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34 Years

Pink House Lands
3740 Jockvale Road

Transportation Impact Study

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3740 Jockvale Road

Transportation Impact Study

Prepared By:

NOVATECH
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario
K2M 1P6

April 2016

Novatech File: 115094
Ref: R-2016-036

April 22, 2016

City of Ottawa
Planning and Growth Management Branch
110 Laurier Ave. W., 4th Floor,
Ottawa, Ontario K1P 1J1

Attention: **Mr. Riley Carter**
Project Manager, Infrastructure Approvals

Dear Sir:

Reference: **3740 Jockvale Road**
Transportation Impact Study
Our File No.: 115094

We are pleased to submit the following Transportation Impact Study (TIS) in support of applications for Draft Plan of Subdivision and Zoning By-law Amendment submitted on behalf of our client, Uniform Urban Developments for the property at 3740 Jockvale Road in Barrhaven.

Uniform Urban Developments intends to construct 90 residential units on the subject property comprised of 34 semi-detached bungalow dwellings and 56 low-rise condominium apartments distributed in four (4) 14-unit buildings. The Draft Plan of Subdivision provides for two road connections with Jockvale Road and a community parkette.

The structure and format of this report is in accordance with the 2008 City of Ottawa Transportation Impact Assessment (TIA) Guidelines. A checklist of the documentation requirements as outlined in Appendix D of the TIA Guidelines is attached overleaf with reference to corresponding report sections.

A PDF version of this report and copies of the electronic software files are provided on the enclosed disk.

Please call if you have any questions as you complete your review.

Yours truly,

NOVATECH

L Bowley.

Lisa Bowley, P.Eng.
Project Engineer

cc: Annibale Ferro – Uniform Urban Developments

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Documentation and Reporting Checklist

Report Context (Section 1.0)

Description of the development (include all of the following that are known at the time of the application):

- ☐ Municipal address;
- ☐ Location relative to major elements of the existing transportation system (e.g., the site is located in the southwest quadrant of the intersection of Main Street/ First Street, 600 metres from the Maple Street Rapid Transit Station);
- ☐ Existing land uses or permitted use provisions in the Official Plan, ZBL, etc.;
- ☐ Proposed land uses and relevant planning regulations to be used in the analysis;
- ☐ Proposed development size (building size, number of residential units, etc.) and location on site;
- ☐ Estimated date of occupancy;
- ☐ Planned phasing of development;
- ☐ Proposed number of parking spaces (not relevant for Draft Plans of Subdivision); and
- ☐ Proposed access points and type of access (full turns, right-in/ right-out, turning restrictions, etc.
- ☐ Study area;
- ☐ Time periods and phasing; and
- ☐ Horizon years (include reference to phased development).

The TIS must include a key plan that shows the general location of the development in relation to the surrounding area. The TIS must also provide a draft site plan of a suitable scale that shows the general location of the development and the proposed access. If the proposed development/ redevelopment is to be constructed in phases, a description must be provided for each phase, identifying the proposed timing of implementation.

Existing Conditions (Section 2.0)

- ☐ Existing roads and ramps in the study area, including jurisdiction, classification, number of lanes, and posted speed limit;
- ☐ Existing intersections, indicating type of control, lane configurations, turning restrictions, and any other relevant data (e.g., extraordinary lane widths, grades, etc.);
- ☐ Existing access points to adjacent developments (both sides of all roads bordering the site);
- ☐ Existing transit system, including stations and stops;
- ☐ Existing on- and off-road bicycle facilities and pedestrian sidewalks and pathway networks;
- ☐ Existing system operations (V/C, LOS); and
- ☐ Major trip generators/ attractors within the Study Area should be indicated.

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The TIS report must include: a context plan of a suitable scale that shows the general location of the development, the proposed access locations and the existing conditions in the surrounding area; figures documenting the existing travel demands by mode; and a summary of collisions for the effected study area roads. A photographic inventory of the transportation network elements in the vicinity of the proposed access points would be beneficial to staff in their review of the Consultant's report.

Demand Forecasting (Section 3.0)

- ☐ General background growth;
- ☐ Other study area developments;
- ☐ Changes to the study area road network;
- ☐ Future background system operations (V/C, LOS, queue lengths):
  - include figures documenting future background travel demands by mode for each horizon year
- ☐ Trip generation rates;
- ☐ Trip distribution and assignment:
  - include figures documenting forecasted site trip generation and assignment by mode; and
  - include figures documenting total future travel demands by mode for each horizon year.

Impact Analysis (Sections 4.0, 5.0, 6.0, 7.0 and 8.0)

- ☐ Total future system operations (V/C, LOS, queue lengths);
- ☐ Signal and auxiliary lane (device) warrants;
- ☐ Operational/ safety assessment (e.g., sight line assessment where grades are an issue);
- ☐ Storage analysis for closely spaced intersections;
- ☐ Pedestrian and bicycle network connections and continuity;
- ☐ On-site circulation and design;
- ☐ Potential for neighbourhood impacts; and
- ☐ TDM.

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Mitigation Measures and Site Design Characteristics (Sections 4.0 and 6.0)

The TIS must identify all mitigation measures required to offset network impacts from the development. The CTS must also identify key site design features required to implement the Official Plan and Transportation Master Plan policies regarding site development.

The TIS must include all of the following, where they are required by the subject development:

- ☐ Location and timing of proposed changes to existing traffic controls at intersections (e.g., new traffic signals, Stop signs, etc.);
- ☐ Location and timing of new intersections, including proposed traffic control measures (e.g., traffic signals, etc.);
- ☐ Requirements for new auxiliary lanes;
- ☐ Mitigation measures required to offset impacts on the surface and Rapid Transit networks;
- ☐ New or modified elements of the bicycle and pedestrian networks;
- ☐ Community impact mitigation measures; and
- ☐ Proposed TDM features or programs to support the site development.

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1.0 INTRODUCTION

A residential subdivision is proposed at 3740 Jockvale Road in the City of Ottawa. The proponent of this development is Uniform Urban Developments. The site is located in the southwest quadrant of the intersection of Jockvale Road and Golflinks Drive South, as shown on **Figure 1**.

The residential development has an area of 7.4 acres and is bounded by the Stonebridge Golf Club to the south and west and residential properties to the north and east.

The subject site is currently zoned as Development Reserve (DR) under the City of Ottawa's Comprehensive Zoning By-law 2008-250 and will require a Zoning By-law Amendment as a condition of draft approval. An application for Zoning By-law Amendment will be filed concurrently with the application for Draft Plan Approval. For the purposes of this study, it is understood that the lands will be re-zoned to an R3Z exception zone for the semi-detached units and R4Z for the low-rise condominiums. The zoning boundary will be along the middle of the proposed public right of way. Permitted uses for the R3Z Zone include a variety of residential uses including semi-detached dwellings. Permitted uses in the R4Z Zone include Planned Unit Development and low-rise apartment dwelling.

1.1 Proposed Development

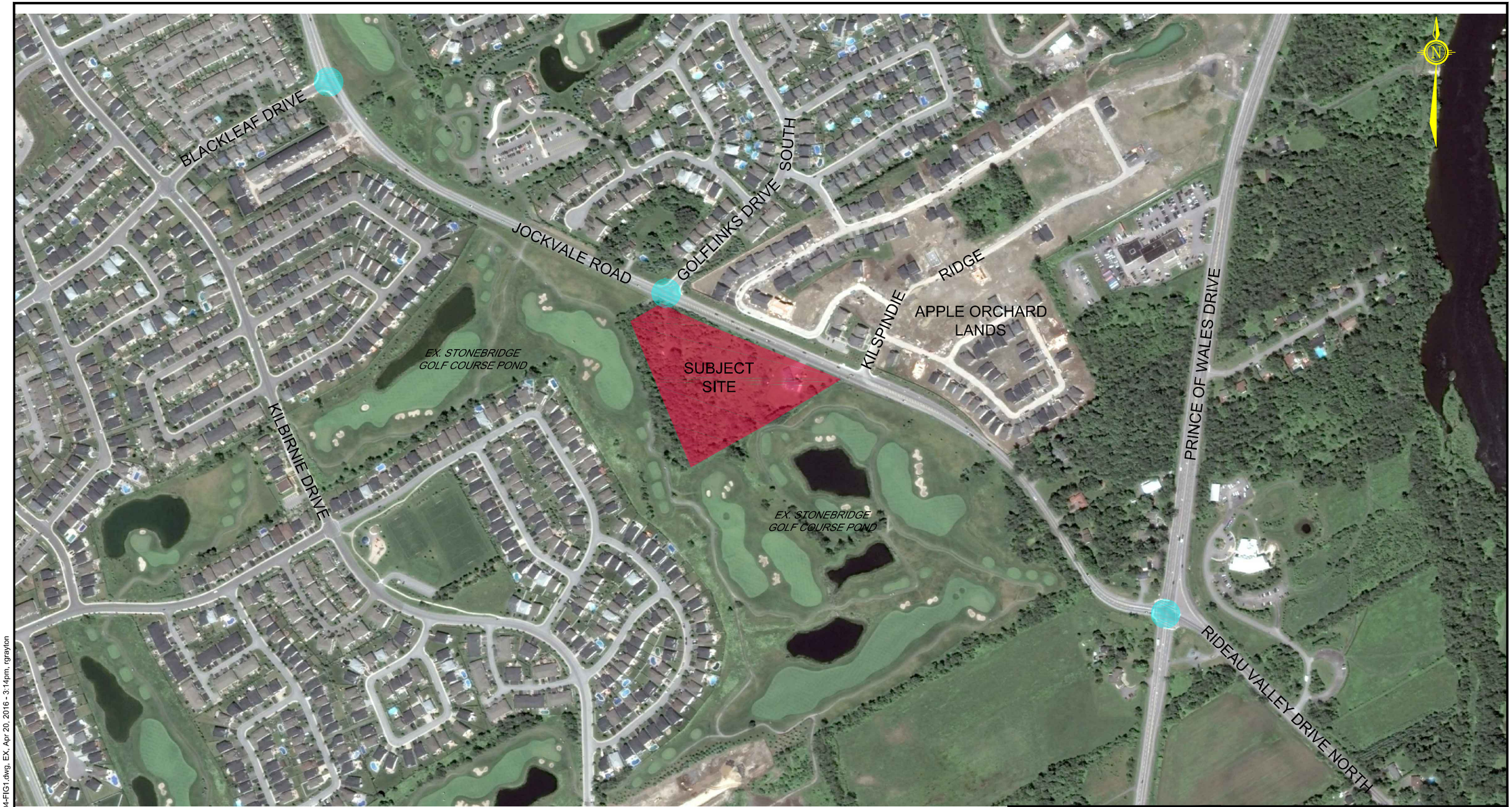
The proposed development consists of a residential subdivision of 90 residential units comprised of 34 semi-detached bungalow dwellings and four (4) 14-unit low-rise condominium apartments. A proposed public local street will serve the development with a right-of-way of 16.5-meters. In addition, the apartments will be served by a private laneway, surface and underground parking lot.

The proposed development will be served by two accesses onto Jockvale Road. The northern access is proposed to be a full movement access and will form the west leg to the existing Jockvale Road / Golflinks Drive South intersection. Roundabout control and signal control have been considered for this intersection. The southern access will be located approximately 195m south of Golflinks Drive South, measuring centreline to centreline, and is proposed to be restricted to right-in-right-out movements.

The development will be completed in a single phase, with construction expected to commence in 2018. For the purposes of this study, it has been assumed that full build-out will be achieved by 2023. The Concept Plan for the subject site is included as **Appendix A**.

1.2 Analysis Methods

The analysis undertaken to assess the transportation impacts of the development is consistent with the requirements of the City of Ottawa *Transportation Impact Assessment (TIA) Guidelines*, published in October 2006.



STUDY AREA INTERSECTIONS

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CITY OF OTTAWA
3740 JOCKVALE ROAD

STUDY AREA AND
SUBJECT SITE

SCALE	JOB	FIGURE
1 : 5000 (0 50 100 150 200)	115094	FIGURE 1
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Intersection capacity analysis has been completed using the software package Synchro 8.0 to evaluate signalized and stop controlled intersections. This software uses methodology from the *Highway Capacity Manual 2000* (HCM), published by the Transportation Research Board. The Rodel V1-Win software package has been used to evaluate roundabout intersections. Rodel uses either HCM or Kimbers equations, which are based on empirical data.

Intersection operating conditions are commonly described in terms of a Level of Service (LOS). LOS is a qualitative measurement of speed, freedom to manoeuvre, interruptions, comfort and convenience. Letters are assigned to six levels, with LOS 'A' representing optimal operating conditions and LOS 'F' representing failing operating conditions.

The City of Ottawa has adopted criteria that directly relate the LOS of a signalized intersection to a volume to capacity (v/c) ratio. Vehicle capacity is defined as the maximum number of vehicles that can pass a given point during a specified period under prevailing traffic conditions. The City's criteria are as follows:

Table 1: Signalized Intersection LOS Criteria

LOS	v/c ratio
A	0 to 0.60
B	0.61 to 0.70
C	0.71 to 0.80
D	0.81 to 0.90
E	0.91 to 1.00
F	>1.00

The LOS for an unsignalized intersection is based on average control delay and is defined for individual movements. Control delay includes initial deceleration, queue move-up time, stopped time and final acceleration. The HCM presents the following criteria relating the LOS for individual movements to average control delay:

Table 2: Unsignalized Intersection LOS Criteria

LOS	Delay (sec/veh)
A	<10
B	10 to 15
C	15 to 25
D	25 to 35
E	35 to 50
F	>50

In this study, movements at signalized and unsignalized intersections have been evaluated in terms of the LOS as defined in the foregoing tables. Mitigation measures in the form of additional lane capacity and/or signal adjustments have been identified for movements with a LOS E or F.

This Transportation Impact Study has been prepared to provide an assessment of the development proposal. The methodologies used to analyze the transportation impacts of the proposed development are described as follows:

- An operational evaluation of the site access and study area intersections under the existing and projected traffic conditions for the weekday AM and PM peak hours,
- An assessment of provisions for non-auto travel modes, including integration with local transit service, and connections with the local pedestrian and bicycle networks,
- A review of the sight distances at the proposed intersections,
- An evaluation of conformance with Transportation Demand Management (TDM) principles.

1.3 Analysis Parameters

The study area for this report was confirmed with City staff, and includes the two proposed site accesses on Jockvale Road as well as the following intersections:

- Jockvale Road / Prince of Wales Drive / Rideau Valley Drive North,
- Jockvale Road / Golflinks Drive South, and
- Jockvale Road / Blackleaf Drive.

The selected time periods for analysis are the weekday AM and PM peak hours. The weekday AM and PM peak hours are considered to represent the 'worst-case' combination of site-generated traffic and adjacent street traffic. Existing traffic conditions within the study area have been examined, along with background and total traffic conditions at the build-out year (2023), and a five-year horizon (2028).

2.0 EXISTING CONDITIONS

2.1 Roadways

Jockvale Road

Jockvale Road is a north-south arterial roadway, running from Greenbank Road (to the north) to Prince of Wales Drive (to the south). Within the limits of the study area, Jockvale Road has a two-lane rural cross-section, with a combination of gravel and paved shoulders. The City of Ottawa Official Plan currently requires a 37.5-meter right-of-way (ROW) to be protected along Jockvale Road in the vicinity of the subject site. The required road widening is indicated on the enclosed Draft Plan (**Appendix A**). Jockvale Road is a designated rural truck route with no load restrictions, and the posted speed is 70km/h within the study area.

Prince of Wales Drive

Prince of Wales Drive is a north-south arterial roadway, running from Preston Street (to the north) to North Gower (to the south). Within the limits of the study area, Prince of Wales Drive has a four-lane rural undivided cross-section with paved shoulders. On-street parking is prohibited at all times. The City of Ottawa Official Plan requires a 40-meter ROW to be protected along the section of Prince of Wales Drive that lies within the South Urban Community. Prince of Wales Drive is a designated truck route with no load restrictions, and the posted speed is 80km/h within the study area.

Rideau Valley Drive
Rideau Valley Drive (North) is a north-south rural arterial roadway. It extends south from Prince of Wales Drive through the village of Manotick to Roger Stevens Drive, parallel to the west bank of the Rideau River. Rideau Valley Drive is a designated truck route with no load restrictions. The posted speed is 70km/h within the study area, reducing to 50km/h on approach to Manotick.

Golflinks Drive
Golflinks Drive is a collector roadway with a two-lane urban cross-section. It forms a closed loop with Jockvale Road, providing access to residential lands located east of Jockvale Road. The posted speed on Golflinks Drive is 40km/h.

Blackleaf Drive
Blackleaf Drive is a collector roadway with a two-lane urban cross-section and posted speed of 40km/h.

2.2 Intersections

Traffic signals are provided at the intersection of Jockvale Road/Prince of Wales Drive/Rideau Valley Drive.

The intersections of Jockvale Road at Golflinks Drive and Jockvale Road at Blackleaf Drive are currently unsignalized.

Lane configurations at each of the study area intersections are summarized as follows:

Jockvale Road/Prince of Wales Drive/Rideau Valley Drive

- Two northbound and two southbound through lanes (Prince of Wales Drive),
- Northbound and southbound left-turn lanes of length 100m and 230m respectively,
- Single lane eastbound approach, with a designated left-turn lane of length 75m,
- Single lane westbound approach, plus a free-flow channelized right-turn lane.

Jockvale Road/Golflinks Drive

- Single lane northbound and southbound through lanes,
- Southbound left-turn lane of length 80m,
- Single lane westbound approach, with a designated left-turn lane of length 35m.

Jockvale Road/Blackleaf Drive

- Single lane northbound and southbound through lanes,
- Northbound left-turn lane of length 110m,
- Southbound right-turn lane facilitating the termination of the second southbound through lane,
- Single lane eastbound approach with no designated turn lanes.

2.3 Existing Pedestrian Facilities

Concrete sidewalks are provided on both sides of Golflinks Drive and Blackleaf Drive. At the study area intersections, these sidewalks tie into the paved shoulders on Jockvale Road. Within the limits of the study area, there are no sidewalks provided along either side of Jockvale Road or Prince of Wales Drive.

Marked crosswalks with pedestrian signal heads and depressed curbs are provided on all legs of the signalized intersection of Jockvale Road and Prince of Wales Drive.

2.4 Existing Bicycle Facilities

The City of Ottawa's Primary Urban Cycling network from the 2013 *Transportation Master Plan* (TMP) designates Prince of Wales Drive and Rideau Valley Drive as spine routes, and Jockvale Road and Golflinks Drive as local cycling routes.

Within the study area limits, Prince of Wales Drive and Jockvale Road are identified as existing cycling routes with paved shoulders. Golflinks Drive is not identified as having existing cycling facilities although the roadway has courtesy lanes along both sides of the road. Courtesy lanes are white painted lines used to visually narrow the roadway and are typically painted at approximately the width of a bike lane.

2.5 Existing Transit Facilities

This report describes all existing transit facilities within a five minute walk of the subject site, which equates to a distance of approximately 400 metres. OC Transpo guidelines recommend that all development in the vicinity of a bus route should have at least one bus stop within a walking distance of 400 metres, if possible.

Bus stop #0434, #2012, and #2354 are located at the intersection of Jockvale Road / Golflinks Drive South, within 200m of the most southerly proposed residences on the subject site. These three stops are served by regular routes 175 and 186, which provide a link between Golflinks Drive and Barrhaven Centre. Route 175 operates with a 30-minute headway during the AM and PM peak periods and a 2-hour headway during the midday period. Route 186 operates with a 60-minute headway during the weekday AM and PM peak periods.

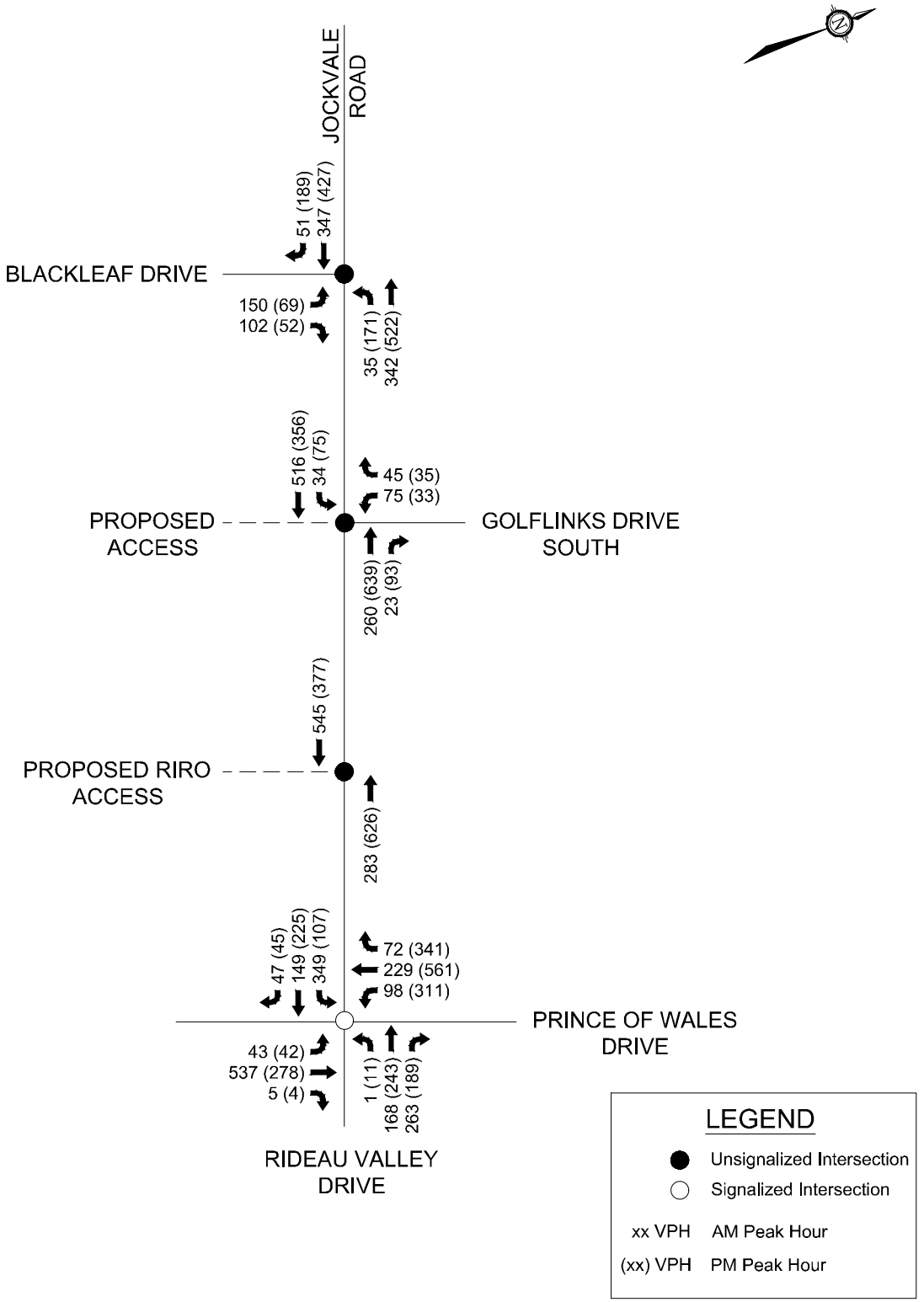
Route details and a copy of the OC Transpo system map (September 2015) that shows the transit facilities available in the vicinity of the study area are provided in **Appendix B**.

2.6 Existing Traffic Volumes

Eight-hour weekday traffic counts were completed by the City of Ottawa at the following study area intersections:

- Jockvale Road/Prince of Wales Drive (Wednesday, October 29, 2014)
- Jockvale Road/Blackleaf Drive (Tuesday, July, 10, 2012)
- Jockvale Road/Golflinks Drive South (Tuesday, July 7, 2015)

The traffic counts are included in **Appendix C**, and the existing traffic volumes for the weekday AM and PM peak hours are shown in **Figure 2**.



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3740 JOCKVALE ROAD

EXISTING TRAFFIC VOLUMES

APR 2016 115094 FIGURE 2

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2.7 Collision Records

Historical collision data from the last three years was obtained from the City's Public Works and Service Department for all study area intersections. Copies of the collision summary reports are included in **Appendix D**.

The collision data has been evaluated to determine if there are any identifiable collision patterns. The Ottawa TIA Guidelines define a collision pattern as more than one collision involving similar directions and impact types. Further analysis may be warranted for intersections with a pattern of six or more collisions for any one movement or a total of 33 or more collisions, over a three-year period.

The following table summarizes the number of collisions reported at each intersection over three years from January 1, 2011 to January 1, 2014.

Table 3: Reported Collisions

Intersection / Road Segment	No. of Reported Collisions (Jan 1, 2011 to Jan 1, 2014)
Jockvale Road/Prince of Wales Drive	17
Jockvale Road – Prince of Wales Drive to Golflinks Drive South	4
Jockvale Road – Golflinks Drive South to Cambrian Road	2

Five of the six collisions reported along Jockvale Road (not at an intersection) occurred when the roadway was wet, icy or had loose snow and therefore may have been influenced by environmental conditions.

Eight of the seventeen collisions recorded at Jockvale Road/Prince of Wales Drive were turning impacts; six were rear-end impacts, and three were angle impacts. Nine of the seventeen collisions occurred under wet, snowy or icy conditions and therefore may have been influenced by environmental factors. Five of the seventeen collisions involved injuries but none involved fatalities. None of the collisions involved pedestrians or cyclists.

Six of the eight turning impacts involved northbound and southbound traffic; of which four occurred at dusk or in the dark. Three of the collisions were between southbound left turning vehicles and northbound through vehicles and three were collisions were between northbound left turning vehicles and southbound through vehicles.

Three of the six rear-end collisions involved eastbound vehicles; the remaining three were made up of one collision in each of the northbound, southbound and westbound directions.

None of the above noted collisions within the study area meet the City's criteria for further analysis with respect to collision patterns or total collisions.

3.0 TRAVEL DEMAND FORECASTING

3.1 Planned Network Improvements

The TMP identifies a need to widen Jockvale Road from two lanes to four lanes between Cambian Road and Prince of Wales Drive, to "accommodate development access and growth for development within the Nepean South Urban Community". The TMP identifies the future widening of Jockvale Road as a Phase 2 project. It is our understanding that this work is currently being designed by Robinson Consultants Inc. and is scheduled for construction between 2020 and 2025.

The Jockvale Road Environmental Study Report (ESR) prepared by Genivar indicates that the proposed design calls for a four-lane urban divided cross section, to be widened on the existing centreline of Jockvale Road. In addition, the existing horizontal and vertical curvature of Jockvale Road as it approaches Prince of Wales Drive will be flattened, and additional lanes will be provided at the Jockvale Road/Prince of Wales intersection. A multi-use recreational pathway is proposed on the west side of Jockvale Road and a sidewalk on the east side. On-road bicycle lanes will be provided on both sides of the roadway. It is expected that improved form of traffic control will be implemented at several intersections along Jockvale Road including Blackleaf Drive and Golflinks Drive as part of the widening works.

Construction is anticipated between 2020 and 2025. In order to provide conservative results, the 2023 background and total traffic conditions have been modelled assuming the current two-lane cross-section on Jockvale Road.

For the purposes of this report, it is assumed the Jockvale Road widening (to four lanes) will be completed by 2028. The widened geometry used will be assumed in accordance with the functional design drawings produced by Genivar as part of the Jockvale Road ESR. Copies of Genivar's functional design are included in this report as **Appendix E**.

3.2 General Background Growth

The future rate of background traffic growth on the study area roadways will be largely dependent on the rate of development within the Stonebridge and Barrhaven South communities. Snapshots from the City's Long Range planning model show an annual growth rate of approximately 4% for Jockvale Road and Prince of Wales Drive between 2011 and 2031.

An annual background growth rate of 4% will be assumed for the purpose of this report for Jockvale Road, Prince of Wales Drive and Rideau Valley Drive. No background growth rate has been applied to the existing traffic volumes on Golflinks Drive South and Blackleaf Drive, as the lands along either side of these corridors are already fully developed.

Where applicable, a growth rate of 4% has been added to the existing traffic volumes to estimate 2023 and 2028 background traffic volumes.

3.3 Future Planned Developments

In addition to background growth, projected site traffic from Stonebridge Orchards and Monarch subdivisions located 3699 and 3701 Jockvale Road have been added to the existing traffic volumes (from Novatech report R-2011-112, excerpt included in **Appendix F**).

The 2023 and 2028 background traffic volumes are shown in **Figure 3** and **Figure 4**, respectively.

3.4 Trip Generation

Trips generated by the proposed development during the weekday AM and PM peak hours have been estimated using relevant peak hour rates identified in the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition*. The trip generation is based on build-out of the development as shown on the Concept Plan (**Appendix A**), using ITE Land Use Codes 230 (Residential Condominium/Townhouse).

The projected peak hour vehicle trips that are expected to be generated by the proposed subdivision are outlined in **Table 4**.

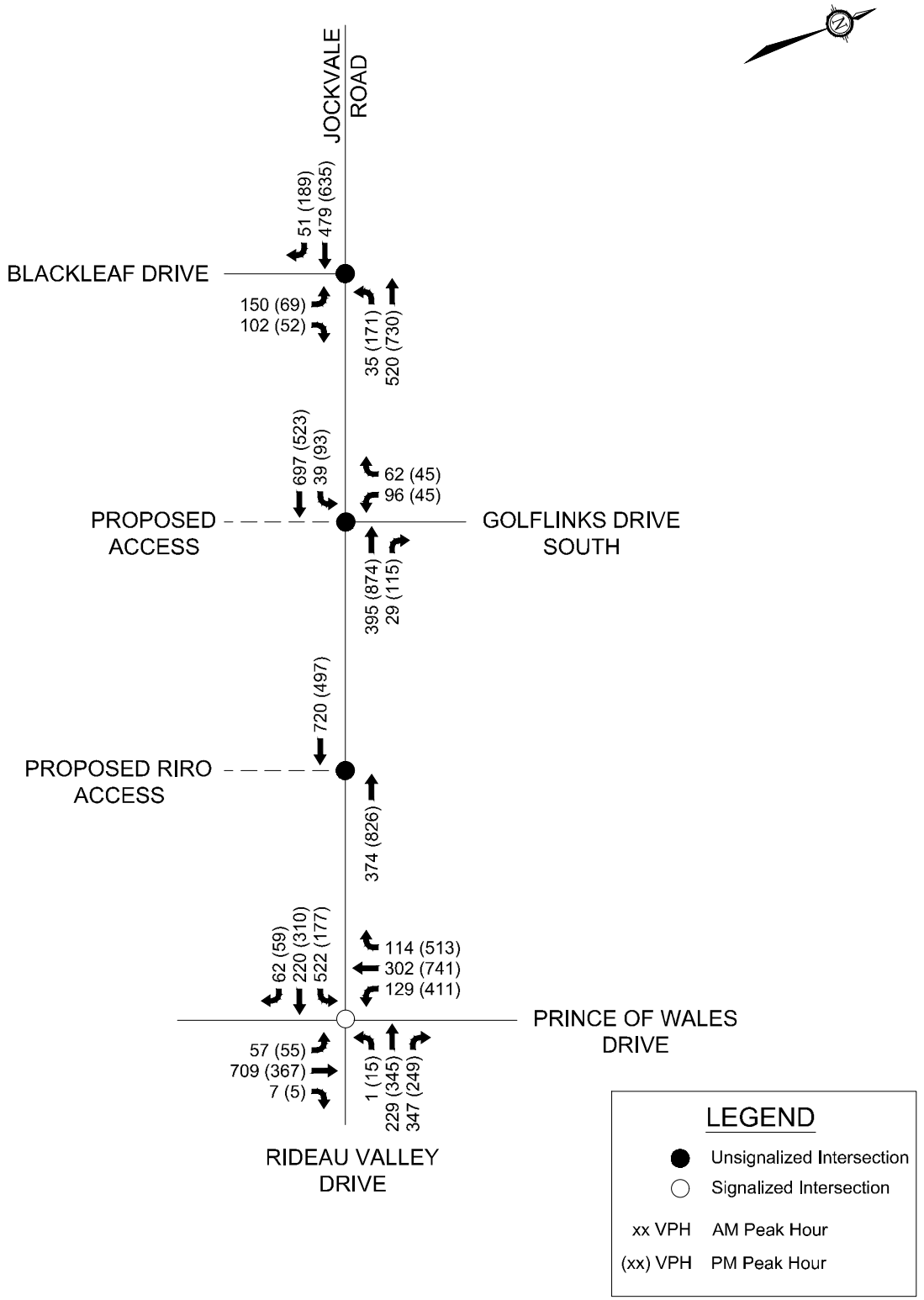
Table 4: ITE Trip Generation

Land Use	ITE Code	#Units	AM Peak (VPH)			PM Peak (VPH)		
			IN	OUT	TOTAL	IN	OUT	TOTAL
Residential Condominium / Townhouse	230	90	8	39	47	37	18	55

The trip generation surveys compiled in the *ITE Trip Generation Manual* only records vehicle trips, and the sites surveyed are typically located in suburban locations in the United States where non-auto modes of transportation typically have a modal share of 10% or less. Where multiple modes of transportation are readily available, it is considered good practice to express projected trip generation volumes in terms of person trips, instead of vehicle trips. To convert ITE vehicle trip rates to person trip rates an adjustment factor of 1.42 has been used to account for non-auto usage and vehicle occupancy. The person trip generation is summarized in **Table 5**.

Table 5: Person Trips

Land Use	Vehicle Trips			Person Trip Factor	Person Trips		
	IN (VPH)	OUT (VPH)	TOTAL (VPH)		IN (PPH)	OUT (PPH)	TOTAL (PPH)
AM Peak Hour	8	39	47	x 1.42 →	11	56	67
PM Peak Hour	37	18	55	x 1.42 →	52	26	78



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3740 JOCKVALE ROAD

2023 BACKGROUND TRAFFIC VOLUMES

APR 2016 115094 FIGURE 3

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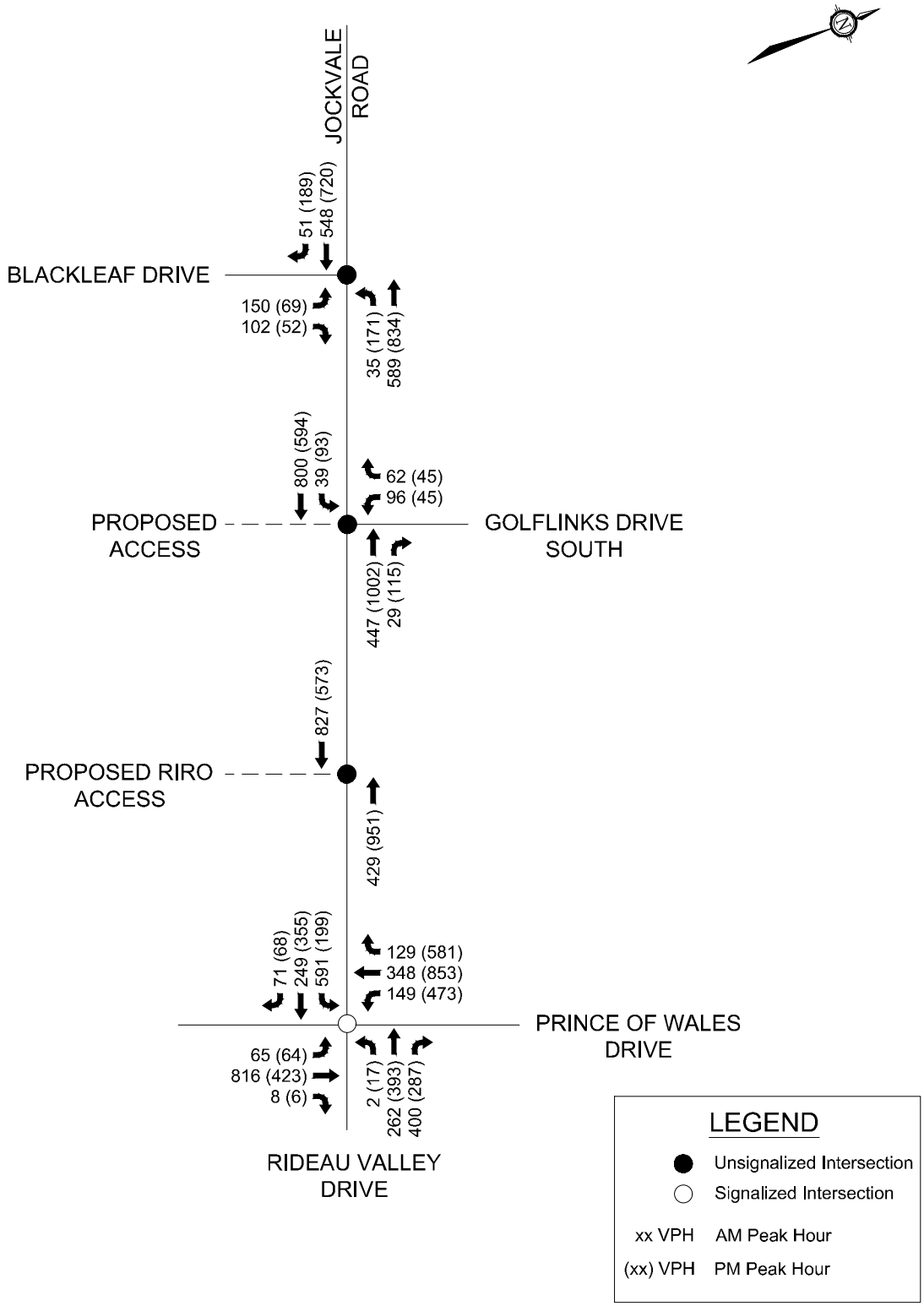

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3740 JOCKVALE ROAD

2028 BACKGROUND TRAFFIC VOLUMES

APR 2016 115094 FIGURE 4

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The number of car trips that the site will generate has been estimated by categorizing the person trips by modal share. The modal shares are based on observed percentages in the *2011 TRANS O-D Survey Report* that are specific to the region referred to as the South Nepean region.

The modal share values applied to the trips generated by the proposed residential developments are based on all observed trips within the South Nepean region, including those with an origin or destination beyond that area.

A full breakdown of the projected person trips by modal share and arrival/departure is shown in **Table 6**.

Table 6: Site-Generated Person Trips by Modal Share

Travel Mode	Modal Share	AM Peak			PM Peak		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Total Person Trips							
Auto Driver	57%	**6**	**32**	**38**	**30**	**15**	**45**
Auto Passenger	14%	2	8	10	7	4	11
Transit	20%	2	11	13	10	5	15
Non-Motorized	9%	1	5	6	5	2	7

For the purpose of this study, it is assumed that all trips generated by the proposed development are primary (i.e. new) trips.

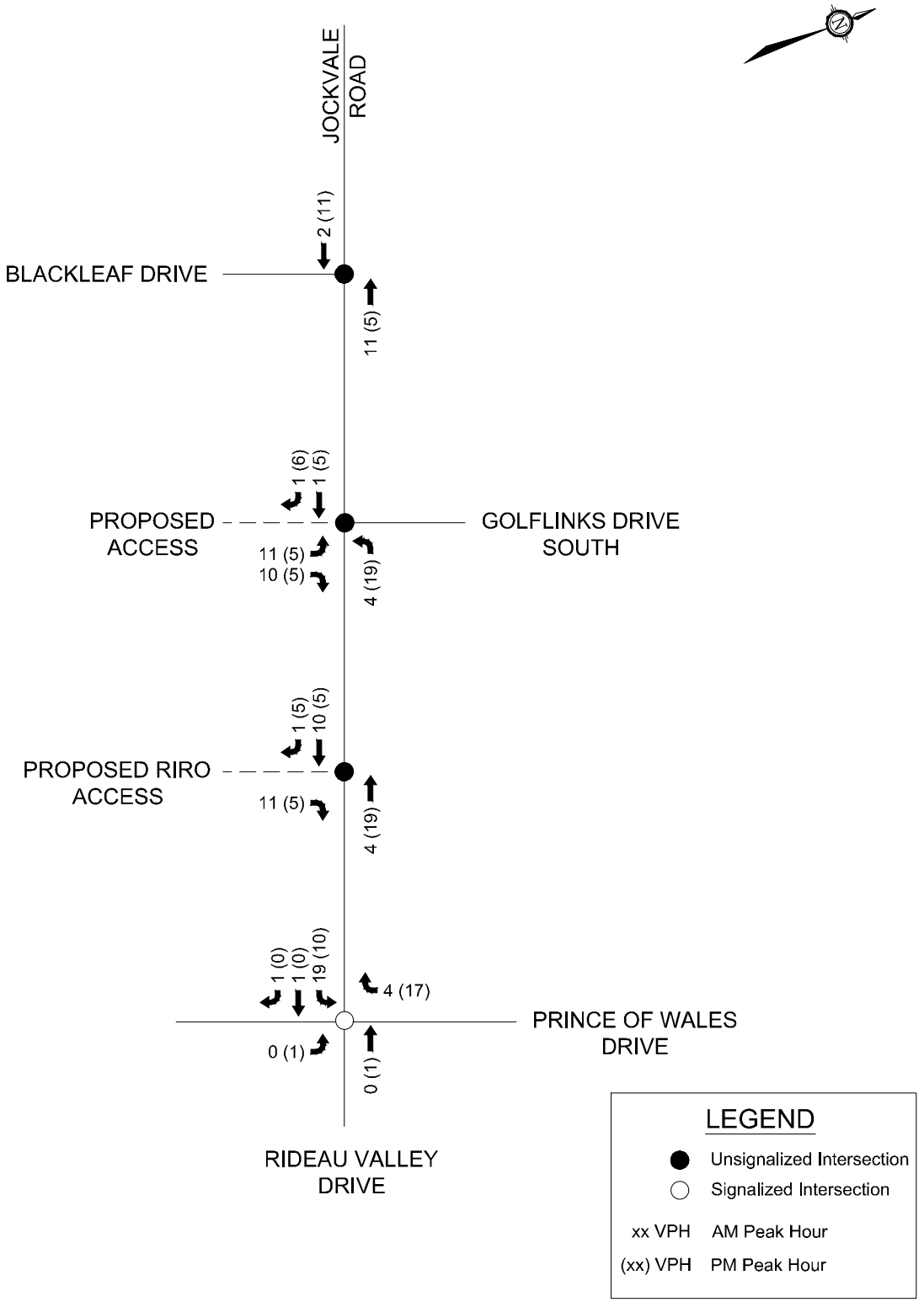
3.5 Trip Distribution

The assumed distribution of site-generated trips has been based on existing traffic patterns on the road network within the study area, the location of local amenities and centres of employment relative to the subject site, and the principles of logical trip routing. The projected distribution of site-generated traffic for the weekday AM and PM peak hours is summarized as follows:

- 60% to/from the south/east via Jockvale Road and Prince of Wales Drive,
- 35% to/from the north via Jockvale Road,
- 5% to/from the south/west via Jockvale Road and Rideau Valley Drive.

It has been assumed that 50% of the site traffic entering from the north or exiting to the south will use the full-movement access on Jockvale Road, and the remaining 50% will use the right-in-right-out access.

Site generated traffic volumes are shown in **Figure 5** for the weekday AM and PM peak hours.



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3740 JOCKVALE ROAD

SITE TRAFFIC VOLUMES

APR 2016 115094 FIGURE 5

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4.0 INTERSECTION ANALYSIS

Intersection capacity analysis has been completed using the Synchro 8 and Rodel V1-Win software packages, and is based on existing traffic signal timing plans obtained from the Public Works and Services Department (included in **Appendix C**). Existing lane configurations are assumed for the existing condition and 2023 scenarios. Widened geometry is assumed for Jockvale Road for the 2028 scenario, in accordance with the Jockvale Road ESR.

Operating conditions at signalized intersections have been evaluated in terms of the volume to capacity (v/c) ratio and the corresponding Level of Service (LOS) based on City of Ottawa criteria. Operating conditions at unsignalized intersections have been evaluated in terms of delay and LOS based on *Highway Capacity Manual 2000* (HCM) criteria. Mitigation measures in the form of additional lane capacity, intersection control modifications, and/or traffic signal adjustments have been identified for movements with a LOS E or F.

4.1 Existing Condition

Intersection capacity analysis has been completed for the existing traffic conditions. The results of the analysis are summarized in the following table for the weekday AM and PM peak hours. Detailed reports are included in **Appendix G1**.

