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## 23, 33 and 39 Deerfox Drive Ottawa, Ontario

### Transportation Impact Assessment

Engineering excellence. Planning precision. Inspired landscapes.

**Proposed Subdivision  
23, 33 and 39 Deerfox Drive**

**Transportation Impact Assessment**

Prepared By:

**NOVATECH**

Suite 200, 240 Michael Cowpland Drive  
Ottawa, Ontario  
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July 2018

Novatech File: 118072  
Ref: R-2018-082

July 24, 2018

City of Ottawa  
Planning and Growth Management Department  
110 Laurier Ave. W., 4<sup>th</sup> Floor,  
Ottawa, Ontario K1P 1J1

**Attention: Ms. Rosanna Baggs**  
**Project Manager, Infrastructure Approvals**

Dear Ms. Baggs:

**Reference: 23, 33 and 39 Deerfox Drive**  
**Transportation Impact Assessment**  
**Novatech File No. 118072**

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We are pleased to submit the following Transportation Impact Assessment in support of a Draft Plan of Subdivision for the properties at 23, 33 and 39 Deerfox Drive, for your review and signoff. The structure and format of this report is in accordance with the City of Ottawa Transportation Impact Assessment Guidelines (June 2017).

If you have any questions or comments regarding this report, please feel free to contact Jennifer Luong, or the undersigned.

Yours truly,

**NOVATECH**



Joshua Audia, B.Sc.  
E.I.T. | Transportation/Traffic

**TABLE OF CONTENTS**

<b>EXECUTIVE SUMMARY .....</b>	<b>I</b>
<b>1.0 INTRODUCTION.....</b>	<b>1</b>
<b>2.0 PROPOSED DEVELOPMENT .....</b>	<b>2</b>
<b>3.0 SCREENING.....</b>	<b>2</b>
3.1 SCREENING FORM .....	2
<b>4.0 SCOPING.....</b>	<b>3</b>
4.1 EXISTING CONDITIONS .....	3
4.1.1 Roadways.....	3
4.1.2 Intersections .....	4
4.1.3 Driveways.....	5
4.1.4 Pedestrian and Cycling Facilities .....	6
4.1.5 Area Traffic Management .....	6
4.1.6 Transit .....	6
4.1.7 Existing Traffic Volumes .....	8
4.1.8 Collision Records.....	9
4.2 PLANNED CONDITIONS .....	9
4.3 STUDY AREA AND TIME PERIODS .....	10
4.4 EXEMPTIONS REVIEW.....	10
<b>5.0 FORECASTING .....</b>	<b>12</b>
5.1 DEVELOPMENT-GENERATED TRAVEL DEMAND.....	12
5.1.1 Trip Generation.....	12
5.1.2 Trip Distribution.....	13
5.1.3 Trip Assignment.....	13
5.2 BACKGROUND TRAFFIC .....	15
5.2.1 General Background Growth Rate .....	15
5.2.2 Other Area Developments .....	15
<b>6.0 ANALYSIS.....</b>	<b>19</b>
6.1 DEVELOPMENT DESIGN .....	19
6.1.1 Site Circulation .....	19
6.1.2 Pedestrian Crossings.....	19
6.2 BOUNDARY STREETS .....	19
6.2.1 Pedestrian Level of Service (PLOS).....	20
6.2.2 Bicycle Level of Service (BLOS) .....	20
6.2.3 Vehicular Level of Service (Auto LOS).....	20
6.2.4 Segment MMLOS Summary .....	21
6.3 ACCESS INTERSECTIONS DESIGN.....	21
6.4 NEIGHBOURHOOD TRAFFIC MANAGEMENT.....	21
<b>7.0 CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>23</b>

## Figures

Figure 1: View of the Subject Site .....	1
Figure 2: OC Transpo Bus Stop Locations .....	7
Figure 3: Existing Network Traffic Volumes .....	8
Figure 4: Proposed Site-Generated Traffic (Full Movement Access on Deerfox Drive).....	14
Figure 5: Proposed Site-Generated Traffic (RIRO Access on Deerfox Drive) .....	14
Figure 6: 2020 Background Traffic .....	16
Figure 7: 2025 Background Traffic .....	16
Figure 8: 2020 Total Traffic (Full Movement Access on Deerfox Drive) .....	17
Figure 9: 2025 Total Traffic (Full Movement Access on Deerfox Drive) .....	17
Figure 10: 2020 Total Traffic (RIRO Access on Deerfox Drive) .....	18
Figure 11: 2025 Total Traffic (RIRO Access on Deerfox Drive) .....	18

## Tables

Table 1: Reported Collisions .....	9
Table 2: TIA Exemptions .....	11
Table 3: Proposed Residential Trip Generation .....	12
Table 4: Proposed Residential Person Trip Generation .....	12
Table 5: Person Trips by Modal Share .....	12
Table 6: Settler's Ridge Way – Residential Trip Generation .....	15
Table 7: Settler's Ridge Way – Residential Person Trip Generation .....	15
Table 8: PLOS Segment Analysis .....	20
Table 9: BLOS Segment Analysis .....	20
Table 10: Auto LOS Segment Analysis .....	20

## Appendices

Appendix A: Concept Plan
Appendix B: TIA Screening Form
Appendix C: OC Transpo Route Maps
Appendix D: Traffic Count Data
Appendix E: Collision Records
Appendix F: Excerpts of 3120-3130 Woodroffe Avenue Transportation Briefs
Appendix G: Speed Survey Data

## EXECUTIVE SUMMARY

This Transportation Impact Assessment (TIA) has been prepared in support of a Draft Plan of Subdivision for the lands located at 23, 33 and 39 Deerfox Drive. The approximately 2.25-hectare site is currently divided into three parcels, each containing a single detached residential dwelling. The proposed subdivision will replace these existing dwellings with approximately 41 new detached residential dwellings.

The proposed subdivision is designated as General Urban Area on Schedule B of the City of Ottawa's Official Plan. The implemented zoning for the property is Residential Second Density (R2), which restricts 'the building form to detached and two principal unit buildings in areas designated as General Urban Area.' The proposed subdivision is subject to the South Nepean Urban Areas 1, 2, and 3 Secondary Plan. Per Schedule A of this Secondary Plan, the site is designated as Low Density Residential, permitting single detached residential dwellings.

The proposed subdivision will replace the existing residences with approximately 41 detached dwelling units, and is anticipated to be constructed in a single phase with full occupancy in the year 2020.

Access to the proposed subdivision will be provided by a full movement access to Settler's Ridge Way via Ryland Street, as well as an access on Deerfox Drive. This TIA will analyze two options for the access on Deerfox Drive: a full movement access and a right-in/right-out access.

The study area for this report will include Woodroffe Avenue, Deerfox Drive, Beatrice Drive, Gleeson Way, Settler's Ridge Way, and Ryland Street. The study area intersections include the signalized intersection at Woodroffe Avenue/Deerfox Drive/Stoneway Drive, and the unsignalized intersections at Deerfox Drive/Gleeson Way and Deerfox Drive/Beatrice Drive, and the proposed unsignalized accesses on Settler's Ridge Way and Deerfox Drive.

The selected time periods for the analysis are the weekday AM and PM peak hours, as they represent the 'worst case' combination of site generated traffic and adjacent street traffic. The proposed development is expected to be completed with full occupancy by the year 2020. As such, the weekday AM and PM peak periods will be analyzed for the buildout year 2020 and the horizon year 2025.

The conclusions and recommendations of this TIA can be summarized as follows:

### Forecasting

- The proposed subdivision is projected to generate approximately 53 person trips during the AM peak period and 58 person trips during the PM peak period, which includes 29 vehicle trips during the AM peak period and 32 vehicle trips during the PM peak period.

### Development Design

- The proposed access on Deerfox Drive will be approximately 85m from the adjacent intersection at Deerfox Drive/Gleeson Way (measured centre-to-centre). This spacing meets the minimum requirements outlined in the TAC *Geometric Design Guide for Canadian Roads*.
- Street One has a proposed ROW width of 16.5m and a proposed roadway width of 8.5m, which is sufficient for a travel lane in each direction and parking on one side of the roadway.

This is adequate given the context of the proposed development, a low-speed residential neighbourhood with limited opportunity for cut-through traffic.

- Consistent with Settler's Ridge Way and the existing section of Ryland Street, no sidewalks will be provided through the proposed subdivision.
- In addition to the existing crosswalk at the north approach of Deerfox Drive/Gleeson Way, the City could consider implementing crosswalks at the east and west approaches, as all-way stop control has already been implemented.

#### Boundary Streets

- The results of the segment MMLOS analysis for Deerfox Drive can be summarized as follows:
  - Deerfox Drive achieves the target PLOS C;
  - Deerfox Drive achieves the target BLOS B;
  - Deerfox Drive surpasses the target Auto LOS D, achieving an Auto LOS A.

#### Access Intersections

- The proposed subdivision will be served by two unsignalized accesses: a full movement access to Settler's Ridge Way via Ryland Street and a full movement access on Deerfox Drive via Street One.
- Neither access is anticipated to meet the OTM or City criteria for all-way stop control. Therefore, side street stop control is recommended for the minor approaches only (Ryland Street at Settler's Ridge Way and Street One at Deerfox Drive).

#### Neighbourhood Traffic Management

- The implementation of a RIRO access on Deerfox Drive is anticipated to add more traffic to Settler's Ridge Way, compared to a full movement access. Additionally, the lack of vehicles turning left into the proposed subdivision from Deerfox Drive would reduce the friction that through traffic would experience when travelling on Deerfox Drive. This is notable given the history of resident concerns regarding speeding in the area. For these reasons, a full movement access at Deerfox Drive is recommended.
- Curb extensions or intersection narrowing at the proposed access to Deerfox Drive are not considered desirable, given the proximity to the all-way stop at Deerfox Drive/Gleeson Way. If the City wishes to consider intersection narrowing to address existing or background traffic conditions, a midblock location between Gleeson Way and Woodroffe Avenue may be more appropriate. No road modifications are recommended as a result of the development-related traffic, as none are required.
- It is anticipated that the curvilinear alignment of Street One will discourage through traffic on Deerfox Drive from using Settler's Ridge Way and Street One as a cut-through route to avoid the all-way stop at Deerfox Drive/Gleeson Way.
- The proposed subdivision at 23, 33 and 39 Deerfox Drive is recommended from a transportation perspective.

## 1.0 INTRODUCTION

This Transportation Impact Assessment (TIA) has been prepared in support of a Draft Plan of Subdivision for the lands located at 23, 33 and 39 Deerfox Drive. The approximately 2.25-hectare site is currently divided into three parcels, each containing a single detached residential dwelling. The proposed subdivision will replace these existing dwellings with approximately 41 new detached residential dwellings.

The subject site is surrounded by the following:

- Deerfox Drive and residences to the north;
- Woodroffe Avenue and residences to the east;
- Residences to the south;
- Settler's Ridge Way and residences to the west.

A view of the subject site is provided in **Figure 1**.

**Figure 1: View of the Subject Site**





## 2.0 PROPOSED DEVELOPMENT

The proposed subdivision is designated as General Urban Area on Schedule B of the City of Ottawa's Official Plan. The implemented zoning for the property is Residential Second Density (R2), which restricts 'the building form to detached and two principal unit buildings in areas designated as General Urban Area.' The proposed subdivision is subject to the South Nepean Urban Areas 1, 2, and 3 Secondary Plan. Per Schedule A of this Secondary Plan, the site is designated as Low Density Residential, permitting single detached residential dwellings.

The proposed subdivision will replace the existing residences with approximately 41 detached dwelling units, and is anticipated to be constructed in a single phase with full occupancy in the year 2020.

Access to the proposed subdivision will be provided by a full movement access to Settler's Ridge Way via Ryland Street, as well as an access on Deerfox Drive. This TIA will analyze two options for the access on Deerfox Drive: a full movement access and a right-in/right-out access.

A copy of the conceptual site plan is included in **Appendix A**.

## 3.0 SCREENING

### 3.1 Screening Form

The City's 2017 TIA Guidelines identify three triggers for completing a TIA report, including trip generation, location, and safety. The criteria for each trigger are outlined in the City's TIA Screening Form.

The trigger results are as follows:

- Trip Generation Trigger: The proposed development is not anticipated to generate over 60 person trips/peak hour; further assessment is not required based on this trigger.
- Location Triggers – The proposed development is not located along a boundary street that is designated as part of the City's Transit Priority, Rapid Transit, or Spine Bicycle Networks; further assessment is not required based on this trigger.
- Safety Triggers – There is a documented history of traffic concerns on Deerfox Drive within 500m of the development; further assessment is required based on this trigger.

It is anticipated that the proposed subdivision will meet only the safety trigger for further assessment, however the City reserves the right to determine the scope of any TIA study based on its professional judgment despite the guidelines. In this case, City staff have confirmed that a TIA is required to address the proposed access configuration, as well as traffic concerns within the study area.

A copy of the TIA Screening Form is included in **Appendix B**.

## **4.0 SCOPING**

### **4.1 Existing Conditions**

#### **4.1.1 Roadways**

All roadways within the study area fall under the jurisdiction of the City of Ottawa.

Woodroffe Avenue is an arterial roadway that runs on a north-south alignment between Carling Avenue and Strandherd Drive. South of Strandherd Drive, Woodroffe Avenue continues as a major collector, and then as a local roadway before terminating just west of Prince of Wales Drive. It has a four-lane divided urban cross-section, sidewalks on both sides of the roadway, and a posted speed limit of 70 km/h within the study area. Woodroffe Avenue is classified as a truck route, allowing full loads. Street parking is not permitted.

Deerfox Drive is a collector roadway that runs on an east-west alignment between Beatrice Drive and Woodroffe Avenue. West of Beatrice Drive, Deerfox Drive continues as a local roadway until becoming Finchley Drive at Palmadeo Drive. East of Woodroffe Avenue, this roadway continues as Stoneway Drive. It has a two-lane undivided urban cross-section, sidewalks on both sides of the roadway, and a posted speed limit of 40 km/h within the study area. Deerfox Drive is not classified as a truck route. Street parking is permitted. The right-of-way (ROW) at the subject site is currently 20m, while the ROW at the adjacent residences on both sides of Deerfox Drive is 26m. The City of Ottawa's Official Plan identifies a ROW protection of 24m throughout the study area. A widening of approximately 2m is required.

Beatrice Drive is a collector roadway that generally runs on a north-south alignment between Longfields Drive and Paul Métivier Drive. North of Longfields Drive, this roadway continues as Mountshannon Drive. It has a two-lane undivided urban cross-section, sidewalks on both sides of the roadway, and a posted speed limit of 40 km/h. Beatrice Drive is not classified as a truck route. Street parking is permitted.

Gleeson Way is a local roadway that runs on a north-south alignment from Deerfox Drive for approximately 165m north, before making a 90-degree curve and continuing on an east-west alignment until terminating at Palmadeo Drive. It has a two-lane undivided urban cross-section, sidewalks on the east/north side of the roadway, and an unposted regulatory speed limit of 50 km/h under the Highway Traffic Act. Gleeson Way is not classified as a truck route. Street parking is permitted.

Settler's Ridge Way is a local roadway that runs on a north-south alignment at Deerfox Drive, before making a series of approximately 90-degree turns and eventually intersecting with Beatrice Drive from the east. West of Beatrice Drive, this roadway continues as Conlan Way until terminating at Appledale Drive. It has a two-lane undivided urban cross-section, no sidewalks, and a posted speed limit of 40 km/h within the study area. Settler's Ridge Way is not classified as a truck route. Street parking is permitted.

Ryland Street is a local roadway which currently runs for approximately 25m east of Settler's Ridge Way, before terminating at the property line of 39 Deerfox Drive approximately 120m south of Deerfox Drive. This roadway will provide access to the proposed subdivision once it is constructed.

