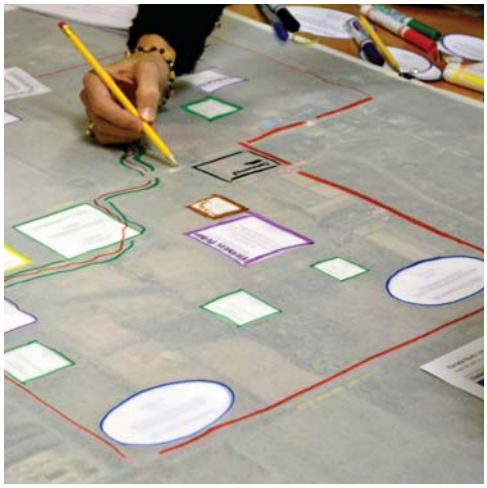
KANATA NORTH
COMMUNITY DESIGN PLAN

TRANSPORTATION MASTER PLAN

EXISTING CONDITIONS REPORT & ADDENDUM



FINAL DRAFT
JUNE 28, 2016

Ottawa

NOVATECH
Engineers, Planners & Landscape Architects

KANATA NORTH COMMUNITY DESIGN PLAN

TRANSPORTATION MASTER PLAN

PREPARED BY:

NOVATECH
SUITE 200, 240 MICHAEL COWPLAND DRIVE
OTTAWA, ON K2M 1P6

WITH THE ASSISTANCE OF:

INTEGRATED ENVIRONMENTAL ASSESSMENT
MORRISON HERSHFIELD GROUP INC.

JUNE/28/2016

NOVATECH FILE NO. 112117
REPORT NO. R-2015-161

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APPENDIX A

KNCDP TMP Existing Conditions Report

Kanata North Urban Expansion Study Area
Community Design Plan
Transportation Master Plan

EXISTING CONDITIONS REPORT

Prepared By:

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

September 2013

Novatech File: 112117
Ref No. R-2013-114

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1.0 INTRODUCTION

The purpose of this report is to describe the current transportation infrastructure network and operating conditions within the Kanata North Urban Expansion Study Area (KNUESA).

The Kanata North Urban Expansion Study Area has an area of approximately 185 hectares (455 acres), encompassing the land north of the established communities of Morgan's Grant, Briarbrook and Brookside, extending east-west from the Canadian National Railway (CNR) to approximately 750m east of Second Line Road. The Kanata North Urban Expansion Study Area is shown in **Figure 1**.

This report will form part of the Community Design Plan (CDP) process which has been initiated as a joint venture of the City of Ottawa and the major land owners within the study area.

2.0 TRANSPORTATION AREA OF INTEREST (TAI)

From the perspective of the existing transportation network and operating conditions, the study area for this report extends beyond the limits of the KNUESA. This report addresses the transportation-related matters in an area bounded by the following:

- to the north, March Road;
- to the south, Terry Fox Drive;
- to the east, March Valley Road;
- to the west, Second Line Road.

The foregoing area is described as the Transportation Area of Interest (TAI) and its limits are shown in **Figure 2**.

3.0 EXISTING TRANSPORTATION CONDITIONS

3.1 Existing Major Road Network

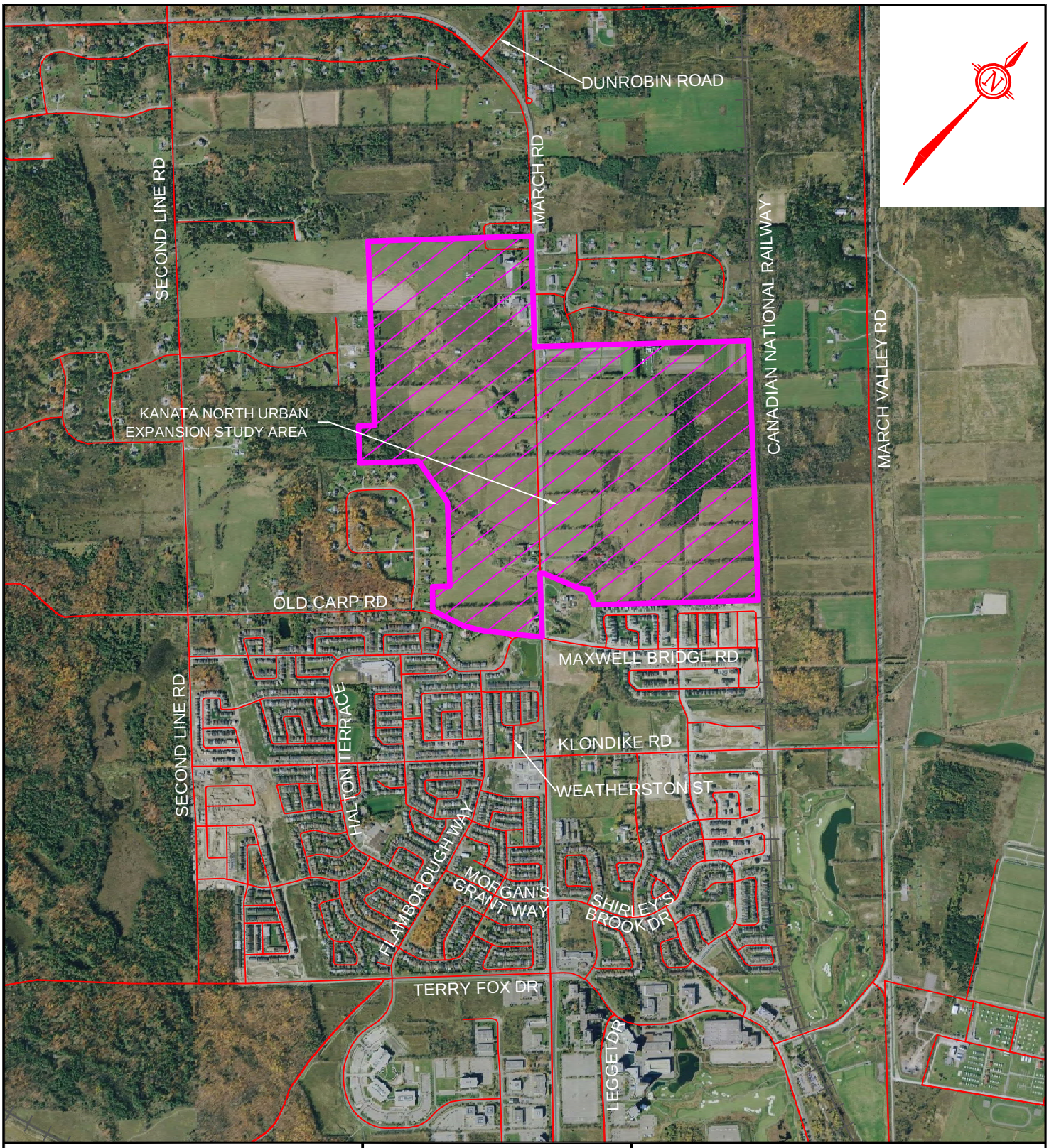
The existing major roadways within the TAI are described as follows:

Terry Fox Drive
Terry Fox Drive is an arterial roadway that runs on an east-west alignment within the TAI. Within the TAI, the intersections of Second Line Road, Flamborough Way and March Road at Terry Fox Drive are signalized.

East of March Road, Terry Fox Drive has a two-lane divided urban cross-section with a posted speed limit of 50kph. West of March Road, Terry Fox Drive has a two-lane undivided rural cross-section with a posted speed limit of 60kph.

March Road
March Road is an arterial roadway that generally runs on a north-south alignment. Within the TAI, the intersections of Second Line Road, Dunrobin Road, Maxwell Bridge Road / Halton Terrace, 250m north of Klondike Road (Sobeys), Klondike Road, Morgans Grant Way / Shirley's Brook Drive and Terry Fox Drive at March Road are signalized.