Table 7: Intersection Analysis - Existing Intersection Operations

Intersection	AM Peak			PM Peak		
	Max. V/C or Delay	LOS	Movement	Max. V/C or Delay	LOS	Movement
Jockvale Road / Blackleaf Drive[2]	30 sec	D	EBL/R	**65 sec**	**F**	**EBL/R**
Jockvale Road / Golflinks Drive S[2]	21 sec	C	WBL	31 sec	D	WBL
Jockvale Road / Prince of Wales Drive[1]	0.72	C	SBL	0.89	D	WBL

1. Signalized intersection
2. Unsignalized intersection

4.1.1 Weekday AM Peak Hour

All approaches to the study area intersections currently operate with acceptable LOS in the weekday AM peak hour, with no queuing or congestion issues identified. The maximum queue lengths for each approach to the study area intersections can be accommodated within available storage lengths.

4.1.2 Weekday PM Peak Hour

Under existing traffic conditions, the Synchro analysis indicates that the eastbound approach to the unsignalized intersection of Jockvale Road and Blackleaf Drive is currently operating with LOS F during the weekday PM peak hour. Traffic turning from Blackleaf Drive onto Jockvale Road is currently being delayed at the intersection by an average of approximately 60 seconds. The corresponding maximum (95th percentile) queue length for this approach is 35 metres.

All other approaches to the study area intersections currently operate with acceptable LOS in the weekday PM peak hour, with no queuing or congestion issues identified. The maximum queue lengths for each approach to the study area intersections can be accommodated within available storage lengths.

A site visit conducted by Novatech staff during the PM peak hour concluded that both the intersection of Blackleaf Drive/Jockvale Road and Golflinks Drive/Jockvale Road were experiencing delay for the eastbound and westbound vehicles respectively. Observed delay for vehicles exiting the Stonebridge community varied from 0-55 seconds. No other concerns were noted during the site visit.

4.1.3 Potential Mitigation Measures

Jockvale Road/Blackleaf Drive

As noted in Section 4.1.2, the eastbound approach to the Jockvale Road/Blackleaf Drive intersection is currently operating with LOS F during the weekday PM peak. This intersection would be expected to operate with acceptable LOS if the existing stop control is replaced with traffic signal control.

The warrant for traffic signals at this intersection is met based on the delay to cross traffic. The Traffic Signal Justification is included in **Appendix H**. If this mitigation measure is implemented, the Level of Service for the eastbound approach is expected to improve from LOS F to LOS A, and the northbound and southbound approaches on Jockvale Road would continue to operate with acceptable LOS during the weekday AM and PM peak hours.

Traffic signals at the intersection of Jockvale Road and Blackleaf Drive were previously recommended, based on the existing traffic condition, in the Novatech report prepared for Stonebridge Orchards and Monarch subdivisions.

It should be noted that the installation of signals at the above noted intersection has been identified as a potential mitigation measure to address an existing failing traffic condition, and not as a means of offsetting any impacts that may be caused by the addition of site traffic that is likely to be generated by the proposed subdivision.

Jockvale Road/Golflinks Drive

Traffic Signal Justification was reviewed for the existing condition at the intersection of Jockvale Road and Golflinks Drive due to on-site observations. The warrant for a traffic signal is not met based on existing traffic volumes. Traffic Signal Justification is included in **Appendix H**.

It is noted that in a meeting between City staff, Uniform Developments (also proponent of the Orchards subdivision opposite the subject development) and residents of the Stonebridge and Orchard communities, the City suggested that the installation of traffic signals is the preferred way of addressing concerns regarding the opening of the Ferguslea Lane road connection between the two communities.

Other Study Area Intersections
No other mitigation measures have been identified for the other intersections within the study area, as none are required.

4.2 2023 Background Traffic

Intersection capacity analysis has been completed for the projected 2023 background traffic conditions.

In the interest of producing conservative results, the 2023 background traffic scenario is based on Jockvale Road with the existing two-lane cross-section.

The results of the analysis are summarized in the following table for the weekday AM and PM peak hours. Detailed reports are included in **Appendix G2**.

Table 8: Intersection Analysis – 2023 Background Traffic (Jockvale Road, two-lane)

Intersection	AM Peak			PM Peak		
	max. v/c or delay	LOS	movement	max. v/c or delay	LOS	movement
Jockvale Road / Blackleaf Drive[1]	**99 sec**	**F**	**EBL/R**	**319 sec**	**F**	**EBL/R**
Jockvale Road / Golflinks Drive S[1]	**44 sec**	**E**	**WBL**	**90 sec**	**F**	**WBL**
Jockvale Road / Prince of Wales Drive[2]	**0.98**	**E**	**SBL**	**0.98**	**E**	**WBL**

1. Unsignalized intersection
2. Signalized intersection

Under projected background traffic conditions in 2023, the Synchro analysis indicates that all study area intersections have movements that are operating under failing conditions with the current geometric road layout and traffic controls.

The Synchro analysis indicates that the southbound approach at the signalized intersection of Jockvale Road and Prince of Wales Drive is expected to operate with LOS E during the weekday AM peak hour. The v/c ratio of this movement is 0.98 and the corresponding maximum (95th percentile) queue length for this approach is approximately 170-metres. This approach is likely to experience congestion problems prior to the upgrading of this intersection, which is proposed as part of the Jockvale Road upgrade and widening project.

The movement experiencing the most delay include the eastbound vehicles on Blackleaf Drive. As presented in the existing analysis, an improved form of traffic control is warranted at this intersection based on delay of crossing traffic.

Under projected background traffic conditions in 2023 the intersection of Jockvale Road and Golflinks Drive is expected to operate under failing conditions. The Traffic Signal Justification was reviewed based on the projected background volumes in 2023. The warrant for traffic signals is not met based on projected traffic volumes. The Traffic Signal Justification is included in **Appendix H**.

We would expect improved level of service for all approaches should the Jockvale Road widening be implemented by 2023.

4.3 2028 Background Traffic

Intersection capacity analysis has been completed for the projected 2028 background traffic conditions. It is assumed that Jockvale Road will have been upgraded and widened as per the functional design presented in the Jockvale Road ESR. For the purpose of this analysis, signal control is assumed at the Blackleaf Drive/Jockvale and Golflinks Drive/Jockvale intersections. The analysis of 2028 traffic conditions has been based on optimized signal timings for the existing and future signalized intersections along Jockvale Road.

The results of the analysis are summarized in the following table for the weekday AM and PM peak hours. Detailed reports are included in **Appendix G2**.

Table 9: Intersection Analysis – 2028 Background Traffic

Intersection	AM Peak			PM Peak		
	max. v/c or delay	LOS	movement	max. v/c or delay	LOS	movement
Jockvale Road / Blackleaf Drive[1]	0.40	A	NBT	0.43	A	NBL
Jockvale Road / Golflinks Drive S[1]	0.47	A	WBL	0.38	A	NBT
Jockvale Road / Prince of Wales Drive[2]	**1.13**	**F**	**SBL**	**1.04**	**F**	**WBL**

1. 90 second cycle length
2. 120 second cycle length

4.3.1 Weekday Peak Hour

Under projected background traffic conditions in 2028, the Jockvale intersections with Blackleaf Drive and Golflinks Drive operate with acceptable LOS during the weekday AM and PM peak hours, with no queuing or congestion issues expected. The maximum queue lengths for each approach to the study area intersections can be accommodated within available storage lengths.

Under projected background traffic conditions in 2028, the intersection of Jockvale Road and Prince of Wales Drive has a few movements that operate under failing conditions. The maximum v/c ratio identified in the Synchro analysis is 1.13, which is expected to occur on the southbound left-turn movement. The corresponding maximum queue length for this movement is approximately 250-metres, which exceeds the length of the proposed left-turn lane. These results indicate that this left-turn queue may spill back into the adjacent through lane, possibly creating a blocking problem.

In the PM peak hour the maximum v/c ratio returned by the Synchro analysis is 1.04, which is expected to occur on the westbound left-turn movement at the signalized intersection of Jockvale Road/Prince of Wales. The corresponding maximum queue length for this movement is approximately 160-metres, which can be accommodated within the left-turn lane.

4.3.2 Potential Mitigation Measures

As noted in Section 4.3.1, the maximum queue length on the southbound left approach to the Jockvale Road/Prince of Wales Drive intersection is expected to exceed the available storage length during the weekday AM peak. Following further analysis, it has been determined that if dual-left-turn lanes of 120-meters (each) are provided on the southbound approach as part of the proposed upgrades to this intersection, the maximum queue length on this approach is expected to drop to 70-metres. The corresponding v/c ratio for this movement is also expected to drop from 1.13 (LOS F) to 0.65 (LOS B).

Similarly, dual westbound left-turn lanes at this intersection would also improve operations. Dual-left turn lanes with a storage length of 90-meters (each) would improve PM peak hour level of service from LOS F to LOS B.

It is anticipated that future operating conditions at the Jockvale Road/Prince of Wales Drive intersection will be further addressed through the detailed design phase of the Jockvale widening project.

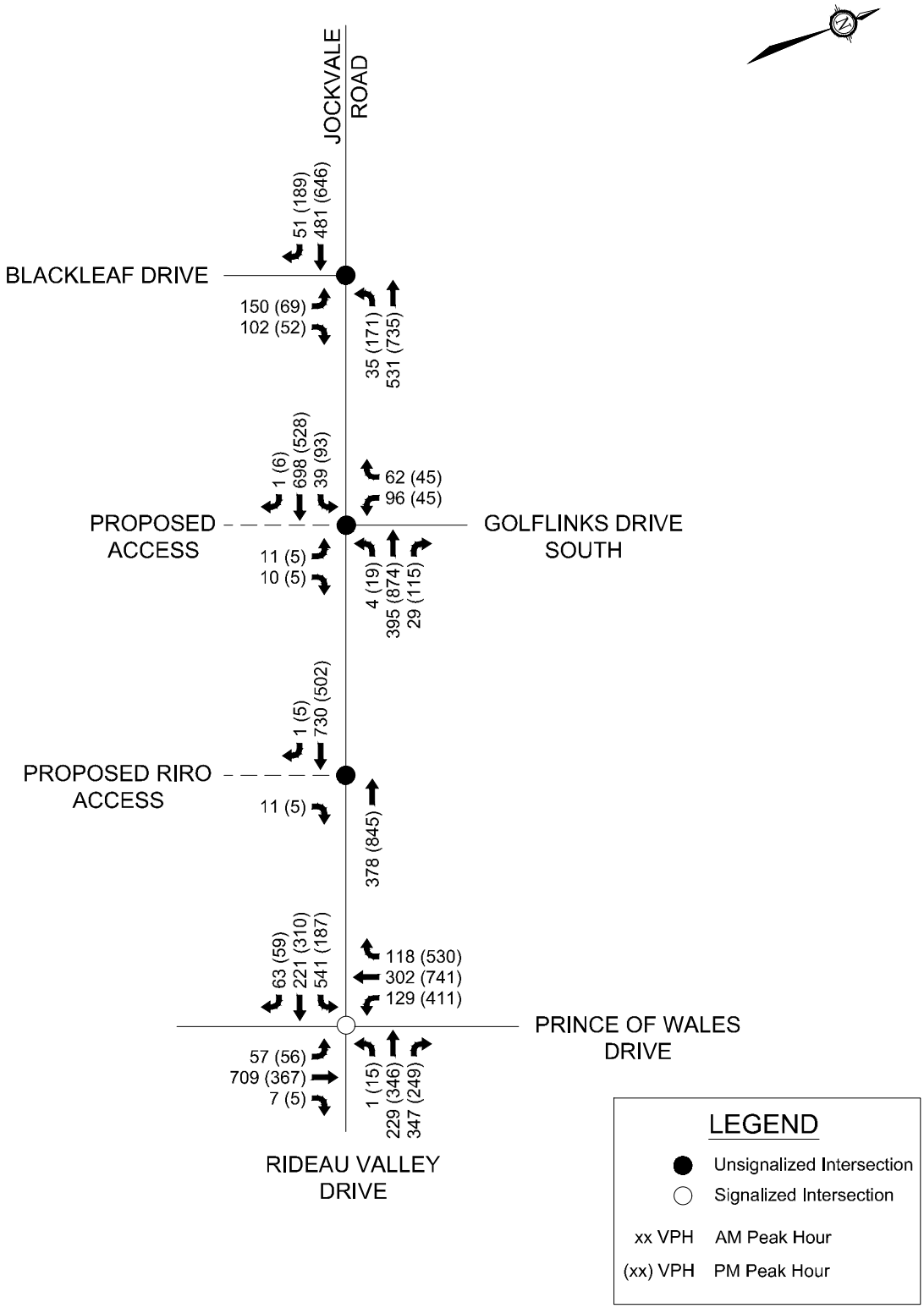
4.4 2023 Total Traffic

Intersection capacity analysis has been completed for the projected 2023 total traffic conditions, which are shown in **Figure 6**.

The proposed development will be served by two accesses onto Jockvale Road. The northern access is proposed to be a full movement access and will form the west leg to the existing Jockvale Road / Golflinks Drive South intersection. The southern access will be located approximately 190m south of Golflinks Drive South and is proposed to be restricted to right-in-right-out movements.

The traffic signal justification was reviewed based on total 2023 traffic volumes. The warrant for traffic signals is not met based on projected traffic (included in **Appendix H**). However, a failing level of service has been identified for 2023 background traffic and traffic control improvements will be required to provide acceptable operating conditions. There is also a need to address existing concerns regarding the unopened Ferguslea Lane road connection between the Stonebridge and Orchard communities. The City of Ottawa's Development Charges By-Law allocates a budget of $200,000 in 2016 for road modifications at this intersection. Subject to eligibility, it is recommended that the installation of traffic signals be considered.

The total traffic conditions in 2023 were analysed based on full buildout of the proposed subdivision and implementation of signals at both the Blackleaf Drive/Jockvale Road and Golflinks Drive/Jockvale Road intersections. Based on volume projections, a northbound left turn lane with



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3740 JOCKVALE ROAD

2023 TOTAL TRAFFIC VOLUMES

APR 2016 115094 FIGURE 6

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a 50-meter parallel length is recommended at the Jockvale Road/Golflinks Drive/proposed access intersection. A functional design of the recommended road modification is shown in **Figure 7**.

The results of the analysis are summarized in the following table for the weekday AM and PM peak hours. Detailed reports are included in **Appendix G3**.

Table 10: Intersection Analysis – 2023 Total Traffic (Jockvale Road, two-lane)

Intersection	AM Peak			PM Peak		
	max. v/c or delay	LOS	movement	max. v/c or delay	LOS	movement
Jockvale Road / Blackleaf Drive[1]	0.63	B	NBT	0.61	B	NBT
Jockvale Road / Golflinks Drive South/ Site Access[1]	0.59	A	SBT	0.74	C	NBT
Jockvale Road/ RIRO Access[3]	15 sec	B	EBR	12 sec	B	EBR
Jockvale Road / Prince of Wales Drive[2]	**1.02**	**F**	**SBL**	**0.99**	**E**	**WBL**

1. 90 second cycle length
2. 120 second cycle length
3. Right-in-Right-out, Unsignalized

The new proposed right-in-right-out, unsignalized site access on Jockvale Road is expected to operate with an average delay of 15 seconds and 12 seconds for eastbound traffic turning onto Jockvale Road during the weekday AM and PM peak hour, respectively. The corresponding maximum queue lengths for this movement are negligible (i.e. less than one car length).

Traffic signal control is expected to provide acceptable levels of service for all approaches at both the Blackleaf Drive and Golflinks Drive intersections along Jockvale Road.

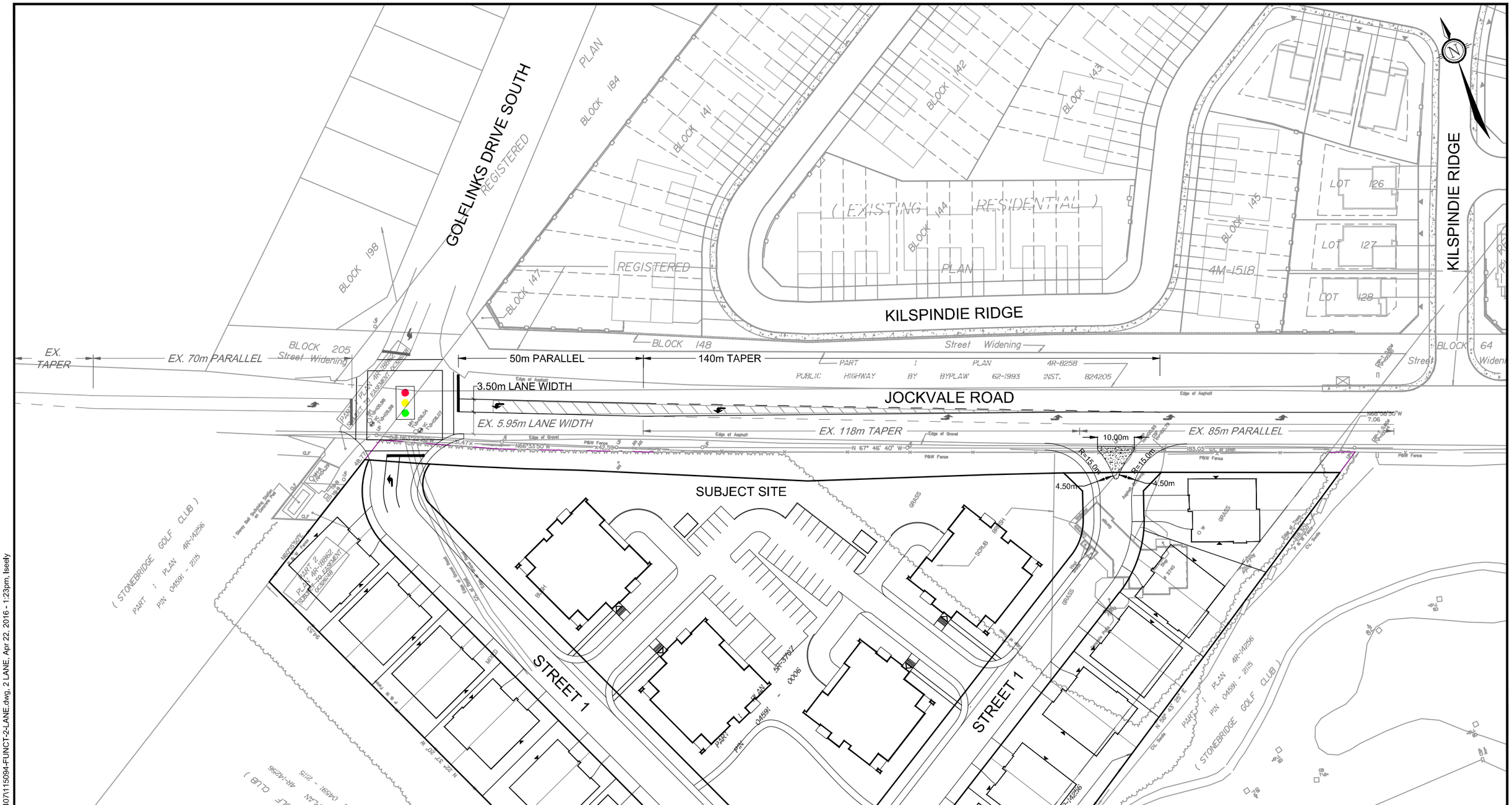
A feasibility analysis was completed to determine if a single lane roundabout could provide sufficient capacity at the Jockvale Road/Golflinks Drive/proposed access intersection in the interim, until the four-lane widening is constructed. A 36-meter inscribed diameter was assumed in light of the posted speed, road classification, truck route designation and Average Annual Daily Traffic (AADT). A conceptual design of a single lane roundabout is shown in **Figure 8**.

Capacity analysis was completed for the 2023 total traffic scenario using Rodel software. The analysis shows that a two-lane approach is required in the northbound direction to provide sufficient capacity in the PM peak. Detailed reports are included in **Appendix G3**.

Other considerations include the location of the intersection at the top of a crest vertical curve, and the impact to future on-site driveways.

Approximate cost of a single-lane roundabout is in the order of $600,000-$800,000. As noted previously, the City of Ottawa's Development Charges By-Law allocates a budget of $200,000 in 2016 for road modifications at this intersection.

In light of the above factors, signal control is identified as the preferred intersection control type for the interim two-lane scenario, until the Jockvale Road widening is constructed.



LEGEND

PROPOSED SIGNALIZED INTERSECTION

PROPOSED RAISED CONCRETE ISLAND FOR RESTRICTED ACCESS

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CITY OF OTTAWA
3740 JOCKVALE ROAD

FUNCTIONAL DESIGN (INTERIM - 2 LANE)

SCALE	DATE	JOB	FIGURE
1 : 1000	APR 2016	115094	FIGURE 7

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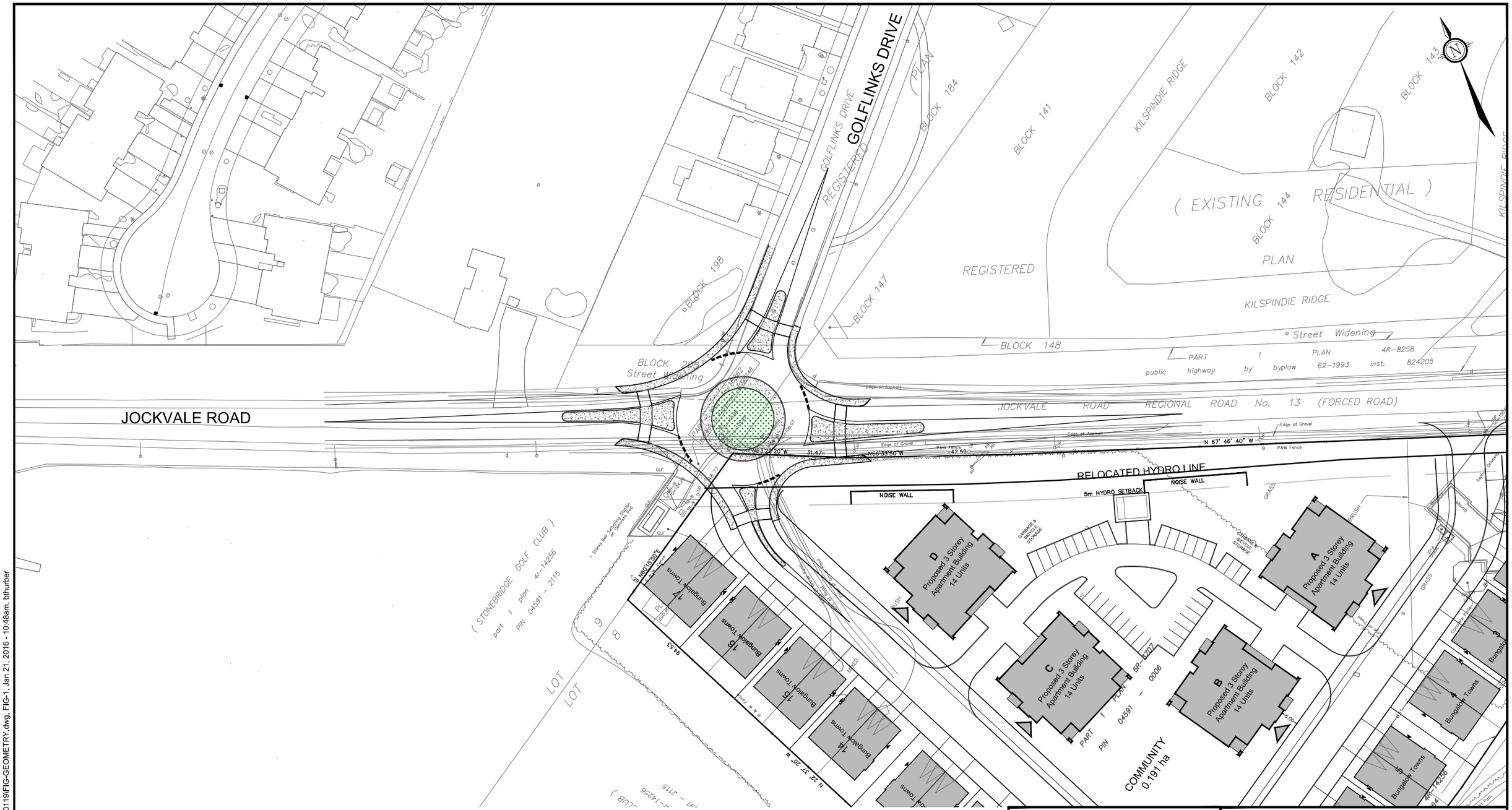

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SINGLE LANE ROUNDABOUT

SCALE 1 : 1000 (0 10 20 30 40)

DATE APR 2016 | JOB 115094 | FIGURE FIGURE 8

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The intersection of Jockvale Road and Prince of Wales Drive continues to experience delay of the left turning vehicles. It is anticipated that the intersection improvements presented in the Jockvale ESR document will improve the level of service at this intersection. The impact of site-generated traffic on this intersection is projected to be very minimal.

4.5 2028 Total Traffic

Intersection capacity analysis has been completed for the projected 2028 total traffic conditions, which are shown in **Figure 9**. It is assumed that the Jockvale Road widening will be complete by the 2028 horizon year. Signal control is assumed at the Blackleaf Drive and Golflinks Drive intersections with Jockvale Road for the purpose of this assessment. The appropriate form of intersection control will be confirmed through the detail design of the Jockvale Road widening project.

The results of the analysis are summarized in the following table for the weekday AM and PM peak hours. Detailed reports are included in **Appendix G3**.

Table 11: Intersection Analysis – 2028 Total Traffic

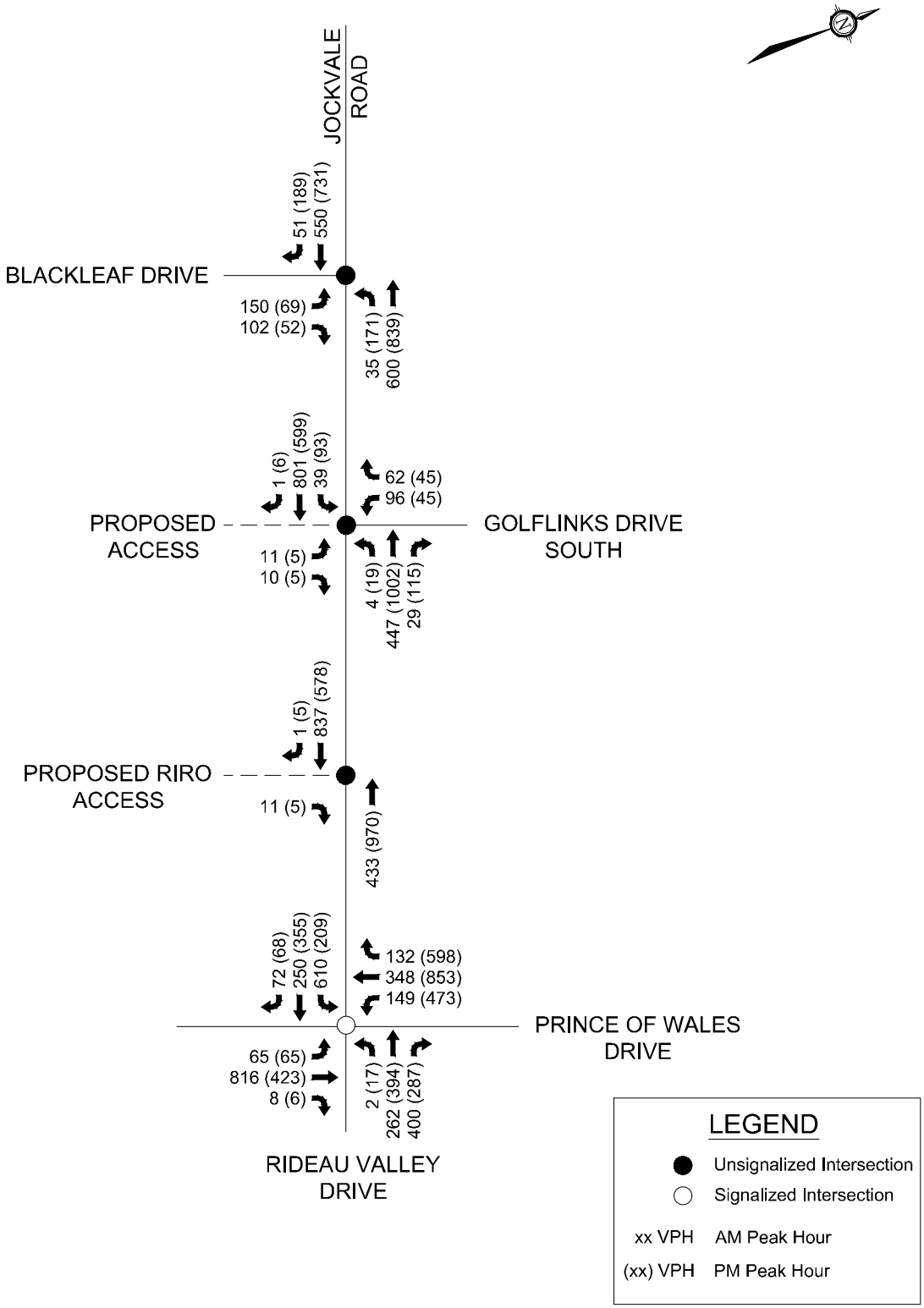
Intersection	AM Peak			PM Peak		
	max. v/c or delay	LOS	movement	max. v/c or delay	LOS	movement
Jockvale Road / Blackleaf Drive[1]	0.41	A	NBT	0.41	A	NBL
Jockvale Road / Golflinks Drive S/ Site Access[1]	0.55	A	WBL	0.38	A	NBT
Jockvale Road / RIRO Access[3]	11 sec	B	EBR	10 sec	B	EBR
Jockvale Road / Prince of Wales Drive[2]	**1.17**	**F**	**SBL**	**1.04**	**F**	**WBL**

1. 90 second cycle length
2. 120 second cycle length
3. Right-in-Right-out, Unsignalized

The impact of site traffic at the study area intersections is expected to be minimal, and all approaches to the site access on Jockvale Road are expected to operate with LOS B or better during the weekday AM and PM peak hour.

A high level assessment of a multi-lane roundabout at the Jockvale Road/Golflinks Drive/Site Access intersection is provided in Section 6.0.

Under total traffic conditions in 2028, the southbound left movement at the intersection of Jockvale Road/Prince of Wales Drive is expected to operate with LOS F during the weekday AM peak hour. The v/c ratio for this movement is 1.17, and the maximum queue length is expected to exceed 250-metres. Under background traffic conditions, the v/c ratio for this movement is 1.13 with a similar maximum queue length.



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3740 JOCKVALE ROAD

2028 TOTAL TRAFFIC VOLUMES

APR 2016 115094 FIGURE 9

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Assuming that the mitigation measures, such as dual left-turn lanes in the westbound and southbound directions of the Jockvale/Prince of Wales intersection, which were previously identified to address potential problems under background traffic will be implemented, all study area intersections will operate with acceptable LOS in 2028 under total traffic conditions. No further mitigation measures to accommodate the addition of site traffic are identified.

5.0 PROVISIONS FOR NON-AUTO MODES

A sidewalk is proposed along one side of the internal public street. The layout and design of internal pedestrian sidewalks for the interior block (condominium apartments) will be completed as part of a future site plan submission. The subdivision will be readily accessible from the ultimate pedestrian and cycling facilities that are to be provided as part of the Jockvale Road upgrade and widening.

As the Barrhaven South and Stonebridge Communities continue to develop and expand in future years, it is anticipated that OC Transpo will expand their bus services in this area. This expansion would make public transit a more attractive mode of transportation for commuters, and would therefore be likely to increase the modal share of transit-based trips to and from the nearby residential lands.

6.0 ON-SITE DESIGN

6.1 Proposed Site Access

6.1.1 Access

A new local roadway will be constructed to serve the proposed development with two proposed connections to Jockvale Road.

The northern access is proposed to be a full movement access and will form the west leg of the existing Jockvale Road / Golflinks Drive South intersection.

The southern access will be located approximately 195m south of Golflinks Drive South and will be restricted to right-in-right-out movements. In the interim a raised island will be constructed on the proposed access approach to discourage left-turn movements. As part of the Jockvale Road widening a centre lane median will be designed and constructed along Jockvale Road to restrict access.

6.1.2 Lane Configuration and Geometry

Interim Geometry

With the addition of the northern site access forming the west leg at the Jockvale Road and Golflinks Drive intersection some minor road widening will be required. Currently, there is an existing southbound left-turn lane, with opposing painted median on Jockvale Road at Golflinks Drive. It is recommended that a northbound left-turn lane be constructed in place of the median. This lane will dovetail with the existing southbound left-turn lane located at Kilspindie Ridge.

The minimum required left-turn lane dimensions have been designed based on a design speed of 80km/h for Jockvale Road. The *Ministry of Transportation (MTO) Geometric Design Standards* indicate that a 130-meter taper and a 50-meter parallel lane are required. A review of

Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads equation (S=1.5NL/(3600/CL)) indicates a minimum storage requirement of 7-meters. The proposed 50-meter parallel lane length will provide sufficient storage for the projected traffic.

The interim Functional Design with the existing two-lane Jockvale Road cross-section, northbound left-turn lane and restricted southern access connection is shown in **Figure 7**.

Ultimate Geometry
A conceptual layout of the ultimate functional design for the site accesses is shown in **Figure 10** based on the preliminary geometry presented in the Jockvale Road ESR.

It is our understanding that the upgraded and widening work is currently being design by Robinson Consultants Inc. and is scheduled for construction between 2020 and 2025.

A conceptual layout for a multi-lane roundabout alternative (**Figure 11**) at the Jockvale Road/Golflinks Road/Site Access intersection was prepared to assist in evaluating possible future impacts, including the following:

- Land acquisition,
- Proposed driveway locations,
- Access to existing utility pedestals to the north.

Based on the conceptual layout, a multi-lane roundabout would require additional property acquisition beyond the protected 37.5m right-of-way and have significant impacts on the proposed subdivision in terms of encroachment relative to the size of the site and access to the existing utility pedestals. Also significant impact to the existing concrete structure and forcemain at the southeast quadrant of the intersection are anticipated. It is recommended that signal control be considered as part of the ultimate geometry at this location.

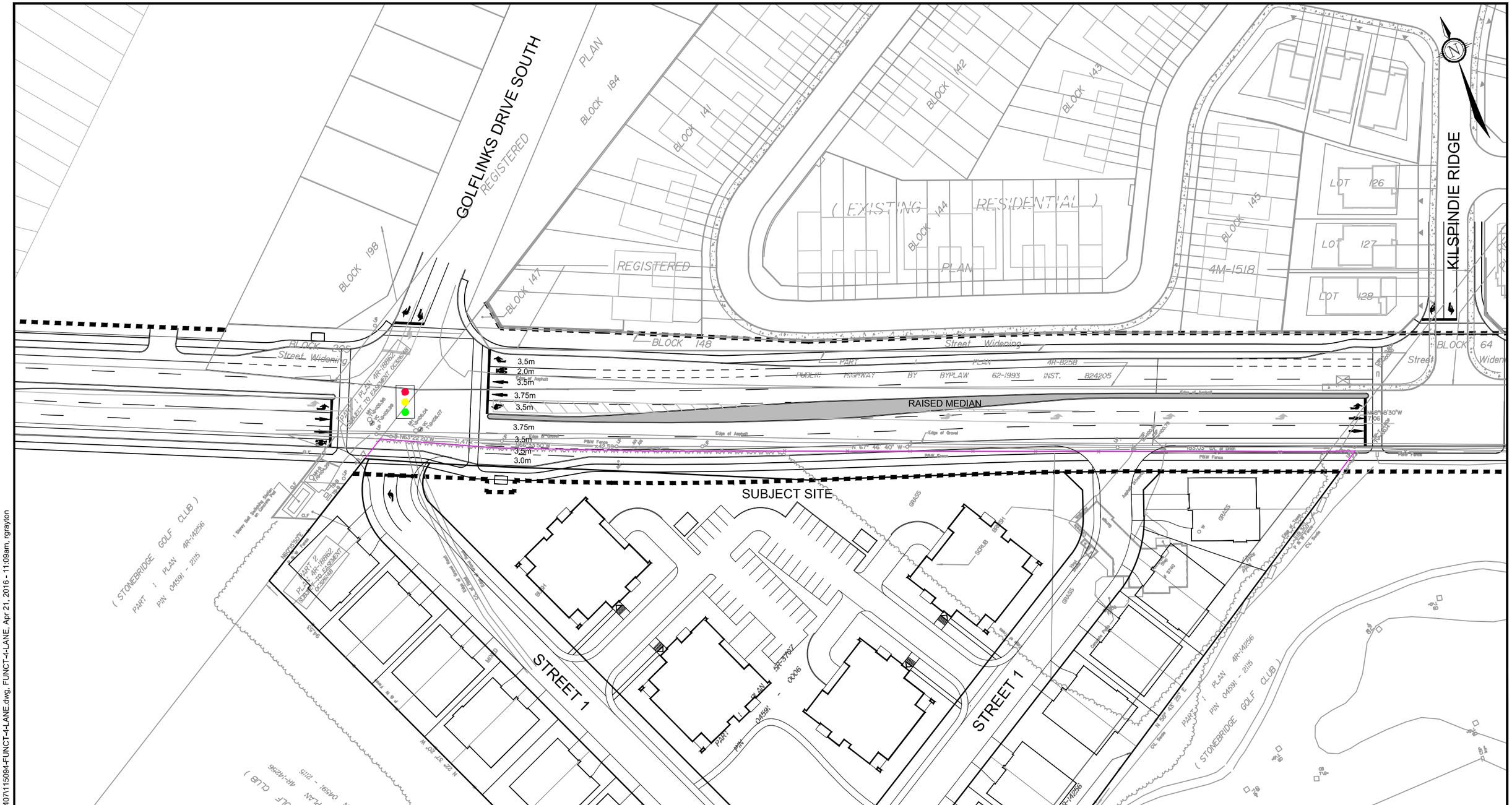
6.1.3 Sight Distances

Turning Movement Sight Distance

The *TAC Geometric Design Guide* identifies sight distance requirements for different types of traffic control. Turning sight distance requirements have been considered for stop control at the proposed intersection. For a design speed of 80 km/h, Figure 2.3.3.4 of the TAC Guide indicates the sight distances shown in **Table 12** are required. The existing sight distances on Jockvale Road were measured in the field by Novatech.

Stopping Sight Distance

In addition to the turning sight distance for vehicles on the access road, drivers on the main road approaching the site accesses should be provided with sufficient stopping sight distance to react, in the event of a driver turning into the site. The stopping sight distance was compared to the required distances outlined in *TAC Guide*. For a design speed of 80km/h, the required stopping sight distance range is 115m to 140m (Table 1.2.5.3).



LEGEND

PROPOSED SIGNALIZED INTERSECTION

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

CITY OF OTTAWA
3740 JOCKVALE ROAD

CONCEPTUAL DESIGN (ULTIMATE - 4 LANE)

SCALE	DATE	JOB	FIGURE
1 : 1000	APR 2016	115094	FIGURE 10

SHT11X17.DWG - 279mmX432mm

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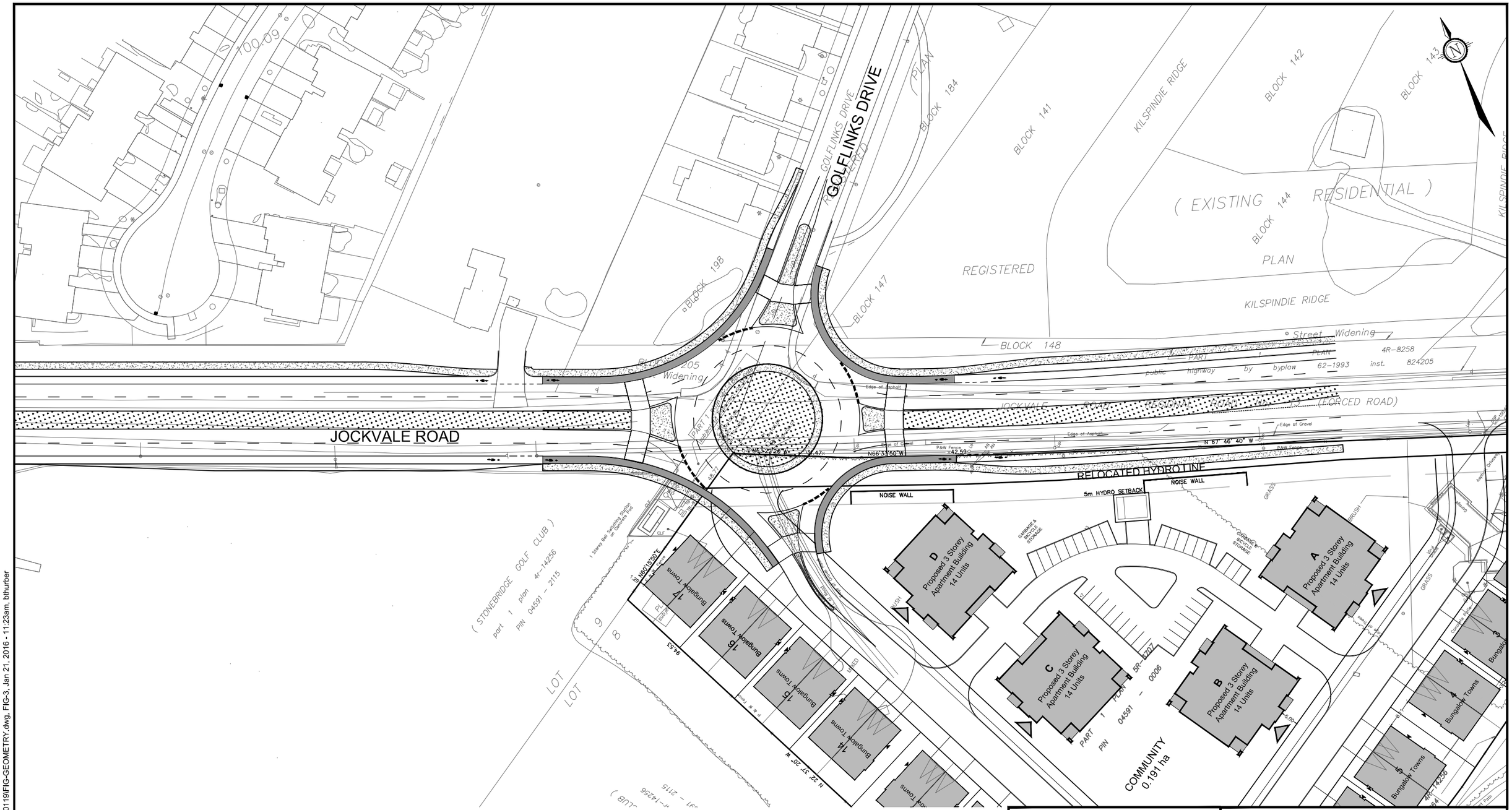

NOVATECH
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Facsimile (613) 254-5867
Website www.novatech-eng.com

CITY OF OTTAWA
3740 JOCKVALE ROAD

MULTI-LANE ROUNDABOUT

SCALE 1 : 1000 (0 10 20 30 40)

DATE APR 2016 | JOB 115094 | FIGURE FIGURE 11

SHT11X17.DWG - 279mmX432mm

M:\2015\115094\CAD\Design\Figures\Traffic\20160119\FIG-GEOMETRY.dwg, FIG-3, Jan 21, 2016 - 11:23am, bthurber

The *TAC Geometric Design Guide for Canadian Roads* tables and figures referenced above are included in **Appendix I** for reference.

The following table summarizes the required and existing sight distances at each of the two access locations with Jockvale Road.

Table 12: Sight Distance

Movement	Required Sight Distance	Existing Sight Distance	
		Street 1 (all movement)	Street 1 (restricted access)
Turning Movement Sight Distance			
Turning left onto a 2-lane road across vehicle approaching from left	170m	450m	N/A
Turning left onto a 2-lane road without being overtaken by a vehicle approaching from right	170-250m	300m	N/A
Turning right onto a 2-lane road without being overtaken by a vehicle approaching from left	150-250m	450m	195m
Stopping Sight Distance			
Northbound on Jockvale	115-140m	370m	N/A
Southbound on Jockvale	115-140m	450m	185m

The location of the proposed accesses satisfies the sight distance requirements outlined in the *TAC Guide*. The departure sight envelopes should be kept free of view obstructions including all structures, parking zones, utility appurtenances, advertising signs, and landscaping.

6.2 Internal Access Roadways

The internal road will have a right-of-way width of 16.5m, a paved road width of 8.5m and a sidewalk on one side, in accordance with City of Ottawa standards. The detailed design of the internal road will be completed during the subdivision registration process, in accordance with the City's Urban Design Guidelines for Greenfield Neighbourhoods. The interior block (condominium apartments) will go through the Site Plan application process, which will review the on-site design in terms of access, parking facilities and emergency and garbage service requirements.

7.0 COMMUNITY IMPACTS

The subject site is bounded by a mix of low-to-medium density residential and recreational development (Stonebridge Golf Club), the proposed subdivision will be accessed directly from Jockvale Road, which is identified as an arterial roadway in the TMP. The subdivision will have no connection to any other arterial or collector roadway, and as such there is no possibility of the new residential street being used as a connecting link for background traffic. Infiltration onto adjacent neighbourhood streets is not anticipated.

