

**EMERALD SUBDIVISION
6544 JACK PINE CRESCENT
GREELY, ONTARIO**

FORECASTING DOCUMENT

July 8, 2021

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Prepared for:

9287043 Canada Corporation

739 TIA Forecasting.doc

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STEP 1 - SCREENING

A Screening Form has been prepared which is included as Exhibit 1.1 in the Appendix. The Screening Form has satisfied the trip Generation Trigger which required the study to proceed to the Scoping Document stage of the Transportation Impact Assessment (TIA). The following will address the requirements of the Scoping Document.

STEP 2 - SCOPING

MODULE 2.1 – Existing and Planned Conditions

Element 2.1.1 – Proposed Development

The Emerald Subdivision is located on 35.0 ha of vacant land north of Apple Orchard Road and west of Stagecoach Road in the Village of Greely. The property has a “DR1” Zoning - Development Reserve Zone. The Site Plan proposes the subdivision to contain 73 single-family homes. Figure 2.1 provides a site location plan of the development.

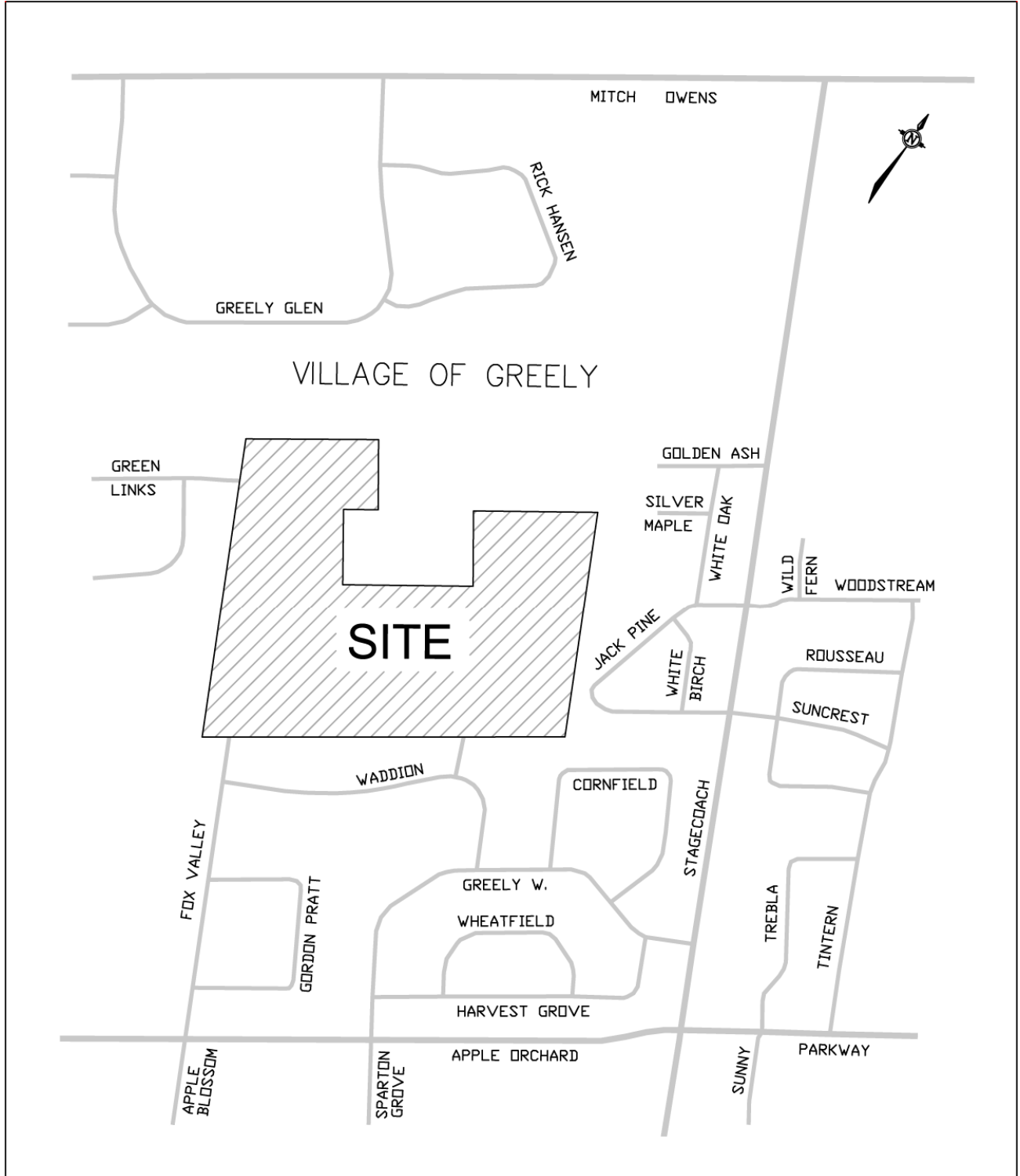
The subdivision site will have three access points, all onto local streets connecting to collector and arterial roads. The first access would be along Jack Pine Crescent to Stagecoach Road, the second along Fox Valley Road to Apple Orchard Road, and the third along the new subdivision road called Green Links Way to Manotick Station Road.

The Emerald Subdivision will be constructed in two phases, and is expected to be totally completed and substantially occupied by the year 2027. Figure 2.2 provides a conceptual site plan of the total subdivision.

Element 2.1.2 – Existing Conditions

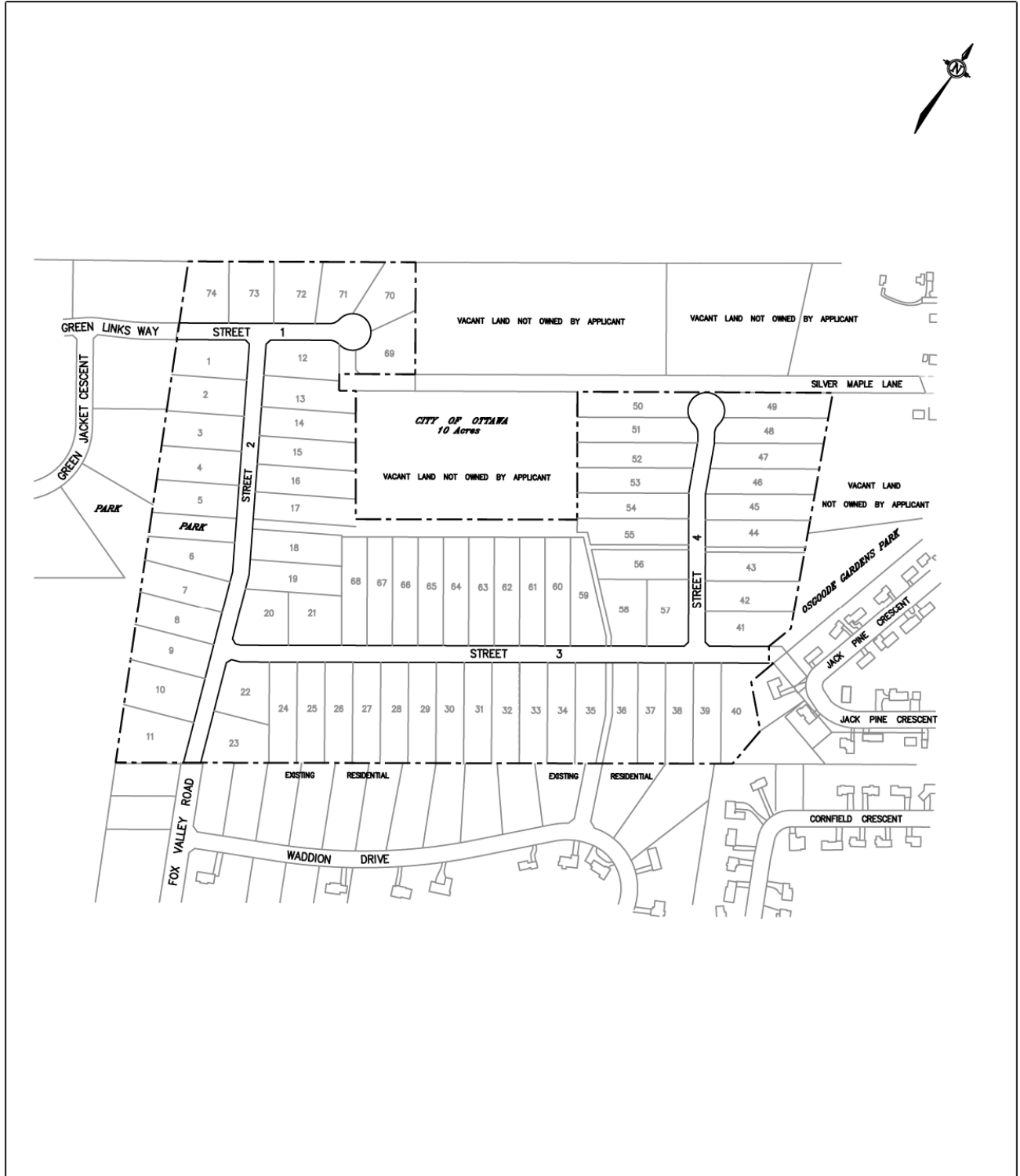
The site is located north of Apple Orchard Road and west of Stagecoach Road on vacant land within the residential community. The subdivision will have three accesses into the site. All accesses will be along local streets which will connect to the surrounding road network.