North of Maxwell Bridge Road, March Road has a two-lane undivided rural cross-section with paved shoulders. South of Maxwell Bridge Road, March Road has a six-lane divided urban cross-

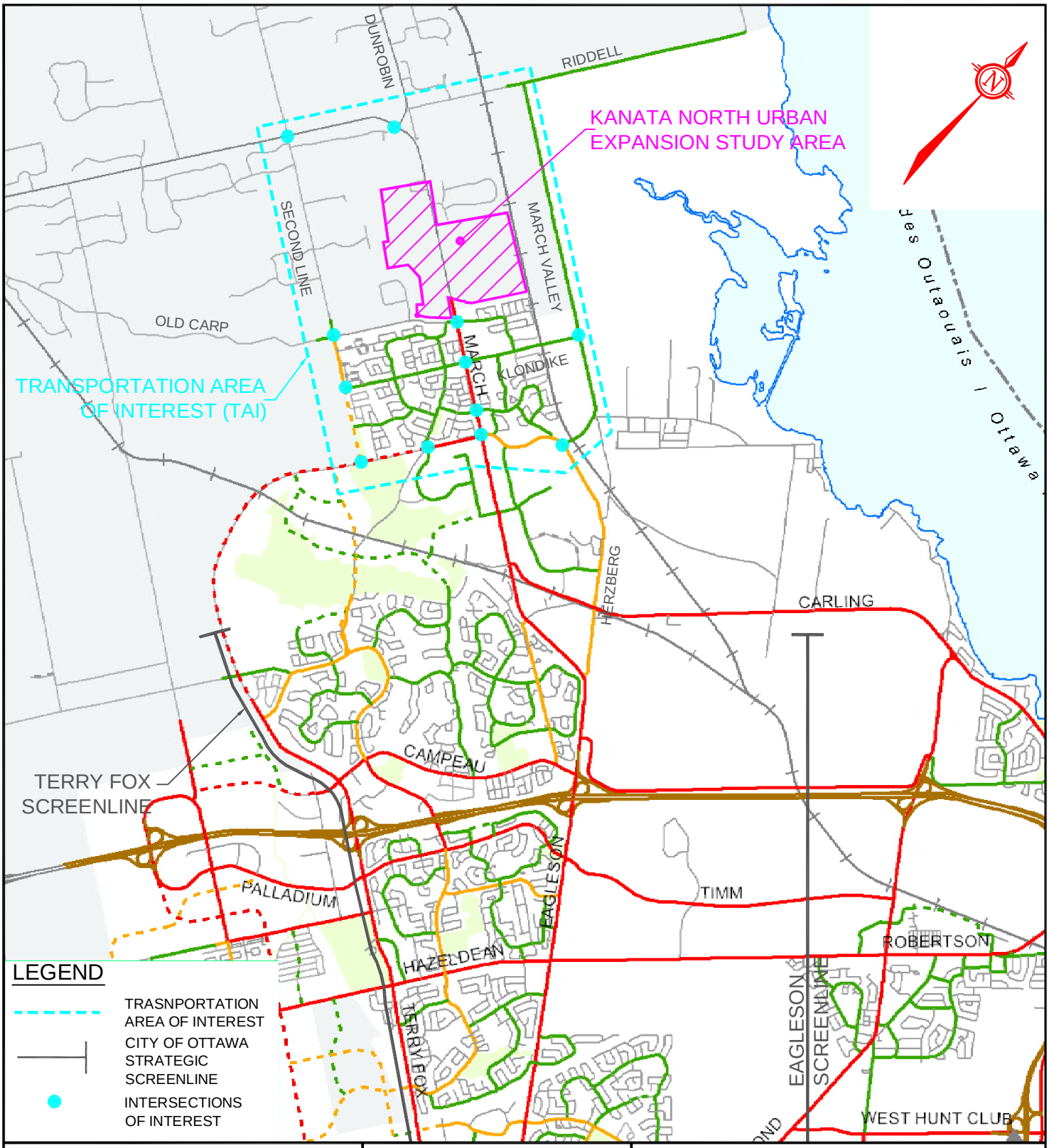


NOVATECH
ENGINEERING
CONSULTANTS LTD.
ENGINEERS & PLANNERS
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada
K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Email: novainfo@novatech-eng.com

KANATA NORTH URBAN EXPANSION STUDY AREA

KEY PLAN

SCALE		
NTS		
DATE	JOB	FIGURE
MAR 2013	112117	FIGURE # 1



NOVATECH
ENGINEERING CONSULTANTS LTD.
ENGINEERS & PLANNERS
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada
K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Email: novainfo@novatech-eng.com

KANATA NORTH URBAN EXPANSION STUDY AREA

TRANSPORTATION AREA OF INTEREST (TAI)

SCALE		
NTS		
DATE	JOB	FIGURE
MAR 2013	112117	FIGURE # 2

section with exception to the segment between Terry Fox Drive and Herzberg Road, where it tapers to a four-lane cross section. March Road has a posted speed limit of 80kph within the TAI.

Dunrobin Road
Dunrobin Road is an arterial roadway that runs on a north-south alignment. The intersection of March Road / Dunrobin Road is signalized. Dunrobin road has a two-lane undivided rural cross-section with paved shoulders. The posted speed limit along Dunrobin Road is 60kph within the TAI.

Second Line Road
Second Line Road runs on a north-south alignment, and is classified as a major collector roadway south of Old Carp Road, and a collector roadway north of Old Carp Road. The intersections of March Road and Terry Fox Drive at Second Line Road are signalized. Within the TAI, Second Line Road has a two-lane undivided rural cross-section with gravel shoulders. Second Line Road has a posted speed limit of 60kph south of Old Carp Road, and 70 kph north of Old Carp Road.

March Valley Road
March Valley Road is a collector roadway that runs on a north-south alignment between Terry Fox Drive and Riddell Drive. March Valley Road has a two-lane undivided rural cross-section with gravel shoulders. The posted speed limit along March Valley Road is 70kph.

Morgan's Grant Way
Morgan's Grant Way is a collector roadway that runs on an east-west alignment between March Road and Flamborough Way. Morgan's Grant Way has a two-lane undivided urban cross-section with a regulatory speed limit of 50kph under the Highway Traffic Act. The March Road / Morgan's Grant Way intersection is signalized.

Shirley's Brook Drive
Shirley's Brook Drive is a collector roadway that generally runs on an east-west alignment between March Road and Helmsdale Drive. Shirley's Brook Drive has a two-lane undivided urban cross-section with a posted speed limit of 40kph.The March Road / Shirley's Brook Drive intersection is signalized.

Klondike Road
Klondike Road is a collector roadway that runs on an east-west alignment between Second Line Road and March Valley Road. Signalized intersections exist along Klondike Road at March Road and Weatherston Street.

Klondike Road has a two-lane undivided urban cross-section west of March Road. East of March Road, Klondike Road has a rural cross-section with gravel shoulders. The roadway segment between Sandhill Road and the CNR has an urban undivided cross-section. Klondike Road has a posted speed limit of 70kph east of the CNR, and 50kph west of the CNR.

Weatherston Street
Weatherston Street is a residential roadway that runs on a north-south alignment between Klondike Road and Breckenridge Cresent. Weatherston Street has a two-lane undivided urban cross-section with a regulatory speed limit of 50kph under the Highway Traffic Act. The Klondike Road / Weatherston Street intersection is signalized.

Halton Terrace
Halton Terrace is a collector roadway that runs between March Road and Flamborough Way. The March Road / Halton Terrace intersection is signalized. Halton Terrace has a two-lane undivided urban cross-section with a posted speed limit of 40kph.

Maxwell Bridge Road
Maxwell Bridge Road is a collector roadway that runs on an east-west alignment between March Road and Celtic Ridge Crescent. The March Road / Maxwell Bridge intersection is signalized. Maxwell Bridge Road has a two-lane undivided urban cross-section with a regulatory speed limit of 50kph under the Highway Traffic Act.

Flamborough Way
Flamborough Way is a collector roadway that runs on a north-south alignment between Halton Terrace and Terry Fox Drive. The Terry Fox Drive / Flamborough Way intersection is signalized. Flamborough Way has a two-lane undivided urban cross-section with a posted speed limit of 40kph.

Old Carp Road
Old Carp Road is a residential roadway that runs on an east-west alignment within the TAI. Within the TAI, Old Carp Road has a two-lane undivided rural cross-section with a posted speed limit of 40kph within the TAI.

3.2 Existing Traffic Volumes

Traffic counts were obtained from the City of Ottawa to verify the existing traffic volumes at the majority of the major intersections within the TAI. As recent traffic counts at some of the major intersections were unavailable, traffic counts were completed by Novatech Engineering Consultants (NECL) at the remaining major intersections within the TAI. The traffic counts were completed at the following times and locations:

- March Road / Second Line Road – Tuesday, August 7th 2012 – (City of Ottawa);
- March Road / Dunrobin Road – Thursday, July 26th 2012 – (City of Ottawa);
- March Road / Halton Terrace / Maxwell Bridge Road – Wednesday, January 16th 2013 – (NECL);
- March Road / Klondike Road – Wednesday, January 30th 2013 – (City of Ottawa);
- March Road / Morgan's Grant Way / Shirley's Brook Drive – Tuesday, August 7th 2012 – (City of Ottawa);
- March Road / Terry Fox Drive – Wednesday, June 29th 2012 – (City of Ottawa);

- Terry Fox Drive / Second Line Road – Friday, May 18th 2012 – (City of Ottawa);
- Terry Fox Drive / Flamborough Way – Tuesday, July 12th 2011 – (City of Ottawa);
- Terry Fox Drive / March Valley Road – Tuesday, January 15th 2013 – (NECL);
- Terry Fox Drive / Legget Drive – Thursday, March 7th 2013 – (City of Ottawa);

- Klondike Road / Second Line Road – Wednesday, January 23rd 2013 – (NECL);
- Klondike Road / Weatherston Street – Monday, June 20th 2011 – (City of Ottawa);
- Klondike Road / March Valley Road – Tuesday, January 15th 2013 – (NECL);

- Second Line Road / Old Carp Road – Wednesday, January 16th 2013 – (NECL).

Weekday vehicular peak hour traffic volumes at the aforementioned intersections are shown in **Figure 3**.

