PROPOSED MIXED-USE RESIDENTIAL-COMMERCIAL DEVELOPMENT,

3130 WOODROFFE AVENUE

CITY OF OTTAWA

FINAL REPORT

SEPTEMBER 13, 2022

Presented to:

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1.0 INTRODUCTION AND INITIAL SCREENING RESULTS

The 2017 City of Ottawa "*Transportation Impact Assessment Guidelines*" set out a multi-step pre-application process where the scope, assumptions, study area and methodology to conduct a transportation impact assessment are detailed and each sequential stage approved.

This report represents the final report, incorporating each step of the 4-step TIA process. Appendix "J" presents a response to the comments provided by City staff on the Step 4 Forecasting report along with references indicating where within this document the comments have been addressed.

1.1 SUMMARY OF DEVELOPMENT

The proposed 3130 Woodroffe mixed-use development is proposed to be comprised of 4 semi-detached residential units (2 buildings) and a 532 m^2 one-storey dental office. The site would be accessed by way of an existing all-movement access on Deerfox Drive and a right-in/right-out Woodroffe Avenue access.

1.2 SCREENING: TRIP GENERATION TRIGGERS

The City of Ottawa TIA guidelines set the threshold for the trip generation trigger at 60 person-trips-or-more during the weekday peak hours. If the proposed development meets the trip threshold, both the Design Review and Network Impact components of the TIA need to be considered. Table 1-1 indicates the composition of the proposed development, the traffic generation rates and inbound/outbound percentages assigned to the two proposed land uses.

Table 1-1: Traffic Generation Rates (ITE)

Land Use	ITE Land Use*	Proposed Development	Morning Peak Hour			Afternoon Peak Hour		
			Rate	In	Out	Rate	In	Out
Semi-Detached Dwellings	220 – Multifamily low-rise	4 dwellings	0.46 (per unit)	23%	77%	0.56 (per unit)	63%	37%
Dental Office	720 – Medical-Dental Office Building	532 m^2 (5,726 ft^2)	2.78 (per 1000 ft^2)	78%	22%	3.46 (per 1000 ft^2)	28%	72%

*Source: ITE Trip Generation Handbook, 10th Edition

Table 1-2 indicates the forecast traffic generation of the proposed 3130 Woodroffe Avenue Mixed-Use Development, according to the ITE trip generation rates indicated in Table 1-1.

Table 1-2: Traffic Generation per ITE Rates (Vehicles-per-Hour)

Land Use	ITE Land Use*	Size	Morning Peak Hour			Afternoon Peak Hour		
			Total	In	Out	Total	In	Out
Semi-Detached Dwellings	220 – Multifamily low-rise	4 dwellings	2	0	2	2	1	1
Dental Office	720 – Medical-Dental Office Building	532 m^2 (5,726 ft^2)	16	12	4	20	6	14
		Total	**18**	**12**	**6**	**22**	**7**	**15**

Table 1-2 indicates that the traffic generation is anticipated to:

- be less than 20vph-per-direction during the peak hours of travel demand; and
- be less than the TIA guideline threshold of 60-trips during the peak hours of travel demand.

The traffic generation trigger is not satisfied.

The proposed development is not required to address the "Network Impact" component of a TIA.

1.3 SCREENING: LOCATION TRIGGERS

The proposed development proposes a right-in/right-out driveway onto Woodroffe Avenue. Woodroffe Avenue is identified as a Spine Bicycle Route on the *Ultimate Cycling Network*[1]. Moreover, Woodroffe Avenue is also a Transit Priority corridor with isolated measures.

Therefore, the location trigger is satisfied.

1.4 SCREENING SAFETY TRIGGERS

Both proposed accesses to the development are located within the area of influence of an adjacent traffic signal-controlled intersection (Woodroffe Ave/Deefrox Dr-Stoneway Dr. intersection).

Therefore, the safety trigger is satisfied

1.5 SCREENING CONCLUSIONS

The screening results indicate that since the Safety and Location Triggers are satisfied, while the Trip Generation Trigger is not … therefore …

The TIA is required to address only the "Design Review" component.

The completed stamped and signed screening form can be found within Appendix "A".

1 *Ottawa Cycling Plan*, November 2013

2.0 SCOPING

2.1 EXISTING AND PLANNED CONDITIONS

2.1.1 Proposed Development

Exhibit 2-1 illustrates the proposed mixed-use residential and commercial development located in the north-west quadrant of the Woodroffe Avenue / Deerfox Drive-Stoneway Drive intersection.

The parcel is currently zoned "*Local Commercial Zone*", which is acceptable zoning for the above-mentioned use.

The site currently contains a residential dwelling with a driveway onto Deerfox Drive. The residential dwelling is to be demolished however, the existing Deerfox driveway and curb depression are to remain.

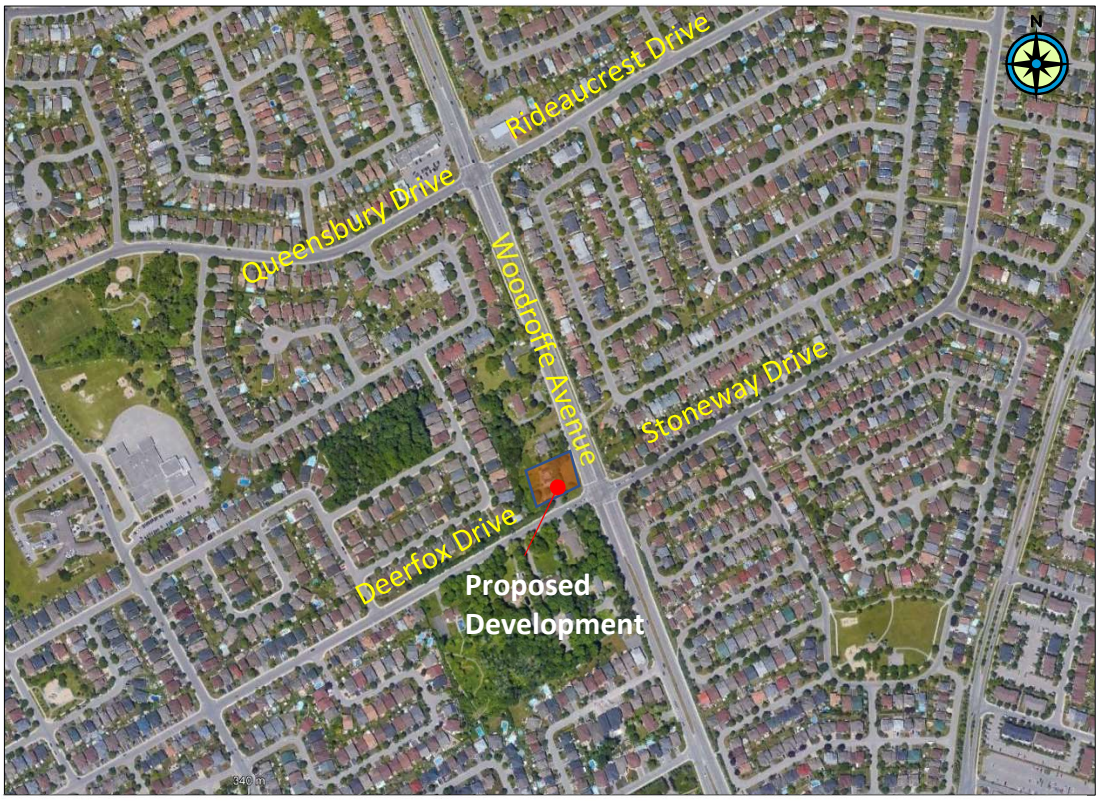


Exhibit 2-1: Location of Proposed Development

Exhibit 2-2 illustrates the proposed site plan (September, 2022) for the development. The full site plan can also be found in Appendix "C", illustrating the following:

- The 532 m^2 dental office located on the east side of the site; and
- The two residential buildings (4 units) located on the west side of the parcel.

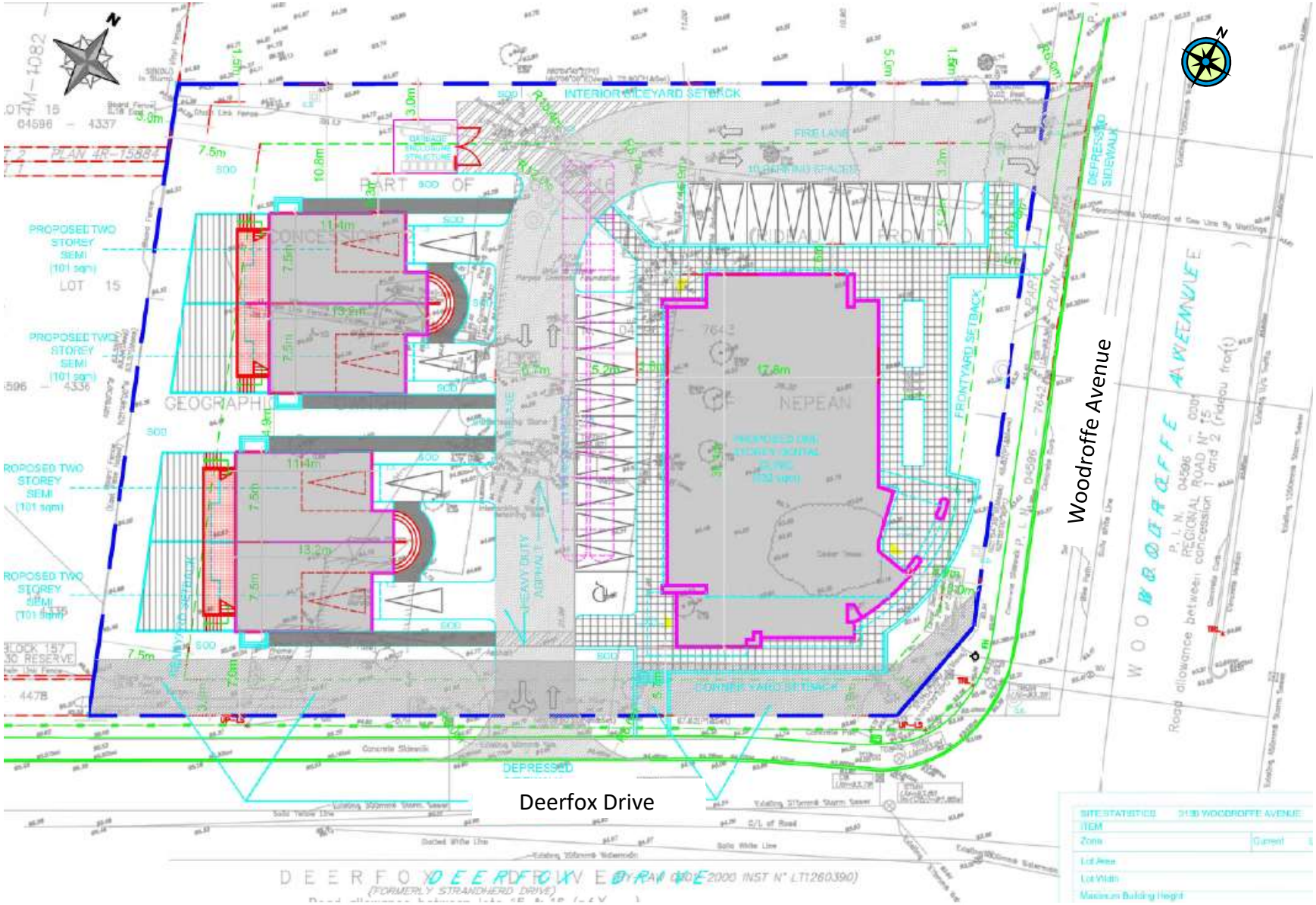


Exhibit 2-2: Proposed Site Plan (September, 2022)

2.1.2 Existing Conditions

2.1.2.1 Study Area Roadways

The City of Ottawa TMP (Map 8) was referenced along with a desktop review of aerial photography to document the existing roadways that would serve the proposed development and surrounding area. The municipal-owned roadways in the vicinity of the proposed development include the following:

Woodroffe Avenue

- is an existing 4-lane divided arterial roadway;
- posted speed limit of 70 km/hr;
- On the approaches to the intersections, the roadway effectively widens to 6 lanes (2 through lanes, 1 LT lane, 1 RT lane, and 2 lanes in the opposing direction);
- Sidewalks and pocket bicycle lanes are provided on each side; and
- A right-in right-out access is proposed given the presence of the existing centre-median;

Deerfox Drive

- is an existing 2-lane undivided collector roadway;
- posted speed limit of 40 km/hr;
- On the approach to the intersection with Woodroffe Avenue, the roadway effectively widens to 3 lanes (1 through-right lane, 1 LT lane, and 1 opposing lane);
- Sidewalks are provided on each side; and
- A full movement access is proposed off this roadway, about 40 meters west of the STOP bar at Woodroffe Ave/Deerfox Drive-Stoneway Drive intersection;

Stoneway Drive

- is an existing 2-lane undivided collector roadway;
- posted speed limit of 40 km/hr;
- On the approach to the intersection with Woodroffe Avenue, the roadway effectively widens to 3 lanes (1 through-right lane, 1 LT lane, and 1 opposing lane); and
- Sidewalks are provided on each side;

Rideaucrest Drive

- is an existing 2-lane undivided collector roadway;
- posted speed limit of 40 km/hr;
- On the approach to the intersection with Woodroffe Avenue, the roadway effectively widens to 3 lanes (1 through-right lane, 1 LT lane, and 1 opposing lane); and
- Sidewalks are provided on each side.

Queensbury Drive

- is an existing 2-lane undivided collector roadway;
- posted speed limit of 40 km/hr;
- On the approach to the intersection with Woodroffe Avenue, the roadway effectively widens to 3 lanes (1 through-right lane, 1 LT lane, and 1 opposing lane); and
- Sidewalks are provided on each side.

2.1.2.2 Study Area Intersections

a. Woodroffe Ave / Deerfox Drive-Stoneway Drive:

This intersection is a 4-leg signal-controlled intersection.

- The northbound major approach provides for one auxiliary NB-LT lane, one auxiliary NB-RT lane and two NB-TH lanes.
- The southbound major approach provides for one auxiliary SB-LT lane, one auxiliary SB-RT lane and two SB-TH lanes.
- The westbound minor approach provides for one WB-LT lane, and one shared WB-Th/WB-RT lane.
- The eastbound minor approach provides for one EB-LT lane, and one shared EB- Th/EB-RT lane.
- Sidewalks are provided in each quadrant of the intersection. Bike lanes are provided on the northbound and southbound major approaches.

Exhibit 2-3 Woodroffe Ave / Deerfox Drive-Stoneway Drive intersection

b. Woodroffe Ave / Queensbury Drive-Rideaucrest Drive:

Exhibit 2-4: Woodroffe Ave / Queensbury Drive Rideaucrest Drive

This intersection is a 4-leg signal-controlled intersection.

- The northbound major approach provides for one auxiliary NB-LT lane, one auxiliary NB-RT lane and two NB-TH lanes;
- The southbound major approach provides for one auxiliary SB-LT lane, one auxiliary SB-RT lane and two SB-TH lanes;
- The westbound minor approach provides for one WB-LT lane, and one shared WB-Th/WB-RT lane;
- The eastbound minor approach provides for one EB-LT lane, and one shared EB-Th/EB-RT lane;
- Sidewalks are provided in each quadrant of the intersection. Bike lanes are provided along northbound and southbound major approaches.

2.1.2.3 Existing Surrounding Driveways

Exhibit 2-5 illustrates the adjacent existing and proposed developments within the immediate proximity (200 meters from each access) of the proposed 3130 Woodfree Avenue mixed-use development. The following developments are **detached residential dwellings** with driveways abutting the adjacent roadways to the proposed development:

- *3102 Woodroffe Avenue* is accessed by a single access that is approximately 195 meters north of the Woodroffe Avenue/Deerfox Drive-Stoneway Drive intersection;
- *3112 Woodroffe Avenue* is accessed by two accesses that are approximately 120 and 160 meters north of the Woodroffe Avenue/Deerfox Drive-Stoneway Drive intersection;
- *3120 Woodroffe Avenue* is accessed by a single access that is approximately 85 meters north of the Woodroffe Avenue/Deerfox Drive-Stoneway Drive intersection;
- *3150 Woodroffe Avenue* is accessed by a single access off Deerfox Drive that is approximately 55 meters west of the Woodroffe Avenue/Deerfox Drive-Stoneway Drive intersection;
- *3162 Woodroffe Avenue* is accessed by a single access that is approximately 150 meters south of the Woodroffe Avenue/Deerfox Drive-Stoneway Drive intersection. A review of existing conditions (June 2021) indicated that the site was up for sale and potential future redevelopment. Currently, there is no development application associated with this parcel;
- *15 Deerfox Drive* accessed by a single access off Deerfox Drive that is approximately 110 meters west of the Woodroffe Avenue/Deerfox Drive-Stoneway Drive intersection;
- *358-386 Stoneway Drive (even)* are 12 dwellings accessed by single accesses on the north side of Stoneway Drive;
- *385-401 Stoneway Drive (odd)* are 9 dwellings accessed by single accesses on the south side of Stoneway Drive;

The following is a recently completed small residential subdivision development:

- *23 Deerfox Drive, 33 Deerfox Drive, 39 Deerfox Drive.* This is a recently completed small subdivision containing 41 detached residential dwellings with an extension of Ryland Street. A review of June 2021 aerial photography indicated that all of the housing units and the roadway were largely completed with some landscaping work remaining to be finished. Thus, for the traffic analysis purposes, the development is assumed to be built-out in existing (2022) conditions.

Exhibit 2-5: Overview of Existing Adjacent Developments

2.1.2.4 Pedestrian and Cycling Facilities

Concrete sidewalks are provided along both sides of all roadways in the study area:

- Woodroffe Avenue;
- Deerfox Drive;
- Stoneway Drive;
- Rideaucrest Drive;
- Queensbury Drive.

In terms of bicycle infrastructure, Woodroffe Avenue is designated as a "Spine Route", while Deerfox Drive is classified as a "Local Route". There are pocket bike lanes provided on both sides of Woodroffe Avenue. All other roadways in the study area provide for mixed bicycle and automobile traffic.

2.1.2.5 Area Traffic Management

No Area Traffic Management strategies have been identified for the boundary roads within the study area.

2.1.2.6 Existing Transit Provisions

Exhibit 2-6 illustrates, and Table 2-1 describes, the existing transit (March 2022) operational service along roadways within the immediate proximity of the proposed development.

Rabid bus route 74 stops along Woodroffe Avenue (bus stop IDs 3516 in southbound and 1100 in northbound directions).

The closest existing Rapid Transit Station is Nepean Woods, located around 900 metres south from the proposed development.

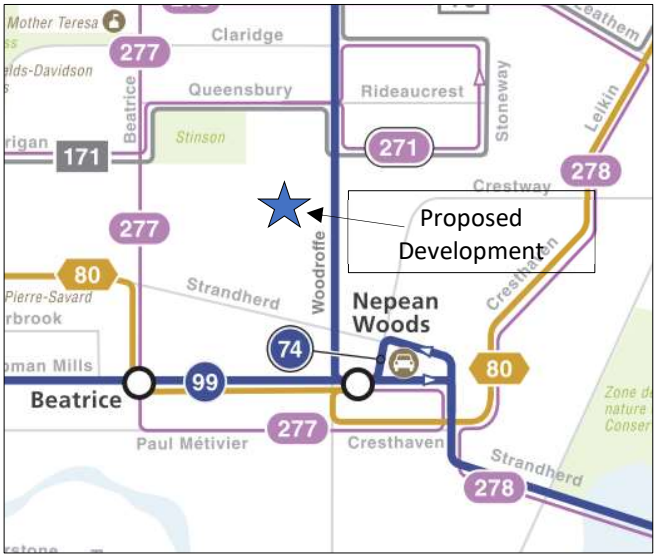


Exhibit 2-6: Transit Lines in the Study Area
(Not to Scale)

Table 2-1: Existing Transit Routes

Route	Description
74	Rapid Bus route connecting Nepean Woods park-and-ride station to Baseline transitway station along Woodroffe Avenue. The route then runs further north to Tunney's Pasture LRT station. The route runs 7 days a week with headways between 15 and 30 minutes.
171	Local Bus route connecting the Barrhaven Centre rapid transit station and Fallowfield rapid transit station via residential streets in central Barrhaven. The buses run 7 days a week with 30-minute headways
271	Peak Hour "Connexion" Bus route between northwestern Barrhaven and Tunney's Pasture. The buses run Monday-Friday in the morning and afternoon peaks in the peak direction of travel. Headways are 30 minutes
99	Rapid Bus route connecting the Barrhaven Centre rapid transit station to Greenboro station via Riverview station. During peak periods on weekdays, the route runs beyond Greenboro towards Hurdman station. On the weekends, the Barrhaven terminus extends beyond Barrhaven Centre to CitiGate/Amazon warehouse development. The buses run 7 days a week with headways as low as 15 minutes during peak hours and as high as 1 hour after midnight
277	Peak Hour "Connexion" Bus route between Nepean Woods and Tunney's Pasture LRT station via Beatrice Drive. The buses run Monday-Friday in the morning and afternoon peaks in the peak direction of travel. Headways are 25-30 minutes.
80	"Frequent" bus route connecting Barrhaven Centre to Tunney's Pasture LRT station via Cresthaven Drive, Merivale Road and Holland Avenue. The buses run 7 days a week with headways between 15 and 30 minutes

2.1.2.7 Existing Peak Hour Travel Demands by Mode

Pedestrian and Cyclist Travel Demand

Table 2-2 indicates the available (2017) morning & afternoon peak hour and 8-hour pedestrian and cyclist traffic volumes obtained from City of Ottawa at the two adjacent intersections to the site.

Both of the intersection traffic counts indicated that they were conducted in the early-to-mid Spring (March-thru-April), 2017 and may not be representative of peak summer-time activity.

The traffic counts were undertaken at:

- the Woodroffe Ave / Deerfox Drive-Stoneway Drive intersection on Thursday, March 2, 2017
- the Woodroffe Ave / Queensbury Drive-Rideaucrest Drive intersection, later in the Spring, on Thursday, April 20, 2017.

The traffic counts indicate the Woodroffe Ave / Queensbury Drive-Rideaucrest Drive intersection exhibits significantly greater pedestrian and cyclist activity when compared to the Woodroffe Ave / Deerfox Drive-Stoneway Drive intersection.

Table 2-2: Pedestrian and Cyclist Peak Hour and 8-Hour Traffic Volumes

Period	Pedestrians Crossing	Woodroffe Ave / Deerfox Drive-Stoneway Drive Intersection	Woodroffe Ave / Queensbury Drive-Rideaucrest Drive Intersection	Cyclist Travelling	Woodroffe Ave / Deerfox Drive-Stoneway Drive Intersection	Woodroffe Ave / Queensbury Drive-Rideaucrest Drive Intersection
8 Hour	**Crossing East Leg**	49	36	**Eastbound**	0	4
AM Peak		13	3		0	1
PM Peak		4	3		0	0
8 - Hour	**Crossing West Leg**	31	78	**Westbound**	0	2
AM Peak		1	2		0	0
PM Peak		0	15		0	0
8 Hour	**Crossing North Leg**	26	140	**Northbound**	1	14
AM Peak		3	29		0	5
PM Peak		2	8		0	2
8 Hour	**Crossing South Leg**	33	111	**Southbound**	1	11
AM Peak		2	7		0	1
PM Peak		5	13		0	3
	Total	**169**	**445**	**Total**	**2**	**43**

Vehicular Travel Demand

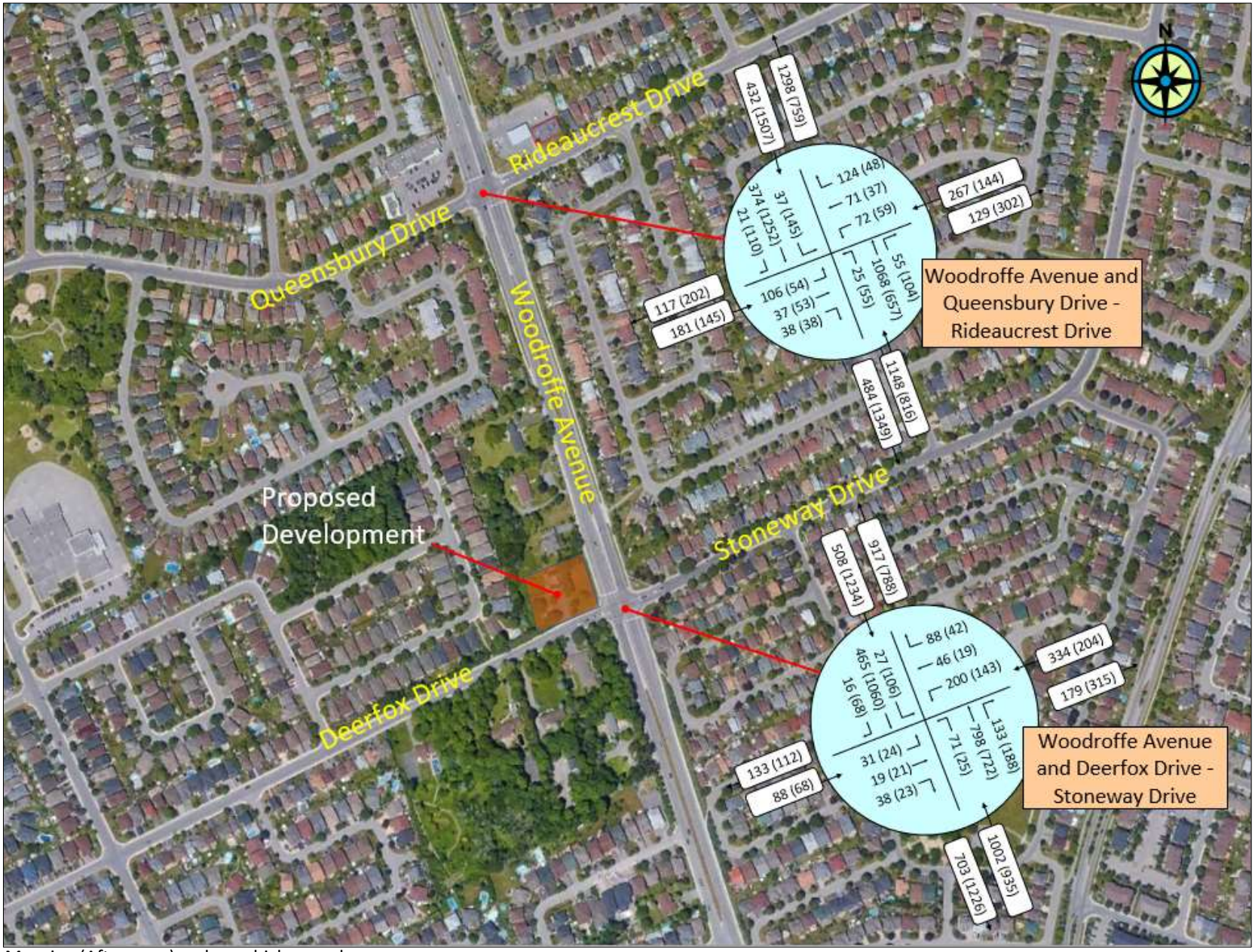
Exhibit 2-7 illustrates the existing (unbalanced) morning and afternoon peak hour traffic volumes within the study area using the traffic count data from the following intersections:

- Woodroffe Avenue and Deerfox Drive – Stoneway Drive; and
- Woodroffe Avenue and Queensbury Drive – Rideaucrest Drive.

Exhibit 2-8 illustrates the existing balanced morning and afternoon peak hour traffic volumes. The following steps were completed in order to bring the traffic to a balanced 2022 horizon year:

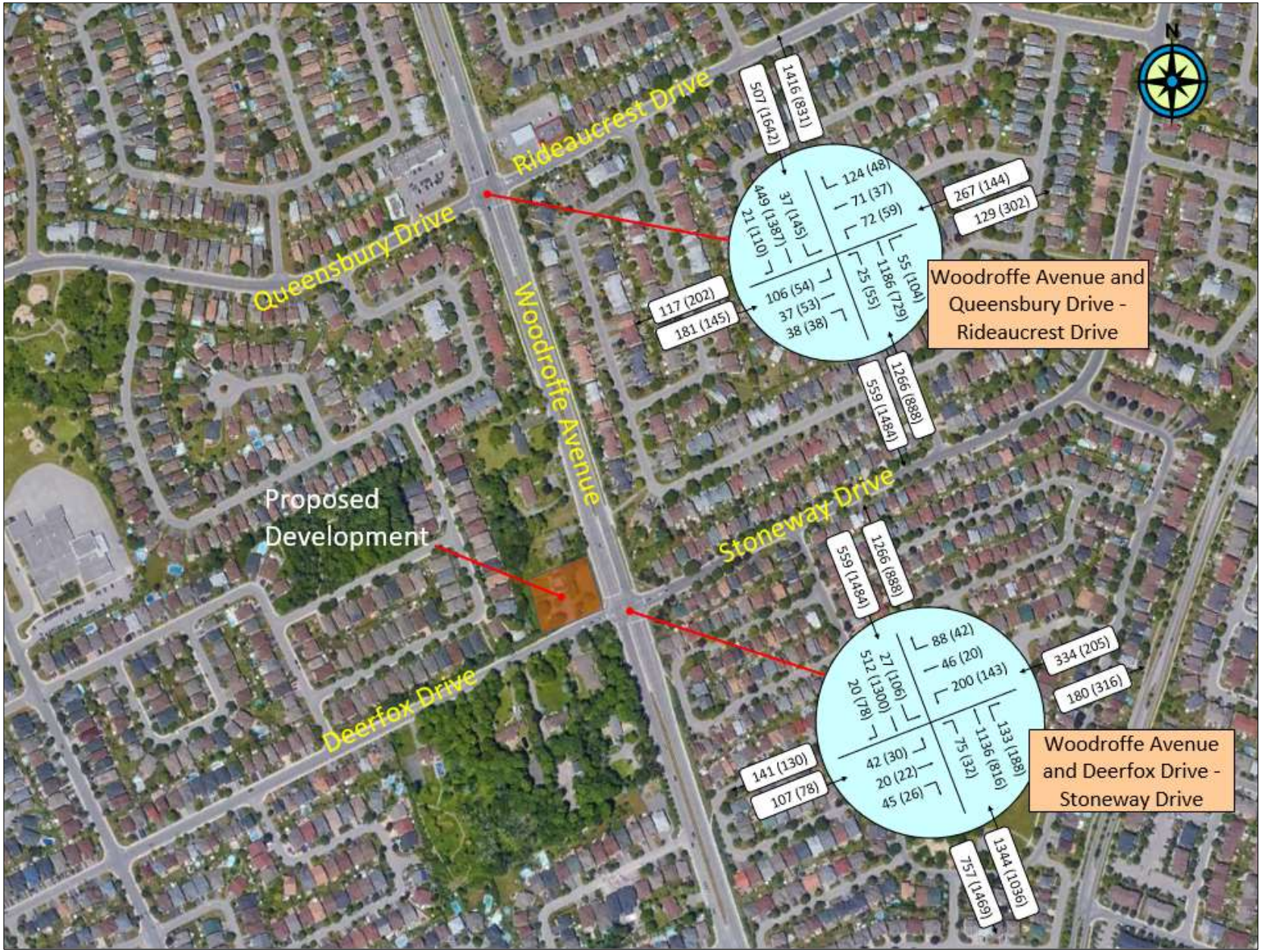
- The two counts were brought to a 2022 horizon year by applying a 2% background growth rate along through movements on Woodroffe Avenue.
- The background growth rate was determined assuming a forecast 2% population growth in the Barrhaven area between 2011 and 2031, identified within the TMP[2]. This is also consistent with assumptions used in a previous Novatech's study of the 23, 33 and 39 Deerfox Drive subdivision[3]; This sub-division traffic was added to the network;
- Additionally, the through traffic along Woodroffe Avenue corridor (between the two study area intersections) was balanced with respect to the traffic count exhibiting the greater volume.

2 City of Ottawa Transportation Master Plan, *November 2013.* Page 21
3 23, 33 and 39 Deerfox Drive Ottawa, Ontario Transportation Impact Asssesment, *Novatech, July 2018*



Morning (Afternoon), vph = vehicles-per-hour

Exhibit 2-7: 2017 Non-Balanced Morning and Afternoon Peak Hour Traffic Volumes



Morning (Afternoon), vph = vehicles-per-hour

Exhibit 2-8: (2022) Balanced Morning and Afternoon Peak Hour Traffic Volumes

2.1.2.8 Existing Road Safety Information

Historical collision information was reviewed for each of the study area intersections and segments. The collision information was provided by the City of Ottawa for ears 2016-through-2020. The collision information provides:

- the date and time of each collision;
- the type of collision (e.g., angle collision, rear-end);
- the severity of damage involved;
- vehicle details (truck, passenger vehicle, etc.);
- vehicle path/maneuver characteristics; and
- the number of pedestrians involved in the collision.

Table 2-3 provides a summary of both intersection and mid-block reported collision for the locations within the study area in terms of the type of collision and collision severity. As well, the table presents the calculated collision rate [as measured in number of collisions per million vehicles that travelled either through the intersection or along the corridor.] A standard collision rate based on the number of collisions- per-million-entering-vehicles (MEV) was calculated. The rate greater than 1.0 collisions/MEV was considered to indicate a potential concern.

Table 2-3 indicates the following:

- The Woodroffe Avenue and Deerfox Drive - Stoneway Drive 4-leg intersection was determined to have 18 collisions over a five-year period and exhibited an overall collision rate of 0.37collisions/MEV which was not considered a concern.
    - 50% of collisions were turning movement collisions;
    - 22% of the collisions resulted in injuries;
    - The number of incidents-per-year ranged from a low of 1 to a maximum of 6.
- The Woodroffe Avenue and Queensbury Drive - Rideaucrest Drive intersection was determined to exhibit a collision rate of 0.61 collisions/MEV which was still considered to be within an acceptable range.
    - 31% of collisions were turning movement collisions, while 28% were rear end collisions;
    - 41% of the collisions resulted in injuries;
    - The number of incidents-per-year ranged from a low of 4 to a maximum of 8.
- Additionally, there were two collisions reported on Woodroffe Avenue between the two study area intersections. Both collisions resulted in property damage only.
- Based on the available data, the two study area intersections exhibit an acceptable level of safety.

Table 2-3: Five -Year Collision History (January 1st, 2016 -to- December 31st, 2020)

Intersection / Mid-block Location		1. Woodroffe Avenue and Deerfox Drive - Stoneway Drive	2. Woodroffe Avenue and Queensbury Drive - Rideaucrest Drive	3. Woodroffe Avenue between Deerfox Drive and Queensbury Drive (mid-block)
Total Collisions		**18**	**29**	**2**
Collision Type	**Rear End**	3	8	0
	Single Vehicle	0	0	0
	Sideswipe	3	0	0
	Turning Movement	9	9	0
	Angle	2	6	0
	Approach	0	0	0
	Other	1	6	2
Collision Severity	**Property Damage**	14	17	2
	Non-Fatal Injury	4	12	0
	Fatal	0	0	0
Intersection AADT		**26,700**	**26,200**	N/A
Collision Rate per MEV		**0.37**	**0.61**	N/A

2.1.3 Planned Transportation Network Changes

To the best of the consultant's knowledge:

- there are no additional planned roadway projects in the vicinity of the study area identified within the City of Ottawa 2013 Transportation Master Plan;
- It was communicated by e-mail on May 30th, 2022 (See Appendix "J") that work (LN56234) by PWES (Public Works and Environmental Services) along Woodroffe Avenue was scheduled for 2022. The scope of work it thought to involve transit priority measures but the scope and PWES's Project Manager at the time of writing remain unknown.

As regards past studies along this section of the Woodroffe Avenue corridor, the "*Woodroffe Avenue Corridor (Fallowfield Road-to-Strandherd Drive) Environmental Study Report*" was submitted to the City's Transportation and Transit Committee on 14 May, 2001. The segment of Woodroffe Avenue applicable to this particular development was defined as "*Section 3*", included Queensview Drive-to-Strandherd Drive, and was to be protected for a 37.5m right-of-way. A review of the GeoOttawa image illustrated within Exhibit 2-9 indicates that the existing protected ROW fronting the proposed development is indeed 37.5m wide.