#### 4.1.2 Intersections

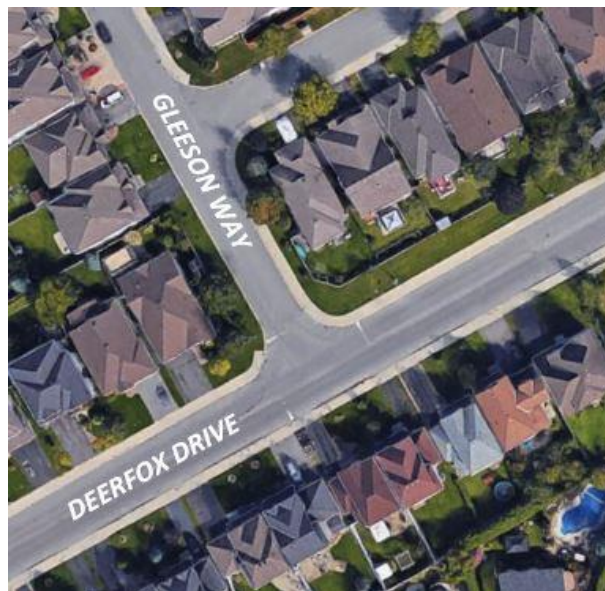
##### Woodroffe Avenue/Deerfox Drive/Stoneway Drive

- Signalized four-legged intersection
- Northbound/Southbound: one left turn lane, two through lanes, one right turn lane
- Eastbound/Westbound: one left turn lane, one shared through/right turn lane
- Bike lanes on northbound and southbound approaches



##### Deerfox Drive/Gleeson Way

- Unsignalized three-legged intersection
- All-way stop controlled
- Southbound: one shared left turn/right turn lane
- Eastbound: one shared left turn/through lane
- Westbound: one shared through/right turn lane



Deerfox Drive/Settler's Ridge Way

- Unsignalized three-legged intersection
- Stop controlled on Settler's Ridge Way
- Northbound: one shared left turn/right turn lane
- Eastbound: one shared through/right turn lane
- Westbound: one shared left turn/through lane

Deerfox Drive/Beatrice Drive

- Unsignalized four-legged intersection
- All-way stop controlled
- Northbound/Southbound: one shared left turn/through/right turn lane
- Eastbound/Westbound: one shared left turn/through/right turn lane

**4.1.3 Driveways**

In accordance with the City's 2017 TIA Guidelines, a review of driveways on the boundary streets within 200m of the proposed accesses is provided as follows:

**Deerfox Drive, North Side:**

- 9 driveways to residences at 54, 56, 58, 60, 62, 64, 66 & 68 Deerfox Drive, and 3130 Woodroffe Avenue

**Deerfox Drive, South Side:**

- 15 driveways to residences at 15, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 71 & 73 Deerfox Drive, and 3150 Woodroffe Avenue

**Settler's Ridge Way, Outside:**

- 25 driveways to residences at 3, 5, 7, 8, 11, 13, 15, 17, 19, 21, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51 & 53 Settler's Ridge Way

**Settler's Ridge Way, Inside:**

- 19 driveways to residences at 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 & 40 Settler's Ridge Way

**4.1.4 Pedestrian and Cycling Facilities**

Concrete sidewalks are provided on both sides of Woodroffe Avenue, Deerfox Drive, and Beatrice Drive. Bike lanes are provided on Woodroffe Avenue.

In the City of Ottawa's primary cycling network, Woodroffe Avenue is classified as a Spine Route, while Deerfox Drive and Beatrice Drive are classified as suggested Local Routes. The 2013 Ottawa Cycling Plan identifies the implementation of shared use lanes on Beatrice Drive north of Deerfox Drive as part of the Barrhaven North-South Neighbourhood Bikeway. The shared use lanes are listed as a Phase 3 (2026-2031) project.

**4.1.5 Area Traffic Management**

There are no Area Traffic Management (ATM) studies within the study area that have been completed or are currently in progress.

An all-way stop control has been implemented at the intersection of Deerfox Drive/Gleeson Way to address residents' concerns of speeding along Deerfox Drive.

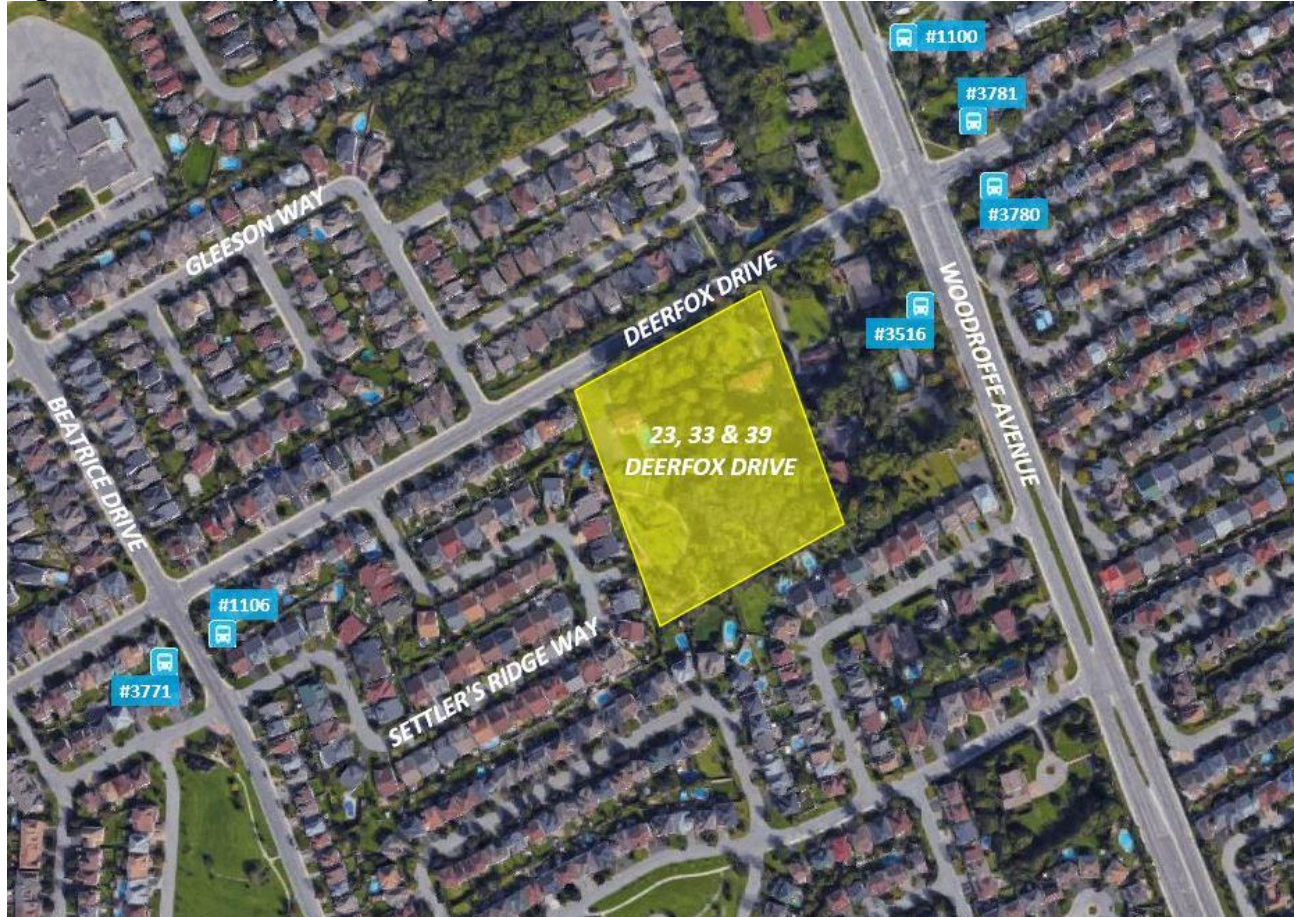
**4.1.6 Transit**

The nearest bus stops to the subject site are as follows:

- Stop #1100 – for routes 94 and 171  
(located on the east side of Woodroffe Avenue, approximately 85m north of Stoneway Drive)
- Stop #3516 – for route 94  
(located on the west side of Woodroffe Avenue, approximately 70m south of Deerfox Drive)
- Stop #3780 – for routes 171 and 271  
(located at the southeast corner of Woodroffe Avenue/Stoneway Drive)
- Stop #3781 – for route 171  
(located at the northeast corner of Woodroffe Avenue/Stoneway Drive)
- Stop #1106 – for route 277  
(located at the southeast corner of Deerfox Drive/Beatrice Drive)
- Stop #3771 – for route 277  
(located at the southwest corner of Deerfox Drive/Beatrice Drive)

Locations of these bus stops are shown in **Figure 2**.



**Figure 2: OC Transpo Bus Stop Locations**

OC Transpo Route 94 travels between Riverview Station and Millennium Station. On weekdays, the route operates every 15 minutes from Riverview Station to either Blair Station or Millennium Station between 6:30am and 6:00pm, and every 30 minutes from 6:00pm to 12:00am. This route does not provide service to the study area during the PM peak period. On weekends, the route operates every 30 minutes between 7:00am and 12:00am.

OC Transpo Route 171 travels between Barrhaven Centre and Fallowfield Station. On weekdays, the route operates every 30 minutes between 6:00am and 7:00pm. On weekends, the route operates every three hours, stopping within the study area at 10:05am, 1:05pm, and 4:05pm.

OC Transpo Route 271 travels between either Woodroffe/Stoneway or Stoneway/Wittingham and Mackenzie King Station. During the weekday AM peak period, this route operates from Woodroffe/Stoneway to Mackenzie Station every 15 minutes between 6:00am and 8:15am. During the weekday PM peak period, this route operates from Mackenzie King Station to Stoneway/Wittingham every 15 minutes between 4:00pm and 7:00pm. The route does not operate outside of these hours, or on weekends.

OC Transpo Route 277 travels between Nepean Woods Station and Mackenzie King Station. During the weekday AM peak period, this route operates from Nepean Woods Station to Mackenzie Station every 15 minutes between 6:00am and 8:30am. During the weekday PM peak period, this route

operates from Mackenzie King Station to Nepean Woods Station every 15 minutes between 4:00pm and 7:00pm. The route does not operate outside of these hours, or on weekends.

OC Transpo maps for the routes outlined above are included in **Appendix C**.

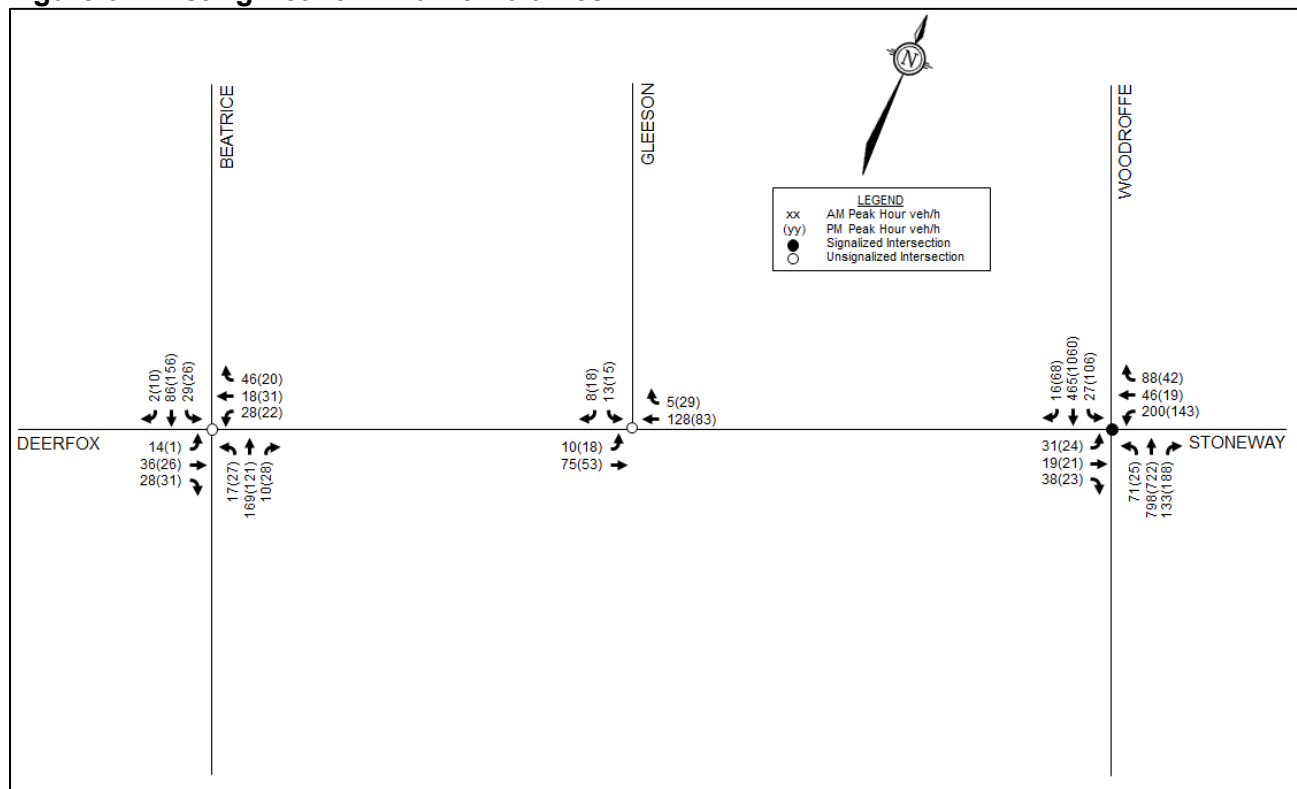
#### 4.1.7 Existing Traffic Volumes

Weekday traffic counts completed by the City of Ottawa were used to determine the existing pedestrian, cyclist and vehicular traffic volumes at the study area intersections. The traffic counts were completed on the following dates:

- Woodroffe Avenue/Deerfox Drive March 2, 2017
- Deerfox Drive/Gleeson Way March 8, 2011
- Deerfox Drive/Beatrice Drive October 18, 2016

While the traffic count for Deerfox Drive/Gleeson Way was conducted more than five years ago, the neighbourhood has been built out for many years. As such, the turning movement counts have been used directly. Through traffic volumes are based on the 2017 count at Woodroffe Avenue/Deerfox Drive, as there is no significant loss or gain in traffic volumes on Deerfox Drive between Woodroffe Avenue and Gleeson Way. The average annual daily traffic (AADT) of Deerfox Drive is 1,942 vehicles/day. Traffic count data is included in **Appendix D**. Traffic volumes within the study area are shown in **Figure 3**.

**Figure 3: Existing Network Traffic Volumes**



#### 4.1.8 Collision Records

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

The collision data has been evaluated to determine if there are any identifiable collision patterns. The number of collisions at each intersection from January 1, 2012 to December 31, 2016 is summarized in **Table 1**.

**Table 1: Reported Collisions**

Intersection	Number of Reported Collisions
Woodroffe Avenue/Deerfox Drive	25
Deerfox Drive/Gleeson Way	0
Deerfox Drive/Beatrice Drive	6

##### Woodroffe Avenue/Deerfox Drive

A total of 25 collisions were reported at this intersection over the last five years, of which there were eight rear-end impacts, five turning movement impacts, two sideswipe impacts, eight angle impacts, and two single-vehicle/other impacts. Seven of the collisions caused injuries, and one collision caused a fatality.

Of the eight rear-end impacts, three involved a northbound through vehicle, two involved a southbound through vehicle, one involved an eastbound through vehicle, one involved a westbound through vehicle, and one involved a westbound right turning vehicle. Three of the eight collisions occurred in poor driving conditions.

Of the eight angle impacts, two involved a northbound vehicle and an eastbound vehicle, four involved a northbound vehicle and a westbound vehicle, one involved a southbound vehicle and an eastbound vehicle, and one involved a southbound vehicle and a westbound vehicle. Four of the eight collisions occurred in poor driving conditions.

Both single-vehicle impacts occurred in good driving conditions, and involved a through vehicle colliding with a pedestrian. A northbound municipal bus collided with a pedestrian, resulting in non-fatal injuries. On December 19, 2014, a southbound passenger car collided with a man in his fifties who was crossing the south approach in a motorized wheelchair. This collision resulted in a fatality.

A Safety Improvement Program (SIP) assessment has not been conducted at this intersection. Typically, the program studies locations with above-average traffic collision rates.

##### Deerfox Drive/Beatrice Drive

A total of six collisions were reported at this intersection over the last five years, of which there were five angle impacts and one single-vehicle/other impact. No fatalities or injuries were reported as a result of the collisions. There have been no reported collisions at this intersection since March 2013.

#### 4.2 Planned Conditions

The City of Ottawa's 2013 Transportation Master Plan (TMP) does not identify any upcoming roadway projects within the study area in its Affordable Road Network.



The Rapid Transit and Transit Priority (RTTP) Network identifies Woodroffe Avenue as a Transit Priority Corridor with Isolated Measures in its 2031 Network Concept. Transit signal priority and queue jump lanes will be implemented between Fallowfield Road and Chapman Mills Drive, in order to improve transit access to the Southwest Transitway.

The 2013 Ottawa Cycling Plan identifies the implementation of shared use lanes on Beatrice Drive north of Deerfox Drive as part of the Barrhaven North-South Neighbourhood Bikeway. The shared use lanes are listed as a Phase 3 (2026-2031) project.

As part of the 2013 Zoning By-Law Amendment application for the properties at 23, 33, and 39 Deerfox Drive in 2013, seven other neighbouring properties were also rezoned. The neighbouring property at 15 Deerfox Drive has been rezoned to R2 (Residential Second Density), and the properties at 3102-3162 Woodroffe Avenue have been rezoned to LC (Local Commercial). There are proposed medical facilities at 3120 and 3130 Woodroffe Avenue, and traffic analysis was completed by Novatech in January 2016 for these two properties. The conceptual plans and the projected traffic generated by the proposed medical facilities are included in **Appendix F**.

#### **4.3 Study Area and Time Periods**

The study area for this report will include Woodroffe Avenue, Deerfox Drive, Beatrice Drive, Gleeson Way, Settler's Ridge Way, and Ryland Street. The study area intersections include the signalized intersection at Woodroffe Avenue/Deerfox Drive/Stoneway Drive, and the unsignalized intersections at Deerfox Drive/Gleeson Way and Deerfox Drive/Beatrice Drive, and the proposed unsignalized accesses on Settler's Ridge Way and Deerfox Drive.

The selected time periods for the analysis are the weekday AM and PM peak hours, as they represent the 'worst case' combination of site generated traffic and adjacent street traffic. The proposed development is expected to be completed with full occupancy by the year 2020. As such, the weekday AM and PM peak periods will be analyzed for the buildout year 2020 and the horizon year 2025.

