

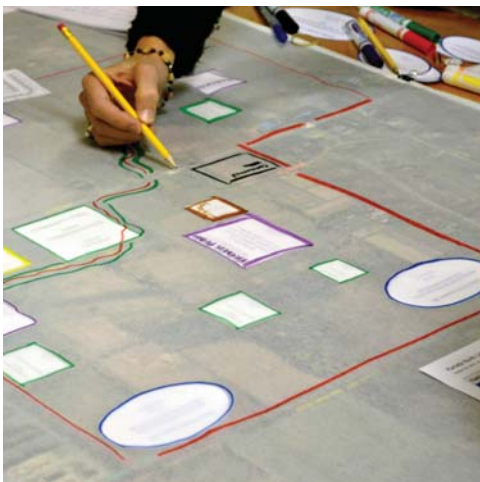


KANATA NORTH

COMMUNITY DESIGN PLAN

TRANSPORTATION MASTER PLAN

REPORT



FINAL DRAFT
JUNE 28, 2016





KANATA NORTH COMMUNITY DESIGN PLAN

TRANSPORTATION MASTER PLAN

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TABLE OF CONTENTS

1.0	INTRODUCTION	1
1.1	KANATA NORTH URBAN EXPANSION AREA	1
1.2	BACKGROUND.....	3
1.3	INTEGRATED PLANNING PROCESS	5
1.4	CONSULTATION PROCESS	7
1.4.1	<i>Public Meetings and Workshop.....</i>	<i>7</i>
1.4.2	<i>Project Team</i>	<i>7</i>
2.0	PURPOSE OF REPORT	9
2.1	METHODS.....	10
2.2	PARAMETERS.....	10
3.0	TRANSPORTATION-RELATED ENVIRONMENTAL ASSESSMENTS	12
4.0	EXISTING TRANSPORTATION CONDITIONS	12
4.1	EXISTING TRANSIT NETWORK AND VOLUMES	13
4.2	EXISTING CYCLING NETWORK AND VOLUMES	13
4.3	EXISTING PEDESTRIAN FACILITIES	16
4.4	SCREENLINE ANALYSIS	18
4.5	EXISTING INTERSECTION OPERATIONS	18
4.6	COLLISION ANALYSIS.....	19
5.0	PLANNED NETWORK CHANGES	19
5.1	RAPID TRANSIT AND TRANSIT PRIORITY PROJECTS.....	20
5.2	FUTURE ROAD NETWORK PROJECTS	21
5.3	OTTAWA CYCLING PLAN	22
5.4	OTTAWA PEDESTRIAN PLAN	24
6.0	TRAVEL DEMAND FORECASTING	24
6.1	TRANSIT RIDERSHIP GROWTH	24
6.2	OTHER STUDY AREA DEVELOPMENTS.....	25
6.3	BACKGROUND GROWTH	25
6.4	BACKGROUND SCREENLINE ANALYSIS	25
6.4.1	<i>2026 Background Screenline Analysis.....</i>	<i>28</i>
6.4.2	<i>2031 Background Screenline Analysis.....</i>	<i>30</i>
6.5	BACKGROUND INTERSECTION ANALYSIS.....	32
6.5.1	<i>2026 Background Intersection Operations.....</i>	<i>33</i>
6.5.2	<i>2031 Background Intersection Operations.....</i>	<i>34</i>
7.0	ALTERNATIVE SOLUTIONS	35
8.0	ALTERNATIVE DESIGN CONCEPTS	37
8.1	PARK AND RIDE FACILITY	42
8.2	MARCH ROAD INTERSECTION CONTROL	43
8.3	OLD CARP ROAD ACCESS	43
8.4	MARCH ROAD ACCESS.....	46
8.5	INTERNAL INTERSECTION CONTROL	47
8.6	EVALUATION RESULTS	48
9.0	RECOMMENDED PLAN.....	51
9.1	PLAN OF ROADS	51
9.1.1	<i>Intersection Spacing.....</i>	<i>51</i>
9.1.2	<i>Complete Streets.....</i>	<i>52</i>
9.1.3	<i>March Road Cross Section</i>	<i>52</i>
9.1.4	<i>Collector Road Cross Section</i>	<i>53</i>

9.1.5	Local Road Cross Section	60
9.2	PEDESTRIAN AND CYCLING PLANS	60
9.3	TRANSIT SERVICING PLAN	67
9.4	PARKING STRATEGY	67
10.0	TRANSPORTATION IMPACT ASSESSMENT	67
10.1	TRIP GENERATION	69
10.2	TRIP DISTRIBUTION	72
10.3	TOTAL SCREENLINE ANALYSIS	73
10.3.1	2026 Total Screenline Analysis	73
10.3.2	2031 Total Screenline Analysis	78
10.4	TOTAL INTERSECTION ANALYSIS	80
10.4.1	2026 Total Traffic	80
10.4.2	2031 Total Traffic	82
10.5	INTERIM TRAFFIC	84
11.0	ENVIRONMENTAL IMPACTS AND MITIGATION	85
11.1	NATURAL ENVIRONMENT	85
11.2	SOCIAL ENVIRONMENT	86
11.3	CULTURAL ENVIRONMENT	88
12.0	PROJECT LISTING	88
13.0	NEXT STEPS	89
13.1	DEVELOPMENT APPROVALS	89
13.1.1	Use of Existing Studies	90
13.1.2	City of Ottawa Development Approvals Process	90
13.1.3	Municipal Approvals	91
13.1.4	External Agency Approvals	91
13.2	DEVELOPMENT CHARGE PROJECTS	92
13.3	DETAIL DESIGN	93
13.4	PROPERTY ACQUISITION	94
13.5	CONSTRUCTION MONITORING	94
13.6	INFRASTRUCTURE STAGING	95
13.6.1	March Road and Bus Rapid Transit Staging	95
13.6.2	Core Services Staging	96
13.7	ENVIRONMENTAL ASSESSMENT AMENDMENT PROCESS	97
13.7.1	Minor Changes	97
13.7.2	Major Changes	97
14.0	CONCLUSIONS AND RECOMMENDATIONS	98

Figures

Figure 1	Kanata North Urban Expansion Area (KNUEA) Context and Location
Figure 2	KNUEA Boundaries and Properties of Sponsoring Landowners
Figure 3	Integrated Class EA and CDP Planning Framework
Figure 4	Transportation Area of Interest
Figure 5	2013 Road and Transit Network
Figure 6	Existing Cycling Network
Figure 7	Existing Pedestrian Network
Figure 8	Rapid Transit and Transit Priority Network – Ultimate Network
Figure 9	Rapid Transit and Transit Priority Network – 2031 Affordable Network
Figure 10	Ultimate Cycling Network
Figure 11	2026 Background Traffic Volumes
Figure 12	2031 Background Traffic Volumes
Figure 13	Screenline – 2026 Background Traffic Volumes
Figure 14	Screenline – 2026 Background Traffic Volumes
Figure 15	Design Concept A
Figure 16	Design Concept B
Figure 17	Design Concept C
Figure 18	Design Concept D
Figure 19	Option A: Four-Leg Intersection at Halton Terrace
Figure 20	Option B: Tee Intersection West of Halton Terrace
Figure 21	Option C: Old Carp Road and Halton Terrace Realignment
Figure 22	Option D: Old Carp Road Realignment
Figure 23	Preferred Land Use Plan
Figure 24	March Road Interim Cross Section
Figure 25	March Road Ultimate Cross Section
Figure 26	Collector Road with Multi-Use Pathway – Typical 1
Figure 27	Collector Road with Multi-Use Pathway – Typical 1 (With Bus Stop)
Figure 28	Collector Road with Multi-Use Pathway – Typical 2
Figure 29	Collector Road with Multi-Use Pathway – Typical 2 (With Bus Stop)
Figure 30	Midblock Collector Road
Figure 31	Local Road – 18m ROW
Figure 32	Local Road – 18m ROW with Sidewalk
Figure 33	Local Road – 16.5m/14m ROW
Figure 34	Parks and Pathways Plan
Figure 35	Demonstration Plan
Figure 36	2026 Total Traffic Volumes
Figure 37	2031 Total Traffic Volumes
Figure 38	Screenline – 2026 Total Traffic Volumes
Figure 39	Screenline – 2031 Total Traffic Volumes

Tables

Table 1	2013 OCP Bicycle Facilities
Table 2	2013 OPP Pedestrian Facilities
Table 3	Directional Capacities (PCU's) at Screenlines
Table 4	Screenline Performance – 2026 Background Traffic
Table 5	Screenline Performance – 2031 Background Traffic
Table 6	Intersection Capacity Analysis – 2026 Background Traffic
Table 7	Intersection Capacity Analysis – 2031 Background Traffic
Table 8	Alternative Transportation Solutions

Table 9	Park and Ride Locations – Evaluation
Table 10	Internal Intersection Control Analysis
Table 11	Evaluation of Alternative Design Concepts
Table 12	ITE Trip Generation
Table 13	Peak Hour Person Trip Generation – Residential and Commercial
Table 14	Peak Hour Person Trips by Modal Share – Residential and Commercial
Table 15	Peak Hour Internally Captured Trips – Residential and Commercial
Table 16	Primary and Pass-by Trips – Commercial
Table 17	Screenline Performance – 2026 Total Traffic
Table 18	Screenline Performance – 2031 Total Traffic
Table 19	Intersection Capacity Analysis – 2026 Total Traffic
Table 20	Intersection Capacity Analysis – 2031 Total Traffic
Table 21	Interim Intersection Analysis
Table 22	Interim Development Traffic
Table 23	Core Services Staging

Appendices

Appendix A	KNCDP TMP Scope of Work
Appendix B	Excerpts from the Kanata North Transitway ESR
Appendix C	Background Synchro Analysis
Appendix D	Technical Memorandums
Appendix E	Total Synchro Analysis
Appendix F	Signal Warrant Calculations

Volume 2 – KNCDP TMP Existing Conditions Report and Addendum

EXECUTIVE SUMMARY

This Transportation Master Plan (TMP) has been prepared as a component of the Community Design Plan (CDP) for Kanata North. The TMP identifies the transportation plan for the community including the collector road network, access locations, provisions for pedestrian and cycling linkages, and interim and ultimate road cross sections that incorporate the planned widening of March Road and the extension of planned transit facilities.

The Kanata North Urban Expansion Area (KNUEA) is approximately 181 hectares in area (447.6 acres) located north of the established urban communities of Morgan's Grant, Briarbrook, and Brookside and adjacent to a number of rural estate subdivisions including Hillside Estates Subdivision to the north, and the Marchbrook Circle and Panandrick subdivisions to the west. The abandoned CN railway corridor forms the KNUEA boundary to the east.

The major landowners in the KNUEA, known collectively as the "Kanata North Land Owners Group" (KNLOG), initiated a Community Design Plan process to fulfill the requirements of the Official Plan. Collectively, the sponsoring land owners represent approximately 87% of the land within the KNUEA. The CDP, while funded by the KNLOG, has been balanced and shaped in accordance with the goals, objectives and policy directives of the City of Ottawa Official Plan.

A critical element of completing a successful planning exercise is the integration of the CDP and Official Plan Amendment (OPA) process with the Municipal Class Environmental Assessment (Class EA) processes for associated infrastructure projects. The objective of the integrated process is to create a set of guiding documents that will shape the development of Kanata North as a healthy, vibrant, liveable community, with a land use plan, Master Servicing Study, Transportation Master Plan and an Environmental Management Plan. Meeting the requirements of the Environmental Assessment Act is a requirement of Section 3.11 of the Official Plan.

The pedestrian, cycling, rapid transit and road networks for the Kanata North CDP are being identified, planned and approved through the Official Plan Amendment process under sections 7 and 21 of the *Planning Act* in a manner that fulfills the requirements of the Municipal Class Environmental Assessment process.

Key elements of the recommended transportation plan for the Kanata North community can be described as follows.

1. An urban cross section is recommended for March Road between Halton Terrace/Maxwell Bridge Road and a point north of Maxwell Road, to be implemented as part of the planned four-lane widening.
2. The City of Ottawa's 2013 TMP Affordable Rapid Transit Network includes the section of the Kanata North Transitway between Corkstown Road and Solandt Road, to be implemented between 2014 and 2031 as an at-grade median Bus Rapid Transit (BRT) facility. It also includes Transit Priority measures between Solandt Road and a future Park and Ride Lot north of Maxwell Bridge Road, to be implemented within the 2031 horizon year.
3. The Ultimate Network includes an extension of the BRT facility to north of Maxwell Bridge Road, with a conceptual future transit corridor extending further north towards Dunrobin Road.

4. The Kanata North Transitway Environmental Project Report (October 2013) identified Park and Ride facilities at Innovation Drive and along March Road north of Maxwell Bridge Road. The Park and Ride north of Maxwell Bridge Road will address future demand resulting from development in the KNUEA. The size and location of the northerly Park and Ride has been established as part of the CDP process for the KNUEA.
5. Background growth along March Road will trigger the need for additional lane capacity by the 2026 build-out year. This is consistent with the City of Ottawa's 2008 TMP, which identified a need to widen March Road from two to four lanes between Old Carp Road and Dunrobin Road. The March Road widening project fell short of the City's affordable road network funding envelope, and was not included in the City's 2013 TMP affordable road projects list. However, the urban portion of the project was at the top of the list for future consideration. As development in the KNUEA progresses, it is anticipated that the urban portion of the project will receive a higher score, and will be included in the affordable road projects list in the next TMP update.
6. The timing of the March Road widening from two to four lanes will be determined by the City of Ottawa through future TMP updates when the urban portion of the project is brought into the affordable plan.
7. Subject to the urban portion of the March Road widening project being brought into the affordable plan, and subject to a reasonable payback period, the Kanata North Landowners Group (KNLOG) is prepared to enter into a front-ending agreement with the City to construct the widening of March Road to four lanes to the limit of the urban area.
8. In light of the projected travel demand, and consistent with the City's direction to reduce auto dependency, consideration should also be given to advancing the implementation of the ultimate median BRT system prior to the 2031 planning horizon.
9. The optimal location for the future KNUEA Park and Ride facility is at the northwest corner of the March Road/North Collector (Streets 'C' and 'E') intersection.
10. Traffic signals are considered the preferred type of intersection control at the March Road access locations.
11. The preferred solution for an access connection to Old Carp Road includes a realignment of Old Carp Road and Halton Terrace such that both roads tee into the proposed North-South Collector (Street 'A').
12. The preferred solution for access connections to March Road includes:
 - four full movement signalized intersections, and
 - a local right-in right-out road connection on the west side of March Road south of the creek corridor.
13. Two right-in right-out driveways are assumed for the commercial uses along the east side of March Road.
14. The collector/collector intersections in the northwest and southwest quadrants of the KNUEA could be considered as possible candidates for roundabout control at the time the applications for Draft Plan of Subdivision are processed by the City.

15. The City's 2013 Transportation Master Plan Update includes policies and actions for providing safe and efficient roads by designing and building complete streets. Complete streets design elements have been considered for all roadways in the KNUEA. The Complete Streets design elements identified in this report should be considered and further refined at the Plan of Subdivision and Site Plan stage.
16. A 44.5m right-of-way width is recommended along March Road between the current urban area boundary and the northern limit of the KNUEA. This right-of-way width will provide for the ultimate extension of the median BRT system.
17. The Kanata North CDP TMP satisfies the requirements of the Municipal Class EA process for the portion of the conceptual future transit corridor, as shown in the City's 2013 TMP, that extends between Maxwell Bridge Road/Halton Terrace and the North Collector (Streets 'C' and 'E'). Additional studies will need to be completed to fulfill the Municipal Class EA requirements for any further extension of the median BRT north of the March Road/North Collector intersection.
18. A median BRT station(s) will be identified along the corridor within the KNUEA, as development occurs and detailed BRT plans are developed. The identification of station location(s) will need to take into consideration the location of the most northerly planned station along the corridor (March/Klondike, as per the approved Kanata North Transitway EA) and the planned park and ride at March Road/North Collector (Streets 'C' and 'E', as per the Kanata North CDP process).
19. It is recommended that interim transit priority measures be examined and implemented as required through the study area as part of the initial widening of March Road from two to four lanes in preparation for the next City of Ottawa TMP update.
20. The proposed March Road cross sections are consistent with the recommendations of the 1994 March Road Reconstruction Environmental Study Report and are addressed by the Kanata North Transitway Environmental Project Report.
21. The interim and ultimate March Road cross sections have geometric features (such as landscaping in the medians and narrow lane widths) that reflect a design speed of 60 kilometres per hour.
22. The right-of-way to be protected along all collector roadways within the KNUEA will be 24m. Future collectors will be provided with a 24m right-of-way but will be built as local roads in the short term. Local roads will have 18m, 16.5m and 14m rights-of-way.
23. The 18m and 16.5m right-of-way widths allow for the provision of sidewalk along local roads leading directly to transit, school, park, institution or retail/commercial/employment land uses, as shown in the Parks and Pathways Plan (**Figure 34** of this report). The 14m right-of-way width will be used for single loaded roads adjacent to open space.
24. The KNCDP TMP Existing Conditions Report indicated that active transportation modal shares within the Transportation Area of Interest (TAI) are significantly lower than the target modal shares identified in the City's 2013 TMP. The walking and cycling facilities included in the Parks and Pathways Plan are anticipated to achieve the City's 2013 TMP targets for active transportation modal shares in the KNUEA.

25. The proposed pedestrian and cycling network provides connections to all land-uses within the subject lands, as well as the existing communities to the north and south. The pedestrian and cycling network will be fully integrated with the City of Ottawa's existing pedestrian and cycling network.
26. Provision for transit service in early phases of development will be encouraged through the creation of Early Service Agreements between developers and City of Ottawa, Transit Services. Early transit service will help achieve the projected ridership targets and minimize vehicular site traffic.
27. Based on the Demonstration Plan, shown as **Figure 35** of this report, the development of the KNU EA has the potential to include 960 singles, 950 street townhouses, 1,040 multi-unit residential units, 300,000 square feet (GFA) of community commercial, 100,000 square feet (GFA) of neighbourhood commercial, three elementary schools, one high school and a park and ride lot consisting of approximately 500 spaces.
28. Construction is expected to begin in 2018. The rate of development will be subject to market demands. For analysis purposes, development is assumed to occur over an 8 year period for a build-out year of 2026.
29. Based on the results of screenline analysis, other corridors in the greater Kanata North area apart from the KNU EA may need to be investigated by the City or through other long-term planning studies to provide additional capacity in the future.
30. Auxiliary lanes at the KNU EA access intersections are recommended as follows:
 - March Road / South Collector (Streets 'A' and 'G')
 - Northbound, southbound and eastbound left turn lanes
 - Dual westbound left turn lanes
 - Northbound right turn lane
 - March Road / Midblock Collector (Street 'D')
 - Northbound and eastbound left turn lane
 - March Road / North Collector (Streets 'C' and 'E')
 - Northbound, southbound, eastbound and westbound left turn lanes
 - March Road / North Local / Maxwell Road
 - Northbound, southbound, eastbound and westbound left turn lanes
 - Old Carp Road / North-South Collector (Street 'A')
 - Westbound left turn lane
 - Halton Terrace / North-South Collector (Street 'A')
 - Westbound left turn lane
31. Additional right-of-way will be required at the March Road/South Collector (Streets 'A' and 'G') intersection beyond the recommended 44.5m corridor to accommodate the recommended northbound right turn lane. The additional right-of-way requirement will be confirmed at the Plan of Subdivision stage.
32. Intersection capacity analysis has been completed to determine how much development can proceed in the KNU EA before any adverse impacts are realized to the existing two-lane March Road.