FIGURE 2.1
SITE LOCATION PLAN



NOT TO SCALE

**FIGURE 2.2
CONCEPTUAL SITE PLAN**



NOT TO SCALE

The following will describe the site access roads and major intersections and road segments within the study area.

JACK PINE CRESCENT

Jack Pine Crescent will provide access to Stagecoach Road for the east portion of the property. Jack Pine Crescent is a local street with a rural cross section and a pavement width of 6.5 m with gravel shoulders. There are no sidewalks along the road. The speed limit is posted at 50 km./h.

FOX VALLEY ROAD

Fox Valley Road is a 7.0 m wide local road connecting the south portion of the property to Apple Orchard Road. The rural road has gravel shoulders with no pedestrian sidewalks. The road does have a pedestrian pathway along the east side of the road from Apple Orchard Road to a point 75 m north of Gordon Pratt Crescent which is approximately 215 m south of the site. The speed limit is unposted.

GREEN LINKS WAY

Green Links Way is a local street constructed as part of the Emerald Links Phase 3 development. The street has been constructed and will provide access to the west portion of the property. The homes have not been built at the time this report is being prepared. Green links Way is a local street with a rural cross-section and a 7.0 m pavement surface with gravel shoulders. There are no sidewalks along the road.

STAGECOACH ROAD

Stagecoach Road is a north-south road designated in the TMP as an arterial road. The road has a two lane rural cross-section and 1.5 m paved shoulders with gravel shoulders. The TMP identifies Stagecoach Road between Mitch Owens Road and Apple Orchard Road as a Spine Route in the Cycling Network-Primary Rural map. There are no sidewalks or dedicated cycling lanes along the road. The speed limit in the vicinity of the site is posted at 70 km./h.

APPLE ORCHARD ROAD

Apple Orchard Road is an east-west collector road. The road is a two lane rural road with gravel shoulders and a 7.0 m pavement width. There are no sidewalks along the road. Apple Orchard Road is a local cycling route with a speed limit posted at 70 km./h.

MANOTICK STATION ROAD

Manotick Station Road is a north-south collector road with a rural cross-section. The road has a pavement width of 7.0 m with gravel shoulders and no sidewalks. The Emerald Subdivision will link to Manotick Station Road through the new Green Links Way which was constructed in 2021.

INTERSECTION OF JACK PINE CRESCENT AND STAGECOACH ROAD

The Jack Pine/Stagecoach intersection is a two-way stop controlled intersection. Stagecoach Road forms the northbound and southbound approaches, Jack Pine Crescent the eastbound approach and Suncrest Drive the westbound approach. Stop signs are placed at the eastbound and westbound approaches. Below is the existing lane configuration of the intersection:

Northbound Stagecoach Road	One shared left/through/right lane
Southbound Stagecoach Road	One shared left/through/right lane
Eastbound Jack Pine Crescent	One shared left/through/right lane (Stop Sign)
Westbound Suncrest Drive	One shared left/through/right lane (Stop Sign)

An aerial photograph of the Jack Pine/Stagecoach intersection showing the intersection geometry is provided below.

INTERSECTION OF JACK PINE CRESCENT AND STAGECOACH ROAD



INTERSECTION OF FOX VALLEY ROAD AND APPLE ORCHARD ROAD

The intersection of Fox Valley Road and Apple Orchard Road is a two-way stop controlled intersection providing access to the south portion of the subdivision. Apple Orchard Road forms the eastbound and westbound approaches, and Fox Valley Road the southbound and Apple Blossom Way the northbound approaches. There are no exclusive turn lanes at the intersection with stop signs placed at the northbound and southbound approaches. Below is the existing lane configuration of the intersection of Fox Valley Road and Apple Orchard:

Northbound Apple Blossom Way	One shared left/through/right lane (Stop Sign)
Southbound Fox Valley Crescent	One shared left/through/right lane (Stop Sign)
Eastbound Apple Orchard Road	One shared left/through/right lane
Westbound Apple Orchard Road	One shared left/through/right lane

The intersection lane geometry is provided below in an aerial photograph.

INTERSECTION OF FOX VALLEY ROAD AND APPLE ORCHARD ROAD



INTERSECTION OF GREEN LINKS WAY AND MANOTICK STATION ROAD

The intersection of Green Links Way and Manotick Station Road is a “T” intersection with Green Links Way forming the westbound stop controlled approach, and Manotick Station Road the northbound and southbound approaches. Green Links Way is being constructed as part of the Emerald Links Phase 3 development, and will provide access to the northwest area of the Emerald Subdivision. At the time this report is being prepared, the road has been constructed along with the asphalt paved surface. No housing units have been completed. Below is the existing lane configuration to the Green Links/Manotick Station intersection:

Northbound Manotick Station Road	One shared through/right lane
Southbound Manotick Station Road	One shared left/through lane
Westbound Green Links Way	One shared left/right turn lane (Stop Sign)

An aerial photograph taken in 2019 is provided below showing the geometry of the Green Links/Manotick Station intersection.

INTERSECTION OF GREEN LINKS WAY AND MANOTICK STATION ROAD



INTERSECTION OF APPLE ORCHARD ROAD AND STAGECOACH ROAD

The intersection of Apple Orchard Road and Stagecoach Road has been recently changed from a two-way stop controlled intersection to an all-way stop controlled intersection. The intersection was modified in 2018 to align the eastbound Apple Orchard Road approach with the westbound Parkway Road approach. There are no dedicated turn lanes at any of the approaches. Below is the existing lane configuration of the intersection of Apple Orchard Road and Stagecoach Road:

Northbound Stagecoach Road	One shared left/through/right lane (Stop Sign)
Southbound Stagecoach Road	One shared left/through/right lane (Stop Sign)
Eastbound Apple Orchard Road	One shared left/through/right lane (Stop Sign)
Westbound Parkway Road	One shared left/through/right lane (Stop Sign)

The lane geometry is shown in an aerial photograph of the Apple Orchard/Stagecoach intersection.

INTERSECTION OF APPLE ORCHARD ROAD AND STAGECOACH ROAD



The most recent traffic counts were obtained from the City of Ottawa for the intersections of Jack Pine/Stagecoach (2019) and Apple Orchard/Stagecoach (2018). Traffic counts will be conducted by the consultant at the Fox Valley/Apple Orchard and Green Links/Manotick Station intersections in 2021 (The counts have not been taken to date but will be conducted at the Forecasting Document stage). Figure 2.3 shows the peak AM and PM hour intersection counts. The counts are provided in the Appendix.

TRANSIT

There is no OC Transpo transit service to the Greely Community.

COLLISION HISTORY

Collision reports were obtained from the City of Ottawa through Open Data Ottawa for the five year time period between the years January 1, 2015 and December 31, 2019. The collision reports were for the Jack Pine/Stagecoach, Fox Valley/Apple Orchard and Apple Orchard/Stagecoach intersections. The Green Links/Manotick Station intersection was not completed until 2021 and no collision data is available. Reported collisions were also obtained for the Stagecoach Road segment between Apple Orchard Road and Jack Pine Crescent (Woodstream Drive), and the Apple Orchard Road segment between Stagecoach Road and Manotick Station Road.

During the five year period, the Apple Orchard/Stagecoach intersection experienced 4 collisions, the Stagecoach Road segment 3 collisions, and the Apple Orchard Road segment 2 collisions. Exhibit 2.3 summarizes the collisions by year and type.

Element 2.1.3 – Planned Conditions

The *Transportation Master Plan 2013* (TMP) was examined to determine if there were any road or transit projects identified within the road network of the surrounding area.