#### **4.4 Exemptions Review**

This module reviews possible exemptions from the final Transportation Impact Assessment, as outlined in the TIA guidelines. The applicable exemptions for this site are shown in **Table 2**.

**Table 2: TIA Exemptions**

Module	Element	Exemption Criteria	Exemption Applies
<b>Design Review Component</b>			
<b>4.1</b> Development Design	4.1.2 Circulation and Access	• Only required for site plans	Exempt
	4.1.3 New Street Networks	• Only required for plans of subdivision	Not Exempt
<b>4.2</b> Parking	4.2.1 Parking Supply	• Only required for site plans	Exempt
	4.2.2 Spillover Parking	• Only required for site plans where parking supply is 15% below unconstrained demand	Exempt
<b>Network Impact Component</b>			
<b>4.5</b> Transportation Demand Management	<i>All elements</i>	• Not required for non-residential site plans expected to have fewer than 60 employees and/or students on location at any given time	Exempt
<b>4.6</b> Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	• Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Not Exempt
<b>4.8</b> Network Concept	<i>All elements</i>	• Only required when proposed development generates more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by the established zoning	Exempt

As the trip generation trigger was not met, the Network Impact Component (Modules 4.5 to 4.9) of the TIA analysis is exempt from further review. However, Module 4.6: Neighbourhood Traffic Management will be reviewed, given the community's history of concerns of traffic within the study area.

Based on the foregoing, the following modules will be included in the TIA report:

- Module 4.1: Development Design
- Module 4.3: Boundary Streets
- Module 4.4: Access Design
- Module 4.6: Neighbourhood Traffic Management

## 5.0 FORECASTING

### 5.1 Development-Generated Travel Demand

#### 5.1.1 Trip Generation

The proposed subdivision will include 41 dwellings, all of which will be detached homes. Trips generated by these dwellings have been estimated using the relevant recommended rates outlined in the *TRANS Trip Generation Manual*, prepared in 2009 by McCormick Rankin Corporation. The vehicle trip generation rates, taken from Table 6.3 of the report, correspond to Single-Detached Dwellings in the Suburban Area (outside the greenbelt). The directional split between inbound and outbound trips are based on the blended splits presented in Table 3.17 of the report. The estimated number of trips generated by the proposed subdivision is shown in **Table 3**.

**Table 3: Proposed Residential Trip Generation**

Land Use	TRANS Rate	Units	AM Peak (VPH)			PM Peak (VPH)		
			IN	OUT	TOT	IN	OUT	TOT
Single-Detached Dwelling	AM: 0.70 PM: 0.90	41 units	8	21	29	23	14	37

The corresponding number of person trips generated by the proposed subdivision are based on the modal shares presented in Table 3.13 of the TRANS report. The estimated number of person trips generated by the proposed subdivision is shown in **Table 4**.

**Table 4: Proposed Residential Person Trip Generation**

Land Use	TRANS Auto Share	AM Peak (PPH)			PM Peak (PPH)		
		IN	OUT	TOT	IN	OUT	TOT
Single-Detached Dwelling	AM: 55% PM: 64%	15	38	53	36	22	58

From the previous table, the proposed subdivision is projected to generate 53 person trips during the AM peak period and 58 person trips during the PM peak period.

The modal shares for the proposed subdivision are assumed to be consistent with the modal shares outlined in the 2011 TRANS O-D Survey Report, specific to the South Nepean region. The modal share values applied to the proposed dwellings are based on all observed trips from/within South Nepean in the AM peak hour, and all observed trips to/within South Nepean in the PM peak hour. A full breakdown of the projected person trips generated by modal share is shown in **Table 5**.

**Table 5: Person Trips by Modal Share**

Travel Mode	Modal Share	AM Peak			PM Peak		
		IN	OUT	TOT	IN	OUT	TOT
<i>Residential Person Trips</i>		15	38	53	36	22	58
Auto Driver	55%	8	21	29	20	12	32
Auto Passenger	15%	2	5	7	5	3	8
Transit	20%	3	8	11	7	5	12
Non-Auto	10%	2	4	6	4	2	6

From the previous table, the proposed subdivision is projected to generate 29 vehicle trips during the AM peak period and 32 vehicle trips during the PM peak period.

### 5.1.2 Trip Distribution

The assumed distribution of trips generated by the proposed subdivision are anticipated to follow the traffic patterns associated with the typical commute (leaving for work during the AM peak hour and returning from work during the PM peak hour). Therefore, the trip distribution is described as follows:

- 50% to/from the north via Woodroffe Avenue
- 5% to/from the north via Beatrice Drive
- 35% to/from the south via Woodroffe Avenue
- 5% to/from the south via Beatrice Drive
- 5% to/from the east via Stoneway Drive/Deerfox Drive

### 5.1.3 Trip Assignment

This TIA considers two options for the proposed access along Deerfox Drive: a full movement access, and a right-in/right-out (RIRO) access. In both scenarios, the proposed access along Settler's Ridge Way is a full movement access. The trip assignment at the accesses is therefore different between the two scenarios due to the turning restriction at the proposed access on Deerfox Drive.

In the case of a full movement access on Deerfox Drive, the trip assignment is as follows:

#### Full Movement Access on Deerfox Drive

- All trips arriving and departing from the north, south, and east via Woodroffe Avenue
- 50% of trips arriving and departing from the north and south via Beatrice Drive

#### Full Movement Access on Settler's Ridge Way

- 50% of trips arriving and departing from the north and south via Beatrice Drive

In the case of a RIRO access on Deerfox Drive, the trip assignment is as follows:

#### RIRO Access on Deerfox Drive

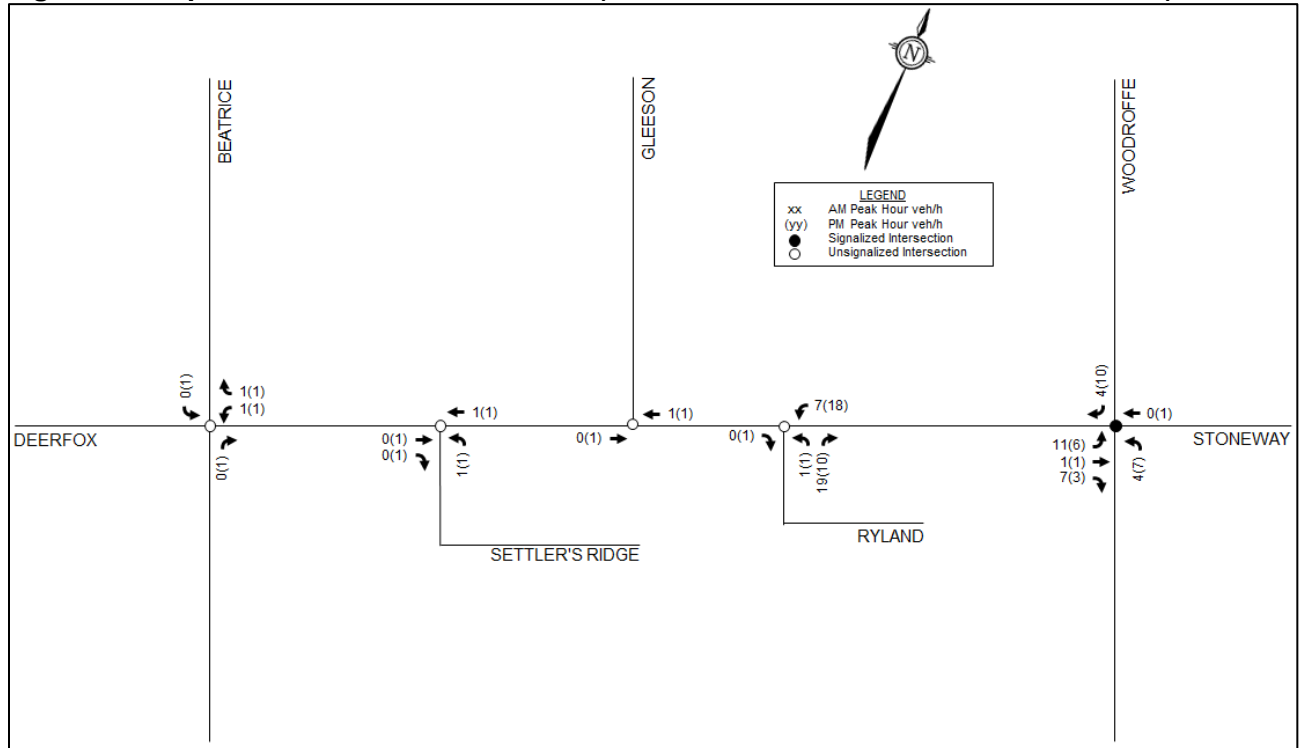
- All trips departing to the north, south, and east via Woodroffe Avenue
- 50% of trips arriving from the north and south via Beatrice Drive

#### Full Movement Access on Settler's Ridge Way

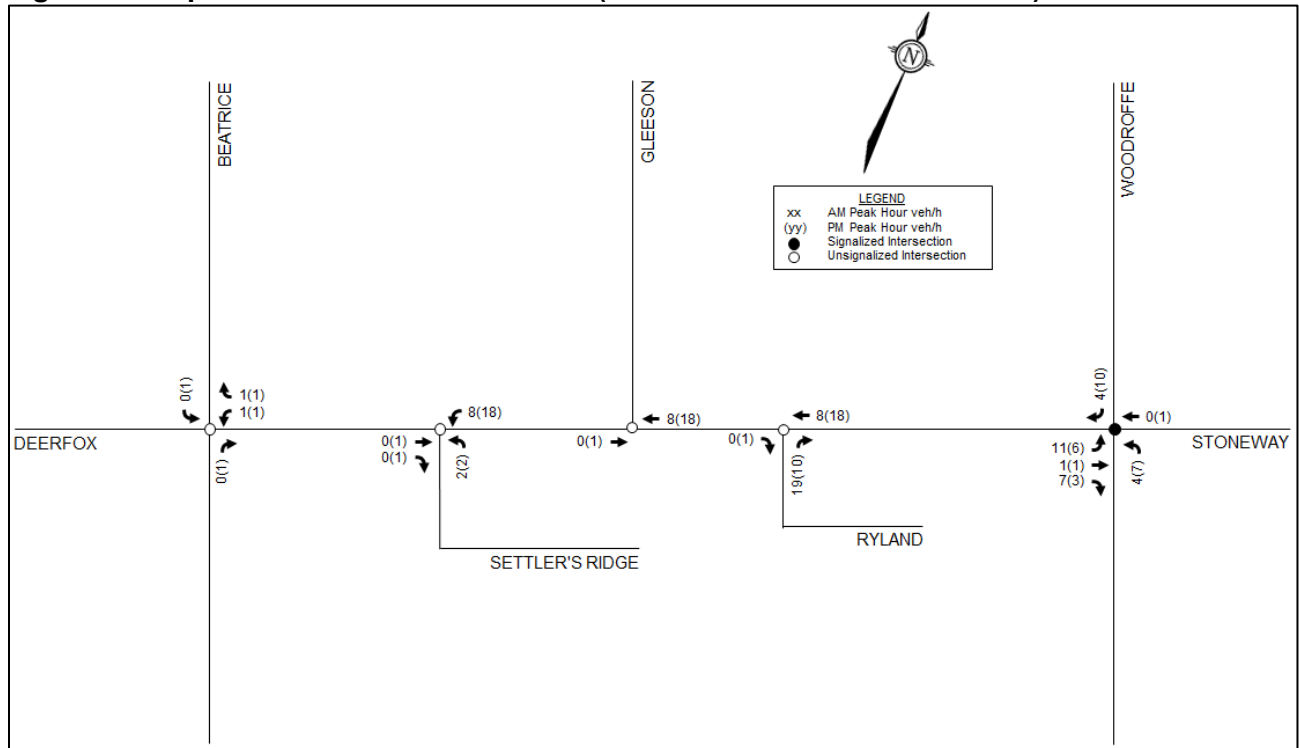
- All trips arriving from the north, south, and east via Woodroffe Avenue
- 50% of trips arriving from the north and south via Beatrice Drive
- All trips departing to the north and south via Beatrice Drive

Trips generated by the proposed subdivision with a full movement access on Deerfox Drive are shown in **Figure 4**. Trips generated by the proposed subdivision with a RIRO access on Deerfox Drive are shown in **Figure 5**.

**Figure 4: Proposed Site-Generated Traffic (Full Movement Access on Deerfox Drive)**



**Figure 5: Proposed Site-Generated Traffic (RIRO Access on Deerfox Drive)**



## 5.2 Background Traffic

### 5.2.1 General Background Growth Rate

A rate of background growth has been established through a review of the City of Ottawa's Strategic Long Range Model, comparing snapshots of 2011 and 2031 AM peak volumes, and the City's 2013 TMP. The snapshots indicate a growth rate of less than 1% on Woodroffe Avenue. Section 2.3 of the TMP projects a 50% growth in the population of the Barrhaven area between 2011 and 2031, which translates to an annual growth rate of approximately 2% per annum. As such, a 2% growth rate has been applied to Woodroffe Avenue, the only arterial roadway within the study area. A 0% growth rate has been applied to all other roadways within the study area.

### 5.2.2 Other Area Developments

The traffic generated by two proposed medical facilities at 3120 and 3130 Woodroffe Avenue have been accounted for in the background traffic. The concept plans and site-generated traffic projections are included in **Appendix F**. Traffic counts were not available at Deerfox Drive/Settler's Ridge Way. While it is acknowledged that the City prefers to estimate traffic volumes at existing developments by conducting traffic counts versus the use of forecasting projections, it is Novatech's position that conducting a count for a development of this size is not cost effective. Therefore, the same methods described in Sections 5.1.1 and 5.1.2 have been used to estimate the traffic generated by the residences on Settler's Ridge Way. The estimated number of trips generated by the residences on Settler's Ridge Way is shown in **Table 6**. The estimated number of person trips generated by the proposed subdivision is shown in **Table 7**.

**Table 6: Settler's Ridge Way – Residential Trip Generation**

Land Use	TRANS Rate	Units	AM Peak (VPH)			PM Peak (VPH)		
			IN	OUT	TOT	IN	OUT	TOT
Single-Detached Dwelling	AM: 0.70 PM: 0.90	58 units	12	29	41	32	20	52

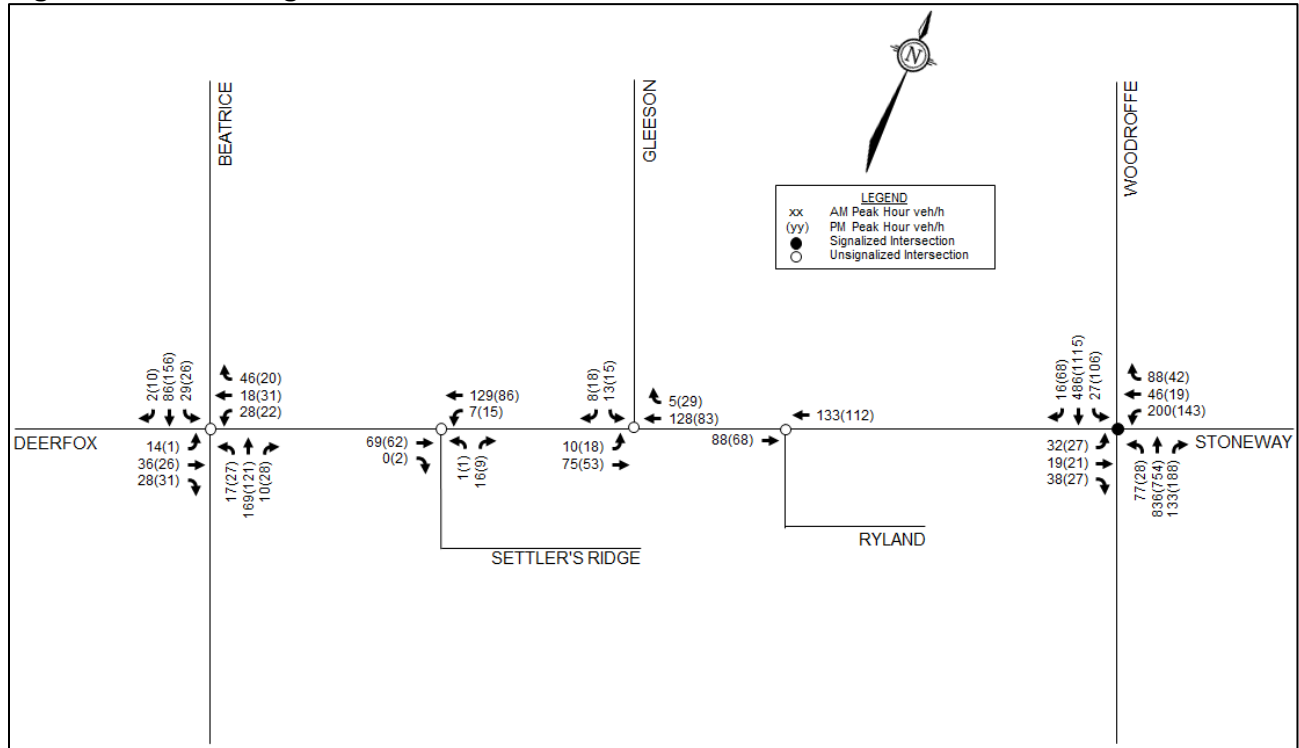
**Table 7: Settler's Ridge Way – Residential Person Trip Generation**