Exhibit 2-9: Woodroffe Avenue: 37.5m Protected ROW

Exhibit 2-10 illustrates the existing sight triangle provisions at the intersection north-west corner of the Woodroffe Avenue and Deer Fox drive intersection. The measurements indicate that the sight triangle requirements have already been conveyed to the City of Ottawa when Woodroffe Avenue was widened in 2008.

Exhibit 2-10: Evaluation of Site Triangle Provisions

Woodroffe Avenue is identified as a Transit Priority Corridor. The 2013 TMP indicated that transit signal priority and queue jump lanes between Fallowfield Road and Chapman Mills Drive were proposed to be implemented by 2031 to improve transit access to the Southwest Transitway[4].

Six residential properties located at 3102-3162 Woodroffe Avenue (including the subject site) have recently been rezoned from residential to LC (Local Commercial) zoning. No pending development applications aside from the subject site were identified.

4 City of Ottawa Transportation Master Plan, *November 2013.* Page 107

2.2 STUDY AREA AND TIME PERIODS

2.2.1 Study Area

The study area is proposed to include the Woodroffe Avenue corridor and two traffic signal-controlled intersections immediately adjacent to the proposed site entrances which include the Woodroffe Ave / Deerfox Drive-Stoneway Drive intersection and the Woodroffe Ave / Queensbury Drive-Rideaucrest Drive intersection.

2.2.2 Time Periods

The study provided an analysis of the weekday morning and afternoon peak hours of travel demand which represent the "worst-case" scenario in terms of weekday commuter traffic volumes.

2.2.3 Horizon Years

The proposed development, at this point in time, is anticipated to be achieved by the end of 2023. The analysis to be undertaken for the forecasting report will also include a period anticipated to be five years after buildout which would be 2028.

2.3 EXEMPTION REQUEST

Table 2-4 reflects exemptions/reductions in scope of work that were requested subsequent to the submission of the Scoping document. The following exemptions are contained within the Design Review and Network Impact Components of the TIA.

Table 2-4: Exemptions as per TIA Guidelines

Module	Element	Exemption Considerations	Include Module in TIA
Design Review Component			
4.1 Development Design	**4.1.3 New Street Networks**	Only required for plans of subdivision	No
4.2 Parking	**4.2.2 Spillover Parking**	Parking Supply is not expected to be deficient	No
Network Impact Component			
4.5 through 4.9	**All elements**	Development not expected to generate more than 60 vehicle-trips during peak hours of travel demand. Therefore, the "Network Impact" component of the TIA is not required	No

3.0 FORECASTING

3.1 DEVELOPMENT GENERATED TRAVEL DEMAND

As described in section 2.1.1, the development consists of the following land uses:

- The dental office (532 m²) located on the east side of the site;
- The two residential buildings (4 units) located on the west side of the parcel.

This section of the report describes the projected trip generation, trip distribution and trip assignment associated with the full build-out of the proposed development.

3.1.1 Trip Generation and Mode Shares

3.1.1.1 Trip Generation Rate

As per the City of Ottawa TIA guidelines, the preferred source for forecasting traffic generation for residential developments is the 2009 TRANS Trip Generation Manual[5]. To forecast the trip generation for the proposed dental office, an ITE trip rate (Land Use 720 – Medical-Dental Office Building) was used.

Table 3-1 below outlines the trip generation rates per both 2009 TRANS Trip Generation Manual (blended rates)[6] and ITE's Trip Generation Handbook[7] for both residential and commercial land uses:

Table 3-1: Vehicle Trip Generation Rates (ITE and TRANS)

Land Use	ITE/TRANS Land Use*	Size	Morning Peak Hour			Afternoon Peak Hour		
			Rate	In	Out	Rate	In	Out
Semi-Detached Dwellings	220 – Multifamily low-rise (ITE)	4 dwellings	0.46 (per unit)	23%	77%	0.56 (per unit)	63%	37%
	224 – Semi-detached dwellings, townhouses, rowhouses (TRANS)		0.54 (per unit)	37%	64%	0.71 (per unit)	53%	47%
Dental Office	720 – Medical-Dental Office Building	532 m² (5,726 ft²)	2.78 (per 1000 ft²)	78%	22%	3.46 (per 1000 ft²)	28%	72%

*Source: 220, 720: ITE Trip Generation Handbook, 10th Edition; 224: 2009 TRANS Trip Generation Manual

Table 3-2 outlines the generated traffic accounting for both rates referenced from Table 3-1. The primary differences between the TRANS and ITE traffic generation rates is the split of trips during the morning peak hour, as well as a higher generation rate during the afternoon peak hour of travel demand. In accordance with the City of Ottawa's TIA guidelines, and to remain more conservative in the adopted assumptions, the higher TRANS trip rates were selected for the residential component of the development.

5 TRANS Trip Generation Residential Trip Rates, *McCormick Rankin Corporation*, October 2009
6 TRANS Trip Generation Residential Trip Rates, Table 6.2 and Table 6.3, Suburban (outside of greenbelt)
7 ITE Trip Generation Handbook, 10th Edition, *Institute of Transportation Engineers*

Table 3-2: Vehicle Trip Generation per ITE and TRANS Rates

Land Use	ITE/TRANS Land Use*	Size	Morning Peak Hour			Afternoon Peak Hour		
			Total	In	Out	Total	In	Out
Semi-Detached Dwellings	224 – Semi-detached dwellings, townhouses, rowhouses (TRANS)	4 dwellings	2	1	1	3	2	1
Dental Office	720 – Medical-Dental Office Building (ITE)	532 m^2 (5,726 ft^2)	16	12	4	20	6	14
Total			**18**	**13**	**5**	**23**	**8**	**15**

*Source: 720: ITE Trip Generation Handbook, 10th Edition; 224: 2009 TRANS Trip Generation Manual

3.1.1.2 Total Development-Generated Person-Trips

This section outlines the conversion rates to translate vehicle-trips into person-trips. The TRANS Trip Generation manual was consulted to determine the auto mode share for the residential component. Table 3.13 of the manual suggests a 52% vehicle driver split during the morning peak hour and 62% during the afternoon peak hour[8] of travel demand.

In the case of dental office, a 10% non-auto mode share and a vehicle occupancy of 1.15 was assumed to translate auto-trips to person trips[9]. Table 3-3 outlines forecast person-trip generation of each component of the proposed development.

Table 3-3: Projected Development-Generated Person Trips

Land Use	Morning Peak Hour			Afternoon Peak Hour		
	Total	In	Out	Total	In	Out
Semi-Detached Dwellings	4	2	2	5	3	2
Dental Office	20	15	5	26	8	18
Total Person Trips	**24**	**17**	**7**	**31**	**11**	**20**

3.1.1.3 Existing Mode Shares

As discussed in section 2.1.2.6, the closest existing Rapid Transit Station is Nepean Woods, which located about 900 metres south from the proposed development. Notably, there is also rapid bus service (Route 74) along Woodroffe Avenue, with bus stops fronting the proposed development. Table 3.13 in TRANS Trip Generation Manual indicates a transit mode split of 24% in the morning peak hour; and a transit mode share of 17% in the afternoon peak hour for the residential component of this development.

8 TRANS Trip Generation Residential Trip Rates, Table 3.13, Page 40. Person trip rates were obtained by dividing vehicle trip rates by 0.52 and 0.62 for AM and PM, correspondingly

9 City of Ottawa TIA Guidelines, *June 2017*, Page 28. Person trip rates were obtained by multiplying vehicle trip rate by 1.28

The 2011 TRANS OD Report[10] for South Nepean TRANS District indicates:

- during the morning peak hour:
  - a 27% transit mode share for trips originating from the district to other districts;
  - a 5% transit mode share for trips destined to the district; and
  - a 4% transit share for trips travelling within the district.
- during the afternoon peak hour:
  - a 4% transit mode share for trips originating from the district to other districts;
  - a 24% transit mode share for trips destined to the district; and
  - a 4% transit share for trips travelling within the district.

The transit mode share is expected to be higher for the residential component of the site compared to the dental office. Meanwhile, the non-auto rates will likely be greater for the dental office, as many local residents may find it convenient to walk, or bike, to the dental office.

3.1.1.4 Future Mode Share Targets

Table 3-4 outlines the future mode share targets for this development, along with justifications for each target. The high auto-driver target represents a conservative assumption, given the proposed commercial land use (dental clinic in suburban area) and existing relatively low transit mode share within South Nepean.

Table 3-4: Future Mode Share Targets

Travel Mode	Mode Share Target	Rationale
Transit	8%	The site has good rapid transit accessibility for commuter connections towards downtown Ottawa, which benefits the residential component of the development. However, the local connections are lacking in reliability and convenience, which is shown by low transit mode share for trips within the zone. Therefore, the dental office patrons are likely to opt for other modes.
Walking	6%	The site has good pedestrian and cycling infrastructure. Nearby residents may opt to use active modes of transportation while visiting the dental office.
Cycling	6%	
Auto Passenger	15%	Auto passenger mode share is assumed to stay at 15%, assuming a 1.15 vehicle occupancy rate[11]
Auto-driver	65%	This is a conservative estimate reflecting the mode of choice for the majority of trips within suburban zones. The auto-driver component is expected to be lower for the residential component of development, which will rely more on transit.

Table 3-5 summarizes forecast development trips by mode. The auto-driver mode share is conservatively projected to be 65 percent. Therefore, out of the 24 and 31 person-trips occurring during the morning and afternoon peak hours of travel demand; 15 and 19 trips would be by motor vehicle respectively.

10 TRANS Origin-Destination Survey, *December 2012*, R.A. Malatest Associates Ltd.
11 City of Ottawa TIA Guidelines, *June 2017*, Page 28

Table 3-5: Projected Trips by Mode

Land Use	Morning Peak Hour			Afternoon Peak Hour		
	Total	In	Out	Total	In	Out
Semi-Detached Dwellings	**4**	**2**	**2**	**5**	**3**	**2**
Auto-driver – 60%	2	1	1	3	2	1
Auto Passenger – 15%	1	1	0	1	0	1
Transit – 20%	1	0	1	1	1	0
Non-Auto – 5%	0	0	0	0	0	0
Dental Office	**20**	**15**	**5**	**26**	**8**	**18**
Auto-driver – 65%	13	10	3	16	5	11
Auto Passenger – 15%	3	2	1	4	1	3
Transit – 5%	1	1	0	2	1	1
Non-Auto – 15%	3	2	1	4	1	3
Total Person Trips	**24**	**17**	**7**	**31**	**11**	**20**
Auto-driver (65%)	**15**	**11**	**4**	**19**	**7**	**12**
Auto Passenger (15%)	4	3	1	5	2	3
Transit (8%)	2	1	1	3	2	1
Non-Auto (12%)	3	2	1	4	1	3

3.1.2 Trip Distribution

The commercial component of proposed development is projected to attract a high number of local trips from within Barrhaven. The majority of trips will follow the Woodroffe Avenue corridor, while a few trips will come from the collector roads in the east and west (Deerfox Drive and Stoneway Drive).

The proposed vehicle trip breakdown is as follows:

- 35% destined to/from Woodroffe Avenue north;
- 50% destined to/from Woodroffe Avenue south;
- 10% destined to/from Stoneway Drive (east);
- 5% destined to/from Deerfox Drive (west).

3.1.3 Trip Assignment

Based on the trip distribution provided above, the following breakdown of vehicle trips by access is proposed:

Inbound trips:

- 35% using the RI-RO access on Woodroffe Avenue
- 65% using the all-movement access on Deerfox Drive

Outbound trips:

- 40% using the RI-RO access on Woodroffe Avenue
- 60% using the all-movement access on Deerfox Drive.

Exhibit 3-1 illustrates projected development-generated traffic in the build-out (2023) horizon year

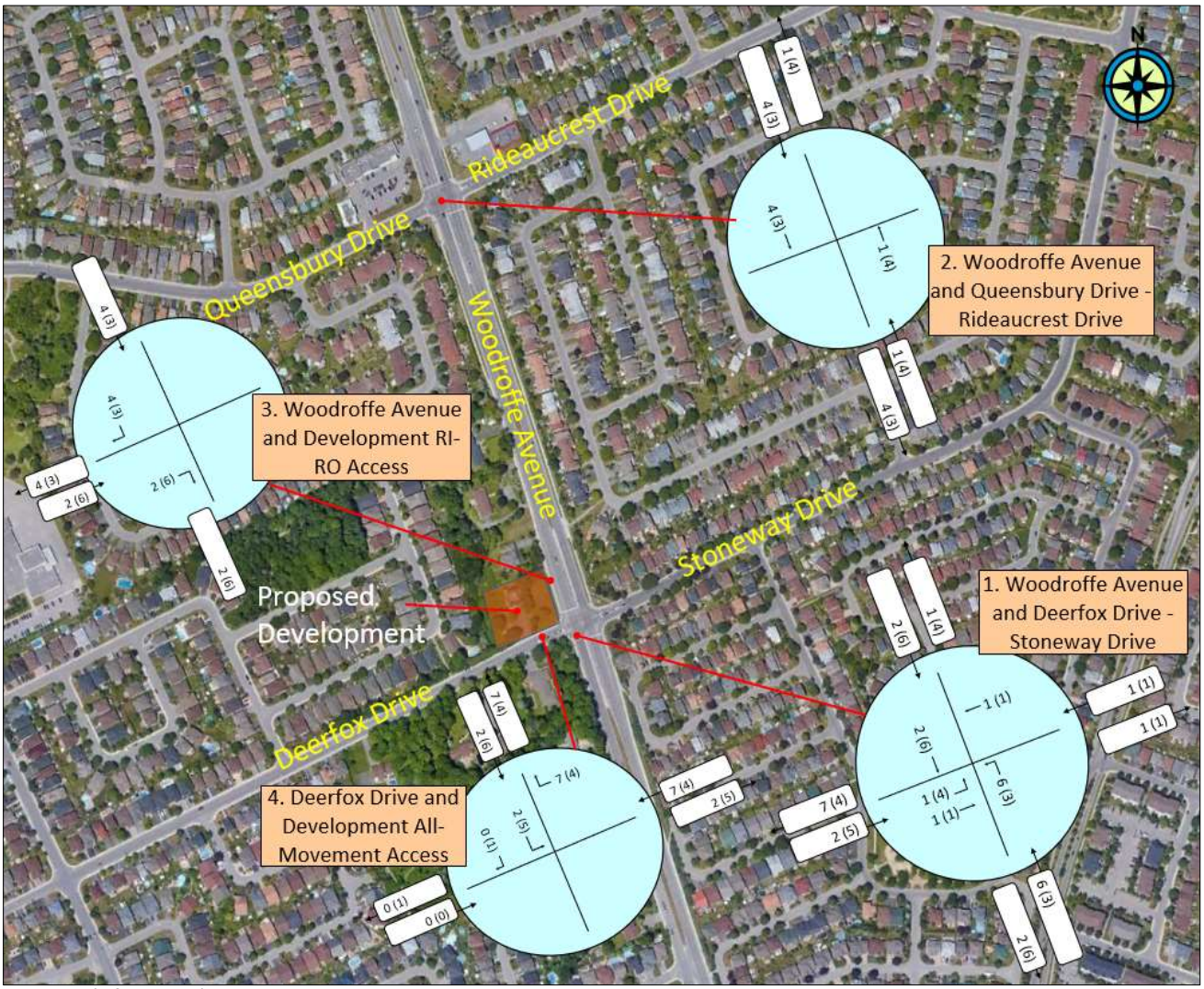


Exhibit 3-1: Site Generated Peak Hour Traffic Volumes

Morning (Afternoon), vph = vehicles-per-hour

3.2 BACKGROUND NETWORK TRAVEL DEMAND

3.2.1 Transportation Network Plans

The traffic signals at the Woodroffe Avenue / Deerfox Drive – Stoneway Drive will operate with fully protected northbound and southbound left turn phasing as of 2023. The intersection capacity analysis was modelled assuming both scenarios (with permissive-protected and fully protected signals) for future horizon years. To model the fully protected NB-LT/SB-LT signal scenario the signal cycle length was kept the same, while the splits were optimized using Synchro™'s built-in signal optimization functionality.

3.2.2 Background Growth

To account for growing population in the Barrhaven area, including both intensification efforts and greenfield development in South Barrhaven, a background traffic growth rate of 2 percent was applied to through movements along Woodroffe Avenue.

3.2.3 Other Developments

As indicated in Section 2.2.1.3, a small subdivision development was recently completed that provides for 41 detached residential dwellings with an extension of Ryland Street (23 Deerfox Drive, 33 Deerfox Drive, 39 Deerfox Drive). The development was assumed to be completed and has been represented in the existing (2022) conditions. It is understood that several adjacent parcels along Woodroffe Avenue have recently been re-zoned from Residential to Local Commercial (LC) use. No pending development applications were located for any of these parcels.

3.3 DEMAND RATIONALIZATION

The following sections summarizes analyses of existing (2022), background 2023, and background 2028 traffic, assuming the proposed development is **not** in place. According to the City of Ottawa's MMLOS guidelines[12], the target vehicular level of service for an intersection in General Urban Area is "D", which corresponds to a volume-to-capacity ratio of 0.9 or less. Table 3-7, Table 3-8 and Table 3-8 indicate that all critical movements operate at an acceptable level of service "D" or better. In existing conditions, both regular (110 seconds) and heavy (130 seconds) morning peak hour signal cycles/splits were considered

The following observations were noted:

- The EB-LT movement at the Woodroffe Avenue and Queensbury Drive-Rideaucrest Drive operates with an average delay of 92 seconds during the morning peak hour of travel demand (130 seconds assuming a heavy AM signal cycle);
- The WB-LT movements at both intersections operate with an average delay of over 50 seconds during both morning and afternoon peak hours of travel demand. This is expected given the long cycle length at both intersections (110, 130 and 115 seconds in the AM, AM heavy and PM, respectively);
- The major leg movements along Woodroffe Avenue (NB-TH and SB-TH) operate well below capacity at a level of service "C" or better in both 2023 and 2028 horizon years.
- The marginal improvement in operational characteristics between existing (2022) and background (2023) years is attributed to adoption of 1.0 peak hour factor (as opposed to 0.9 in existing conditions). This approach is consistent with City of Ottawa's TIA guidelines methodology.

3.3.1 Existing Traffic Analysis

Table 3-7 summarizes the existing (2022) intersection capacity analysis (see Exhibit 3-3 for traffic volumes) undertaken with Synchro™ 11 traffic software for traffic-signal controlled intersections.

12 City of Ottawa MMLOS Guidelines, *September 2015*, IBI Group. Pages 21-24

The following analysis assumes the development is **not** in place and considers the effects of background traffic growth and adjacent development traffic (The Synchro analysis output sheets can be found in Appendix "E".)

Table 3-6: Existing (2022) Traffic Analysis

Intersection:	***Control Type***	***Weekday Morning Peak Hour [Heavy AM Cycle] (Afternoon Peak Hour)***				
		Critical Movement				
		Approach / Movement	95th Percentile Queue (m)	Delay (seconds)	LOS	v/c
1. Woodroffe Avenue and Deerfox Drive – Stoneway Drive	Traffic Signal	*WB-LT* *[WB-LT]* *(WB-LT)*	69 [77] (52)	63.5 [70.1] (62.8)	D [D] (C)	0.82 [0.81] (0.72)
		NB-TH *[NB-TH]* *(SB-TH)*	140 [157] (45)	18.9 [19.0] (7.9)	B [B] (B)	0.63 [0.60] (0.68)
2 Woodroffe Avenue and Queensbury Drive – Rideaucrest Drive	Traffic Signal	*EB-LT* ***[EB-LT]*** *(WB-LT)*	41 **[51]** (24)	71.2 **[91.7]** (53.1)	C **[D]** (A)	0.77 **[0.84]** (0.44)
		NB-TH *[NB-TH]* *(SB-TH)*	147 [174] (227)	25.4 [26.5] (15.7)	B [B] (C)	0.62 [0.61] (0.71)

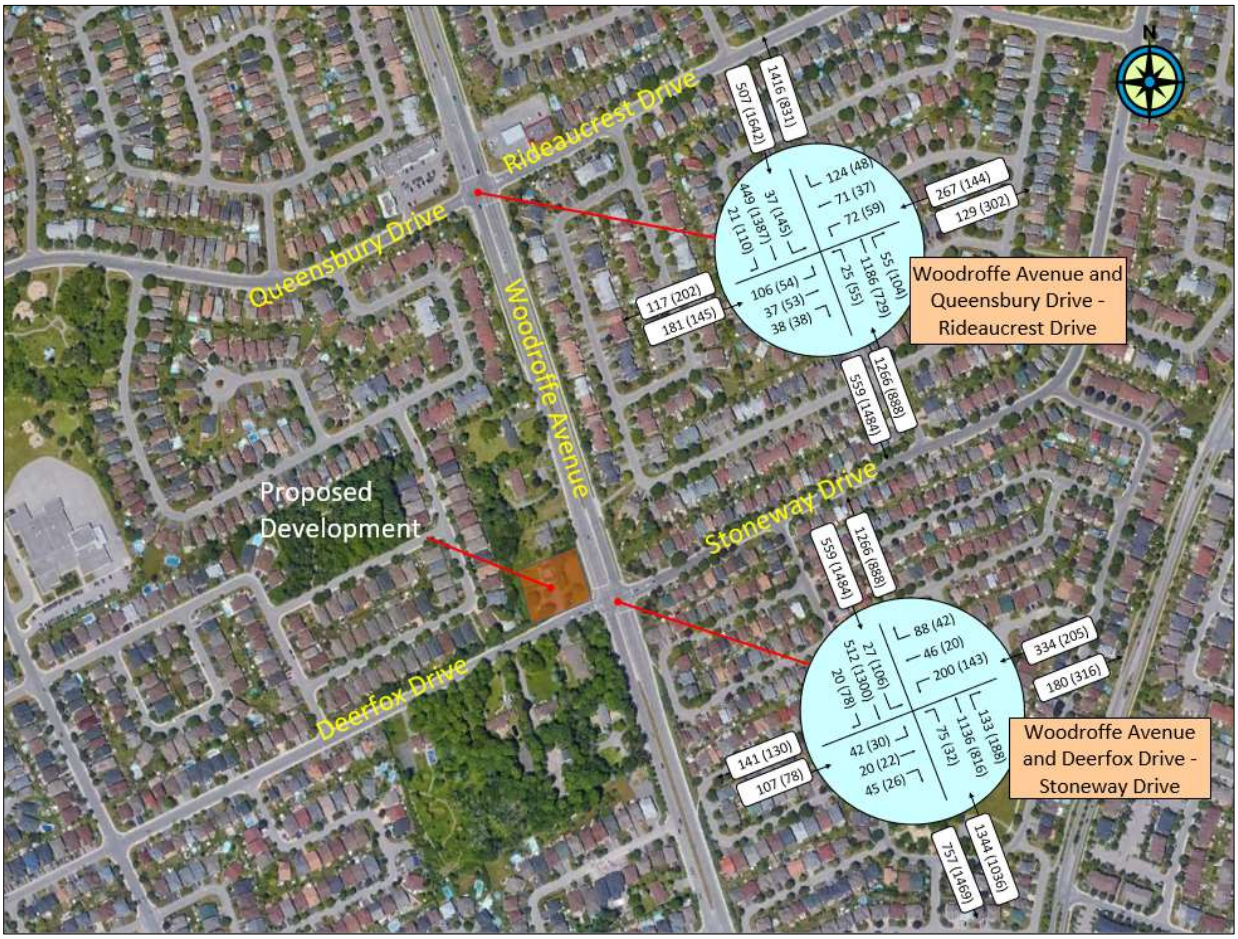


Exhibit 3-2: Existing (2022) Peak Hour Traffic Volumes

Morning (Afternoon), vph = vehicles-per-hour

3.3.2 Background 2023 Traffic Analysis

Table 3-7 summarizes the background 2023 intersection capacity analysis (See Exhibit 3-3 for traffic volumes) undertaken with Synchro™ 11 traffic software for traffic-signal controlled intersections. This analysis assumes the development is **not** in place and only considers the effects of background growth and adjacent development traffic. (The Synchro analysis output sheets can be found in Appendix "F".)

Table 3-7: Background 2023 Traffic Analysis

Intersection:	*Control Type*	*Weekday Morning Peak Hour (Afternoon Peak Hour)*				
		Critical Movement				
		Approach / Movement	95th Percentile Queue (m)	Delay (seconds)	LOS	v/c
1. Woodroffe Avenue and Deerfox Drive – Stoneway Drive	Traffic Signal (Permissive-Protected NB-LT and SB-LT), Existing Splits	*WB-LT (WB-LT)*	62 (49)	61.9 (63.8)	C (C)	0.78 (0.71)
		NB-TH (SB-TH)	123 (28)	16.7 (6.9)	A (B)	0.56 (0.61)
		NB-LT (SB-LT)	12 (6)	8.0 (5.3)	A (A)	0.14 (0.31)
	Traffic Signal (Fully Protected NB-LT and SB-LT), Optimized Splits	*WB-LT (WB-LT)*	61 (47)	60.7 (61.0)	C (B)	0.78 (0.68)
		NB-TH (SB-TH)	125 (40)	17.5 (9.2)	A (B)	0.57 (0.62)
		NB-LT (SB-LT)	30 (40)	60.5 (80.3)	A (B)	0.52 (0.67)
2 Woodroffe Avenue and Queensbury Drive – Rideaucrest Drive	Traffic Signal	*EB-LT (WB-LT)*	36 (22	60.0 (52)	B (A)	0.67 (0.40)
		NB-TH (SB-TH)	118 (179)	19.6 (15.5)	A (B)	0.56 (0.64)

Exhibit 3-3: Background 2023 Peak Hour Traffic Volumes

Morning (Afternoon), vph = vehicles-per-hour

3.3.3 Background 2028 Traffic Analysis

Table 3-8 summarizes the background 2028 intersection capacity analysis (see Exhibit 3-4 for traffic volumes) undertaken with Synchro™ 11 traffic software for signal control. This analysis assumes the development is **not** in place and only considers the effects of background growth and adjacent development traffic. Synchro analysis output sheets can be found in Appendix "F".

Table 3-8: Background 2028 Traffic Analysis

Intersection:	*Control Type*	*Weekday Morning Peak Hour (Afternoon Peak Hour)*				
		Critical Movement				
		Approach / Movement	95th Percentile Queue (m)	Delay (seconds)	LOS	v/c
1. Woodroffe Avenue and Deerfox Drive – Stoneway Drive	Traffic Signal (Permissive-Protected NB-LT and SB-LT), Existing Splits	*WB-LT (WB-LT)*	62 (49)	61.9 (63.8)	C (C)	0.78 (0.71)
		NB-TH (SB-TH)	142 (36)	17.8 (7.3)	B (B)	0.62 (0.67)
		NB-LT (SB-LT)	12 (5)	8.1 (5.5)	A (A)	0.15 (0.34)
	Traffic Signal (Fully Protected NB-LT and SB-LT), Optimized Splits	*WB-LT (WB-LT)*	62 (47)	62.1 (61.0)	C (B)	0.78 (0.68)
		NB-TH (SB-TH)	141 (61)	18.5 (9.6)	B (B)	0.63 (0.68)
		NB-LT (SB-LT)	30 (37)	61.1 (79.1)	A (B)	0.53 (0.67)
2 Woodroffe Avenue and Queensbury Drive – Rideaucrest Drive	Traffic Signal	*EB-LT (WB-LT)*	36 (22)	60.0 (52.0)	B (A)	0.67 (0.40)
		NB-TH (SB-TH)	136 (225)	22.6 (17.0)	B (C)	0.61 (0.70)

Exhibit 3-4: Background 2028 Peak Hour Traffic Volumes

Morning (Afternoon), vph = vehicles-per-hour

The tables and exhibits indicate that the study area intersections will continue to operate below capacity into the 2028 horizon year (assuming the development is not in place).

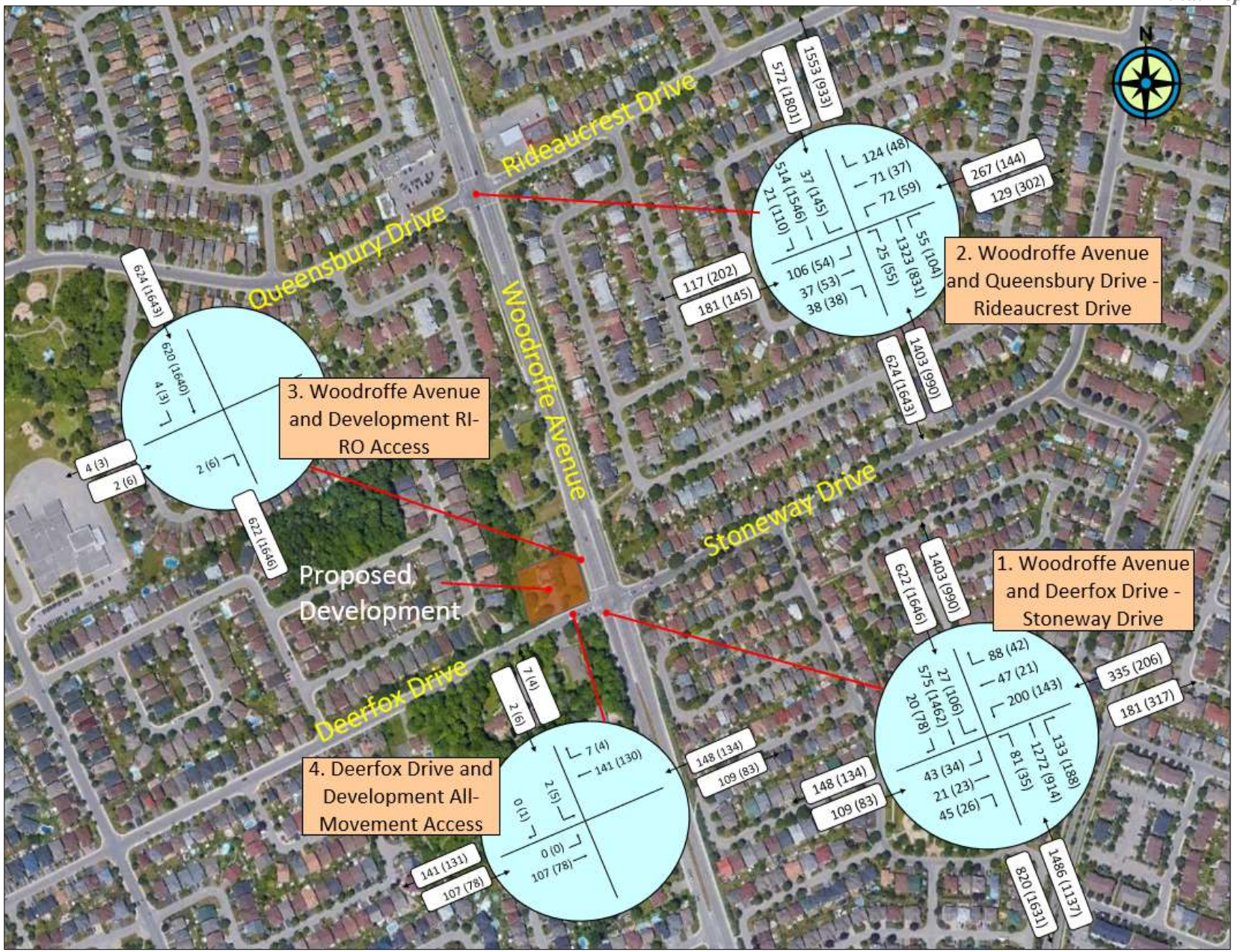
The advent of implementing fully protected north-south left turns at the Woodroffe Avenue and Deerfox Drive-Stoneway Drive intersection will result in significantly increased delays for the left turn movements off Woodroffe Avenue. Despite that, the critical level of service for SB-LT movement during the afternoon peak hour of travel demand was found to be LOS "B".

3.3.4 Total Traffic Forecasts

Exhibit 3-5 and Exhibit 3-6 illustrate total traffic forecasts for years 2023 and 2028, which combine the projected background network traffic and development-generated traffic demands. The advent of development is expected to cause a low-to-negligible impact on the surrounding transportation network, adding a total of 15 two-way auto-vehicle trips during the morning peak hour of travel demand, and 19 two-way auto-vehicle trips during the afternoon peak hour of travel demand.

Morning (Afternoon), vph = vehicles-per-hour

Exhibit 3-5: Total 2023 Peak Hour Traffic Volumes (with Development)



Morning (Afternoon), vph = vehicles-per-hour

Exhibit 3-6: Total 2028 Peak Hour Traffic Volumes (with Development)

4.0 STRATEGY

4.1 DEVELOPMENT DESIGN

4.1.1 Design for Sustainable Modes

Appendix "G" provides City of Ottawa's Travel Demand Management (TDM) Supportive Development Design and Infrastructure checklists for both the residential and retail components of the site. A review of the checklists indicate that the development meets all of the required TDM infrastructure measures.

The development was found to provide good pedestrian connectivity to Deerfox Drive and Woodroffe Avenue. The dental office has frontage along Woodroffe Avenue and Deerfox Drive, while the residential component of the development fronts an internal roadway. A bicycle rack is provided in close proximity to Woodroffe Avenue.

A review of nearby active transportation infrastructure indicates that pedestrian sidewalks are provided on both sides of Woodroffe Avenue and Deerfox Drive. Woodroffe Avenue is a spine bicycle route with bike lanes on each side of the roadway. The nearest transit stops are Woodroffe / Deerfox in the southbound direction and Woodroffe / Stoneway in the northbound direction. Both bus stops are serviced by Route 74 and provide service to Tunney's Pasture LRT station and Nepean Woods rapid transit station, respectively.

4.1.2 Circulation and Access

Appendix "H" provides a review of on-site truck (HSU) turning movements. The review of the turning movements indicates that heavy vehicle circulation with vehicles entering from Woodroffe Avenue and existing onto Deerfox Drive is satisfactory.

4.2 PARKING

4.2.1 Motor Vehicle Parking

The proposed development is considered a "mixed-use" development which contains both residential and non-residential uses. The parking stall requirement for the residential and visitor components of the development were determined as follows knowing the development is contained within Area "C" (Suburban) within Schedule 1A of the City of Ottawa's parking by-law.

- *Resident Parking:* The City's minimum parking rate applicable to the residential component of the development (4 semi-detached units) was found to be 1 parking stall per unit.[13] This would indicate that 4 parking stalls would be required.
- Visitor Parking: According to the City of Ottawa's by-law, "In the case of a townhouse dwelling or stacked dwelling, where each dwelling unit has a driveway accessing a garage or carport located on the same lot as that dwelling unit, and in the case of a planned unit development, where a dwelling unit has a driveway accessing its own garage or carport; no visitor parking is required for that

13. City of Ottawa By-Law 2016-249, Table 101, Row 7, Dwelling Units, semi-detached, Area "C" on Schedule 1A

dwelling unit."[14] Therefore, no visitor parking provisions are required for the residential component of the development.

- *Dental Office Parking:* The City's minimum parking rate applicable to the Dental Office component of the development is 4 parking stalls per 100 m^2 of gross floor area[15]. Given the development's gross floor area of 532m^2, 21 parking stalls are required

Table 4-1 summarizes the supply of parking required by the City of Ottawa's by-laws compared to the planned parking provisions associated with the proposed development. The table indicates that the planned development's supply of parking requirements satisfied the City of Ottawa's by-law requirements.

Table 4-1: Auto Parking Provisions Summary

Land Use	*City Requirement*	*Parking Provisions*
		Surface Stalls
Residential	4 stalls	4 stalls
Dental Office	21 stalls	21 stalls
Total	**25 stalls**	**25 stalls**

4.2.2 Bicycle Parking

The City of Ottawa's bicycle parking requirements[16] indicate that 1 bicycle stall is required per-1,000 m^2 of gross floor area (GFA) of the dental office. Therefore, given the 532m^2 GFA of the dental office, only a single bicycle parking stall is required. There are no additional bicycle parking stall requirements for the residential component of the site, since the proposed dwellings contain a garage. The proposed planned development would provide for 3 bicycle stalls, which exceeds the City of Ottawa's by-law requirements.

Table 4-2 summarizes the bicycle parking stall requirement of the City of Ottawa's by-law as compared to the bicycle parking provisions associated with the proposed development. The table indicates that the planned development exceeds the City cycling stall requirements.