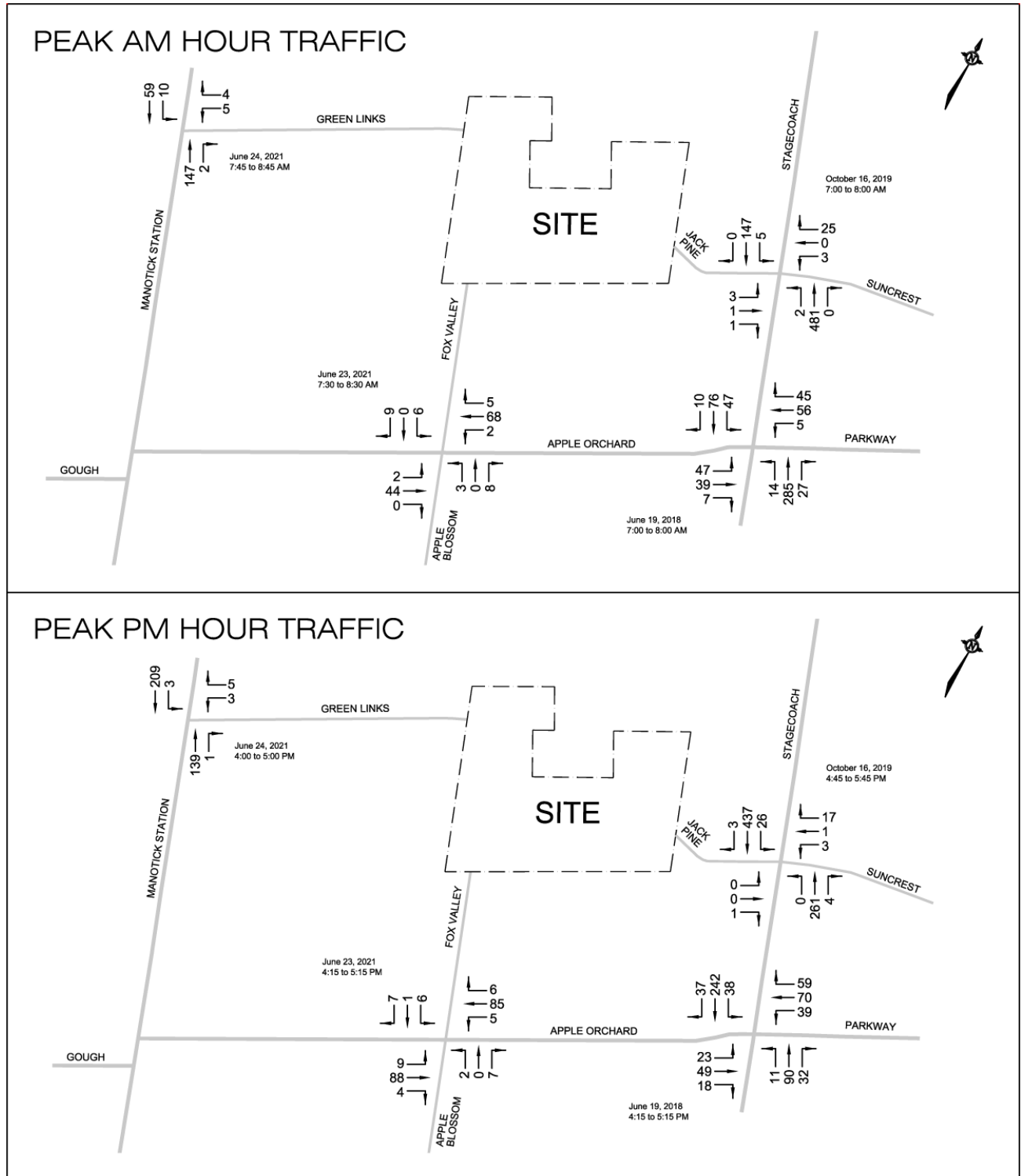
The TMP did not identify any road modifications projects in the Affordable Network Plan for the surrounding area. The Apple Orchard/Stagecoach intersection was modified in 2018 to align Apple Orchard Road with Parkway Road. Traffic control signals may be installed at a future date when warranted.

The Greely Community does not have OC Transpo bus service. There are no transit projects identified in the TMP for the Greely area.

The following is the only significant development proposed or under construction within one kilometre of the site:

- The Emerald Links Phase 3 subdivision is proposed adjacent to the west limit of the site. The subdivision proposes 43 single-family homes with one access onto Manotick Station Road, and a second access along Green Links Way which connects to Street 1 of the Emerald Subdivision. The subdivision is currently under construction and is expected to be completed by the 2027 build out date.

**FIGURE 2.3
 PEAK AM AND PM HOUR TRAFFIC COUNTS**



MODULE 2.2 – Study Area and Time Periods

Element 2.2.1 – Study Area

The study area for the Emerald Subdivision will be confined to the site access points at the Jack Pine/Stagecoach, Fox Valley/Apple Orchard and Green Links/Manotick Station intersections. The Apple Orchard/Stagecoach intersection will also be included in the analysis. The intersections represent the subdivision access points and major intersections within one kilometre of the site.

The study will examine the intersection geometry and roadway segments in accordance with the *Transportation Impact Assessment Guidelines (2017)*. Traffic calming measures within the internal subdivision streets will be examined in accordance with the City of Ottawa *Traffic Calming Design Guidelines, April 2019*.

Element 2.2.2 – Time Periods

The time period for the analysis would be the weekday peak AM and PM time period of traffic which would occur during the peak hour of the subdivision development and the adjacent road traffic when drivers are travelling to and from work.

Element 2.2.3 – Horizon Years

The TIA will address the impact of the site generated trips from the proposed residential subdivision. The horizon year of the study will be the total completion of the development at the year 2027. The analysis will further examine the impact at the year 2032 which is five years beyond completion.

MODULE 2.3 – Exemptions Review

The exemptions, which provide possible reductions to the scope of work of the TIA Study, were examined using Table 4: Possible Exemptions which is provided in the City's *Transportation Impact Assessment Guidelines (2017)*. Utilizing the table, the following lists the possible exemptions proposed for the TIA Study report:

MODULE	ELEMENT	EXEMPTION CONSIDERATIONS
Design Review Component		
4.1 Development Design	4.1.2 Circulation and Access	Not Required – Only required for site plans
	4.1.3 New Street Networks	Required - Required for subdivisions
4.2 Parking	4.2.1 Parking Supply	Not Required – Only required for site plans
	4.2.2 Spillover Parking	Not Required - Only required for site plans

Network Impact Component		
4.5 Transportation Demand Management	All Elements	Required – TDM measures will be examined
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Required – The site will have access onto arterial or collector roads through local streets from the subdivision
4.8 Network Concept		Not Required - The subdivision would not generate more than 200 person-trips per peak hour in excess of the volume permitted by established zoning

STEP 3 - FORECASTING

MODULE 3.1 - Development-generated Travel Demand

Element 3.1.1 – Trip Generation and Mode Shares

The Emerald Subdivision will consist of 73 single-family homes on a 35.0 ha parcel of land. The site will have access to Stagecoach Road, Apple Orchard Road and Manotick Station Road from three internal local streets.

The number of expected site generated trips utilized the trip statistical data documented in the *TRANS Trip Generation Manual, Summary Report October 2020*. The analysis used the Person-Trip Generation Rates from Table 3 of the TRANS document for ITE Land Use Code 210, “Single-detached”. Peak period person-trips would occur between 7:00 AM and 9:30 AM, and between 3:30 PM and 6:00 PM. The person-trip rates for the AM and PM peak period are shown below in Table 3.1.

**TABLE 3.1
 PEAK PERIOD PERSON-TRIP GENERATION RATES AND TRIPS**

Single-Family Housing	Peak AM Period	Peak PM Period
Trip Rate	2.05 T/Dwelling Units	2.48 T/Dwelling Units
Person-Trips (73 Units)	150 Person-Trips	181 Person-Trips

The Emerald Subdivision is located in the Rural Southeast sector of the region. The mode share of peak period trips was determined from Table 6 of the TRANS document for Single-Detached Housing located in Other Rural Districts sector. Since there is no transit service in the Greely area, the transit share shown in Table 6 was evenly distributed between the Auto Driver and Auto Passenger travel modes. Table 3.2 below presents the peak period person-trips from the subdivision for various modes of travel.

**TABLE 3.2
 MODE SHARE SUMMARY (Peak Period Person-Trips)**

FUTURE MODE SHARE TARGETS FOR SINGLE-DETACHED HOUSING				
Travel Mode	AM % Peak Period	AM Per. Trips Peak Period	PM % Peak Period	PM Per. Trips Peak Period
Auto Driver	72%	108	74%	134
Auto Passenger	26%	39	24%	43
Transit	0%	0	0%	0
Cycling	2%	3	2%	4
Walking	0%	0	0%	0
Total	100%	150 per. trips	100%	181 per. trips

The Mode Share of Table 3.2 presenting the peak period person-trips was adjusted to peak hour person-trips using the adjustment factors presented in Table 4 of the TRANS document. Table 3.3 shows the peak AM and PM hour person-trips.