On-site parking will be provided in accordance with the minimum requirements of the Zoning By-law. Parking infiltration onto area roadways is not anticipated.

8.0 TRANSPORTATION DEMAND MANAGEMENT

The City of Ottawa has developed a comprehensive Transportation Demand Management (TDM) strategy as part of its efforts to reduce automobile dependency. TDM measures can reduce transportation infrastructure requirements by encouraging people to change their travel mode, timing or destination.

The proposed development conforms to the City's TDM initiatives by providing easy access to the local pedestrian, bicycle and transit systems as outlined in Section 5.0. It is expected that the future widening and improvement of Jockvale Road will provide more opportunities to effectively implement the City's TDM strategy within the study area and the South Urban Community.

9.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the foregoing analysis, the main conclusions and recommendations of this report are as follows:

- This report was prepared in support of a Draft Plan of Subdivision application and Zoning By-law Amendment for the 3740 Jockvale Road site.

- The proposed development will be served by two accesses onto Jockvale Road. The northern access is proposed to be a full movement access and will form the west leg of the existing Jockvale Road / Golflinks Drive South intersection. The southern access will be located approximately 195-meters south of Golflinks Drive and is proposed to be restricted to right-in-right-out movements. The location of the proposed accesses satisfies the sight distance requirements outlined in the *Transportation Association of Canada Geometric Design Guide for Canadian Roads*.

- The Transportation Master Plan identifies a need to widen Jockvale Road from two lanes to four lanes between Cambian Road and Prince of Wales Drive. It is our understanding that this work is currently being designed by Robinson Consultants Inc. and is scheduled for construction between 2020 and 2025.

- Based on the existing traffic condition, intersection control modifications are required at the intersection of Jockvale Road and Blackleaf Drive.

- Based on background projected volumes in 2028 acceptable levels of service are expected assuming the implementation of the Jockvale Road widening and traffic signals at the Blackleaf Drive/Jockvale Road and Golflinks Drive/Jockvale Road intersections. Consideration of southbound and westbound dual-left turn lanes is recommended at the intersection of Prince of Wales and Jockvale Road as part of the planned Jockvale Road widening.

- The warrant for traffic signals is not met at the Golflinks Drive/Jockvale Road/Site Access intersection based on 2023 projected traffic. However, a failing level of service has been identified for 2023 background traffic and traffic control improvements will be required to provide acceptable operating conditions. There is also a need to address existing concerns regarding the unopened Ferguslea Lane road connection between the Stonebridge and Orchard communities. The City of Ottawa's Development Charges By-Law allocates a budget of $200,000 in 2016 for road modifications at this intersection. Subject to eligibility, it is recommended that the installation of traffic signals be considered.

- A northbound left-turn lane with 50-meter parallel length is recommended at the Jockvale Road/Golflinks/Site Access intersection which requires minor road widening.

- A single lane roundabout is not expected to provide sufficient capacity at the Jockvale Road/Golflinks/Site Access intersection in the interim until the Jockvale Road widening is constructed.

- A multi-lane roundabout at the Jockvale Road/Golflinks/Site Access intersection would result in a major encroachment onto the site, impacting driveway locations and requiring property acquisition beyond the 37.5-meter right-of-way protection. Access to existing utility pedestals and a concrete structure and forcemain would also be impacted. It is recommended that signal control be considered as part of the ultimate geometry.

- The proposed subdivision includes adequate provisions for non-auto travel modes, including access to local pedestrian, bicycle, and transit systems.

Prepared by:

NOVATECH

Lisa Bowley, P.Eng.
Project Engineer

Reviewed by:

Jennifer Luong, P.Eng.
Project Manager

APPENDIX A

Concept Plan
and
Draft Plan

Unit Count

Bungalow Semis	34
Condo Flats	56
Total	90
Surface Condo Parking	40

Stonebridge
Golf Club

JOCKVALE ROAD | Stonebridge
concept site plan

APRIL 14, 2016
scale: 1:750

uniform URBAN DEVELOPMENTS

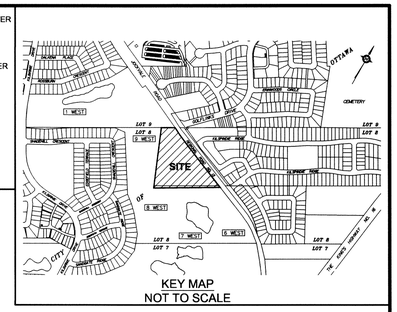
BARRY J. HOBIN & ASSOCIATES ARCHITECTS INCORPORATED

SUBJECT TO THE CONDITIONS, IF ANY, SET FORTH IN OUR LETTER DATED

_____.

THIS DRAFT PLAN IS APPROVED BY THE CITY OF OTTAWA UNDER SECTION 51 OF THE PLANNING ACT.
THIS _____ DAY OF _____.

FELICE PETTI, P. ENG., MANAGER
DEVELOPMENT REVIEW, SUBURBAN SERVICES
PLANNING AND GROWTH MANAGEMENT DEPARTMENT
PLANNING AND INFRASTRUCTURE PORTFOLIO
CITY OF OTTAWA



DRAFT PLAN OF SUBDIVISION OF

PART OF LOT 8
CONCESSION 2 (RIDEAU FRONT)
Geographic Township of Nepean
CITY OF OTTAWA
Prepared by Annis , O'Sullivan , Vollebekk Ltd.

Scale 1 : 500

20 15 10 5 0 10 20 Metres

Metric
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

SURVEYOR'S CERTIFICATE

I CERTIFY THAT :
The boundaries of the lands to be subdivided and their relationship to adjoining lands have been accurately and correctly shown.

April 22/2016 — Edward M. Lancaster
Date — Edward M. Lancaster, ONTARIO LAND SURVEYOR

OWNER'S CERTIFICATE

This is to certify that I am the agent for the owners of the lands to be subdivided and that this plan was prepared in accordance with my instructions.

_____ Date

_____
Uniform Urban Developments
I have the authority to bind the corporation

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51-17 OF THE PLANNING ACT

(a) see plan
(b) see plan
(c) see plan
(d) multi-family residential housing, park, openspace
(e) see plan
(f) see plan
(g) see plan
(h) City of Ottawa
(i) see soils report
(j) see plan
(k) sanitary, storm sewers, municipal water, bell, hydro, cable and gas to be available
(l) see plan

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S5
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: Nepean@aovltd.com
Ontario Land Surveyors

Job No. 17071-16 Uniform PtLtB C2 RF NP DPS F | N

APPENDIX B

OC Transpo System Map

Tartan
173
170
73
Strandherd
173
Marketplace
Marketplace
Barrhaven Centre
Greenbank
Strandherd
186
Pierre-Savard
176
Strandherd
Marketplace
175
177
99
Beatrice
Jockvale
St. Joseph
205
PM
Longfields
Bren-Maur
Rivière Jock River
Beatrice
Woodroffe
Stoneway
171
71
77
176
94
Nepean Woods
Chapman Mills
Paul Métivier
176
77
Crestway
94
AM
PM
Cresthaven
77
176
Strandherd
77
Strandherd-Armstrong
94
99
99
The
Riverstone
Pondhollow
175
Golflinks
Jockvale
Grand Canal
Cambrian
177
Minto Rec. Complex
Complexe réc. Minto
Blackleaf
Greenbank
Kilbirnie
Dundonald
Kilmarnock
Kilbirnie
177
175
186
205
Barnsdale
Beatrice - 3049
99 77 406
176 Eastbound Only
Vers l'est seulement
Nepean Woods - 3048
94 99 176 406
Riverview - 3040
94 99 189 406

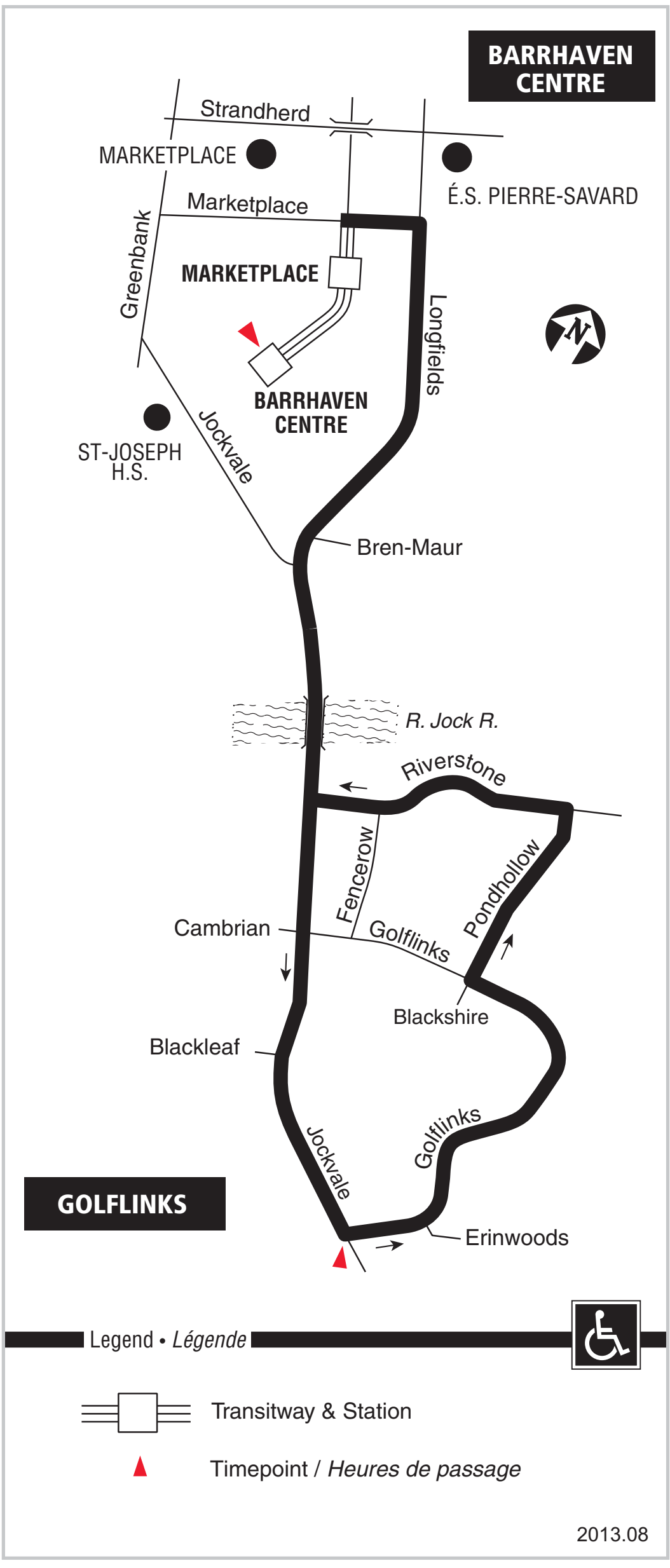
OC Transpo

175 BARRHAVEN CENTRE / GOLFLINKS

7 days a week / 7 jours par semaine

Peak periods and selected trips

Périodes de pointe et trajets sélectionnés



Information / Renseignement.....**613-741-4390**

Customer Relations
Service à la clientèle **613-842-3600**

Lost and Found / Objets perdus **613-563-4011**

Schedule / Horaire.....**613-560-1000**

Text / Texto **560560**

plus your four digit bus stop number / *plus* votre numéro d'arrêt à quatre chiffres

Effective / En vigueur Sept. 1 sept. 2013

613-741-4390 octranspo.com

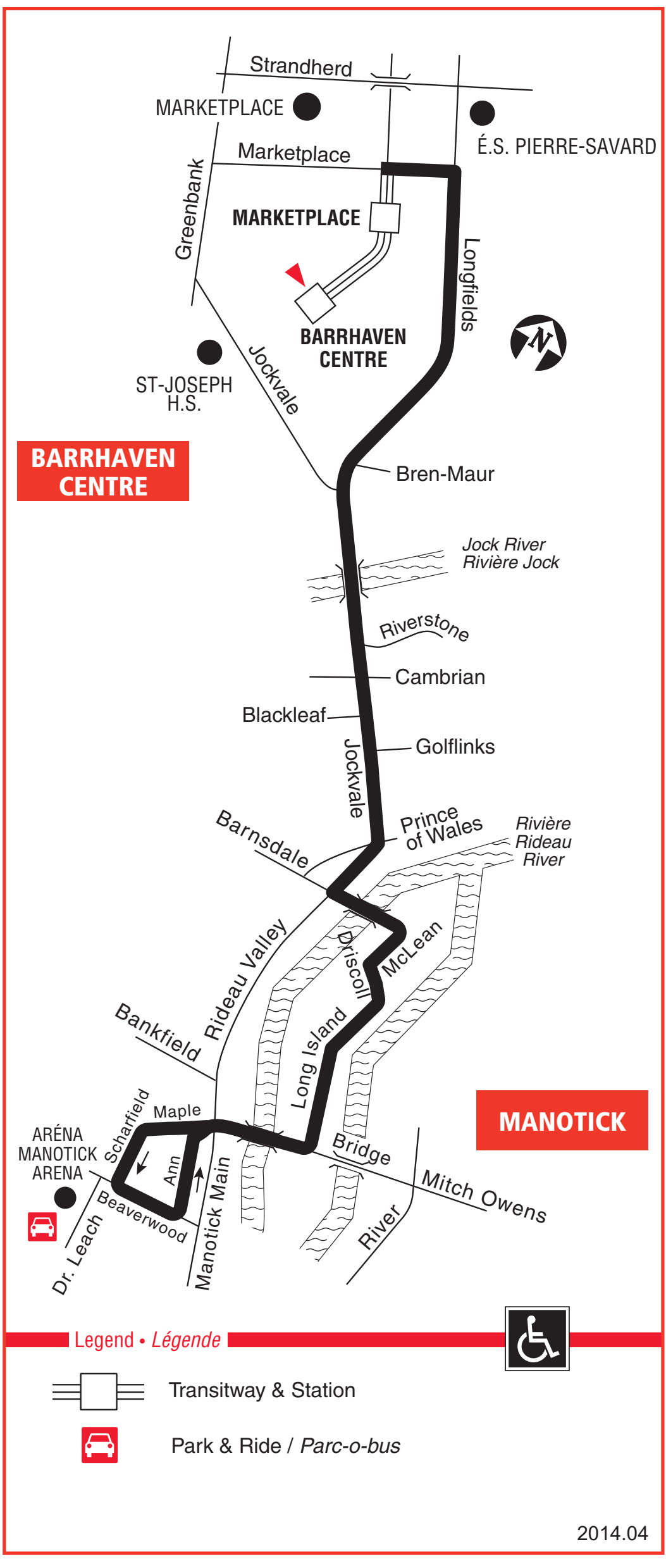
OC Transpo

186 BARRHAVEN CENTRE / MANOTICK

Monday to Friday / Lundi au vendredi

Peak periods only

Périodes de pointe seulement



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plus your four digit bus stop number / *plus* votre numéro d'arrêt à quatre chiffres

Effective / En vigueur Sept. 1 sept. 2013

613-741-4390 octranspo.com

APPENDIX C

Traffic Count Data and Signal Timings

City of Ottawa
110 Laurier Ave West

Ottawa, Ontario, Canada K1P 1J1
613-580-2424 Ibrahim.Conteh@ottawa.ca

Count Name: Blackleaf Dr and Jockvale Rd
Site Code:
Start Date: 10/07/2012

Turning Movement Data

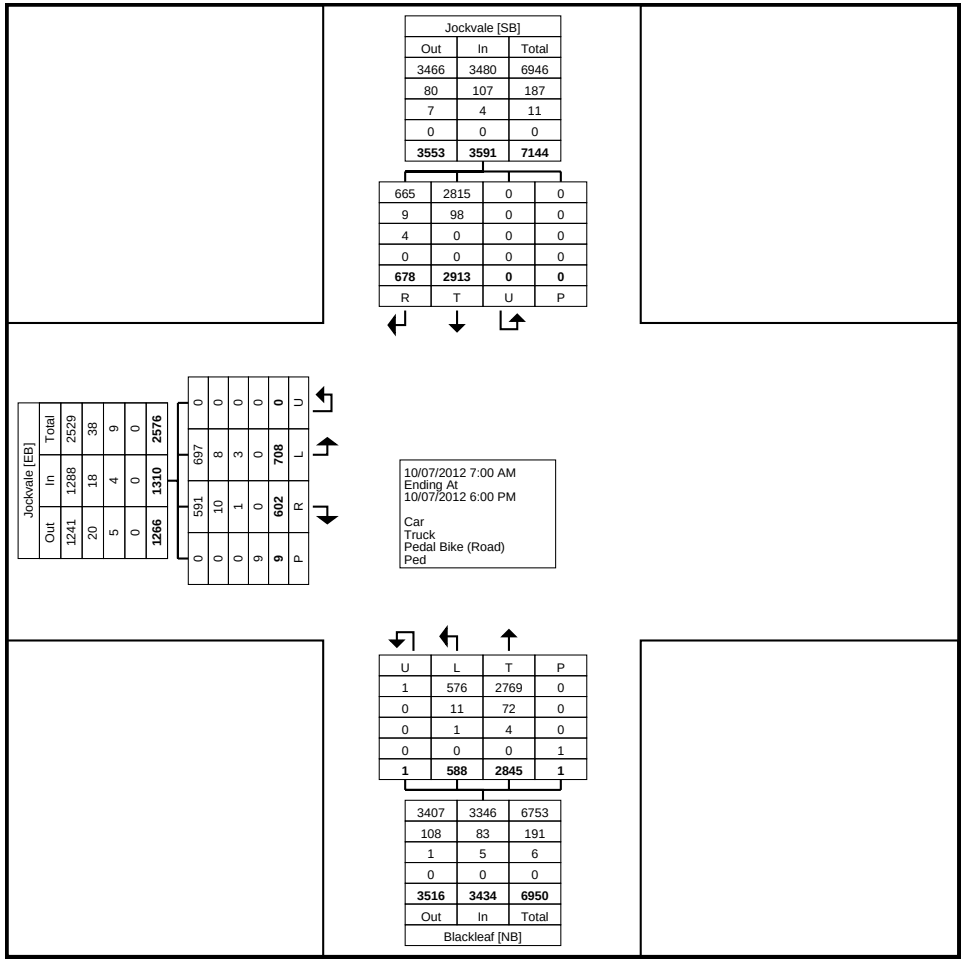
Start Time	Jockvale Southbound					~~Blackleaf~~ Northbound					~~Jockvale~~ Eastbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:00 AM	77	3	0	0	80	12	67	0	0	79	29	43	0	0	72	231
7:15 AM	83	6	0	0	89	10	58	0	0	68	30	54	0	0	84	241
7:30 AM	96	4	0	0	100	11	49	0	0	60	39	46	0	0	85	245
7:45 AM	91	12	0	0	103	8	57	0	1	65	36	29	0	1	65	233
Hourly Total	347	25	0	0	372	41	231	0	1	272	134	172	0	1	306	950
8:00 AM	71	7	0	0	78	9	86	0	0	95	46	30	0	0	76	249
8:15 AM	91	13	0	0	104	6	79	0	0	85	41	27	0	0	68	257
8:30 AM	98	14	0	0	112	11	92	0	0	103	40	26	0	0	66	281
8:45 AM	87	17	0	0	104	9	85	0	0	94	23	19	0	1	42	240
Hourly Total	347	51	0	0	398	35	342	0	0	377	150	102	0	1	252	1027
9:00 AM	72	11	0	0	83	11	71	0	0	82	17	30	0	0	47	212
9:15 AM	63	12	0	0	75	8	80	0	0	88	26	20	0	0	46	209
9:30 AM	71	12	0	0	83	14	64	0	0	78	24	18	0	0	42	203
9:45 AM	48	9	0	0	57	8	81	0	0	89	23	21	0	0	44	190
Hourly Total	254	44	0	0	298	41	296	0	0	337	90	89	0	0	179	814
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	76	14	0	0	90	17	78	0	0	95	16	15	0	0	31	216
11:45 AM	80	21	0	0	101	11	105	0	0	116	21	6	0	0	27	244
Hourly Total	156	35	0	0	191	28	183	0	0	211	37	21	0	0	58	460
12:00 PM	77	20	0	0	97	17	89	0	0	106	20	8	0	0	28	231
12:15 PM	72	21	0	0	93	10	77	0	0	87	17	11	0	0	28	208
12:30 PM	104	16	0	0	120	9	74	0	0	83	23	6	0	0	29	232
12:45 PM	109	25	0	0	134	12	63	0	0	75	11	16	0	0	27	236
Hourly Total	362	82	0	0	444	48	303	0	0	351	71	41	0	0	112	907
1:00 PM	91	18	0	0	109	7	70	0	0	77	18	14	0	0	32	218
1:15 PM	65	15	0	0	80	5	89	1	0	95	16	10	0	0	26	201
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	156	33	0	0	189	12	159	1	0	172	34	24	0	0	58	419
3:00 PM	104	14	0	0	118	12	104	0	0	116	18	14	0	0	32	266
3:15 PM	88	17	0	0	105	17	89	0	0	106	12	10	0	1	22	233
3:30 PM	117	17	0	0	134	15	101	0	0	116	11	18	0	1	29	279
3:45 PM	103	25	0	0	128	32	110	0	0	142	18	12	0	0	30	300
Hourly Total	412	73	0	0	485	76	404	0	0	480	59	54	0	2	113	1078
4:00 PM	97	31	0	0	128	30	90	0	0	120	9	13	0	0	22	270
4:15 PM	127	32	0	0	159	26	91	0	0	117	19	14	0	2	33	309
4:30 PM	104	44	0	0	148	38	117	0	0	155	15	13	0	0	28	331
4:45 PM	124	39	0	0	163	42	107	0	0	149	21	7	0	0	28	340
Hourly Total	452	146	0	0	598	136	405	0	0	541	64	47	0	2	111	1250
5:00 PM	97	40	0	0	137	41	126	0	0	167	10	11	0	1	21	325
5:15 PM	131	45	0	0	176	41	121	0	0	162	19	15	0	2	34	372
5:30 PM	101	57	0	0	158	48	128	0	0	176	16	14	0	0	30	364

5:45 PM	98	47	0	0	145	41	147	0	0	188	24	12	0	0	36	369
Hourly Total	427	189	0	0	616	171	522	0	0	693	69	52	0	3	121	1430
Grand Total	2913	678	0	0	3591	588	2845	1	1	3434	708	602	0	9	1310	8335
Approach %	81.1	18.9	0.0	-	-	17.1	82.8	0.0	-	-	54.0	46.0	0.0	-	-	-
Total %	34.9	8.1	0.0	-	43.1	7.1	34.1	0.0	-	41.2	8.5	7.2	0.0	-	15.7	-
Car	2815	665	0	-	3480	576	2769	1	-	3346	697	591	0	-	1288	8114
% Car	96.6	98.1	-	-	96.9	98.0	97.3	100.0	-	97.4	98.4	98.2	-	-	98.3	97.3
Truck	98	9	0	-	107	11	72	0	-	83	8	10	0	-	18	208
% Truck	3.4	1.3	-	-	3.0	1.9	2.5	0.0	-	2.4	1.1	1.7	-	-	1.4	2.5
Pedal Bike (Road)	0	4	0	-	4	1	4	0	-	5	3	1	0	-	4	13
% Pedal Bike (Road)	0.0	0.6	-	-	0.1	0.2	0.1	0.0	-	0.1	0.4	0.2	-	-	0.3	0.2
Ped	-	-	-	0	-	-	-	-	1	-	-	-	-	9	-	-
% Ped	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-

City of Ottawa
110 Laurier Ave West

Ottawa, Ontario, Canada K1P 1J1
613-580-2424 Ibrahim.Conteh@ottawa.ca

Count Name: Blackleaf Dr and Jockvale Rd
Site Code:
Start Date: 10/07/2012
Page No: 3



Turning Movement Data Plot

City of Ottawa
110 Laurier Ave West

Ottawa, Ontario, Canada K1P 1J1
613-580-2424 Ibrahim.Conteh@ottawa.ca

Count Name: Blackleaf Dr and Jockvale Rd
Site Code:
Start Date: 10/07/2012

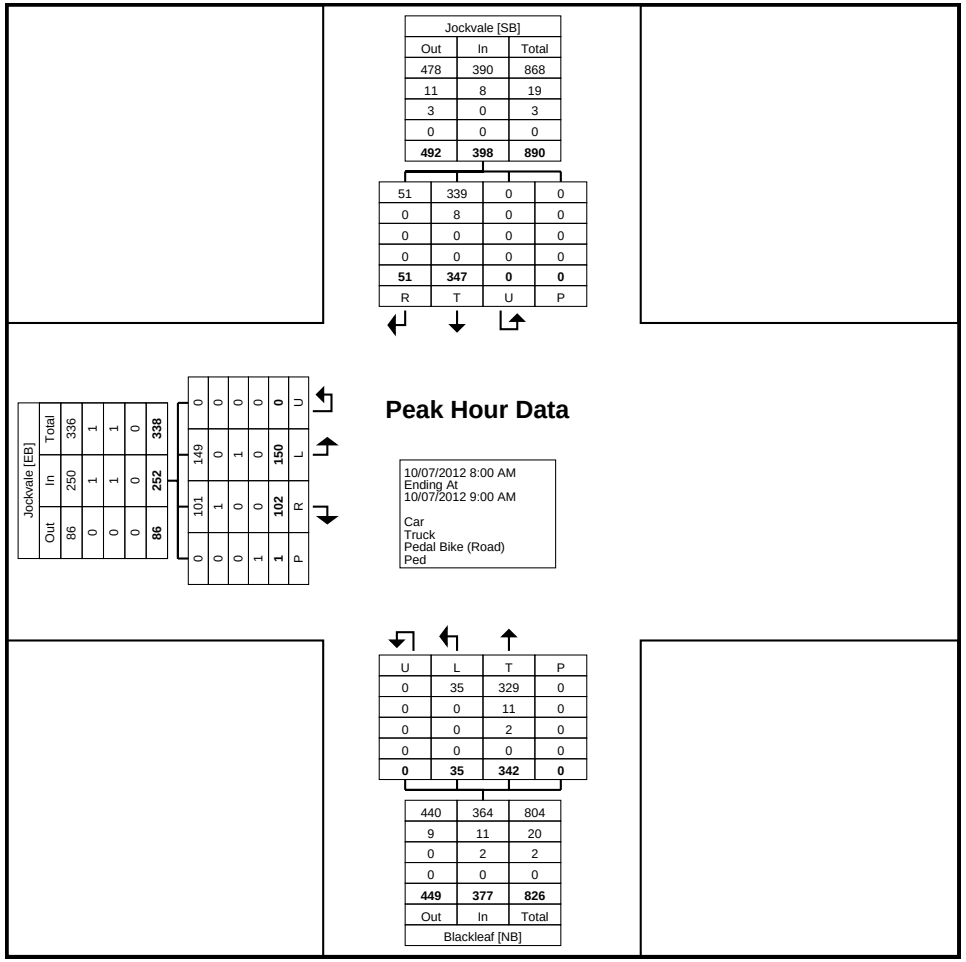
Turning Movement Peak Hour Data (8:00 AM)

Start Time	Jockvale Southbound					Blackleaf Northbound					Jockvale Eastbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
8:00 AM	71	7	0	0	78	9	86	0	0	95	46	30	0	0	76	249
8:15 AM	91	13	0	0	104	6	79	0	0	85	41	27	0	0	68	257
8:30 AM	98	14	0	0	112	11	92	0	0	103	40	26	0	0	66	281
8:45 AM	87	17	0	0	104	9	85	0	0	94	23	19	0	1	42	240
Total	347	51	0	0	398	35	342	0	0	377	150	102	0	1	252	1027
Approach %	87.2	12.8	0.0	-	-	9.3	90.7	0.0	-	-	59.5	40.5	0.0	-	-	-
Total %	33.8	5.0	0.0	-	38.8	3.4	33.3	0.0	-	36.7	14.6	9.9	0.0	-	24.5	-
PHF	0.885	0.750	0.000	-	0.888	0.795	0.929	0.000	-	0.915	0.815	0.850	0.000	-	0.829	0.914
Car	339	51	0	-	390	35	329	0	-	364	149	101	0	-	250	1004
% Car	97.7	100.0	-	-	98.0	100.0	96.2	-	-	96.6	99.3	99.0	-	-	99.2	97.8
Truck	8	0	0	-	8	0	11	0	-	11	0	1	0	-	1	20
% Truck	2.3	0.0	-	-	2.0	0.0	3.2	-	-	2.9	0.0	1.0	-	-	0.4	1.9
Pedal Bike (Road)	0	0	0	-	0	0	2	0	-	2	1	0	0	-	1	3
% Pedal Bike (Road)	0.0	0.0	-	-	0.0	0.0	0.6	-	-	0.5	0.7	0.0	-	-	0.4	0.3
Ped	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-
% Ped	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

City of Ottawa
110 Laurier Ave West

Ottawa, Ontario, Canada K1P 1J1
613-580-2424 Ibrahim.Conteh@ottawa.ca

Count Name: Blackleaf Dr and Jockvale Rd
Site Code:
Start Date: 10/07/2012
Page No: 5



Turning Movement Peak Hour Data Plot (8:00 AM)

City of Ottawa
110 Laurier Ave West

Ottawa, Ontario, Canada K1P 1J1
613-580-2424 Ibrahim.Conteh@ottawa.ca

Count Name: Blackleaf Dr and Jockvale Rd
Site Code:
Start Date: 10/07/2012

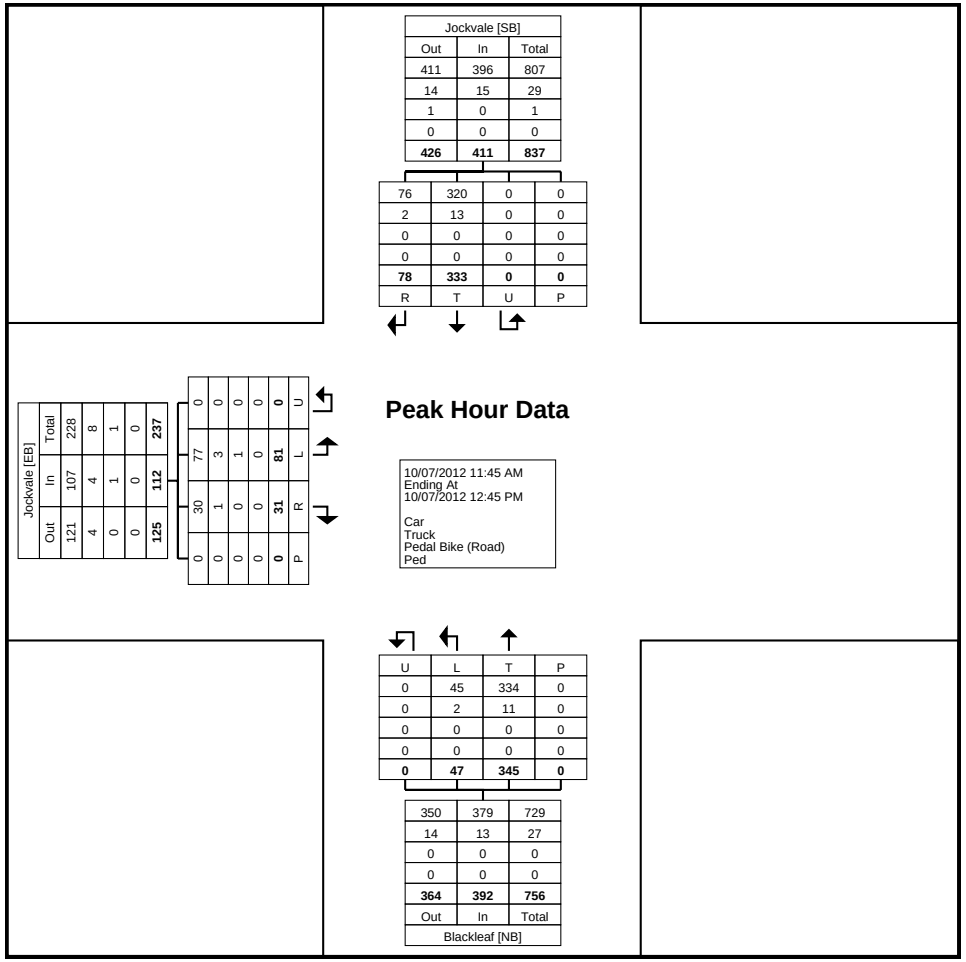
Turning Movement Peak Hour Data (11:45 AM)

Start Time	Jockvale Southbound					Blackleaf Northbound					Jockvale Eastbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
11:45 AM	80	21	0	0	101	11	105	0	0	116	21	6	0	0	27	244
12:00 PM	77	20	0	0	97	17	89	0	0	106	20	8	0	0	28	231
12:15 PM	72	21	0	0	93	10	77	0	0	87	17	11	0	0	28	208
12:30 PM	104	16	0	0	120	9	74	0	0	83	23	6	0	0	29	232
Total	333	78	0	0	411	47	345	0	0	392	81	31	0	0	112	915
Approach %	81.0	19.0	0.0	-	-	12.0	88.0	0.0	-	-	72.3	27.7	0.0	-	-	-
Total %	36.4	8.5	0.0	-	44.9	5.1	37.7	0.0	-	42.8	8.9	3.4	0.0	-	12.2	-
PHF	0.800	0.929	0.000	-	0.856	0.691	0.821	0.000	-	0.845	0.880	0.705	0.000	-	0.966	0.938
Car	320	76	0	-	396	45	334	0	-	379	77	30	0	-	107	882
% Car	96.1	97.4	-	-	96.4	95.7	96.8	-	-	96.7	95.1	96.8	-	-	95.5	96.4
Truck	13	2	0	-	15	2	11	0	-	13	3	1	0	-	4	32
% Truck	3.9	2.6	-	-	3.6	4.3	3.2	-	-	3.3	3.7	3.2	-	-	3.6	3.5
Pedal Bike (Road)	0	0	0	-	0	0	0	0	-	0	1	0	0	-	1	1
% Pedal Bike (Road)	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	1.2	0.0	-	-	0.9	0.1
Ped	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Ped	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

City of Ottawa
110 Laurier Ave West

Ottawa, Ontario, Canada K1P 1J1
613-580-2424 Ibrahim.Conteh@ottawa.ca

Count Name: Blackleaf Dr and Jockvale Rd
Site Code:
Start Date: 10/07/2012
Page No: 7



Turning Movement Peak Hour Data Plot (11:45 AM)

City of Ottawa
110 Laurier Ave West

Ottawa, Ontario, Canada K1P 1J1
613-580-2424 Ibrahim.Conteh@ottawa.ca

Count Name: Blackleaf Dr and Jockvale Rd
Site Code:
Start Date: 10/07/2012

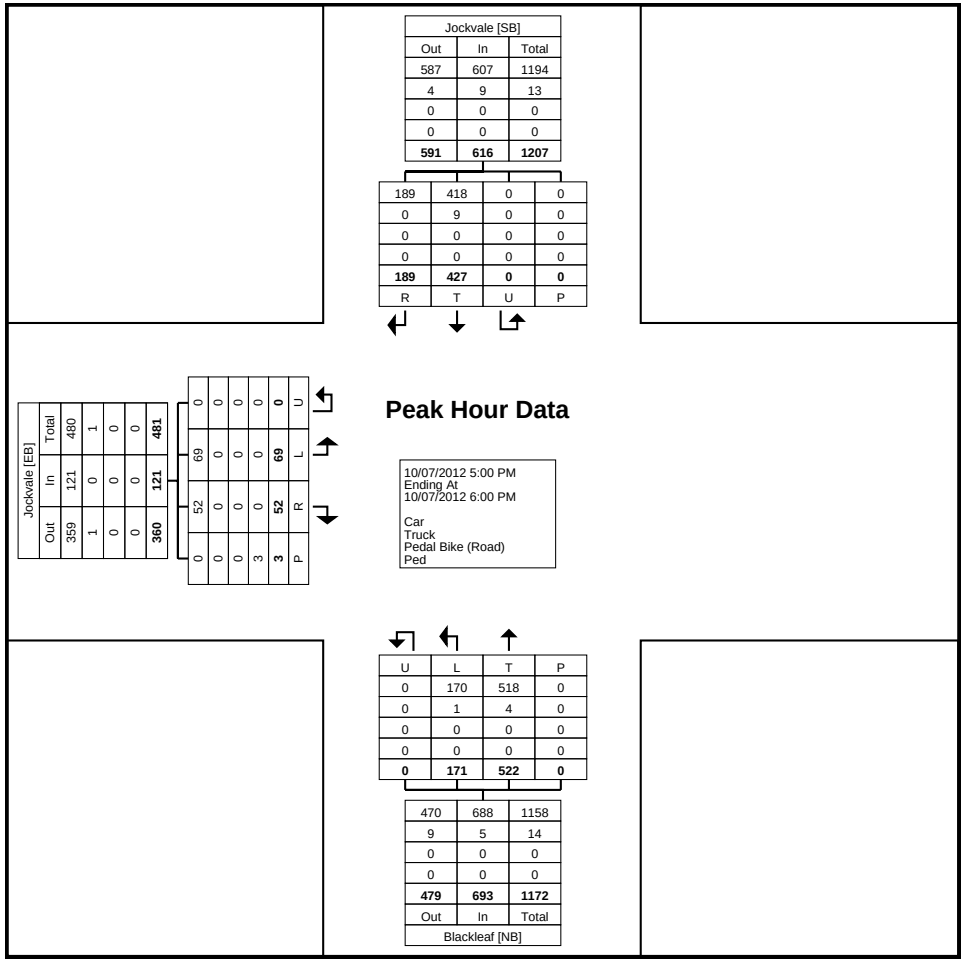
Turning Movement Peak Hour Data (5:00 PM)

Start Time	Jockvale Southbound					Blackleaf Northbound					Jockvale Eastbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
5:00 PM	97	40	0	0	137	41	126	0	0	167	10	11	0	1	21	325
5:15 PM	131	45	0	0	176	41	121	0	0	162	19	15	0	2	34	372
5:30 PM	101	57	0	0	158	48	128	0	0	176	16	14	0	0	30	364
5:45 PM	98	47	0	0	145	41	147	0	0	188	24	12	0	0	36	369
Total	427	189	0	0	616	171	522	0	0	693	69	52	0	3	121	1430
Approach %	69.3	30.7	0.0	-	-	24.7	75.3	0.0	-	-	57.0	43.0	0.0	-	-	-
Total %	29.9	13.2	0.0	-	43.1	12.0	36.5	0.0	-	48.5	4.8	3.6	0.0	-	8.5	-
PHF	0.815	0.829	0.000	-	0.875	0.891	0.888	0.000	-	0.922	0.719	0.867	0.000	-	0.840	0.961
Car	418	189	0	-	607	170	518	0	-	688	69	52	0	-	121	1416
% Car	97.9	100.0	-	-	98.5	99.4	99.2	-	-	99.3	100.0	100.0	-	-	100.0	99.0
Truck	9	0	0	-	9	1	4	0	-	5	0	0	0	-	0	14
% Truck	2.1	0.0	-	-	1.5	0.6	0.8	-	-	0.7	0.0	0.0	-	-	0.0	1.0
Pedal Bike (Road)	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Pedal Bike (Road)	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Ped	-	-	-	0	-	-	-	-	0	-	-	-	-	3	-	-
% Ped	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

City of Ottawa
110 Laurier Ave West

Ottawa, Ontario, Canada K1P 1J1
613-580-2424 Ibrahim.Conteh@ottawa.ca

Count Name: Blackleaf Dr and Jockvale Rd
Site Code:
Start Date: 10/07/2012
Page No: 9



Turning Movement Peak Hour Data Plot (5:00 PM)

Public Works - Traffic Services

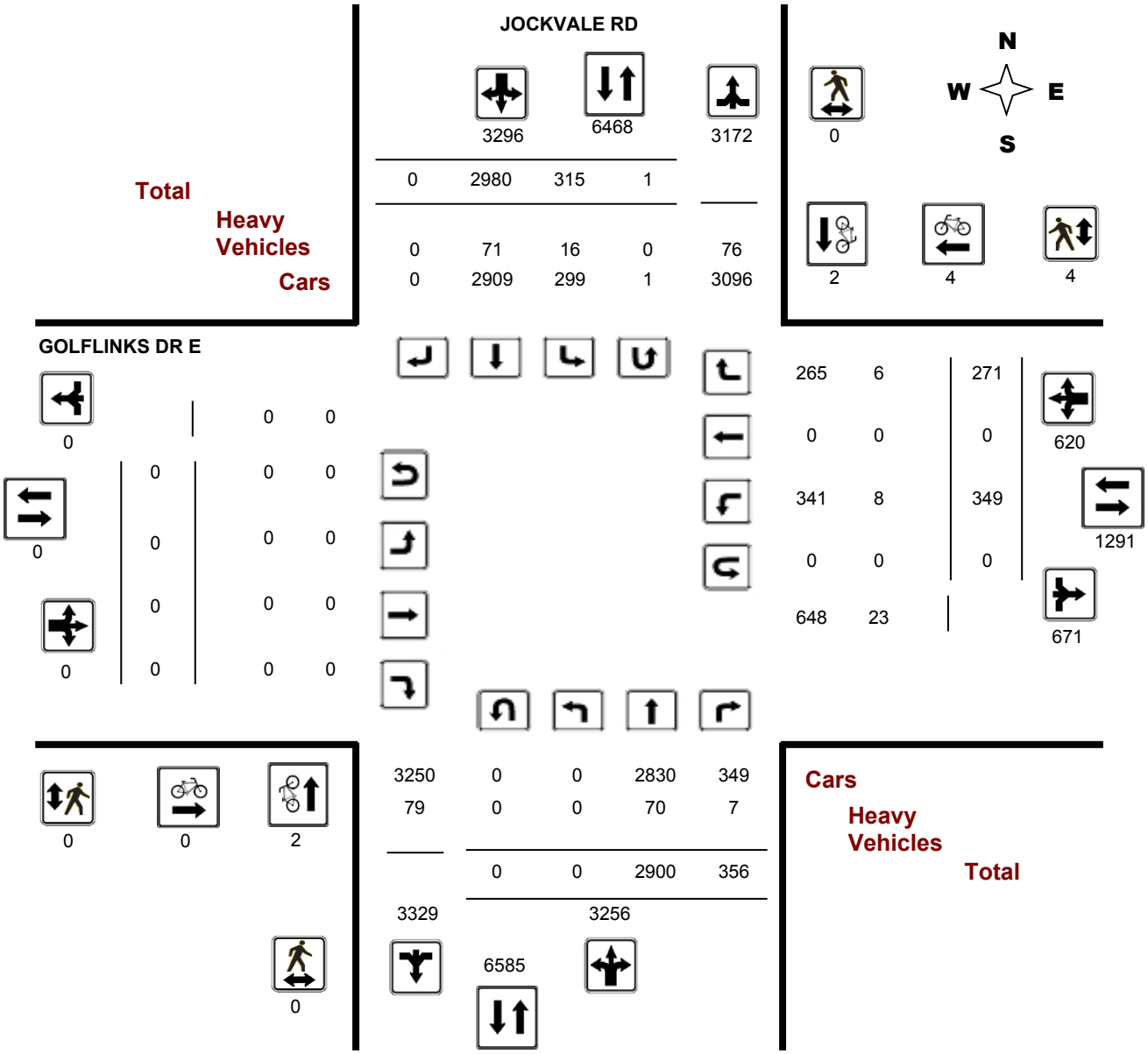
Turning Movement Count - Full Study Diagram

GOLFLINKS DR E @ JOCKVALE RD

Survey Date: Tuesday, July 07, 2015

WO#: 34902

Device: Miovision



Comments

Public Works - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order
34902

GOLFLINKS DR E @ JOCKVALE RD

Count Date: Tuesday, July 07, 2015

Start Time: 07:00

	JOCKVALE RD			GOLFLINKS DR E			
Time Period	Northbound	Southbound	**Street Total**	Eastbound	Westbound	**Street Total**	**Grand Total**
07:00 08:00	0	1	**1**	0	0	**0**	**1**
08:00 09:00	1	0	**1**	0	0	**0**	**1**
09:00 10:00	0	0	**0**	0	0	**0**	**0**
11:30 12:30	1	0	**1**	0	0	**0**	**1**
12:30 13:30	0	0	**0**	0	1	**1**	**1**
15:00 16:00	0	0	**0**	0	0	**0**	**0**
16:00 17:00	0	0	**0**	0	0	**0**	**0**
17:00 18:00	0	1	**1**	0	3	**3**	**4**
Total	2	2	**4**	0	4	**4**	**8**

Comment:

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

Public Works - Traffic Services

W.O.
34902

Turning Movement Count - Heavy Vehicle Report

GOLFLINKS DR E @ JOCKVALE RD

Survey Date: Tuesday, July 07, 2015

		JOCKVALE RD									GOLFLINKS DR E									
		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	12	1	**13**	2	8	0	**10**	**23**	0	0	0	**0**	2	0	1	**3**	**3**	**26**
08:00	09:00	0	16	1	**17**	5	11	0	**16**	**33**	0	0	0	**0**	2	0	2	**4**	**4**	**37**
09:00	10:00	0	12	3	**15**	0	6	0	**6**	**21**	0	0	0	**0**	1	0	1	**2**	**2**	**23**
11:30	12:30	0	7	0	**7**	0	11	0	**11**	**18**	0	0	0	**0**	0	0	1	**1**	**1**	**19**
12:30	13:30	0	7	1	**8**	1	16	0	**17**	**25**	0	0	0	**0**	1	0	0	**1**	**1**	**26**
15:00	16:00	0	8	0	**8**	2	9	0	**11**	**19**	0	0	0	**0**	1	0	1	**2**	**2**	**21**
16:00	17:00	0	6	0	**6**	3	6	0	**9**	**15**	0	0	0	**0**	1	0	0	**1**	**1**	**16**
17:00	18:00	0	2	1	**3**	3	4	0	**7**	**10**	0	0	0	**0**	0	0	0	**0**	**0**	**10**
Total :		0	70	7	**77**	16	71	0	**87**	**164**	0	0	0	**0**	8	0	6	**14**	**14**	**178**

Heavy Vehicles are vehicles having one rear axle with four or more wheels, or having two or more rear axles. These vehicles include most O.C. Transpo, school and inter-city buses. Further, they ARE included in the Turning Movement Count Summary.