Table 4-2: Bicycle Parking Provisions Summary

Land Use	*City Requirement*	*Parking Provisions*
		Surface Stalls
Residential (Semi-Detached with garage)	0 stalls	3 stalls
Dental Office	1 stall	
Total	**1 stall**	**3 stalls**

14. City of Ottawa By-Law 2016-249, Section 102, Clause (4)
15. City of Ottawa By-Law 2016-249, Table 101, Row N51, Medical Facility, Area "C" on Schedule 1A
16 City of Ottawa By-Law 2016-249, Section 111, Table 11A, (b) and (g)

4.3 BOUNDARY STREET DESIGN

City of Ottawa's Multi-Modal Level of Service Guidelines[17] along with the MMLOS addendum[18] were used to evaluate multi-modal operational characteristics of roadway segments in the vicinity of the proposed development. The City of Ottawa's Multi-Modal Level of Service Guidelines outline the following level of service measures for various non-automotive transportation modes in the city:

- Pedestrian Level of Service (PLOS);
- Bicycle Level of Service (BLOS);
- Transit Level of Service (TLOS); and
- Truck Level of Service (TkLOS).

Exhibit 4-1 illustrates the location of the following boundary street segments analyzed for MMLOS:

- Woodroffe Avenue Northbound;
- Woodroffe Avenue Southbound;
- Deerfox Drive Westbound;
- Stoneway Drive Eastbound;

Exhibit 4-1: Boundary Street Segments for MMLOS Analysis

17 Multi-Modal Level of Service (MMLOS) Guidelines, IBI Group, September 2015
18 Document 5: Addendum to the City's Multi-Modal Level of Service Guidelines, December 2016

Table 4-3 provides results of segment MMLOS analysis.

Table 4-3: Segment MMLOS Analysis Results

Location		Level of Service and Targets							
Roadway Segment	**Policy Area/ Land Use Designation**	**PLOS**	**Target PLOS**	**BLOS**	**Target BLOS**	**TLOS**	**Target TLOS**	**TkLOS**	**Target TkLOS**
Woodroffe Avenue Northbound	General Urban Area	D	C	E	C	D	D	A	D
Woodroffe Avenue Southbound		F	C	E	C	D	D	A	D
Stoneway Drive Eastbound		B	C	B	B	E	D	N/A	
Deerfox Drive Westbound		B	C	B	B	D	D	N/A	

Note – Levels of Service highlighted in bold font fail to meet the respective target LOS
Detailed segment MMLOS analysis calculations are provided within Appendix "I".

Pedestrian Level of Service (PLOS): Northbound and Southbound segments of Woodroffe Avenue fail to meet the minimum desirable target for PLOS "C" for General Urban Area policy area. This can be primarily attributed to an operating speed of 80 km/h along Woodroffe Avenue, as well as high volumes of traffic along the curb lane. The other two roadway segments meet their minimum desirable PLOS targets.

Bicycle Level of Service (BLOS): Northbound and Southbound segments of Woodroffe Avenue exhibit a BLOS "E", and fail to meet the minimum desirable target for BLOS "C" for a bicycle spine route. This poor level of service is attributed to an operating speed of 80 km/h along Woodroffe Avenue. The other two roadway segments meet their minimum desirable BLOS targets.

Transit Level of Service (TLOS): Stoneway Drive Eastbound exhibits a TLOS "E" due to medium driveway friction (from residential driveways along the road), which can slow down transit buses travelling along the road. The other three roadway segments meet their minimum desirable TLOS targets.

Truck Level of Service (TkLOS): The two Woodroffe Avenue roadway segments were found to exceed the target for Truck Level of Service (TLOS). Due to the absence of a set target within the MMLOS guidelines, the two road segments classified as collector roads (Deerfox Drive and Stoneway Drive) were not evaluated.

4.4 ACCESS INTERSECTION DESIGN

As indicated in Section 1.1, the following two accesses that would support the development:

- A right in-right out access from Woodroffe Avenue primarily used to support the proposed dental clinic; and
- A full movement access from Deerfox Drive primarily used to access the residential dwellings.

Both of the above access locations were approved in a previous site plan submission.

4.4.1 Access Control

Both of the proposed accesses to the development would operate with STOP control. The projected traffic volumes destined to, and originating from the development were deemed too low to trigger the warrants for other traffic control measures.

4.4.2 Access Design

Since both accesses are operating as a minor leg-STOP control, no MMLOS analysis (including the auto LOS intersection capacity analysis) is required to be performed for these intersections. The City of Ottawa's MMLOS guidelines state that the LOS analysis is applicable to signalized intersections only[19].

The low traffic volumes generated by the proposed development did not trigger the trip generation warrant[20]. The impact of the nominal amount of vehicle traffic generated by the proposed development upon the two adjacent intersections along Woodroffe Avenue was considered to be negligible.

The proposed accesses will make use of existing curb depressions (without wide radii curved curbs) that are already in place.

4.4.3 Location and Design Characteristics of Proposed Accesses

The following summarizes the design characteristics of the two proposed accesses to/from the development:

Woodroffe Avenue Right-in-Right-out Access:

- The access is located approximately 40 meters north from the STOP line of the adjacent Woodroffe Avenue and Deerfox Drive-Stoneway Drive intersection, and approximately 40 meters south of 3120 Woodroffe Avenue driveway;
- The north edge of the access driveway is located 1.5 meters south from the property line, which satisfies City of Ottawa's minimum requirement of 0.3 meters;
- No median break on Woodroffe Avenue is proposed, thus the access will operate as right-in right-out only;
- The access is approximately 6 meters in width;
- The access affords approximately 9 meters of clear throat length;
    - *The 9m length falls short of TAC's clear throat length requirement[21] of 15 meters for an access from an arterial road. However, given the low projected traffic volumes, and the limited right-in right-out configuration of this access, the provided clear throat length is considered acceptable.*

19 Multi-Modal Level of Service (MMLOS) Guidelines, IBI Group, September 2015. Page 4
20 See section1.2
21 TAC Manual 2017, Chapter 8 – Access, Chapter 8.9.10, page 56

Deerfox Drive Full Movement Access:

- The access is located approximately 25 meters west from the STOP line of the adjacent Woodroffe Avenue and Deerfox Drive-Stoneway Drive intersection;
- The access is located more than 20 meters away from the property line on each side;
- The access is approximately 6 meters in width;
- The access affords approximately 9 meters of clear throat length;
  - *The length satisfies TAC's clear throat length requirement of 8 meters for an access from a collector roadway.*

4.4.3.1 Access Sight Lines

A review of recent (June 2021) Google Street View imaging was conducted to ensure adequate sightlines are provided at each of the two access intersections.

Exhibit 4-2 illustrates the street view looking north on Woodroffe Avenue at the proposed site entrance. The image indicated that there are no trees or other objects blocking the sight-lines as of the imagery date (June 2021).

Exhibit 4-2: Woodroffe Avenue Street View

Exhibit 4-3 illustrates the street view looking west on Deerfox Drive near the proposed site entrance. The image indicated that the existing tree (shown in the red frame) on the east side of the driveway may interfere with existing sightlines. A review of the site plan indicates that the tree will be removed and a new tree will be planted further away form the road.

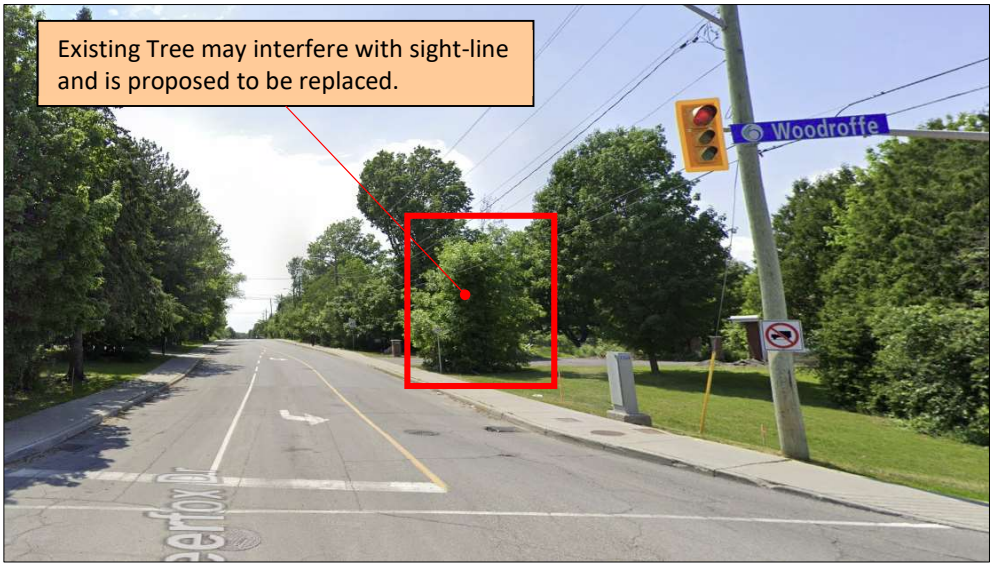


Exhibit 4-3: Deerfox Drive Street View

4.5 General Transportation Comment Responses

General transportation comments received on April 12, 2022 and May 19, 2022 are addressed in the Appendix "J".

The architect and proponent has been notified to implement the following changes to the site plan, if found to be applicable:

- The ROW (Right-of-Way) protection limits for adjacent roads on the site plan are to be illustrated on the drawings;
- The 5.0m x 5.0m sight triangle at the north-west quadrant of the Woodroffe Avenue and Deerfox Drive intersection is to be clearly labelled;
- The above ground building footprints and permanent walls shown on the drawings must not extend above or below the sight triangles or ROW protection limits; and
- The permanent structures (such as curbing, stairs, retaining walls, all underground foundations and bicycle parking racks) do not extend into the City's right-of-way limits.

The development proponent will be notified of the following concerns:

- the owner shall be required to enter into maintenance and liability agreement for all pavers, plant and landscaping material placed in the City right-of-way and the owner shall assume all maintenance and replacement responsibilities in perpetuity;
- should the property owner wish to use a portion of the City's road allowance for construction staging, prior to obtaining a building permit, the property owner must obtain an approved Traffic Management Plan from the Manager, Traffic Management, Transportation Services Department.

5.0 CONCLUSION

The proposed 3130 Woodroffe Avenue Mixed-Use development …

- is expected to cause a negligible increase in motor-vehicle traffic volumes at the adjacent intersections;
- provides sufficient parking facilities for both vehicles and bicycles;
- provides adequate connections to transit and active modes infrastructure in the area;
- ensures adequate circulation of heavy vehicle traffic;

The development proponent is encouraged to monitor traffic volumes at both development entrances for any issues that may arise concerning traffic circulation internal to the site.

The City of Ottawa is encouraged to permit the proposed 3130 Woodroffe Avenue Mixed-Use Development Site Plan Application to proceed from the transportation/traffic standpoint.

Should you have any questions or comments, please do not hesitate to contact us.

Yours truly,

Mr. Arthur Gordon B.A. P.Eng
Principal Engineer
Castleglenn Consultants Inc.

Mr. Andrey Kirillov B.Eng , EIT
Transportation Planner
Castleglenn Consultants Inc.

APPENDIX A: CERTIFICATION FORM FOR TIA STUDY PROJECT MANAGER

Certification Form for TIA Study PM

TIA Plan Reports

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

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

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

CERTIFICATION

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

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

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

Dated at Ottawa (City) this 24 day of March, 20 22.

Name : Arthur Gordon

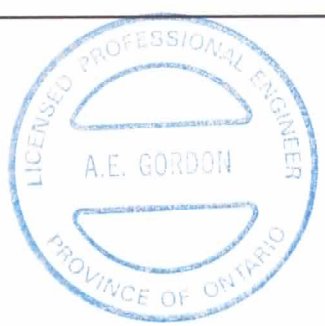
Professional title: Principal

Arthur Gordon

Signature of individual certifier that s/he meets the above criteria

Office Contact Information (Please Print)	
Address:	2460 Lancaster Road, Suite 200
City / Postal Code:	K1B 4S5
Telephone / Extension:	613-731-4052
E-Mail Address:	agordon@castleglenn.ca

Stamp



APPENDIX B: SCREENING FORM

City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	3130 Woodroffe Ave
Description of Location	Four Semi Detached Units and a Dental Clinic in Barrhaven
Land Use Classification	LC8 H(11)
Development Size (units)	4 residential + dental clinic
Development Size (m^2)	924
Number of Accesses and Locations	2
Phase of Development	1
Buildout Year	2023

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

2. Trip Generation Trigger

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

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

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

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

3. Location Triggers

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

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

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

4. Safety Triggers

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

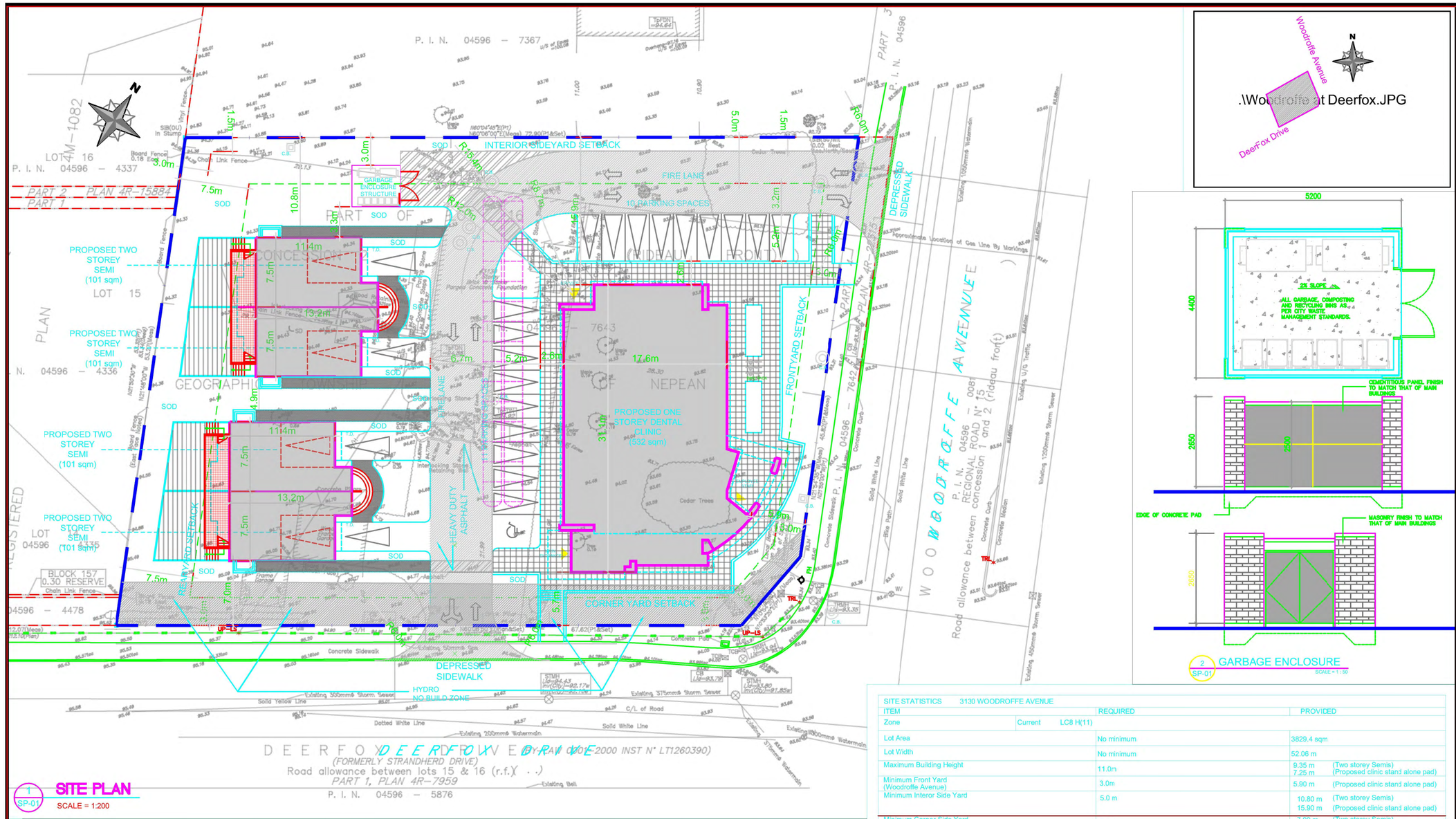
If any of the above questions were answered with 'Yes,' the Safety Trigger is satisfied.

5. Summary

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

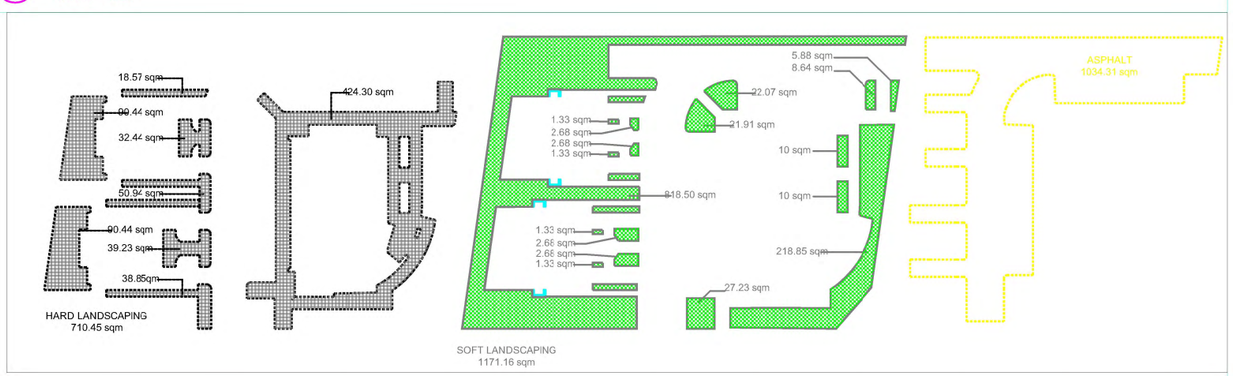
If none of the triggers are satisfied, the TIA Study is complete. If one or more of the triggers is satisfied, the TIA Study must continue into the next stage (Screening and Scoping).

APPENDIX C: SITE PLAN



1 SP-01 **SITE PLAN**

SCALE = 1:200



2 SP-01 **GARBAGE ENCLOSURE**

SCALE = 1:50

CLIENT/OWNER:

Vo and Van Holdings Corporation
65 Loch Isle Road
Nepean, Ontario
K2H 8G7
613-720-4090

SITE INFORMATION DERIVED FROM SURVEY TITLED,

TOPOGRAPHICAL PLAN OF
PART OF LOT 16
CONCESSION 2 (RIDEAU FRONT)
GEOGRAPHIC TOWNSHIP OF NEPEAN
CITY OF OTTAWA
Prepared by
PARLEY, SMITH & DENIS SURVEYING LTD. 2020

LEGEND:

- PROPERTY LINE
- PROPERTY SETBACK
- OHW — OVERHEAD WIRES
- EXISTING BUILDING
- BUILDING ENTRANCE
- W.P. WALL MOUNTED LIGHT
- H.P. HYDRO FOLE
- F.H. FIRE HYDRANT
- M.H. MANHOLE
- C.B. CATCH BASIN
- RETAINING WALL
- D.C. DEPRESSED CURB
- X 100.00 EXISTING GRADE
- 100.00 PROPOSED GRADE
- INTERLOCK PAVERS
- DESIGNATED FIRE ROUTE
- TERRACE
- DECK
- PRIVACY WALL (7'-0" Height)

No.	REVISIONS	BY	DATE
13			
12			
11			
10			
09			
08			
07	FOR REVIEW	JP	SEPT. 01 2022
06	FOR REVIEW	PE	JUNE 16 2022
05	FOR REVIEW	GB	MAR. 16 2022
04	FOR REVIEW	GB	MAR. 10 2022
03	FOR REVIEW	PE	OCT. 06 2021
02	FOR REVIEW	PE	OCT. 01 2021
01	FOR REVIEW	PE	SEPT. 20 2021

SITE STATISTICS 3130 WOODROFFE AVENUE				
ITEM		REQUIRED	PROVIDED	
Zone	Current LC8 H(11)			
Lot Area		No minimum	3829.4 sqm	
Lot Width		No minimum	52.06 m	
Maximum Building Height		11.0m	9.35 m 7.25 m	(Two storey Semis) (Proposed clinic stand alone pad)
Minimum Front Yard (Woodroffe Avenue)		3.0m	5.90 m	(Proposed clinic stand alone pad)
Minimum Interor Side Yard		5.0 m	10.80 m 15.90 m	(Two storey Semis) (Proposed clinic stand alone pad)
Minimum Corner Side Yard (Deerfox Drive)		3.0 m	7.00 m 5.70 m	(Two storey Semis) (Proposed clinic stand alone pad)
Minimum Rear Yard		7.5 m	7.50 m	(Two storey Semis)
Building Footprint		n/a	405 sqm 532 sqm	(Four two storey Semis) (Proposed clinic stand alone pad)
Maximum Lot Coverage		n/a	405 sqm 532 sqm 937 sqm	(Four two storey Semis) (Proposed clinic stand alone pad) TOTAL (24%)
PARKING SPACES	Medical	4 Spaces per 100 sqm of medical clinic GFA Minus exterior walls, washrooms and utility/ Laundry room 478.80 sqm (19 required)	19 Spaces	
	Sems	1 per unit (Four Semis) (4 required)	4 spaces	
Required Bike Racks		1 Space per 2000 sqm of medical clinic GFA (0.2 required)	3 Spaces	
Maximum width of landscaping area				
	Adjacent to parking abutting a street	3.0 m	3.0 m	

NOT AUTHENTIC UNLESS SIGNED AND DATED

P² concepts
ARCHITECTURE LIMITED
OTTAWA, ONTARIO, K1Y 4W8

CONSULTING ENGINEERS

STRUCTURAL

MECHANICAL

ELECTRICAL

DESIGNED BY:	DRAWN BY:	APPROVED BY:
P.E.	P.E.	P.E.

PROJECT

3130 WOODROFFE AVENUE
OTTAWA

DRAWING TITLE

SITE PLAN

PROJECT NO. 0391

DATE SEPT., 20, 2021

SP-01

D07-12-22-0055

PLAN # 17351

APPENDIX D: EXISTING TRAFFIC COUNTS, SIGNAL TIMINGS AND COLLISION DATA

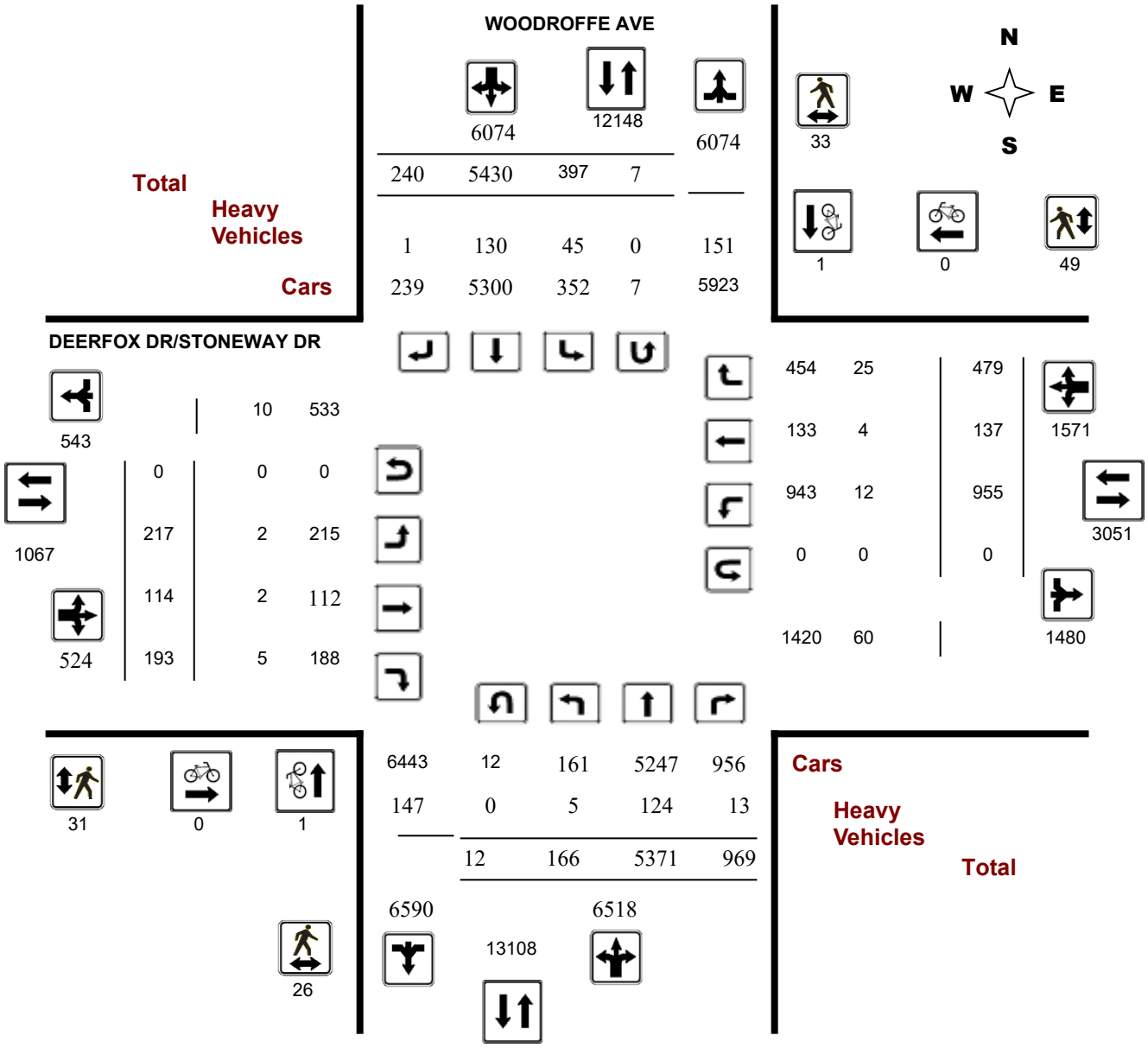
Transportation Services - Traffic Services

Turning Movement Count - Study Results

WOODROFFE AVE @ DEERFOX DR/STONEWAY DR

Survey Date: Thursday, March 02, 2017
Start Time: 07:00
WO No: 36727
Device: Miovision

Full Study Diagram



Transportation Services - Traffic Services

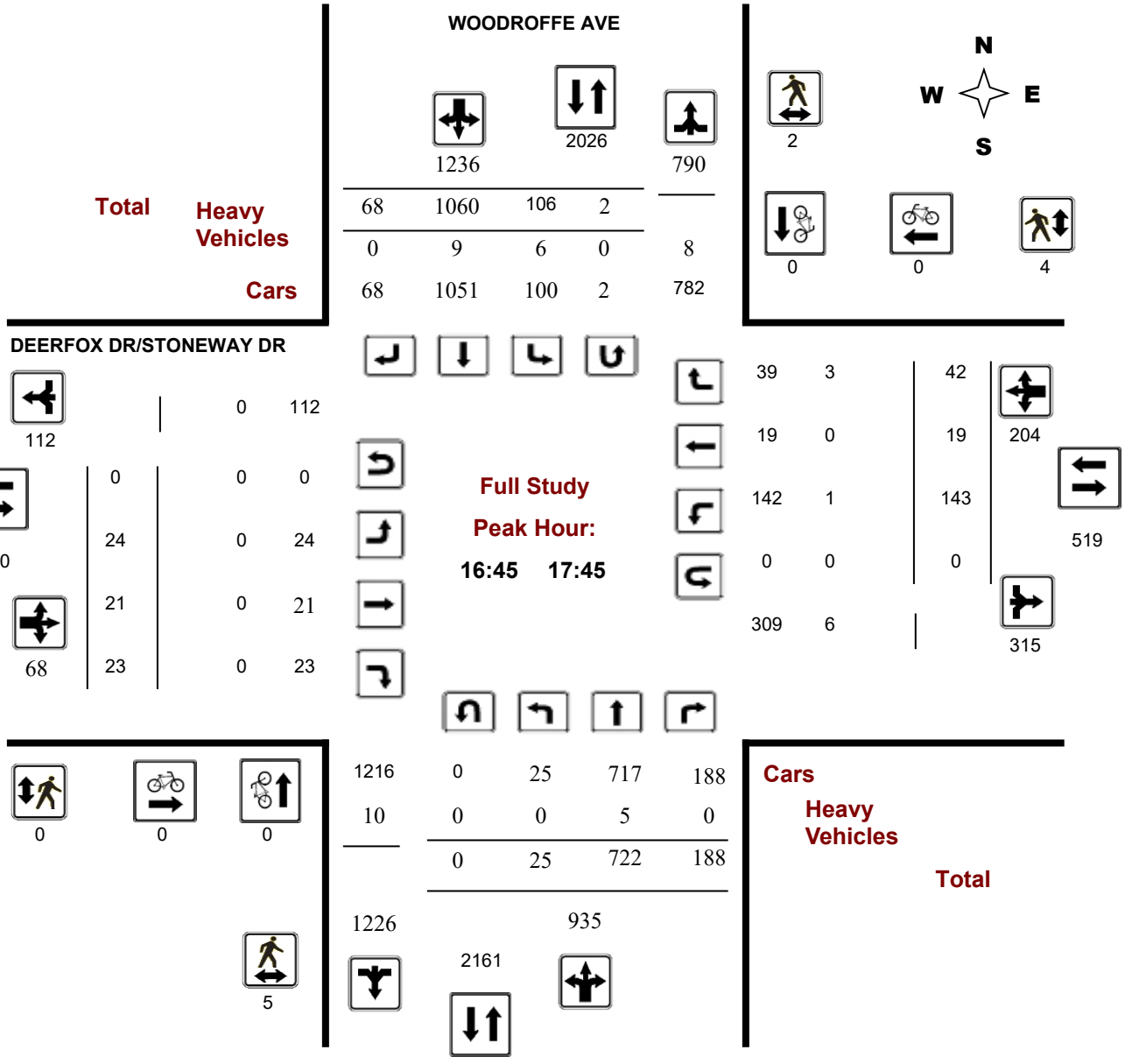
Turning Movement Count - Study Results

WOODROFFE AVE @ DEERFOX DR/STONEWAY DR

Survey Date: Thursday, March 02, 2017 **WO No:** 36727

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

Full Study Peak Hour Diagram



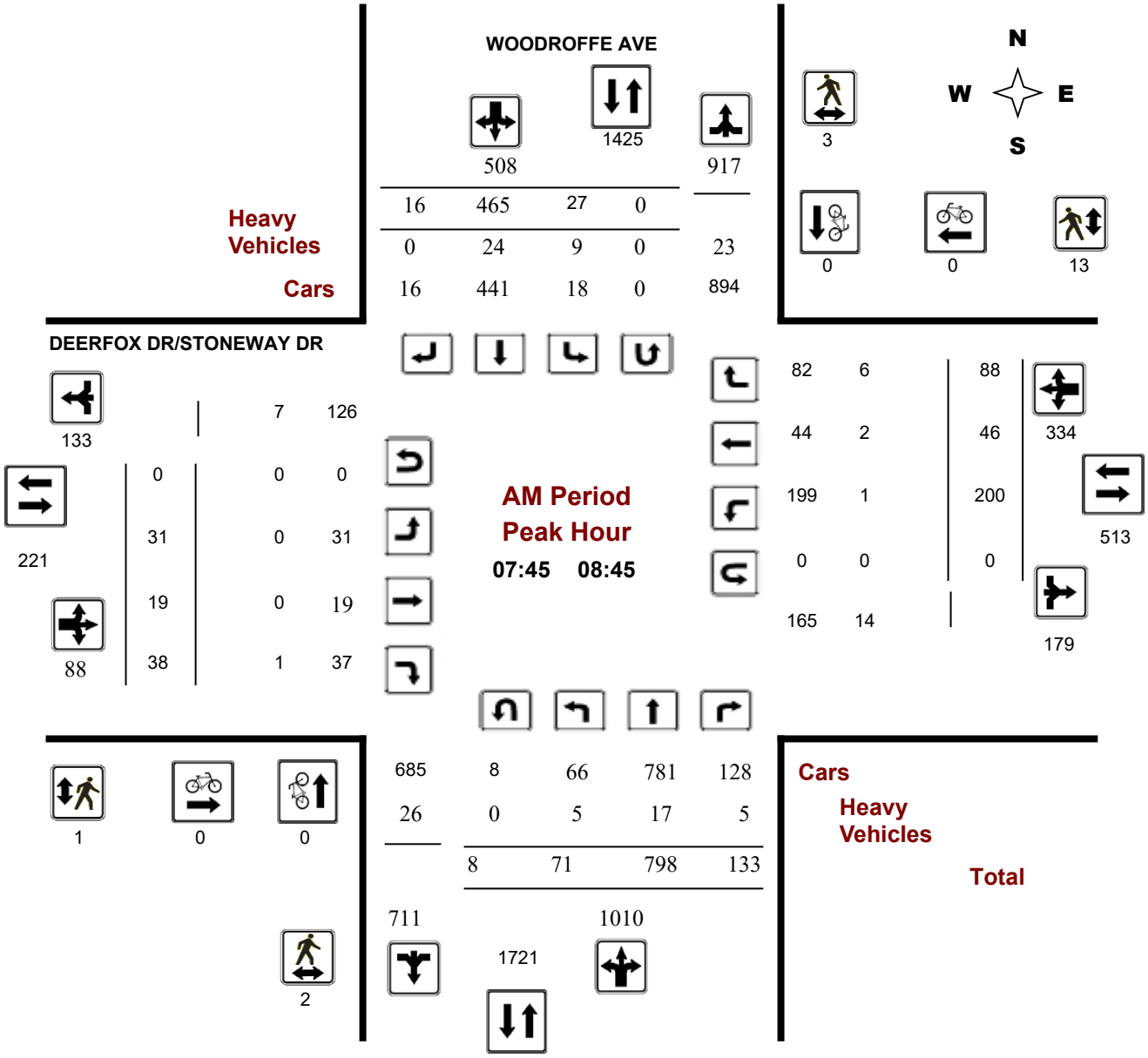
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

WOODROFFE AVE @ DEERFOX DR/STONEWAY DR

Survey Date: Thursday, March 02, 2017 **WO No:** 36727

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



Cars

Heavy Vehicles

Total

Comments

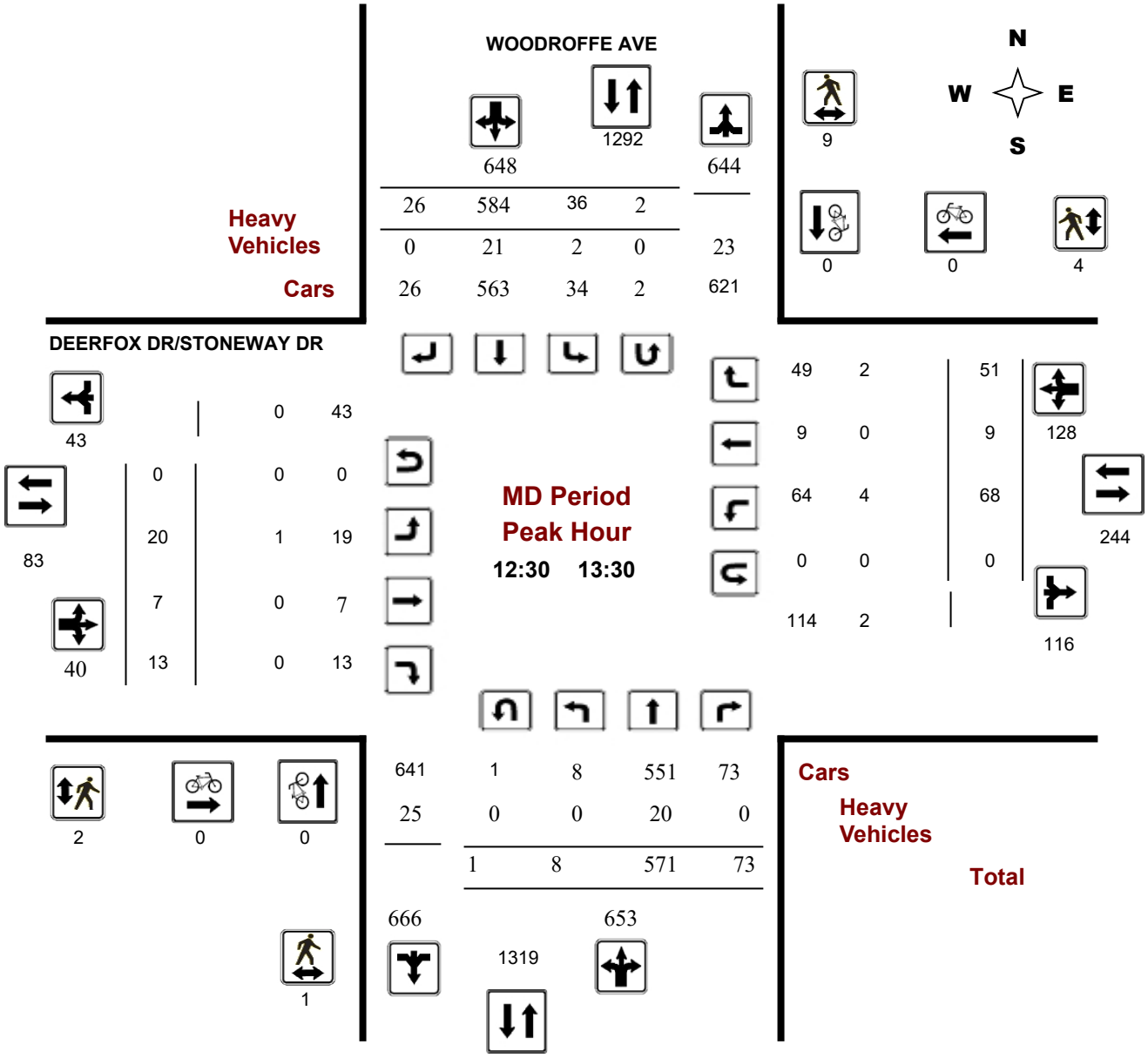
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