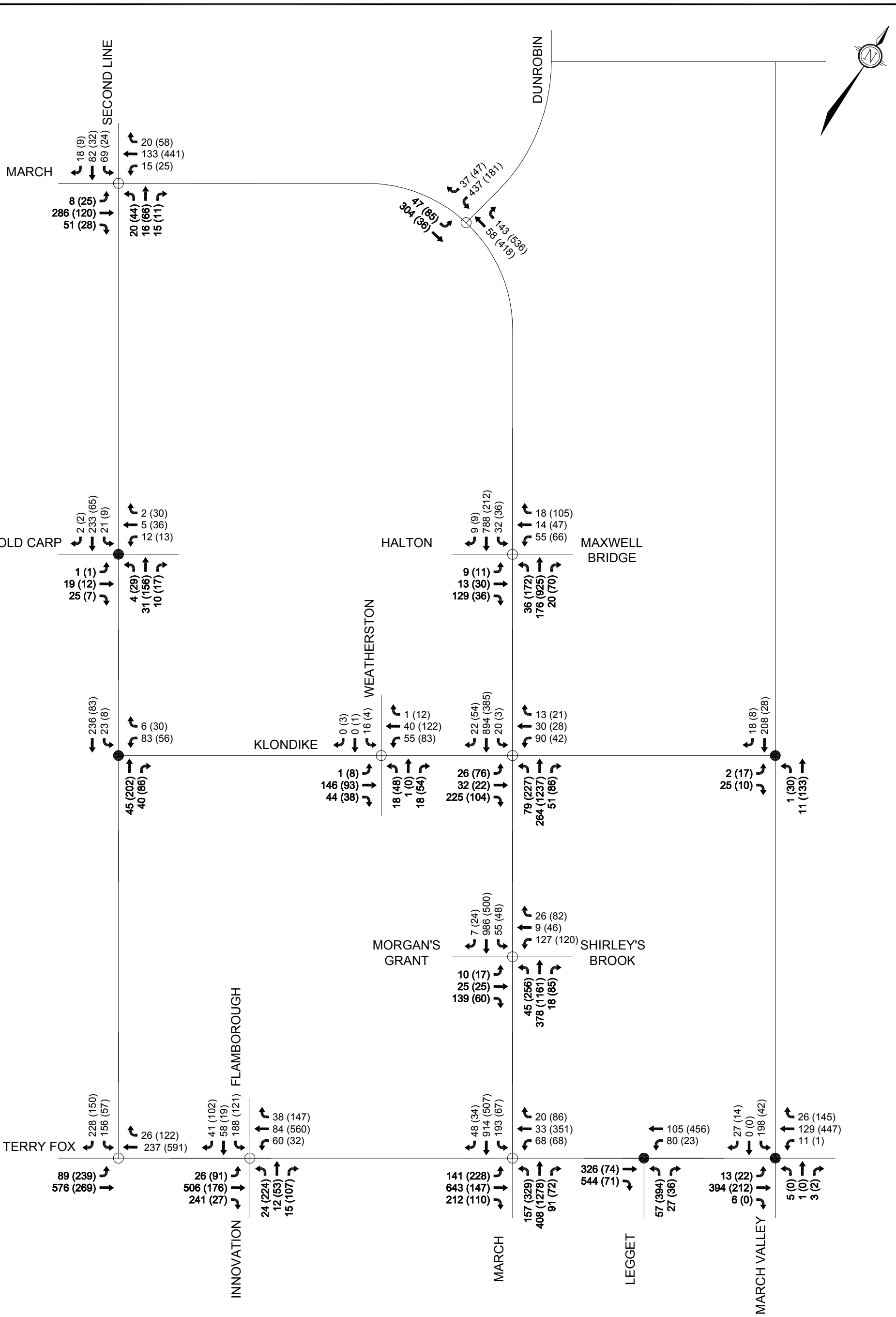
3.3 Existing Intersection Operations

Intersection capacity analysis has been completed using the Synchro 8.0 software package. Operating conditions at signalized intersections have been evaluated in terms of volume to capacity (v/c) ratio and the corresponding Level Of Service (LOS) based on City of Ottawa Criteria. Operating conditions at unsignalized intersections have been evaluated in terms of delay and LOS based on *Highway Capacity Manual 2010* (HCM) criteria. Mitigation measures have been identified for movements with LOS E or F.

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

Table 1: 2013 Existing Intersection Operations

Intersection	Lane Group	AM Peak Hour				PM Peak Hour			
		v/c or Delay	LOS	Queue	Storage	v/c or Delay	LOS	Queue	Storage
March Road / Second Line Road[1]	SBL/T/R	0.46	A	25m	-	0.19	A	15m	-
	EBL	0.01		None	35m	0.06		5m	35m
	EBT/R	0.45		**40m**	-	0.16		5m	-
	WBT	0.15		15m	-	0.46		10m	-
March Road / Dunrobin Road[1]	SBL/R	0.61	B	30m	50m	0.43	B	25m	50m
	WBR	0.21		10m	90	0.64		80m	90m
March Road / Maxwell Bridge Road / Halton Terrace[1]	SBL	0.05	B	5m	40m	0.10	A	5m	40m
	SBT	0.42		**65m**	-	0.12		15m	-
	SBR	0.01		None	10m	0.01		None	10m
	WBL	0.63		25m	40m	0.42		25m	40m
	WBT/R	0.12		10m	-	0.55		30m	-
March Road / Klondike Road[1]	SBL	0.14	A	10m	50m	0.03	A	5m	50m
	SBT/R	0.47		**65m**	-	0.26		30m	-
	NBL	0.25		15m	2 x 100m	0.53		30m	2 x 100m
	EBT/R	0.51		20m	-	0.29		15m	-
	WBL	0.49		**30m**	15m	0.28		**15m**	15m
	WBT/R	0.15		**15m**	-	0.24		**15m**	-
March Road / Morgan's Grant Way / Shirley's Brook Drive[1]	SBT	0.35	B	**55m**	-	0.20	B	30m	-
	SBR	0.01		None	35m	0.03		None	35m
	NBL	0.13		10m	90m	0.43		30m	90m
	NBT	0.14		20m	-	0.41		**70m**	-
	NBR	0.02		None	35m	0.09		5m	35m
	WBL	0.65		**45m**	30m	0.65		**45m**	30m
March Road / Terry Fox Drive[1]	SBL	**1.36**	F	**105m**	60m	0.50	F	30m	60m
	SBT	0.63		**85m**	-	0.27		40m	-
	SBR	0.09		None	80m	0.05		None	80m



NOVATECH ENGINEERING CONSULTANTS LTD.
ENGINEERS & PLANNERS
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada
K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Email: novainfo@novatech-eng.com

LEGEND

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

KANATA NORTH URBAN EXPANSION STUDY AREA

EXISTING TRAFFIC VOLUMES

MAR 2013 112117 FIGURE # 3

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Intersection	Lane Group	AM Peak Hour				PM Peak Hour			
		v/c or Delay	LOS	Queue	Storage	v/c or Delay	LOS	Queue	Storage
	NBL	0.59		30m	2 x 175m	**1.11**		75m	2 x 175m
	NBT	0.28		35m	-	0.63		**105m**	-
	NBR	0.17		None	50m	0.10		None	50m
	EBL	0.24		25m	80m	0.85		50m	2 x 80m
	EBT	0.76		**85m**	-	0.23		25m	-
	EBR	0.41		15m	60m	0.28		10m	60m
	WBL	0.28		15m	2 x 70m	0.31		15m	2 x 70m
	WBT	0.05		5m	-	0.69		**55m**	-
	WBR	0.05		None	50m	0.25		None	50m
Terry Fox Drive / Second Line Road[1]	SBL	0.64	B	**50m**	40m	0.33	A	25m	40m
	EBL	0.12		10m	60m	0.45		15m	60m
	EBT	0.49		**75m**	-	0.22		20m	-
	WBT	0.24		40m	-	0.60		100m	-
Terry Fox Drive / Flamborough Way[1]	SBL	0.87	D	50m	40m	0.41	C	30m	40m
	NBL	0.12		10m	40m	0.73		**50m**	40m
Terry Fox Drive / March Valley Road	SBL/T/R	24s	C	25m	-	18s	C	5m	-
Klondike Road / Second Line Road	NBL/T	8s	A	None	-	9s	A	None	-
	EBL/R	9s		None	-	8s		None	-
Klondike Road / Weatherston Street[1]	NBL	0.06	A	5m	-	0.29	A	15m	-
	EBL	0.00		None	15m	0.01		None	15m
	EBT/R	0.14		**25m**	-	0.13		**15m**	-
Klondike Road / March Valley Road	EBL/R	10 s	A	None	-	10s	A	None	-
Second Line Road / Old Carp Road	NBL/T/R	9 s	A	None	-	8s	A	None	-
	SBL/T/R	8 s		None	-	9s		None	-

1. Signalized Intersection

Under existing traffic conditions during the AM peak hour, the Synchro model indicates that the southbound left turn movement at the March Road / Terry Fox Drive intersection is operating with a v/c of 1.36, which corresponds to a LOS F. The maximum (i.e. 95th percentile) queue length for this movement is approximately 105m, which exceeds the left turn lane storage length of 60m.