33. For the purpose of the interim analysis, it is assumed that the initial phases of development will include the collector road network, collector access connections to March Road and predominantly residential land uses. Any initial commercial development would reduce the assumed amount of residential development.
34. Intersection capacity analysis suggests that approximately 1,650 units can be developed in the KNUEA prior to any adverse impact on the existing two-lane March Road.
35. Consistent with the current policies of the City of Ottawa's 2014 Development Charges (DC) Background Study regarding the widening of existing arterial roads, the required roadway modifications at the interim access connections to March Road should be eligible for DC funding.

The TMP component of the Kanata North CDP satisfies the requirements of Phases 1 through 4 of the Municipal Class EA Process. Infrastructure projects that will be undertaken in concert with development of the KNUEA and their schedule classification are as follows:

- Streets A, B, C, D, E, F, and G, including multi-use pathways, and interim roadway modifications at the access connections to March Road and Old Carp Road (Schedule C)
- Extension of BRT from north of Halton Terrace/Maxwell Bridge Road to Streets 'C' and 'E' (Schedule B)

Recreational pathways to and around the stormwater management ponds will be undertaken as part of the stormwater management pond projects, as identified in the KNCDP Environmental Management Plan. The recreational pathways that follow the 40m creek corridors will cost less than \$3.5 million to implement and do not require a separate project listing, in accordance with the Class EA document.

The BRT Extension is considered a Schedule B project due to its location within the March Road right-of-way. Since the BRT lanes will be located along the center of March Road, any adverse environmental effects are well understood from a technical perspective, are minor in nature, and mitigation is well understood.

In conclusion, the development reflected in the KNCDP Preferred Land Use Plan can be adequately served by a minimal amount of transportation infrastructure in addition to what is already identified in the City's 2013 TMP.

1.0 INTRODUCTION

This Transportation Master Plan has been prepared as a component of the Community Design Plan (CDP) for Kanata North. The CDP will establish a community-wide land-use framework for the Kanata North Urban Expansion Area (KNUEA) that reflects the principles, objectives and policies for community development as directed by the Official Plan. The purpose of a CDP is to provide a level of direction between Official Plan policy and development approval to enable development to occur incrementally over time in an optimum and coordinated manner. Community design plans are used as a guide to the preparation and review of future applications for development.

The TMP identifies the transportation plan for the community including the collector road network, access locations, provisions for pedestrian and cycling linkages, and interim and ultimate road cross sections that incorporate the planned widening of March Road and the extension of planned transit facilities.

1.1 Kanata North Urban Expansion Area

The Kanata North Urban Expansion Area (KNUEA) is approximately 181 hectares in area (447.6 acres) located north of the established urban communities of Morgan's Grant, Briarbrook, and Brookside and adjacent to a number of rural estate subdivisions including Hillview Estates Subdivision to the north, and the Marchbrook Circle and Panandrick subdivisions to the west. The abandoned CN railway corridor forms the KNUEA boundary to the east. For the purposes of this report, March Road is considered to run north/south.

As shown on **Figure 1**, the KNUEA extends north from the urban portion of Kanata along both sides of March Road. The area is predominantly rural but also includes existing development such as St. Isidore Roman Catholic Church and St. Isidore Catholic School (Ottawa Catholic School Board) as well as several other existing rural residential and commercial uses along the west side of March Road.

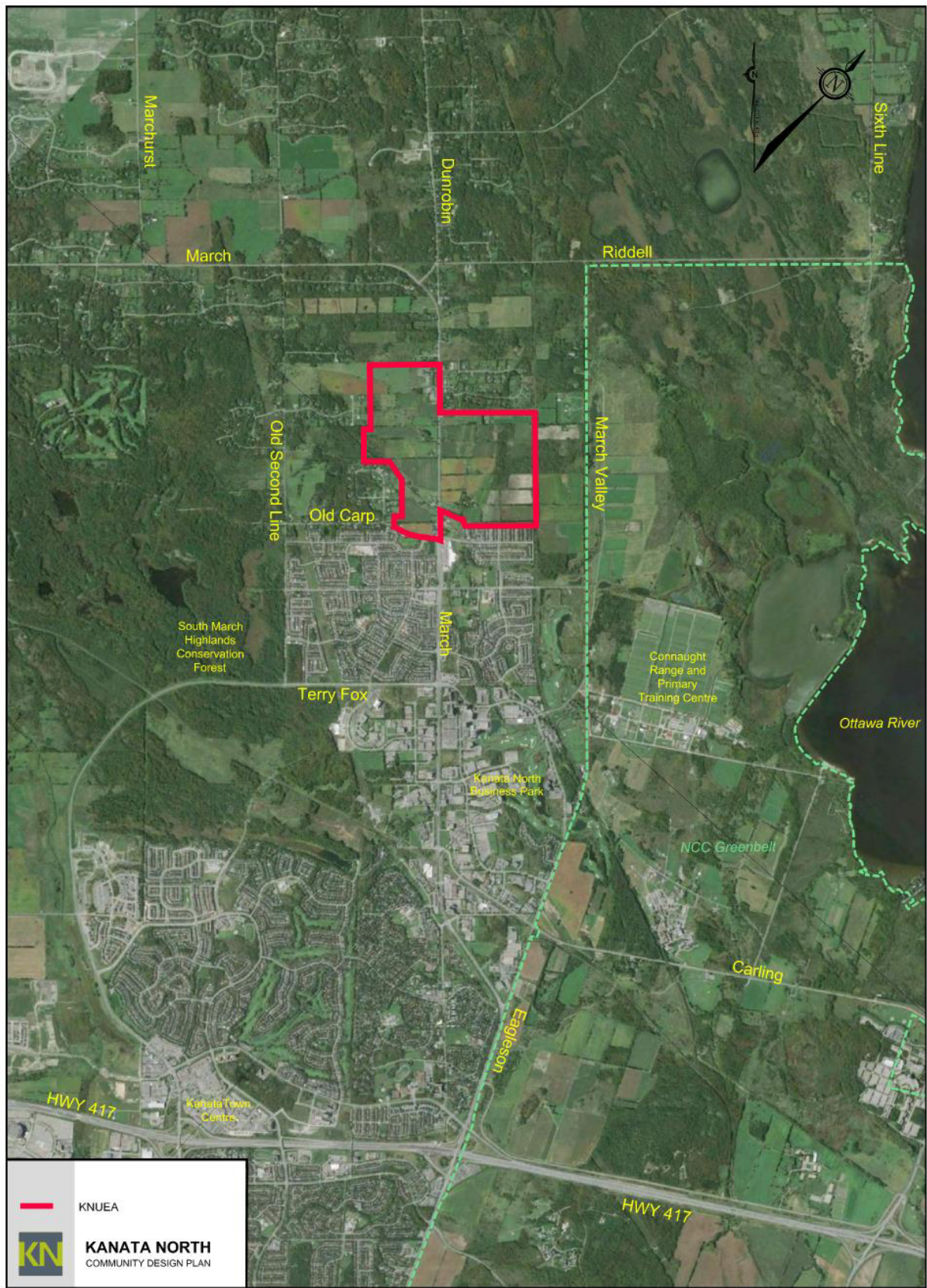


Figure 1 – Kanata North Urban Expansion Area (KNUEA) Context and Location

1.2 Background

When the City's Official Plan was reviewed in 2009, City Council and the Ontario Municipal Board approved a number of urban expansion areas to support projected population growth to 2031. The Kanata North Urban Expansion Area (KNUEA) was one of several areas amended from a "General Rural" designation to "Urban Expansion Study Area" through Official Plan Amendment 76 (OPA 76).

OPA 76 also added Section 3.11 of the Official Plan which sets out a process for further amending the "Urban Expansion Study Area" to "General Urban Area" and other land use designations appropriate for urban development. The preparation of a CDP, including satisfying Environmental Assessment and Official Plan Amendment requirements, is a necessary component of this process and must be completed before the City will consider development applications for the area.

The major landowners in the KNUEA, known collectively as the "Kanata North Land Owners Group" (KNLOG), initiated a Community Design Plan process to fulfill the requirements of the Official Plan. Collectively, the sponsoring land owners represent approximately 87% of the land within the KNUEA. The CDP, while funded by the KNLOG, has been balanced and shaped in accordance with the goals, objectives and policy directives of the City of Ottawa Official Plan.

The Sponsoring Landowners include:

- Metcalfe Realty Company Ltd.;
- Brigil (3223701 Canada Inc.);
- Valecraft (8409706 Canada Inc.)/JG Rivard Ltd.; and
- Junic/Multivesco (7089121 Canada Inc.).

Early in the process formal invitations were sent to other landowners to participate; however, none other than the group listed above chose to join the KNLOG. Non-participating landowners have been involved in the CDP process through consultation and opportunities to comment as the plan evolved.

Figure 2 provides a map showing the ownership of lands within the KNUEA. Adjacent properties owned by members of the KNLOG are also shown. For clarity, the KNUEA is sometimes referred to as being divided into quadrants, east and west of March Road and north and south roughly based on property ownership. The quadrants are labeled on **Figure 2**.

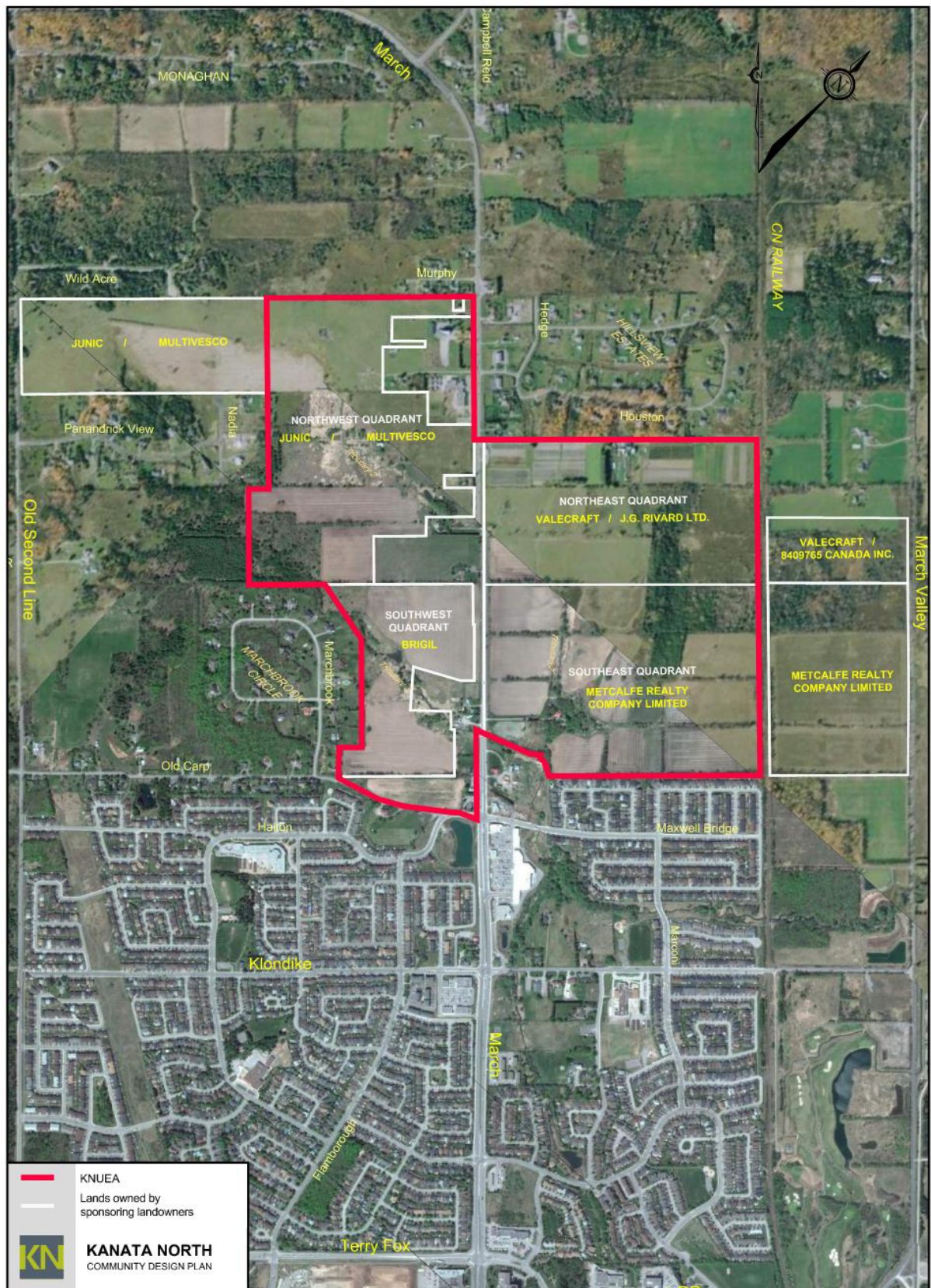


Figure 2 - KNUEA Boundaries and Properties of Sponsoring Landowners

1.3 Integrated Planning Process

A critical element of completing a successful planning exercise is the integration of the CDP and Official Plan Amendment (OPA) process with the Municipal Class Environmental Assessment (Class EA) processes for associated infrastructure projects. The objective of the integrated process is to create a set of guiding documents that will shape the development of Kanata North as a healthy, vibrant, liveable community. The guiding documents are as follows:

- a Community Design Plan (CDP) to determine the location of land uses and provide direction for future development in the KNUFA;
- an Environmental Management Plan (EMP) to address the management of the Natural Heritage System;
- a Transportation Master Plan (TMP) to provide an integrated and sustainable transportation network; and
- a Master Servicing Study (MSS) to inform the design and implementation of sanitary, water, and stormwater management infrastructure.

The Planning Act process to implement the CDP will be an Official Plan Amendment approved by City Council, implementing the recommendations set out in the EMP, TMP, MSS and CDP.

The Master Plans set out a network of roads and municipal infrastructure including water, sanitary and stormwater management system(s). These facilities will ultimately be turned over to the City of Ottawa as municipal infrastructure through the subdivision approvals process. The Province of Ontario's Environmental Assessment Act requires an Environmental Assessment for any major public sector undertaking which includes public roads, transit, water, sanitary and stormwater installations. Meeting requirements of the Environmental Assessment Act is a requirement of Section 3.11 of the Official Plan.

Combining the CDP process with the Class EA creates an opportunity to co-ordinate the approval requirements of the Environmental Assessment Act and the Planning Act and provides an integrated approach to the planning and development of all aspects of the community. For example, an integrated planning process means that background studies and existing conditions reports can be shared between the two processes, stakeholders and advisory committees are able to consider all aspects of planning and servicing, and the public review and approval processes can be consolidated and simplified. The Master Plan and CDP process was integrated in accordance with Approach #4 as outlined in the Class EA.

A figure showing the integration of the Class EA process and the Community Design Plan/Official Plan Amendment process is provided as **Figure 3**.

KANATA NORTH URBAN EXPANSION STUDY AREA CDP

Class EA and Planning Act Processes

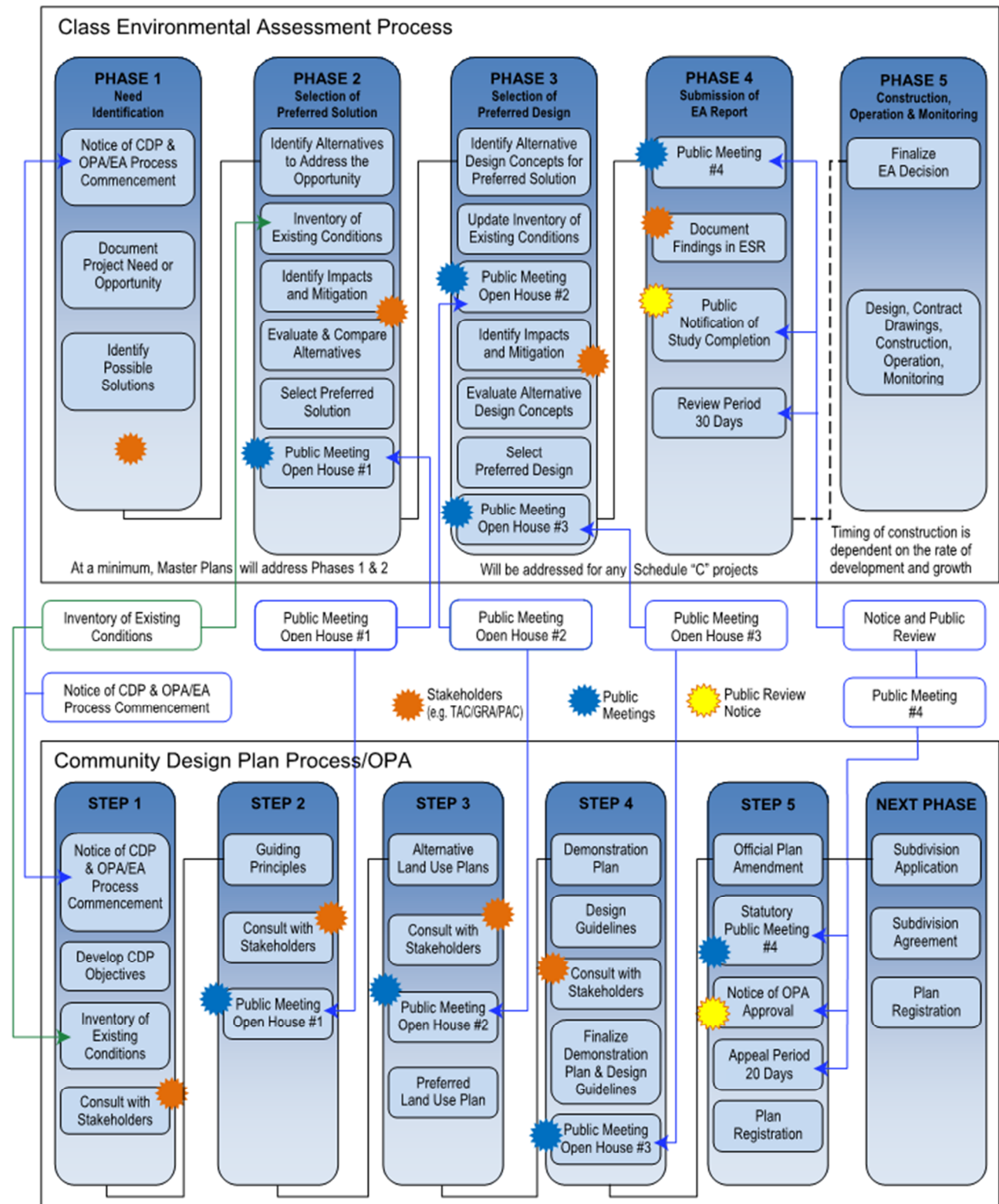


Figure 3 - Integrated Class EA and CDP Planning Framework

1.4 Consultation Process

1.4.1 Public Meetings and Workshop

Both the CDP and Environment Assessment processes include an important component of public consultation that gives the public and community stakeholders meaningful opportunities to be involved in shaping the community.