Public Works - Traffic Services

Work Order
34902

Turning Movement Count - Pedestrian Volume Report

GOLFLINKS DR E @ JOCKVALE RD

Count Date: Tuesday, July 07, 2015 **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	0	0	**0**	0	1	**1**	**1**
07:15 07:30	0	0	**0**	0	0	**0**	**0**
07:30 07:45	0	0	**0**	0	0	**0**	**0**
07:45 08:00	0	0	**0**	0	0	**0**	**0**
07:00 08:00	0	0	**0**	0	1	**1**	**1**
08:00 08:15	0	0	**0**	0	0	**0**	**0**
08:15 08:30	0	0	**0**	0	0	**0**	**0**
08:30 08:45	0	0	**0**	0	0	**0**	**0**
08:45 09:00	0	0	**0**	0	0	**0**	**0**
08:00 09:00	0	0	**0**	0	0	**0**	**0**
09:00 09:15	0	0	**0**	0	0	**0**	**0**
09:15 09:30	0	0	**0**	0	0	**0**	**0**
09:30 09:45	0	0	**0**	0	0	**0**	**0**
09:45 10:00	0	0	**0**	0	0	**0**	**0**
09:00 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**
11:30 12:30	0	0	**0**	0	1	**1**	**1**
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	0	**0**	**0**
12:30 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	0	0	**0**	0	1	**1**	**1**
15:00 16:00	0	0	**0**	0	1	**1**	**1**
16:00 16:15	0	0	**0**	0	0	**0**	**0**
16:15 16:30	0	0	**0**	0	1	**1**	**1**
16:30 16:45	0	0	**0**	0	0	**0**	**0**
16:45 17:00	0	0	**0**	0	0	**0**	**0**
16:00 17:00	0	0	**0**	0	1	**1**	**1**
17:00 17:15	0	0	**0**	0	0	**0**	**0**
17:15 17:30	0	0	**0**	0	0	**0**	**0**
17:30 17:45	0	0	**0**	0	0	**0**	**0**
17:45 18:00	0	0	**0**	0	0	**0**	**0**
17:00 18:00	0	0	**0**	0	0	**0**	**0**
Total	0	0	**0**	0	4	**4**	**4**

Comment:

Public Works - Traffic Services

Work Order
34902

Turning Movement Count - Full Study Summary Report

GOLFLINKS DR E @ JOCKVALE RD

Survey Date: Tuesday, July 07, 2015

Total Observed U-Turns				AADT Factor
Northbound:	0	Southbound:	1	.90
Eastbound:	0	Westbound:	0	

Full Study

	JOCKVALE RD									GOLFLINKS DR E									
	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	192	19	**211**	24	493	0	**517**	**728**	0	0	0	**0**	83	0	37	**120**	**120**	**848**
08:00 09:00	0	272	23	**295**	31	513	0	**544**	**839**	0	0	0	**0**	66	0	43	**109**	**109**	**948**
09:00 10:00	0	256	35	**291**	19	310	0	**329**	**620**	0	0	0	**0**	41	0	21	**62**	**62**	**682**
11:30 12:30	0	306	31	**337**	42	304	0	**346**	**683**	0	0	0	**0**	35	0	40	**75**	**75**	**758**
12:30 13:30	0	292	37	**329**	27	340	0	**367**	**696**	0	0	0	**0**	32	0	37	**69**	**69**	**765**
15:00 16:00	0	428	50	**478**	41	337	0	**378**	**856**	0	0	0	**0**	30	0	35	**65**	**65**	**921**
16:00 17:00	0	515	68	**583**	56	327	0	**383**	**966**	0	0	0	**0**	29	0	23	**52**	**52**	**1018**
17:00 18:00	0	639	93	**732**	75	356	0	**431**	**1163**	0	0	0	**0**	33	0	35	**68**	**68**	**1231**
Total	0	2900	356	**3256**	315	2980	0	**3295**	**6551**	0	0	0	**0**	349	0	271	**620**	**620**	**7171**
Equ 12Hr	0	4030	494	**4524**	437	4142	0	**4579**	**9103**	0	0	0	**0**	485	0	376	**861**	**861**	**9964**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
Avg 12Hr	0	3627	445	**4072**	393	3727	0	**4121**	**8193**	0	0	0	**0**	436	0	338	**774**	**774**	**8967**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**.90**					
Avg 24Hr	0	4751	582	**5334**	514	4882	0	**5398**	**10732**	0	0	0	**0**	571	0	442	**1013**	**1013**	**11746**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

Comments:

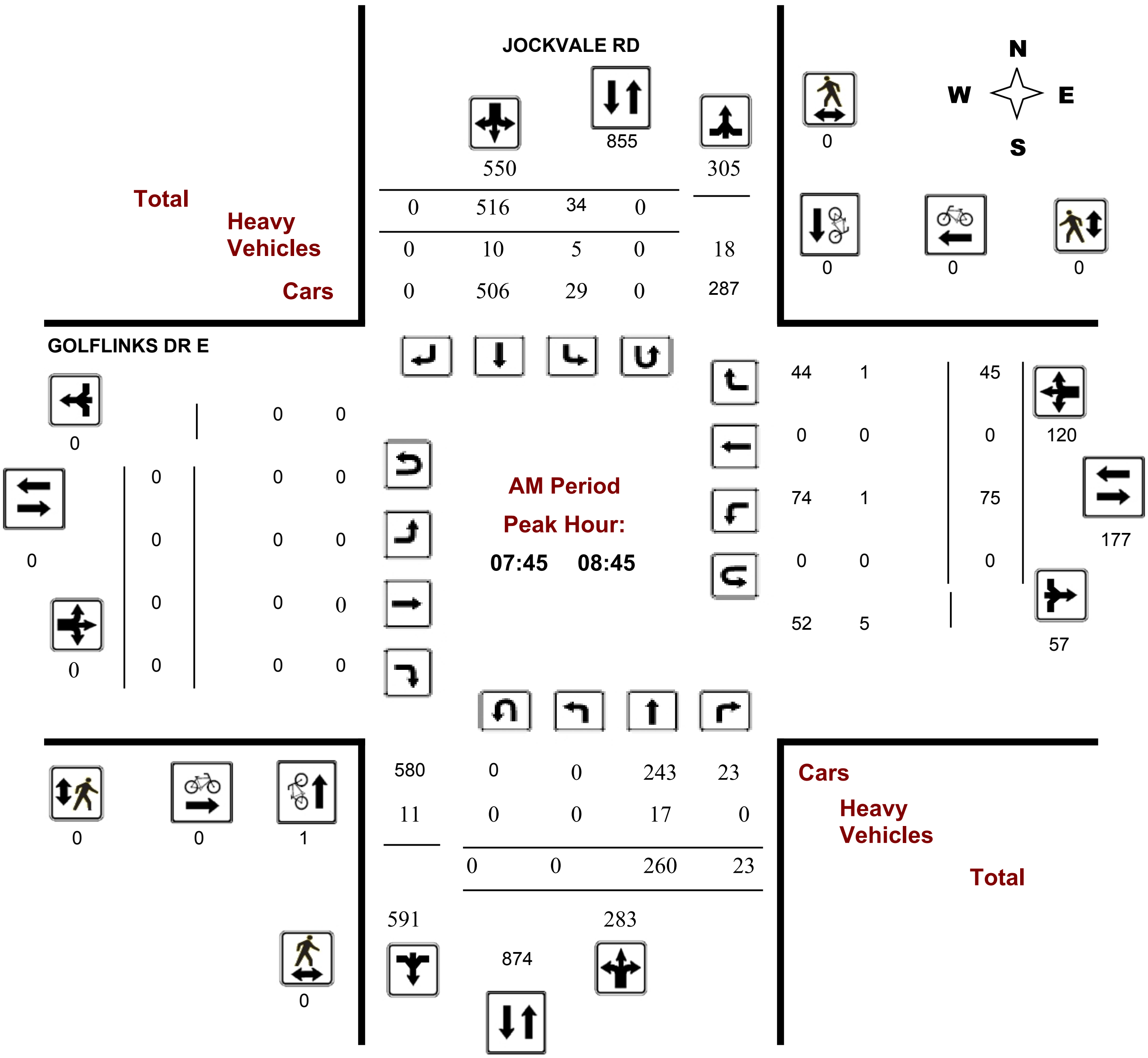
Note: U-Turns are included in Totals.

Turning Movement Count - Full Study Peak Hour Diagram

GOLFLINKS DR E @ JOCKVALE RD

Survey Date: Tuesday, July 07, 2015 **WO No:** 34902

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



Comments

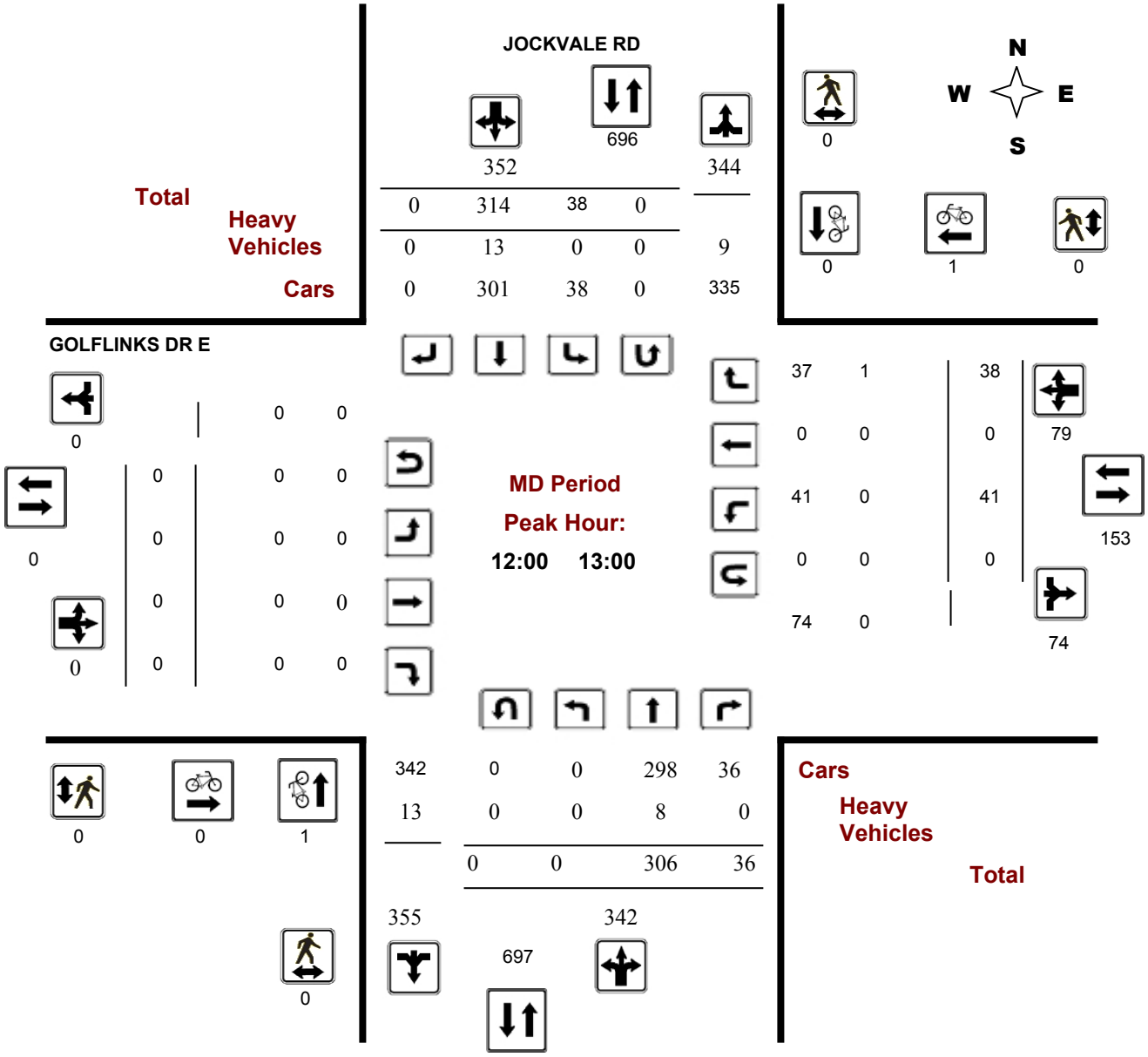
Public Works - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GOLFLINKS DR E @ JOCKVALE RD

Survey Date: Tuesday, July 07, 2015 **WO No:** 34902

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



Comments

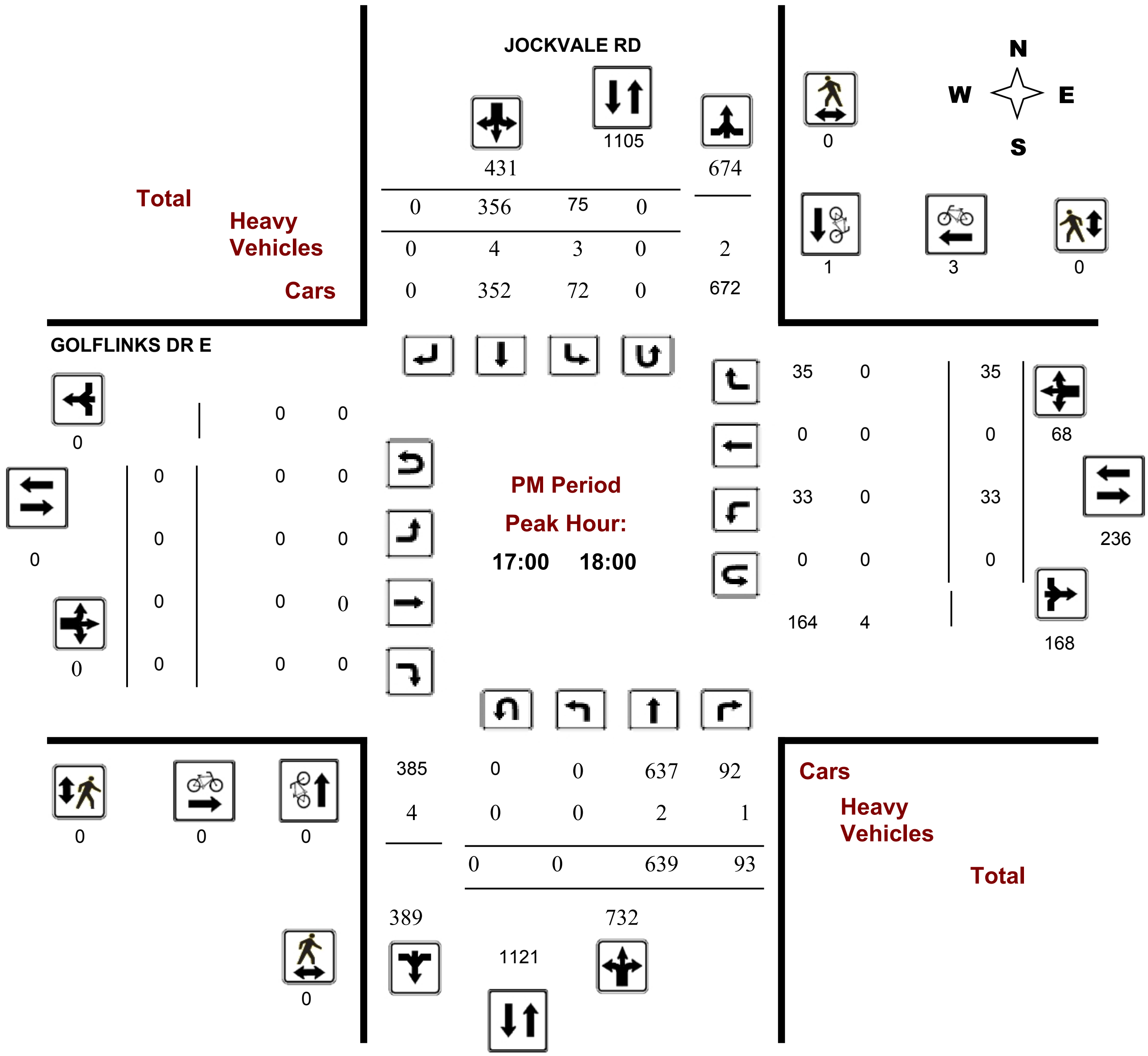
Public Works - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

GOLFLINKS DR E @ JOCKVALE RD

Survey Date: Tuesday, July 07, 2015 **WO No:** 34902

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



Comments

Public Works - Traffic Services

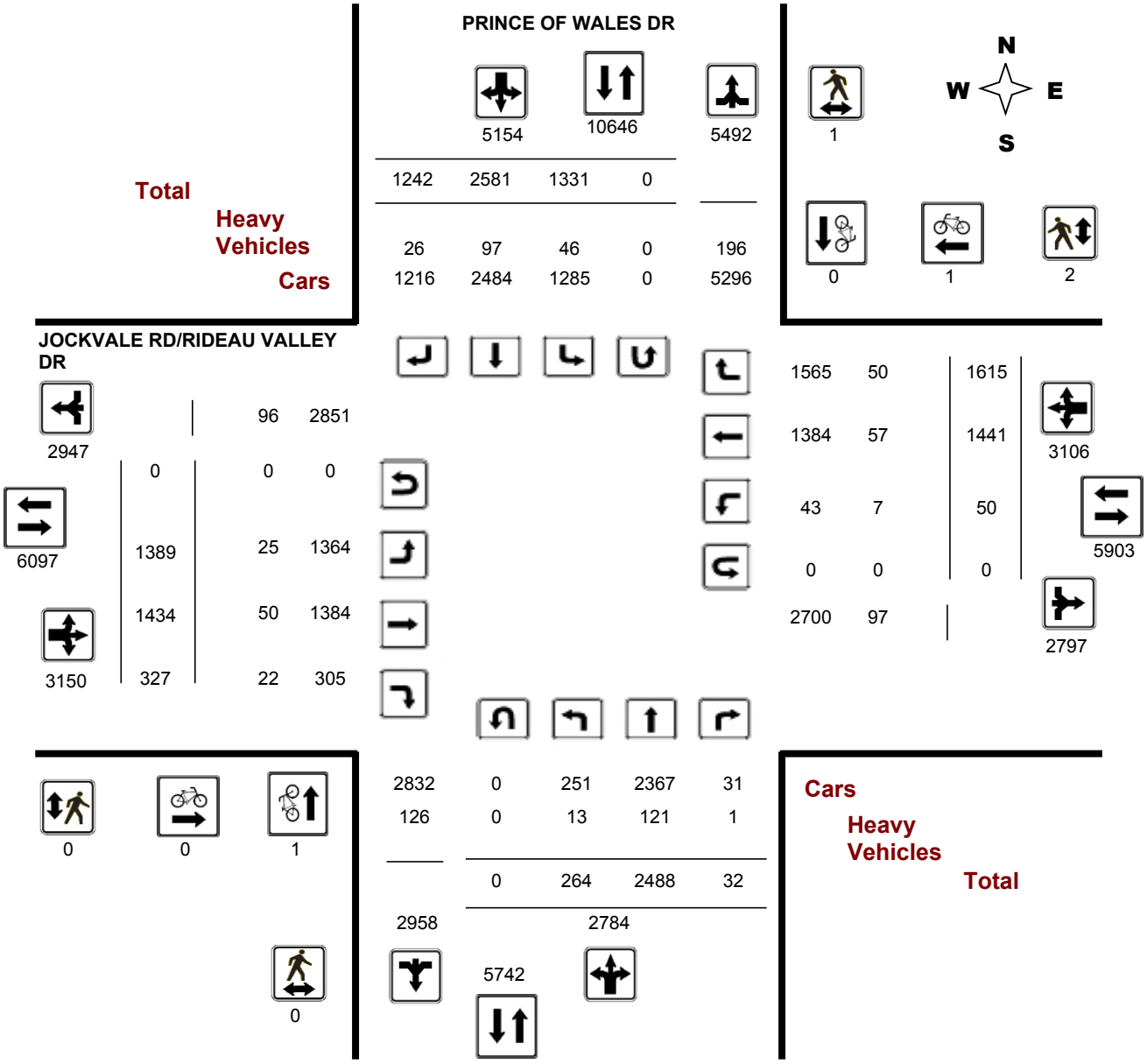
Turning Movement Count - Full Study Diagram

JOCKVALE RD/RIDEAU VALLEY DR @ PRINCE OF WALES

Survey Date: Wednesday, October 29, 2014

WO#: 29887

Device: Miovision



Comments

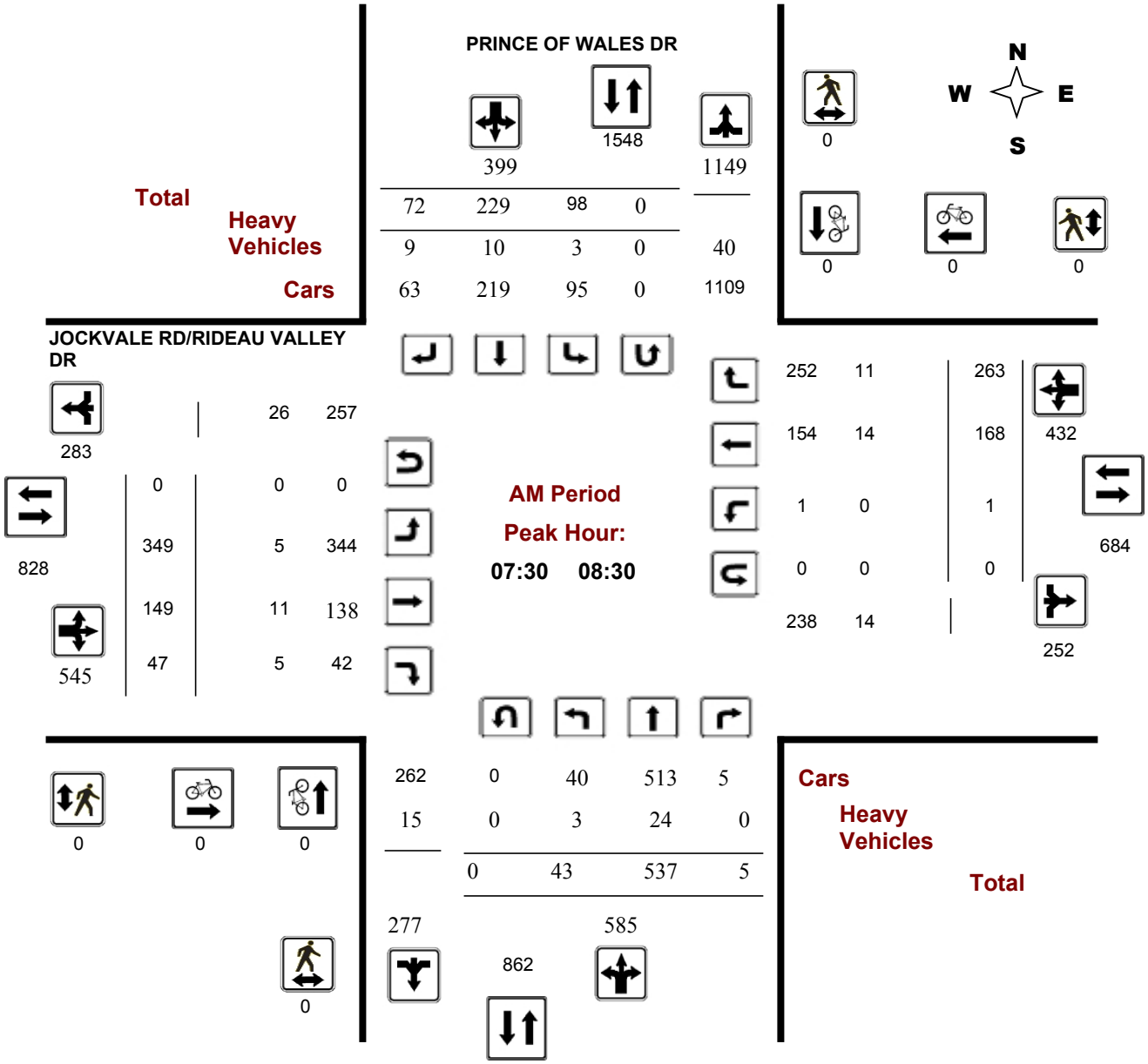
Public Works - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

JOCKVALE RD/RIDEAU VALLEY DR @ PRINCE OF WALES

Survey Date: Wednesday, October 29, 2014 **WO No:** 29887

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



Comments

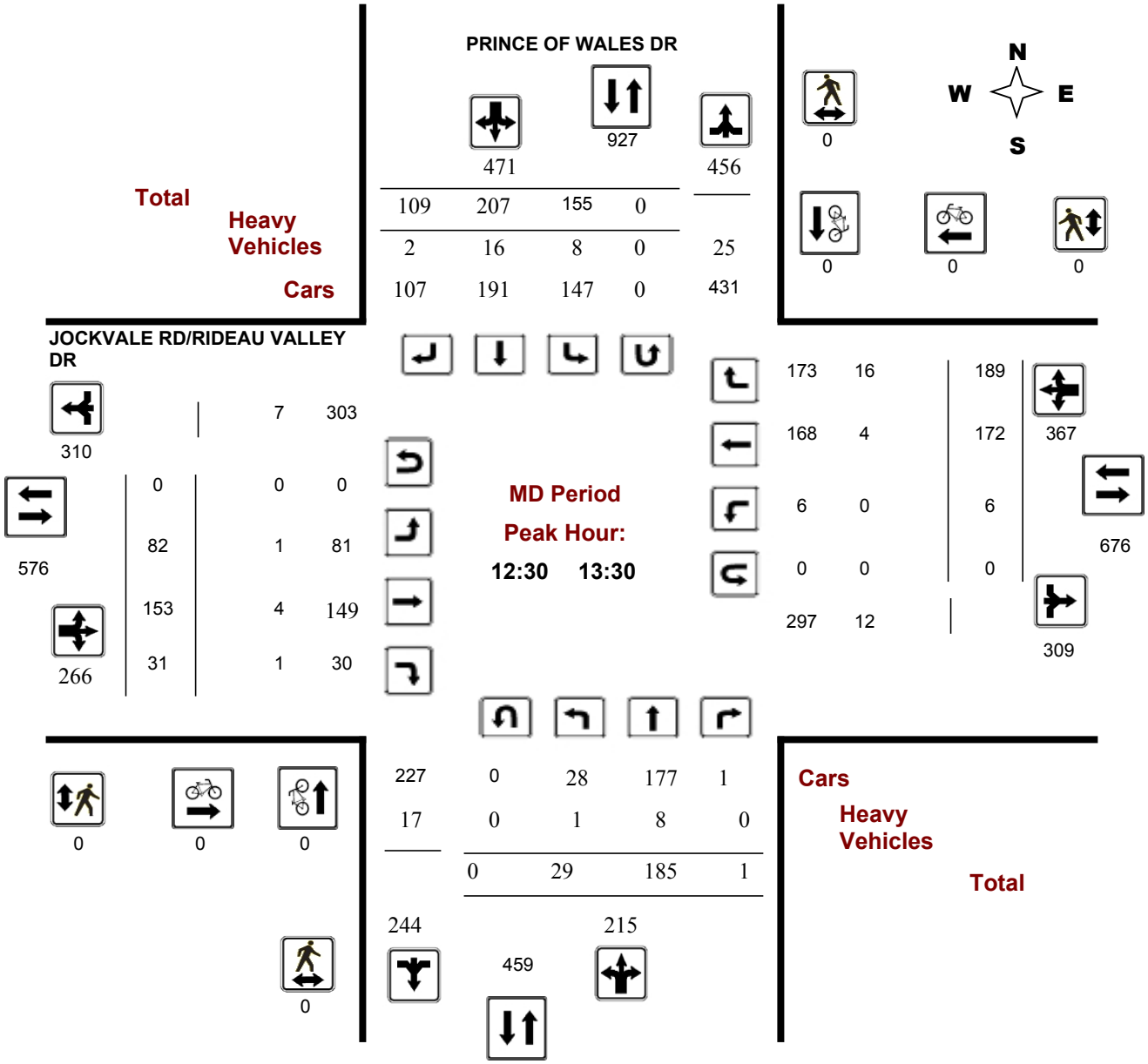
Public Works - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

JOCKVALE RD/RIDEAU VALLEY DR @ PRINCE OF WALES

Survey Date: Wednesday, October 29, 2014 **WO No:** 29887

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



Comments

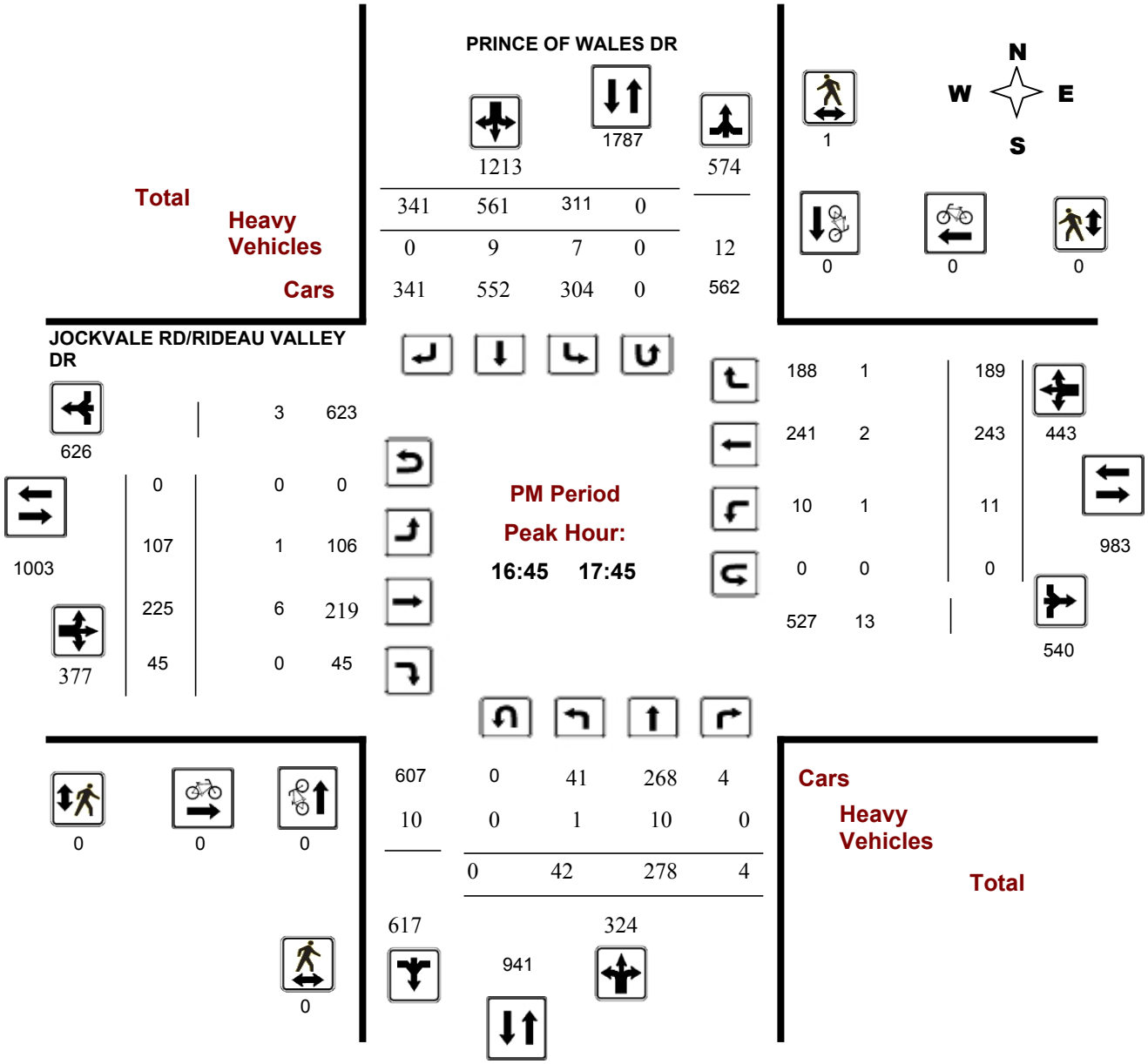
Public Works - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

JOCKVALE RD/RIDEAU VALLEY DR @ PRINCE OF WALES

Survey Date: Wednesday, October 29, 2014 **WO No:** 29887

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



Comments

Public Works - Traffic Services

Work Order
29887

Turning Movement Count - Full Study Summary Report

JOCKVALE RD/RIDEAU VALLEY DR @ PRINCE OF WALES

Survey Date: Wednesday, October 29, 2014

Total Observed U-Turns				AADT Factor
Northbound:	0	Southbound:	0	.90
Eastbound:	0	Westbound:	0	

Full Study

	PRINCE OF WALES DR									JOCKVALE RD/RIDEAU VALLEY DR									
	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	37	617	7	**661**	71	192	60	**323**	**984**	391	128	29	**548**	2	147	263	**412**	**960**	**1944**
08:00 09:00	38	427	4	**469**	118	196	81	**395**	**864**	296	149	54	**499**	2	168	234	**404**	**903**	**1767**
09:00 10:00	15	308	7	**330**	107	174	72	**353**	**683**	184	115	33	**332**	3	146	250	**399**	**731**	**1414**
11:30 12:30	30	190	3	**223**	143	192	111	**446**	**669**	96	172	33	**301**	5	169	169	**343**	**644**	**1313**
12:30 13:30	29	185	1	**215**	155	207	109	**471**	**686**	82	153	31	**266**	6	172	189	**367**	**633**	**1319**
15:00 16:00	37	235	3	**275**	199	480	191	**870**	**1145**	99	252	49	**400**	8	189	167	**364**	**764**	**1909**
16:00 17:00	41	266	3	**310**	258	614	276	**1148**	**1458**	106	256	53	**415**	17	218	153	**388**	**803**	**2261**
17:00 18:00	37	260	4	**301**	280	526	342	**1148**	**1449**	135	209	45	**389**	7	232	190	**429**	**818**	**2267**
Total	264	2488	32	**2784**	1331	2581	1242	**5154**	**7938**	1389	1434	327	**3150**	50	1441	1615	**3106**	**6256**	**14194**
Equ 12Hr	366	3458	44	**3868**	1850	3587	1726	**7163**	**11031**	1930	1993	454	**4377**	69	2002	2244	**4315**	**8692**	**19723**

Note: These values are calculated by multiplying the totals by the appropriate expansion factor. **1.39**

Avg 12Hr	330	3112	40	**3482**	1665	3228	1553	**6446**	**9928**	1737	1793	408	**3939**	62	1801	2019	**3883**	**7822**	**17750**

Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. **.90**

Avg 24Hr	432	4076	52	**4561**	2181	4228	2034	**8444**	**13005**	2275	2348	534	**5160**	81	2359	2644	**5086**	**10246**	**23252**

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 are **not** included in Totals.

Public Works - Traffic Services

W.O. 29887

Turning Movement Count - 15 Minute Summary Report

JOCKVALE RD/RIDEAU VALLEY DR @ PRINCE OF WALES

Survey Date: Wednesday, October 29, 2014

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

		PRINCE OF WALES DR									JOCKVALE RD/RIDEAU VALLEY DR									
		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	11	157	0	**168**	19	32	8	**59**	**227**	104	22	6	**132**	0	26	59	**85**	**217**	**444**
07:15	07:30	6	152	2	**160**	11	45	19	**75**	**235**	92	22	6	**120**	2	36	63	**101**	**221**	**456**
07:30	07:45	9	178	3	**190**	16	40	22	**78**	**268**	103	33	7	**143**	0	32	69	**101**	**244**	**512**
07:45	08:00	11	130	2	**143**	25	75	11	**111**	**254**	92	51	10	**153**	0	53	72	**125**	**278**	**532**
08:00	08:15	14	125	0	**139**	21	55	20	**96**	**235**	79	23	13	**115**	1	38	66	**105**	**220**	**455**
08:15	08:30	9	104	0	**113**	36	59	19	**114**	**227**	75	42	17	**134**	0	45	56	**101**	**235**	**462**
08:30	08:45	5	107	2	**114**	25	39	21	**85**	**199**	73	36	18	**127**	0	39	55	**94**	**221**	**420**
08:45	09:00	10	91	2	**103**	36	43	21	**100**	**203**	69	48	6	**123**	1	46	57	**104**	**227**	**430**
09:00	09:15	4	82	1	**87**	28	33	15	**76**	**163**	56	46	10	**112**	1	32	82	**115**	**227**	**390**
09:15	09:30	2	68	3	**73**	32	44	26	**102**	**175**	53	22	7	**82**	1	38	66	**105**	**187**	**362**
09:30	09:45	3	92	0	**95**	26	40	17	**83**	**178**	45	20	11	**76**	0	34	52	**86**	**162**	**340**
09:45	10:00	6	66	3	**75**	21	57	14	**92**	**167**	30	27	5	**62**	1	42	50	**93**	**155**	**322**
11:30	11:45	11	46	1	**58**	41	47	16	**104**	**162**	30	50	11	**91**	0	45	53	**98**	**189**	**351**
11:45	12:00	7	50	1	**58**	30	49	29	**108**	**166**	21	39	9	**69**	3	45	41	**89**	**158**	**324**
12:00	12:15	10	42	0	**52**	34	59	29	**122**	**174**	24	48	8	**80**	1	41	36	**78**	**158**	**332**
12:15	12:30	2	52	1	**55**	38	37	37	**112**	**167**	21	35	5	**61**	1	38	39	**78**	**139**	**306**
12:30	12:45	5	49	1	**55**	46	51	21	**118**	**173**	27	29	4	**60**	1	42	48	**91**	**151**	**324**
12:45	13:00	11	39	0	**50**	38	43	27	**108**	**158**	20	45	12	**77**	1	45	39	**85**	**162**	**320**
13:00	13:15	10	52	0	**62**	32	60	29	**121**	**183**	21	42	3	**66**	2	45	54	**101**	**167**	**350**
13:15	13:30	3	45	0	**48**	39	53	32	**124**	**172**	14	37	12	**63**	2	40	48	**90**	**153**	**325**
15:00	15:15	13	57	2	**72**	52	87	33	**172**	**244**	22	47	10	**79**	2	35	42	**79**	**158**	**402**
15:15	15:30	12	57	0	**69**	35	120	53	**208**	**277**	23	59	11	**93**	3	55	40	**98**	**191**	**468**
15:30	15:45	4	63	0	**67**	50	148	50	**248**	**315**	30	83	15	**128**	0	53	42	**95**	**223**	**538**
15:45	16:00	8	58	1	**67**	62	125	55	**242**	**309**	24	63	13	**100**	3	46	43	**92**	**192**	**501**
16:00	16:15	14	45	1	**60**	50	136	67	**253**	**313**	23	67	17	**107**	4	47	37	**88**	**195**	**508**
16:15	16:30	6	79	1	**86**	63	168	73	**304**	**390**	28	61	11	**100**	5	49	37	**91**	**191**	**581**
16:30	16:45	7	71	0	**78**	61	153	62	**276**	**354**	31	67	11	**109**	4	60	40	**104**	**213**	**567**
16:45	17:00	14	71	1	**86**	84	157	74	**315**	**401**	24	61	14	**99**	4	62	39	**105**	**204**	**605**
17:00	17:15	9	51	1	**61**	77	137	98	**312**	**373**	22	44	11	**77**	3	66	56	**125**	**202**	**575**
17:15	17:30	12	77	1	**90**	89	131	76	**296**	**386**	27	74	12	**113**	0	46	43	**89**	**202**	**588**
17:30	17:45	7	79	1	**87**	61	136	93	**290**	**377**	34	46	8	**88**	4	69	51	**124**	**212**	**589**
17:45	18:00	9	53	1	**63**	53	122	75	**250**	**313**	52	45	14	**111**	0	51	40	**91**	**202**	**515**
TOTAL:		264	2488	32	**2784**	1331	2581	1242	**5154**	**7938**	1389	1434	327	**3150**	50	1441	1615	**3106**	**6256**	**14194**

Note: U-Turns are included in Totals.

Comment:

Public Works - Traffic Services

Work Order
29887

Turning Movement Count - Pedestrian Volume Report

JOCKVALE RD/RIDEAU VALLEY DR @ PRINCE OF WALES

Count Date: Wednesday, October 29, 2014 **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	0	0	**0**	0	0	**0**	**0**
07:15 07:30	0	0	**0**	0	0	**0**	**0**
07:30 07:45	0	0	**0**	0	0	**0**	**0**
07:45 08:00	0	0	**0**	0	0	**0**	**0**
07:00 08:00	0	0	**0**	0	0	**0**	**0**
08:00 08:15	0	0	**0**	0	0	**0**	**0**
08:15 08:30	0	0	**0**	0	0	**0**	**0**
08:30 08:45	0	0	**0**	0	0	**0**	**0**
08:45 09:00	0	0	**0**	0	0	**0**	**0**
08:00 09:00	0	0	**0**	0	0	**0**	**0**
09:00 09:15	0	0	**0**	0	0	**0**	**0**
09:15 09:30	0	0	**0**	0	0	**0**	**0**
09:30 09:45	0	0	**0**	0	0	**0**	**0**
09:45 10:00	0	0	**0**	0	0	**0**	**0**
09:00 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	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**
11:30 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	0	**0**	**0**
12:30 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	0	0	**0**	0	0	**0**	**0**
15:00 16:00	0	0	**0**	0	0	**0**	**0**
16:00 16:15	0	0	**0**	0	0	**0**	**0**
16:15 16:30	0	0	**0**	0	2	**2**	**2**
16:30 16:45	0	0	**0**	0	0	**0**	**0**
16:45 17:00	0	0	**0**	0	0	**0**	**0**
16:00 17:00	0	0	**0**	0	2	**2**	**2**
17:00 17:15	0	1	**1**	0	0	**0**	**1**
17:15 17:30	0	0	**0**	0	0	**0**	**0**
17:30 17:45	0	0	**0**	0	0	**0**	**0**
17:45 18:00	0	0	**0**	0	0	**0**	**0**
17:00 18:00	0	1	**1**	0	0	**0**	**1**
Total	0	1	**1**	0	2	**2**	**3**

Comment:

Public Works - Traffic Services

W.O.
29887

Turning Movement Count - Heavy Vehicle Report

JOCKVALE RD/RIDEAU VALLEY DR @ PRINCE OF WALES

Survey Date: Wednesday, October 29, 2014

		PRINCE OF WALES DR									JOCKVALE RD/RIDEAU VALLEY DR									
		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	2	28	0	**30**	2	10	5	**17**	**47**	5	6	0	**11**	1	17	12	**30**	**41**	**88**
08:00	09:00	4	19	0	**23**	3	17	7	**27**	**50**	2	10	6	**18**	0	7	7	**14**	**32**	**82**
09:00	10:00	2	14	0	**16**	7	13	3	**23**	**39**	1	4	3	**8**	2	9	3	**14**	**22**	**61**
11:30	12:30	2	11	0	**13**	8	6	4	**18**	**31**	4	3	3	**10**	0	6	3	**9**	**19**	**50**
12:30	13:30	1	8	0	**9**	8	16	2	**26**	**35**	1	4	1	**6**	0	4	16	**20**	**26**	**61**
15:00	16:00	1	18	1	**20**	5	15	4	**24**	**44**	7	8	2	**17**	3	6	6	**15**	**32**	**76**
16:00	17:00	0	12	0	**12**	6	14	1	**21**	**33**	2	8	7	**17**	0	7	2	**9**	**26**	**59**
17:00	18:00	1	11	0	**12**	7	6	0	**13**	**25**	3	7	0	**10**	1	1	1	**3**	**13**	**38**
Total :		13	121	1	**135**	46	97	26	**169**	**304**	25	50	22	**97**	7	57	50	**114**	**211**	**515**

Heavy Vehicles are vehicles having one rear axle with four or more wheels, or having two or more rear axles. These vehicles include most O.C. Transpo, school and inter-city buses. Further, they ARE included in the Turning Movement Count Summary.