**TABLE 3.3
 MODE SHARE SUMMARY (Peak AM and PM Hour Person-Trips)**

PEAK AM AND PM HOUR PERSON-TRIPS		
Travel Mode	Peak AM Hour	Peak PM Hour
Auto Driver	52	59
Auto Passenger	20	19
Transit	0	0
Cycling	2	2
Walking	0	0

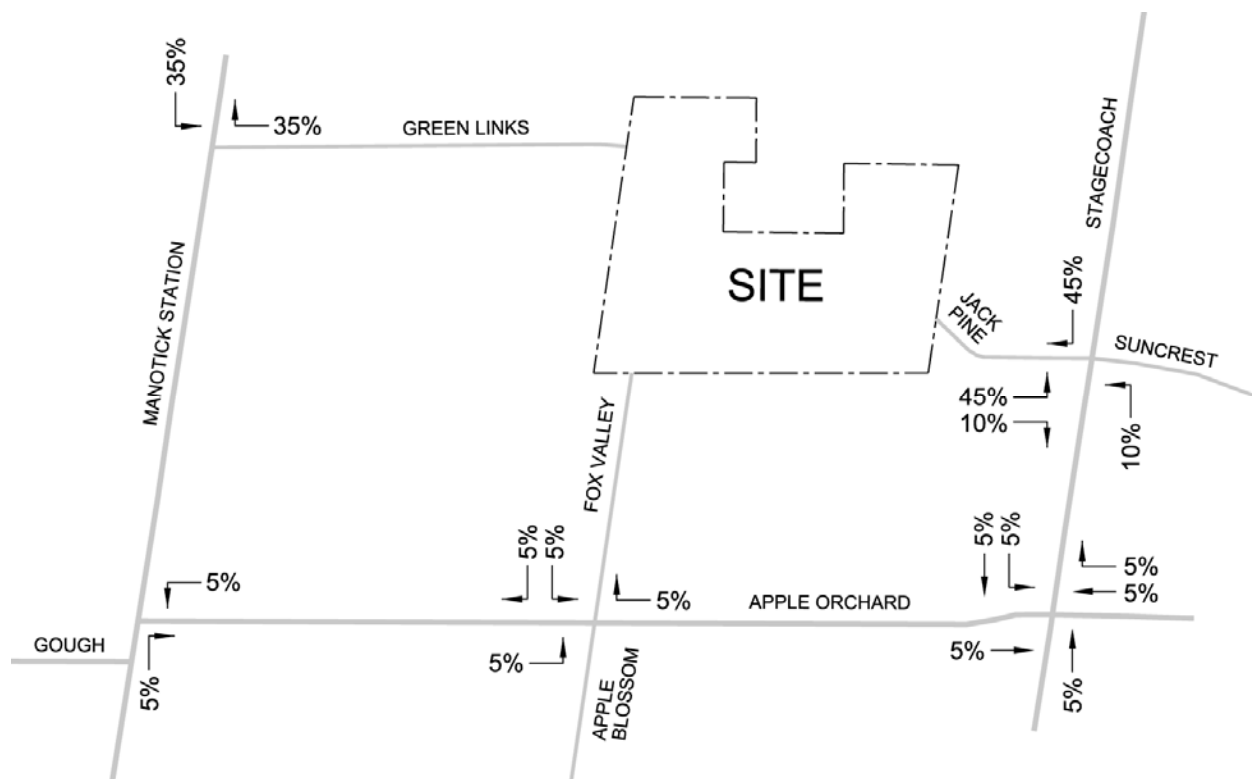
The TIA Guidelines allow for three Trip Reduction Factors. The three trip reductions would consist of trips from existing development on site, pass-by trips, and shared trips within the site between two or more uses. No trip reduction factors were applied for the following reasons:

1. The site is vacant with no existing development on site which would generate new trips.
2. The residential use would generate all primary trips with no pass-by trips.
3. The residential single-family home land use would be a single use with no shared trips between other uses on site.

Element 3.1.2 – Trip Distribution

The distribution of site generated vehicle-trips for the proposed Emerald Subdivision was determined from the traffic patterns determined from the peak hour traffic counts at surrounding intersections which would comprise mainly of trips to/from work. The trip pattern was applied to the access points to the subdivision assuming the shortest and most convenient route. The trip distribution for the residential trips during the weekday peak AM and PM hour is shown in the figure below.

SUBDIVISION TRIP DISTRIBUTION



Element 3.1.3 – Trip Assignment

The distribution of site generated vehicle-trips was determined by applying the directional distribution shown in Table 9 of the TRANS document for a single-detached housing type, to the Auto Driver trips shown in Table 3.3. Table 3.4 presents the distribution of vehicle-trips entering and exiting the subdivision.

**TABLE 3.4
 PEAK HOUR DISTRIBUTION OF VEHICLE-TRIPS**

LAND USE \ PEAK HOUR TRIPS	WEEKDAY PEAK AM HR.			WEEKDAY PEAK PM HR.		
	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT
73 Single-Family Homes	52	16 (30%)	36 (70%)	59	37 (62%)	22 (38%)

The trip distribution, as discussed in Element 3.1.2, was applied to the peak AM and PM peak hour vehicle-trips shown in Table 3.4. Figure 3.1 presents the peak AM and PM hour residential trips to/from the site.

MODULE 3.2 - Background Network Travel Demands

Element 3.2.1 – Transportation Network Plans

The City of Ottawa *Transportation Master Plan (TMP) 2013* was reviewed to identify transit and roadway projects in the vicinity of the development. The east-west approaches (Apple Orchard and Parkway) of the Apple Orchard/Stagecoach intersection were aligned during an intersection modification in 2018. The intersection is an all-way stop controlled intersection with the possibility of traffic signals at a future date when warranted. There are no transportation projects identified in the TMP.

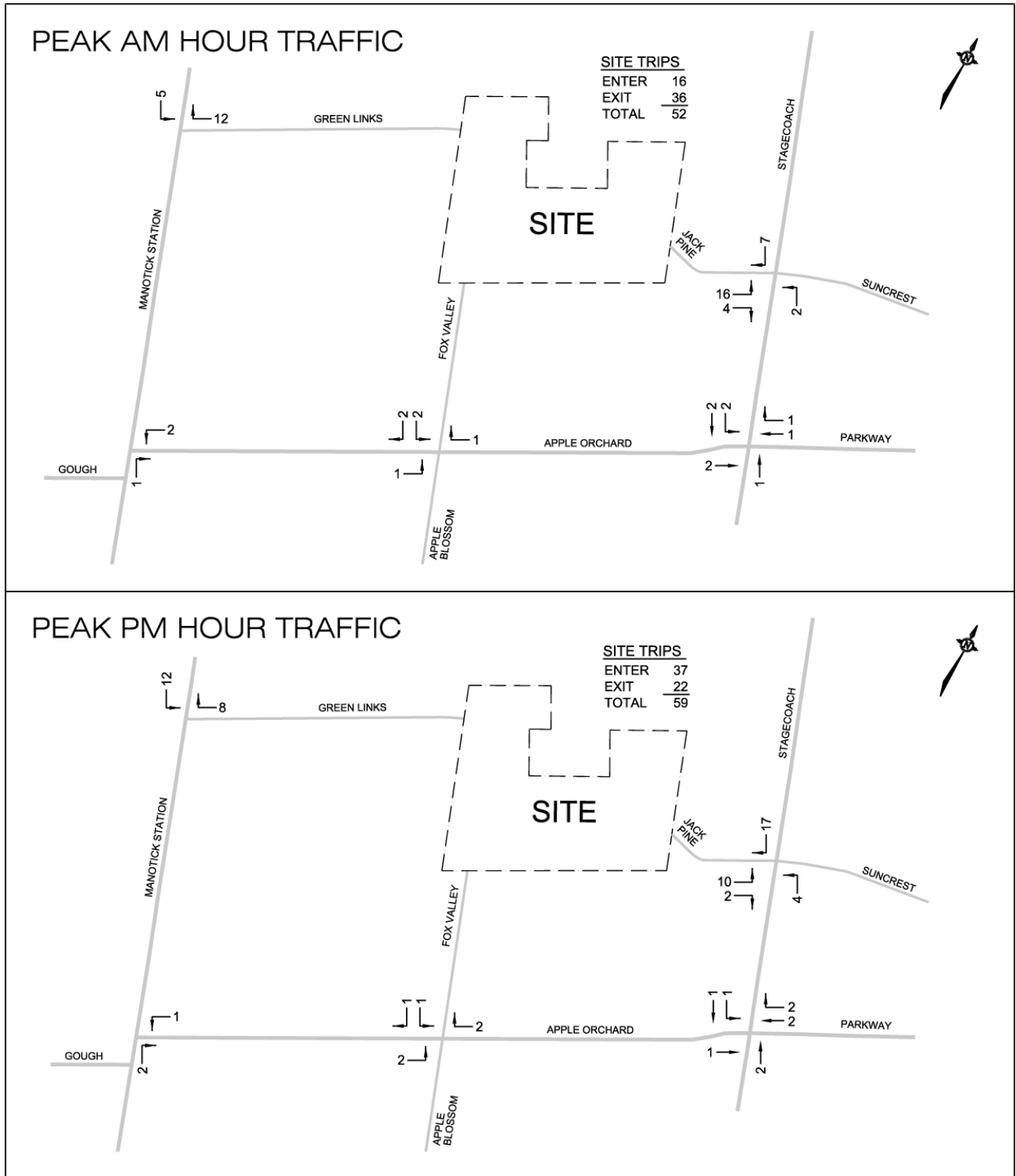
Element 3.2.2 – Background Growth

Peak hour traffic counts were taken by the consultant at the Fox Valley/Apple Orchard and Green Links/Manotick Station intersections in July 2021. To convert the 2021 counts to the expected pre-COVID-19 traffic volumes, a conversion factor was applied to the counts. The factor was determined from a comparison of traffic counts taken in 2018 and again in 2020 on a rural section of Russell Road east of Ottawa which would capture commuter trips travelling to/from Ottawa for work. The counts showed that the 2020 counts decreased by 11 percent during the peak AM hour and 15 percent during the peak PM hour when compared to the 2018 counts. The study has therefore assumed a 20 percent COVID-19 adjustment factor which was applied to all approaches of the Fox Valley/Apple Orchard and Green Links/Manotick Station intersections which converted the counts to pre- COVID-19 traffic volumes.