A Consultation Plan was developed as part of the initial Terms of Reference for the Kanata North CDP and three public open houses and a workshop session were held in Kanata between the summer of 2013 and spring of 2016. The first two open houses and workshop led to the development of the preferred options for land use, transportation, infrastructure and environmental management. The third open house presented the preferred land use plan and supporting master plans to the community. A fourth and final public meeting was held in June 2016 to present the CDP, Official Plan Amendment and Master Plans to Planning Committee.

Additional information about the public consultation process is available in the Kanata North Community Design Plan and in the Kanata North Public Consultation Report prepared by Morrison Hershfield.

1.4.2 Project Team

The preparation of the CDP included the participation of a number of committees or teams created to enable a collaborative study process encompassing a range of stakeholders.

Core Project Team (CPT)

The Core Project Team (CPT) was established to lead the CDP process. The CPT was comprised of the Kanata North Land Owners Group, the Consultant Team, and City of Ottawa staff from the Department of Planning and Growth Management. The primary function of the CPT was to review reports, resolve issues and achieve consensus at each step of the CDP work program.

Novatech was retained by the KNLOG as Project Managers to lead the Consulting Team. Novatech was also responsible for Land Use Planning, Urban Design, the Master Servicing Study, Transportation Master Plan, and the Environmental Management Plan. The City of Ottawa provided an internal project manager for coordination and guidance. The CPT had representation from the following organizations:

City of Ottawa

- City of Ottawa staff from the Planning and Growth Management Department;

Kanata North Land Owners Group

- Metcalfe Realty Company Ltd.;
- Brigil (3223701 Canada Inc.);
- Valecraft (8409706 Canada Inc.)/JG Rivard Ltd.; and
- Junic/Multivesco (7089121 Canada Inc.).

Consulting Team

- Land Use Planning and Urban Design – Novatech;
- Integrated Environmental Assessment – Morrison Hershfield;
- Master Servicing Study – Novatech;
- Transportation Master Plan – Novatech;
- Environmental Management Plan – Novatech;
- Geotechnical – Paterson Group Inc.;
- Hydrogeology – Paterson Group Inc.;
- Natural Heritage and Species at Risk (Environment) - Muncaster Environmental Planning Inc., DST, Bowfin Environmental, McKinley Environmental Solutions;
- Fluvial Geomorphology – Matrix Solutions and Parish Geomorphics;
- Archaeology – Paterson Group Inc.; and
- Potable Water Assessment – Stantec.

Technical Advisory Committee (TAC)

The Technical Advisory Committee (TAC) was created to provide guidance and review critical deliverables on an as-needed basis. Specifically, TAC Meetings were held to discuss the evolving land use plan and information related to the preparation of the Transportation Master Plan, Master Servicing Study and Environmental Management Plan. In addition, as needed, the members of the TAC were available to provide input throughout the CDP process. Representatives of the following organizations were invited to participate:

- CPT Members (as needed);
- City of Ottawa Planning and Growth Management Department;
- City of Ottawa Traffic Services;
- City of Ottawa Parks and Recreation Branch;
- City of Ottawa Infrastructure Approvals;
- City of Ottawa Transit Services;
- Ottawa Public Health;
- Ottawa Public Library;
- Ottawa Carleton District School Board (OCDSB);
- Conseil des écoles publiques de l'Est de l'Ontario (CEPEO);
- Ottawa Catholic School Board (OCSB);
- Conseil des écoles catholiques du Centre-Est (CECCE); and
- Hydro Ottawa.

Government Review Agencies (GRA) are specific agencies with an interest in land use and development. The GRA were provided with copies of all notices prepared for the project and requested to provide input and comments. Representatives were invited to sit as regular members of the TAC and depending on the agency were involved to provide technical input at various stages from the initial steps to reviewing the details of alternative designs. The level of participation was at the discretion of the agency/representative and some agencies were involved throughout the process while others were consulted primarily to acknowledge they will have a role in future subdivision applications. Individual meetings were held with GRA as required and TAC meeting agendas were distributed in advance to assist in determining if attendance/participation was required. Government Review Agencies consulted included:

- Ontario Ministry of the Environment and Climate Change (Environment);
- Ontario Ministry of Natural Resources and Forestry (Environment);
- Ontario Ministry of Tourism, Culture and Sport (Archaeology);
- Ontario Ministry of Aboriginal Affairs (Heritage);
- Mississippi Valley Conservation Authority (Environment/Floodplain);
- National Capital Commission (Adjacent landowner); and
- Department of Fisheries and Oceans Canada (Fish habitat);

Public Advisory Committee (PAC)

The varied interests of the surrounding community (i.e., community associations, local residents, and special interest groups) were represented through a Public Advisory Committee (PAC). The PAC met with members of the project team on a regular basis to:

- Identify any community issues early in the CDP process;
- Review technical analyses;
- Provide direct input to the establishment of the guiding principles of the CDP;
- Review land use alternatives; and
- Provide meaningful feedback on all study activities and work-in-progress.

The composition of the PAC was determined through consultation with the Ward Councillors and City of Ottawa staff and included:

- City Councillors from Wards 4 (Kanata North) and 5 (West Carleton-March)
- Residents and representatives of the March Rural Community Association and the Briarbrook, Brookside and Morgan's Grant Community Association
- A representative from the Kanata Chamber of Commerce

2.0 PURPOSE OF REPORT

The purpose of this TMP is to document the transportation analysis for the long-term transportation infrastructure needs in support of the Kanata North CDP.

This report details the transportation plan which has been designed to meet the full range of long-term transportation needs when the KNUFA is fully built-out by approximately 2026. The transportation infrastructure networks that are recommended will ensure appropriate levels of transportation service for the future growth of the West Urban Community (WUC) in general, and the urban development recommended in the KNCDF.

The pedestrian, cycling, rapid transit and road networks for the Kanata North CDP are being identified, planned and approved through the Official Plan Amendment process under sections 7 and 21 of the *Planning Act* in a manner that fulfills the requirements of the Municipal Class Environmental Assessment process.

2.1 Methods

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

- A screenline analysis to evaluate the mainline capacity of Terry Fox Drive, March Road and Legget Drive under the background and total traffic conditions during the weekday AM and PM peak hours;
- An operational evaluation of the study area intersections under the background and total traffic conditions during the weekday AM and PM peak hours;
- An assessment of alternative transportation solutions;
- An assessment of alternative access intersection control alternatives;
- Mitigation measures in the form of additional lane capacity and/or signal adjustments are identified to address operational problems that are attributable to the development of the KNU EA;
- An evaluation of the long term transit needs within the KNU EA;
- An evaluation of the long term pedestrian and cycling needs within the KNU EA.

2.2 Parameters

The scope of work for this TMP was agreed upon with the City of Ottawa and is included in **Appendix A** for reference.

An Existing Conditions Report (ECR) was prepared by Novatech in September 2013 as part of the KNCDP process. The ECR was prepared to describe the current transportation infrastructure network and operating conditions. An addendum to the ECR was issued in February 2014 to address comments provided by the City. The ECR and addendum addressed the transportation-related matters in an area bounded by the following:

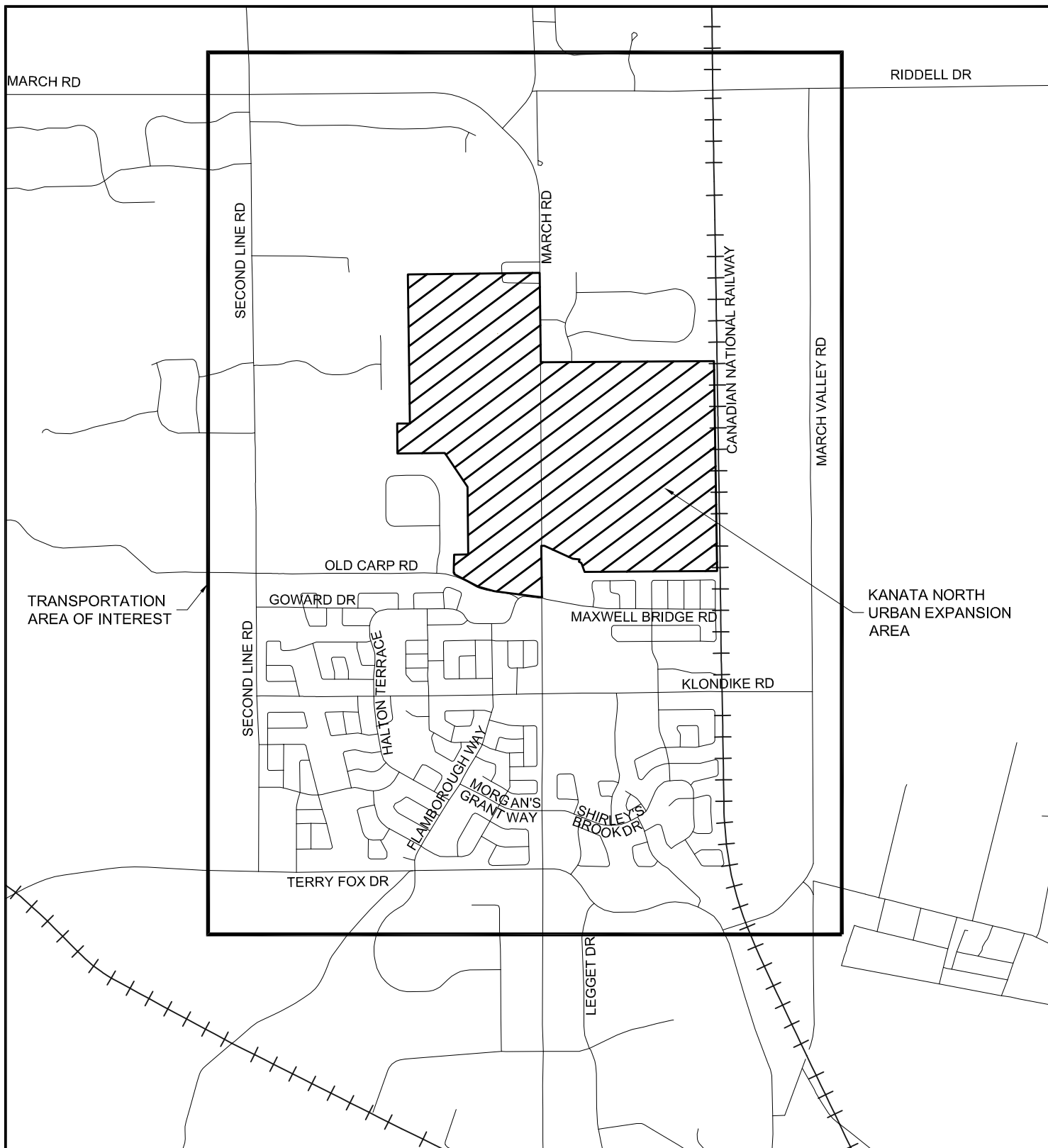
- to the north, March Road;
- to the south, Terry Fox Drive;
- to the east, March Valley Road;
- to the west, Second Line Road;
- all intersections along March Road between Terry Fox Drive and Highway 417.

The transportation area of interest (TAI) for this report has been refined to reflect all major intersections along March Road and Terry Fox Drive within a 2.5km radius of the KNU EA. The new TAI includes the following intersections:

- All signalized intersections along March Road between Second Line Road and Terry Fox Drive;
- Terry Fox Drive / Flamborough Way / Innovation Drive;
- Terry Fox Drive / Legget Drive.

The limits of the TAI for this report are shown in **Figure 4**.

The time periods selected for the analysis include the weekday AM and PM peak hours. These time periods represent the 'worst case' combination of site-generated traffic and adjacent roadway traffic.



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KANATA NORTH COMMUNITY DESIGN PLAN



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FIGURE NO. 4
TRANSPORTATION
AREA OF INTEREST



Engineers, Planners & Landscape Architects

Construction is expected to begin in 2018. The rate of development of the KNUEA will be subject to market demands, and cannot be confirmed with certainty. It is anticipated that full build-out will be achieved in approximately 8 years following commencement of construction. Analysis has been completed for an interim phase of development, 2026 build-out and a five year horizon of 2031.

3.0 TRANSPORTATION-RELATED ENVIRONMENTAL ASSESSMENTS

An Environmental Study Report (ESR) was prepared by A.J. Robinson & Associates Inc. and submitted to the Regional Municipality of Ottawa-Carleton in May 1994 for the March Road Reconstruction project. The study identifies the widening required along March Road between Highway 417 and Dunrobin Road. An urban cross section is identified between Highway 417 and Old Carp Road and a rural cross section is identified between Old Carp Road and Dunrobin.

An Environmental Project Report (EPR) was prepared by Delcan and submitted to the City of Ottawa in October 2013 for the Kanata North Transitway. The Kanata North Transitway extends along March Road from the Highway 417/March-Eagleson Interchange to north of Halton Terrace/Maxwell Bridge Road.

The Kanata North Transitway study proposes to implement a Bus Rapid Transit (BRT) system along March Road with stations located at the Highway 417/March-Eagleson Interchange, Corkstown Road, Herzberg Road, Richardson Side Road, Carling Avenue, Solandt Road, Terry Fox Drive and Klondike Road. Park and Ride facilities are proposed at the Terry Fox Drive/Innovation Drive intersection and along March Road north of Old Carp Road/Maxwell Bridge Road (within the KNUEA). Construction of the Park and Ride facility at Terry Fox Drive/Innovation Drive began in the spring of 2016, and has an anticipated opening date of late 2016.

The City of Ottawa's *Official Plan* (OP) identifies a 44.5m right-of-way to be protected along March Road between Teron Road and the urban area limit. This right-of-way will protect for the widening of March Road to accommodate four lanes of traffic and the BRT as identified in the Kanata North Transitway EPR. The northern limit of the Kanata North Transitway as recommended in the EPR is shown on the design drawing attached in **Appendix B**. The City of Ottawa's OP identifies a 34m right-of-way to be protected along March Road between the urban area limit and Dunrobin Road. This right-of-way protects for the widening of March Road to four lanes as identified in the March Road Reconstruction ESR.

With the development of the KNUEA, it is recommended that the urban cross section be extended from Halton Terrace/Maxwell Bridge Road to a point north of the Maxwell Road/St. Isidore intersection.

4.0 EXISTING TRANSPORTATION CONDITIONS

The KNCDP TMP Existing Conditions Report (ECR) and addendum were prepared early on in the CDP process and describe the 2013 existing transportation infrastructure network and operating conditions. Copies of the ECR and addendum are included in **Volume 2**.

The findings of the ECR and addendum are summarized in the following sections.

4.1 Existing Transit Network and Volumes

In 2013, the TAI was served by OC Transpo express route 60, Transitway route 93 and school route 674. The 2013 transit network for the TAI is shown in **Figure 5**.

During the AM peak hour approximately 150 passengers entered and 290 passengers departed the TAI via transit. Approximately 85% of the outbound passengers during the AM peak hour used the express route 60, while the residual used the regular route 93. During the PM peak hour approximately 240 passengers entered and 100 passengers departed the TAI via transit. Approximately 85% of the inbound passengers during the PM peak hour used the express route 60, while the residual used the regular route 93.

4.2 Existing Cycling Network and Volumes

Bicycle lanes are provided along both sides of Terry Fox Drive within the TAI, March Road between Highway 417 and approximately 150m north of Maxwell Bridge Road, and Legget Drive between Terry Fox Drive and Solandt Road. Paved shoulders are provided for cyclists along March Road between Murphy's Court and approximately 150m north of Maxwell Bridge Road, as well as Second Line Road south of Klondike Road.

Off-road pathways located within the TAI are described as follows:

- East side of Second Line Road between Klondike Road and Terry Fox Drive;
- South side of Terry Fox Drive west of March Road;
- West/South side of Innovation Drive;
- Within hydro corridor east of Second Line Road travelling north between Terry Fox Drive and the existing residential communities.

An extensive recreational pathway network exists within the South March Highlands Conservation Forest, located west of Second Line Road between Terry Fox Drive and Old Carp Road.

The existing cycling network for the TAI is shown in **Figure 6**.