WOODROFFE AVE @ DEERFOX DR/STONEWAY DR

Survey Date: Thursday, March 02, 2017 **WO No:** 36727

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



Comments

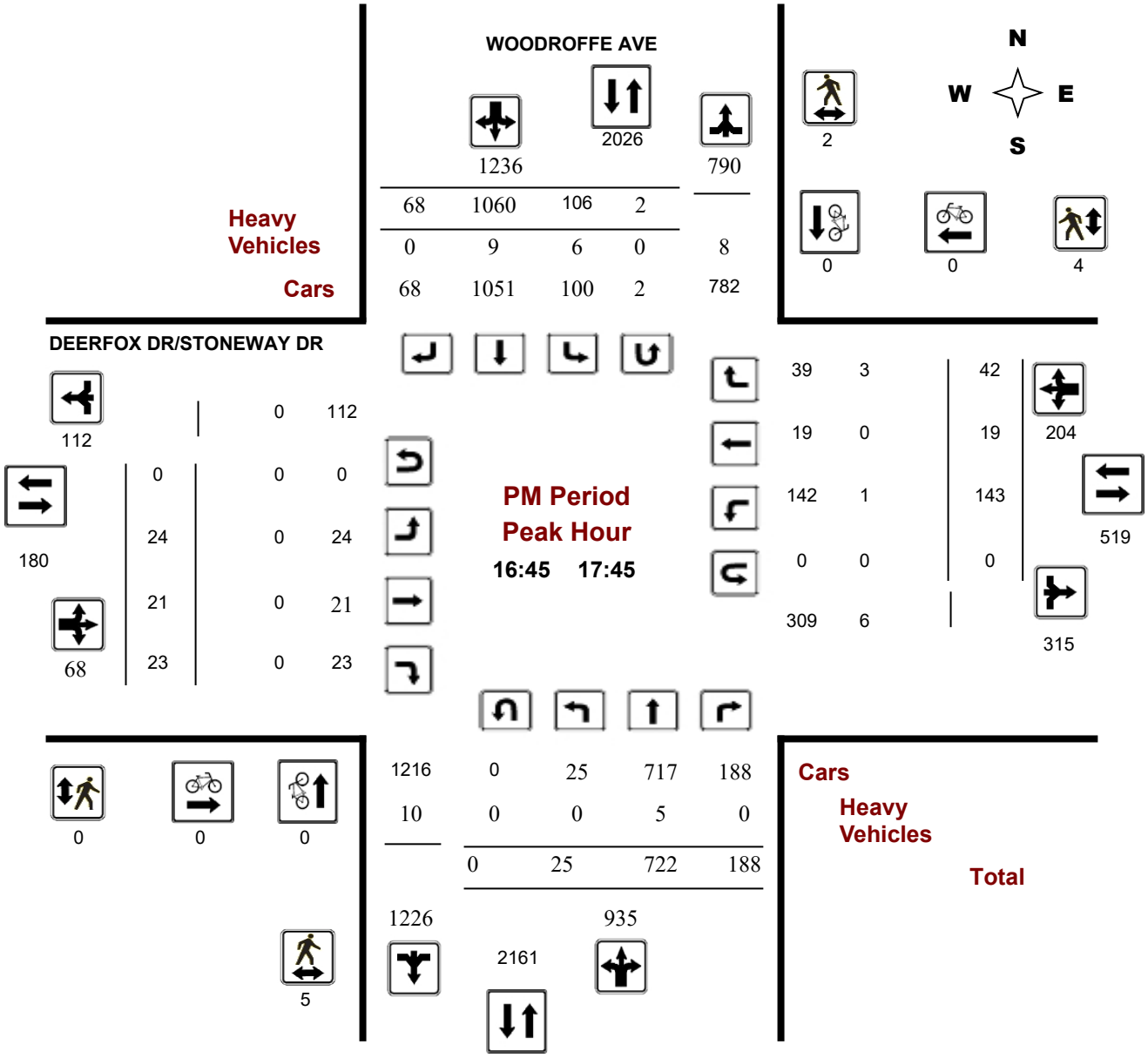
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

WOODROFFE AVE @ DEERFOX DR/STONEWAY DR

Survey Date: Thursday, March 02, 2017 **WO No:** 36727

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



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

WOODROFFE AVE @ DEERFOX DR/STONEWAY DR

Survey Date: Thursday, March 02, 2017 **WO No:** 36727

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

Full Study Summary (8 HR Standard)

Survey Date: Thursday, March 02, 2017

Total Observed U-Turns

Northbound: 12 Southbound: 7

Eastbound: 0 Westbound: 0

AADT Factor

1.00

	WOODROFFE AVE								DEERFOX DR/STONEWAY 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	19	924	81	**1024**	17	381	10	**408**	**1432**	41	10	34	**85**	151	21	111	**283**	**368**	**1800**
08:00 09:00	61	807	118	**986**	29	473	16	**518**	**1504**	27	22	42	**91**	181	47	83	**311**	**402**	**1906**
09:00 10:00	4	603	80	**687**	28	415	8	**451**	**1138**	38	10	15	**63**	78	8	60	**146**	**209**	**1347**
11:30 12:30	7	545	73	**625**	40	522	23	**585**	**1210**	18	10	15	**43**	83	5	47	**135**	**178**	**1388**
12:30 13:30	8	571	73	**652**	36	584	26	**646**	**1298**	20	7	13	**40**	68	9	51	**128**	**168**	**1466**
15:00 16:00	16	565	149	**730**	64	926	48	**1038**	**1768**	24	20	28	**72**	121	19	44	**184**	**256**	**2024**
16:00 17:00	28	645	206	**879**	94	1066	51	**1211**	**2090**	25	17	22	**64**	132	10	37	**179**	**243**	**2333**
17:00 18:00	23	711	189	**923**	89	1063	58	**1210**	**2133**	24	18	24	**66**	141	18	46	**205**	**271**	**2404**
Sub Total	166	5371	969	**6506**	397	5430	240	**6067**	**12573**	217	114	193	**524**	955	137	479	**1571**	**2095**	**14668**
U Turns	12			**12**	7			**7**	**19**	**0**			**0**	0			**0**	**0**	**19**
Total	178	5371	969	**6518**	404	5430	240	**6074**	**12592**	217	114	193	**524**	955	137	479	**1571**	**2095**	**14687**
EQ 12Hr	247	7466	1347	**9060**	562	7548	334	**8444**	**17504**	302	158	268	**728**	1327	190	666	**2183**	**2911**	**20415**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	247	7466	1347	**9060**	562	7548	334	**8444**	**17504**	302	158	268	**728**	1327	190	666	**2183**	**2911**	**20415**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**1.00**					
AVG 24Hr	324	9780	1765	**11869**	736	9888	438	**11062**	**22931**	396	207	351	**954**	1738	249	872	**2859**	**3813**	**26744**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

WOODROFFE AVE @ DEERFOX DR/STONEWAY DR

Survey Date: Thursday, March 02, 2017 **WO No:** 36727

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

Full Study 15 Minute Increments

		WOODROFFE AVE									DEERFOX DR/STONEWAY 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		218	19			95	3		**340**		1	8			1	35		**84**	**424**
07:15	07:30		281	19			82	2		**389**		2	9			5	24		**85**	**474**
07:30	07:45		224	16			95	1		**342**		3	9			9	32		**105**	**447**
07:45	08:00		201	27			109	4		**365**		4	8			6	20		**94**	**459**
08:00	08:15		217	33			95	1		**381**		6	8			10	25		**99**	**480**
08:15	08:30		181	50			132	7		**403**		6	13			9	22		**111**	**514**
08:30	08:45		199	23			129	4		**369**		3	9			21	21		**118**	**487**
08:45	09:00		210	12			117	4		**356**		7	12			7	15		**74**	**430**
09:00	09:15		171	23			126	3		**332**		4	7			1	12		**61**	**393**
09:15	09:30		153	22			109	3		**294**		2	2			3	19		**63**	**357**
09:30	09:45		134	17			92	2		**256**		2	5			3	14		**48**	**304**
09:45	10:00		145	18			88	0		**256**		2	1			1	15		**37**	**293**
11:30	11:45		134	19			131	4		**298**		3	6			2	10		**50**	**348**
11:45	12:00		131	16			134	5		**296**		2	2			1	12		**37**	**333**
12:00	12:15		153	18			130	8		**325**		1	4			0	10		**37**	**362**
12:15	12:30		127	20			127	6		**293**		4	3			2	15		**54**	**347**
12:30	12:45		156	16			121	3		**313**		1	1			1	16		**43**	**356**
12:45	13:00		137	18			167	10		**343**		2	2			4	11		**51**	**394**
13:00	13:15		141	22			136	9		**321**		0	6			1	11		**34**	**355**
13:15	13:30		137	17			160	4		**324**		4	4			3	13		**40**	**364**
15:00	15:15		149	18			198	12		**391**		6	9			6	10		**76**	**467**
15:15	15:30		133	43			226	10		**432**		4	8			4	12		**69**	**501**
15:30	15:45		135	43			243	10		**452**		6	8			6	9		**59**	**511**
15:45	16:00		148	45			259	16		**494**		4	3			3	13		**52**	**546**
16:00	16:15		156	51			277	12		**523**		4	8			2	11		**58**	**581**
16:15	16:30		155	52			260	13		**505**		5	3			3	6		**52**	**557**
16:30	16:45		179	54			267	8		**545**		1	8			0	10		**69**	**614**
16:45	17:00		155	49			262	18		**519**		7	3			5	10		**64**	**583**
17:00	17:15		163	53			277	21		**552**		2	6			5	12		**77**	**629**
17:15	17:30		197	44			266	14		**547**		8	4			5	9		**63**	**610**
17:30	17:45		207	42			255	15		**553**		4	10			4	11		**68**	**621**
17:45	18:00		144	50			265	8		**483**		4	4			4	14		**63**	**546**
Total:		0	5371	969	0	0	5430	240	0	**12592**	0	114	193	0	0	137	479	0	**12592**	**14,687**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

WOODROFFE AVE @ DEERFOX DR/STONEWAY DR

Survey Date: Thursday, March 02, 2017 **WO No:** 36727

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

Full Study Cyclist Volume

Time Period		WOODROFFE AVE			DEERFOX DR/STONEWAY DR			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street 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**
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**
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**
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**
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**
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**
16:00	16:15	0	1	**1**	0	0	**0**	**1**
16:15	16:30	0	0	**0**	0	0	**0**	**0**
16:30	16:45	0	0	**0**	0	0	**0**	**0**
16:45	17:00	0	0	**0**	0	0	**0**	**0**
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	1	0	**1**	0	0	**0**	**1**
Total		1	1	**2**	0	0	**0**	**2**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

WOODROFFE AVE @ DEERFOX DR/STONEWAY DR

Survey Date: Thursday, March 02, 2017 **WO No:** 36727

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

Full Study Pedestrian Volume

	WOODROFFE AVE			DEERFOX DR/STONEWAY DR			
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	1	**1**	0	1	**1**	**2**
07:15 07:30	0	0	**0**	1	3	**4**	**4**
07:30 07:45	0	3	**3**	2	1	**3**	**6**
07:45 08:00	0	2	**2**	0	3	**3**	**5**
08:00 08:15	2	0	**2**	1	1	**2**	**4**
08:15 08:30	0	0	**0**	0	6	**6**	**6**
08:30 08:45	0	1	**1**	0	3	**3**	**4**
08:45 09:00	0	0	**0**	1	3	**4**	**4**
09:00 09:15	0	1	**1**	0	1	**1**	**2**
09:15 09:30	0	1	**1**	2	0	**2**	**3**
09:30 09:45	0	1	**1**	0	0	**0**	**1**
09:45 10:00	1	3	**4**	2	2	**4**	**8**
11:30 11:45	0	1	**1**	0	0	**0**	**1**
11:45 12:00	0	0	**0**	0	0	**0**	**0**
12:00 12:15	1	0	**1**	5	1	**6**	**7**
12:15 12:30	0	1	**1**	1	2	**3**	**4**
12:30 12:45	0	6	**6**	2	2	**4**	**10**
12:45 13:00	0	0	**0**	0	0	**0**	**0**
13:00 13:15	1	1	**2**	0	0	**0**	**2**
13:15 13:30	0	2	**2**	0	2	**2**	**4**
15:00 15:15	0	1	**1**	3	0	**3**	**4**
15:15 15:30	5	0	**5**	2	4	**6**	**11**
15:30 15:45	3	1	**4**	0	1	**1**	**5**
15:45 16:00	4	2	**6**	3	2	**5**	**11**
16:00 16:15	1	0	**1**	3	2	**5**	**6**
16:15 16:30	1	1	**2**	0	3	**3**	**5**
16:30 16:45	1	1	**2**	1	1	**2**	**4**
16:45 17:00	0	1	**1**	0	1	**1**	**2**
17:00 17:15	2	1	**3**	0	1	**1**	**4**
17:15 17:30	1	0	**1**	0	0	**0**	**1**
17:30 17:45	2	0	**2**	0	2	**2**	**4**
17:45 18:00	1	1	**2**	2	1	**3**	**5**
Total	26	33	**59**	31	49	**80**	**139**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

WOODROFFE AVE @ DEERFOX DR/STONEWAY DR

Survey Date: Thursday, March 02, 2017 **WO No:** 36727

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

Full Study Heavy Vehicles

		WOODROFFE AVE									DEERFOX DR/STONEWAY 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	0	4	1		2	4	0		**11**	0	0	0		0	0	1		**1**	**12**
07:15	07:30	0	6	0		2	2	0		**10**	0	0	0		0	0	1		**1**	**11**
07:30	07:45	0	3	0		3	2	0		**8**	0	0	0		2	0	1		**3**	**11**
07:45	08:00	2	1	2		3	3	0		**11**	0	0	0		0	1	1		**2**	**13**
08:00	08:15	2	3	1		2	5	0		**13**	0	0	1		0	0	0		**1**	**14**
08:15	08:30	1	6	1		1	9	0		**18**	0	0	0		0	1	4		**5**	**23**
08:30	08:45	0	7	1		3	7	0		**18**	0	0	0		1	0	1		**2**	**20**
08:45	09:00	0	7	0		0	2	0		**9**	0	1	0		0	0	1		**2**	**11**
09:00	09:15	0	5	1		0	9	1		**16**	1	0	1		0	0	0		**2**	**18**
09:15	09:30	0	5	0		1	3	0		**9**	0	1	0		0	1	1		**3**	**12**
09:30	09:45	0	3	1		1	4	0		**9**	0	0	0		0	0	0		**0**	**9**
09:45	10:00	0	6	0		0	6	0		**12**	0	0	0		0	0	1		**1**	**13**
11:30	11:45	0	4	0		3	5	0		**12**	0	0	0		0	0	0		**0**	**12**
11:45	12:00	0	7	0		0	3	0		**10**	0	0	0		0	0	2		**2**	**12**
12:00	12:15	0	3	0		1	4	0		**8**	0	0	0		0	0	0		**0**	**8**
12:15	12:30	0	4	0		0	2	0		**6**	0	0	0		1	0	1		**2**	**8**
12:30	12:45	0	4	0		1	3	0		**8**	0	0	0		2	0	0		**2**	**10**
12:45	13:00	0	6	0		0	8	0		**14**	0	0	0		0	0	1		**1**	**15**
13:00	13:15	0	6	0		1	4	0		**11**	0	0	0		0	0	0		**0**	**11**
13:15	13:30	0	4	0		0	6	0		**10**	1	0	0		2	0	1		**4**	**14**
15:00	15:15	0	4	1		0	6	0		**11**	0	0	1		1	0	0		**2**	**13**
15:15	15:30	0	9	0		3	7	0		**19**	0	0	1		1	1	0		**3**	**22**
15:30	15:45	0	3	1		2	2	0		**8**	0	0	1		0	0	1		**2**	**10**
15:45	16:00	0	6	1		0	7	0		**14**	0	0	0		0	0	1		**1**	**15**
16:00	16:15	0	2	0		1	2	0		**5**	0	0	0		0	0	0		**0**	**5**
16:15	16:30	0	1	1		4	4	0		**10**	0	0	0		1	0	1		**2**	**12**
16:30	16:45	0	0	1		2	1	0		**4**	0	0	0		0	0	1		**1**	**5**
16:45	17:00	0	3	0		1	3	0		**7**	0	0	0		0	0	2		**2**	**9**
17:00	17:15	0	2	0		4	2	0		**8**	0	0	0		1	0	0		**1**	**9**
17:15	17:30	0	0	0		0	1	0		**1**	0	0	0		0	0	1		**1**	**2**
17:30	17:45	0	0	0		1	3	0		**4**	0	0	0		0	0	0		**0**	**4**
17:45	18:00	0	0	0		3	1	0		**4**	0	0	0		0	0	1		**1**	**5**
Total:	None	5	124	13	**0**	45	130	1	**0**	**318**	2	2	5	**0**	12	4	25	**0**	**50**	**368**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

WOODROFFE AVE @ DEERFOX DR/STONEWAY DR

Survey Date: Thursday, March 02, 2017 **WO No:** 36727

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

Full Study 15 Minute U-Turn Total

Time Period		WOODROFFE AVE Northbound U-Turn Total	WOODROFFE AVE Southbound U-Turn Total	DEERFOX DR/STONEWAY DR Eastbound U-Turn Total	DEERFOX DR/STONEWAY DR Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	**0**
07:15	07:30	0	0	0	0	**0**
07:30	07:45	0	0	0	0	**0**
07:45	08:00	4	0	0	0	**4**
08:00	08:15	1	0	0	0	**1**
08:15	08:30	3	0	0	0	**3**
08:30	08:45	0	0	0	0	**0**
08:45	09:00	1	0	0	0	**1**
09:00	09:15	0	0	0	0	**0**
09:15	09:30	0	0	0	0	**0**
09:30	09:45	0	0	0	0	**0**
09:45	10:00	0	0	0	0	**0**
11:30	11:45	0	0	0	0	**0**
11:45	12:00	0	0	0	0	**0**
12:00	12:15	1	0	0	0	**1**
12:15	12:30	0	1	0	0	**1**
12:30	12:45	0	0	0	0	**0**
12:45	13:00	1	1	0	0	**2**
13:00	13:15	0	0	0	0	**0**
13:15	13:30	0	1	0	0	**1**
15:00	15:15	1	0	0	0	**1**
15:15	15:30	0	0	0	0	**0**
15:30	15:45	0	0	0	0	**0**
15:45	16:00	0	0	0	0	**0**
16:00	16:15	0	1	0	0	**1**
16:15	16:30	0	0	0	0	**0**
16:30	16:45	0	1	0	0	**1**
16:45	17:00	0	0	0	0	**0**
17:00	17:15	0	2	0	0	**2**
17:15	17:30	0	0	0	0	**0**
17:30	17:45	0	0	0	0	**0**
17:45	18:00	0	0	0	0	**0**
Total		12	7	0	0	**19**

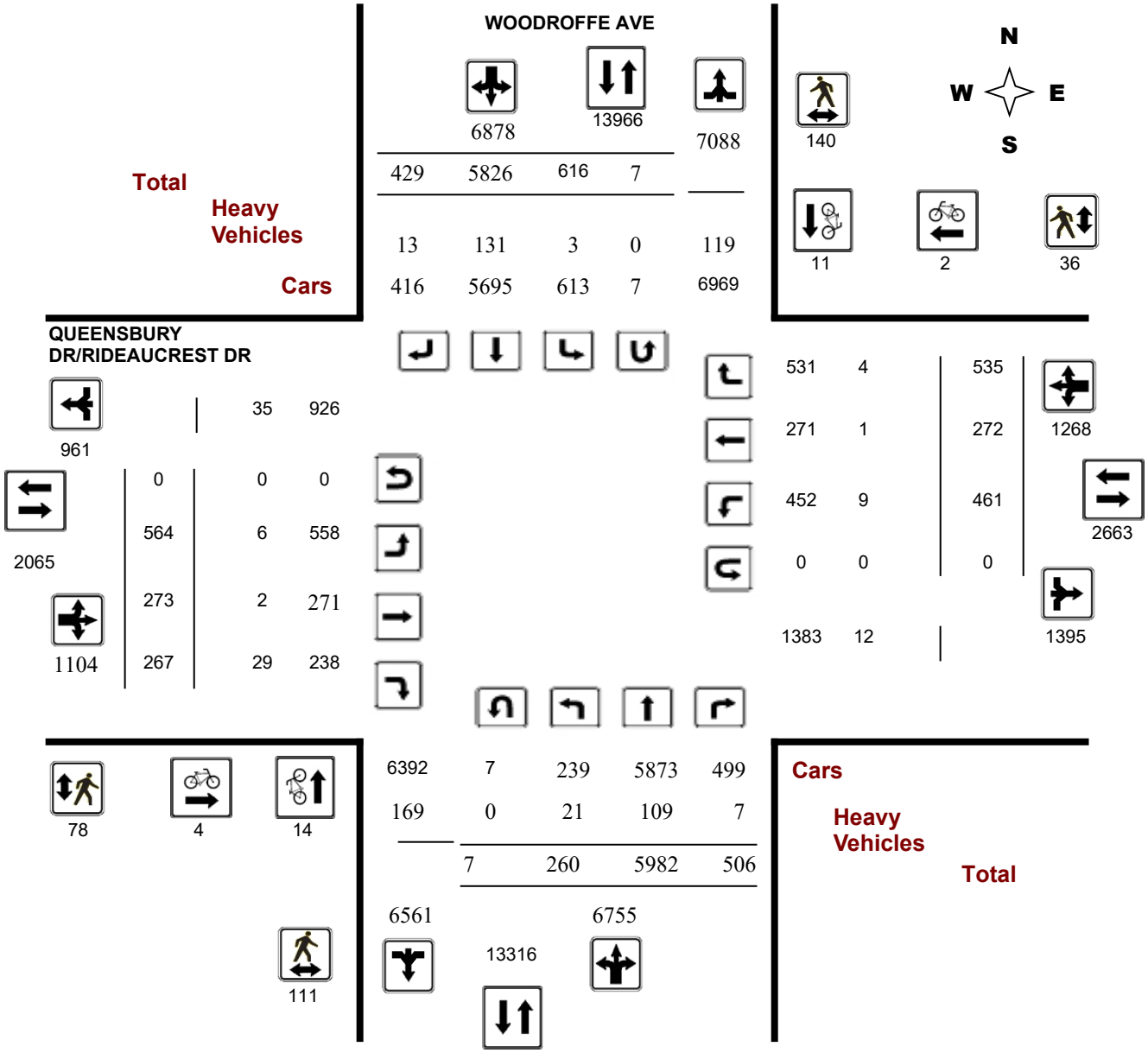
Transportation Services - Traffic Services

Turning Movement Count - Study Results

WOODROFFE AVE @ QUEENSBURY DR/RIDEAUCREST DR

Survey Date: Thursday, April 20, 2017
Start Time: 07:00
WO No: 36931
Device: Miovision

Full Study Diagram



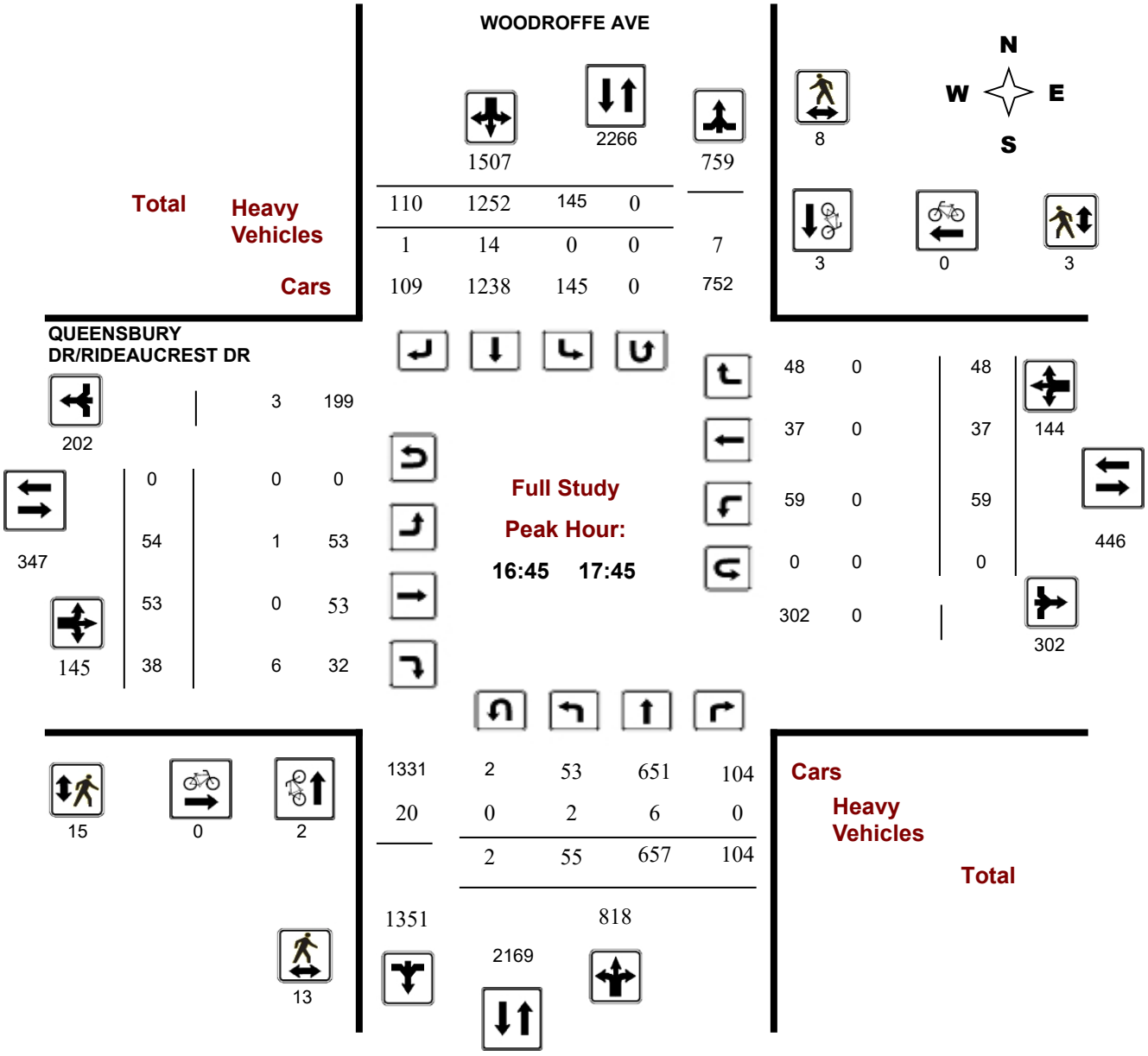
Transportation Services - Traffic Services

Turning Movement Count - Study Results

WOODROFFE AVE @ QUEENSBURY DR/RIDEAUCREST DR

Survey Date: Thursday, April 20, 2017
Start Time: 07:00
WO No: 36931
Device: Miovision

Full Study Peak Hour Diagram



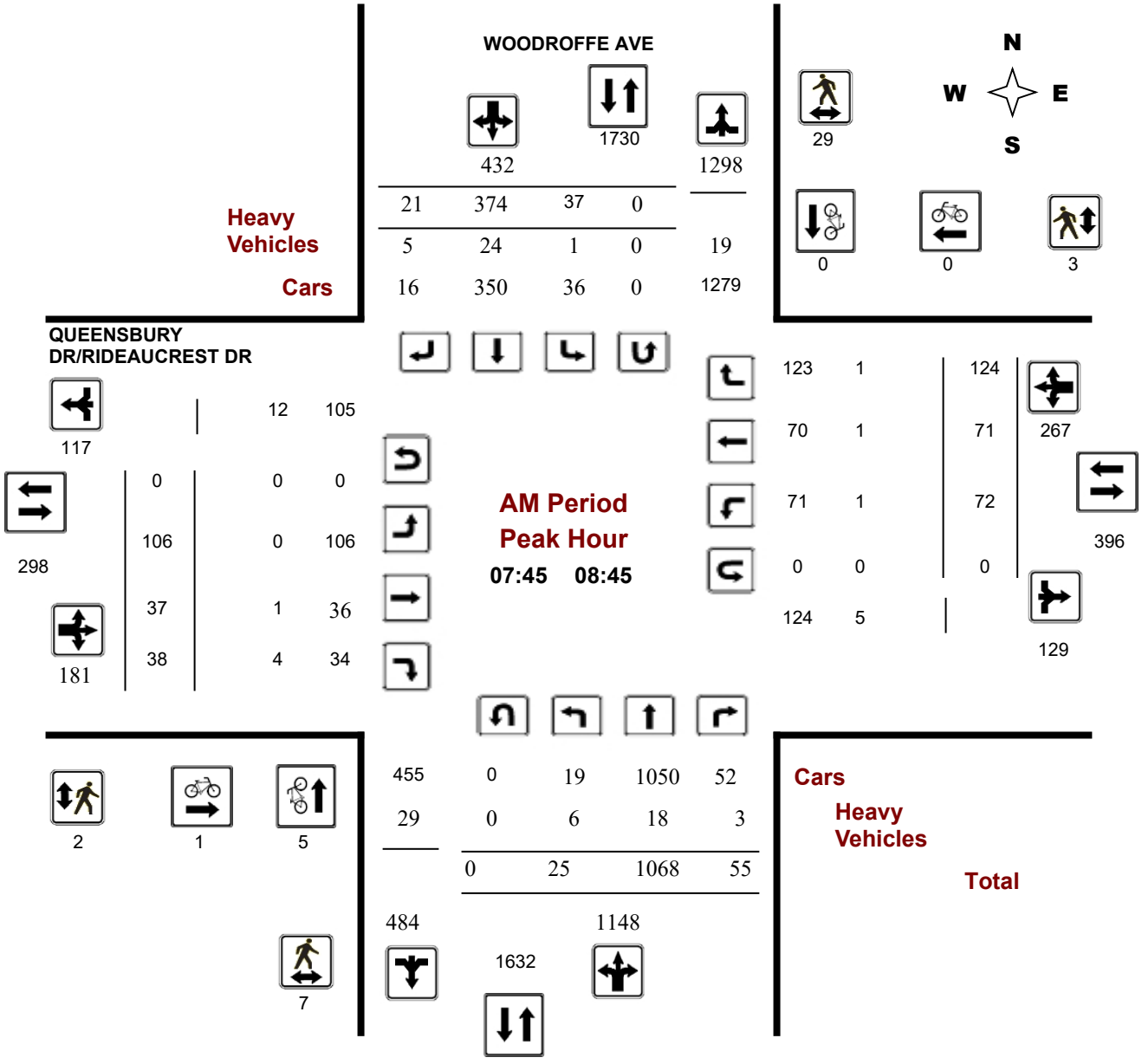
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

WOODROFFE AVE @ QUEENSBURY DR/RIDEAUCREST DR

Survey Date: Thursday, April 20, 2017
Start Time: 07:00

WO No: 36931
Device: Miovision



Comments

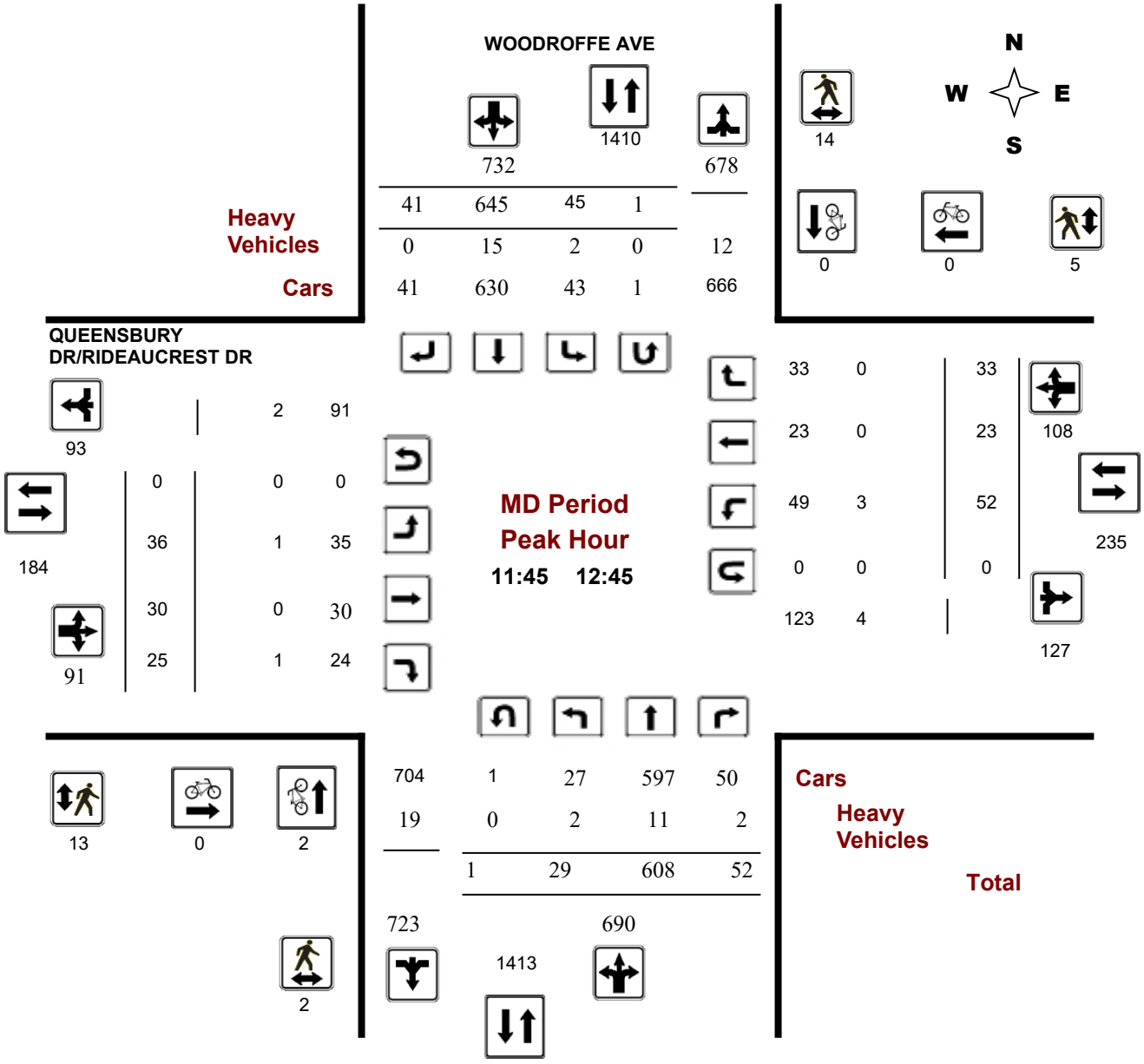
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