The growth in background traffic at the intersections within the study area was determined by the following two methods:

- The examination of historical traffic counts obtained from the City of Ottawa at the Apple Orchard/Stagecoach intersection between the year of 2011 and 2018. The counts determined that the volume of background traffic decreased at an annual average compounded rate of between -2 and -3 percent.

**FIGURE 3.1
 PEAK AM AND PM HOUR SITE GENERATED TRIPS**



NOT TO SCALE

- The trip trend of trips to/from the Rural Southeast area for auto driver trips was examined in the *National Capital Region Travel Trends* document prepared by the IBI Group. The document showed that the trip trend from the Rural Southeast area has increased at an annual average compounded rate of 0.88 percent for the peak AM hour between the years of 2005 and 2011.

The study has therefore assumed that the background traffic would experience an annual average compounded increase of 1.0 percent which is consistent with traffic studies for other development in the area. The 1.0 percent annual increase would translate to the following growth factors which were applied to all intersection approaches:

Growth Factor at the Jack Pine/Stagecoach Intersection

2019 → 2027 = 1.083 Completion
2019 → 2032 = 1.138 Completion + 5 Years

Growth Factor at the Apple Orchard/Stagecoach Intersection

2018 → 2027 = 1.094 Completion
2018 → 2032 = 1.149 Completion + 5 Years

Growth Factor at Fox Valley/Apple Orchard and Green Links/Manotick Station Intersections

2021 → 2027 = 1.062 Completion
2021 → 2032 = 1.116 Completion + 5 Years

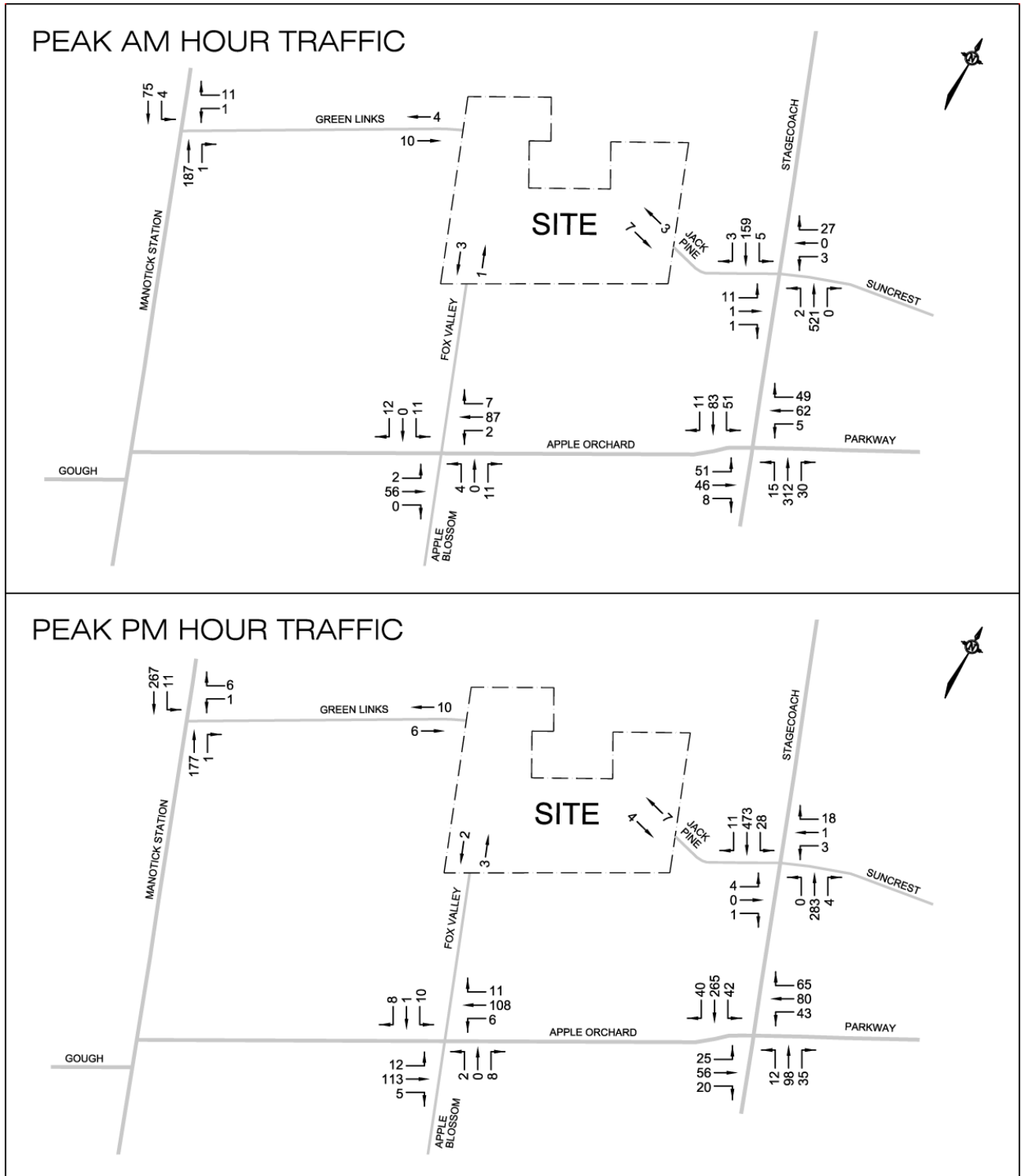
Element 3.2.3 – Other Developments

Other development in the area which would contribute to the increase in background traffic is the following:

- The Emerald Links Country Estates Phase III subdivision is located adjacent to the west limit of the subdivision. The Emerald Links Country Estates will contain 43 single-family homes which are currently under construction. The development will have one access point onto Manotick Station Road, with access through the proposed Emerald Subdivision to Fox Valley Road and to Stagecoach Road by way of Jack Pine Crescent. Due to the size of the subdivision, no TIA study was required but trips were determined using the TRANS Trip Generation Manual.

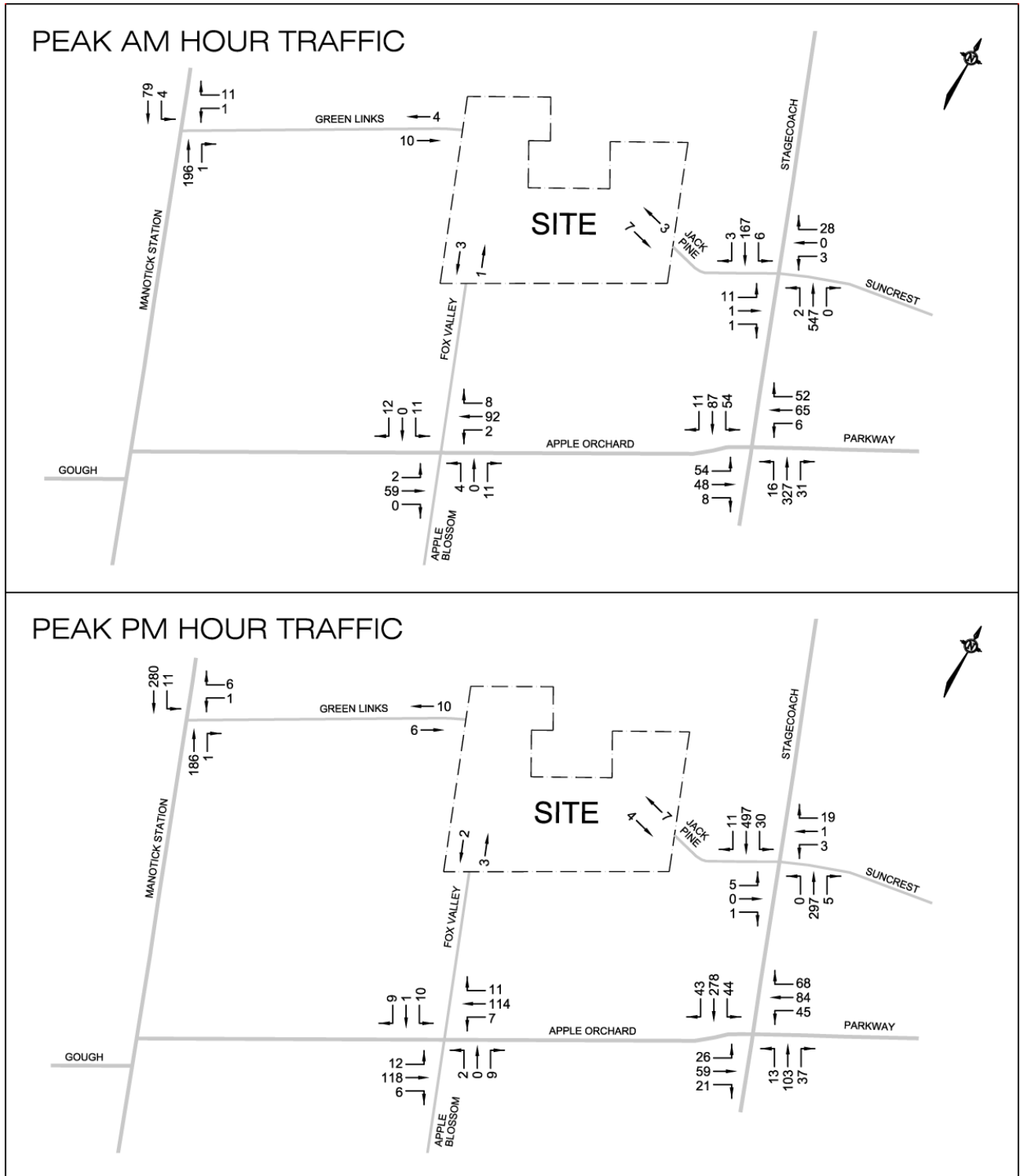
The COVID-19 adjustment, the annual average growth in background traffic, and the site generated trips from the Emerald Links Country Estates subdivision were applied to all approaches of the intersections examined in the study area. Figure 3.2 presents the 2027 peak AM and PM peak hour background vehicle traffic (does not include trips from the proposed Emerald Subdivision). Figure 3.3 shows the expected 2032 peak hour background traffic which represents five years beyond completion of the development.

