permitted		0.914									0.950	
Satd. Flow (perm)	0	3021	0	0	1729	0	0	1745	0	0	1432	0
Satd. Flow (RTOR)					2						116	
Lane Group Flow (vph)	0	401	0	0	594	0	0	0	0	0	143	0
Turn Type	Perm	NA			NA					Perm	NA	
Protected Phases		2			6			3			4	
Permitted Phases	2			6			3			4		
Detector Phase	2	2		6	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	5.0		10.0	10.0	
Minimum Split (s)	20.5	20.5		20.5	20.5		10.5	10.5		22.5	22.5	
Total Split (s)	41.0	41.0		41.0	41.0		11.0	11.0		23.0	23.0	
Total Split (%)	54.7%	54.7%		54.7%	54.7%		14.7%	14.7%		30.7%	30.7%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2		2.2	2.2		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.5			5.5			5.5			5.5	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Act Effct Green (s)		46.6			46.6						17.4	
Actuated g/C Ratio		0.62			0.62						0.23	
v/c Ratio		0.21			0.55						0.34	
Control Delay		6.6			10.7						9.9	
Queue Delay		0.0			0.0						0.0	
Total Delay		6.6			10.7						9.9	
LOS		A			B						A	
Approach Delay		6.6			10.7						9.9	
Approach LOS		A			B						A	
Queue Length 50th (m)		11.5			42.8						3.0	
Queue Length 95th (m)		17.3			68.3						16.2	
Internal Link Dist (m)		213.6			167.2			9.8			311.8	
Turn Bay Length (m)												
Base Capacity (vph)		1875			1073						423	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.21			0.55						0.34	

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.55
Intersection Signal Delay: 9.1 Intersection LOS: A
Intersection Capacity Utilization 55.1% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 5: Private/Western & Wellington



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	135	55	39	361	14	68	354	7	20	589	73
Future Volume (vph)	36	135	55	39	361	14	68	354	7	20	589	73
Satd. Flow (prot)	0	1657	0	0	1724	0	0	1726	0	0	1710	0
Flt Permitted		0.845			0.952			0.834			0.983	
Satd. Flow (perm)	0	1408	0	0	1648	0	0	1450	0	0	1682	0
Satd. Flow (RTOR)		21			2							
Lane Group Flow (vph)	0	226	0	0	414	0	0	429	0	0	682	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		32.7	32.7		32.7	32.7	
Total Split (s)	35.0	35.0		35.0	35.0		50.0	50.0		50.0	50.0	
Total Split (%)	41.2%	41.2%		41.2%	41.2%		58.8%	58.8%		58.8%	58.8%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.7	2.7		2.7	2.7		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			5.7			5.7	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)		25.2			25.2			48.1			48.1	
Actuated g/C Ratio		0.30			0.30			0.57			0.57	
v/c Ratio		0.52			0.84			0.52			0.72	
Control Delay		26.3			44.1			15.3			27.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		26.3			44.1			15.3			27.2	
LOS		C			D			B			C	
Approach Delay		26.3			44.1			15.3			27.2	
Approach LOS		C			D			B			C	
Queue Length 50th (m)		26.7			60.8			41.5			98.4	
Queue Length 95th (m)		45.5			#92.9			72.2			m116.1	
Internal Link Dist (m)		377.2			388.4			224.9			268.0	
Turn Bay Length (m)												
Base Capacity (vph)		494			563			819			951	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.46			0.74			0.52			0.72	

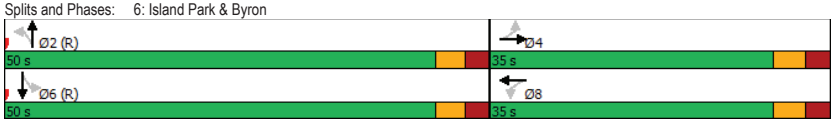
Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 82 (96%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 28.2	Intersection LOS: C
Intersection Capacity Utilization 92.3%	ICU Level of Service F
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Island Park & Byron



Appendix G

Synchro Intersection Worksheets – 2027 Future Background Conditions

CGH TRANSPORTATION

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	456	54	43	223	22	41	318	90	57	682	92
Future Volume (vph)	105	456	54	43	223	22	41	318	90	57	682	92
Satd. Flow (prot)	1658	1745	1483	1658	1710	0	0	1673	0	1658	1705	0
Flt Permitted	0.551			0.305				0.564		0.452		
Satd. Flow (perm)	921	1745	1423	528	1710	0	0	949	0	779	1705	0
Satd. Flow (RTOR)			40		6			19			10	
Lane Group Flow (vph)	105	456	54	43	245	0	0	449	0	57	774	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		34.5	34.5		34.5	34.5	
Total Split (s)	42.0	42.0	42.0	42.0	42.0		53.0	53.0		53.0	53.0	
Total Split (%)	44.2%	44.2%	44.2%	44.2%	44.2%		55.8%	55.8%		55.8%	55.8%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0			6.5		6.5	6.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max	Max	Max	Max		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	36.0	36.0	36.0	36.0	36.0			46.5		46.5	46.5	
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38			0.49		0.49	0.49	
v/c Ratio	0.30	0.69	0.10	0.21	0.38			0.95		0.15	0.92	
Control Delay	23.7	31.4	9.0	23.6	22.9			57.5		14.8	40.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0		0.0	0.0	
Total Delay	23.7	31.4	9.0	23.6	22.9			57.5		14.8	40.9	
LOS	C	C	A	C	C			E		B	D	
Approach Delay		28.1			23.0			57.5			39.1	
Approach LOS		C			C			E			D	
Queue Length 50th (m)	13.3	69.1	1.6	5.3	31.1			74.8		5.5	125.5	
Queue Length 95th (m)	26.5	103.7	8.9	13.5	50.8			#126.3		12.7	#203.7	
Internal Link Dist (m)		206.8			289.3			318.7			431.8	
Turn Bay Length (m)	50.0		25.0	245.0						25.0		
Base Capacity (vph)	349	661	564	200	651			474		381	839	
Starvation Cap Reductn	0	0	0	0	0			0		0	0	
Spillback Cap Reductn	0	0	0	0	0			0		0	0	
Storage Cap Reductn	0	0	0	0	0			0		0	0	
Reduced v/c Ratio	0.30	0.69	0.10	0.21	0.38			0.95		0.15	0.92	

Intersection Summary

Cycle Length: 95
Actuated Cycle Length: 95
Offset: 38 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95
Intersection Signal Delay: 37.7 Intersection LOS: D
Intersection Capacity Utilization 109.9% ICU Level of Service H
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Island Park & Scott