Printed on: 2015-Oct-06

Public Works - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order
29887

JOCKVALE RD/RIDEAU VALLEY DR @ PRINCE OF WALES

Count Date: Wednesday, October 29, 2014

Start Time: 07:00

	PRINCE OF WALES DR			JOCKVALE RD/RIDEAU VALLEY DR			
Time Period	Northbound	Southbound	**Street Total**	Eastbound	Westbound	**Street Total**	**Grand Total**
07:00 08:00	0	0	**0**	0	0	**0**	**0**
08:00 09:00	1	0	**1**	0	0	**0**	**1**
09:00 10:00	0	0	**0**	0	0	**0**	**0**
11:30 12:30	0	0	**0**	0	0	**0**	**0**
12:30 13:30	0	0	**0**	0	0	**0**	**0**
15:00 16:00	0	0	**0**	0	1	**1**	**1**
16:00 17:00	0	0	**0**	0	0	**0**	**0**
17:00 18:00	0	0	**0**	0	0	**0**	**0**
Total	1	0	**1**	0	1	**1**	**2**

Comment:

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

Public Works - Traffic Services

W.O. 34902

Turning Movement Count - 15 Minute Summary Report

GOLFLINKS DR E @ JOCKVALE RD

Survey Date: Tuesday, July 07, 2015

Total Observed U-Turns

Northbound: 0 Southbound: 1

Eastbound: 0 Westbound: 0

		JOCKVALE RD									GOLFLINKS DR E									
		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	34	1	**35**	6	108	0	**114**	**149**	0	0	0	**0**	22	0	12	**34**	**34**	**183**
07:15	07:30	0	54	8	**62**	3	118	0	**121**	**183**	0	0	0	**0**	23	0	7	**30**	**30**	**213**
07:30	07:45	0	40	3	**43**	6	132	0	**138**	**181**	0	0	0	**0**	18	0	4	**22**	**22**	**203**
07:45	08:00	0	64	7	**71**	9	135	0	**144**	**215**	0	0	0	**0**	20	0	14	**34**	**34**	**249**
08:00	08:15	0	69	7	**76**	10	136	0	**146**	**222**	0	0	0	**0**	12	0	11	**23**	**23**	**245**
08:15	08:30	0	65	2	**67**	6	118	0	**124**	**191**	0	0	0	**0**	22	0	9	**31**	**31**	**222**
08:30	08:45	0	62	7	**69**	9	127	0	**136**	**205**	0	0	0	**0**	21	0	11	**32**	**32**	**237**
08:45	09:00	0	76	7	**83**	6	132	0	**138**	**221**	0	0	0	**0**	11	0	12	**23**	**23**	**244**
09:00	09:15	0	67	14	**81**	10	88	0	**98**	**179**	0	0	0	**0**	10	0	8	**18**	**18**	**197**
09:15	09:30	0	63	6	**69**	3	77	0	**80**	**149**	0	0	0	**0**	7	0	3	**10**	**10**	**159**
09:30	09:45	0	69	11	**80**	3	77	0	**80**	**160**	0	0	0	**0**	13	0	5	**18**	**18**	**178**
09:45	10:00	0	57	4	**61**	3	68	0	**71**	**132**	0	0	0	**0**	11	0	5	**16**	**16**	**148**
11:30	11:45	0	71	6	**77**	9	91	0	**100**	**177**	0	0	0	**0**	6	0	11	**17**	**17**	**194**
11:45	12:00	0	73	7	**80**	7	70	0	**78**	**158**	0	0	0	**0**	7	0	8	**15**	**15**	**173**
12:00	12:15	0	93	12	**105**	16	71	0	**87**	**192**	0	0	0	**0**	14	0	10	**24**	**24**	**216**
12:15	12:30	0	69	6	**75**	10	72	0	**82**	**157**	0	0	0	**0**	8	0	11	**19**	**19**	**176**
12:30	12:45	0	76	8	**84**	6	84	0	**90**	**174**	0	0	0	**0**	12	0	6	**18**	**18**	**192**
12:45	13:00	0	68	10	**78**	6	87	0	**93**	**171**	0	0	0	**0**	7	0	11	**18**	**18**	**189**
13:00	13:15	0	81	10	**91**	7	84	0	**91**	**182**	0	0	0	**0**	4	0	14	**18**	**18**	**200**
13:15	13:30	0	67	9	**76**	8	85	0	**93**	**169**	0	0	0	**0**	9	0	6	**15**	**15**	**184**
15:00	15:15	0	94	12	**106**	10	76	0	**86**	**192**	0	0	0	**0**	6	0	7	**13**	**13**	**205**
15:15	15:30	0	93	11	**104**	10	84	0	**94**	**198**	0	0	0	**0**	9	0	7	**16**	**16**	**214**
15:30	15:45	0	124	15	**139**	13	90	0	**103**	**242**	0	0	0	**0**	7	0	13	**20**	**20**	**262**
15:45	16:00	0	117	12	**129**	8	87	0	**95**	**224**	0	0	0	**0**	8	0	8	**16**	**16**	**240**
16:00	16:15	0	122	10	**132**	15	97	0	**112**	**244**	0	0	0	**0**	4	0	4	**8**	**8**	**252**
16:15	16:30	0	127	12	**139**	15	75	0	**90**	**229**	0	0	0	**0**	11	0	12	**23**	**23**	**252**
16:30	16:45	0	136	25	**161**	11	81	0	**92**	**253**	0	0	0	**0**	7	0	5	**12**	**12**	**265**
16:45	17:00	0	130	21	**151**	15	74	0	**89**	**240**	0	0	0	**0**	7	0	2	**9**	**9**	**249**
17:00	17:15	0	166	28	**194**	16	92	0	**108**	**302**	0	0	0	**0**	9	0	13	**22**	**22**	**324**
17:15	17:30	0	162	14	**176**	18	80	0	**98**	**274**	0	0	0	**0**	8	0	5	**13**	**13**	**287**
17:30	17:45	0	177	25	**202**	25	87	0	**112**	**314**	0	0	0	**0**	12	0	12	**24**	**24**	**338**
17:45	18:00	0	134	26	**160**	16	97	0	**113**	**273**	0	0	0	**0**	4	0	5	**9**	**9**	**282**
TOTAL:		0	2900	356	**3256**	315	2980	0	**3296**	**6552**	0	0	0	**0**	349	0	271	**620**	**620**	**7172**

Note: U-Turns are included in Totals.

Comment:

Traffic Signal Timing

City of Ottawa, Public Works & Services Department

Traffic Operations Unit

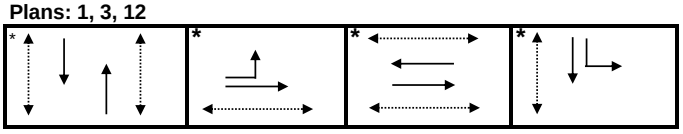
Intersection:	***Main:*** Prince of Wales Dr.	***Side:*** Jockvale Rd.	
Controller:	**MS-3200**	**TSD:**	6376
Author:	Basel Ansari	**Date:**	05-Oct-15

Existing Timing Plans†

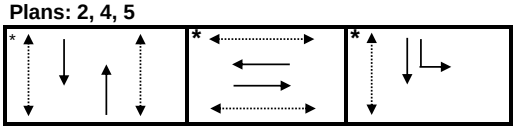
	Plan						**Ped Minimum Time**		
	AM Peak 1	**Off Peak** 2	**PM Peak** 3	**Night** 4	**Evening** 5	**Off + EBLT** 12	***Walk***	***DW***	***A+R***
Cycle	FREE	FREE	FREE	FREE	FREE	FREE			
Offset	-	-	-	-	-	-			
NB Thru	min 41.6	max 38.6	min 38.6	max 38.6	max 38.6	min 38.6	7	13	4.6+2.0
SB Thru	min 41.6	max 38.6	min 38.6	max 38.6	max 38.6	min 38.6	7	13	4.6+2.0
EB Left	max 21.4	-	max 21.4	-	-	max 14.4	-	-	4.2+2.2
EB Thru	max 46.4	max 36.4	max 46.4	max 21.4	max 41.4	max 38.4	7	18	4.2+2.2
WB Thru	max 31.4	max 36.4	max 31.4	max 21.4	max 41.4	max 38.4	7	18	4.2+2.2
SB Left	max 26.6	max 26.6	max 26.6	max 26.6	max 26.6	max 26.6	-	-	4.6+2.0

Phasing Sequence‡

Plans: 1, 3, 12



Plans: 2, 4, 5



Notes:

1) Plans 1, 3, and 12 have pedestrian recalls for NB and SB

2) The minimum green time for NB and SB Thru is 20s for Plans 2, 4 and 5

3) For Plan 4, EB and WB Thru movements will receive a minimum green of 25s if the pedestrian phase is actuated

Schedule

Weekday

Time	Plan
0:15	4
6:00	1
9:30	12
15:00	3
18:30	5
22:30	4

Weekend

Time	Plan
0:15	4
7:00	2
10:00	12
18:00	2
22:00	4

Notes

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

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

Asterix (*) Indicates actuated phase

(fp): Fully Protected Left Turn

Pedestrian signal

Cost is $56.50 ($50 + HST)

APPENDIX D

Collision Data

Collision Main Detail Summary

OnTRAC Reporting System

FROM: 2011-01-01 TO: 201-01-01

JOCKVALE RD, CAMBRIAN RD to GOLFLINKS DR S

Former Municipality: **Nepean** Traffic Control: **No control** Number of Collisions: **6**

DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
2011-02-21	Mo	02:07	Snow	Dark	Approaching	Non-fatal	V1 S	Loose snow	Going ahead	Automobile, station	Other motor vehicle	0
							V2 N	Loose snow	Going ahead	Automobile, station	Other motor vehicle	
2011-09-18	Sun	11:30	Clear	Daylight	Sideswipe	P.D. only	V1 N	Dry	Overtaking	Truck and trailer	Other motor vehicle	0
							V2 N	Dry	Going ahead	Automobile, station	Other motor vehicle	

JOCKVALE RD, GOLFLINKS DR to PRINCE OF WALES DR

Former Municipality: **Nepean** Traffic Control: **No control** Number of Collisions: **4**

DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
2012-01-31	Tue	14:43	Snow	Daylight	Single vehicle	P.D. only	V1 S	Wet	Going ahead	Automobile, station	Ran off road	0
2012-02-24	Fri	14:36	Snow	Daylight	Rear end	P.D. only	V1 E	Ice	Slowing or	Automobile, station	Other motor vehicle	0
							V2 E	Ice	Stopped	Pick-up truck	Other motor vehicle	
2013-01-06	Sun	14:02	Snow	Daylight	Approaching	Non-fatal	V1 W	Loose snow	Going ahead	Automobile, station	Skidding/Sliding	0
							V2 E	Loose snow	Going ahead	Automobile, station	Other motor vehicle	
2013-03-04	Mo	16:46	Clear	Daylight	Rear end	P.D. only	V1 W	Wet	Going ahead	Passenger van	Other motor vehicle	0
							V2 W	Wet	Going ahead	Pick-up truck	Other motor vehicle	

(Note: Time of Day = "00:00" represents unknown collision time

Collision Main Detail Summary

OnTRAC Reporting System

FROM: 2011-01-01 TO: 2014-01-01

JOCKVALE RD & PRINCE OF WALES DR

Former Municipality: **Nepean** Traffic Control: **Traffic signal** Number of Collisions: **17**

DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
2011-01-25	Tue	13:12	Clear	Daylight	Turning	P.D. only	V1 W	Wet	Turning right	Automobile, station	Other motor vehicle	0
							V2 W	Wet	Going ahead	Snow plow	Other motor vehicle	
2011-01-25	Tue	07:15	Snow	Dawn	Rear end	P.D. only	V1 E	Loose snow	Slowing or	Automobile, station	Other motor vehicle	
							V2 E	Loose snow	Stopped	Automobile, station	Other motor vehicle	
							V3 E	Loose snow	Stopped	Pick-up truck	Other motor vehicle	
2011-10-05	We	08:30	Clear	Daylight	Turning	Non-fatal	V1 E	Dry	Turning left	Automobile, station	Other motor vehicle	0
							V2 W	Dry	Going ahead	Delivery van	Other motor vehicle	
2011-10-28	Fri	15:28	Clear	Daylight	Turning	P.D. only	V1 N	Dry	Turning left	Automobile, station	Other motor vehicle	0
							V2 S	Dry	Going ahead	Automobile, station	Other motor vehicle	
2011-11-14	Mo	19:43	Rain	Dark	Turning	P.D. only	V1 N	Wet	Turning left	Automobile, station	Other motor vehicle	0
							V2 S	Wet	Going ahead	Automobile, station	Other motor vehicle	
2011-12-29	Thu	17:15	Snow	Dark	Turning	P.D. only	V1 S	Wet	Turning left	Automobile, station	Other motor vehicle	0
							V2 N	Wet	Going ahead	Passenger van	Other motor vehicle	
2012-02-24	Fri	14:33	Snow	Daylight	Rear end	P.D. only	V1 E	Ice	Slowing or	Automobile, station	Other motor vehicle	0
							V2 E	Ice	Stopped	Pick-up truck	Other motor vehicle	
2012-03-18	Sun	09:40	Clear	Daylight	Rear end	P.D. only	V1 N	Dry	Slowing or	Pick-up truck	Other motor vehicle	0
							V2 N	Dry	Stopped	Automobile, station	Other motor vehicle	
2012-07-21	Sat	20:00	Clear	Daylight	Turning	Non-fatal	V1 S	Dry	Turning left	Automobile, station	Other motor vehicle	0
							V2 N	Dry	Going ahead	Automobile, station	Other motor vehicle	
2012-07-22	Sun	15:30	Clear	Daylight	Rear end	P.D. only	V1 W	Dry	Going ahead	Passenger van	Other motor vehicle	0
							V2 W	Dry	Stopped	Pick-up truck	Other motor vehicle	
2013-01-07	Mo	22:35	Clear	Dark	Angle	P.D. only	V1 W	Wet	Going ahead	Pick-up truck	Other motor vehicle	0
							V2 N	Wet	Going ahead	Pick-up truck	Other motor vehicle	
2013-02-05	Tue	07:42	Clear	Daylight	Rear end	P.D. only	V1 E	Dry	Turning left	Automobile, station	Other motor vehicle	0
							V2 E	Dry	Turning left	Automobile, station	Other motor vehicle	
2013-02-08	Fri	14:35	Snow	Daylight	Angle	P.D. only	V1 S	Loose snow	Turning right	Pick-up truck	Other motor vehicle	0
							V2 E	Loose snow	Stopped	Pick-up truck	Other motor vehicle	

(Note: Time of Day = "00:00" represents unknown collision time

Collision Main Detail Summary

OnTRAC Reporting System

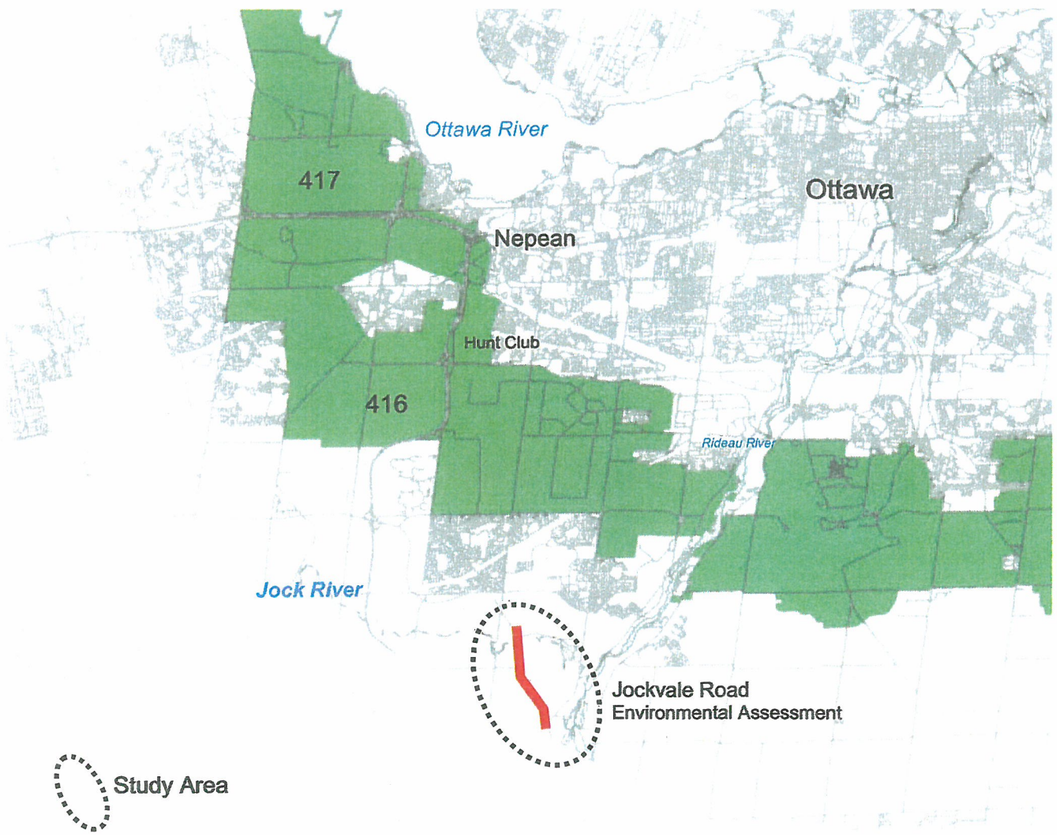
FROM: 2011-01-01 TO: 2014-01-01

DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
2013-05-23	Thu	00:30	Clear	Dark	Angle	Non-fatal	V1 E	Wet	Going ahead	Police vehicle	Other motor vehicle	0
							V2 N	Wet	Going ahead	Passenger van	Other motor vehicle	
2013-07-19	Fri	17:30	Rain	Daylight	Rear end	Non-fatal	V1 S	Wet	Slowing or	Automobile, station	Other motor vehicle	0
							V2 S	Wet	Stopped	Automobile, station	Other motor vehicle	
2013-11-20	We	16:31	Clear	Dusk	Turning	Non-fatal	V1 S	Dry	Turning left	Automobile, station	Other motor vehicle	0
							V2 N	Dry	Going ahead	Automobile, station	Other motor vehicle	
2013-12-11	We	06:41	Clear	Dark	Turning	P.D. only	V1 N	Dry	Turning left	Passenger van	Other motor vehicle	0
							V2 S	Dry	Going ahead	Automobile, station	Other motor vehicle	

(Note: Time of Day = "00:00" represents unknown collision time

APPENDIX E

Excerpts from:
Jockvale Road Environmental Study Report
Prepared by Genivar
(January 2009)



OT-07-027-00-OT

City of Ottawa

Jockvale Road Environmental Assessment Study

Jock River to Prince of Wales Drive

Environmental Study Report

January 2009

Prepared by:

GENIVAR

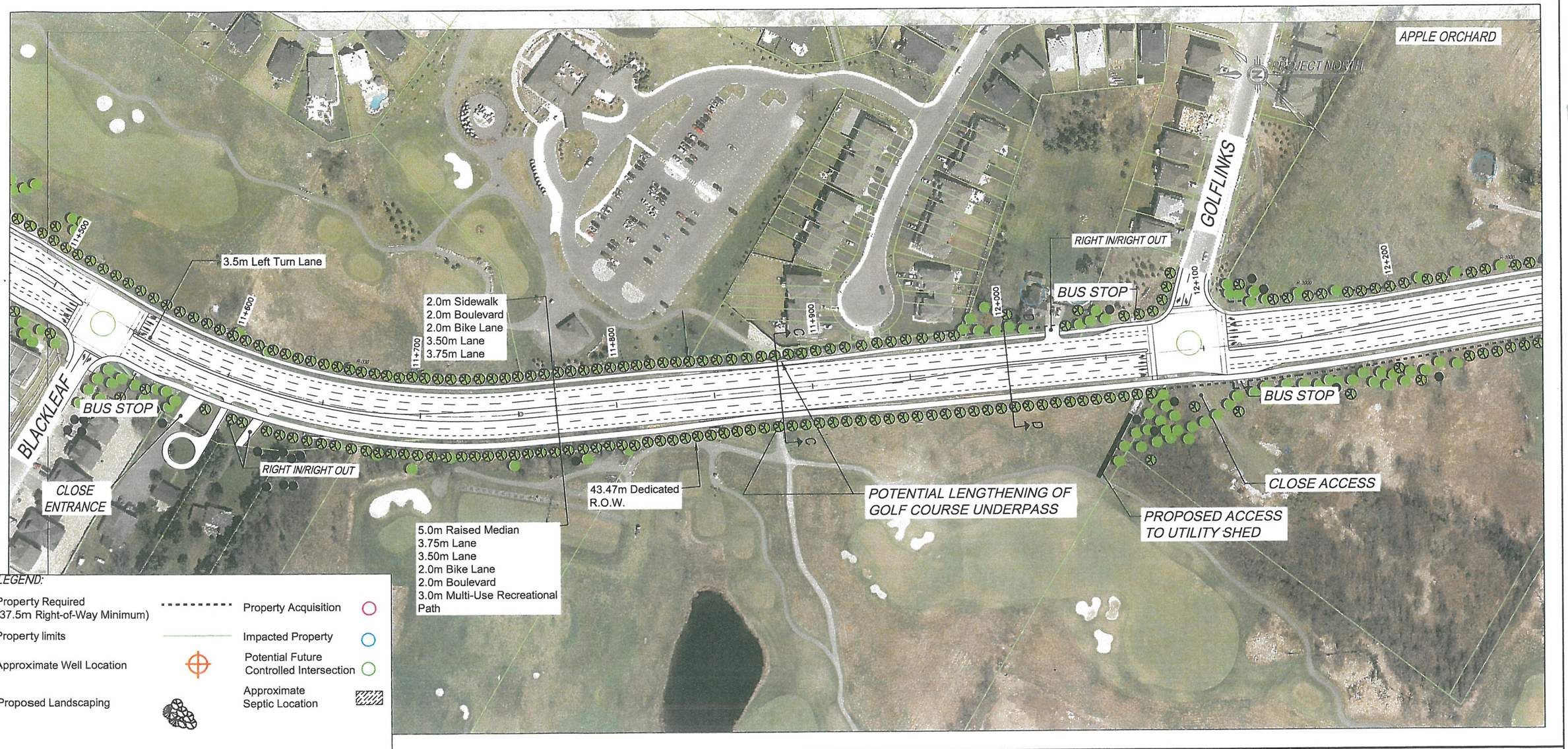


FIGURE 6-3

RECOMMENDED PLAN

SCALE: 25m 0 50m
Horizontal 1:2000

Ottawa

JOCKVALE ROAD
Environmental Assessment Study

GENIVAR

2007-027-Jockvale Rd Widening EA/Tech/DWG/TESR/2007-027-Recommended Plan.dwg - 12 December 2008 - 13:45

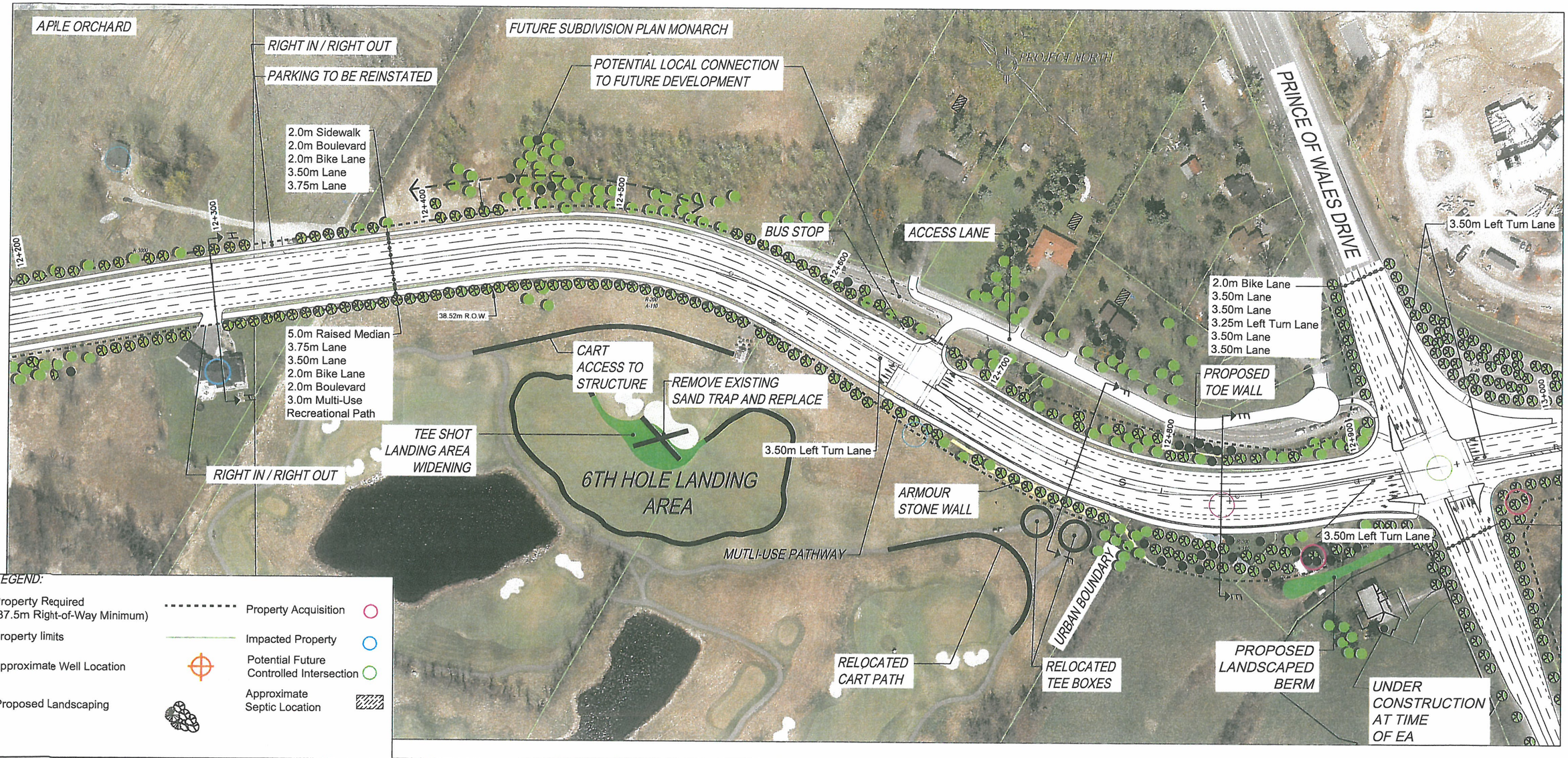


FIGURE 6-4

RECOMMENDED PLAN

SCALE: 25m 0 50m
Horizontal 1:2000

Ottawa

JOCKVALE ROAD
Environmental Assessment Study

GENIVAR

2007-027-Jockvale Rd Widening EA/Tech/DWG/TESR/2007-027-Recommended Plan.dwg - 12 December 2008 - 13:45

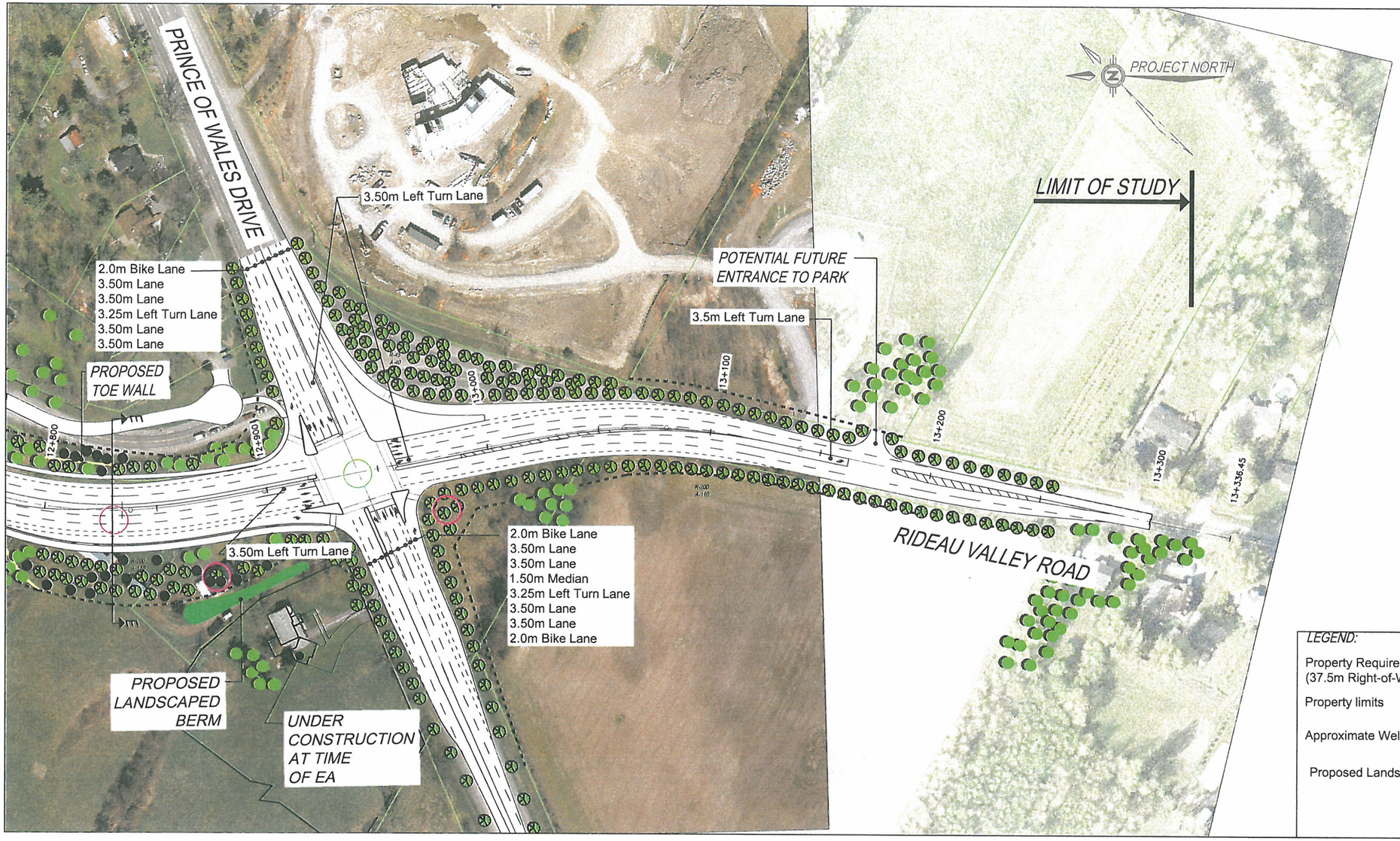


FIGURE 6-5

RECOMMENDED PLAN

SCALE: 25m 0 50m

Horizontal 1:2000

Ottawa

GENIVAR

JOCKVALE ROAD
Environmental Assessment Study

2007-027-Jockvale Rd Widening EA/Tech/DWG/TESR/2007-027-Recommended Pl dwg - 12 December 2008 - 13:45

APPENDIX F

Excerpts from:
Apple Orchard Lands and Monarch Subdivision
Transportation Impact Study
Prepared by Novatech
(July 2011)

Apple Orchard Lands
3699 Jockvale Road, Ottawa

and

Monarch Subdivision
3701 Jockvale Road, Ottawa

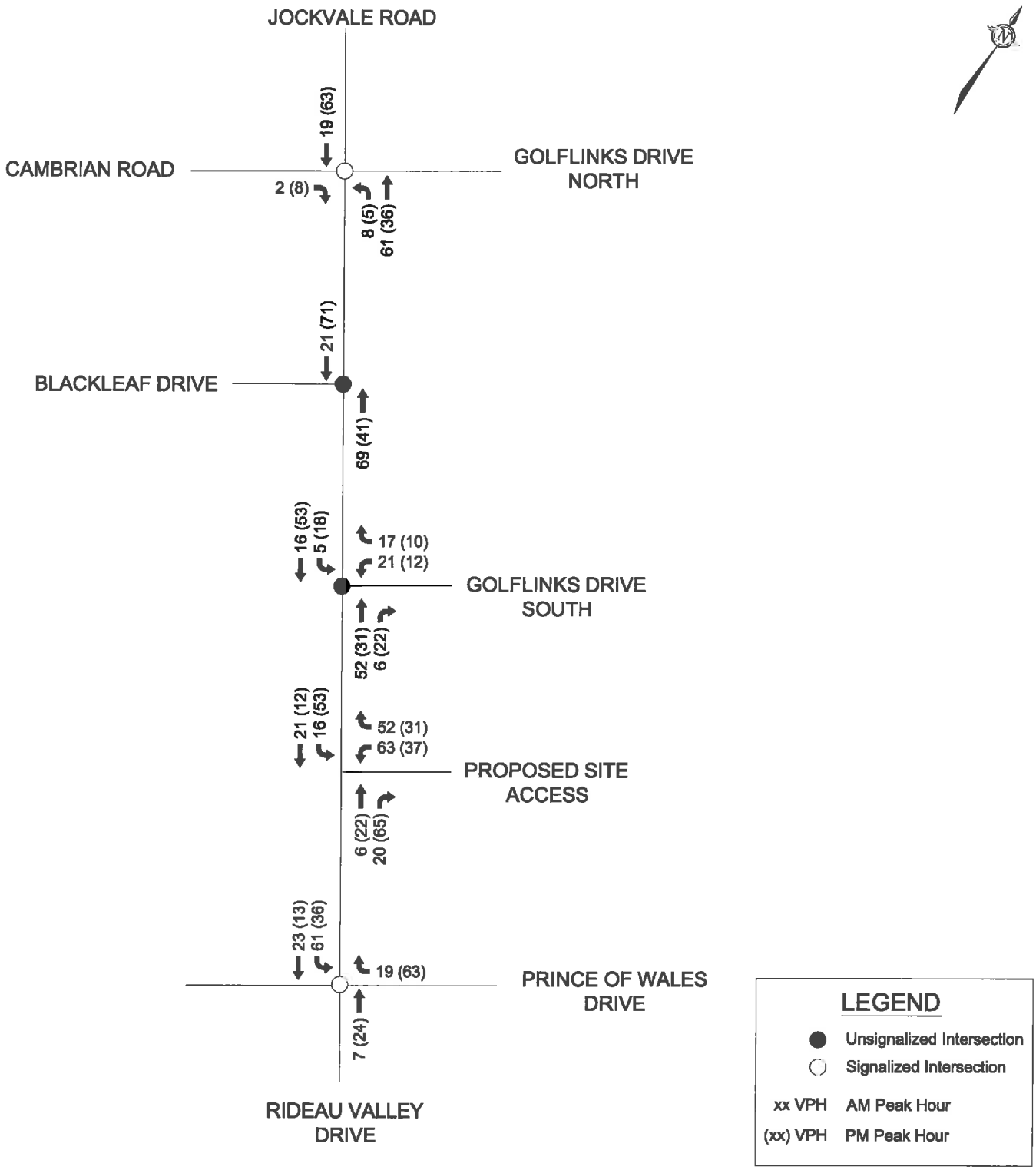
TRANSPORTATION IMPACT STUDY

Prepared By:

NOVATECH ENGINEERING CONSULTANTS LTD.
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario
K2M 1P6

July 2011

Novatech File: 109119
Ref No. R-2011-112



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Email: novainfo@novatech-eng.com

STONEBRIDGE ORCHARD & MONARCH SUBDIVISIONS 3699 & 3701 JOCKVALE RD

SITE TRAFFIC

JULY 2011 109119 FIGURE 6

M:\2009\109119\CAD\Design\Figures\Traffic\109119-Figures1-9.dwg, FIG6, Jun 22, 2011 - 5:07pm, goneill
SHT8X11.DWG - 216mmX278mm

APPENDIX G1

Synchro Intersection Analysis Reports
Existing Conditions

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	150	102	35	342	347	51
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	165	112	38	376	381	56
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	834	381	437			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	834	381	437			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	50	83	97			
cM capacity (veh/h)	326	666	1117			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	277	38	376	381	56
Volume Left	165	38	0	0	0
Volume Right	112	0	0	0	56
cSH	411	1117	1700	1700	1700
Volume to Capacity	0.67	0.03	0.22	0.22	0.03
Queue Length 95th (m)	36.5	0.8	0.0	0.0	0.0
Control Delay (s)	30.0	8.3	0.0	0.0	0.0
Lane LOS	D	A			
Approach Delay (s)	30.0	0.8		0.0	
Approach LOS	D				

Intersection Summary			
Average Delay	7.6		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	75	45	260	23	34	516
Sign Control	Stop		Free			Free
Grade	0%		2%			2%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	78	47	271	24	35	538
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	891	283			295	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	891	283			295	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	74	94			97	
cM capacity (veh/h)	303	754			1261	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	78	47	295	35	538
Volume Left	78	0	0	35	0
Volume Right	0	47	24	0	0
cSH	303	754	1700	1261	1700
Volume to Capacity	0.26	0.06	0.17	0.03	0.32
Queue Length 95th (m)	7.7	1.5	0.0	0.7	0.0
Control Delay (s)	21.0	10.1	0.0	7.9	0.0
Lane LOS	C	B		A	
Approach Delay (s)	16.9		0.0	0.5	
Approach LOS	C				

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		

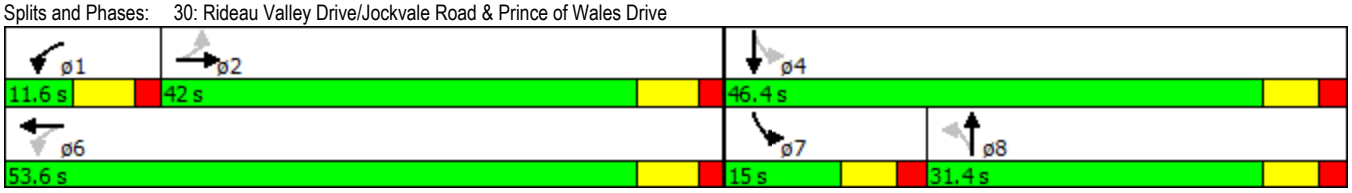
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	537	5	98	229	72	1	168	263	349	149	47
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		0%			2%			3%			-10%	
Storage Length (m)	100.0		0.0	230.0		0.0	0.0		55.0	75.0		0.0
Storage Lanes	1		0	1		0	0		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00						1.00			1.00	
Frt		0.999			0.964				0.850		0.964	
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1647	3289	0	1646	3173	0	0	1740	1479	1763	1782	0
Flt Permitted	0.554			0.231				0.999		0.501		
Satd. Flow (perm)	960	3289	0	400	3173	0	0	1739	1479	930	1782	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			56				281		19	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		528.5			331.7			398.7			638.3	
Travel Time (s)		23.8			14.9			20.5			32.8	
Confl. Peds. (#/hr)			3				3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	47	584	5	107	249	78	1	183	286	379	162	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	589	0	107	327	0	0	184	286	379	213	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.07	1.07	1.07	1.08	1.08	1.08	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	1		1	1		1	1	1	1	1	
Detector Template												
Leading Detector (m)	15.2	15.2		15.2	15.2		15.2	15.2	15.2	15.2	15.2	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	15.2	15.2		15.2	15.2		15.2	15.2	15.2	15.2	15.2	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Free	pm+pt	NA	
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2			6			8		Free	4		
Detector Phase	2	2		1	6		8	8		7	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0		10.0	10.0		5.0	10.0	
Minimum Split (s)	41.6	41.6		11.6	41.6		31.4	31.4		11.4	31.4	
Total Split (s)	42.0	42.0		11.6	53.6		31.4	31.4		15.0	46.4	
Total Split (%)	42.0%	42.0%		11.6%	53.6%		31.4%	31.4%		15.0%	46.4%	
Yellow Time (s)	4.6	4.6		4.6	4.6		4.2	4.2		4.2	4.2	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	6.6	6.6		6.6	6.6			6.4		6.4	6.4	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Recall Mode	Ped	Ped		None	Ped		Max	Max		None	Max	
Act Effct Green (s)	22.1	22.1		31.1	31.1			25.1	84.4	40.2	40.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.26	0.26		0.37	0.37			0.30	1.00	0.48	0.48	
v/c Ratio	0.19	0.68		0.48	0.27			0.36	0.19	0.72	0.25	
Control Delay	27.2	33.0		25.2	15.4			27.3	0.3	26.8	14.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	27.2	33.0		25.2	15.4			27.3	0.3	26.8	14.1	
LOS	C	C		C	B			C	A	C	B	
Approach Delay		32.6			17.9			10.9			22.2	
Approach LOS		C			B			B			C	
Queue Length 50th (m)	6.1	46.6		11.4	15.4			23.3	0.0	39.5	17.8	
Queue Length 95th (m)	14.8	63.7		21.7	24.4			45.0	0.0	#80.9	36.1	
Internal Link Dist (m)		504.5			307.7			374.7			614.3	
Turn Bay Length (m)	100.0			230.0					55.0	75.0		
Base Capacity (vph)	405	1388		221	1801			518	1479	528	859	
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	0.12	0.42		0.48	0.18			0.36	0.19	0.72	0.25	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 84.4
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 21.9 Intersection LOS: C
Intersection Capacity Utilization 85.2% 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: 30: Rideau Valley Drive/Jockvale Road & Prince of Wales Drive



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	69	52	171	522	427	189
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	76	57	188	574	469	208
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1419	469	677			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1419	469	677			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	37	90	79			
cM capacity (veh/h)	120	594	910			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	133	188	574	469	208
Volume Left	76	188	0	0	0
Volume Right	57	0	0	0	208
cSH	182	910	1700	1700	1700
Volume to Capacity	0.73	0.21	0.34	0.28	0.12
Queue Length 95th (m)	35.2	5.9	0.0	0.0	0.0
Control Delay (s)	65.0	10.0	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	65.0	2.5		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	6.7		
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	33	35	639	93	75	356
Sign Control	Stop		Free			Free
Grade	0%		2%			2%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	34	36	666	97	78	371
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1241	714			762	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1241	714			762	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	80	92			91	
cM capacity (veh/h)	174	430			845	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	34	36	762	78	371
Volume Left	34	0	0	78	0
Volume Right	0	36	97	0	0
cSH	174	430	1700	845	1700
Volume to Capacity	0.20	0.08	0.45	0.09	0.22
Queue Length 95th (m)	5.4	2.1	0.0	2.3	0.0
Control Delay (s)	30.6	14.2	0.0	9.7	0.0
Lane LOS	D	B		A	
Approach Delay (s)	22.2		0.0	1.7	
Approach LOS	C				