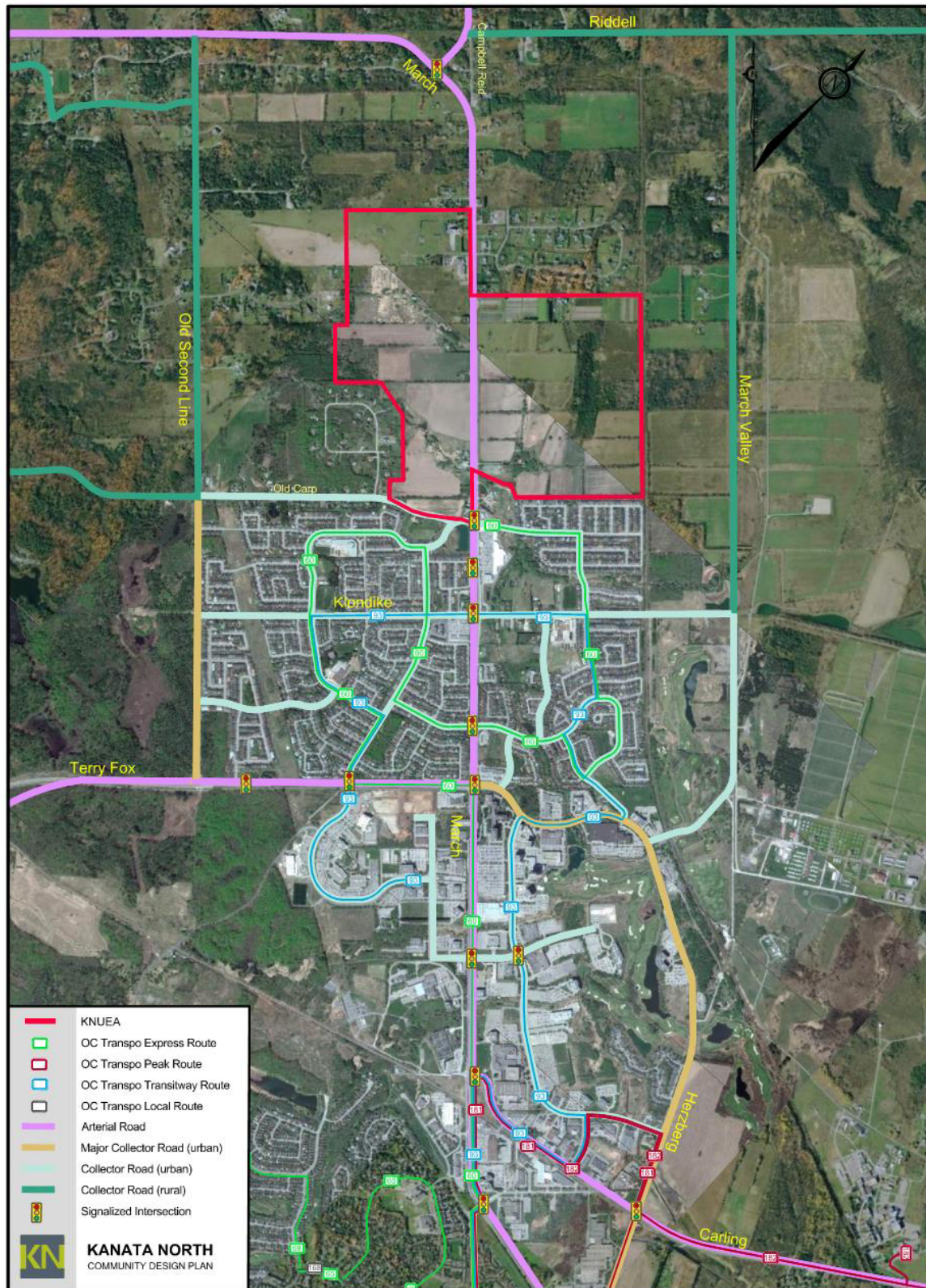


Figure 5 – 2013 Road and Transit Network

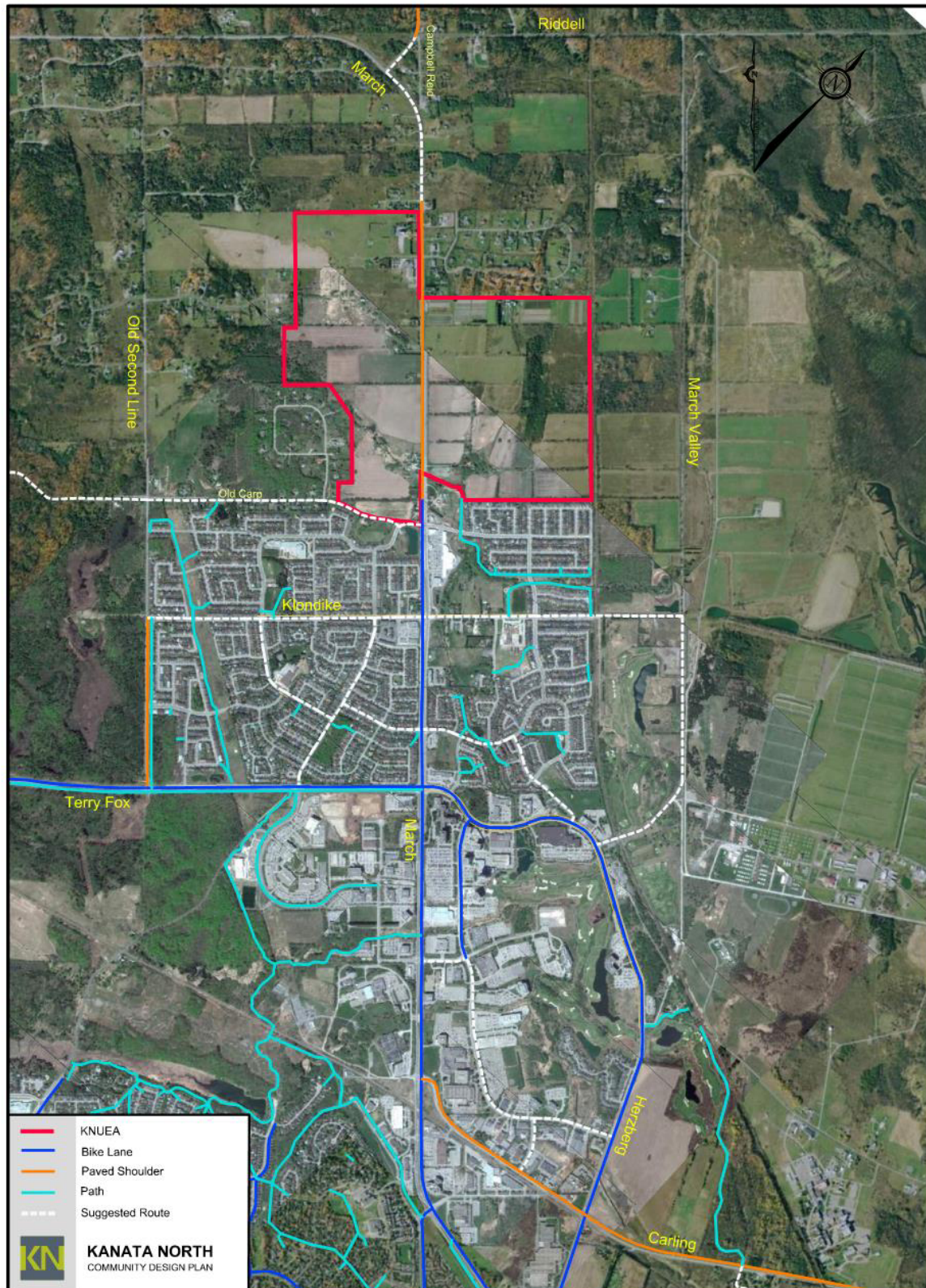


Figure 6 – Existing Cycling Network

Recent traffic counts show that the existing cycling volumes within the TAI are significantly lower than the target modal share identified in the City's 2013 TMP. The low cycling volumes within the TAI suggest that there are deficiencies in the existing cycling network. The deficiencies can be described as follows:

- No cycling facilities are provided along March Road north of Maxwell Bridge Road;
- No cycling facilities are provided along March Valley Road.

4.3 Existing Pedestrian Facilities

Sidewalks are provided along both sides of March Road south of Maxwell Bridge Road / Halton Terrace. North of Maxwell Bridge / Halton Terrace paved shoulders are provided along March Road.

Sidewalks are provided along both sides of Halton Terrace west of March Road. Gravel shoulders are provided along both sides of Old Carp Road west of Halton Terrace.

A recreational pathway extends through the west half of the Morgan's Grant community, extending south of Old Carp Road to Oakside Crescent, then following the hydro corridor east of Second Line Road between Goward Drive and Terry Fox Drive. A second pathway connection to the Morgan's Grant community is provided south of Old Carp Road at Marchbrook Circle.

A recreational pathway extends south of the KNUFA to Maxwell Bridge Road east of Shirley's Brook.

Sidewalks are provided along both sides of Maxwell Bridge Road between March Road and Marconi Avenue. East of Marconi Avenue the sidewalk along the north side of Maxwell Bridge Road is continued.

The ECR provides a full description of sidewalks, off-road pathways and multi-use pathways within the TAI.

The existing pedestrian network for the TAI is shown in **Figure 7**.

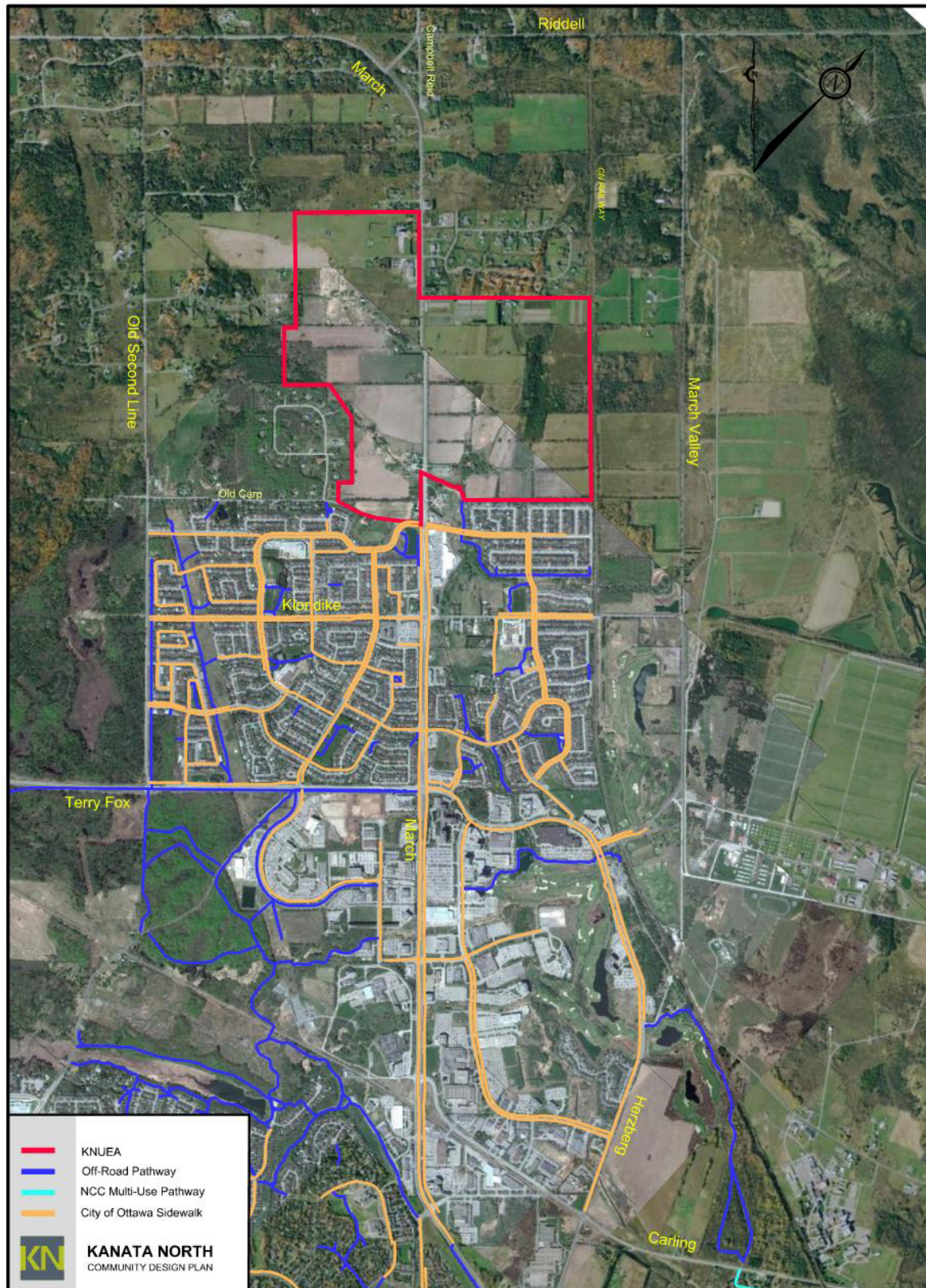


Figure 7 – Existing Pedestrian Network

4.4 Screenline Analysis

A screenline is defined as an imaginary line that is crossed by a given number of traffic corridors. A screenline located immediately south of Terry Fox Drive and bound by Second Line Road in the west and March Valley Road in the east was used to measure mainline capacity for the TAI. The location of the TAI screenline is shown in Figures 18 and 19 of the KNCDP TMP Existing Conditions Report included in **Volume 2**. Corridors crossing the study area screenline include Terry Fox Drive (west of Second Line Road and east of March Valley Road), Innovation Drive, March Road, and Legget Drive. A lane capacity analysis was performed using recent traffic count data.

All of the roads crossing the study area screenline showed peak hour v/c ratios of 0.76 or lower, corresponding to a LOS 'C' or better. The screenline analysis suggests that the adjacent road network to the south has sufficient through lane capacity to accommodate additional traffic.

Recent vehicle, transit, bicycle and pedestrian data was reviewed to determine the existing modal shares at the study area screenline in the peak direction of travel. As the TAI is located at the northern boundary of the Kanata / Stittsville region, the existing screenline modal shares were compared with the modal shares observed in the *2011 Trans Origin-Destination Survey Report* for the Kanata / Stittsville region.

The transit modal shares crossing the study area screenline during the AM and PM peak hours were significantly lower than the observed transit modal shares presented in the *2011 Trans O-D Survey Report* for the Kanata / Stittsville region. Since the rapid transit stations within the Kanata / Stittsville region are centralized along Highway 417, transit accessibility and usage is greater south of the TAI. It is noteworthy that the observed modal shares within the TAI were much closer to those reported for the Rural West region located immediately north of the TAI. It is possible that the reduced transit usage within the TAI during peak hours is due to the lack of a bus rapid transit hub in this area (such as the Eagleson Park and Ride facility).

4.5 Existing Intersection Operations

Intersection capacity analysis was completed using a macroscopic traffic software package (Synchro 8.0). Existing operating conditions were assessed at the TAI intersections for the weekday AM and PM peak hours. The weekday AM and PM peak hour analysis shows failing operating conditions for movements at the following intersections:

- northbound and southbound left turn movements at the March Road/Terry Fox Drive intersection,
- multiple movements at the March Road/Solandt Road intersection,
- northbound and southbound left turn movements at the March Road/Carling Avenue/Station Road intersection,
- westbound through/left turn movement at the March Road/Gateway Shopping Centre intersection,
- multiple movements at the March Road/Teron Road/Richardson Side Road intersection,
- southbound and westbound left turn movements at the March Road/Corkstown Road intersection,
- multiple movements at the March Road/Campeau Drive/Highway 417 intersection.

While the screenline analysis suggests that there is sufficient mainline capacity in the road network immediately south of Terry Fox Drive, the intersection analysis identifies failing operating conditions for movements at a number of intersections south of the KNU EA.

It should be noted that screenline analysis is a high-level comparison of forecasted demands and lane capacities on the major road network, whereas intersection analysis is a more detailed evaluation tool and more accurately reflects the operating conditions based on:

- the allocation of green time at signalized intersections to vehicular and pedestrian travel modes, and
- the provision of auxiliary turning lanes.

The intersection analysis results are considered a more accurate representation of actual operating conditions in this respect.

4.6 Collision Analysis

Historical collision data from the last three years was reviewed to determine if there are any identifiable collision patterns. The Ottawa *Transportation Impact Assessment (TIA) Guidelines* define a collision pattern as more than one collision at a roadway location that involves similar directions and impact types. Further analysis may be warranted for intersections with a pattern of six or more collisions for any one movement or a total of 33 or more collisions, over a three-year period.

Collision data at the following intersections meet the criteria for further analysis:

- Six turning impacts at the March Road / Morgan's Grant Way intersection involved a southbound vehicle turning left and a northbound vehicle going ahead,
- A total of thirty-seven collisions occurred at the March Road / Terry Fox Drive intersection within the last three years.
- All seventeen turning impacts at the March Road / Terry Fox Drive intersection involved a northbound or southbound vehicle turning left onto Terry Fox Drive. Four of the turning collisions involved more than two vehicles.

One fatality was noted at the intersection of March Road / Morgan's Grant Way. This collision was a turning impact, which involved a southbound vehicle turning left and a northbound dump-truck going ahead. It occurred during the hours of dusk under unfavourable roadway conditions, suggesting that environmental factors may have had a significant influence on the collision.

5.0 PLANNED NETWORK CHANGES

The City of Ottawa's *Transportation Master Plan (TMP)* was approved by City Council in December 2013. The TMP identifies the transportation facilities and services the City intends to implement by 2031 to meet the travel needs of residents and businesses, and to support the development pattern outlined in the City of Ottawa *Official Plan (OP)*.

The following will outline the transportation policies and projects that will be relevant to the provision of adequate transportation services to the urban development in the KNU EA.

5.1 Rapid Transit and Transit Priority Projects

The successful implementation of an expanded Rapid Transit and Transit Priority (RTTP) Network will be a critical element in the achievement of the City's transit objectives. The City of Ottawa's 2013 TMP has developed an Ultimate RTTP Network, as shown in **Figure 8**, but it recognizes that the City's capital investment in rapid transit projects must be affordable.

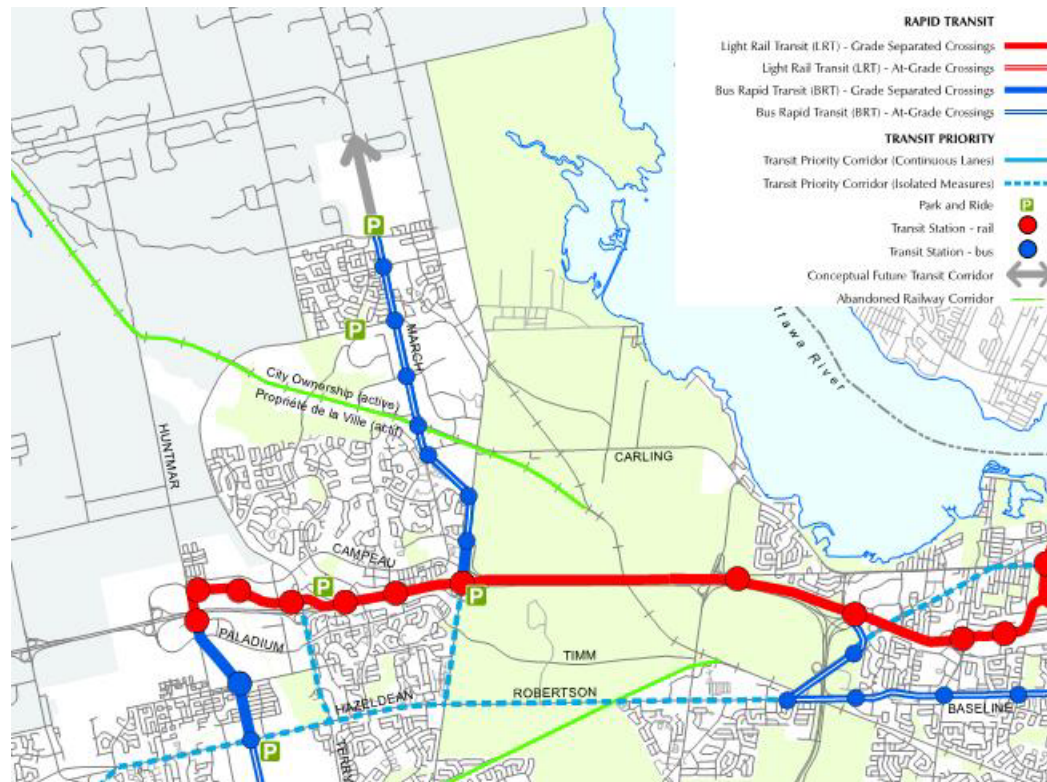


Figure 8 – Rapid Transit and Transit Priority: Ultimate Network

For that reason, the TMP recommends the implementation of a subset of the Ultimate RTTP Network, called the Affordable RTTP Network. The Affordable RTTP Network, as shown in **Figure 9**, strategically selected Light Rail Transit (LRT), Bus Rapid Transit (BRT) and O-Train projects to be completed by 2031, providing as many Ultimate Network benefits (i.e. ridership gains, opportunities for land use intensification and operating cost savings) as possible within the City's projected funding envelope.