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	322	134	180	256	2	143	38	103	21	55	13
Future Volume (vph)	2	322	134	180	256	2	143	38	103	21	55	13
Satd. Flow (prot)	0	3076	0	0	3245	0	1658	1518	0	0	1683	0
Flt Permitted		0.953			0.654		0.699				0.926	
Satd. Flow (perm)	0	2931	0	0	2131	0	1206	1518	0	0	1572	0
Satd. Flow (RTOR)		98			1			103			12	
Lane Group Flow (vph)	0	458	0	0	438	0	143	141	0	0	89	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	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.1	31.1		31.1	31.1		27.6	27.6		27.6	27.6	
Total Split (s)	35.0	35.0		35.0	35.0		30.0	30.0		30.0	30.0	
Total Split (%)	46.7%	46.7%		46.7%	46.7%		40.0%	40.0%		40.0%	40.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.8	2.8		2.8	2.8		2.3	2.3		2.3	2.3	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0			0.0	
Total Lost Time (s)		6.1			6.1		5.6	5.6			5.6	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effct Green (s)		30.9			30.9		28.4	28.4			28.4	
Actuated g/C Ratio		0.41			0.41		0.38	0.38			0.38	
v/c Ratio		0.36			0.50		0.31	0.22			0.15	
Control Delay		13.2			19.3		19.5	7.1			15.0	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		13.2			19.3		19.5	7.1			15.0	
LOS		B			B		B	A			B	
Approach Delay		13.2			19.3			13.4			15.0	
Approach LOS		B			B			B			B	
Queue Length 50th (m)		18.3			24.5		13.6	3.3			6.8	
Queue Length 95th (m)		29.5			37.9		29.9	15.1			17.4	
Internal Link Dist (m)		282.3			180.4			201.3			128.2	
Turn Bay Length (m)												
Base Capacity (vph)		1265			878		456	638			602	
Starvation Cap Reductn		0			0		0	0			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.36			0.50		0.31	0.22			0.15	

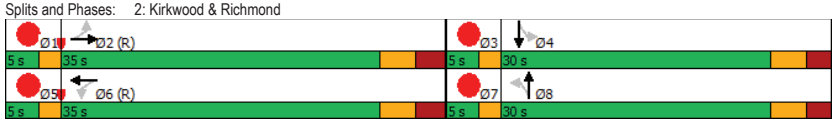
Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 25 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	1.0	1.0	1.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	7%	7%	7%	7%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Maximum v/c Ratio: 0.50	
Intersection Signal Delay: 15.5	Intersection LOS: B
Intersection Capacity Utilization 71.9%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Kirkwood & Richmond

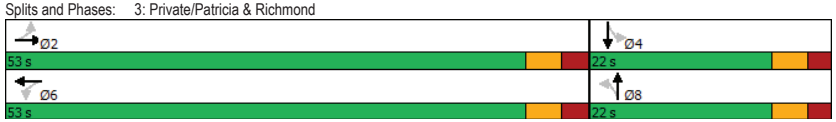


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	439	3	1	368	9	23	0	26	24	0	40
Future Volume (vph)	17	439	3	1	368	9	23	0	26	24	0	40
Satd. Flow (prot)	0	3304	0	0	3297	0	0	1559	0	0	1536	0
Flt Permitted		0.937			0.954			0.818			0.856	
Satd. Flow (perm)	0	3099	0	0	3145	0	0	1292	0	0	1332	0
Satd. Flow (RTOR)		2			6			41			41	
Lane Group Flow (vph)	0	459	0	0	378	0	0	49	0	0	64	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	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	33.8	33.8		33.8	33.8		21.5	21.5		21.5	21.5	
Total Split (s)	53.0	53.0		53.0	53.0		22.0	22.0		22.0	22.0	
Total Split (%)	70.7%	70.7%		70.7%	70.7%		29.3%	29.3%		29.3%	29.3%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.8			5.8			5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Act Effct Green (s)		55.8			55.8			11.1			11.1	
Actuated g/C Ratio		0.80			0.80			0.16			0.16	
v/c Ratio		0.18			0.15			0.20			0.26	
Control Delay		3.7			3.5			12.8			15.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		3.7			3.5			12.8			15.7	
LOS		A			A			B			B	
Approach Delay		3.7			3.5			12.8			15.7	
Approach LOS		A			A			B			B	
Queue Length 50th (m)		9.1			7.1			0.9			2.6	
Queue Length 95th (m)		18.7			15.2			8.8			11.9	
Internal Link Dist (m)		180.4			177.6			16.2			168.6	
Turn Bay Length (m)												
Base Capacity (vph)		2486			2524			338			347	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.18			0.15			0.14			0.18	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 69.5
Natural Cycle: 60
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.26

Intersection Signal Delay: 4.9	Intersection LOS: A
Intersection Capacity Utilization 45.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Private/Patricia & Richmond



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	372	50	54	245	16	65	408	75	31	684	53
Future Volume (vph)	58	372	50	54	245	16	65	408	75	31	684	53
Satd. Flow (prot)	0	3203	0	0	3243	0	1658	1686	0	1658	1724	0
Flt Permitted		0.856			0.770		0.129			0.347		
Satd. Flow (perm)	0	2738	0	0	2501	0	225	1686	0	606	1724	0
Satd. Flow (RTOR)		13			6			13			5	
Lane Group Flow (vph)	0	480	0	0	315	0	65	483	0	31	737	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Minimum Split (s)	31.3	31.3		31.3	31.3		21.9	21.9		21.9	21.9	
Total Split (s)	35.0	35.0		35.0	35.0		50.0	50.0		50.0	50.0	
Total Split (%)	36.8%	36.8%		36.8%	36.8%		52.6%	52.6%		52.6%	52.6%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.9	2.9		2.9	2.9	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.3			6.3		5.9	5.9		5.9	5.9	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Act Effct Green (s)		28.7			28.7		44.1	44.1		44.1	44.1	
Actuated g/C Ratio		0.30			0.30		0.46	0.46		0.46	0.46	
v/c Ratio		0.57			0.42		0.62	0.61		0.11	0.92	
Control Delay		30.4			28.0		49.8	25.9		6.7	20.6	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		30.4			28.0		49.8	25.9		6.7	20.6	
LOS		C			C		D	C		A	C	
Approach Delay		30.4			28.0			28.7			20.0	
Approach LOS		C			C			C			C	
Queue Length 50th (m)		37.8			23.6		8.1	55.1		0.8	19.8	
Queue Length 95th (m)		53.7			35.7		m15.7	94.0		m1.4	m#65.8	
Internal Link Dist (m)		177.6			213.6			268.0			318.7	
Turn Bay Length (m)							15.0			10.0		
Base Capacity (vph)		836			759		104	789		281	802	
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		0.57			0.42		0.63	0.61		0.11	0.92	