FIGURE 3.2
2027 PEAK AM AND PM HOUR BACKGROUND TRAFFIC



NOT TO SCALE

FIGURE 3.3
2032 PEAK AM AND PM HOUR BACKGROUND TRAFFIC



NOT TO SCALE

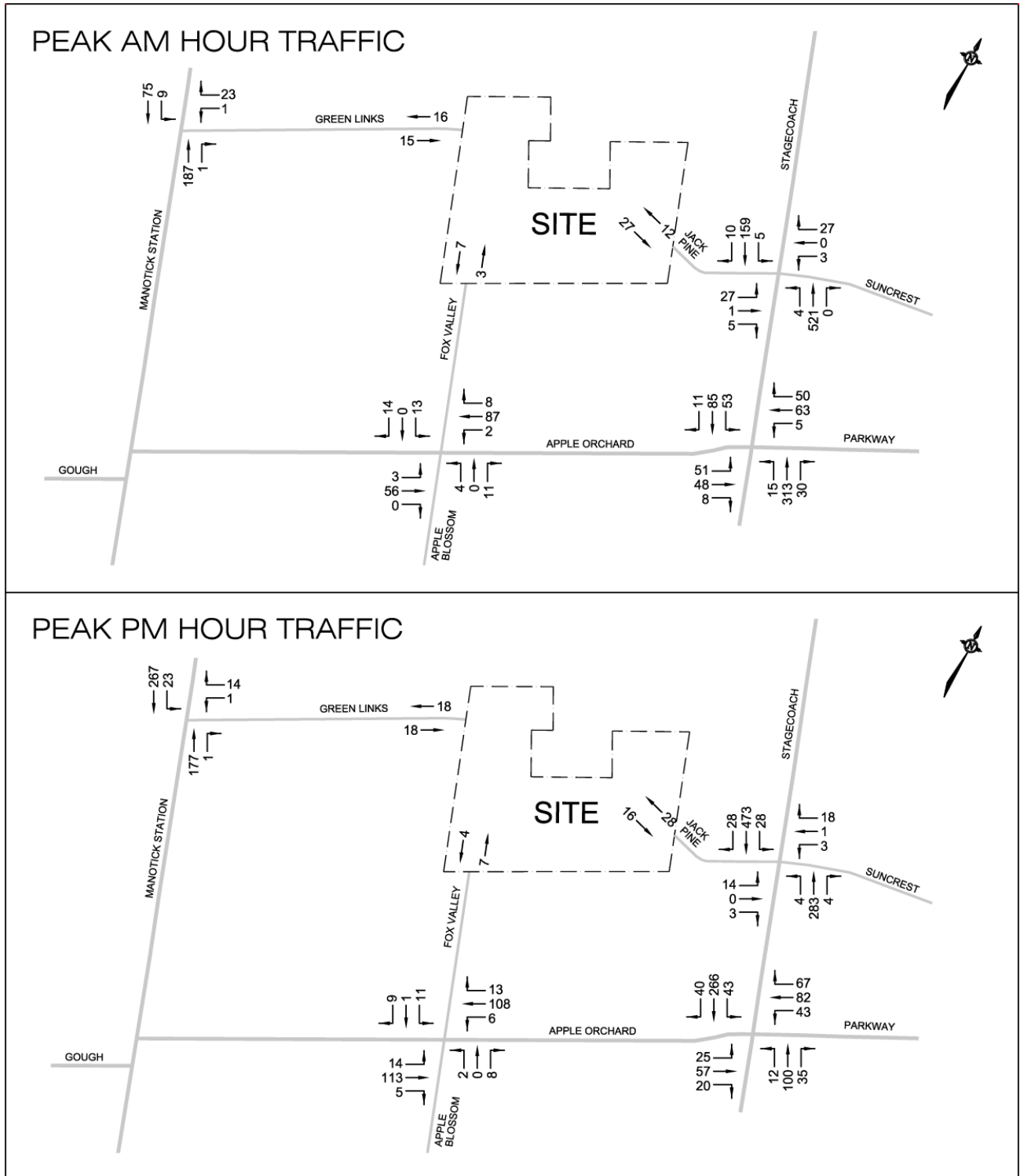
MODULE 3.3 - Demand Rationalization

The Village of Greely is in a low density rural area. All roadways in the area handle a low volume of traffic and contain sufficient capacity for future development. The transportation network in the study area comprises of two lane rural roads. There are no exclusive turn lanes at any of the intersections, and all intersections are controlled by stop signs.

The trips generated by the site are expected to be low resulting in a minor impact on the surrounding road network. There would be no requirement to reduce travel demand from the development due to insufficient infrastructure capacity. Any reduction in peak hour travel demand could be accomplished by providing OC Transpo transit service to Greely.

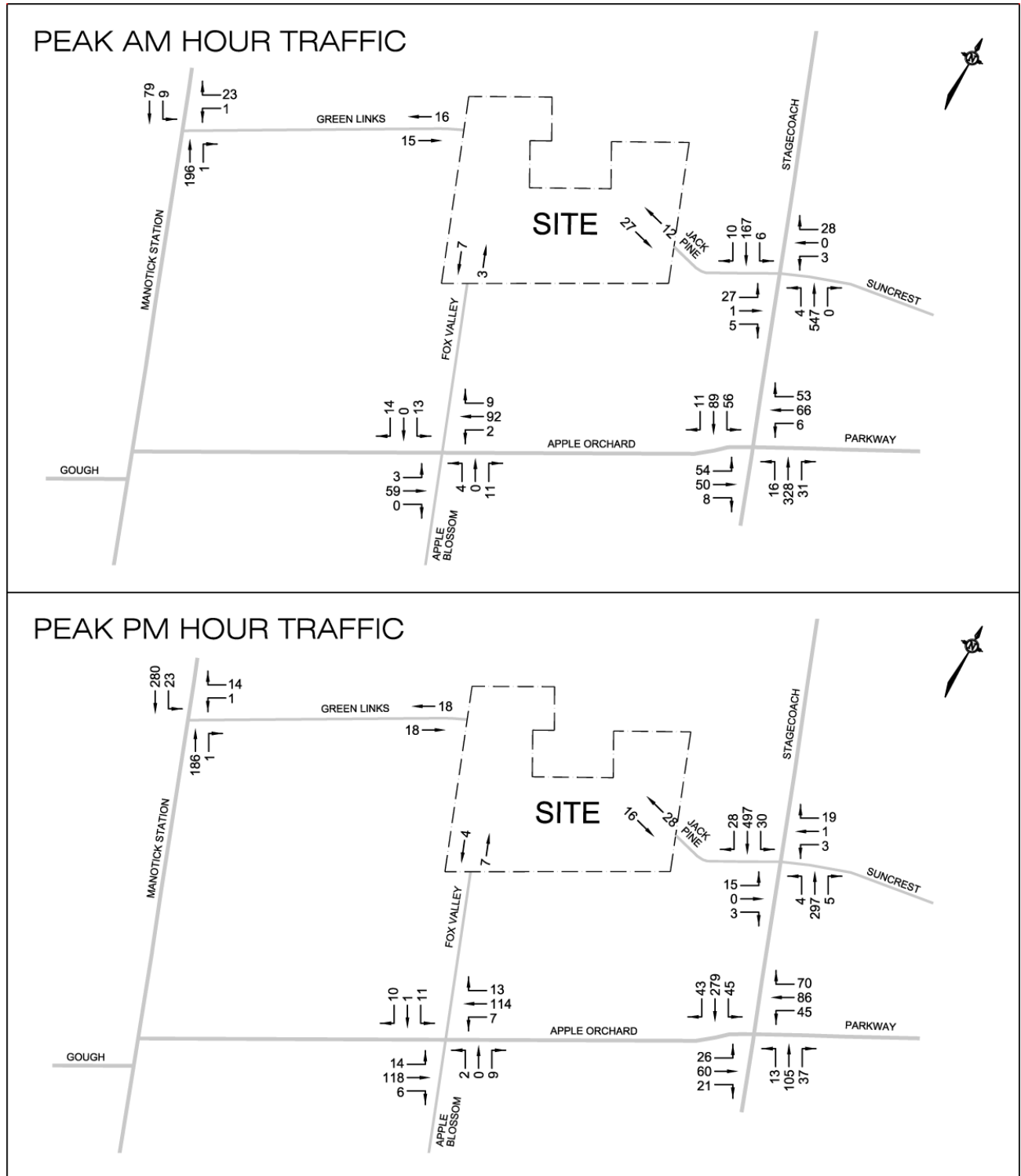
The total vehicular traffic is the sum of the peak hour site generated trips and the peak hour background traffic. The site generated trips would be the addition of the Emerald Subdivision trips from Figure 3.1, and the background traffic (Figure 3.2 for the year 2027 and Figure 3.3 for the year 2032). Figure 3.4 presents the total 2027 peak hour vehicular traffic and Figure 3.5 the total 2032 peak hour vehicular traffic.