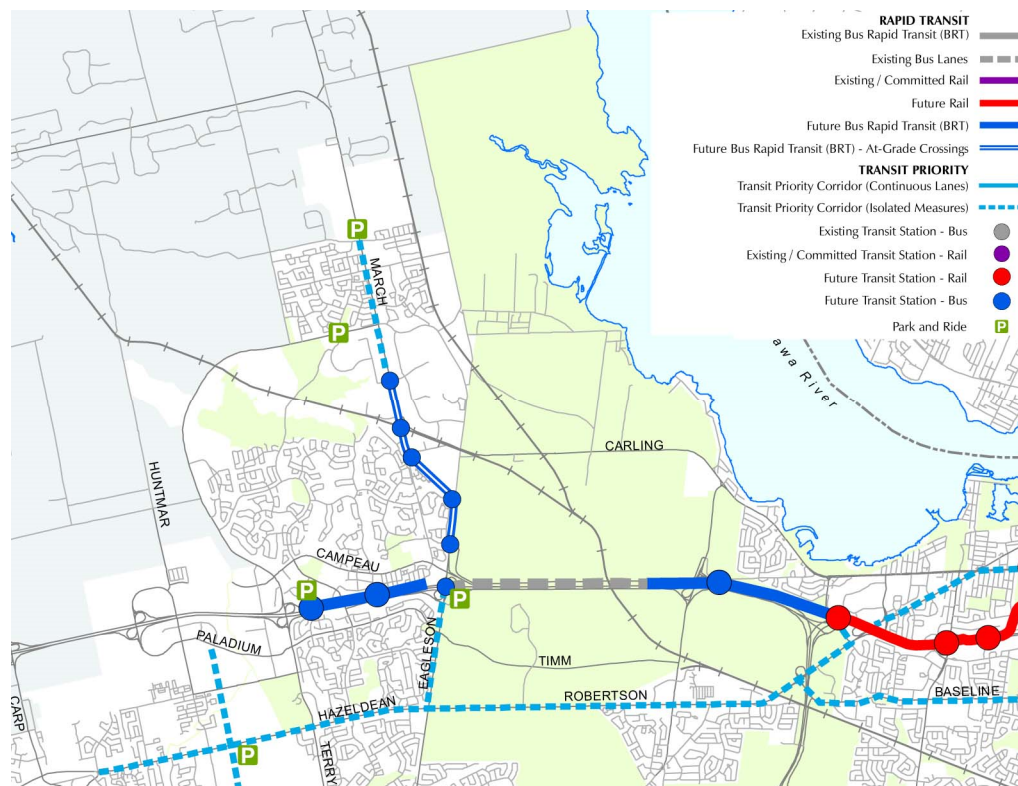


Figure 9 – Rapid Transit and Transit Priority: 2031 Affordable Concept

The City of Ottawa's 2013 TMP Affordable Rapid Transit Network includes the section of the Kanata North Transitway between Corkstown Road and Solandt Road, to be implemented between 2014 and 2031 as an at-grade median Bus Rapid Transit (BRT) facility. The Kanata North Transitway will provide high quality transit access to the major employment areas along March Road in Kanata North.

The Affordable Network also includes Transit Priority measures between Solandt Road and a future Park and Ride Lot north of Maxwell Bridge Road, to be implemented within the 2031 horizon year.

The Ultimate Network includes an extension of the BRT facility to north of Maxwell Bridge Road, with a conceptual future transit corridor extending further north towards Dunrobin Road.

The Kanata North Transitway Environmental Project Report (October 2013) identified Park and Ride facilities at the Terry Fox Drive/Innovation Drive intersection and along March Road north of Old Carp Road/Maxwell Bridge Road (within the KNU EA). As previously noted, the Park and Ride at Terry Fox Drive/Innovation Drive has an anticipated opening date of late 2016. The Park and Ride north of Maxwell Bridge Road in the KNU EA will address future demand resulting from development in the KNU EA. The size and location of this Park and Ride has been established as part of the CDP process for the KNU EA.

5.2 Future Road Network Projects

The City of Ottawa's 2013 TMP has developed an ultimate 2031 Road Network Concept, but it recognizes that the City must be financially prudent in constructing new road infrastructure due to

the availability of funds. For that reason, the TMP recommends the implementation of a subset of the ultimate 2031 Road Network Concept, referred to as the Affordable Road Network.

The only infrastructure project within the TAI identified in the 2013 TMP Affordable Road Network is the urbanization of the existing two-lane rural cross-section of Klondike Road between March Road and Sandhill Road to provide continuity between March Road and the new residential developments in Kanata North. This project is identified for Phase 1 (2014-2019) implementation in the TMP.

The City of Ottawa's 2008 TMP identified a requirement to widen March Road from two to four lanes from Old Carp Road to Dunrobin Road. This would provide additional vehicular capacity to growth areas in Kanata North. The 2008 TMP identified the widening of March Road between Old Carp Road and Dunrobin Road as a Phase Three project with implementation between the years of 2023 and 2031.

IBI Group produced the Road Network Development Report in September 2013 to determine an affordable road projects list for consideration in the City's 2013 TMP. Each road project identified in the 2008 TMP with the addition of a few new projects were assigned a score out of 20 points based on their ability to address five criteria worth four points each, as described below:

- Provides access to new development – the degree to which the project makes lands accessible for new development
- Manages congestion – the degree to which the project alleviates congestion on the roadway or on adjacent roadways
- Cost effectiveness – The ratio of capital cost to vehicle-kilometres travelled. The lower the ratio, the higher the score
- Address network gaps – Improves connectivity that, in turn, reduces pressures on existing neighbourhoods
- Supports non-motorized and transit infrastructure – whether the project will improve the operating environment for transit, cyclists, and pedestrians

The March Road widening project was split into urban and rural components for the scoring exercise. The March Road widening project fell short of the City's affordable road network funding envelope, and was not included in the City's 2013 TMP affordable road projects list. However, the urban portion of the project was at the top of the list for future consideration. As development in the KNUFA progresses, it is anticipated that the urban portion of the project will receive a higher score, and will be included in the affordable road projects list in the next TMP update.

The City of Ottawa's 2014 Development Charges (DC) Background Study indicates that the widening of existing arterial roads are considered development charges projects and are therefore eligible for DC funding. Subject to the urban portion of the March Road widening project being brought into the affordable plan, and subject to a reasonable payback period, the Kanata North Landowners Group (KNLOG) is prepared to enter into a front-ending agreement with the City to construct the widening of March Road to four lanes to the limit of the urban area.

5.3 Ottawa Cycling Plan

The *Ottawa Cycling Plan* (OCP) is a long-term strategy to develop, strengthen and support a cycling culture in the City of Ottawa. The OCP outlines key objectives for cycling in Ottawa. It sets forth the basis for further development and implementation of a comprehensive cycling network. The ultimate cycling network for the TAI is shown in **Figure 10**.

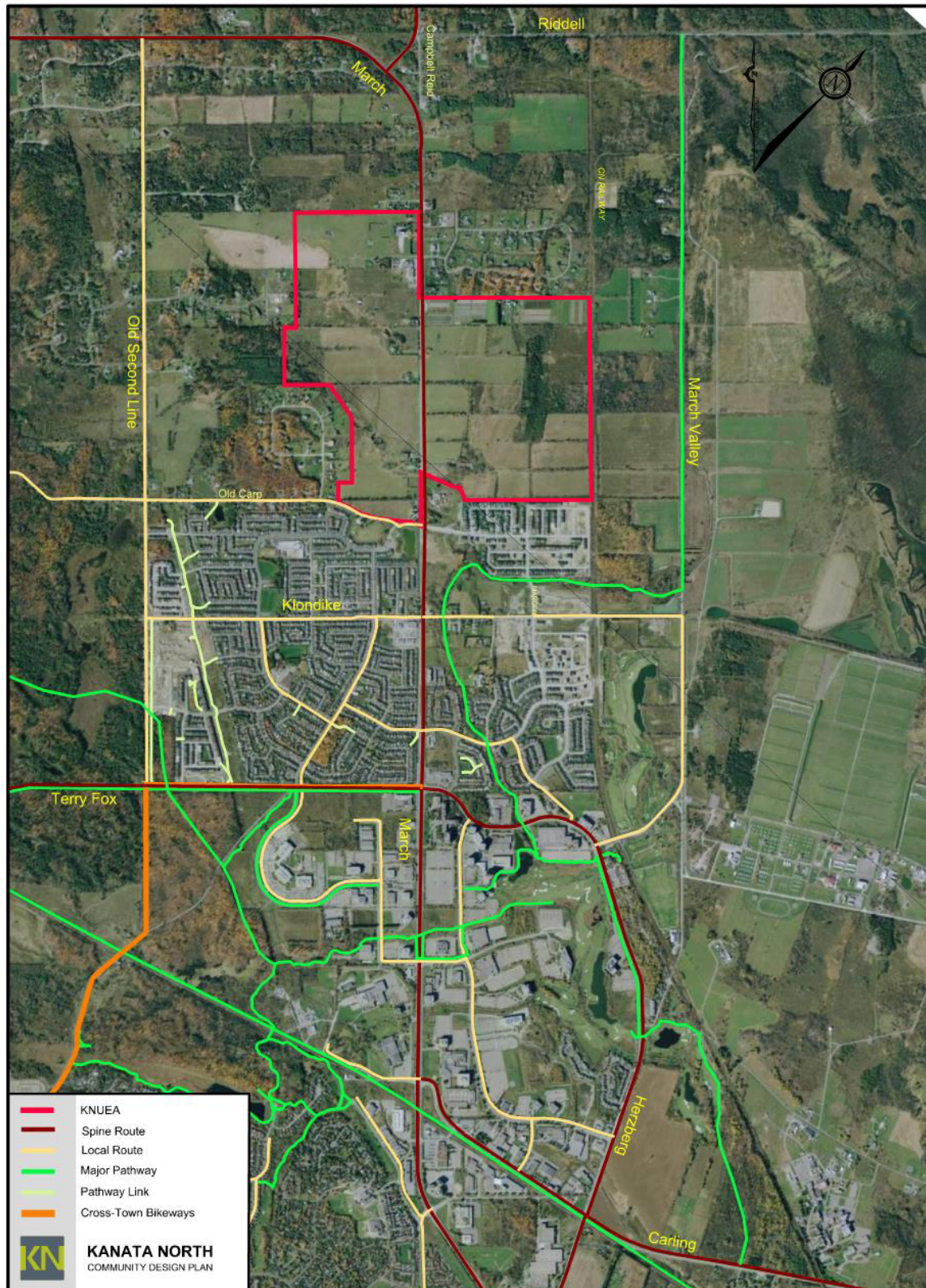


Figure 10 – Ultimate Cycling Network

Future cycling facilities that will be relevant to the provision of adequate cycling services within the TAI are outlined in the OCP as follows:

Table 1: 2013 OCP Bicycle Facilities

Bicycle Facility	Description	Phase
Bicycle Lanes	Flamborough Way, Hines Road and Innovation Drive	Phase 2 (2020-2025)
	Terry Fox Drive immediately west of March Road	Phase 2 (2020-2025)

5.4 Ottawa Pedestrian Plan

The *Ottawa Pedestrian Plan* (OPP) has been developed to recognize the crucial role that walking plays in creating an attractive, accessible, liveable, safe and healthy city.

Future pedestrian facilities that will be relevant to the provision of adequate pedestrian service to the TAI are outlined in the OPP as follows:

Table 2: 2013 OPP Pedestrian Facilities

Pedestrian Facility	Description	Phase
Concrete Sidewalk	Along the north side of Klondike Road, between March Road and Sandhill Road	Phase 1 (2014-2019)
	Along the south side of Halton Terrace between Newcastle Avenue and Flamborough Way	Phase 1 (2014-2019)
	Along the north side of Brady Avenue between Halton Terrace and 40m west of Newcastle Avenue	Phase 2 (2020-2025)

6.0 TRAVEL DEMAND FORECASTING

6.1 Transit Ridership Growth

The transit projects outlined in the City's 2013 Affordable RTTP Network for the Kanata North area are anticipated to increase the existing Transit Modal Shares (TMS) in the Kanata North area. The 2031 affordable network concept includes:

- the Kanata North Transitway, an at-grade BRT system between Corkstown Road and Solandt Road,
- the Innovation Drive Park and Ride (to be constructed in 2016) and the KNU EA Park and Ride, and
- transit priority measures between Solandt Road and the KNU EA Park and Ride north of Maxwell Bridge Road.

The City of Ottawa 2013 TMP identifies target TMS for different areas within the City. Exhibit 2.13 of the 2013 TMP identifies a target TMS of 21% by 2031 for all trips departing the Kanata/Stittsville area during the AM peak period. With the development of the aforementioned transit facilities in the Kanata North area, the KNU EA is expected to meet the target TMS for the Kanata/Stittsville area.

Based on the foregoing, the existing TMS is projected to increase from 7% and 5% during the AM and PM peak hours respectively to 21% (target TMS) by 2031. The projected traffic volumes along the study area roadways have been adjusted to reflect the projected increase in transit usage within the Kanata/Stittsville area.

6.2 Other Study Area Developments

In the last six months, there have been no Zoning By-law (ZBL) or Site Plan Control (SPC) applications submitted to the City of Ottawa for any property within a 500m radius of the subject site. To the best of our knowledge, there are no planned developments at a greater distance that are likely to have a significant impact on the future background traffic volumes within the TAI.

6.3 Background Growth

Snapshots of the City of Ottawa's 2011 and 2031 long range model were obtained for the Kanata North Area. The 2031 model reflects an increased transit modal share due to the implementation of the Kanata North Transitway, and incorporates development assumptions for the KNUEA. Since the KNUEA is located north of the existing urban boundary, development related traffic has been incorporated into zones 5440 and 5430 of the TRANS Model Traffic Zone System. Zones 5440 and 5430 are bound by the following:

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

City of Ottawa staff advised that the traffic volumes along March Road near the future Innovation Drive Park and Ride (to be constructed in 2016) will provide an adequate representation of the traffic growth along the March Road corridor by the 2031 horizon year. The City of Ottawa's 2011 and 2031 long range models suggest an annual growth rate of 0.5% for traffic volumes within the TAI.

It appears that the development assumptions incorporated in the City's long range model for the KNUEA are low, based on the 2031 traffic projections. For the purpose of this study, it is conservatively assumed that the 0.5% annual growth rate applies to background traffic only and the development-related traffic generated by the KNUEA is estimated separately. The analysis results will be robust in this regard and representative of a worst-case scenario.

For the purpose of this study, background traffic volumes for the 2026 build-out and 2031 horizon years were estimated by increasing the existing transit modal shares to 21% and applying a 0.5% growth rate per annum to the traffic volumes within the TAI. Background traffic volumes for the 2026 build-out and 2031 horizon years are shown in **Figures 11 and 12**.

6.4 Background Screenline Analysis

The study area screenline in the KNCDP TMP ECR was refined to reflect the limits of the new TAI, as discussed in **Section 2.2** of this report. The refined screenline is located immediately south of Terry Fox Drive, and is bound by Innovation Drive to the west and Legget Drive to the east. Traffic volumes crossing the screenline are captured at Terry Fox Drive (west of Innovation Drive), Innovation Drive, March Road, Legget Drive and Terry Fox Drive (east of Legget Drive).

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LEGEND

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Unsignalized Intersection

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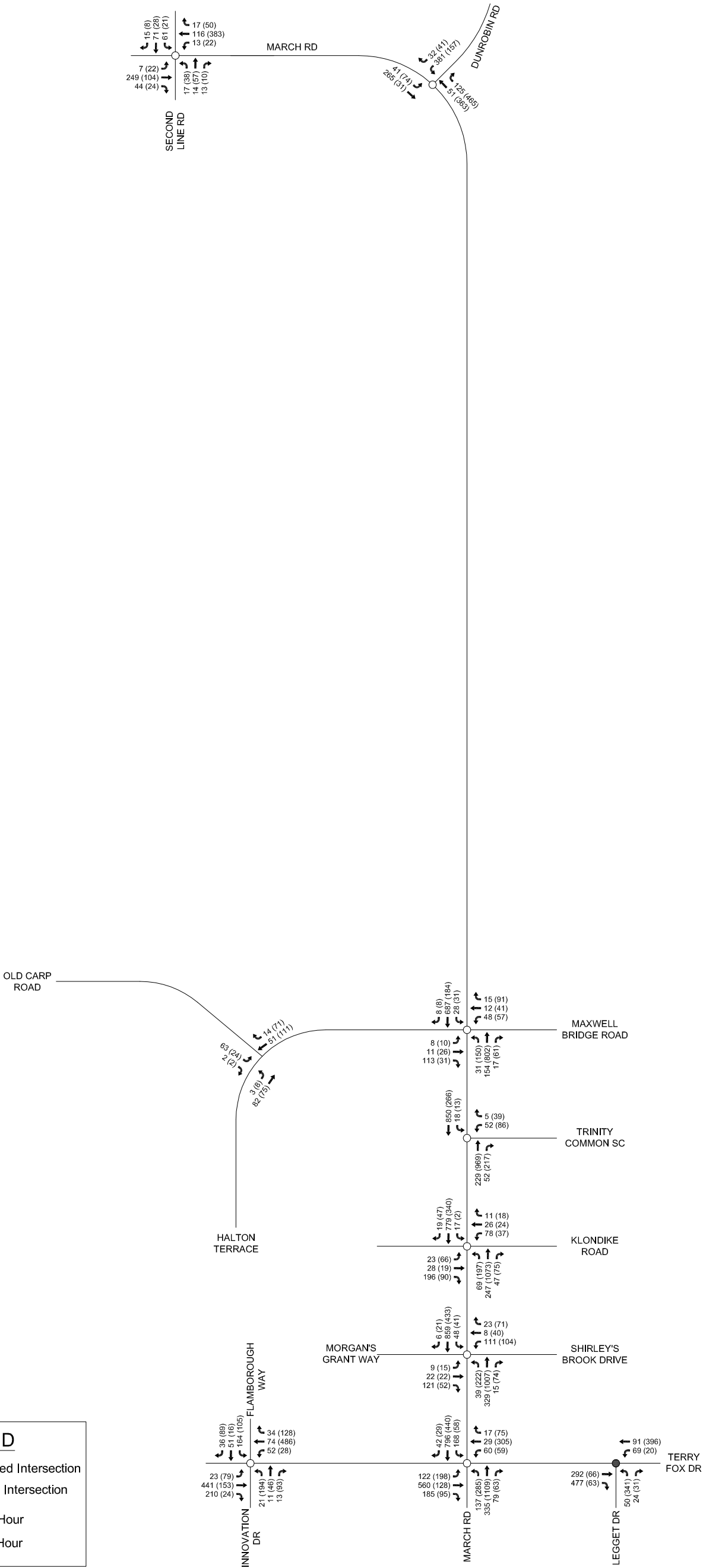
Signalized Intersection