The failing southbound left turn movement at the Terry Fox Drive / March Road intersection can be mitigated through traffic signal optimization. The v/c associated with the southbound left turn movement can be reduced to 0.72, while reducing the queue length to approximately 70m. The forgoing traffic signal optimization maintains a maximum v/c of 0.80 associated with the eastbound through movement, corresponding to an overall LOS C at the Terry Fox Drive / March Road intersection during the AM peak hour.

Under existing traffic conditions during the PM peak hour, the Synchro model indicates that the northbound left turn movement at the March Road / Terry Fox Drive intersection is operating with a v/c of 1.11, which corresponds to a LOS F. The maximum (i.e. 95th percentile) queue length for this movement is approximately 75m.

The failing northbound left turn movement at the Terry Fox Drive / March Road intersection can be mitigated through traffic signal optimization. The v/c associated with the northbound left turn movement can be reduced to 0.69, while reducing the queue length to approximately 50m. The foregoing traffic signal optimization maintains a maximum v/c of 0.69 associated with the northbound left turn and westbound through movement, corresponding to an overall LOS B at the Terry Fox Drive / March Road intersection during the PM peak hour.

The maximum (i.e. 95th percentile) queue lengths highlighted in bold in **Table 1** identify the maximum queue lengths expected to:

- Exceed their available storage capacities; or
- Block access to an adjacent auxiliary turning lane, by extending back across its full length.

With a few minor exceptions, all maximum queue lengths for the turning movements at the study area intersections can be accommodated within their respective storage capacities. Any blocking effects that may be created by the maximum queue lengths identified in Table 1 are expected to be intermittent, and unlikely to have any significant impact on driver delay.

3.4 Existing Transit Network and Volumes

The current network of transit routes operated by OC Transpo in the vicinity of the Kanata North Urban Expansion Study Area is shown in **Figure 4**.

For the transit routes within the TAI, observed passenger activity data for each bus stop along the route was obtained from OC Transpo. The transit data collected by OC Transpo between September and December 2012 can be found in **Appendix B**.

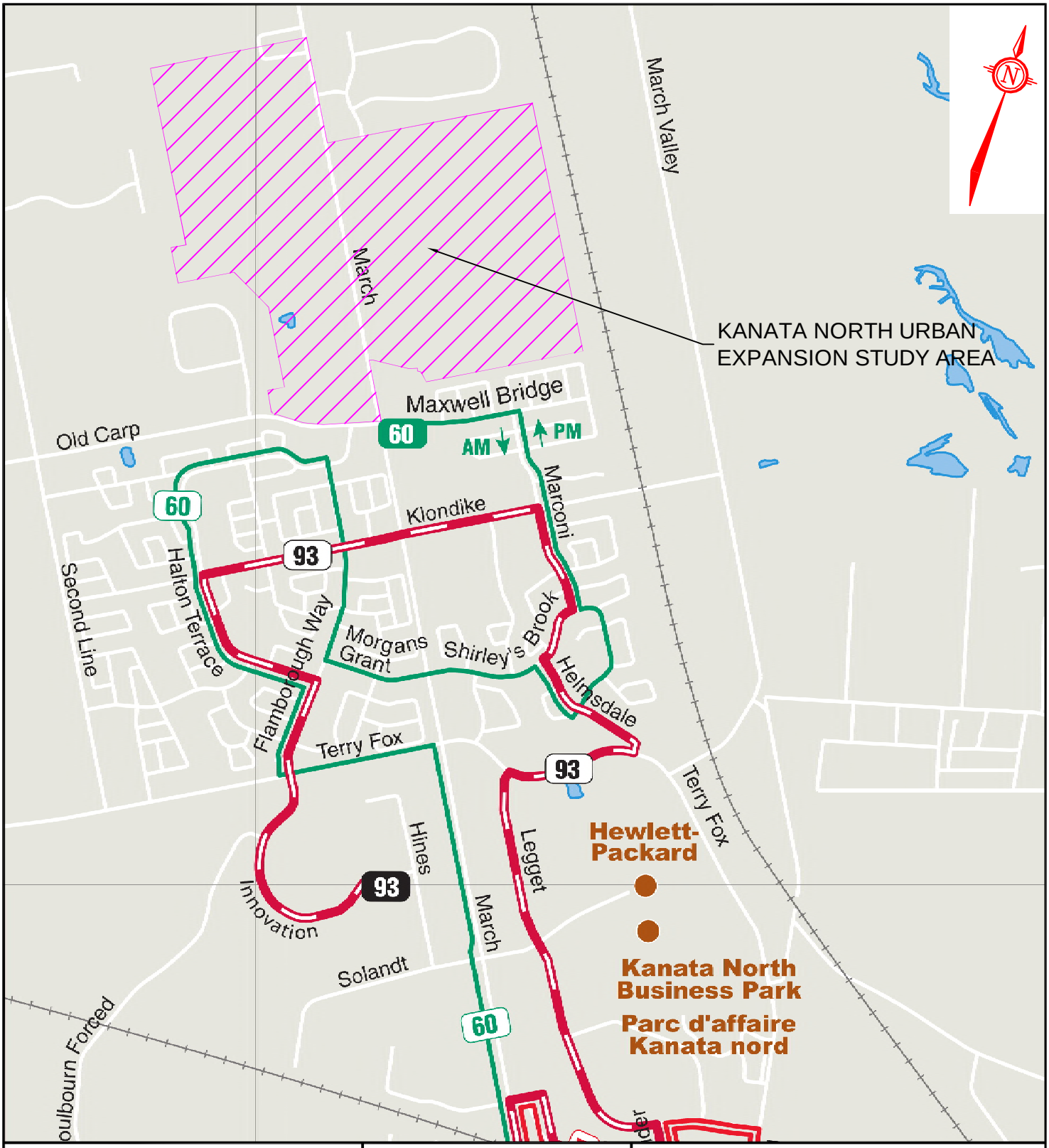
3.4.1 OC Transpo Express Route 60

The express route 60 travels through the established communities of Brookside, Briarbrook and Morgan's Grant located within the TAI. The express route 60 provides a transit connection between Kanata North and downtown during the weekday AM and PM peak hours (5:30-08:30 AM, 3:00-6:00 PM). The route 60 – eastbound commences within the TAI along Maxwell Bridge Road, with its terminus at the Hurdman Transit Station. The route 60 – westbound commences at the Hurdman Transit Station, with its terminus along Maxwell Bridge Road within the TAI. The scheduled travel time from Maxwell Bridge Road to the Mackenzie King Transit Station is approximately 60 minutes with 15 minute headways.

Figures 5 and 6 shows the bus stop locations and total daily bus stop activity within the TAI for the express route 60.

As shown in Figure 5, the majority of the activity associated with the eastbound route occurs between bus stop #1165 and #1819. Figure 6 shows that the majority of the activity associated with the westbound route occurs between bus stop # 1260 and #3676. More activity occurs west of March Road, compared to east of March Road as more residential development currently exists west of March Road. It should also be noted that there is a high amount of activity occurring along the westbound route at the bus stop #4875.

Figures 7 and 8 show the median number of passengers boarding/alighting the bus at each bus stop location, as well as the median ridership volume of buses travelling to/from the TAI. It should