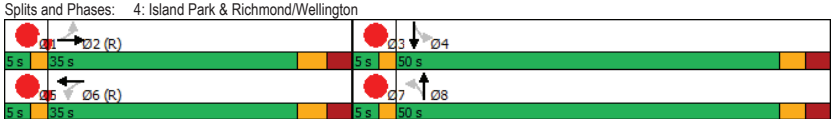
Intersection Summary	
Cycle Length: 95	
Actuated Cycle Length: 95	
Offset: 28 (29%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 25.8	Intersection LOS: C
Intersection Capacity Utilization 103.4%	ICU Level of Service G
Analysis Period (min) 15	

Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	3	5	7
Permitted Phases				
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	5%	5%	5%	5%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Island Park & Richmond/Wellington



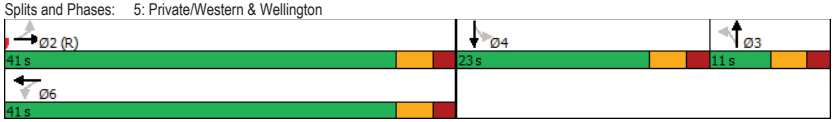
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	437	0	0	248	10	0	0	0	25	0	20
Future Volume (vph)	16	437	0	0	248	10	0	0	0	25	0	20
Satd. Flow (prot)	0	3309	0	0	1727	0	0	1745	0	0	1577	0
Flt Permitted		0.943									0.950	
Satd. Flow (perm)	0	3117	0	0	1727	0	0	1745	0	0	1539	0
Satd. Flow (RTOR)					4						116	
Lane Group Flow (vph)	0	453	0	0	258	0	0	0	0	0	45	0
Turn Type	Perm	NA			NA					Perm	NA	
Protected Phases		2			6			3			4	
Permitted Phases	2			6			3			4		
Detector Phase	2	2		6	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	5.0		10.0	10.0	
Minimum Split (s)	20.5	20.5		20.5	20.5		10.5	10.5		22.5	22.5	
Total Split (s)	41.0	41.0		41.0	41.0		11.0	11.0		23.0	23.0	
Total Split (%)	54.7%	54.7%		54.7%	54.7%		14.7%	14.7%		30.7%	30.7%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2		2.2	2.2		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.5			5.5			5.5			5.5	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Act Effct Green (s)		61.0			61.0						11.4	
Actuated g/C Ratio		0.81			0.81						0.15	
v/c Ratio		0.18			0.18						0.14	
Control Delay		3.5			3.9						0.8	
Queue Delay		0.0			0.0						0.0	
Total Delay		3.5			3.9						0.8	
LOS		A			A						A	
Approach Delay		3.5			3.9						0.8	
Approach LOS		A			A						A	
Queue Length 50th (m)		8.8			9.5						0.0	
Queue Length 95th (m)		19.1			23.6						0.0	
Internal Link Dist (m)		213.6			167.2			9.8			311.8	
Turn Bay Length (m)												
Base Capacity (vph)		2535			1405						448	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.18			0.18						0.10	

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 27 (36%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.18

Intersection Signal Delay: 3.5	Intersection LOS: A
Intersection Capacity Utilization 44.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Private/Western & Wellington



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	168	71	21	129	12	78	524	11	49	694	32
Future Volume (vph)	50	168	71	21	129	12	78	524	11	49	694	32
Satd. Flow (prot)	0	1651	0	0	1707	0	0	1730	0	0	1725	0
Flt Permitted		0.904			0.907			0.830			0.934	
Satd. Flow (perm)	0	1495	0	0	1555	0	0	1442	0	0	1615	0
Satd. Flow (RTOR)		17			4							
Lane Group Flow (vph)	0	289	0	0	162	0	0	613	0	0	775	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		32.7	32.7		32.7	32.7	
Total Split (s)	31.0	31.0		31.0	31.0		64.0	64.0		64.0	64.0	
Total Split (%)	32.6%	32.6%		32.6%	32.6%		67.4%	67.4%		67.4%	67.4%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.7	2.7		2.7	2.7		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			5.7			5.7	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)		21.1			21.1			62.2			62.2	
Actuated g/C Ratio		0.22			0.22			0.65			0.65	
v/c Ratio		0.84			0.47			0.65			0.73	
Control Delay		54.0			34.9			15.0			9.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		54.0			34.9			15.0			9.7	
LOS		D			C			B			A	
Approach Delay		54.0			34.9			15.0			9.7	
Approach LOS		D			C			B			A	
Queue Length 50th (m)		47.2			24.8			63.4			33.4	
Queue Length 95th (m)		#76.7			41.9			109.8			m46.4	
Internal Link Dist (m)		377.2			388.4			224.9			268.0	
Turn Bay Length (m)												
Base Capacity (vph)		405			412			943			1057	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.71			0.39			0.65			0.73	

Intersection Summary

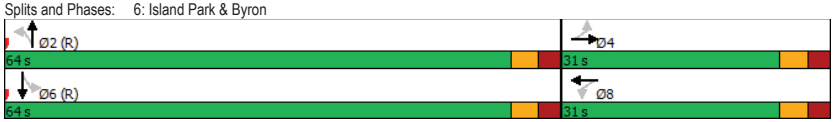
Cycle Length: 95
Actuated Cycle Length: 95
Offset: 73 (77%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 20.6	Intersection LOS: C
Intersection Capacity Utilization 90.7%	ICU Level of Service E
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Island Park & Byron