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AM Peak Hour

(xx) VPH

PM Peak Hour



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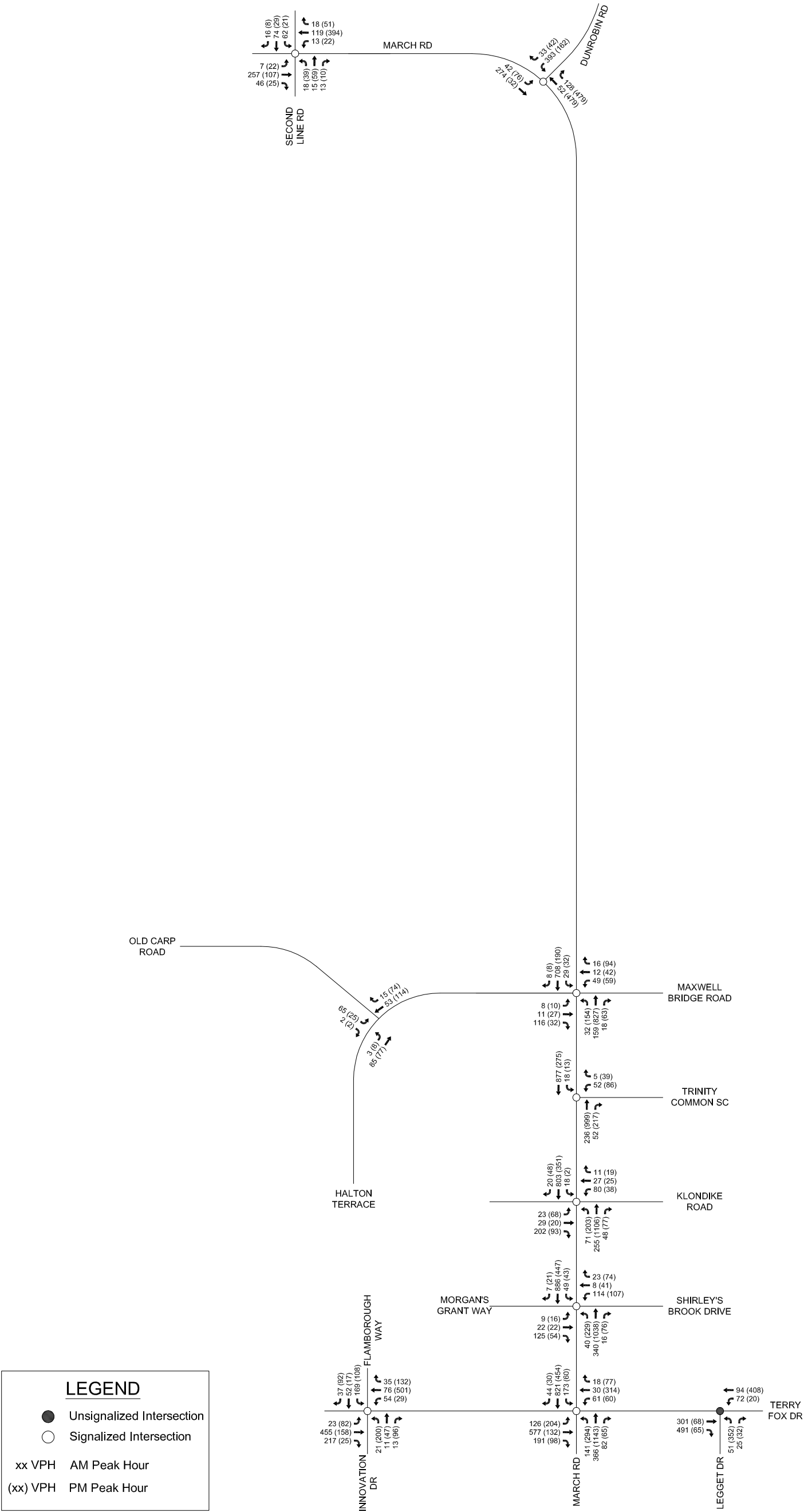
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FIGURE NO. 11
2026 BACKGROUND
TRAFFIC VOLUMES



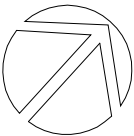
Engineers, Planners & Landscape Architects

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KANATA NORTH

COMMUNITY DESIGN PLAN



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FIGURE NO. 12
2031 BACKGROUND
TRAFFIC VOLUMES



Following the implementation of the City's ultimate transit network concept, which includes extending the median BRT from Solandt Road to the KNUEA Park and Ride, most of March Road will have two through lanes in each direction, except the section south of Herzberg Road which will have three northbound through lanes and two southbound through lanes. Implementation of the ultimate network concept is not anticipated until post 2031. As a result, three lanes in each direction are assumed on March Road at the TAI screenline for the 2026 and 2031 screenline analysis.

An additional screenline was developed immediately north of the March Road/Maxwell Bridge Drive/Halton Terrace intersection to determine when additional lane capacity is required along March Road through the KNUEA. The location of the refined TAI screenline and the new March Road screenline are shown in **Figure 13**.

The directional capacities of these two screenlines are shown in the following table, based on the existing roadway lane configurations.

Table 3: Directional Capacities (PCU's) at Screenlines

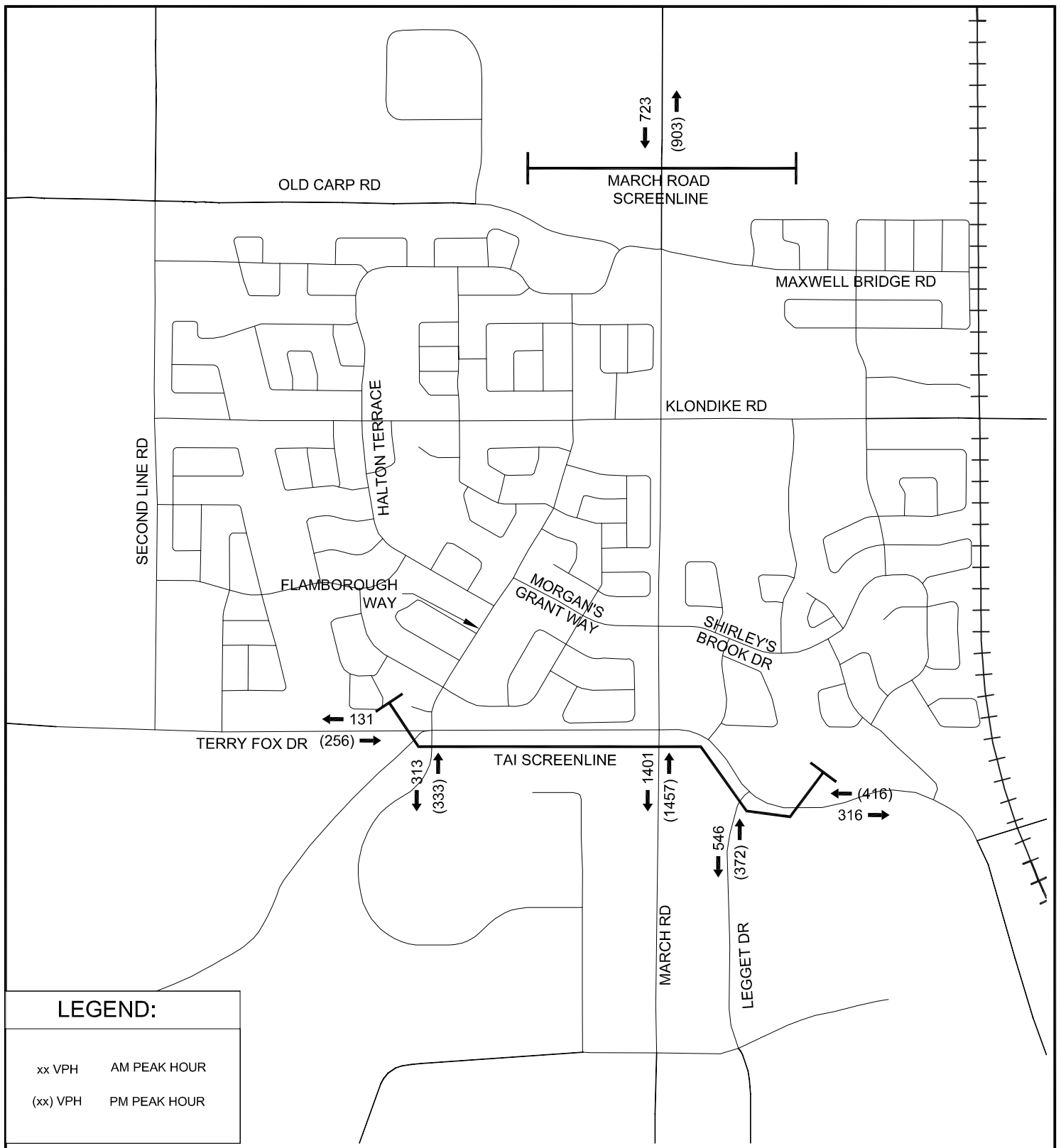
Roadway	# Lanes	Assumed Capacity
<i>TAI Screenline</i>		
Terry Fox Drive (west of Innovation Drive)	1	900
Innovation Drive	1	900
March Road	3	2700
Legget Drive	1	900
Terry Fox Drive (east of Legget Drive)	1	900
Total		6300
<i>March Road Screenline (north of Halton Terrace/Maxwell Bridge)</i>		
March Road	1	900
Total		900

The above information was used to estimate the peak hour levels of service available over the full length of the screenlines for the projected background traffic condition. Commercial vehicle volumes at the screenlines were accounted for by the application of a 1.16 commercial vehicle factor (5% heavy goods, 6% light goods) to the peak hour directional traffic volumes. Outside the urban core, the City of Ottawa screenline operational standard is LOS 'D' ($v/c \leq 0.90$).

6.4.1 2026 Background Screenline Analysis

The 2026 background traffic volumes crossing the TAI and March Road screenlines during the weekday AM and PM peak hours are shown in **Figure 13**. The following table shows the LOS available at the screenlines during the AM and PM peak hours under the 2026 background traffic condition.

M:\2012\112117\CAD\Design\Figures\Traffic\TMP\FINAL\Screenline.dwg, SCRL BACK 2026, Mar 29, 2016 - 10:45am, bbyveldt



KANATA NORTH COMMUNITY DESIGN PLAN



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FIGURE NO. 13

SCREENLINE - 2026 BACKGROUND TRAFFIC VOLUMES



Table 4: 2026 Background Screenline Performance

Road	Directional Capacity (PCU's)	Peak Directional Traffic Volumes		Peak Directional PCU's		v/c Ratios and LOS				Current Directional Capacity @ LOS 'D'	Deficiencies	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak		PM Peak			AM Peak	PM Peak
						v/c	LOS	v/c	LOS			
TAI Screenline												
Terry Fox (west of Innovation)	900	131	256	152	297	0.17	A	0.33	A	810	None	None
Innovation	900	313	333	363	386	0.40	A	0.43	A	810	None	None
March	2700	1041	1457	1208	1690	0.45	A	0.63	B	2430	None	None
Legget	900	546	372	632	431	0.70	C	0.48	A	810	None	None
Terry Fox (east of Legget)	900	316	416	367	483	0.41	A	0.54	A	810	None	None
Overall	6300	2347	2834	2722	3287	0.43	A	0.52	A	5670	None	None
March Road Screenline												
March	900	723	903	839	1048	0.93	E	1.16	F	810	29	238

The TAI screenline is anticipated to operate below capacity during the AM and PM peak hours under the 2026 background traffic condition. The TAI screenline is anticipated to operate with a v/c ratio of 0.43 during the AM peak hour and 0.52 during the PM peak hour.

The March Road screenline is anticipated to operate above capacity during the AM and PM peak hours under the 2026 background traffic condition. This suggests that background growth along March Road will trigger the need for additional lane capacity by the 2026 build-out year. This is consistent with the City of Ottawa's 2008 TMP, which identified a need to widen March Road from two to four lanes between Old Carp Road and Dunrobin Road.

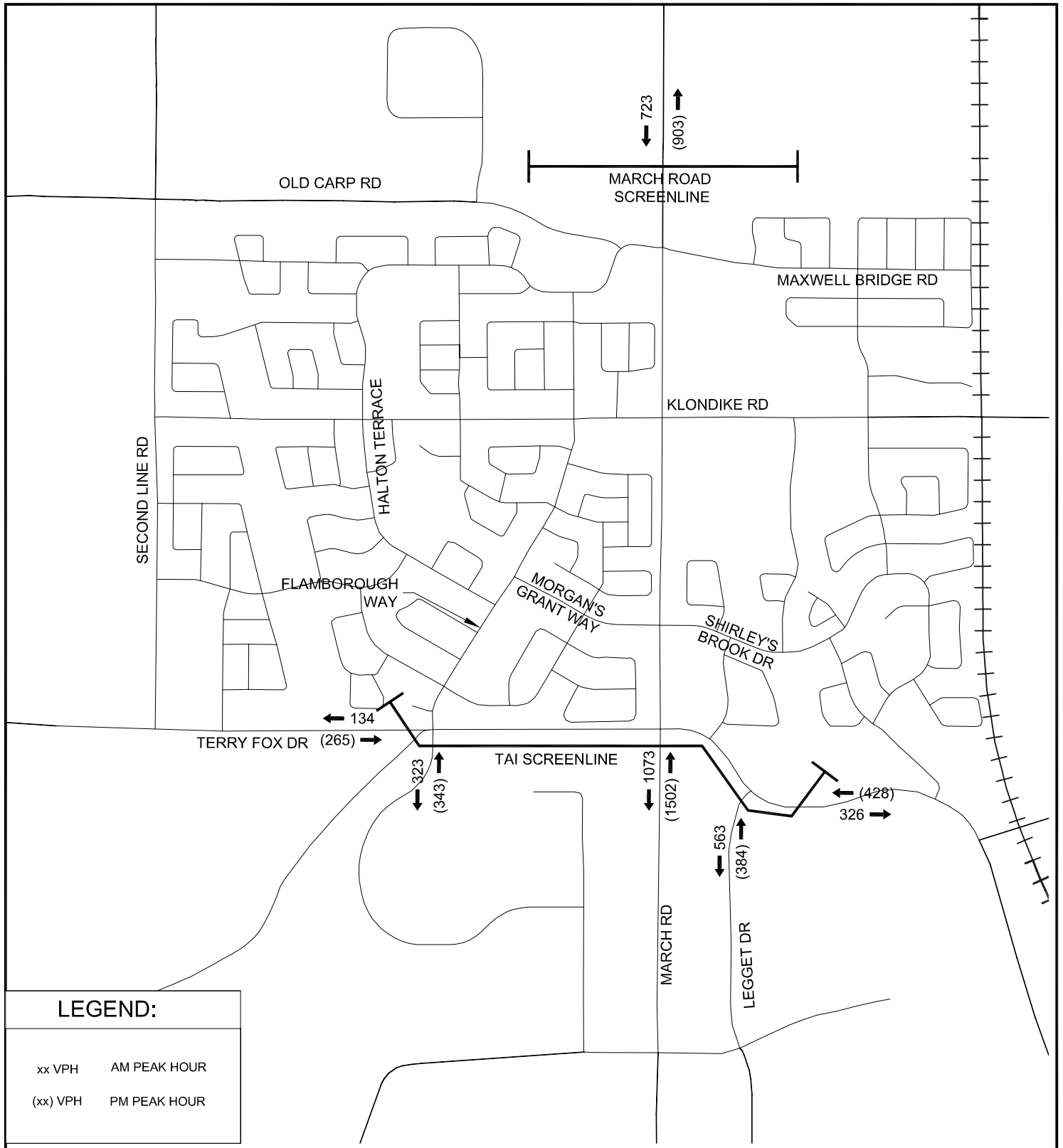
As noted in **Section 5.2**, the March Road widening project was not included in the City's 2013 TMP affordable road projects list. However, as development in the KNUFA progresses it is anticipated that the urban portion of the March Road widening project will receive a higher ranking and be included in the affordable road projects list in the next TMP update.

In light of the projected travel demand, and consistent with the City's direction to reduce auto dependency, consideration should also be given to advancing the implementation of the ultimate median BRT system prior to the 2031 planning horizon.

6.4.2 2031 Background Screenline Analysis

The 2031 background traffic volumes crossing the TAI and March Road screenlines during the weekday AM and PM peak hours are shown in **Figure 14**. The following table shows the LOS available at the screenlines during the weekday AM and PM peak hours under the 2031 background traffic condition.

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LEGEND:

xx VPH AM PEAK HOUR
(xx) VPH PM PEAK HOUR



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FIGURE NO. 14

**SCREENLINE - 2031 BACKGROUND
TRAFFIC VOLUMES**



Table 5: 2031 Background Screenline Performance

Road	Directional Capacity (PCU's)	Peak Directional Traffic Volumes		Peak Directional PCU's		v/c Ratios and LOS				Directional Capacity @ LOS 'D'	Deficiencies	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak		PM Peak			AM Peak	PM Peak
						v/c	LOS	v/c	LOS			
TAI Screenline												
Terry Fox (west of Innovation)	900	134	265	155	307	0.17	A	0.34	A	810	None	None
Innovation	900	323	343	375	398	0.42	A	0.44	A	810	None	None
March	2700	1073	1502	1245	1742	0.46	A	0.65	B	2430	None	None
Legget	900	563	384	653	445	0.72	C	0.49	A	810	None	None
Terry Fox (east of Legget)	900	326	428	378	497	0.42	A	0.55	A	810	None	None
Overall	6300	2419	2922	2806	3389	0.45	A	0.54	A	5670	None	None
March Road Screenline												
March	900	745	931	864	1080	0.96	E	1.2	F	810	54	270

The TAI screenline is anticipated to operate below capacity during the AM and PM peak hours under the 2031 background traffic condition. The TAI screenline is anticipated to operate with a v/c ratio of 0.45 during the AM peak hour and 0.54 during the PM peak hour.

The March Road screenline is anticipated to continue to operate above capacity during the AM and PM peak hours under the 2031 background traffic condition.

As noted in **Section 5.2**, the March Road widening project was not included in the City's 2013 TMP affordable road projects list. However, as development in the KNUFA progresses it is anticipated that the urban portion of the March Road widening project will receive a higher ranking and be included in the affordable road projects list in the next TMP update.

In light of the projected travel demand, and consistent with the City's direction to reduce auto dependency, consideration should also be given to advancing the implementation of the ultimate median BRT system prior to the 2031 planning horizon.

6.5 Background Intersection Analysis

Intersection capacity analysis has been completed using the software package Synchro 8.0. This software uses methodology from the *Highway Capacity Manual 2010* (HCM), published by the Transportation Research Board, to evaluate signalized and unsignalized intersections.

Intersection operating conditions are commonly described in terms of a Level of Service (LOS). LOS is a qualitative measurement of speed, freedom to manoeuvre, interruptions, comfort and

convenience. Letters are assigned to six levels, with LOS 'A' representing optimal operating conditions and LOS 'F' representing failing operating conditions.