WOODROFFE AVE @ QUEENSBURY DR/RIDEAUCREST DR

Survey Date: Thursday, April 20, 2017
Start Time: 07:00

WO No: 36931
Device: Miovision



Comments

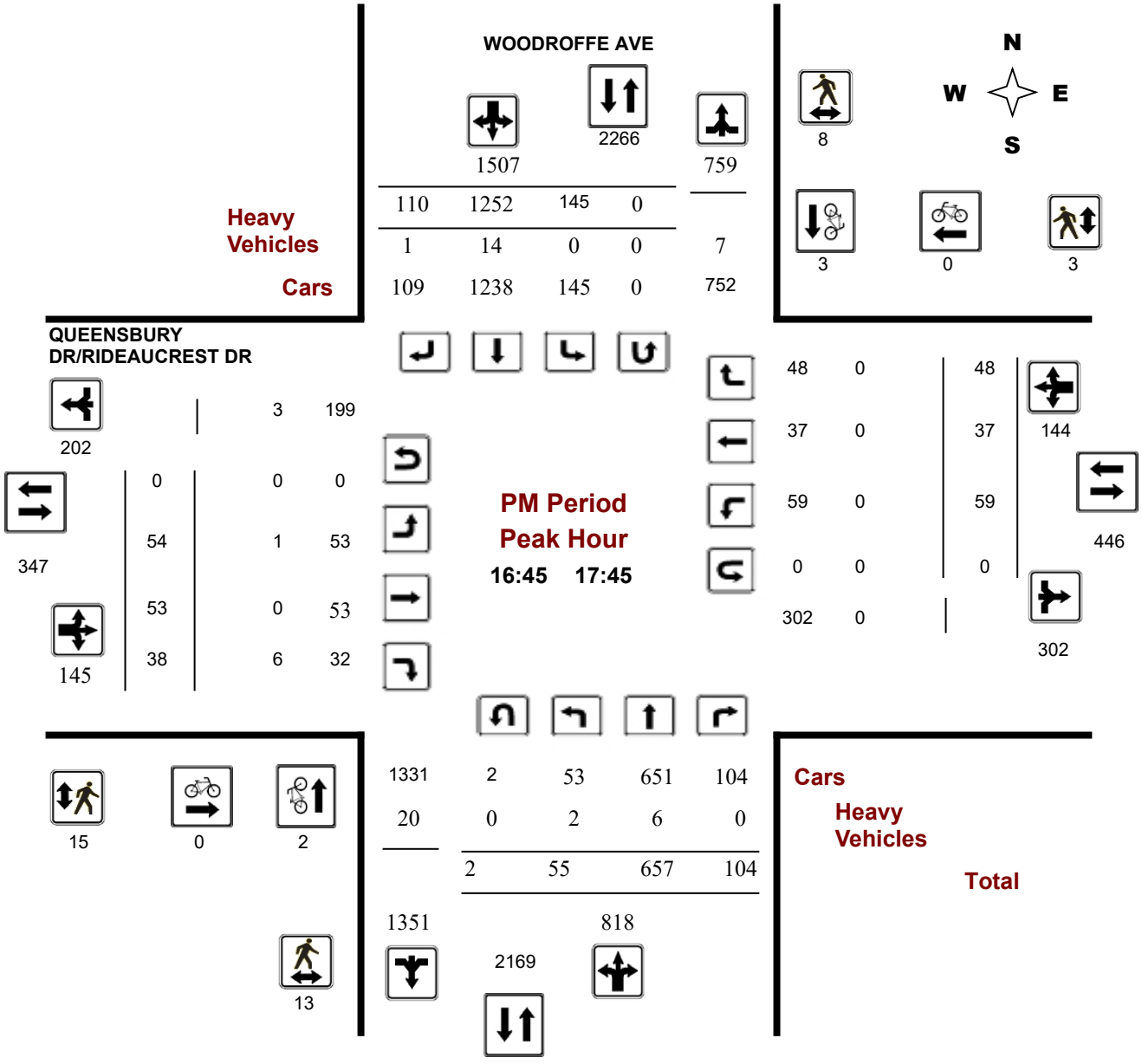
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

WOODROFFE AVE @ QUEENSBURY DR/RIDEAUCREST DR

Survey Date: Thursday, April 20, 2017 **WO No:** 36931

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



Comments

Transportation Services - Traffic Services

Turning Movement Count - Study Results

WOODROFFE AVE @ QUEENSBURY DR/RIDEAUCREST DR

Survey Date: Thursday, April 20, 2017 **WO No:** 36931

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

Full Study Summary (8 HR Standard)

Survey Date: Thursday, April 20, 2017

Total Observed U-Turns

Northbound: 7 Southbound: 7

Eastbound: 0 Westbound: 0

AADT Factor

.90

	WOODROFFE AVE								QUEENSBURY DR/RIDEAUCREST 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	16	1087	43	**1146**	35	336	14	**385**	**1531**	105	21	23	**149**	76	36	150	**262**	**411**	**1942**
08:00 09:00	26	1050	47	**1123**	34	361	25	**420**	**1543**	109	43	40	**192**	70	73	106	**249**	**441**	**1984**
09:00 10:00	27	711	58	**796**	41	454	24	**519**	**1315**	79	24	23	**126**	62	21	53	**136**	**262**	**1577**
11:30 12:30	23	615	53	**691**	51	614	35	**700**	**1391**	47	35	30	**112**	48	27	34	**109**	**221**	**1612**
12:30 13:30	26	572	50	**648**	54	590	40	**684**	**1332**	59	14	22	**95**	37	14	41	**92**	**187**	**1519**
15:00 16:00	35	614	72	**721**	121	1011	90	**1222**	**1943**	51	44	44	**139**	44	36	42	**122**	**261**	**2204**
16:00 17:00	42	647	87	**776**	147	1233	98	**1478**	**2254**	60	49	48	**157**	64	36	61	**161**	**318**	**2572**
17:00 18:00	65	686	96	**847**	133	1227	103	**1463**	**2310**	54	43	37	**134**	60	29	48	**137**	**271**	**2581**
Sub Total	260	5982	506	**6748**	616	5826	429	**6871**	**13619**	564	273	267	**1104**	461	272	535	**1268**	**2372**	**15991**
U Turns	7			**7**	7			**7**	**14**	**0**			**0**	0			**0**	**0**	**14**
Total	267	5982	506	**6755**	623	5826	429	**6878**	**13633**	564	273	267	**1104**	461	272	535	**1268**	**2372**	**16005**
EQ 12Hr	371	8315	703	**9389**	866	8098	596	**9560**	**18949**	784	379	371	**1534**	641	378	744	**1763**	**3297**	**22246**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.														**1.39**					
AVG 12Hr	334	7484	633	**8451**	779	7288	536	**8603**	**17054**	706	341	334	**1381**	577	340	670	**1587**	**2968**	**20022**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.														**.90**					
AVG 24Hr	438	9804	829	**11071**	1020	9547	702	**11269**	**22340**	925	447	438	**1810**	756	445	878	**2079**	**3889**	**26229**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.														**1.31**					

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

Transportation Services - Traffic Services

Turning Movement Count - Study Results

WOODROFFE AVE @ QUEENSBURY DR/RIDEAUCREST DR

Survey Date: Thursday, April 20, 2017 **WO No:** 36931

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

Full Study 15 Minute Increments

		WOODROFFE AVE									QUEENSBURY DR/RIDEAUCREST 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		260	15			72	2		**359**		9	5			4	41		**104**	**463**
07:15	07:30		272	6			88	3		**382**		5	4			13	44		**122**	**504**
07:30	07:45		291	10			77	5		**395**		5	7			9	33		**103**	**498**
07:45	08:00		264	12			99	4		**396**		2	7			10	32		**82**	**478**
08:00	08:15		283	12			69	10		**385**		8	12			14	18		**100**	**485**
08:15	08:30		287	17			107	5		**433**		12	8			24	35		**127**	**560**
08:30	08:45		234	14			99	2		**366**		15	11			23	39		**139**	**505**
08:45	09:00		246	4			86	8		**360**		8	9			12	14		**75**	**435**
09:00	09:15		229	19			128	8		**405**		9	5			5	10		**77**	**482**
09:15	09:30		172	17			105	6		**320**		3	7			5	18		**66**	**386**
09:30	09:45		175	12			120	3		**325**		7	7			3	12		**53**	**378**
09:45	10:00		135	10			101	7		**265**		5	4			8	13		**66**	**331**
11:30	11:45		160	12			148	8		**347**		8	8			5	12		**57**	**404**
11:45	12:00		157	16			134	10		**338**		11	7			7	9		**60**	**398**
12:00	12:15		144	17			163	6		**346**		9	5			7	8		**51**	**397**
12:15	12:30		154	8			169	11		**362**		7	10			8	5		**53**	**415**
12:30	12:45		153	11			179	14		**376**		3	3			1	11		**35**	**411**
12:45	13:00		138	14			157	8		**336**		6	7			7	12		**59**	**395**
13:00	13:15		132	13			124	9		**300**		5	8			2	9		**45**	**345**
13:15	13:30		149	12			130	9		**323**		0	4			4	9		**48**	**371**
15:00	15:15		138	21			218	16		**434**		12	7			13	12		**70**	**504**
15:15	15:30		136	17			275	23		**490**		11	16			7	2		**66**	**556**
15:30	15:45		176	13			232	24		**479**		13	7			6	14		**56**	**535**
15:45	16:00		164	21			286	27		**542**		8	14			10	14		**69**	**611**
16:00	16:15		167	20			312	31		**582**		9	13			7	18		**73**	**655**
16:15	16:30		149	20			299	13		**533**		10	12			3	17		**80**	**613**
16:30	16:45		186	20			314	21		**581**		13	9			10	13		**78**	**659**
16:45	17:00		145	27			308	33		**562**		17	14			16	13		**87**	**649**
17:00	17:15		170	26			300	25		**562**		9	5			5	14		**62**	**624**
17:15	17:30		175	28			318	26		**599**		14	8			8	5		**62**	**661**
17:30	17:45		167	23			326	26		**602**		13	11			8	16		**78**	**680**
17:45	18:00		174	19			283	26		**548**		7	13			8	13		**69**	**617**
Total:		0	5982	506	0	0	5826	429	0	**13633**	0	273	267	0	0	272	535	0	**13633**	**16,005**

Note: U-Turns are included in Totals.

Transportation Services - Traffic Services

Turning Movement Count - Study Results

WOODROFFE AVE @ QUEENSBURY DR/RIDEAUCREST DR

Survey Date: Thursday, April 20, 2017 **WO No:** 36931

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

Full Study Cyclist Volume

Time Period		WOODROFFE AVE			QUEENSBURY DR/RIDEAUCREST DR			
		Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00	07:15	0	0	**0**	0	0	**0**	**0**
07:15	07:30	0	1	**1**	0	0	**0**	**1**
07:30	07:45	0	0	**0**	0	0	**0**	**0**
07:45	08:00	0	0	**0**	0	0	**0**	**0**
08:00	08:15	4	0	**4**	0	0	**0**	**4**
08:15	08:30	1	0	**1**	1	0	**1**	**2**
08:30	08:45	0	0	**0**	0	0	**0**	**0**
08:45	09:00	2	0	**2**	0	2	**2**	**4**
09:00	09:15	1	0	**1**	0	0	**0**	**1**
09:15	09:30	0	1	**1**	0	0	**0**	**1**
09:30	09:45	1	0	**1**	0	0	**0**	**1**
09:45	10:00	0	0	**0**	0	0	**0**	**0**
11:30	11:45	0	1	**1**	0	0	**0**	**1**
11:45	12:00	1	0	**1**	0	0	**0**	**1**
12:00	12:15	1	0	**1**	0	0	**0**	**1**
12:15	12:30	0	0	**0**	0	0	**0**	**0**
12:30	12:45	0	0	**0**	0	0	**0**	**0**
12:45	13:00	0	1	**1**	0	0	**0**	**1**
13:00	13:15	0	0	**0**	0	0	**0**	**0**
13:15	13:30	0	0	**0**	0	0	**0**	**0**
15:00	15:15	0	0	**0**	0	0	**0**	**0**
15:15	15:30	0	1	**1**	2	0	**2**	**3**
15:30	15:45	0	0	**0**	0	0	**0**	**0**
15:45	16:00	0	0	**0**	1	0	**1**	**1**
16:00	16:15	0	1	**1**	0	0	**0**	**1**
16:15	16:30	0	0	**0**	0	0	**0**	**0**
16:30	16:45	0	0	**0**	0	0	**0**	**0**
16:45	17:00	1	0	**1**	0	0	**0**	**1**
17:00	17:15	1	3	**4**	0	0	**0**	**4**
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	1	2	**3**	0	0	**0**	**3**
Total		14	11	**25**	4	2	**6**	**31**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

WOODROFFE AVE @ QUEENSBURY DR/RIDEAUCREST DR

Survey Date: Thursday, April 20, 2017 **WO No:** 36931

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

Full Study Pedestrian Volume

	WOODROFFE AVE			QUEENSBURY DR/RIDEAUCREST DR			
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	1	3	**4**	1	1	**2**	**6**
07:15 07:30	0	3	**3**	0	0	**0**	**3**
07:30 07:45	0	5	**5**	0	1	**1**	**6**
07:45 08:00	0	7	**7**	0	0	**0**	**7**
08:00 08:15	5	7	**12**	0	2	**2**	**14**
08:15 08:30	1	10	**11**	1	1	**2**	**13**
08:30 08:45	1	5	**6**	1	0	**1**	**7**
08:45 09:00	3	2	**5**	0	0	**0**	**5**
09:00 09:15	0	5	**5**	1	0	**1**	**6**
09:15 09:30	1	3	**4**	2	1	**3**	**7**
09:30 09:45	1	4	**5**	0	3	**3**	**8**
09:45 10:00	0	2	**2**	1	1	**2**	**4**
11:30 11:45	3	2	**5**	5	2	**7**	**12**
11:45 12:00	0	4	**4**	4	1	**5**	**9**
12:00 12:15	1	4	**5**	4	2	**6**	**11**
12:15 12:30	1	3	**4**	5	0	**5**	**9**
12:30 12:45	0	3	**3**	0	2	**2**	**5**
12:45 13:00	2	3	**5**	1	1	**2**	**7**
13:00 13:15	0	3	**3**	1	1	**2**	**5**
13:15 13:30	0	1	**1**	1	1	**2**	**3**
15:00 15:15	7	3	**10**	3	2	**5**	**15**
15:15 15:30	25	11	**36**	5	4	**9**	**45**
15:30 15:45	23	11	**34**	7	1	**8**	**42**
15:45 16:00	6	9	**15**	3	1	**4**	**19**
16:00 16:15	1	4	**5**	3	3	**6**	**11**
16:15 16:30	7	6	**13**	6	2	**8**	**21**
16:30 16:45	3	5	**8**	3	0	**3**	**11**
16:45 17:00	3	0	**3**	6	1	**7**	**10**
17:00 17:15	0	2	**2**	0	1	**1**	**3**
17:15 17:30	8	4	**12**	5	1	**6**	**18**
17:30 17:45	2	2	**4**	4	0	**4**	**8**
17:45 18:00	6	4	**10**	5	0	**5**	**15**
Total	111	140	**251**	78	36	**114**	**365**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

WOODROFFE AVE @ QUEENSBURY DR/RIDEAUCREST DR

Survey Date: Thursday, April 20, 2017 **WO No:** 36931

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

Full Study Heavy Vehicles

		WOODROFFE AVE									QUEENSBURY DR/RIDEAUCREST 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	0	3	0		0	6	1		**10**	0	0	1		0	0	0		**1**	**11**
07:15	07:30	1	4	0		0	5	1		**11**	0	0	0		0	0	0		**0**	**11**
07:30	07:45	0	4	0		0	4	1		**9**	0	0	1		1	0	0		**2**	**11**
07:45	08:00	1	4	1		1	8	1		**16**	0	0	0		0	1	1		**2**	**18**
08:00	08:15	0	8	0		0	2	1		**11**	0	1	2		1	0	0		**4**	**15**
08:15	08:30	3	5	1		0	7	3		**19**	0	0	0		0	0	0		**0**	**19**
08:30	08:45	2	1	1		0	7	0		**11**	0	0	2		0	0	0		**2**	**13**
08:45	09:00	1	9	0		0	3	1		**14**	0	0	0		1	0	0		**1**	**15**
09:00	09:15	0	7	0		0	9	0		**16**	0	0	1		0	0	1		**2**	**18**
09:15	09:30	1	4	0		0	2	0		**7**	0	0	0		1	0	0		**1**	**8**
09:30	09:45	0	2	0		0	3	0		**5**	0	0	2		0	0	0		**2**	**7**
09:45	10:00	2	4	1		0	3	1		**11**	0	0	0		0	0	0		**0**	**11**
11:30	11:45	0	6	0		0	2	0		**8**	0	0	1		0	0	0		**1**	**9**
11:45	12:00	1	4	1		1	5	0		**12**	1	0	0		0	0	0		**1**	**13**
12:00	12:15	0	2	0		0	4	0		**6**	0	0	1		2	0	0		**3**	**9**
12:15	12:30	1	2	1		0	4	0		**8**	0	0	0		0	0	0		**0**	**8**
12:30	12:45	0	3	0		1	2	0		**6**	0	0	0		1	0	0		**1**	**7**
12:45	13:00	1	4	0		0	4	0		**9**	0	0	2		1	0	0		**3**	**12**
13:00	13:15	0	3	0		0	2	0		**5**	0	0	1		0	0	0		**1**	**6**
13:15	13:30	1	1	0		0	2	0		**4**	0	0	0		0	0	0		**0**	**4**
15:00	15:15	0	3	1		0	8	1		**13**	0	1	0		1	0	0		**2**	**15**
15:15	15:30	1	4	0		0	9	1		**15**	1	0	2		0	0	0		**3**	**18**
15:30	15:45	0	7	0		0	1	0		**8**	1	0	1		0	0	1		**3**	**11**
15:45	16:00	1	2	0		0	5	0		**8**	1	0	2		0	0	0		**3**	**11**
16:00	16:15	0	4	0		0	1	0		**5**	0	0	1		0	0	0		**1**	**6**
16:15	16:30	0	1	0		0	3	0		**4**	0	0	2		0	0	1		**3**	**7**
16:30	16:45	1	1	0		0	4	0		**6**	0	0	0		0	0	0		**0**	**6**
16:45	17:00	1	2	0		0	5	0		**8**	0	0	2		0	0	0		**2**	**10**
17:00	17:15	0	2	0		0	1	0		**3**	0	0	1		0	0	0		**1**	**4**
17:15	17:30	1	0	0		0	6	0		**7**	1	0	1		0	0	0		**2**	**9**
17:30	17:45	0	2	0		0	2	1		**5**	0	0	2		0	0	0		**2**	**7**
17:45	18:00	1	1	0		0	2	0		**4**	1	0	1		0	0	0		**2**	**6**
Total:	None	21	109	7	**0**	3	131	13	**0**	**284**	6	2	29	**0**	9	1	4	**0**	**51**	**335**

Transportation Services - Traffic Services

Turning Movement Count - Study Results

WOODROFFE AVE @ QUEENSBURY DR/RIDEAUCREST DR

Survey Date: Thursday, April 20, 2017 **WO No:** 36931

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

Full Study 15 Minute U-Turn Total

Time Period		WOODROFFE AVE		QUEENSBURY DR/RIDEAUCREST DR		
		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	1	0	0	0	**1**
07:15	07:30	0	0	0	0	**0**
07:30	07:45	0	0	0	0	**0**
07:45	08:00	0	0	0	0	**0**
08:00	08:15	0	0	0	0	**0**
08:15	08:30	0	0	0	0	**0**
08:30	08:45	0	0	0	0	**0**
08:45	09:00	1	0	0	0	**1**
09:00	09:15	0	0	0	0	**0**
09:15	09:30	0	0	0	0	**0**
09:30	09:45	0	0	0	0	**0**
09:45	10:00	0	0	0	0	**0**
11:30	11:45	0	0	0	0	**0**
11:45	12:00	0	1	0	0	**1**
12:00	12:15	0	0	0	0	**0**
12:15	12:30	1	0	0	0	**1**
12:30	12:45	0	0	0	0	**0**
12:45	13:00	0	0	0	0	**0**
13:00	13:15	0	3	0	0	**3**
13:15	13:30	0	0	0	0	**0**
15:00	15:15	1	1	0	0	**2**
15:15	15:30	0	0	0	0	**0**
15:30	15:45	0	0	0	0	**0**
15:45	16:00	0	0	0	0	**0**
16:00	16:15	1	0	0	0	**1**
16:15	16:30	0	1	0	0	**1**
16:30	16:45	0	1	0	0	**1**
16:45	17:00	1	0	0	0	**1**
17:00	17:15	1	0	0	0	**1**
17:15	17:30	0	0	0	0	**0**
17:30	17:45	0	0	0	0	**0**
17:45	18:00	0	0	0	0	**0**
Total		7	7	0	0	**14**

Traffic Signal Timing

City of Ottawa, Public Works & Environmental Services Department

Traffic Signal Operations Unit

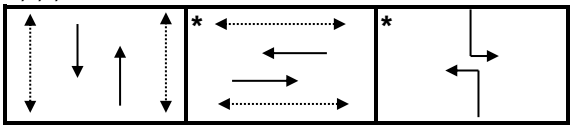
Intersection:	***Main:*** Woodroffe	***Side:***	Queensbury / Rideaucrest
Controller:	**3200+**	**TSD:**	**6260**
Author:	Ruben Bonzele	**Date:**	16-Mar-2022

Existing Timing Plans†

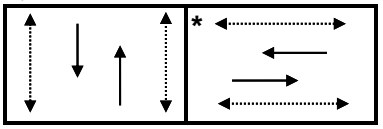
	Plan						**Ped Minimum Time**		
	AM Peak	**Off Peak**	**PM Peak**	**Night**	**Weekend**	**AM Heavy**	***Walk***	***DW***	***A+R***
	1	2	3	4	5	11			
Cycle	110	105	115	70	90	130			
Offset	13	29	14	0	68	71			
NB Thru	62	57	59	34	54	74	7	12	4.2+2.1
SB Thru	62	57	59	34	54	74	7	12	4.2+2.1
EB Thru	36	36	36	36	36	42	7	22	3.0+4.0
WB Thru	36	36	36	36	36	42	7	22	3.0+4.0
NB Left	12	12	20	-	-	14	-	-	4.2+2.1
SB Left	12	12	20	-	-	14	-	-	4.2+2.1

Phasing Sequence‡

Plan: 1,2,3,11



Plan: 4,5



Schedule

Weekday

Time	Plan
0:15	4
6:00	1
7:00	11
9:00	1
9:30	2
15:00	3
18:30	2
22:30	4

Weekend

Time	Plan
0:15	4
8:30	5
22:30	4

Notes

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

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

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

◄·····► Pedestrian signal

Cost is $61.16 ($54.12 + HST)

Traffic Signal Timing

City of Ottawa, Public Works & Environmental Services Department

Traffic Signal Operations Unit

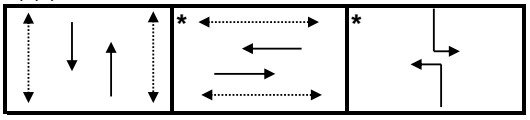
Intersection:	***Main:*** Woodroffe	***Side:***	Deerfox / Stoneway
Controller:	**MS 3200**	**TSD:**	**6372**
Author:	Ruben Bonzele	**Date:**	16-Mar-2022

Existing Timing Plans†

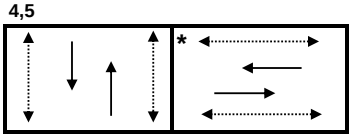
	Plan						**Ped Minimum Time**		
	AM Peak 1	**Off Peak** 2	**PM Peak** 3	**Night** 4	**Weekend** 5	**AM Heavy** 11	***Walk***	***DW***	***A+R***
Cycle	110	105	115	70	90	130			
Offset	33	38	29	X	5	44			
NB Thru	60	57	59	34	54	72	7	13	4.2+2.2
SB Thru	60	57	59	34	54	72	7	13	4.2+2.2
EB Thru	36	36	36	36	36	44	7	21	3.0+4.1
WB Thru	36	36	36	36	36	44	7	21	3.0+4.1
NB Left	14	12	20	-	-	14	-	-	4.2+2.2
SB Left	14	12	20	-	-	14	-	-	4.2+2.2

Phasing Sequence‡

Plan: 1,2,3,11



Plan: 4,5



Schedule

Weekday

Time	Plan
0:15	4
6:00	1
7:00	11
9:00	1
9:30	2
15:00	3
18:30	2
22:30	4

Weekend

Time	Plan
0:15	4
8:30	5
22:30	4

Notes

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

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

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

◄·····► Pedestrian signal

Cost is $61.16 ($54.12 + HST)

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2016 **To:** December 31, 2020

Location: WOODROFFE AVE @ DEERFOX DR/STONEWAY DR

Traffic Control: Traffic signal **Total Collisions:** 18

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Apr-08, Fri,08:28	Clear	Angle	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Oct-16, Mon,22:30	Clear	Other	P.D. only	Dry	West	Reversing	Unknown	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Nov-17, Fri,16:12	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Passenger van	Other motor vehicle	
2017-Dec-14, Thu,17:09	Drifting Snow	Turning movement	P.D. only	Slush	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2017-Dec-19, Tue,05:15	Clear	Turning movement	P.D. only	Slush	North	Turning left	Pick-up truck	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Dec-26, Tue,11:00	Clear	Angle	P.D. only	Packed snow	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Dec-30, Sat,14:35	Snow	Turning movement	P.D. only	Packed snow	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Jan-04, Thu,16:45	Snow	Sideswipe	P.D. only	Packed snow	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Jan-07, Sun,13:45	Clear	Rear end	P.D. only	Wet	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2018-May-15, Tue,09:00	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2016 **To:** December 31, 2020

Location: WOODROFFE AVE @ DEERFOX DR/STONEWAY DR

Traffic Control: Traffic signal **Total Collisions:** 18

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Sep-14, Fri,20:35	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Sep-21, Fri,21:06	Clear	Turning movement	P.D. only	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Passenger van	Other motor vehicle	
2019-Aug-30, Fri,18:58	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Pick-up truck	Other motor vehicle	
2019-Nov-15, Fri,22:41	Clear	Turning movement	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Dec-16, Mon,19:22	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2019-Dec-22, Sun,17:56	Clear	Turning movement	Non-fatal injury	Wet	South	Turning left	Passenger van	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Mar-08, Sun,12:17	Clear	Rear end	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Slowing or stopping	Passenger van	Other motor vehicle	
2020-Dec-05, Sat,15:17	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: WOODROFFE AVE @ QUEENSBURY DR/RIDEAUCREST DR

Traffic Control: Traffic signal **Total Collisions:** 29

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Jan-12, Tue,17:47	Snow	Angle	P.D. only	Loose snow	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Pick-up truck	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2016 **To:** December 31, 2020

Location: WOODROFFE AVE @ QUEENSBURY DR/RIDEAUCREST DR

Traffic Control: Traffic signal **Total Collisions:** 29

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Jan-18, Mon,20:00	Drifting Snow	Turning movement	Non-fatal injury	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Pick-up truck	Other motor vehicle	
2016-Feb-25, Thu,22:18	Clear	SMV other	P.D. only	Ice	South	Turning right	Pick-up truck	Pole (sign, parking meter)	0
2016-Jun-24, Fri,22:38	Clear	SMV other	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Pedestrian	1
2016-Jul-26, Tue,20:30	Clear	Rear end	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Pick-up truck	Other motor vehicle	
					South	Stopped	Pick-up truck	Other motor vehicle	
2016-Aug-21, Sun,21:15	Clear	Other	P.D. only	Dry	West	Reversing	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Pick-up truck	Other motor vehicle	
2016-Sep-24, Sat,09:22	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Unknown	Other motor vehicle	
2017-Jan-06, Fri,12:05	Clear	Angle	P.D. only	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2017-Jan-12, Thu,16:13	Rain	SMV other	Non-fatal injury	Wet	East	Turning left	Automobile, station wagon	Pedestrian	1
2017-Jan-22, Sun,20:24	Clear	Turning movement	Non-fatal injury	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-May-19, Fri,18:39	Clear	Rear end	Non-fatal injury	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Aug-11, Fri,16:30	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Nov-03, Fri,11:55	Clear	SMV other	Non-fatal injury	Wet	East	Turning left	Automobile, station wagon	Pedestrian	1
2017-Nov-24, Fri,17:59	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2016 **To:** December 31, 2020

Location: WOODROFFE AVE @ QUEENSBURY DR/RIDEAUCREST DR

Traffic Control: Traffic signal **Total Collisions:** 29

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2017-Nov-28, Tue,07:50	Clear	Angle	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Jul-09, Mon,18:21	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jul-10, Tue,20:12	Clear	Rear end	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Dec-07, Fri,09:47	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Pick-up truck	Other motor vehicle	
2018-Dec-26, Wed,10:27	Clear	Angle	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Pick-up truck	Other motor vehicle	
2019-Jan-01, Tue,05:31	Snow	Turning movement	P.D. only	Loose snow	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Feb-27, Wed,18:49	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-May-25, Sat,03:56	Clear	Angle	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Oct-19, Sat,16:55	Clear	Rear end	P.D. only	Dry	East	Overtaking	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Dec-07, Sat,12:49	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2016 **To:** December 31, 2020

Location: WOODROFFE AVE @ QUEENSBURY DR/RIDEAUCREST DR

Traffic Control: Traffic signal **Total Collisions:** 29

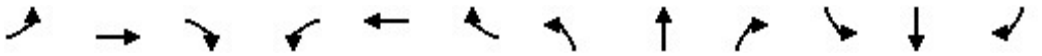
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Dec-14, Sat,14:51	Rain	Angle	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Turning left	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Apr-07, Tue,20:41	Clear	Rear end	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2020-Jul-10, Fri,10:14	Clear	Other	Non-fatal injury	Dry	East	Going ahead	Bicycle	Other motor vehicle	0
					West	Turning right	Automobile, station wagon	Cyclist	
2020-Dec-14, Mon,09:35	Clear	Turning movement	P.D. only	Dry	North	Turning left	Pick-up truck	Other motor vehicle	0
					South	Going ahead	Pick-up truck	Other motor vehicle	
2020-Dec-17, Thu,12:14	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Passenger van	Other motor vehicle	

Location: WOODROFFE AVE btwn DEERFOX DR & QUEENSBURY DR

Traffic Control: No control **Total Collisions:** 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Feb-17, Wed,19:32	Snow	SMV other	P.D. only	Ice	North	Going ahead	Pick-up truck	Skidding/sliding	0
2016-Jul-30, Sat,02:10	Clear	SMV unattended vehicle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Unattended vehicle	0

APPENDIX E: EXISTING (2022) SYNCHRO ANALYSIS

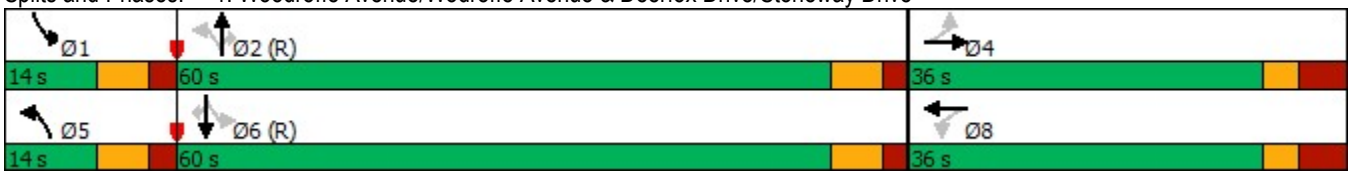


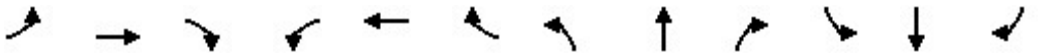
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	20	45	200	46	88	75	1136	133	27	512	20
Future Volume (vph)	42	20	45	200	46	88	75	1136	133	27	512	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.896			0.901				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1597	0	1712	1547	0	1616	3390	1488	1300	3293	1547
Flt Permitted	0.642			0.710			0.402			0.149		
Satd. Flow (perm)	1168	1597	0	1279	1547	0	684	3390	1488	204	3293	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		50			85				108			104
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		298.9			331.3			373.2			421.1	
Travel Time (s)		26.9			29.8			22.4			25.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	3%	1%	4%	7%	7%	2%	4%	33%	5%	0%
Adj. Flow (vph)	47	22	50	222	51	98	83	1262	148	30	569	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	72	0	222	149	0	83	1262	148	30	569	22
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	35.1	35.1		35.6	35.6		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	36.0	36.0		36.0	36.0		14.0	60.0	60.0	14.0	60.0	60.0
Total Split (%)	32.7%	32.7%		32.7%	32.7%		12.7%	54.5%	54.5%	12.7%	54.5%	54.5%
Maximum Green (s)	28.9	28.9		28.9	28.9		7.6	53.6	53.6	7.6	53.6	53.6
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.1	4.1		4.1	4.1		2.2	2.2	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
Total Lost Time (s)	7.1	7.1		7.1	7.1		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	21.0	21.0		21.0	21.0			13.0	13.0		13.0	13.0
Pedestrian Calls (#/hr)	5	5		5	5			5	5		5	5
Act Effct Green (s)	23.4	23.4		23.4	23.4		69.6	65.0	65.0	67.3	62.0	62.0
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.63	0.59	0.59	0.61	0.56	0.56
v/c Ratio	0.19	0.19		0.82	0.38		0.17	0.63	0.16	0.16	0.31	0.02
Control Delay	35.0	14.6		63.5	18.4		8.7	18.9	5.4	8.5	10.2	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	35.0	14.6		63.5	18.4		8.7	18.9	5.4	8.5	10.2	0.1
LOS	D	B		E	B		A	B	A	A	B	A
Approach Delay		22.7			45.4			17.0			9.7	
Approach LOS		C			D			B			A	
Queue Length 50th (m)	8.3	3.8		45.3	11.3		5.9	99.2	3.9	1.6	16.2	0.0
Queue Length 95th (m)	17.5	14.6		69.4	27.4		12.9	139.5	14.9	4.0	21.1	0.1
Internal Link Dist (m)		274.9			307.3			349.2			397.1	
Turn Bay Length (m)	30.0			30.0			50.0		50.0	50.0		50.0
Base Capacity (vph)	306	456		336	469		497	2004	923	202	1855	917
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	0.15	0.16		0.66	0.32		0.17	0.63	0.16	0.15	0.31	0.02

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 33 (30%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 19.6		Intersection LOS: B	
Intersection Capacity Utilization 75.7%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Woodroffe Avenue/Wodroffe Avenue & Deerfox Drive/Stoneway Drive





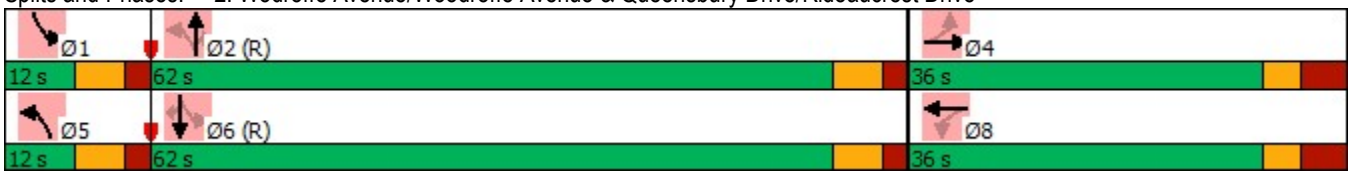
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	37	38	72	71	124	25	1186	55	37	449	21
Future Volume (vph)	106	37	38	72	71	124	25	1186	55	37	449	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	60.0		0.0	60.0		50.0	90.0		40.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.924			0.905				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1571	0	1712	1631	0	1394	3390	1473	1679	3262	1248
Flt Permitted	0.459			0.703			0.461			0.143		
Satd. Flow (perm)	835	1571	0	1267	1631	0	677	3390	1473	253	3262	1248
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42			78				102			102
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		199.4			261.8			421.1			126.8	
Travel Time (s)		17.9			23.6			25.3			7.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	11%	1%	1%	1%	24%	2%	5%	3%	6%	24%
Adj. Flow (vph)	118	41	42	80	79	138	28	1318	61	41	499	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	118	83	0	80	217	0	28	1318	61	41	499	23
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	36.0	36.0		36.0	36.0		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	36.0	36.0		36.0	36.0		12.0	62.0	62.0	12.0	62.0	62.0
Total Split (%)	32.7%	32.7%		32.7%	32.7%		10.9%	56.4%	56.4%	10.9%	56.4%	56.4%
Maximum Green (s)	29.0	29.0		29.0	29.0		5.7	55.7	55.7	5.7	55.7	55.7
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.0	4.0		4.0	4.0		2.1	2.1	2.1	2.1	2.1	2.1
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)	7.0	7.0		7.0	7.0		6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0			12.0	12.0		12.0	12.0
Pedestrian Calls (#/hr)	20	20		20	20			5	5		5	5
Act Effct Green (s)	20.2	20.2		20.2	20.2		72.7	69.2	69.2	72.7	69.2	69.2
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.66	0.63	0.63	0.66	0.63	0.63
v/c Ratio	0.77	0.26		0.34	0.60		0.06	0.62	0.06	0.17	0.24	0.03
Control Delay	71.2	20.6		40.4	31.4		15.3	25.4	8.3	9.0	11.6	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