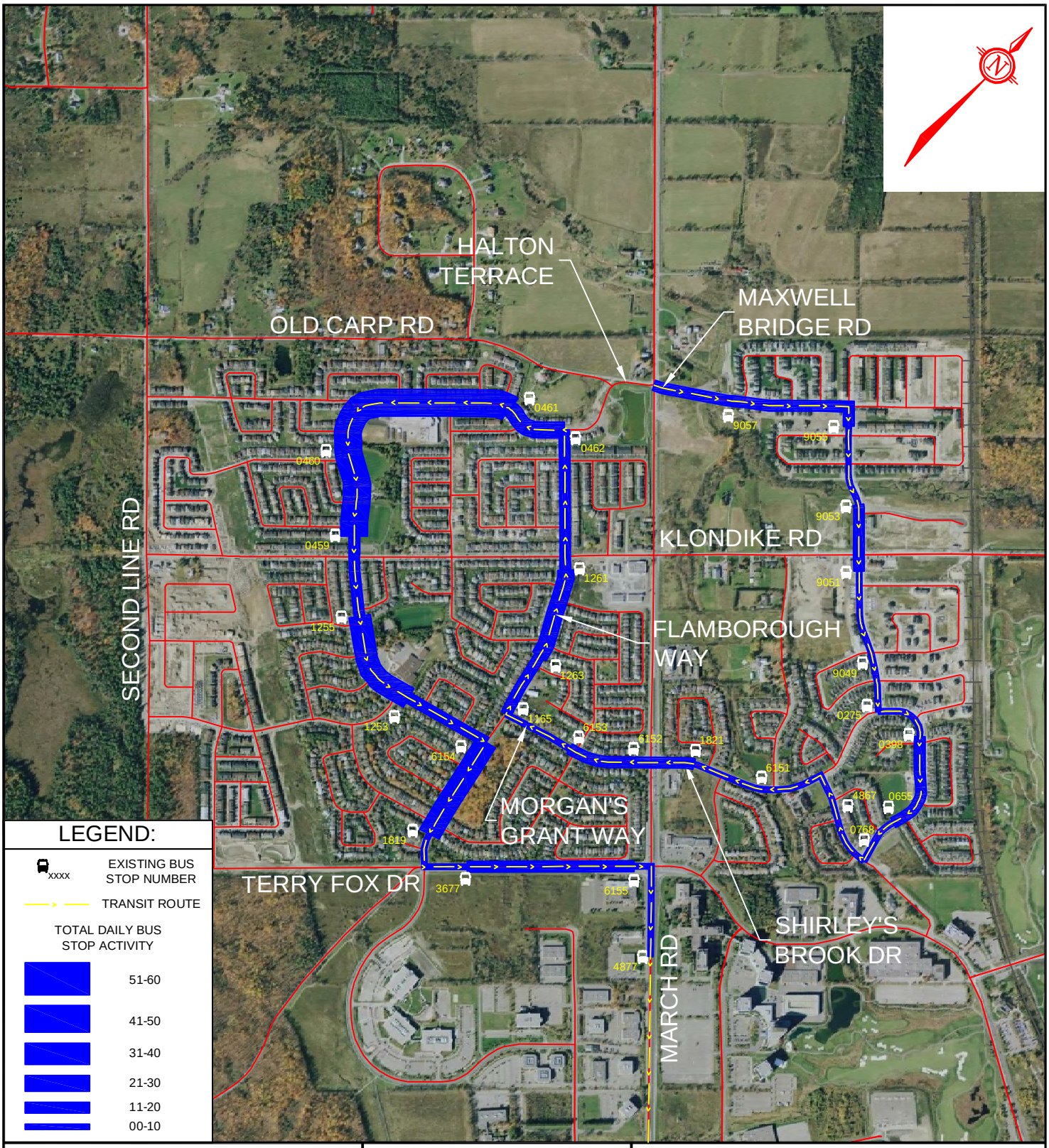


NOVATECH
ENGINEERING
CONSULTANTS LTD.
ENGINEERS & PLANNERS
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada
K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Email: novainfo@novatech-eng.com

KANATA NORTH URBAN EXPANSION STUDY AREA

CURRENT PUBLIC TRANSIT ROUTES

SCALE		
NTS		
DATE	JOB	FIGURE
MAR 2013	112117	FIGURE # 4



NOVATECH
ENGINEERING CONSULTANTS LTD.
ENGINEERS & PLANNERS
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada
K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Email: novainfo@novatech-eng.com

KANATA NORTH URBAN EXPANSION STUDY AREA

TRANSIT ROUTE 60 - EASTBOUND TOTAL DAILY BUS STOP ACTIVITY

SCALE		
NTS		
DATE	JOB	FIGURE
MAR 2013	112117	FIGURE # 5

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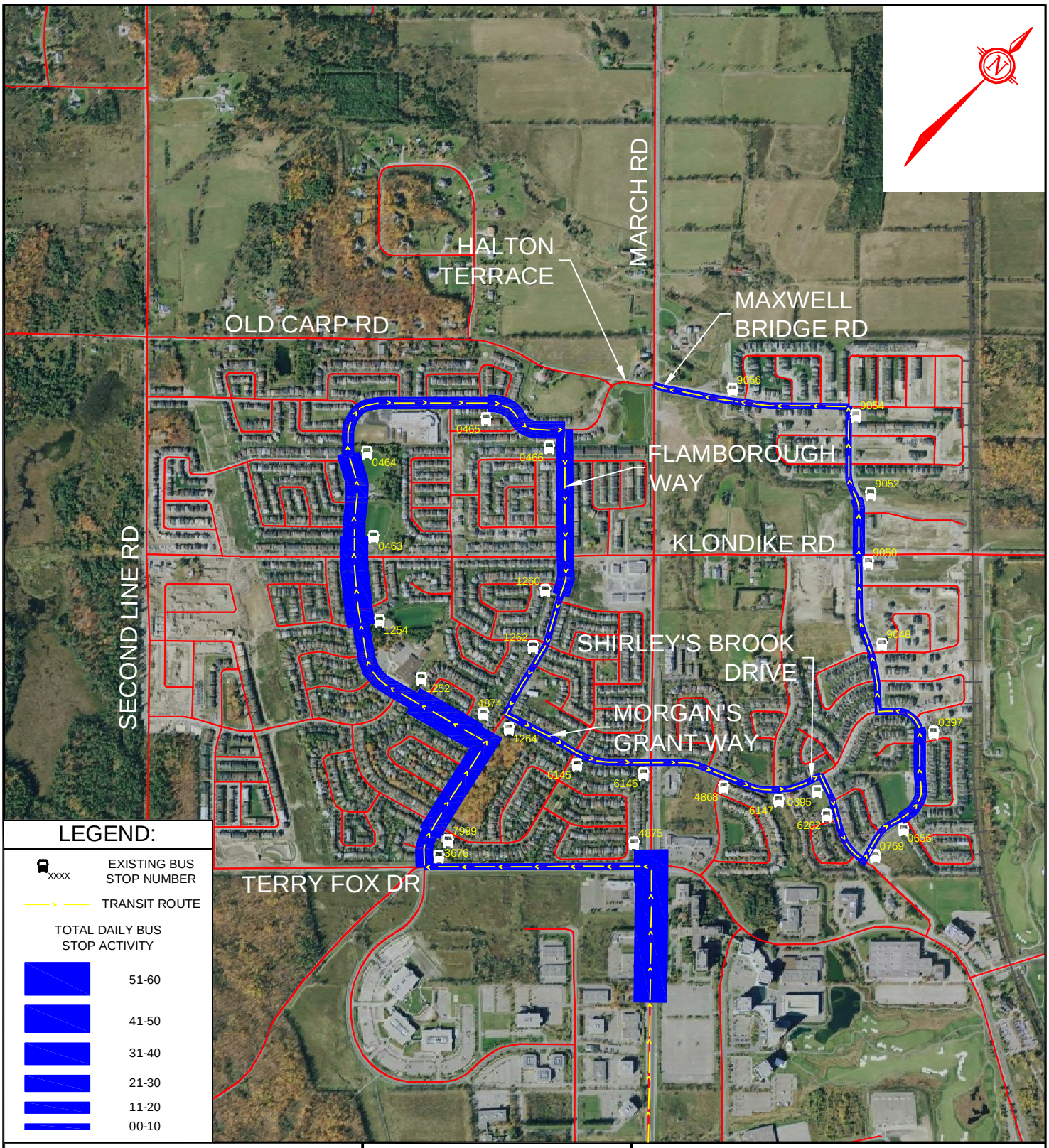

LEGEND:

- xxxx — EXISTING BUS STOP NUMBER
- TRANSIT ROUTE

TOTAL DAILY BUS STOP ACTIVITY

- 51-60
- 41-50
- 31-40
- 21-30
- 11-20
- 00-10

NOVATECH ENGINEERING CONSULTANTS LTD.
ENGINEERS & PLANNERS
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada
K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Email: novainfo@novatech-eng.com