Land Use	TRANS Auto Share	AM Peak (PPH)			PM Peak (PPH)		
		IN	OUT	TOT	IN	OUT	TOT
Single-Detached Dwelling	AM: 55% PM: 64%	22	53	75	50	31	81

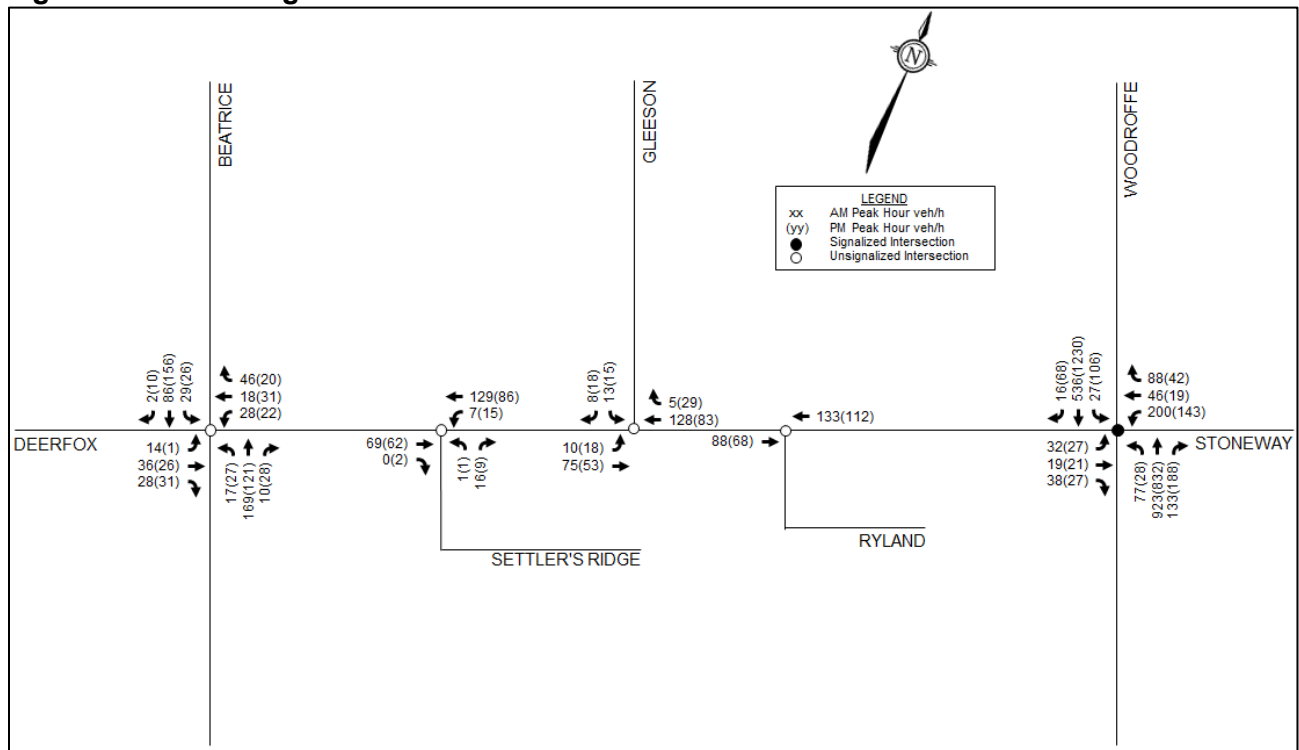
With a 55% auto driver modal share per the *TRANS O-D Survey Report*, this results in 41 vehicle trips during the AM peak period and 45 vehicle trips during the PM peak period. Only trips arriving from and departing to the north and east via Woodroffe Avenue are assumed to access Deerfox Drive, with all other trips accessing Beatrice Drive directly from Settler's Ridge Way. The trips accessing Deerfox Drive are accounted for in the background traffic volumes.

Background volumes for the buildout year 2020 and horizon year 2025 are presented in **Figure 6** and **Figure 7**, respectively. The total traffic volumes, with a full movement access on Deerfox Drive, for the buildout year 2020 and horizon year 2025 are presented in **Figure 8** and **Figure 9**, respectively. The total traffic volumes, with a RIRO access on Deerfox Drive, for the buildout year 2020 and horizon year 2025 are presented in **Figure 10** and **Figure 11**, respectively.

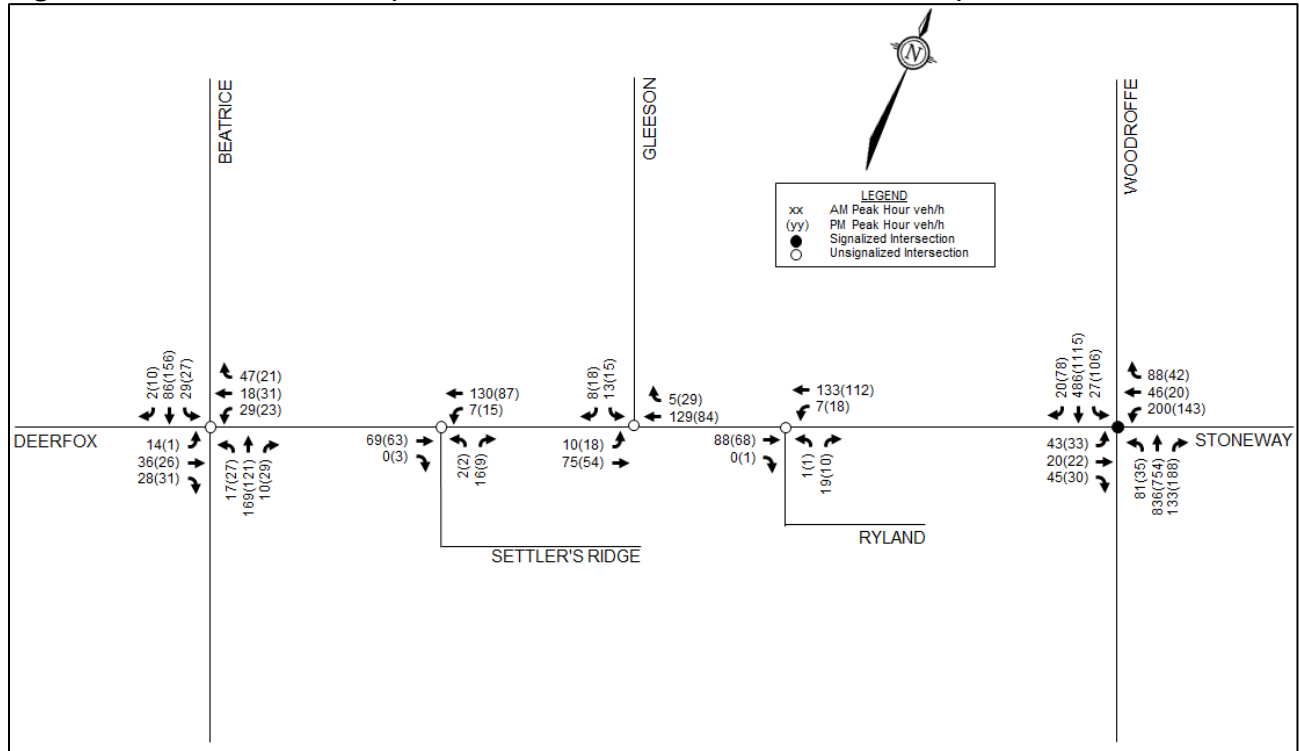
**Figure 6: 2020 Background Traffic**



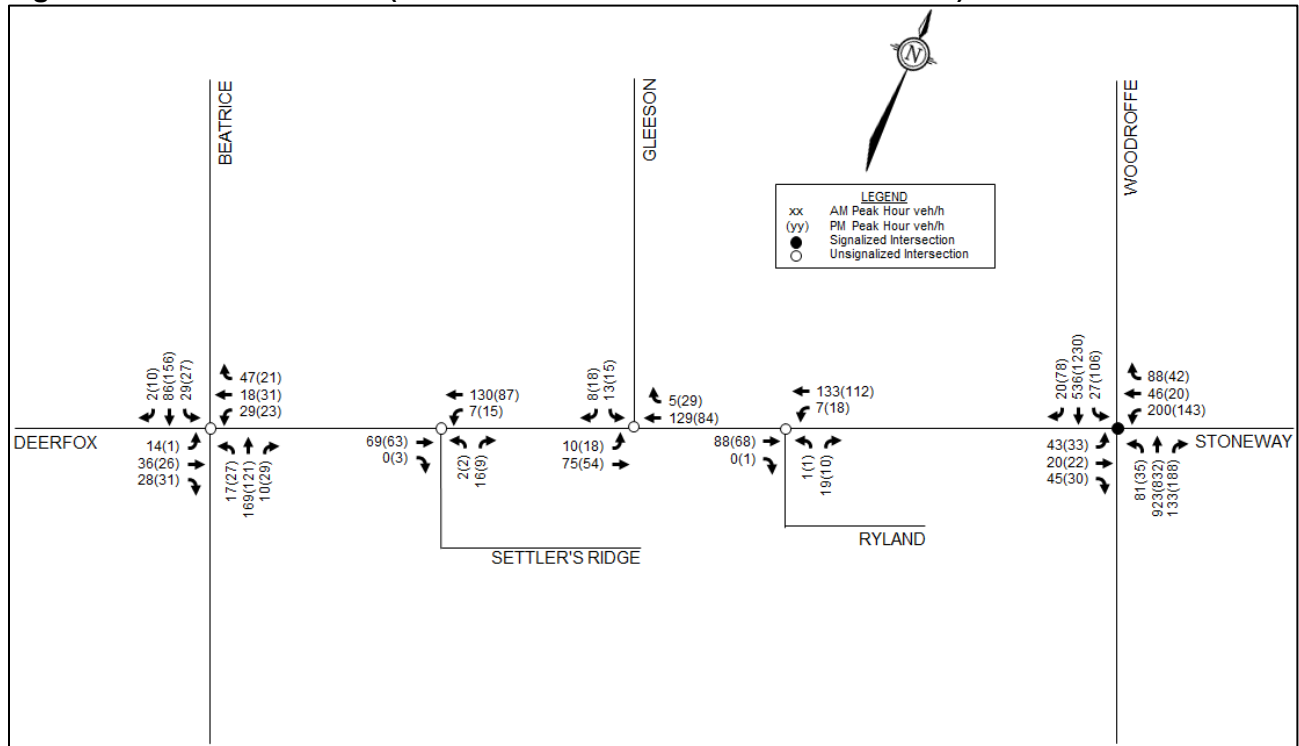
**Figure 7: 2025 Background Traffic**



**Figure 8: 2020 Total Traffic (Full Movement Access on Deerfox Drive)**

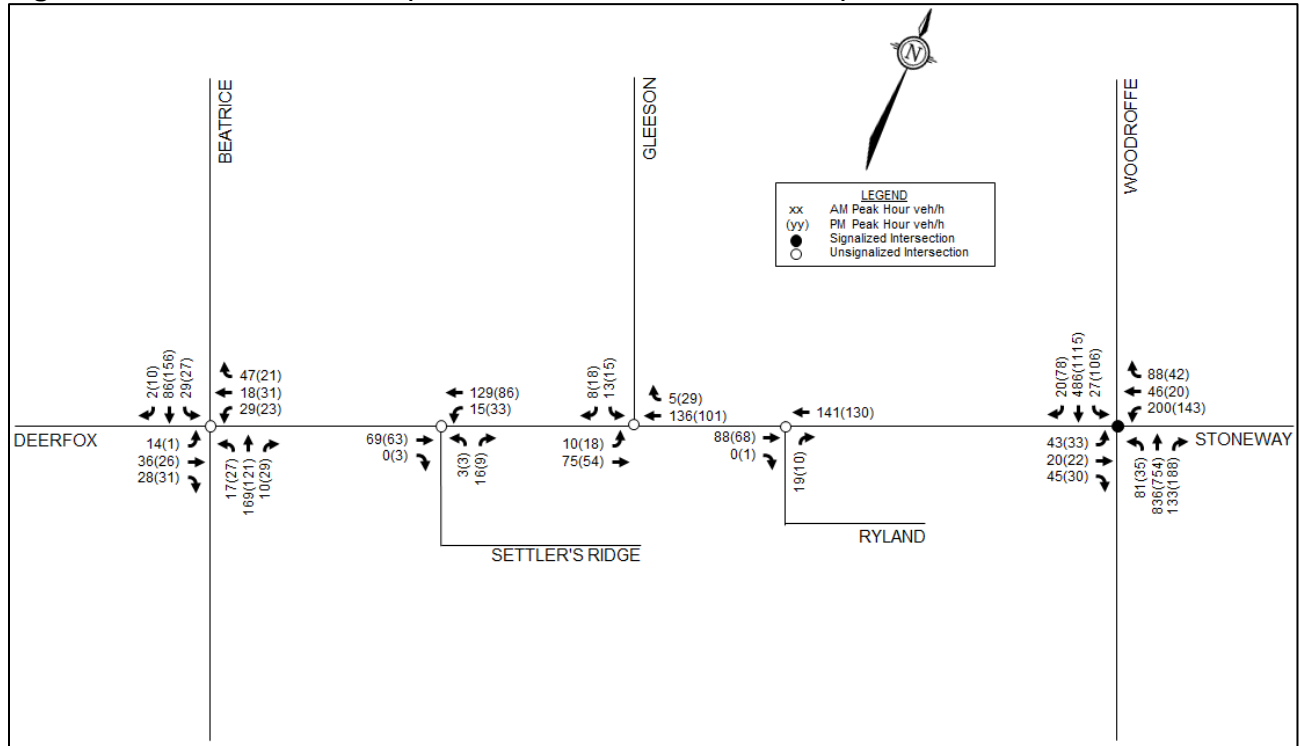


**Figure 9: 2025 Total Traffic (Full Movement Access on Deerfox Drive)**

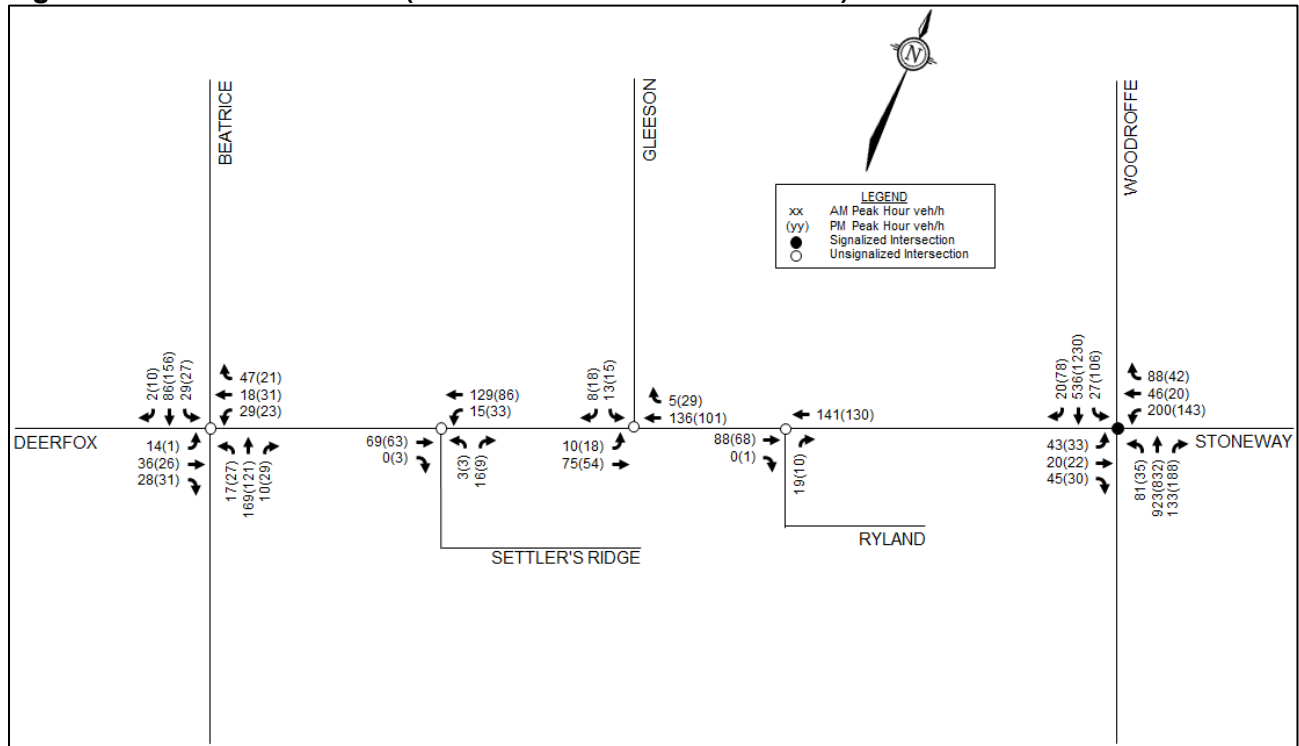




**Figure 10: 2020 Total Traffic (RIRO Access on Deerfox Drive)**



**Figure 11: 2025 Total Traffic (RIRO Access on Deerfox Drive)**



## 6.0 ANALYSIS

### 6.1 Development Design

This section provides a review of the development design in terms of site circulation and pedestrian crossings. A review of the City's Transportation Demand Management (TDM) – Supportive Development Design and Infrastructure Checklist is exempt from Draft Plan of Subdivision applications.