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		

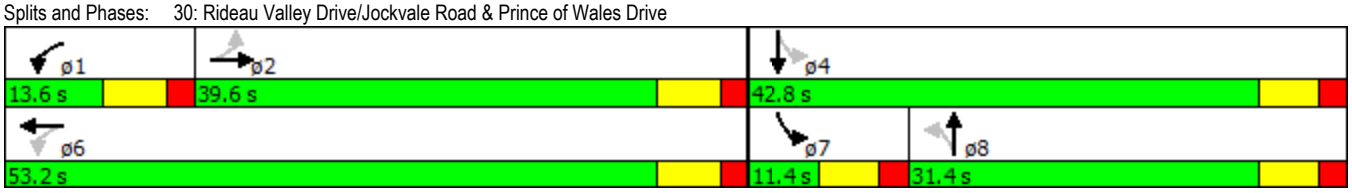
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	278	4	311	561	341	11	243	189	107	225	45
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		0%			2%			3%			-10%	
Storage Length (m)	100.0		0.0	230.0		0.0	0.0		55.0	75.0		0.0
Storage Lanes	1		0	1		0	0		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00						1.00			1.00	
Frt		0.998			0.943				0.850		0.975	
Flt Protected	0.950			0.950				0.998		0.950		
Satd. Flow (prot)	1647	3286	0	1646	3104	0	0	1737	1479	1763	1804	0
Flt Permitted	0.289			0.429				0.980		0.407		
Satd. Flow (perm)	501	3286	0	743	3104	0	0	1706	1479	755	1804	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			186				261		12	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		528.5			331.7			398.7			638.3	
Travel Time (s)		23.8			14.9			20.5			32.8	
Confl. Peds. (#/hr)			3				3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	46	302	4	338	610	371	12	264	205	116	245	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	46	306	0	338	981	0	0	276	205	116	294	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.07	1.07	1.07	1.08	1.08	1.08	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	1		1	1		1	1	1	1	1	
Detector Template												
Leading Detector (m)	15.2	15.2		15.2	15.2		15.2	15.2	15.2	15.2	15.2	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	15.2	15.2		15.2	15.2		15.2	15.2	15.2	15.2	15.2	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Free	pm+pt	NA	
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2			6			8		Free	4		
Detector Phase	2	2		1	6		8	8		7	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0		10.0	10.0		5.0	10.0	
Minimum Split (s)	39.6	39.6		12.6	39.6		31.4	31.4		11.4	31.4	
Total Split (s)	39.6	39.6		13.6	53.2		31.4	31.4		11.4	42.8	
Total Split (%)	41.3%	41.3%		14.2%	55.4%		32.7%	32.7%		11.9%	44.6%	
Yellow Time (s)	4.6	4.6		4.6	4.6		4.2	4.2		4.2	4.2	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	6.6	6.6		6.6	6.6			6.4		6.4	6.4	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Recall Mode	Ped	Ped		None	Ped		Max	Max		None	Max	
Act Effct Green (s)	20.7	20.7		34.3	34.3			27.3	83.7	36.4	36.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.25	0.25		0.41	0.41			0.33	1.00	0.43	0.43	
v/c Ratio	0.37	0.38		0.89	0.71			0.50	0.14	0.30	0.37	
Control Delay	36.1	27.6		48.7	19.7			27.8	0.2	16.9	17.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	36.1	27.6		48.7	19.7			27.8	0.2	16.9	17.2	
LOS	D	C		D	B			C	A	B	B	
Approach Delay		28.7			27.1			16.1			17.1	
Approach LOS		C			C			B			B	
Queue Length 50th (m)	6.1	21.3		39.0	54.2			36.2	0.0	10.7	28.7	
Queue Length 95th (m)	16.2	32.3		#82.1	75.4			62.8	0.0	21.9	50.7	
Internal Link Dist (m)		504.5			307.7			374.7			614.3	
Turn Bay Length (m)	100.0			230.0					55.0	75.0		
Base Capacity (vph)	197	1296		379	1810			556	1479	388	791	
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	0.23	0.24		0.89	0.54			0.50	0.14	0.30	0.37	

Intersection Summary

Area Type: Other
Cycle Length: 96
Actuated Cycle Length: 83.7
Natural Cycle: 95
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 23.7 Intersection LOS: C
Intersection Capacity Utilization 101.2% 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: 30: Rideau Valley Drive/Jockvale Road & Prince of Wales Drive

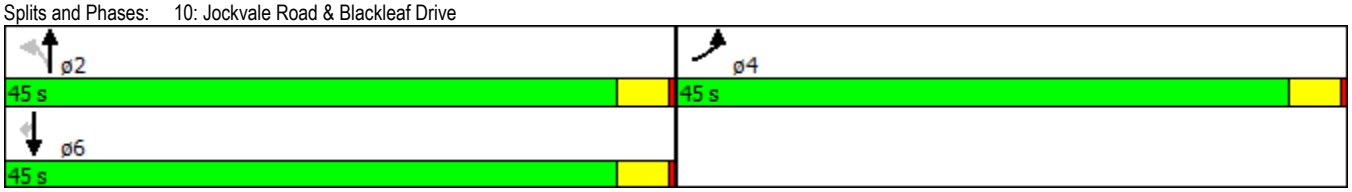


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	69	52	171	522	427	189
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	4.8	4.8	3.7	3.7	3.7	3.7
Storage Length (m)	0.0	0.0	110.0			0.0
Storage Lanes	1	0	1			1
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99					0.98
Frt	0.942					0.850
Flt Protected	0.972		0.950			
Satd. Flow (prot)	1815	0	1679	1767	1784	1517
Flt Permitted	0.972		0.475			
Satd. Flow (perm)	1815	0	839	1767	1784	1483
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	55					208
Link Speed (k/h)	40			70	70	
Link Distance (m)	261.2			561.2	330.7	
Travel Time (s)	23.5			28.9	17.0	
Confl. Bikes (#/hr)		1				3
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Adj. Flow (vph)	76	57	188	574	469	208
Shared Lane Traffic (%)						
Lane Group Flow (vph)	133	0	188	574	469	208
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	4.8			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.91	0.91	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1		1	1	1	1
Detector Template						
Leading Detector (m)	15.2		15.2	15.2	15.2	15.2
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	15.2		15.2	15.2	15.2	15.2
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Turn Type	Prot		Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Detector Phase	4		2	2	6	6
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	20.0		20.0	20.0	20.0	20.0
Total Split (s)	45.0		45.0	45.0	45.0	45.0
Total Split (%)	50.0%		50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	0.5		0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		Min	Min	Min	Min
Act Effct Green (s)	8.1		28.6	28.6	28.6	28.6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Actuated g/C Ratio	0.20		0.70	0.70	0.70	0.70
v/c Ratio	0.33		0.32	0.47	0.38	0.19
Control Delay	12.7		6.2	6.1	5.3	1.3
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	12.7		6.2	6.1	5.3	1.3
LOS	B		A	A	A	A
Approach Delay	12.7			6.2	4.1	
Approach LOS	B			A	A	
Queue Length 50th (m)	4.8		5.1	17.9	13.3	0.0
Queue Length 95th (m)	16.6		16.1	42.5	31.7	5.0
Internal Link Dist (m)	237.2			537.2	306.7	
Turn Bay Length (m)			110.0			
Base Capacity (vph)	1713		790	1664	1680	1409
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	0.08		0.24	0.34	0.28	0.15

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 40.9	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 5.8	Intersection LOS: A
Intersection Capacity Utilization 51.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 10: Jockvale Road & Blackleaf Drive



APPENDIX G2

Synchro Intersection Analysis Reports
Background Traffic

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	150	102	35	520	479	51
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	165	112	38	571	526	56
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1175	526	582			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1175	526	582			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	19	80	96			
cM capacity (veh/h)	204	552	987			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	277	38	571	526	56
Volume Left	165	38	0	0	0
Volume Right	112	0	0	0	56
cSH	273	987	1700	1700	1700
Volume to Capacity	1.01	0.04	0.34	0.31	0.03
Queue Length 95th (m)	79.2	0.9	0.0	0.0	0.0
Control Delay (s)	98.7	8.8	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	98.7	0.6		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	18.8		
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	96	62	395	29	39	697
Sign Control	Stop		Free			Free
Grade	0%		2%			2%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	100	65	411	30	41	726
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1234	427			442	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1234	427			442	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	47	90			96	
cM capacity (veh/h)	187	626			1113	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	100	65	442	41	726
Volume Left	100	0	0	41	0
Volume Right	0	65	30	0	0
cSH	187	626	1700	1113	1700
Volume to Capacity	0.53	0.10	0.26	0.04	0.43
Queue Length 95th (m)	20.9	2.6	0.0	0.9	0.0
Control Delay (s)	44.4	11.4	0.0	8.4	0.0
Lane LOS	E	B		A	
Approach Delay (s)	31.5		0.0	0.4	
Approach LOS	D				

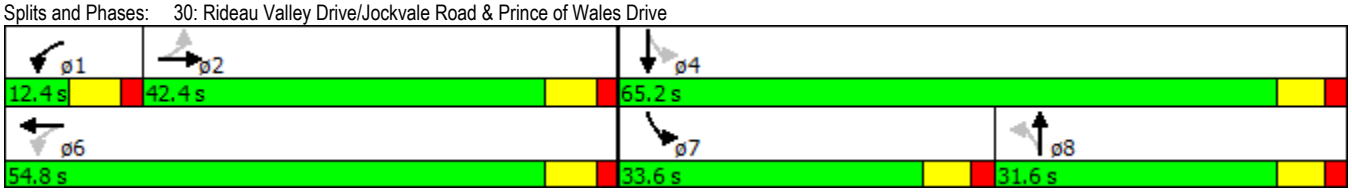
Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	709	7	129	302	114	1	229	347	522	220	62
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		0%			2%			3%			-10%	
Storage Length (m)	100.0		0.0	230.0		0.0	0.0		55.0	75.0		0.0
Storage Lanes	1		0	1		0	0		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00						1.00			1.00	
Frt		0.998			0.959				0.850		0.967	
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1647	3286	0	1646	3157	0	0	1740	1479	1763	1788	0
Flt Permitted	0.491			0.125				0.999		0.325		
Satd. Flow (perm)	851	3286	0	217	3157	0	0	1739	1479	603	1788	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			55				242		16	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		528.5			331.7			398.7			638.3	
Travel Time (s)		23.8			14.9			20.5			32.8	
Confl. Peds. (#/hr)			3				3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	62	771	8	140	328	124	1	249	377	567	239	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	779	0	140	452	0	0	250	377	567	306	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.07	1.07	1.07	1.08	1.08	1.08	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	1		1	1		1	1	1	1	1	
Detector Template												
Leading Detector (m)	15.2	15.2		15.2	15.2		15.2	15.2	15.2	15.2	15.2	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	15.2	15.2		15.2	15.2		15.2	15.2	15.2	15.2	15.2	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Free	pm+pt	NA	
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2			6			8		Free	4		
Detector Phase	2	2		1	6		8	8		7	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0		10.0	10.0		5.0	10.0	
Minimum Split (s)	41.6	41.6		11.6	41.6		31.4	31.4		11.4	31.4	
Total Split (s)	42.4	42.4		12.4	54.8		31.6	31.6		33.6	65.2	
Total Split (%)	35.3%	35.3%		10.3%	45.7%		26.3%	26.3%		28.0%	54.3%	
Maximum Green (s)	35.8	35.8		5.8	48.2		25.2	25.2		27.2	58.8	
Yellow Time (s)	4.6	4.6		4.6	4.6		4.2	4.2		4.2	4.2	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	6.6	6.6		6.6	6.6			6.4		6.4	6.4	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	Ped	Ped		None	Ped		Max	Max		None	Max	
Walk Time (s)	7.0	7.0			7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	13.0	13.0			13.0		18.0	18.0			18.0	
Pedestrian Calls (#/hr)	0	0			0		2	2			0	
Act Effct Green (s)	31.7	31.7		44.1	44.1			25.2	116.0	58.9	58.9	
Actuated g/C Ratio	0.27	0.27		0.38	0.38			0.22	1.00	0.51	0.51	
v/c Ratio	0.27	0.87		0.91	0.37			0.66	0.25	0.98	0.33	
Control Delay	36.1	51.3		81.9	23.2			51.9	0.4	57.2	17.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	36.1	51.3		81.9	23.2			51.9	0.4	57.2	17.9	
LOS	D	D		F	C			D	A	E	B	
Approach Delay		50.2			37.1			20.9			43.4	
Approach LOS		D			D			C			D	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 116	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 39.3	Intersection LOS: D
Intersection Capacity Utilization 98.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 30: Rideau Valley Drive/Jockvale Road & Prince of Wales Drive



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	69	52	171	730	635	189
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	76	57	188	802	698	208
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1876	698	905			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1876	698	905			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	87	75			
cM capacity (veh/h)	59	441	747			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	133	188	802	698	208
Volume Left	76	188	0	0	0
Volume Right	57	0	0	0	208
cSH	94	747	1700	1700	1700
Volume to Capacity	1.42	0.25	0.47	0.41	0.12
Queue Length 95th (m)	75.4	7.6	0.0	0.0	0.0
Control Delay (s)	319.4	11.4	0.0	0.0	0.0
Lane LOS	F	B			
Approach Delay (s)	319.4	2.2		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	22.0		
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	45	45	874	115	93	523
Sign Control	Stop		Free			Free
Grade	0%		2%			2%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	47	47	910	120	97	545
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1709	970			1030	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1709	970			1030	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	45	85			86	
cM capacity (veh/h)	85	306			670	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	47	47	1030	97	545
Volume Left	47	0	0	97	0
Volume Right	0	47	120	0	0
cSH	85	306	1700	670	1700
Volume to Capacity	0.55	0.15	0.61	0.14	0.32
Queue Length 95th (m)	18.5	4.1	0.0	3.8	0.0
Control Delay (s)	90.3	18.9	0.0	11.3	0.0
Lane LOS	F	C		B	
Approach Delay (s)	54.6		0.0	1.7	
Approach LOS	F				

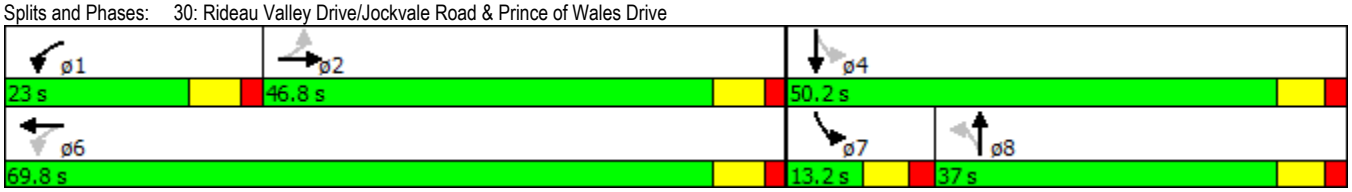
Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	367	5	411	741	513	15	345	249	177	310	59
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		0%			2%			3%			-10%	
Storage Length (m)	100.0		0.0	230.0		0.0	0.0		55.0	75.0		0.0
Storage Lanes	1		0	1		0	0		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00						1.00			1.00	
Frt		0.998			0.939				0.850		0.976	
Flt Protected	0.950			0.950				0.998		0.950		
Satd. Flow (prot)	1647	3286	0	1646	3091	0	0	1737	1479	1763	1806	0
Flt Permitted	0.146			0.364				0.973		0.217		
Satd. Flow (perm)	253	3286	0	631	3091	0	0	1693	1479	403	1806	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			220				209		9	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		528.5			331.7			398.7			638.3	
Travel Time (s)		23.8			14.9			20.5			32.8	
Confl. Peds. (#/hr)			3				3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	60	399	5	447	805	558	16	375	271	192	337	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	404	0	447	1363	0	0	391	271	192	401	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.07	1.07	1.07	1.08	1.08	1.08	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	1		1	1		1	1	1	1	1	
Detector Template												
Leading Detector (m)	15.2	15.2		15.2	15.2		15.2	15.2	15.2	15.2	15.2	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	15.2	15.2		15.2	15.2		15.2	15.2	15.2	15.2	15.2	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Free	pm+pt	NA	
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2			6			8		Free	4		
Detector Phase	2	2		1	6		8	8		7	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0		10.0	10.0		5.0	10.0	
Minimum Split (s)	38.6	38.6		11.6	38.6		31.4	31.4		11.4	31.4	
Total Split (s)	46.8	46.8		23.0	69.8		37.0	37.0		13.2	50.2	
Total Split (%)	39.0%	39.0%		19.2%	58.2%		30.8%	30.8%		11.0%	41.8%	
Maximum Green (s)	40.2	40.2		16.4	63.2		30.6	30.6		6.8	43.8	
Yellow Time (s)	4.6	4.6		4.6	4.6		4.2	4.2		4.2	4.2	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	6.6	6.6		6.6	6.6			6.4		6.4	6.4	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	Ped	Ped		None	Ped		Max	Max		None	Max	
Walk Time (s)	7.0	7.0			7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	13.0	13.0			13.0		18.0	18.0			18.0	
Pedestrian Calls (#/hr)	0	0			0		2	2			0	
Act Effct Green (s)	30.1	30.1		53.3	53.3			30.8	110.4	44.1	44.1	
Actuated g/C Ratio	0.27	0.27		0.48	0.48			0.28	1.00	0.40	0.40	
v/c Ratio	0.88	0.45		0.98	0.85			0.83	0.18	0.78	0.55	
Control Delay	118.8	34.2		61.5	26.4			55.2	0.3	50.5	30.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	118.8	34.2		61.5	26.4			55.2	0.3	50.5	30.2	
LOS	F	C		E	C			E	A	D	C	
Approach Delay		45.1			35.1			32.7			36.8	
Approach LOS		D			D			C			D	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 110.4	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 36.2	Intersection LOS: D
Intersection Capacity Utilization 118.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 30: Rideau Valley Drive/Jockvale Road & Prince of Wales Drive

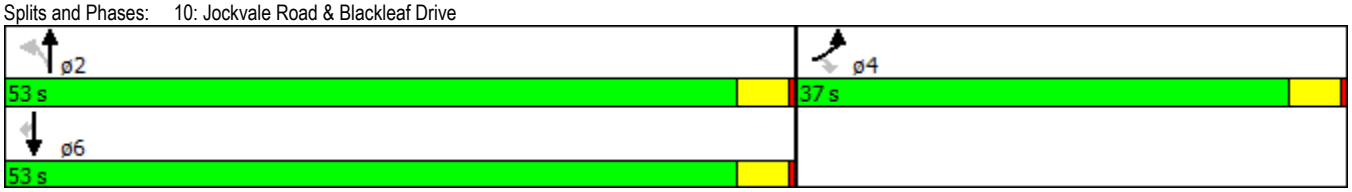


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	150	102	35	589	548	51
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.8	3.5	3.8
Storage Length (m)	20.0	0.0	120.0			40.0
Storage Lanes	1	1	1			1
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor		0.99				0.98
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1658	1483	1642	3394	3316	1533
Flt Permitted	0.950		0.424			
Satd. Flow (perm)	1658	1465	733	3394	3316	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		112				56
Link Speed (k/h)	40			60	60	
Link Distance (m)	261.2			561.2	330.7	
Travel Time (s)	23.5			33.7	19.8	
Confl. Bikes (#/hr)		1				3
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Adj. Flow (vph)	165	112	38	647	602	56
Shared Lane Traffic (%)						
Lane Group Flow (vph)	165	112	38	647	602	56
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.04	1.09	1.04
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1	1	1	1	1
Detector Template						
Leading Detector (m)	15.2	15.2	15.2	15.2	15.2	15.2
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	15.2	15.2	15.2	15.2	15.2	15.2
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	37.0	37.0	53.0	53.0	53.0	53.0
Total Split (%)	41.1%	41.1%	58.9%	58.9%	58.9%	58.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	Min	Min	Min	Min
Act Effct Green (s)	9.0	9.0	15.3	15.3	15.3	15.3

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Actuated g/C Ratio	0.28	0.28	0.47	0.47	0.47	0.47
v/c Ratio	0.36	0.23	0.11	0.40	0.39	0.08
Control Delay	11.2	3.9	6.5	6.9	6.8	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.2	3.9	6.5	6.9	6.8	2.5
LOS	B	A	A	A	A	A
Approach Delay	8.2			6.8	6.4	
Approach LOS	A			A	A	
Queue Length 50th (m)	5.3	0.0	0.9	9.3	8.5	0.0
Queue Length 95th (m)	16.2	6.0	4.2	19.8	18.5	3.1
Internal Link Dist (m)	237.2			537.2	306.7	
Turn Bay Length (m)	20.0		120.0			40.0
Base Capacity (vph)	1582	1403	733	3394	3316	1500
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.08	0.05	0.19	0.18	0.04

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 32.4	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.40	
Intersection Signal Delay: 6.9	Intersection LOS: A
Intersection Capacity Utilization 38.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 10: Jockvale Road & Blackleaf Drive



Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	ø4
Lane Configurations							
Volume (vph)	447	29	39	800	96	62	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Lane Width (m)	3.8	3.5	3.5	3.8	3.5	2.4	
Grade (%)	2%			2%	0%		
Storage Length (m)		50.0	70.0		20.0	0.0	
Storage Lanes		1	1		0	1	
Taper Length (m)			7.5		7.5		
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3393	1468	1641	3393	1658	1300	
Flt Permitted			0.475				
Satd. Flow (perm)	3393	1468	821	3393	1745	1300	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		32				67	
Link Speed (k/h)	60			60	40		
Link Distance (m)	187.7			561.2	141.1		
Travel Time (s)	11.3			33.7	12.7		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	486	32	42	870	104	67	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	486	32	42	870	104	67	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.5			3.5	3.5		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	4.8			4.8	4.8		
Two way Left Turn Lane							
Headway Factor	1.06	1.10	1.10	1.06	1.09	1.28	
Turning Speed (k/h)		14	24		24	14	
Number of Detectors	2	1	1	2	1	1	
Detector Template	Thru	Right	Left	Thru	Left	Right	
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)	9.4			9.4			
Detector 2 Size(m)	0.6			0.6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			
Turn Type	NA	Perm	Perm	NA	Perm	Perm	
Protected Phases	2			6			4
Permitted Phases		2	6		8	8	
Detector Phase	2	2	6	6	8	8	
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	61.0	61.0	61.0	61.0	29.0	29.0	29.0
Total Split (%)	67.8%	67.8%	67.8%	67.8%	32.2%	32.2%	32%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag							

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	ø4
Lead-Lag Optimize?							
Recall Mode	Max	Max	Max	Max	None	None	None
Act Effct Green (s)	64.9	64.9	64.9	64.9	10.1	10.1	
Actuated g/C Ratio	0.81	0.81	0.81	0.81	0.13	0.13	
v/c Ratio	0.18	0.03	0.06	0.32	0.47	0.30	
Control Delay	2.6	1.2	2.9	3.1	39.0	11.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	2.6	1.2	2.9	3.1	39.0	11.9	
LOS	A	A	A	A	D	B	
Approach Delay	2.5			3.1	28.4		
Approach LOS	A			A	C		
Queue Length 50th (m)	7.6	0.0	1.1	15.7	15.0	0.0	
Queue Length 95th (m)	14.1	1.9	3.9	27.3	27.5	9.9	
Internal Link Dist (m)	163.7			537.2	117.1		
Turn Bay Length (m)		50.0	70.0		20.0		
Base Capacity (vph)	2754	1197	666	2754	546	453	
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	0.18	0.03	0.06	0.32	0.19	0.15	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 80	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 5.6	Intersection LOS: A
Intersection Capacity Utilization 35.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 20: Jockvale Road & Golflinks

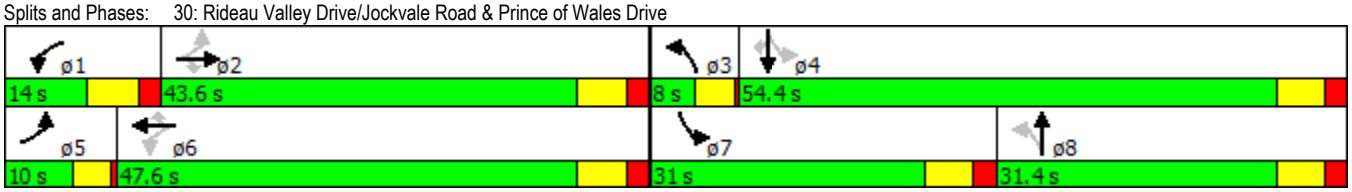
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	816	8	149	348	129	2	262	400	591	249	71
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.2	3.5	3.5	3.2	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			2%			3%			-10%	
Storage Length (m)	100.0		45.0	230.0		30.0	60.0		55.0	75.0		90.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.98				1.00					0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1556	3221	1441	1555	3219	1440	1617	3234	1447	1724	3448	1542
Flt Permitted	0.528			0.099			0.585			0.434		
Satd. Flow (perm)	865	3221	1416	162	3219	1440	993	3234	1447	788	3448	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			162			162			222			105
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		528.5			331.7			398.7			638.3	
Travel Time (s)		23.8			14.9			23.9			38.3	
Confl. Peds. (#/hr)			3				3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	71	887	9	162	378	140	2	285	435	642	271	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	887	9	162	378	140	2	285	435	642	271	77
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.2			3.2			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.09	1.09	1.15	1.10	1.10	1.11	1.11	1.11	1.02	1.02	1.02
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	1	1	1	1	1	1	1	1	1	1	1
Detector Template												
Leading Detector (m)	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		Free	4		4
Detector Phase	5	2	2	1	6	6	3	8		7	4	4
Switch Phase												
Minimum Initial (s)	4.0	20.0	20.0	5.0	20.0	20.0	4.0	10.0		5.0	10.0	10.0
Minimum Split (s)	8.0	41.6	41.6	11.6	41.6	41.6	8.0	31.4		11.4	31.4	31.4
Total Split (s)	10.0	43.6	43.6	14.0	47.6	47.6	8.0	31.4		31.0	54.4	54.4
Total Split (%)	8.3%	36.3%	36.3%	11.7%	39.7%	39.7%	6.7%	26.2%		25.8%	45.3%	45.3%
Yellow Time (s)	3.5	4.6	4.6	4.6	4.6	4.6	3.5	4.2		4.2	4.2	4.2
All-Red Time (s)	0.5	2.0	2.0	2.0	2.0	2.0	0.5	2.2		2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	6.6	6.6	6.6	6.6	6.6	4.0	6.4		6.4	6.4	6.4
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Ped	Ped	None	Ped	Ped	None	Max		None	Max	Max

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	44.1	35.5	35.5	47.4	41.6	41.6	31.4	25.0	118.5	56.0	54.4	54.4
Actuated g/C Ratio	0.37	0.30	0.30	0.40	0.35	0.35	0.26	0.21	1.00	0.47	0.46	0.46
v/c Ratio	0.20	0.92	0.02	1.07	0.33	0.23	0.01	0.42	0.30	1.13	0.17	0.10
Control Delay	21.2	55.5	0.0	120.4	29.9	3.7	19.0	43.0	0.5	107.6	20.0	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.2	55.5	0.0	120.4	29.9	3.7	19.0	43.0	0.5	107.6	20.0	2.2
LOS	C	E	A	F	C	A	B	D	A	F	C	A
Approach Delay		52.5			46.0			17.4			75.4	
Approach LOS		D			D			B			E	
Queue Length 50th (m)	9.5	104.8	0.0	~28.4	34.7	0.0	0.3	30.8	0.0	~155.6	18.9	0.0
Queue Length 95th (m)	18.4	#140.1	0.0	#71.8	47.7	9.7	1.7	44.2	0.0	#246.6	31.0	5.0
Internal Link Dist (m)		504.5			307.7			374.7			614.3	
Turn Bay Length (m)	100.0		45.0	230.0		30.0	60.0		55.0	75.0		90.0
Base Capacity (vph)	356	1006	553	152	1134	612	284	682	1447	566	1583	753
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.88	0.02	1.07	0.33	0.23	0.01	0.42	0.30	1.13	0.17	0.10

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 118.5
Natural Cycle: 140
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.13
Intersection Signal Delay: 50.4 Intersection LOS: D
Intersection Capacity Utilization 97.1% ICU Level of Service F
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: 30: Rideau Valley Drive/Jockvale Road & Prince of Wales Drive



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	69	52	171	834	720	189
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.8	3.5	3.8
Storage Length (m)	20.0	0.0	120.0			40.0
Storage Lanes	1	1	1			1
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor		0.99				0.98
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1691	1513	1642	3394	3316	1533
Flt Permitted	0.950		0.350			
Satd. Flow (perm)	1691	1493	605	3394	3316	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		57				208
Link Speed (k/h)	40			60	60	
Link Distance (m)	261.2			561.2	330.7	
Travel Time (s)	23.5			33.7	19.8	
Confl. Bikes (#/hr)		1				3
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	3%	3%	2%	2%
Adj. Flow (vph)	76	57	188	916	791	208
Shared Lane Traffic (%)						
Lane Group Flow (vph)	76	57	188	916	791	208
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.04	1.09	1.04
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1	1	1	1	1
Detector Template						
Leading Detector (m)	15.2	15.2	15.2	15.2	15.2	15.2
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	15.2	15.2	15.2	15.2	15.2	15.2
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	21.0	21.0	69.0	69.0	69.0	69.0
Total Split (%)	23.3%	23.3%	76.7%	76.7%	76.7%	76.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	Min	Min	Min	Min
Act Effct Green (s)	7.7	7.7	30.2	30.2	30.2	30.2

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Actuated g/C Ratio	0.18	0.18	0.72	0.72	0.72	0.72
v/c Ratio	0.25	0.18	0.43	0.38	0.33	0.18
Control Delay	19.0	7.8	8.3	4.1	3.9	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	7.8	8.3	4.1	3.9	1.1
LOS	B	A	A	A	A	A
Approach Delay	14.2			4.8	3.3	
Approach LOS	B			A	A	
Queue Length 50th (m)	4.9	0.0	5.4	13.1	10.8	0.0
Queue Length 95th (m)	15.3	7.2	19.7	25.1	21.1	4.5
Internal Link Dist (m)	237.2			537.2	306.7	
Turn Bay Length (m)	20.0		120.0			40.0
Base Capacity (vph)	717	666	605	3394	3316	1500
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.09	0.31	0.27	0.24	0.14

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 42.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.43	
Intersection Signal Delay: 4.7	Intersection LOS: A
Intersection Capacity Utilization 45.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 10: Jockvale Road & Blackleaf Drive

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	ø4
Lane Configurations							
Volume (vph)	1002	115	93	594	45	45	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Lane Width (m)	3.8	3.5	3.5	3.8	3.5	2.4	
Grade (%)	2%			2%	0%		
Storage Length (m)		50.0	70.0		20.0	0.0	
Storage Lanes		1	1		0	1	
Taper Length (m)			7.5		7.5		
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3393	1468	1641	3393	1658	1300	
Flt Permitted			0.252				
Satd. Flow (perm)	3393	1468	435	3393	1745	1300	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		125				49	
Link Speed (k/h)	60			60	40		
Link Distance (m)	187.7			561.2	141.1		
Travel Time (s)	11.3			33.7	12.7		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	1089	125	101	646	49	49	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1089	125	101	646	49	49	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.5			3.5	3.5		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	4.8			4.8	4.8		
Two way Left Turn Lane							
Headway Factor	1.06	1.10	1.10	1.06	1.09	1.28	
Turning Speed (k/h)		14	24		24	14	
Number of Detectors	2	1	1	2	1	1	
Detector Template	Thru	Right	Left	Thru	Left	Right	
Leading Detector (m)	10.0	2.0	2.0	10.0	2.0	2.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	0.6	2.0	2.0	0.6	2.0	2.0	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)	9.4			9.4			
Detector 2 Size(m)	0.6			0.6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			
Turn Type	NA	Perm	Perm	NA	Perm	Perm	
Protected Phases	2			6			4
Permitted Phases		2	6		8	8	
Detector Phase	2	2	6	6	8	8	
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	69.0	69.0	69.0	69.0	21.0	21.0	21.0
Total Split (%)	76.7%	76.7%	76.7%	76.7%	23.3%	23.3%	23%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag							

Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	ø4
Lead-Lag Optimize?							
Recall Mode	Max	Max	Max	Max	None	None	None
Act Effct Green (s)	77.1	77.1	77.1	77.1	8.0	8.0	
Actuated g/C Ratio	0.85	0.85	0.85	0.85	0.09	0.09	
v/c Ratio	0.38	0.10	0.27	0.22	0.32	0.31	
Control Delay	2.4	0.6	4.2	1.9	43.2	16.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	2.4	0.6	4.2	1.9	43.2	16.2	
LOS	A	A	A	A	D	B	
Approach Delay	2.2			2.2	29.7		
Approach LOS	A			A	C		
Queue Length 50th (m)	18.1	0.0	2.8	8.9	8.7	0.0	
Queue Length 95th (m)	29.3	2.7	8.7	15.1	17.6	9.7	
Internal Link Dist (m)	163.7			537.2	117.1		
Turn Bay Length (m)		50.0	70.0		20.0		
Base Capacity (vph)	2899	1272	371	2899	329	285	
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	0.38	0.10	0.27	0.22	0.15	0.17	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.38
Intersection Signal Delay: 3.5 — Intersection LOS: A
Intersection Capacity Utilization 48.0% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 20: Jockvale Road & Golflinks

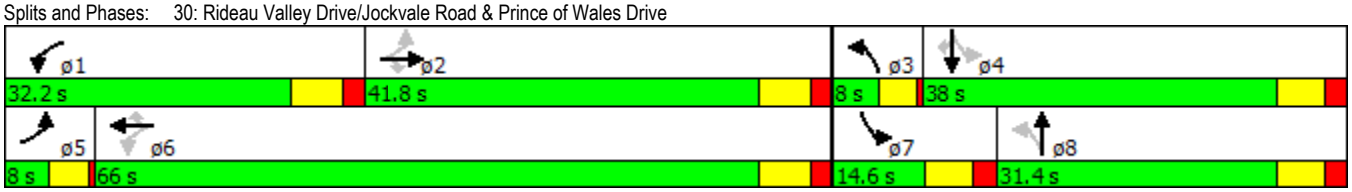
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	64	423	6	473	853	581	17	393	287	199	355	68
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.2	3.5	3.5	3.2	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			2%			3%			-10%	
Storage Length (m)	100.0		45.0	230.0		30.0	60.0		55.0	75.0		90.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.98				1.00					0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1556	3221	1441	1555	3219	1440	1617	3234	1447	1724	3448	1542
Flt Permitted	0.308			0.276			0.523			0.324		
Satd. Flow (perm)	505	3221	1416	452	3219	1440	888	3234	1447	588	3448	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			222			259			312			165
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		528.5			331.7			398.7			638.3	
Travel Time (s)		23.8			14.9			23.9			38.3	
Confl. Peds. (#/hr)			3				3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	70	460	7	514	927	632	18	427	312	216	386	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	70	460	7	514	927	632	18	427	312	216	386	74
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.2			3.2			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.09	1.09	1.15	1.10	1.10	1.11	1.11	1.11	1.02	1.02	1.02
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	1	1	1	1	1	1	1	1	1	1	1
Detector Template												
Leading Detector (m)	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		Free	4		4
Detector Phase	5	2	2	1	6	6	3	8		7	4	4
Switch Phase												
Minimum Initial (s)	4.0	20.0	20.0	5.0	20.0	20.0	4.0	10.0		5.0	10.0	10.0
Minimum Split (s)	8.0	41.6	41.6	11.6	41.6	41.6	8.0	31.4		11.4	31.4	31.4
Total Split (s)	8.0	41.8	41.8	32.2	66.0	66.0	8.0	31.4		14.6	38.0	38.0
Total Split (%)	6.7%	34.8%	34.8%	26.8%	55.0%	55.0%	6.7%	26.2%		12.2%	31.7%	31.7%
Yellow Time (s)	3.5	4.6	4.6	4.6	4.6	4.6	3.5	4.2		4.2	4.2	4.2
All-Red Time (s)	0.5	2.0	2.0	2.0	2.0	2.0	0.5	2.2		2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	6.6	6.6	6.6	6.6	6.6	4.0	6.4		6.4	6.4	6.4
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Ped	Ped	None	Ped	Ped	None	Max		None	Max	Max

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	30.5	23.9	23.9	56.2	49.8	49.8	31.5	25.1	108.9	39.7	36.7	36.7
Actuated g/C Ratio	0.28	0.22	0.22	0.52	0.46	0.46	0.29	0.23	1.00	0.36	0.34	0.34
v/c Ratio	0.39	0.65	0.01	1.04	0.63	0.79	0.06	0.57	0.22	0.72	0.33	0.12
Control Delay	23.2	43.1	0.0	75.5	25.0	22.9	24.1	41.6	0.3	42.9	29.8	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	43.1	0.0	75.5	25.0	22.9	24.1	41.6	0.3	42.9	29.8	0.4
LOS	C	D	A	E	C	C	C	D	A	D	C	A
Approach Delay		40.0			36.9			24.2			30.8	
Approach LOS		D			D			C			C	
Queue Length 50th (m)	6.8	47.0	0.0	~88.3	79.0	70.9	2.2	40.3	0.0	30.9	28.5	0.0
Queue Length 95th (m)	13.3	63.0	0.0	#158.1	98.7	120.8	7.9	65.8	0.0	#71.9	54.4	0.0
Internal Link Dist (m)		504.5			307.7			374.7			614.3	
Turn Bay Length (m)	100.0		45.0	230.0		30.0	60.0		55.0	75.0		90.0
Base Capacity (vph)	180	1043	609	493	1760	904	283	744	1447	300	1160	620
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.44	0.01	1.04	0.53	0.70	0.06	0.57	0.22	0.72	0.33	0.12

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 108.9
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.04
Intersection Signal Delay: 33.9 Intersection LOS: C
Intersection Capacity Utilization 89.1% ICU Level of Service E
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: 30: Rideau Valley Drive/Jockvale Road & Prince of Wales Drive



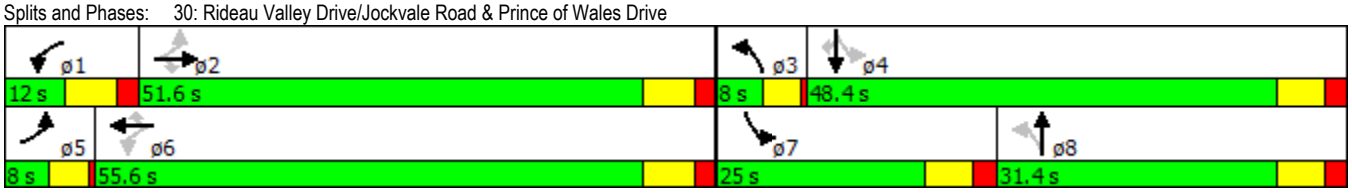
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	816	8	149	348	129	2	262	400	591	249	71
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.2	3.5	3.5	3.2	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			2%			3%			-10%	
Storage Length (m)	100.0		45.0	90.0		30.0	60.0		55.0	120.0		90.0
Storage Lanes	1		1	2		1	1		1	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor			0.98				1.00					0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1556	3221	1441	3018	3219	1440	1617	3234	1447	3344	3448	1542
Flt Permitted	0.528			0.124			0.585			0.448		
Satd. Flow (perm)	865	3221	1416	394	3219	1440	993	3234	1447	1577	3448	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			162			162			222			105
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		528.5			331.7			398.7			638.3	
Travel Time (s)		23.8			14.9			23.9			38.3	
Confl. Peds. (#/hr)			3				3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	71	887	9	162	378	140	2	285	435	642	271	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	887	9	162	378	140	2	285	435	642	271	77
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.4			6.4			7.0			7.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.09	1.09	1.15	1.10	1.10	1.11	1.11	1.11	1.02	1.02	1.02
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	1	1	1	1	1	1	1	1	1	1	1
Detector Template												
Leading Detector (m)	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		Free	4		4
Detector Phase	5	2	2	1	6	6	3	8		7	4	4
Switch Phase												
Minimum Initial (s)	4.0	20.0	20.0	5.0	20.0	20.0	4.0	10.0		5.0	10.0	10.0
Minimum Split (s)	8.0	41.6	41.6	11.6	41.6	41.6	8.0	31.4		11.4	31.4	31.4
Total Split (s)	8.0	51.6	51.6	12.0	55.6	55.6	8.0	31.4		25.0	48.4	48.4
Total Split (%)	6.7%	43.0%	43.0%	10.0%	46.3%	46.3%	6.7%	26.2%		20.8%	40.3%	40.3%
Yellow Time (s)	3.5	4.6	4.6	4.6	4.6	4.6	3.5	4.2		4.2	4.2	4.2
All-Red Time (s)	0.5	2.0	2.0	2.0	2.0	2.0	0.5	2.2		2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	6.6	6.6	6.6	6.6	6.6	4.0	6.4		6.4	6.4	6.4
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Ped	Ped	None	Ped	Ped	None	Max		None	Max	Max

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	42.2	35.6	35.6	45.6	41.4	41.4	31.6	25.1	110.0	49.3	47.8	47.8
Actuated g/C Ratio	0.38	0.32	0.32	0.41	0.38	0.38	0.29	0.23	1.00	0.45	0.43	0.43
v/c Ratio	0.20	0.85	0.02	0.55	0.31	0.22	0.01	0.39	0.30	0.65	0.18	0.11
Control Delay	19.0	43.5	0.0	26.0	25.3	3.1	20.0	39.2	0.5	25.2	21.2	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	43.5	0.0	26.0	25.3	3.1	20.0	39.2	0.5	25.2	21.2	2.6
LOS	B	D	A	C	C	A	B	D	A	C	C	A
Approach Delay		41.3			20.9			15.9			22.4	
Approach LOS		D			C			B			C	
Queue Length 50th (m)	8.5	93.8	0.0	10.6	30.9	0.0	0.2	27.7	0.0	47.4	17.9	0.0
Queue Length 95th (m)	16.6	117.6	0.0	16.8	42.5	8.6	1.8	44.2	0.0	71.2	33.8	5.5
Internal Link Dist (m)		504.5			307.7			374.7			614.3	
Turn Bay Length (m)	100.0		45.0	90.0		30.0	60.0		55.0	120.0		90.0
Base Capacity (vph)	356	1324	677	292	1442	734	307	739	1447	1007	1499	719
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.67	0.01	0.55	0.26	0.19	0.01	0.39	0.30	0.64	0.18	0.11

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 110
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 26.1 Intersection LOS: C
Intersection Capacity Utilization 76.1% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 30: Rideau Valley Drive/Jockvale Road & Prince of Wales Drive



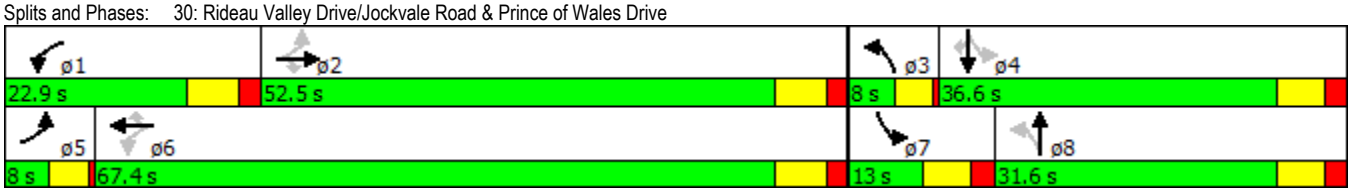
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	64	423	6	473	853	581	17	393	287	199	355	68
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.2	3.5	3.5	3.2	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			2%			3%			-10%	
Storage Length (m)	100.0		45.0	90.0		30.0	60.0		55.0	120.0		90.0
Storage Lanes	1		1	2		1	1		1	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor			0.98				1.00					0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1556	3221	1441	3018	3219	1440	1617	3234	1447	3344	3448	1542
Flt Permitted	0.291			0.325			0.523			0.344		
Satd. Flow (perm)	477	3221	1416	1032	3219	1440	888	3234	1447	1211	3448	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			164			261			312			165
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		528.5			331.7			398.7			638.3	
Travel Time (s)		23.8			14.9			23.9			38.3	
Confl. Peds. (#/hr)			3				3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	70	460	7	514	927	632	18	427	312	216	386	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	70	460	7	514	927	632	18	427	312	216	386	74
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.4			6.4			7.0			7.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.09	1.09	1.15	1.10	1.10	1.11	1.11	1.11	1.02	1.02	1.02
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	1	1	1	1	1	1	1	1	1	1	1
Detector Template												
Leading Detector (m)	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		Free	4		4
Detector Phase	5	2	2	1	6	6	3	8		7	4	4
Switch Phase												
Minimum Initial (s)	4.0	20.0	20.0	5.0	20.0	20.0	4.0	10.0		5.0	10.0	10.0
Minimum Split (s)	8.0	41.6	41.6	11.6	41.6	41.6	8.0	31.4		11.4	31.4	31.4
Total Split (s)	8.0	52.5	52.5	22.9	67.4	67.4	8.0	31.6		13.0	36.6	36.6
Total Split (%)	6.7%	43.8%	43.8%	19.1%	56.2%	56.2%	6.7%	26.3%		10.8%	30.5%	30.5%
Yellow Time (s)	3.5	4.6	4.6	4.6	4.6	4.6	3.5	4.2		4.2	4.2	4.2
All-Red Time (s)	0.5	2.0	2.0	2.0	2.0	2.0	0.5	2.2		2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	6.6	6.6	6.6	6.6	6.6	4.0	6.4		6.4	6.4	6.4
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Ped	Ped	None	Ped	Ped	None	Max		None	Max	Max

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	34.7	28.0	28.0	49.8	43.5	43.5	32.0	25.5	101.6	38.1	35.8	35.8
Actuated g/C Ratio	0.34	0.28	0.28	0.49	0.43	0.43	0.31	0.25	1.00	0.38	0.35	0.35
v/c Ratio	0.34	0.52	0.01	0.64	0.67	0.83	0.06	0.53	0.22	0.36	0.32	0.12
Control Delay	18.5	32.6	0.0	19.4	25.9	24.7	23.8	37.5	0.3	25.2	28.1	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.5	32.6	0.0	19.4	25.9	24.7	23.8	37.5	0.3	25.2	28.1	0.4
LOS	B	C	A	B	C	C	C	D	A	C	C	A
Approach Delay		30.4			23.9			21.9			24.1	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	6.6	40.4	0.0	30.5	77.0	68.5	2.0	36.4	0.0	13.5	25.9	0.0
Queue Length 95th (m)	12.9	54.4	0.0	40.4	96.2	117.1	8.0	65.7	0.0	28.5	55.3	0.0
Internal Link Dist (m)		504.5			307.7			374.7			614.3	
Turn Bay Length (m)	100.0		45.0	90.0		30.0	60.0		55.0	120.0		90.0
Base Capacity (vph)	205	1471	735	828	1948	974	308	811	1447	594	1213	641
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.31	0.01	0.62	0.48	0.65	0.06	0.53	0.22	0.36	0.32	0.12