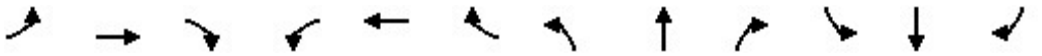
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	71.2	20.6		40.4	31.4		15.3	25.4	8.3	9.0	11.6	0.0
LOS	E	C		D	C		B	C	A	A	B	A
Approach Delay		50.3			33.8			24.5			10.9	
Approach LOS		D			C			C			B	
Queue Length 50th (m)	24.8	7.6		15.4	27.8		2.7	99.7	0.8	2.3	25.1	0.0
Queue Length 95th (m)	41.1	18.7		26.6	46.5		m7.5	147.3	m6.6	7.4	42.6	0.0
Internal Link Dist (m)		175.4			237.8			397.1			102.8	
Turn Bay Length (m)	60.0			60.0			60.0		50.0	90.0		40.0
Base Capacity (vph)	220	445		334	487		485	2131	964	242	2051	822
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	0.54	0.19		0.24	0.45		0.06	0.62	0.06	0.17	0.24	0.03

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 13 (12%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 24.6 Intersection LOS: C
Intersection Capacity Utilization 69.7% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Wodroffe Avenue/Woodroffe Avenue & Queensbury Drive/Rideaucrest Drive



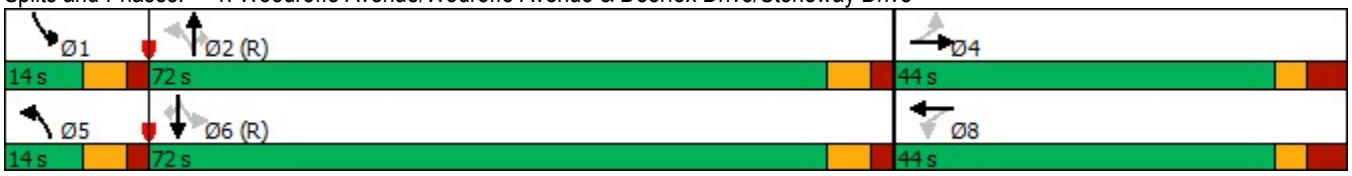


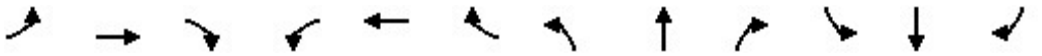
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	20	45	200	46	88	75	1136	133	27	512	20
Future Volume (vph)	42	20	45	200	46	88	75	1136	133	27	512	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.896			0.901				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1597	0	1712	1547	0	1616	3390	1488	1300	3293	1547
Flt Permitted	0.612			0.710			0.394			0.159		
Satd. Flow (perm)	1114	1597	0	1279	1547	0	670	3390	1488	218	3293	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		50			74				94			88
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		298.9			331.3			373.2			421.1	
Travel Time (s)		26.9			29.8			22.4			25.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	3%	1%	4%	7%	7%	2%	4%	33%	5%	0%
Adj. Flow (vph)	47	22	50	222	51	98	83	1262	148	30	569	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	72	0	222	149	0	83	1262	148	30	569	22
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	35.1	35.1		35.6	35.6		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	44.0	44.0		44.0	44.0		14.0	72.0	72.0	14.0	72.0	72.0
Total Split (%)	33.8%	33.8%		33.8%	33.8%		10.8%	55.4%	55.4%	10.8%	55.4%	55.4%
Maximum Green (s)	36.9	36.9		36.9	36.9		7.6	65.6	65.6	7.6	65.6	65.6
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.1	4.1		4.1	4.1		2.2	2.2	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
Total Lost Time (s)	7.1	7.1		7.1	7.1		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	21.0	21.0		21.0	21.0			13.0	13.0		13.0	13.0
Pedestrian Calls (#/hr)	5	5		5	5			5	5		5	5
Act Effct Green (s)	27.8	27.8		27.8	27.8		85.5	80.6	80.6	81.4	74.9	74.9
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.66	0.62	0.62	0.63	0.58	0.58
v/c Ratio	0.20	0.19		0.81	0.38		0.17	0.60	0.15	0.16	0.30	0.02
Control Delay	41.0	16.0		70.1	23.2		9.2	19.0	6.3	11.2	15.3	0.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	41.0	16.0		70.1	23.2		9.2	19.0	6.3	11.2	15.3	0.8
LOS	D	B		E	C		A	B	A	B	B	A
Approach Delay		25.9			51.3			17.2			14.6	
Approach LOS		C			D			B			B	
Queue Length 50th (m)	10.0	4.5		54.5	16.0		6.6	107.7	5.7	1.4	48.6	0.3
Queue Length 95th (m)	19.1	15.7		77.2	32.6		15.1	157.3	18.2	3.9	69.6	1.1
Internal Link Dist (m)		274.9			307.3			349.2			397.1	
Turn Bay Length (m)	30.0			30.0			50.0		50.0	50.0		50.0
Base Capacity (vph)	316	489		363	492		497	2102	958	201	1898	929
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	0.15	0.15		0.61	0.30		0.17	0.60	0.15	0.15	0.30	0.02

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 44 (34%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 21.8		Intersection LOS: C	
Intersection Capacity Utilization 75.7%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Woodroffe Avenue/Wodroffe Avenue & Deerfox Drive/Stoneway Drive





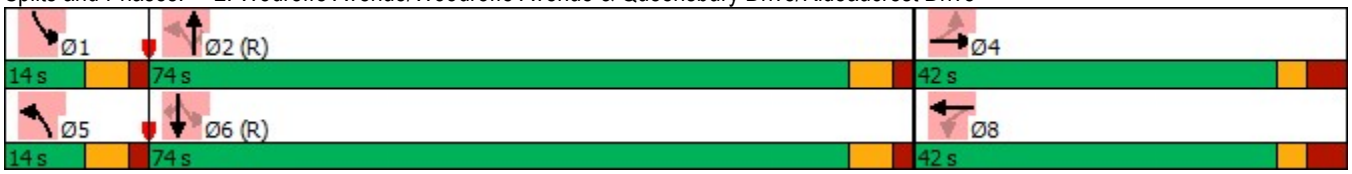
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	37	38	72	71	124	25	1186	55	37	449	21
Future Volume (vph)	106	37	38	72	71	124	25	1186	55	37	449	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	60.0		0.0	60.0		50.0	90.0		40.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.924			0.905				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1571	0	1712	1631	0	1394	3390	1473	1679	3262	1248
Flt Permitted	0.425			0.703			0.466			0.144		
Satd. Flow (perm)	774	1571	0	1267	1631	0	684	3390	1473	254	3262	1248
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		39			66				86			86
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		199.4			261.8			421.1			126.8	
Travel Time (s)		17.9			23.6			25.3			7.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	11%	1%	1%	1%	24%	2%	5%	3%	6%	24%
Adj. Flow (vph)	118	41	42	80	79	138	28	1318	61	41	499	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	118	83	0	80	217	0	28	1318	61	41	499	23
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	36.0	36.0		36.0	36.0		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	42.0	42.0		42.0	42.0		14.0	74.0	74.0	14.0	74.0	74.0
Total Split (%)	32.3%	32.3%		32.3%	32.3%		10.8%	56.9%	56.9%	10.8%	56.9%	56.9%
Maximum Green (s)	35.0	35.0		35.0	35.0		7.7	67.7	67.7	7.7	67.7	67.7
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.0	4.0		4.0	4.0		2.1	2.1	2.1	2.1	2.1	2.1
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)	7.0	7.0		7.0	7.0		6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0			12.0	12.0		12.0	12.0
Pedestrian Calls (#/hr)	20	20		20	20			5	5		5	5
Act Effct Green (s)	23.8	23.8		23.8	23.8		87.7	82.5	82.5	89.3	85.0	85.0
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.67	0.63	0.63	0.69	0.65	0.65
v/c Ratio	0.84	0.26		0.35	0.62		0.06	0.61	0.06	0.17	0.23	0.03
Control Delay	91.7	25.5		48.0	40.0		14.5	26.5	9.2	8.8	11.6	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

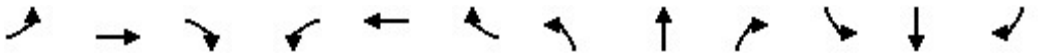
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	91.7	25.5		48.0	40.0		14.5	26.5	9.2	8.8	11.6	0.0
LOS	F	C		D	D		B	C	A	A	B	A
Approach Delay		64.3			42.2			25.5			11.0	
Approach LOS		E			D			C			B	
Queue Length 50th (m)	27.9	9.1		17.2	34.0		3.0	110.5	0.6	3.2	32.0	0.0
Queue Length 95th (m)	#50.5	22.5		31.0	58.0		m8.6	173.5	m10.7	7.5	45.1	0.0
Internal Link Dist (m)		175.4			237.8			397.1			102.8	
Turn Bay Length (m)	60.0			60.0			60.0		50.0	90.0		40.0
Base Capacity (vph)	208	451		341	487		508	2150	965	259	2133	845
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	0.57	0.18		0.23	0.45		0.06	0.61	0.06	0.16	0.23	0.03

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 13 (10%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 27.4 Intersection LOS: C
Intersection Capacity Utilization 69.7% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Wodroffe Avenue/Woodroffe Avenue & Queensbury Drive/Rideaucrest Drive



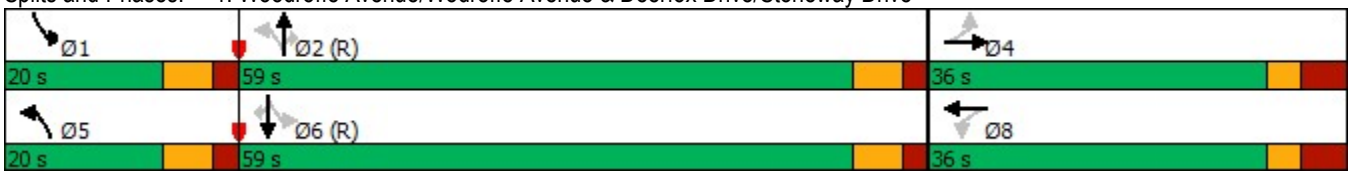


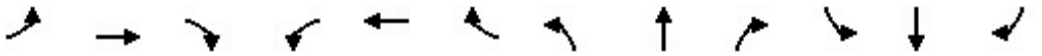
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	22	26	143	20	42	32	816	188	106	1300	78
Future Volume (vph)	30	22	26	143	20	42	32	816	188	106	1300	78
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.918			0.898				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1644	0	1712	1541	0	1616	3390	1488	1300	3293	1547
Flt Permitted	0.712			0.722			0.127			0.244		
Satd. Flow (perm)	1296	1644	0	1301	1541	0	216	3390	1488	334	3293	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29			47				192			100
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		298.9			331.3			373.2			421.1	
Travel Time (s)		26.9			29.8			22.4			25.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	3%	1%	4%	7%	7%	2%	4%	33%	5%	0%
Adj. Flow (vph)	33	24	29	159	22	47	36	907	209	118	1444	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	53	0	159	69	0	36	907	209	118	1444	87
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	35.1	35.1		35.6	35.6		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	36.0	36.0		36.0	36.0		20.0	59.0	59.0	20.0	59.0	59.0
Total Split (%)	31.3%	31.3%		31.3%	31.3%		17.4%	51.3%	51.3%	17.4%	51.3%	51.3%
Maximum Green (s)	28.9	28.9		28.9	28.9		13.6	52.6	52.6	13.6	52.6	52.6
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.1	4.1		4.1	4.1		2.2	2.2	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
Total Lost Time (s)	7.1	7.1		7.1	7.1		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	21.0	21.0		21.0	21.0			13.0	13.0		13.0	13.0
Pedestrian Calls (#/hr)	5	5		5	5			5	5		5	5
Act Effct Green (s)	19.5	19.5		19.5	19.5		72.9	66.6	66.6	80.4	74.1	74.1
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.63	0.58	0.58	0.70	0.64	0.64
v/c Ratio	0.15	0.18		0.72	0.23		0.17	0.46	0.22	0.38	0.68	0.08
Control Delay	39.3	21.8		62.8	17.8		8.7	16.3	3.5	9.5	8.6	1.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	39.3	21.8		62.8	17.8		8.7	16.3	3.5	9.5	8.6	1.1
LOS	D	C		E	B		A	B	A	A	A	A
Approach Delay		28.5			49.1			13.7			8.2	
Approach LOS		C			D			B			A	
Queue Length 50th (m)	6.4	4.6		34.3	4.2		2.1	57.5	1.5	4.2	26.8	0.0
Queue Length 95th (m)	14.0	14.2		52.4	15.2		6.5	94.5	14.5	m9.6	49.1	m1.5
Internal Link Dist (m)		274.9			307.3			349.2			397.1	
Turn Bay Length (m)	30.0			30.0			50.0		50.0	50.0		50.0
Base Capacity (vph)	325	434		326	422		315	1962	942	352	2121	1032
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	0.10	0.12		0.49	0.16		0.11	0.46	0.22	0.34	0.68	0.08

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 29 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 13.8		Intersection LOS: B	
Intersection Capacity Utilization 73.7%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Woodroffe Avenue/Wodroffe Avenue & Deerfox Drive/Stoneway Drive



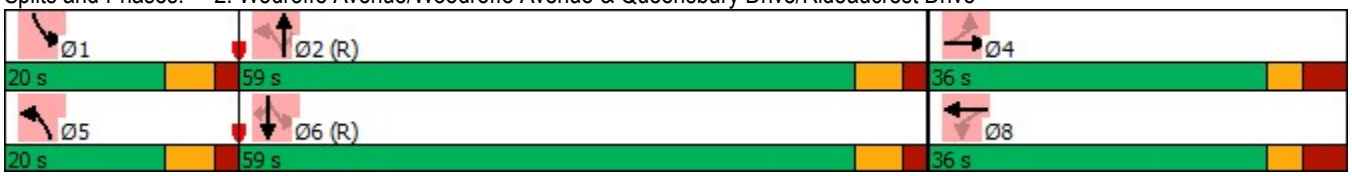


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	53	38	59	37	48	55	729	104	145	1387	110
Future Volume (vph)	54	53	38	59	37	48	55	729	104	145	1387	110
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	60.0		0.0	60.0		50.0	90.0		40.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.938			0.915				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1606	0	1712	1649	0	1394	3390	1473	1679	3262	1248
Flt Permitted	0.696			0.692			0.112			0.303		
Satd. Flow (perm)	1267	1606	0	1247	1649	0	164	3390	1473	535	3262	1248
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30			53				116			98
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		199.4			261.8			421.1			126.8	
Travel Time (s)		17.9			23.6			25.3			7.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	11%	1%	1%	1%	24%	2%	5%	3%	6%	24%
Adj. Flow (vph)	60	59	42	66	41	53	61	810	116	161	1541	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	101	0	66	94	0	61	810	116	161	1541	122
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	36.0	36.0		36.0	36.0		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	36.0	36.0		36.0	36.0		20.0	59.0	59.0	20.0	59.0	59.0
Total Split (%)	31.3%	31.3%		31.3%	31.3%		17.4%	51.3%	51.3%	17.4%	51.3%	51.3%
Maximum Green (s)	29.0	29.0		29.0	29.0		13.7	52.7	52.7	13.7	52.7	52.7
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.0	4.0		4.0	4.0		2.1	2.1	2.1	2.1	2.1	2.1
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)	7.0	7.0		7.0	7.0		6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0			12.0	12.0		12.0	12.0
Pedestrian Calls (#/hr)	5	5		5	5			5	5		5	5
Act Effct Green (s)	13.9	13.9		13.9	13.9		80.0	72.8	72.8	84.1	76.7	76.7
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.70	0.63	0.63	0.73	0.67	0.67
v/c Ratio	0.39	0.46		0.44	0.38		0.32	0.38	0.12	0.34	0.71	0.14
Control Delay	51.0	37.3		53.1	25.0		19.3	14.9	6.9	6.9	17.5	4.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	51.0	37.3		53.1	25.0		19.3	14.9	6.9	6.9	17.5	4.1
LOS	D	D		D	C		B	B	A	A	B	A
Approach Delay		42.4			36.6			14.3			15.7	
Approach LOS		D			D			B			B	
Queue Length 50th (m)	13.0	15.3		14.4	8.7		2.4	34.6	0.0	7.1	102.6	1.6
Queue Length 95th (m)	22.0	26.9		23.9	20.3		22.1	80.6	17.5	22.6	#227.2	12.7
Internal Link Dist (m)		175.4			237.8			397.1			102.8	
Turn Bay Length (m)	60.0			60.0			60.0		50.0	90.0		40.0
Base Capacity (vph)	319	427		314	455		269	2146	975	541	2175	865
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	0.19	0.24		0.21	0.21		0.23	0.38	0.12	0.30	0.71	0.14

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 14 (12%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 17.7		Intersection LOS: B	
Intersection Capacity Utilization 71.1%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 2: Wodroffe Avenue/Woodroffe Avenue & Queensbury Drive/Rideaucrest Drive



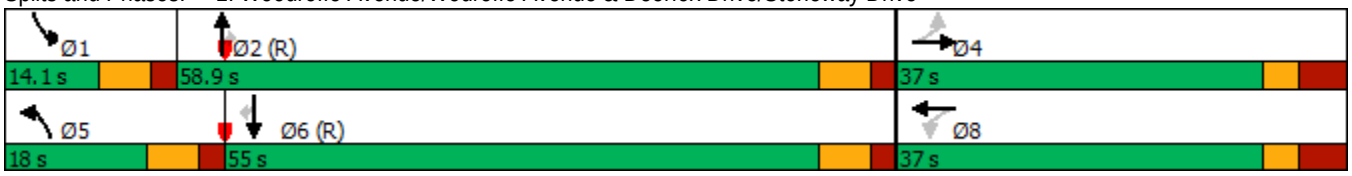
APPENDIX F: BACKGROUND (2023 AND 2028) SYNCHRO ANALYSIS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	20	45	200	46	88	75	1159	133	27	522	20
Future Volume (vph)	42	20	45	200	46	88	75	1159	133	27	522	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.896			0.901				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1598	0	1712	1547	0	1616	3390	1488	1300	3293	1547
Flt Permitted	0.671			0.715			0.950			0.950		
Satd. Flow (perm)	1221	1598	0	1288	1547	0	1616	3390	1488	1300	3293	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		45			86				104			104
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		298.9			331.3			373.2			421.1	
Travel Time (s)		26.9			29.8			22.4			25.3	
Peak Hour 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
Heavy Vehicles (%)	0%	0%	3%	1%	4%	7%	7%	2%	4%	33%	5%	0%
Adj. Flow (vph)	42	20	45	200	46	88	75	1159	133	27	522	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	65	0	200	134	0	75	1159	133	27	522	20
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	35.1	35.1		35.6	35.6		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	37.0	37.0		37.0	37.0		18.0	58.9	58.9	14.1	55.0	55.0
Total Split (%)	33.6%	33.6%		33.6%	33.6%		16.4%	53.5%	53.5%	12.8%	50.0%	50.0%
Maximum Green (s)	29.9	29.9		29.9	29.9		11.6	52.5	52.5	7.7	48.6	48.6
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.1	4.1		4.1	4.1		2.2	2.2	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
Total Lost Time (s)	7.1	7.1		7.1	7.1		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	21.0	21.0		21.0	21.0			13.0	13.0		13.0	13.0
Pedestrian Calls (#/hr)	5	5		5	5			5	5		5	5
Act Effct Green (s)	22.1	22.1		22.1	22.1		9.8	65.7	65.7	7.3	60.8	60.8
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.09	0.60	0.60	0.07	0.55	0.55
v/c Ratio	0.17	0.18		0.78	0.35		0.52	0.57	0.14	0.31	0.29	0.02
Control Delay	35.3	15.2		60.7	16.5		60.5	17.5	5.0	70.7	11.1	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	35.3	15.2		60.7	16.5		60.5	17.5	5.0	70.7	11.1	0.1
LOS	D	B		E	B		E	B	A	E	B	A
Approach Delay		23.1			43.0			18.7			13.6	
Approach LOS		C			D			B			B	
Queue Length 50th (m)	7.5	3.5		40.8	8.6		15.6	85.9	2.7	6.2	17.3	0.0
Queue Length 95th (m)	15.8	13.5		61.2	23.0		29.9	125.4	13.4	15.9	22.7	0.1
Internal Link Dist (m)		274.9			307.3			349.2			397.1	
Turn Bay Length (m)	30.0			30.0			50.0		50.0	50.0		50.0
Base Capacity (vph)	331	467		350	483		171	2025	930	94	1818	900
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	0.13	0.14		0.57	0.28		0.44	0.57	0.14	0.29	0.29	0.02

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 33 (30%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 21.1		Intersection LOS: C	
Intersection Capacity Utilization 76.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Woodroffe Avenue/Wodroffe Avenue & Deerfox Drive/Stoneway Drive



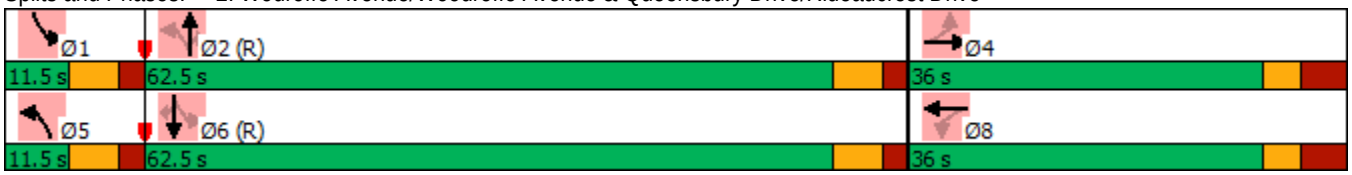
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	37	38	72	71	124	25	1209	55	37	459	21
Future Volume (vph)	106	37	38	72	71	124	25	1209	55	37	459	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	60.0		0.0	60.0		50.0	90.0		40.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.924			0.905				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1571	0	1712	1631	0	1394	3390	1473	1679	3262	1248
Flt Permitted	0.502			0.708			0.486			0.175		
Satd. Flow (perm)	914	1571	0	1276	1631	0	713	3390	1473	309	3262	1248
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38			78				102			102
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		199.4			261.8			421.1			126.8	
Travel Time (s)		17.9			23.6			25.3			7.6	
Peak Hour 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
Heavy Vehicles (%)	0%	3%	11%	1%	1%	1%	24%	2%	5%	3%	6%	24%
Adj. Flow (vph)	106	37	38	72	71	124	25	1209	55	37	459	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	106	75	0	72	195	0	25	1209	55	37	459	21
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	36.0	36.0		36.0	36.0		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	36.0	36.0		36.0	36.0		11.5	62.5	62.5	11.5	62.5	62.5
Total Split (%)	32.7%	32.7%		32.7%	32.7%		10.5%	56.8%	56.8%	10.5%	56.8%	56.8%
Maximum Green (s)	29.0	29.0		29.0	29.0		5.2	56.2	56.2	5.2	56.2	56.2
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.0	4.0		4.0	4.0		2.1	2.1	2.1	2.1	2.1	2.1
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)	7.0	7.0		7.0	7.0		6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0			12.0	12.0		12.0	12.0
Pedestrian Calls (#/hr)	20	20		20	20			5	5		5	5
Act Effct Green (s)	19.2	19.2		19.2	19.2		73.7	70.4	70.4	73.7	70.4	70.4
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.67	0.64	0.64	0.67	0.64	0.64
v/c Ratio	0.67	0.25		0.32	0.56		0.05	0.56	0.06	0.13	0.22	0.03
Control Delay	60.0	21.0		40.4	28.9		13.8	19.6	5.8	8.4	11.0	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

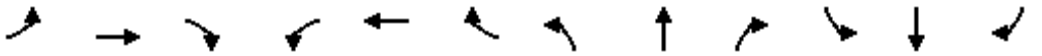
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	60.0	21.0		40.4	28.9		13.8	19.6	5.8	8.4	11.0	0.0
LOS	E	C		D	C		B	B	A	A	B	A
Approach Delay		43.9			32.0			18.9			10.3	
Approach LOS		D			C			B			B	
Queue Length 50th (m)	22.2	7.0		14.1	23.5		1.5	64.3	0.0	1.9	21.4	0.0
Queue Length 95th (m)	36.2	17.3		24.3	40.3		m6.4	118.4	m5.2	6.9	38.7	0.0
Internal Link Dist (m)		175.4			237.8			397.1			102.8	
Turn Bay Length (m)	60.0			60.0			60.0		50.0	90.0		40.0
Base Capacity (vph)	240	442		336	487		511	2168	979	276	2087	835
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	0.44	0.17		0.21	0.40		0.05	0.56	0.06	0.13	0.22	0.03

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 13 (12%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 20.5 Intersection LOS: C
Intersection Capacity Utilization 70.4% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Wodroffe Avenue/Woodroffe Avenue & Queensbury Drive/Rideaucrest Drive



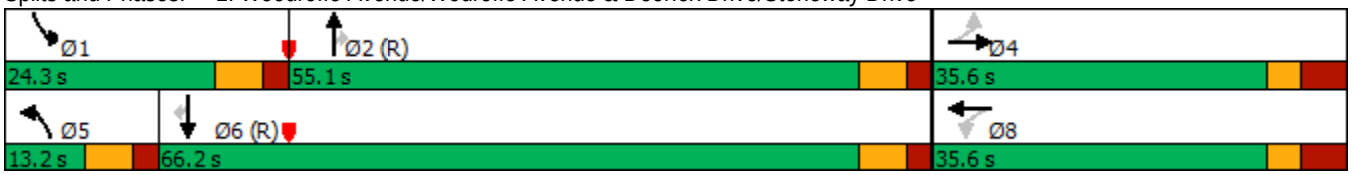


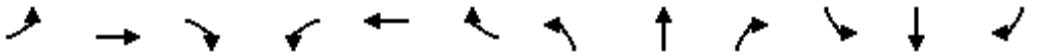
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	22	26	143	20	42	32	832	188	106	1326	78
Future Volume (vph)	30	22	26	143	20	42	32	832	188	106	1326	78
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.919			0.898				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1646	0	1712	1541	0	1616	3390	1488	1300	3293	1547
Flt Permitted	0.717			0.726			0.950			0.950		
Satd. Flow (perm)	1305	1646	0	1308	1541	0	1616	3390	1488	1300	3293	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			42				177			100
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		298.9			331.3			373.2			421.1	
Travel Time (s)		26.9			29.8			22.4			25.3	
Peak Hour 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
Heavy Vehicles (%)	0%	0%	3%	1%	4%	7%	7%	2%	4%	33%	5%	0%
Adj. Flow (vph)	30	22	26	143	20	42	32	832	188	106	1326	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	48	0	143	62	0	32	832	188	106	1326	78
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	35.1	35.1		35.6	35.6		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	35.6	35.6		35.6	35.6		13.2	55.1	55.1	24.3	66.2	66.2
Total Split (%)	31.0%	31.0%		31.0%	31.0%		11.5%	47.9%	47.9%	21.1%	57.6%	57.6%
Maximum Green (s)	28.5	28.5		28.5	28.5		6.8	48.7	48.7	17.9	59.8	59.8
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.1	4.1		4.1	4.1		2.2	2.2	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
Total Lost Time (s)	7.1	7.1		7.1	7.1		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	21.0	21.0		21.0	21.0			13.0	13.0		13.0	13.0
Pedestrian Calls (#/hr)	5	5		5	5			5	5		5	5
Act Effct Green (s)	18.4	18.4		18.4	18.4		7.2	62.6	62.6	14.1	74.5	74.5
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.06	0.54	0.54	0.12	0.65	0.65
v/c Ratio	0.14	0.17		0.68	0.22		0.32	0.45	0.21	0.67	0.62	0.08
Control Delay	39.8	22.5		61.0	18.5		59.9	18.6	3.9	80.3	9.2	1.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	39.8	22.5		61.0	18.5		59.9	18.6	3.9	80.3	9.2	1.5
LOS	D	C		E	B		E	B	A	F	A	A
Approach Delay		29.2			48.1			17.3			13.8	
Approach LOS		C			D			B			B	
Queue Length 50th (m)	5.9	4.3		30.9	3.9		7.0	56.8	1.1	25.7	29.9	0.0
Queue Length 95th (m)	13.0	13.4		47.2	14.2		17.1	93.3	14.5	m40.3	56.9	m2.6
Internal Link Dist (m)		274.9			307.3			349.2			397.1	
Turn Bay Length (m)	30.0			30.0			50.0		50.0	50.0		50.0
Base Capacity (vph)	323	427		324	413		105	1846	890	203	2133	1037
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	0.09	0.11		0.44	0.15		0.30	0.45	0.21	0.52	0.62	0.08

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 29 (25%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 18.0		Intersection LOS: B	
Intersection Capacity Utilization 74.5%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Woodroffe Avenue/Wodroffe Avenue & Deerfox Drive/Stoneway Drive





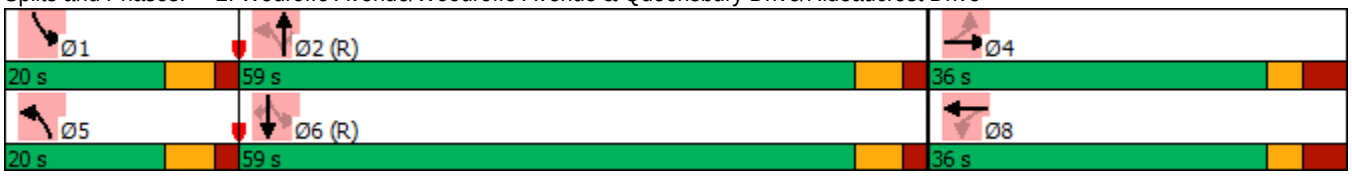
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	53	38	59	37	48	55	745	104	145	1413	110
Future Volume (vph)	54	53	38	59	37	48	55	745	104	145	1413	110
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	60.0		0.0	60.0		50.0	90.0		40.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.937			0.915				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1604	0	1712	1649	0	1394	3390	1473	1679	3262	1248
Flt Permitted	0.702			0.698			0.142			0.332		
Satd. Flow (perm)	1278	1604	0	1258	1649	0	208	3390	1473	587	3262	1248
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30			48				104			98
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		199.4			261.8			421.1			126.8	
Travel Time (s)		17.9			23.6			25.3			7.6	
Peak Hour 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
Heavy Vehicles (%)	0%	3%	11%	1%	1%	1%	24%	2%	5%	3%	6%	24%
Adj. Flow (vph)	54	53	38	59	37	48	55	745	104	145	1413	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	91	0	59	85	0	55	745	104	145	1413	110
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	36.0	36.0		36.0	36.0		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	36.0	36.0		36.0	36.0		20.0	59.0	59.0	20.0	59.0	59.0
Total Split (%)	31.3%	31.3%		31.3%	31.3%		17.4%	51.3%	51.3%	17.4%	51.3%	51.3%
Maximum Green (s)	29.0	29.0		29.0	29.0		13.7	52.7	52.7	13.7	52.7	52.7
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.0	4.0		4.0	4.0		2.1	2.1	2.1	2.1	2.1	2.1
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)	7.0	7.0		7.0	7.0		6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0			12.0	12.0		12.0	12.0
Pedestrian Calls (#/hr)	5	5		5	5			5	5		5	5
Act Effct Green (s)	13.4	13.4		13.4	13.4		80.6	73.7	73.7	84.5	77.4	77.4
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.70	0.64	0.64	0.73	0.67	0.67
v/c Ratio	0.36	0.43		0.40	0.36		0.25	0.34	0.11	0.28	0.64	0.13
Control Delay	50.3	35.7		52.0	25.1		16.1	15.0	7.9	6.2	15.5	3.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	50.3	35.7		52.0	25.1		16.1	15.0	7.9	6.2	15.5	3.5
LOS	D	D		D	C		B	B	A	A	B	A
Approach Delay		41.2			36.2			14.3			13.9	
Approach LOS		D			D			B			B	
Queue Length 50th (m)	11.7	13.2		12.9	7.9		2.1	28.7	0.0	6.1	85.1	0.8
Queue Length 95th (m)	20.4	24.2		21.8	19.0		19.7	76.9	18.1	20.5	179.1	10.5
Internal Link Dist (m)		175.4			237.8			397.1			102.8	
Turn Bay Length (m)	60.0			60.0			60.0		50.0	90.0		40.0
Base Capacity (vph)	322	426		317	451		298	2171	981	578	2196	872
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	0.17	0.21		0.19	0.19		0.18	0.34	0.11	0.25	0.64	0.13

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 115
Offset: 14 (12%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 16.5 Intersection LOS: B
Intersection Capacity Utilization 71.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 2: Wodroffe Avenue/Woodroffe Avenue & Queensbury Drive/Rideaucrest Drive

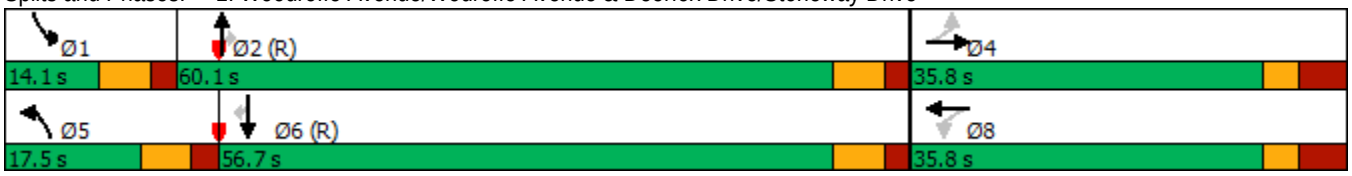


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	20	45	200	46	88	75	1272	133	27	573	20
Future Volume (vph)	42	20	45	200	46	88	75	1272	133	27	573	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.896			0.901				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1598	0	1712	1547	0	1616	3390	1488	1300	3293	1547
Flt Permitted	0.671			0.715			0.950			0.950		
Satd. Flow (perm)	1221	1598	0	1288	1547	0	1616	3390	1488	1300	3293	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		45			85				104			104
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		298.9			331.3			373.2			421.1	
Travel Time (s)		26.9			29.8			22.4			25.3	
Peak Hour 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
Heavy Vehicles (%)	0%	0%	3%	1%	4%	7%	7%	2%	4%	33%	5%	0%
Adj. Flow (vph)	42	20	45	200	46	88	75	1272	133	27	573	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	65	0	200	134	0	75	1272	133	27	573	20
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	35.1	35.1		35.6	35.6		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	35.8	35.8		35.8	35.8		17.5	60.1	60.1	14.1	56.7	56.7
Total Split (%)	32.5%	32.5%		32.5%	32.5%		15.9%	54.6%	54.6%	12.8%	51.5%	51.5%
Maximum Green (s)	28.7	28.7		28.7	28.7		11.1	53.7	53.7	7.7	50.3	50.3
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.1	4.1		4.1	4.1		2.2	2.2	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
Total Lost Time (s)	7.1	7.1		7.1	7.1		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	21.0	21.0		21.0	21.0			13.0	13.0		13.0	13.0
Pedestrian Calls (#/hr)	5	5		5	5			5	5		5	5
Act Effct Green (s)	21.8	21.8		21.8	21.8		9.7	66.0	66.0	7.3	61.1	61.1
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.09	0.60	0.60	0.07	0.56	0.56
v/c Ratio	0.17	0.18		0.78	0.36		0.53	0.63	0.14	0.31	0.31	0.02
Control Delay	35.8	15.5		62.1	17.0		61.1	18.5	4.9	71.6	10.6	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	35.8	15.5		62.1	17.0		61.1	18.5	4.9	71.6	10.6	0.1
LOS	D	B		E	B		E	B	A	E	B	A
Approach Delay		23.5			44.0			19.4			12.9	
Approach LOS		C			D			B			B	
Queue Length 50th (m)	7.5	3.5		40.8	8.7		15.6	99.4	2.7	6.2	16.8	0.0
Queue Length 95th (m)	16.0	13.7		62.2	23.6		30.1	141.2	13.1	15.7	22.0	0.0
Internal Link Dist (m)		274.9			307.3			349.2			397.1	
Turn Bay Length (m)	30.0			30.0			50.0		50.0	50.0		50.0
Base Capacity (vph)	318	450		336	466		166	2033	934	94	1829	905
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	0.13	0.14		0.60	0.29		0.45	0.63	0.14	0.29	0.31	0.02