KANATA NORTH URBAN EXPANSION STUDY AREA

TRANSIT ROUTE 60 - WESTBOUND TOTAL DAILY BUS STOP ACTIVITY

SCALE		
NTS		
DATE	JOB	FIGURE
MAR 2013	112117	FIGURE # 6

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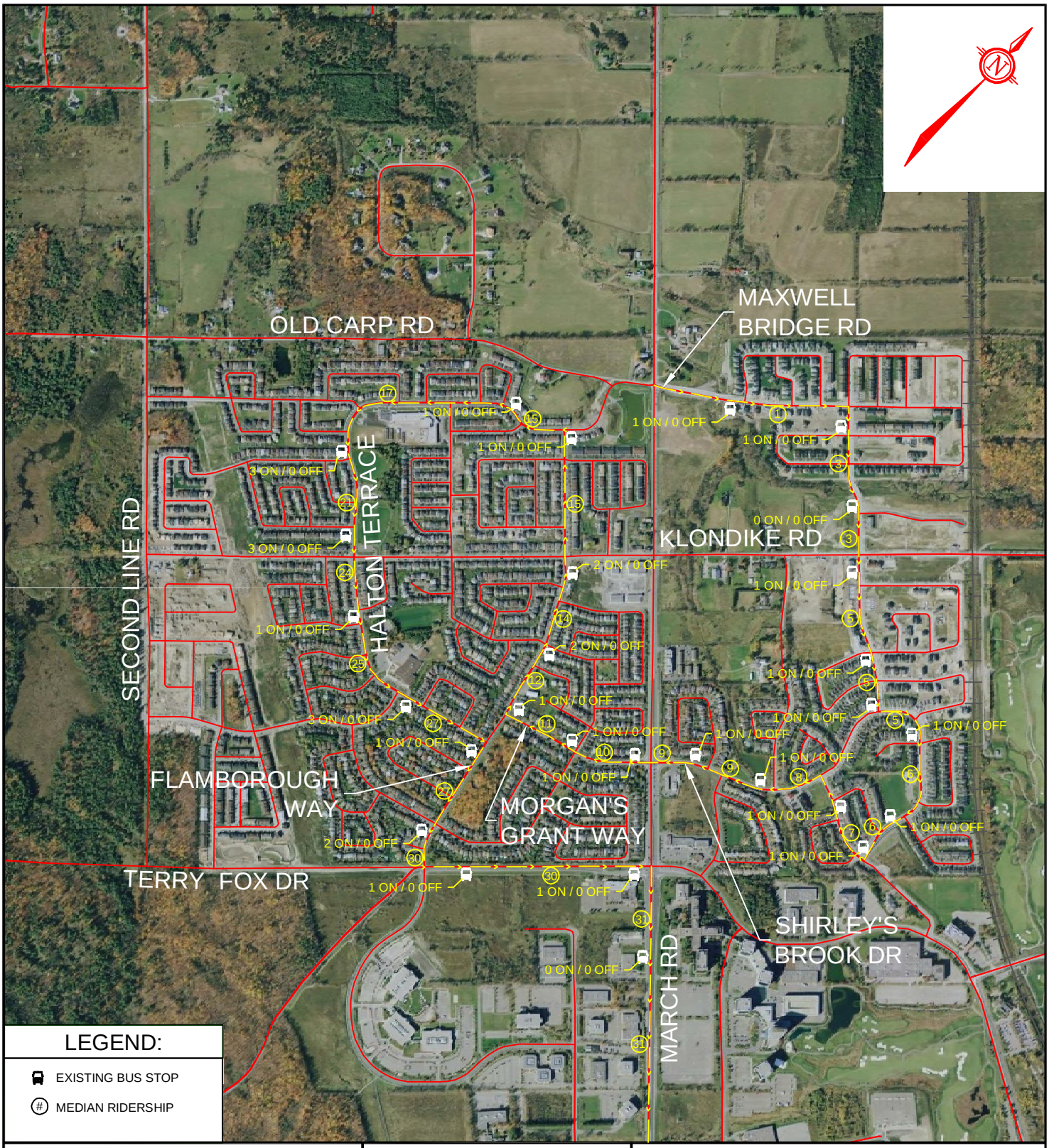

LEGEND:

- EXISTING BUS STOP
- (#) MEDIAN RIDERSHIP

NOVATECH ENGINEERING CONSULTANTS LTD.
ENGINEERS & PLANNERS
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada
K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Email: novainfo@novatech-eng.com

KANATA NORTH URBAN EXPANSION STUDY AREA

TRANSIT ROUTE 60 - EASTBOUND MEDIAN PASSENGER BOARDING/ALIGHTING

SCALE		
NTS		
DATE: MAR 2013	JOB: 112117	FIGURE: FIGURE # 7

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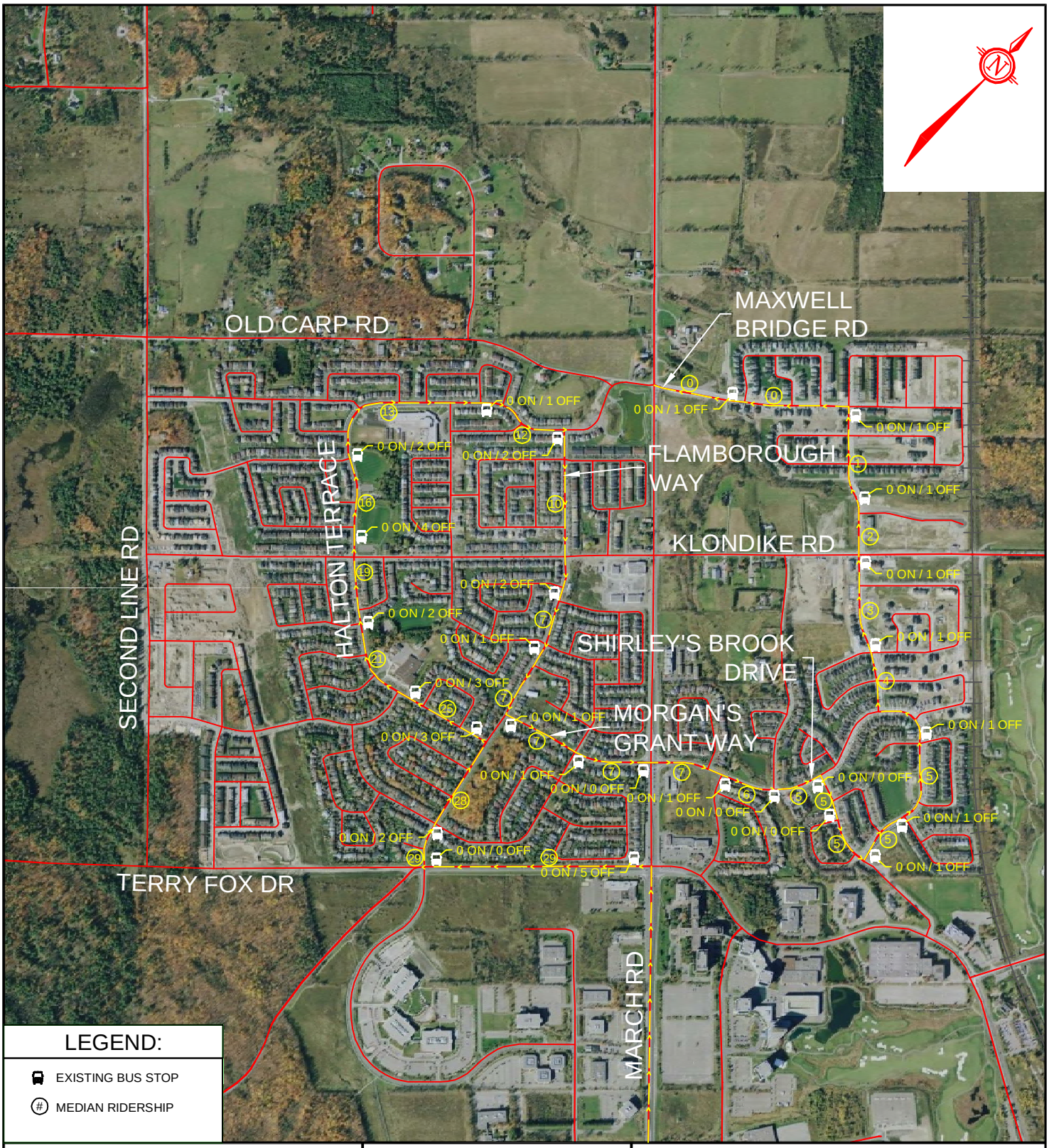


LEGEND:

- EXISTING BUS STOP
- (#) MEDIAN RIDERSHIP

NOVATECH ENGINEERING CONSULTANTS LTD.
ENGINEERS & PLANNERS
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada
K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Email: novainfo@novatech-eng.com

KANATA NORTH URBAN EXPANSION STUDY AREA

TRANSIT ROUTE 60 - WESTBOUND MEDIAN PASSENGER BOARDING/ALIGHTING

SCALE		
NTS		
DATE	JOB	FIGURE
MAR 2013	112117	FIGURE # 8

be noted that the median ridership volume is not cumulative; it has been derived from its own set of data.

As shown in Figure 7, the median ridership volume of buses travelling the express route 60 – eastbound is 30 passengers prior to exiting the TAI. Figure 8 shows that the median ridership volume of buses travelling the express route 60 – westbound is 34 passengers prior to entering the TAI.

3.4.2 OC Transpo Regular Route 93

The regular route 93 travels through the established communities of Morgan's Grant and Shirley's Brook located within the TAI. The route 93 – eastbound commences along Innovation Drive, travelling through the TAI with its terminus at the Lincoln Fields Transit Station. The route 93 – westbound commences at the Lincoln Fields Transit Station, with its terminus along Innovation Drive. On weekdays the route 93 runs between 6:00 – 12:00 AM with 15 minute headways during the peak hours. On weekends the route 93 runs between 7:00 – 12:00 AM with 30 minute headways. The scheduled travel time from Klondike Road to the Lincoln Fields Transit Station is approximately 35 minutes. The Lincoln Fields Transit Station provides a connection to the existing OC Transpo transit network. In particular, the Lincoln Fields Transit Station provides a connection with the regular route 95, which travels to the downtown region with a scheduled travel time of approximately 20 minutes.

Figures 9 and 10 show the bus stop locations and total daily bus stop activity within the TAI for the regular route 93.