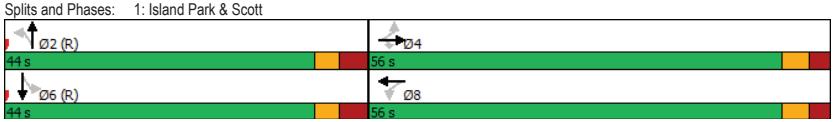


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	312	44	201	449	101	15	269	13	27	457	73
Future Volume (vph)	105	312	44	201	449	101	15	269	13	27	457	73
Satd. Flow (prot)	1658	1745	1483	1658	1660	0	0	1725	0	1658	1694	0
Flt Permitted	0.312			0.520				0.883		0.506		
Satd. Flow (perm)	528	1745	1391	885	1660	0	0	1527	0	866	1694	0
Satd. Flow (RTOR)			44		16			3			9	
Lane Group Flow (vph)	105	312	44	201	550	0	0	297	0	27	530	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Detector Phase	4	4	4	8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	32.0	32.0	32.0	32.0	32.0		34.5	34.5		34.5	34.5	
Total Split (s)	56.0	56.0	56.0	56.0	56.0		44.0	44.0		44.0	44.0	
Total Split (%)	56.0%	56.0%	56.0%	56.0%	56.0%		44.0%	44.0%		44.0%	44.0%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.7	2.7	2.7	2.7	2.7		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0			6.5		6.5	6.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max	Max	Max	Max		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)	50.0	50.0	50.0	50.0	50.0			37.5		37.5	37.5	
Actuated g/C Ratio	0.50	0.50	0.50	0.50	0.50			0.38		0.38	0.38	
v/c Ratio	0.40	0.36	0.06	0.45	0.66			0.52		0.08	0.83	
Control Delay	21.3	16.7	4.2	20.4	22.7			27.9		21.2	40.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0		0.0	0.0	
Total Delay	21.3	16.7	4.2	20.4	22.7			27.9		21.2	40.7	
LOS	C	B	A	C	C			C		C	D	
Approach Delay		16.6			22.0			27.9			39.8	
Approach LOS		B			C			C			D	
Queue Length 50th (m)	12.2	35.3	0.0	24.2	74.0			43.5		3.3	90.3	
Queue Length 95th (m)	26.5	54.2	5.2	43.7	110.3			68.6		9.1	#145.4	
Internal Link Dist (m)		206.8			289.3			318.7			431.8	
Turn Bay Length (m)	50.0		25.0	245.0						25.0		
Base Capacity (vph)	264	872	717	442	838			574		324	640	
Starvation Cap Reductn	0	0	0	0	0			0		0	0	
Spillback Cap Reductn	0	0	0	0	0			0		0	0	
Storage Cap Reductn	0	0	0	0	0			0		0	0	
Reduced v/c Ratio	0.40	0.36	0.06	0.45	0.66			0.52		0.08	0.83	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 2 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83
Intersection Signal Delay: 26.4 Intersection LOS: C
Intersection Capacity Utilization 86.3% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Island Park & Scott



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	291	169	228	563	28	214	39	199	5	44	3
Future Volume (vph)	2	291	169	228	563	28	214	39	199	5	44	3
Satd. Flow (prot)	0	2920	0	0	3230	0	1658	1475	0	0	1716	0
Flt Permitted		0.952			0.689		0.702				0.965	
Satd. Flow (perm)	0	2779	0	0	2206	0	1169	1475	0	0	1662	0
Satd. Flow (RTOR)		161			5			199			3	
Lane Group Flow (vph)	0	462	0	0	819	0	214	238	0	0	52	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	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.1	31.1		31.1	31.1		27.6	27.6		27.6	27.6	
Total Split (s)	40.0	40.0		40.0	40.0		35.0	35.0		35.0	35.0	
Total Split (%)	47.1%	47.1%		47.1%	47.1%		41.2%	41.2%		41.2%	41.2%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.8	2.8		2.8	2.8		2.3	2.3		2.3	2.3	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0			0.0	
Total Lost Time (s)		6.1			6.1		5.6	5.6			5.6	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effct Green (s)		33.9			33.9		20.4	20.4			20.1	
Actuated g/C Ratio		0.40			0.40		0.24	0.24			0.24	
v/c Ratio		0.38			0.93		0.76	0.47			0.13	
Control Delay		12.5			43.0		46.6	8.8			22.1	
Queue Delay		0.0			0.0		0.0	0.0			0.0	
Total Delay		12.5			43.0		46.6	8.8			22.1	
LOS		B			D		D	A			C	
Approach Delay		12.5			43.0			26.7			22.1	
Approach LOS		B			D			C			C	
Queue Length 50th (m)		16.9			64.8		32.4	5.0			6.2	
Queue Length 95th (m)		28.4			#103.2		49.3	19.6			12.8	
Internal Link Dist (m)		282.3			180.4			201.3			128.2	
Turn Bay Length (m)												
Base Capacity (vph)		1205			882		404	640			576	
Starvation Cap Reductn		0			0		0	0			0	
Spillback Cap Reductn		0			0		0	0			0	
Storage Cap Reductn		0			0		0	0			0	
Reduced v/c Ratio		0.38			0.93		0.53	0.37			0.09	

Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 79 (93%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	1.0	1.0	1.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	6%	6%	6%	6%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

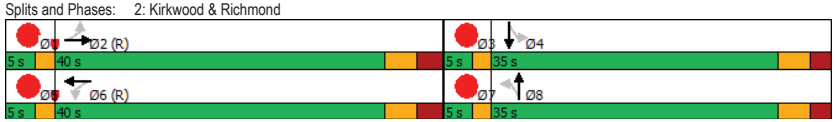
Intersection Summary

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 30.4	Intersection LOS: C
Intersection Capacity Utilization 75.2%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 2: Kirkwood & Richmond

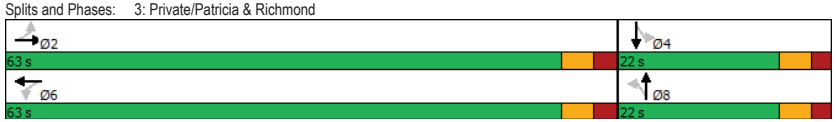


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	424	19	13	805	29	3	0	3	16	0	26
Future Volume (vph)	20	424	19	13	805	29	3	0	3	16	0	26
Satd. Flow (prot)	0	3277	0	0	3286	0	0	1561	0	0	1543	0
Flt Permitted		0.907			0.947			0.830			0.872	
Satd. Flow (perm)	0	2976	0	0	3113	0	0	1319	0	0	1360	0
Satd. Flow (RTOR)		11			9			36			36	
Lane Group Flow (vph)	0	463	0	0	847	0	0	6	0	0	42	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	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	33.8	33.8		33.8	33.8		21.5	21.5		21.5	21.5	
Total Split (s)	63.0	63.0		63.0	63.0		22.0	22.0		22.0	22.0	
Total Split (%)	74.1%	74.1%		74.1%	74.1%		25.9%	25.9%		25.9%	25.9%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.8			5.8			5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Act Effct Green (s)		70.2			70.2			11.2			11.2	
Actuated g/C Ratio		0.84			0.84			0.13			0.13	
v/c Ratio		0.19			0.32			0.03			0.20	
Control Delay		3.0			3.6			0.3			15.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		3.0			3.6			0.3			15.2	
LOS		A			A			A			B	
Approach Delay		3.0			3.6			0.3			15.2	
Approach LOS		A			A			A			B	
Queue Length 50th (m)		9.0			19.5			0.0			1.0	
Queue Length 95th (m)		18.3			36.7			0.0			9.0	
Internal Link Dist (m)		180.4			177.6			16.2			168.6	
Turn Bay Length (m)												
Base Capacity (vph)		2499			2613			290			298	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.19			0.32			0.02			0.14	

Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 83.6
Natural Cycle: 60
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.32

Intersection Signal Delay: 3.7 Intersection LOS: A
Intersection Capacity Utilization 54.0% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: Private/Patricia & Richmond



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	348	61	88	621	15	54	241	76	56	552	118
Future Volume (vph)	29	348	61	88	621	15	54	241	76	56	552	118
Satd. Flow (prot)	0	3184	0	0	3278	0	1658	1659	0	1658	1690	0
Flt Permitted		0.862			0.790		0.118			0.485		
Satd. Flow (perm)	0	2749	0	0	2591	0	206	1659	0	830	1690	0
Satd. Flow (RTOR)		23			3			22			15	
Lane Group Flow (vph)	0	438	0	0	724	0	54	317	0	56	670	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	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	31.3	31.3		31.3	31.3		21.9	21.9		21.9	21.9	
Total Split (s)	35.0	35.0		35.0	35.0		40.0	40.0		40.0	40.0	
Total Split (%)	41.2%	41.2%		41.2%	41.2%		47.1%	47.1%		47.1%	47.1%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.9	2.9		2.9	2.9	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.3			6.3		5.9	5.9		5.9	5.9	
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max		C-Max	C-Max		Max	Max		Max	Max	
Act Effct Green (s)		28.7			28.7		34.1	34.1		34.1	34.1	
Actuated g/C Ratio		0.34			0.34		0.40	0.40		0.40	0.40	
v/c Ratio		0.46			0.83		0.66	0.47		0.17	0.98	
Control Delay		22.8			35.5		53.1	16.6		18.1	55.7	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		22.8			35.5		53.1	16.6		18.1	55.7	
LOS		C			D		D	B		B	E	
Approach Delay		22.8			35.5			21.9			52.8	
Approach LOS		C			D			C			D	
Queue Length 50th (m)		27.4			55.9		3.6	18.6		5.7	102.6	
Queue Length 95th (m)		40.7			#85.1		m#19.2	m40.9		13.6	#173.8	
Internal Link Dist (m)		177.6			213.6			268.0			318.7	
Turn Bay Length (m)							15.0			10.0		
Base Capacity (vph)		943			876		82	678		332	686	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.46			0.83		0.66	0.47		0.17	0.98	

Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 53 (62%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Lane Group	Ø1	Ø3	Ø5	Ø7
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Satd. Flow (RTOR)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	3	5	7
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	1.0	1.0	1.0
Minimum Split (s)	5.0	5.0	5.0	5.0
Total Split (s)	5.0	5.0	5.0	5.0
Total Split (%)	6%	6%	6%	6%
Yellow Time (s)	2.0	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (m)				
Queue Length 95th (m)				
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

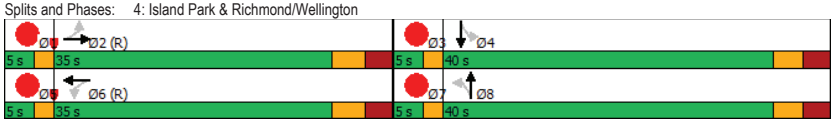
Intersection Summary

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 36.3	Intersection LOS: D
Intersection Capacity Utilization 102.6%	ICU Level of Service G
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Island Park & Richmond/Wellington



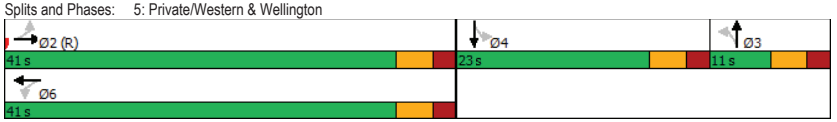
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	407	0	0	588	13	0	0	0	30	0	113
Future Volume (vph)	22	407	0	0	588	13	0	0	0	30	0	113
Satd. Flow (prot)	0	3306	0	0	1730	0	0	1745	0	0	1492	0
Flt Permitted		0.916									0.950	
Satd. Flow (perm)	0	3028	0	0	1730	0	0	1745	0	0	1432	0
Satd. Flow (RTOR)					2						116	
Lane Group Flow (vph)	0	429	0	0	601	0	0	0	0	0	143	0
Turn Type	Perm	NA			NA					Perm	NA	
Protected Phases		2			6			3			4	
Permitted Phases	2			6			3			4		
Detector Phase	2	2		6	6		3	3		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	5.0		10.0	10.0	
Minimum Split (s)	20.5	20.5		20.5	20.5		10.5	10.5		22.5	22.5	
Total Split (s)	41.0	41.0		41.0	41.0		11.0	11.0		23.0	23.0	
Total Split (%)	54.7%	54.7%		54.7%	54.7%		14.7%	14.7%		30.7%	30.7%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.2	2.2		2.2	2.2		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.5			5.5			5.5			5.5	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	C-Max	C-Max		None	None		None	None		None	None	
Act Effct Green (s)		46.6			46.6						17.4	
Actuated g/C Ratio		0.62			0.62						0.23	
v/c Ratio		0.23			0.56						0.34	
Control Delay		6.7			10.8						9.9	
Queue Delay		0.0			0.0						0.0	
Total Delay		6.7			10.8						9.9	
LOS		A			B						A	
Approach Delay		6.7			10.8						9.9	
Approach LOS		A			B						A	
Queue Length 50th (m)		12.5			43.7						3.0	
Queue Length 95th (m)		18.6			69.4						16.2	
Internal Link Dist (m)		213.6			167.2			9.8			311.8	
Turn Bay Length (m)												
Base Capacity (vph)		1879			1074						423	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.23			0.56						0.34	

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56
Intersection Signal Delay: 9.2 Intersection LOS: A
Intersection Capacity Utilization 55.5% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 5: Private/Western & Wellington