#### 6.1.1 Site Circulation

The Transportation Association of Canada (TAC) *Geometric Design Guide for Canadian Roads* stipulates that the minimum desired distance between two T-intersections is 60m along a collector roadway. The proposed access on Deerfox Drive will be approximately 85m from the adjacent intersection at Deerfox Drive/Gleeson Way (measured centre-to-centre).

A ROW width of 16.5m is proposed for Street One within the proposed subdivision. Within the proposed ROW, an 8.5m roadway width is proposed, which can accommodate a travel lane in each direction and a parking lane on one side of the roadway. This width is sufficient given the context of the proposed development, a low-speed residential neighbourhood. Consistent with Settler's Ridge Way and the existing section of Ryland Street, no sidewalks will be provided.

#### 6.1.2 Pedestrian Crossings

The *Ontario Traffic Manual* (OTM) – Book 15 identifies the following criteria for the consideration of a pedestrian crossover (PXO):

- If the total 8-hour pedestrian volume crossing the main road is greater than 100 and the total 8-hour vehicular volume is greater than 750 vehicles; or
- If the crossing location provides system connectivity or is on a desired pedestrian line.

Based on the 8-hour traffic count conducted at Woodroffe Avenue/Deerfox Drive/Stoneway Drive, the 8-hour two-way vehicular volume on Deerfox Drive exceeds 750 vehicles. However, the 8-hour pedestrian volume crossing Deerfox Drive does not reach the 100 pedestrian threshold.

### 6.2 Boundary Streets

This section provides a review of Deerfox Drive using complete streets principles. The *Multi-Modal Level of Service* (MMLOS) guidelines produced by IBI Group in October 2015 were used to evaluate the levels of service for the boundary roadways for each mode of transportation. Schedule B of the City of Ottawa's Official Plan identifies Deerfox Drive as being within the General Urban Area. As transit does not provide service on Deerfox Drive, and Deerfox Drive is not classified as a truck route, the transit level of service (TLOS) and truck level of service (TkLOS) have not been evaluated. Targets for pedestrian level of service (PLOS), bicycle level of service (BLOS), and vehicular level of service (Auto LOS) for Deerfox Drive adhere to those outlined in Exhibit 22 of the MMLOS guidelines.

### 6.2.1 Pedestrian Level of Service (PLOS)

Exhibit 4 of the MMLOS guidelines has been used to evaluate the segment PLOS of Deerfox Drive. Exhibit 22 of the MMLOS guidelines suggest a target PLOS C for all roadways within the General Urban Area. The results of the segment PLOS analysis are summarized in **Table 8**.

**Table 8: PLOS Segment Analysis**

Sidewalk Width	Boulevard Width	Avg. Daily Curb Lane Traffic Volume	Presence of On-Street Parking	Operating Speed <sup>(1)</sup>	Segment PLOS
<b>Deerfox Drive (north side)</b>					
≥ 2.0m	0m	≤ 3000 vpd	Yes	58 km/h	C
<b>Deerfox Drive (south side)</b>					
≥ 2.0m	0m	≤ 3000 vpd	Yes	58 km/h	C

1. Operating speed of Deerfox Drive taken as the 85<sup>th</sup>-percentile speed from 2016 City speed survey (included in **Appendix G**)

### 6.2.2 Bicycle Level of Service (BLOS)

Exhibit 11 of the MMLOS guidelines has been used to evaluate the segment BLOS of Deerfox Drive. Exhibit 22 of the MMLOS guidelines suggest a target BLOS B for Local Cycling Routes within the General Urban Area. The results of the segment BLOS analysis are summarized in **Table 9**.

**Table 9: BLOS Segment Analysis**

Road Class	Bike Route	Type of Bikeway	Travel Lanes	Centerline Type	Operating Speed	Segment BLOS
<b>Deerfox Drive (Woodroffe Avenue to Beatrice Drive)</b>						
Collector	Local Route	Mixed Traffic	2	No Markings	58 km/h	B

### 6.2.3 Vehicular Level of Service (Auto LOS)

Exhibit 22 of the MMLOS guidelines suggest a target Auto LOS D for all roadways within the General Urban Area. The typical lane capacity along the study area roadways are based on the City's guidelines for the TRANS Long-Range Transportation Model. The lane capacity along Deerfox Drive has been estimated based on roadway classification and general characteristics (i.e. suburban with limited access, urban with on-street parking, etc.). The results of the Auto LOS analysis are summarized in **Table 10**.

**Table 10: Auto LOS Segment Analysis**

Direction	Directional Capacity	Traffic Volumes		V/C Ratio and LOS			
		AM Peak	PM Peak	AM Peak		PM Peak	
				V/C	LOS	V/C	LOS
Deerfox Drive (Woodroffe Avenue to Beatrice Drive)							
Eastbound	600 vph	88	68	0.15	A	0.11	A
Westbound	600 vph	133	112	0.22	A	0.19	A

#### 6.2.4 Segment MMLOS Summary

The results of the segment MMLOS analysis for Deerfox Drive can be summarized as follows:

- Deerfox Drive achieves the target PLOS C;
- Deerfox Drive achieves the target BLOS B;
- Deerfox Drive surpasses the target Auto LOS D, achieving an Auto LOS A.

Since all relevant level of service targets have been met, no recommendations have been made in improving the multi-modal levels of service on Deerfox Drive.

#### 6.3 Access Intersections Design

The proposed subdivision will be served by two unsignalized accesses: a full movement access to Settler's Ridge Way via Ryland Street and a full movement access on Deerfox Drive. The reasons for recommending a full movement access on Deerfox Drive are discussed in Section 6.4.

The *Ontario Traffic Manual – Book 5* identifies criteria for the implementation of all-way stop control. Based on OTM Book 5, all-way stop control at a three-legged intersection should be implemented if the total vehicle volumes on all approaches to an intersection exceed 350 vehicles during the peak hour and if the split does not exceed 75%/25%.

The City of Ottawa identifies its own criteria for the implementation of all-way stop control. Based on the City's criteria, all-way stop control for local or collector roadways is warranted if any of the following three criteria are met:

- Volume: Total vehicles on all approaches average more than 200 per hour over an 8-hour weekday period, and the total minor street volume (including pedestrians) average more than 80 per hour over the same 8-hour period;
- Collision: An average of three or more collisions have occurred over a three-year period (including only the collisions which can be prevented by all-way stop control);
- Visibility: The sight distance from a point 2.7m from the edge of the major street is less than 55m to the left and 60m to the right.

The two proposed accesses do not meet the OTM or City criteria for all-way stop control. Therefore, it is recommended that stop control be implemented only on the minor approaches (Ryland Street at Settler's Ridge Way and Street One at Deerfox Drive).

#### 6.4 Neighbourhood Traffic Management

All external site-generated trips will originate from or are destined to Woodroffe Avenue, Beatrice Drive, or Stoneway Drive via Deerfox Drive. Trips to/from the south via Beatrice Drive may enter or exit the study area on Settler's Ridge Way rather than Deerfox Drive. As discussed in Section 5.1.2, this exception accounts for only 5% of all trips generated by the proposed subdivision. Therefore, 95% of trips generated by the proposed subdivision will use Deerfox Drive at some point when travelling through the study area.

For collector roadways, the TIA guidelines provide two thresholds for developing a Neighbourhood Traffic Management (NTM) plan: a maximum of 2,500 vehicles/day or a maximum of 300 vehicles during the highest peak hour. At full buildout, neither of these thresholds are anticipated to be

exceeded, and the addition of site-generated traffic is not anticipated to change the function of Deerfox Drive as a collector roadway. As such, an NTM plan has not been developed as part of this application.

There are no Area Traffic Management (ATM) studies within the study area that have been completed or are currently in progress. To address residents' concerns about speeding on Deerfox Drive, an all-way stop control has been implemented at the intersection of Deerfox Drive/Gleeson Way. Per discussions with City staff, this TIA analyzes two options for the proposed access on Deerfox Drive: a full movement access and a RIRO access.

As shown in **Figure 8** through **Figure 11**, the proposed subdivision is projected to generate 19 AM peak vehicle trips and 10 PM peak vehicle trips turning right onto Deerfox Drive from Street One, as well as one PM peak vehicle trip turning right onto Street One from Deerfox Drive. These trips are consistent for both the full movement access and the RIRO access scenarios. With a full movement access, the proposed subdivision is also projected to generate one AM peak vehicle trip and one PM peak vehicle trip turning left onto Deerfox Drive from Street One, as well as seven AM peak vehicle trips and 18 PM peak vehicle trips turning left onto Street One from Deerfox Drive. These vehicle trips are displaced to Settler's Ridge Way in the case of a RIRO access on Deerfox Drive.

A comparison of the projected two-way traffic volumes on Settler's Ridge Way for both the full movement and RIRO access options is as follows:

- Full Movement Access: 25 vehicles during the AM peak and 29 vehicles during the PM peak
- RIRO Access: 34 vehicles during the AM peak and 48 vehicles during the PM peak

The implementation of a RIRO access on Deerfox Drive is anticipated to add more traffic to Settler's Ridge Way than if a full movement access was implemented. Additionally, the lack of vehicles turning left into the proposed subdivision from Deerfox Drive reduces the friction that through traffic would experience when travelling on Deerfox Drive. This is notable given the history of resident concerns regarding speeding in the area. For these reasons, a full movement access at Deerfox Drive is recommended.

The City expressed a desire to see increased friction on Deerfox Drive through new driveways along the site frontage and possible curb extensions or intersection narrowing at the proposed access. Two lots west of Street One are proposed to have driveways to Deerfox Drive. The lots east of Street One would have to be reverse walkout units to have driveways along Deerfox Drive, due to grading (residents would drive into the basement level). This would be an unusual product and difficult to sell. Additionally, these units are to be serviced from Street One rather than Deerfox Drive. For these reasons, the units east of Street One will back onto Deerfox Drive and mimic the existing residential dwellings on the north side of Deerfox Drive.

As noted above, the traffic projections don't meet the criteria for an ATM study. In addition, curb extensions or intersection narrowing at the proposed access to Deerfox Drive are not considered desirable, given the proximity to the all-way stop at Deerfox Drive/Gleeson Way. If the City wishes to consider intersection narrowing to address existing or background traffic conditions, a midblock location between Gleeson Way and Woodroffe Avenue may be more appropriate (60-70m east of Street One). No road modifications are recommended as a result of the development-related traffic, as none are required.

It is anticipated that the curvilinear alignment of Street One will discourage through traffic on Deerfox Drive from using Settler's Ridge Way and Street One as a cut-through route to avoid the all-way stop at Deerfox Drive/Gleeson Way.

## 7.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the foregoing, the conclusions and recommendations of this TIA can be summarized as follows:

### Forecasting

- The proposed subdivision is projected to generate approximately 53 person trips during the AM peak period and 58 person trips during the PM peak period, which includes 29 vehicle trips during the AM peak period and 32 vehicle trips during the PM peak period.

### Development Design

- The proposed access on Deerfox Drive will be approximately 85m from the adjacent intersection at Deerfox Drive/Gleeson Way (measured centre-to-centre). This spacing meets the minimum requirements outlined in the TAC *Geometric Design Guide for Canadian Roads*.
- Street One has a proposed ROW width of 16.5m and a proposed roadway width of 8.5m, which is sufficient for a travel lane in each direction and parking on one side of the roadway. This is adequate given the context of the proposed development, a low-speed residential neighbourhood with limited opportunity for cut-through traffic.
- Consistent with Settler's Ridge Way and the existing section of Ryland Street, no sidewalks will be provided through the proposed subdivision.
- In addition to the existing crosswalk at the north approach of Deerfox Drive/Gleeson Way, the City could consider implementing crosswalks at the east and west approaches, as all-way stop control has already been implemented.

### Boundary Streets

- The results of the segment MMLOS analysis for Deerfox Drive can be summarized as follows:
  - Deerfox Drive achieves the target PLOS C;
  - Deerfox Drive achieves the target BLOS B;
  - Deerfox Drive surpasses the target Auto LOS D, achieving an Auto LOS A.

### Access Intersections

- The proposed subdivision will be served by two unsignalized accesses: a full movement access to Settler's Ridge Way via Ryland Street and a full movement access on Deerfox Drive via Street One.
- Neither access is anticipated to meet the OTM or City criteria for all-way stop control. Therefore, side street stop control is recommended for the minor approaches only (Ryland Street at Settler's Ridge Way and Street One at Deerfox Drive).

### Neighbourhood Traffic Management

- The implementation of a RIRO access on Deerfox Drive is anticipated to add more traffic to Settler's Ridge Way, compared to a full movement access. Additionally, the lack of vehicles

turning left into the proposed subdivision from Deerfox Drive would reduce the friction that through traffic would experience when travelling on Deerfox Drive. This is notable given the history of resident concerns regarding speeding in the area. For these reasons, a full movement access at Deerfox Drive is recommended.

- Curb extensions or intersection narrowing at the proposed access to Deerfox Drive are not considered desirable, given the proximity to the all-way stop at Deerfox Drive/Gleeson Way. If the City wishes to consider intersection narrowing to address existing or background traffic conditions, a midblock location between Gleeson Way and Woodroffe Avenue may be more appropriate. No road modifications are recommended as a result of the development-related traffic, as none are required.
- It is anticipated that the curvilinear alignment of Street One will discourage through traffic on Deerfox Drive from using Settler's Ridge Way and Street One as a cut-through route to avoid the all-way stop at Deerfox Drive/Gleeson Way.
- The proposed subdivision at 23, 33 and 39 Deerfox Drive is recommended from a transportation perspective.

## NOVATECH

Prepared by:



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E.I.T.,  
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Reviewed by:



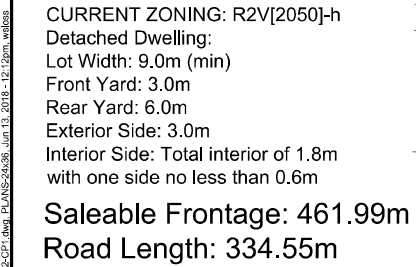
Jennifer Luong, P.Eng.  
Senior Project Manager,  
Transportation/Traffic



## **APPENDIX A**

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### Concept Plan



						<b>SCALE</b>
						1:500 (A1) / 1:1000 (11x17)
2.	REVISED PER COMMENTS	JUN 12/18	GLW			
1.	REVISED PER COMMENTS	JUN 06/18	GLW			
No.	REVISION	DATE	BY			

**FOR REVIEW ONLY**

PROJECT No.	118072-00
REV # 2	
DRAWING No.	118072-CP1

## **APPENDIX B**

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### TIA Screening Form

## City of Ottawa 2017 TIA Guidelines Screening Form

### 1. Description of Proposed Development

Municipal Address	<b>23, 33 &amp; 39 Deerfox Drive</b>
Description of Location	<b>The approximately 2.25-hectare property is located:</b> <ul style="list-style-type: none"> <li>• <b>South of Deerfox Drive, midblock between Settler's Ridge Way and Woodroffe Avenue</b></li> </ul>
Land Use Classification	<b>Residential</b>
Development Size (units)	<b>41 units</b>
Development Size (m <sup>2</sup> )	<b>-</b>
Number of Accesses and Locations	<ul style="list-style-type: none"> <li>• <b>One access on Settler's Ridge Way</b></li> <li>• <b>One access on Deerfox Drive</b></li> </ul>
Phase of Development	<b>1</b>
Buildout Year	<b>2020</b>

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

### 2. Trip Generation Trigger

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

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

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

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

### 3. Location Triggers

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

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

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

### 4. Safety Triggers

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

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

### 5. Summary

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

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

## **APPENDIX C**

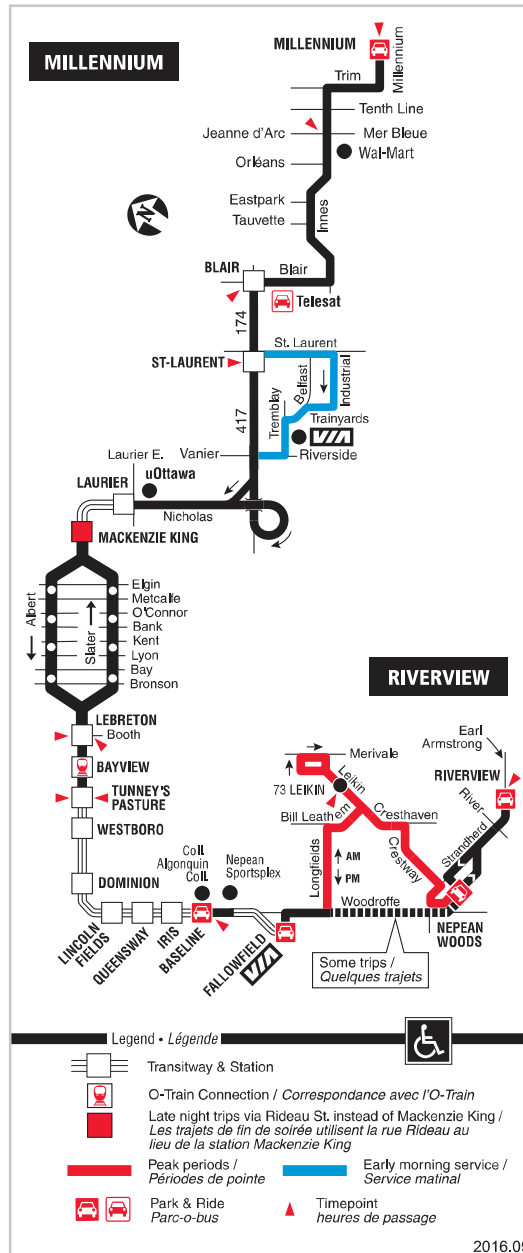
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### OC Transpo Route Maps