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

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

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

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

In this study, movements at signalized and unsignalized intersections have been evaluated in terms of the LOS as defined in the foregoing tables.

Intersection capacity analysis has been completed for the projected 2026 and 2031 background traffic conditions.

6.5.1 2026 Background Intersection Operations

The signal timing plans for all intersections within the urban area have been optimized and coordinated to demonstrate the overall capacity of the network. 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 C**.

Table 6: Intersection Capacity Analysis – 2026 Background Traffic

Intersection	AM Peak			PM Peak		
	Max v/c or Delay	LOS	Movement	Max v/c or Delay	LOS	Movement
March Road / Second Line Road ¹	0.40	A	SB	0.40	A	WBT
March Road / Dunrobin Road ¹	0.58	A	SBL	0.55	A	WBR
Old Carp Road / Halton Terrace ²	10s	A	EB	10s	A	EB
March Road / Maxwell Bridge Road / Halton Terrace ¹	0.45	A	EBT/R	0.57	A	WBT/R
March Road / Trinity Common SC ¹	0.33	A	WBL	0.52	A	WBL
March Road / Klondike Road ¹	0.57	A	WBL	0.56	A	NBL
March Road / Morgan's Grant Way / Shirley's Brook Drive ¹	0.57	A	WBL	0.64	B	WBL
March Road / Terry Fox Drive ¹	0.77	C	EBT	0.68	B	WBT
Terry Fox Drive / Flamborough Way / Innovation Drive ¹	0.75	C	SBL	0.72	C	NBL
Terry Fox Drive / Legget Drive ²	17 sec	C	NB	33 sec	D	NB

1. Signalized Intersection

2. Unsignalized Intersection

All intersections within the TAI are anticipated to operate with an acceptable LOS during the weekday AM and PM peak hours under the 2026 background traffic condition. The maximum (i.e., 95th percentile) queue length associated with various left turn movements at intersections within the TAI are anticipated to exceed the existing storage capacity, but will still be accommodated within the existing taper length.

6.5.2 2031 Background Intersection Operations

The signal timing plans for all intersections within the urban area have been optimized and coordinated to demonstrate the overall capacity of the network. 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 C**.

Table 7: Intersection Capacity Analysis – 2031 Background Traffic

Intersection	AM Peak			PM Peak		
	Max v/c or Delay	LOS	Movement	Max v/c or Delay	LOS	Movement
March Road / Second Line Road ¹	0.44	A	SB	0.42	A	WBT
March Road / Dunrobin Road ¹	0.58	A	SBL	0.56	A	WBR
Old Carp Road / Halton Terrace	10s	A	EB	10s	A	EB
March Road / Maxwell Bridge Road / Halton Terrace ¹	0.46	A	EBT/R	0.58	A	WBT/R
March Road / Trinity Common SC ¹	0.33	A	WBL	0.52	A	WBL
March Road / Klondike Road ¹	0.59	A	EBT/R	0.58	A	NBL
March Road / Morgan's Grant Way / Shirley's Brook Drive ¹	0.63	B	WBL	0.65	B	WBL
March Road / Terry Fox Drive ¹	0.77	C	EBT	0.69	B	WBT
Terry Fox Drive / Flamborough Way / Innovation Drive ¹	0.76	C	SBL	0.75	C	NBL
Terry Fox Drive / Legget Drive ²	18 sec	C	NB	38 sec	E	NB

1. Signalized Intersection

2. Unsignalized Intersection

The Terry Fox Drive / Legget Drive intersection is expected to operate with a 38 second delay, corresponding to a LOS E, during the PM peak hour. It should be noted that this delay is attributable to background growth along the study area roadways; therefore no mitigation measures are identified.

All other study area intersections are anticipated to operate under acceptable conditions during the weekday AM and PM peak hours. The maximum (i.e. 95th percentile) queue lengths at intersections within the TAI are anticipated to increase slightly, but do not result in any adverse traffic related impacts.

7.0 ALTERNATIVE SOLUTIONS

Based on the results of the background traffic analysis, it was determined that increased capacity will be required along March Road to accommodate projected growth in traffic volumes. A number of alternative transportation solutions were generated to address the need for increased capacity.

The Municipal Class EA document describes “alternative solutions” as reasonable and feasible ways of addressing a problem or opportunity. For the transportation component of this study, the problem or opportunity is to identify the transportation elements that are required to support the development of the KNU EA. As with most problems or opportunities, there is more than one way to meet this objective.

A brief description of the alternative transportation solutions considered as part of this study is provided below.




- **Solution 1 – “Do Nothing”**
KNU EA is served by the existing transportation network, including planned network improvements identified in the City’s Transportation Master Plan.
- **Solution 2 – Increase Road Capacity**
Improvement to existing roadways, and provision of an internal collector road network within KNU EA
- **Solution 3 – Increase Transit Ridership**
Introduction of alternative transit opportunities, including transit priority measures per the City’s 2031 Affordable Network Concept
- **Solution 4 – Active Transportation/Transportation Demand Management (TDM)**
Provision of desirable walking and cycling facilities, explore opportunities to promote specific TDM initiatives

An evaluation of the above alternatives is provided in the following table.

Table 8: Alternative Transportation Solutions

Criteria	Solution 1	Solution 2	Solution 3	Solution 4
	“Do Nothing”	Increase Road Capacity	Increase Transit Ridership	Promote Active Transportation
Transportation and Land use	✗	✓	✓	✓
Social Environment	✗	~	✓	✓
Natural Environment	✗	~	✓	✓
Comment	Fails to address multi-modal travel demand	Provides capacity to minimize congestion Fails to address transit and active modes	Assists in achieving city-wide transit modal share targets Fails to address auto and active travel modes	Encourages sustainable travel modes Fails to address auto and transit travel modes

Criteria	Solution 1	Solution 2	Solution 3	Solution 4
	“Do Nothing”	Increase Road Capacity	Increase Transit Ridership	Promote Active Transportation
Carried Forward	No	Yes	Yes	Yes

-  Negative Impact
 Neutral/Mitigable Impact
 Positive Impact

The preferred transportation solution is a combination of Solutions 2, 3, and 4 to promote multi-modal integration of trips, with connectivity to adjacent urban areas (bicycle lanes, sidewalks, pathways, etc.).

The main transportation elements planned to support the development of the KNUEA include:

Roads:

- Widening of March Road from two to four lanes through the study area (EA completed, project included in the City's ultimate 2031 Network Concept, but not currently in the Affordable Plan)
- Provide access opportunities along March Road and Old Carp Road
- Establish internal collector road pattern

Transit:

- Establish size and location of proposed KNUEA Park and Ride
- Interim transit priority measures between the north limit of the BRT at Solandt Road and the KNUEA Park and Ride Lot
- Ultimate extension of Kanata North Transitway through the study area (included in the City's Ultimate Network, but not currently in the Affordable Plan)
- Provide connections to existing transit network

Active Transportation:

- Develop road cross-sections with a focus on pedestrian, cycling and transit elements
- Develop park and pathway plan complete with sidewalks, multi-use pathways and recreational trails
- Provide connections to existing pedestrian and cycling networks

It is recommended that the City examine and implement interim transit priority measures as required through the study area as part of the March Road widening project in preparation for the next City of Ottawa TMP update.

8.0 ALTERNATIVE DESIGN CONCEPTS

Following the selection of the preferred transportation alternative, four alternative design concepts were generated with various collector road patterns, park and ride locations, road and pathway connections, and forms of intersection control. The alternative design concepts and a brief description of their unique characteristics is provided as follows.

Design Concept A is shown in **Figure 15**.

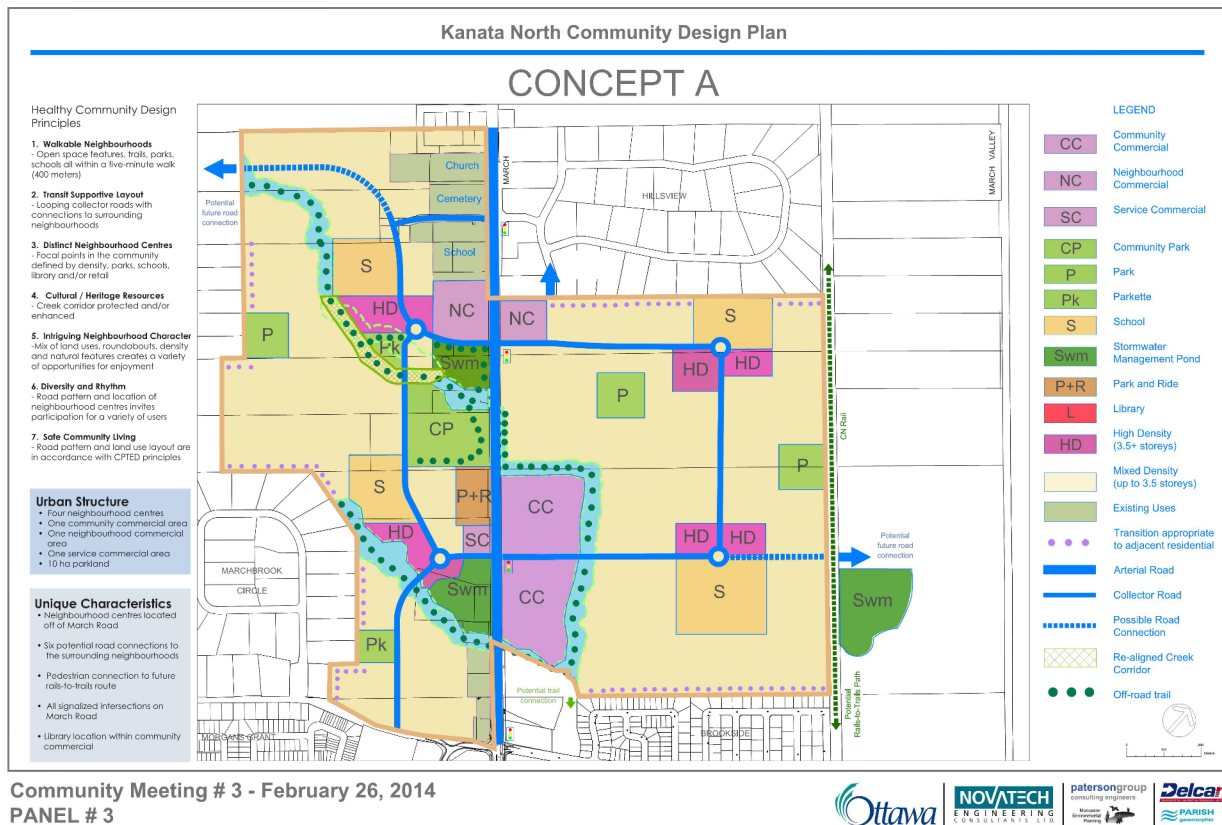
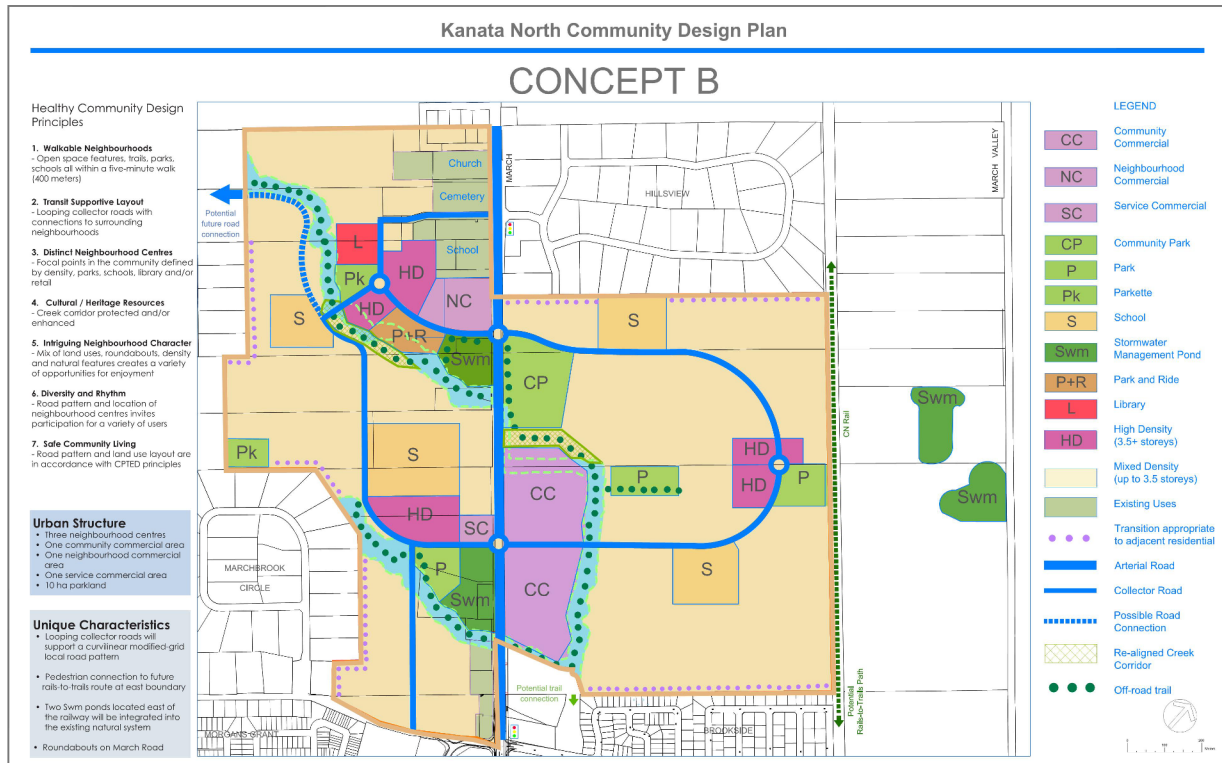


Figure 15 – Design Concept A

This alternative design features:

- neighbourhood centres located off March Road;
- six potential road connections to the surrounding neighbourhoods;
- pedestrian connection to future rails-to-trails route;
- a centralized park and ride location;
- signalized intersections on March Road; and
- a library location within the community commercial.

Design Concept B is shown in **Figure 16**.



Community Meeting # 3 - February 26, 2014
PANEL # 4

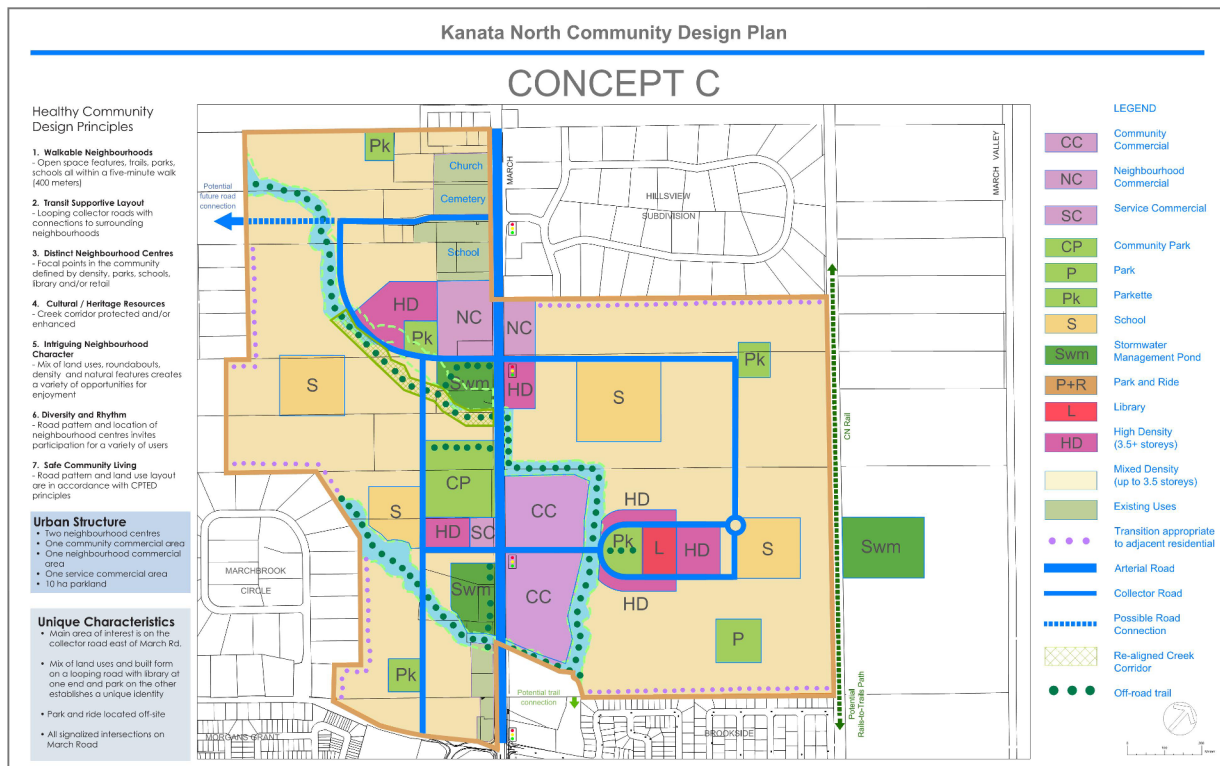


Figure 16 – Design Concept B

This alternative design features:

- Looping collector roads support a curvilinear modified-grid local road pattern;
- pedestrian connection to future rails-to-trails route at east boundary;
- two SWM ponds located east of the railway, to be integrated into the existing natural system;
- Park and Ride located at the end of the line for major transit routes; and
- roundabouts on March Road.

Design Concept C is shown in **Figure 17**.