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 101.6
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 24.4 Intersection LOS: C
Intersection Capacity Utilization 74.7% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 30: Rideau Valley Drive/Jockvale Road & Prince of Wales Drive



APPENDIX G3

Synchro Intersection Analysis Reports
Total Traffic
and
Rodel Analysis Results

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	150	102	35	531	481	51
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	4.8	4.8	3.7	3.7	3.7	3.7
Storage Length (m)	0.0	0.0	110.0			0.0
Storage Lanes	1	0	1			1
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99					0.98
Frt	0.945					0.850
Flt Protected	0.971		0.950			
Satd. Flow (prot)	1819	0	1679	1767	1784	1517
Flt Permitted	0.971		0.380			
Satd. Flow (perm)	1819	0	671	1767	1784	1484
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	39					56
Link Speed (k/h)	40			70	70	
Link Distance (m)	261.2			561.2	330.7	
Travel Time (s)	23.5			28.9	17.0	
Confl. Bikes (#/hr)		1				3
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Adj. Flow (vph)	165	112	38	584	529	56
Shared Lane Traffic (%)						
Lane Group Flow (vph)	277	0	38	584	529	56
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	4.8			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.91	0.91	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1		1	1	1	1
Detector Template						
Leading Detector (m)	15.2		15.2	15.2	15.2	15.2
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	15.2		15.2	15.2	15.2	15.2
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Turn Type	Prot		Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Detector Phase	4		2	2	6	6
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	20.0		20.0	20.0	20.0	20.0
Total Split (s)	31.0		59.0	59.0	59.0	59.0
Total Split (%)	34.4%		65.6%	65.6%	65.6%	65.6%
Maximum Green (s)	27.0		55.0	55.0	55.0	55.0
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	0.5		0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Recall Mode	None		Min	Min	Min	Min
Walk Time (s)	5.0		5.0	5.0	5.0	5.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	11.5		21.9	21.9	21.9	21.9
Actuated g/C Ratio	0.28		0.52	0.52	0.52	0.52
v/c Ratio	0.52		0.11	0.63	0.57	0.07
Control Delay	15.7		6.6	11.2	10.0	2.3
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	15.7		6.6	11.2	10.0	2.3
LOS	B		A	B	A	A
Approach Delay	15.7			10.9	9.2	
Approach LOS	B			B	A	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 41.8	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 11.1	Intersection LOS: B
Intersection Capacity Utilization 52.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 10: Jockvale Road & Blackleaf Drive

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	4	395	29	39	698	1	11	0	10	96	0	62
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		2%			2%			-4%			0%	
Storage Length (m)	50.0		0.0	80.0		0.0	15.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990						0.850			0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1678	1733	0	1678	1749	0	1729	1547	0	1695	1517	0
Flt Permitted	0.308			0.491			0.715			0.751		
Satd. Flow (perm)	544	1733	0	867	1749	0	1301	1547	0	1340	1517	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10						289			519	
Link Speed (k/h)		70			70			40			40	
Link Distance (m)		187.7			561.2			113.1			134.1	
Travel Time (s)		9.7			28.9			10.2			12.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	4	411	30	41	727	1	11	0	10	100	0	65
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	441	0	41	728	0	11	10	0	100	65	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.03	1.03	1.03	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	68.0	68.0		68.0	68.0		22.0	22.0		22.0	22.0	
Total Split (%)	75.6%	75.6%		75.6%	75.6%		24.4%	24.4%		24.4%	24.4%	
Maximum Green (s)	64.0	64.0		64.0	64.0		18.0	18.0		18.0	18.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	32.2	32.2		32.2	32.2		9.1	9.1		9.3	9.3	
Actuated g/C Ratio	0.71	0.71		0.71	0.71		0.20	0.20		0.20	0.20	
v/c Ratio	0.01	0.36		0.07	0.59		0.04	0.02		0.37	0.09	
Control Delay	3.8	5.2		4.1	7.9		17.4	0.1		22.1	0.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.8	5.2		4.1	7.9		17.4	0.1		22.1	0.2	
LOS	A	A		A	A		B	A		C	A	
Approach Delay		5.2			7.7			9.1			13.5	
Approach LOS		A			A			A			B	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 45.4
Natural Cycle: 55
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.59
Intersection Signal Delay: 7.6 — Intersection LOS: A
Intersection Capacity Utilization 57.8% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 20: Street 1/Golflinks & Jockvale Road

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	730	1	0	378	0	11
Sign Control	Free			Free	Stop	
Grade	-10%			2%	-4%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	793	1	0	411	0	12
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	188					
pX, platoon unblocked			0.75		0.75	0.75
vC, conflicting volume			795		1205	794
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			564		1108	563
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	97
cM capacity (veh/h)			756		175	396

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	795	411	12
Volume Left	0	0	0
Volume Right	1	0	12
cSH	1700	1700	396
Volume to Capacity	0.47	0.24	0.03
Queue Length 95th (m)	0.0	0.0	0.7
Control Delay (s)	0.0	0.0	14.4
Lane LOS			B
Approach Delay (s)	0.0	0.0	14.4
Approach LOS			B

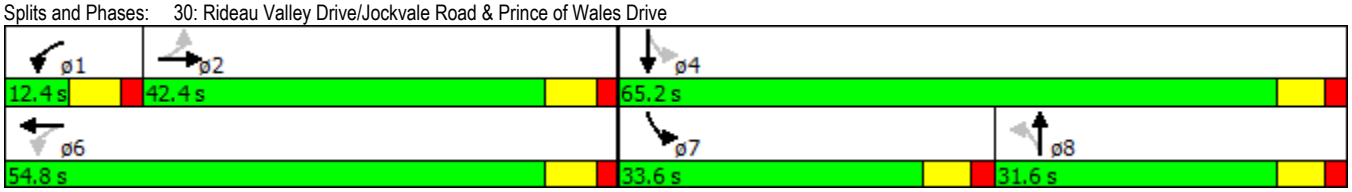
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	709	7	129	302	118	1	229	347	541	221	63
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		0%			2%			3%			-10%	
Storage Length (m)	100.0		0.0	230.0		0.0	0.0		55.0	75.0		0.0
Storage Lanes	1		0	1		0	0		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00						1.00			1.00	
Frt		0.998			0.958				0.850		0.967	
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1647	3286	0	1646	3153	0	0	1740	1479	1763	1788	0
Flt Permitted	0.489			0.125				0.999		0.325		
Satd. Flow (perm)	848	3286	0	217	3153	0	0	1739	1479	603	1788	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			57				236		17	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		528.5			331.7			398.7			638.3	
Travel Time (s)		23.8			14.9			20.5			32.8	
Confl. Peds. (#/hr)			3				3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	62	771	8	140	328	128	1	249	377	588	240	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	779	0	140	456	0	0	250	377	588	308	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.07	1.07	1.07	1.08	1.08	1.08	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	1		1	1		1	1	1	1	1	
Detector Template												
Leading Detector (m)	15.2	15.2		15.2	15.2		15.2	15.2	15.2	15.2	15.2	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	15.2	15.2		15.2	15.2		15.2	15.2	15.2	15.2	15.2	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Free	pm+pt	NA	
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2			6			8		Free	4		
Detector Phase	2	2		1	6		8	8		7	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0		10.0	10.0		5.0	10.0	
Minimum Split (s)	41.6	41.6		11.6	41.6		31.4	31.4		11.4	31.4	
Total Split (s)	42.4	42.4		12.4	54.8		31.6	31.6		33.6	65.2	
Total Split (%)	35.3%	35.3%		10.3%	45.7%		26.3%	26.3%		28.0%	54.3%	
Maximum Green (s)	35.8	35.8		5.8	48.2		25.2	25.2		27.2	58.8	
Yellow Time (s)	4.6	4.6		4.6	4.6		4.2	4.2		4.2	4.2	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	6.6	6.6		6.6	6.6			6.4		6.4	6.4	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	Ped	Ped		None	Ped		Max	Max		None	Max	
Walk Time (s)	7.0	7.0			7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	13.0	13.0			13.0		18.0	18.0			18.0	
Pedestrian Calls (#/hr)	0	0			0		2	2			0	
Act Effct Green (s)	31.7	31.7		44.1	44.1			25.2	116.0	58.9	58.9	
Actuated g/C Ratio	0.27	0.27		0.38	0.38			0.22	1.00	0.51	0.51	
v/c Ratio	0.27	0.87		0.91	0.37			0.66	0.25	1.02	0.34	
Control Delay	36.1	51.3		81.9	23.2			51.9	0.4	66.4	17.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	36.1	51.3		81.9	23.2			51.9	0.4	66.4	17.9	
LOS	D	D		F	C			D	A	E	B	
Approach Delay		50.2			37.0			20.9			49.7	
Approach LOS		D			D			C			D	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 116	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 41.2	Intersection LOS: D
Intersection Capacity Utilization 99.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 30: Rideau Valley Drive/Jockvale Road & Prince of Wales Drive



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	69	52	171	735	646	189
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	4.8	4.8	3.7	3.7	3.7	3.7
Storage Length (m)	0.0	0.0	110.0			0.0
Storage Lanes	1	0	1			1
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99					0.98
Frt	0.942					0.850
Flt Protected	0.972		0.950			
Satd. Flow (prot)	1814	0	1679	1767	1784	1517
Flt Permitted	0.972		0.334			
Satd. Flow (perm)	1814	0	590	1767	1784	1484
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	36					208
Link Speed (k/h)	40			70	70	
Link Distance (m)	261.2			561.2	330.7	
Travel Time (s)	23.5			28.9	17.0	
Confl. Bikes (#/hr)		1				3
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Adj. Flow (vph)	76	57	188	808	710	208
Shared Lane Traffic (%)						
Lane Group Flow (vph)	133	0	188	808	710	208
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	4.8			3.7	3.7	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.91	0.91	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1		1	1	1	1
Detector Template						
Leading Detector (m)	15.2		15.2	15.2	15.2	15.2
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	15.2		15.2	15.2	15.2	15.2
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Turn Type	Prot		Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Detector Phase	4		2	2	6	6
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	20.0		20.0	20.0	20.0	20.0
Total Split (s)	20.0		70.0	70.0	70.0	70.0
Total Split (%)	22.2%		77.8%	77.8%	77.8%	77.8%
Maximum Green (s)	16.0		66.0	66.0	66.0	66.0
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	0.5		0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0		4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Recall Mode	None		Min	Min	Min	Min
Walk Time (s)	5.0		5.0	5.0	5.0	5.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	8.6		38.0	38.0	38.0	38.0
Actuated g/C Ratio	0.17		0.75	0.75	0.75	0.75
v/c Ratio	0.40		0.43	0.61	0.53	0.18
Control Delay	20.3		8.0	7.4	6.2	1.0
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	20.3		8.0	7.4	6.2	1.0
LOS	C		A	A	A	A
Approach Delay	20.3			7.5	5.0	
Approach LOS	C			A	A	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 50.9	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 7.2	Intersection LOS: A
Intersection Capacity Utilization 63.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: Jockvale Road & Blackleaf Drive

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	19	874	115	93	528	6	5	0	5	45	0	45
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		2%			2%			-4%			0%	
Storage Length (m)	50.0		0.0	80.0		0.0	15.0		0.0	35.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.983			0.998			0.850			0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1678	1722	0	1678	1746	0	1729	1547	0	1695	1517	0
Flt Permitted	0.433			0.201			0.726			0.754		
Satd. Flow (perm)	765	1722	0	355	1746	0	1321	1547	0	1345	1517	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			2			415			215	
Link Speed (k/h)		70			70			40			40	
Link Distance (m)		187.7			561.2			113.1			134.1	
Travel Time (s)		9.7			28.9			10.2			12.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	20	910	120	97	550	6	5	0	5	47	0	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	1030	0	97	556	0	5	5	0	47	47	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.07	1.07	1.07	1.07	1.07	1.07	1.03	1.03	1.03	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	70.0	70.0		70.0	70.0		20.0	20.0		20.0	20.0	
Total Split (%)	77.8%	77.8%		77.8%	77.8%		22.2%	22.2%		22.2%	22.2%	
Maximum Green (s)	66.0	66.0		66.0	66.0		16.0	16.0		16.0	16.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5	0.5		0.5	0.5		0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Walk Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	50.4	50.4		50.4	50.4		8.6	8.6		8.6	8.6	
Actuated g/C Ratio	0.81	0.81		0.81	0.81		0.14	0.14		0.14	0.14	
v/c Ratio	0.03	0.74		0.34	0.40		0.03	0.01		0.26	0.12	
Control Delay	2.4	9.0		6.8	3.8		30.6	0.0		33.8	0.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	2.4	9.0		6.8	3.8		30.6	0.0		33.8	0.6	
LOS	A	A		A	A		C	A		C	A	
Approach Delay		8.9			4.2			15.3			17.2	
Approach LOS		A			A			B			B	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 62.6	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 7.7	Intersection LOS: A
Intersection Capacity Utilization 80.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 20: Street 1/Golflinks & Jockvale Road

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	502	5	0	845	0	5
Sign Control	Free			Free	Stop	
Grade	-10%			2%	-4%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	546	5	0	918	0	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	188					
pX, platoon unblocked			0.92		0.92	0.92
vC, conflicting volume			551		1467	548
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			464		1464	461
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			1000		130	550

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	551	918	5
Volume Left	0	0	0
Volume Right	5	0	5
cSH	1700	1700	550
Volume to Capacity	0.32	0.54	0.01
Queue Length 95th (m)	0.0	0.0	0.2
Control Delay (s)	0.0	0.0	11.6
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.6
Approach LOS			B

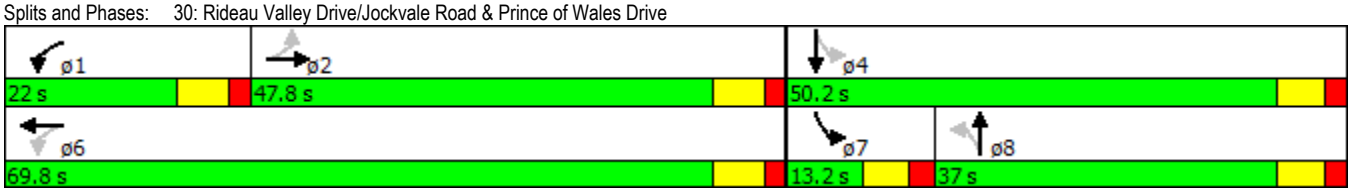
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	56	367	5	411	741	530	15	346	249	187	310	59
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Grade (%)		0%			2%			3%			-10%	
Storage Length (m)	100.0		0.0	230.0		0.0	0.0		55.0	75.0		0.0
Storage Lanes	1		0	1		0	0		1	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00						1.00			1.00	
Frt		0.998			0.937				0.850		0.976	
Flt Protected	0.950			0.950				0.998		0.950		
Satd. Flow (prot)	1647	3286	0	1646	3084	0	0	1737	1479	1763	1806	0
Flt Permitted	0.134			0.373				0.973		0.213		
Satd. Flow (perm)	232	3286	0	646	3084	0	0	1693	1479	395	1806	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			227				209		9	
Link Speed (k/h)		80			80			70			70	
Link Distance (m)		528.5			331.7			398.7			638.3	
Travel Time (s)		23.8			14.9			20.5			32.8	
Confl. Peds. (#/hr)			3				3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	61	399	5	447	805	576	16	376	271	203	337	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	61	404	0	447	1381	0	0	392	271	203	401	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.07	1.07	1.07	1.08	1.08	1.08	0.99	0.99	0.99
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	1		1	1		1	1	1	1	1	
Detector Template												
Leading Detector (m)	15.2	15.2		15.2	15.2		15.2	15.2	15.2	15.2	15.2	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	15.2	15.2		15.2	15.2		15.2	15.2	15.2	15.2	15.2	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Free	pm+pt	NA	
Protected Phases		2		1	6			8		7	4	
Permitted Phases	2			6			8		Free	4		
Detector Phase	2	2		1	6		8	8		7	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0		5.0	20.0		10.0	10.0		5.0	10.0	
Minimum Split (s)	41.6	41.6		11.6	41.6		31.4	31.4		11.4	31.4	
Total Split (s)	47.8	47.8		22.0	69.8		37.0	37.0		13.2	50.2	
Total Split (%)	39.8%	39.8%		18.3%	58.2%		30.8%	30.8%		11.0%	41.8%	
Maximum Green (s)	41.2	41.2		15.4	63.2		30.6	30.6		6.8	43.8	
Yellow Time (s)	4.6	4.6		4.6	4.6		4.2	4.2		4.2	4.2	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Lost Time (s)	6.6	6.6		6.6	6.6			6.4		6.4	6.4	
Lead/Lag	Lag	Lag		Lead			Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	Ped	Ped		None	Ped		Max	Max		None	Max	
Walk Time (s)	7.0	7.0			7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	13.0	13.0			13.0		18.0	18.0			18.0	
Pedestrian Calls (#/hr)	0	0			0		2	2			0	
Act Effct Green (s)	31.9	31.9		54.0	54.0			30.8	111.2	44.1	44.1	
Actuated g/C Ratio	0.29	0.29		0.49	0.49			0.28	1.00	0.40	0.40	
v/c Ratio	0.92	0.43		0.99	0.86			0.84	0.18	0.85	0.56	
Control Delay	132.8	33.0		63.4	26.6			56.4	0.3	58.7	30.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	132.8	33.0		63.4	26.6			56.4	0.3	58.7	30.6	
LOS	F	C		E	C			E	A	E	C	
Approach Delay		46.1			35.6			33.4			40.1	
Approach LOS		D			D			C			D	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 111.2	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 37.3	Intersection LOS: D
Intersection Capacity Utilization 119.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 30: Rideau Valley Drive/Jockvale Road & Prince of Wales Drive

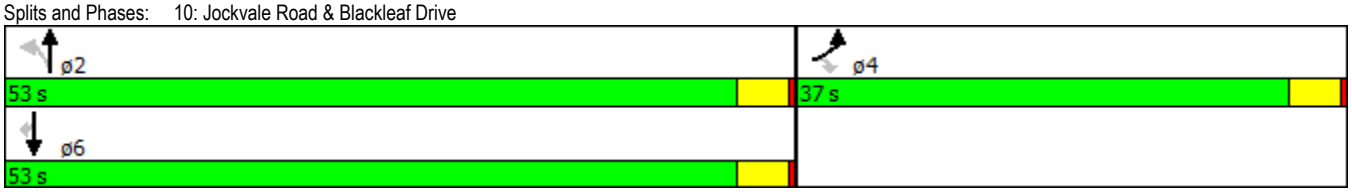


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	150	102	35	600	550	51
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.8	3.5	3.8
Storage Length (m)	20.0	0.0	120.0			40.0
Storage Lanes	1	1	1			1
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor		0.99				0.98
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1658	1483	1642	3394	3316	1533
Flt Permitted	0.950		0.423			
Satd. Flow (perm)	1658	1465	731	3394	3316	1500
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		112				56
Link Speed (k/h)	40			60	60	
Link Distance (m)	261.2			561.2	330.7	
Travel Time (s)	23.5			33.7	19.8	
Confl. Bikes (#/hr)		1				3
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Adj. Flow (vph)	165	112	38	659	604	56
Shared Lane Traffic (%)						
Lane Group Flow (vph)	165	112	38	659	604	56
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.04	1.09	1.04
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1	1	1	1	1
Detector Template						
Leading Detector (m)	15.2	15.2	15.2	15.2	15.2	15.2
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	15.2	15.2	15.2	15.2	15.2	15.2
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	37.0	37.0	53.0	53.0	53.0	53.0
Total Split (%)	41.1%	41.1%	58.9%	58.9%	58.9%	58.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	Min	Min	Min	Min
Act Effct Green (s)	9.0	9.0	15.4	15.4	15.4	15.4

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Actuated g/C Ratio	0.28	0.28	0.47	0.47	0.47	0.47
v/c Ratio	0.36	0.23	0.11	0.41	0.38	0.08
Control Delay	11.3	3.9	6.5	6.9	6.8	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.3	3.9	6.5	6.9	6.8	2.5
LOS	B	A	A	A	A	A
Approach Delay	8.3			6.9	6.4	
Approach LOS	A			A	A	
Queue Length 50th (m)	5.4	0.0	0.9	9.5	8.6	0.0
Queue Length 95th (m)	16.4	6.0	4.2	20.4	18.6	3.1
Internal Link Dist (m)	237.2			537.2	306.7	
Turn Bay Length (m)	20.0		120.0			40.0
Base Capacity (vph)	1580	1401	731	3394	3316	1500
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.08	0.05	0.19	0.18	0.04

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 32.5	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.41	
Intersection Signal Delay: 6.9	Intersection LOS: A
Intersection Capacity Utilization 38.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 10: Jockvale Road & Blackleaf Drive



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	4	447	29	39	801	1	11	0	10	96	0	62
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.8	3.5	3.5	3.8	3.5	3.5	3.5	2.4	3.5	3.5	2.4
Grade (%)		2%			2%			-4%			0%	
Storage Length (m)	50.0		50.0	80.0		20.0	20.0		0.0	35.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.850			0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1641	3393	1468	1641	3393	1468	1691	1513	0	1658	1483	0
Flt Permitted	0.314			0.475			0.713			0.750		
Satd. Flow (perm)	542	3393	1468	821	3393	1468	1269	1513	0	1309	1483	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			32			12		174			398	
Link Speed (k/h)		60			60			40			40	
Link Distance (m)		187.7			561.2			158.6			141.1	
Travel Time (s)		11.3			33.7			14.3			12.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	486	32	42	871	1	12	0	11	104	0	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	486	32	42	871	1	12	11	0	104	67	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.10	1.06	1.10	1.10	1.06	1.10	1.06	1.06	1.25	1.09	1.09	1.28
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2		2	6		6	4			8		
Detector Phase	2	2	2	6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0		20.0	20.0	
Total Split (s)	60.0	60.0	60.0	60.0	60.0	60.0	30.0	30.0		30.0	30.0	
Total Split (%)	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%	33.3%	33.3%		33.3%	33.3%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lead-Lag Optimize?												
Recall Mode	Max	Max	Max	Max	Max	Max	None	None		None	None	
Act Effct Green (s)	63.2	63.2	63.2	63.2	63.2	63.2	11.3	11.3		11.6	11.6	
Actuated g/C Ratio	0.79	0.79	0.79	0.79	0.79	0.79	0.14	0.14		0.15	0.15	
v/c Ratio	0.01	0.18	0.03	0.06	0.32	0.00	0.07	0.03		0.55	0.12	
Control Delay	3.5	3.2	1.4	3.6	3.8	0.0	27.6	0.2		41.9	0.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	3.5	3.2	1.4	3.6	3.8	0.0	27.6	0.2		41.9	0.5	
LOS	A	A	A	A	A	A	C	A		D	A	
Approach Delay		3.1			3.7			14.5			25.7	
Approach LOS		A			A			B			C	
Queue Length 50th (m)	0.1	8.5	0.0	1.3	17.5	0.0	1.6	0.0		14.6	0.0	
Queue Length 95th (m)	0.9	16.7	2.2	4.6	32.3	0.0	5.7	0.0		27.9	0.0	
Internal Link Dist (m)		163.7			537.2			134.6			117.1	
Turn Bay Length (m)	50.0		50.0	80.0		20.0	20.0			35.0		
Base Capacity (vph)	430	2692	1171	651	2692	1167	414	611		427	752	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.01	0.18	0.03	0.06	0.32	0.00	0.03	0.02		0.24	0.09	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 79.7
Natural Cycle: 40
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 6.0 — Intersection LOS: A
Intersection Capacity Utilization 49.0% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 20: Street 1/Golflinks & Jockvale Road

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	837	1	0	433	0	11
Sign Control	Free			Free	Stop	
Grade	-10%			2%	-4%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	910	1	0	471	0	12
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	188					
pX, platoon unblocked			0.95		0.95	0.95
vC, conflicting volume			911		1146	455
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			794		1041	313
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			780		214	647

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	607	304	235	235	12
Volume Left	0	0	0	0	0
Volume Right	0	1	0	0	12
cSH	1700	1700	1700	1700	647
Volume to Capacity	0.36	0.18	0.14	0.14	0.02
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.4
Control Delay (s)	0.0	0.0	0.0	0.0	10.7
Lane LOS					B
Approach Delay (s)	0.0		0.0		10.7
Approach LOS					B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	34.5%	ICU Level of Service	A
Analysis Period (min)	15		

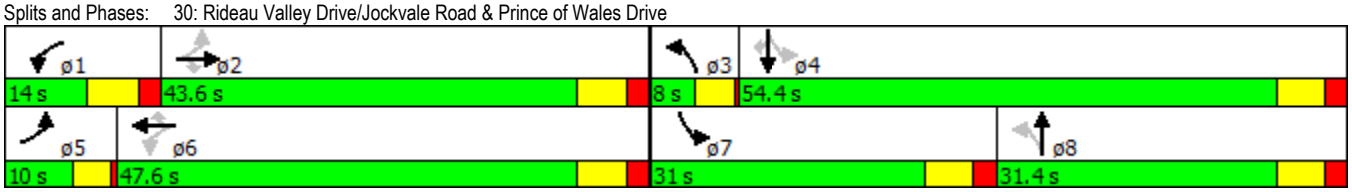
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	816	8	149	348	132	2	262	400	610	250	72
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.2	3.5	3.5	3.2	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			2%			3%			-10%	
Storage Length (m)	100.0		45.0	230.0		30.0	60.0		55.0	75.0		90.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.98				1.00					0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1556	3221	1441	1555	3219	1440	1617	3234	1447	1724	3448	1542
Flt Permitted	0.528			0.099			0.584			0.434		
Satd. Flow (perm)	865	3221	1416	162	3219	1440	991	3234	1447	788	3448	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			162			162			222			105
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		528.5			331.7			398.7			638.3	
Travel Time (s)		23.8			14.9			23.9			38.3	
Confl. Peds. (#/hr)			3				3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	71	887	9	162	378	143	2	285	435	663	272	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	887	9	162	378	143	2	285	435	663	272	78
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.2			3.2			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.09	1.09	1.15	1.10	1.10	1.11	1.11	1.11	1.02	1.02	1.02
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	1	1	1	1	1	1	1	1	1	1	1
Detector Template												
Leading Detector (m)	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		Free	4		4
Detector Phase	5	2	2	1	6	6	3	8		7	4	4
Switch Phase												
Minimum Initial (s)	4.0	20.0	20.0	5.0	20.0	20.0	4.0	10.0		5.0	10.0	10.0
Minimum Split (s)	8.0	41.6	41.6	11.6	41.6	41.6	8.0	31.4		11.4	31.4	31.4
Total Split (s)	10.0	43.6	43.6	14.0	47.6	47.6	8.0	31.4		31.0	54.4	54.4
Total Split (%)	8.3%	36.3%	36.3%	11.7%	39.7%	39.7%	6.7%	26.2%		25.8%	45.3%	45.3%
Yellow Time (s)	3.5	4.6	4.6	4.6	4.6	4.6	3.5	4.2		4.2	4.2	4.2
All-Red Time (s)	0.5	2.0	2.0	2.0	2.0	2.0	0.5	2.2		2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	6.6	6.6	6.6	6.6	6.6	4.0	6.4		6.4	6.4	6.4
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Ped	Ped	None	Ped	Ped	None	Max		None	Max	Max

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	44.1	35.5	35.5	47.4	41.6	41.6	31.4	25.0	118.5	56.0	54.4	54.4
Actuated g/C Ratio	0.37	0.30	0.30	0.40	0.35	0.35	0.26	0.21	1.00	0.47	0.46	0.46
v/c Ratio	0.20	0.92	0.02	1.07	0.33	0.23	0.01	0.42	0.30	1.17	0.17	0.10
Control Delay	21.2	55.5	0.0	120.4	29.9	4.0	19.0	43.0	0.5	121.6	20.0	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.2	55.5	0.0	120.4	29.9	4.0	19.0	43.0	0.5	121.6	20.0	2.3
LOS	C	E	A	F	C	A	B	D	A	F	C	A
Approach Delay		52.5			45.9			17.4			85.1	
Approach LOS		D			D			B			F	
Queue Length 50th (m)	9.5	104.8	0.0	~28.4	34.7	0.0	0.3	30.8	0.0	~170.5	19.0	0.0
Queue Length 95th (m)	18.4	#140.1	0.0	#71.8	47.7	10.3	1.7	44.2	0.0	#257.8	31.2	5.3
Internal Link Dist (m)		504.5			307.7			374.7			614.3	
Turn Bay Length (m)	100.0		45.0	230.0		30.0	60.0		55.0	75.0		90.0
Base Capacity (vph)	356	1006	553	152	1134	612	283	682	1447	566	1583	753
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.88	0.02	1.07	0.33	0.23	0.01	0.42	0.30	1.17	0.17	0.10

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 118.5
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.17
Intersection Signal Delay: 53.4 Intersection LOS: D
Intersection Capacity Utilization 98.2% ICU Level of Service F
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: 30: Rideau Valley Drive/Jockvale Road & Prince of Wales Drive

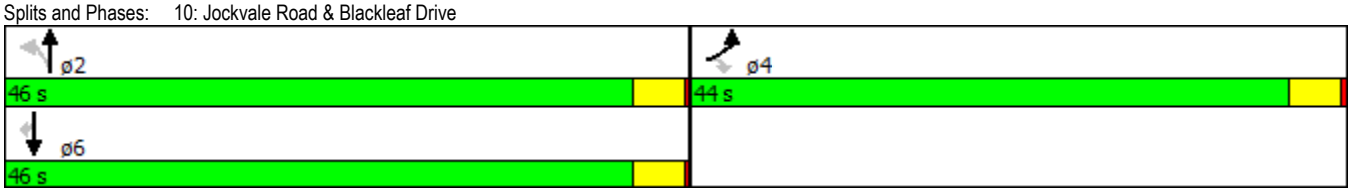


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	69	52	171	839	731	189
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.8	3.5	3.8
Storage Length (m)	20.0	0.0	120.0			40.0
Storage Lanes	1	1	1			1
Taper Length (m)	7.5		7.5			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor		0.99				0.98
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1658	1483	1642	3394	3316	1533
Flt Permitted	0.950		0.344			
Satd. Flow (perm)	1658	1465	594	3394	3316	1499
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		57				208
Link Speed (k/h)	40			60	60	
Link Distance (m)	261.2			561.2	330.7	
Travel Time (s)	23.5			33.7	19.8	
Confl. Bikes (#/hr)		1				3
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Adj. Flow (vph)	76	57	188	922	803	208
Shared Lane Traffic (%)						
Lane Group Flow (vph)	76	57	188	922	803	208
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.5			3.5	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.04	1.09	1.04
Turning Speed (k/h)	24	14	24			14
Number of Detectors	1	1	1	1	1	1
Detector Template						
Leading Detector (m)	15.2	15.2	15.2	15.2	15.2	15.2
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	15.2	15.2	15.2	15.2	15.2	15.2
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	44.0	44.0	46.0	46.0	46.0	46.0
Total Split (%)	48.9%	48.9%	51.1%	51.1%	51.1%	51.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	Min	Min	Min	Min
Act Effct Green (s)	8.3	8.3	43.6	43.6	43.6	43.6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Actuated g/C Ratio	0.15	0.15	0.78	0.78	0.78	0.78
v/c Ratio	0.31	0.22	0.41	0.35	0.31	0.17
Control Delay	26.6	9.5	7.0	3.4	3.3	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.6	9.5	7.0	3.4	3.3	0.9
LOS	C	A	A	A	A	A
Approach Delay	19.3			4.1	2.8	
Approach LOS	B			A	A	
Queue Length 50th (m)	7.8	0.0	6.1	14.6	12.2	0.0
Queue Length 95th (m)	17.4	8.0	19.3	25.2	21.4	4.3
Internal Link Dist (m)	237.2			537.2	306.7	
Turn Bay Length (m)	20.0		120.0			40.0
Base Capacity (vph)	1207	1082	461	2636	2575	1210
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	0.06	0.05	0.41	0.35	0.31	0.17

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 56.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.41	
Intersection Signal Delay: 4.4	Intersection LOS: A
Intersection Capacity Utilization 45.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 10: Jockvale Road & Blackleaf Drive



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	19	1002	115	93	599	6	5	0	5	45	0	45
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.8	3.5	3.5	3.8	3.5	3.5	3.5	2.4	3.5	3.5	2.4
Grade (%)		2%			2%			-4%			0%	
Storage Length (m)	50.0		50.0	80.0		20.0	20.0		0.0	35.0		0.0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.850			0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1641	3393	1468	1641	3393	1468	1691	1513	0	1658	1483	0
Flt Permitted	0.404			0.251			0.725			0.754		
Satd. Flow (perm)	698	3393	1468	434	3393	1468	1290	1513	0	1316	1483	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			125			12		339			150	
Link Speed (k/h)		60			60			40			40	
Link Distance (m)		187.7			561.2			158.6			141.1	
Travel Time (s)		11.3			33.7			14.3			12.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	1089	125	101	651	7	5	0	5	49	0	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	1089	125	101	651	7	5	5	0	49	49	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.10	1.06	1.10	1.10	1.06	1.10	1.06	1.06	1.25	1.09	1.09	1.28
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2		2	6		6	4			8		
Detector Phase	2	2	2	6	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0		20.0	20.0	
Total Split (s)	69.0	69.0	69.0	69.0	69.0	69.0	21.0	21.0		21.0	21.0	
Total Split (%)	76.7%	76.7%	76.7%	76.7%	76.7%	76.7%	23.3%	23.3%		23.3%	23.3%	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lead/Lag												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lead-Lag Optimize?												
Recall Mode	Max	Max	Max	Max	Max	Max	None	None		None	None	
Act Effct Green (s)	75.6	75.6	75.6	75.6	75.6	75.6	8.8	8.8		8.8	8.8	
Actuated g/C Ratio	0.84	0.84	0.84	0.84	0.84	0.84	0.10	0.10		0.10	0.10	
v/c Ratio	0.04	0.38	0.10	0.28	0.23	0.01	0.04	0.01		0.38	0.17	
Control Delay	2.3	2.8	0.7	4.7	2.2	1.0	34.2	0.0		45.1	1.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	2.3	2.8	0.7	4.7	2.2	1.0	34.2	0.0		45.1	1.4	
LOS	A	A	A	A	A	A	C	A		D	A	
Approach Delay		2.5			2.5			17.1			23.2	
Approach LOS		A			A			B			C	
Queue Length 50th (m)	0.5	19.4	0.0	3.0	9.7	0.0	0.9	0.0		8.6	0.0	
Queue Length 95th (m)	2.1	33.1	3.1	9.9	17.3	0.6	3.8	0.0		17.3	0.0	
Internal Link Dist (m)		163.7			537.2			134.6			117.1	
Turn Bay Length (m)	50.0		50.0	80.0		20.0	20.0			35.0		
Base Capacity (vph)	589	2864	1258	366	2864	1241	245	562		250	403	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.04	0.38	0.10	0.28	0.23	0.01	0.02	0.01		0.20	0.12	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 89.6
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.38
Intersection Signal Delay: 3.6 — Intersection LOS: A
Intersection Capacity Utilization 54.0% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 20: Street 1/Golflinks & Jockvale Road

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	578	5	0	970	0	5
Sign Control	Free			Free	Stop	
Grade	-10%			2%	-4%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	628	5	0	1054	0	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	188					
pX, platoon unblocked			1.00		1.00	1.00
vC, conflicting volume			634		1158	317
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			631		1156	314
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			946		190	682

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	419	215	527	527	5
Volume Left	0	0	0	0	0
Volume Right	0	5	0	0	5
cSH	1700	1700	1700	1700	682
Volume to Capacity	0.25	0.13	0.31	0.31	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.2
Control Delay (s)	0.0	0.0	0.0	0.0	10.3
Lane LOS					B
Approach Delay (s)	0.0		0.0		10.3
Approach LOS					B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	31.6%	ICU Level of Service	A
Analysis Period (min)	15		

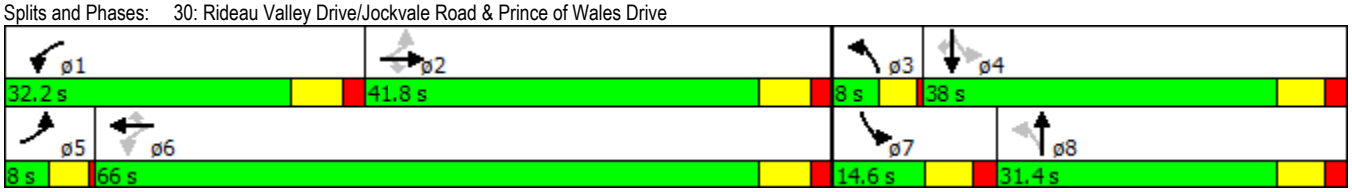
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	423	6	473	853	598	17	393	287	209	355	68
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.2	3.5	3.5	3.2	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			2%			3%			-10%	
Storage Length (m)	100.0		45.0	230.0		30.0	60.0		55.0	75.0		90.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.98				1.00					0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1556	3221	1441	1555	3219	1440	1617	3234	1447	1724	3448	1542
Flt Permitted	0.308			0.281			0.523			0.323		
Satd. Flow (perm)	505	3221	1416	460	3219	1440	888	3234	1447	586	3448	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			222			258			312			165
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		528.5			331.7			398.7			638.3	
Travel Time (s)		23.8			14.9			23.9			38.3	
Confl. Peds. (#/hr)			3				3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	71	460	7	514	927	650	18	427	312	227	386	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	460	7	514	927	650	18	427	312	227	386	74
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.2			3.2			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.09	1.09	1.15	1.10	1.10	1.11	1.11	1.11	1.02	1.02	1.02
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	1	1	1	1	1	1	1	1	1	1	1
Detector Template												
Leading Detector (m)	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		Free	4		4
Detector Phase	5	2	2	1	6	6	3	8		7	4	4
Switch Phase												
Minimum Initial (s)	4.0	20.0	20.0	5.0	20.0	20.0	4.0	10.0		5.0	10.0	10.0
Minimum Split (s)	8.0	41.6	41.6	11.6	41.6	41.6	8.0	31.4		11.4	31.4	31.4
Total Split (s)	8.0	41.8	41.8	32.2	66.0	66.0	8.0	31.4		14.6	38.0	38.0
Total Split (%)	6.7%	34.8%	34.8%	26.8%	55.0%	55.0%	6.7%	26.2%		12.2%	31.7%	31.7%
Yellow Time (s)	3.5	4.6	4.6	4.6	4.6	4.6	3.5	4.2		4.2	4.2	4.2
All-Red Time (s)	0.5	2.0	2.0	2.0	2.0	2.0	0.5	2.2		2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	6.6	6.6	6.6	6.6	6.6	4.0	6.4		6.4	6.4	6.4
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Ped	Ped	None	Ped	Ped	None	Max		None	Max	Max

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	31.2	24.6	24.6	56.9	50.6	50.6	31.5	25.1	109.7	39.7	36.7	36.7
Actuated g/C Ratio	0.28	0.22	0.22	0.52	0.46	0.46	0.29	0.23	1.00	0.36	0.33	0.33
v/c Ratio	0.39	0.64	0.01	1.04	0.63	0.81	0.06	0.58	0.22	0.76	0.33	0.12
Control Delay	23.1	42.5	0.0	74.0	24.8	24.2	24.5	42.1	0.3	47.0	30.3	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.1	42.5	0.0	74.0	24.8	24.2	24.5	42.1	0.3	47.0	30.3	0.4
LOS	C	D	A	E	C	C	C	D	A	D	C	A
Approach Delay		39.4			36.7			24.5			32.6	
Approach LOS		D			D			C			C	
Queue Length 50th (m)	6.9	47.0	0.0	~87.4	79.0	76.4	2.2	40.3	0.0	32.7	28.5	0.0
Queue Length 95th (m)	13.4	63.0	0.0	#156.7	98.7	129.6	7.9	65.8	0.0	#79.6	54.4	0.0
Internal Link Dist (m)		504.5			307.7			374.7			614.3	
Turn Bay Length (m)	100.0		45.0	230.0		30.0	60.0		55.0	75.0		90.0
Base Capacity (vph)	182	1036	606	494	1748	899	281	739	1447	297	1154	617
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.44	0.01	1.04	0.53	0.72	0.06	0.58	0.22	0.76	0.33	0.12

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 109.7
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.04
Intersection Signal Delay: 34.1 Intersection LOS: C
Intersection Capacity Utilization 89.7% ICU Level of Service E
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: 30: Rideau Valley Drive/Jockvale Road & Prince of Wales Drive



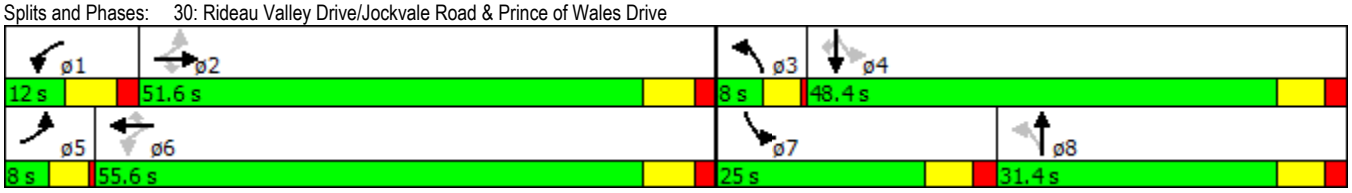
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	816	8	149	348	132	2	262	400	610	250	72
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.2	3.5	3.5	3.2	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			2%			3%			-10%	
Storage Length (m)	100.0		45.0	90.0		30.0	60.0		55.0	120.0		90.0
Storage Lanes	1		1	2		1	1		1	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor			0.98				1.00					0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1556	3221	1441	3018	3219	1440	1617	3234	1447	3344	3448	1542
Flt Permitted	0.528			0.124			0.584			0.448		
Satd. Flow (perm)	865	3221	1416	394	3219	1440	991	3234	1447	1577	3448	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			162			162			222			105
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		528.5			331.7			398.7			638.3	
Travel Time (s)		23.8			14.9			23.9			38.3	
Confl. Peds. (#/hr)			3				3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	71	887	9	162	378	143	2	285	435	663	272	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	887	9	162	378	143	2	285	435	663	272	78
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.4			6.4			7.0			7.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.09	1.09	1.15	1.10	1.10	1.11	1.11	1.11	1.02	1.02	1.02
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	1	1	1	1	1	1	1	1	1	1	1
Detector Template												
Leading Detector (m)	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		Free	4		4
Detector Phase	5	2	2	1	6	6	3	8		7	4	4
Switch Phase												
Minimum Initial (s)	4.0	20.0	20.0	5.0	20.0	20.0	4.0	10.0		5.0	10.0	10.0
Minimum Split (s)	8.0	41.6	41.6	11.6	41.6	41.6	8.0	31.4		11.4	31.4	31.4
Total Split (s)	8.0	51.6	51.6	12.0	55.6	55.6	8.0	31.4		25.0	48.4	48.4
Total Split (%)	6.7%	43.0%	43.0%	10.0%	46.3%	46.3%	6.7%	26.2%		20.8%	40.3%	40.3%
Yellow Time (s)	3.5	4.6	4.6	4.6	4.6	4.6	3.5	4.2		4.2	4.2	4.2
All-Red Time (s)	0.5	2.0	2.0	2.0	2.0	2.0	0.5	2.2		2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	6.6	6.6	6.6	6.6	6.6	4.0	6.4		6.4	6.4	6.4
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Ped	Ped	None	Ped	Ped	None	Max		None	Max	Max

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	42.3	35.6	35.6	45.7	41.5	41.5	31.6	25.1	110.2	49.4	48.0	48.0
Actuated g/C Ratio	0.38	0.32	0.32	0.41	0.38	0.38	0.29	0.23	1.00	0.45	0.44	0.44
v/c Ratio	0.20	0.85	0.02	0.55	0.31	0.22	0.01	0.39	0.30	0.67	0.18	0.11
Control Delay	19.0	43.5	0.0	26.1	25.4	3.3	20.0	39.3	0.5	25.8	21.2	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	43.5	0.0	26.1	25.4	3.3	20.0	39.3	0.5	25.8	21.2	2.7
LOS	B	D	A	C	C	A	B	D	A	C	C	A
Approach Delay		41.3			20.9			15.9			22.8	
Approach LOS		D			C			B			C	
Queue Length 50th (m)	8.5	93.8	0.0	10.6	30.9	0.0	0.2	27.7	0.0	49.3	18.0	0.0
Queue Length 95th (m)	16.6	117.6	0.0	16.8	42.5	9.2	1.8	44.2	0.0	73.9	34.1	5.8
Internal Link Dist (m)		504.5			307.7			374.7			614.3	
Turn Bay Length (m)	100.0		45.0	90.0		30.0	60.0		55.0	120.0		90.0
Base Capacity (vph)	356	1322	677	292	1439	733	306	737	1447	1007	1500	719
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.67	0.01	0.55	0.26	0.20	0.01	0.39	0.30	0.66	0.18	0.11