FIGURE 3.4
2027 PEAK AM AND PM HOUR TOTAL TRAFFIC



NOT TO SCALE

FIGURE 3.5
2032 PEAK AM AND PM HOUR TOTAL TRAFFIC



NOT TO SCALE

APPENDIX

SCREENING FORM

TRAFFIC COUNTS

COLLISION SUMMARY

EXHIBIT 1.1 SCREENING FORM

City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	Village of Greely. One of seven parcels with address 6544 Jack Pine Cr.
Description of Location	Emerald Subdivision - 6544 Jack Pins Crescent (See Figure 2.1)
Land Use Classification	"DR1" Zoning – Development Reserve Zone
Development Size (units)	73 Single-Family Housing Units (See Figure 2.2)
Development Size (ha)	35.0 ha Lot Area
Number of Accesses and Locations	Three accesses. One access onto Fox Valley Road, second onto Jack Pine Crescent, and third onto Green Links Way
Phase of Development	Two Phases of development
Buildout Year	2027

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

	Yes	No
73 Single-Family units > 40 Minimum Development Size	X	

** 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 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).

EXHIBIT 2.1
2019 PEAK AM HOUR TRAFFIC COUNTS - STAGECOACH/JACK PINE



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

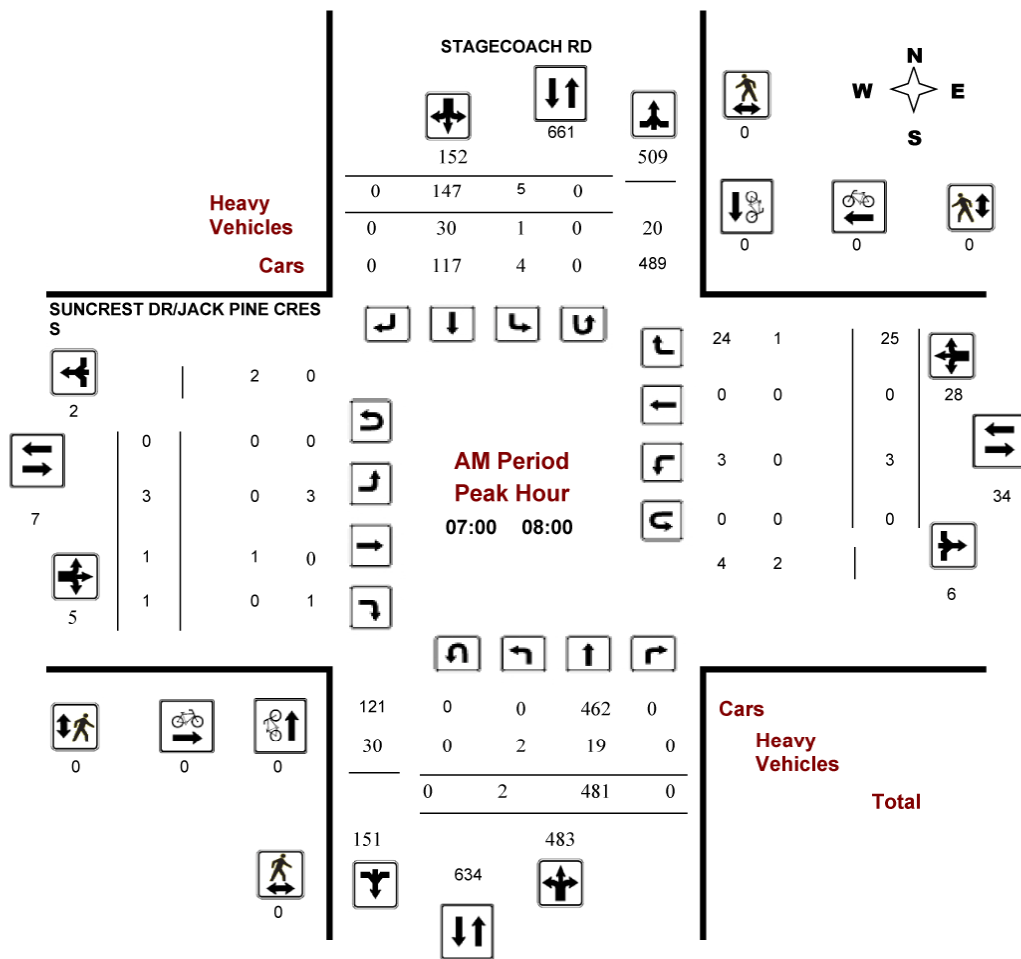
STAGECOACH RD @ SUNCREST DR/JACK PINE CRES S