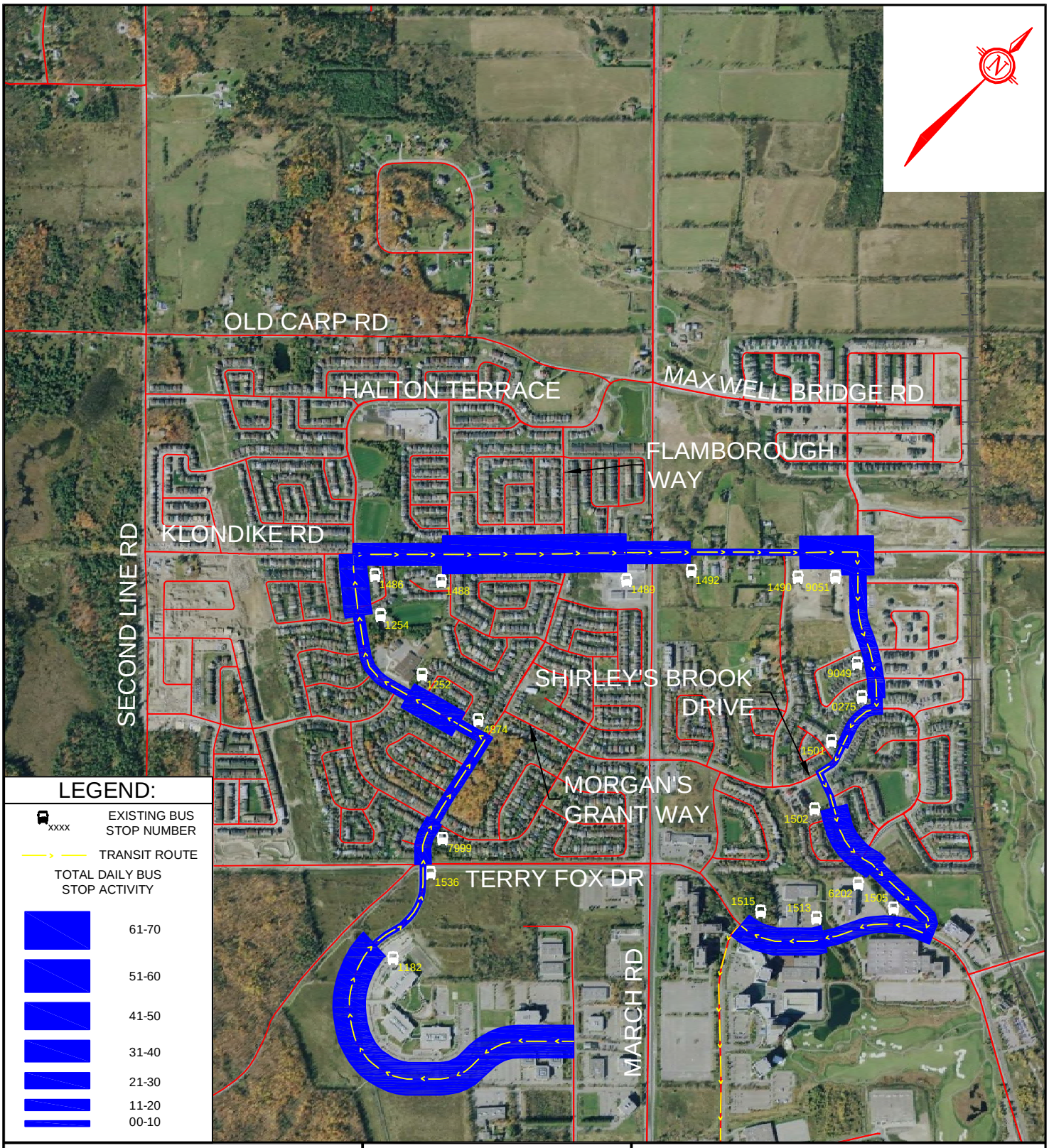
As shown in Figures 9 and 10, the activity associated with the regular route 93 is relatively evenly distributed within the TAI. It should be noted that there is a high amount of activity occurring at the bus stop #1489 and #6588 as a result of the retail development located in the southwest quadrant of the March Road / Klondike Road intersection. A high amount of activity exists at the bus stop #1182 & #1183, which is predominantly commuter flow as Innovation Drive provides access to the Kanata North Business Park.

Figures 11 and 12 show the median number of passengers boarding/alighting the bus at each bus stop location, as well as the median ridership volume of buses travelling to/from the TAI. It should be noted that the median ridership volume is not cumulative; it has been derived from its own set of data.

As shown in Figure 11, the median ridership of buses travelling the regular route 93 – eastbound is 12 passengers prior to exiting the TAI. Figure 12 shows that the median ridership volume of buses travelling the regular route 93 – westbound is 12 passengers prior to entering the TAI.

3.4.3 OC Transpo School Route 674

The school route 674 provides a transit connection between the Kanata North communities and the All Saints Catholic High School located on Kanata Avenue. The school route 674 is identical to the regular route 93 throughout the TAI. The 674 deviates from the route 93 at the Beaverbrook Road / Teron Road intersection, where it travels west towards Kanata Avenue. Four buses travel to the All Saints Catholic High School between 7:00-8:00 AM, and back to the TAI between 2:30-3:30 PM on weekdays. It should be noted that the travel times of the school route 674 do not coincide with the peak hour of traffic within the TAI.



LEGEND:

- xxxx — EXISTING BUS STOP NUMBER
- TRANSIT ROUTE
- TOTAL DAILY BUS STOP ACTIVITY
  - 61-70
  - 51-60
  - 41-50
  - 31-40
  - 21-30
  - 11-20
  - 00-10

NOVATECH ENGINEERING CONSULTANTS LTD.
ENGINEERS & PLANNERS
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada
K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Email: novainfo@novatech-eng.com

KANATA NORTH URBAN EXPANSION STUDY AREA

TRANSIT ROUTE 93 - EASTBOUND TOTAL DAILY BUS STOP ACTIVITY

SCALE		
NTS		
DATE: MAR 2013	JOB: 112117	FIGURE: FIGURE # 9

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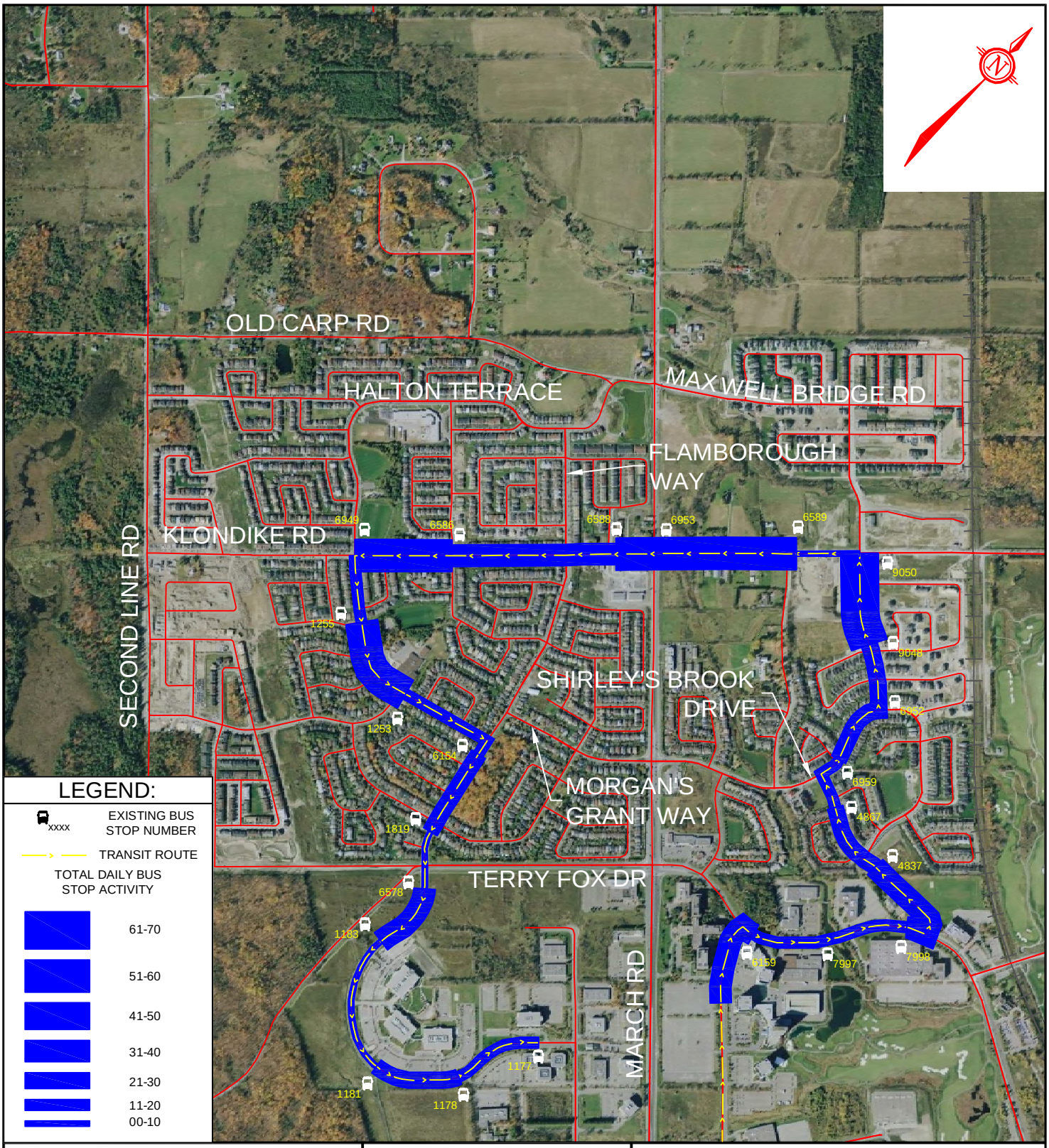