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 110.2
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 26.2 Intersection LOS: C
Intersection Capacity Utilization 76.7% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 30: Rideau Valley Drive/Jockvale Road & Prince of Wales Drive



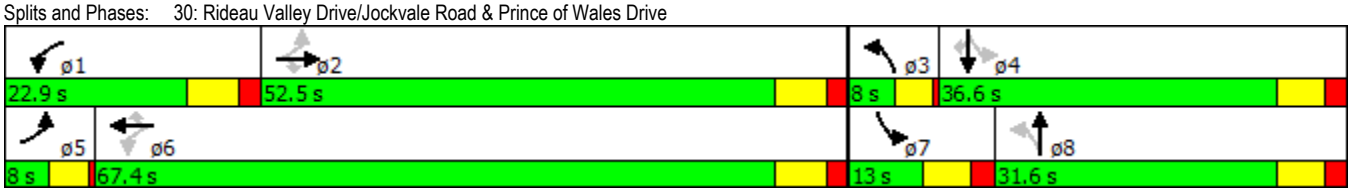
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	423	6	473	853	598	17	394	287	209	355	68
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.2	3.5	3.5	3.2	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			2%			3%			-10%	
Storage Length (m)	100.0		45.0	90.0		30.0	60.0		55.0	120.0		90.0
Storage Lanes	1		1	2		1	1		1	2		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor			0.98				1.00					0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1556	3221	1441	3018	3219	1440	1617	3234	1447	3344	3448	1542
Flt Permitted	0.292			0.330			0.523			0.340		
Satd. Flow (perm)	478	3221	1416	1048	3219	1440	888	3234	1447	1197	3448	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			164			260			312			165
Link Speed (k/h)		80			80			60			60	
Link Distance (m)		528.5			331.7			398.7			638.3	
Travel Time (s)		23.8			14.9			23.9			38.3	
Confl. Peds. (#/hr)			3				3					3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	71	460	7	514	927	650	18	428	312	227	386	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	460	7	514	927	650	18	428	312	227	386	74
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		6.4			6.4			7.0			7.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.14	1.09	1.09	1.15	1.10	1.10	1.11	1.11	1.11	1.02	1.02	1.02
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	1	1	1	1	1	1	1	1	1	1	1
Detector Template												
Leading Detector (m)	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.2
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		Free	4		4
Detector Phase	5	2	2	1	6	6	3	8		7	4	4
Switch Phase												
Minimum Initial (s)	4.0	20.0	20.0	5.0	20.0	20.0	4.0	10.0		5.0	10.0	10.0
Minimum Split (s)	8.0	41.6	41.6	11.6	41.6	41.6	8.0	31.4		11.4	31.4	31.4
Total Split (s)	8.0	52.5	52.5	22.9	67.4	67.4	8.0	31.6		13.0	36.6	36.6
Total Split (%)	6.7%	43.8%	43.8%	19.1%	56.2%	56.2%	6.7%	26.3%		10.8%	30.5%	30.5%
Yellow Time (s)	3.5	4.6	4.6	4.6	4.6	4.6	3.5	4.2		4.2	4.2	4.2
All-Red Time (s)	0.5	2.0	2.0	2.0	2.0	2.0	0.5	2.2		2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	6.6	6.6	6.6	6.6	6.6	4.0	6.4		6.4	6.4	6.4
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Ped	Ped	None	Ped	Ped	None	Max		None	Max	Max

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)	35.8	29.1	29.1	50.9	44.6	44.6	32.0	25.5	102.7	38.1	35.8	35.8
Actuated g/C Ratio	0.35	0.28	0.28	0.50	0.43	0.43	0.31	0.25	1.00	0.37	0.35	0.35
v/c Ratio	0.34	0.50	0.01	0.64	0.66	0.84	0.06	0.53	0.22	0.39	0.32	0.12
Control Delay	18.3	32.1	0.0	19.1	25.5	26.1	24.4	38.3	0.3	26.1	28.7	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.3	32.1	0.0	19.1	25.5	26.1	24.4	38.3	0.3	26.1	28.7	0.4
LOS	B	C	A	B	C	C	C	D	A	C	C	A
Approach Delay		29.8			24.1			22.4			24.8	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	6.7	40.4	0.0	30.5	77.0	73.9	2.1	37.7	0.0	14.7	26.9	0.0
Queue Length 95th (m)	13.0	54.4	0.0	40.4	96.2	125.6	8.0	65.8	0.0	29.8	55.3	0.0
Internal Link Dist (m)		504.5			307.7			374.7			614.3	
Turn Bay Length (m)	100.0		45.0	90.0		30.0	60.0		55.0	120.0		90.0
Base Capacity (vph)	209	1456	729	835	1927	966	305	802	1447	584	1201	636
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.32	0.01	0.62	0.48	0.67	0.06	0.53	0.22	0.39	0.32	0.12

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 102.7
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 24.7 Intersection LOS: C
Intersection Capacity Utilization 74.7% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 30: Rideau Valley Drive/Jockvale Road & Prince of Wales Drive



Project: Jockvale and Golflinks

Scheme name: 2023 PM Total

Control Data

Option	Setting	Option	Setting
Capacity Model	Rodel-Win1	Mode	Mode1 - Target Average Delay
Queue Model	Rodel-Win1	Delay Model	Rodel-Win1
Flows	Peak Hour Factor	Time Slice	7.5 minutes
Delay	Queuing	Light / Dark	Light

Geometry Data for Empirical Model

Leg	Approach Geometry				
	Leg Name	Bearing	G	V (m)	nv
1	Jockvale (north)	0	0	3.75	1
2	Street 1 (west)	90	0	3.75	1
3	Jockvale (south)	180	0	3.75	1
4	Golflinks (east)	270	0	3.75	1

Leg	Entry Geometry					Circ Geom		
	Ave Del (m)	ne	L' (m)	R (m)	?	D (m)	C (m)	nc
1	15					36.00		1
2	15					36.00		1
3	15					36.00		1
4	15					36.00		1

Leg	Exit Geometry			
	Ex (m)	nex	Vx (m)	nvx
1	5.50	2	3.75	1
2	5.50	2	3.75	1
3	5.50	2	3.75	1
4	5.50	2	3.75	1

Leg	Entry Capacity Modifiers		
	-+ Cap (v/h)	Xwalk Fact	Conf Level (%)
1	0	1.000	85
2	0	1.000	85
3	0	1.000	85
4	0	1.000	85

Flow Modifiers and Flow Data

Leg	Leg Name	Flow Modifiers	
		%Truck	Factor
1	Jockvale (north)	2.0	1.00
2	Street 1 (west)	2.0	1.00
3	Jockvale (south)	2.0	1.00
4	Golflinks (east)	2.0	1.00

Leg	Arrival Turning Flows (veh/hr)				
	U-Turn	Exit-3	Exit-2	Exit-1	Bypass
1	0	93	536	0	0
2	0	7	0	9	0
3	0	25	881	115	0
4	0	45	0	45	0

Leg	Arrival Volume Ratios			Arrival Volume Times (min)			PHF
	Ratio1	Ratio2	Ratio3	Time1	Time2	Time3	
1	0.750	1.125	0.750	0	30	60	0.92
2	0.750	1.125	0.750	0	30	60	0.92
3	0.750	1.125	0.750	0	30	60	0.92
4	0.750	1.125	0.750	0	30	60	0.92

Model Results

Global performance

Leg	Leg Name	Global Performance				
		Parameter	Units	Entries	Bypasses	Total
1	Jockvale (north)	Arrive Flows	veh/hr	1756		1756
2	Street 1 (west)	Capacity	veh/hr	3346		3346
3	Jockvale (south)	Average Delay	sec/veh	9.94		9.94
4	Golflinks (east)	L.O.S. (Signal)	A – F	A		A

Entry Flow and Capacity (60min)

Leg	Bypass Type	Flow Rate (veh/hr)		Opp Rate (veh/hr)		Capacity (veh/hr)		Ave VCR	
		Entry	Bypass	Entry	Bypass	Entry	Bypass	Entry	Bypass
1	None	629		70		888		0.730	
2	None	16		673		550		0.030	
3	None	1021		100		1486		0.698	
4	None	90		912		422		0.218	

Entry Queues and Delays (60min)

Leg	Ave Del (sec/veh)			Max Del (sec/veh)		95% Queue		LOS A-F		
	Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Entry	Byp	Leg
1	13.6		13.6	18.5		7.4		B		B
2	6.7		6.7	7.9		0.1		A		A
3	7.7		7.7	10.4		7.3		A		A
4	10.7		10.7	13.9		1.0		B		B

Entry Slope and Intercept (60min)

Leg	Bypass Type	Y Intercept (vehs/hr)		Slope (tangent)		X Intercept (vehs/hr)	
		Entry	Bypass	Entry	Bypass	Entry	Bypass
1	None	925		0.5389		1717	
2	None	911		0.5360		1700	
3	None	1553		0.6683		2324	
4	None	911		0.5360		1700	

Entry Flow and Capacity (Peak 7.5min)

Leg	Bypass Type	Flow Rate (veh/hr)		Opp Rate (veh/hr)		Capacity (veh/hr)		Ave VCR	
		Entry	Bypass	Entry	Bypass	Entry	Bypass	Entry	Bypass
1	None	684		76		884		0.7963	
2	None	17		728		521		0.0339	
3	None	1110		108		1481		0.7623	
4	None	98		989		381		0.2629	

Entry Queues and Delays (Peak 7.5min)

Leg	Ave Del (sec/veh)			Max Del (sec/veh)		95% Queue		LOS A-F		
	Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Entry	Byp	Leg
1	15.0		15.0	18.5		7.4		C		C
2	6.8		6.8	7.9		0.1		A		A
3	8.5		8.5	10.4		7.3		A		A
4	11.6		11.6	13.9		1.0		B		B

Entry Slope and Intercept (Peak 7.5min)

Leg	Bypass Type	Y Intercept (vehs/hr)		Slope (tangent)		X Intercept (vehs/hr)	
		Entry	Bypass	Entry	Bypass	Entry	Bypass
1	None	925		0.5389		1717	
2	None	911		0.5360		1700	
3	None	1553		0.6683		2324	
4	None	911		0.5360		1700	

Scheme Notes

(none)

APPENDIX H

Traffic Signal Justification

NOVATECH ENGINEERING CONSULTANTS LTD.

TRAFFIC SIGNAL JUSTIFICATION

LOCATION: Jockvale Rd. at Blackleaf Dr. (Minor)

DATE: 2012 (City of Ottawa - Count)

Posted speed 70km/hr.

JUSTIFICATION 1 – Minimum Vehicular Volume

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				PERCENTAGE WARRANT								
APPROACH LANES	1		2 or MORE		HOUR ENDING								TOTAL ACROSS
FLOW CONDITION	FREE FLOW	RESTR FLOW	FREE FLOW	RESTR FLOW	8:00	9:00 *	10:00	12:30	13:30	16:00 *	17:00 *	18:00 *	
A. ALL APPROACHES	480	720	600	900	950	1027	814	899	887	1078	1250	1430	
	(385)	(575)	(480)	(720)									
	100% FULFILLED				100%	100%	100%	100%	100%	100%	100%	100%	800%
	80% FULFILLED												
	ACTUAL % IF BELOW 80% VALUE												
									TOTAL DOWN:				800%
									AVERAGE (TOTAL/8):				100%

→ T Intersection Add 50%

	180	255	180	255									
	143	203	143	203									
B. MINOR STREET BOTH APPROACHES	120	170	120	170	306	252	179	114	114	113	111	121	TOTAL ACROSS
	(95)	(135)	(95)	(135)									
	100% FULFILLED				100%	100%							200%
	80% FULFILLED						80%						80%
	ACTUAL % IF BELOW 80% VALUE							63%	65%	63%	62%	67%	318%
									TOTAL DOWN:				598%
									AVERAGE (TOTAL/8):				75%

JUSTIFICATION 2 – Delay To Cross Traffic

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				PERCENTAGE WARRANT								
APPROACH LANES	1		2 or MORE		HOUR ENDING								TOTAL ACROSS
FLOW CONDITION	FREE FLOW	RESTR FLOW	FREE FLOW	RESTR FLOW	8:00	9:00	10:00	12:30	13:30	16:00	17:00	18:00	
A. MAJOR STREET BOTH APPROACHES	480	720	600	900	644	775	635	785	793	965	1139	1309	
	(385)	(575)	(480)	(720)									
	100% FULFILLED				100%	100%	100%	100%	100%	100%	100%	100%	800%
	80% FULFILLED												
	ACTUAL % IF BELOW 80% VALUE												
									TOTAL DOWN:				800%
									AVERAGE (TOTAL/8):				100%

B. TRAFFIC CROSSING MAJOR STREET	50	75	50	75	134	150	90	74	68	59	64	69	TOTAL ACROSS
	(40)	(60)	(40)	(60)									
	100% FULFILLED				100%	100%	100%	100%	100%	100%	100%	100%	800%
	80% FULFILLED												
	ACTUAL % IF BELOW 80% VALUE												
									TOTAL DOWN:				800%
									AVERAGE (TOTAL/8):				100%

NOVATECH ENGINEERING CONSULTANTS LTD.

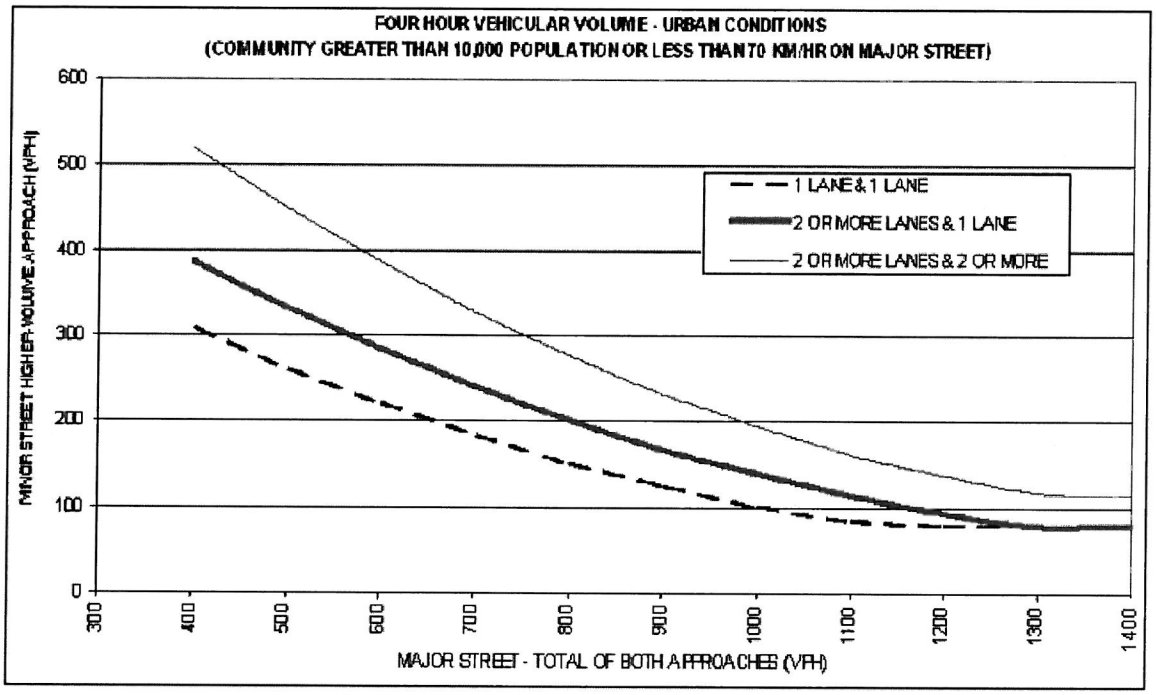
TRAFFIC SIGNAL JUSTIFICATION

LOCATION: Jockvale Rd at Blackleaf Dr (Minor)

DATE: 2012 (City of Ottawa - count)

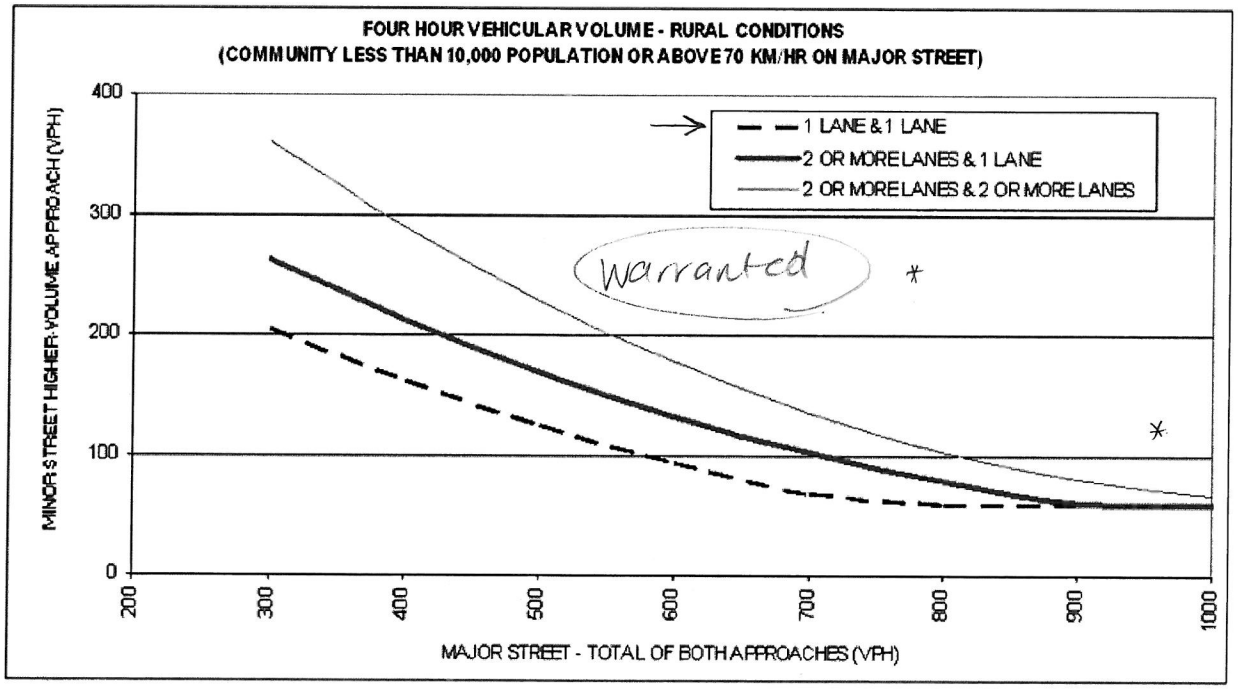
JUSTIFICATION 4 – Minimum Four-Hour Vehicle Volume

A. Restricted Flow



B. Free Flow

121/1309
111/1139
113/965
252/775



NOVATECH ENGINEERING CONSULTANTS LTD.

TRAFFIC SIGNAL JUSTIFICATION SUMMARY TABLE

LOCATION: Jockvale Rd at Blackleaf Dr.

DATE: 2012 (City of Ottawa - Count)

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT		COMPLIANCE	
		FREE FLOW	RESTRICTED FLOW		
		OPERATING SPEED ≥ 70KM/H	OPERATING SPEED < 70 KM/H	SECTIONAL %	ENTIRE % (2)
1. MINIMUM VEHICULAR WARRANT	A. Vehicle volume, all approaches for each of the heaviest 8 hours of an average day, and	480 600 (2 or more lane approach	720 900 (2 or more lane approach	100%	75%
	B. Vehicle volume, along minor street, for each of the same 8 hours.	120 180 (tee intersection)	170 255 (tee intersection)	75%	
2. DELAY TO CROSS TRAFFIC	A. Vehicle volume, along major street for each for the heaviest 8 hours of an average day, and	480 600 (2 or more lane approach)	720 900 (2 or more lane approach	100%	100%
	B (1). Combined vehicle and pedestrian volume crossing the major street for each of the same 8 hours	50	75	100%	
3. VOLUME/DELAY COMBINATION	The above Justifications (1 and 2) both satisfied to the extent of 80% or more	Yes ☐		No ☑	
4. MINIMUM FOUR HOUR VEHICLE VOLUME	Plotted point representing hourly volume for minor approach vs. major approach for four highest hours of an average day fall above the applicable curve	Yes ☑		No ☐	
5. COLLISION EXPERIENCE	A. Total reported accidents of types susceptible to correction by a traffic signal, per 12 month period averaged over a 36 month period, and	5			
	B. Adequate trial of less restrictive remedies, where satisfactory observance and enforcement have failed to reduce the number of accidents	Yes ☐		No ☐	
6. PEDESTRIAN VOLUME AND DELAY	A. Plotted point representing 8 hour pedestrian volume vs. 8 hour vehicular volume fall in justified zone, and	Yes ☐		No ☐	
	B. Plotted point representing 8 hour volume of pedestrian experiencing delays of 10 s or more vs. 8 hour pedestrian volume fall in justified zone	Yes ☐		No ☐	

NOTES

1) For definition of crossing volume refer to the Ontario Traffic Manual Book 12, Section 4.5 (Nov. 2007).
2) The lowest sectional percentage governs the entire Justification.

NOVATECH ENGINEERING CONSULTANTS LTD.

TRAFFIC SIGNAL JUSTIFICATION

LOCATION: Jockvale Rd. at Golf Links (Minor)

DATE: 2015 (City of Ottawa - Count)

JUSTIFICATION 1 – Minimum Vehicular Volume

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				PERCENTAGE WARRANT								
APPROACH LANES	1		2 or MORE		HOUR ENDING								TOTAL ACROSS
FLOW CONDITION	FREE FLOW	RESTR FLOW	FREE FLOW	RESTR FLOW	8:00	9:00	10:00	12:30	13:30	16:00	17:00	18:00	
A. ALL APPROACHES	480	720	600	900	848	948	682	758	765	921	1018	1231	
	(385)	(575)	(480)	(720)									
	100% FULFILLED				100%	100%	100%	100%	100%	100%	100%	100%	800%
	80% FULFILLED												
	ACTUAL % IF BELOW 80% VALUE												
									TOTAL DOWN:				800%
									AVERAGE (TOTAL/8):				100%

T Intersection Add 50%

	180	**255**	**180**	**255**
	143	**203**	**143**	**203**

B. MINOR STREET BOTH APPROACHES	120	170	120	170	120	109	62	75	69	65	52	68	TOTAL ACROSS
	(95)	(135)	(95)	(135)									
	100% FULFILLED												
	80% FULFILLED												
	ACTUAL % IF BELOW 80% VALUE				67%	61%	34%	42%	38%	36%	29%	38%	345%
									TOTAL DOWN:				345%
									AVERAGE (TOTAL/8):				43%

JUSTIFICATION 2 – Delay To Cross Traffic

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				PERCENTAGE WARRANT								
APPROACH LANES	1		2 or MORE		HOUR ENDING								TOTAL ACROSS
FLOW CONDITION	FREE FLOW	RESTR FLOW	FREE FLOW	RESTR FLOW	8:00	9:00	10:00	12:30	13:30	16:00	17:00	18:00	
A. MAJOR STREET BOTH APPROACHES	480	720	600	900	728	839	620	683	696	856	966	1163	
	(385)	(575)	(480)	(720)									
	100% FULFILLED				100%	100%	100%	100%	100%	100%	100%	100%	800%
	80% FULFILLED												
	ACTUAL % IF BELOW 80% VALUE												
									TOTAL DOWN:				800%
									AVERAGE (TOTAL/8):				100%

B. TRAFFIC CROSSING MAJOR STREET	50	75	50	75	83	66	41	35	32	30	29	33	TOTAL ACROSS
	(40)	(60)	(40)	(60)									
	100% FULFILLED				100%	100%							200%
	80% FULFILLED						80%						80%
	ACTUAL % IF BELOW 80% VALUE							70%	64%	60%	58%	66%	318%
									TOTAL DOWN:				598%
									AVERAGE (TOTAL/8):				74%

NOVATECH ENGINEERING CONSULTANTS LTD.

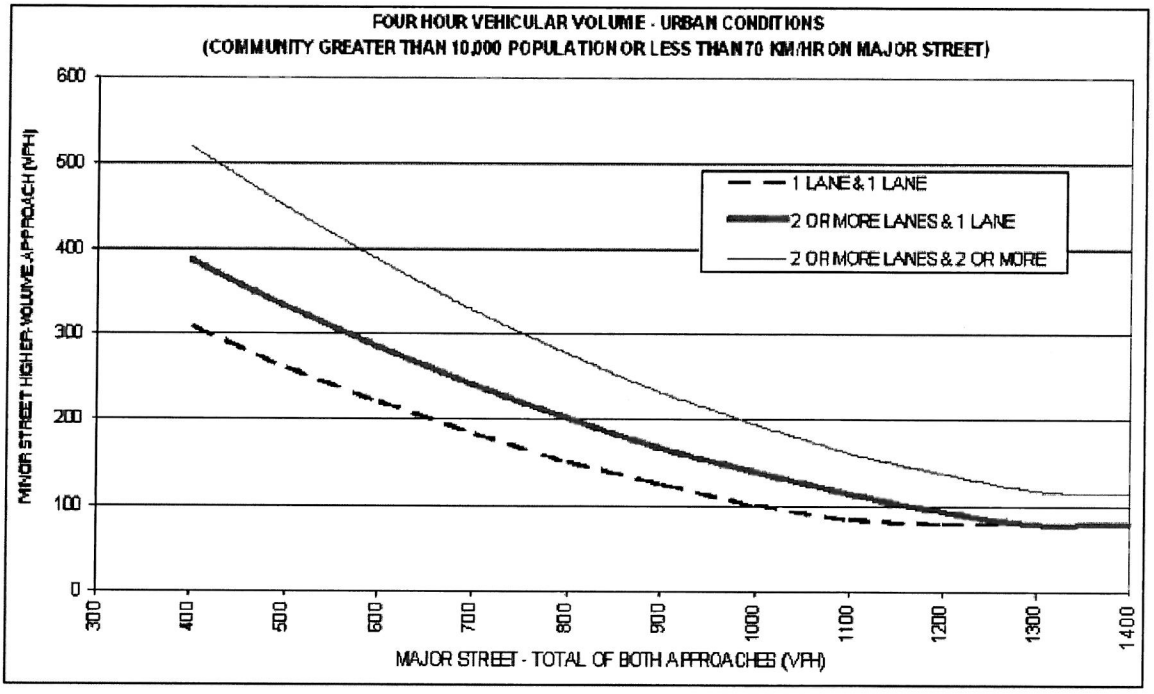
TRAFFIC SIGNAL JUSTIFICATION

LOCATION: Jockvale Rd at Golf links

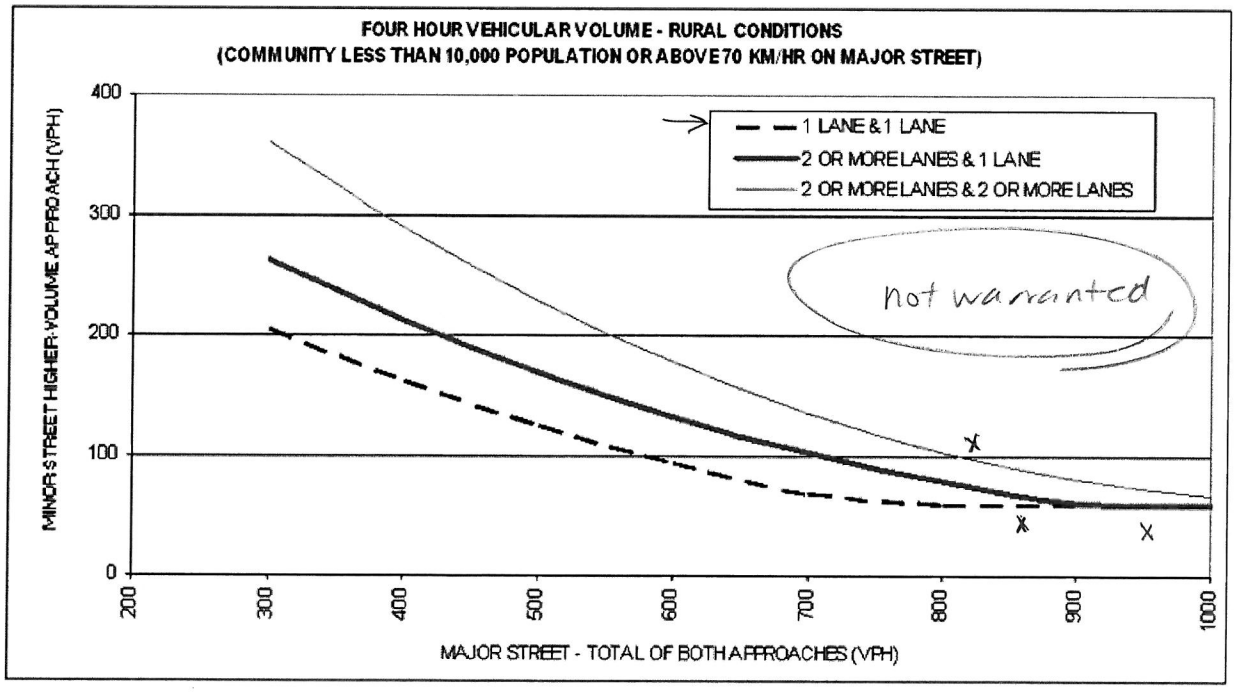
DATE: 2015 (City of Ottawa)

JUSTIFICATION 4 – Minimum Four-Hour Vehicle Volume

A. Restricted Flow



B. Free Flow



NOVATECH ENGINEERING CONSULTANTS LTD.

TRAFFIC SIGNAL JUSTIFICATION SUMMARY TABLE

LOCATION: Jockvale at Golflinks

DATE: 2015 (City of Ottawa)

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT		COMPLIANCE	
		FREE FLOW (circled)	RESTRICTED FLOW		
		OPERATING SPEED ≥ 70KM/H	OPERATING SPEED < 70 KM/H	SECTIONAL %	ENTIRE % (2)
1. MINIMUM VEHICULAR WARRANT	A. Vehicle volume, all approaches for each of the heaviest 8 hours of an average day, and	480 600 (2 or more lane approach	720 900 (2 or more lane approach	100%	43%
	B. Vehicle volume, along minor street, for each of the same 8 hours.	120 180 (tee intersection)	170 255 (tee intersection)	43%	
2. DELAY TO CROSS TRAFFIC	A. Vehicle volume, along major street for each for the heaviest 8 hours of an average day, and	480 600 (2 or more lane approach)	720 900 (2 or more lane approach	100%	74%
	B (1). Combined vehicle and pedestrian volume crossing the major street for each of the same 8 hours	50	75	74%	
3. VOLUME/DELAY COMBINATION	The above Justifications (1 and 2) both satisfied to the extent of 80% or more	Yes ☐		No ☑	
4. MINIMUM FOUR HOUR VEHICLE VOLUME	Plotted point representing hourly volume for minor approach vs. major approach for four highest hours of an average day fall above the applicable curve	Yes ☐		No ☑	
5. COLLISION EXPERIENCE	A. Total reported accidents of types susceptible to correction by a traffic signal, per 12 month period averaged over a 36 month period, and	5			
	B. Adequate trial of less restrictive remedies, where satisfactory observance and enforcement have failed to reduce the number of accidents	Yes ☐		No ☐	
6. PEDESTRIAN VOLUME AND DELAY	A. Plotted point representing 8 hour pedestrian volume vs. 8 hour vehicular volume fall in justified zone, and	Yes ☐		No ☐	
	B. Plotted point representing 8 hour volume of pedestrian experiencing delays of 10 s or more vs. 8 hour pedestrian volume fall in justified zone	Yes ☐		No ☐	

NOTES

1) For definition of crossing volume refer to the Ontario Traffic Manual Book 12, Section 4.5 (Nov. 2007).
2) The lowest sectional percentage governs the entire Justification.

Not warranted

NOVATECH ENGINEERING CONSULTANTS LTD.

TRAFFIC SIGNAL JUSTIFICATION USING PROJECTED VOLUMES

LOCATION: Jochvale Rd **at** Golflinks Drive

YEAR: 2023 (Background, projected)

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT		COMPLIANCE		
		FREE FLOW	RESTRICTED FLOW	SECTIONAL		ENTIRE % (2)
		OPERATING SPEED ≥ 70KM/H	OPERATING SPEED < 70 KM/H	NUMERICAL	PERCENT	
1. MINIMUM VEHICULAR WARRANT	A. Vehicle volume, all approaches (average hour)	→ 480 600 (2 or more lane approach	720 900 (2 or more lane approach	753	156%	34%
	B. Vehicle volume along minor street (average hour)	120 → 180 (tee intersection)	170 255 (tee intersection)	62	34%	
2. DELAY TO CROSS TRAFFIC	A. Vehicle volume along major street (average hour)	→ 480 600 (2 or more lane approach)	720 900 (2 or more lane approach	691	144%	70%
	B (1). Combined vehicle and pedestrian volume crossing the major street (average hour)	50	75	35	70%	

NOTES

1) For definition of crossing volume refer to the Ontario Traffic Manual Book 12, Section 4.5 (Nov. 2007).
2) The lowest sectional percentage governs the entire Justification.
3) Average hourly volumes estimated from peak hour volumes, AHV = PM / 2 or AHV = (AM + PM) / 4.

Not warranted

NOVATECH ENGINEERING CONSULTANTS LTD.

TRAFFIC SIGNAL JUSTIFICATION USING PROJECTED VOLUMES

LOCATION: Jochvale Rd **at** Golf links Drive

YEAR: 2003 (total - projected, 4 leg)

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT		COMPLIANCE		
		FREE FLOW	RESTRICTED FLOW	SECTIONAL		ENTIRE % (2)
		OPERATING SPEED ≥ 70KM/H	OPERATING SPEED < 70 KM/H	NUMERICAL	PERCENT	
1. MINIMUM VEHICULAR WARRANT	A. Vehicle volume, all approaches (average hour)	→ 480 600 (2 or more lane approach	720 900 (2 or more lane approach	770	160%	58%
	B. Vehicle volume along minor street (average hour)	→ 120 180 (tee intersection)	170 255 (tee intersection)	69	58%	
2. DELAY TO CROSS TRAFFIC	A. Vehicle volume along major street (average hour)	→ 480 600 (2 or more lane approach)	720 900 (2 or more lane approach	701	146%	78%
	B (1). Combined vehicle and pedestrian volume crossing the major street (average hour)	50	75	39	78%	

NOTES

1) For definition of crossing volume refer to the Ontario Traffic Manual Book 12, Section 4.5 (Nov. 2007).
2) The lowest sectional percentage governs the entire Justification.
3) Average hourly volumes estimated from peak hour volumes, AHV = PM / 2 or AHV = (AM + PM) / 4.

Not warranted

APPENDIX I

Sight Distance Calculations

Table 1.2.5.3 Stopping Sight Distance for Automobiles[4] and Trucks with Antilock Braking Systems[8]

Design Speed (km/h)	Assumed Operating Speed* (km/h)	Perception and Reaction time (s)	Perception and Reaction distance (m)	Coefficient of Friction	Braking Distance (m)	Stopping Sight Distance (rounded) (m)
40	40	2.5	27.8	0.38	16.6	45
50	47 - 50	2.5	32.7 - 34.7	0.35	24.8 - 28.1	60 - 65
60	55 - 60	2.5	38.2 - 41.7	0.33	36.1 - 42.9	75 - 85
70	63 - 70	2.5	43.7 - 48.6	0.31	50.4 - 62.2	95 - 110
80	70 - 80	2.5	48.6 - 55.5	0.30	64.2 - 83.9	115 - 140
90	77 - 90	2.5	53.5 - 62.5	0.30	77.7 - 106.2	130 - 170
100	85 - 100	2.5	59.0 - 69.4	0.29	98.0 - 135.6	160 - 210
110	91 - 110	2.5	63.2 - 76.4	0.28	116.3 - 170.0	180 - 250
120	98 - 120	2.5	68.0 - 83.3	0.28	134.9 - 202.3	200 - 290
130	105-130	2.5	72.9 - 90.3	0.28	155.0 - 237.6	230 - 330

Note: * Range of assumed operating speed is from average running speed for low-volume conditions to design speed.

utilizing more of the available friction. In fact, the results indicated that the stopping sight distances from Table 1.2.5.3 would be adequate if antilock brakes were in general use on trucks.

Table 1.2.5.4 shows stopping sight distances for trucks with conventional brakes, and compares them to the stopping sight distances given in Table 1.2.5.3.

The increased stopping sight distances for trucks with conventional brakes (i.e. the majority of the current fleet) are generally offset by increased driver eye height for the purposes of vertical curve calculations. However, where driver eye height is not an advantage, such as on horizontal curves or approaching controlled intersections, the greater stopping sight distances should be used.

Sight restrictions such as shrubs, trees, cut slopes, or buildings may occur on the inside of horizontal curves. Although truck drivers have higher eye heights, the required truck driver sight distance may not be offset by the higher eye height unless the obstructions are physically below the driver's line of sight.

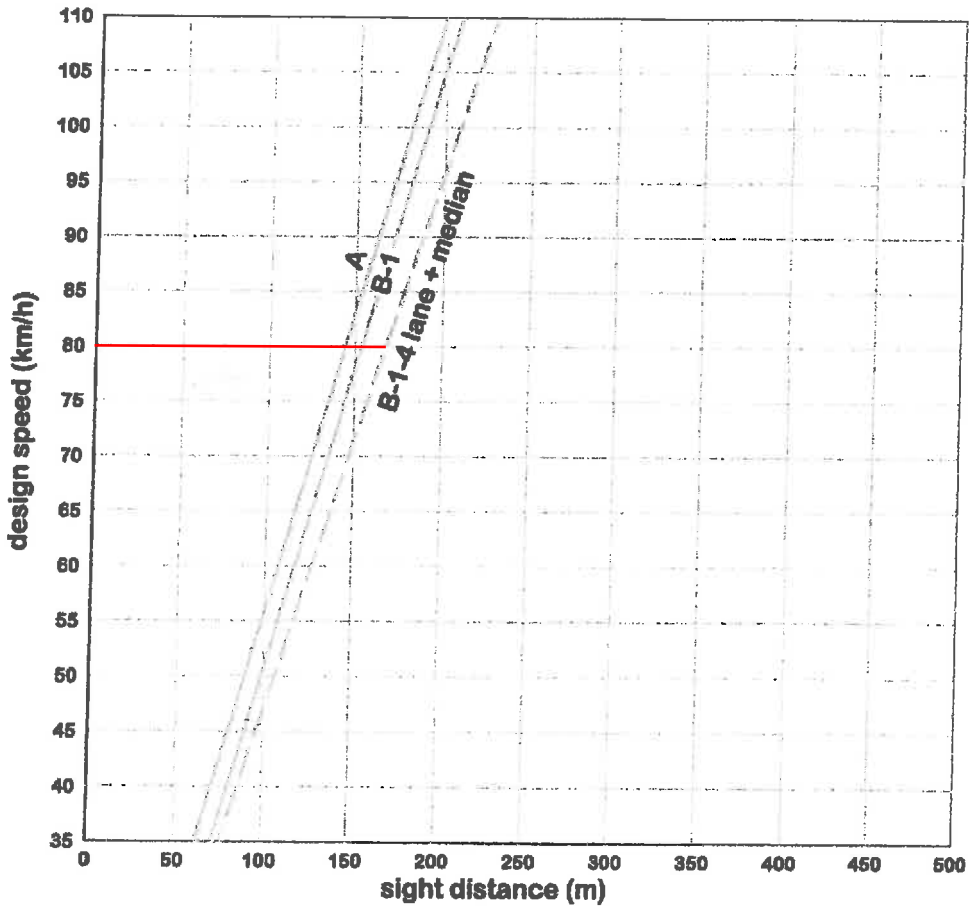
The Effect of Grade

Braking distances will increase on downgrades and decrease on upgrades. When the roadway is on a grade, the formula for braking distance is:

$$d = \frac{V^2}{254\,(f \pm G)} \qquad (1.2.6)$$

Where G = the percent grade divided by 100 (up is positive, down is negative) and all other terms are as noted in Equation 1.2.4.

Figure 2.3.3.4a Sight Distance for Crossing Movements and Vehicles Turning Left across Passenger Vehicle approaching from the Left

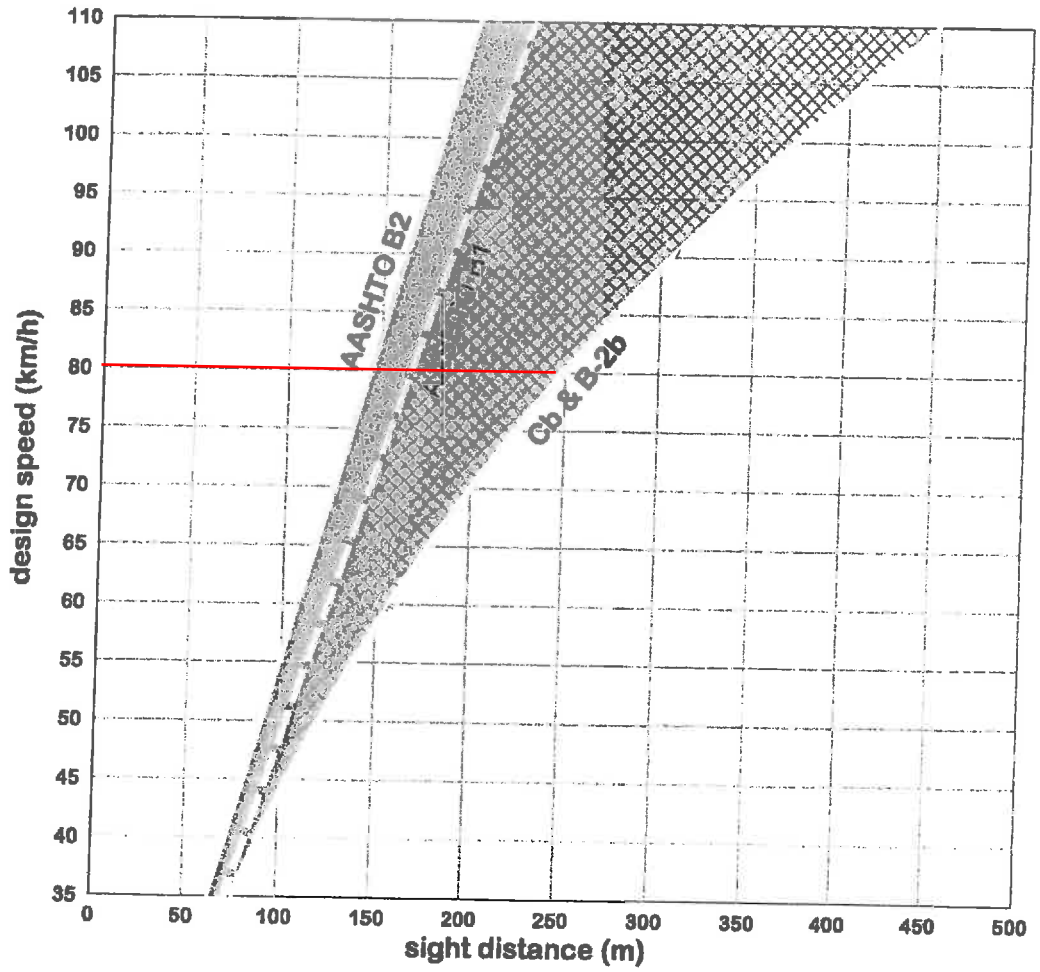


A – sight distance for passenger vehicle crossing a two –lane roadway from stop.

B-1 – sight distance for passenger vehicle turning left onto a two-lane roadway across passenger vehicle approaching from the left.

B-1-4 lane + median – sight distance for passenger vehicle turning left onto a four-lane roadway across passenger vehicle approaching from the left when median width is less than the vehicle length.

Figure 2.3.3.4b Sight Distance for Turning Movements with Vehicles approaching in the Intended Direction of Travel



Area bounded by AASHTO B1 and B-2b (crosshatched) – design domain for sight distance for passenger vehicle to turn left onto a two-lane roadway without being overtaken by a vehicle approaching from the right.

Area bounded by AASHTO B2 and Cb (shaded) – design domain for sight distance for passenger vehicle to turn right onto a two-lane roadway without being overtaken by a vehicle approaching from the left.