# 94

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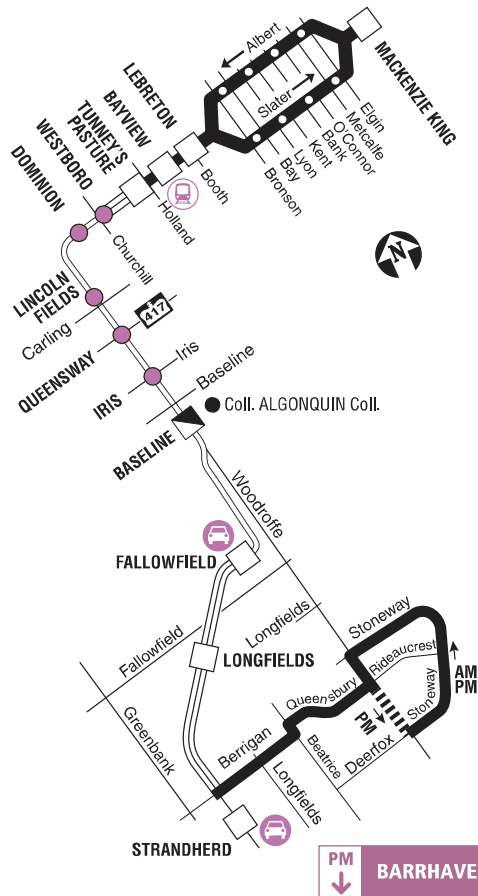
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




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

**Effective / En vigueur Sept. 4 sept. 2016**





**271****Connexion****MACKENZIE KING  
BARRHAVEN****Monday to Friday / Lundi au vendredi**Peak periods only  
Périodes de pointe seulement**AM  
↑  
MACKENZIE  
KING****PM  
↓  
BARRHAVEN****Legend • Légende**

-  Transitway & Station
-  Limited stops: Off only in AM / No stop in PM  
*Arrêts limités : Débarquement en AM seulement / Aucun arrêt en PM*
-  Off only in AM / Full service in PM  
*Débarquement en AM seulement / Service complet en PM*
-  Line 2 - O-Train Trillium Line  
*Ligne 2 - O-Train Ligne Trillium*
-  Park & Ride / Parc-o-bus

2016.12

Information / Renseignement ..... **613-741-4390**Customer Relations  
Service à la clientèle ..... **613-842-3600**Lost and Found / Objets perdus ..... **613-563-4011**Transecure ..... **613-741-2478**Schedule / Horaire ..... **613-560-1000**Text / Texto ..... **560560**  
*plus your four digit bus stop number / plus votre numéro d'arrêt à quatre chiffres***Effective December 25, 2016****En vigueur 25 décembre 2016****octranspo.com**

# 277

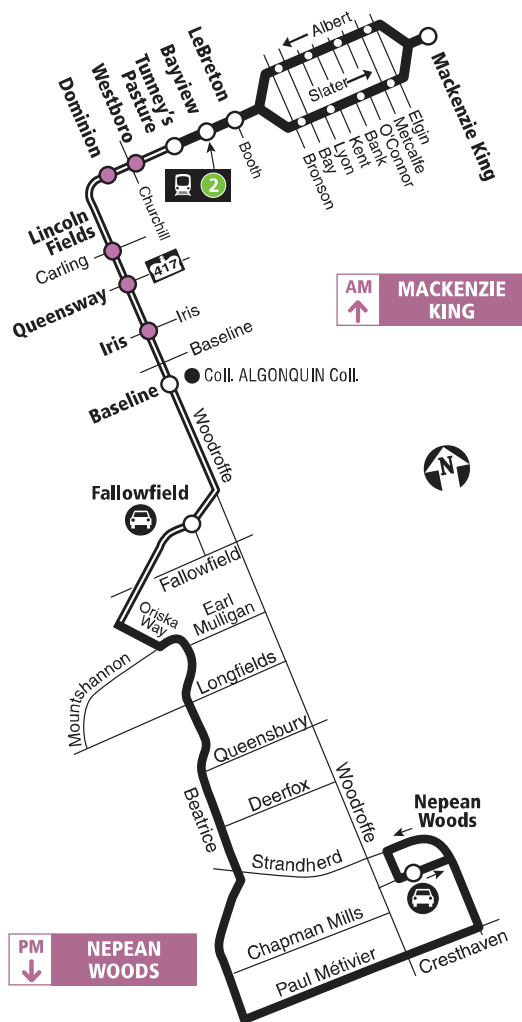
## MACKENZIE KING NEPEAN WOODS

Connexion

Monday to Friday / Lundi au vendredi

Peak periods only

Périodes de pointe seulement



- Transitway & Station
- Limited stops: Off only in AM / No stop in PM  
Arrêts limités : Débarquement en AM seulement / Aucun arrêt en PM
- Park & Ride / Parc-o-bus

2017.12



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

Text / Texto .....560560

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

Customer Relations

Service à la clientèle ..... 613-842-3600

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

Security / Sécurité ..... 613-741-2478

Effective December 24, 2017

En vigueur 24 décembre 2017



INFO 613-741-4390  
octranspo.com

## **APPENDIX D**

---

### Traffic Count Data

## Turning Movement Count - Full Study Summary Report

### WOODROFFE AVE @ DEERFOX DR/STONEWAY DR

**Survey Date:** Thursday, March 02, 2017

**Total Observed U-Turns**

Northbound:	12	Southbound:	7
Eastbound:	0	Westbound:	0

**AADT Factor**

1.00

**Full Study**

WOODROFFE AVE										DEERFOX DR/STONEWAY DR										STR TOT	Grand Total
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				
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				7	19				0				0	0	19		
Total	166	5371	969	6518	397	5430	240	6074	12592	217	114	193	524	955	137	479	1571	2095	14687		
EQ 12Hr	231	7466	1347	9060	552	7548	334	8443	17503	302	158	268	728	1327	190	666	2184	2912	20415		
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													1.39								
AVG 12Hr	231	7466	1347	9060	552	7548	334	8443	17503	302	158	268	728	1327	190	666	2184	2912	20415		
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													1.00								
AVG 24Hr	302	9780	1764	11869	723	9887	437	11060	22929	395	208	351	954	1739	249	872	2861	3815	26744		
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.													1.31								

**Comments:**

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

## Turning Movement Count - Peak Hour Diagram

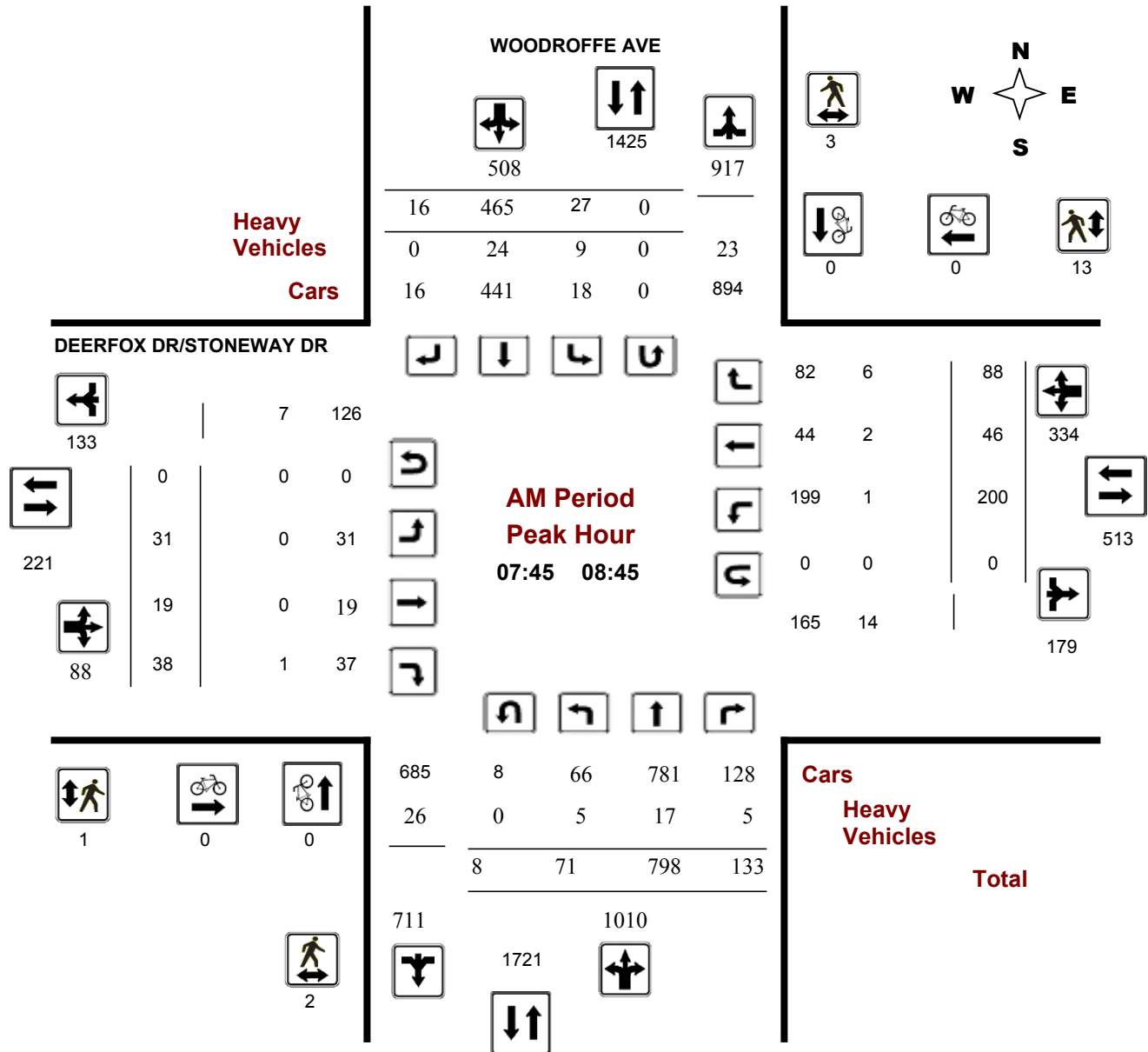
### WOODROFFE AVE @ DEERFOX DR/STONEWAY DR

**Survey Date:** Thursday, March 02, 2017

**Start Time:** 07:00

**WO No:** 36727

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

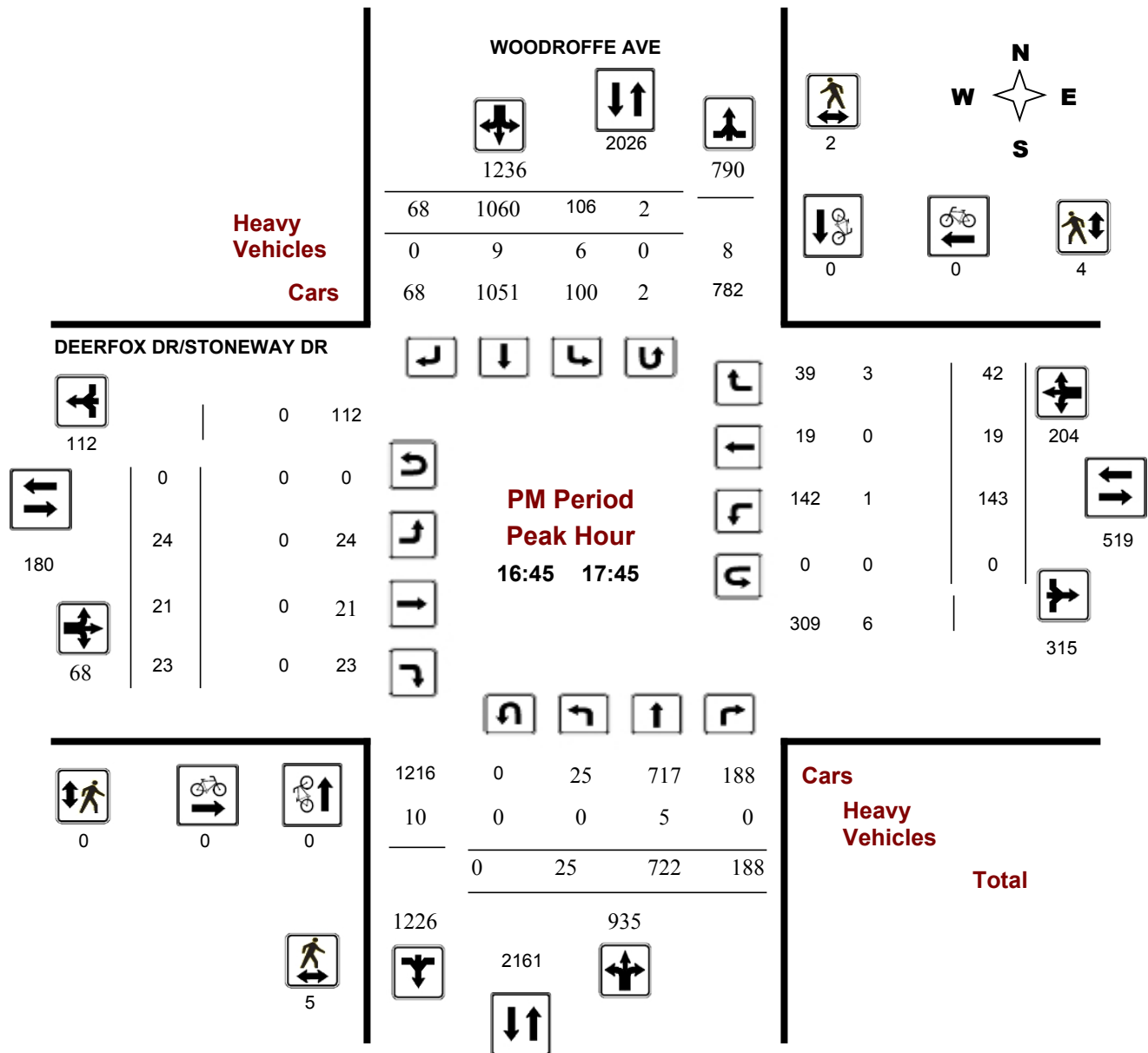
### WOODROFFE AVE @ DEERFOX DR/STONEWAY DR

**Survey Date:** Thursday, March 02, 2017

**Start Time:** 07:00

**WO No:** 36727

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Full Study Peak Hour Diagram