Survey Date: Wednesday, October 16, 2019

WO No: 38885

Start Time: 07:00

Device: Miovision



2019 PEAK PM HOUR TRAFFIC COUNTS - STAGECOACH/JACK PINE



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

STAGECOACH RD @ SUNCREST DR/JACK PINE CRES S

Survey Date: Wednesday, October 16, 2019

WO No: 38885

Start Time: 07:00

Device: Miovision

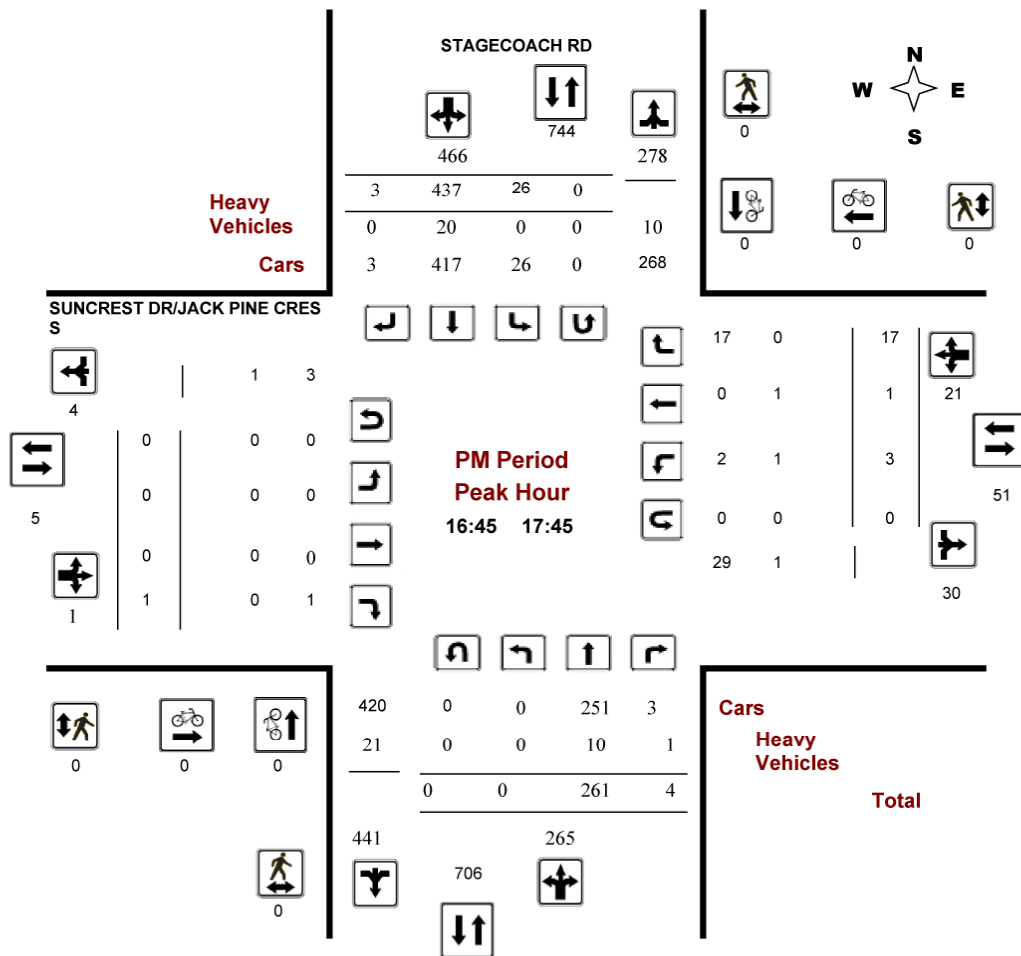


EXHIBIT 2.2
2018 PEAK AM HOUR TRAFFIC COUNTS - APPLE ORCHARD/STAGECOACH



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

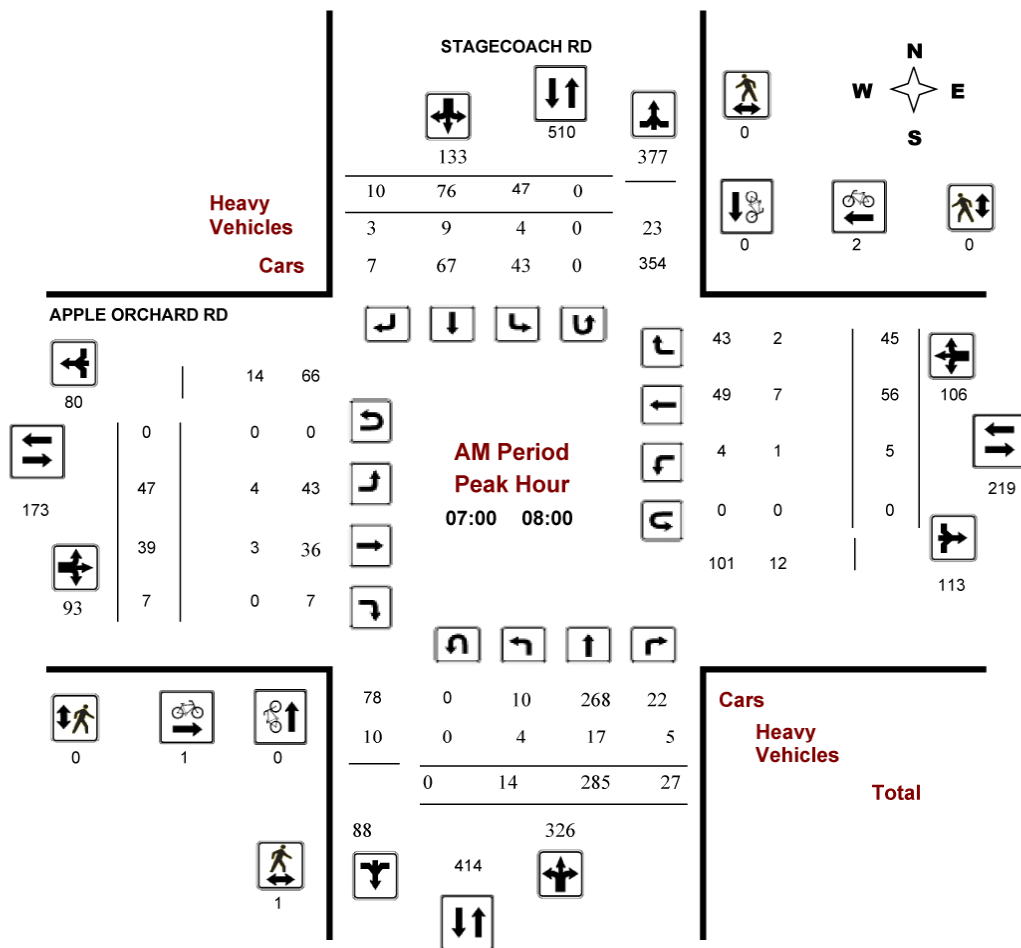
APPLE ORCHARD RD @ STAGECOACH RD

Survey Date: Tuesday, June 19, 2018

Start Time: 07:00

WO No: 39839

Device: Miovision



2018 PEAK PM HOUR TRAFFIC COUNTS - APPLE ORCHARD/STAGECOACH



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

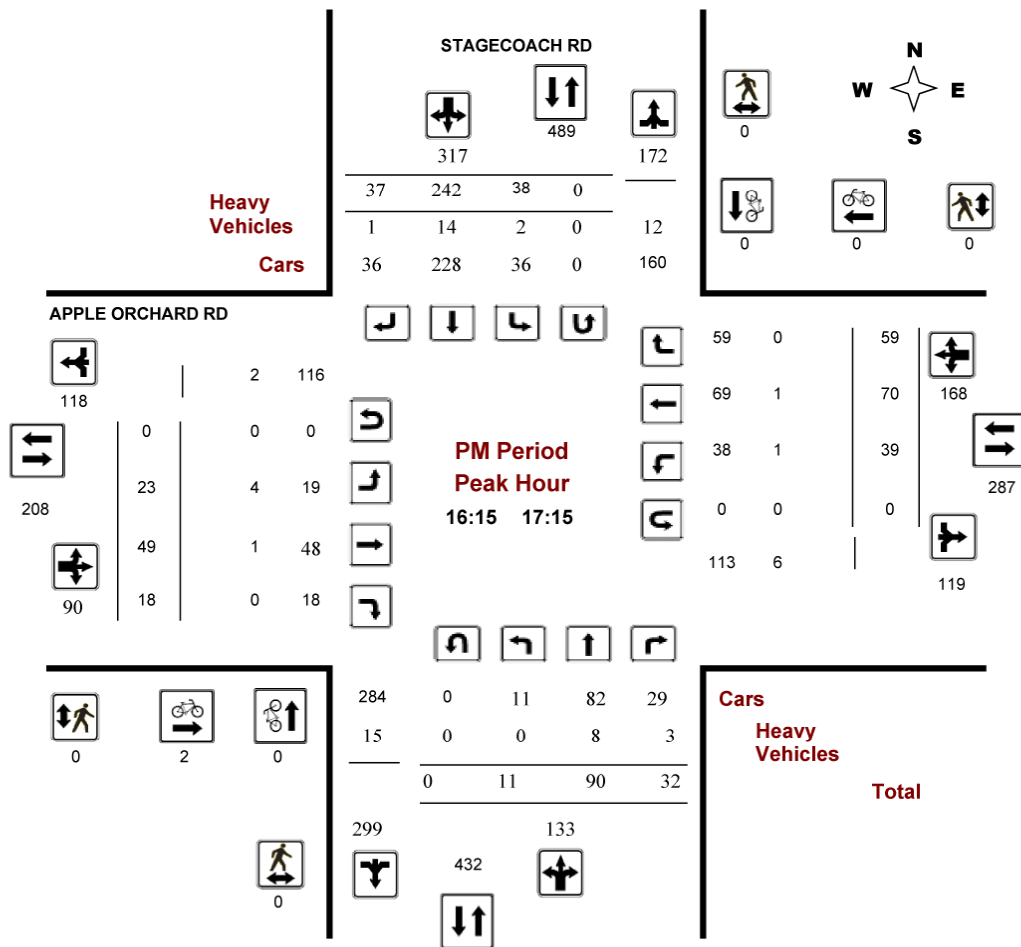
APPLE ORCHARD RD @ STAGECOACH RD

Survey Date: Tuesday, June 19, 2018

WO No: 39839

Start Time: 07:00

Device: Miovision



**EXHIBIT 2.3
 COLLISION SUMMARY**

YEAR	COLLISION TYPE				OTHER (SMV)	TOTAL
	REAR END	ANGULAR	TURNING	SIDESWIPE		
Intersection of Jack Pine Crescent and Stagecoach Road						
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	0	0	0	0	0	0
Intersection of Fox Valley Road and Apple Orchard Road						
2015	0	0	0	0	0	0
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	0	0	0	0	0	0
Intersection of Apple Orchard Road and Stagecoach Road						
2015	0	0	0	0	0	0
2016	0	0	1	0	0	1
2017	0	1	0	0	0	1
2018	0	1	0	0	0	1
2019	<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>
Total	0	3	1	0	0	4
Stagecoach Road Segment between Jack Pine Ct. N and Apple Orchard Rd.						
2015	0	0	0	0	1	1
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	0	0	0
2019	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u>2</u>
Total	0	0	1	0	2	3
Apple Orchard Road Segment between Stagecoach Rd. and Manotick Station Rd.						
2015	0	0	0	0	1	1
2016	0	0	0	0	0	0
2017	0	0	0	0	0	0
2018	0	0	0	0	1	1
2019	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	0	0	0	0	2	2