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 33 (30%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 21.2		Intersection LOS: C	
Intersection Capacity Utilization 79.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Woodroffe Avenue/Wodroffe Avenue & Deerfox Drive/Stoneway Drive



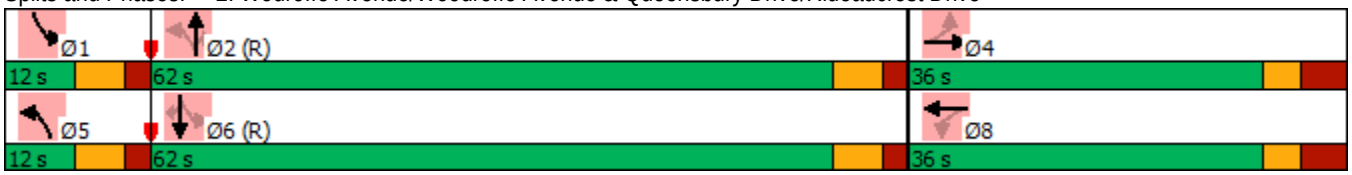
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	37	38	72	71	124	25	1322	55	37	510	21
Future Volume (vph)	106	37	38	72	71	124	25	1322	55	37	510	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	60.0		0.0	60.0		50.0	90.0		40.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.924			0.905				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1571	0	1712	1631	0	1394	3390	1473	1679	3262	1248
Flt Permitted	0.502			0.708			0.456			0.145		
Satd. Flow (perm)	914	1571	0	1276	1631	0	669	3390	1473	256	3262	1248
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38			78				102			102
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		199.4			261.8			421.1			126.8	
Travel Time (s)		17.9			23.6			25.3			7.6	
Peak Hour 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
Heavy Vehicles (%)	0%	3%	11%	1%	1%	1%	24%	2%	5%	3%	6%	24%
Adj. Flow (vph)	106	37	38	72	71	124	25	1322	55	37	510	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	106	75	0	72	195	0	25	1322	55	37	510	21
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	36.0	36.0		36.0	36.0		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	36.0	36.0		36.0	36.0		12.0	62.0	62.0	12.0	62.0	62.0
Total Split (%)	32.7%	32.7%		32.7%	32.7%		10.9%	56.4%	56.4%	10.9%	56.4%	56.4%
Maximum Green (s)	29.0	29.0		29.0	29.0		5.7	55.7	55.7	5.7	55.7	55.7
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.0	4.0		4.0	4.0		2.1	2.1	2.1	2.1	2.1	2.1
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)	7.0	7.0		7.0	7.0		6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0			12.0	12.0		12.0	12.0
Pedestrian Calls (#/hr)	20	20		20	20			5	5		5	5
Act Effct Green (s)	19.2	19.2		19.2	19.2		73.7	70.2	70.2	73.7	70.2	70.2
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.67	0.64	0.64	0.67	0.64	0.64
v/c Ratio	0.67	0.25		0.32	0.56		0.05	0.61	0.06	0.15	0.25	0.03
Control Delay	60.0	21.0		40.4	28.9		14.5	22.6	6.6	8.6	11.3	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

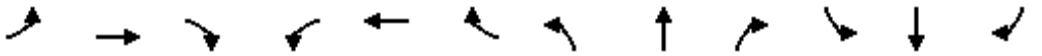
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	60.0	21.0		40.4	28.9		14.5	22.6	6.6	8.6	11.3	0.0
LOS	E	C		D	C		B	C	A	A	B	A
Approach Delay		43.9			32.0			21.9			10.7	
Approach LOS		D			C			C			B	
Queue Length 50th (m)	22.2	7.0		14.1	23.5		2.0	86.2	0.3	1.9	24.2	0.0
Queue Length 95th (m)	36.2	17.3		24.3	40.3		m6.3	136.1	m4.8	6.9	43.6	0.0
Internal Link Dist (m)		175.4			237.8			397.1			102.8	
Turn Bay Length (m)	60.0			60.0			60.0		50.0	90.0		40.0
Base Capacity (vph)	240	442		336	487		485	2162	976	246	2081	833
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	0.44	0.17		0.21	0.40		0.05	0.61	0.06	0.15	0.25	0.03

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 13 (12%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 22.0 Intersection LOS: C
Intersection Capacity Utilization 73.7% ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Wodroffe Avenue/Woodroffe Avenue & Queensbury Drive/Rideaucrest Drive



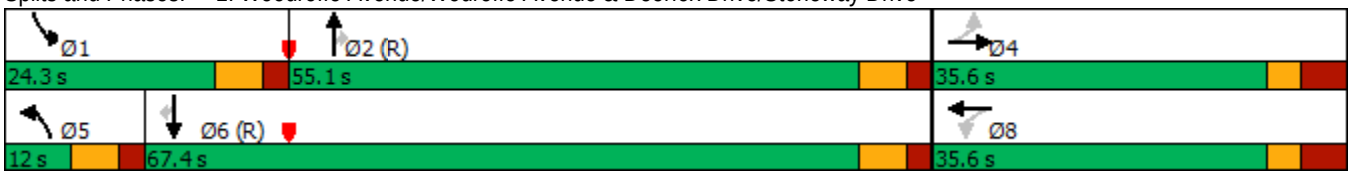


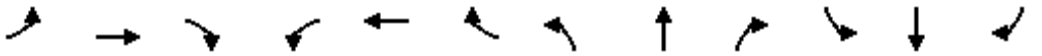
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	22	26	143	20	42	32	914	188	106	1456	78
Future Volume (vph)	30	22	26	143	20	42	32	914	188	106	1456	78
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.919			0.898				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1646	0	1712	1541	0	1616	3390	1488	1300	3293	1547
Flt Permitted	0.717			0.726			0.950			0.950		
Satd. Flow (perm)	1305	1646	0	1308	1541	0	1616	3390	1488	1300	3293	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			42				161			100
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		298.9			331.3			373.2			421.1	
Travel Time (s)		26.9			29.8			22.4			25.3	
Peak Hour 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
Heavy Vehicles (%)	0%	0%	3%	1%	4%	7%	7%	2%	4%	33%	5%	0%
Adj. Flow (vph)	30	22	26	143	20	42	32	914	188	106	1456	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	48	0	143	62	0	32	914	188	106	1456	78
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	35.1	35.1		35.6	35.6		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	35.6	35.6		35.6	35.6		12.0	55.1	55.1	24.3	67.4	67.4
Total Split (%)	31.0%	31.0%		31.0%	31.0%		10.4%	47.9%	47.9%	21.1%	58.6%	58.6%
Maximum Green (s)	28.5	28.5		28.5	28.5		5.6	48.7	48.7	17.9	61.0	61.0
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.1	4.1		4.1	4.1		2.2	2.2	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
Total Lost Time (s)	7.1	7.1		7.1	7.1		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	21.0	21.0		21.0	21.0			13.0	13.0		13.0	13.0
Pedestrian Calls (#/hr)	5	5		5	5			5	5		5	5
Act Effct Green (s)	18.4	18.4		18.4	18.4		6.9	62.6	62.6	14.1	74.7	74.7
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.06	0.54	0.54	0.12	0.65	0.65
v/c Ratio	0.14	0.17		0.68	0.22		0.33	0.50	0.21	0.67	0.68	0.07
Control Delay	39.8	22.5		61.0	18.5		61.1	19.4	4.8	79.1	9.6	1.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	39.8	22.5		61.0	18.5		61.1	19.4	4.8	79.1	9.6	1.5
LOS	D	C		E	B		E	B	A	E	A	A
Approach Delay		29.2			48.1			18.1			13.7	
Approach LOS		C			D			B			B	
Queue Length 50th (m)	5.9	4.3		30.9	3.9		7.0	64.5	2.7	25.8	32.0	0.0
Queue Length 95th (m)	13.0	13.4		47.2	14.2		17.3	105.3	16.9	m37.2	61.2	m2.2
Internal Link Dist (m)		274.9			307.3			349.2			397.1	
Turn Bay Length (m)	30.0			30.0			50.0		50.0	50.0		50.0
Base Capacity (vph)	323	427		324	413		97	1846	883	203	2140	1040
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	0.09	0.11		0.44	0.15		0.33	0.50	0.21	0.52	0.68	0.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 29 (25%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 18.0		Intersection LOS: B	
Intersection Capacity Utilization 78.3%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Woodroffe Avenue/Wodroffe Avenue & Deerfox Drive/Stoneway Drive





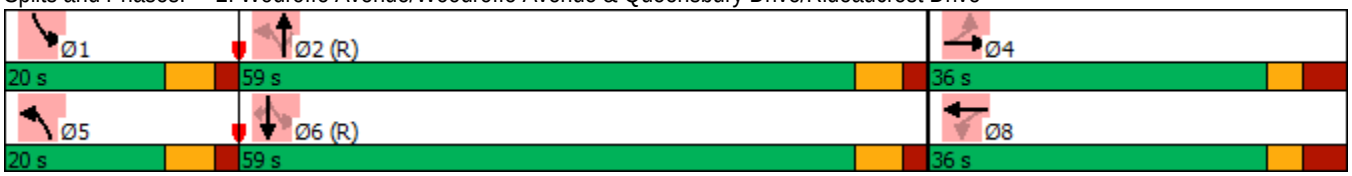
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	53	38	59	37	48	55	827	104	145	1543	110
Future Volume (vph)	54	53	38	59	37	48	55	827	104	145	1543	110
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	60.0		0.0	60.0		50.0	90.0		40.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.937			0.915				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1604	0	1712	1649	0	1394	3390	1473	1679	3262	1248
Flt Permitted	0.702			0.698			0.114			0.298		
Satd. Flow (perm)	1278	1604	0	1258	1649	0	167	3390	1473	527	3262	1248
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30			48				104			98
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		199.4			261.8			421.1			126.8	
Travel Time (s)		17.9			23.6			25.3			7.6	
Peak Hour 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
Heavy Vehicles (%)	0%	3%	11%	1%	1%	1%	24%	2%	5%	3%	6%	24%
Adj. Flow (vph)	54	53	38	59	37	48	55	827	104	145	1543	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	91	0	59	85	0	55	827	104	145	1543	110
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	36.0	36.0		36.0	36.0		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	36.0	36.0		36.0	36.0		20.0	59.0	59.0	20.0	59.0	59.0
Total Split (%)	31.3%	31.3%		31.3%	31.3%		17.4%	51.3%	51.3%	17.4%	51.3%	51.3%
Maximum Green (s)	29.0	29.0		29.0	29.0		13.7	52.7	52.7	13.7	52.7	52.7
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.0	4.0		4.0	4.0		2.1	2.1	2.1	2.1	2.1	2.1
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)	7.0	7.0		7.0	7.0		6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0			12.0	12.0		12.0	12.0
Pedestrian Calls (#/hr)	5	5		5	5			5	5		5	5
Act Effct Green (s)	13.4	13.4		13.4	13.4		80.6	73.7	73.7	84.5	77.4	77.4
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.70	0.64	0.64	0.73	0.67	0.67
v/c Ratio	0.36	0.43		0.40	0.36		0.29	0.38	0.11	0.31	0.70	0.13
Control Delay	50.3	35.7		52.0	25.1		18.6	16.2	8.7	6.5	17.0	3.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

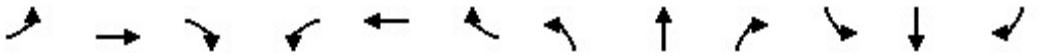
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	50.3	35.7		52.0	25.1		18.6	16.2	8.7	6.5	17.0	3.5
LOS	D	D		D	C		B	B	A	A	B	A
Approach Delay		41.2			36.2			15.6			15.3	
Approach LOS		D			D			B			B	
Queue Length 50th (m)	11.7	13.2		12.9	7.9		2.1	32.0	0.0	6.1	100.0	0.8
Queue Length 95th (m)	20.4	24.2		21.8	19.0		21.0	87.3	19.3	20.5	#225.1	10.5
Internal Link Dist (m)		175.4			237.8			397.1			102.8	
Turn Bay Length (m)	60.0			60.0			60.0		50.0	90.0		40.0
Base Capacity (vph)	322	426		317	451		272	2171	981	539	2196	872
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	0.17	0.21		0.19	0.19		0.20	0.38	0.11	0.27	0.70	0.13

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 115
Offset: 14 (12%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 17.6 Intersection LOS: B
Intersection Capacity Utilization 75.6% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Wodroffe Avenue/Woodroffe Avenue & Queensbury Drive/Rideaucrest Drive



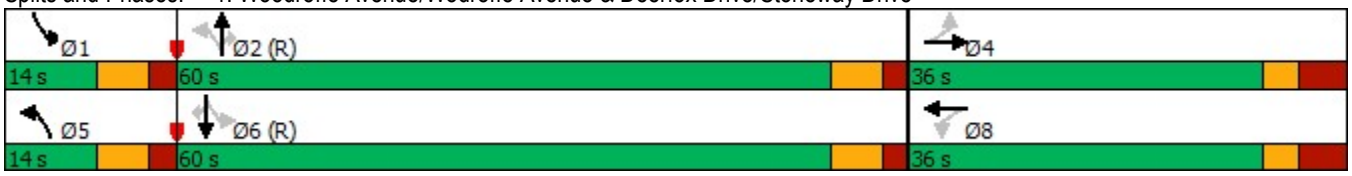


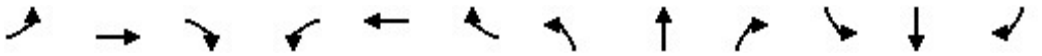
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	20	45	200	46	88	75	1159	133	27	522	20
Future Volume (vph)	42	20	45	200	46	88	75	1159	133	27	522	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.896			0.901				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1598	0	1712	1547	0	1616	3390	1488	1300	3293	1547
Flt Permitted	0.671			0.715			0.430			0.185		
Satd. Flow (perm)	1221	1598	0	1288	1547	0	731	3390	1488	253	3293	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		45			85				105			104
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		298.9			331.3			373.2			421.1	
Travel Time (s)		26.9			29.8			22.4			25.3	
Peak Hour 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
Heavy Vehicles (%)	0%	0%	3%	1%	4%	7%	7%	2%	4%	33%	5%	0%
Adj. Flow (vph)	42	20	45	200	46	88	75	1159	133	27	522	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	65	0	200	134	0	75	1159	133	27	522	20
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	35.1	35.1		35.6	35.6		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	36.0	36.0		36.0	36.0		14.0	60.0	60.0	14.0	60.0	60.0
Total Split (%)	32.7%	32.7%		32.7%	32.7%		12.7%	54.5%	54.5%	12.7%	54.5%	54.5%
Maximum Green (s)	28.9	28.9		28.9	28.9		7.6	53.6	53.6	7.6	53.6	53.6
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.1	4.1		4.1	4.1		2.2	2.2	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
Total Lost Time (s)	7.1	7.1		7.1	7.1		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	21.0	21.0		21.0	21.0			13.0	13.0		13.0	13.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effct Green (s)	21.8	21.8		21.8	21.8		71.3	66.7	66.7	68.9	63.7	63.7
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.65	0.61	0.61	0.63	0.58	0.58
v/c Ratio	0.17	0.18		0.78	0.36		0.14	0.56	0.14	0.12	0.27	0.02
Control Delay	35.7	15.5		61.9	17.0		8.0	16.7	4.7	7.1	10.4	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	35.7	15.5		61.9	17.0		8.0	16.7	4.7	7.1	10.4	0.1
LOS	D	B		E	B		A	B	A	A	B	A
Approach Delay		23.4			43.9			15.0			9.9	
Approach LOS		C			D			B			A	
Queue Length 50th (m)	7.5	3.5		40.8	8.7		5.0	83.0	2.6	1.4	14.6	0.0
Queue Length 95th (m)	16.0	13.7		62.0	23.5		11.8	122.8	13.0	3.8	19.4	0.1
Internal Link Dist (m)		274.9			307.3			349.2			397.1	
Turn Bay Length (m)	30.0			30.0			50.0		50.0	50.0		50.0
Base Capacity (vph)	320	453		338	469		536	2055	943	232	1905	939
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	0.13	0.14		0.59	0.29		0.14	0.56	0.14	0.12	0.27	0.02

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 33 (30%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 18.2		Intersection LOS: B	
Intersection Capacity Utilization 76.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Woodroffe Avenue/Wodroffe Avenue & Deerfox Drive/Stoneway Drive





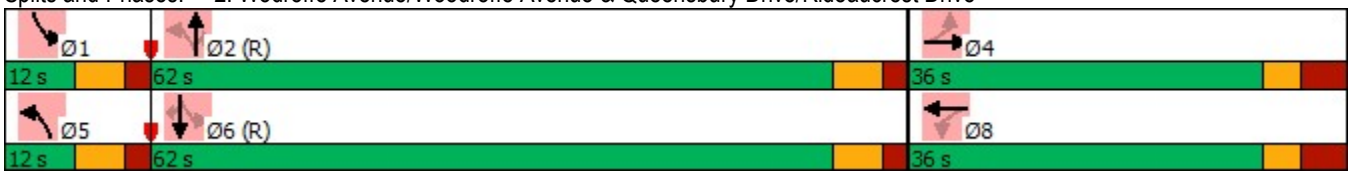
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	37	38	72	71	124	25	1209	55	37	459	21
Future Volume (vph)	106	37	38	72	71	124	25	1209	55	37	459	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	60.0		0.0	60.0		50.0	90.0		40.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.924			0.905				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1571	0	1712	1631	0	1394	3390	1473	1679	3262	1248
Flt Permitted	0.466			0.708			0.488			0.181		
Satd. Flow (perm)	848	1571	0	1276	1631	0	716	3390	1473	320	3262	1248
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38			78				102			102
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		199.4			261.8			421.1			126.8	
Travel Time (s)		17.9			23.6			25.3			7.6	
Peak Hour 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
Heavy Vehicles (%)	0%	3%	11%	1%	1%	1%	24%	2%	5%	3%	6%	24%
Adj. Flow (vph)	106	37	38	72	71	124	25	1209	55	37	459	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	106	75	0	72	195	0	25	1209	55	37	459	21
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	36.0	36.0		36.0	36.0		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	36.0	36.0		36.0	36.0		12.0	62.0	62.0	12.0	62.0	62.0
Total Split (%)	32.7%	32.7%		32.7%	32.7%		10.9%	56.4%	56.4%	10.9%	56.4%	56.4%
Maximum Green (s)	29.0	29.0		29.0	29.0		5.7	55.7	55.7	5.7	55.7	55.7
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.0	4.0		4.0	4.0		2.1	2.1	2.1	2.1	2.1	2.1
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)	7.0	7.0		7.0	7.0		6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0			12.0	12.0		12.0	12.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effct Green (s)	16.4	16.4		16.4	16.4		76.4	72.5	72.5	76.6	72.6	72.6
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.69	0.66	0.66	0.70	0.66	0.66
v/c Ratio	0.84	0.28		0.38	0.63		0.05	0.54	0.05	0.12	0.21	0.02
Control Delay	90.2	24.0		45.8	34.1		11.7	20.3	6.5	6.5	9.5	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

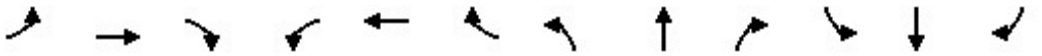
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	90.2	24.0		45.8	34.1		11.7	20.3	6.5	6.5	9.5	0.0
LOS	F	C		D	C		B	C	A	A	A	A
Approach Delay		62.8			37.3			19.5			8.9	
Approach LOS		E			D			B			A	
Queue Length 50th (m)	22.4	7.0		14.1	23.5		1.8	78.5	0.1	1.9	21.4	0.0
Queue Length 95th (m)	39.3	18.4		25.8	42.9		m6.7	133.3	m6.4	6.0	36.5	0.0
Internal Link Dist (m)		175.4			237.8			397.1			102.8	
Turn Bay Length (m)	60.0			60.0			60.0		50.0	90.0		40.0
Base Capacity (vph)	223	442		336	487		535	2233	1005	300	2151	857
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	0.48	0.17		0.21	0.40		0.05	0.54	0.05	0.12	0.21	0.02

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 13 (12%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 22.7 Intersection LOS: C
Intersection Capacity Utilization 70.4% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Wodroffe Avenue/Woodroffe Avenue & Queensbury Drive/Rideaucrest Drive



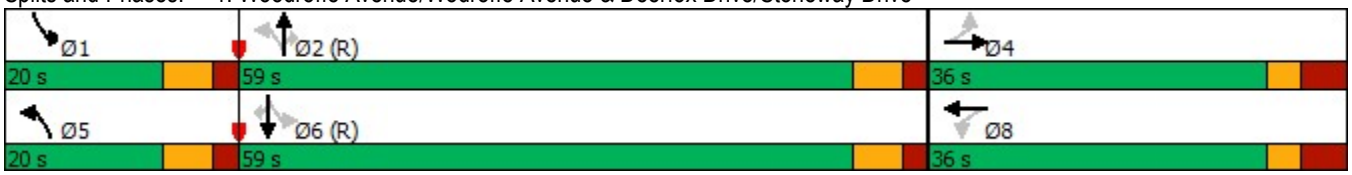


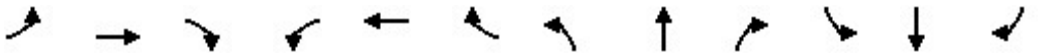
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	22	26	143	20	42	32	832	188	106	1326	78
Future Volume (vph)	30	22	26	143	20	42	32	832	188	106	1326	78
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.919			0.898				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1646	0	1712	1541	0	1616	3390	1488	1300	3293	1547
Flt Permitted	0.717			0.726			0.160			0.279		
Satd. Flow (perm)	1305	1646	0	1308	1541	0	272	3390	1488	382	3293	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			42				188			100
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		298.9			331.3			373.2			421.1	
Travel Time (s)		26.9			29.8			22.4			25.3	
Peak Hour 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
Heavy Vehicles (%)	0%	0%	3%	1%	4%	7%	7%	2%	4%	33%	5%	0%
Adj. Flow (vph)	30	22	26	143	20	42	32	832	188	106	1326	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	48	0	143	62	0	32	832	188	106	1326	78
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	35.1	35.1		35.6	35.6		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	36.0	36.0		36.0	36.0		20.0	59.0	59.0	20.0	59.0	59.0
Total Split (%)	31.3%	31.3%		31.3%	31.3%		17.4%	51.3%	51.3%	17.4%	51.3%	51.3%
Maximum Green (s)	28.9	28.9		28.9	28.9		13.6	52.6	52.6	13.6	52.6	52.6
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.1	4.1		4.1	4.1		2.2	2.2	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
Total Lost Time (s)	7.1	7.1		7.1	7.1		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	21.0	21.0		21.0	21.0			13.0	13.0		13.0	13.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effct Green (s)	17.8	17.8		17.8	17.8		74.9	68.7	68.7	81.7	75.8	75.8
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.65	0.60	0.60	0.71	0.66	0.66
v/c Ratio	0.15	0.17		0.71	0.23		0.13	0.41	0.20	0.31	0.61	0.07
Control Delay	40.9	23.3		63.8	19.1		7.2	14.2	2.5	5.3	6.9	0.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	40.9	23.3		63.8	19.1		7.2	14.2	2.5	5.3	6.9	0.2
LOS	D	C		E	B		A	B	A	A	A	A
Approach Delay		30.1			50.3			11.9			6.5	
Approach LOS		C			D			B			A	
Queue Length 50th (m)	5.9	4.3		30.9	3.9		1.8	49.0	0.0	3.7	24.5	0.0
Queue Length 95th (m)	13.5	13.9		48.8	14.7		5.5	78.6	10.9	m6.1	28.0	m0.2
Internal Link Dist (m)		274.9			307.3			349.2			397.1	
Turn Bay Length (m)	30.0			30.0			50.0		50.0	50.0		50.0
Base Capacity (vph)	327	433		328	418		353	2025	964	386	2171	1054
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	0.09	0.11		0.44	0.15		0.09	0.41	0.20	0.27	0.61	0.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 29 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 12.3		Intersection LOS: B	
Intersection Capacity Utilization 74.5%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Woodroffe Avenue/Wodroffe Avenue & Deerfox Drive/Stoneway Drive





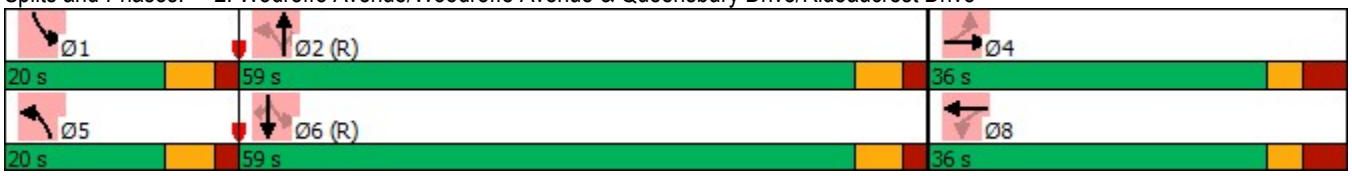
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	53	38	59	37	48	55	745	104	145	1413	110
Future Volume (vph)	54	53	38	59	37	48	55	745	104	145	1413	110
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	60.0		0.0	60.0		50.0	90.0		40.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.937			0.915				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1604	0	1712	1649	0	1394	3390	1473	1679	3262	1248
Flt Permitted	0.702			0.698			0.148			0.338		
Satd. Flow (perm)	1278	1604	0	1258	1649	0	217	3390	1473	597	3262	1248
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30			48				104			98
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		199.4			261.8			421.1			126.8	
Travel Time (s)		17.9			23.6			25.3			7.6	
Peak Hour 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
Heavy Vehicles (%)	0%	3%	11%	1%	1%	1%	24%	2%	5%	3%	6%	24%
Adj. Flow (vph)	54	53	38	59	37	48	55	745	104	145	1413	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	91	0	59	85	0	55	745	104	145	1413	110
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	36.0	36.0		36.0	36.0		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	36.0	36.0		36.0	36.0		20.0	59.0	59.0	20.0	59.0	59.0
Total Split (%)	31.3%	31.3%		31.3%	31.3%		17.4%	51.3%	51.3%	17.4%	51.3%	51.3%
Maximum Green (s)	29.0	29.0		29.0	29.0		13.7	52.7	52.7	13.7	52.7	52.7
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.0	4.0		4.0	4.0		2.1	2.1	2.1	2.1	2.1	2.1
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)	7.0	7.0		7.0	7.0		6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0			12.0	12.0		12.0	12.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effct Green (s)	10.7	10.7		10.7	10.7		83.4	76.8	76.8	87.0	80.3	80.3
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.73	0.67	0.67	0.76	0.70	0.70
v/c Ratio	0.45	0.51		0.50	0.43		0.24	0.33	0.10	0.28	0.62	0.12
Control Delay	60.2	43.2		63.1	30.4		10.2	10.1	3.5	4.6	12.1	2.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

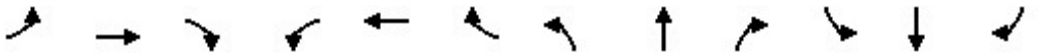
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	60.2	43.2		63.1	30.4		10.2	10.1	3.5	4.6	12.1	2.4
LOS	E	D		E	C		B	B	A	A	B	A
Approach Delay		49.5			43.8			9.4			10.8	
Approach LOS		D			D			A			B	
Queue Length 50th (m)	11.7	13.2		12.9	7.9		2.1	31.7	0.0	6.1	85.1	0.8
Queue Length 95th (m)	23.7	28.3		25.4	22.1		14.1	58.7	10.6	13.0	129.2	7.6
Internal Link Dist (m)		175.4			237.8			397.1			102.8	
Turn Bay Length (m)	60.0			60.0			60.0		50.0	90.0		40.0
Base Capacity (vph)	322	426		317	451		310	2262	1017	599	2278	901
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	0.17	0.21		0.19	0.19		0.18	0.33	0.10	0.24	0.62	0.12

Intersection Summary

Area Type: Other
Cycle Length: 115
Actuated Cycle Length: 115
Offset: 14 (12%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 14.0 Intersection LOS: B
Intersection Capacity Utilization 71.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 2: Wodroffe Avenue/Woodroffe Avenue & Queensbury Drive/Rideaucrest Drive



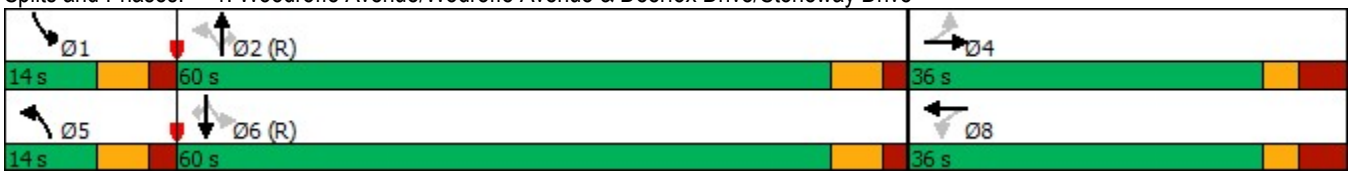


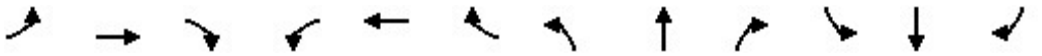
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	20	45	200	46	88	75	1272	133	27	573	20
Future Volume (vph)	42	20	45	200	46	88	75	1272	133	27	573	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.896			0.901				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1598	0	1712	1547	0	1616	3390	1488	1300	3293	1547
Flt Permitted	0.671			0.715			0.403			0.152		
Satd. Flow (perm)	1221	1598	0	1288	1547	0	685	3390	1488	208	3293	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		45			85				104			104
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		298.9			331.3			373.2			421.1	
Travel Time (s)		26.9			29.8			22.4			25.3	
Peak Hour 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
Heavy Vehicles (%)	0%	0%	3%	1%	4%	7%	7%	2%	4%	33%	5%	0%
Adj. Flow (vph)	42	20	45	200	46	88	75	1272	133	27	573	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	65	0	200	134	0	75	1272	133	27	573	20
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	35.1	35.1		35.6	35.6		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	36.0	36.0		36.0	36.0		14.0	60.0	60.0	14.0	60.0	60.0
Total Split (%)	32.7%	32.7%		32.7%	32.7%		12.7%	54.5%	54.5%	12.7%	54.5%	54.5%
Maximum Green (s)	28.9	28.9		28.9	28.9		7.6	53.6	53.6	7.6	53.6	53.6
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.1	4.1		4.1	4.1		2.2	2.2	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
Total Lost Time (s)	7.1	7.1		7.1	7.1		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	21.0	21.0		21.0	21.0			13.0	13.0		13.0	13.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effct Green (s)	21.8	21.8		21.8	21.8		71.3	66.7	66.7	68.9	63.7	63.7
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.65	0.61	0.61	0.63	0.58	0.58
v/c Ratio	0.17	0.18		0.78	0.36		0.15	0.62	0.14	0.14	0.30	0.02
Control Delay	35.7	15.5		61.9	17.0		8.1	17.8	4.7	7.5	10.2	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	35.7	15.5		61.9	17.0		8.1	17.8	4.7	7.5	10.2	0.1
LOS	D	B		E	B		A	B	A	A	B	A
Approach Delay		23.4			43.9			16.1			9.7	
Approach LOS		C			D			B			A	
Queue Length 50th (m)	7.5	3.5		40.8	8.7		5.0	96.0	2.7	1.3	15.1	0.0
Queue Length 95th (m)	16.0	13.7		62.0	23.5		11.8	141.5	13.1	3.5	19.7	0.0
Internal Link Dist (m)		274.9			307.3			349.2			397.1	
Turn Bay Length (m)	30.0			30.0			50.0		50.0	50.0		50.0
Base Capacity (vph)	320	453		338	469		509	2055	943	207	1905	939
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	0.13	0.14		0.59	0.29		0.15	0.62	0.14	0.13	0.30	0.02

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 33 (30%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 18.5		Intersection LOS: B	
Intersection Capacity Utilization 79.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Woodroffe Avenue/Wodroffe Avenue & Deerfox Drive/Stoneway Drive



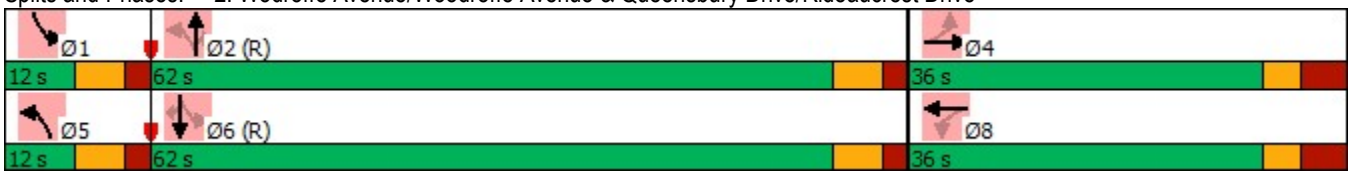


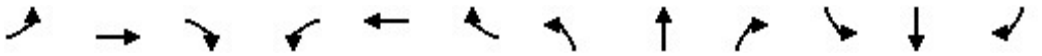
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	37	38	72	71	124	25	1322	55	37	510	21
Future Volume (vph)	106	37	38	72	71	124	25	1322	55	37	510	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	60.0		0.0	60.0		50.0	90.0		40.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.924			0.905				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1571	0	1712	1631	0	1394	3390	1473	1679	3262	1248
Flt Permitted	0.466			0.708			0.460			0.151		
Satd. Flow (perm)	848	1571	0	1276	1631	0	675	3390	1473	267	3262	1248
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38			78				102			102
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		199.4			261.8			421.1			126.8	
Travel Time (s)		17.9			23.6			25.3			7.6	
Peak Hour 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
Heavy Vehicles (%)	0%	3%	11%	1%	1%	1%	24%	2%	5%	3%	6%	24%
Adj. Flow (vph)	106	37	38	72	71	124	25	1322	55	37	510	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	106	75	0	72	195	0	25	1322	55	37	510	21
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	36.0	36.0		36.0	36.0		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	36.0	36.0		36.0	36.0		12.0	62.0	62.0	12.0	62.0	62.0
Total Split (%)	32.7%	32.7%		32.7%	32.7%		10.9%	56.4%	56.4%	10.9%	56.4%	56.4%
Maximum Green (s)	29.0	29.0		29.0	29.0		5.7	55.7	55.7	5.7	55.7	55.7
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.0	4.0		4.0	4.0		2.1	2.1	2.1	2.1	2.1	2.1
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)	7.0	7.0		7.0	7.0		6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0			12.0	12.0		12.0	12.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effct Green (s)	16.4	16.4		16.4	16.4		76.4	72.5	72.5	76.6	72.6	72.6
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.69	0.66	0.66	0.70	0.66	0.66
v/c Ratio	0.84	0.28		0.38	0.63		0.05	0.59	0.05	0.14	0.24	0.02
Control Delay	90.2	24.0		45.8	34.1		11.5	21.9	6.6	6.7	9.7	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	90.2	24.0		45.8	34.1		11.5	21.9	6.6	6.7	9.7	0.0
LOS	F	C		D	C		B	C	A	A	A	A
Approach Delay		62.8			37.3			21.1			9.2	
Approach LOS		E			D			C			A	
Queue Length 50th (m)	22.4	7.0		14.1	23.5		2.1	92.5	0.3	1.9	24.2	0.0
Queue Length 95th (m)	39.3	18.4		25.8	42.9		m6.2	147.5	m5.6	6.0	40.7	0.0
Internal Link Dist (m)		175.4			237.8			397.1			102.8	
Turn Bay Length (m)	60.0			60.0			60.0		50.0	90.0		40.0
Base Capacity (vph)	223	442		336	487		509	2233	1005	266	2151	857
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	0.48	0.17		0.21	0.40		0.05	0.59	0.05	0.14	0.24	0.02