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	137	55	39	398	14	68	354	7	20	634	73
Future Volume (vph)	36	137	55	39	398	14	68	354	7	20	634	73
Satd. Flow (prot)	0	1657	0	0	1728	0	0	1726	0	0	1711	0
Flt Permitted		0.840			0.954			0.824			0.984	
Satd. Flow (perm)	0	1400	0	0	1653	0	0	1432	0	0	1685	0
Satd. Flow (RTOR)		20			2							
Lane Group Flow (vph)	0	228	0	0	451	0	0	429	0	0	727	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	23.0	23.0		23.0	23.0		32.7	32.7		32.7	32.7	
Total Split (s)	35.0	35.0		35.0	35.0		50.0	50.0		50.0	50.0	
Total Split (%)	41.2%	41.2%		41.2%	41.2%		58.8%	58.8%		58.8%	58.8%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.7	2.7		2.7	2.7		2.7	2.7		2.7	2.7	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			5.7			5.7	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max		C-Max	C-Max	
Act Effct Green (s)		26.4			26.4			46.9			46.9	
Actuated g/C Ratio		0.31			0.31			0.55			0.55	
v/c Ratio		0.51			0.88			0.54			0.78	
Control Delay		25.5			46.7			16.3			29.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		25.5			46.7			16.3			29.7	
LOS		C			D			B			C	
Approach Delay		25.5			46.7			16.3			29.7	
Approach LOS		C			D			B			C	
Queue Length 50th (m)		26.2			65.7			44.4			107.6	
Queue Length 95th (m)		46.3			#112.2			72.7			m117.6	
Internal Link Dist (m)		377.2			388.4			224.9			268.0	
Turn Bay Length (m)												
Base Capacity (vph)		490			565			790			929	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.47			0.80			0.54			0.78	

Intersection Summary

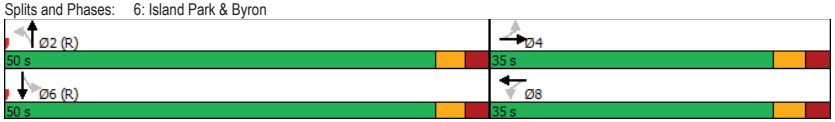
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 82 (96%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 30.2	Intersection LOS: C
Intersection Capacity Utilization 95.3%	ICU Level of Service F
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Island Park & Byron



Appendix H

MMLOS Analysis

CGH TRANSPORTATION

Multi-Modal Level of Service - Segments Form

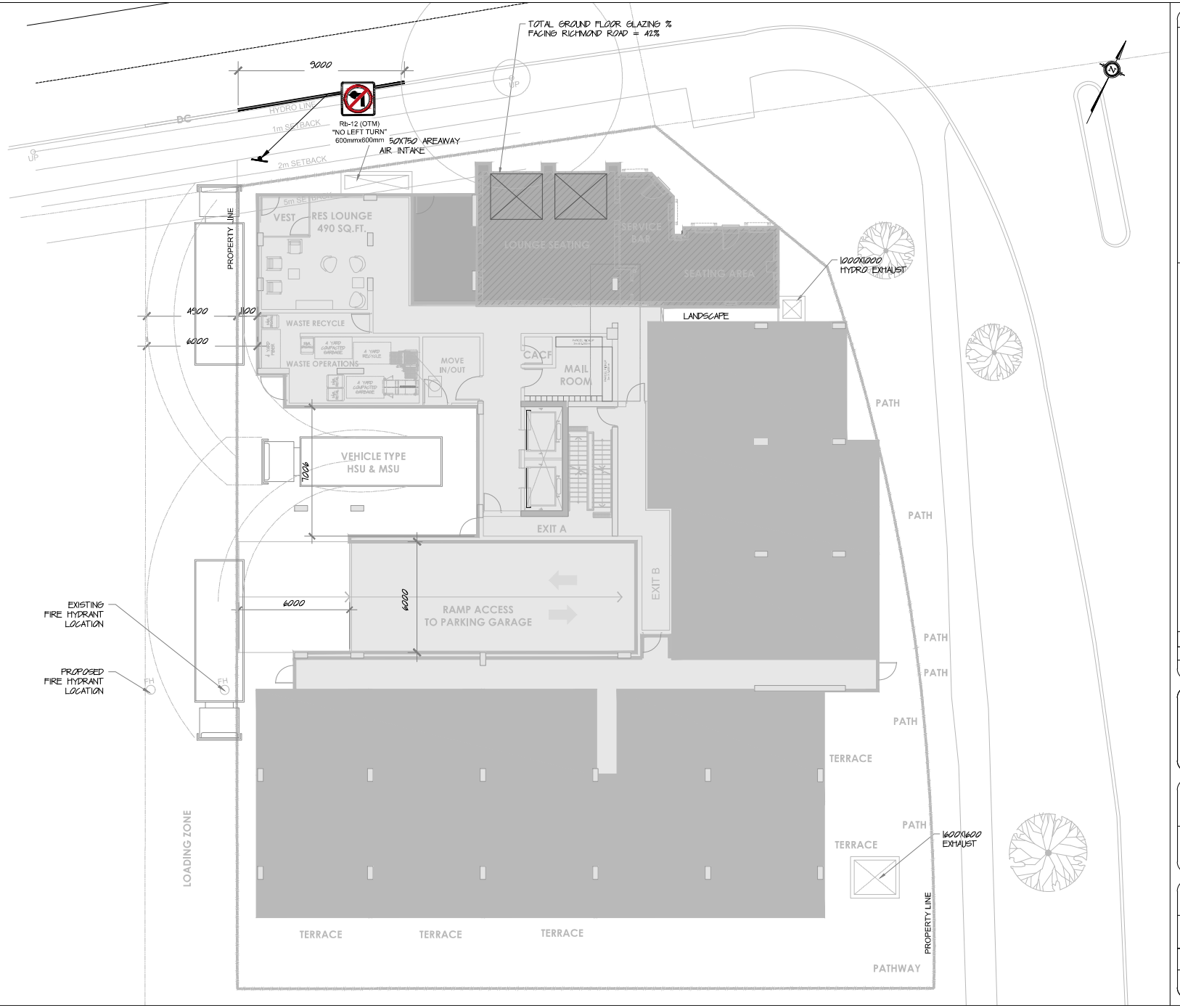
Consultant	**CGH Transportation Inc.**	**Project**	**2018-08**
Scenario	**Existing / Future**	**Date**	**2022-05-11**
Comments			