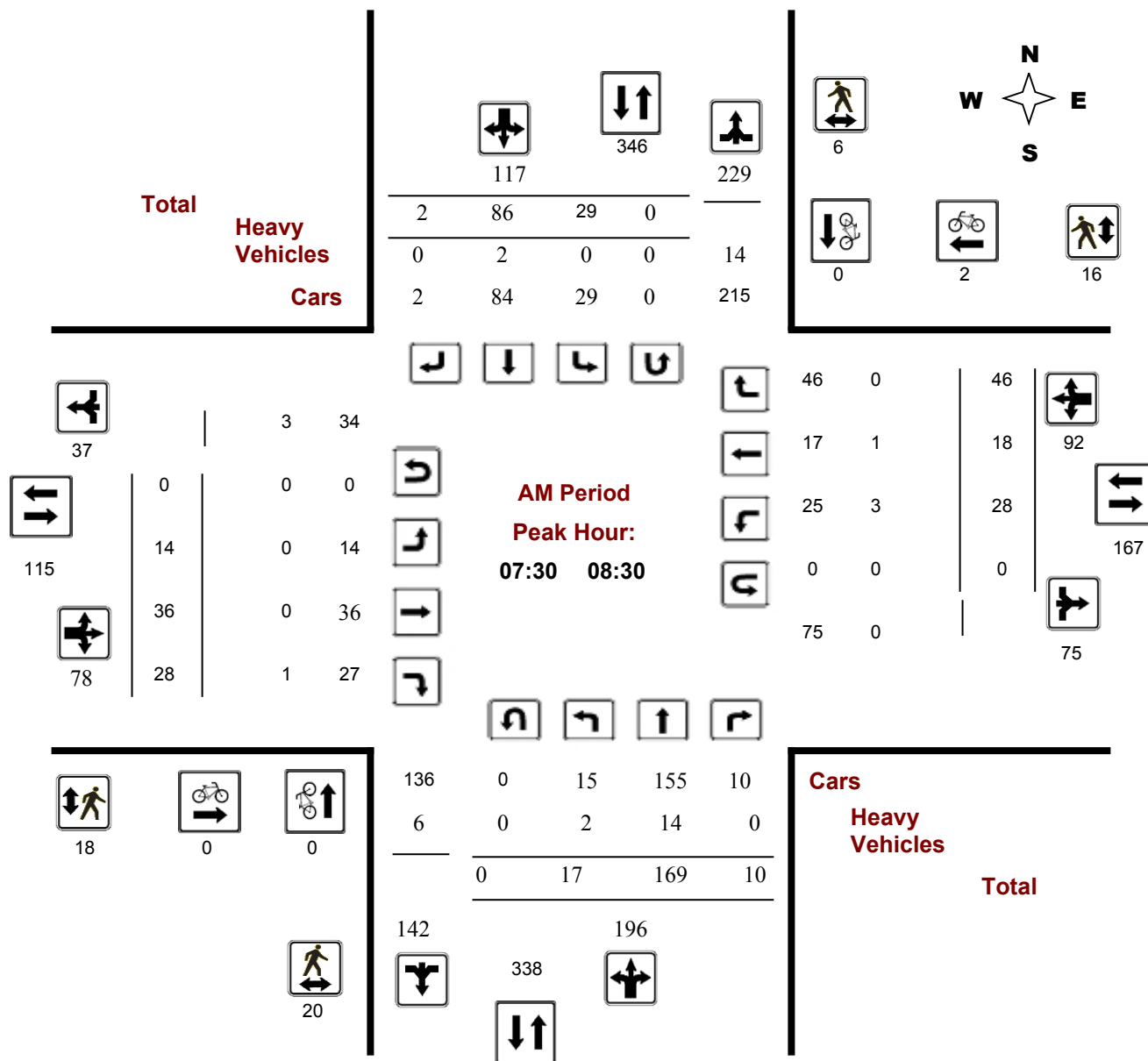
### BEATRICE DR @ DEERFOX DR

**Survey Date:** Tuesday, October 18, 2016

**Start Time:** 07:00

**WO No:** 36394

**Device:** Miovision





# Transportation Services - Traffic Services

## Turning Movement Count - Full Study Peak Hour Diagram

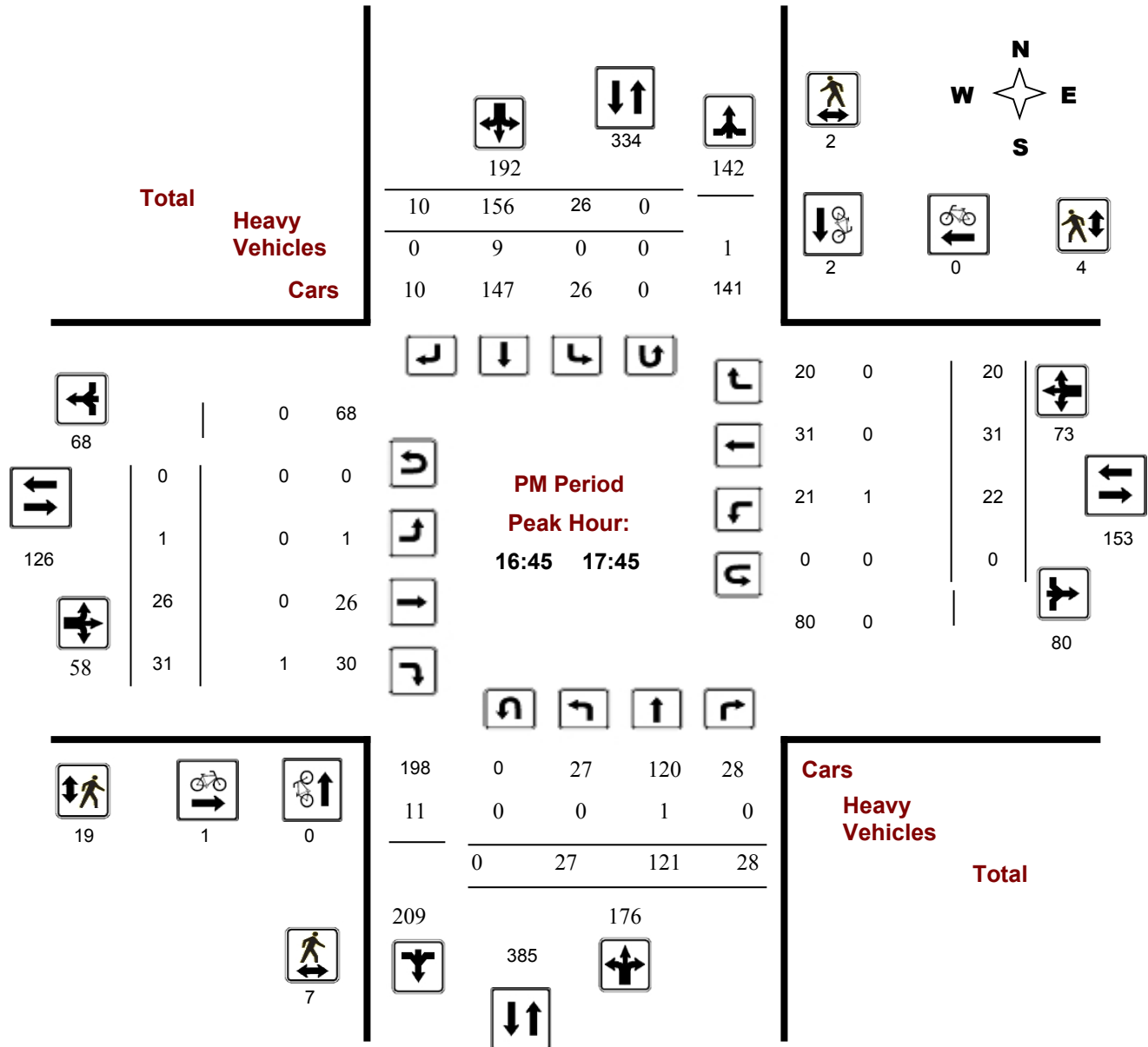
### BEATRICE DR @ DEERFOX DR

**Survey Date:** Tuesday, October 18, 2016

**Start Time:** 07:00

**WO No:** 36394

**Device:** Miovision





## Turning Movement Count - Peak Hour Diagram

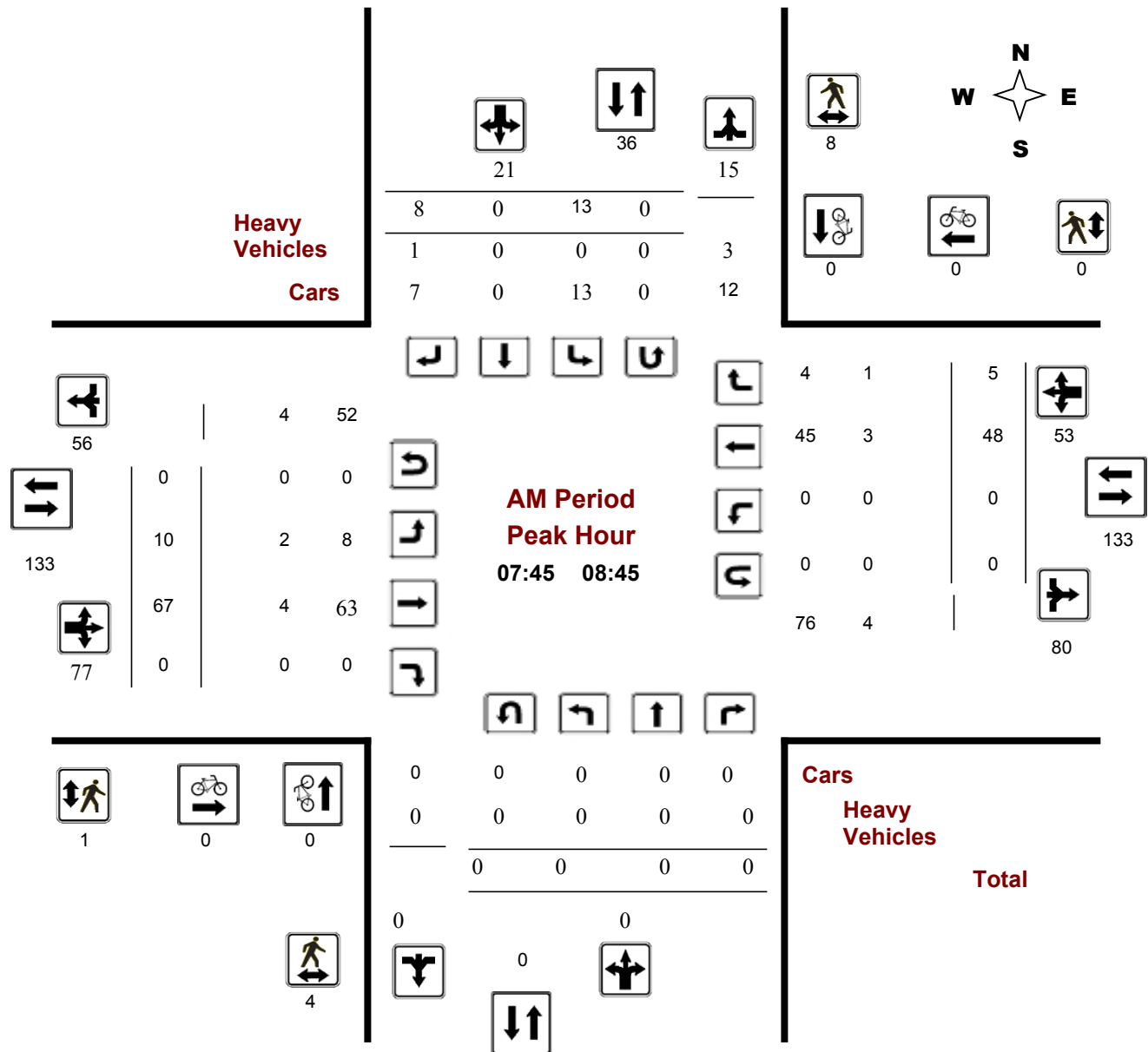
### DEERFOX DR @ GLEESON WAY

**Survey Date:** Tuesday, March 08, 2011

**Start Time:** 07:00

**WO No:** 750

**Device:** Miovision



## Turning Movement Count - Peak Hour Diagram

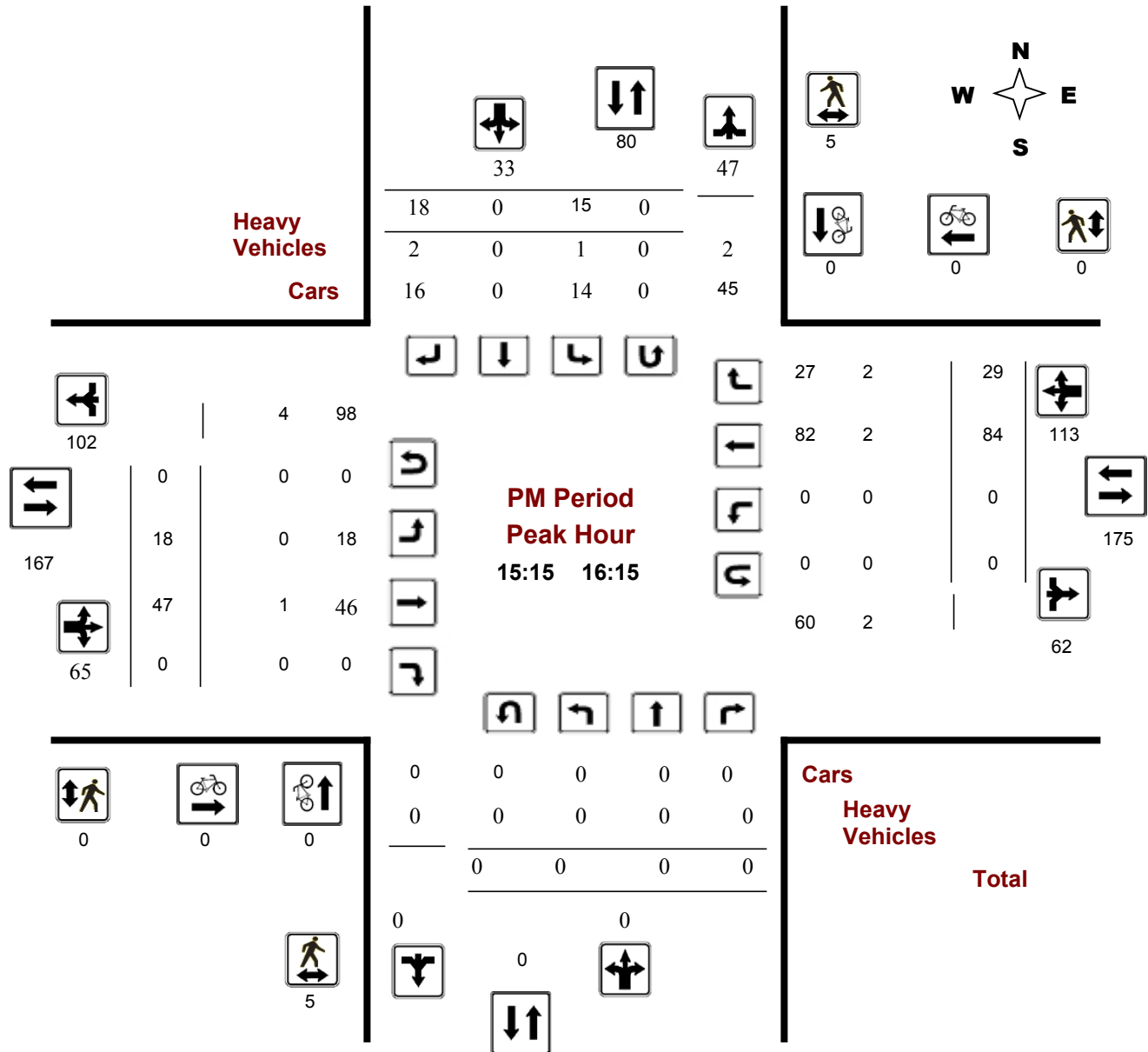
### DEERFOX DR @ GLEESON WAY

**Survey Date:** Tuesday, March 08, 2011

**Start Time:** 07:00

**WO No:** 750

**Device:** Miovision



**Comments**

## **APPENDIX E**

---

### Collision Records



# City Operations - Transportation Services

## Collision Details Report - Public Version

**From:** January 1, 2012 **To:** December 31, 2016

**Location:** BEATRICE DR @ DEERFOX DR

**Traffic Control:** Stop sign

**Total Collisions:** 6

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2013-Mar-27, Wed,22:28	Clear	Angle	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Pick-up truck	Other motor vehicle	
2012-Mar-04, Sun,17:38	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2012-Feb-24, Fri,16:10	Rain	Angle	P.D. only	Ice	North	Slowing or stopping	Pick-up truck	Skidding/sliding	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2012-Feb-29, Wed,19:00	Clear	Other	P.D. only	Wet	East	Reversing	Pick-up truck	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2012-Nov-28, Wed,20:02	Clear	Angle	P.D. only	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Passenger van	Other motor vehicle	
2012-Dec-27, Thu,20:57	Snow	Angle	P.D. only	Loose snow	West	Turning right	Automobile, station wagon	Other motor vehicle	

North      Going ahead      Pick-up truck      Other motor vehicle

**Location:** WOODROFFE AVE @ DEERFOX DR/STONEWAY DR

**Traffic Control:** Traffic signal

**Total Collisions:** 25

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Jan-03, Fri,08:30	Clear	Angle	P.D. only	Ice	North	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Pick-up truck	Other motor vehicle	
2014-Jan-07, Tue,18:45	Clear	Rear end	P.D. only	Ice	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2014-Jan-27, Mon,11:30	Drifting Snow	Angle	P.D. only	Packed snow	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Turning left	Pick-up truck	Other motor vehicle	
2014-Feb-03, Mon,20:33	Snow	Rear end	P.D. only	Dry	South	Going ahead	Passenger van	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2014-Aug-01, Fri,08:30	Clear	Rear end	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle	
					West	Turning right	Pick-up truck	Other motor vehicle	
2014-Sep-15, Mon,15:47	Clear	Turning movement	Non-fatal injury	Dry	West	Turning left	Passenger van	Other motor vehicle	

					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Dec-19, Fri,10:53	Clear	SMV other	Fatal injury	Dry	South	Going ahead	Automobile, station wagon	Pedestrian	1
2015-Feb-20, Fri,19:25	Clear	Rear end	Non-fatal injury	Dry	South	Going ahead	Pick-up truck	Other motor vehicle	
					South	Slowing or stopping	Pick-up truck	Other motor vehicle	
2015-Apr-27, Mon,10:36	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	
					West	Turning left	Truck and trailer	Other motor vehicle	
2015-Jan-02, Fri,13:57	Clear	Angle	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Jan-08, Thu,07:00	Snow	Rear end	Non-fatal injury	Ice	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Pick-up truck	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Oct-16, Fri,21:04	Rain	Angle	P.D. only	Wet	West	Turning right	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Pick-up truck	Other motor vehicle	
2016-Apr-08, Fri,08:28	Clear	Angle	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	

2013-Feb-23, Sat,13:54	Snow	Angle	Non-fatal injury	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Jul-03, Wed,18:15	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Turning right	Pick-up truck	Other motor vehicle
2013-Aug-15, Thu,12:45	Clear	Sideswipe	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2013-Aug-21, Wed,06:54	Clear	Turning movement	P.D. only	Dry	South	Turning left	Pick-up truck	Other motor vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle
2013-Dec-08, Sun,10:27	Clear	Rear end	P.D. only	Dry	North	Going ahead	Passenger van	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2012-Mar-06, Tue,16:23	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Pick-up truck	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2012-May-09, Wed,11:05	Clear	Angle	P.D. only	Dry	West	Turning left	Pick-up truck	Other motor vehicle
					South	Going ahead	Pick-up truck	Other motor vehicle