Community Meeting # 3 - February 26, 2014
PANEL # 5

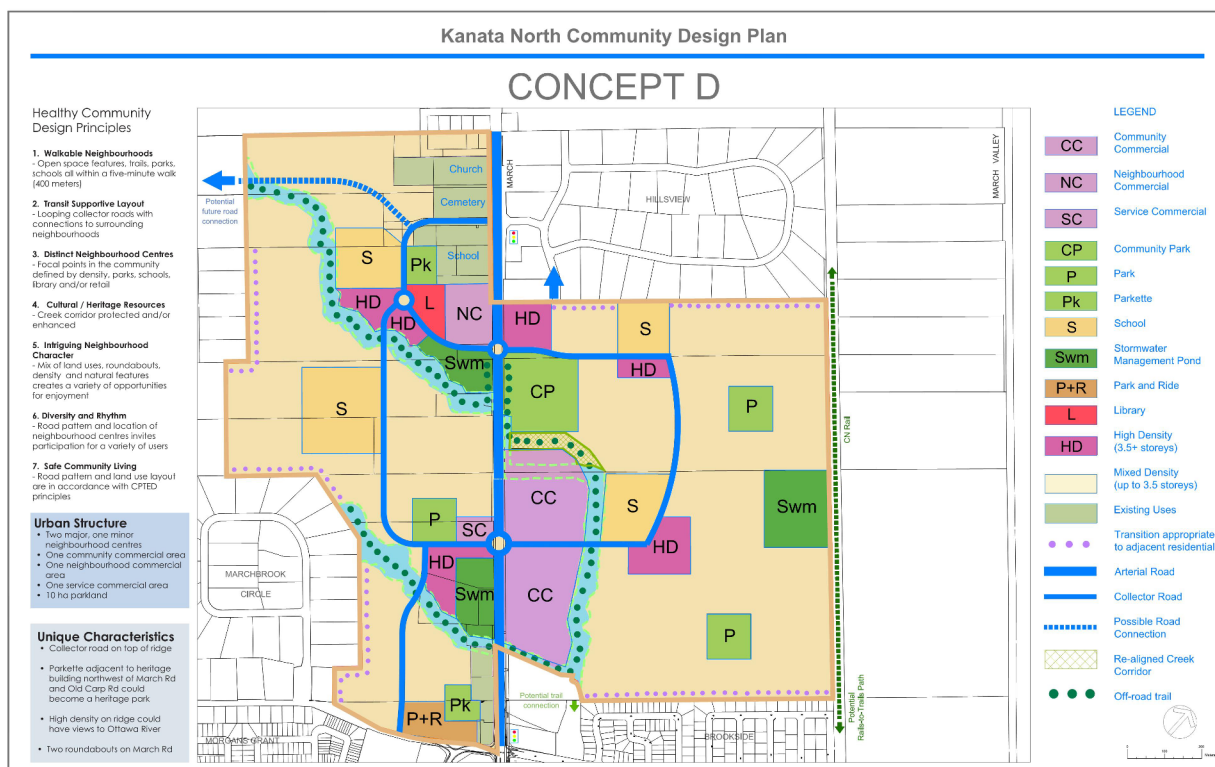


Figure 17 – Design Concept C

This alternative design features:

- main area of interest on the collector road east of March Road;
- mix of land uses and built form on a looping road with library at one end and park on the other establishes a unique identity;
- Park and Ride located off-site; and
- signalized intersections on March Road.

Design Concept D is shown in **Figure 18**.



Community Meeting # 3 - February 26, 2014
PANEL # 6



Figure 18 – Design Concept D

This alternative design features:

- Collector road on top of ridge;
- parkette adjacent to heritage building northwest of March Road and Old Carp Rd, which could become a heritage park;
- high density on ridge that could have views to Ottawa River;
- park and ride located 'downstream of the intended direction of travel; and
- roundabouts on March Road.

The four alternative design concepts were evaluated using the technical and economic criteria of geometry, network/system integration, capacity and operations, transit connectivity, cycling/pedestrian connectivity, capital costs, and operating costs.

Technical memorandums were prepared to assist with the evaluation of certain elements of the alternative design concepts, including:

- the size and location of the proposed Park and Ride
- intersection control for March Road accesses
- access to Old Carp Road
- access to March Road
- internal intersection control

The following sections summarize the findings and conclusions of the technical memorandums.

8.1 Park and Ride Facility

A memorandum was prepared by Novatech in November 2013 outlining a set of calculations to determine the projected park and ride demand likely to be generated by the development of the KNUEA. The memorandum outlines the typical 'modes of access' associated with rapid transit facilities, and calculates the park and ride demand during the weekday AM peak hour. A copy of the memorandum can be found in **Appendix D**.

Based on the calculations presented in memorandum, approximately 350 parking spaces will be sufficient to meet the projected park and ride demand likely to be generated by the KNUEA. Through discussions with the City it was determined that the park and ride should have a minimum of 500 parking spaces, to accommodate commuters from the rural area. It was determined that a park and ride parcel consisting of 2.5ha would be sufficient to develop a park and ride containing 500 parking spaces.

As shown in the alternative design concepts, four possible locations were considered as part of the CDP process.

Concept A

The main benefits of Concept A are that the park and ride is centralized within the KNUEA, and is collocated adjacent to the community park and community commercial parcels. The main drawback of Concept A is that the park and ride will not be the end of the line for major transit routes, meaning that transit services will have to continue north of the park and ride and an additional parcel would be required to provide a bus turnaround location. Another disadvantage of a centralized park and ride is that the core of the community is not kept active, as the park and ride is not expected to generate much activity during the day or on weekends.

Concept B

The main benefits of Concept B are that the Park and Ride is located at the end of the line for major transit routes. It is collocated adjacent to a stormwater management pond to the east, neighbourhood commercial to the north and high density to the west, and provides ample opportunity for future expansions to the north. A northerly park and ride location also serves rural users from the north without requiring them to traverse the community core. The main drawback of this concept is that the park and ride is located opposite the intended direction of travel for commuters, meaning KNUEA commuters will have to backtrack to get to the park and ride.

Concept C

In Concept C, the park and ride location is assumed to be outside and to the north of the KNUEA. The main benefits of Concept C are that the location of the park and ride will provide ample opportunity for future expansions to the north, and could be the end of the line for major transit routes travelling through the KNUEA. The main drawbacks of this concept are that the park and ride will be a standalone development and will not be collocated with any urban development. The park and ride lot is also located opposite the intended direction of travel for commuters, meaning KNUEA commuters would be enticed to use the Innovation Drive Park and Ride location rather than the KNUEA Park and Ride.

Concept D

The main benefit of Concept D is that the location of the park and ride will have the largest catchment area as it is located downstream of the intended direction of travel. The main drawbacks of this concept are that the park and ride is not collocated with open space (stormwater management pond/community park) or major commercial areas, and it is not the end of the line for major transit routes, meaning that transit services will have to continue north of the park and ride and an additional parcel would be required to provide a bus turnaround location. Another disadvantage of a southerly park and ride location is that rural users from the north are required to traverse the core of the community.

The evaluation of the four park and ride locations is presented in the table below.

Table 9: Park and Ride Locations – Evaluation

Evaluation Criteria	Concept A	Concept B	Concept C	Concept D
Catchment Area	3	2	1	4
Transit Operations	2	4	3	1
Surrounding Land Use	4	3	1	2
Future Development Expansions	2	3	4	1
Total	11	12	9	8

Note: Ranking 1-4, 4 being the best alternative

Based on the foregoing evaluation, the Park and Ride location presented in Concept B is considered the optimal location.

8.2 March Road Intersection Control

A memorandum was prepared in April 2014 outlining the feasibility of roundabout and signalized intersection control along March Road at the proposed KNCDP access intersections. A copy of the memorandum can be found in **Appendix D**.

The memorandum included a high-level estimate of trip generation for the development of the KNUEA and presented intersection analysis to determine the preferred type of control at the March Road access locations. The analysis determined that a roundabout would require an outer diameter of 55m to 60m to provide acceptable conditions on all approaches. The analysis of signal control yielded favourable results, assuming optimized signal timings with 130 second cycle lengths.

In light of the analysis presented in the memorandum, traffic signals are considered the preferred type of control at the March Road access locations for the following reasons:

- The constraints of the 44.5m ROW corridor;
- The need to give priority to March Road traffic.

8.3 Old Carp Road Access

A memorandum was prepared by Novatech in October 2015 to assess alternative alignments for the proposed access connection to Old Carp Road. A copy of the memorandum can be found in **Appendix D**. Residents along Old Carp Road expressed concerns about the additional traffic volumes attributable to the KNUEA using Old Carp Road.

Four alternative alignments were considered when developing the preferred configuration for the proposed Old Carp Road connection. The four alternative alignments and a brief description are shown in the following figures.

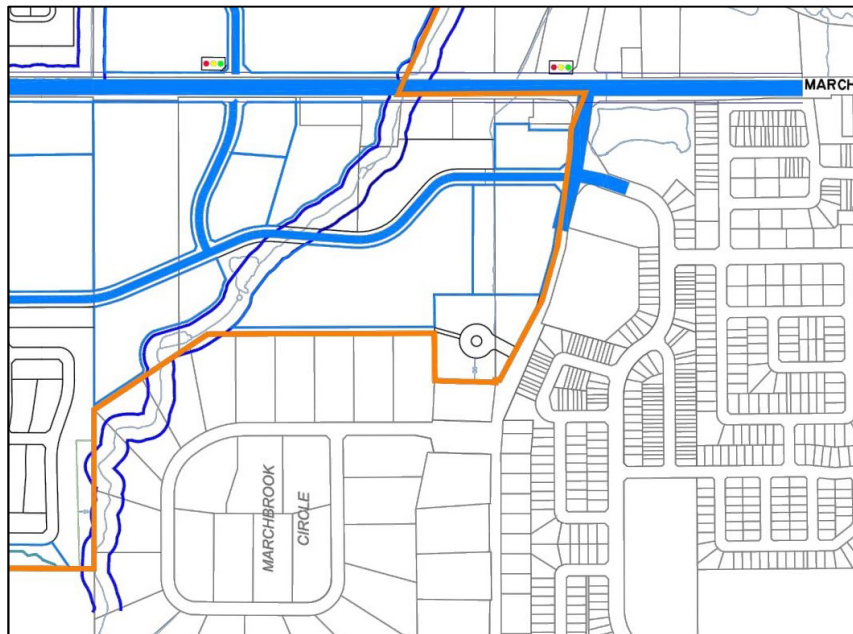


Figure 19 – Option A: Four-Leg Intersection at Halton Terrace

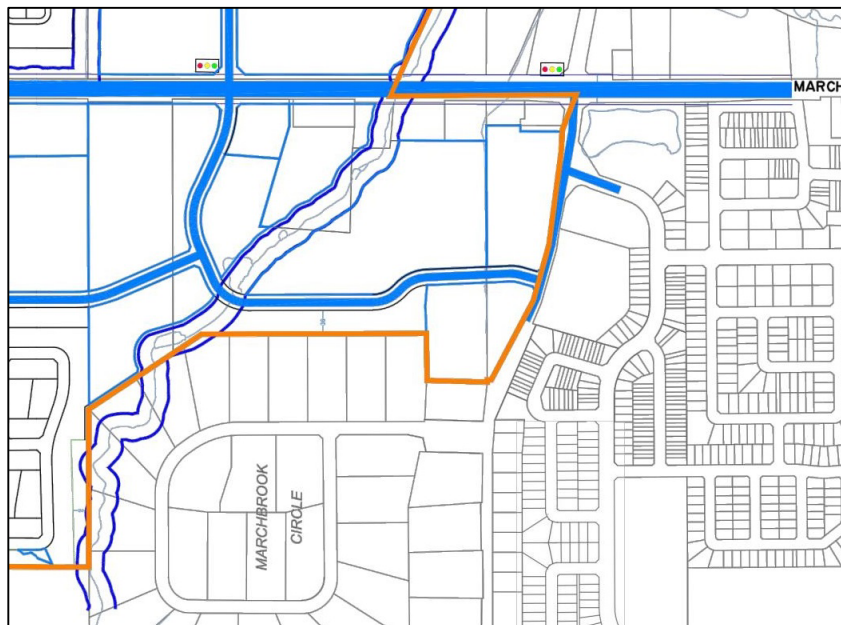


Figure 20 – Option B: Tee Intersection West of Halton Terrace

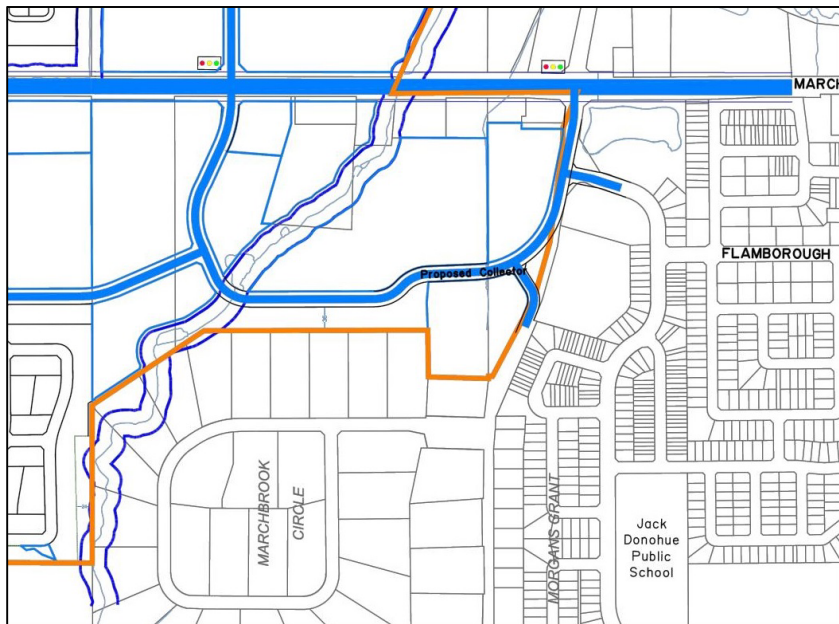


Figure 21 – Option C: Old Carp Road and Halton Terrace Realignments

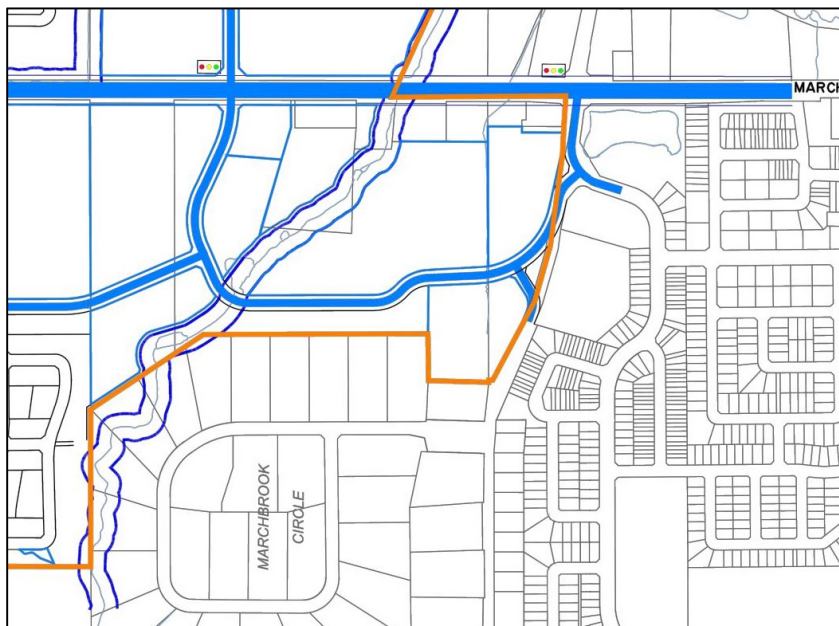


Figure 22 – Option D: Old Carp Road Realignment

Based on the evaluation presented in the memorandum, the alignment Option C represents the technically preferred solution for an access connection to Old Carp Road.

While the projected amount of development traffic travelling west on Old Carp Road is expected to be minimal, area residents have expressed concerns regarding the impact of the increased traffic using Old Carp Road. Should problems arise, a variety of mitigation measures could be considered to address adverse impacts, including:

- Turn restrictions at Old Carp Road and the proposed north-south collector
- Speed cushions on Old Carp Road

Consultation with the City's Area Traffic Management group is recommended in the event of any unforeseen negative impacts.

8.4 March Road Access

Alternative design concepts A through D were based on three full movement access connections to March Road and one full movement access connection to Old Carp Road.

The alternative alignments for the Old Carp Road connection were presented to the public at a neighbourhood meeting on October 5, 2015. At the meeting, members of the public noted that the proposed signal spacing on March Road within the study area greatly exceeded the existing signal spacing immediately to the south. The design team was challenged to consider an option with additional access connections to March Road and no connection to Old Carp Road.

A concept including no connection to Old Carp Road and an additional right-in right-out (RIRO) connection to March Road approximately 120m north of the Maxwell Bridge/Halton Terrace intersection was assessed in a technical memorandum dated October 13th, 2015. A copy of the memorandum can be found in **Appendix D**. It was recommended that a connection to Old Carp Road be maintained instead of an additional RIRO connection to March Road for the following reasons:

- a dual northbound left turn lane would be required at the southerly collector intersection on March Road,
- connectivity to the Morgan's Grant community, and
- direct access for emergency vehicles coming from the south.

The potential for two additional signalized access connections to March Road was introduced at a TMP TAC meeting on October 15th, 2015. One additional signal was proposed approximately 190m south of the northerly collector intersection and another additional signal was proposed immediately south of the creek crossing, approximately 240m north of the Maxwell Bridge/Halton Terrace intersection.

Analysis of the five new signalized intersections on March Road and no vehicular connection to Old Carp Road was presented in a technical memorandum dated November 25th, 2015. A copy of the memorandum can be found in **Appendix D**. The analysis demonstrated acceptable operating conditions in terms of intersection capacity and vehicle storage/queueing requirements.

In addition to the results of the technical analysis, the following strong planning reasons support the provision of a full movement signalized intersection at the northerly location:

- an additional full signal improves the accessibility/permeability of the development west of March Road,
- a full signal provides a safe and predictable environment for pedestrians crossing March Road, and
- a full signal significantly improves access to the proposed high school.

An adverse effect of additional signalized intersections on March Road is the increased travel time for bus service.

Following discussions with senior City staff, it was concluded that the transportation network should include:

- four full movement signalized intersections along March Road, including the north and south collector roads, the mid-block road connection at the proposed high school, and the road connection opposite Maxwell Road,
- a connection to Old Carp Road, designed appropriately to discourage westbound traffic on Old Carp Road,
- a local right-in right-out road connection on the west side of March Road south of the creek corridor.

8.5 Internal Intersection Control

A memorandum was prepared in October 2015 to outline the analysis undertaken to determine the preferred type of intersection control at four internal collector/collector intersections within the KNUEA. A copy of the memorandum can be found in **Appendix D**. The four internal intersections include the collector/collector intersections in the northwest, southwest, northeast and southeast quadrants. Alternative control types considered include stop control and a conventional single lane roundabout.

The form of stop control, whether two-way or all-way, can be determined at the Draft Plan stage as volume projections may be determined more accurately at that time. Mini roundabouts could also be considered as a possible form of control at that time as they are generally small enough to fit within a standard right-of-way. The City of Ottawa is currently awaiting the results of the mini roundabout pilot project, and has not determined whether mini roundabouts will be carried forward within the City.

An intersection control analysis was performed based on the methodology presented in the City of Ottawa *Roundabout Policy Report* prepared by GHD in September 2013. A decision matrix was used to compare economic and non-economic criteria, and to be responsive to the needs of individual locations. The base criteria for evaluating roundabouts at urban intersections were agreed upon with City members of the Transportation Master Plan Technical Advisory Committee and are listed as follows:

- Cost (Construction and Maintenance)
- Safety
- Capacity
- Pedestrians and Cyclists
- Environmental
- Access management
- Transit
- Property impacts

Based on the analysis presented in the memorandum, the collector/collector intersections in the northwest and southwest quadrants could be considered as possible candidates for roundabout control at the time the applications for Draft Plan of Subdivision are processed by the City.

The collector/collector intersections in the northeast and southeast quadrants should be considered as possible candidates for stop control/mini roundabout at the time the applications Draft Plan of Subdivision are processed by the City.