SEGMENTS		**Street A**	Richmond	Island Park	-
			1	2	3
Pedestrian	Sidewalk Width Boulevard Width	-	≥ 2 m 0.5 - 2 m	1.8 m > 2 m	
	Avg Daily Curb Lane Traffic Volume		≤ 3000	> 3000	
	Operating Speed On-Street Parking		> 50 to 60 km/h yes	> 30 to 50 km/h no	
	Exposure to Traffic PLoS		**A**	**C**	**-**
	Effective Sidewalk Width				
	Pedestrian Volume				
	Crowding PLoS		**-**	**-**	**-**
	Level of Service		**-**	**-**	**-**
Bicycle	Type of Cycling Facility	F	Mixed Traffic	Curbside Bike Lane	
	Number of Travel Lanes		4-5 lanes total	≤ 1 each direction	
	Operating Speed		≥ 50 to 60 km/h	≤ 50 km/h	
	# of Lanes & Operating Speed LoS		**E**	**A**	**-**
	Bike Lane (+ Parking Lane) Width			<1.2 m	
	Bike Lane Width LoS		**-**	**F**	**-**
	Bike Lane Blockages			Rare	
	Blockage LoS		**-**	**A**	**-**
	Median Refuge Width (no median = < 1.8 m)		< 1.8 m refuge	< 1.8 m refuge	
	No. of Lanes at Unsignalized Crossing		≤ 3 lanes	≤ 3 lanes	
	Sidestreet Operating Speed		>40 to 50 km/h	>40 to 50 km/h	
	Unsignalized Crossing - Lowest LoS		**B**	**A**	**-**
	Level of Service		**E**	**F**	**-**
Transit	Facility Type	D	Mixed Traffic		
	Friction or Ratio Transit:Posted Speed		Vt/Vp ≥ 0.8		
	Level of Service		**D**	**-**	**-**
Truck	Truck Lane Width	C	≤ 3.3 m		
	Travel Lanes per Direction		> 1		
	Level of Service		**C**	**-**	**-**
Auto	**Level of Service**	**Not Applicable**			

Appendix I

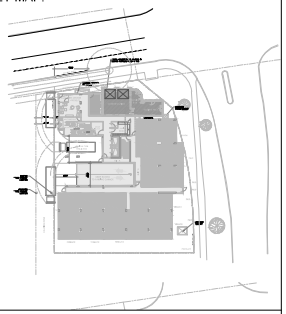
Proposed Access Signage Plan

CGH TRANSPORTATION



Notes:

KEY MAP:



REV:	DESCRIPTION:	BY:	DATE:
01	Issued for Review	AN	2023-01-27

STATUS:

CGH Transportation
6 Plaza Court
Ottawa, ON
K2H 7W1
(343) 999-9117

CLIENT: Hobin Architecture Incorporated

ARCHITECT:

SITE: 70 Richmond Rd

TITLE: Signage Plan

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
NTS	2023-01-27	AN	AH

PROJECT NO:	DRAWING NO:	REVISION:
2022-072	001	01

Appendix J

TDM Checklist

CGH TRANSPORTATION

TDM Measures Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

BASIC — The measure is generally feasible and effective, and in most cases would benefit the development and its users

BETTER — The measure could maximize support for users of sustainable modes, and optimize development performance

★ — The measure is one of the most dependably effective tools to encourage the use of sustainable modes

		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		1. TDM PROGRAM MANAGEMENT	
		1.1 Program coordinator	
BASIC	★	1.1.1 Designate an internal coordinator, or contract with an external coordinator	☐
		1.2 Travel surveys	
BETTER		1.2.1 Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☐
		2. WALKING AND CYCLING	
		2.1 Information on walking/cycling routes & destinations	
BASIC		2.1.1 Display local area maps with walking/cycling access routes and key destinations at major entrances	☑
		2.2 Bicycle skills training	
		Commuter travel	
BETTER	★	2.2.1 Offer on-site cycling courses for commuters, or subsidize off-site courses	☐
		2.3 Valet bike parking	
		Visitor travel	
BETTER		2.3.1 Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	☐

		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		3. TRANSIT	
		3.1 Transit information	
BASIC		3.1.1 Display relevant transit schedules and route maps at entrances	☑
BASIC		3.1.2 Provide online links to OC Transpo and STO information	☑
BETTER		3.1.3 Provide real-time arrival information display at entrances	☐
		3.2 Transit fare incentives	
		Commuter travel	
BETTER		3.2.1 Offer preloaded PRESTO cards to encourage commuters to use transit	☐
BETTER	★	3.2.2 Subsidize or reimburse monthly transit pass purchases by employees	☐
		Visitor travel	
BETTER		3.2.3 Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games)	☐
		3.3 Enhanced public transit service	
		Commuter travel	
BETTER		3.3.1 Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	☐
		Visitor travel	
BETTER		3.3.2 Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	☐
		3.4 Private transit service	
		Commuter travel	
BETTER		3.4.1 Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for shift changes, weekends)	☐
		Visitor travel	
BETTER		3.4.2 Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for festivals, concerts, games)	☐

		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
	4.	**RIDESHARING**	
	4.1	**Ridematching service**	
		Commuter travel	
BASIC ★	4.1.1	Provide a dedicated ridematching portal at OttawaRideMatch.com	☐
	4.2	**Carpool parking price incentives**	
		Commuter travel	
BETTER	4.2.1	Provide discounts on parking costs for registered carpools	☐
	4.3	**Vanpool service**	
		Commuter travel	
BETTER	4.3.1	Provide a vanpooling service for long-distance commuters	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Bikeshare stations & memberships**	
BETTER	5.1.1	Contract with provider to install on-site bikeshare station for use by commuters and visitors	☐
		Commuter travel	
BETTER	5.1.2	Provide employees with bikeshare memberships for local business travel	☐
	5.2	**Carshare vehicles & memberships**	
		Commuter travel	
BETTER	5.2.1	Contract with provider to install on-site carshare vehicles and promote their use by tenants	☐
BETTER	5.2.2	Provide employees with carshare memberships for local business travel	☐
	6.	**PARKING**	
	6.1	**Priced parking**	
		Commuter travel	
BASIC ★	6.1.1	Charge for long-term parking (daily, weekly, monthly)	☐
BASIC	6.1.2	Unbundle parking cost from lease rates at multi-tenant sites	☐
		Visitor travel	
BETTER	6.1.3	Charge for short-term parking (hourly)	☐