2012-May-15, Tue,22:15	Clear	SMV other	Non-fatal injury	Dry	North	Going ahead	Municipal transit bus	Pedestrian	1
2012-Aug-31, Fri,20:47	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2012-Jul-10, Tue,12:54	Clear	Angle	P.D. only	Dry	West	Going ahead	Off-road 2 wheels	Other motor vehicle	
					North	Going ahead	Pick-up truck	Other motor vehicle	
2012-Dec-27, Thu,07:06	Snow	Turning movement	P.D. only	Loose snow	South	Turning left	Municipal transit bus	Other motor vehicle	
					North	Going ahead	Pick-up truck	Other motor vehicle	
2012-Dec-28, Fri,15:10	Clear	Rear end	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	

**Location:** WOODROFFE AVE btwn DEERFOX DR & TIERNEY DR

**Traffic Control:** No control

**Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-May-31, Sat,15:15	Clear	Rear end	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	
					North	Slowing or stopping	Passenger van	Other motor vehicle	

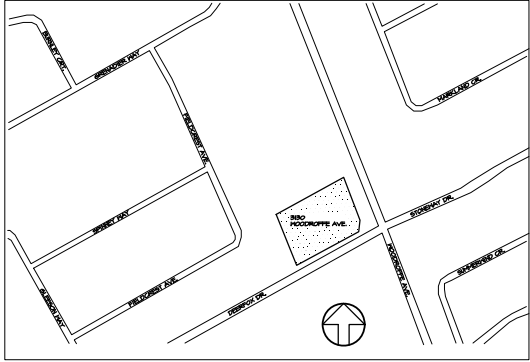


## **APPENDIX F**

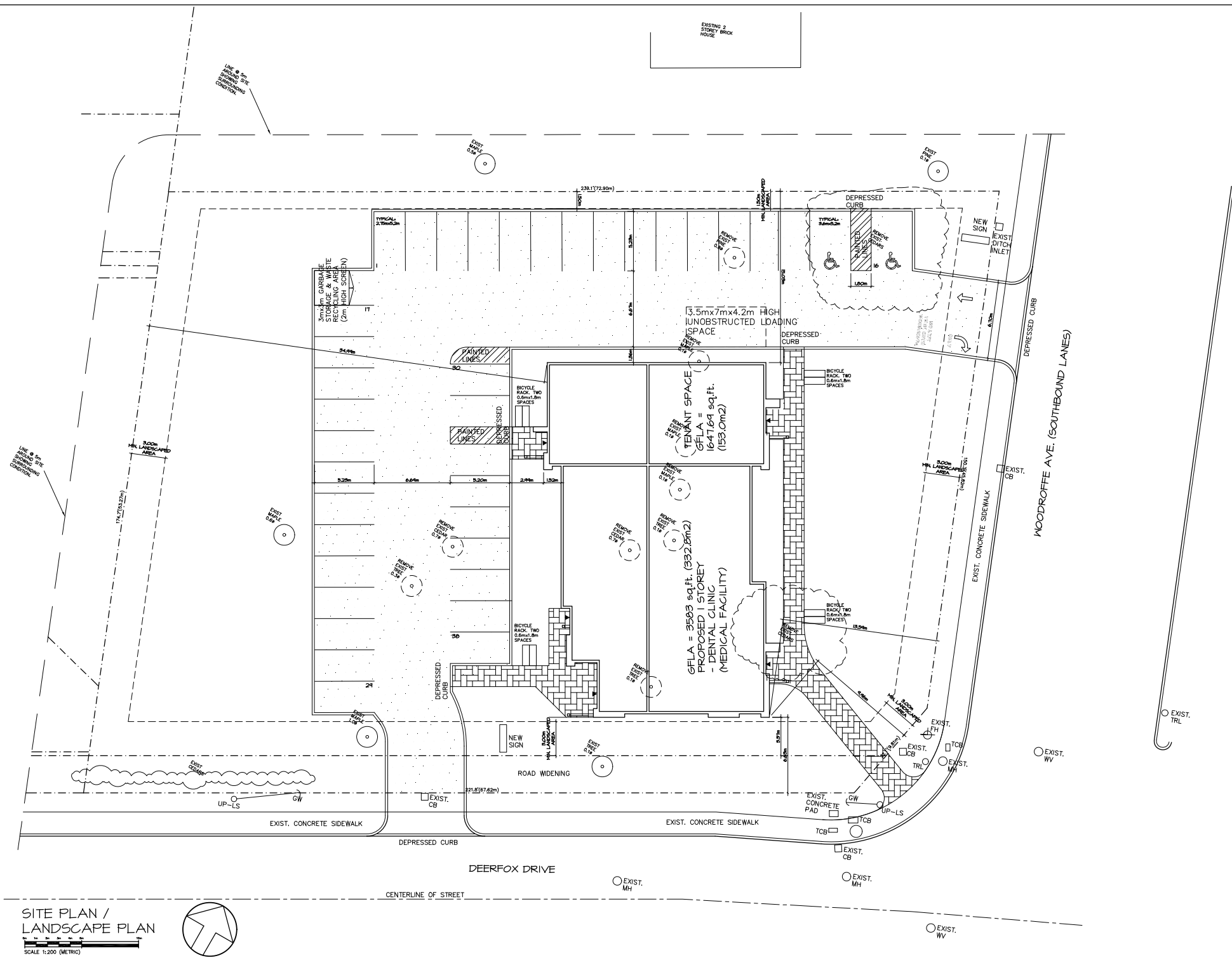
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Excerpts of 3120-3130 Woodroffe Avenue Transportation Briefs





KEY PLAN SCALE N.T.S.



- LEGEND**
- NEW WHITE CEDAR
  - NEW WHITE SPRUCE
  - ENTRANCE LOCATION
  - WINDOW WELL
  - GENERAL LOT DRAINAGE
  - 5' WOOD FENCE
  - HYDRO POLE
  - OVERHEAD WIRE (HYDRO BELL CABLE)
  - 8" DIA. STEEL BOLLARD
  - CB CBMH MH CATCH BASIN, MANHOLE
  - ASPHALT
  - LANDSCAPED

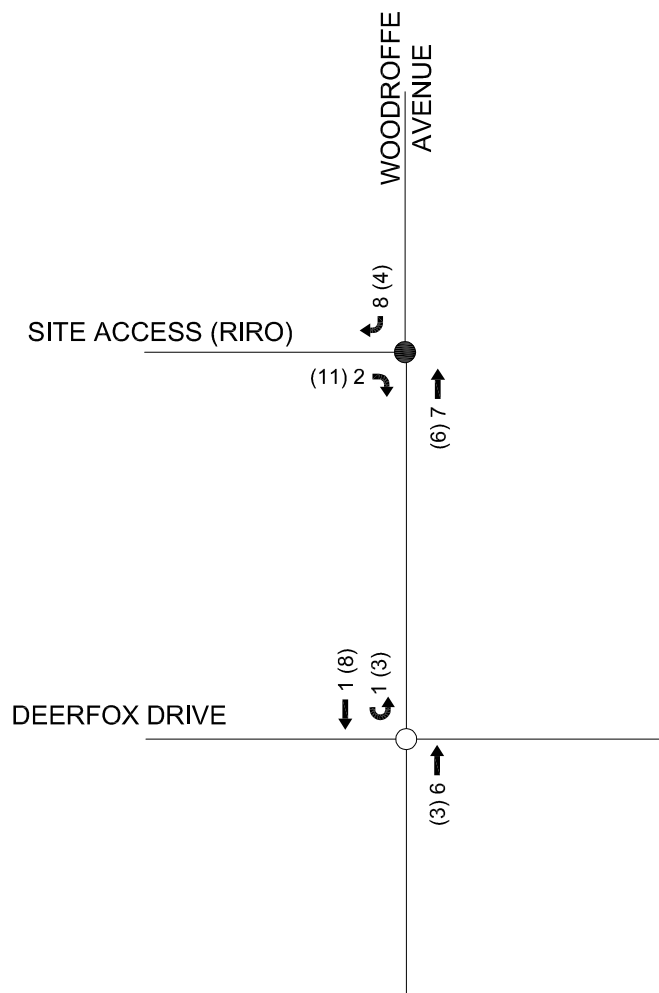
BUILDING AREA = 543.6m<sup>2</sup>  
ASPHALT AREA & CURBS = 1255.4m<sup>2</sup>  
GRASS = 1890.9m<sup>2</sup>  
WALKWAYS/PATIO = 139.5m<sup>2</sup>  
SITE AREA = 3829.48m<sup>2</sup> (41220.2sq.ft.)

**ZONING - LC8(2050)H(1)-h  
LOCAL COMMERCIAL ZONE (SEC.189-190)**

MEDICAL FACILITY  
MIN. LOT WIDTH - No Min.  
MIN. LOT AREA - No Min.  
MAX. BUILDING HEIGHT - 12.5m  
MIN. FRONT YARD SETBACK - 3m  
MIN. CORNER SIDE YARD SETBACK - 3m  
MIN. REAR YARD SETBACK - 7.5m TO RESIDEN. ZONE  
MIN. INTERIOR SIDE YARD SETBACK - No Min.  
MIN. LANDSCAPED AREA WIDTH ABUTTING A STREET - 3m  
ABUTTING A RESIDENTIAL ZONE - 3m  
OTHER CASES - No Min.  
MIN. LANDSCAPED WIDTH AROUND PARKING LOT = SECTION 110

PROPOSED:  
45.82m  
3829.48m<sup>2</sup>  
4.67m  
13.59m  
6.63m (3.37m from future road widening)  
34.99m  
15.03m  
3m  
3m

PARKING-4 Spaces/100m<sup>2</sup> of GFA  
4 spaces x GFA/100 = 19 spaces  
38 SPACES



### LEGEND

- Unsignalized Intersection
- Signalized Intersection
- xx VPH AM Peak Hour
- (xx) VPH PM Peak Hour



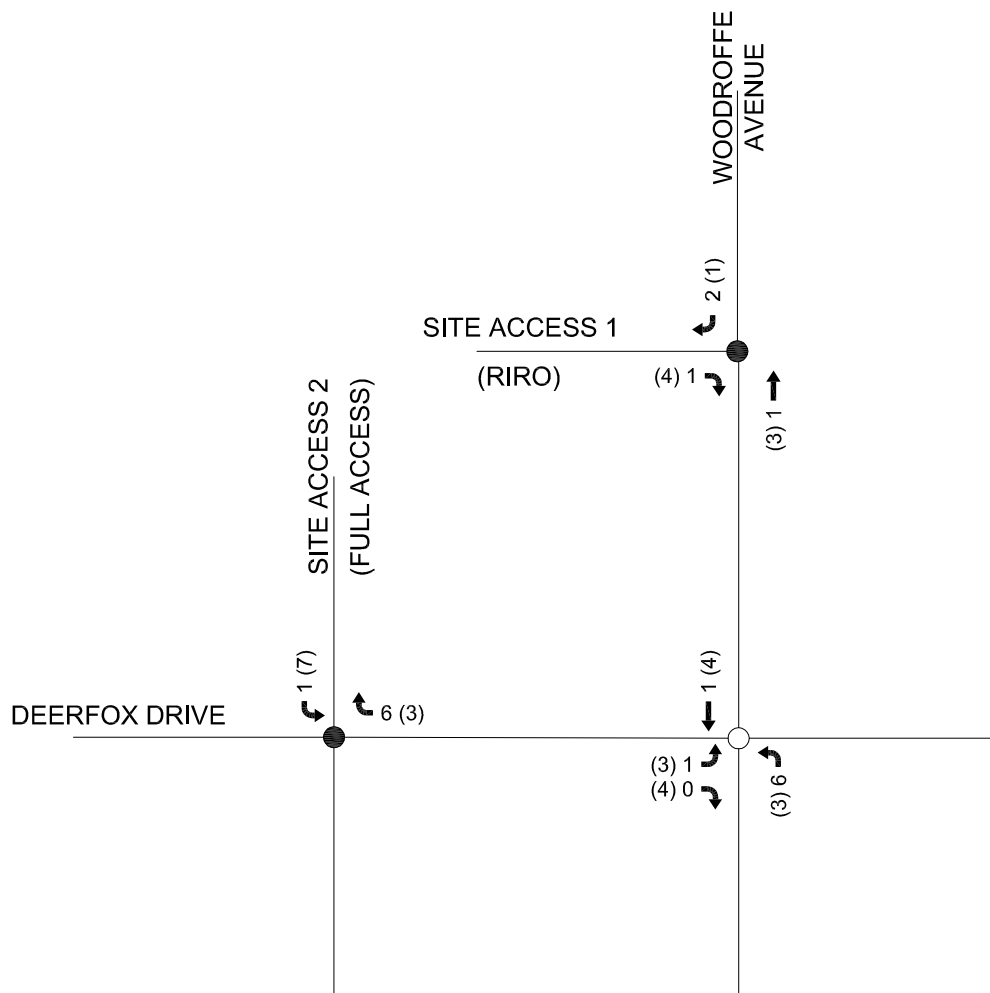
Engineers, Planners & Landscape Architects  
Suite 200, 240 Michael Cowpland Drive  
Ottawa, Ontario, Canada K2M 1P6

Telephone (613) 254-9643  
Facsimile (613) 254-5867  
Website [www.novatech-eng.com](http://www.novatech-eng.com)

3120 WOODROFFE AVENUE

SITE TRAFFIC

DEC 2015 115040 FIGURE 4



### LEGEND

- Unsignalized Intersection
- Signalized Intersection
- xx VPH AM Peak Hour
- (xx) VPH PM Peak Hour



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Website [www.novatech-eng.com](http://www.novatech-eng.com)

3130 WOODROFFE AVENUE

SITE TRAFFIC

DEC 2015

115041

FIGURE 4

## **APPENDIX G**

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### Speed Survey Data

Site Code: 311193311194  
Station ID: 31119  
BET GLEESON WAY AND  
WOODROFFE AVE  
Date Start: 04-Jul-16

Start Time	140	4150	5160	6170	7180	8190	91100	101110	111120	121130	131140	141150	151999	Total
07-07-16	0	4	7	0	0	0	0	0	0	0	0	0	0	11
00:15	0	4	2	0	0	0	0	0	0	0	0	0	0	6
00:30	0	1	1	0	0	0	0	0	0	0	0	0	0	2
00:45	0	3	0	1	0	0	0	0	0	0	0	0	0	4
	0	12	10	1	0	0	0	0	0	0	0	0	0	23
01:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
01:15	1	0	0	1	0	0	0	0	0	0	0	0	0	2
01:30	1	2	0	1	0	0	0	0	0	0	0	0	0	4
01:45	0	3	0	0	0	1	0	0	0	0	0	0	0	4
	2	9	0	2	0	1	0	0	0	0	0	0	0	14
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15	1	0	1	0	0	0	0	0	0	0	0	0	0	2
02:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1	0	1	0	0	0	0	0	0	0	0	0	0	2
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:30	1	0	0	0	0	0	0	0	0	0	0	0	0	1
03:45	1	0	1	0	0	0	0	0	0	0	0	0	0	2
	2	2	1	0	0	0	0	0	0	0	0	0	0	5
04:00	0	1	0	1	0	0	0	0	0	0	0	0	0	2
04:15	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:30	2	2	0	1	0	0	0	0	0	0	0	0	0	5
04:45	0	0	1	0	0	0	0	0	0	0	0	0	0	1
	2	5	1	2	0	0	0	0	0	0	0	0	0	10
05:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
05:15	0	4	0	0	0	0	0	0	0	0	0	0	0	4
05:30	1	1	2	2	0	0	0	0	0	0	0	0	0	6
05:45	1	4	3	0	1	0	0	0	0	0	0	0	0	9
	2	12	6	2	1	0	0	0	0	0	0	0	0	23
06:00	1	11	9	1	0	0	0	0	0	0	0	0	0	22
06:15	3	9	6	1	0	0	0	0	0	0	0	0	0	19
06:30	0	11	6	3	0	0	0	0	0	0	0	0	0	20
06:45	4	13	9	1	0	0	0	0	0	0	0	0	0	27
	8	44	30	6	0	0	0	0	0	0	0	0	0	88
07:00	1	10	14	1	0	0	0	0	0	0	0	0	0	26
07:15	3	9	8	0	0	0	0	0	0	0	0	0	0	20
07:30	1	16	9	0	0	0	0	0	0	0	0	0	0	26
07:45	2	12	20	3	0	0	0	0	0	0	0	0	0	37
	7	47	51	4	0	0	0	0	0	0	0	0	0	109
08:00	4	10	15	0	0									

Total	51	217	172	33	1	1	0	0	0	0	0	0	0	475
Total	680	2531	2487	533	45	6	0	0	0	0	0	0	0	6282

15th Percentile : 41 KPH  
 50th Percentile : 49 KPH  
 85th Percentile : 58 KPH  
 95th Percentile : 65 KPH

Stats                    Mean Speed(Average) : 49 KPH  
                           15 KPH Pace Speed : 41-55 KPH  
                           Number in Pace : 3774  
                           Percent in Pace : 60.1%  
 Number of Vehicles > 40 KPH : 5602  
 Percent of Vehicles > 40 KPH : 89.2%