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ENGINEERS & PLANNERS
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada
K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Email: novainfo@novatech-eng.com

KANATA NORTH URBAN EXPANSION STUDY AREA

TRANSIT ROUTE 93 - WESTBOUND TOTAL DAILY BUS STOP ACTIVITY

SCALE		
NTS		
DATE	JOB	FIGURE
MAR 2013	112117	FIGURE # 10

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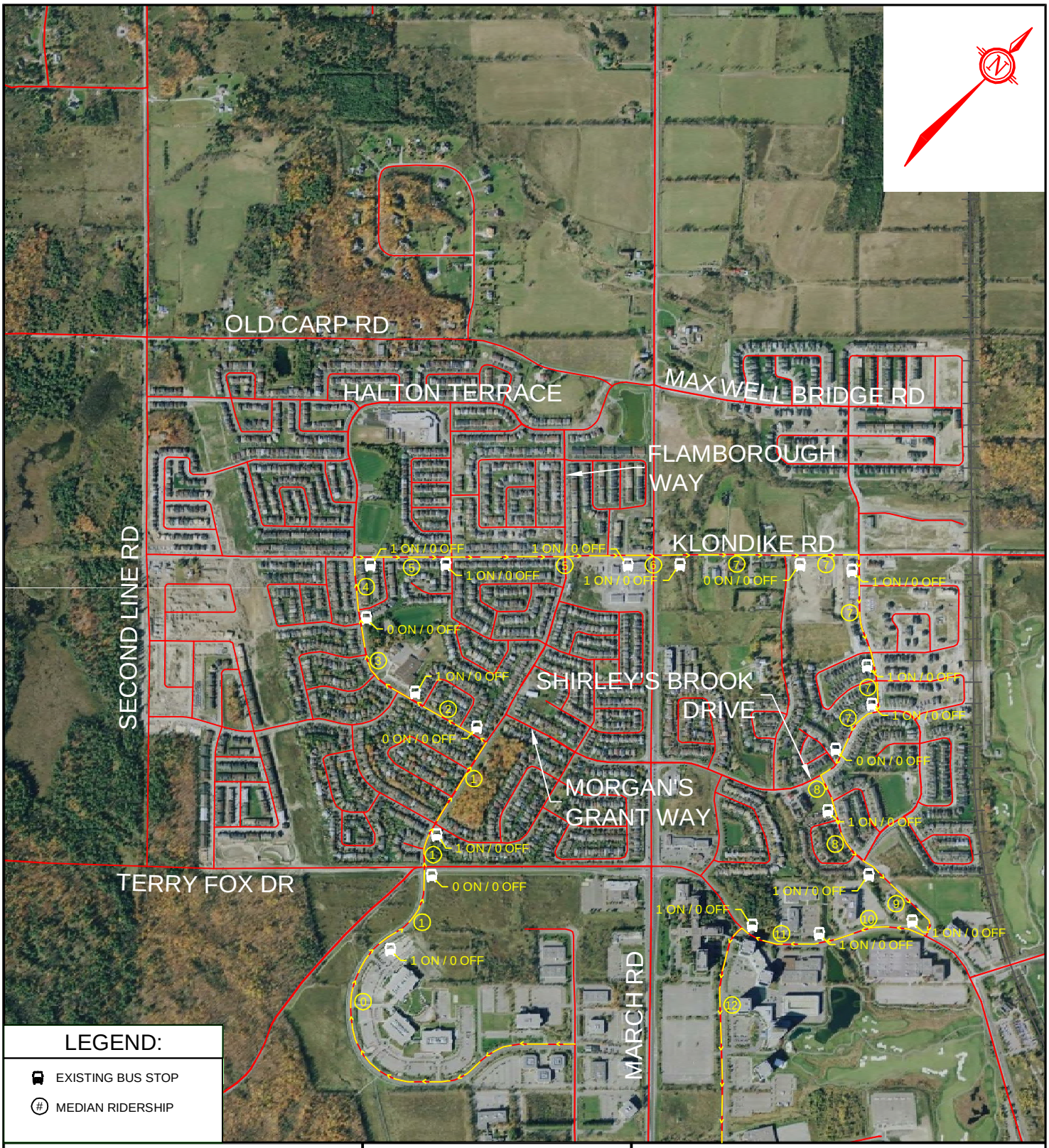

LEGEND:

- EXISTING BUS STOP
- (#) MEDIAN RIDERSHIP

NOVATECH
ENGINEERING CONSULTANTS LTD.
ENGINEERS & PLANNERS
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada
K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Email: novainfo@novatech-eng.com

KANATA NORTH URBAN EXPANSION STUDY AREA

TRANSIT ROUTE 93 - EASTBOUND MEDIAN PASSENGER BOARDING/ALIGHTING

SCALE		
NTS		
DATE	JOB	FIGURE
MAR 2013	112117	FIGURE # 11

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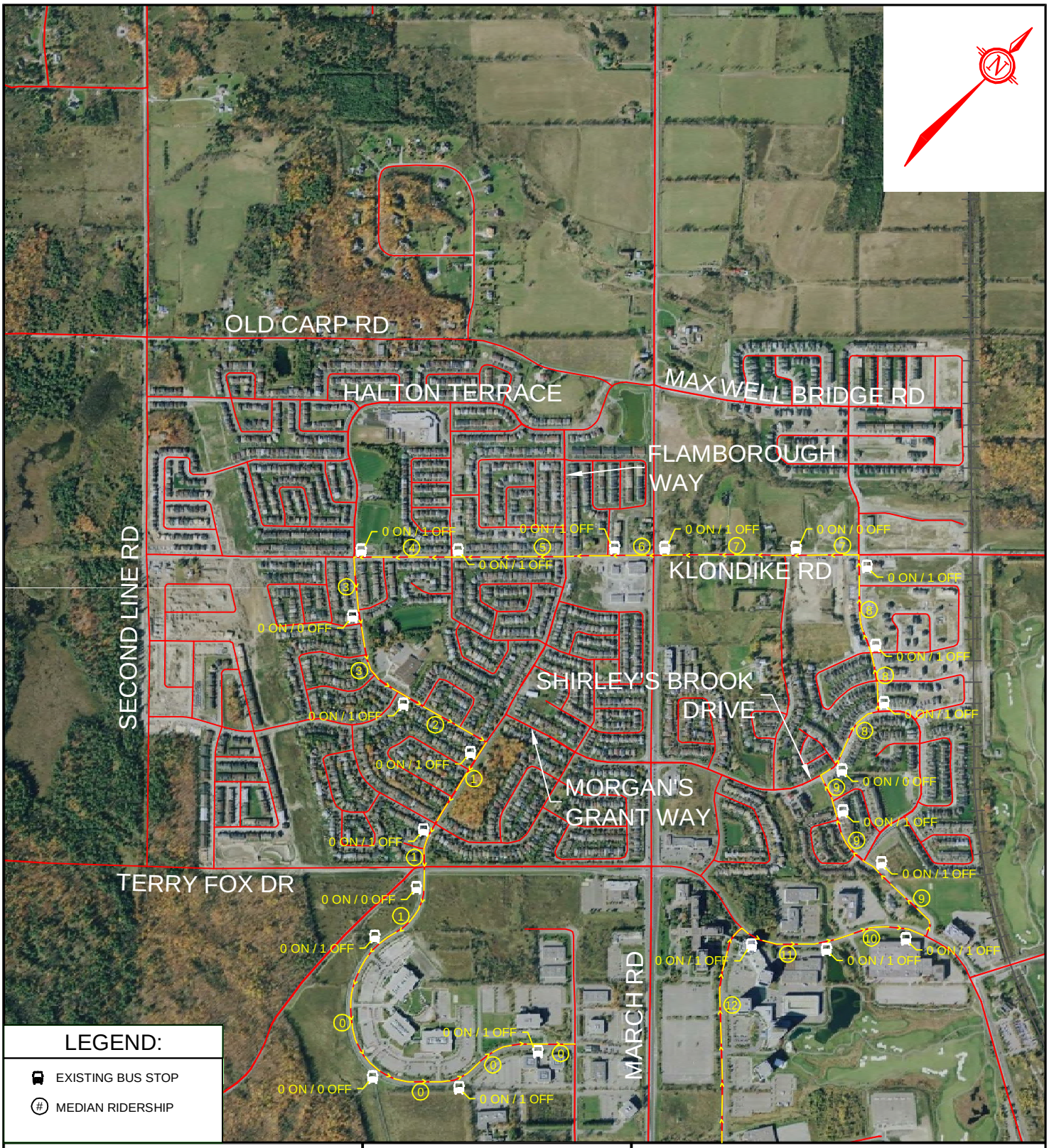

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Ottawa, Ontario, Canada
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Telephone (613) 254-9643
Facsimile (613) 254-5867
Email: novainfo@novatech-eng.com

KANATA NORTH URBAN EXPANSION STUDY AREA

TRANSIT ROUTE 93 - WESTBOUND MEDIAN PASSENGER BOARDING/ALIGHTING

SCALE		
NTS		
DATE	JOB	FIGURE
MAR 2013	112117	FIGURE # 12