		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
	7.	**TDM MARKETING & COMMUNICATIONS**	
	7.1	**Multimodal travel information**	
		Commuter travel	
BASIC ★	7.1.1	Provide a multimodal travel option information package to new/relocating employees and students	☐
		Visitor travel	
BETTER ★	7.1.2	Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games)	☐
	7.2	**Personalized trip planning**	
		Commuter travel	
BETTER ★	7.2.1	Offer personalized trip planning to new/relocating employees	☐
	7.3	**Promotions**	
		Commuter travel	
BETTER	7.3.1	Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes	☐
	8.	**OTHER INCENTIVES & AMENITIES**	
	8.1	**Emergency ride home**	
		Commuter travel	
BETTER ★	8.1.1	Provide emergency ride home service to non-driving commuters	☐
	8.2	**Alternative work arrangements**	
		Commuter travel	
BASIC ★	8.2.1	Encourage flexible work hours	☐
BETTER	8.2.2	Encourage compressed workweeks	☐
BETTER ★	8.2.3	Encourage telework	☐
	8.3	**Local business travel options**	
		Commuter travel	
BASIC ★	8.3.1	Provide local business travel options that minimize the need for employees to bring a personal car to work	☐
	8.4	**Commuter incentives**	
		Commuter travel	
BETTER	8.4.1	Offer employees a taxable, mode-neutral commuting allowance	☐
	8.5	**On-site amenities**	
		Commuter travel	
BETTER	8.5.1	Provide on-site amenities/services to minimize mid-day or mid-commute errands	☐

TDM Measures Checklist:
Residential Developments (multi-family, condominium or subdivision)

Legend

- BASIC — The measure is generally feasible and effective, and in most cases would benefit the development and its users
- BETTER — The measure could maximize support for users of sustainable modes, and optimize development performance
- ★ — The measure is one of the most dependably effective tools to encourage the use of sustainable modes

		TDM measures: *Residential developments*	Check if proposed & add descriptions
		1. TDM PROGRAM MANAGEMENT	
		1.1 Program coordinator	
BASIC	★	1.1.1 Designate an internal coordinator, or contract with an external coordinator	☐
		1.2 Travel surveys	
BETTER		1.2.1 Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☐
		2. WALKING AND CYCLING	
		2.1 Information on walking/cycling routes & destinations	
BASIC		2.1.1 Display local area maps with walking/cycling access routes and key destinations at major entrances *(multi-family, condominium)*	☑
		2.2 Bicycle skills training	
BETTER		2.2.1 Offer on-site cycling courses for residents, or subsidize off-site courses	☐

		TDM measures: *Residential developments*	Check if proposed & add descriptions
		3. TRANSIT	
		3.1 Transit information	
BASIC		3.1.1 Display relevant transit schedules and route maps at entrances *(multi-family, condominium)*	☑
BETTER		3.1.2 Provide real-time arrival information display at entrances *(multi-family, condominium)*	☐
		3.2 Transit fare incentives	
BASIC	★	3.2.1 Offer PRESTO cards preloaded with one monthly transit pass on residence purchase/move-in, to encourage residents to use transit	☑
BETTER		3.2.2 Offer at least one year of free monthly transit passes on residence purchase/move-in	☐
		3.3 Enhanced public transit service	
BETTER	★	3.3.1 Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels *(subdivision)*	☐
		3.4 Private transit service	
BETTER		3.4.1 Provide shuttle service for seniors homes or lifestyle communities (e.g. scheduled mall or supermarket runs)	☐
		4. CARSHARING & BIKESHARING	
		4.1 Bikeshare stations & memberships	
BETTER		4.1.1 Contract with provider to install on-site bikeshare station *(multi-family)*	☐
BETTER		4.1.2 Provide residents with bikeshare memberships, either free or subsidized *(multi-family)*	☐
		4.2 Carshare vehicles & memberships	
BETTER		4.2.1 Contract with provider to install on-site carshare vehicles and promote their use by residents	☐
BETTER		4.2.2 Provide residents with carshare memberships, either free or subsidized	☐
		5. PARKING	
		5.1 Priced parking	
BASIC	★	5.1.1 Unbundle parking cost from purchase price *(condominium)*	☑
BASIC	★	5.1.2 Unbundle parking cost from monthly rent *(multi-family)*	☑

			TDM measures: *Residential developments*	Check if proposed & add descriptions
		6.	**TDM MARKETING & COMMUNICATIONS**	
		6.1	**Multimodal travel information**	
BASIC	★	6.1.1	Provide a multimodal travel option information package to new residents	☐
		6.2	**Personalized trip planning**	
BETTER	★	6.2.1	Offer personalized trip planning to new residents	☐

TDM-Supportive Development Design and Infrastructure Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

REQUIRED	The Official Plan or Zoning By-law provides related guidance that must be followed
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☑
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☑
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☑
	1.2	**Facilities for walking & cycling**	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)*	☑
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	☑

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	☐
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☑
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☑
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☐
	1.3	**Amenities for walking & cycling**	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☐
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☐

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	☐
BETTER	2.1.5	Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☐
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	☐
	2.3	**Shower & change facilities**	
BASIC	2.3.1	Provide shower and change facilities for the use of active commuters	☐
BETTER	2.3.2	In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	☐
	2.4	**Bicycle repair station**	
BETTER	2.4.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☐
	4.2	**Carpool parking**	
BASIC	4.2.1	Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools	☐
BETTER	4.2.2	At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐

TDM-Supportive Development Design and Infrastructure Checklist **City of Ottawa**
Version 1.0 (30 June 2017)

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☑
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	☐
	7.	**OTHER**	
	7.1	**On-site amenities to minimize off-site trips**	
BETTER	7.1.1	Provide on-site amenities to minimize mid-day or mid-commute errands	☐

TDM-Supportive Development Design and Infrastructure Checklist:
Residential Developments (multi-family or condominium)

Legend

REQUIRED	The Official Plan or Zoning By-law provides related guidance that must be followed
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☑
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☑
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☑
	1.2	**Facilities for walking & cycling**	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)*	☑
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	☑

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	☐
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☑
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☑
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☐
	1.3	**Amenities for walking & cycling**	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☐
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☐

	TDM-supportive design & infrastructure measures: *Residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☑
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	☑
	2.3	**Bicycle repair station**	
BETTER	2.3.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐

TDM-Supportive Development Design and Infrastructure Checklist **City of Ottawa**
Version 1.0 (30 June 2017)

	TDM-supportive design & infrastructure measures: *Residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☑
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	☐