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 13 (12%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 23.2		Intersection LOS: C	
Intersection Capacity Utilization 73.7%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 2: Wodroffe Avenue/Woodroffe Avenue & Queensbury Drive/Rideaucrest Drive



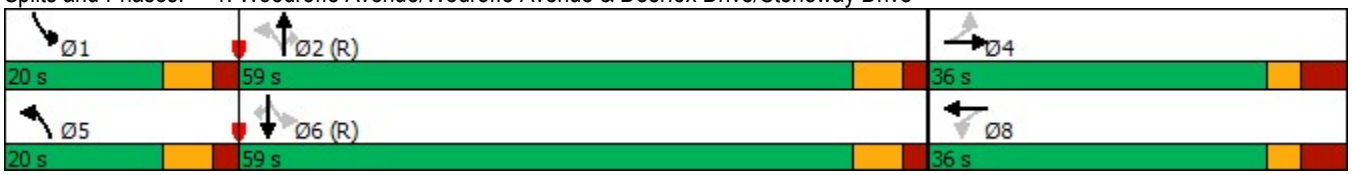


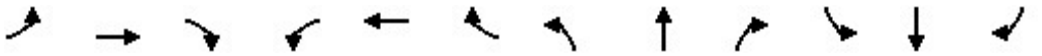
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	22	26	143	20	42	32	914	188	106	1456	78
Future Volume (vph)	30	22	26	143	20	42	32	914	188	106	1456	78
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0		0.0	30.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.919			0.898				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1646	0	1712	1541	0	1616	3390	1488	1300	3293	1547
Flt Permitted	0.717			0.726			0.129			0.248		
Satd. Flow (perm)	1305	1646	0	1308	1541	0	219	3390	1488	339	3293	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			42				171			100
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		298.9			331.3			373.2			421.1	
Travel Time (s)		26.9			29.8			22.4			25.3	
Peak Hour 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
Heavy Vehicles (%)	0%	0%	3%	1%	4%	7%	7%	2%	4%	33%	5%	0%
Adj. Flow (vph)	30	22	26	143	20	42	32	914	188	106	1456	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	48	0	143	62	0	32	914	188	106	1456	78
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	35.1	35.1		35.6	35.6		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	36.0	36.0		36.0	36.0		20.0	59.0	59.0	20.0	59.0	59.0
Total Split (%)	31.3%	31.3%		31.3%	31.3%		17.4%	51.3%	51.3%	17.4%	51.3%	51.3%
Maximum Green (s)	28.9	28.9		28.9	28.9		13.6	52.6	52.6	13.6	52.6	52.6
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.1	4.1		4.1	4.1		2.2	2.2	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
Total Lost Time (s)	7.1	7.1		7.1	7.1		6.4	6.4	6.4	6.4	6.4	6.4
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	21.0	21.0		21.0	21.0			13.0	13.0		13.0	13.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effct Green (s)	17.8	17.8		17.8	17.8		74.9	68.7	68.7	81.7	75.8	75.8
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.65	0.60	0.60	0.71	0.66	0.66
v/c Ratio	0.15	0.17		0.71	0.23		0.15	0.45	0.20	0.34	0.67	0.07
Control Delay	40.9	23.3		63.8	19.1		7.6	14.8	3.2	5.5	7.3	0.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	40.9	23.3		63.8	19.1		7.6	14.8	3.2	5.5	7.3	0.2
LOS	D	C		E	B		A	B	A	A	A	A
Approach Delay		30.1			50.3			12.7			6.8	
Approach LOS		C			D			B			A	
Queue Length 50th (m)	5.9	4.3		30.9	3.9		1.8	55.6	1.5	3.6	26.1	0.0
Queue Length 95th (m)	13.5	13.9		48.8	14.7		5.5	88.7	13.0	m5.4	35.7	m0.2
Internal Link Dist (m)		274.9			307.3			349.2			397.1	
Turn Bay Length (m)	30.0			30.0			50.0		50.0	50.0		50.0
Base Capacity (vph)	327	433		328	418		321	2025	958	360	2171	1054
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	0.09	0.11		0.44	0.15		0.10	0.45	0.20	0.29	0.67	0.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 29 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 12.5		Intersection LOS: B	
Intersection Capacity Utilization 78.3%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 1: Woodroffe Avenue/Wodroffe Avenue & Deerfox Drive/Stoneway Drive



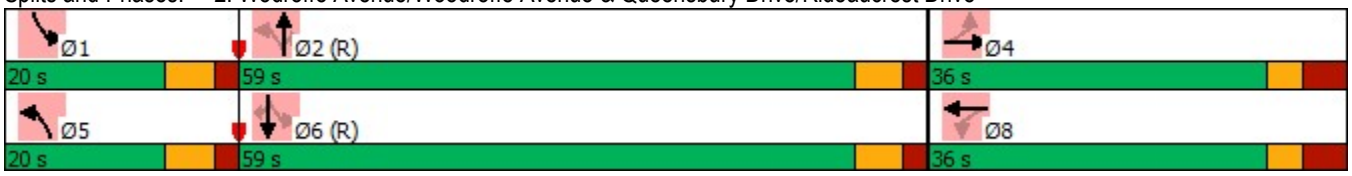


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	53	38	59	37	48	55	827	104	145	1543	110
Future Volume (vph)	54	53	38	59	37	48	55	827	104	145	1543	110
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		0.0	60.0		0.0	60.0		50.0	90.0		40.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.937			0.915				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1729	1604	0	1712	1649	0	1394	3390	1473	1679	3262	1248
Flt Permitted	0.702			0.698			0.121			0.305		
Satd. Flow (perm)	1278	1604	0	1258	1649	0	178	3390	1473	539	3262	1248
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30			48				104			98
Link Speed (k/h)		40			40			60			60	
Link Distance (m)		199.4			261.8			421.1			126.8	
Travel Time (s)		17.9			23.6			25.3			7.6	
Peak Hour 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
Heavy Vehicles (%)	0%	3%	11%	1%	1%	1%	24%	2%	5%	3%	6%	24%
Adj. Flow (vph)	54	53	38	59	37	48	55	827	104	145	1543	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	91	0	59	85	0	55	827	104	145	1543	110
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	36.0	36.0		36.0	36.0		11.4	26.4	26.4	11.4	26.4	26.4
Total Split (s)	36.0	36.0		36.0	36.0		20.0	59.0	59.0	20.0	59.0	59.0
Total Split (%)	31.3%	31.3%		31.3%	31.3%		17.4%	51.3%	51.3%	17.4%	51.3%	51.3%
Maximum Green (s)	29.0	29.0		29.0	29.0		13.7	52.7	52.7	13.7	52.7	52.7
Yellow Time (s)	3.0	3.0		3.0	3.0		4.2	4.2	4.2	4.2	4.2	4.2
All-Red Time (s)	4.0	4.0		4.0	4.0		2.1	2.1	2.1	2.1	2.1	2.1
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)	7.0	7.0		7.0	7.0		6.3	6.3	6.3	6.3	6.3	6.3
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
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	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	22.0	22.0		22.0	22.0			12.0	12.0		12.0	12.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effct Green (s)	10.7	10.7		10.7	10.7		83.4	76.8	76.8	87.0	80.3	80.3
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.73	0.67	0.67	0.76	0.70	0.70
v/c Ratio	0.45	0.51		0.50	0.43		0.28	0.37	0.10	0.30	0.68	0.12
Control Delay	60.2	43.2		63.1	30.4		12.9	10.9	4.0	4.9	13.4	2.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	60.2	43.2		63.1	30.4		12.9	10.9	4.0	4.9	13.4	2.4
LOS	E	D		E	C		B	B	A	A	B	A
Approach Delay		49.5			43.8			10.3			12.0	
Approach LOS		D			D			B			B	
Queue Length 50th (m)	11.7	13.2		12.9	7.9		2.1	35.4	0.0	6.1	100.0	0.8
Queue Length 95th (m)	23.7	28.3		25.4	22.1		15.9	69.1	12.4	13.0	151.9	7.6
Internal Link Dist (m)		175.4			237.8			397.1			102.8	
Turn Bay Length (m)	60.0			60.0			60.0		50.0	90.0		40.0
Base Capacity (vph)	322	426		317	451		284	2262	1017	561	2278	901
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	0.17	0.21		0.19	0.19		0.19	0.37	0.10	0.26	0.68	0.12

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 14 (12%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 14.7		Intersection LOS: B	
Intersection Capacity Utilization 75.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 2: Wodroffe Avenue/Woodroffe Avenue & Queensbury Drive/Rideaucrest Drive



APPENDIX G: TDM-SUPPORTIVE DEVELOPMENT CHECKLIST

Introduction

The City of Ottawa's *Transportation Impact Assessment (TIA) Guidelines* (specifically Module 4.1—Development Design) requires proponents of qualifying developments to use the City's **TDM-Supportive Development Design and Infrastructure Checklist** to assess the opportunity to implement design elements that are supportive of sustainable modes. The goal of this assessment is to ensure that the development provides safe and efficient access for all users, while creating an environment that encourages walking, cycling and transit use.

The remaining sections of this document are:

- Using the Checklist
- Glossary
- TDM-Supportive Development Design and Infrastructure Checklist: Non-Residential Developments
- TDM-Supportive Development Design and Infrastructure Checklist: Residential Developments

Readers are encouraged to contact the City of Ottawa's TDM Officer for any guidance and assistance they require to complete this checklist.

Using the Checklist

This **TDM-Supportive Development Design and Infrastructure Checklist** document includes two actual checklists, one for non-residential developments (office, institutional, retail or industrial) and one for residential developments (multi-family or condominium only; subdivisions are exempt). Readers may download the applicable checklist in electronic format and complete it electronically, or print it out and complete it by hand. As an alternative, they may create a freestanding document that lists the design and infrastructure measures being proposed and provides additional detail on them.

Each measure in the checklist is numbered for easy reference. Each measure is also flagged as:

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

Glossary

This glossary defines and describes the following measures that are identified in the **TDM-Supportive Development Design and Infrastructure Checklist**:

Walking & cycling: Routes
- Building location & access points
- Facilities for walking & cycling
- Amenities for walking & cycling

Walking & cycling: End-of-trip facilities
- Bicycle parking
- Secure bicycle parking
- Shower & change facilities
- Bicycle repair station

Transit
- Walking routes to transit
- Customer amenities

Ridesharing
- Pick-up & drop-off facilities
- Carpool parking

Carsharing & bikesharing
- Carshare parking spaces
- Bikeshare station location

Parking
- Number of parking spaces
- Separate long-term & short-term parking areas

Other
- On-site amenities to minimize off-site trips

In addition to specific references made in this glossary, readers should consult the City of Ottawa's design and planning guidelines for a variety of different land uses and contexts, available on the City's website at www.ottawa.ca. Readers may also find the following resources to be helpful:

- *Promoting Sustainable Transportation through Site Design*, Institute of Transportation Engineers, 2004 (www.cite7.org/wpdm-package/iterp-promoting-sustainable-transportation)
- *Bicycle End-of-Trip Facilities: A Guide for Canadian Municipalities and Employers*, Transport Canada, 2010 (www.fcm.ca/Documents/tools/GMF/Transport_Canada/BikeEndofTrip_EN.pdf)

▶ *Walking & cycling: Routes*

Building location & access points. Correctly positioning buildings and their entrances can help make walking convenient, comfortable and safe. Minimizing travel distances and maximizing visibility are key.

Facilities for walking & cycling. The Official Plan gives clear direction on the provision and design of walking and cycling facilities for both access and circulation. On larger, busier sites (e.g. multi-building campuses) the inclusion of sidewalks, pathways, marked crossings, stop signs and traffic calming features can create a safer and more supportive environment for active transportation.

Amenities for walking & cycling. Lighting, landscaping, benches and wayfinding can make walking and cycling safer and more secure, comfortable and accessible.

▶ *Walking & cycling: End-of-trip facilities*

Bicycle parking. The Official Plan and Zoning By-law both address the need for adequate bicycle parking at developments. Weather protection and theft prevention are major concerns for commuters who spend hundreds or thousands of dollars on a quality bicycle. Bicycle racks should have a design that enables secure locking while preventing damage to wheels. They should be located within sight of busy areas such as main building entrances or staffed parking kiosks.

Secure bicycle parking. Ottawa's Zoning By-law requires a secure area for bicycles at office or residential developments having more than 50 bicycle parking spaces. Lockable outdoor bike cages or indoor storage rooms that limit access to registered users are ideal.

Shower & change facilities. Longer-distance cyclists, joggers and even pedestrians can need a place to shower and change at work; the lack of such facilities is a major barrier to active commuting. Lockers and drying racks provide a place to store gear away from workspaces, and showers and grooming stations allow commuters to make themselves presentable for the office.

Bicycle repair station. Cycling commuters can experience maintenance issues that make the homeward trip difficult or impossible. A small supply of tools (e.g. air pump, Allen keys, wrenches) and supplies (e.g. inner tube patches, chain lubricant) in the workplace can help.

▶ *Transit*

Customer amenities. Larger developments that feature an on-site transit stop can make transit use more attractive by providing shelters, lighting and benches. Even better, they could integrate the passenger waiting area into a building entrance.

▶ *Ridesharing*

Pick-up & drop-off facilities. Having a safe place to load or unload passengers (for carpools as well as taxis and ride-hailing services) without obstructing pedestrians, cyclists or other vehicles can help make carpooling work.

Carpool parking. At destinations with large parking lots (or lots that regularly fill to capacity), signed priority carpool parking spaces can be an effective ridesharing incentive. Priority spaces are frequently abused by non-carpoolers, so a system to provide registered users with vehicle identification tags is recommended.

▶ *Carsharing & bikesharing*

Carshare parking spaces. For developments where carsharing could be an attractive option for employees, visitors or residents, ensuring an attractive location for future carshare parking spaces can avoid challenges associated with future retrofits.

Bikeshare station location. For developments where bikesharing could be an attractive option for employees, visitor or residents, ensuring an attractive location for a future bikeshare station can avoid challenges associated with future retrofits.

▶ *Parking*

Number of parking spaces. Parking capacity is an important variable in development design, as it can either support or subvert the mode share targets set during the transportation impact analysis (TIA). While the Zoning By-law establishes any minimum and/or maximum requirements for parking capacity, it also allows a reduction in any minimum to reflect the existence of on-site shower, change and locker rooms provided for cyclists.

Separate long-term & short-term parking areas. Because access to unused parking spaces can be a powerful incentive to drive, developments can better manage their parking supply and travel behaviours by separating long-term from short-term parking through the use of landscaping, gated controls or signs. Doing so makes it difficult for long-term parkers (e.g. commuters) to park in short-term areas (e.g. for visitors) as long as enforcement occurs; it also protects long-term parking capacity for its intended users.

▶ *Other*

On-site amenities to minimize off-site trips. Developments that offer facilities to limit employees' need for a car during their commute (e.g. to drop off children at daycare) or during their workday (e.g. to hit the gym) can free employees to make the commuting decision that otherwise works best for them.

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

Legend

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

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

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

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

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

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

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

Legend

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

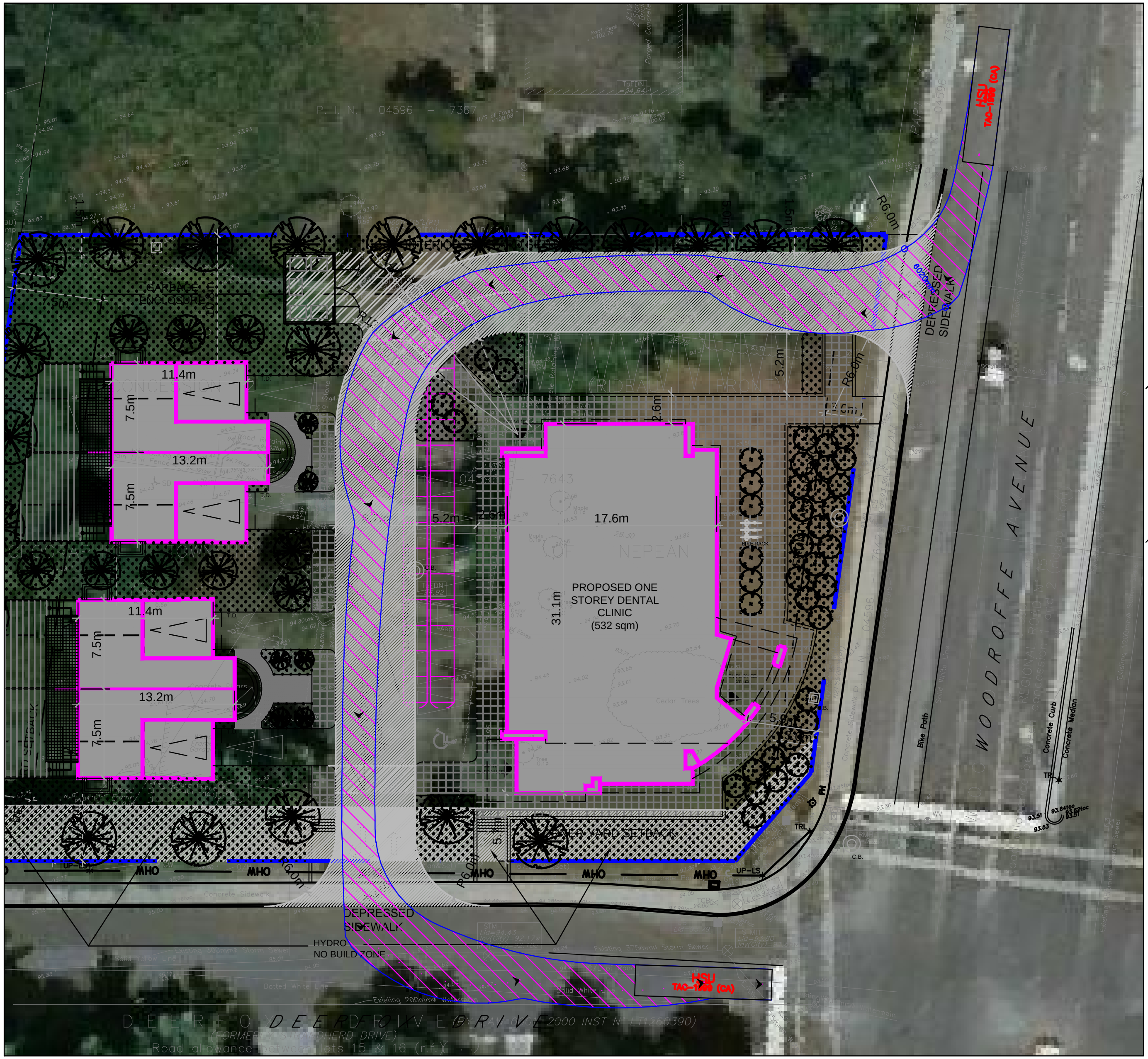
		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate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

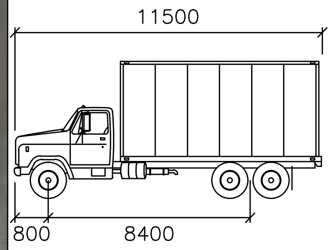
TDM-supportive design & infrastructure measures: *Residential developments*			Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas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

	TDM-supportive design & infrastructure measures: *Residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☒ Garages are provided
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☒
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☒ Garages provided
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	☐ N/A
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☒ All spaces are garage spaces
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	☐
	2.3	**Bicycle repair station**	
BETTER	2.3.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐ None on site
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐ N/A
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐

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

APPENDIX H: HEAVY VEHICLE TURNING MOVEMENT ANALYSIS





HSU mm

Width	:	2600
Track	:	2600
Lock to Lock Time	:	6.0
Steering Angle	:	39.7

APPENDIX I: SEGMENT MMLOS ANALYSIS

Performance Measure	*Roadway Segments Adjacent to the Development*			
	Northbound Woodroffe Ave	Southbound Woodroffe Ave	Eastbound Stoneway Drive	Westbound Deerfox Drive
Pedestrian LOS (PLOS)				
Sidewalk Width (m)	2	2	2	2
Boulevard Width (m)	2	0	0	0
Average Daily Curb Lane Traffic Volume	5000	5000	1000	2700
Presence of On-Street Parking	No	No	No	No
Operating Speed (km/h) Posted +10 km/hr	80	80	50	50
Segment PLOS	D	F	B	B
Target PLOS	C	C	C	C
Bicycle LOS (BLOS)				
Bikeway Type	Bike Lanes	Bike Lanes	Mixed Traffic	Mixed Traffic
Number of Lanes per direction	2	2	1	1
Bike Lane Width (m)	2	2.3	N/A	N/A
Operating Speed (km/h) Posted +10 km/hr	80	80	50	50
Bike Lane Blockage	N/A	N/A	N/A	N/A
Segment BLOS	**E**	**E**	B	B
Target BLOS	C	C	B	B
Transit LOS (TLOS)				
Facility Type	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
Level/Exposure to Parking/Driveway Friction	Limited	Limited	Medium	Limited
Average Transit Travel Speed (km/h)	N/A	N/A	N/A	N/A
Posted Speed Limit (km/h)	80	80	50	50
Segment TLOS	D	D	**E**	D
Target TLOS	D	D	D	D
Truck LOS (TkLOS)				
Number of lanes (in each direction)	2	2	1	1
Curb Lane Width (m)	>3.7	>3.7	>3.7	>3.7
Segment TkLOS	A	A	B	B
Target TkLOS	D	D	N/A	N/A

APPENDIX J: RESPONSE TO GENERAL TRANSPORTATION COMMENTS

Appendix "J": City of Ottawa Comments and Responses

Traffic Signal Design

TS-1: For any future models in Synchro, please model Woodroffe & Deerfox with fully protected NS lefts. This is being implemented this year.

Response: Changes have been made to the 2023 and 2028 background analysis (Sections 3.2.2 and 3.3.3; Tables 3-7 and 3-8), and the results are reported both with, and without, fully protected N-S left turns being implemented.

General Comments

GC-1: Work by PWES along Woodroffe Avenue is targeted to start this season.

Response: This has been noted in Section 2.1.3. The scope of work at the time of writing is unknown and a City project manager remains to be assigned to the project. (See May 30th, 2022 e-mail from City at end of this appendix.)

GC-2: Deer Fox Drive is designated as a collector road within the City's Official Plan with a ROW protection limit of 24.0 metres. The ROW protection limit and the offset distance (12.0 metres) are to be dimensioned from the existing centerline of pavement and shown on the drawings. The Certified Ontario Land Surveyor is to confirm the ROW protected limits and any portion that may fall within the private property to be conveyed to the City.

Response: Architect will be notified as per Section 4.5. The ROW protection limits will be illustrated on the drawings,

GC-3: ROW interpretation – Land for a road widening will be taken equally from both sides of a road, measured from the centreline in existence at the time of the widening if required by the City. The centreline is a line running down the middle of a road surface, equidistant from both edges of the pavement. In determining the centreline, paved shoulders, bus lay-bys, auxiliary lanes, turning lanes and other special circumstances are not included in the road surface.

Response: Thank you for the clarification. The above parameters will be used to determine the ROW limits. The Architect will be notified as per Section 4.5.

GC-4: Woodroffe Avenue is designated as an arterial road within the City's Official Plan with a ROW protection limit of 34.5 to 57.0 metres. Subject to unequal widening outlined in Woodroffe Avenue ESR. The Certified Ontario Land Surveyor is to confirm the ROW protected limits and any portion that may fall within the private property to be conveyed to the City.

Response: Section 2.1.3 addresses this. The Woodroffe Avenue ESR was reviewed, which specifies that a 37.5m wide ROW is to be protected on Woodroffe Avenue between Rideaucrest-to-Strandherd which includes the Deerfox Drive intersection. The appropriate ROW protection limits will be shown on the drawings. On April 22nd, 2022 an e-mail from Wally Dubyk expressed his concurrence that the protected ROW of 37.5 metres and sight triangle dimensions may have already been provided. He requested that the proponent submit a copy of the surveyed property parcel to the City as part of the Site Plan Agreement. This was communicated to the proponent.

GC-5: A 5.0 metres x 5.0 metres sight triangle would be required at the intersection of Woodroffe Avenue and Deer Fox drive. The sight triangle area is to be conveyed to the City and is to be shown on all drawings. The sight triangle dimensions are to be measured from the ROW protected limits.

Response: The Architect has been notified as per Section 4.5. The sight triangle will be shown on drawings. The property required for the sight triangle has already been conveyed to the City as part of the previous widening of Woodroffe Avenue in accordance with the approved ESR. The existing sight triangle provisions are illustrated in Exhibit 2-10 in Section 2.1.3. The sight triangle property requirements appeared to have already been satisfied with the previous 2008 widening along Woodroffe Avenue.

GC-6: All underground and above ground building footprints and permanent walls need to be shown on the plan to confirm that any permanent structure does not extend either above or below into the sight triangles and/or future road widening protection limits.

Response: The architect will be notified as per Section 4.5. Any appropriate changes will be made.

GC-7: Permanent structures such as curbing, stairs, retaining walls, and underground parking foundation also bicycle parking racks are not to extend into the City's right-of-way limits.

Response: The architect will be notified as per Section 4.5. The architect is to confirm that these elements do not extend ROW limits

GC-8: The consultant should review the sight distance to the access and any obstructions that may hinder the view of the driver.

Response: The sightlines for both accesses were reviewed (See Section 4.4.1.1.). There are no obstructions along the Woodroffe Avenue access. A tree on the east side of the Deerfox Drive driveway/access will likely be required to be removed/relocated/replaced, as indicated on the site plan.

GC-9: The Owner acknowledges and agrees that all private accesses to Roads shall comply with the City's Private Approach By-Law being By-Law No. 2003-447 as amended https://ottawa.ca/en/living-ottawa/laws-licences-and-permits/laws/law-z/private-approach-law-no-2003-447 or as approved through the Site Plan control process.

Response: As per Section 4.4, the access locations were approved as a part of previous site plan submission.

GC-10: The concrete sidewalks should be 2.0 metres in width and be continuous and depressed through the proposed accesses (please refer to the City's sidewalk and curb standard drawing SC7.1 for unsignalized entrance).

Response: According to the results of the MMLOS analysis (See Section 4.3 and Appendix "I"), The existing sidewalks conform to this requirement.

GC-11: Ensure that the end of the curb return at the proposed driveway does not encroach within the frontage of the adjacent property.

Response: This was addressed in Section 4.4. Both driveways are to use depressed curbs without wide radii curved curbs. This design requirement does not apply.

GC-12: No private approach shall be constructed within 0.3 metres of any adjacent property measured at the highway line, and at the curb line or roadway edge.

Response: This was addressed in Section 4.4.1. The Woodroffe Avenue access is to be located 1.5 meters away from the nearest property line, satisfying the above requirement. The Deerfox Drive access is located more than 20 meters away from the adjacent property line.

GC-13: The closure of an existing private approach shall reinstate the sidewalk, shoulder, curb and boulevard to City standards.

Response: Addressed in Section 4.4. This does not apply. The proposed development will not result in the closure of any existing private approach as the existing depressed curbs and sidewalks will be used to support the development.

GC-14: The minimum clear throat length required is 15.0 metres from end of curb radius. Please refer to TAC Manual Chapter 8; Table 8.9.3 and Figure 8.5.2 for appropriate throat length and dimensioning.

Response: This was addressed in Section 4.4.1. The Woodroffe Avenue access has a clear throat length of 9 meters. Given the low projected traffic volumes, and the right-in right-out configuration of this access, the provided clear throat length is considered acceptable. The Deerfox Drive access affords 9 meters of clear throat length, which satisfies TAC's requirement for an access off a collector road.

GC-15: The Owner shall be required to enter into maintenance and liability agreement for all pavers, plant and landscaping material placed in the City right-of-way and the Owner shall assume all maintenance and replacement responsibilities in perpetuity.

Response: The architect and development proponent have been notified of this as per Section 4.5.

GC-16: Bicycle parking spaces are required as per Section 111 of the Ottawa Comprehensive Zoning By-law. Bicycle parking spaces should be located in safe, secure places near main entrances and preferably protected from the weather.

Response: This was addressed in Section 4.2.2. The number of bicycle spaces (3 stalls) to be provided for the one storey dental clinic was found to satisfy Section 111 of Ottawa's Comprehensive Zoning By-Law. The 3 bicycle stalls would be located near the main entrance off Woodroffe Avenue. The residential component of the development does not require bicycle parking provisions as per the by-law, since the 4 dwelling units will each contain a dedicated garage.

GC-17: Should the property Owner wish to use a portion of the City's road allowance for construction staging, prior to obtaining a building permit, the property Owner must obtain an approved Traffic Management Plan from the Manager, Traffic Management, Transportation Services Department. The city has the right for any reason to deny use of the Road Allowance and to amend the approved Traffic Management Plan as required.

Response: The architect and development proponent have been notified of this as per Section 4.5.

From: Dubyk, Wally <Wally.Dubyk@ottawa.ca>
Sent: Thursday, May 19, 2022 2:39 PM
To: Andrey Kirillov <akirillov@castleglenn.ca>
Subject: 3130 Woodroffe Ave - TIA Forecasting Report Comment

Hi Andrey,

Please review the following comments;

3130 Woodroffe Ave
D07-12-22-0055
TIA Forecasting Report – Castleglenn, Dated April 28, 2022

Traffic Signal Design

TS-1 For any future models in Synchro, please model Woodroffe & Deerfox with fully protected NS lefts. This is being implemented this year.

General Comments

CG-1 Work by PWES along Woodroffe Avenue is targeted to start this season.

CG-2 Deer Fox Drive is designated as a Collector road within the City's Official Plan with a ROW protection limit of 24.0 metres. The ROW protection limit and the offset distance (12.0 metres) are to be dimensioned from the existing centerline of pavement and shown on the drawings. The Certified Ontario Land Surveyor is to confirm the ROW protected limits and any portion that may fall within the private property to be conveyed to the City.

CG-3 ROW interpretation – Land for a road widening will be taken equally from both sides of a road, measured from the centreline in existence at the time of the widening if required by the City. The centreline is a line running down the middle of a road surface, equidistant from both edges of the pavement. In determining the centreline, paved shoulders, bus lay-bys, auxiliary lanes, turning lanes and other special circumstances are not included in the road surface.

CG-4 Woodroffe Avenue is designated as an Arterial road within the City's Official Plan with a ROW protection limit of 34.5 to 57.0 metres. Subject to unequal widening outlined in Woodroffe Avenue ESR. The Certified Ontario Land Surveyor is to confirm the ROW protected limits and any portion that may fall within the private property to be conveyed to the City.

CG-5 A 5.0 metres x 5.0 metres sight triangle would be required at the intersection of Woodroffe Avenue and Deer Fox drive. The sight triangle area is to be conveyed to the City and is to be shown on all drawings. The sight triangle dimensions are to be measured from the ROW protected limits.

CG-6 All underground and above ground building footprints and permanent walls need to be shown on the plan to confirm that any permanent structure does not extend either above or below into the sight triangles and/or future road widening protection limits.

CG-7 Permanent structures such as curbing, stairs, retaining walls, and underground parking foundation also bicycle parking racks are not to extend into the City's right-of-way limits.

CG-8 The consultant should review the sight distance to the access and any obstructions that may hinder the view of the driver.

CG-9 The Owner acknowledges and agrees that all private accesses to Roads shall comply with the City's Private Approach By-Law being By-Law No. 2003-447 as amended https://ottawa.ca/en/living-ottawa/laws-licences-and-permits/laws/law-z/private-approach-law-no-2003-447 or as approved through the Site Plan control process.

CG-10 The concrete sidewalks should be 2.0 metres in width and be continuous and depressed through the proposed accesses (please refer to the City's sidewalk and curb standard drawing SC7.1 for unsignalized entrance).

CG-11 Ensure that the end of the curb return at the proposed driveway does not encroach within the frontage of the adjacent property.

CG-12 No private approach shall be constructed within 0.3 metres of any adjacent property measured at the highway line, and at the curb line or roadway edge.

CG-13 The closure of an existing private approach shall reinstate the sidewalk, shoulder, curb and boulevard to City standards.

CG-14 The minimum clear throat length required is 15.0 metres from end of curb radius. Please refer to TAC Manual Chapter 8; Table 8.9.3 and Figure 8.5.2 for appropriate throat length and dimensioning.

CG-15 The Owner shall be required to enter into maintenance and liability agreement for all pavers, plant and landscaping material placed in the City right-of-way and the Owner shall assume all maintenance and replacement responsibilities in perpetuity.

CG-16 Bicycle parking spaces are required as per Section 111 of the Ottawa Comprehensive Zoning By-law. Bicycle parking spaces should be located in safe, secure places near main entrances and preferably protected from the weather.

CG-17 Should the property Owner wish to use a portion of the City's road allowance for construction staging, prior to obtaining a building permit, the property Owner must obtain an approved Traffic Management Plan from the Manager, Traffic Management, Transportation Services Department. The city has the right for any reason to deny use of the Road Allowance and to amend the approved Traffic Management Plan as required.

Wally Dubyk C.E.T.
Transportation Project Manager - Transportation Review
Planning, Real Estate and Economic Development Department
Wally.Dubyk@ottawa.ca

From: Dubyk, Wally <Wally.Dubyk@ottawa.ca>
Sent: Monday, May 30, 2022 12:07 PM
To: Andrey Kirillov <akirillov@castleglenn.ca>
Subject: RE: 3130 Woodroffe Ave - TIA Forecasting Report Comment

Hi Andrey,

Thank you for your response to the City's comments. Please ensure that both the comments and response are in the next TIA Step 4 – Strategy report, also provide the Synchro revision in digital format.

The name of the Project Manager is not available at this time.

LN56234

Forecast ID	LN56234
Type of Work	Work by PWES
Project Type	
STATUS	In Progress
Construction Year	This Year
Delivered By	TIES
CLIENT	TIES
Construction Contract	Not Available
Project Manager	Not Available

Wally Dubyk C.E.T.
Transportation Project Manager - Transportation Review
Planning, Real Estate and Economic Development Department
Wally.Dubyk@ottawa.ca

From: Dubyk, Wally <Wally.Dubyk@ottawa.ca>
Sent: Wednesday, June 29, 2022 9:48 AM
To: Andrey Kirillov <akirillov@castleglenn.ca>
Cc: Scaramozzino, Tracey <Tracey.Scaramozzino@ottawa.ca>
Subject: 3130 Woodroffe Ave - TIA Strategy Comments

Hi Andrey,

Please review the following comments;

3130 Woodroffe Avenue

D07-12-22-0055

TIA Strategy Report – Castleglenn Consultants, Dated June 06, 2022

Site Plan SP-01, Revision #3, Dated October 06, 2021 (within report)

Transportation Engineering Services

No comment.

Traffic Signal Design

No comments with initial TIS for this circulation. Traffic Signal Unit reserves the right to make future comments based on subsequent submissions.

If there are any future proposed changes in the existing roadway geometry that would require the signalization of an intersection or modifications to an existing signalized intersection, the City of Ottawa Traffic Signal Unit would be required to complete a traffic signal plant design and would need to be engaged in reviews during the functional design stage.

Woodroffe & Deerfox is being converted into fully protected lefts north/south this summer. All future files should be modelled as such.

A scenario with fully protected N-S left turns was added to sections 3.3.2 and 3.3.3 (Background 2023 and 2028 analyses). Synchro's signal optimization function was used to determine signal splits.

Pedestrian calls/h should be coded

Pedestrian calls/hour were coded into all existing and future protected signal scenarios. 5 calls per hour were used on all phases (except E-W Woodroffe Ave crossing phase at Woodroffe/Queensbury/Rideaucrest intersection in the AM, which was set to 20 calls per hour since it had higher observed pedestrian volumes). Analysis in sections 3.3.1, 3.3.2 and 3.3.3 was updated.

Existing AM synchro should be modelled using the AM heavy plan, 130 cycle length running 7-9AM.

A scenario with AM Heavy plan was included in the existing AM analysis (Section 3.3.1).